

TORCH CLEAN ENERGY

Request for Amendment to Special Use Permit
Docket SU-23-11

Cochise County

May 31, 2023

929 Pearl Street, Suite 300, Boulder, CO 80302

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1.0 PROJECT SUMMARY

On May 10th, 2023, Winchester Solar I, LLC and Winchester Solar II, LLC (the Applicant) was granted conditional Special Use Permit approval to construct, operate, and maintain a solar photovoltaic (PV) energy generation facility and battery energy storage system (BESS) with the potential for future expansion of up to 500 MW of solar generation and 500 MW of battery storage (Exhibit C). Collectively, these facilities are referred to as the "**Project**." The Project will interconnect at the Winchester Substation located to the west of the site via an overhead line.

1.1 Purpose for Amendment Request

The Applicant is seeking to amend the Special Use Permit to include an additional two parcels (209-86-001B and 209-86-001D) to the Project area as well as increase the expansion potential of the Project to 660 MW of solar power generation and battery storage. If the request for amendment is approved, the additional parcels will serve as an optimized location for the Project substation and battery yard. It is worth noting that the owner of the additional two parcels reached out to the Project during the Special Use Permit Process and wanted to participate in the Project. In addition, as agreed upon in the May 10th Planning Commission meeting, we have amended the original Project footprint so that the updated Project boundary is .25 miles further from neighboring landowners in the northeast corner of the site.

1.2 Project Location and Access

Including the additional two parcels, the Project area would be comprised of approximately 4,080 acres of land currently zoned RU-4 Rural. The Project is generally located north of the intersection of Highway 10 and Interstate 191 (Exhibit A) and is comprised of both privately-owned parcels as well as tracts of State Trust land, as outlined in the table below (Table 1). It is important to note that a larger acreage has been included in this application to allow flexibility for ongoing design optimization as site constraints are studied as well as for future expansion.

Access (ingress and egress) to the Project will be located at the interchange of Interstate 10 and U.S. Route 191, as shown in the Concept Plan (Exhibit A). Additionally, the Project is requesting a secondary access in the northeastern corner of the requested additional land, as shown in the Concept Plan in Exhibit A.

APN or S/T/R	Acreage	Status
209-86-001B	484.56	Requesting approval via amendment
209-86-001D	160.67	Requesting approval via amendment
All of APN 203-01-024A	80.01	Approved via SU-23-22
A portion of APN 209-86-002A	626	Approved via SU-23-22
A portion of APN 203-01-036	1,368	Approved via SU-23-22
Section 16, 14S, Range 24E (ASLD)	640	Approved via SU-23-22
Portion of the W 1/2 Section 15, 14S, 24E (ASLD)	65	Approved via SU-23-22
Portion of the NW 1/4, Section 21, 14S, 24E (ASLD)	81	Approved via SU-23-22
Portion of SE 1/4, Section 20, 14S, 24E (ASLD)	105	Approved via SU-23-22
SW 1/4 Section 19, 14S, 24E (ASLD)	160	Approved via SU-23-22
Portion of the NE 1/4 Section 30, 14S, 24E (ASLD)	148	Approved via SU-23-22
NW 1/4 Section 24, 14S, 23E (ASLD)	160	Approved via SU-23-22

Table 1. Parcel Number or S/T/R, Approximate Acreage, and Approval Status

2.0 PROJECT CONSIDERATIONS:

2.1 Site Selection

The Winchester Project area has been thoughtfully selected considering several factors, including the compatible adjacent land uses, existing transmission infrastructure, minimal topographic variability, proximity to transportation corridors, and various environmental factors.

2.2 Compatibility with Comprehensive Plan and Zoning Ordinance

The Project land is zoned RU-4 and designated as Category D (Rural) in the Cochise County Comprehensive Plan. In the Plan, Category D areas are characterized by low rates of growth, unimproved roads, low densities, large tracts of undeveloped private and public lands, and availability of sites large enough for intensive industrial uses that cannot be accommodated in other growth areas. These characteristics are compatible with the nature of utility-scale solar and battery storage projects which require a substantial amount of land to generate the power needed by local utilities. The Cochise County Zoning Ordinance states that solar energy power plants may be permitted in the RU zoning district by special use authorization. It is also worth noting that the Cochise County Comprehensive Plan includes goals and policies intended to support renewable energy efforts within the county.

2.3 Natural Resources

The Project area is predominantly within the Semidesert Grassland biotic community, while a portion of the Project area is within the Madrean Evergreen Woodland biotic community. The topography is the site is varied, ranging from relatively flat to rolling hills. A number of ephemeral washes generally flow from the

northwest to the southeast of the Project area. The land use in the Project's vicinity is largely undisturbed semidesert grassland, with the exception of roads, a residence and associated structures, and areas where the site has been sectioned or fenced.

Vegetation within the Project area is typical of semidesert grassland and shrub-invaded semidesert grassland with small-stature trees, shrubs, cacti, and succulents that are broadly scattered and the area hosts both native and non-native plant species. The Project will minimize grading, and hence, disturbance to plant root systems. Where the land is not graded, existing vegetation will be mowed with the hope that the roots will be preserved and existing vegetation will regrow.

SWCA has written a biological evaluation (Exhibit C) that summarizes the flora and fauna within the expanded boundary of the Project area as well as a Technical Memorandum regarding Potential Avian Impacts (Exhibit D).

2.4 Water Use

Winchester will not require any water resources to generate or store electricity. However, during the construction phases of the Project which are estimated to last between 10-12 months, water may be pumped from an on-site well to be used as a dust mitigation measure. The quantity of water for dust mitigation during construction varies depending on the time of year and weather, but the Applicant will ensure county requirements are met for dust mitigation. Once operational, water may very occasionally be brought to site on an as-needed basis to wash panels to optimize module performance. This water use would be minimal and has historically not been required.

2.5 Project Impacts on Real Estate Values

A number of studies indicate that utility-scale solar facilities do not have a measurable impact on the value of adjacent properties. In some situations, they have even been shown to have a positive effect. One study in Illinois found that the value of properties within a one-mile radius from a solar facility increased by an average of 2% post-solar installation.[1] The same study cited the same upward trend for property values within two miles of a solar facility in Indiana.[2]

Another study performed by CohnReznick Valuation Advisory Services analyzed the property value trends of both agricultural and residential properties which were adjacent to 11 existing solar facilities. The results showed no adverse effects on property values in the short or long-term.[3]

Because of Winchester's rural location and non-residential surrounding land uses, no adverse impacts to property values are expected.

[1] Kirkland, Richard C. Grandy Solar Impact Study. Kirkland Appraisals, 25 Feb. 2016, kirdlandapprasials.com
[2] Lines, Andrew. "Property Impact Study: Solar Farms in Illinois." Mcleancounty.gov, Nexia International, 7 Aug. 2018
[3] CohnReznik, LLC, 8 April, 2019, Adjacent Property Values Solar Impact Study: A Study of Seven Existing Solar Facilities

2.6 Traffic

Traffic to and from the Project will be heaviest during the construction phase. During the height of construction, which is expected to last roughly 6 to 8 months, approximately 15 to 30 trucks and 160 passenger vehicles can be expected to travel to and from the site per day to deliver materials and perform construction and install tasks. It is worth noting that this is an estimate based on previous experience. Following the construction phase, traffic will substantially decline during the testing phase of the Project, which is anticipated to last between 2 to 4 months. Once operational, traffic to and from the Project will be very minimal and infrequent as the site will be monitored remotely using a supervisory communication and data acquisition (SCADA) system. An estimate of 3 to 5 vehicles will travel to and from the site per month after the completion of construction and testing.

2.7 Noise

The majority of the noise associated with utility-scale solar and battery projects occurs during the temporary phase of construction. Equipment needed for site preparation and construction can include dozers, chippers, pile drivers, forklifts, and various trucks. According to the Federal Highway Administration Construction Handbook, the maximum noise from the above equipment does not exceed 72 decibels from 200 feet away, which is the equivalent to the noise of a busy office.[4] Once operational, electrical discharge from transmission lines, operation of inverters, and the rotation of solar trackers can create humming or buzzing noises, though these noises will be minimal and would not affect any area outside the Project. The Cochise County Zoning Ordinance states no specific noise regulations for the RU-4 zoning designation.

3.0 Regulatory Framework

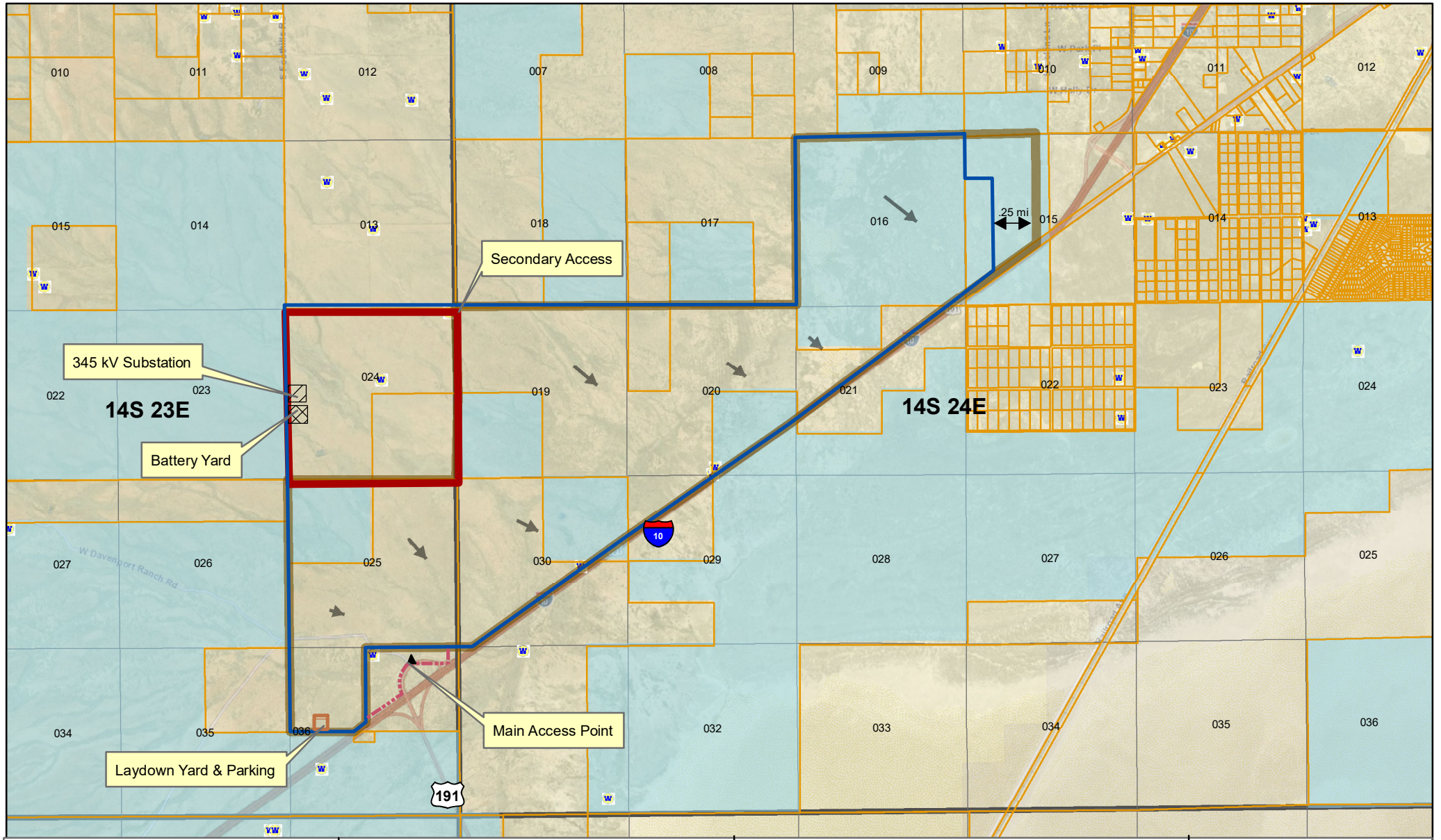
The Project will conform to all applicable federal, state, and local statutes, regulations, and enforceable plans. The following table outlines the authorizations anticipated to be necessary for the Project.

[4] U.S. Department of Transportation. FHWA Highway Construction Handbook. 2006. https://rosap.ntl.bts.gov/view/dot/8837/dot_8837_DS1.pd

Permit/Compliance	Authorizing Authority	Action Item
Federal Permits		
Bald and Golden Eagle Protection Act (BGEPA) Compliance	USFWS and AZGFD	Biological Evaluation
Endangered Species Act (ESA) Compliance	USFWS and AZGFD	Biological Evaluation
Migratory Bird Treaty Act (MBTA) Compliance	USFWS and AZGFD	Biological Evaluation
National Historic Preservation Act (NHPA) Section 106 Compliance	Arizona SHPO	Class III Survey
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)	American Society for Testing and Materials (ASTM) Standard E 1527-13	Phase 1 ESA
Clean Water Act (CWA), Section 401 and Section 402- Water Quality Certification	U.S Army Corps of Engineers	Obtain Permit
Determination of No Hazard	Federal Aviation Administration	File 7460-1 Obstruction Evaluation
State of Arizona Permits		
Arizona Certificate of Environmental Compatibility (CEC)	Arizona Corporation Commission	Line Siting Committee Hearing
Clean Water Act, Section 402 - NPDES Permit (General Construction Permit)	Arizona Department of Environmental Quality (ADEQ)	SWPPP and GCP
Groundwater/Surface Management Permit	Arizona Department Water Resources - Well	Obtain Permit, if applicable
Notice of Intent to Clear Land	Arizona Department of Agriculture (ADA)	Send notice to ADA
Air Quality Permit(s)	Arizona Department of Environmental Quality - Air Quality	Obtain Permit, if applicable
Aquifer Protection Permit	Arizona Department of Environmental Quality - Aquifer Protection	Usually not needed for Solar Projects in Az.
Cochise County Permits		
Special Use Permit	Cochise County	Submit for permit
Clearing Permit	Cochise County	Submit for permit
Building Permit	Cochise County	Submit for permit
Driveway/ROW Permit	Cochise County	Submit for permit
Floodplain Use Permit	Cochise County	Submit for permit

4.0 Exhibits

4.1 Exhibit A: Concept Plan



- Access Road
- Revised Project Boundary
- Permenter Land (New SU Case)
- Case #SU-23-11
- Drain Arrows
- County Parcel Boundaries
- AZ DEQ Wells
- State Trust Land

Winchester Energy Development 160MW

Concept Plan

May 22, 2023

Notes:
1. Substation and BESS location is preliminary and may move during final design but not less than 0.5 miles from I-10
2. Modules 10-15 ft tall
3. Project is on Private Land and ASLD land
4. Permanent Parking will be located at the substation
5. Temporary Parking will be located at Access Point along with a temporary laydown yard. Location shown in preliminary
6. A wetland delineation will be completed and confrimed by USACE and wetland features will be avoided except where crossings are needed for roads and cables and submitted to the County.
7. All archeological sites will be avoided
8. Project assumes no internal parcel setbacks
9. All Electrical equipment will be 1 foot above BFE

0 0.275 0.55 1.1 Miles

N

TORCH CLEAN ENERGY

4.2 Exhibit B: Special Use Permit Application and Questionnaire

Cochise County
Development Services
Planning Division
Public Programs...Personal Service
www.cochise.az.gov

APPLICATION FOR A SPECIAL USE

Applicant's Name: Winchester Solar I, LLC and Winchester Solar II, LLC ("Project")

Name of All Property Owner(s): John L Permenter & previous Cochise 3600 and ASLD

Applicant Mailing Address:

c/o Torch Clean Energy, LLC 929 Pearl St, Suite 300, Boulder, CO 80302

Street # Town State Zip code

Subject Property Address (if different than mailing address):

4207 S Permenter Road Willcox AZ 85643

Street # Town State Zip code

Email Address: sborn@torchcleanenergy.com

Phone Number: (303) 775-1773

Tax Parcel Number: 209-86-001B & 209-86-001D; and approved case SU-23-11

Current Zoning Designation: RU-4

Comprehensive Plan Land Use Category/Growth Area: Rural D

Comprehensive Plan Land Use Designation: NA

Area Plan Designation (if applicable): NA

Size of Property (in acreage or square feet): 651.21 ac (New total = 4,080 ac)

How many acres will be cleared and developed? 1600 acres for first phase

Please note that this acreage will depend on final civil plans.

Describe your relationship to this application. (Select one)

☐ I am the property owner

☑ I am an authorized agent for the property owner

Bisbee Office
1415 Melody Lane, Building F
Bisbee, Arizona 85603
520-432-9300
520-432-9278 fax
planningandzoning@cochise.az.gov

If the applicant is not the property owner, please attach a notarized letter of authorization to this application.

The Purpose of a Special Use

Special Uses include uses or activities with a greater potential for impacts on neighboring properties than the permitted uses in a Zoning District. Examples of Special Uses are manufacturing, RV Parks, guest ranches, hospitals and schools. These more intense uses must be carefully reviewed to decide if they could make good neighbors to the existing uses. For this reason, a Special Use Permit requires a public hearing and approval by the Planning and Zoning Commission before it is allowed.

What is the Process?

1. Pre-application meeting with County planning staff.
2. Citizen Review Process – the applicant must send notice to all property owners within a radius of no less than 300 feet of the subject parcel(s), as shown on the most recent available records of the last property tax assessment. The County Zoning Inspector may expand the mailed notification area to greater than a 300-foot radius at time of application acceptance if there are compatibility concerns associated with the request.
3. Application Submittal
4. Technical review by relevant internal staff and external agencies
5. Public Hearing – Planning and Zoning Commission (Approval/Denial)

Appeals

The Commission action can be appealed to the Board of Supervisors by anyone who disagrees with the outcome. Appeals must be filed within fifteen (15) calendar days of the Commission action.
The applications are available online "Appeal: Board of Supervisors."

Required Submittals

1. This application
2. Citizen Review Report
3. Site plan -drawn to scale showing the existing and proposed District boundaries and an accurate legal description of the area being petitioned for amendment. See "concept plan instructions for special uses" (included in this application). Please see our website for an example plan: https://www.cochise.az.gov/development-services/special-uses
4. Letter of Authorization (for authorized agents, if applicable)
5. Hazardous or polluting materials attachment (only if hazardous materials are proposed, if applicable)
6. Deed restrictions (if applicable)
7. Outdoor lighting, manufacturers specifications (if applicable)
8. Processing Fee

Concept Plan Instructions for Special Uses

Sometimes, an applicant will seek approval for a particular special use or uses on a piece of property well ahead of actual construction or operation of that use. Often the exact dimensions of structures or configuration of uses on the property are not known yet until the uses have been approved and the applicant has invested resources into site planning. The Zoning Regulations allow for the submittal of a "Concept Plan" in lieu of a site plan in the case of phased special uses on one property or a special use where construction is not anticipated within one year. However, if the use(s) are approved by the Planning and Zoning Commission, then a detailed site plan meeting the requirements of the Zoning Regulations will be required for each use or phase and shall be in substantial conformance with the approved special use. If the site plan is not within substantial conformance with the approved use and concept plan, then the special use will need to be reviewed, in a public hearing, by the Commission once again to modify the original proposal. **Note: any**

anticipated waivers of site development standards such as setbacks, screening, landscaping or parking spaces must be requested, justified, and approved by the Commission prior to the issuance of a building permit.

In order to adequately review the proposed special use(s) on a piece of property, a Concept Plan must include at a minimum the following information:

- Parcel boundaries and adjacent roads;
- The general location, size and height of all structures and uses (existing and proposed), including minimum setbacks from parcel boundaries, washes and roads;
- The general location and minimum number of parking spaces to be provided, including proposed surface and width of driveways;
- Proposed screening and landscaping;
- Any significant topographical features (washes, hills, rock outcroppings, wetlands) and cultural features of the property and adjacent parcels;
- If applicable, project phasing (approximate schedule of uses and construction) and any other information deemed necessary to effectively review the Special Use.

Please state the reason for this request and why it should be supported.

The Project is requesting an amendment to Cochise County SUP Docket SU-23-11 to include an additional two parcels (209-86-001B and 209-86-001D) to the Project area, increase the expansion potential of the Project to 660 MW of solar and battery storage, as well as permit a secondary access point. The 660 MW of power generation would provide the amount of power required for roughly 138,600 homes.

Identify the utility company/service provider for each of the following services and state if additional provisions or future connections are required in the space below.

Service Provider	**Service Provider**	**Additional Provisions Required**
Water/Well	Not applicable/needed	
Sewer/Septic	Not applicable/needed	
Electricity	Sulphur Springs	
Natural Gas	Not applicable/needed	
Telephone	Cellular	
Fire Protection	Outside County fire service area	
Waste Disposal	Construction trash to be taken off-site	

Is this request consistent with all deed restrictions or private covenants in effect for this property? If applicable, please include a copy of these restrictions/covenants with this application.

☐ Yes ☐ No ☑ Not applicable (no deed restrictions or covenants)

Describe all **existing** structures/uses present on the subject parcel. Note: the size and location of existing structures must be shown on the accompanying site plan.

There is an existing house as well as a few structures in the northeast of the additional land for the Project.

Describe all **proposed** structures/uses on the parcel that to be placed on the parcel. Note: the size and location of proposed structures must be shown on the accompanying site plan.

The additional land would host the Project Substation, battery energy storage system (BESS) yard, as well as rows of solar modules mounted on racking equipment that tracks the sun throughout the day. Inverters will be used to convert the power from direct current to alternating current and transformers will "step up" the power to transmission voltage. A battery energy storage system (BESS) is planned to be constructed as part of the Project which will require inverters, transformers, a cooling system and fire detection and prevention.

Is the proposed special use consistent with stated purpose of the current zoning district? Explain.

The Project site is located in zoning district RU-4 and designated as Category D. The proposed solar and battery energy storage facilities are consistent with the stated purpose of these districts. Per the Plan, Category D areas are characterized by low rates of growth and large tracts of undeveloped lands, and availability of sites large enough to be used for intensive used that can't be accommodated in other growth areas. Additionally, per the Cochise County Zoning Ordinance, solar energy power plants may be permitted in RU zoning districts by Special Use Authorization only.

Describe all intermediate and final products/services that will be produced/offered/sold, if applicable.

The Project will generate electricity to be sold under long-term Power Purchase Agreements (PPAs) with an investor-owned utility and cooperative.

What materials will be used to construct the new building(s)? (Note, for an existing building(s), please also list the construction type(s), i.e., factory-built building, wood, block, metal).

There will be no buildings.

Will the project be constructed/completed within one year or phased?

☐ One year

☑ Phased

If this is a phased project, describe the phases here and physically depict them on the site plan.

The Project's first phase will include two 80 MW solar facilities as well as two 80 MW battery storage facilities. Additional land is being permitted for an expansion in the future.

What are the days and hours of operation (if applicable)?

Days of the week: Every day

12 AM to 12 PM

Number of employees (if applicable):

Initially 120 Future: 2-4

Total average daily traffic generated (non-residential uses):

How many vehicles will be entering and leaving the site (per day)? 160 passenger vehicles (During construction)

Total trucks (e.g., by type, number of wheels, or weight)? 15-30/day during construction

Estimate which direction(s) and on which road(s) the traffic will travel from the site.

Ingress/egress will occur via the same route at the interchange of US 191 & Hwy 10.

If more than one direction, estimate the percentage that travel in each direction.

Ingress/egress via the same access point at the interchange of US 191 and Hwy 10.

At what time of day, day of week and season (if applicable) is traffic the heaviest?

Traffic will be heaviest during daylight hours midway through the construction period.

Water Use:

Estimate the total gallons of water needed for the proposed use: per day 0 per year 0

Please indicate your water source Once operational, water may be brought to site on an as-needed basis.

If your property is served by a private well, show the existing or proposed location on the site plan.

Well locations are shown on the site plan.

List any strategies you will employ, on site, to minimize water use, recycle water, and/or enhance onsite natural recharge.

The photovoltaic technology which will be utilized at the Project will not require any water consumption to generate electricity. Because of the arid nature of the Project location, module washing may be necessary on a very infrequent basis as annual monsoons should help to keep the panels clean. Should additional cleaning become necessary, water will be trucked in from an outside source because water must be free of any particles.

Will your property be served by a septic system? ☐ Yes ☑ No

If yes, show the septic tank, leach field and 100% expansion area on the site plan, and indicate whether the system is existing or proposed.

Does your parcel have permanent legal access*? If no, what steps are you taking to obtain such access? (*Our Zoning Regulations state that no building permit for a nonresidential use shall be issued unless a site has permanent and direct access to a publicly maintained street or street where a private maintenance agreement is in place. Said access shall be not less than twenty (20) feet wide throughout its entire length and shall adjoin the site for a minimum distance of twenty (20) feet. If access is from a private road or easement provide documentation of your right to use this road or easement and a private maintenance agreement.)

The Project does have permanent legal access from existing roads off of the interchange from Interstate 10.

Which streets or easements will be used for traffic entering or exiting the property? (Please label on the accompanying plan)

Ingress and egress will likely both occur from the service road at the interchange of Highway 10 and US 191, as shown on the Concept Plan. A secondary access point has been proposed off Permenter Road, as shown in the Concept Plan.

What impact will this have on the traffic volume of roads serving this subject property?

The impact will be most severe during the construction period of the Project. It is estimated that there will be 15-30 delivery trucks/day on average and construction vehicles could be up to 160/day during the peak of construction. Once the Project is operational, there will be very minimal traffic as the Project will be remotely monitored through a SCADA system.

How many driveway cuts are proposed along streets or easements to allow site access? State whether this is an increase/decrease and whether any existing cuts will need relocation.

The Project's primary access point will be via an existing driveway off of the I-10 and US 191 interchange. A secondary access point is proposed off of Permenter Road using the existing driveway.

Does the subject parcel have site access onto a major road?

☑ Yes ☐ No

Are you requesting any modifications or waivers from site development standards? If yes, explain.

A variance from the the solar ordinance section 1824.02 Setbacks is requested for internal parcel boundaries such that the setbacks are only applied to the exterior of the Project.

1824.06 Decommission and Site Restoration: Applicant is requesting this be submitted with the building permit.

Is the subject property within Sierra Vista Sub-Watershed Overlay Zone? If so, please indicate this, and that you understand that it may be subject to additional plan reviews and inspections whenever a building permit is required.

☐ Yes, and I understand the permitting requirements ☑ No, it's outside the boundaries

Please describe your citizen review process (if applicable). Specifically, state whether you received any responses to your mailed notice or public meeting. Explain how your special use application has incorporated the feedback you received.

The Project has mailed out notification letters to parcels within 0.25 miles of the Project area and will report back to the County as comments come in. Please note the Project was originally sited 14 miles to the west, but has moved locations due to landowner and ASLD grazing lessee concerns about impacts to grazing operations.

Describe any outdoor activity associated with your special use proposal, if applicable.

The Project will be constructed outdoors.

Will outdoor storage of equipment, materials or products be needed? If yes, show the location on the site plan. Describe any measures to be taken to screen this storage from neighboring properties.

A construction laydown yard will be needed to store equipment and materials. The preliminary location of this is shown on the Concept Plan.

Will any noise or vibrations be produced that can be heard or felt on neighboring properties on a regular basis? if yes; describe the level and duration of this noise. What measures are you proposing to prevent this noise from being heard on neighboring properties?

Once the Project is operational, the Project will not produce any noise or vibrations that can be heard or felt on neighboring properties. The majority of the noise will be produced during the construction period, though noise impacts to neighboring properties will be minimal due to the rural location of the Project.

Will odors be created? If yes, what measures will be taken to prevent these odors from escaping onto neighboring properties?

The Project will not produce any odors.

Will any on-site activities attract pests, such as flies or mice? If yes, what measures will be taken to prevent a nuisance on neighboring properties?

There will be no on-site activities which attract pests.

Will additional dust be created on a regular basis? If yes, what measures will be taken to prevent this dust from escaping onto neighboring properties or roadways?

Dust will be created by construction traffic and will be controlled using water from an on-site well or water trucks, as needed.

Is outdoor lighting proposed? If yes, show the location(s) on the site plan. Indicate how neighboring properties and roadways will be shielded from light spillover. Please submit manufacturer's specifications for all light fixtures.

☑ Yes ☐ No There will be at least two foot candles at the substation as recommended by NEC guidelines that will be switch operation.

Will you be performing any off-site construction (e.g., access aprons, driveways, and culverts)? If yes, show details on the site plan. Note: The County may require off-site improvements reasonably related to the impacts of the use such as road or drainage improvements.

☑ Yes ☐ No A road will be graded from the access point shown on the site plan to the Project boundary.

Show on-site drainage flow on the site plan. Will drainage patterns on site be changed? If so, please indicate on the site plan and describe below.

Drainage Flow arrows are shown on the site plan. Generally drainage patterns will not change as minimal grading is needed. Included in this application is a preliminary drainage report. A more detailed drainage report that meets Cochise County requirements will be submitted with the clearing and building permits.

If more than one acre is to be cleared, describe the proposed dust and erosion control measures to be used and show on site plan, if appropriate.

A water truck, or possibly environmentally safe polymers, will be used for dust control. Silt fences; coir logs (coconut fiber), coir blankets, etc., will be used to reduce water erosion during construction. In the post-construction phase, the only permanently cleared land will be land area used for a substation, inverter and transformers skids, and the battery system. After construction is completed, soil stabilization and re-seeding efforts will serve as natural erosion control as well as a dust mitigation measure.

Do you anticipate the use of any hazardous or dangerous materials? If yes, please complete a "Hazardous or Polluting Materials Attachment" and attach it to this application.

☐ Yes ☑ No

I hereby certify that I am the owner or duly authorized owner's agent and all information in this questionnaire, in the Joint Permit Application and on the site plan is accurate. I understand that if any information is false, it may be grounds for revocation of the Commercial Use/ Building/ Special Use Permit. In addition, I hereby request all inspections necessary to process this application, and if the permit is issued, I request all inspections necessary to monitor progress, and document completion, at all stages of the work related to this permit. Failure to obtain permits may result in fines or other penalties.

Sara Borum — May 31, 2023

Applicant Signature — Date

4.3 Exhibit C: Special Use Permit Approval with Conditions

COCHISE COUNTY Arizona

Development Services Department

NOTICE OF ACTION

May 11, 2023

Winchester Solar I, LLC and Winchester Solar II, LLC
c/o Torch Clean Energy, LLC
929 Pearl St, Suite 300,
Boulder, CO 80302
Transmitted Via email

RE: Docket SU-23-11 (Winchester Solar)

Dear Applicant,

As you are aware, on Wednesday, May 10, 2023, the Cochise County Planning and Zoning Commission (Commission) voted 6-1 (approve, deny) to **conditionally approve** your request to Authorization to construct, operate, and maintain a proposed Solar Energy Power Plant and Battery Energy Storage System (BESS) Project on 3,584-acres of land, where listed on the following table:

APN or Section, Township, and Range	Acreage
All of APN 203-01-024A	80.01 acres
A portion of APN 209-86-002A	620 acres
A portion of APN 203-01-036	1,348 acres
Section 16, 14S, Range 24E (ASLD)	640 acres
Portion of the W 1/2 Section 15, 14S, 24E (ASLD)	210 acres
Portion of the NW 1/4, Section 21, 14S, 24E (ASLD)	75 acres
Portion of SE 1/4, Section 20, 14S, 24E (ASLD)	103 acres
SW 1/4 Section 19, 14S, 24E (ASLD)	160 acres
Portion of the NE 1/4 Section 30, 14S, 24E (ASLD)	146 acres
NW 1/4 Section 24, 14S, 23E (ASLD)	160 acres

Table 1. Parcel/PLSS Description and Approximate Acreages

Note: As a reminder, the Commission's action was to authorize you to apply for the appropriate permits for your requested use; this permission does not relieve you of the obligation to apply for and obtain all required permits such as a County Planning and Zoning Department Use Permit and Building Permit, a Land Clearing Permit, and/or other permits as may be applicable. You should contact the Planning Department Permit Coordinator if you have any questions on what types of permits you need to obtain.

