TETRA TECH EC, INC.

DOCKET
09-AFC-8
DATE DEC 31 2009
RECD. JAN 04 2010

December 31, 2009

California Energy Commission
Docket No. 09-AFC-8
1516 9th St.
Sacramento, CA 95814

Genesis Solar Energy Project - Docket Number 09-AFC-8

Docket Clerk:

Included with this letter is one hard copy and one electronic copy of the ***Notification of Lake or Streambed Alteration for the Genesis Solar Energy Project*** and the six attachments to the form.

The documentation and associated fee for the notification was also sent to the California Department of Fish and Game on December 31, 2009.

Sincerely,

Tricia Bernhardt
Project Manager/Tetra Tech EC

cc: Mike Monasmith /CEC Project Manager

143 Union Boulevard, Suite 1010, Lakewood, CO 80228-1875
Tel 303.988.2202 Fax 303.980.3539
www.tteci.com

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION FOR THE
GENESIS SOLAR ENERGY PROJECT

Docket No. 09-AFC-8

PROOF OF SERVICE
(Revised 12/22/09)

APPLICANT
Ryan O'Keefe, Vice President
Genesis Solar LLC
700 Universe Boulevard
Juno Beach, Florida 33408
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Meg Russel/Project Manager
Duane McCloud/Lead Engineer
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San Francisco, CA 94102
Diane.fellman@nexteraenergy.com

APPLICANT'S CONSULTANTS
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Tetra Tech, EC
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sgalati@gb-llp.com

INTERESTED AGENCIES
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e-recipient@caiso.com

Allison Shaffer, Project Manager
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Palm Springs South Coast
Field Office
1201 Bird Center Drive
Palm Springs, CA 92262
Allison_Shaffer@blm.gov

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ENERGY COMMISSION
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*indicates change

DECLARATION OF SERVICE

I, Tricia Bernhardt, declare that on 12/31/, 2009, I served and filed copies of the attached Notification of Lake or Streambed Alteration - Genesis Solar Energy Project, dated 12/31/2009. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: **[http://ww.energy.ca.gov/sitingcases/genesis_solar]**.

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(Check all that Apply)

FOR SERVICE TO ALL OTHER PARTIES:

X sent electronically to all email addresses on the Proof of Service list;

X by personal delivery or by depositing in the United States mail at Sacramento, California, with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

AND

FOR FILING WITH THE ENERGY COMMISSION:

X sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (***preferred method***);

OR

_____ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 09-AFC-8
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

FOR DEPARTMENT USE ONLY				
Date Received	*Amount Received*	*Amount Due*	*Date Complete*	*Notification No.*
	$	$		

STATE OF CALIFORNIA

DEPARTMENT OF FISH AND GAME

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

Complete EACH field, unless otherwise indicated, following the enclosed instructions and submit ALL required enclosures. Attach additional pages, if necessary.

1. APPLICANT PROPOSING PROJECT

Name	Ryan O'Keefe		
Business/Agency	Genesis Solar, LLC		
Street Address	700 Universe Boulevard		
City, State, Zip	Juno Beach, FL 33408		
Telephone	561-304-5237	Fax	
Email	ryanokeefe@nexteraenergy.com		

2. CONTACT PERSON (*Complete only if different from applicant*)

Name	Kenneth Stein		
Street Address	700 Universe Boulevard		
City, State, Zip	Juno Beach, FL 33408		
Telephone	561-691-2216	Fax	
Email	Kenneth.Stein@nexteraenergy.com		

3. PROPERTY OWNER (*Complete only if different from applicant*)

Name	Bureau of Land Management (BLM)		
Street Address	1201 Bird Center Drive		
City, State, Zip	Palm Springs, CA 92262		
Telephone	760-833-7104	Fax	
Email	Allison_Shaffer@blm.gov		

4. PROJECT NAME AND AGREEMENT TERM

A. Project Name	Genesis Solar Project			
B. Agreement Term Requested	☐ Regular (*5 years or less*) ☑ Long-term (*greater than 5 years*)			
C. Project Term		D. Seasonal Work Period		E. Number of Work Days
Beginning (*year*)	Ending (*year*)	Start Date (*month/day*)	End Date (*month/day*)	
2010	2040	To be determined	To be determined	To be determined

5. AGREEMENT TYPE

Check the applicable box. If box B, C, D, or E is checked, complete the specified attachment.	
A.	☑ Standard *(Most construction projects, excluding the categories listed below)*
B.	☐ Gravel/Sand/Rock Extraction (*Attachment A*) *Mine I.D. Number:* _____
C.	☐ Timber Harvesting (*Attachment B*) THP *Number:* _____
D.	☐ Water Diversion/Extraction/Impoundment (*Attachment C*) *SWRCB Number:* _____
E.	☐ Routine Maintenance (*Attachment D*)
F.	☐ DFG Fisheries Restoration Grant Program (FRGP) *FRGP Contract Number:* _____
G.	☐ Master
H.	☐ Master Timber Harvesting

6. FEES

Please see the current fee schedule to determine the appropriate notification fee. Itemize each project's estimated cost and corresponding fee. ***Note: The Department may not process this notification until the correct fee has been received.***

	A. Project	B. Project Cost	C. Project Fee
1	Genesis Solar Project	>$500,000	$4,000
2			
3			
4			
5			
		D. Base Fee *(if applicable)*	
		E. TOTAL FEE ENCLOSED	$4,000

7. PRIOR NOTIFICATION OR ORDER

A. Has a notification previously been submitted to, or a Lake or Streambed Alteration Agreement previously been issued by, the Department for the project described in this notification?

☐ Yes (*Provide the information below*) ☑ No

Applicant: _____ Notification Number: _____ Date: _____

B. Is this notification being submitted in response to an order, notice, or other directive ("order") by a court or administrative agency (including the Department)?

☑ No ☐ Yes (*Enclose a copy of the order, notice, or other directive. If the directive is not in writing, identify the person who directed the applicant to submit this notification and the agency he or she represents, and describe the circumstances relating to the order.*)

☐ *Continued on additional page(s)*

8. PROJECT LOCATION

A. Address or description of project location.

(*Include a map that marks the location of the project with a reference to the nearest city or town, and provide driving directions from a major road or highway*)

The Project is located in eastern Riverside County, between the communities of Blythe, California (approximately 25 miles east of the Project site) and Desert Center, California (approximately 27 miles west of the Project site). The Project is located in Township 6S Range 18E and Township 6S Range 19E, San Bernardino Base and Meridian. The Project area is shown on the Ford Dry Lake and McCoy Spring United States Geological Survey (USGS) topographic maps.

Genesis Solar, LLC has applied for a 4,640-acre right-of-way (ROW) grant from the Bureau of Land Management (BLM) for development of the Project. Once constructed, the Project would permanently occupy approximately 1,800 acres within this area (the Project footprint), plus approximately 90 acres for linear facilities. The land around the Project site is predominantly owned and managed by the BLM. All vehicular traffic approaching the site will use I-10. Site access will be provided via a new paved road that will connect the I-10 intersection at Wile's Well Road with the Project site.

Please refer to Attachment 1 for maps of the project location.

☑ *Continued on additional page(s)*

B. River, stream, or lake affected by the project.	Multiple unnamed ephemeral washes (see Attachment 2)
C. What water body is the river, stream, or lake tributary to?	Ford Dry Lake watershed
D. Is the river or stream segment affected by the project listed in the state or federal Wild and Scenic Rivers Acts?	☐ Yes ☑ No ☐ Unknown
E. County	Riverside

F. USGS 7.5 Minute Quad Map Name	G. Township	H. Range	I. Section	J. ¼ Section
Ford Dry Lake 7 McCoy Spring	6S	18E & 19E		see Att #2, Table 1-1

☑ *Continued on additional page(s)*

K. Meridian (*check one*) ☐ Humboldt ☐ Mt. Diablo ☑ San Bernardino

L. Assessor's Parcel Number(s)

See Attachment # 3

☑ *Continued on additional page(s)*

M. Coordinates (*If available, provide at least latitude/longitude or UTM coordinates and check appropriate boxes)*

Latitude/Longitude	*Latitude:* 33.666307	*Longitude:* -114.994725	
	☐ Degrees/Minutes/Seconds	☑ Decimal Degrees	☐ Decimal Minutes
UTM	*Easting:* 685918	*Northing:* 3726974	☐ Zone 10 ☑ Zone 11
Datum used for Latitude/Longitude or UTM	☐ NAD 27	☑ NAD 83 or WGS 84	

9. PROJECT CATEGORY AND WORK TYPE *(Check each box that applies)*

PROJECT CATEGORY	NEW CONSTRUCTION	REPLACE EXISTING STRUCTURE	REPAIR/MAINTAIN EXISTING STRUCTURE
Bank stabilization – bioengineering/recontouring	☐	☐	☐
Bank stabilization – rip-rap/retaining wall/gabion	☐	☐	☐
Boat dock/pier	☐	☐	☐
Boat ramp	☐	☐	☐
Bridge	☐	☐	☐
Channel clearing/vegetation management	☐	☐	☐
Culvert	☐	☐	☐
Debris basin	☐	☐	☐
Dam	☐	☐	☐
Diversion structure – weir or pump intake	☐	☐	☐
Filling of wetland, river, stream, or lake	☐	☐	☐
Geotechnical survey	☐	☐	☐
Habitat enhancement – revegetation/mitigation	☐	☐	☐
Levee	☐	☐	☐
Low water crossing	☐	☐	☐
Road/trail	☐	☐	☐
Sediment removal – pond, stream, or marina	☐	☐	☐
Storm drain outfall structure	☐	☐	☐
Temporary stream crossing	☐	☐	☐
Utility crossing : Horizontal Directional Drilling	☐	☐	☐
Jack/bore	☐	☐	☐
Open trench	☐	☐	☐
Other *(specify)*: Solar Energy Generation Project	☑	☐	☐

10. PROJECT DESCRIPTION

A. Describe the project in detail. Photographs of the project location and immediate surrounding area should be included.

- Include any structures (e.g., rip-rap, culverts, or channel clearing) that will be placed, built, or completed in or near the stream, river, or lake.
- Specify the type and volume of materials that will be used.
- If water will be diverted or drafted, specify the purpose or use.

Enclose diagrams, drawings, plans, and/or maps that provide all of the following: site specific construction details; the dimensions of each structure and/or extent of each activity in the bed, channel, bank or floodplain; an overview of the entire project area (i.e., "bird's-eye view") showing the location of each structure and/or activity, significant area features, and where the equipment/machinery will enter and exit the project area.

Genesis Solar, LLC, proposes to construct, own, and operate the Genesis Solar Energy Project (Project). The Project is a concentrating solar electric generating facility that would be located in Riverside County. The Project consists of two adjacent solar electric generating facilities with a nominal net electrical output of 125 megawatts (MW) each, for a total net electrical output of 250 MW. Electrical power would be produced using parabolic trough technology and steam turbine generators fed from solar steam generators. The solar steam generators receive heated transfer fluid from solar thermal equipment comprised of arrays of parabolic mirrors that collect energy from the sun.

The power block (i.e., where the steam turbine generator will be located) and solar arrays would occupy approximately 1,800 acres of the requested 4,640-acre right-of-way (ROW) grant from the Bureau of Land Management (BLM); the linear facilities would occupy approximately 90 acres.

The transmission line, access road, and natural gas pipeline will be co-located in one linear corridor to serve the main plant site . This corridor would exit the facility to the south and would be approximately 6.5 miles long. The generation tie-line would cross Interstate 10 (I-10), and tie into the Blythe Energy Project Transmission Line. The generation tie-line would use the existing pole structures of the Blythe Energy Transmission Line to interconnect with the proposed Colorado River Substation to the east.
Construction plans are to clear and grade the site with heavy equipment to provide a uniform gently southwest sloping grade and to construct drainage channels and roads. The total site earth work quantities for the Project site, including the evaporation and retention ponds excavations and protective berm fill placement, will result in a balanced cut-and-fill earthwork of approximately 712,000 cubic yards of cut and 1 million cubic yards of fill, based on the preliminary site design and layout.

Please refer to Attachment 1 for Project plans and a more detailed Project description.

☑ *Continued on additional page(s)*

B. Specify the equipment and machinery that will be used to complete the project.

Construction equipment will include earthmoving and support equipment such as graders, scrapers, bulldozers, backhoes, augers, water and dump trucks.

☐ *Continued on additional page(s)*

C. Will water be present during the proposed work period (specified in box 4.D) in the stream, river, or lake (specified in box 8.B).	☐ Yes ☑ No (*Skip to box 11*)
D. Will the proposed project require work in the wetted portion of the channel?	☐ Yes (*Enclose a plan to divert water around work site*) ☑ No

11. PROJECT IMPACTS

A. Describe impacts to the bed, channel, and bank of the river, stream, or lake, and the associated riparian habitat. Specify the dimensions of the modifications in length (linear feet) and area (square feet or acres) and the type and volume of material (cubic yards) that will be moved, displaced, or otherwise disturbed, if applicable.

The entire study area is crossed by numerous ephemeral washes ranging from small, weakly expressed erosional features to broad (over 10 feet wide) channels. Project Construction will result in the diversion of on-site flows around and through the site. Table C1 in Attachment 2 provides a summary of the ephemeral washes that would be affected by Project construction and operation.

☑ *Continued on additional page(s)*

B. Will the project affect any vegetation? ☑ Yes (*Complete the tables below*) ☐ No

Vegetation Type	Temporary Impact	Permanent Impact
Sonoran Creosote Bush Scrub	Linear feet: _____ Total area: _____	Linear feet: _____ Total area: _____
Stabilized and Partially Stabilized Sand Dunes	Linear feet: _____ Total area: _____	Linear feet: _____ Total area: _____

Tree Species	Number of Trees to be Removed	Trunk Diameter (range)
Ironwood		Greater than 4 inches
Palo Verde		Greater than 4 inches
Smoketree		Greater than 4 inches

☐ *Continued on additional page(s)*

C. Are any special status animal or plant species, or habitat that could support such species, known to be present on or near the project site?

☑ Yes *(List each species and/or describe the habitat below)* ☐ No ☐ Unknown

Desert Tortoise (Gopherus agassizii)

☐ *Continued on additional page(s)*

D. Identify the source(s) of information that supports a "yes" or "no" answer above in Box 11.C.

Genesis Solar Energy Project Application for Certification (09-AFC-08) submitted to the CEC 8/13/09; Genesis Solar Energy Project Application for incidental Take Permit submitted to CDFG

☐ *Continued on additional page(s)*

E. Has a biological study been completed for the project site?

☑ Yes (*Enclose the biological study*) ☐ No

Note: A biological assessment or study may be required to evaluate potential project impacts on biological resources.

F. Has a hydrological study been completed for the project or project site?

☑ Yes (*Enclose the hydrological study*) ☐ No

Note: A hydrological study or other information on site hydraulics (e.g., flows, channel characteristics, and/or flood recurrence intervals) may be required to evaluate potential project impacts on hydrology.

12. MEASURES TO PROTECT FISH, WILDIFE, AND PLANT RESOURCES

A. Describe the techniques that will be used to prevent sediment from entering watercourses during and after construction.

Overall, the Project will result in disturbance of approximately 1,800 acres, including both permanent and temporary disturbance at the plant site. A Drainage, Erosion and Sediment Control Plan (Attachment 4), which includes a construction phase Storm Water Pollution Prevention Plan (SWPPP), describes a series of management controls and Best Management Practies (BMPs) to minimize erosion and impacts to drainage.

☑ *Continued on additional page(s)*

B. Describe project avoidance and/or minimization measures to protect fish, wildlife, and plant resources.

Please see Attachment 5 for a description of avoidance and mitigation measures.

☑ *Continued on additional page(s)*

C. Describe any project mitigation and/or compensation measures to protect fish, wildlife, and plant resources.

Please see Attachment 6 for a description of compensation measures.

☑ *Continued on additional page(s)*

13. PERMITS

List any local, state, and federal permits required for the project and check the corresponding box(es). Enclose a copy of each permit that has been issued.

A. California Energy Commission Certification ☑ Applied ☐ Issued

B. BLM Right-of-Way Grant ☑ Applied ☐ Issued

C. CDFG Incidental Take Permit ☑ Applied ☐ Issued

D. Unknown whether ☐ local, ☐ state, or ☐ federal permit is needed for the project. (*Check each box that applies*)

☐ *Continued on additional page(s)*

14. ENVIRONMENTAL REVIEW

A. Has a draft or final document been prepared for the project pursuant to the California Environmental Quality Act (CEQA), National Environmental Protection Act (NEPA), California Endangered Species Act (CESA) and/or federal Endangered Species Act (ESA)?

☐ Yes (*Check the box for each CEQA, NEPA, CESA, and ESA document that has been prepared and enclose a copy of each*)

☑ No (*Check the box for each CEQA, NEPA, CESA, and ESA document listed below that will be or is being prepared*)

☐ Notice of Exemption	☑ Mitigated Negative Declaration	☑ NEPA document (*type*): EIS
☐ Initial Study	☐ Environmental Impact Report	☑ CESA document (*type*): Incidental Take
☐ Negative Declaration	☐ Notice of Determination *(Enclose)*	☐ ESA document (*type*):
☐ THP/ NTMP	☐ Mitigation, Monitoring, Reporting Plan	

B. State Clearinghouse Number (*if applicable*)			
C. Has a CEQA lead agency been determined?	☑ Yes (*Complete boxes D, E, and F*)	☐ No (*Skip to box 14.G*)	
D. CEQA Lead Agency	California Energy Commisssion		
E. Contact Person	Mike Monasmith	F. Telephone Number	916-654-4894

G. If the project described in this notification is part of a larger project or plan, briefly describe that larger project or plan.

Not applicable

☐ *Continued on additional page(s)*

H. Has an environmental filing fee (Fish and Game Code section 711.4) been paid?

☐ Yes (*Enclose proof of payment*) ☐ No (*Briefly explain below the reason a filing fee has not been paid)*

Note: If a filing fee is required, the Department may not finalize a Lake or Streambed Alteration Agreement until the filing fee is paid.

15. SITE INSPECTION

Check one box only.

☐ In the event the Department determines that a site inspection is necessary, I hereby authorize a Department representative to enter the property where the project described in this notification will take place at any reasonable time, and hereby certify that I am authorized to grant the Department such entry.

☑ I request the Department to first contact (*insert name*) Allison Shaffer, Project Manager, BLM at (*insert telephone number*) 760-833-7104 to schedule a date and time to enter the property where the project described in this notification will take place. I understand that this may delay the Department's determination as to whether a Lake or Streambed Alteration Agreement is required and/or the Department's issuance of a draft agreement pursuant to this notification.

16. DIGITAL FORMAT

Is any of the information included as part of the notification available in digital format (i.e., CD, DVD, etc.)?

- [x] Yes (Please enclose the information via digital media with the completed notification form)
- [ ] No

17. SIGNATURE

I hereby certify that to the best of my knowledge the information in this notification is true and correct and that I am authorized to sign this notification as, or on behalf of, the applicant. I understand that if any information in this notification is found to be untrue or incorrect, the Department may suspend processing this notification or suspend or revoke any draft or final Lake or Streambed Alteration Agreement issued pursuant to this notification. I understand also that if any information in this notification is found to be untrue or incorrect and the project described in this notification has already begun, I and/or the applicant may be subject to civil or criminal prosecution. I understand that this notification applies only to the project(s) described herein and that I and/or the applicant may be subject to civil or criminal prosecution for undertaking any project not described herein unless the Department has been separately notified of that project in accordance with Fish and Game Code section 1602 or 1611.

Tricia Bernhardt

Signature of Applicant or Applicant's Authorized Representative

December 30, 2009

Date

Tricia Bernhardt

Print Name

ATTACHMENT 1

PROJECT DESCRIPTION

3.0 FACILITY DESCRIPTION AND LOCATION

3.1 INTRODUCTION

The Genesis Solar Energy Project (the Project) will consist of two independent concentrated solar electric generating facilities (aka power plants or plant) with a nominal net electrical output of 125 megawatts (MW) each, for a total net electrical output of 250 MW. The plants will use well-established parabolic trough solar thermal technology to produce electrical power using steam turbine generators (STG) fed from solar steam generators (SSG). The SSG receives heated heat transfer fluid (HTF) from solar thermal equipment comprised of arrays of parabolic mirrors that collect energy from the sun.

Each plant will use natural gas-fueled auxiliary boilers to reduce start-up time and provide HTF freeze protection. Freeze protection will maintain the HTF at a minimum of 100 degrees Fahrenheit (°F).

The Project proposes to use a wet cooling tower for power plant cooling. Water for cooling tower make-up, process water make-up, and other industrial uses such as mirror washing will be supplied from on-site groundwater wells, which will also be used to supply water for employee use (*e.g.,* drinking, showers, sinks, and toilets). A package water treatment system will be used to treat the water to meet potable standards. A sanitary septic system and on-site leach field will be used to dispose sanitary wastewater.

Project cooling water blowdown will be piped to lined, on-site evaporation ponds. The ponds will be sized to retain approximately seven years' worth of solids and will be cleaned out periodically during the life of the plant to ensure the solids do not reach a depth greater than approximately three feet. Dewatered residues from the ponds will be sent to an appropriate off-site landfill as non-hazardous waste.

3.2 LOCATION OF FACILITIES AND ACRES DISTURBED

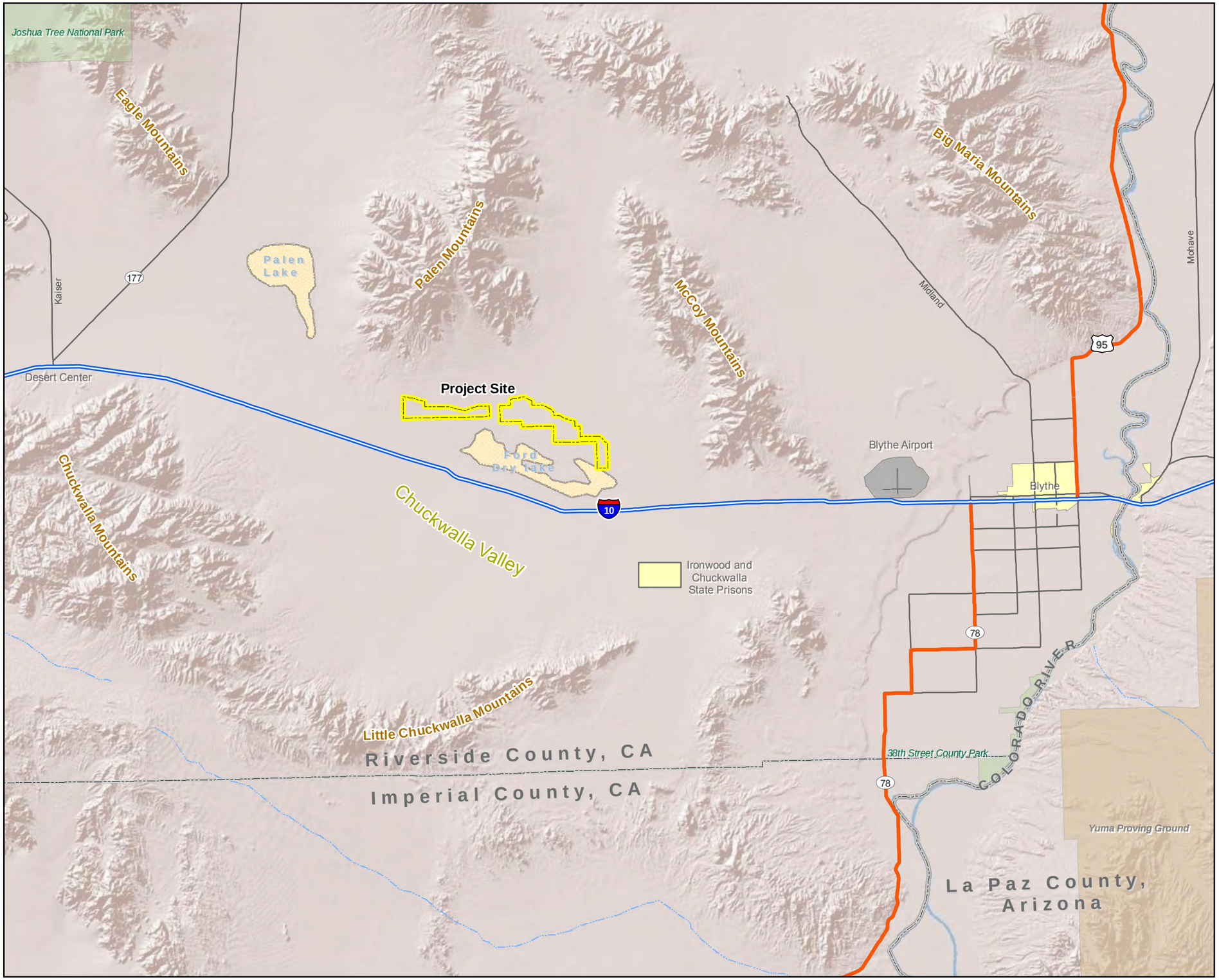
The Project is located in eastern Riverside County, between the communities of Blythe, California (approximately 25 miles east of the Project site) and Desert Center, California (approximately 27 miles west of the Project site). The Ironwood and Chuckwalla State Prisons (adjacent to each other) are located approximately nine miles to the south of the Project site (Figure 3.2-1).