The Commission imposed the following conditions of approval on these applicable permits:

Planning, Zoning and Building Safety
1415 Melody Lane, Building F
Bisbee, Arizona 85603
520-432-9300
planningandzoning@cochise.az.gov

1. Within 30-days of approval of the Special Use, the applicant shall provide the County a signed Acceptance of Conditions form and a Waiver of Claims form arising from ARS Section 12-1134. Prior to operation of the Special Use, the applicant shall apply for a building/use permit for the project within 12-months of approval. The building/use permit shall include a site plan in conformance with all applicable site development standards (except as modified) and with Section 1705 of the Zoning Regulations, the completed Special Use permit questionnaire and application, and appropriate fees. A permit must be issued within 18-months of the Special Use approval otherwise, the Special Use may be deemed void upon 30-day notification to the applicant;
2. It is the applicant's responsibility to obtain any additional permits, or meet any additional Conditions, that may apply to the proposed use pursuant to other federal, state, or local laws or regulations;
3. Any changes to the approved Special Use will be considered a Modification to this Special Use and will require review and approval of the Planning and Zoning Commission.
4. The project owner shall maintain the project site with perennial vegetated groundcover and noncompacted soil. Where grading is not required during project construction, any existing vegetation will be mowed rather than removed completely.
5. The project owner shall exclusively use PV panels with an anti-reflectivity coating that is integral to the panel.
6. All panels shall be regularly inspected and continuously maintained by the project owner. Any broken or damaged panels shall be properly and safely removed in a timely manner from the site.
7. To reduce the optical illusion of water that closely spaced panels can create, the project shall be designed with no less a twelve-foot distance between all tracker rows.
8. The applicant shall submit a completed wetland delineation, confirmed by USACE prior to commercial permit issuance. Wetland features shall be avoided except where crossings are needed for roads and cables.
9. To the extent feasible, non-fenced, wildlife corridors within project boundaries shall be reserved near washes or in areas determined by the AZGFD to be appropriate for a wildlife highway crossing.
10. The final locations of the proposed substation and battery energy storage system may deviate from what is indicated on the concept plan, provided each are located within project boundaries a minimum of 0.5 miles from I-10.
11. Pursuant to 1824.03 of the Zoning Regulations, which mandates wildlife-friendly fencing, the applicant shall reserve a 6–8-inch gap between the ground surface and the bottom of the perimeter fencing.
12. The commission grants a waiver from setback required to internal parcel boundaries. Instead, minimum setbacks of 40' shall only be applied to the exterior boundaries of the Project indicated by the concept plan.
13. The project owner shall maintain an additional buffer from the northeastern project boundary limits, no less than ¼ mile for the life of the project.

If you or anyone disagrees with the action taken by the Commission, the Zoning Regulations allows for an appeal of the action to the Board of Supervisors. Such appeal must be filed within fifteen (15) calendar days of the Commission's action on May 25, 2023. If you have any questions, please feel free to call me at (520) 432-9266 or email me at cmclachlan@cochise.az.gov.

Sincerely,

Christine McLachlan

Christine McLachlan, AICP
Planning Division Manager

Acceptance of Conditions:
Special Use Approval, Docket No. SU-23-11 (Winchester Solar)

I, the undersigned, am an authorized agent for all parcels, and part of parcels, included in docket SU 23-11 (Winchester Solar). This property is the subject property for Docket SU-23-11, being a request for Special Use Authorization to construct, operate, and maintain a proposed Solar Energy Power Plant and Battery Energy Storage System (BESS) Project. On May 10, 2023, the Cochise County Planning and Zoning Commission conditionally approved Docket SU-23-11, subject to the following conditions of approval, to which I agree to adhere:

1. Within 30-days of approval of the Special Use, the applicant shall provide the County a signed Acceptance of Conditions form and a Waiver of Claims form arising from ARS Section 12-1134. Prior to operation of the Special Use, the applicant shall apply for a building/use permit for the project within 12-months of approval. The building/use permit shall include a site plan in conformance with all applicable site development standards (except as modified) and with Section 1705 of the Zoning Regulations, the completed Special Use permit questionnaire and application, and appropriate fees. A permit must be issued within 18-months of the Special Use approval otherwise, the Special Use may be deemed void upon 30-day notification to the applicant;
2. It is the applicant's responsibility to obtain any additional permits, or meet any additional Conditions, that may apply to the proposed use pursuant to other federal, state, or local laws or regulations;
3. Any changes to the approved Special Use will be considered a Modification to this Special Use and will require review and approval of the Planning and Zoning Commission.
4. The project owner shall maintain the project site with perennial vegetated groundcover and noncompacted soil. Where grading is not required during project construction, any existing vegetation will be mowed rather than removed completely.
5. The project owner shall exclusively use PV panels with an anti-reflectivity coating that is integral to the panel.
6. All panels shall be regularly inspected and continuously maintained by the project owner. Any broken or damaged panels shall be properly and safely removed in a timely manner from the site.
7. To reduce the optical illusion of water that closely spaced panels can create, the project shall be designed with no less a twelve-foot distance between all tracker rows.
8. The applicant shall submit a completed wetland delineation, confirmed by USACE prior to commercial permit issuance. Wetland features shall be avoided except where crossings are needed for roads and cables.
9. To the extent feasible, non-fenced, wildlife corridors within project boundaries shall be reserved near washes or in areas determined by the AZGFD to be appropriate for a wildlife highway crossing.
10. The final locations of the proposed substation and battery energy storage system may deviate from what is indicated on the concept plan, provided each are located within project boundaries a minimum of 0.5 miles from I-10.
11. Pursuant to 1824.03 of the Zoning Regulations, which mandates wildlife-friendly fencing, the applicant shall reserve a 6–8-inch gap between the ground surface and the bottom of the perimeter fencing.
12. The commission grants a waiver from setback required to internal parcel boundaries. Instead, minimum setbacks of 40' shall only be applied to the exterior boundaries of the Project indicated by the concept plan.
13. The project owner shall maintain an additional buffer from the northeastern project boundary limits, no less than ¼ mile for the life of the project.

Sara Bowen _____ May 17, 2023 _____

Authorized Agent Date

BENROSS CORPORATION

May 16, 2023

Ms. Christine McLachlan
Cochise County Planning and Zoning
1415 Melody Lane, Building F
Bisbee, Arizona 85603

No. SU-23-11: Diminution of Value Waiver

Dear Christine:

Here is the waiver for diminution of value which I have signed before a notary.

Best regards,

Michael Ben-Horin
General Partner
Cochise 3600 L.L.L.P.

6991 E. Camelback Rd, Ste. D-100, Scottsdale AZ 85251 mike@benross.com
3200 E. CAMELBACK ROAD, SUITE 130 • PHOENIX, ARIZONA 85018 • (602) 468 0040 • FAX (602) 468 1265 • ben@benross-corporation.com

ACCEPTANCE OF CONDITIONS/WAIVER FOR DIMINUTION OF VALUE
Special Use Approval, Docket No. SU-23-11 (Winchester Solar)

203-01-024A, 209-86-002A ?

I, the undersigned, am the owner for parcel 203-01-036, included in docket SU 23-11 (Winchester Solar). This property is the subject property for Docket SU-23-11, being a request for Special Use Authorization to construct, operate, and maintain a proposed Solar Energy Power Plant and Battery Energy Storage System (BESS) Project on rural zoned parcels.

By signing this document, I, the undersigned property owner, waive any right to compensation for diminution in value pursuant to Arizona Revised Statutes §12-1134 that may now or in the future exist as a result of the approval of Docket # SU-23-11.

Dated this 16th day of May, 2023.

AUTHORIZED AGENT (s): [Entity name and descriptions]

By: Michael Ben-Horin
Print Name

MBH
Sign Name

Its: General Partner
[Title]

STATE OF Arizona)
County of Maricopa) ss

The foregoing instrument was acknowledged before me on May 16, 2023by.

Notary Public

My commission expires:

1/19/2026

(TO BE RECORDED BY PLANNING DEPARTMENT)

NOTARY PUBLIC JAMIE POPE MARICOPA CO., AZ COMM. NO. 621257 COMM. EXP. 01-19-26

4.4 Exhibit D: Biological Report

Biological Evaluation for the Winchester Solar and Battery Storage Project in Cochise County, Arizona

MARCH 2023 (REVISED MAY 2023)

PREPARED FOR

Winchester Solar I & 2

PREPARED BY

SWCA Environmental Consultants

BIOLOGICAL EVALUATION OF THE WINCHESTER SOLAR AND BATTERY ENERGY STORAGE PROJECT IN COCHISE COUNTY, ARIZONA

Prepared for

Winchester Solar I & II
Sara R. Born, P.E.
Director of Project Development
929 Pearl Street, Suite 300
Boulder, Colorado 80302
sborn@torchcleanenergy.com

Prepared by

SWCA Environmental Consultants
1645 South Plaza Way
Flagstaff, Arizona 86001
(928) 774-5500
www.swca.com

SWCA Project No. 80483

March 2023 (Revised May 2023)

EXECUTIVE SUMMARY

The purpose of this biological evaluation (BE) is to address the Endangered Species Act of 1973, as amended (ESA) (16 United States Code 1531 et seq.), for the proposed Winchester Solar and Battery Energy Storage Facility in Cochise County, Arizona. Winchester is proposing to develop a solar and battery energy storage facility (project) on approximately 4,240 acres (2,710 acres on privately owned land and 1,530 acres on Arizona State Land Department [ASLD] lands) in Cochise County, Arizona (project area). The survey area is in Sections 24, 25, and 36, Township (T) 14 South (S), Range (R) 23 East (E); and Sections 15, 16, 19 through 21, and 29 and 30, T14S, R24E Gila and Salt River Baseline and Meridian.

The objectives of this BE are to 1) describe vegetation communities in the survey area and 2) evaluate habitat suitability for both federally listed and special-status species. This BE is intended to identify and document special-status species and habitat that may be present within the survey area.

One of the 27 species listed by the U.S. Fish and Wildlife Service as endangered; threatened; experimental population, non-essential; or candidate species for Cochise County may occur in the survey area. The monarch butterfly (*Danaus plexippus*), a candidate that does not currently receive protection under the ESA, but that may be listed in the future, may occur within the survey area because the survey area is within the known range of the species and contains suitable habitat. While the survey area is within the range of the jaguar (*Panthera onca*), that species is unlikely to occur because of lack of habitat and human disturbance in the vicinity of the project. The other 25 species are not likely to occur in the survey area because the survey area is clearly beyond the known geographic or elevational range of these 25 species, or it does not contain vegetation or landscape features known to support these species, or both. This BE includes a summary of habitat requirements, potential for occurrence, and possible effects of the project for the 27 listed species.

The project would have *no effect* on any species listed under the ESA. For the monarch butterfly, the project *may impact individuals but is not likely to result in a trend toward federal listing or loss of viability.* Furthermore, the proposed project activities would not create habitat for any of these species. Five species of greatest conservation need (SGCN) have occurrence records within 5 miles of the project, and others have the potential to occur based on modeled habitat. For SGCN that occur, the project *may impact individuals but is not likely to result in a trend toward federal listing or loss of viability.*

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) was contracted by Winchester Solar 1 & 2 (Winchester) to complete a biological evaluation (BE) for the Winchester Solar and Battery Energy Storage Facility Project (project) in northwestern Cochise County, Arizona (Figure 1). Winchester is proposing to develop a solar and battery energy storage facility (project) on approximately 4,240 acres (2,710 on privately owned land and 1,530 on Arizona State Land Department [ASLD] lands) in Cochise County, Arizona. The survey area is in Sections 24, 25, and 36, Township (T) 14 South (S), Range (R) 23 East (E); and Sections 15, 16, 19 through 21, and 29 and 30, T14S, R24E Gila and Salt River Baseline and Meridian (Figure 2). The purpose of this BE is to address the Endangered Species Act of 1973, as amended (ESA) (16 United States Code [USC] 1531 *et seq*.), the Migratory Bird Treaty Act of 1918 (16 USC 703–712) (MBTA), the Bald and Golden Eagle Protection Act of 1940, as amended (16 USC 668–668d or 50 Code of Federal Regulations Part 22), and other special-status species regulations.

The scope of work for this BE included:

- review of the U.S. Fish and Wildlife Service (USFWS) species list for Cochise County generated through the Information for Planning and Conservation (IPaC) system;
- review of the Arizona Game and Fish Department (AGFD) online occurrence records for special-status species near the survey area;
- results of the field reconnaissance of the property; and
- evaluation of the potential for the species listed in this report to occur in the survey area.

2 METHODS

SWCA biologist Tyler Loomis conducted field reconnaissance of the survey area on March 20, 2023. Biologists Neil Clark and John Durham provided updated plant and wildlife information gathered while conducting other surveys in the biological survey area. The U.S. Geological Survey 7.5-minute quadrangle Red Bird Hills, Arizona, and maps provided by the client were used for general orientation and to locate the project boundaries. The field reconnaissance consisted of a pedestrian survey of the survey area to evaluate vegetation and landscape features considered important to the potential occurrence of special-status plant and animal species. Vegetation was classified to the community level according to the map "Biotic Communities of the Southwest" (Brown 1994) and plant taxonomy and nomenclature followed the standardized information presented in the PLANTS database maintained by the Natural Resources Conservation Service (NRCS) (NRCS 2023). Federally listed plants are referred to by the nomenclature used by the USFWS for listing.

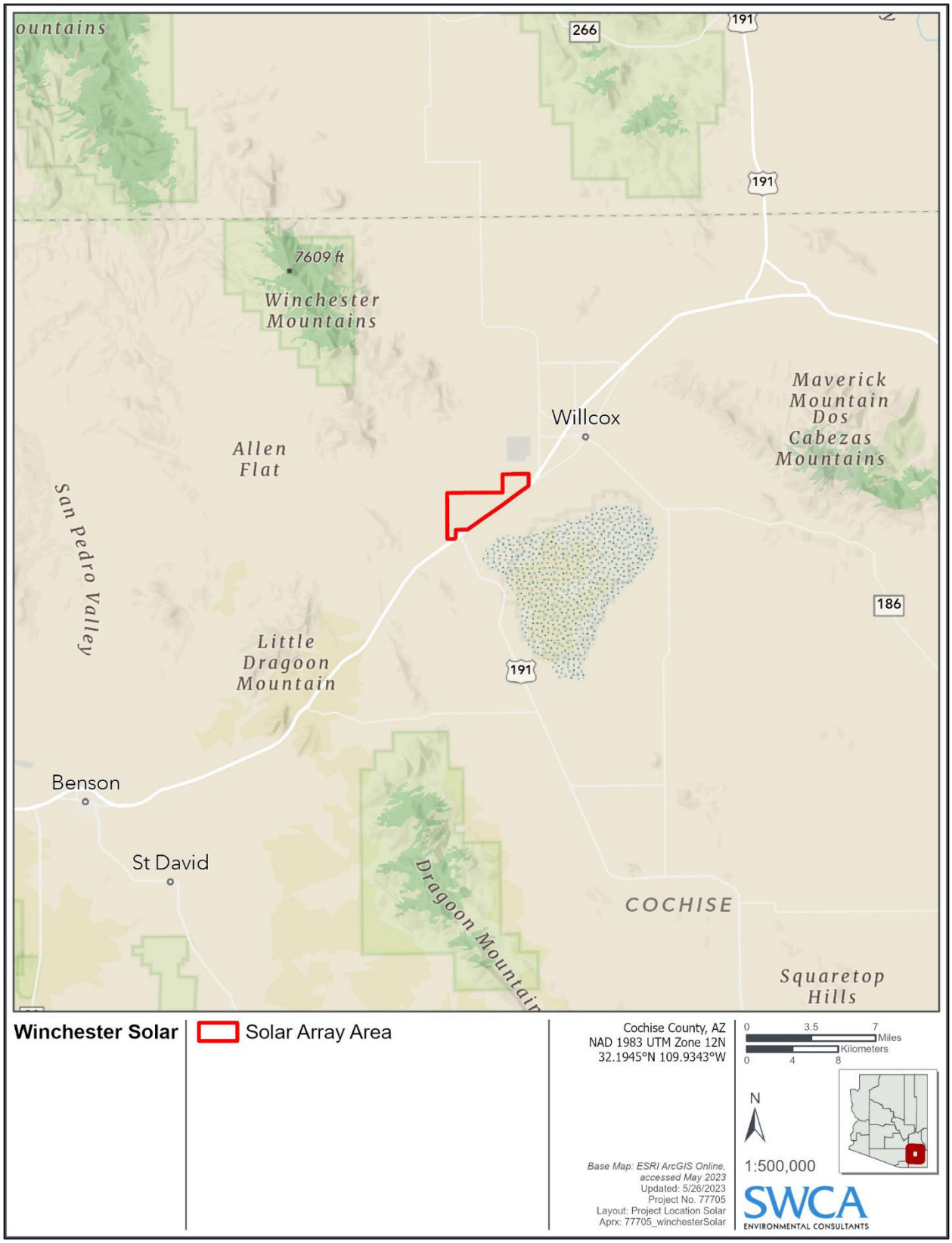


Figure 1. General location of the survey area.

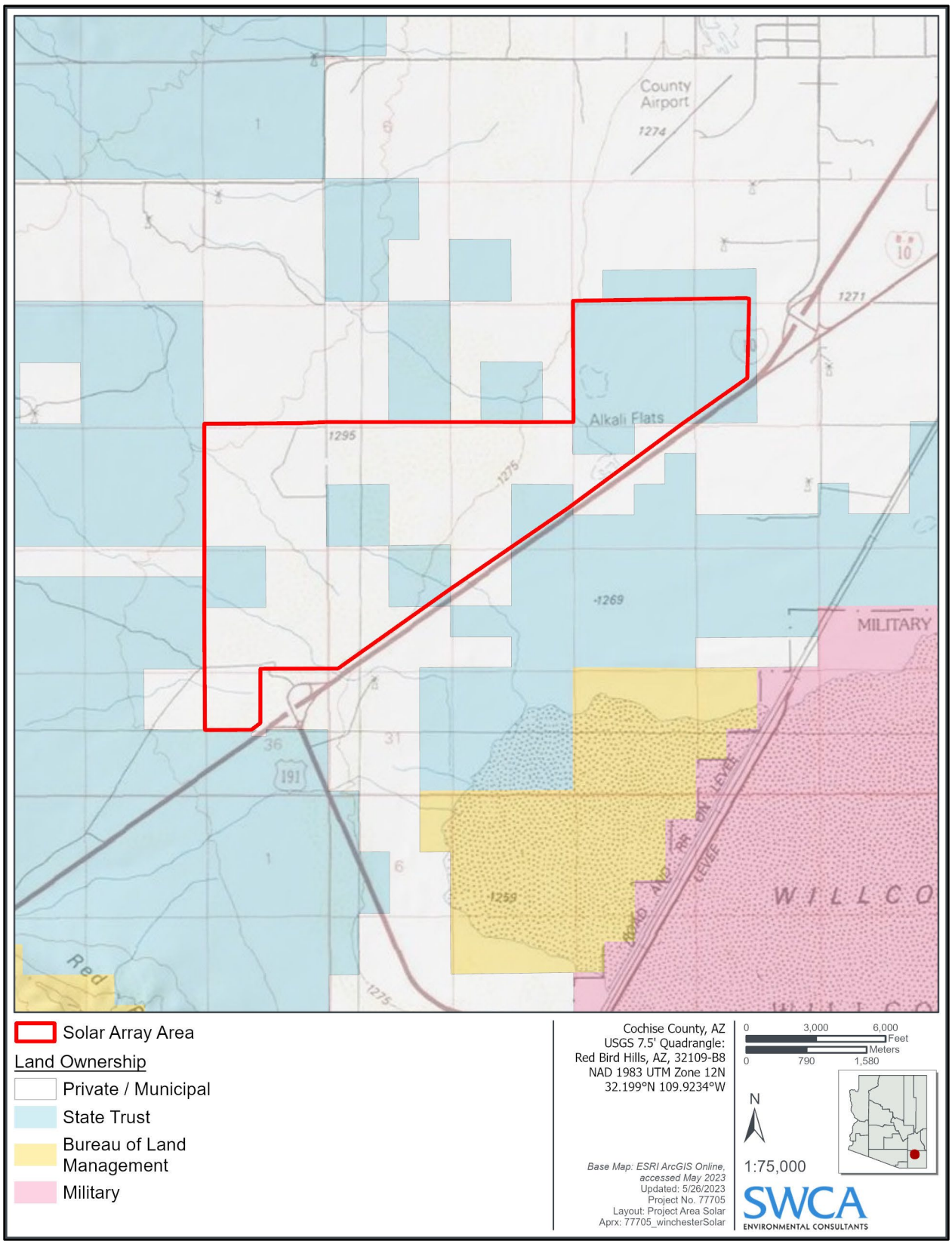


Figure 2. Survey area location.

2.1 Species Identification

The USFWS maintains a list of protected species and the critical habitat that is known to occur in each Arizona county. In addition, survey area specific information regarding protected species and the critical habitat is available online through the USFWS IPaC database (USFWS 2023a). Appendix A provides the IPaC list. These species are currently listed or are proposed for listing as endangered or threatened under the ESA. The list also includes non-essential experimental population species. The ESA specifically prohibits the "take" of a listed wildlife species. However, the ESA does not provide the same take protections of plant species, except on federal land. Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct." Some bird species also receive legal protection under the federal Migratory Bird Treaty Act (16 USC 703–712).

The AGFD maintains a statewide database, the Heritage Data Management System (HDMS), which tracks records for federally listed species and other species of special concern. SWCA accessed HDMS through the Arizona Heritage Geographic Information System (AZHGIS) online environmental review tool to determine whether any federally proposed or designated critical habitat or special-status species have been documented in or near the survey area (AGFD 2023a). Appendix B includes the search results.

The potential for occurrence on the property of the species addressed in this BE was based on 1) documented records; 2) existing information on distribution; and 3) qualitative comparisons of the habitat requirements of each species with vegetation communities or landscape features in the survey area[1]. Possible impacts to these species were evaluated based on reasonably foreseeable project-related activities.

2.2 Species Evaluation

The potential for occurrence of each species was summarized according to the categories listed below. Because not all species are accommodated precisely by a given category (i.e., category definitions may be too restrictive), an expanded rationale for each category assignment is provided. Potential for occurrence categories are as follows:

- *Known to occur*—the species has been documented in the survey area by a reliable observer.
- *May occur*—the survey area is within the species' currently known range, and vegetation communities, soils, etc., resemble those known to be used by the species.
- *Unlikely to occur*—the survey area is within the species' currently known range, but vegetation communities, soils, etc., do not resemble those known to be used by the species, or the survey area is clearly outside the species' currently known range.

Those species listed by the USFWS were assigned to one of three categories of possible effect, following USFWS recommendations. The effects determinations recommended by USFWS are as follows:

- *May affect, is likely to adversely affect* – the proposed project is likely to adversely affect a species if 1) the species occurs or may occur in the project site and 2) any adverse effect on listed

[1] SWCA agrees with Hall et al. (1997) that habitat is organism specific and thus not synonymous with vegetation community. However, we have refined their definition to read as follows: habitat is an area in which some members of a species regularly occur continuously or seasonally. In the field, habitat is operationally defined by the presence or absence of a species. Areas that appear suitable for a species but that have not been surveyed are considered possible habitat. We avoid using the term potential with respect to habitat because potential is defined as "capable of becoming but not yet in existence"; possible, on the other hand, is defined as "of uncertain likelihood". We also avoid using the terms "unoccupied habitat" or "suitable, but unoccupied habitat," which represent a contradiction in terms.

species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial. In the event that the overall effect of the proposed action is beneficial to the listed species but also is likely to cause some adverse effects, then the proposed action "is likely to adversely affect" the listed species.

- *May affect, is not likely to adversely affect* – the project is not likely to adversely affect a species if 1) the species may occur, but its presence has not been documented and/or surveys following approved protocol have been conducted with negative results and/or 2) project activity effects on a listed species are expected to be discountable, insignificant, or completely beneficial.
- **Beneficial effects** – contemporaneous positive effects without any adverse effects on the species. **Insignificant effects** relate to the size of the impact and should never reach the scale where take occurs. **Discountable effects** are those extremely unlikely to occur. Based on best judgment, a person would not 1) be able to meaningfully measure, detect, or evaluate insignificant effects or 2) expect discountable effects to occur.
- *No effect* – the project will have no effect on a species if 1) it has no likelihood of effect on a listed species or its designated critical habitat (including effects that may be beneficial, insignificant, or discountable) or 2) the species' habitat does not occur in the project site.

Because species not listed as threatened or endangered are not protected under the authority of the ESA, impact determinations for these species do not follow the above USFWS recommendations. Instead, the impact determinations for any species listed as candidate or proposed threatened and not protected under the ESA are as follows:

- *No impact* – the project would have no impact on a species if 1) the species is considered unlikely to occur (range, vegetation, etc., are inappropriate) and 2) the species or its sign was not observed during surveys of the survey area.
- *Beneficial impact* – the project is likely to benefit the species, whether it is currently present or not, by creating or enhancing habitat elements known to be used by the species.
- *May impact individuals but is not likely to result in a trend toward federal listing or loss of viability* – the project is not likely to adversely impact a species if 1) the species may occur but its presence has not been documented and 2) project activities would not result in disturbance to areas or habitat elements known to be used by the species.
- *May impact individuals and is likely to result in a trend toward federal listing or loss of viability* – the project is likely to adversely impact a species if 1) the species is known to occur in the survey area and 2) project activities would disturb areas or habitat elements known to be used by the species or would directly affect an individual.

3 RESULTS

3.1 Ecological Overview

The survey area is mapped within the Semidesert Grassland biotic community (Brown 1994), at an elevation ranging from 4,165 to 4,965 feet above mean sea level (amsl) in northwest Cochise County, Arizona.

The survey area is north of Interstate 10 (I-10) where it intersects with U.S. Route 191. I-10 forms the southeast boundary of the proposed solar array area. The survey area occurs along the western edge of the

Sulphur Springs Valley. The Willcox Playa is approximately 1.2 miles southeast of the survey area, across I-10. The topography within the survey area is varied but is generally relatively flat and sloping southeast toward the Willcox Playa. The Winchester Mountains, San Pedro River, Little Dragoon Mountains, and Dos Cabezas Mountains lie 5 miles northeast, 19 miles west, 8 miles southwest, and 9.5 miles northeast of the survey area, respectively.

Several unnamed ephemeral washes cross the survey area. In the eastern portion of the survey area, drainages generally flow from northwest to southeast toward the Willcox Playa or flow from south to north toward a larger unnamed drainage that ultimately flows into the Willcox Playa.

Several excavated cattle ponds/tanks occur within the survey area, all of which contained water at time of the survey (March 20, 2023). The shores of the excavated cattle ponds were typically barren or were bordered by scattered velvet mesquite (*Prosopis velutina*) and thistle (*Cirsium* sp.). No emergent vegetation occurred within the excavated stock ponds. Soils varied widely across the survey area, ranging from sandy to rocky with alkali flats being mapped within the survey area.

The survey area contains human disturbances, including unnamed dirt roads ranging from well-maintained, graded dirt roads to two-tracks associated with existing electrical infrastructure or fence lines, a residence and associated structures and access roads in the southern portion of the survey area, and areas where the survey area appears to have been chained. Off-highway vehicle use and cattle grazing were also observed.

Land use in the vicinity surrounding the survey area is largely undisturbed semidesert grassland, with the exception of existing roads (including I-10) with sparsely distributed residential areas, cattle ranch operations, agricultural activities associated with the Sulphur Springs Valley and San Pedro River areas, and a solar generation facility.

3.2 Vegetation

Vegetation is generally uniform throughout the survey area except for along the washes. Vegetation cover and species diversity increases within and surrounding the xeroriparian washes, however, no riparian areas or wetlands occur. No broadleaf deciduous riparian vegetation communities (i.e., communities containing willow [*Salix* spp.], ash [*Fraxinus* spp.], etc.) were noted in the survey area.

Vegetation within the survey area is typical of semidesert grassland and shrub-invaded semidesert grassland. Vegetation was typically open, with small-stature trees, shrubs, cacti, and succulents that are widely scattered and form a sparse upper canopy with an understory of grasses and patches of bare ground.

Grasses included native species such as curly-mesquite (*Hilaria belangeri*), deergrass (*Muhlenbergia rigens*), hairy grama (*Bouteloua hirsuta*), low woollygrass (*Dasyochloa pulchella*), purple threeawn (*Aristida purpurea*), side-oats grama (*Bouteloua curtipendula*), tobosagrass (*Pleuraphis mutica*), and nonnative species including Bermudagrass (*Cynodon dactylon*) and Lehmann lovegrass (*Eragrostis lehmanniana*). Common forbs and subshrubs included careless weed (*Amaranth palmeri*), desert globemallow (*Sphaeralcea ambigua*), desert thorn-apple (*Datura discolor*), desert zinnia (*Zinnia acerosa*), milkweed (*Asclepias* sp.), prickly poppy (*Argenome gracilenta*), thistle (*Circium* sp.), and trailing windmills (*Allionia incarnata*). Common trees and shrubs, and succulents included banana yucca (*Yucca baccata*), burroweed (*Isocoma tenuisecta*), cactus apple (*Opuntia engelmannii*), candy barrelcactus (*Ferocactus wislizeni*), catclaw mimosa (*Mimosa aculeaticarpa* var. *biuncifera*), Christmas cactus (*Cylindropuntia leptocaulis*), desertbroom (*Baccharis sarothroides*), dollarjoint pricklypear (*Opuntia chlorotica*), honey mesquite (*Prosopis glandulosa*), jointfir (*Ephedra* sp.), ocotillo (*Fouquieria splendens*), Palmer's century plant (*Agave palmeri*), pinkflower hedgehog cactus (*Echinocereus fendleri*),

purple pricklypear (*Opuntia macrocentra*), sacahuista (*Nolina microcarpa*), soaptree yucca (*Yucca elata*), spinystar (*Escobaria vivipara*), twistspine pricklypear (*Opuntia macrorhiza*), velvet mesquite (*Prosopis velutina*), walkingstick cactus (*Cylindropuntia spinosior*), water jacket (*Lycium andersonii*), and whitethorn acacia (*Vachellia constricta*).

Nonnative plant species present within the survey area included Bermudagrass, Lehmann lovegrass, prickly Russian thistle (*Salsola tragus*), and redstem stork's bill (*Erodium cicutarium*). Thistle was also observed, but because this plant could not be identified to species, it is unknown if the species was native or nonnative in origin.

Sixteen of the plant species observed within the survey area are protected under the Arizona Native Plant Law (Arizona Revised Statutes [ARS] 3-904) as administered by the Arizona Department of Agriculture (ADA). These species are banana yucca, cactus apple, candy barrelcactus, Christmas cactus, dollarjoint pricklypear, honey mesquite, ocotillo, Palmer's century plant, pinkflower hedgehog cactus, purple pricklypear, sacahuista, soaptree yucca, spinystar, twistspine pricklypear, velvet mesquite, and walkingstick cactus. More information regarding this state regulation can be found on the ADA's *Protected Native Plants by Category* website (ADA 2023a). Other protected native plants have the potential to occur. A notice of intent for the removal or destruction of these plants must be provided to the ADA before any such action (Appendix C). For projects over 40 acres, the ADA requires 60 days written notice.

No noxious weed species were identified during the site visit. More information regarding noxious weeds listed by the ADA under Arizona Administrative Code R3-4-245 is available on the ADA's Plant Services Division website (ADA 2023b).

3.3 Wildlife

Site conditions during the field reconnaissance were extremely windy, which likely reduced the number of wildlife species observed. Eleven avian species were documented within the survey area during the site visit: American avocet (*Recurvirostra americana*), ash-throated flycatcher (*Myiarchus cinerascens*), black-throated sparrow (*Amphispiza bilineata*), Brewer's sparrow (*Spizella breweri*), Chihuahuan meadowlark (*Sturnella lilianae*), common raven (*Corvus corax*), great-horned owl (*Bubo virginianus*), green-winged teal (*Anas crecca*), loggerhead shrike (*Lanius ludovicianus*), mourning dove (*Zenaida macroura*), and red-tailed hawk (*Buteo jamaicensis*). An active great-horned owl nest was observed in the survey area on a transformer attached to a utility pole.

All avian species observed in the survey area are protected under the MBTA (16 USC 703–712), which provides federal protection to all migratory birds, including nests and eggs. To relocate or alter any MBTA-protected nests or western burrowing owl (*Athene cunicularia hypugaea*) burrows, a permit must be obtained from the USFWS to maintain compliance with the MBTA. However, Section 1 of the Interim Empty Nest Policy of the USFWS Region 2 states that if the nest is completely inactive at the time of destruction or movement, a permit is not required to comply with the MBTA. If an active nest is observed before or during construction, measures should be taken to protect the nest from destruction in accordance with the MBTA.

No mammals or reptiles were observed. Small mammal burrows were observed, but none appeared to be suitable for use by western burrowing owl. No owls or evidence of use by western burrowing owls was observed within the survey area. No fish or amphibians were observed in the cattle tanks. No suitable bat roost sites (e.g., natural caves or mine features) are present in the survey area; however, bat roost sites likely occur in the mountains to the north, west, and south of the survey area.

The survey area does not intersect with any wildlife linkages although it does intersect with an important connectivity zone (ICZ) (see Appendix B). ICZs are general areas throughout the landscape that contribute the most to permeability of the whole landscape (Perkl 2013). The construction of the solar project would reduce the ability of wildlife to move through the area. In a letter dated April 24, 2023, AGFD indicated that maintaining habitat connectivity is a priority for AGFD. In its response letter to AGFD on May 2, 2023, Torch Clean Energy indicated that a) if a wildlife crossing is proposed along the southern edge of the project, they will work with AGFD on locating a corridor that allows for connectivity and b) the project will leave vegetation intact or mow vegetation rather than completely remove it whenever possible c) that the site will be revegetated after construction to comply with the federal National Pollutant Discharge Elimination System permit and, d) if possible, Winchester will incorporate a 6 to 8 inch gap between the ground and the bottom of fence to allow wildlife species to continue to use the survey area.

3.4 Species Evaluation

One of the 27 species listed by the USFWS as endangered; threatened; experimental population, non-essential (EXPN); or candidate species for Cochise County is likely to occur in the survey area. The monarch butterfly (*Danaus plexippus*), a candidate that does not currently receive protection under the ESA, but that may be listed in the future, may occur within the survey area because the survey area is within the known range of the species and contains suitable habitat. Although the survey area is within the range of the jaguar (*Panthera onca*), that species is unlikely to occur because of lack of habitat and human disturbance in the vicinity of the project. The other 25 species are not likely to occur in the survey area because the survey area is clearly beyond the known geographic or elevational range of these 25 species, or it does not contain vegetation or landscape features known to support these species, or both. Table 1 and the narrative following the table summarize habitat requirements, potential for occurrence, and possible effects of the project for the 27 listed species. The project would have *no effect* on any species listed under the ESA. For the monarch butterfly, the project *may impact individuals but is not likely to result in a trend toward federal listing or loss of viability.*

According to AZHGIS environmental online review tool, the survey area does not occur within federally proposed or designated critical habitat (AGFD 2023a). The AZHGIS-generated response reported 14 special-status species are known to occur within 5 miles of the survey area (AGFD 2023a; see Appendix B): red flower onion (*Allium rhizomatum*), golden eagle (*Aquila chrysaetos*), Arizona striped whiptail *(Aspidoscelis arizonae*), snowy plover (*Charadrius nivosus nivosus*), monarch butterfly, bald eagle (winter population) (*Haliaeetus leucocephalus*), Texas horned lizard (*Phrynosoma cornutum*), Plains leopard frog (*Rana blairi*), Chiricahua leopard frog (*Rana chiricahuensis*), Slevin's bunchgrass lizard (*Sceloporus slevini*), and desert box turtle (*Terrapene ornata luteola*). Of these occurrence records, five are listed as Species of Greatest Conservation Need (SGCN) in Arizona (see Appendix B). SGCN receive no statutory protection in Arizona. The SGCN designation and tier ranking is used to develop conservation strategies and develop recommendations for land management activities and development projects (AGFD 2023c).

Table 1 addresses the monarch butterfly and Chiricahua leopard frog, and Section 3.6 addresses the golden and bald eagles. The red flower onion and Slevin's bunchgrass lizard are typically found in mountainous area and would not be expected to occur in the survey area (AGFD 2023b). The Plains leopard frog has an isolated population in the west Chiricahua Mountains and into the Sulphur Springs Valley (AGFD 2023b); however, this population is approximately 30 miles southeast of the survey area, and there is not a riparian corridor connecting the two areas; therefore, this species would be unlikely to occur.

Based on habitat and range, the Arizona striped whiptail, the Texas horned lizard and the ornate box turtle have the potential to occur in the survey area (AGFD 2023b). The snowy plover is a shorebird that has been observed at the Lake Cochise and Twin Lakes Golf Course, approximately 3.7 miles east of the survey area (eBird 2023); thus, this species may occasionally fly over the survey area and has the potential to stopover at the stock tanks in the survey area during dispersal or migration. Given the ephemeral nature of the stock tanks in the survey area and their small size, snowy plovers would not be expected to breed in the survey area. For the above species that may occur, construction and operation of the project *may impact individuals but is not likely to result in a trend toward federal listing or loss of viability* because of the abundance of similar grassland habitats outside of the survey area in the vicinity and because the survey area does not contain riparian areas, pristine grassland, or other habitats of high value to wildlife species.

According to the AZHGIS environmental online tool (AGFD 2023a; see Appendix B), modeled habitat for 66 SGCN have been predicted to occur in the survey area based on modeled habitat. Some of these species are listed under the ESA and are evaluated in Table 1, and several of them overlap with the species discussed above. Some of the remaining species have the potential to occur in the survey area as permanent residents or as seasonal migrants or occasional dispersers whereas others would be excluded on the basis of observed habitat conditions within the survey area.

Table 1. Federally Listed Species Potentially Occurring in Cochise County, Arizona

Common Name (Species Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Survey Area	Determination of Effect
Bartram's stonecrop (*Graptopetalum bartramii*)	T	Occupies shaded areas on rocky outcrops and soil litter in arroyos and canyons of the sky island mountains of southeast Arizona at an elevation range of 3,900 to 6,700 feet amsl.	There is no suitable habitat for this species in the survey area. Further, known populations of this species are distant from the survey area in the Chiricahua Mountains.	No effect.
Beardless chinchweed (*Pectis imberbis*)	E	Occupies open grassland and oak/grassland habitats between 4,000 and 5,500 feet amsl. Typically found on steep, south-facing, sunny to partially shaded hillslopes, with eroding bedrock and open areas with little competition from other plant species. Also found along trails, roads, and cow paths and on mine tailings or overburden (USFWS 2018). This species is associated with areas that contain a native vegetation composition over a monoculture of nonnative species (personal communication, email from Julie Crawford, USFWS, to Eleanor Gladding, SWCA, April 5, 2021). Known from Santa Cruz County, southeast Pima County, and far southwest Cochise County in Arizona.	Unlikely to occur. Open grassland with disturbances is present in the survey area. However, the nearest known population of this species in the Santa Rita Mountains is more than 30 miles southwest of the survey area.	No effect.
Beautiful shiner (*Cyprinella formosa*)	T	This fish was originally known in Arizona only in the San Bernardino Valley. It was locally extirpated but was reintroduced to San Bernardino National Wildlife Refuge in 1990. The species is suspected to live in small streams and intermittent pools of creeks and has survived well in ponds where introduced.	Unlikely to occur. There are no suitable permanent aquatic or semi-aquatic habitats in the survey area. Further, the survey area is more than 70 miles northwest of the only known population of this species.	No effect.
Canelo Hills ladies' tresses (*Spiranthes delitescens*)	E	Found at elevations between 4,585 and 4,970 feet amsl in cienega wetlands, usually intermixed with tall grasses and sedges on fine-grained, highly organic, saturated soils. Only known from four cienegas in south Arizona: Canelo Hills, Babocomari, San Rafael, and Turkey Creek.	Unlikely to occur. There is no suitable cienega or marshland habitat within the survey area, and the nearest known population is more than 30 miles southwest of the survey area.	No effect.

Common Name (Species Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Survey Area	Determination of Effect
Chiricahua leopard frog (*Rana chiricahuensis*)	T	Permanent or semi-permanent springs, livestock tanks, and streams in the upper portions of watersheds at elevations between 3,000 and 9,000 feet. Often do not coexist with nonnative species (e.g., bullfrogs, nonnative fishes, crayfish). In Arizona, may occur in east-central and southeastern portions of the state.	Unlikely to occur. Although this species is documented within 5 miles of the project area and there are numerous ephemeral drainages and livestock tanks, there are no recent records (1995 to present) from the Pinaleño Mountains or Sulphur Springs Valley (USFWS 2007). The species is now absent from all but one of the southeast Arizona valley bottom cienega complexes. Critical habitat for the species, as well as the nearest known population, is approximately 18 miles south of the survey area in the Dragoon Mountains. As these known populations are further from the survey area than the known dispersal distance for this species and no populations have been recently recorded within the vicinity, it is unlikely that this species would be present within the project or use it as a dispersal corridor.	No effect.
Cochise pincushion cactus (*Coryphantha robbinsiorum*)	T	Occurs on rolling hills of gray limestone between 4,200 and 5,200 feet amsl. Plants are found in bedrock cracks in Chihuahuan desertscrub habitat. Known only from far southeast Cochise County, Arizona, and north Sonora, Mexico.	Unlikely to occur. The only known occurrence of this species in Arizona is more than 50 miles southeast of the survey area. In addition, the survey area does not contain gray limestone bedrock crack habitat for this species	No effect.
Desert pupfish (*Cyprinodon macularis*)	E	Found in shallow waters of desert springs, small streams, and marshes at elevations below 5,000 feet amsl. One natural population still occurs in Quitobaquito Spring and Quitobaquito Pond in Pima County, and reintroductions have been made in Pima, Pinal, Maricopa, Graham, Cochise, La Paz, and Yavapai Counties.	Unlikely to occur. There are no suitable perennial water sources in the survey area.	No effect.
Gila chub (*Gila intermedia*)	E	Found in pools in smaller streams, cienegas, and artificial ponds ranging in elevation from 2,000 to 5,500 feet amsl. Highly secretive, adults prefer deeper, quieter waters in pools and eddies below riffles or runs, often remaining in cover from terrestrial vegetation, boulder, and fallen logs.	Unlikely to occur. There are no suitable permanent water sources suitable for this species in or adjacent to the survey area.	No effect.
Gila topminnow (incl. Yaqui) (*Poeciliopsis occidentalis*)	E	Occurs in small streams, springs, and cienegas at elevations below 4,500 feet amsl, primarily in shallow areas with aquatic vegetation and debris for cover. In Arizona, most of the remaining native populations are in the Santa Cruz River system.	Unlikely to occur. There are no suitable perennial water sources in the survey area.	No effect.

Common Name (Species Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Survey Area	Determination of Effect
Huachuca water-umbel (*Lilaeopsis schaffneriana* var. *recurva*)	E	Semi-aquatic to aquatic perennial found in shallow water or saturated soil of cienegas or marshy wetlands at elevations between 4,000 and 6,500 feet amsl. Known from the Huachuca Mountains, Canelo Hills, headwaters of the Santa Cruz River to Black Draw, and the San Pedro River.	Unlikely to occur. There is no suitable cienega or marshland habitat within the survey area.	No effect.
Jaguar (*Panthera onca*)	E	Jaguars were once prominent in south Arizona and were found in Sonoran desertscrub up through subalpine conifer forest at elevations between 1,600 and 9,000 feet amsl. Based on 25 historical (from 1902 to 2001) reliable and spatially accurate jaguar sighting records in Arizona, the majority of jaguars were observed in scrub grasslands (56%) and Madrean evergreen forests (20%), all were within 6.2 miles of a water source, and most occurred in moderately rugged to extremely rugged terrain (Hatten et al 2005).	See Section 3.4.1.	
Loach minnow (*Tiaroga cobitis*)	E	Found in small to large perennial creeks and rivers, typically in shallow, turbulent riffles with cobble substrate, swift currents, and filamentous algae at elevations below 8,000 feet amsl. Its range in Arizona is limited to reaches in the East Fork of the White River (Navajo County); Aravaipa, Deer, and Turkey Creeks (Graham and Pinal Counties); San Francisco and Blue Rivers; and Eagle, Campbell Blue, and Little Blue Creeks (Greenlee County). A population was discovered in the Black River in 1996.	Unlikely to occur. There are no perennial creeks or rivers in the survey area, and the survey area is distant from the known occurrences of this species.	No effect.
Mexican spotted owl (*Strix occidentalis lucida*)	T	Found in mature montane forests and woodlands and steep, shady, wooded canyons. Can also be found in mixed-conifer and pine-oak vegetation types. It generally nests in older forests of mixed conifers or ponderosa pine (*Pinus ponderosa*)–Gambel oak (*Quercus gambelii*). Nests in live trees on natural platforms (e.g., dwarf mistletoe [*Arceuthobium* spp.] brooms), snags, and canyon walls at elevations between 4,100 and 9,000 feet amsl.	Unlikely to occur. The survey area does not contain suitable habitat for this species.	No effect.
Mexican wolf (*Canis lupus baileyi*)	EXPN	Occurs in the Mexican Wolf Experimental Population Area in central and south Arizona. Mexican wolves are found in a variety of southwestern habitats; however, they are absent from the desert areas and prefer mountain woodlands.	Unlikely to occur. The survey area does not contain suitable habitat for this species. The survey area is additionally outside of the wolf management zone 1 where this species would be introduced within the Mexican Wolf Experimental Population Area.	No effect.

Common Name (Species Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Survey Area	Determination of Effect
Monarch butterfly (*Danaus plexippus*)	C	Habitat is complex. Generally, breeding areas include virtually all patches of milkweed (*Asclepias* sp.). The species occurs throughout Arizona during the summer and migrates to winter in Mexico and California, though small numbers do overwinter in the low deserts of southwest Arizona	May occur. There are species occurrence records monarch within 5 miles of the survey area (AGFD 2023a). Milkweed plants were observed during field surveys. Additionally, other flowering plants that adult monarch butterflies may use for forage occur.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability.
New Mexican ridge-nosed rattlesnake (*Crotalus willardi obscurus*)	T	Occurs above 5,000 feet amsl in Madrean evergreen woodland and Petran montane conifer forest. Prefers pine-oak woodland where it frequents drainages with canopy cover and abundant leaf litter. Known in Arizona only from the Peloncillo Mountains on the New Mexico border.	The only known records for this species are approximately 40 miles to the east in the Peloncillo Mountains.	No effect.
Northern aplomado falcon (*Falco femoralis septentrionalis*)	EXPN	The species has somewhat variable habitat preferences, with historic habitats in Arizona, including semidesert grassland or riparian associations with scattered trees and shrubs at elevations from 3,300–4,900 feet above sea level. They do not build their own nest, but occupy old stick nests left by raptors; and those of Chihuahuan ravens (*Corvus cryptoleucus*) are used extensively. Nests are typically in mesquite, yucca, or low bushes up to 5 m in height.	Unlikely to occur. Though the boundary of the 10(j) reintroduction area includes all of New Mexico and Arizona, birds have only been released in New Mexico. This species has not been recorded in Arizona since 1977 and is considered extirpated from the state (AGFD 2023b). Habitat in the survey area has been degraded over many years by livestock grazing, which resulted in reduction of grassland habitat and its natural fire regime and promoted the incursion of mesquite and other shrubs.	No effect.
Northern Mexican gartersnake (*Thamnophis eques megalops*)	T	Riparian obligate species, found in lotic and lentic habitats that include cienegas and stock tanks (earthen impoundments) and rivers containing pools and backwaters. Most frequently found between 3,000 and 5,000 feet amsl but may occur up to approximately 8,500 feet amsl. Uses adjacent terrestrial habitats for foraging, thermoregulation, gestation, shelter, immigration, emigration, and brumation. Core population areas in Arizona include mid/upper Verde River drainage, mid/lower Tonto Creek, and the San Rafael Valley.	Unlikely to occur. Suitable habitat for this species is not present in or adjacent to the survey area. The nearest critical habitat occurs along the San Pedro River approximately 30 miles to the upstream of where Tres Alamos Wash flows into it. Although it is thought to have a low-density population in the San Pedro River (USFWS 2014), this species is unlikely to disperse overland to the project area, as the stock tanks did not have any emergent vegetation and had sparse shoreline vegetation. In addition, the stock tanks did not contain any of this species' preferred prey, native fish, or native frogs. In addition, there are no occurrence records for this species within 5 miles of the survey area (AGFD 2023a).	No effect.

Common Name (Species Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Survey Area	Determination of Effect
Ocelot (*Leopardus pardalis*)	E	In Arizona, this species has typically been observed in subtropical thorn forest, thornscrub, and dense, brushy thickets at elevations below 8,000 feet amsl and is often found in riparian bottomlands. The critical habitat component is probably dense cover near the ground and complete avoidance of open country. In Arizona, there are five recent confirmed sightings of ocelot in Cochise County (2009–2012), one confirmed sighting near Globe (2010), and unconfirmed sightings in the Chiricahua and Peloncillo Mountains.	Unlikely to occur. This species is very rare, and there are no dense, brushy thickets or riparian bottomlands in the survey area. In recent years, this species has been documented in several areas in southern Arizona. The nearest known occurrence of this species is in the Whetstone Mountains, which is more than 20 miles southwest of the survey area. All of the known occurrences of this species in Arizona, with the exception of the individual observed near Globe, have occurred south of I-10, which is a known barrier to wildlife movement, making this species less likely to disperse across the survey area from mountainous areas in the southern portion of the state where it might occur.	No effect.
San Bernardino springsnail (*Pyrgulopsis bernardina*)	T	This species is only known from a couple of spring sites on private property adjacent to the San Bernardino National Wildlife Refuge and at seven sites in adjacent Sonora, Mexico. The type locality is a 1-foot-wide stream choked with watercress (*Nasturtium officinale*) (AGFD 2023b).	Unlikely to occur. There is no suitable habitat for this species in the survey area. Further, the survey area is more than 70 miles northwest of the only known population of this species in Arizona.	No effect.
Sonoran tiger salamander (*Ambystoma tigrinum stebbinsi*)	E	Normally occur from desert grassland habitat up to Petran montane conifer forest but occasionally as low as Arizona Upland desertscrub. They breed in a variety of aquatic habitats including lakes, streams, ponds, livestock water catchments, temporary pools and other water sources. Adults occur beneath objects on the ground, in animal burrows, in caves, or among plant roots. Elevation ranges from 5,100 to 9,400 feet amsl. Species is currently known within the headwaters of the Santa Cruz and San Pedro rivers.	Unlikely to occur. The survey area is more than 50 miles northeast of the nearest known population of this species.	No effect.
Southwestern willow flycatcher (*Empidonax traillii extimus*)	E	Found in dense riparian habitats along streams, rivers, and other wetlands where cottonwood, willow, boxelder (*Acer negundo*), saltcedar (*Tamarix* spp.), Russian olive (*Elaeagnus angustifolia*), buttonbush (*Cephalanthus* spp.), and arrowweed (*Pluchea sericea*) are present. Nests are found in thickets of trees and shrubs, primarily those that are 13 to 23 feet high, among dense, homogeneous foliage. Habitat occurs at elevations below 8,500 feet amsl.	Unlikely to occur. Suitable habitat for this species is not present in or adjacent to the survey area. There are no occurrence records for this species within 5 miles of the survey area (AGFD 2023a).	No effect.
Spikedace (*Meda fulgida*)	E	Mid-water habitats, including runs, pools, and swirling eddies below 4,500 feet amsl.	Unlikely to occur. There are no suitable perennial water sources in the survey area.	No effect.

Common Name (Species Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Survey Area	Determination of Effect
Wright's marsh thistle (*Cirsium wrightii*)	T	A wetland obligate species occurring at alkaline spring seeps and cienegas from 3,800 to 6,000 feet amsl. The only historically known Arizona population is located in the San Bernadino Cienega and has been extirpated (USFWS 2017).	Unlikely to occur. The only known Arizona population has been extirpated and is located approximately 70 miles southeast of the survey area.	No effect.
Yaqui catfish (*Ictalurus pricei*)	T	Occupies small to medium currents of larger rivers over gravel and sand substrates, and deep pools of smaller tributaries. The Yaqui catfish is native to the states of Sonora and Chihuahua, Mexico. They have been introduced into Arizona at the San Bernardino National Wildlife Refuge and in a tributary to the Sulphur Springs Valley.	Unlikely to occur. The project is not near either of the introduced populations and does not contain suitable habitat. Further, the survey area is more than 70 miles northwest of the only known population of this species in Arizona.	No effect.
Yaqui chub (*Gila purpurea*)	E	This species occurs primarily in Cochise County, Arizona, at the San Bernardino National Wildlife Refuge, in House Pond at the Slaughter Ranch Historic Site, and in West Turkey Creek. The species occupies springs and creeks with silt, clay, mud, sand, gravel, and boulder substrates in waters of no to moderate current. Overhanging riparian vegetation provides habitat associated with stream banks.	Unlikely to occur. There are no suitable spring or creek habitats in the survey area. Further, the survey area is more than 55 miles southeast of the nearest known population of this species.	No effect.
Yellow-billed cuckoo (*Coccyzus americanus*)	T	Typically found in riparian woodland vegetation (cottonwood, willow, or saltcedar) at elevations below 6,600 feet amsl. Dense understory foliage appears to be an important factor in nest site selection. The highest concentrations in Arizona are along the Agua Fria, San Pedro, upper Santa Cruz, and Verde River drainages and Cienega and Sonoita Creeks.	Unlikely to occur. Suitable habitat for this species is not present in the survey area. There are no occurrence records for this species within 5 miles of the survey area (AGFD 2023a).	No effect.

Sources: Range or habitat information is from AGFD (2023a, 2023b); Arizona Rare Plant Committee (ca. 2001); Corman and Wise-Gervais (2005); USFWS (2023b).

* USFWS Status Definitions:

C = Candidate. Candidate species are those for which the USFWS has sufficient information on biological vulnerability and threats to support proposals to list as endangered or threatened under the ESA. However, proposed rules have not yet been issued because such actions are precluded at present by other listing activity.

E = Endangered. An animal or plant species in danger of extinction throughout all or a significant portion of its range.

EXPN = Experimental Population, Non-Essential. Experimental populations of a species designated under Section 10(j) of the ESA for which the USFWS, through the best available information, believes is not essential for the continued existence of the species. Regulatory restrictions are considerably reduced under an EXPN designation.

T = Threatened. An animal or plant species likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

3.4.1 Jaguar (Panthera onca)

3.4.1.1 HABITAT SUITABILITY AND POTENTIAL FOR OCCURRENCE

The survey area is within the geographical range of this species (USFWS 2023b). As recently as 2021, a jaguar was observed in Dos Cabezas Mountains, approximately 9.5 miles northeast of the survey area (Wildlife Conservation Society [WCS] 2023). The exact location of the occurrences of this individual in the Dos Cabezas Mountains is unknown or obscured because of sensitivity. However, there are no reported occurrences of this species within 5 miles of the project in the AZHGIS online environmental review tool database (AGFD 2023a) (Appendix B). Recent sightings of jaguar in the United States have been in locations of relatively low human influence, intermediate to extremely rugged terrain, and typically found within Madrean evergreen woodland or semidesert grassland (Culver 2016). However, these biotic communities are at a landscape scale and may not adequately measure the microhabitat characteristics of sites where jaguars have actually been detected according to Culver (2016). Most grassland detections in the United States occurred in rocky canyons with mature oaks (*Quercus* spp.), sycamores (*Platanus* spp.), mesquite (*Prosopis velutina*), or acacias (*Vachellia* sp. or *Senegalia* sp.).

The survey area does not contain rocky canyons or moderately to extremely rugged terrain. In addition, the survey area is adjacent to I-10 and shows signs of human disturbance (e.g., cattle ranching, OHV use, and well-maintained dirt roads designed to be used by passenger vehicles. I-10 is a known barrier to wildlife movement, and all jaguars that occurred in the United States in recent years (before the 1960s) have occurred south of I-10 (WCS 2023).

Jaguars are *unlikely to occur* in the survey area because: 1) it contains relatively sparse vegetation and is not situated within a rocky canyon or within rugged terrain; 2) it is close to roads including I-10, and 3) any jaguars dispersing from the Dos Cabezas Mountains would be unlikely to choose to cross I-10 or the residential, commercial, or agricultural areas surrounding Willcox, Arizona, all of which occur between the Dos Cabeza Mountains and the survey area.

3.4.1.2 EFFECTS

There would be *no effect* to jaguar individuals because they are unlikely to occur in the project area or immediate vicinity. In addition, construction of the project would not constitute habitat loss for this species or be likely to reduce the availability of its prey species.

3.5 Migratory Bird Treaty Act

The MBTA provides federal protection to all migratory birds, including nests and eggs. To relocate or alter any MBTA-protected nests, a permit must be obtained from the USFWS to maintain compliance with the MBTA. However, Section 1 of the Interim Empty Nest Policy of the USFWS, Region 2, states that if the nest is completely inactive at the time of destruction or movement, a permit is not required to comply with the MBTA. If an active nest is observed before or during construction, measures should be taken to protect the nest from destruction and to avoid a possible violation of the MBTA.

Eleven avian species were observed in the survey area, and many other bird species have the likelihood of occurring. All the observed species are protected under the MBTA. The habitat in the survey area is not suitable for western burrowing owls. No sign of western burrowing owls occupying the site (e.g., burrows, whitewash, pellets) was observed in the survey area, and no individual owls were observed. One nest was observed in the survey area, and additional nests may occur as potential nesting substrate (e.g., shrubs, trees, cacti, snags, transmission towers) occurs throughout the survey area. A discovery of any species covered under the MBTA nesting within the survey area would require avoidance of active nests and may limit the timing of some ground-disturbing activities. Nesting generally

occurs from March through September (and January through June for raptors). Measures to prevent birds from nesting, such as placement of exclusionary netting or removal of nesting habitat (e.g., blading and tree removal), can be implemented before the breeding season and are allowable under the MBTA. If round-disturbing activities occur during the nesting season, preconstruction surveys for nesting birds are recommended.

In a letter dated April 24, 2023, AGFD indicated concern that solar panels could have an impact on sandhill crane (*Antigone canadensis*) and other shorebird species due to its close proximity to the Willcox Playa as these birds have the potential to mistake solar panels for open water. In its response letter to AGFD on May 2, 2023, Torch Clean Energy indicated that the project would follow AGFD recommendations: a) the project will use solar panels that reduced reflectivity, b) the project will include more space between modules rows to reduce the optical illusion of water, c) the project will follow Avian Power Line Interaction Committee standards and will explore feasibility of incorporating bird diverters into project design, and d) the project will perform quarterly inspection of site and will report injured or dead species.

3.6 Bald and Golden Eagles Protection Act

No suitable bald eagle or golden eagle nesting habitat is in or near the survey area. Although the survey area does not contain bodies of water that would contain the bald eagle's preferred prey (i.e., fish) (AGFD 2023b), it may provide limited foraging items for this species in the form of large mammal carrion and waterfowl. Communal roosting sites are unlikely to occur within or proximal to the project area because it is far from aquatic foraging resources and tall trees are absent or extremely rare on the survey area are limited. eBird (2023) indicates that bald eagle has been documented within approximately 4 miles of the survey area. Therefore, this species has the potential to occur in the survey area. The survey area is within the golden eagle's year-round range and contains appropriate foraging (i.e., open grassland vegetation communities) (Kochert et al. 2002) and nesting habitats. Golden eagle has been documented within 0.25 mile of the survey area (eBird 2023). Though no concentrated prey sources were observed during the March 2023 reconnaissance visit, the species is expected to use the site for foraging given the presence of nearby nesting sites (i.e., mountainous areas with cliffs) and appropriate foraging conditions. Impacts of the project on eagles would be loss of a small amount of foraging habitat. Because the foraging habitat in the survey area has relatively low value for both species and abundant foraging habitat occurs outside the survey area for both species, impacts because of the loss of foraging habitat from construction of this project would be extremely minor as individuals of both species would be expected to shift their use to other locations within the vicinity.

These species are protected under both the MBTA and the Bald and Golden Eagle Protection Act. The bald eagle is an SGCN Tier 1 species, and the golden eagle is an SGCN Tier 2 species.

4 LIMITATIONS AND WARRANTY

Within the limitations of schedule, budget, and scope of work, SWCA warrants that this study was conducted in accordance with accepted environmental science practices, including the technical guidelines, evaluation criteria, and species' listing status in effect at the time this evaluation was performed, as outlined in the species evaluation.

The results and conclusions of this report represent the best professional judgment of SWCA scientists and are based on information provided by the project proponent and on information obtained from agencies and other sources during the study. No other warranty, expressed or implied, is made. This report should be reviewed by the appropriate regulatory agencies before any detailed site- planning or construction activities occur.