Surrounding features include the McCoy Mountains to the east, the Palen Mountains (including the Palen/McCoy Wilderness Area) to the north, and Ford Dry Lake, a dry lakebed, to the south. Interstate 10 (I-10) is located approximately two miles south of the southernmost border of the Project site.

Genesis Solar, LLC has applied for a 4,640-acre right-of-way (ROW) grant from the Bureau of Land Management (BLM) for development of the Project. Once constructed, the Project would permanently occupy approximately 1,800 acres within this area (the Project footprint), plus approximately 90 acres for linear facilities. The land around the Project site is predominantly owned and managed by the BLM (Figure 3.2-2).

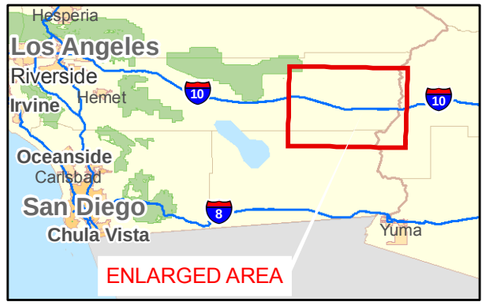
The Project is located in Township 6S Range 18E and Township 6S Range 19E, San Bernardino Base and Meridian. A summary legal description of the BLM-requested ROW is provided in Table 3.2-1.

Printing Date: 8/24/2009 9:16 AM
File: P:\GIS\Projects\Cogentrix\Maps\McCullough\Genesis-RegionalLocationMap-Figure 3.2-1.mxd



GENESIS SOLAR, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY, CALIFORNIA



Legend

- Project Site
- Interstate
- Highway
- Major Road
- Local Road
- County Boundary
- State Boundary
- Lake/River
- Lake Intermittent
- Parks (Regional)
- Military Installation
- Urban Areas
- Airport Area

N

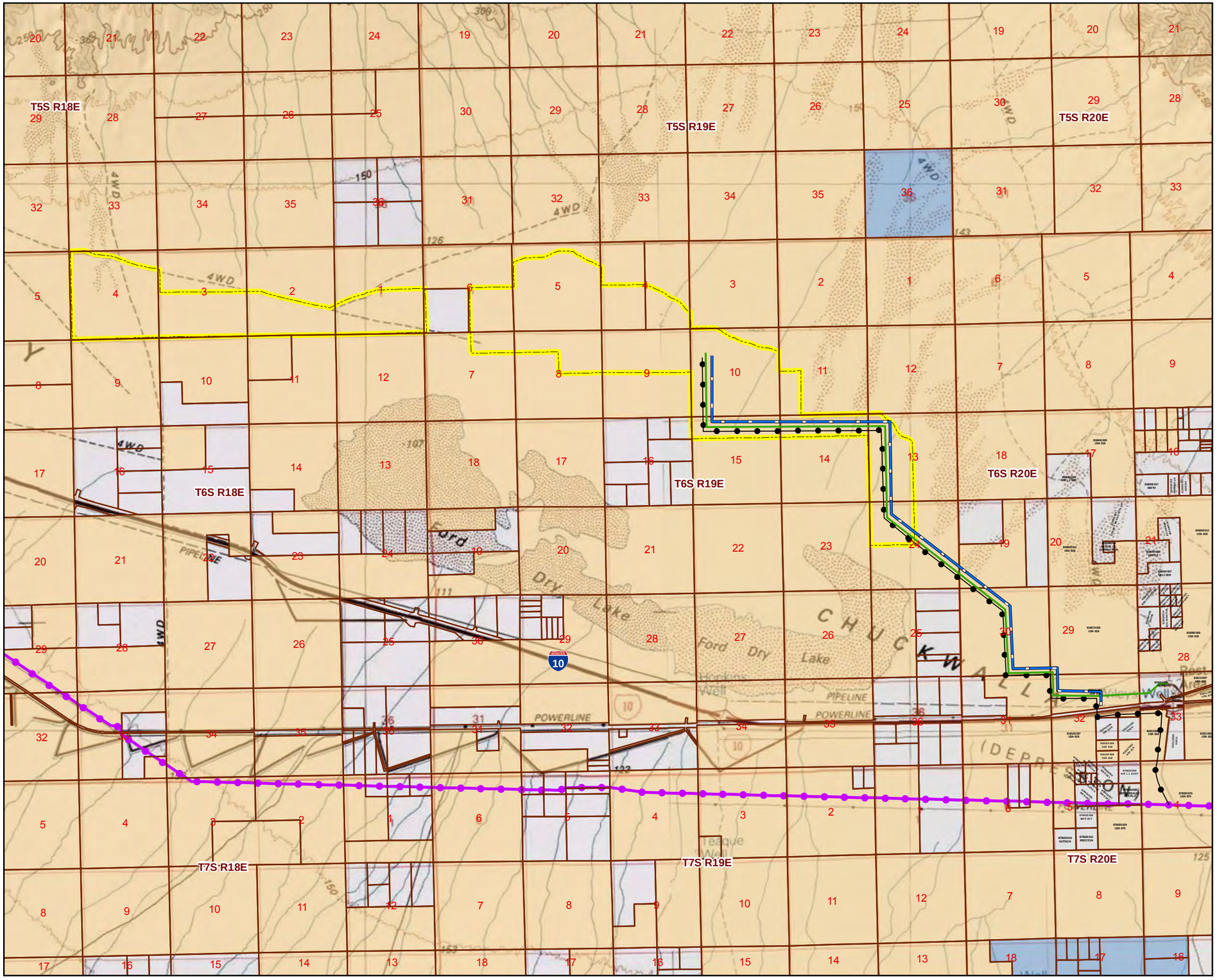
0 2.5 5 7.5 10
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM

FIGURE 3.2-1
PROJECT LOCATION

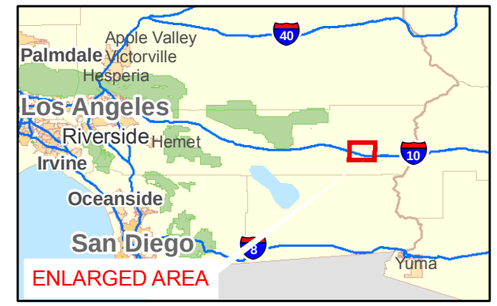
TETRA TECH EC, INC.

Printing Date: 8/19/2009 2:30 PM
File: P:\GIS\Projects\FPL\Maps\Genesis\Genesis-LandOwnership-Overall.mxd



GENESIS SOLAR, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY, CALIFORNIA



Legend

- Proposed Gas Line
- Proposed Access
- Proposed Transmission Interconnection
- Blythe Energy Project Transmission Line
- Parcel Lines
- Project Site
- BLM
- Private
- State Of California

N

0 0.75 1.5 2.25 3
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, Riverside County

3.2-2
LAND OWNERSHIP

TETRA TECH EC, INC

Table 3.2-1. Requested ROW for the Project

Section	Aliquot	Estimated Acres
Township 6S, Range 19E, San Bernardino Base & Meridian		
4	S ½ except wilderness	260
5	All except wilderness	550
6	SE ¼	160
7	N ½ NE ¼	80
8	NE ¼, N ½ NW ¼	240
9	N ½	320
10	All except wilderness	580
11	SW ¼	160
13	NW ¼ except wilderness; SW ¼	280
14	N ¾, NW ¼, N ¾, NE ¼	240
15	N ½ NW ¼ , N ½ NE ¼	160
24	W ½ N ½	160
	Subtotal, T 6 S, R 19 E:	3,190
Township 6S, Range 18E, San Bernardino Base & Meridian		
1	S ½ except wilderness	290
2	S ½ except wilderness	260
3	S ½	320
4	All except wilderness	580
	Subtotal, T 6S, R18 E:	1,450
	Total, Modified ROW, 1/4/08	**4,640**

The Project will consist of the main facility footprint and associated linear corridor. Table 3.2-2 provides the total acres of permanent and temporary disturbance associated with the entire Project.

Table 3.2-2. Acres of Temporary and Permanent Disturbance

	Dimensions	Quantity	Acres
Temporary Disturbance:			
Transmission Line			
Construction laydown/assembly areas	100' X 200'	1	0.46
Conductor Pulling Area	50' X 140'	25	4.02
Crossing Structures	100' X 100'	4	1.84
Pole Pad Construction Areas	50' X 50' (note 1)	60	2.91
Gas Line			
Construction Right-of-Way	50' X 6 miles (note 2)	1	36.36
Roads			
Site Access Road Construction	50' X 6.5 miles (note 3)	1	15.76

Table 3.2-2. Acres of Temporary and Permanent Disturbance

	Dimensions	Quantity	Acres
Total Temporary Disturbance			61.35
Permanent Disturbance:			
Transmission Pole Pads	6' X 6'	60	0.05
Spur Roads	70' X 14'	60	1.90
Substation Expansion	75' X 240'	1	0.41
Site Access Road	30' X 6.5 miles	1	23.64
Gas Line	N/A	N/A	N/A
Project Footprint	varies	1	1800.00
Total Permanent Disturbance			**1826.00**

Notes

[1] The 50' X 50' Pole Pad Construction area does not include the 6' X 6' permanent pole pad disturbance or the portion of the spur road that is coincident with the 50' X 50' pole pad construction area.

[2] Approximately 20' of the gas line construction ROW will overlap the access road construction ROW; therefore, it has not been included in the temporary disturbance calculation.

[3] The temporary disturbance shown excludes the permanent disturbance for the access road.

3.3 PHYSICAL SITE DESCRIPTION

The Project is situated within the northeastern portion of Chuckwalla Valley, an east-southeast trending valley in eastern Riverside County. Physiographically, the Project site lies near the toe of alluvial fans emanating from the Palen Mountains to the north and the McCoy Mountains to the east, and the eastern portion of the Project site is underlain by a broad valley-axial drainage that extends southward between these mountains and drains to the Ford Dry Lake playa located about one mile south of the Project site. The Project site is relatively flat and generally slopes from north to south with elevations of approximately 400 to 370 feet above mean sea level. It is occupied by a community of low creosote and bursage scrub vegetation and is shown on the Ford Dry Lake and McCoy Spring United States Geological Survey (USGS) topographic maps. The area has historically been used for both off-highway vehicle use and sheep grazing; however, neither activity currently occurs.

The Project is located in an arid desert climate, and therefore has extreme daily temperature changes, low annual precipitation, strong seasonal winds, and mostly clear skies. Evaporation rates are higher than precipitation rates. Average rainfall in the Project area is around 5 to 6 inches annually, but a single rainstorm, particularly during the monsoon season from mid-July to the end of August, can bring 1 to 3 inches of rain in a few hours. Extreme events in the nearby area have recorded over 10 inches of rain in 24 hours. The vast majority of the time, the area is dry and devoid of any surface flow anywhere in either Project area. Evaporation potential is around 90 to 100 inches annually as described in more detail in Section 5.4, Water Resources. The Federal Emergency Management Agency (FEMA) has not mapped the site for the presence of floodplains.

3.4 POWER PLANT GENERATION FACILITY

3.4.1 Power Plant Site Arrangement

Figure 3.4-1 shows the layout of Project facilities on the plant site including:

- Overall plant area and facilities footprint
- Power blocks
- Control room and local warehouse locations
- Administration building
- Solar collector field arrangements
- Evaporation ponds
- Bioremediation land treatment unit (LTU)
- Onsite transmission facilities
- Onsite gas pipeline facilities
- Drainage realignment
- Existing groundwater wells used for water supply
- Access road from I-10

The Project power block and solar arrays will occupy approximately 1,360 acres of the 1,800-acre site. Additionally, evaporation ponds, access road, administration buildings and other support facilities, LTU, and some open areas will be fenced for a total of 1,800 acres.

Figures 3.4-2 and 3.4-3 are plot plans of the Project's power blocks. As shown on Figures 3.4-2 and 3.4-3, major components of the Project include:

- SSG heat exchangers
- Two STGs and condenser
- Two wet cooling towers
- Two natural gas-fired auxiliary boilers
- Steam-fed HTF freeze protection heat exchangers
- HTF surge volume tanks
- Two firewater pumps and pump house with associated diesel fuel tank
- Emergency diesel generators
- Two raw water storage tanks
- Two treated water storage tanks
- Two demineralized water storage tanks
- Ancillary equipment

Elevation drawings of plant facilities are provided in Figures 3.4-4 and 3.4-5, which include views looking west (Section A-A) and looking north (Section B-B) for Units 1 and 2, respectively.

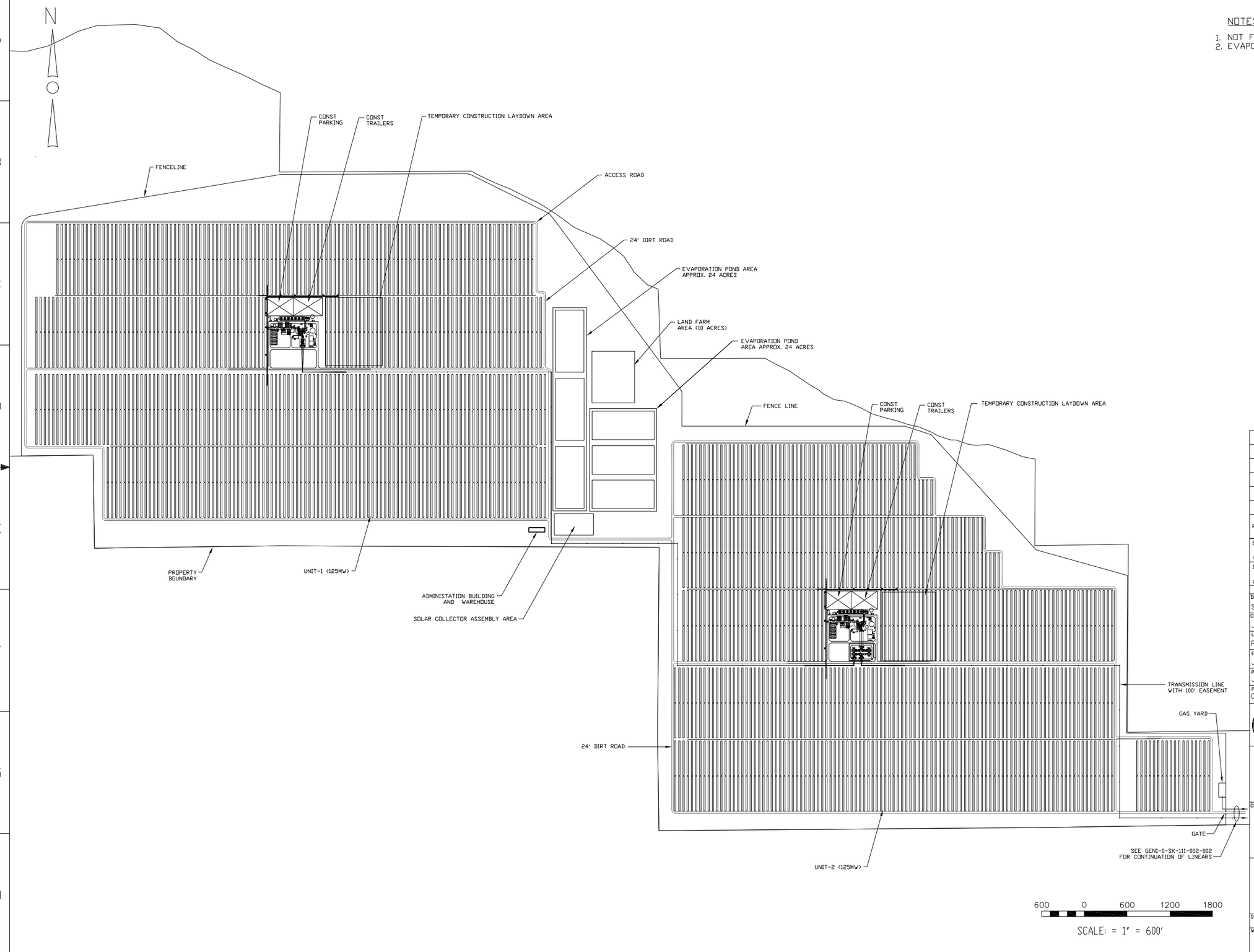
3.4.2 Process Description

This section describes the power generation process and thermodynamic cycle employed by the Project. Each 125 MW power plant consists of:

- STG
- SSG heat exchangers

NOTES:

1. NOT FOR CONSTRUCTION.
2. EVAPORATION POND SIZE NOT FINALIZED.



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C	08 12 09	ISSUED FOR REVIEW	PL	JF	PL	JF	JF	JF	CN
B	07 09 09	ISSUE FOR REVIEW	RWG	TR	PL	TR	JF	JF	BP
A	05 18 09	ISSUED FOR REVIEW	SC	JF	PL	TR		JF	BP

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DRAWN BY: S. CHERRY
CHECKED BY: J. FOSTER
LEAD DESIGNER: P. LOUEN
ENGINEER/TECH SPECIALIST: J. FOSTER
PROJECT ENGINEERING MANAGER: J. FOSTER
PROJECT MANAGER: C. NITOFF

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CLIENT/PROJECT TITLE
GENESIS SOLAR, LLC
GENESIS SOLAR ENERGY PROJECT

GENERAL ARRANGEMENT
OVERALL SITE PLAN
FIGURE 3.4-1

SCALE 1" = 600'
DRAWING SIZE ARCH D (36" x 24")
WORLEYPARSONS DWG. NO. GENI-0-SK-111-002-001
REV D

GENI-0-SK-111-002-001-R0.dwg
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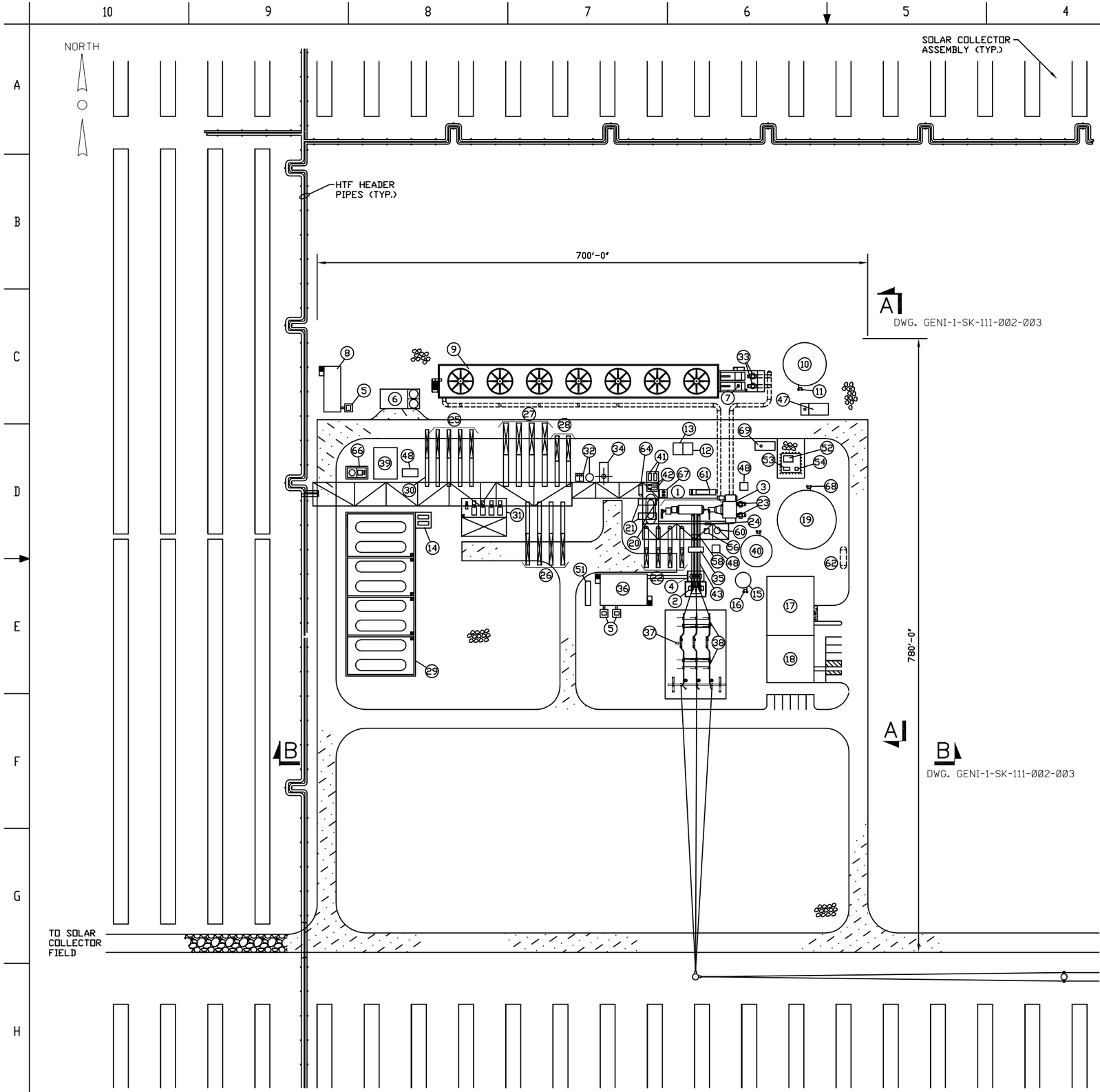