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APPENDIX A

USFWS IPaC Species List for Survey Area

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

There is an ongoing issue with accessing projects that have large or complex geometry. We are working on a solution. If you are unable to access an existing project, please submit a helpdesk ticket by clicking "contact us" at the bottom of the page and we will assist you with access. Thank you for your patience. ×

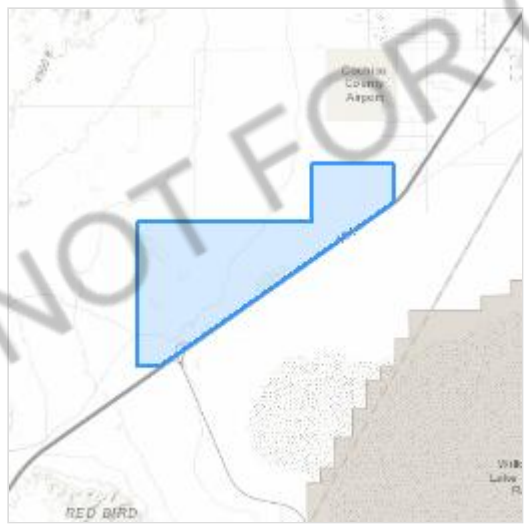
Thi…cal hal…e's (US… ref…ect are… are…ust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

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

NOT FOR CONSULTATION

Location

Cochise County, Arizona



Local office

Arizona Ecological Services Field Office

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

9828 North 31st Ave

#c3
Phoenix, AZ 85051-2517

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Endangered species

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

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

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

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

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

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

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

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

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2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

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

Mammals

NAME	STATUS
Jaguar Panthera onca Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3944	Endangered
Mexican Wolf Canis lupus baileyi No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3916	EXPN

Birds

NAME	STATUS
Mexican Spotted Owl Strix occidentalis lucida Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/8196	Threatened
Northern Aplomado Falcon Falco femoralis septentrionalis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1923	EXPN
Yellow-billed Cuckoo Coccyzus americanus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Amphibians

NAME	STATUS

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NAME	STATUS
Chiricahua Leopard Frog Rana chiricahuensis Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/1516	Threatened

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Wright's Marsh Thistle Cirsium wrightii There is **final** critical habitat for this species. https://ecos.fws.gov/ecp/species/8963	Threatened

Critical habitats

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

There are no critical habitats at this location.

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

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

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NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Oct 15 to Jul 31
Bendire's Thrasher Toxostoma bendirei This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9435	Breeds Mar 15 to Jul 31

Black-throated Gray Warbler Dendroica nigrescens — Breeds May 1 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Long-eared Owl asio otus — Breeds Mar 1 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3631

Olive-sided Flycatcher Contopus cooperi — Breeds May 20 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3914

Rufous-winged Sparrow Aimophila carpalis — Breeds Jun 15 to Sep 30
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Virginia's Warbler Vermivora virginiae — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9441

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Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey

effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

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

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

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

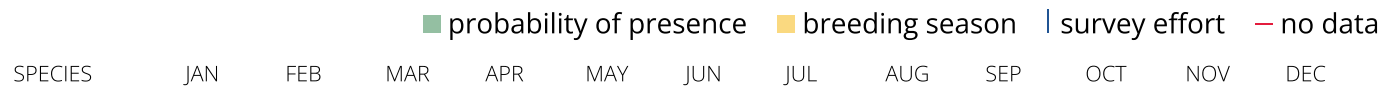
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

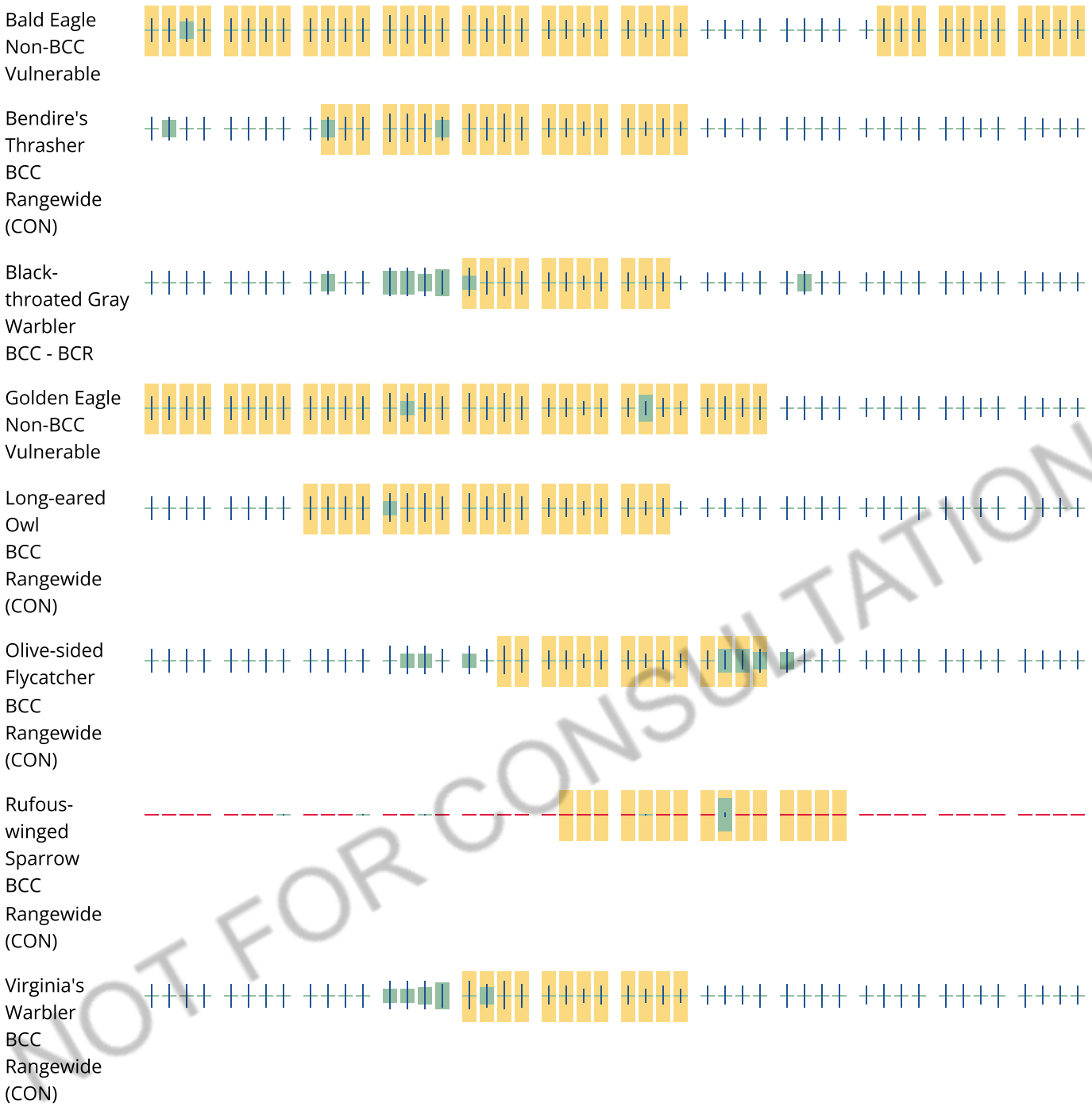
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

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

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

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

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

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

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

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

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

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

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

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

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

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

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

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

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Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

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

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

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

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Facilities

National Wildlife Refuge lands

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

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

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

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

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

This location overlaps the following wetlands:

RIVERINE

- R5UBH
- R4SBJ

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

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

Data limitations

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

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

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

Data exclusions

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

Data precautions

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

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APPENDIX B

AGFD Environmental Online Review Tool Report

Arizona Environmental Online Review Tool Report

Arizona Game and Fish Department Mission
To conserve Arizona's diverse wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations.

Project Name:

Winchester Solar and Battery Storage Project

Project Description:

Winchester is proposing to develop a solar and battery energy storage facility

Project Type:

Energy Storage/Production/Transfer, Energy Production (generation), photovoltaic solar facility (new)

Contact Person:

Stacy Campbell

Organization:

SWCA

On Behalf Of:

PRIVATE

Project ID:

HGIS-18734

Please review the entire report for project type and/or species recommendations for the location information entered. Please retain a copy for future reference.

Disclaimer:

1. This Environmental Review is based on the project study area that was entered. The report must be updated if the project study area, location, or the type of project changes.
2. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area. This review is also not intended to replace environmental consultation (including federal consultation under the Endangered Species Act), land use permitting, or the Departments review of site-specific projects.
3. The Departments Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there. HDMS data contains information about species occurrences that have actually been reported to the Department. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. Arizona Wildlife Conservation Strategy (AWCS), specifically Species of Greatest Conservation Need (SGCN), represent potential species distribution models for the State of Arizona which are subject to ongoing change, modification and refinement. The status of a wildlife resource can change quickly, and the availability of new data will necessitate a refined assessment.

Locations Accuracy Disclaimer:
Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Report is solely responsible for the project location and thus the correctness of the Project Review Report content.

Recommendations Disclaimer:

1. The Department is interested in the conservation of all fish and wildlife resources, including those species listed in this report and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
2. Recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation).
3. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project. These recommendations are preliminary in scope, designed to provide early considerations on all species of wildlife.
4. Making this information directly available does not substitute for the Department's review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.
5. Further coordination with the Department requires the submittal of this Environmental Review Report with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map). Once AGFD had received the information, please allow 30 days for completion of project reviews. Send requests to:
   Project Evaluation Program, Habitat Branch
   Arizona Game and Fish Department
   5000 West Carefree Highway
   Phoenix, Arizona 85086-5000
   Phone Number: (623) 236-7600
   Fax Number: (623) 236-7366
   Or
   PEP@azgfd.gov
6. Coordination may also be necessary under the National Environmental Policy Act (NEPA) and/or Endangered Species Act (ESA). Site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies

Winchester Solar and Battery Storage Project

USA Topo Basemap With Locator Map



Buffered Project Boundary

Project Boundary



Project Size (acres): 4,327.94

Lat/Long (DD): 32.2007 / -109.9305

County(s): Cochise

AGFD Region(s): Tucson

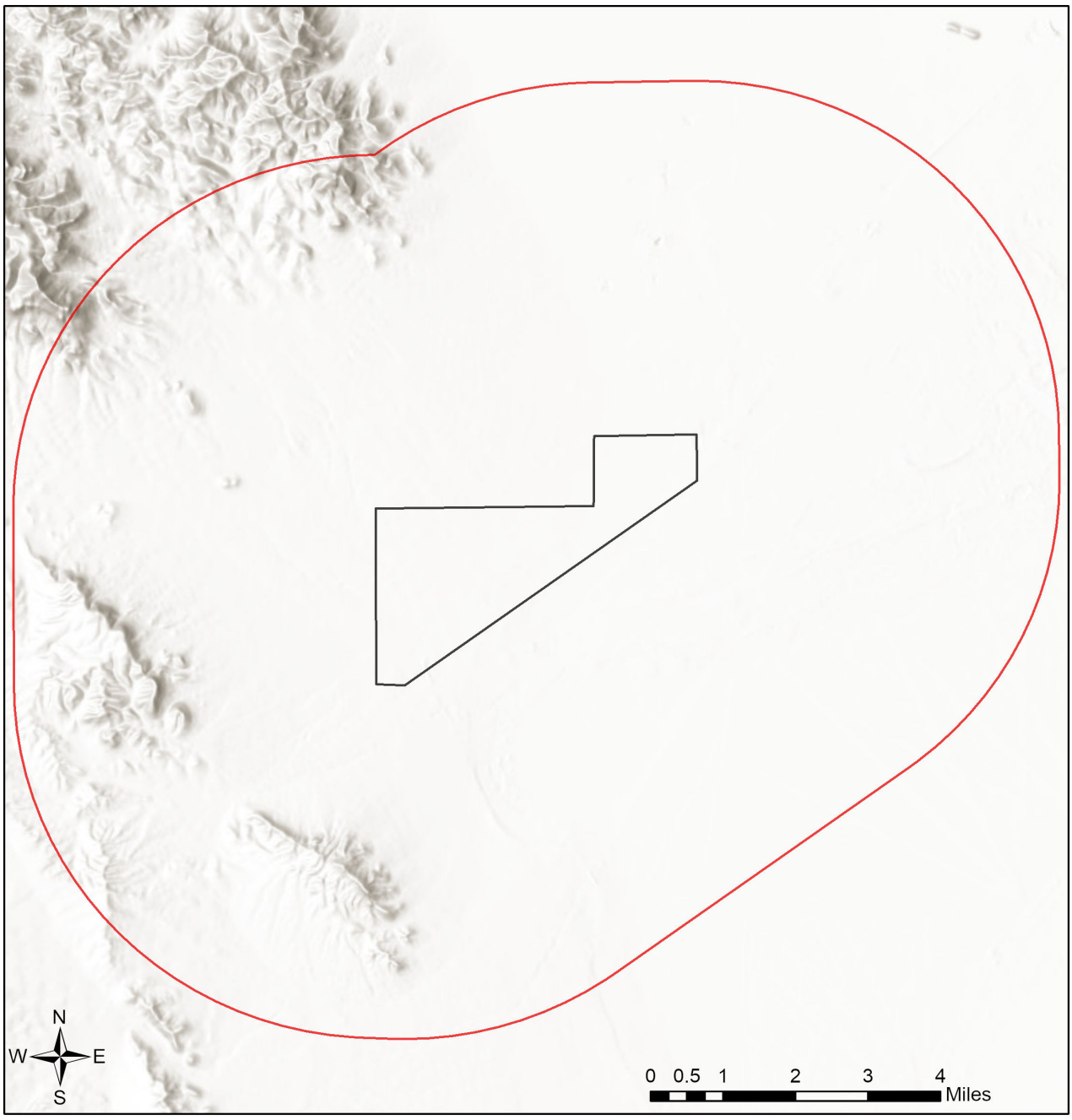
Township/Range(s): T14S, R23E; T14S, R24E

USGS Quad(s): RED BIRD HILLS

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Winchester Solar and Battery Storage Project

Web Map As Submitted By User



Buffered Project Boundary

Project Boundary

Project Size (acres): 4,327.94

Lat/Long (DD): 32.2007 / -109.9305

County(s): Cochise

AGFD Region(s): Tucson

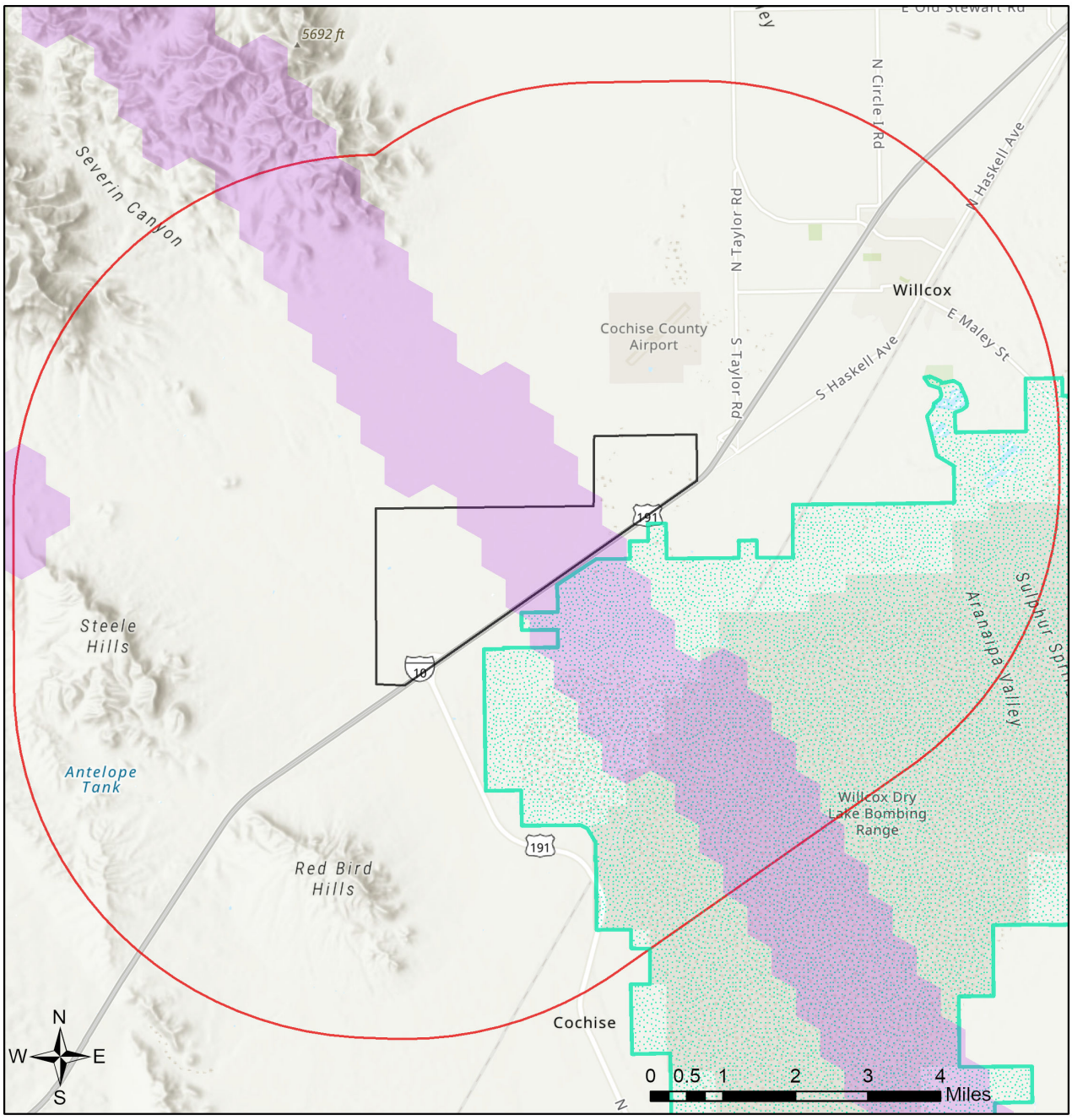
Township/Range(s): T14S, R23E; T14S, R24E

USGS Quad(s): RED BIRD HILLS

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Winchester Solar and Battery Storage Project

Important Areas



- Buffered Project Boundary
- Project Boundary
- Important Bird Areas
- Critical Habitat
- Pinal County Riparian
- Important Connectivity Zones
- Wildlife Connectivity

Project Size (acres): 4,327.94

Lat/Long (DD): 32.2007 / -109.9305

County(s): Cochise

AGFD Region(s): Tucson

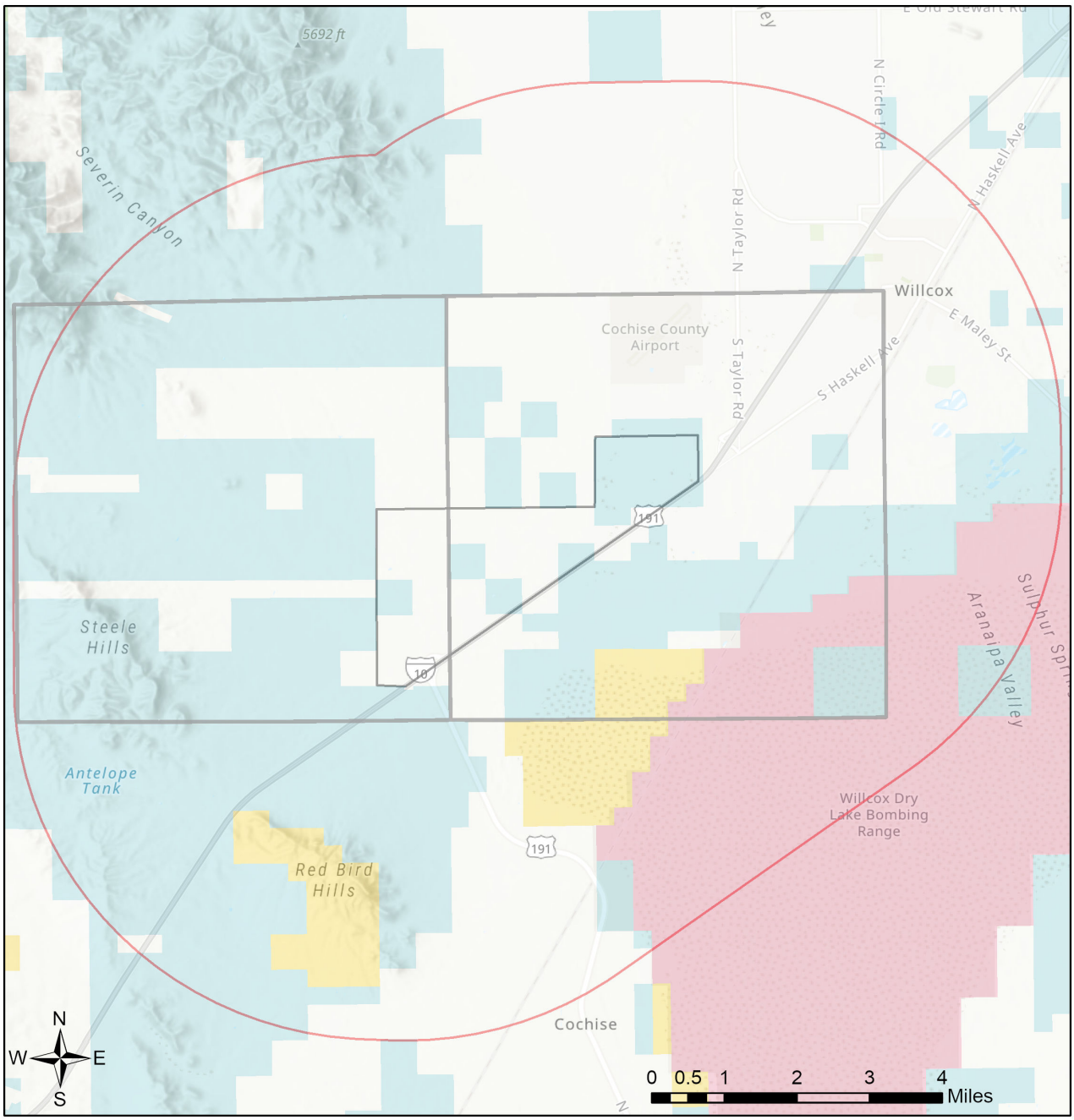
Township/Range(s): T14S, R23E; T14S, R24E

USGS Quad(s): RED BIRD HILLS

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community
Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Winchester Solar and Battery Storage Project

Township/Ranges and Land Ownership



- Buffered Project Boundary
- Project Boundary
- AZ Game & Fish Dept.
- BLM
- BOR
- Indian Res.
- Military
- Mixed/Other
- National Park/Mon.
- Private
- State & Regional Parks
- State Trust
- US Forest Service
- Wildlife Area/Refuge
- Township/Ranges

Project Size (acres): 4,327.94

Lat/Long (DD): 32.2007 / -109.9305

County(s): Cochise

AGFD Region(s): Tucson

Township/Range(s): T14S, R23E; T14S, R24E

USGS Quad(s): RED BIRD HILLS

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community
Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Special Status Species Documented within 5 Miles of Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Allium rhizomatum	Redflower Onion				SR	
Aquila chrysaetos	Golden Eagle	BGA		S		2
Aspidoscelis arizonae	Arizona Striped Whiptail			S		
Charadrius nivosus nivosus	Snowy Plover					2
Danaus plexippus	Monarch	C		S		
Haliaeetus leucocephalus (wintering pop.)	Bald Eagle - Winter Population	SC, BGA	S	S		
Phrynosoma cornutum	Texas Horned Lizard	SC				
Rana blairi	Plains Leopard Frog			S		1
Rana chiricahuensis	Chiricahua Leopard Frog	LT				1
Sceloporus slevini	Slevin's Bunchgrass Lizard		S	S		2
Terrapene ornata luteola	Desert Box Turtle			S		

Note: Status code definitions can be found at https://www.azgfd.com/wildlife/planning/wildlifeguidelines/statusdefinitions/
.

Special Areas Documented that Intersect with Project Footprint as Drawn

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Important Connectivity Zone	Wildlife Connectivity					
Willcox Playa and Cochise Lakes	Conservation Opportunity Area					

Note: Status code definitions can be found at https://www.azgfd.com/wildlife/planning/wildlifeguidelines/statusdefinitions/
.

Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Ammodramus savannarum ammolegus	Arizona grasshopper sparrow					
Ammodramus savannarum perpallidus	Western Grasshopper Sparrow					
Ammospermophilus harrisii	Harris' Antelope Squirrel					
Anthus spragueii	Sprague's Pipit	SC				2
Antilocapra americana americana	American Pronghorn					2
Aquila chrysaetos	Golden Eagle			S		2
Artemisiospiza nevadensis	Sagebrush Sparrow					
Asio otus	Long-eared Owl					2
Aspidoscelis sonorae	Sonoran Spotted Whiptail					2
Athene cunicularia hypugaea	Western Burrowing Owl	SC	S	S		2
Auriparus flaviceps	Verdin					2
Buteo regalis	Ferruginous Hawk	SC		S		2
Buteo swainsoni	Swainson's Hawk					2

Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Buteogallus anthracinus	Common Black Hawk					2
Calcarius ornatus	Chestnut-collared Longspur					2
Callipepla squamata	Scaled Quail					2
Calypte costae	Costa's Hummingbird					2
Camptostoma imberbe	Northern Beardless-Tyrannulet		S			2
Campylorhynchus brunneicapillus	Cactus Wren					2
Catharus ustulatus	Swainson's Thrush					2
Chaetodipus baileyi	Bailey's Pocket Mouse					2
Charadrius montanus	Mountain Plover	SC				2
Choeronycteris mexicana	Mexican Long-tongued Bat	SC	S	S		2
Chordeiles minor	Common Nighthawk					2
Coccyzus americanus	Yellow-billed Cuckoo (Western DPS)					
Colaptes chrysoides	Gilded Flicker			S		2
Coluber bilineatus	Sonoran Whipsnake					2
Columbina inca	Inca Dove					2
Corvus cryptoleucus	Chihuahuan Raven					2
Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat	SC	S	S		1
Cynanthus latirostris	Broad-billed Hummingbird		S			2
Cynomys ludovicianus	Black-tailed Prairie Dog	CCA		S		1
Elgaria kingii	Madrean Alligator Lizard					2
Empidonax wrightii	Gray Flycatcher					2
Eumops perotis californicus	Greater Western Bonneted Bat					
Falco mexicanus	Prairie Falcon					2
Falco peregrinus anatum	American Peregrine Falcon					
Falco sparverius	American Kestrel					2
Gopherus morafkai	Sonoran Desert Tortoise	CCA	S	S		1
Haemorhous cassinii	Cassin's Finch					2
Heloderma suspectum	Gila Monster					1
Hypsiglena sp. nov.	Hooded Nightsnake					2
Icterus bullockii	Bullock's Oriole					2
Idionycteris phyllotis	Allen's Lappet-browed Bat	SC	S	S		2
Incilius alvarius	Sonoran Desert Toad					2
Kinosternon flavescens	Yellow Mud Turtle					2
Kinosternon sonoriense sonoriense	Desert Mud Turtle					
Lanius ludovicianus	Loggerhead Shrike	SC				2
Lasiurus blossevillii	Western Red Bat		S			2
Lasiurus cinereus	Hoary Bat					2
Lasiurus xanthinus	Western Yellow Bat		S			2
Leptonycteris yerbabuenae	Lesser Long-nosed Bat	SC				1

Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Lithobates chiricahuensis	Chiricahua Leopard Frog	LT				1
Lithobates yavapaiensis	Lowland Leopard Frog	SC	S	S		1
Megascops kennicottii	Western Screech-owl					
Melanerpes uropygialis	Gila Woodpecker					2
Melospiza lincolnii	Lincoln's Sparrow					2
Micrathene whitneyi	Elf Owl					
Micruroides euryxanthus	Sonoran Coralsnake					2
Myadestes townsendi	Townsend's Solitaire					2
Myotis auriculus	Southwestern Myotis					2
Myotis thysanodes	Fringed Myotis	SC				2
Myotis velifer	Cave Myotis	SC		S		2
Myotis yumanensis	Yuma Myotis	SC				2
Notiosorex cockrumi	Cockrum's Desert Shrew					2
Nyctinomops femorosaccus	Pocketed Free-tailed Bat					2
Nyctinomops macrotis	Big Free-tailed Bat	SC				2
Parabuteo unicinctus	Harris's Hawk					2
Passerculus sandwichensis	Savannah Sparrow					2
Peucaea botterii arizonae	Arizona Botteri's Sparrow			S		2
Pooecetes gramineus	Vesper Sparrow					2
Rhynchophanes mccownii	McCown's Longspur					2
Setophaga nigrescens	Black-throated Gray Warbler					2
Spizella breweri	Brewer's Sparrow					2
Tadarida brasiliensis	Brazilian Free-tailed Bat					
Terrapene ornata	Ornate Box Turtle			S		1
Toxostoma bendirei	Bendire's Thrasher					2

Species of Economic and Recreation Importance Predicted that Intersect with Project Footprint as Drawn

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Antilocapra americana americana	America Pronghorn					
Callipepla gambelii	Gambel's Quail					
Callipepla squamata	Scaled Quail					
Odocoileus hemionus	Mule Deer					
Patagioenas fasciata	Band-tailed Pigeon					
Pecari tajacu	Javelina					
Puma concolor	Mountain Lion					
Zenaida asiatica	White-winged Dove					
Zenaida macroura	Mourning Dove					

Project Type: Energy Storage/Production/Transfer, Energy Production (generation), photovoltaic solar facility (new)

Project Type Recommendations:
During the planning stages of your project, please consider the local or regional needs of wildlife in regards to movement, connectivity, and access to habitat needs. Loss of this permeability prevents wildlife from accessing resources, finding mates, reduces gene flow, prevents wildlife from re-colonizing areas where local extirpations may have occurred, and ultimately prevents wildlife from contributing to ecosystem functions, such as pollination, seed dispersal, control of prey numbers, and resistance to invasive species. In many cases, streams and washes provide natural movement corridors for wildlife and should be maintained in their natural state. Uplands also support a large diversity of species, and should be contained within important wildlife movement corridors. In addition, maintaining biodiversity and ecosystem functions can be facilitated through improving designs of structures, fences, roadways, and culverts to promote passage for a variety of wildlife. Guidelines for many of these can be found at: https://www.azgfd.com/wildlife/planning/wildlifeguidelines/.

Consider impacts of outdoor lighting on wildlife and develop measures or alternatives that can be taken to increase human safety while minimizing potential impacts to wildlife. Conduct wildlife surveys to determine species within project area, and evaluate proposed activities based on species biology and natural history to determine if artificial lighting may disrupt behavior patterns or habitat use. Use only the minimum amount of light needed for safety. Narrow spectrum bulbs should be used as often as possible to lower the range of species affected by lighting. All lighting should be shielded, canted, or cut to ensure that light reaches only areas needing illumination.