EQUIPMENT DESCRIPTIONS

1 STEAM TURBINE/GENERATOR
2 GSU TRANSFORMER
3 SURFACE CONDENSER
4 UNIT AUXILIARY TRANSFORMER
5 STATION SERVICE TRANSFORMERS
6 COOLING TOWER CHEMICAL FEED/STORAGE AREA
7 AUXILIARY COOLING PUMP (BACK-UP/START-UP)
8 COOLING TOWER ELECTRICAL ENCLOSURE
9 COOLING TOWER
10 RAW, FIRE, TANK (500,000 GAL)
11 SERVICE WATER PUMPS
12 CO2 BOTTLE STORAGE
13 H2 BOTTLE STORAGE
14 OVERFLOW TANK PUMPS
15 DEMIN WATER STORAGE TANK (40,000 GAL)
16 DEMIN WATER PUMP SKID
17 WATER TREATMENT AREA (CYCLE CHEM FEED, DEMIN TRAIN, MMF, RO, SAMPLE PANEL, LAB, AIR COMP)
18 CONTROL ROOM/WAREHOUSE BUILDING
19 TREATED WATER TANK (1,250,000 GAL)
20 DEAERATOR/STORAGE TANK/FEEDWATER HEATER
21 FEEDWATER PUMPS
22 FEEDWATER HEATERS
23 CONDENSATE PUMPS
24 GLAND STEAM CONDENSER
25 ECONOMIZERS
26 REHEATERS
27 EVAPORATORS
28 SUPERHEATERS
29 EXPANSION TANKS AND CONTAINMENT AREA
30 HTF FREEZE PROTECTION HEAT EXCHANGER
31 HTF CIRCULATING PUMPS AND CONTAINMENT AREA
32 BLOWDOWN TANK AND SUMP/PUMPS
33 CIRCULATING WATER PUMPS
34 AUXILIARY BOILER
35 GENERATOR CIRCUIT BREAKER
36 MAIN ELECTRICAL ENCLOSURE
37 MAIN CIRCUIT BREAKER
38 MAIN DISCONNECT
39 ULLAGE SYSTEM AND CONTAINMENT AREA
40 WASTE WATER TANK (250,000 GAL)
41 CLOSED COOLING WATER HEAT EXCHANGERS
42 CLOSED COOLING WATER PUMPS
43 ISOLATED PHASE BUS DUCT
44 NOT USED
45 NOT USED
46 NOT USED
47 FIRE PUMP HOUSE
48 FIRE PROTECTION SPRINKLER HOUSE
49 NOT USED
50 NOT USED
51 4KV, 2500KVA UPS
52 ABOVE GROUND DIESEL FUEL STORAGE TANK (3,000 GAL)
53 DIESEL FUEL PUMP
54 WASH TRUCK DEMIN FILL STATION
55 NOT USED
56 STEAM JET AIR INJECTOR
57 NOT USED
58 EXCITATION TRANSFORMER
59 NOT USED
60 TURBINE AREA FLASH TANK
61 LUBE OIL AND EHC SKID
62 OIL/WATER SEPARATOR
63 NOT USED
64 CLOSED COOLING WATER EXPANSION TANK
65 NOT USED
66 NITROGEN BULK STORAGE AND VAPORIZER
67 EQUIPMENT DRAINS SUMP AND PUMPS
68 TREATED WATER PUMP SKID
69 EMERGENCY DIESEL GENERATOR

NOTES:

1. NOT FOR CONSTRUCTION.

LEGEND:

- YARD AGGREGATE
- ROAD AGGREGATE
- ASPHALT
- CONCRETE
- PIPE RACK
- PULL SPACE

60 0 60 120 180

SCALE: 1" = 60'

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D	08 17 09	CHANGED FIGURE NUMBER	PL	JF	PL	JF	JF	JF	CN
C	08 12 09	ISSUED FOR REVIEW	PL	JF	PL	JF	JF	JF	CN
B	07 09 09	ISSUE FOR REVIEW	RVG	TR	PL	TR	JF	JF	BP
A	04 27 09	ISSUED FOR REVIEW	SC	TR	PL	TR	JF	JF	BP

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APPROVED STATUS — DATE — LDE

REPRESENTS REVIEWED AND APPROVED DESIGN. ANY PORTION MARKED "HOLD" RETAINS PRELIMINARY STATUS.

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CHECKED BY: J. FOSTER
LEAD DESIGNER: P. LOUEN
ENGINEER/TECH SPECIALIST: J. FOSTER
PROJECT ENGINEERING MANAGER: J. FOSTER
PROJECT MANAGER: C. NITOFF

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WorleyParsons resources & energy

CLIENT/PROJECT TITLE

GENESIS SOLAR, LLC
GENESIS SOLAR ENERGY PROJECT

GENERAL ARRANGEMENT
CONCEPTUAL POWER BLOCK LAYOUT UNIT 1
FIGURE 3.4-2

SCALE 1"=60'
DRAWING SIZE ARCH D (36" x 24")
WORLEYPARSONS DWG. NO. GENI-1-SK-111-002-002
REV D

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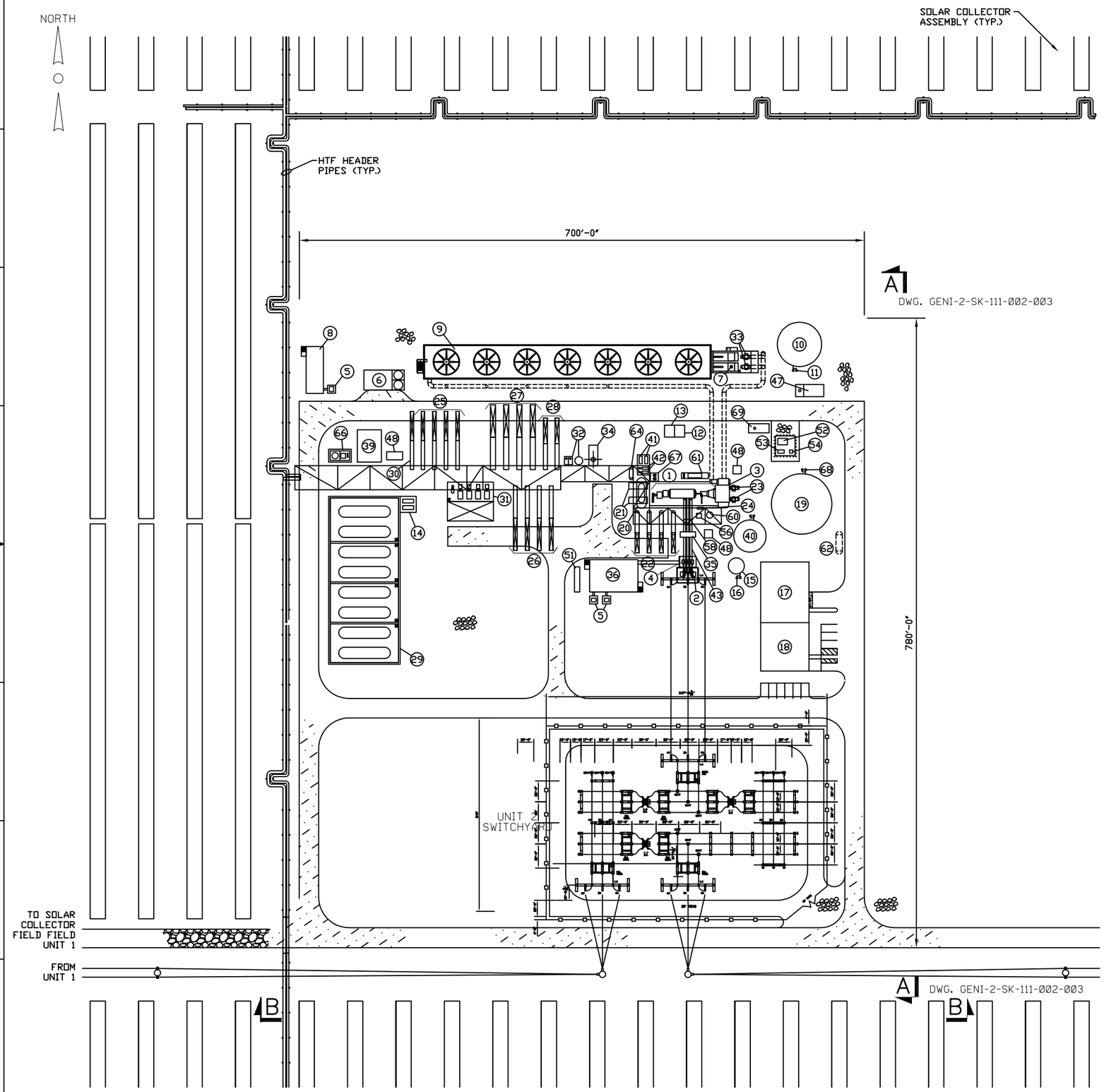

EQUIPMENT DESCRIPTIONS

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5 STATION SERVICE TRANSFORMERS
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25 ECONOMIZERS
26 REHEATERS
27 EVAPORATORS
28 SUPERHEATERS
29 EXPANSION TANKS AND CONTAINMENT AREA
30 HTF FREEZE PROTECTION AND WARNUP HEATER (GAS-FIRED)
31 HTF CIRCULATING PUMPS AND CONTAINMENT AREA
32 BLOWDOWN TANK AND SUMP/PUMPS
33 CIRCULATING WATER PUMPS
34 AUXILIARY BOILER
35 GENERATOR CIRCUIT BREAKER
36 MAIN ELECTRICAL ENCLOSURE
37 NOT USED
38 NOT USED
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42 CLOSED COOLING WATER PUMPS
43 ISOLATED PHASE BUS DUCT
44 NOT USED
45 NOT USED
46 NOT USED
47 FIRE PUMP HOUSE
48 FIRE PROTECTION SPRINKLER HOUSE
49 NOT USED
50 NOT USED
51 10s-START DIESEL GENERATOR
52 ABOVE GROUND DIESEL FUEL STORAGE TANK (3,000 GAL)
53 DIESEL FUEL PUMP
54 WASH TRUCK DEMIN FILL STATION
55 NOT USED
56 STEAM JET AIR INJECTOR
57 NOT USED
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59 NOT USED
60 TURBINE AREA FLASH TANK
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62 OIL/WATER SEPARATOR
63 NOT USED
64 CLOSED COOLING WATER EXPANSION TANK
65 NOT USED
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68 TREATED WATER PUMP SKID
69 EMERGENCY DIESEL GENERATOR

NOTES:

1. NOT FOR CONSTRUCTION.

LEGEND:

- YARD AGGREGATE
- ROAD AGGREGATE
- ASPHALT
- CONCRETE
- PIPE RACK
- PULL SPACE

60 0 60 120 180
SCALE: 1" = 60'

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PROJECT MANAGER: C. NITOFF

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GENESIS SOLAR ENERGY PROJECT

GENERAL ARRANGEMENT
CONCEPTUAL POWER BLOCK LAYOUT UNIT 2
FIGURE 3.4-3

SCALE 1"=60'
DRAWING SIZE ARCH D (36" x 24")
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REV D

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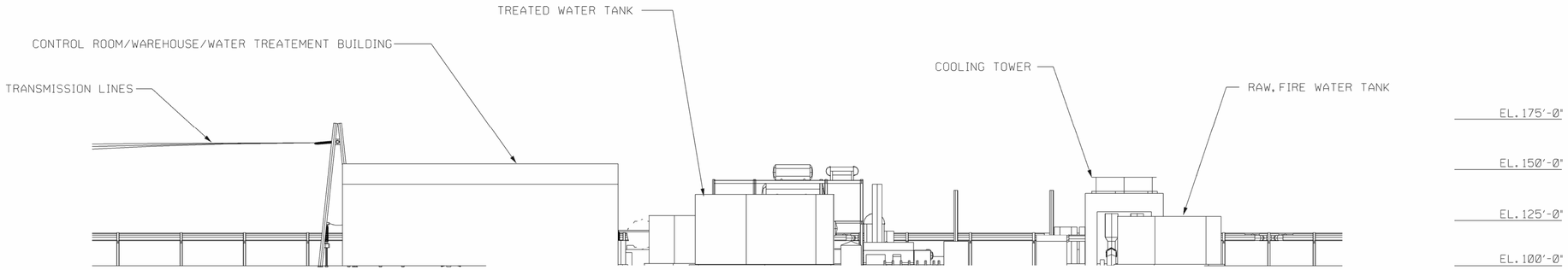

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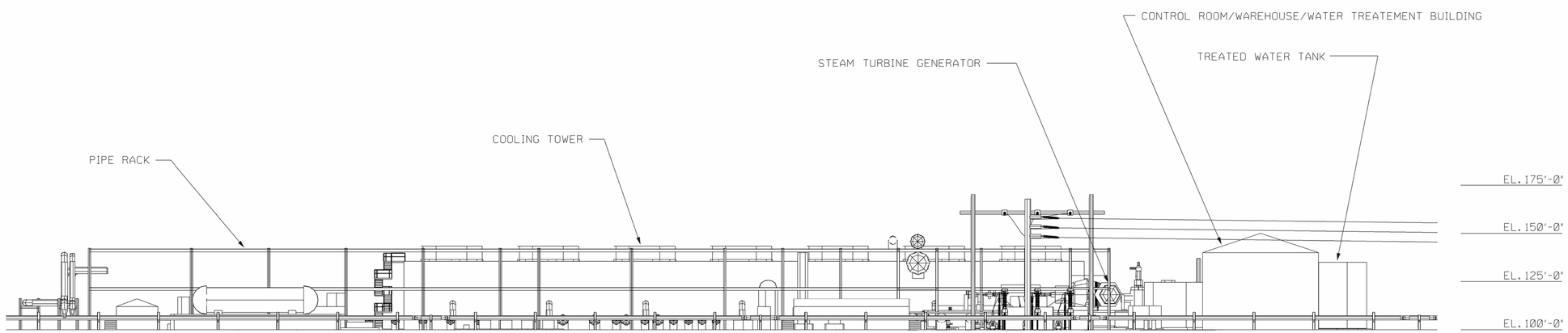

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FROM DWG. GENI-1-SK-111-002-003
LOOKING NORTH

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PROJECT MANAGER: C. NITOFF

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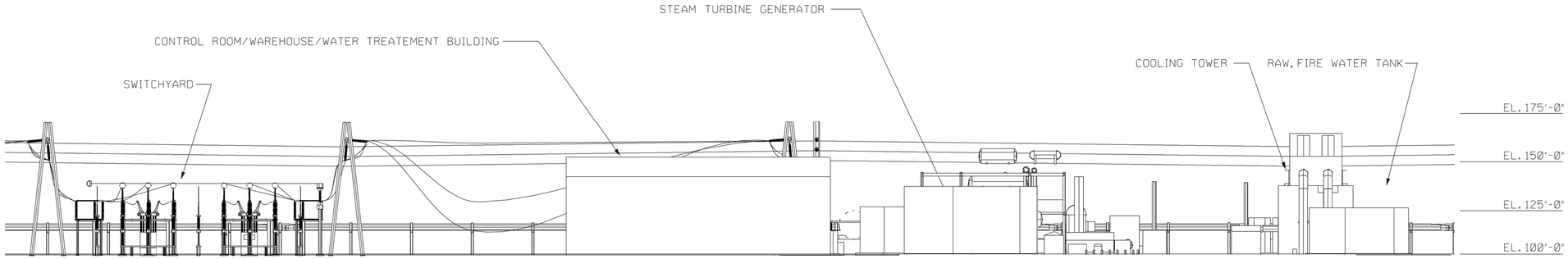
GENESIS SOLAR ENERGY PROJECT

GENERAL ARRANGEMENT
POWER BLOCK ELEVATION VIEW
FIGURE 3.4-4

SCALE: 1' = 30'
DRAWING SIZE: ARCH D (36" x 24")
WORLEYPARSONS DWG. NO.: GENI-1-SK-111-002-003
REV: B

$$DESIGN-FILE-NAME$$
$$$DATE$$$ $$$$TIME$$$$



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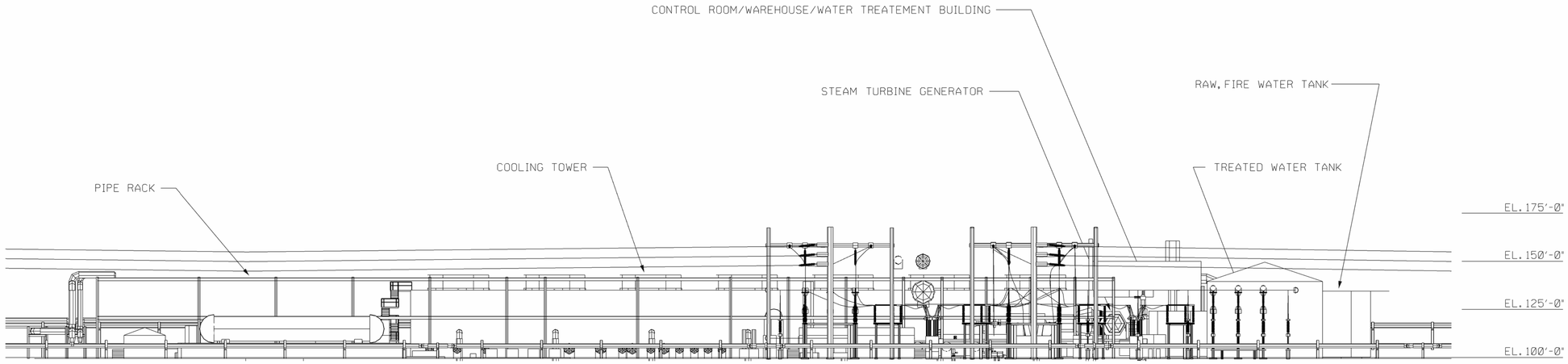

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FROM DWG. GENI-2-SK-111-002-003
LOOKING NORTH

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GENESIS SOLAR, LLC
GENESIS SOLAR ENERGY PROJECT

GENERAL ARRANGEMENT
POWER BLOCK ELEVATION VIEW
FIGURE 3.4-5

SCALE: 1' = 30'
DRAWING SIZE: ARCH D (36" x 24")
WORLEYPARSONS DWG. NO.: GENI-2-SK-111-002-003
REV: A

$$DESIGN-FILE-NAME$$
$$$DATE$$$ $$$$TIME$$$$

- Surface condenser
- Feedwater pumps
- Deaerator
- Feedwater heaters
- Wet cooling tower
- Evaporation ponds
- Natural gas-fired boilers
- Solar thermal collection field

The plant's power cycle is the Rankine-with-reheat thermodynamic cycle. A preliminary heat balance diagram for the process is included in Figure 3.4-6. The thermal input is via heated HTF from the parabolic trough solar field at a temperature of approximately 740 °F.

Overall annual availability for each 125 MW facility is expected to be between 96 to 98 percent of possible operating hours (between 3,000 and 3,200 hours per year). Each plant's capacity factor will depend on the local solar insolation, but has been estimated to be approximately 27 percent, or approximately 300,000 MWh/year. Each 125 MW plant will use the Rankine thermodynamic cycle with reheat described as follows:

Process 1: The working fluid (water) is pumped from low to high pressure. During this process, steam extracted from the STG is used to preheat the water prior to entering the SSG system, which increases overall cycle efficiency.

Process 2: The high pressure liquid enters the SSG system where it is heated theoretically at constant pressure by the HTF to become superheated steam.

Process 3: The superheated steam expands through the high pressure section of the steam turbine, turning the generator to produce electricity. This steam is then reheated in different vessels that are part of the SSG system and sent to the reheat section of the steam turbine. The reheat exhausts into the low pressure (LP) section of the steam turbine.

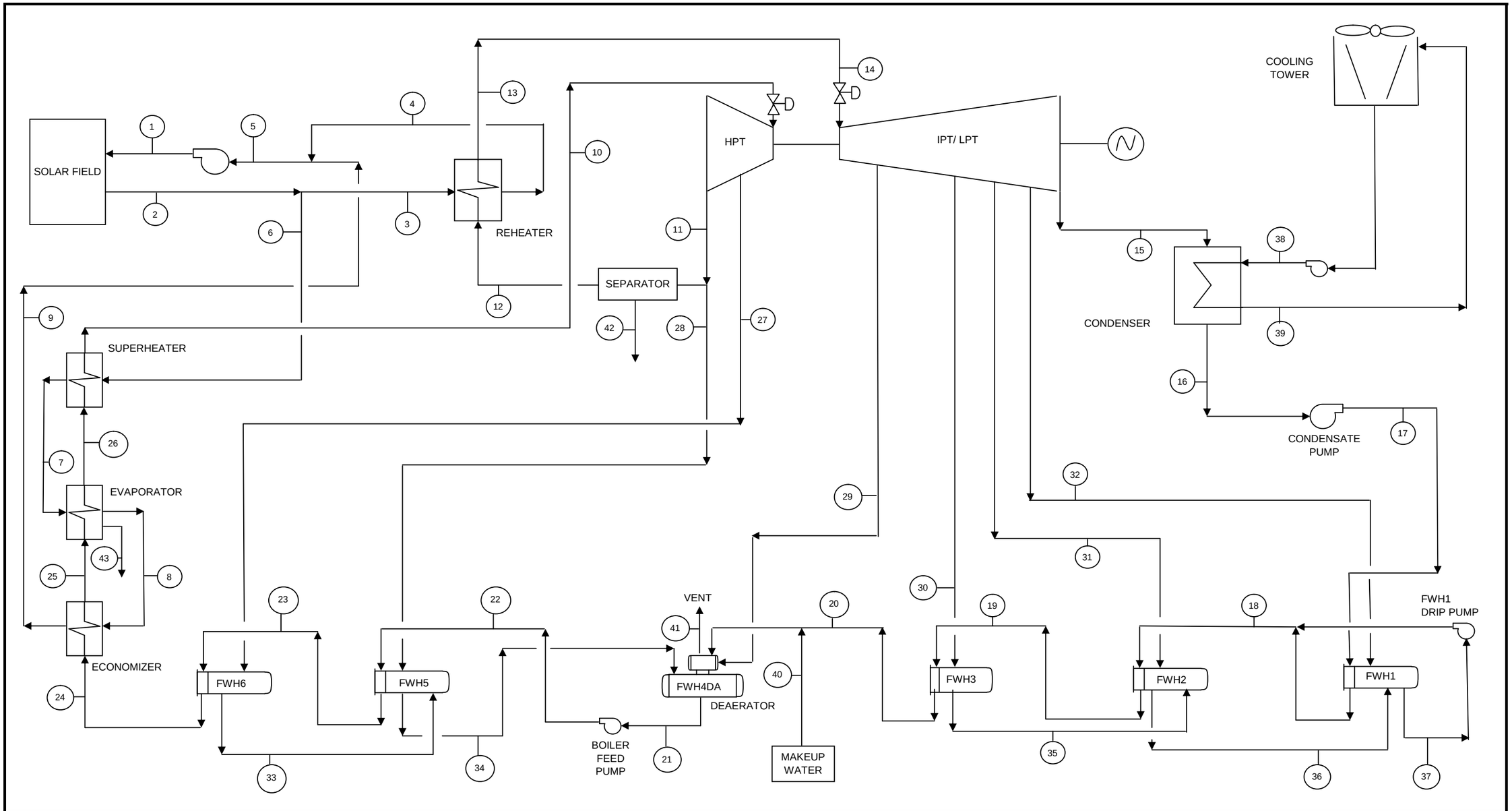
Process 4: The wet steam from the LP section then enters the surface condenser where it is cooled at a constant low pressure to become a saturated liquid. The condensed liquid returns to Process 1.