Minimize the potential introduction or spread of exotic invasive species, including aquatic and terrestrial plants, animals, insects and pathogens. Precautions should be taken to wash and/or decontaminate all equipment utilized in the project activities before entering and leaving the site. See the Arizona Department of Agriculture website for a list of prohibited and restricted noxious weeds at https://www.invasivespeciesinfo.gov/unitedstates/az.shtml and the Arizona Native Plant Society https://aznps.com/invas for recommendations on how to control. To view a list of documented invasive species or to report invasive species in or near your project area visit iMapInvasives - a national cloud-based application for tracking and managing invasive species at https://imap.natureserve.org/imap/services/page/map.html.

- To build a list: zoom to your area of interest, use the identify/measure tool to draw a polygon around your area of interest, and select “See What’s Here” for a list of reported species. To export the list, you must have an account and be logged in. You can then use the export tool to draw a boundary and export the records in a csv file.

Minimization and mitigation of impacts to wildlife and fish species due to changes in water quality, quantity, chemistry, temperature, and alteration to flow regimes (timing, magnitude, duration, and frequency of floods) should be evaluated. Minimize impacts to springs, in-stream flow, and consider irrigation improvements to decrease water use. If dredging is a project component, consider timing of the project in order to minimize impacts to spawning fish and other aquatic species (include spawning seasons), and to reduce spread of exotic invasive species. We recommend early direct coordination with Project Evaluation Program for projects that could impact water resources, wetlands, streams, springs, and/or riparian habitats.

The Department recommends that wildlife surveys are conducted to determine if noise-sensitive species occur within the project area. Avoidance or minimization measures could include conducting project activities outside of breeding seasons.

For any powerlines built, proper design and construction of the transmission line is necessary to prevent or minimize risk of electrocution of raptors, owls, vultures, and golden or bald eagles, which are protected under state and federal laws. Limit project activities during the breeding season for birds, generally March through late August, depending on species in the local area (raptors breed in early February through May). Conduct avian surveys to determine bird species that may be utilizing the area and develop a plan to avoid disturbance during the nesting season. For underground powerlines, trenches should be covered or back-filled as soon as possible. Incorporate escape ramps in ditches or fencing along the perimeter to deter small mammals and herpetofauna (snakes, lizards, tortoise) from entering ditches. In addition, indirect affects to wildlife due to construction (timing of activity, clearing of rights-of-way, associated bridges and culverts, affects to wetlands, fences) should also be considered and mitigated.

Based on the project type entered, coordination with State Historic Preservation Office may be required (https://azstateparks.com/).

Based on the project type entered, coordination with U.S. Fish and Wildlife Service (Migratory Bird Treaty Act) may be required (https://www.fws.gov/office/arizona-ecological-services).

Vegetation restoration projects (including treatments of invasive or exotic species) should have a completed site-evaluation plan (identifying environmental conditions necessary to re-establish native vegetation), a revegetation plan (species, density, method of establishment), a short and long-term monitoring plan, including adaptive management guidelines to address needs for replacement vegetation.

The Department requests further coordination to provide project/species specific recommendations, please contact Project Evaluation Program directly at PEP@azgfd.gov.

Project Location and/or Species Recommendations:
HDMS records indicate that one or more native plants listed on the **Arizona Native Plant Law and Antiquities Act** have been documented within the vicinity of your project area. Please contact:
Arizona Department of Agriculture
1688 W Adams St.
Phoenix, AZ 85007
Phone: 602.542.4373
https://agriculture.az.gov/sites/default/files/Native%20Plant%20Rules%20-%20AZ%20Dept%20of%20Ag.pdf starts on page 44

HDMS records indicate that **Chiricahua Leopard Frogs** have been documented within the vicinity of your project area. Please review the Chiricahua Leopard Frog Management Guidelines found at: https://s3.amazonaws.com/azgfd-portal-wordpress/PortalImages/files/wildlife/planningFor/wildlifeFriendlyGuidelines/FINALLithchirHabitatGdlns.pdf

Analysis indicates that your project is located in the vicinity of an identified Conservation Opportunity Area (COA). While there are many areas in Arizona that present abundant conservation opportunities, COAs are specific areas on the landscape that the Department identified as having the greatest potential for conservation efforts. COAs were identified using species and habitat data, the presence of unique landscape features, and Departmental expertise. COAs range in size, scope, and focal species and/or habitats and are strictly a non-regulatory conservation tool for the public and our conservation partners to consider. For more information regarding this particular COA near your project area and the Department's suggestions for potential conservation efforts, please visit the COA profile at https://awcs.azgfd.com/conservation-opportunity-areas.

HDMS records indicate that one or more **Listed, Proposed, or Candidate** species or **Critical Habitat** (Designated or Proposed) have been documented in the vicinity of your project. The Endangered Species Act (ESA) gives the US Fish and Wildlife Service (USFWS) regulatory authority over all federally listed species. Please contact USFWS Ecological Services Offices at https://www.fws.gov/office/arizona-ecological-services or:

Phoenix Main Office
9828 North 31st Avenue #C3
Phoenix, AZ 85051-2517
Phone: 602-242-0210
Fax: 602-242-2513

Tucson Sub-Office
201 N. Bonita Suite 141
Tucson, AZ 85745
Phone: 520-670-6144
Fax: 520-670-6155

Flagstaff Sub-Office
SW Forest Science Complex
2500 S. Pine Knoll Dr.
Flagstaff, AZ 86001
Phone: 928-556-2157
Fax: 928-556-2121

Analysis indicates that your project is located in the vicinity of an identified ***wildlife habitat connectivity feature***.
The **Statewide Wildlife Connectivity Assessment's Important Connectivity Zones** (ICZs) represent general areas throughout the landscape which contribute the most to permeability of the whole landscape. ICZs may be used to help identify, in part, areas where more discrete corridor modeling ought to occur. The reports provide recommendations for opportunities to preserve or enhance permeability. Project planning and implementation efforts should focus on maintaining and improving opportunities for wildlife permeability. For information pertaining to the linkage assessment and wildlife species that may be affected, please refer to: https://s3.amazonaws.com/azgfd-portal-wordpress/azgfd.wp/wp-content/uploads/0001/01/23120719/ALIWCA_Final_Report_Perkl_2013_lowres.pdf.
Please contact the Project Evaluation Program (pep@azgfd.gov) for specific project recommendations.

APPENDIX C

Notice of Intent to Clear Land

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

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

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

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

   Owner's Name _____ Phone _____

   Address _____

   Agent's Name _____ Phone _____

   Address _____

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

   County _____

   Name of Property/Project _____

   Address _____

   Physical Location (attach map) _____

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

   Tax Parcel ID Nos. _____

   Legal Description (or attach copy) _____

   Number of Acres to be Cleared _____

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

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

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

   ☐ Owner has already arranged for salvage of the plants.

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

   ☐ Other _____

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

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

Signature _____ **Date** May 31, 2023

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

Explanation Of This Form

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

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

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

Notice to Landowner:

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

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

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

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

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

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

4.5 Exhibit E: Avian Impact Evaluation

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Sound Science. Creative Solutions.®

1645 South Plaza Way
Flagstaff, Arizona 86001
Tel 928.774.5500 Fax 928.779.2709
www.swca.com

TECHNICAL MEMORANDUM

To: Sara R, Born, P.E., Director of Project Development
Winchester Energy Development, LLC
929 Pearl Street, Suite 300
Boulder, Colorado 80302
sborn@torchcleanenergy.com

From: Tom Koronkiewicz, Avian Ecologist/Environmental Specialist

Date: March 21, 2023

Re: **Potential Avian Impact Summary, Winchester Energy Development / SWCA Project No. 77705**

INTRODUCTION

Winchester Energy Development, LLC (Winchester), is proposing to develop a solar and battery energy storage facility (project) on Arizona State Land Department (ASLD) and privately owned lands in Cochise County, Arizona. The proposed photovoltaic (PV) solar energy facility located on ASLD and privately owned lands would have a generation capacity of up to 160 megawatts (MW) of solar and 160 MW of battery energy storage. Construction would result in approximately 1,120 acres of semidesert grassland and Madrean evergreen woodland biotic communities (Brown 1994) to be covered in PV solar panels. The project site will be mowed prior to the start of construction, and it is the expectation that with time this habitat would return to semidesert grassland and where significantly impacted the site will be stabilized with grasses. (Figure 1).

Winchester requested that SWCA Environmental Consultants (SWCA) summarize the potential impacts of the project to bird species that use the landscape near the proposed site, using the most recent and cited publicly available literature. To do this, SWCA reviewed literature that quantified PV solar facility-related bird mortality rates and identified potential mechanisms that could explain potential impacts to birds.

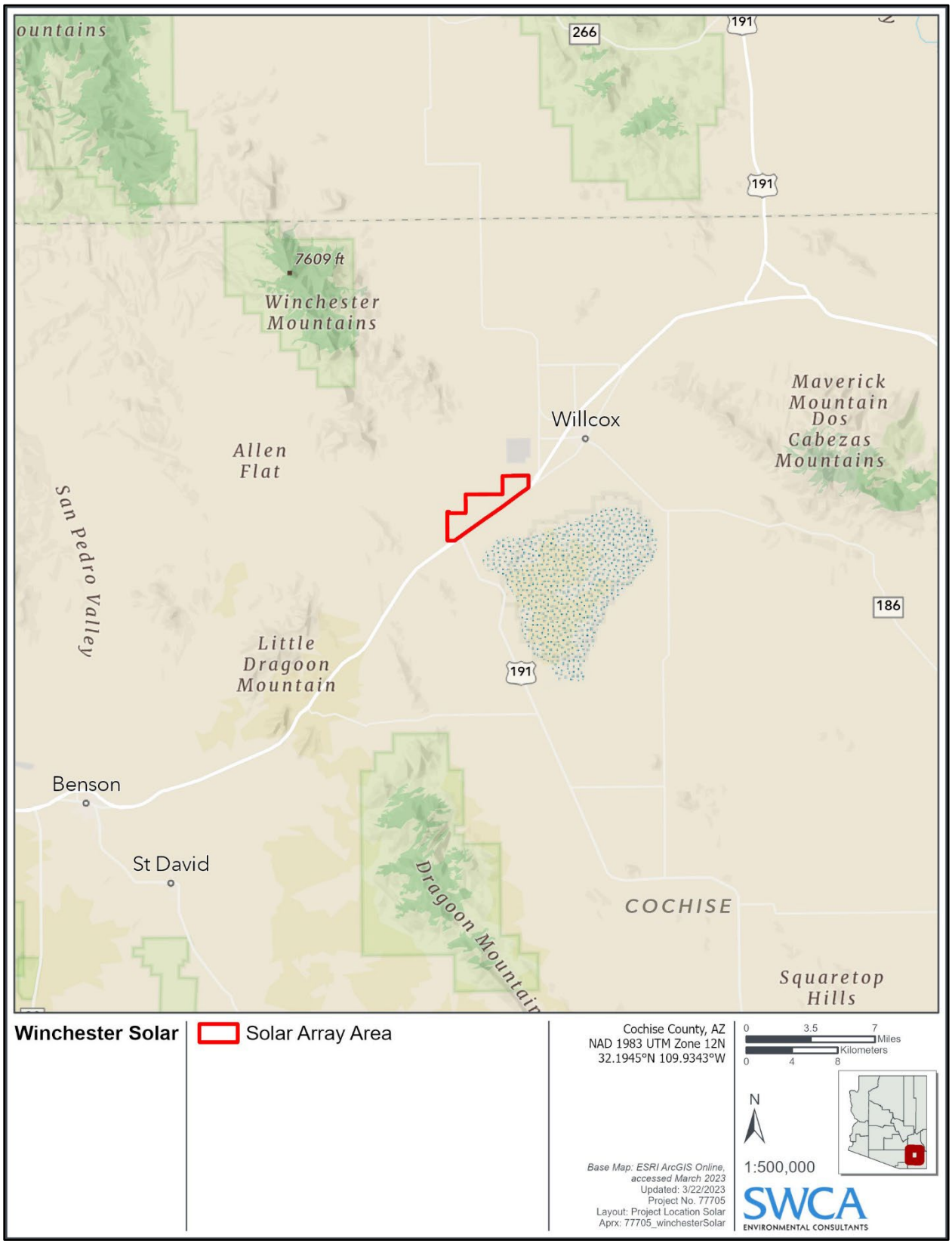


Figure 1. Project location.

Literature Describing Potential Bird Impacts at PV Solar Facilities

Unlike wind energy, few publicly available studies currently address potential bird impacts from PV solar facilities, and risks to bird species are not well understood (BSG Ecology 2014; Leitner 2009; Walston et al. 2015; Western Ecosystems Technology, Inc. [WEST] 2014). The recent study by Kosciuch et al. (2020) reviewed the existing literature related to bird carcass observations made near southwestern U.S. PV solar facilities. They identified 10 solar facilities, all in southern California or Nevada,[1] where carcass observation rates have been quantified. In each instance, quantification was based on repeated searches of PV solar sites during which observations of bird carcasses were recorded. Kosciuch et al. (2020) reported that total bird fatality estimates averaged across facilities were only 0.44 birds per acre per year. While some of these fatalities may have resulted because of the PV solar facility, others would have occurred whether the facility was present or not; these deaths represent "baseline mortality," or naturally occurring mortality. One of the facilities in the Kosciuch et al. (2020) review found that only about 25% of the total bird mortalities may have been facility-related, while the remaining 75% likely represented baseline mortality.

Another approach to estimating bird fatality at PV solar facilities uses necropsy data to assign a cause of death to individual carcasses. Kosciuch et al. (2020) reported that, among the intact carcasses observed across the sites they reviewed, approximately 38% died of collisions or electrocution (that is, they were facility-related). This result is similar to Kagan et al. (2014) who reported necropsy-based estimates of 31% facility-related impacts.

Based on the preceding information, it can be assumed that approximately two-thirds of total bird fatalities at PV solar facilities would have occurred naturally, at baseline. Thus, the existing data from sites in southern California or Nevada, suggest approximately 0.15 facility-related bird mortalities per acre per year. Of these mortalities, 55% would likely occur among passerines (songbirds; e.g., sparrows, robins, and cardinals), 17% among doves and pigeons, and about 8% among waterbirds (e.g., wading birds and waterfowl). Whether these rates would be similar for the proposed project is undetermined. Estimations would likely result in erroneous findings due to the overall lack of publicly available data in Arizona, the use of modern solar panel design for the proposed project (see below), and because the proposed project is in a relatively different habitat than the project sites referenced above. Further, because bird fatality data for PV solar facilities have only recently become available, and these data are exceptionally limited, science-based predictions of potential bird impacts are limited.

Potential Causes of Bird Impacts at PV Solar Facilities

Bird carcass observations at PV solar facilities have prompted several researchers to speculate as to causal mechanisms that could explain such occurrences. The following theories have been considered:

1. One hypothesis is that solar facilities may attract birds that mistake the reflective solar panels for a body of water and suffer collision trauma when attempting to land, which has been called the "lake effect." Moreover, it has been further hypothesized that water birds, which require a body of water to take off and land, may become trapped at a solar facility after landing if they are unable to reach nearby surface water. However, there is no clear evidence for the lake effect phenomenon to date, and mortalities at PV solar facilities have included both landbird and waterbird species (Kagan et al. 2014). Evidence that birds collide with PV solar panels more

[1] Data characterizing bird mortality rates at PV solar facilities are sparse. For example, Walston et al. (2016) conducted a systematic literature and internet search and identified only a single California facility that had collected data appropriate for estimating bird mortality rate. The 10 facilities identified by Kosciuch et al. (2020) were the result of a systematic literature and internet search supplemented with interviews of government agencies and solar facility operators.

often than non-reflective stationary infrastructure is also lacking, as is evidence that collisions with PV panels at solar facilities are a biologically significant source of avian mortality.

2. Some glass and plastic objects can alter the polarization of natural light, thereby attracting certain species of insects, with the increased density of insects attracting birds to a site. Alternatively, birds themselves may also key on light polarization and be drawn to such objects. Under either of the polarization hypotheses, carcass observations could be elevated relative to the baseline, at least in part, simply because on-site bird density exceeds the density in other nearby areas.

The PV solar panels to be used for the proposed project have a modern design. The panels have surface coatings that are designed to maximize energy absorption; these were not available a few years ago. As a result of the coatings, the glare and reflection are significantly reduced relative to solar panels at existing older facilities. The reduction in reflectivity and differential impacts on light polarization relative to older panels at the proposed project would limit the potential for adverse impacts to birds arising from either reflectivity or light polarization.

Contextualizing Potential Bird Impacts at PV Solar Facilities

Numerous anthropogenic mortality sources directly kill birds. Cause-specific annual mortality in the United States varies from billions (domestic cat predation) to hundreds of millions (building and automobile collisions), tens of millions (power line collisions), millions (power line electrocutions, communication tower collisions), and hundreds of thousands (wind turbine collisions) (Loss et al. 2015). Walston et al. (2016) estimated between 37,000 and 138,600 total U.S. bird deaths per year across all types of solar facilities. These data lead to the conclusion that, in the context of other anthropogenic sources of bird impacts and mortality (here we consider domesticated cats to be anthropogenic), the potential effect of PV solar facilities is far from significant on bird populations.

Conclusion

We conclude that, under reasonable worst-case assumptions, the project could result in minor potential impacts to birds, primarily passerines, doves, and pigeons near the facility. The project could also result in minor potential impacts to waterbirds due to the proximity of the Willcox Playa, which is located less than 2 miles to the southeast of the proposed project. However, it could be argued that waterbirds would likely be more drawn to the playa itself than the PV solar facility.

Importantly, the resulting potential change in bird abundance near the project, if any, would not result in any species-specific population-level effects and would not persist past the operational life of the project. Further, to the extent that the demand for electricity increases, with energy production trying to optimize the methods used to generate electricity, PV solar is likely a preferable alternative from a bird impact perspective relative to other potential sources of electricity generation. Additional structured bird impact studies of utility-scale PV solar facilities are necessary before conclusions about potential impacts to birds associated with PV solar facilities can be drawn.

Limitations and Warranty

Within the limitations of schedule, budget, and scope of work, SWCA warrants that this summary was conducted using the most recent, best publicly available science at the time this evaluation was performed, as outlined. The results and conclusions of this summary represent the best professional judgment of SWCA scientists and are based on information provided by the project proponent and on information obtained from publicly available literature. No other warranty, expressed or implied, is made.

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4.6 Exhibit F: Hydrology Study

TECHNICAL MEMORANDUM

To: Sara Born, PE – Torch Clean Energy, LLC

From: Kimley-Horn and Associates, Inc.

Date: May 19, 2023

Subject: Winchester Energy Development
Limited Detail 2D Hydrology Study
Cochise County, Arizona

Kimley-Horn and Associates, Inc. (Kimley-Horn) has prepared a two-dimensional flow study for the potential Winchester Energy Development in north Cochise County, Arizona. The intent of this study is to evaluate the approximate 100-year and 500-year ponding depths within the subject tracts (north and south) due to flows associated with tributaries to Wilcox Playa and local rainfall in the vicinity of the subject tract.

The subject tracts lie within Federal Emergency Management Agency (FEMA) Zone A, AE, AO, and X Special Flood Hazard Areas (SFHA) associated with Wilcox Playa and its tributaries. This study conducted a high-level analysis of runoff contribution from the Wilcox Playa watershed to evaluate backwater effects of ponding in Wilcox Playa on the subject tracts. A more detailed analysis is needed to accurately delineate the Special Flood Hazard Area (SFHA) for future development. This study should be used for internal planning purposes only and should not be used for submittal to regulatory agencies.

The subject tracts are approximately 8,250 acres and located in Cochise County, approximately 6 miles west of Willcox, Arizona and 62 miles east of Tucson, Arizona. The total contributing watershed to Wilcox Playa is approximately 1,654 square miles. The site location is shown in the attached *Vicinity Map*.

The following memorandum describes the methodology used to perform this analysis and results of the study.

METHODOLOGY

Hydrology

The hydrologic analysis was performed in general accordance with the currently published Arizona Department of Transportation (ADOT) Highway Drainage Design Manual (“Manual”).

Kimley-Horn created a hydrologic model for this study. The U.S. Army Corps HEC-HMS (Hydrologic Engineering Center Hydrologic Modeling System) v. 4.8 hydrologic modeling program was used to generate the 100-year and 500-year precipitation hyetographs used as boundary conditions for the HEC-RAS 2D model. The NOAA Precipitation Frequency Data Server was used to determine the NOAA Atlas 14 rainfall depths for the model area. The precipitation hyetographs were input into HEC-RAS 2D as described in the Hydraulics section of this memo. Initial abstraction and infiltration were calculated

using the Green and Ampt Method in the hydraulic model to accurately apply excess precipitation across the 2D mesh. Further detail regarding infiltration calculations is provided in the next section.

The hydrologic model was used to calculate the total contributing runoff volume to Wilcox Playa during the 100-yr and 500-yr storm events. Runoff losses for the total contributing watershed were calculated using the Green & Ampt method for the 100-year and 500-year storm events. A stage-storage relationship table was developed from existing topography described in the Hydraulics section of this memo. The maximum ponding water surface elevation (WSEL) was calculated by comparing the total runoff volume with the cumulative storage volume in the playa to the 0.1' accuracy. The 100-year and 500-year WSEL was 4139.5 and 4140.4, respectively. Calculations and reference tables are attached.

The drainage boundary for the study and the overall watershed are shown in the attached *Drainage Area Maps*.

Hydraulics

Hydraulic modeling of the site was performed using the U.S. Army Corps of Engineers' HEC-RAS 2D v. 6.2 hydraulic modeling software. HEC-RAS 2D is a two-dimensional hydrodynamic routing model that performs hydraulic routing using Implicit Finite Volume solution to the 2D unsteady flow equations. This type of model is generally used to estimate flooding limits and velocity distributions for both confined and unconfined flow.

Topographic information for the two-dimensional area is based on current publicly available USGS 1-meter digital elevation model (DEM). The vertical datum is NAVD88.

A 2D computational mesh based on the topographic information was generated in HEC-RAS to perform hydraulic modeling. A grid size of 100' X 100' was used for the model area. Breaklines were added in areas of topographic relief to align the cells with the direction of flow and capture the detail of underlying topographic high points and low points. Breaklines were added along flow centerlines, embankments, road centerlines, and ridge lines within the model area to further refine the grid. A breakline grid spacing of 50' was used for these areas.

Based on aerial imagery, several structures were considered significant and were modeled as part of this study. These culverts were identified and sizes estimated using aerial imagery and engineering judgement. A site visit was not performed as part of this study.

The hydrologic model consists of one subbasin that encompasses the contributing watershed draining to the subject tract. The 2D subbasin covers approximately 106.9 square miles.

The incremental precipitation hyetograph calculated in HEC-HMS was applied to the 2D model area as a precipitation boundary condition. The incremental time series data was applied uniformly across each cell within the entire 2D model domain. An infiltration layer using the Green and Ampt Method was created to accurately model infiltration loss within the 2D mesh. The flow direction and depth are based on several factors, including topography and surface roughness. The Manning's "n" value for friction losses is based on existing land cover, engineering judgement, the ADOT Hydrology Manual, and the Maricopa County FLO-2D Verification Report. The WSEL was used as a constant stage-storage downstream boundary condition for each storm event in the hydraulic model.

RESULTS

Results of the hydraulic modeling are shown on the attached *Inundation Maps*. The following tables summarize the results as a breakdown of the percentage of the subject tract by inundation.

The below tables do not exclude FEMA Floodplain. Cochise County requires a Floodplain Use Permit to be obtained before construction or development begins within any regulatory floodplain and FEMA SFHAs, including Zone A, AO, and AE. A FEMA Elevation Certificate will be required for the project to demonstrate compliance with regulatory flood elevation requirements outlined in the Cochise County Floodplain Requirements (December, 2015) published by the Cochise County Flood Control District. Additionally, the project will have to show no adverse impact, which is classified as not increasing the water surface elevation of the base flood more than one tenth of a foot along adjacent boundaries, and will not increase the flow velocity by more than 10%.

Table 1: 100-Year Percentage of Project Area by Depth (North)

Depth (ft)	Percentage (%)	Cumulative Percentage (%)
0.00 – 0.50	63.9%	63.9%
0.51 – 1.00	17.2%	81.1%
1.01 – 2.00	13.1%	94.2%
2.01 – 3.00	3.5%	97.6%
3.01 – 5.00	2.2%	99.8%
5.01 – 10.00	0.2%	100.0%
>10.00	0.0%	100.0%

Table 2: 100-Year Percentage of Project Area by Depth (South)

Depth (ft)	Percentage (%)	Cumulative Percentage (%)
0.00 – 0.50	69.1%	69.1%
0.51 – 1.00	10.8%	79.9%
1.01 – 2.00	8.2%	88.1%
2.01 – 3.00	2.6%	90.7%
3.01 – 5.00	8.8%	99.5%
5.01 – 10.00	0.5%	100.0%
>10.00	0.0%	100.0%

Table 3: 500-Year Percentage of Project Area by Depth (North)

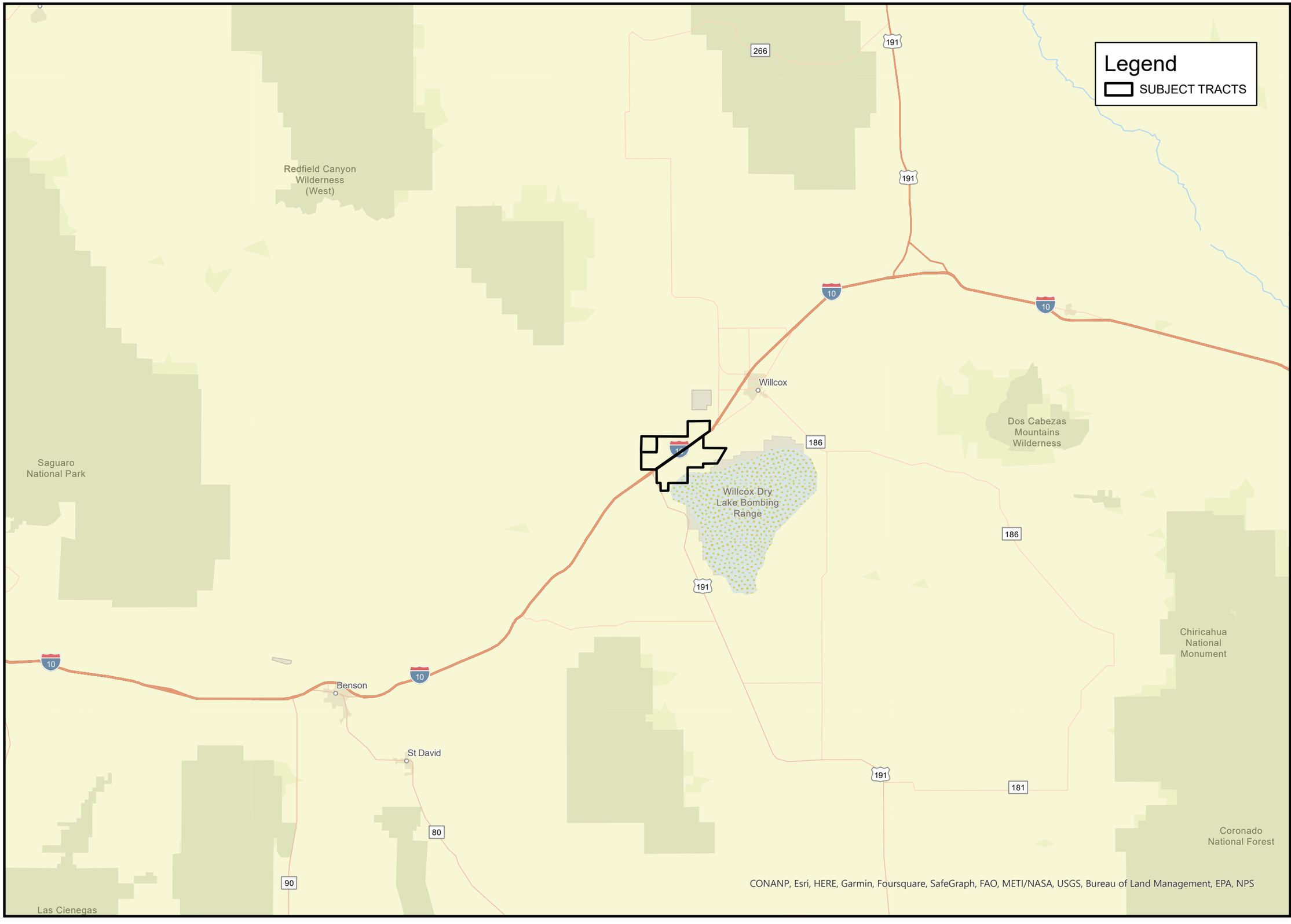
Depth (ft)	Percentage (%)	Cumulative Percentage (%)
0.00 – 0.50	51.7%	51.7%
0.51 – 1.00	20.7%	72.4%
1.01 – 2.00	16.5%	88.9%
2.01 – 3.00	6.9%	95.8%
3.01 – 5.00	3.7%	99.5%
5.01 – 10.00	0.5%	100.0%
>10.00	0.0%	100.0%

Table 4: 500-Year Percentage of Project Area by Depth (South)

Depth (ft)	Percentage (%)	Cumulative Percentage (%)
0.00 – 0.50	58.3%	58.3%
0.51 – 1.00	14.3%	72.5%
1.01 – 2.00	12.2%	84.8%
2.01 – 3.00	4.1%	88.9%
3.01 – 5.00	10.0%	98.9%
5.01 – 10.00	1.1%	100.0%
>10.00	0.0%	100.0%

ATTACHMENTS

Vicinity Map
Drainage Area Maps
Hydrologic Calculations
100-Year Inundation Map
100-Year Velocity Map
100-Year Scour Map
500-Year Inundation Map
500-Year Velocity Map
500-Year Scour Map



Kimley»Horn
7740 NORTH 16TH STREET SUITE 300
PHOENIX, AZ 85020
PHONE: 602-944-5500

WINCHESTER SOLAR II
COCHISE COUNTY, AZ

VICINITY MAP

PROJ NO.:	094850005
DATE:	MAY 2023
DESIGN:	AAT
DRAWN:	RR
CHECKED:	AAT

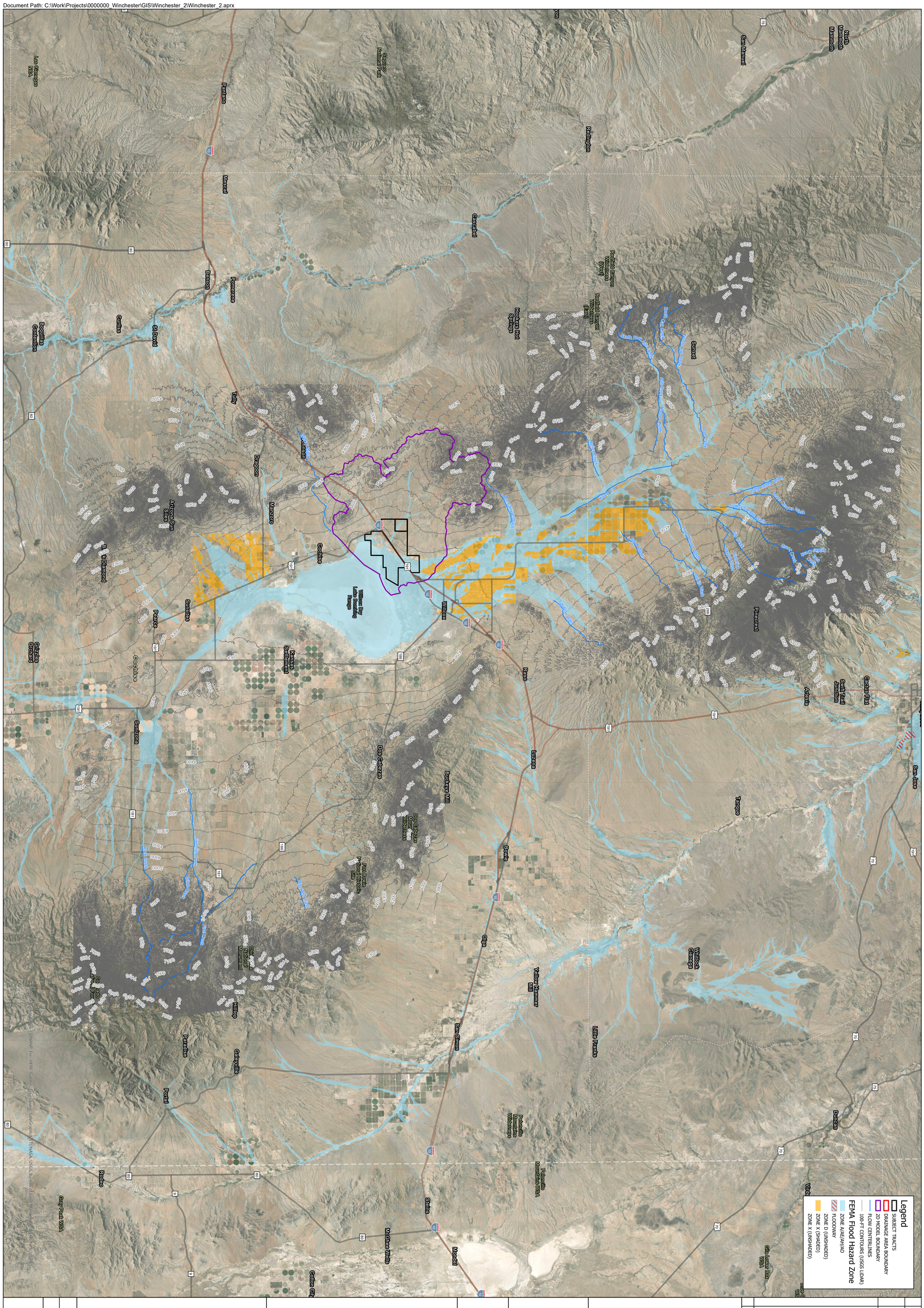
N

1 inch = 30,000 feet

SHEET 1

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Document Path: C:\Work\Projects\0000000_Winchester\GIS\Winchester_2\Winchester_2.aprx



SHEET NUMBER 2	PROJECT NO. 09485005	DATE MAY 2023	OVERALL DRAINAGE AREA MAP WILCOX PLAYA	WINCHESTER SOLAR II COCHISE COUNTY, AZ	1 inch = 17,500 feet

Kimley»Horn
7740 NORTH 16TH STREET SUITE 300
PHOENIX, AZ 85020
PHONE: 602-944-5500

DESIGN:	AAT
DRAWN:	RR
REVIEW:	AAT

Legend

- SUBJECT TRACTS
- 2D MODEL BOUNDARY
- 25-FT CONTOURS (USGS LiDAR)
- FLOW CENTERLINES

FEMA Flood Hazard Zone

- ZONE A/AE/AH/AO
- FLOODWAY
- ZONE D (UNSHADED)
- ZONE X (SHADED)
- ZONE X (UNSHADED)

DESIGN:	AAT
DRAWN:	RR
REVIEW:	AAT

Kimley»Horn
7740 NORTH 16TH STREET SUITE 300
PHOENIX, AZ 85020
PHONE: 602-944-5500

N

1 inch = 3,500 feet

WINCHESTER SOLAR II
COCHISE COUNTY, AZ

SITE DRAINAGE AREA MAP WILCOX PLAYA

DATE
MAY 2023

PROJECT NO.
09485005

SHEET NUMBER
3

Earthstar Geographics, CONANP, Esri, HERE, Garmin, Foursquare, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA

Document Path: C:\Work\Projects\0000000_Winchester\GIS\Winchester_2\Winchester_2.aprx

NOAA Atlas 14, Volume 1, Version 5
Location name: Cochise, Arizona, USA*
Latitude: 32.2069°, Longitude: -109.8071°
Elevation: m/ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.269** (0.234-0.312)	**0.345** (0.299-0.399)	**0.450** (0.388-0.520)	**0.527** (0.454-0.607)	**0.629** (0.538-0.727)	**0.707** (0.598-0.820)	**0.784** (0.658-0.912)	**0.862** (0.715-1.01)	**0.963** (0.784-1.14)	**1.04** (0.836-1.24)
10-min	**0.410** (0.356-0.474)	**0.525** (0.455-0.608)	**0.685** (0.591-0.791)	**0.802** (0.691-0.924)	**0.958** (0.819-1.11)	**1.08** (0.911-1.25)	**1.19** (1.00-1.39)	**1.31** (1.09-1.53)	**1.47** (1.19-1.73)	**1.59** (1.27-1.89)
15-min	**0.508** (0.441-0.588)	**0.651** (0.564-0.753)	**0.849** (0.733-0.981)	**0.994** (0.856-1.15)	**1.19** (1.01-1.37)	**1.33** (1.13-1.55)	**1.48** (1.24-1.72)	**1.63** (1.35-1.90)	**1.82** (1.48-2.15)	**1.97** (1.58-2.35)
30-min	**0.685** (0.594-0.792)	**0.876** (0.759-1.01)	**1.14** (0.987-1.32)	**1.34** (1.15-1.54)	**1.60** (1.37-1.85)	**1.80** (1.52-2.08)	**1.99** (1.67-2.32)	**2.19** (1.82-2.56)	**2.45** (1.99-2.89)	**2.65** (2.12-3.16)
60-min	**0.847** (0.736-0.980)	**1.09** (0.940-1.26)	**1.42** (1.22-1.63)	**1.66** (1.43-1.91)	**1.98** (1.69-2.29)	**2.22** (1.88-2.58)	**2.47** (2.07-2.87)	**2.71** (2.25-3.17)	**3.03** (2.46-3.58)	**3.28** (2.63-3.91)
2-hr	**0.962** (0.838-1.11)	**1.22** (1.06-1.40)	**1.57** (1.37-1.80)	**1.85** (1.60-2.12)	**2.23** (1.92-2.56)	**2.53** (2.15-2.90)	**2.84** (2.39-3.28)	**3.16** (2.62-3.67)	**3.60** (2.93-4.21)	**3.94** (3.16-4.66)
3-hr	**0.995** (0.875-1.14)	**1.26** (1.11-1.44)	**1.60** (1.40-1.83)	**1.88** (1.64-2.14)	**2.27** (1.97-2.59)	**2.58** (2.21-2.95)	**2.91** (2.46-3.34)	**3.25** (2.71-3.75)	**3.72** (3.03-4.35)	**4.11** (3.28-4.86)
6-hr	**1.13** (0.992-1.29)	**1.42** (1.24-1.62)	**1.79** (1.57-2.04)	**2.10** (1.83-2.40)	**2.54** (2.20-2.89)	**2.90** (2.48-3.30)	**3.28** (2.77-3.76)	**3.68** (3.06-4.24)	**4.25** (3.44-4.95)	**4.71** (3.74-5.54)
12-hr	**1.22** (1.07-1.39)	**1.53** (1.35-1.74)	**1.91** (1.68-2.18)	**2.23** (1.96-2.54)	**2.68** (2.33-3.05)	**3.04** (2.62-3.47)	**3.42** (2.90-3.92)	**3.82** (3.19-4.41)	**4.38** (3.59-5.11)	**4.84** (3.89-5.69)
24-hr	**1.37** (1.26-1.51)	**1.72** (1.58-1.89)	**2.14** (1.96-2.35)	**2.47** (2.25-2.70)	**2.90** (2.64-3.18)	**3.23** (2.93-3.55)	**3.56** (3.21-3.94)	**3.89** (3.49-4.45)	**4.43** (3.84-5.16)	**4.89** (4.10-5.75)
2-day	**1.50** (1.38-1.63)	**1.87** (1.72-2.04)	**2.32** (2.13-2.52)	**2.66** (2.44-2.89)	**3.12** (2.85-3.39)	**3.46** (3.15-3.77)	**3.81** (3.44-4.16)	**4.15** (3.73-4.56)	**4.60** (4.09-5.22)	**4.94** (4.36-5.81)
3-day	**1.63** (1.50-1.77)	**2.03** (1.87-2.21)	**2.51** (2.31-2.72)	**2.88** (2.65-3.12)	**3.37** (3.09-3.66)	**3.74** (3.41-4.07)	**4.12** (3.73-4.49)	**4.49** (4.04-4.91)	**4.98** (4.44-5.55)	**5.35** (4.73-6.08)
4-day	**1.76** (1.62-1.90)	**2.19** (2.02-2.38)	**2.70** (2.49-2.93)	**3.10** (2.85-3.36)	**3.62** (3.33-3.93)	**4.02** (3.68-4.36)	**4.43** (4.02-4.81)	**4.83** (4.36-5.27)	**5.36** (4.78-5.88)	**5.76** (5.10-6.36)
7-day	**2.06** (1.90-2.24)	**2.57** (2.38-2.79)	**3.16** (2.92-3.42)	**3.61** (3.33-3.91)	**4.21** (3.87-4.56)	**4.65** (4.26-5.05)	**5.09** (4.64-5.54)	**5.53** (5.01-6.04)	**6.09** (5.48-6.69)	**6.51** (5.81-7.20)
10-day	**2.33** (2.15-2.52)	**2.90** (2.67-3.14)	**3.55** (3.27-3.85)	**4.05** (3.73-4.40)	**4.71** (4.33-5.11)	**5.21** (4.76-5.66)	**5.70** (5.19-6.21)	**6.18** (5.60-6.76)	**6.80** (6.12-7.48)	**7.26** (6.48-8.03)
20-day	**3.10** (2.86-3.34)	**3.86** (3.57-4.17)	**4.71** (4.35-5.09)	**5.33** (4.92-5.75)	**6.10** (5.62-6.58)	**6.65** (6.12-7.19)	**7.17** (6.58-7.77)	**7.67** (7.00-8.33)	**8.28** (7.53-9.03)	**8.71** (7.88-9.54)
30-day	**3.79** (3.51-4.08)	**4.72** (4.37-5.10)	**5.72** (5.30-6.16)	**6.43** (5.96-6.93)	**7.31** (6.77-7.89)	**7.93** (7.32-8.57)	**8.51** (7.85-9.22)	**9.06** (8.32-9.84)	**9.71** (8.88-10.6)	**10.2** (9.26-11.1)
45-day	**4.58** (4.24-4.93)	**5.69** (5.27-6.14)	**6.84** (6.34-7.36)	**7.65** (7.09-8.24)	**8.62** (7.99-9.29)	**9.29** (8.59-10.0)	**9.90** (9.14-10.7)	**10.5** (9.63-11.3)	**11.1** (10.2-12.1)	**11.5** (10.6-12.6)
60-day	**5.27** (4.88-5.66)	**6.55** (6.07-7.04)	**7.84** (7.27-8.41)	**8.74** (8.10-9.38)	**9.80** (9.08-10.5)	**10.5** (9.73-11.3)	**11.2** (10.3-12.0)	**11.8** (10.8-12.7)	**12.4** (11.4-13.5)	**12.9** (11.8-14.0)

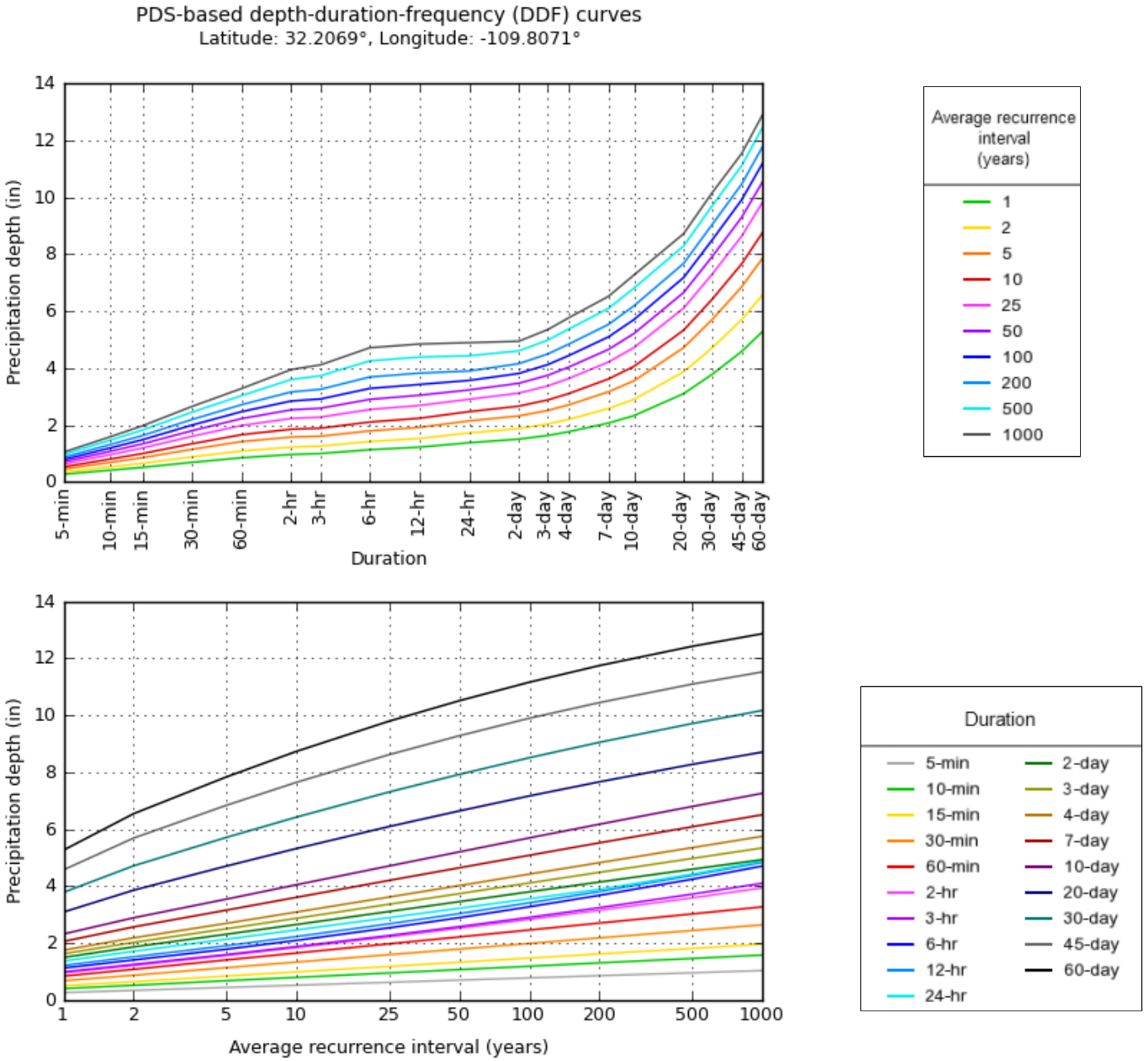
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical



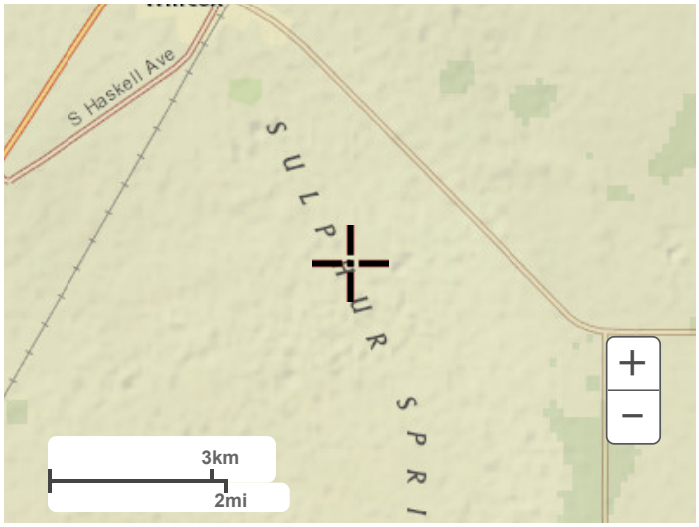
NOAA Atlas 14, Volume 1, Version 5

Created (GMT): Thu Mar 23 16:50:47 2023

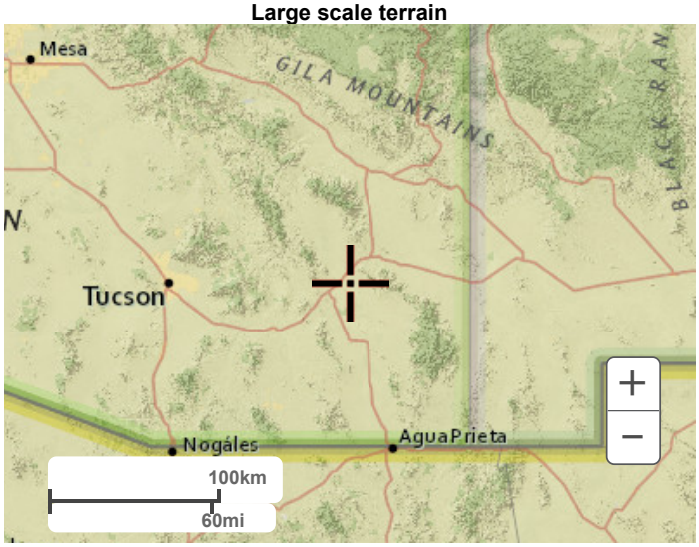
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Maps & aerials

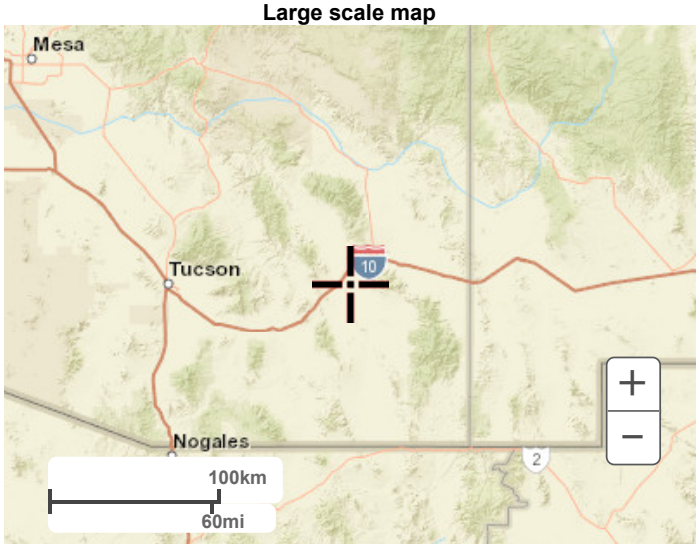
Small scale terrain



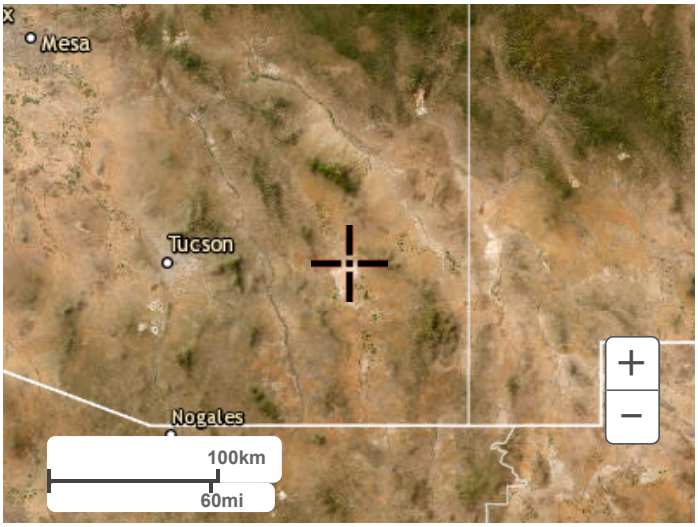
Large scale terrain



Large scale map



Large scale aerial



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Infiltration Loss Parameter Calculations
Green and Ampt Method

AZ Soil Type	NRCS Soil Survey ID	Subarea Name	MUSYM	MUKEY	Wilting Point (ratio)	Field Capacity (ratio)	Saturation (ratio)	Suction (in)*	Conductivity (in/hr)*	Impervious Fraction	DTHETA_D	DTHETA_N	Area (ac)	Area (sqmi)
1385200	AZ666	Wilcox	57	1385200	0.13	0.26	0.42	13.51	0.16	25	0.16	0.29	4921.05	7.6891
1385202	AZ666	Wilcox	12	1385202	0.08	0.17	0.43	2.67	0.49	25	0.26	0.35	1624.17	2.5378
1385206	AZ666	Wilcox	61	1385206	0.11	0.25	0.42	12.69	0.17	0	0.17	0.31	228.67	0.3573
1539328	AZ666	Wilcox	89	1539328	0.11	0.24	0.42	12.41	0.18	25	0.18	0.31	2321.16	3.6268
1539329	AZ666	Wilcox	79	1539329	0.12	0.21	0.43	5.04	0.37	0	0.22	0.31	13118.75	20.498
1539330	AZ666	Wilcox	6	1539330	0.07	0.15	0.4	4.05	0.69	0	0.25	0.33	11432.55	17.8634
1539331	AZ666	Wilcox	16	1539331	0.08	0.2	0.44	6.89	0.48	0	0.24	0.36	6718.9	10.4983
1677402	AZ666	Wilcox	47	1677402	0.26	0.41	0.5	19.24	0.04	0	0.09	0.24	11621.81	18.1591
1677403	AZ666	Wilcox	81	1677403	0.16	0.29	0.43	15.53	0.13	0	0.14	0.27	982.12	1.5346
1677408	AZ666	Wilcox	54	1677408	0.09	0.18	0.43	3.06	0.78	0	0.25	0.34	175.42	0.2741
1677410	AZ666	Wilcox	69	1677410	0.12	0.21	0.4	6.3	0.17	15	0.19	0.28	1043.04	1.6298
1677414	AZ666	Wilcox	23	1677414	0.15	0.28	0.45	12.46	0.13	20	0.17	0.3	7908.93	12.3577
1677416	AZ666	Wilcox	21	1677416	0.2	0.36	0.49	18.55	0.1	0	0.13	0.29	75.6	0.1181
1677417	AZ666	Wilcox	24	1677417	0.22	0.33	0.48	5.8	0.07	0	0.15	0.26	2188.81	3.42
1677418	AZ666	Wilcox	58	1677418	0.11	0.25	0.44	10.48	0.3	20	0.19	0.33	16420.95	25.6577
1678525	AZ666	Wilcox	60	1678525	0.3	0.42	0.48	11.42	0.01	0	0.06	0.18	503.85	0.7873
1678526	AZ666	Wilcox	37	1678526	0.3	0.42	0.48	11.42	0.01	0	0.06	0.18	3778.25	5.9035
1727320	AZ666	Wilcox	4	1727320	0.25	0.4	0.51	16.95	0.06	0	0.11	0.26	149.01	0.2328
1727321	AZ666	Wilcox	82	1727321	0.33	0.45	0.52	10.77	0.02	0	0.07	0.19	38.37	0.06
1727323	AZ666	Wilcox	64	1727323	0.09	0.22	0.4	13.72	0.18	0	0.18	0.31	4064.95	6.3515
1727328	AZ666	Wilcox	5	1727328	0.28	0.41	0.49	13.07	0.03	0	0.08	0.21	422.57	0.6603
1896425	AZ666	Wilcox	62	1896425	0.13	0.25	0.42	9.06	0.15	0	0.17	0.29	2343.29	3.6614
1896647	AZ666	Wilcox	72	1896647	0.13	0.26	0.41	15.12	0.17	0	0.15	0.28	4493.52	7.0211
1896652	AZ666	Wilcox	51	1896652	0.16	0.32	0.45	24.1	0.1	0	0.13	0.29	554.98	0.8672
1896843	AZ666	Wilcox	67	1896843	0.06	0.18	0.42	8.16	0.58	0	0.24	0.36	544.8	0.8513
1896887	AZ666	Wilcox	59	1896887	0.08	0.18	0.4	6.36	0.47	0	0.22	0.32	10804.38	16.8818
2498553	AZ673	Wilcox	2	2498553	0.28	0.41	0.49	13.08	0.02	20	0.08	0.21	21931.95	34.2687
2498557	AZ673	Wilcox	11	2498557	0.29	0.41	0.5	13	0.03	0	0.09	0.21	129.59	0.2025
2498560	AZ673	Wilcox	37	2498560	0.09	0.18	0.43	3.21	0.46	35	0.25	0.34	2779.64	4.3432
2498572	AZ673	Wilcox	9	2498572	0.15	0.28	0.43	14.09	0.1	20	0.15	0.28	2342.03	3.6594
2498574	AZ673	Wilcox	12	2498574	0.23	0.36	0.47	14.21	0.05	0	0.11	0.24	12818.14	20.0283
2498575	AZ673	Wilcox	36	2498575	0.19	0.33	0.46	17.17	0.09	0	0.13	0.27	1052.31	1.6442
2498576	AZ673	Wilcox	54	2498576	0.09	0.17	0.4	3.83	0.58	0	0.23	0.31	5557.26	8.6832
2498577	AZ673	Wilcox	18	2498577	0.15	0.28	0.43	14.05	0.09	15	0.15	0.28	590.56	0.9227
2498578	AZ673	Wilcox	1	2498578	0.14	0.3	0.43	21.8	0.13	0	0.13	0.29	1014.17	1.5846
2498579	AZ673	Wilcox	10	2498579	0.08	0.16	0.41	3.8	0.54	0	0.25	0.33	1145.25	1.7894
2498580	AZ673	Wilcox	52	2498580	0.06	0.14	0.38	2.97	0.74	0	0.24	0.32	124.85	0.1951
2500951	AZ673	Wilcox	42	2500951	0.08	0.17	0.42	3.51	0.75	0	0.25	0.34	44998.59	70.3103
2500953	AZ673	Wilcox	31	2500953	0.05	0.11	0.4	0.97	0.65	20	0.29	0.35	600.23	0.9379
2500954	AZ673	Wilcox	44	2500954	0.14	0.28	0.42	15.26	0.09	10	0.14	0.28	73.34	0.1146
2500956	AZ673	Wilcox	27	2500956	0.08	0.17	0.4	4.39	0.65	0	0.23	0.32	20335.86	31.7748
2513581	AZ673	Wilcox	35	2513581	0.1	0.24	0.44	11.61	0.38	0	0.2	0.34	3780.43	5.9069
2513584	AZ673	Wilcox	14	2513584	0.08	0.17	0.42	3.4	0.82	0	0.25	0.34	4424.8	6.9138
2513587	AZ673	Wilcox	43	2513587	0.22	0.35	0.45	15.59	0.05	0	0.1	0.23	14014.09	21.897
2513594	AZ673	Wilcox	55	2513594	0.3	0.42	0.48	11.42	0.01	100	0.06	0.18	18.84	0.0294
2513599	AZ673	Wilcox	40	2513599	0.23	0.36	0.46	15.14	0.05	0	0.1	0.23	90.35	0.1412
2513600	AZ673	Wilcox	13	2513600	0.08	0.17	0.4	4.39	0.65	0	0.23	0.32	186.11	0.2908
2513601	AZ673	Wilcox	53	2513601	0.15	0.29	0.44	14.01	0.17	0	0.15	0.29	461.64	0.7213
2513602	AZ673	Wilcox	41	2513602	0.15	0.25	0.42	7.24	0.23	0	0.17	0.27	145.94	0.228
53652	AZ664	Wilcox	12	53652	0.08	0.17	0.42	3.52	0.7	0	0.25	0.34	8188.37	12.7943
53655	AZ664	Wilcox	15	53655	0.09	0.17	0.4	4.13	0.54	0	0.23	0.31	148.69	0.2323
53658	AZ664	Wilcox	18	53658	0.13	0.27	0.44	11.65	0.18	25	0.17	0.31	9230.88	14.4232
53659	AZ664	Wilcox	19	53659	0.16	0.28	0.44	10.12	0.16	0	0.16	0.28	8605.42	13.446
53668	AZ664	Wilcox	27	53668	0.22	0.37	0.48	18.32	0.06	0	0.11	0.26	2674.35	4.1787
53672	AZ664	Wilcox	30	53672	0.12	0.2	0.41	4.19	0.34	0	0.21	0.29	2406.13	3.7596
53673	AZ664	Wilcox	31	53673	0.13	0.26	0.43	12.81	0.16	25	0.17	0.3	1746.04	2.7282
53674	AZ664	Wilcox	32	53674	0.17	0.28	0.43	9.27	0.13	15	0.15	0.26	13269.04	20.7329
53676	AZ664	Wilcox	34	53676	0.14	0.32	0.47	20.3	0.18	0	0.15	0.33	37779.72	59.0308
53677	AZ664	Wilcox	35	53677	0.29	0.43	0.54	10.09	0.06	0	0.11	0.25	872.19	1.3628
53678	AZ664	Wilcox	36	53678	0.11	0.25	0.45	9.89	0.32	0	0.2	0.34	5665.28	8.852
53679	AZ664	Wilcox	37	53679	0.27	0.4	0.5	12.07	0.03	0	0.1	0.23	14211.82	22.206