As the HTF is circulated from the SSG to the solar field, it absorbs solar energy and provides a high temperature (740°F) energy source for the Rankine cycle. Waste heat is rejected in Process 4. As the turbine exhaust is condensed, the heat is transferred to the cool circulating water. The warm circulating water carries the heat to the wet cooling tower to be rejected.

3.4.3 Steam Turbine-Generator (STG)

As described earlier, steam from the SSG is sent to the STG. The steam expands through the STG turbine blades to drive the steam turbine, which in turn drives the generator. The Project's STG is expected to be a two casing reheat type with six to seven feedwater heater extraction points and down axial flow LP exhaust. The STG is equipped with accessories required to provide efficient, safe, and reliable operation, including the following:

- Governor system
- Steam admission system



Rev B	BD	08/11/09
Rev A	BD	04/06/09
Description	By	Date

EXPECTED PERFORMANCE
FOR INFORMATION ONLY

	Name	Signature	Date
Engineer:	B. Doar		8/11/2009
Checked:	G.Pratt		8/11/2009
Approved:			

Figure 3.4-6

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HEAT BALANCE DIAGRAM

Genesis Solar, LLC - Genesis Solar Energy Project
125 MW Solar Thermal Plant

Rev B

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Genesis Solar, LLC - Genesis Solar Energy Project
125 MW Solar Thermal Plant
Rev B
Date 8/11/2009
Heat Balance Data

EXPECTED PERFORMANCE FOR INFORMATION

#	Description		HOT DAY	ANNUAL AVERAGE
-	Ambient Conditions	Ambient DB Temperature (F)	112.9	83.2
-	Ambient Conditions	Ambient DB Temperature (F)	78.6	57.8
-	Ambient Conditions	Ambient Relative Humidity	22%	18%
-	System Performance	Gross Power Output (kW)	139,985	142,021
-	System Performance	Power Factor	0.90	0.90
-	System Performance	Gross Steam Cycle Efficiency	38.0%	38.6%
-	System Performance	Aux Loads (kW)	14,993	14,990
-	System Performance	Net Output (MW)	124.99	127.03
-	System Performance	Net Steam Cycle Efficiency	34.0%	34.5%
1	HTF to Solar Field	Flow (lb/hr)	12,280,000	12,280,000
		Temp (F)	565.0	565.0
		Press (psia)	-	-
		Enthalpy (BTU/lb)	234.7	234.7
2	HTF from Solar Field	Flow (lb/hr)	12,280,000	12,280,000
		Temp (F)	740.0	740.0
		Press (psia)	-	-
		Enthalpy (BTU/lb)	336.9	336.9
3	HTF to Reheater	Flow (lb/hr)	2,060,990	2,061,156
		Temp (F)	740.0	740.0
		Press (psia)	-	-
		Enthalpy (BTU/lb)	336.9	336.9
4	HTF from Reheater	Flow (lb/hr)	2,060,990	2,061,156
		Temp (F)	565.0	565.0
		Press (psia)	-	-
		Enthalpy (BTU/lb)	234.7	234.7
5	HTF to Pump	Flow (lb/hr)	12,280,000	12,280,000
		Temp (F)	565.0	565.0
		Press (psia)	-	-
		Enthalpy (BTU/lb)	234.7	234.7
6	HTF to Superheater	Flow (lb/hr)	10,219,010	10,218,844
		Temp (F)	740.0	740.0
		Press (psia)	-	-
		Enthalpy (BTU/lb)	336.9	336.9
7	HTF Supply to Boiler	Flow (lb/hr)	10,219,010	10,218,844
		Temp (F)	-	-
		Press (psia)	-	-
		Enthalpy (BTU/lb)	-	-
8	HTF to Economizer	Flow (lb/hr)	10,219,010	10,218,844
		Temp (F)	-	-
		Press (psia)	-	-
		Enthalpy (BTU/lb)	-	-
9	HTF from Economizer	Flow (lb/hr)	10,219,010	10,218,844
		Temp (F)	565.0	565.0
		Press (psia)	-	-
		Enthalpy (BTU/lb)	234.7	234.7
10	HP Steam to STG	Flow (lb/hr)	1,204,624	1,204,624
		Temp (F)	709.5	709.5
		Press (psia)	1465.1	1465.3

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Genesis Solar, LLC - Genesis Solar Energy Project
125 MW Solar Thermal Plant
Rev B
Date 8/11/2009
Heat Balance Data

EXPECTED PERFORMANCE FOR INFORMATION

#	Description		HOT DAY	ANNUAL AVERAGE
		Enthalpy (BTU/lb)	1298.8	1298.7
11	CRH Steam from STG	Flow (lb/hr)	1,168,328	1,168,340
		Temp (F)	409.2	409.2
		Press (psia)	274.3	274.3
		Enthalpy (BTU/lb)	1168.3	1168.3
12	CRH Steam to Reheater	Flow (lb/hr)	1,023,916	1,023,945
		Temp (F)	405.0	405.1
		Press (psia)	261.8	261.8
		Enthalpy (BTU/lb)	1201.4	1201.4
13	HRH Steam from Reheater	Flow (lb/hr)	1,023,916	1,023,945
		Temp (F)	704.0	704.0
		Press (psia)	243.8	243.8
		Enthalpy (BTU/lb)	1374.0	1374.0
14	HRH Steam to STG	Flow (lb/hr)	1,023,916	1,023,945
		Temp (F)	703.3	703.3
		Press (psia)	236.8	236.8
		Enthalpy (BTU/lb)	1374.0	1374.0
15	STG Exhaust	Flow (lb/hr)	816,175	806,908
		Temp (F)	110.3	97.9
		Press (psia)	1.29	0.89
		Enthalpy (BTU/lb)	1010.4	999.9
16	From Condenser Hotwell	Flow (lb/hr)	816,175	806,908
		Temp (F)	110.3	97.9
		Press (psia)	1.3	0.9
		Enthalpy (BTU/lb)	78.3	65.9
17	Condensate Pump Discharge to FWH1	Flow (lb/hr)	816,175	806,908
		Temp (F)	110.5	98.2
		Press (psia)	-	-
		Enthalpy (BTU/lb)	79.1	66.8
18	Condensate to FWH2	Flow (lb/hr)	960,496	960,441
		Temp (F)	196.9	195.0
		Press (psia)	-	-
		Enthalpy (BTU/lb)	165.4	163.5
19	Condensate to FWH3	Flow (lb/hr)	960,496	960,441
		Temp (F)	237.6	237.1
		Press (psia)	-	-
		Enthalpy (BTU/lb)	206.4	205.9
20	Condensate to FWH4/Deaerator	Flow (lb/hr)	960,496	960,441
		Temp (F)	272.3	272.2
		Press (psia)	-	-
		Enthalpy (BTU/lb)	241.5	241.4
21	Boiler Feed Pump Suction	Flow (lb/hr)	1,229,205	1,229,208
		Temp (F)	332.3	332.4
		Press (psia)	106.4	106.5
		Enthalpy (BTU/lb)	303.3	303.3
22	Feedwater to FWH5	Flow (lb/hr)	1,229,205	1,229,208
		Temp (F)	335.8	335.8
		Press (psia)	-	-

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Genesis Solar, LLC - Genesis Solar Energy Project
125 MW Solar Thermal Plant
Rev B
Date 8/11/2009
Heat Balance Data

EXPECTED PERFORMANCE FOR INFORMATION

#	Description		HOT DAY	ANNUAL AVERAGE
		Enthalpy (BTU/lb)	309.3	309.3
23	Feedwater to FWH6	Flow (lb/hr)	1,229,201	1,229,208
		Temp (F)	403.6	403.6
		Press (psia)	-	-
		Enthalpy (BTU/lb)	380.4	380.4
24	Feedwater to Economizer	Flow (lb/hr)	1,229,201	1,229,208
		Temp (F)	425.3	425.3
		Press (psia)	-	-
		Enthalpy (BTU/lb)	403.8	403.8
25	Feedwater to Evaporator	Flow (lb/hr)	1,229,201	1,229,208
		Temp (F)	-	-
		Press (psia)	-	-
		Enthalpy (BTU/lb)	-	-
26	HP Steam to Superheater	Flow (lb/hr)	1,204,624	1,204,624
		Temp (F)	-	-
		Press (psia)	-	-
		Enthalpy (BTU/lb)	-	-
27	Extraction Steam to FWH6	Flow (lb/hr)	36,292	36,284
		Temp (F)	436.5	436.5
		Press (psia)	367.8	367.8
		Enthalpy (BTU/lb)	1189.3	1189.3
28	Extraction Steam to FWH5	Flow (lb/hr)	100,635	100,599
		Temp (F)	409.2	409.2
		Press (psia)	274.3	274.3
		Enthalpy (BTU/lb)	1168.3	1168.3
29	IP/LP Steam Extraction to FWH4 / Deaearator	Flow (lb/hr)	63,420	63,504
		Temp (F)	543.7	545.2
		Press (psia)	106.4	106.5
		Enthalpy (BTU/lb)	1300.9	1301.6
30	IP/LP Steam Extraction to FWH3	Flow (lb/hr)	33,572	33,939
		Temp (F)	389.2	391.4
		Press (psia)	50.6	50.7
		Enthalpy (BTU/lb)	1229.5	1230.6
31	IP/LP Steam Extraction to FWH2	Flow (lb/hr)	37,914	39,067
		Temp (F)	295.7	298.1
		Press (psia)	29.1	29.1
		Enthalpy (BTU/lb)	1187.1	1188.3
32	IP/LP Steam Extraction to FWH1	Flow (lb/hr)	72,834	80,527
		Temp (F)	205.1	204.5
		Press (psia)	12.8	12.6
		Enthalpy (BTU/lb)	1131.7	1132.3
33	Drain from FWH6	Flow (lb/hr)	36,292	36,284
		Temp (F)	412.6	412.6
		Press (psia)	365.8	365.8
		Enthalpy (BTU/lb)	388.8	388.8
34	Drain from FWH5	Flow (lb/hr)	136,928	136,883
		Temp (F)	344.8	344.8
		Press (psia)	272.3	272.3

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Genesis Solar, LLC - Genesis Solar Energy Project
125 MW Solar Thermal Plant
Rev B
Date 8/11/2009
Heat Balance Data

EXPECTED PERFORMANCE FOR INFORMATION

#	Description		HOT DAY	ANNUAL AVERAGE
		Enthalpy (BTU/lb)	316.5	316.5
35	Drain from FWH3	Flow (lb/hr)	33,572	33,939
		Temp (F)	246.7	246.3
		Press (psia)	48.6	48.6
		Enthalpy (BTU/lb)	215.2	214.9
36	Drain from FWH2	Flow (lb/hr)	71,487	73,006
		Temp (F)	205.9	204.5
		Press (psia)	27.1	27.0
		Enthalpy (BTU/lb)	174.0	172.6
37	Drain from FWH1	Flow (lb/hr)	144,320	153,533
		Temp (F)	201.1	199.6
		Press (psia)	11.8	11.4
		Enthalpy (BTU/lb)	169.2	167.6
38	Circ Water to Condenser	Flow (lb/hr)	44,890,132	44,890,132
		Temp (F)	88.3	75.8
		Press (psia)	45.0	45.0
		Enthalpy (BTU/lb)	56.4	43.9
39	Circ Water from Condenser	Flow (lb/hr)	44,890,132	44,890,132
		Temp (F)	105.3	92.6
		Press (psia)	37.7	37.5
		Enthalpy (BTU/lb)	73.4	60.7
40	Makeup Water	Flow (lb/hr)	26,985	26,985
		Temp (F)	70.0	70.0
		Press (psia)	160.0	160.0
		Enthalpy (BTU/lb)	38.5	38.5
41	Vent from FWH4 / Deaearator	Flow (lb/hr)	2,401	2,401
		Temp (F)	332.3	332.4
		Press (psia)	106.4	106.5
		Enthalpy (BTU/lb)	1,188.3	1,188.3
42	Water Drain from Separator	Flow (lb/hr)	43,777	43,796
		Temp (F)	407.4	407.4
		Press (psia)	268.8	268.8
		Enthalpy (BTU/lb)	383.1	383.1
43	Blowdown	Flow (lb/hr)	24,584	24,584
		Temp (F)	-	-
		Press (psia)	-	-
		Enthalpy (BTU/lb)	-	-

- Gland seal system
- Lubrication oil system including oil coolers and filters
- Generator coolers
- Metal enclosures designed for outdoor service for STG auxiliary systems

3.4.4 Energy Conversion Facilities Description

This section describes the major energy conversion components of the Project including the STG, SSG, HTF heater, and solar collection system.

3.4.4.1 Description of Technology

The collector field is made up of multiple single-axis-tracking parabolic trough solar collectors aligned on a north-south axis. Each solar collector has a parabolic-shaped reflector that focuses the sun's direct normal radiation on a receiver known as a heat collection element (HCE) located at the focal point of the parabola.

The collectors track the sun from east to west during the diurnal cycle to ensure the sun is continuously focused on the HCE. The HTF is heated up to approximately 740 °F as it circulates through the HCEs and returns to the SSG where the fluid is used to generate high-pressure steam.

3.4.4.2 Major Solar Equipment

The major pieces of equipment for the solar portion of the Project, each of which is discussed below, are as follows:

- Heat collection element (HCE)
- Solar collector assembly (SCA)
- HTF
- Mirrors
- Connectors
- SSG heat exchangers
- HTF heater
- HTF expansion tanks
- HTF ullage/flash system
- HTF piping headers

3.4.4.3 Heat Collection Elements

The HCE consists of a steel tube with a selective coating, surrounded by an evacuated glass tube insulator. The coating gives it excellent selective heat transfer properties. The evacuated glass tube enclosure protects the selective surface and reduces heat loss by insulating it.

The outer glass cylinder has anti-reflective coating on the inner and outer surfaces to reduce reflective losses (increasing the transmissivity). Typically, getters (metallic substances that are designed to absorb gas molecules) are installed in the vacuum space to absorb hydrogen and other gases that permeate into the vacuum annulus over time to maintain its insulating properties.

3.4.4.4 Solar Collector Assemblies

The SCAs are dynamic structures that rotate around the north/south axis to track the sun as it moves through the sky. The axis of rotation is located at the collector center of mass to minimize the required tracking power. The tracking is controlled by a local controller on each SCA.

3.4.4.5 Heat Transfer Fluid

Therminol™ (VP-1), an aromatic hydrocarbon, biphenyl-diphenyl oxide manufactured by Solutia, is currently being considered as the HTF for the Project. Therminol is a special high-temperature oil that has an excellent operating history and is used in many heat transfer processes. Dowtherm A, an essentially chemically identical product manufactured by Dow, is being considered as an alternative to Therminol™ (VP-1).

3.4.4.6 Mirrors

Low-iron glass mirrors are mounted on the SCA. These mirrors are reliable components that have shown no long-term degradation in reflective quality. Twenty-year-old mirrors can be cleaned and brought back to like-new reflectivity. Long-term endurance of the mirror, as measured by the experience at Solar Electric Generating Station (SEGS), indicates mirror life of 30 years or more can be expected for the Project.

Flexible mirror reflectivity monitoring procedures using demineralized water for mirror washing is critical. The periodic monitoring of mirror reflectivity provides a valuable quality control tool for mirror washing and helps to optimize wash labor.

3.4.4.7 Solar Steam Generator System

The SSG system design is similar to any “kettle boiler” shell and tube heat exchanger in that the hot HTF is circulated through tubes and the steam is produced on the shell side. The SSG system includes heat exchangers for preheating the condensate, superheating the steam, and reheating steam, in addition to the boiler vessels.

3.4.4.8 HTF Freeze Protection Heat Exchanger

The HTF freezes at temperatures below 54 °F. To eliminate the problem of HTF freezing, steam-fed shell and tube heat exchangers will be used to keep the HTF above 100 °F whenever the facility is offline. As discussed above, the auxiliary boilers will supply the heat for this process as well as performing the function of a startup boiler. This dual-use configuration reduces the number of individual emission sources.

3.4.4.9 HTF Expansion Tank

Expansion tanks are required to accommodate the volumetric change that occurs when heating the HTF to the operating temperature. Nitrogen will be used to blanket the headspace of the tanks. The nitrogen purge prevents oxidation or contamination of the HTF by reducing its exposure to atmospheric air.

3.4.4.10 HTF Ullage/Flash System

During plant operation, HTF will degrade into components of high and low boilers (substances with boiling points higher and lower than the HTF). The low boilers are removed from the process as vapors through the ullage system. The high boilers are removed from the process as liquid and sediment through the HTF flash system.

3.4.4.11 HTF Piping Header

Supply and return piping is routed to allow for balanced flow through all the HCEs. Expansion loops will be located as required to maintain the composite pipe stress within American Society of Mechanical Engineers (ASME) B31.1 Power Piping code allowable limits. The steel piping in the mirrored trough sections of the array will be connected with ball joints and will not be rigidly mounted to foundations or other structures.

3.4.5 Major Electrical Systems and Equipment

This section describes the major electrical systems and equipment. Roughly 10 percent of the STG output will be used on-site for plant auxiliary loads such as motors, heaters, control systems, and general facility loads including lighting and heating, ventilation, and air conditioning (HVAC). Some of the power needed for on-site uses will be converted from alternating current (AC) to direct current (DC) for power plant control systems and emergency backup systems. The descriptions of the major electrical systems and equipment provided in the following subsections reflect AC power unless otherwise noted. All electrical facilities equipment will be designed in accordance with applicable codes and standards listed in Section 3.11.

Power will be generated by the STG (size and generation voltage is depending on the final generator selection) and stepped up by a fan-cooled generator step-up transformer (GSUT). Start-up power will be back-fed through the GSUT. Once the STG is running, it will supply the plant auxiliary power through a generator bus tap and the unit auxiliary transformer (UAT). The plant stand-by electrical power requirements will be back-fed through the GSUT and UAT. There will also be an alternate back-feed power source to the main auxiliary switchgear. This will be key-interlocked with the main auxiliary power source to prevent both sources from operating simultaneously.

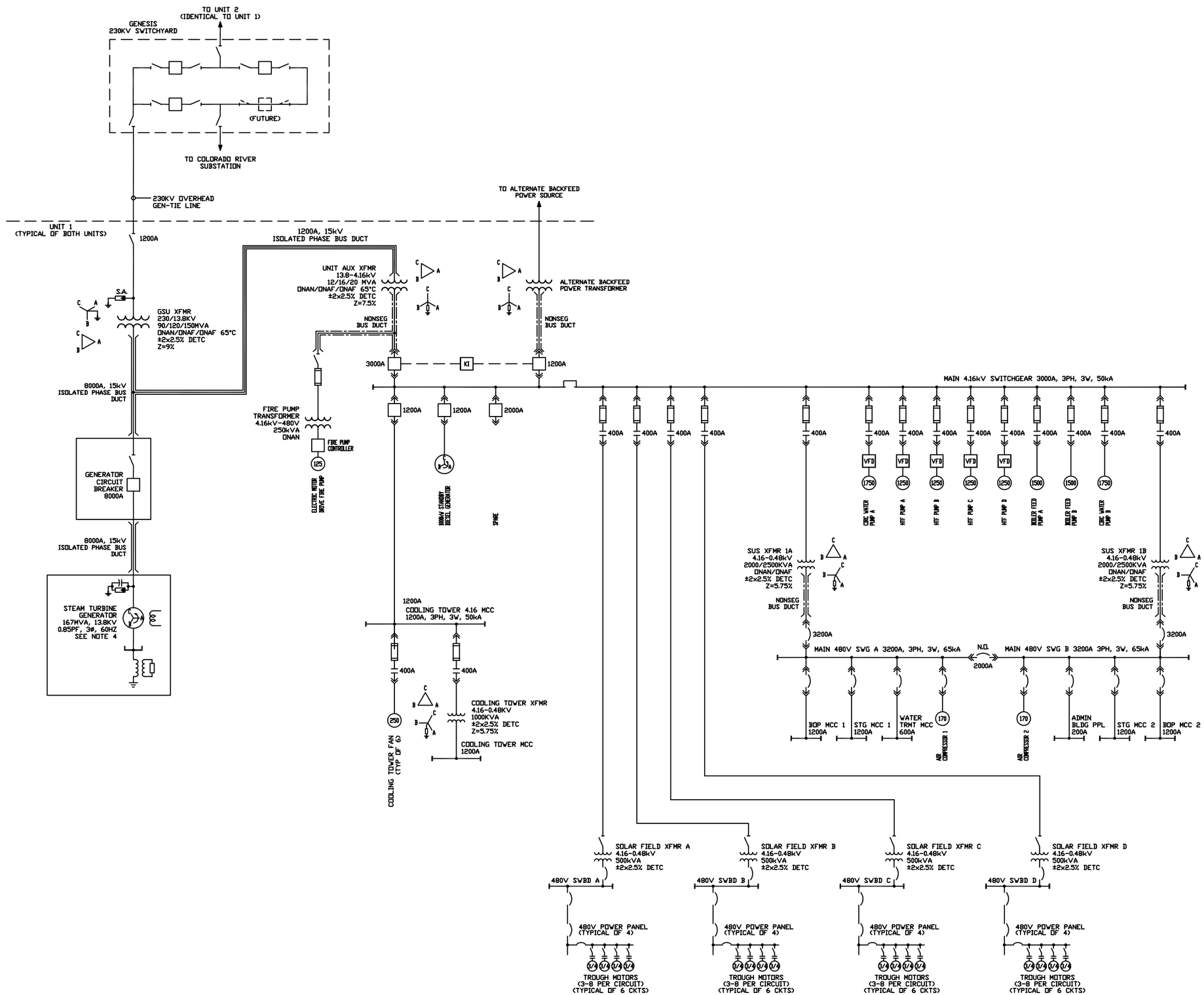
3.4.5.1 Grounding

The electrical system is susceptible to ground faults, lightning, and switching surges that can pose hazards to site personnel and electrical equipment. The station grounding system provides an adequate path to ground to permit the dissipation of current created by these events. The station ground grid will be designed for adequate capacity to dissipate ground current.

Bare conductors will be installed below-grade in a grid pattern throughout the power block area. Each junction of the grid will be bonded together by an exothermic weld or compression connection. Ground resistivity readings will be used to determine the necessary numbers of ground rods and grid spacing to ensure safe step and touch potentials under severe fault conditions. Grounding stingers will be brought from the ground grid to connect to building steel and non-energized metallic parts of electrical equipment.