Calculated Values						
W*A	FCAP*A	SAT*A	log(PSIF)*A	log(XKSAT)*A	IMP*A	A (ac)
639.74	1279.47	2066.84	5564.01	-3916.57	123026.25	4921.05
129.93	276.11	698.39	692.73	-503.17	40604.25	1624.17
25.15	57.17	96.04	252.33	-175.97	0.00	228.67
255.33	557.08	974.89	2538.82	-1728.63	58029.00	2321.16
1574.25	2754.94	5641.06	9215.01	-5664.65	0.00	13118.75
800.28	1714.88	4573.02	6944.76	-1842.37	0.00	11432.55
537.51	1343.78	2956.32	5631.91	-2141.71	0.00	6718.90
3021.67	4764.94	5810.91	14924.79	-16246.59	0.00	11621.81
157.14	284.81	422.31	1169.87	-870.21	0.00	982.12
15.79	31.58	75.43	85.21	-18.93	0.00	175.42
125.16	219.04	417.22	833.74	-802.67	15645.60	1043.04
1186.34	2214.50	3559.02	8664.38	-7007.76	158178.60	7908.93
15.12	27.22	37.04	95.89	-75.60	0.00	75.60
481.54	722.31	1050.63	1671.00	-2527.86	0.00	2188.81
1806.30	4105.24	7225.22	16755.30	-8586.17	328419.00	16420.95
151.16	211.62	241.85	532.91	-1007.70	0.00	503.85
1133.48	1586.87	1813.56	3996.13	-7556.50	0.00	3778.25
37.25	59.60	76.00	183.16	-182.07	0.00	149.01
12.66	17.27	19.95	39.61	-65.19	0.00	38.37
365.85	894.29	1625.98	4623.29	-3027.28	0.00	4064.95
118.32	173.25	207.06	471.70	-643.52	0.00	422.57
304.63	585.82	984.18	2242.83	-1930.66	0.00	2343.29
584.16	1168.32	1842.34	5300.34	-3457.99	0.00	4493.52
88.80	177.59	249.74	766.99	-554.98	0.00	554.98
32.69	98.06	228.82	496.69	-128.88	0.00	544.80
864.35	1944.79	4321.75	8680.86	-3542.78	0.00	10804.38
6140.95	8992.10	10746.66	24489.39	-37261.73	438639.00	21931.95
37.58	53.13	64.80	144.36	-197.35	0.00	129.59
250.17	500.34	1195.25	1407.90	-937.41	97287.40	2779.64
351.30	655.77	1007.07	2690.78	-2342.03	46840.60	2342.03
2948.17	4614.53	6024.53	14774.11	-16676.78	0.00	12818.14
199.94	347.26	484.06	1299.36	-1100.46	0.00	1052.31
500.15	944.73	2222.90	3240.99	-1314.69	0.00	5557.26
88.58	165.36	253.94	677.77	-617.58	8858.40	590.56
141.98	304.25	436.09	1357.42	-898.61	0.00	1014.17
91.62	183.24	469.55	664.00	-306.48	0.00	1145.25
7.49	17.48	47.44	59.02	-16.33	0.00	124.85
3599.89	7649.76	18899.41	24538.05	-5622.07	0.00	44998.59
30.01	66.03	240.09	-7.94	-112.30	12004.60	600.23
10.27	20.54	30.80	86.80	-76.70	733.40	73.34
1626.87	3457.10	8134.34	13065.07	-3804.57	0.00	20335.86
378.04	907.30	1663.39	4025.52	-1588.60	0.00	3780.43
353.98	752.22	1858.42	2351.69	-381.36	0.00	4424.80
3083.10	4904.93	6306.34	16716.65	-18232.75	0.00	14014.09
5.65	7.91	9.04	19.93	-37.68	1884.00	18.84
20.78	32.53	41.56	106.62	-117.55	0.00	90.35
14.89	31.64	74.44	119.57	-34.82	0.00	186.11
69.25	133.88	203.12	529.24	-355.26	0.00	461.64
21.89	36.49	61.29	125.47	-93.15	0.00	145.94
655.07	1392.02	3439.12	4475.29	-1268.39	0.00	8188.37
13.38	25.28	59.48	91.59	-39.79	0.00	148.69
1200.01	2492.34	4061.59	9843.13	-6874.49	230772.00	9230.88
1376.87	2409.52	3786.38	8650.00	-6848.88	0.00	8605.42
588.36	989.51	1283.69	3377.50	-3267.65	0.00	2674.35
288.74	481.23	986.51	1497.13	-1127.32	0.00	2406.13
226.99	453.97	750.80	1933.83	-1389.64	43651.00	1746.04
2255.74	3715.33	5705.69	12832.22	-11757.12	199035.60	13269.04
5289.16	12089.51	17756.47	49396.83	-28135.60	0.00	37779.72
252.94	375.04	470.98	875.58	-1065.68	0.00	872.19
623.18	1416.32	2549.38	5638.07	-2803.46	0.00	5665.28
3837.19	5684.73	7105.91	15373.03	-21642.88	0.00	14211.82

Infiltration Loss Parameter Calculations
Green and Ampt Method

53680	AZ664	Wilcox	38	53680	0.06	0.15	0.4	4.06	0.67	0	0.25	0.34	7280.42	11.3757	436.83	1092.06	2912.17	4430.33	-1266.25	0.00	7280.42
53682	AZ664	Wilcox	4	53682	0.2	0.31	0.44	10.22	0.07	10	0.13	0.24	14647.53	22.8868	2929.51	4540.73	6444.91	14785.96	-16916.46	146475.30	14647.53
53685	AZ664	Wilcox	42	53685	0.09	0.19	0.4	8.28	0.35	0	0.21	0.31	36606.4	57.1975	3294.58	6955.22	14642.56	33605.79	-16690.03	0.00	36606.40
53686	AZ664	Wilcox	43	53686	0.08	0.17	0.4	4.64	0.57	0	0.23	0.32	1353.28	2.1145	108.26	230.06	541.31	901.99	-330.37	0.00	1353.28
53688	AZ664	Wilcox	45	53688	0.19	0.32	0.45	11.31	0.1	0	0.13	0.26	43569	68.0766	8278.11	13942.08	19606.05	45898.31	-43569.00	0.00	43569.00
53689	AZ664	Wilcox	5	53689	0.21	0.33	0.45	9.65	0.06	20	0.12	0.24	7468.57	11.6696	1568.40	2464.63	3360.86	7353.01	-9125.46	149371.40	7468.57
53691	AZ664	Wilcox	7	53691	0.11	0.18	0.41	2.26	0.37	0	0.23	0.3	556.3	0.8692	61.19	100.13	228.08	196.99	-240.21	0.00	556.30
53694	AZ665	Wilcox	BeC	53694	0.13	0.23	0.44	4.28	0.37	0	0.21	0.31	608.05	0.9501	79.05	139.85	267.54	383.95	-262.55	0.00	608.05
53695	AZ665	Wilcox	Ca	53695	0.07	0.2	0.39	13.76	0.33	0	0.19	0.32	1891.01	2.9547	132.37	378.20	737.49	2153.14	-910.49	0.00	1891.01
53696	AZ665	Wilcox	Cc	53696	0.21	0.35	0.46	15.17	0.06	0	0.11	0.25	7758.28	12.1223	1629.24	2715.40	3568.81	9162.42	-9479.44	0.00	7758.28
53697	AZ665	Wilcox	Ce	53697	0.21	0.35	0.46	15.17	0.06	0	0.11	0.25	2230.18	3.4847	468.34	780.56	1025.88	2633.81	-2724.94	0.00	2230.18
53698	AZ665	Wilcox	Cg	53698	0.3	0.42	0.5	13.14	0.02	0	0.08	0.2	415.53	0.6493	124.66	174.52	207.77	464.81	-705.97	0.00	415.53
53699	AZ665	Wilcox	CmA	53699	0.08	0.18	0.42	4.06	0.71	0	0.24	0.34	9950.47	15.5476	796.04	1791.08	4179.20	6055.12	-1480.05	0.00	9950.47
53700	AZ665	Wilcox	CnA	53700	0.08	0.18	0.42	4.06	0.55	0	0.24	0.34	3742.29	5.8473	299.38	673.61	1571.76	2277.28	-971.64	0.00	3742.29
53701	AZ665	Wilcox	CnC	53701	0.08	0.18	0.42	4.06	0.55	0	0.24	0.34	657.72	1.0277	52.62	118.39	276.24	400.24	-170.77	0.00	657.72
53702	AZ665	Wilcox	Co	53702	0.08	0.18	0.42	4.06	0.71	0	0.24	0.34	1112.45	1.7382	89.00	200.24	467.23	676.95	-165.47	0.00	1112.45
53703	AZ665	Wilcox	Cs	53703	0.08	0.18	0.42	4.06	0.71	0	0.24	0.34	3891.11	6.0799	311.29	700.40	1634.27	2367.84	-578.77	0.00	3891.11
53704	AZ665	Wilcox	Ct	53704	0.09	0.18	0.4	4.97	0.53	0	0.22	0.31	21187.19	33.105	1906.85	3813.69	8474.88	14753.84	-5841.82	0.00	21187.19
53705	AZ665	Wilcox	Dr	53705	0.05	0.1	0.41	0.52	1.41	0	0.31	0.36	3296.51	5.1508	164.83	329.65	1351.57	-936.20	491.90	0.00	3296.51
53706	AZ665	Wilcox	Du	53706	0.13	0.26	0.41	14.57	0.2	0	0.15	0.28	5219.16	8.1549	678.49	1356.98	2139.86	6072.28	-3648.04	0.00	5219.16
53707	AZ665	Wilcox	Dv	53707	0.15	0.28	0.42	15.76	0.14	0	0.14	0.27	814.35	1.2724	122.15	228.02	342.03	975.23	-695.35	0.00	814.35
53708	AZ665	Wilcox	Ef	53708	0.21	0.37	0.48	19.21	0.07	0	0.11	0.27	12419.23	19.4051	2608.04	4595.12	5961.23	15940.42	-14342.99	0.00	12419.23
53709	AZ665	Wilcox	FoA	53709	0.15	0.28	0.42	15.76	0.14	0	0.14	0.27	11194.39	17.4912	1679.16	3134.43	4701.64	13405.91	-9558.58	0.00	11194.39
53710	AZ665	Wilcox	FrA	53710	0.18	0.29	0.43	10.39	0.1	0	0.14	0.25	3019.76	4.7184	543.56	875.73	1298.50	3069.93	-3019.76	0.00	3019.76
53711	AZ665	Wilcox	FrB	53711	0.16	0.25	0.41	5.83	0.16	0	0.16	0.25	485.8	0.7591	77.73	121.45	199.18	371.96	-386.64	0.00	485.80
53712	AZ665	Wilcox	Fy	53712	0.06	0.16	0.4	6.66	0.69	0	0.24	0.34	5160.19	8.0628	309.61	825.63	2064.08	4249.28	-831.57	0.00	5160.19
53713	AZ665	Wilcox	Go	53713	0.07	0.16	0.4	5.39	0.7	0	0.24	0.33	30429.8	47.5466	2130.09	4868.77	12171.92	22262.10	-4713.64	0.00	30429.80
53714	AZ665	Wilcox	Gr	53714	0.1	0.19	0.42	4.26	0.53	0	0.23	0.32	10136.69	15.8386	1013.67	1925.97	4257.41	6380.13	-2794.93	0.00	10136.69
53715	AZ665	Wilcox	Gs	53715	0.1	0.24	0.43	11.75	0.36	0	0.19	0.33	16043.5	25.068	1604.35	3850.44	6898.71	17167.15	-7118.46	0.00	16043.50
53716	AZ665	Wilcox	Gt	53716	0.21	0.35	0.44	16.65	0.05	0	0.09	0.23	11041.84	17.2529	2318.79	3864.64	4858.41	13486.66	-14365.77	0.00	11041.84
53717	AZ665	Wilcox	Gu	53717	0.27	0.4	0.48	15.73	0.02	0	0.08	0.21	778.32	1.2161	210.15	311.33	373.59	931.44	-1322.34	0.00	778.32
53718	AZ665	Wilcox	Ka	53718	0.15	0.29	0.44	14.01	0.17	0	0.15	0.29	16352.89	25.5514	2452.93	4742.34	7195.27	18747.58	-12584.38	0.00	16352.89
53719	AZ665	Wilcox	KbE	53719	0.12	0.25	0.43	12.33	0.22	0	0.18	0.31	3756.48	5.8695	450.78	939.12	1615.29	4098.18	-2470.18	0.00	3756.48
53720	AZ665	Wilcox	KhE	53720	0.12	0.25	0.43	12.33	0.2	0	0.18	0.31	1655.33	2.5865	198.64	413.83	711.79	1805.90	-1157.03	0.00	1655.33
53721	AZ665	Wilcox	LuD	53721	0.19	0.33	0.45	15.03	0.07	0	0.12	0.26	777.94	1.2155	147.81	256.72	350.07	915.60	-898.44	0.00	777.94
53722	AZ665	Wilcox	LvE	53722	0.13	0.26	0.43	12.81	0.15	0	0.17	0.3	1989.94	3.1093	258.69	517.38	855.67	2203.96	-1639.53	0.00	1989.94
53723	AZ665	Wilcox	Mc	53723	0.15	0.29	0.44	14.01	0.17	0	0.15	0.29	13104.3	20.4755	1965.65	3800.25	5765.89	15023.27	-10084.43	0.00	13104.30
53724	AZ665	Wilcox	Mk	53724	0.15	0.29	0.44	14.01	0.17	0	0.15	0.29	1627.61	2.5431	244.14	472.01	716.15	1865.95	-1252.53	0.00	1627.61
53725	AZ665	Wilcox	Pm	53725	0.16	0.32	0.46	17.46	0.16	0	0.14	0.3	30493.15	47.6455	4878.90	9757.81	14026.85	37873.84	-24268.89	0.00	30493.15
53726	AZ665	Wilcox	Pr	53726	0.11	0.25	0.47	7.65	0.57	0	0.22	0.36	2978.33	4.6536	327.62	744.58	1399.82	2631.84	-727.09	0.00	2978.33
53727	AZ665	Wilcox	SnA	53727	0.08	0.16	0.4	4.04	0.65	0	0.24	0.32	19536.72	30.5261	1562.94	3125.88	7814.69	11846.70	-3655.06	0.00	19536.72
53728	AZ665	Wilcox	SnB	53728	0.08	0.16	0.4	4.04	0.65	0	0.24	0.32	2797.17	4.3706	223.77	447.55	1118.87	1696.15	-523.31	0.00	2797.17
53729	AZ665	Wilcox	SoA	53729	0.08	0.16	0.4	4.04	0.59	0	0.24	0.32	827.14	1.2924	66.17	132.34	330.86	501.56	-189.54	0.00	827.14
53730	AZ665	Wilcox	St	53730	0.1	0.23	0.41	13.62	0.32	0	0.18	0.31	8702.91	13.5983	870.29	2001.67	3568.19	9870.64	-4306.64	0.00	8702.91
53731	AZ665	Wilcox	To	53731	0.02	0.08	0.42	0.31	2	0	0.34	0.4	514.9	0.8045	10.30	41.19	216.26	-261.90	155.00	0.00	514.90
53732	AZ665	Wilcox	TrC	53732	0.25	0.38	0.46	17.1	0.02	0	0.08	0.21	10686.1	16.697	2671.53	4060.72	4915.61	13175.92	-18155.36	0.00	10686.10
53733	AZ665	Wilcox	TuA	53733	0.09	0.18	0.4	4.97	0.46	0	0.22	0.31	19920.58	31.1259	1792.85	3585.70	7968.23	13871.82	-6718.06	0.00	19920.58
53734	AZ665	Wilcox	TvD	53734	0.08	0.21	0.4	12.52	0.35	0	0.19	0.32	362.53	0.5664	29.00	76.13	145.01	397.91	-165.29	0.00	362.53
53735	AZ665	Wilcox	TwA	53735	0.17	0.27	0.41	9.6	0.11	0	0.14	0.24	32992.94	51.5515	5608.80	8908.09	13527.11	32408.02	-31627.27	0.00	32992.94
53736	AZ665	Wilcox	Vn	53736	0.03	0.09	0.41	0.95	1.65	0	0.32	0.38	4967.72	7.7621	149.03	447.09	2036.77	-110.66	1080.40	0.00	4967.72
54934	AZ671	Wilcox	5	54934	0.11	0.23	0.42	7.81	0.31	0	0.19	0.31	157.21	0.2456	17.29	36.16	66.03	140.33	-79.96	0.00	157.21
54937	AZ671	Wilcox	70	54937	0.19	0.32	0.45	12.07	0.1	0	0.13	0.26	223.62	0.3494	42.49	71.56	100.63	241.89	-223.62	0.00	223.62
54938	AZ671	Wilcox	58	54938	0.2	0.31	0.46	8.06	0.08	0	0.15	0.26	411.33	0.6427	82.27	127.51	189.21	372.80	-451.19	0.00	411.33
54946	AZ671	Wilcox	142	54946	0.07	0.16	0.42	3.85	0.57	0	0.26	0.35	274.38	0.4287	19.21	43.90	115.24	160.64	-66.98	0.00	274.38
54949	AZ671	Wilcox	10	54949	0.04	0.12	0.4	3.52	0.64	0	0.28	0.36	192.45	0.3007	7.70	23.09	76.98	105.18	-37.30	0.00	192.45
54950	AZ671	Wilcox	37	54950	0.07	0.16	0.42	3.24	0.81	0	0.26	0.35	65.71	0.1027	4.60	10.51	27.60	33.55	-6.01	0.00	65.71
54969	AZ671	Wilcox	130	54969	0.07	0.16	0.4	5.18	0.5	0	0.24	0.33	28.99	0.0453	2.03	4.64	11.60	20.71	-8.73	0.00	28.99
54973	AZ671	Wilcox	129	54973	0.09	0.21	0.4	9.46	0.32	0	0.19	0.31	764	1.1938	68.76	160.44	305.60	745.58	-378.07	0.00	764.00
54974	AZ671	Wilcox	78	54974	0.21	0.37	0.48	19.21	0.06	0	0.11	0.27	177.9	0.278	37.36	65.82	85.39	228.34	-217.37	0.00	177.90
54981	AZ671	Wilcox	33	54981	0.06	0.15	0.43	2.69	1.11	0	0.28	0.37	218.76	0.3418	13.13	32.81	94.07	94.01	9.91	0.00	218.76
54982	AZ671	Wilcox	32	54982	0.04	0.09	0.42	0.34	1.55	0	0.33	0.38	102.58	0.1603	4.10	9.23	43.08	-48.06	19.52	0.00	102.58
54984	AZ671	Wilcox	147	54984	0.08	0.17	0.4	4.9	0.61	0	0.23	0.32	497.76	0.7778	39.82	84.62	199.10	343.55	-106.85	0.00	497.76
54985	AZ671	Wilcox	145	54985	0.09	0.22	0.41	13.1	0.32	0	0.19	0.32	289.6	0.4525	26.06	63.71	118.74	323.56	-143.31	0.00	289.60
54991	AZ671	Wilcox	40	54991	0.09	0.18	0.41	4.75	0.5	0	0.23	0.32	4181.75	6.534	376.36	752.72	1714.52	2829.76	-1258.83	0.00	4181.75

Infiltration Loss Parameter Calculations
Green and Ampt Method

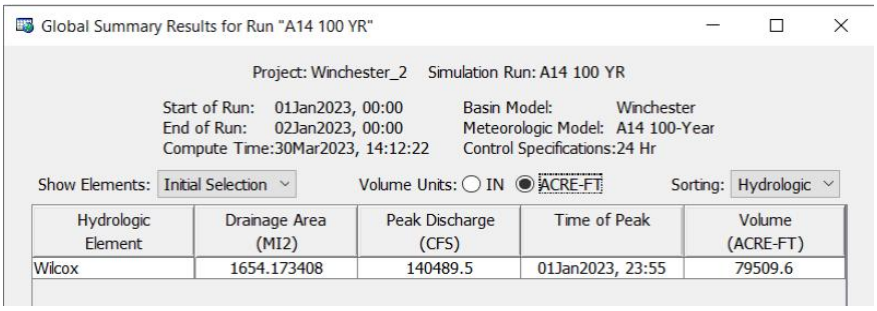
54993	AZ671	Wilcox	97	54993	0.18	0.29	0.44	10.28	0.09	0	0.15	0.26	2141.57	3.3462		385.48	621.06	942.29	2167.25	-2239.56	0.00	2141.57
54994	AZ671	Wilcox	79	54994	0.19	0.35	0.45	22.19	0.06	0	0.1	0.26	567	0.8859		107.73	198.45	255.15	763.27	-692.79	0.00	567.00
55000	AZ671	Wilcox	20	55000	0.09	0.19	0.42	4.74	0.38	0	0.23	0.33	757.54	1.1837		68.18	143.93	318.17	511.93	-318.33	0.00	757.54
55003	AZ671	Wilcox	151	55003	0.2	0.33	0.45	13.79	0.07	0	0.12	0.25	249.46	0.3898		49.89	82.32	112.26	284.28	-288.10	0.00	249.46
55004	AZ671	Wilcox	62	55004	0.08	0.17	0.44	2.02	0.67	0	0.27	0.36	384.9	0.6014		30.79	65.43	169.36	117.53	-66.94	0.00	384.90
55008	AZ671	Wilcox	71	55008	0.09	0.17	0.42	3.81	0.61	0	0.25	0.33	1022.39	1.5975		92.02	173.81	429.40	593.93	-219.48	0.00	1022.39
55009	AZ671	Wilcox	117	55009	0.07	0.15	0.43	3.63	0.92	0	0.28	0.36	1091.73	1.7058		76.42	163.76	469.44	611.27	-39.53	0.00	1091.73
55010	AZ671	Wilcox	152	55010	0.09	0.22	0.43	11.09	0.34	30	0.21	0.34	203.74	0.3183		18.34	44.82	87.61	212.89	-95.46	6112.20	203.74
55014	AZ671	Wilcox	84	55014	0.17	0.28	0.44	8.3	0.11	0	0.16	0.27	2534.44	3.9601		430.85	709.64	1115.15	2329.35	-2429.53	0.00	2534.44
55015	AZ671	Wilcox	125	55015	0.1	0.27	0.42	22.13	0.16	0	0.15	0.32	1323.14	2.0674		132.31	357.25	555.72	1779.60	-1053.06	0.00	1323.14
55016	AZ671	Wilcox	8	55016	0.07	0.16	0.39	5.02	0.59	0	0.23	0.32	2890.06	4.5157		202.30	462.41	1127.12	2025.08	-662.25	0.00	2890.06
55017	AZ671	Wilcox	90	55017	0.11	0.22	0.42	7.12	0.37	0	0.2	0.31	105.85	0.1654		11.64	23.29	44.46	90.24	-45.71	0.00	105.85
55021	AZ671	Wilcox	94	55021	0.05	0.14	0.43	2.26	0.92	0	0.29	0.38	894.35	1.3974		44.72	125.21	384.57	316.70	-32.39	0.00	894.35
55028	AZ671	Wilcox	44	55028	0.3	0.42	0.48	11.42	0.01	0	0.06	0.18	565.97	0.8843		169.79	237.71	271.67	598.61	-1131.94	0.00	565.97
55030	AZ671	Wilcox	18	55030	0.13	0.22	0.42	5.53	0.28	0	0.2	0.29	221.65	0.3463		28.81	48.76	93.09	164.63	-122.54	0.00	221.65
55036	AZ671	Wilcox	102	55036	0.13	0.26	0.43	12.81	0.13	30	0.17	0.3	39.78	0.0622		5.17	10.34	17.11	44.06	-35.25	1193.40	39.78
55039	AZ671	Wilcox	60	55039	0.2	0.33	0.44	13.83	0.06	0	0.11	0.24	5582.93	8.7233		1116.59	1842.37	2456.49	6369.13	-6821.50	0.00	5582.93
55045	AZ671	Wilcox	30	55045	0.18	0.33	0.45	17.44	0.1	0	0.12	0.27	122.49	0.1914		22.05	40.42	55.12	152.08	-122.49	0.00	122.49
55047	AZ671	Wilcox	88	55047	0.04	0.12	0.43	3.01	1.31	0	0.31	0.39	1077.95	1.6843		43.12	129.35	463.52	515.87	126.41	0.00	1077.95
55051	AZ671	Wilcox	105	55051	0.14	0.26	0.43	8.51	0.23	0	0.17	0.29	3176.48	4.9633		444.71	825.88	1365.89	2953.90	-2027.46	0.00	3176.48
55052	AZ671	Wilcox	1	55052	0.06	0.15	0.41	3.82	0.88	0	0.26	0.35	585.54	0.9149		35.13	87.83	240.07	340.82	-32.51	0.00	585.54
55056	AZ671	Wilcox	41	55056	0.15	0.25	0.42	6.85	0.16	0	0.17	0.27	1449.67	2.2651		217.45	362.42	608.86	1211.48	-1153.76	0.00	1449.67
55058	AZ671	Wilcox	42	55058	0.19	0.3	0.43	9.58	0.06	0	0.13	0.24	2616.55	4.0884		497.14	784.97	1125.12	2567.79	-3197.03	0.00	2616.55
55060	AZ671	Wilcox	119	55060	0.09	0.21	0.43	8.79	0.31	0	0.22	0.34	24.09	0.0376		2.17	5.06	10.36	22.74	-12.25	0.00	24.09
55063	AZ671	Wilcox	4	55063	0.22	0.34	0.45	10.92	0.07	0	0.11	0.23	148.21	0.2316		32.61	50.39	66.69	153.87	-171.17	0.00	148.21
55069	AZ671	Wilcox	124	55069	0.09	0.18	0.43	3.68	0.58	0	0.25	0.34	172.85	0.2701		15.56	31.11	74.33	97.81	-40.89	0.00	172.85
55071	AZ671	Wilcox	103	55071	0.08	0.18	0.42	3.62	0.72	30	0.24	0.34	1092.79	1.7075		87.42	196.70	458.97	610.55	-155.91	32783.70	1092.79
55072	AZ671	Wilcox	128	55072	0.08	0.17	0.44	2.71	0.75	50	0.27	0.36	689.63	1.0775		55.17	117.24	303.44	298.59	-86.16	34481.50	689.63
599867	AZ665	Wilcox	W	599867	0.3	0.42	0.48	11.42	0.01	100	0.06	0.18	27975.4	43.7116		8392.62	11749.67	13428.19	29588.63	-55950.80	2797540.00	27975.40
60109	AZ666	Wilcox	26	60109	0.11	0.2	0.42	4.8	0.42	0	0.22	0.31	515.45	0.8054		56.70	103.09	216.49	351.15	-194.20	0.00	515.45
60112	AZ666	Wilcox	11	60112	0.2	0.3	0.44	8.02	0.08	0	0.14	0.24	1272.58	1.9884		254.52	381.77	559.94	1150.63	-1395.91	0.00	1272.58
60113	AZ666	Wilcox	25	60113	0.07	0.16	0.42	3.24	0.87	0	0.26	0.35	1061.88	1.6592		74.33	169.90	445.99	542.14	-64.22	0.00	1061.88
60120	AZ666	Wilcox	35	60120	0.03	0.09	0.44	0.93	1.89	0	0.35	0.41	2405.55	3.7587		72.17	216.50	1058.44	-75.82	665.04	0.00	2405.55
60128	AZ666	Wilcox	55	60128	0.08	0.16	0.4	4.46	0.64	0	0.24	0.32	1536.73	2.4011		122.94	245.88	614.69	997.85	-297.85	0.00	1536.73
60129	AZ666	Wilcox	7	60129	0.03	0.08	0.41	0.18	1.46	0	0.33	0.38	509.8	0.7966		15.29	40.78	209.02	-379.66	83.79	0.00	509.80
658380	US	Wilcox	s302	658380	0.21	0.37	0.47	20.54	0.05	0	0.1	0.26	0	0		0.00	0.00	0.00	0.00	0.00	0.00	0.00
658398	US	Wilcox	s320	658398	0.11	0.26	0.45	11.09	0.32	0	0.19	0.34	2853.17	4.4581		313.85	741.82	1283.93	2981.37	-1411.89	0.00	2853.17
658399	US	Wilcox	s321	658399	0.12	0.25	0.41	11.86	0.22	0	0.16	0.29	0	0		0.00	0.00	0.00	0.00	0.00	0.00	0.00
658401	US	Wilcox	s323	658401	0.13	0.22	0.41	6.18	0.25	0	0.19	0.28	20053.98	31.3343		2607.02	4411.88	8222.13	15862.47	-12073.70	0.00	20053.98
658481	US	Wilcox	s403	658481	0.1	0.21	0.44	5.11	0.4	10	0.23	0.34	106.63	0.1666		10.66	22.39	46.92	75.54	-42.43	1066.30	106.63
658512	US	Wilcox	s434	658512	0.18	0.29	0.41	12.94	0.06	0	0.12	0.23	1723.42	2.6928		310.22	499.79	706.60	1916.33	-2105.76	0.00	1723.42
658513	US	Wilcox	s435	658513	0.11	0.23	0.43	7.59	0.29	20	0.2	0.32	1108.05	1.7313		121.89	254.85	476.46	975.35	-595.69	22161.00	1108.05
658542	US	Wilcox	s464	658542	0.09	0.18	0.4	5.01	0.39	35	0.22	0.31	11774.8	18.3981		1059.73	2119.46	4709.92	8240.45	-4815.13	412118.00	11774.80
658551	US	Wilcox	s473	658551	0.13	0.22	0.43	4.5	0.31	0	0.21	0.3	1123.93	1.7561		146.11	247.26	483.29	734.17	-571.67	0.00	1123.93
658552	US	Wilcox	s474	658552	0.11	0.2	0.42	4.7	0.35	20	0.22	0.31	80.52	0.1258		8.86	16.10	33.82	54.12	-36.71	1610.40	80.52
658555	US	Wilcox	s477	658555	0.06	0.14	0.38	5.2	0.44	0	0.24	0.32	2635.87	4.1185		158.15	369.02	1001.63	1887.29	-939.81	0.00	2635.87
658556	US	Wilcox	s478	658556	0.12	0.25	0.41	11.99	0.19	30	0.16	0.29	92400.3	144.3755		11088.04	23100.08	37884.12	99683.22	-66643.38	2772009.00	92400.30
658557	US	Wilcox	s479	658557	0.11	0.2	0.41	4.75	0.33	30	0.21	0.3	28806.05	45.0095		3168.67	5761.21	11810.48	19492.87	-13869.71	864181.50	28806.05
658561	US	Wilcox	s483	658561	0.13	0.25	0.43	8.69	0.23	0	0.18	0.3	9250.49	14.4539		1202.56	2312.62	3977.71	8686.39	-5904.33	0.00	9250.49
658567	US	Wilcox	s489	658567	0.12	0.26	0.45	11.04	0.21	30	0.19	0.33	6148.63	9.6072		737.84	1598.64	2766.88	6412.83	-4167.42	184458.90	6148.63
658578	US	Wilcox	s500	658578	0.19	0.33	0.44	16.6	0.04	0	0.11	0.25	5026.2	7.8534		954.98	1658.65	2211.53	6132.51	-7026.33	0.00	5026.20
705063	AZ665	Wilcox	BPI	705063	0.06	0.14	0.38	2.97	0.74	0	0.24	0.32	32.96	0.0515		1.98	4.61	12.52	15.58	-4.31	0.00	32.96
705064	AZ665	Wilcox	GPI	705064	0.02	0.06	0.41	0.29	2	0	0.35	0.39	220.3	0.3442		4.41	13.22	90.32	-118.43	66.32	0.00	220.30
															Sum	147029.15	270611.14	455709.83	987984.63	-748889.52	9229171.30	1058845	AC
															Weighted Average	**0.14**	**0.26**	**0.43**	**8.57**	**0.20**	**8.72**		