3.4.5.2 Electrical Generation

As shown in the key one line diagram, Figure 3.4-7, the Project's STGs will tie into a 230 kV on-site switchyard. The STGs generate electricity at 13.8 kV that will connect to the switchyard at 230 kV via a generator circuit breaker (GCB) and a GSUT. The GCB will be rated at 8000 Amperes (A) and will include an 8000/5 A current transformers and 14.4-0.12 kV voltage transformers for generator bus duct, and UAT protection. A disconnect switch will be included with the generator circuit breaker for generator disconnect and transformer maintenance. An 8000 A isolated phase bus duct will connect the generator to the GCB and the GCB to the GSUT. The GSUTs will be 150 megavolt-amps (MVA), 230-13.8 kV, two-winding, delta-wye grounded, and fan-cooled (using oil-immersed natural circulation, multi-stage, forced air cooling). The neutral point of high-voltage winding will be solidly



NOTES

1. NOT FOR CONSTRUCTION.
2. ALL EQUIPMENT SIZING IS PRELIMINARY AND SUBJECT TO CHANGE.
3. FINAL GSU VOLTAGE AND IMPEDANCE RATINGS TO BE CHOSEN TO MEET VAR FLOW REQUIREMENTS FOR SPECIFIC SITE.
4. 140MW IS THE MAXIMUM ESTIMATED OUTPUT FROM THE GENERATOR.

REV	DATE	DESCRIPTION	DRAWN	CHECKED	LEAD DESIGNER	ENGINEER/TECH SPEC	LEAD ELEC	PROJ ENGR	PROJ MANAGER
B	08 17 09	CHANGED FIGURE NUMBER	PL	JH	PL	JH	JH		NC
A	08 04 09	ISSUED FOR REVIEW	PL	JH	PL	JH	JH		NC

PRELIMINARY STATUS — DATE — REPRESENTS GENERAL DESIGN CONCEPTS BASED ON ASSUMPTIONS. REVIEWED NOT CHECKED.
L.DE

APPROVED STATUS — DATE — REPRESENTS REVIEWED AND APPROVED DESIGN. ANY PORTION MARKED "HOLD" RETAINS PRELIMINARY STATUS.
L.DE

ORIGINATING PERSONNEL

DRAWN BY: P. LOUEN
CHECKED BY: J. HODAPP
LEAD DESIGNER: P. LOUEN
ENGINEER/TECH SPECIALIST: J. HODAPP
PROJECT ENGINEERING MANAGER:
PROJECT MANAGER: N. CHRISTO

Zero Harm — Leadership, No Incidents, Safe Behavior

PROFESSIONAL ENGINEER'S SEAL

ORIGINALLY PREPARED UNDER THE RESPONSIBLE SUPERVISION OF
PE: STATE:
LIC. NO.: DATE:

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CLIENT/PROJECT TITLE

GENESIS SOLAR, LLC
GENESIS SOLAR ENERGY PROJECT

CONCEPTUAL
KEY ONE LINE DIAGRAM (TYP. 1 OF 2 UNITS)
FIGURE 3.4-7

SCALE: NONE
DRAWING SIZE: ARCH D (36" x 24")
WORLEYPARSONS DWG. NO.: GENI-0-SK-623-206-001
REV: B

GENI-0-SK-623-206-001-R8.dwg
18-Aug-2009 - 07:27

grounded. The main step-up transformer will have metal oxide surge arrestors connected to the high-voltage terminals and will have manual de-energized ("no-load") tap changers located in high-voltage windings to allow for a nominal voltage plus or minus five percent with a 2.5 percent differential to allow for generator output voltage variations. The GSUT will rest on a concrete pad with a perimeter berm designed to contain the transformer non-polychlorinated biphenyl (PCB) insulating oil in the event of a leak or spill.

The plant site switchyard will be located near the unit two power block, as shown in Figure 3.4-3, and will require an overhead 795 thousand circular mils (kcmil) size, steel-reinforced, aluminum conductor unit tie line for the connection to both unit's GSUTs. The switchyard will consist of 230 kV switchyard circuit breakers with 230 kV, 1200 A disconnect switches on each side of the breaker for breaker maintenance. The switchyard breakers will be of the dead tank design with 1200/5 multi-ratio current transformers on each bushing and 230-0.12 kV coupling capacitor voltage transformers located near the breaker control cabinet for protection of the gen-tie line during normal operation or the GSUT and the UAT during back-feed. The switchyard breakers will also be coordinated with the GCBs and 4.16 kV station service switchgear main breakers for bus duct, GSUT, UAT, and unit tie line protection and will also be used for generator synchronizing.

A disconnect switch will be located at the gen-tie line termination within the switchyard for line isolation. The switchyard will be equipped with metering accuracy instrument transformers. Lightning arresters will be provided in the area of the takeoff towers to protect against surges due to lightning strikes. Tubular aluminum alloy bus will be used in the switchyard. Cable connections between the tube bus and equipment will be aluminum or aluminum alloy type cable. Electrical faults will be detected, isolated, and cleared in a safe and coordinated manner as soon as practical to ensure the safety of equipment, personnel, and the public. Protective relaying will meet Institute of Electrical and Electronic Engineers (IEEE) requirements and will be coordinated with the utility.

3.4.6 Fuel Supply and Use

As shown in Figure 3.4-1 and discussed in Section 3.4, the auxiliary boilers will be fueled by natural gas supplied from a new six-mile, eight-inch pipeline connected to an existing Southern California Edison (SCE) pipeline located north of I-10. Natural gas delivered to the Project site will flow through a revenue quality flow meter, pressure regulation station, and filtering equipment, and will provide gas to the auxiliary boilers for each 125 MW power plant. Safety pressure relief valves are provided downstream of the pressure regulation valves. The estimated natural gas usage for each auxiliary boiler is 30 million British thermal units per hour (MMBtu/hr) or a total of 60 MMBtu/hr for the Project. The maximum annual natural gas usage is expected to be 60 million standard cubic feet per year (MMSCF/yr) for a maximum of 60,000 MMBtu/year. Table 3.4-1 shows the typical composition of the natural gas used to fuel the Project's auxiliary boilers.

Table 3.4-1. Typical Natural Gas Composition

Component	Molar Percent (%)	Component	Molar Percent (%)
Methane, CH_4	96.11	Butane, C_4H_{10}	0.10
Ethane, C_2H_6	1.80	Pentane, C_5H_{12}	0.00
Propane, C_3H_8	0.30	Hexane, C_6H_{12}	0.03
Carbon Dioxide, CO_2	1.24	Nitrogen, N_2	0.04
Total	**100.00**		
Sulfur (grains per 100 dry standard cubic feet (dscf))			0.20
Higher Heating Value (Btu/scf)			1,020

3.4.7 Water Supply and Consumptive Requirements

The Project's various water uses include makeup for the circulating water system, makeup for the SSG, water for solar collector mirror washing, service water, potable water, and fire protection water. Water balance diagrams corresponding to typical annual (83.2 °F dry bulb/57.8 °F wet bulb) and typical summer (112.9 °F dry bulb/78.6 °F wet bulb) operation are presented in Figures 3.4-8 and 3.4-9, respectively.

Table 3.4-2. Typical Water Usage Estimate

Water Use	Annualized Average Rate [1] (gpm)	Estimated Peak Rate [2] (gpm)	Estimated Annual Use (Acre-Feet)
Plant Operation	1000	4026	1644
Potable water	10	10	16

[1] The estimated groundwater usage in gallons per minute is based on an average daily consumption for (2) 125 MW power plants

[2] The "peak" rate is the instantaneous maximum for summer usage for (2) 125 MW power plants.

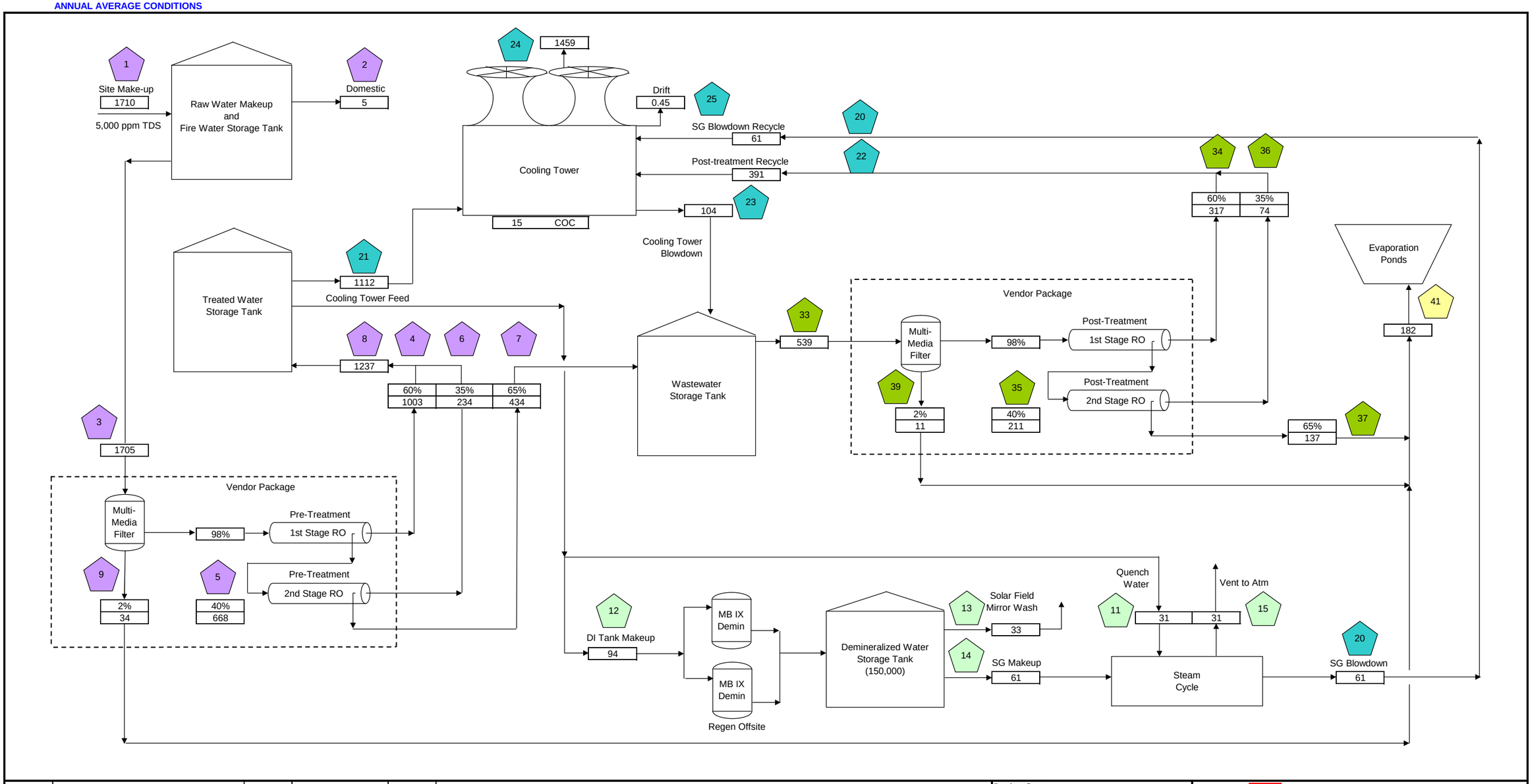
3.4.7.1 Water Requirements

The estimated water requirements for the power plant are presented in Table 3.4-2. The average total annual water usage for each 125 MW power plant is estimated to be about 822 acre-feet per year, or 1644 for the Project, which corresponds to an estimated average daily flow rate of about 1000 gallons per minute (gpm). Usage rates will vary during the year and will be higher in the summer months when the peak maximum flow rate is estimated to be as high as about 2,013 gpm for each 125 MW power plant, or 4,026 for the Project. Equipment sizing will be consistent with peak daily rates to ensure adequate design margin. The makeup flow, on average, will be approximately 1,464,000 gallons per day for both units, with a summer peak makeup increasing to approximately 2,622,000 gallons per day.

3.4.7.2 Water Treatment

The peak load (summer) water balance diagram presented in Figure 3.4-9 shows the power plant's various water uses and water treatment processes. The raw water, circulating water, process water, and mirror washing water all require on-site treatment and this treatment varies according to the

ANNUAL AVERAGE CONDITIONS



Rev.	Description	By	Date	Checked
C	Update Title Block	SDS	8/18/2009	JWL
B	Updated Estimated Flow Rates	SDS	8/12/2009	JWL
A	Updated for water Quality	SDS	7/29/2009	JWL

Figure 3.4-8

Design Case:

Configuration	Solar/Steam Cycle	
Dry bulb Temp	83.20	Deg F
Wet Bulb Temp	57.80	Deg F
Amb Pressure	14.67	psia

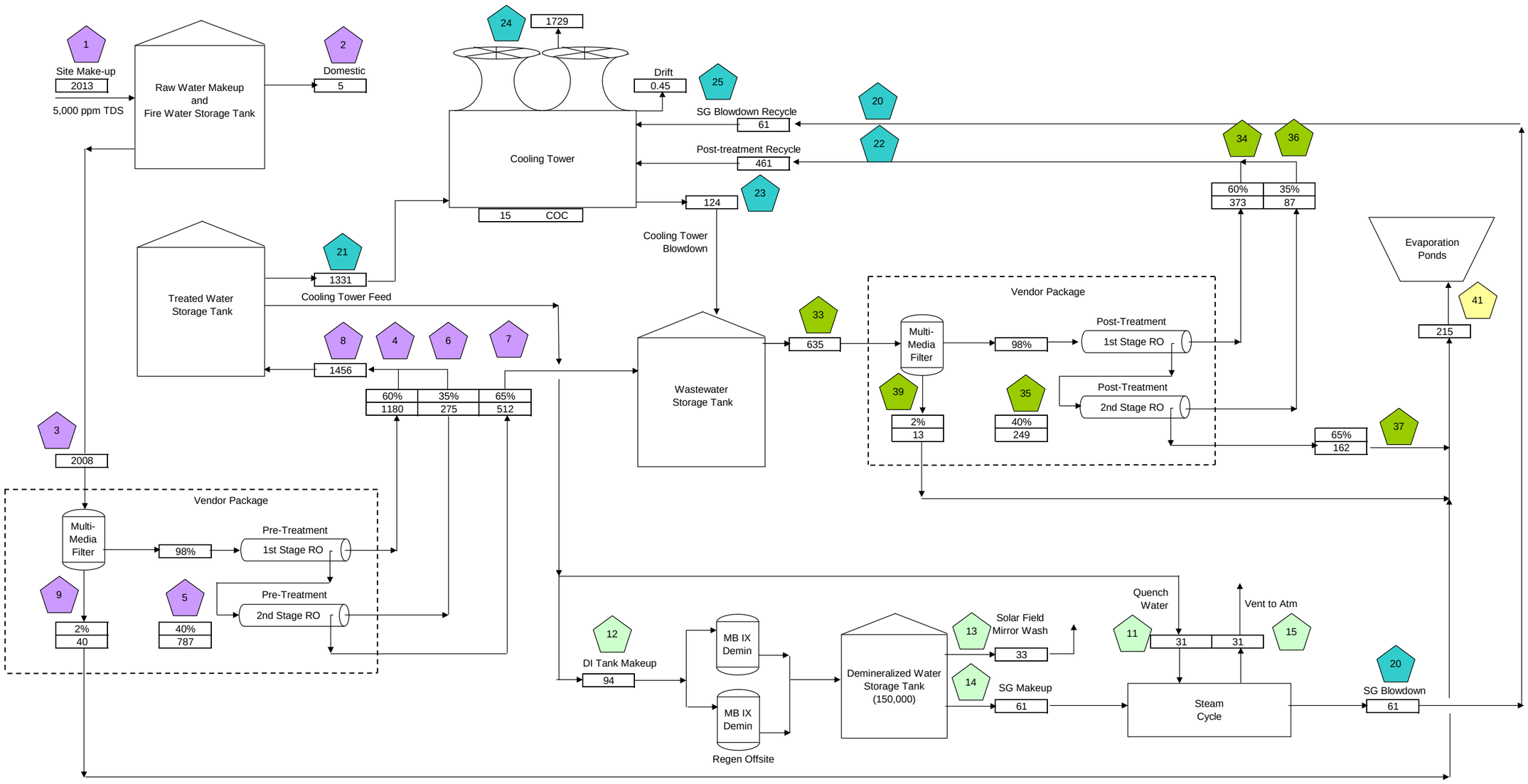
WorleyParsons
resources & energy

Water Balance - Estimated Annual Average (5000 TDS)

Genesis Solar Energy Project

Rev C

SUMMER PEAK CONDITIONS



Rev.	Description	By	Date	Checked
C	Updated Title Block	SDS	40,043	JWL
B	Updated Estimated Flow Rates	SDS	8/12/2009	JWL
A	Updated for water Quality	SDS	7/29/2009	JWL

Figure 3.4-9

Design Case:

Configuration	Solar/Steam Cycle	
Dry bulb Temp	112.90	Deg F
Wet Bulb Temp	78.60	Deg F
Amb Pressure	14.67	psia

WorleyParsons
resources & energy

Water Balance - Estimated Summer Peak (5000 TDS)

Genesis Solar Energy Project

Rev C

quality required for each of these uses. The power plant's design consists of a pre-treatment system upstream of the cooling tower, and a post-treatment system downstream of the cooling tower.

Water is cycled in the cooling tower until the concentration of chemical constituents rises to levels where it becomes unusable and it is blown down as a waste stream. The number of cycles undertaken are called cycles of concentration (COC). The number of COCs in the cooling tower is limited by the incoming water chemistry and the behavior of chemistry constituents as the concentration increases. Without any pre-treatment of the raw water ("makeup water") from groundwater on site, the calcium concentration would limit the process to about five COCs due to the potential to form calcium carbonate ($CaCO_3$) scale, and silica would limit the process to 10 COCs due to the formation of silica (SiO_2) and magnesium silicate scale. Because of the limitation of these constituents in the process, pre-treatment of the makeup water is desirable to reduce the quantity of makeup water required.

The pre-treatment design for the Project takes into account the relatively high concentrations of chloride and sodium present in the makeup water to the site. As the makeup water has high concentrations of highly-soluble species (*e.g.,* sodium, chloride and sulfate), and relatively low concentrations of lower-solubility species (*e.g.,* calcium and magnesium), a multi-media filter (MMF) and two-stage reverse osmosis (RO) unit was selected for pre-treatment upstream of the cooling tower. The MMF removes solids or particulates from the makeup water that may damage or reduce the efficiency of the RO membranes. In the two-stage RO design, the waste stream from the first-stage RO unit is fed into the second-stage RO for additional water recovery, and the treated water from both units combine and are stored in the treated water storage tank before use in the cooling tower. The waste stream from the MMF unit is discharged into the on-site evaporation ponds and waste stream from the second RO unit is discharged into the wastewater storage tank.

A pre-treatment RO unit provides the benefit of reducing the concentration of total dissolved solids (TDS), as well as removing most of the calcium and silica from the makeup water, thus allowing the cooling tower COCs to increase to 15.

The modeled water chemistry of the blowdown from the cooling tower after 15 COCs indicates chloride, sodium, and sulfate will be the primary species, along with lower concentrations of scale forming species (*i.e.,* calcium, magnesium and silica) that were not removed during pre-treatment. Therefore, post-treatment is needed to recover most of the wastewater for reuse to decrease the quantity of makeup water required, and decrease the size of the waste management units (evaporation ponds). Post-treatment will consist of an MMF and RO unit, where similar to the pre-treatment process, the MMF will remove solids from the cooling tower blowdown that may damage or reduce the efficiency of the RO membranes. Treated water through the RO units will be returned to the cooling tower for recycling, further increasing its effective COC, and the waste stream from the MMF and second RO unit will be discharged into on-site evaporation ponds.

As aforementioned, there are several tanks on site which will contain the raw water, treated water, and wastewater, which will have the following capacity:

- Raw Water/Fire Water Storage Tank: 500,000 gallons
- Treated Water Storage Tank: 1,250,000 gallons
- Wastewater Storage Tank: 250,000 gallons

Tanks were sized to provide sufficient water to support operation of the plant during peak operating conditions, as well as provide a 12-hour storage capacity to enable continued operation when a failure interrupts water or wastewater treatment capabilities. The tanks also allow the plant to levelize water supply requirements on a 24-hour basis and eliminate midday demand peaks. The Raw Water/Fire Water Storage Tank provides water for plant operation and fire protection, as discussed in Section 3.4.11.

In addition to the pre- and post-treatment of water for the cooling tower, there is also a demineralizer treatment process for the steam cycle process. The treatment requirements for this process are outlined in Section 3.4.7.5.

3.4.7.3 Water Source and Quality

As discussed in greater detail in Section 5.4, Water Resources, water in sufficient quantity and quality is available by pumping groundwater from wells to be installed at the Project site. A minimum of two groundwater supply wells will be located near each unit's power block area. The Project well field will also include a sufficient number of standby wells to provide the Project with water in the event the primary wells are shut down for maintenance. As currently planned, the wells will pump groundwater from the Bouse Formation and/or underlying Fanglomerate within the Chuckwalla Valley Groundwater Basin. The Bouse Formation occurs at a depth of approximately 260 feet below ground surface (bgs) at the site and extends to approximately 2,050 feet bgs, and the Fanglomerate is inferred to extend from approximately 2,050 to 2,950 feet bgs. On a preliminary basis, the wells are proposed to pump groundwater from below 800 feet bgs. The characteristics and yield of the aquifer that is proposed for the Project water supply, and the long-term effect of pumping of the groundwater system, are discussed in more detail in Section 5.4, Water Resources. As discussed in that section, water quality generally improves with depth, and it is reasonable to expect that further investigation to support detailed Project design will reveal depths within the aquifer that can be developed to produce a better quality (lower TDS) water supply that is still in the brackish range (greater than 1,000 milligrams per liter (mg/L) TDS), but the use of which would result in similar impacts.

The Bouse Formation and Fanglomerate are confined aquifers, so drawdown impacts realized when pumping from this formation or the underlying Fanglomerate will be spread out over a greater distance than in an unconfined aquifer, and impacts to the overlying water table will be similarly diffused. In addition, groundwater in the Bouse Formation and lower Fanglomerate is brackish, and meets State water policy requirements for use as a source of power plant cooling water (SWRCB Resolution No. 79-58). Impacts from pumping groundwater from the Bouse Formation as a source of water supply were investigated and determined to be less than significant. The characteristics and yield of the aquifer that is proposed for the Project water supply, and the long-term effect of pumping of the groundwater system, are discussed in more detail in Section 5.4, Water Resources.

In addition to using on-site groundwater, Genesis Solar, LLC is continuing to explore options that may utilize local industrial facility treated wastewater. Due to the limited quantity of treated water, this would be pursed in order to supplemental the groundwater source.

Groundwater quality varies markedly in the basin. In general, groundwater in the western portion of the basin near Desert Center contains lower concentrations of dissolved solids than groundwater in the eastern portion of the basin near Ford Dry Lake (see Section 5.4, Water Resources). Test wells were drilled on the Project site and samples were collected in June and July 2009. The samples were analyzed for the key chemistry parameters important for determining the water and wastewater treatment systems, as well as for estimating the concentration of species likely to be in the

evaporation ponds. The estimated water quality for the plant makeup water was derived from a sample collected from water-bearing sediments of the Bouse Formation occurring about 800 feet bgs (see Table 3.4-3).

Key findings were the TDS measurement of 5000 mg/L, and the primary contributors to the TDS: chloride (Cl) of 2300 mg/L, sodium (Na) of 1500 mg/L, and sulfate (SO_4) of 800 mg/L. These high-solubility species comprised greater than 90 percent of the TDS, with low-solubility species such as calcium (Ca) of 66 mg/L, magnesium (Mg) of 14 mg/L and silica (SiO_2) of 15 mg/L, making up less than 10 percent. This concentration of high-solubility species suggested precipitation methods of water treatment such as clarification may not be an optimal means for purification, and methods such as membrane separation (*e.g.,* RO) would be more effective for significantly reducing the TDS. Low-solubility species, such as hardness elements and silica, are known to precipitate and deposit on system components when in excess of their solubility limits (sometimes identified by cooling tower manufacturer's limits). Therefore, this was factored into the water treatment design discussed in Section 3.4.7.12.

Table 3.4-3. Typical Water Quality Data in the Project Area

Analyte	Concentration at 800 ft bgs (mg/L unless noted)
pH	7.8 units
TDS	5,000
Total Alkalinity (as CaCO3 @ pH 4.3)	150
Specific Conductance (@ 25 deg. C)	8,800 uS/cm
Total Hardness (as CaCO3)	220
Chloride	2,300
Sulfate	810
Fluoride	1.1
Nitrite	ND
Nitrate	0.5
Dissolved Silica	15
Sodium	1,500
Magnesium	14
Potassium	12
Calcium	66
Manganese	0.029
Iron	0.46
Beryllium	ND
Vanadium	ND
Chromium	ND
Cobalt	ND
Nickel	ND
Copper	ND
Zinc	ND
Arsenic	0.0092
Selenium	ND

Table 3.4-3. Typical Water Quality Data in the Project Area

Analyte	Concentration at 800 ft bgs (mg/L unless noted)
Molybdenum	0.24
Silver	ND
Cadmium	ND
Antimony	ND
Barium	0.033
Mercury	ND
Thallium	ND
Lead	ND

ND – Not Detected

3.4.7.4 Circulating Water Treatment

Circulating water will be modified with chemical treatment to prevent the growth of bacteria, formation of scale, and minimization of corrosion of the Cooling Tower fill and Condenser tubes. These chemicals include a biocide, pH control solution, scale inhibitor, and corrosion inhibitor.

- **Biocide:** An open recirculating cooling system provides a favorable environment for biological growth. If this growth is not controlled, severe biological fouling and accelerated corrosion can occur. Sodium hypochlorite is the most common chemical used for controlling the biological growth, slime, and algae. Sodium hypochlorite is used because is it safer to handle and less likely to precipitate than other chlorine or bromine compounds. Sodium hypochlorite may be continuously fed at lower concentrations (*e.g.,* 0.1 to 0.2 ppm), or may be dosed in higher concentrations (*e.g.,* 1.0 ppm) for short periods a few times each day.
- **pH Control:** With the increase in cycles of concentration, the pH typically increases. Many species have reverse solubility (*i.e.,* they tend to precipitate as the pH increases). To control the scale formation of these species, an acid such as hydrochloric acid or sulfuric acid is added. Lowering pH through acid feed not only reduces the scaling tendencies of calcium carbonate, but many other pH-sensitive species that can precipitate on heat-transfer surfaces and reduce heat-transfer capability.
- **Scale Inhibitors:** Anti-scalants are surface-active materials that interfere with the precipitation reactions by either threshold inhibition, crystal modification, or dispersion. This enables higher cooling water cycles of concentration and permits operation at "supersaturated" conditions.
- **Corrosion Inhibitors:** Corrosion inhibitors may be added to the circulating water to reduce the rate of corrosion of metals or alloys in contact with the water. Circulating water can range from scale-forming to scale-dissolving (corrosive). Changes in the pH and COCs can impact whether or not scale will form and to what extent the water will be corrosive. Corrosion inhibitors such as phosphate and zinc may be added to help reduce corrosion rates.

3.4.7.5 Steam Cycle Process Water

Makeup water for the steam cycle must meet stringent specifications for suspended and dissolved solids. To meet these specifications, water from the treated water storage tank is sent to a DI makeup water tank, and then processed through a demineralized water makeup system consisting of mixed-

bed demineralizers and a 40,000 gallon demineralized water storage tank. Water produced by this system will also be used for the mirror washing described below.

Additional conditioning of the condensate and feedwater circulating in the steam cycle is provided by means of a chemical feed system. To minimize corrosion, an oxygen scavenger for dissolved oxygen control, and an alkaline solution for pH control, are fed into the condensate. To minimize scale formation in the SSG, a solution of disodium phosphate (DSP) and tri-sodium phosphate (TSP) may be fed into each feedwater system. The chemical feed systems include an oxygen scavenger feed tank, an alkaline solution (amine) feed tank, and a phosphate solution feed tank. The feed tanks are provided with two full-capacity metering pumps.

A steam cycle sampling and analysis system monitors the water quality at various points in the plant's steam cycle. The water quality data are used to guide adjustments in water treatment processes and determine the need for other corrective operational or maintenance measures. Steam and water samples are routed to a sample panel where steam samples are condensed and the pressure and temperature of all samples are reduced as necessary. The samples are then directed to automatic analyzers for continuous monitoring of conductivity and pH. All monitored values are indicated at the sample panel and critical values are transmitted to the plant control room. Grab samples are periodically obtained at the sample panel for chemical analyses that provide information on a range of water quality parameters.

3.4.7.6 Solar Mirror Washing Water

To facilitate dust and contaminant removal, deionized (demineralized) water from the demineralized water storage tank is used to spray clean the solar mirrors on a periodic basis, determined by the reflectivity monitoring program. This operation is generally done at night and involves a water truck spraying deionized water on the mirrors in a drive-by fashion. The deionized water production facilities, already in place for SSG makeup water, will be sized to accommodate the additional solar mirror washing demand of about two acre-feet per year and is shown on the water balance diagrams. Water from the washing operation is expected to mostly evaporate on the mirror surface with no appreciable runoff.

3.4.7.7 Cooling Systems

Each power plant includes two cooling systems: 1) the steam cycle heat rejection system (*e.g.,* cooling tower); and 2) the closed cooling water system (equipment cooling), each of which is discussed below.

3.4.7.8 Steam Cycle Heat Rejection System

The cooling system for heat rejection from the steam cycle consists of a surface condenser, circulating water system, and wet cooling tower. The surface condenser receives exhaust steam from the LP section of the STG and condenses it to liquid for return to the SSG. The surface condenser is a shell-and-tube heat exchanger with wet, saturated steam condensing on the shell side and circulating water flowing through the tubes to provide cooling. The warmed circulating water exits the condenser and flows to the cooling tower to be cooled and reused.

The circulating water is distributed among multiple cells of the cooling tower, where it cascades downward through each cell and then collects in the cooling tower basin. The mechanical draft cooling tower employs electric motor-driven fans to move air through each cooling tower cell. The cascading circulating water is partially evaporated, and the evaporated water is dispersed to the

atmosphere as part of the moist air leaving each cooling tower cell. As discussed in Section 5.10, Visual Resources, because of climatic conditions at the site, visible moisture plumes are expected to occur relatively infrequently and largely in winter months, and no need is expected for a plume-abated cooling tower.

The circulating water is cooled primarily through partial evaporation and secondarily through heat transfer with the air. The cooled circulating water is pumped from the cooling tower basin back to the surface condenser and auxiliary cooling water system.

3.4.7.9 Auxiliary Cooling Water System

The auxiliary cooling water system uses water from the cooling tower for the purpose of cooling equipment including the STG lubrication oil cooler, the STG generator cooler, steam cycle sample coolers, large pumps, etc. The water picks up heat from the various equipment items being cooled and rejects the heat to the cooling tower.

3.4.8 Waste Management

Project wastes include wastewater, non-hazardous solid waste, hazardous solid waste, and hazardous liquid waste. Project waste streams and management details are discussed in Section 5.4, Water Resources and Section 5.13, Waste Management.

3.4.8.1 Wastewater

The water balance diagrams (Figures 3.4-8 and 3.4-9) show the power plant's wastewater streams and flow rate during annual average and summer peak conditions.

Wastewater is segregated into two separate collection systems, one for industrial streams and one for sanitary wastes. Industrial wastewater from both the pre-treatment and post-treatment systems will be piped to three 8-acre evaporation ponds for disposal. The evaporation ponds make up a total combined area of 24 acres for each 125 MW unit (48 acres of pond for both 125 MW units). There are three primary and one occasional waste streams discharging into the evaporation ponds:

- Pre-cooling tower water treatment MMF waste stream
- Post-cooling tower water treatment MMF waste stream
- Post-cooling tower water treatment 2nd Stage RO waste stream
- Occasionally, storm water accumulated in the proposed LTU that will be used to treat soil affected by spills of HTF

On an annual average, blowdown to the evaporation ponds will be approximately 90,000 gallons per day for each unit, increasing to approximately 140,000 gallons per day for each unit during peak summer conditions.

The Project's sanitary system will collect wastewater from sanitary facilities such as sinks and toilets. This waste stream will be sent to an on-site sanitary waste septic system designed and permitted in accordance with Riverside County Department of Health Services standards.

3.4.8.2 Evaporation Ponds

As noted above, it is expected each 125 MW unit will have three double-lined evaporation ponds. Each pond will have a nominal surface area of eight acres resulting in a total of 24 acres of evaporation ponds for each unit or a total of 48 acres of ponds for both 125 MW units. The ponds will be designed and

permitted as Class II Surface Impoundments in accordance with Colorado River Regional Water Quality Control Board (CRRWQCB) requirements, as well as the requirements of the California Integrated Waste Management Board (CIWMB). Multiple ponds are planned to allow plant operations to continue in the event a pond needs to be taken out of service for some reason, *e.g.,* needed maintenance. Each pond will have enough surface area so the evaporation rate exceeds the cooling tower blowdown rate at maximum design conditions and annual average conditions.

The average pond depth is eight feet and residual precipitated solids will be removed approximately every seven years to maintain a solids depth no greater than approximately three feet for operational and safety purposes. The precipitated solids will be sampled and analyzed to meet the characterization requirements of the receiving disposal facility. The characteristics of the precipitated solids will determine the transportation and disposal methodology. It is anticipated the pond solids and other non-hazardous wastes would be classified as Class II Designated Waste, a non-hazardous industrial waste. Genesis Solar, LLC will test the pond solids using appropriate test methods in advance of removal from the evaporation ponds to confirm this determination; however, preliminary data estimates show the material will be non-hazardous. Approximately 6,150 tons of evaporative residue will be accumulated yearly, which equates to approximately 50,000 tons of evaporative residue being removed during each cleanout and a total estimated amount of 214,500 tons over 30 years.

The pond liner system will consist of a 60 mil high density polyethylene (HDPE) primary liner and a secondary 40 mil HDPE liner. Between the liners is a synthetic drainage geonet and collection piping that is used as part of the leachate collection and removal system (LCRS). There will be a hard surface protective layer on top of the 60 mil HPDE which will consist of a non-woven geotextile, a one foot thick granular fill/free draining material, and a one foot thick hard surface such as roller-compacted concrete. The hard surface provides protection against accidental damage to the HDPE from falling objects, varying climatic conditions, and worker activities during cleanout and maintenance. Monitoring of the evaporation ponds will be required to detect the presence of liquid and/or constituents of concern. Based on the experience of the existing SEGS plants, it is expected the constituents of concern for this monitoring will include chloride, sodium, sulfate, TDS, biphenyl, diphenyl oxide, potassium, selenium, and phosphate.

3.4.8.3 On-site Bioremediation Land Treatment Unit

The Project will include a bioremediation LTU to treat soil impacted by incidental spills and leaks of HTF at various concentrations. The unit will be designed and permitted as a Class II LTU in accordance with CRRWQCB and CIWMB requirements. The LTU will cover an area of approximately 600 feet by 725 feet, including the staging area, and will cater for both 125 MW units. The LTU will be constructed with a prepared base consisting of two feet of compacted, low permeability, lime treated material and be surrounded on all sides by a minimum two foot high compacted earthen berm with slopes of approximately 3:1 (horizontal:vertical).

HTF-impacted soils must be characterized as hazardous or non-hazardous waste to determine whether the material can be treated in the LTU or must be removed for off-site disposal. HTF-impacted soils will be promptly excavated and relocated to a staging area, and characterized in accordance with California and Federal law. If the soil is characterized as a hazardous waste, the impacted soils will be transported from the site by a licensed hazardous waste hauler for disposal at a licensed hazardous waste landfill. No HTF-impacted soils characterized as hazardous waste will be disposed or treated on site. Based on past experience, it is anticipated that soil containing 10,000

milligrams per kilogram (mg/kg) HTF or more will be managed as hazardous waste, and soil containing less than 10,000 mg/kg HTF will be non-hazardous waste and can be managed at the site.

If the soil is characterized as a non-hazardous waste, it will be spread in the LTU for bioremediation treatment. Treatment of the HTF-impacted soil in the LTU will involve spreading, turning, and moisture conditioning, and may involve addition of nitrogen and phosphorous nutrients (*i.e.,* fertilizers) as needed to simulate consumption of HTF by the indigenous bacteria. In general, more highly impacted soil may be covered with plastic sheeting to prevent contact with storm water and control potential odors and emissions, as well as for moisture and temperature retention. Once the soil has been treated to a concentration of less than 100 mg/kg HTF, it will be moved from the LTU to another portion of the site until it is reused at the facility as fill material.

Based on available operation data from other sites, it is anticipated approximately 750 cubic yards (on average) of HTF-affected soil may be treated per year. Larger or smaller quantities could be generated during some years, depending on the frequency and size of leaks and spills.

3.4.8.4 Other Non-Hazardous Solid Waste

Construction, operation, and maintenance of the Project will generate non-hazardous solid wastes typical of power generation or other industrial facilities (see Section 5.13, Waste Management). These wastes include scrap metal and plastic, insulation material, paper, glass, empty containers, and other miscellaneous solid wastes. These materials will be disposed by means of contracted refuse collection and recycling services.

3.4.8.5 Hazardous Solid and Liquid Waste

Small quantities of hazardous wastes will be generated during Project construction and operation. Hazardous wastes generated during the construction phase will include substances such as paint and primer, thinners, and solvents. Hazardous solid and liquid waste streams generated during Project operations include substances such as used hydraulic fluids, oils, greases, filters, etc., as well as spent cleaning solutions and spent batteries. To the extent possible, both construction and operation-phase hazardous wastes will be recycled. Tables 5.13-2 (construction phase) and 5.13-3 (operations phase) in Section 5.13, Waste Management, summarize Project hazardous waste streams in terms of quantities, origin and composition, and management method(s).

3.4.9 Hazardous Material Management

There will be a variety of hazardous materials used and stored during construction and operation of the Project, as summarized below. Section 5.12, Hazardous Materials Handling, provides additional data on the hazardous materials that will be used during construction and operation, including quantities, associated hazards and permissible exposure limits, storage methods, and special handling precautions.

Hazardous materials that will be used during construction include gasoline, diesel fuel, oil, lubricants, and small quantities of solvents and paints. All hazardous materials used during construction and operation will be stored on site in storage tanks/vessels/containers that are specifically designed for the characteristics of the materials to be stored; as appropriate, the storage facilities will include the needed secondary containment in case of tank/vessel failure.

A variety of safety-related plans and programs will be developed and implemented to ensure safe handling, storage, and use of hazardous materials (*e.g.,* Hazardous Material Business Plan). Plant personnel will be supplied with appropriate personal protective equipment (PPE) and will be properly

trained in the use of PPE and the handling, use, and cleanup of hazardous materials used at the facility, as well as procedures to be followed in the event of a leak or spill. Adequate supplies of appropriate cleanup materials will be stored on site (see Sections 5.12 through 5.15 for additional discussion regarding waste and hazardous materials management, worker safety, and public health).

3.4.10 Air Emissions Control and Monitoring

Installation and operation of the Project will result in a change in the emissions signature for the site. Criteria pollutant emissions from the proposed auxiliary boilers, fire pump engines, emergency generator engines, and cooling towers are delineated in Sections 5.2.2.2 through 5.2.2.5. Construction-related emissions are addressed in Section 5.2.2.6, and emissions of hazardous air pollutants (HAPs) are discussed in Section 5.15, Public Health, and quantified in Appendix B.1.

Operation of the Project will result in emissions to the atmosphere of both criteria and toxic air pollutants from the proposed auxiliary boilers, fire pump engines, emergency generator engines, and cooling towers, and fugitive losses from the HTF system. Construction-related emissions are associated with site disturbance resulting from site preparation and with the typical emissions and associated construction-related activities encountered at any construction site.

Power plants, with individual equipment capacity of 25 MW or greater that use natural gas or other fuels with low sulfur content, are subject to the Phase II Program of Title IV, which requires plants to install Continuous Emission Monitoring Systems (CEMS) in accordance with 40 CFR Part 75 and report annual emissions of sulfur oxides (SO_x) and nitrogen oxides (NO_x).

3.4.11 Fire Protection

Fire protection systems are provided to limit personnel injury, property loss, and Project downtime resulting from a fire. The systems include a fire protection water system and portable fire extinguishers.

Each 125 MW power plant's fire protection water system will be supplied from a dedicated 360,000-gallon portion of the 500,000-gallon raw water storage tank located on the plant site. One electric and one diesel-fueled backup firewater pump, each with a capacity of 3,000 gallons per minute, will deliver water to the fire protection water-piping network for each plant. A smaller electric motor-driven pump jockey pump will maintain pressure in the piping network. If the jockey pump is unable to maintain a set operating pressure in the piping network, the diesel fire pump starts automatically.

The piping network will be configured in a loop so a piping failure can be isolated with shutoff valves without interrupting the supply of water to a majority of the loop. The piping network will supply fire hydrants located at intervals throughout the power plant site, a sprinkler deluge system at each unit transformer, HTF expansion tank and circulating pump area, and sprinkler systems at the STG, and in the operations and administration buildings. Portable fire extinguishers of appropriate sizes and types will be located throughout the plant site.

Fire protection for the solar field will be provided by zoned isolation of the HTF lines in the event of a rupture that results in fire. As vegetation or other combustible materials will not be allowed in the solar field, the HTF will be allowed to extinguish itself naturally, since the remainder of the field is of nonflammable material (aluminum, steel, and glass) (see Section 5.14, Worker Safety, for additional discussion of on- and off-site fire protection measures).

3.4.12 Plant Auxiliary Systems

The following plant auxiliary systems control, protect, and support the power plant and its operation.

3.4.12.1 Distributed Control System

The Distributed Control System (DCS) provides control, monitoring, alarm, and data storage functions for power plant systems. These include:

- Control of the STG, SSG system, and balance-of-plant systems in a coordinated manner
- Monitoring of operating parameters from plant systems and equipment
- Visual display of the associated operating data to control operators and technicians
- Detection of abnormal operating parameters and parameter trends
- Provision of visual and audible alarms to apprise control operators of such conditions
- Storage and retrieval of historical operating data

The DCS is a microprocessor-based system. Redundant capability is provided for critical DCS components such that no single component failure will cause a plant outage. The DCS consists of the following major components:

- Computer monitor-based control operator interface (redundant)
- Computer monitor-based control engineering work station
- Multi-function processors (redundant)
- Input/output processors (redundant for critical control parameters)
- Field sensors and distributed processors (redundant for critical control parameters)
- Historical data archive
- Printers, data highways, data links, control cabling, and cable trays

The DCS is linked to the control systems furnished by the STG supplier and the solar field controls. These datalinks provide STG control, monitoring, alarm, and data storage functions via the control operator interface and control technician workstation of the DCS.

3.4.12.2 Lighting System

The Project's lighting system will provide operations and maintenance personnel with illumination in both normal and emergency conditions. The system will consist primarily of AC lighting, but will include DC lighting for activities or emergency egress required during an outage of the plant's AC electrical system. The lighting system will also provide AC convenience outlets for portable lamps and tools. Lighting will be designed to provide the minimum illumination needed to achieve safety and security objectives and will be shielded and oriented to focus illumination on the desired areas and minimize additional nighttime illumination in the site vicinity.

3.4.12.3 Cathodic and Freeze Protection Systems

Cathodic protection systems protect against electrochemical corrosion of underground metal piping and structures. Underground metal piping structures will have cathodic protection as necessary based on soil conditions.

Freeze protection systems (heat tracing) will be employed to protect small water and condensate piping systems that cannot be easily drained. Also due to the high freezing temperature of the solar

field's HTF (54°F), steam-fed HTF freeze protection heat exchangers will be provided to protect the system during the night hours and colder months. Overall natural gas fuel usage is included in Section 3.4.6.

3.4.12.4 Service Air and Instrument Air Systems

The service air system supplies compressed air to hose connections located at intervals throughout the power plant. Compressors deliver compressed air at a regulated pressure to the service air-piping network. The instrument air system provides dry, filtered air to pneumatic operators and devices throughout the power plant. Air from the service air system is dried, filtered, and pressure regulated prior to delivery to the instrument air-piping network.

3.4.12.5 HTF Leak Detection

Leak detection of HTF will be accomplished in a combination of ways. Small leaks, possibly at ball joints or other connections, will be located based on daily inspection of the solar field. Those small leaks can then be corrected via repacking of joints or valves or by minor repairs if needed. The ability to isolate loops and sections of the field will allow for quick repairs. In order to identify and react to larger sudden leaks quickly, the Project is considering a combination of remote pressure sensing equipment and remote operating valves that would allow for isolation of large areas of the field, or possibly the entire field. Such features will be developed as part of the detail design process.

3.5 POWER PLANT CIVIL/STRUCTURAL FEATURES

The following subsections describe civil/structural features of the Project, as illustrated in the power block arrangements presented in Figures 3.4-2 and 3.4-3. The power plant will be designed in conformance with 2007 California Building Code and the applicable wind and seismic criteria for site location. As noted earlier, sensitive Project facilities (*e.g.,* power block, evaporation pond) will be placed at specific on-site locations that avoid mapped AP fault zones.

3.5.1 SSG System, STG and Associated Equipment

The SSG system, STG, and condenser will be located outdoors and supported on reinforced concrete mat foundations. The STG foundation will include a reinforced concrete pedestal that supports the STG above the surface condenser. The one step-up transformer and GSUT will be supported on reinforced concrete mat foundations. Balance-of-plant (BOP) mechanical and electrical equipment will be supported on individual reinforced concrete pads. BOP components/materials include piping, valves, cables, switches, etc. that are not included with major equipment and are generally installed or erected onsite.

3.5.2 Solar Array Support Structures

Each solar collector array will be supported by structures (stands) that connect the parabolic troughs to the drive mechanism. Each array will be supported by multiple individual foundations with a foundation located approximately every 40 feet along the array. Foundation design will be based on site-specific geotechnical conditions to ensure the solar array stands are able to support all loading conditions (including wind loading) at the Project site.

3.5.3 Buildings

The Project will include a common administration building and warehouse between the two 125 MW power plants. A control building will be located in each power block. The design and construction of

the administration building and warehouse will be consistent with normal building standards. Other plant site "buildings" will include the water treatment building, as well as a number of pre-engineered enclosures for mechanical and electrical equipment. Building columns are supported on reinforced concrete mat foundations or individual spread footings and the structures rest on reinforced concrete slabs. The total square footage of the various Project buildings and pre-engineered enclosures (*e.g.,* control rooms, administration building, warehouse, electrical equipment enclosures, fire pumps, and diesel generators) is approximately 39,000 square feet.