* Indicates log weighted average was calculated in accordance with Appendix B of the ADOT Drainage Manual

initial content sat content suction conductivity % imp

Wilcox Playa Stage-Storage

ELEVATION (Ft)	AREA (Sq Ft)	CUMULATIVE VOLUME (CF)	CUMULATIVE VOLUME (Ac-Ft)
4138.0	1,252,365,899	1,429,078,869	32,807
4138.1	1,275,279,979	1,555,376,599	35,707
4138.2	1,294,442,973	1,683,871,347	38,656
4138.3	1,312,571,855	1,813,707,143	41,637
4138.4	1,329,283,724	1,946,047,773	44,675
4138.5	1,350,860,340	2,080,128,136	47,753
4138.6	1,364,548,024	2,215,895,681	50,870
4138.7	1,375,062,894	2,352,956,333	54,016
4138.8	1,385,241,990	2,490,447,027	57,173
4138.9	1,393,761,726	2,629,589,410	60,367
4139.0	1,403,009,257	2,769,565,098	63,580
4139.1	1,408,317,761	2,910,207,432	66,809
4139.2	1,413,095,691	3,051,391,194	70,050
4139.3	1,417,554,364	3,192,373,092	73,287
4139.4	1,421,634,076	3,334,499,088	76,550
4139.5	1,426,669,578	3,477,039,512	**79,822**
4139.6	1,430,230,333	3,619,982,260	83,103
4139.7	1,433,551,584	3,763,292,199	86,393
4139.8	1,436,681,696	3,906,245,762	89,675
4139.9	1,439,715,475	4,050,225,942	92,980
4140.0	1,443,747,929	4,194,526,980	96,293
4140.1	1,446,741,977	4,339,156,469	99,613
4140.2	1,449,744,390	4,484,104,491	102,941
4140.3	1,452,697,641	4,628,659,882	106,259
4140.4	1,455,679,618	4,774,239,414	**109,601**
4140.5	1,459,693,564	4,920,136,431	112,951
4140.6	1,462,701,770	5,066,361,984	116,308
4140.7	1,465,793,627	5,212,910,858	119,672
4140.8	1,468,973,397	5,359,076,017	123,027
4140.9	1,472,182,443	5,506,297,763	126,407
4141.0	1,476,421,692	5,653,858,076	129,795

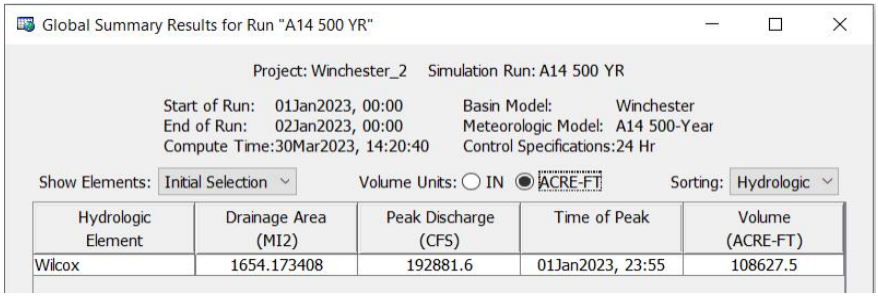

Global Summary Results for Run "A14 100 YR"

Project: Winchester_2 Simulation Run: A14 100 YR

Start of Run: 01Jan2023, 00:00 Basin Model: Winchester
End of Run: 02Jan2023, 00:00 Meteorologic Model: A14 100-Year
Compute Time:30Mar2023, 14:12:22 Control Specifications:24 Hr

Show Elements: Initial Selection Volume Units: IN ACRE-FT Sorting: Hydrologic

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (ACRE-FT)
Wilcox	1654.173408	140489.5	01Jan2023, 23:55	79509.6


Global Summary Results for Run "A14 500 YR"

Project: Winchester_2 Simulation Run: A14 500 YR

Start of Run: 01Jan2023, 00:00 Basin Model: Winchester
End of Run: 02Jan2023, 00:00 Meteorologic Model: A14 500-Year
Compute Time:30Mar2023, 14:20:40 Control Specifications:24 Hr

Show Elements: Initial Selection Volume Units: IN ACRE-FT Sorting: Hydrologic

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (ACRE-FT)
Wilcox	1654.173408	192881.6	01Jan2023, 23:55	108627.5

Legend

SUBJECT TRACTS

2D MODEL BOUNDARY

Depth (ft)

Value

< 0.5

0.5 - 1

1 - 2

2 - 3

3 - 5

5 - 10

> 10

Pine Peak

E Old Stewart Rd

N Taylor Rd

N Rex Allen Dr

N Haskell Ave

W Airport Rd

Willcox

E Maley St

S Haskell Ave

Twin Lakes Golf Course

S Railway

Willcox Dry Lake Bombing Range

Cochise

Earthstar Geographics, CONANP, Esri, HERE, Garmin, Foursquare, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USGS

Document Path: C:\Work\Projects\000000_Winchester\GIS\Winchester_2\Winchester_2.aprx

DESIGN: AAT

DRAWN: RR

REVIEW: AAT

Kimley»Horn

7740 NORTH 16TH STREET SUITE 300

PHOENIX, AZ 85020

PHONE: 602-944-5500

N

1 inch = 3,500 feet

WINCHESTER SOLAR II

COCHISE COUNTY, AZ

100-YEAR INUNDATION EXISTING CONDITIONS

DATE

MAY 2023

PROJECT NO.

09485005

SHEET NUMBER

4

Legend

SUBJECT TRACTS

2D MODEL BOUNDARY

VELOCITY (fps)

- < 0.5
- 0.5 - 1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 10
- > 10

Pine Tank

E Old Stewart Rd

N Taylor Rd

N Bisbee Ave

N Haskell Ave

W Airport Rd

Willcox

E Maley St

S Haskell Ave

Twin Lakes Golf Course

S Railway

Willcox Bay Lake Bombing Range

Cochise

Maxar, CONANP, Esri, HERE, Garmin, Foursquare, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA

DESIGN: AAT
DRAWN: RR
REVIEW: AAT

Kimley»Horn
7740 NORTH 16TH STREET SUITE 300
PHOENIX, AZ 85020
PHONE: 602-944-5500

N

1 inch = 3,500 feet

WINCHESTER SOLAR II
COCHISE COUNTY, AZ

100-YEAR VELOCITY EXISTING CONDITIONS

DATE
MAY 2023

PROJECT NO.
09485005

SHEET NUMBER
5

Document Path: C:\Work\Projects\0000000_Winchester\GIS\Winchester_2\Winchester_2.aprx

Legend

SUBJECT TRACTS

2D MODEL BOUNDARY

Scour_Focal

Depth

< 0.5

0.5 - 1

1 - 1.5

1.5 - 2

2 - 3

> 3

Pine Tank

E Old Stewart Rd

N Road Runner Rd

N Taylor Rd

N Bisbee Rd

N Haskell Ave

W Airport Rd

Willcox

E Maley St

S Haskell Ave

Twin Lakes Golf Course

S Railway

Willcox Bay Lake Bombing Range

Cochise

Earthstar Geographics, CONANP, Esri, HERE, Garmin, Foursquare, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA

Document Path: C:\Work\Projects\0000000_Winchester\GIS\Winchester_2\Winchester_2.aprx

DESIGN: AAT
DRAWN: RR
REVIEW: AAT

Kimley»Horn
7740 NORTH 16TH STREET SUITE 300
PHOENIX, AZ 85020
PHONE: 602-944-5500

N

1 inch = 3,500 feet

WINCHESTER SOLAR II
COCHISE COUNTY, AZ

100-YEAR SCOUR DEPTH
EXISTING CONDITIONS

DATE
MAY 2023

PROJECT NO.
09485005

SHEET NUMBER
6

Legend

SUBJECT TRACTS

2D MODEL BOUNDARY

DEPTH (FT)

Value

< 0.5

0.5 - 1

1 - 2

2 - 3

3 - 5

5 - 10

> 10

Pine Tank

E Old Stewart Rd

N Taylor Rd

N Rex Allen Dr

N Haskell Ave

W Airport Rd

Willcox

E Maley St

S Haskell Ave

Twin Lakes Golf Course

S Railway

Willcox Bay Leke Bombing Range

Cochise

Earthstar Geographics, CONANP, Esri, HERE, Garmin, Foursquare, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA

DESIGN: AAT

DRAWN: RR

REVIEW: AAT

Kimley»Horn

7740 NORTH 16TH STREET SUITE 300

PHOENIX, AZ 85020

PHONE: 602-944-5500

N

1 inch = 3,500 feet

WINCHESTER SOLAR II

COCHISE COUNTY, AZ

500-YEAR INUNDATION EXISTING CONDITIONS

DATE

MAY 2023

PROJECT NO.

09485005

SHEET NUMBER

7

Document Path: C:\Work\Projects\0000000_Winchester\GIS\Winchester_2\Winchester_2.aprx

Legend

SUBJECT TRACTS

2D MODEL BOUNDARY

VELOCITY (fps)

- < 0.5
- 0.5 - 1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 10
- > 10

Pine Tank

E Old Stewart Rd

N Road Forman Rd

N Taylor Rd

N Bisbee Rd

N Haskell Ave

W Airport Rd

Willcox

E Maley St

S Haskell Ave

Twin Lakes Golf Course

S Railway

Willcox Bay Lake Bombing Range

Cochise

Earthstar Geographics, CONANP, Esri, HERE, Garmin, Foursquare, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USGS

DESIGN:	AAT
DRAWN:	RR
REVIEW:	AAT

Kimley»Horn

7740 NORTH 16TH STREET SUITE 300

PHOENIX, AZ 85020

PHONE: 602-944-5500

N

1 inch = 3,500 feet

WINCHESTER SOLAR II
COCHISE COUNTY, AZ

500-YEAR VELOCITY EXISTING CONDITIONS

DATE
MAY 2023

PROJECT NO.
09485005

SHEET NUMBER
8

Document Path: C:\Work\Projects\0000000_Winchester\GIS\Winchester_2\Winchester_2.aprx

Legend

SUBJECT TRACTS

2D MODEL BOUNDARY

Scour_Focal

Depth

< 0.5

0.5 - 1

1 - 1.5

1.5 - 2

2 - 3

> 3

S Rex Allen Dr

S Rex Allen Dr

S Rex Allen Dr

Geronimo Dr

S Kansas Rd

S Kansas Rd

10

191

Esri Community Maps Contributors, CONANP, Esri, HERE, Garmin, Foursquare, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census, Military Bur, Maxar

Lake Bonding Range

Document Path: C:\Work\Projects\0000000_Winchester\GIS\Winchester_2\Winchester_2.aprx

	DESIGN:	DRAWN:	REVIEW:
	AAT	RR	AAT

Kimley»Horn

7740 NORTH 16TH STREET SUITE 300

PHOENIX, AZ 85020

PHONE: 602-944-5500

N

1 inch = 1,500 feet

WINCHESTER SOLAR II

COCHISE COUNTY, AZ

500-YEAR SCOUR DEPTH EXISTING CONDITIONS

DATE
MAY 2023

PROJECT NO.
09485005

SHEET NUMBER
9

4.7 Exhibit G: Visual Resources Memorandum

TECHNICAL MEMORANDUM

To:	Ms. Sara Born, P.E. Torch Clean Energy, LLC 929 Pearl Street, Suite 300 Boulder, CO 80302
From:	Kimley-Horn and Associates, Inc.
Date:	March 30, 2023
Subject:	Winchester Energy Development – Cochise County, Arizona – Key Observation Points Memorandum

Purpose

The purpose of this memorandum is to depict the visual features (e.g., landforms, vegetation, and existing built features) surrounding the proposed Winchester Energy Development Project (Project), located in Cochise County, Arizona, and how the Project would be perceived by observers from each key observation point (KOP).

Project Description

The Project is located in the northwestern quadrant of Cochise County and is approximately 130 miles southeast of the City of Phoenix. The Project encompasses approximately 3,529 acres (Project Site) adjacent to the north of Interstate 10 (I-10). The Project would consist of photovoltaic (PV) panels approximately 55 feet setback from the Project Site boundary. Additionally, an 8-foot deer fence would be placed 40 feet from the Project Site boundary. The tracker panels would be mounted on driven piers, with the top of the pier approximately 6 feet above the ground level. For additional visualization of the Project, see **Appendix A: Visual Simulations**.

Key Observation Point 1: Interstate 10 (I-10) and United States Route 191 (US 191) Looking Northwest

This KOP represents the view of a passenger in a vehicle traveling northeast on Interstate 10 (I-10) on the southern boundary of the Project Site; see inset map of **Figure 1: Key Observation Point (KOP) 1**. Views from this KOP are generally represented by panoramic views of dense desert scrub and grassland bushes. The foreground of this KOP consists of low, indistinct grasses and moderate-height desert vegetation. The background consists of distant views of the Winchester Mountains, which has the high point at Reiley Peak (7,631 feet above mean sea level [AMSL]) compared to the 4,196 foot elevation at which KOP 1 was taken. The remainder of the view from KOP 1, except for Reiley Peak and the Winchester Mountains, is relatively flat with no immediate elevation changes.

The solar array within the viewshed of this KOP would be approximately 98 feet northwest from this location. Based on viewer perspective as a traveler moving northeast on the I-10, the overall distance from the KOP and the solar array in relation to the viewer, the Project, when viewed from this KOP, would not be perceivably altered due to the presence of existing dense vegetation and the prominence of the Winchester Mountains in the background, which becomes the focus of viewer attention. Additionally, the panels and piers would only be 6 feet above the ground level. The 8-foot deer fence would be visible from a distance while traveling on the road, but the main viewshed consisting of the Winchester Mountains and native vegetation would remain visible. Therefore, from KOP 1, it is anticipated that there would be no perceived visual contrast created by the Project within the existing landscape.

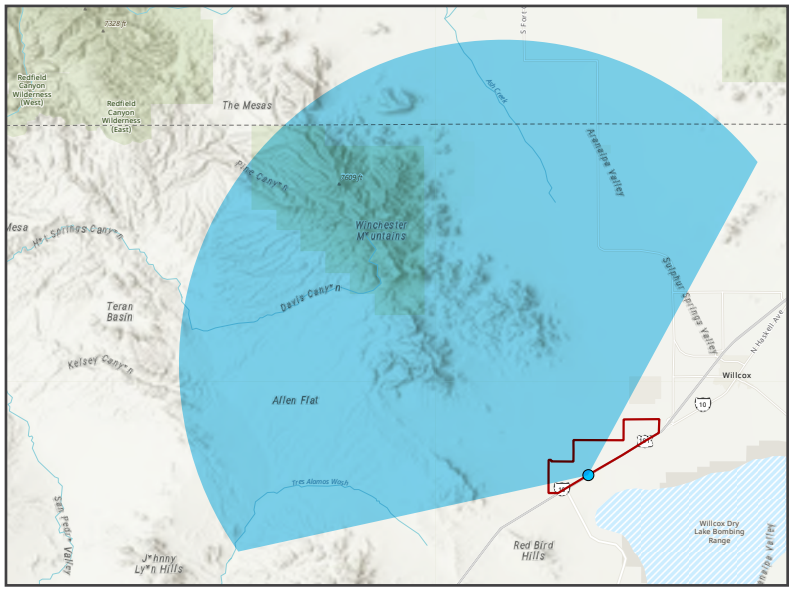
KOP 2: Interstate 10 (I-10) and North Taylor Road Looking Southwest

This KOP represents the view of a passenger in a vehicle or person traveling west of North Taylor Road off of the off-ramp of I-10. This KOP was taken approximately 0.28 miles west of North Taylor Road and 0.80 miles southwest of the Cochise County Airport; see inset map of **Figure 2: Key Observation Point (KOP) 2**. Views from this KOP are generally represented by views of dense desert scrub separated by an unpaved road (Holley Lane, but demarked as West Holly Drive by signage). Overhead poles and wired post fencing demarcate the road from the scrubs. A residence with various ancillary structures and parked trailers is located approximately 0.10 miles west of KOP 2. The background consists of distant views of Steele Hills (5,203 feet AMSL) and Red Bird Hills (5,105 feet AMSL), compared to the 4,176 foot elevation at which KOP 2 was taken. The remainder of the view from KOP 2 is relatively flat with no immediate elevation changes.

The solar array within the viewshed of this KOP would be approximately 2,026 feet southwest from this location. Based on viewer perspective as they travel south on I-10 from this location, the overall distance from the KOP and the solar array in relation to the viewer, the Project, when viewed from this KOP, would not be perceivably altered due to the presence of existing vegetation, the residence and fencing, and the elevated ridges in the distance. While the low vegetation in the foreground may no longer be distinct, the views of Steele Hills and Red Bird Hills would still be visible from KOP 2. Therefore, from KOP 2, it is anticipated that there would be no perceived visual contrast created by the Project within the existing landscape.







Base Photographic Documentation	
Date	03/15/2023
Time	11:54:58
Viewpoint Elevation (ft)	4,196

Proposed Infrastructure Information	
Closest Distance to Panels (ft)	98

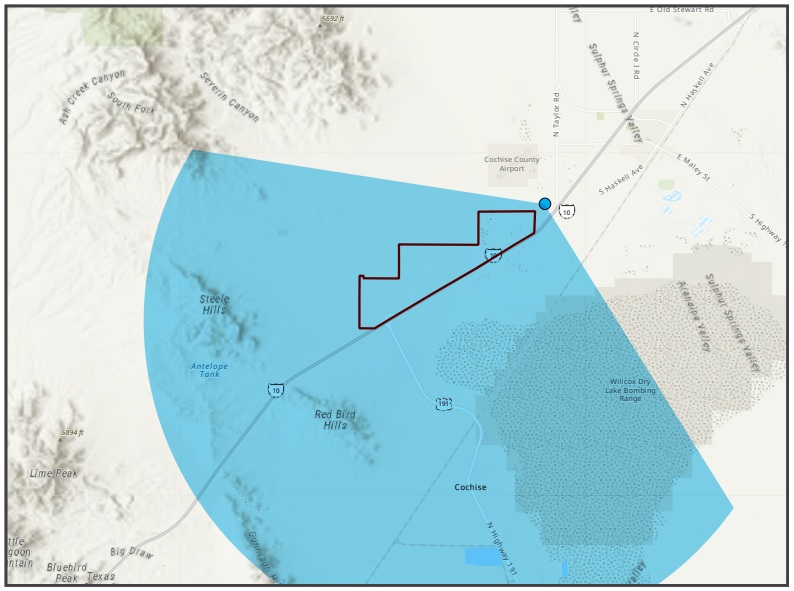
Source: ArcGIS Pro 2023

FIGURE 1: Key Observation Point (KOP) 1
Winchester Energy Development

Kimley»Horn







KOP | Project Boundary | Photo Angle

Base Photographic Documentation	
Date	03/15/2023
Time	11:25:46
Viewpoint Elevation (ft)	4,176

Proposed Infrastructure Information	
Closest Distance to Panels (ft)	2026

Source: ArcGIS Pro 2023

FIGURE 2: Key Observation Point (KOP) 2
Winchester Energy Development

Kimley»Horn

APPENDIX A: VISUAL SIMULATIONS





4.8 Exhibit H: Landowner Authorization Letter

Christine McLachlan
Planning Division
Cochise County
1415 Melody Lane
Bisbee, AZ 85603

May 25, 2023

RE: Letter of Authorization for Amendment to Special Use Permit SU-23-11

Dear Ms. McLachlan,

As the property owner of parcels 209-86-001B and 209-86-001D, I authorize the submittal of an amendment to Special Use Permit Docket SU-23-11 by Torch Clean Energy to include the above parcels within the Special Use request.

Should you have any questions about this letter of authorization, please do not hesitate to contact me at (602) 717-9215.

Respectfully,

John Les Permenter

4.9 Exhibit I: Citizen Review Process

The Applicant mailed the following Project notification letter to parcels within 0.25 miles of the Project on May 26th, 2023 and will report back to the County as comments are received.

May 26, 2023

Dear Neighbors,

I am writing to notify you of a proposed amendment to the Special Use Permit (Docket SU-23-11) for the Winchester Solar Project. As you may know, at the Cochise County Planning and Zoning Commission meeting on May 10th, 2023, the Project was conditionally approved to construct, operate, and maintain a proposed Solar Energy Power Plant and Battery Energy Storage System (BESS) Project on 3,584 acres of land in Cochise County. The purpose for the request for an amended permit is to include an additional two parcels (209-86-001B and 209-86-001D) within the Project, totaling 651.21 acres. This area is depicted with a red boundary in the attached concept plan.

Please do not hesitate to contact me with any questions or concerns at the phone number or email address below.

Respectfully,

Sara Born
Director of Project Development
Torch Clean Energy
sborn@torchcleanenergy.com
(303) 775-1773

5.0 Exhibit J: AZGFD Correspondence

Arizona Game & Fish Department
Attn: Tiffany Sprague
5000 Carefree Highway
Phoenix, AZ 85086

May 2, 2023

In a letter from the Arizona Game and Fish Department (Department) dated April 24, 2023, the Department expressed interest in working with Torch Clean Energy, LLC during the planning and development of the Winchester Solar I and II facilities (Project) located in Cochise County. The Department provided comments and best management practices for Torch's considerations to offset potential impacts to wildlife throughout the planning and development of the Project. Torch and the Department discussed each concern and potential solutions in a meeting on April 26, 2023.

The below outlines the Department's concerns and suggestions as well as responses from Torch regarding the ways, where possible, the Project can address the Department's concerns and mitigate potential impacts.

- The Department has concerns regarding the potential for bird fatalities or injuries (i.e. bird strikes) if avian species mistake the solar panels for open water and stated that they would welcome the opportunity to explore conservation measures with Torch with the aim to reduce potential impacts to cranes and other avian species, such as the following:

    - The Department encourages the use of non-reflective coatings on the solar panels.

        - *The majority of modern solar modules include an advanced coating that reduces reflectivity of the solar panel to allow the PV cell to make more energy with the same amount of sunlight. When procuring solar panels for the Project, Torch will seek panels with an anti-reflectivity coating that is integral to the panel in order to reduce impacts to avian species.*

    - To the extent feasible, the Department recommends maximizing the spacing between the solar panels to reduce the "lake effect," in which continuous closely spaced panel arrays create an optical illusion of water.

        - *Because the Project boundary includes a larger acreage than necessary to meet the target generation capacity for the Project, Torch is able to design the Project to include more space between module rows than is typically planned for within solar facilities in order to mitigate the potential for bird strikes. Torch will maintain a distance of 12 feet between tracker rows. It is also important to note that trackers typically rotate every 10-15 minutes and are stored at a 60-degree angle when the sun is not shining so the panels are parallel to the earth for only 1-15 minutes per day.*

    - The Department encourages the use of both bird diverters and near-ultraviolet light Avian Collision Avoidance Systems (ACAS) and following Avion Power Line Interaction Committee ("APLIC") standards on any new powerlines needed for this project.

        - *Torch will follow APLIC guidelines and will explore the feasibility of incorporating bird diverters and ACAS into the design of the Winchester generation-tie line and will coordinate with the Department in a few months on this topic once the Project has applied for a Certificate of Environmental Compatibility with the Arizona Corporation Commission.*

    - The Department encourages Torch to implement post-construction monitoring for avian injuries and fatalities.

        - *The Operations and Management (O&M) team selected for the Project will perform quarterly inspections of the site, and, during this process they will also identify and report (with photo, lat/long, date, and time of sighting) any injured or dead species.*

- The Department recommends conducting additional surveys in the project area and adjacent lands to further assess wildlife species presence. Surveys should be of sufficient duration and intensity to adequately assess all habitat types and potential species occurrence in and adjacent to the project area.

    - *Torch and the Department discussed that additional avion surveys ahead of construction would yield little to no additional information that could be used for project siting to reduce impacts to avian species.*

- The Department recommends conducting additional surveys in the project area and adjacent lands to further assess wildlife species presence, and noted the documentation of bald and golden eagles within 5 miles of the Project area. The Department stated that if Torch is uncertain about effects of the project to eagles, or if it is anticipated the project will not be in compliance with the Bald and Golden Eagle Protection Act (BGEPA), the Department recommends contacting USFWS for technical assistance as well as Tuk Jacobson.

    - *Torch will contact USFWS and AZGFD, if needed, and will remain in compliance with the BGEPA.*

- The Department noted that vegetation within the Project area may provide nesting opportunities for avian species that are regulated under the Migratory Bird Treaty Act. Breeding season for birds in this area is generally mid-January through late September, and raptor nesting season is generally January through late June. If it is anticipated the project will not be in compliance with the MBTA, the Department recommends contacting the USFWS for technical assistance.

    - *Torch will coordinate with USFWS, if needed, and will remain in compliance with the MBTA.*

- The Department noted that the western burrowing owl, sonoran desert tortoise, and a variety of other Arizona Species of Greatest Conservation Need have the potential to occur within the project area. If wildlife are encountered during construction activities, the Department recommends moving them out of harm's way (no more than .25 miles outside the project boundary within similar habitat).

    - *In a survey performed by SWCA, there were no western burrowing owl species, sonoran desert tortoise*

species, or species sign in the area; nor were there burrow for either. However, Torch will do pre-construction surveys per the MBTA and state-listed sensitive species guidelines ahead of any ground disturbance.

- The Department prioritizes habitat connectivity and wildlife movement corridors are important for wildlife to respond to changing environmental conditions. In the meeting between Torch and the Department, the following opportunities were discussed to incorporate connectivity into the project design:

    - Incorporating open corridors across the project area to facilitate wildlife movement, including maintaining the ephemeral washes that occur in the project area in their natural state without fencing or other barriers to wildlife movement.

        - *Torch is actively working with the Department on this topic; the Connectivity Department within AZGFD is evaluating if a wildlife highway crossing is proposed along the southern edge of the project site. If a wildlife crossing is proposed, Torch will work with the Department on locating a corridor that allows for connectivity.*

    - Retaining habitat features underneath the panels, including vegetation and soils.

        - *The Project will aim to minimize grading and, where grading is not required and the vegetation can be mowed rather than removed completely, the Project will do so. In order to comply with federal National Pollutant Discharge Elimination System ("NDPES") permit, the site will be stabilized with vegetation.*

    - Leaving a 6-8 inch gap between the ground surface and bottom of the fence to allow for smaller wildlife species to move freely through the area and make use of any habitat within the project boundary.

        - *Torch will incorporate a 6" to 8" gap between the ground surface and bottom of fence within Project designs, though in the event Project security becomes a concern for financial lenders or insurance providers, Torch will coordinate with the Department on potentially reducing or eliminating the gap.*

- Finally, the Department offered the following general recommendations to reduce potential impacts to wildlife and habitat during construction and operation of the facility:

    - Conducting a Native Plant Inventory to identify, record, and coordinate plant salvage efforts for species that are protected under the Arizona Native Plant Law.

        - *A Native Plant Inventory per Arizona State Land Department (ASLD) protocol will be completed by SWCA for the transmission line area located on ASLD lands, and because of the homogeneity of the habitat in this area, this inventory will be helpful in further identifying vegetation features/species composition for the Project area as well.*

- Taking precautions to wash and/or decontaminate equipment before entering and leaving the site.

    - *As there will be very minimal disturbance of the soil and soil will not likely not be brought in from offsite, contamination of equipment is likely very minimal. Torch will refer to the list of prohibited and restricted noxious weeds and the Arizona Native Plant Society for recommendations on how to control them and ensure the contractor makes a reasonable effort to integrate this into the Worker Education Awareness Program.*

- Trenching and backfilling crew work to be close together to minimize the amount of open trenches at any given time. When trenches cannot be back-filled immediately, the Department recommends escape ramps be constructed at least every 90 meters. Escape ramps can be short lateral trenches or wooden planks sloping to the surface. The Department recommends that slopes be less than 45 degrees and trenches that have been left open overnight be inspected to remove animals prior to backfilling.

    - *Torch will commit to utilizing escape ramps at least every 90 meters and should wildlife be encountered within open trenches, the Engineering, Procurement, and Contractor ("EPC") staff will remove the wildlife based on protocols established within a Worker Education Awareness Program.*

- Using only the minimum amount of light needed for safety. If feasible, narrow spectrum lighting is wildlife-friendly and should be used as often as possible to minimize the number of species affected. It is also beneficial that lighting is shielded, canted, or cut to minimize the amount of upward shining light.

    - *The Project's only lighting will be two foot candles at the substation, per the National Electric Safety Code Table 111-1. A foot candle is defined as enough light to saturate one square foot with one lumen of light. This lighting will only be used when necessary during maintenance.*

Torch looks forward to continue coordinating with Arizona Game and Fish to identify best wildlife management practices for the Project. Please don't hesitate to reach out with further questions or concerns at (303) 775-1773 or sborn@torchcleanenergy.com.

Respectfully,



Sara Born, P.E.
Director of Project Development
Torch Clean Energy

From:	Tom Koronkiewicz
To:	Sara Born
Cc:	Rachael Taylor; Adam Davis; Stacy Campbell; Dean Hazle
Subject:	FW: Winchester Project AGFD Summary Memo
Date:	Thursday, May 4, 2023 7:12:40 PM
Attachments:	image001.png

Sara – great response from AGFD for the data room and county.

Tom Koronkiewicz
Environmental Specialist | Senior Project Manager

SWCA Environmental Consultants
1645 South Plaza Way
Flagstaff, Arizona
O: 928.249.8473 | C: 928.853.4126

From: Tiffany Sprague <tsprague@azgfd.gov>
Sent: Thursday, May 4, 2023 4:29 PM
To: Sara Born <sborn@torchcleanenergy.com>
Cc: Adam Davis <adavis@torchcleanenergy.com>; Laura Paulson <lpaulson@azgfd.gov>; Rachael Taylor <rtaylor@torchcleanenergy.com>; Stacy Campbell <SCampbell@swca.com>; Tom Koronkiewicz <tkoronkiewicz@swca.com>
Subject: Re: Winchester Project AGFD Summary Memo

Hi, Sara and team. Thanks again for meeting with us and for this great summary of the discussion. The Department really appreciates this feedback and the incorporation of our recommendations.

I am still waiting for further info regarding connectivity plans for I-10 in that area and will share that as it becomes available. The information I've gleaned so far is that connectivity is currently provided through some existing culverts, although I'm not sure of the size of those culverts and what species can pass through them. It would be good to maintain access to those culverts. However, at the same time, we don't want to push animals to the roadway (either through corridors or through perimeter fencing) without directly funneling them into those culverts, as that could result in more animals trying to cross at grade. Depending on the setback from I-10, it might be worth a conversation with ADOT to determine plans in that area and how to reduce the potential of wildlife-vehicle collisions.

I'll keep you posted as we learn more. Happy to discuss or answer any questions, too.

Thanks!

TIFFANY SPRAGUE | PROJECT EVALUATION PROGRAM SPECIALIST

ARIZONA GAME AND FISH DEPARTMENT - WMHB

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Join our new Conservation Membership program and ensure a wildlife legacy for the future.

On Tue, May 2, 2023 at 2:26 PM Sara Born <sborn@torchcleanenergy.com> wrote:

> Hi Tiffany and Laura,
>
> Attached is a letter summarizing our call and take aways in how to address the main concerns that AGFD has. Let me know if you have any additional comments or want to jump on the phone to discuss further or if this looks good to you all.
>
> Warm Regards, Sara
>
> Sara R. Born, P.E.
> Director of Project Development
> Torch Clean Energy
> E-mail: sborn@torchcleanenergy.com
> Phone: Office - 720.699.8465; Cell – 303.775.1773
> 929 Pearl Street, Suite 300, Boulder, Colorado 80302