3.5.4 Water Storage Tanks

There will be a number of covered water tanks on site for each 125 MW power plant. For each plant, there will be a 500,000-gallon raw water storage tank for short-term backup cooling water supply, with a portion (360,000 gallons) dedicated to the plant's fire protection water system; a 1,250,000-gallon treated water storage tank; and a 250,000 waste water storage tank. There also will be a 40,000-gallon storage tank for storage of demineralized water. Water storage tanks will be vertical, cylindrical, field-erected steel tanks supported on foundations consisting of either a reinforced concrete mat or a reinforced concrete ring wall with an interior bearing layer of compacted sand supporting the tank bottom.

3.5.5 Roads, Fencing, and Security

As discussed in Section 5.11, Traffic and Transportation, the Project site is located in a remote section of Riverside County, about four miles north of I-10, and approximately 25 miles west of Blythe. Regional access to the area is limited to I-10. There is very little circulation in the surrounding area other than I-10, mostly consisting of off-road vehicle trails and roadways extending from the Ford Dry Lake exit. The nearest paved road to the site, other than I-10, is Wiley's Well Road, about five miles east of the Project. Wiley's Well Road runs south to the Chuckwalla Valley State Prison complex. All vehicular traffic approaching the site will use I-10.

Only a small portion of the overall plant site will be paved, primarily the site access road and portions of each power block (paved parking lot and roads encircling the STG and SSG areas). The remaining portions of the power block will be gravel surfaced. In total, the power blocks will be approximately 24 acres with approximately 35 acres of paved area for the entire Project. The solar field will remain unpaved and without a gravel surface in order to prevent rock damage from mirror wash vehicle traffic; an approved dust suppression coating will be used on the dirt roadways within and around the solar field.

The entire site will be fenced appropriately to restrict public access during construction and operations. Chain-link security fencing will be installed around the site perimeter, switchyard, and other areas requiring controlled access. The security fence will be eight feet tall, topped with one foot of barbed wire (three strands) mounted on 45-degree extension arms and posts set in concrete (see Figure 3.4-1).

Controlled access gates will be located at the entrances to the facility. Site gates will be swing or rolling type access gates. Access through the main gate will require an electronic swipe card, preventing unaccompanied visitors from accessing the Facility. All Facility personnel, contractors, and visitors will be logged in and out of the Facility at the main office during normal business hours. Visitors and non-Genesis Solar, LLC employees will be allowed entry only with approval from a staff member at the Facility.

3.5.6 Site Drainage

As discussed in Appendix A, Drainage Erosion and Sediment Control Plan (DESCP), natural drainage across the site is episodic, shallow, and occurs over a broad area primarily as sheet flow or in shallow washes. In desert regions, the catchment boundaries and distribution of drainage may shift over time based on the ground conditions, intensity of the storm event, velocity of the flow, and sediment transportation including USGS quadrangle maps and aerial images. The watershed boundary and sub-basin boundaries selected for this Project site were based on existing information. The total watershed modeled encompasses 93,182 acres of which 91,696 acres are off-site.

Under post-developed conditions, it is proposed to divert the off-site watershed in three channels:

- Runoff from sub-basin 1 (north-western) will be diverted through a channel on the west side of the west 125 MW unit.
- Runoff from sub-basin 2 (north) will be diverted through a channel between the two 125 MW units.
- Runoff from sub-basin 3 (north-eastern) will be diverted though a channel along the east side of the east 125 MW unit.

A report titled *Survey for Jurisdiction Waters and Wetlands at the Genesis Solar Energy Project* is included in Appendix C-1 of this AFC. The survey concluded two drainage areas may be considered waters of the State. Consultation with the CDFG and U.S. Army Corps of Engineers (USACE) is underway, but a determination on jurisdiction of the waters has yet to be made.

These three main channels and associated diversion berms on the down slope sides will divert flows downstream of the site following their existing drainage paths, causing no impact to the site. The channels and diversion berms will be sized sufficiently to pass the anticipated flows and entrained sediment volumes; will be armored as necessary for erosion protection using natural gravel derived during site grading activities; and will be maintained periodically or after major storm events as needed to sustain their proper function. The main purposes of the diversion are to prevent interaction with off-site storm water and on-site storm water which will:

- Allow natural groundwater recharge of the off-site storm water with no contact with the changed flow conditions of the on-site water.
- Protect the site infrastructure from flash flood events, which have the potential to damage the solar parabolic troughs.
- Control treatment of the on-site flows from the solar collector array (location of HTF within the solar parabolic troughs).
- Protect the site from upstream sediment loading.
- Control on-site flows in detention basins to ensure there is no increase in post developed flow discharging from the site, minimize the impact on downstream drainage features (lake playas, etc).
- Maximize the developable area within the solar field.

On-site storm water management for the completed facility will be provided through the use of source control techniques, site design, and treatment control.

The storm flows from the solar collector arrays will be treated through the use of swales, ditches, and detention ponds. Preliminary volumes required for the detention basins are 66 acre-feet for the 125

MW unit in the west, and 49 acre-feet for the 125 MW unit in the east. These volumes are based on the detention ponds receiving the 100-year, 24-hour event post-development runoff from the site, and then discharging the run-off at the pre-developed rate into the existing drainage system. The Riverside County Stormwater Quality Best Management Practice Design Handbook requires extended detention basins to release runoff over a 48 hour drawdown period, and the outlet sized to retain the first half of the design volume for a minimum of 24 hours (Riverside County, 2006).

Locations within the power block for the potential of chemical or oil releases will be fully contained. Rainfall within the containment areas will be allowed to evaporate or will be drained through an oil/water separator. Locations within the power block where “contact” storm water may occur will be contained within a system of curbs or trenches. Drains from these curbed areas or containment trenches will be directed to an oil/water separator. The oil separated and captured within the oil/water separator will be trucked off-site to a licensed disposal/recycling facility. Clean water discharged from the oil/water separator will be used on site by discharging it to the cooling tower or to the raw water storage tank. The water discharge from the oil/water separator will not be discharged to the storm water system.

As summarized in Section 5.4, Water Resources, and described in the preliminary DESCP provided in Appendix A, the Project will employ a comprehensive system of management controls, including site-specific Best Management Practices (BMPs), to minimize storm water contact with contaminants and thus minimize pollutants in storm water. These management controls include:

- Erosion Control
- Sediment Control
- Wind Erosion
- Tracking Control
- Non-stormwater discharges
- Waste Management

The site is found within “RIVERSIDE COUNTY AND INCORPORATED AREAS” within FEMA (Federal Emergency Management Agency); however, there are no flood insurance maps provided for this area (WorleyParsons, 2009). It has been assumed all off-site water will be contained within the preliminary drainage channels and routed around the site; therefore, no flooding mapping has been undertaken. On-site, there will be sheet flow across the solar fields and into drainage channels, which shall direct flow into a detention basin. Due to the desert conditions, it is anticipated stormwater will infiltrate into the ground during rainfall events within the channels and detention basin. In a 100 year, 24 hour storm event, only 3.51 inches of rain precipitation are expected (WorleyParsons, 2009).

3.5.7 Earthwork

Solar fields have fairly stringent grading requirements as parabolic troughs must be almost level along their troughs and grades perpendicular to the troughs are generally benched to two percent or less. Under pre-developed conditions, each 125 MW module generally slopes from the northeast to the southwest. Grading for post-developed conditions will slightly modify the existing contours to provide a surface level appropriate for the parabolic troughs. The preliminary grading is designed to ensure the run off from solar fields is directed into the appropriate drainage channel, and the power block, evaporation ponds, and land farm units are protected in the 100-year, 24-hour storm event.

The DESCP includes the finished grade elevations and preliminary contour lines across the entire site. The total site earth work quantities for the Project site, including the evaporation and retention pond excavations and protective berm fill placement, will result in a balanced cut-and-fill earthwork of approximately 712,000 cubic yards of cut and one million cubic yards of fill, based on the preliminary site design and layout (Genesis Solar, LLC, 2009). More exact earthwork quantities will be determined after the detailed aerial and ground surveys are completed. Final site design and layout will take into account additional environmental, land use, and engineering constraints. The final grading design will include adjustments to the grades to provide balanced earthwork cut and fill quantities. This will be accomplished by raising/lowering the grades to obtain a balanced site. Each solar pad will be graded with the intent of balancing the cut-and-fill as much as possible to minimize earth movement on the site. Drainage diversion channels and protective berms will also be developed with a balance of cut and fill earthwork.

3.6 TRANSMISSION FACILITIES

3.6.1 Interconnection to Substation

The power from both units will be transformed through the GSUTs located near each generator to 230 kV. Conductors will connect the GSUTs to the new Genesis switchyard located near the power block for unit two, as shown by Figure 3.4-3.

The Genesis switchyard will contain three breakers and three line takeoff structures. It will have space for a future breaker and line takeoff structure. Air insulated structures will be utilized giving the switchyard a size of approximately 270 feet by 400 feet. The switchyard and interconnections will be built for 230 kV and will operate at that nominal voltage. Instrument transformers (current and capacitive voltage transformers) will be included for protection. Shield wires and lightning arrestors will be included to protect substation equipment and personnel against lightning strikes. The switchyard arrangement is shown in the power block layout general arrangement for unit two.

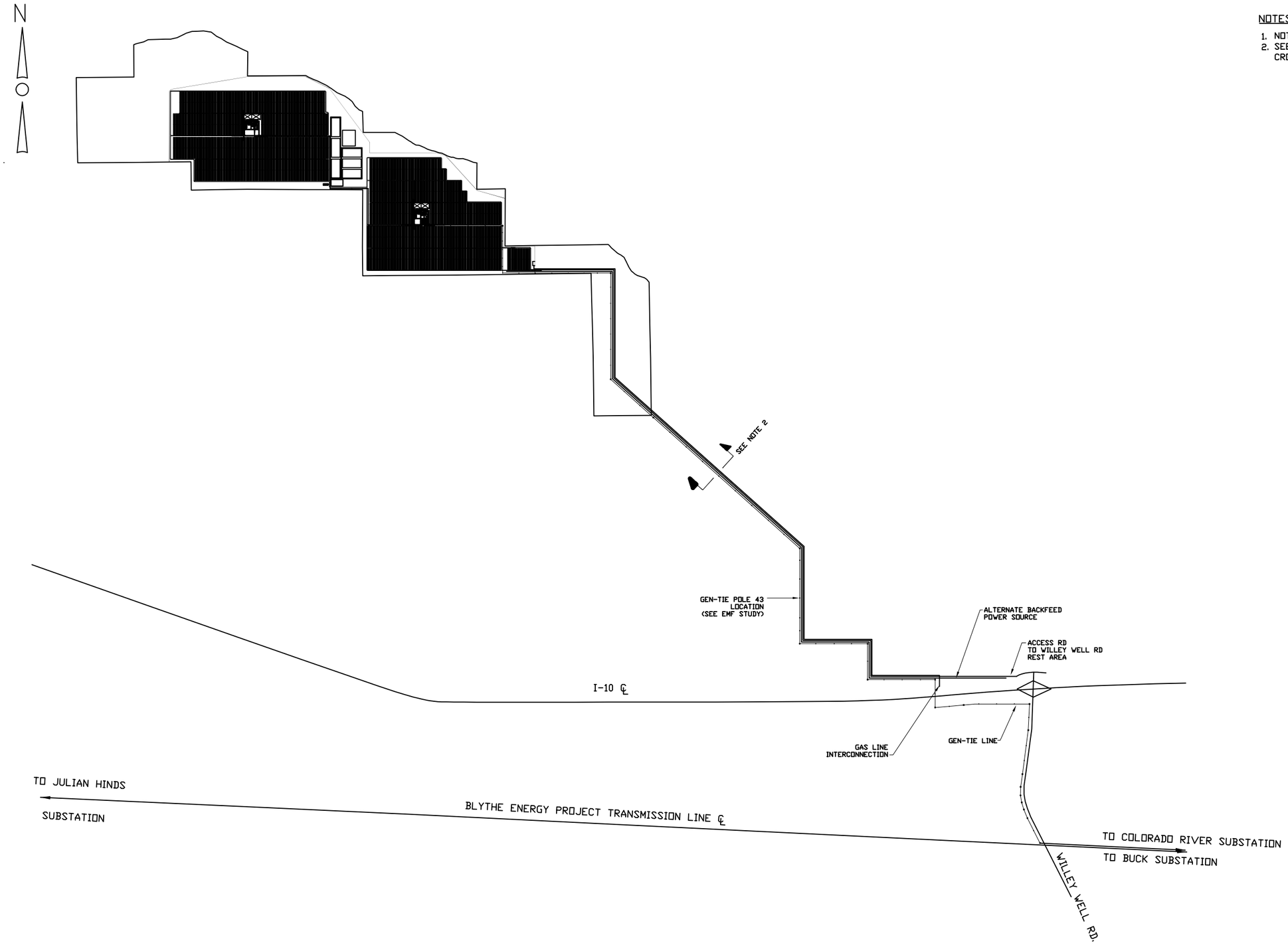
The generated electrical power from the Project switchyard will be transmitted through a generation-tie (gen-tie) line that will be routed in a southeasterly ROW eventually connecting to the proposed Southern California Edison (SoCal Edison) 500-230 kV Colorado River substation. The line will travel in the southeast direction to a point where it will cross the existing Imperial Irrigation District (IID) Blythe to Eagle Mountain 161 kV transmission line and then I-10. From the I-10 crossing, the gen-tie line will continue south where it will eventually meet the Blythe Energy Project Transmission Line (BEPTL), see Figures 3.6-1 and 3.6-2. From that location, the gen-tie line will travel east and share a length of double-circuit, transmission poles with the BEPTL where it will ultimately terminate at the interconnection point within the Colorado River Substation. For more information on the double circuit portion of the Blythe-Julian Hinds line, see the Blythe Energy Project Request for Staff Approved Project Modifications (99-AFC-8C). The Blythe-to-Eagle Mountain 161 kV transmission line and I-10 crossings will be designed in accordance with the most current revision of the IEEE National Electric Safety Code (NESC) and the California Public Utilities Commission's Rules for Overhead Line Construction, GO-95.

3.6.2 Interconnection Design Considerations

The nominal 250 MW Project net output produces approximately 738A at 230 kV and at a 0.85 power factor. The conductor proposed for the gen-tie is bundled 795.0-kcmil "Drake" with a summer maximum continuous ampacity of approximately 906A per conductor or 1816A per bundle.

NOTES:

1. NOT FOR CONSTRUCTION.
2. SEE GENI-0-SK-111-002-003 FOR LINEAR CROSS SECTION.



REV	DATE	DESCRIPTION	DRAWN	CHECKED	LEAD DESIGNER	ENGINEER/ TECH SPEC.	LEAD DISC. ENGINEER	PROJ ENGR MANAGER	PROJECT MANAGER
B	08 11 17 '09	CHANGED FIGURE NUMBER	PL	JH	PL	JH	JH	JF	CN
A	08 11 '09	ISSUED FOR INITIAL REVIEW	SC	JH	PL	JH	JH	JF	CN

PRELIMINARY STATUS — LDE J. HODAPP — DATE 08/11/2009 — REPRESENTS GENERAL DESIGN CONCEPTS BASED ON ASSUMPTIONS. REVIEWED NOT CHECKED.

APPROVED STATUS — LDE — DATE — REPRESENTS REVIEWED AND APPROVED DESIGN. ANY PORTION MARKED "HOLD" RETAINS PRELIMINARY STATUS.

ORIGINATING PERSONNEL

DRAWN BY: S. CHERRY
CHECKED BY: J. HODAPP
LEAD DESIGNER: P. LOUEN
ENGINEER/TECH SPECIALIST: J. HODAPP
PROJECT ENGINEERING MANAGER: J. FOSTER
PROJECT MANAGER: C. NITOFF

PROFESSIONAL ENGINEER'S SEAL

Zero Harm — Leadership, No Incidents, Safe Behavior

ORIGINALLY PREPARED UNDER THE RESPONSIBLE SUPERVISION OF
PE: _____ STATE: _____
LIC. NO.: _____ DATE: _____

WorleyParsons resources & energy

CLIENT/PROJECT TITLE

GENESIS SOLAR, LLC
GENESIS SOLAR ENERGY PROJECT

GENERAL ARRANGEMENT
GEN-TIE AND GAS LINE ROUTE
FIGURE 3.6-1

SCALE: NTS
DRAWING SIZE: ARCH D (36" x 24")
WORLEYPARSONS DWG. NO.: GENI-0-SK-111-002-002
REV: B

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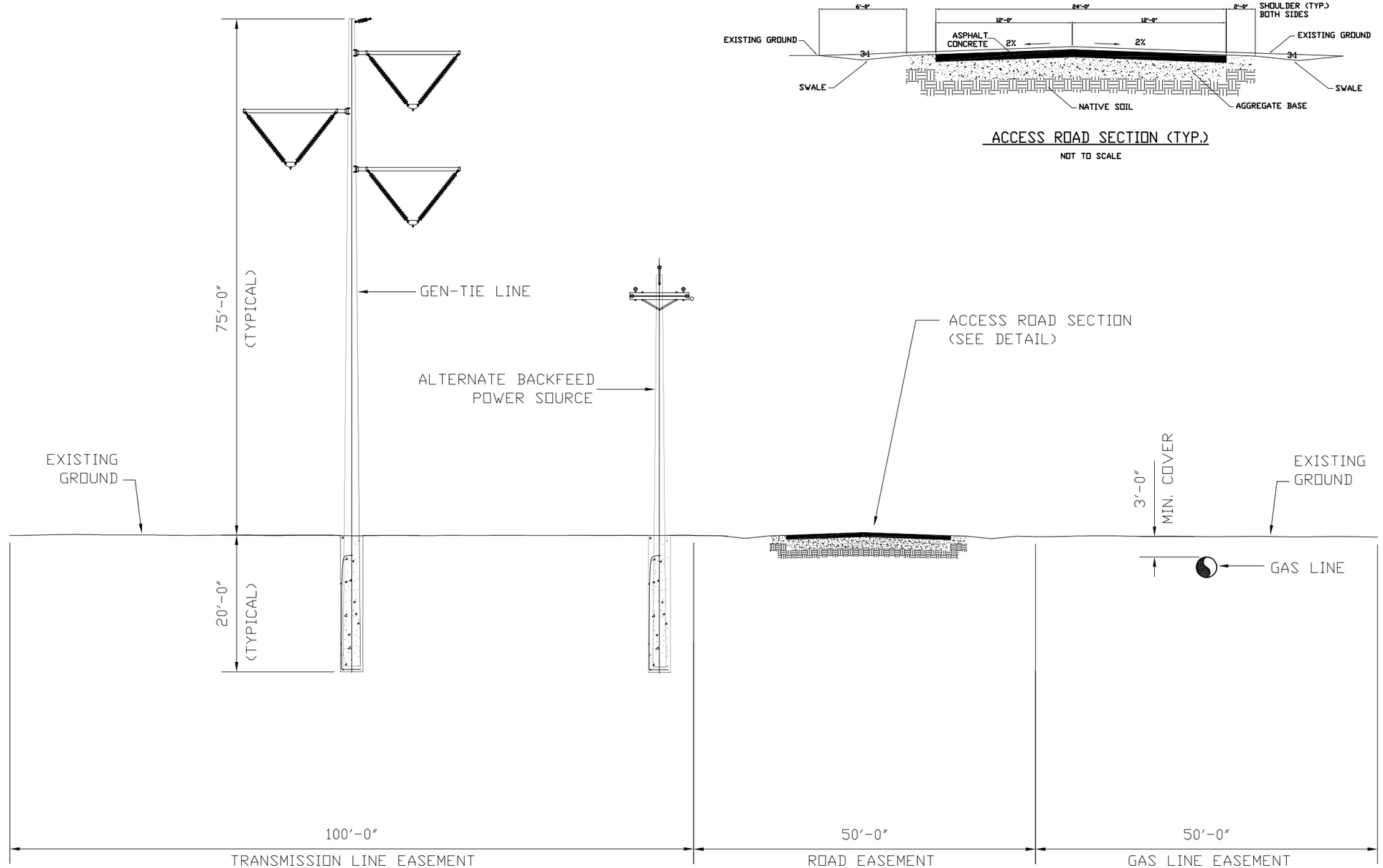

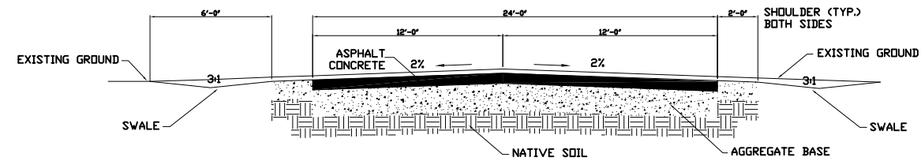

ACCESS ROAD SECTION (TYP.)

NOT TO SCALE

REV	DATE	DESCRIPTION	DRAWN	CHECKED	LEAD DESIGNER	ENGINEER/ TECH SPEC	LEAD ENGR	PROJ ENGR MANAGER	PROJECT MANAGER
B	08 17 09	CHANGED FIGURE NUMBER	PL	JF	PL	JF	JF	JF	CN
A	08 05 09	ISSUED FOR INITIAL REVIEW	SC	JF	PL	JF	JF	JF	CN

PRELIMINARY STATUS — DATE — L.DE J. FOSTER — 08/12/09

REPRESENTS GENERAL DESIGN CONCEPTS BASED ON ASSUMPTIONS. REVIEWED NOT CHECKED.

APPROVED STATUS — DATE — L.DE

REPRESENTS REVIEWED AND APPROVED DESIGN. ANY PORTION MARKED "HOLD" RETAINS PRELIMINARY STATUS.

ORIGINATING PERSONNEL

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PROJECT ENGINEERING MANAGER: J. FOSTER

PROJECT MANAGER: C. NITOFF

Zero Harm — Leadership No nonsense Safe Behavior

ORIGINALLY PREPARED UNDER THE RESPONSIBLE SUPERVISION OF PE:___ STATE:___ LIC. NO.:___ DATE:___

WorleyParsons resources & energy

CLIENT/PROJECT TITLE

GENESIS SOLAR, LLC

GENESIS SOLAR ENERGY PROJECT

GENERAL ARRANGEMENT

PROJECT LINEARS

TYPICAL CROSS SECTION, FIGURE 3.6-2

SCALE: NTS — DRAWING SIZE: ARCH D (36" x 24")

WORLEYPARSONS DWG. NO.: GENI-0-SK-111-002-003 — REV: B

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The gen-tie line will be constructed for operation at 230kV, the nominal operating voltage of the regional transmission system. The use of 230 kV as the targeted design voltage in this AFC is consistent with the industry use of the 230-kV term to describe the nominal voltage for this class of system. Each circuit will be supported by mono-pole structures at approximately 800 feet intervals with final heights as determined during detailed design. The lines will be insulated from the poles using porcelain insulators engineered for safe and reliable operation at a worst-case voltage of 241.5 kV (nominal, plus five percent). Shield wires will be included along the length of the lines to protect against lightning strikes (see Figure 4.2-1 in Section 4, Safety and Reliability). The pole designs were engineered to provide conceptual design limits for purposes of the electric and magnetic field (EMF) studies and in accordance with the current Blythe-Julian Hinds structures. Final transmission structure design including tangent, angle, dead end, and pull-off structures and associated hardware will be determined during the final engineering of the proposed interconnection.

3.6.3 Transmission System Upgrades

The Project will require an interconnection upgrade at the Colorado River Substation. The feasibility study is complete for the Project. SCE will prepare an interconnection System Impact Study (SIS) under an agreement with the Applicant. This study will define the impacts on the transmission line system and define system upgrades that may be needed (if any) that are attributable to the new generation.

3.7 PROJECT CONSTRUCTION

3.7.1 Power Generation Facility

Major milestones of the planned Project construction schedule are as follows:

- Begin construction Unit 1: Month 1
- Startup and test Unit 1: Month 21
- Commercial operation Unit 1: Month 25
- Begin construction Unit 2: Month 12
- Startup and test Unit 2: Month 33
- Commercial operation Unit 2: Month 37

Project construction is expected to occur over a total of 37 months. Project construction will require an average of 650 employees over the entire 37-month construction period, with manpower requirements peaking at approximately 1100 workers in Month 23 of construction. The construction workforce will consist of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel. Table 5.8-12 in Section 5.8, Socioeconomics, provides a breakdown of the construction workforce by skill over the entire construction period.

Construction of each 125 MW Unit is expected to take approximately 25 months with each unit being phased by 12 months. Table 3.7-1 depicts a proposed construction plan for the Project.

Table 3.7-1. Proposed Project Construction Plan

Activity	Unit 1	Unit 2
Mobilization	Month 1	Month 12
Delineate and mark the boundaries of the construction zone	Month 1	Month 12
Stabilize construction entrance/exit and roadway; install tire wash	Month 1	Month 12
Establish parking and staging areas for vehicle and equipment storage; maintenance	Month 1	Month 12
Establish laydown area(s) for materials storage/staging	Month 1	Month 12
Establish concrete washout area	Month 1	Month 12
Clear and grub; strip topsoil	Months 1–2	Months 12–13
Install certified weed-free fiber rolls or silt fence at the base of slopes adjacent to delineated sensitive areas (*i.e.,* wetlands), if any	Months 1–2	Months 12–13
Construct stormwater infiltration/evaporation area	Months 2–7	Months 13–19
Assemble and erect parabolic troughs	Months 6–18	Months 18–30
Construct power block	Months 7–22	Months 19–34
Construct reinforced concrete foundations	Months 5–11	Months 17–23
Trench gas line corridor	Months 15–19	NA
Construct administration/warehouse building	Months 24–25	NA
Commissioning and testing	Months 21–25	Months 33–37

Temporary construction laydown and parking areas will be provided within the power plant site (see Figure 3.4-1). Construction power will be provided by the local distribution system and routed to the site along wood poles within the 230 kV ROW. Due to the size of the plant site, the solar field laydown area will be relocated periodically as the solar field is built out. The construction sequence for power plant construction includes the following general steps:

- ***Site Preparation:*** this includes detailed construction surveys, mobilization of construction staff, grading, and preparation of drainage features. Grading for the solar field, power block, and rerouted wash will be completed during the first nine months of the construction schedule.
- ***Foundations:*** this includes excavations for large equipment (STG, SSG, GSUT, cooling tower, etc.), footings for the solar field, and ancillary foundations in the power block.
- ***Major Equipment Installation:*** once the foundations are complete the larger equipment will be installed. The solar field components will be assembled in an on-site erection facility and installed on their foundations.
- ***BOP:*** with the major equipment in place, the remaining field work will be piping, electrical, and smaller component installations.
- ***Testing and Commissioning:*** testing of subsystems will be done as they are completed. Major equipment will be tested once all supporting subsystems are installed and tested.

Equipment and materials will be delivered to the Project plant site by truck; large components (*e.g.,* STG) will be brought by rail to a rail siding in the town of Blythe and then are expected to be trucked to the site on I-10.

3.7.2 Civil Works

The construction sequence for civil works includes the following general steps:

- **Site Disturbance:** Once all areas are appropriately staked and signed and access to the site has been established, grading activities will occur over an extensive portion of the site. Grading will commence with rough grading activities, including grubbing, clearing, moisture conditioning, bulk grading, and initial compaction. The first ground-disturbing activities to take place will be the initial clearing and grading to prepare the site for the storm water drainage, construction, and equipment foundation pads. Temporary drainage ditches and berms will also be designed around construction work areas, soil stockpile areas, and excavation areas to minimize the amount of potential pollutant or sediment-laden surface water runoff.
- **Site Grading:** The solar pad grading of the site will have an average slope of one to three percent on the north-south direction. Each solar pad will be graded with the intent of balancing the cut-and-fill as much as possible to minimize earth movement on the site. Drainage diversion channels and protective berms will also be developed with a balance of cut and fill earthwork.
- **Site Drainage:** The post-development sediment/retention basin at the discharge points will provide storm water pollution prevention BMP controls along with retention time to reduce the peak off-site discharge to match pre-development conditions. The road berm will also be constructed to provide site protection from storm water run-on during a 100-year return storm event. The toe of the western protective berm slope may be armored with soil cement cover and rip rap to provide for slope erosion protection during a heavy storm event.
- **Internal Road System:** A primary access road will be constructed to the power block area. This road will be 24 feet wide and paved with approximately 3,000 tons of imported asphalt concrete material. Auxiliary roads will be 24 feet wide and use compacted native materials or gravel surface.
- **Restoration of Temporary Disturbance:** All temporarily disturbed areas will be restored to their preconstruction conditions, as required by the BLM. Temporary access roads used during construction will also be regraded and restored to pre-existing function and grade. BLM approved seed mixes will be applied to temporarily disturbed areas, as required. No fertilizer will be used during stabilization or rehabilitation activities unless authorized by the BLM. No vegetation will be restored or encouraged within the solar field because of the fire hazard. Vegetation within the LTU area will be controlled to prevent containment from being compromised. When construction of storm water management structures is complete, contours will be carefully restored to the extent feasible.

3.7.3 Generator Tie Line

The gen-tie line will be constructed with crews working continuously along the ROW, with construction of the entire gen-tie line requiring a peak workforce of approximately 34 workers. Gen-tie line construction will include the following activities:

- Preparation of marshalling yards
- Access road and spur road construction

- Clearing and grading of pole sites
- Foundation preparation and installation of poles
- Conductor installation
- Cleanup and site reclamation

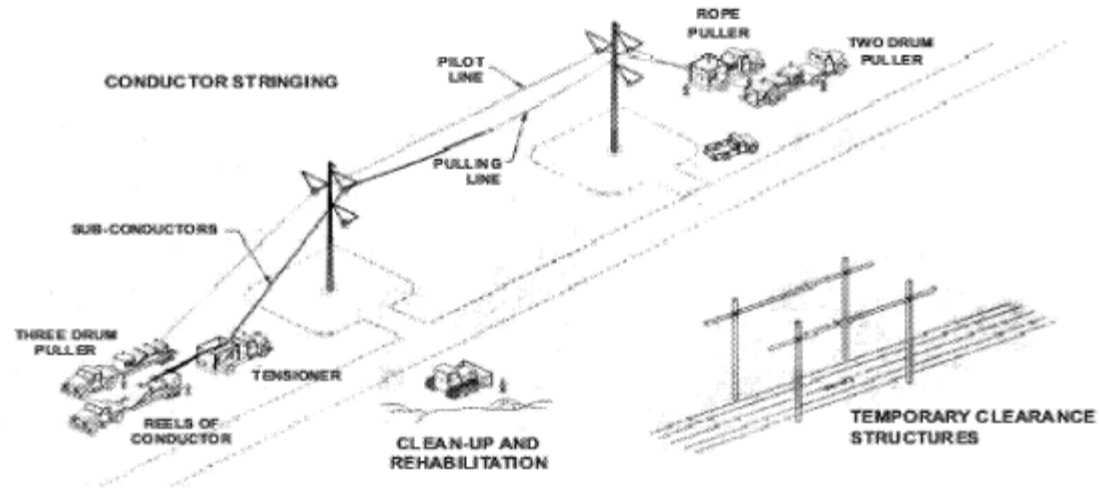
Various construction activities would occur during the construction process with several construction crews operating simultaneously at different locations. Permanent and temporary ground disturbances associated with the construction of the Project gen-tie line are estimated in Table 3.2-2. The following subsections describe in more detail the construction activities associated with the Project gen-tie line.

- ***Marshalling Yards:*** Construction staging/laydown and parking areas are proposed for two locations: 1) within the Project site, and 2) at the Wiley Well Rest area. Construction materials such as concrete, wire and cable, fuels, and small tools and consumables would be delivered to the staging/laydown areas by truck. Mobile trailers or similar suitable facilities (for example, modular offices) would be used for construction offices to be located at the Project staging/laydown areas.
- ***Road Work:*** The construction, operation, and maintenance of the proposed gen-tie line would require that heavy vehicles access structure sites along the road. The Project proposes to use the newly constructed site access road and Wiley Well Road for all construction, operation, and maintenance activities associated with the gen-tie line. If required, new spur roads, approximately 14 feet wide and averaging 70 feet in length, would be constructed from the access roads to the structure sites. Each spur road would lead to a construction pad for a pole structure.
- ***Pole Pads:*** At each site, a work area would be required for the structure footing location, structure assembly, and the necessary crane maneuvers. The work area would be cleared of vegetation only to the extent necessary and the construction pad would be leveled to facilitate the safe operation of equipment such as construction cranes.
- ***Pole Erection:*** Transmission line pole structure foundation excavations would be made with power drilling equipment. A vehicle-mounted power auger or backhoe would be used to excavate for the structure foundation. Although not expected, in some instances blasting could be necessary because of specific geologic conditions. In the unlikely event blasting is necessary, conventional or plastic explosives would be used. Safeguards (*e.g.* blasting mats) would be employed when adjacent areas require protection.

  Installation of new steel or concrete pole structures to support the 230 kV bundled circuit would begin with the excavation of foundations approximately 6 feet in diameter and 20 feet in depth. A truck-mounted auger, backhoe, or similar equipment would typically be used for excavation of this type. Once the foundation holes have been cleaned, the poles with preassembled insulators, hardware, and stringing sheaves would be lifted into position, inserted into the foundation holes, and gravel or concrete would be poured in to backfill the hole and create a foundation. Erecting each pole structure takes approximately two to three hours.
- ***Conductor Installation:*** Typical conductor stringing activities are illustrated below. For public and existing line protection, during wire installation crossing structures would be erected adjacent to the highway and IID's Blythe-to-Eagle Mountain line, or other structures requiring protection during conductor installation. Crossing structures would consist of H-frame wood poles placed on either side of an obstacle. These structures would prevent ground wire, conductors, or equipment from falling on an obstacle and would be removed following the completion of conductor

installation. Equipment for erecting the crossing structures would be the same as the equipment discussed above for transmission pole installation. Crossing structures may not be required for small roads or other areas where suitable safety measures such as barriers, flagmen, or other traffic controls could be used.

Pilot lines would be pulled (strung) from structure to structure and threaded through the stringing sheaves at each structure. This phase of work may be accomplished through the use of helicopters to minimize or otherwise eliminate the need to traverse the ROW along the ground from structure to structure. Following the pilot lines, a larger diameter stronger line would be attached to the conductors to pull them onto the structures. This process would be repeated until the ground wire or conductor is pulled through all sheaves.



- ***Pulling Sites:*** The shield wire and conductors would be strung using powered pulling equipment at one end and powered braking or tensioning equipment would be approximately one mile apart. Tensioners and/or pullers, line trucks, wire trailers, and tractors needed for stringing and anchoring ground wire or conductor would be necessary at each pulling site. The tensioner, in concert with the puller, would maintain tension on the shield wires or conductors while they would be pulled through the structures. There will be approximately 25 pulling sites required to install the conductors along this segment of the gen-tie line. The sites will be accessed from the Project access roads or Wiley's Well Road.
- ***Clean up and Site Reclamation:*** Construction sites, material storage yards, and access roads would be kept in an orderly condition throughout the construction period. Approved enclosed refuse containers would be used throughout the Project. Refuse and trash would be removed from the sites and disposed in an approved manner. Oils or chemicals would be hauled to a disposal facility authorized to accept such materials. Open burning of construction trash would not be acceptable.

  The post-construction ROW would be restored as required by the BLM. All practical means would be made to restore the land to its original contour and restore the natural drainage patterns along the ROW. Because re-vegetation would be difficult in many areas of the Project because of low amounts of precipitation, it would be important to minimize disturbance during construction.

3.7.4 Natural Gas Pipeline

Construction of the gas pipeline will be the responsibility of SoCal Gas (SCG) and is expected to take three to six months with a peak workforce of approximately 46 workers. Provisions for construction contractor employee parking for the pipeline construction will be accommodated by the Applicant at the plant site, except for those supervisory contractor employee and agency inspection vehicles which must be temporarily parked along the route while construction takes place. Most major pieces of pipeline construction equipment will remain along the pipeline ROW during construction with storage and staging of equipment and supplies either located at the Project plant site or other acceptable site selected by SCG at the time construction is underway. Excavated earth material would be stored within the construction ROW. During nonworking hours, any open trench will be covered with wood or other material of sufficient strength to support wildlife.

A “will serve” letter was received from SGC on August 21, 2009. The Project will be served by a high pressure transmission line located near I-10. Capacity analysis detail for the proposed line will be completed as the project progresses.

Genesis Solar, LLC anticipates the construction of the natural gas pipeline will generally consist of the following elements, subject to SCG providing further information.

- ***Trenching:*** The optimal trench will be approximately 48 inches wide and 4 to 10 feet deep. With loose soil, a trench up to eight feet wide at the top and three feet wide at the bottom may be required. The trench depth will provide a minimum cover of 36 inches.
- ***Stringing:*** The pipeline components will be staged along the trench on wooden skids in preparation for installation.
- ***Installation:*** Installation consists of bending, welding, and coating the weld-joint areas of the pipe after it has been strung, padding the ditch with sand or fine spoil, and lowering the pipe string into the trench following non-destructive testing of all wells.
- ***Backfilling:*** consists of returning spoil back into the trench around and on top of the pipe, ensuring the surface is returned to its original grade or level. The backfill will be compacted to protect the stability of the pipe and minimize subsequent subsidence.

Trenchless construction methods may be used for short crossings under existing water lines or other buried pipelines. Boring pits will be dug on each side of the crossing to accommodate the process. Cleanup consists of restoring the surface of the roadway or ROW by removing any construction debris, grading to the original grade and contour, and revegetating or repairing where required.

The pipeline will undergo hydrostatic testing which involves filling the line with water, venting all air, increasing the pressure to the specified code requirements, and holding the pressure for a period of time. After hydrostatic testing, the test water will be chemically analyzed for contaminants and discharged to the surrounding area pursuant to the Project Construction SWPPP unless the analysis shows the water is contaminated; in which case, the water would be trucked to an appropriate disposal facility. Following hydrostatic testing, the pipeline will be cleaned and dried, purged of air, and filled with natural gas for operation.

3.8 FACILITY OPERATION

The Project will have a moderate sized workforce during operation; an estimated total workforce of 40 to 50 full time equivalent personnel will be needed to staff the facility 24 hours per day/seven days per

week. When the plant is not operating (generating electricity), personnel will be present as necessary for maintenance, start-up, and/or site security.

3.9 FACILITY CLOSURE

Facility closure can occur on either a temporary or permanent basis. Temporary closure is a cessation of facility operations for a period of time greater than would be required for routine maintenance, overhaul, or replacement of major plant equipment. Temporary closures may be caused by damage to the facility from events such as fire, earthquake, or other natural occurrences, or by short-term economic considerations.

Permanent closure is a cessation of facility operations with no intent to restart. Permanent closure may result from a combination of facility age and economic considerations, or from damage considered beyond repair or other reasons. Temporary and permanent facility closures are both addressed below.

3.9.1 Temporary Closure

In the case of a temporary closure, security for the Project facilities will be maintained on a 24-hour basis and the CEC and other responsible agencies will be notified. The course of action that will be followed will depend on whether or not the temporary closure involves a release of hazardous materials.

If there is no actual or threatened release of hazardous materials, a contingency plan will be implemented for the temporary halting of facility operations. The purpose of this contingency plan, to be developed prior to the beginning of operations, is to ensure compliance with all applicable Laws, Ordinances, Regulations, and Standards (LORS) and appropriate protection of public health, safety, and the environment. Depending on the expected duration of the temporary shutdown, the contingency plan may include the draining and proper disposal of chemicals from storage tanks and other facility equipment, the safe shutdown of all plant equipment, and various other measures to protect onsite workers, the public, and the environment.

If the temporary closure involves an actual or threatened release of hazardous materials to the environment, procedures will be implemented as provided in a Hazardous Materials Business Plan that will be developed for the Project (see Section 5.12, Hazardous Materials Handling). Procedures will include, but not be limited to, the following:

- Measures to control the release of hazardous materials.
- Requirements for notifying the appropriate agencies and the public.
- Emergency response procedures.
- Training requirements for Project personnel in hazardous materials release response and control.

Once the hazardous materials release has been resolved, temporary closure will proceed as described above for temporary closure without a hazardous materials release.

3.9.2 Permanent Closure

The planned operational life of the Project is 30 years, but the Project facility conceivably could operate for a longer or shorter period depending upon economic considerations or other circumstances. For example, if the Project facility remains economically viable, it could operate for more than 30 years, which would defer environmental impacts associated with closure and with the

development of replacement power generating facilities. However, if the facility were to become economically non-viable before 30 years of operation, it could be closed permanently sooner.

Regardless of when permanent closure occurs, a decommissioning plan specifying the appropriate closure procedures will be developed and implemented. As in the case of a temporary closure, security for the Project facility will be maintained on a 24-hour basis. During permanent closure, the CEC and other responsible agencies will be notified of the decommissioning schedule and plans.

The procedures provided in the decommissioning plan will be designed to ensure public health and safety, environmental protection, and compliance with applicable LORS. Prior to the beginning of permanent closure activities, the decommissioning plan will be submitted to the CEC for review and approval.

Depending on conditions at the time of closure, the closure measures may range from extensive "mothballing" to the complete removal of Project equipment and other structures.

In general, the decommissioning plan for the Project will address the following:

- Proposed decommissioning measures for the power plant and all associated facilities constructed as part of the Project, designation of equipment and appurtenances to be removed or that may remain in place, as applicable.
- Activities necessary for site reclamation.
- Provisions for recycling facility components, collection and disposal of wastes, and resale of unused chemicals back to suppliers or other parties.
- Decommissioning alternatives other than full restoration of the site.
- Costs associated with the proposed decommissioning and reclamation activities and the source of funds to implement these activities.
- Conformance with applicable LORS and with local/regional plans.

As it is not possible to predict at present the conditions that will exist at the time decommissioning decisions must be made, decommissioning details will be developed and provided to the CEC when the time for permanent closure is closer and more information is available.

If the evaporation ponds or LTU require temporary closure, the Closure and Post-Closure Maintenance Plan shall be implemented. A Preliminary Closure and Post-Closure Maintenance Plan for both waste management units will be submitted to the CRRWQCB with the application for a Report of Waste Discharge (RoWD) (see Appendix H). It is anticipated these facilities will undergo "clean closure," meaning post-closure maintenance will not be required. The Detection Monitoring Plan in the RoWD is also based on closure of these waste management units after the 30 year operating life; therefore, if there was a reduction or extension in the operating life of the system, discussions with the CRRWQCB will be undertaken to adjust this plan accordingly.

ATTACHMENT 2

SURVEY FOR JURISDICTIONAL WATERS AND WETLANDS AT THE GENESIS SOLAR ENERGY PROJECT

Survey for Jurisdictional Waters and Wetlands at the Genesis Solar Energy Project Eastern Riverside County, California

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Santa Ana, CA 92705

Prepared For:

Genesis Solar, LLC

Revision 1
December 2009

Contents

1.0 INTRODUCTION 1
1.1 Project Location 1
1.2 Environmental Setting 1
1.2.1 Vegetation 3
1.2.2 Climate and Hydrology 4
1.2.3 Soil 4

2.0 METHODS 6

3.0 RESULTS 7
3.1 Ephemeral Washes 7

4.0 SUMMARY OF JURISDICTIONAL ASSESSMENT 8
4.1 Waters of the U.S. 8
4.2 Waters of the State 9

5.0 FIELD BIOLOGISTS 10

6.0 REFERENCES 11

TABLES

Table 1-1. Requested BLM ROW 3
Table 3-1. Ephemeral Wash Plant Species Observed during Surveys 8

FIGURES

Figure 1-1. Project Location 2
Figure 1-2. Soil Map 5

APPENDICES

Appendix A. Soil Associations and Series Within the Project Area
Appendix B. Aerial and Field Survey Results Mapsheets
Appendix C. Field Survey Data
Appendix D. Downstream Wash Data
Appendix E. Photograph Log

1.0 INTRODUCTION

Genesis Solar, LLC (Genesis Solar) is proposing to develop a 250-megawatt (MW) solar thermal power generating plant in Riverside County, California (Figure 1-1). Genesis Solar has applied for a 4,640-acre right-of-way (ROW) grant from the Bureau of Land Management (BLM) for development of the Genesis Solar Energy Project (Project). Once constructed, the Project would permanently occupy approximately 1,800 acres within this area, plus approximately 90 acres for linear facilities. The total permanent Project footprint would be 1,890 acres (collectively referred to as the Project area).

This report presents the findings of a field survey for Waters and Wetlands at the Project near Ford Dry Lake. The information provided in this report is intended to serve multiple purposes, including:

(a) To comply with section 404 of the Clean Water Act (CWA) and to provide the U.S. Army Corps of Engineers (USACE) with sufficient information to make a jurisdictional determination for Waters of the U.S. within the Project area;

(b) To comply with California Department of Fish and Game (CDFG) Code (Section 1602) and provide information to CDFG to use in evaluating the extent of state jurisdiction in the Project area;

(c) To provide information that can be used by the Colorado River Regional Water Quality Control Board to issue a CWA 401(c) certification if needed, and;

(d) To provide information that will inform the Application for Certification for the Project with the California Energy Commission.

1.1 Project Location

The proposed Project is located approximately 25 miles west of Blythe, California, on lands managed by the BLM (Figure 1-1). Surrounding features include the McCoy Mountains to the east, the Palen Mountains (including the Palen/McCoy Wilderness Area) to the north, and Ford Dry Lake to the south. Interstate 10 (I-10) is located approximately 2 miles south of the proposed solar facility.

Table 1-1 lists the sections and partial sections in the ROW grant application filed with the BLM. The actual Project footprint and the amount of land disturbed (permanent and temporary disturbance) are estimated to be 1,890 acres. The Project will require a transmission line, access road, and natural gas pipeline (linear facilities). The site would be accessed from the Wiley's Well Road exit from I-10 following pipeline maintenance roads and BLM roads.

1.2 Environmental Setting

The Project is located in the Chuckwalla Valley in Riverside County, an east-west-trending valley that slopes to the east, has no outlet, and contains several playas, including Ford Dry Lake, which is the lowest in elevation. The mountains to the west that form the drainage divides (Eagle Mountains, Chuckwalla Mountains, and Orocopia Mountains) have greater topographic relief than those to the east, with maximum elevations near or above 4,000 feet above mean sea level (msl). The surrounding mountains to the east (Palen, McCoy, Little Chuckwalla, and Mule) have lower relief and maximum elevations generally below 3,000 feet above msl. Fluvial erosion from surrounding mountains has formed alluvial fan and bajada surfaces leading down to the dry lakes on the valley bottom.

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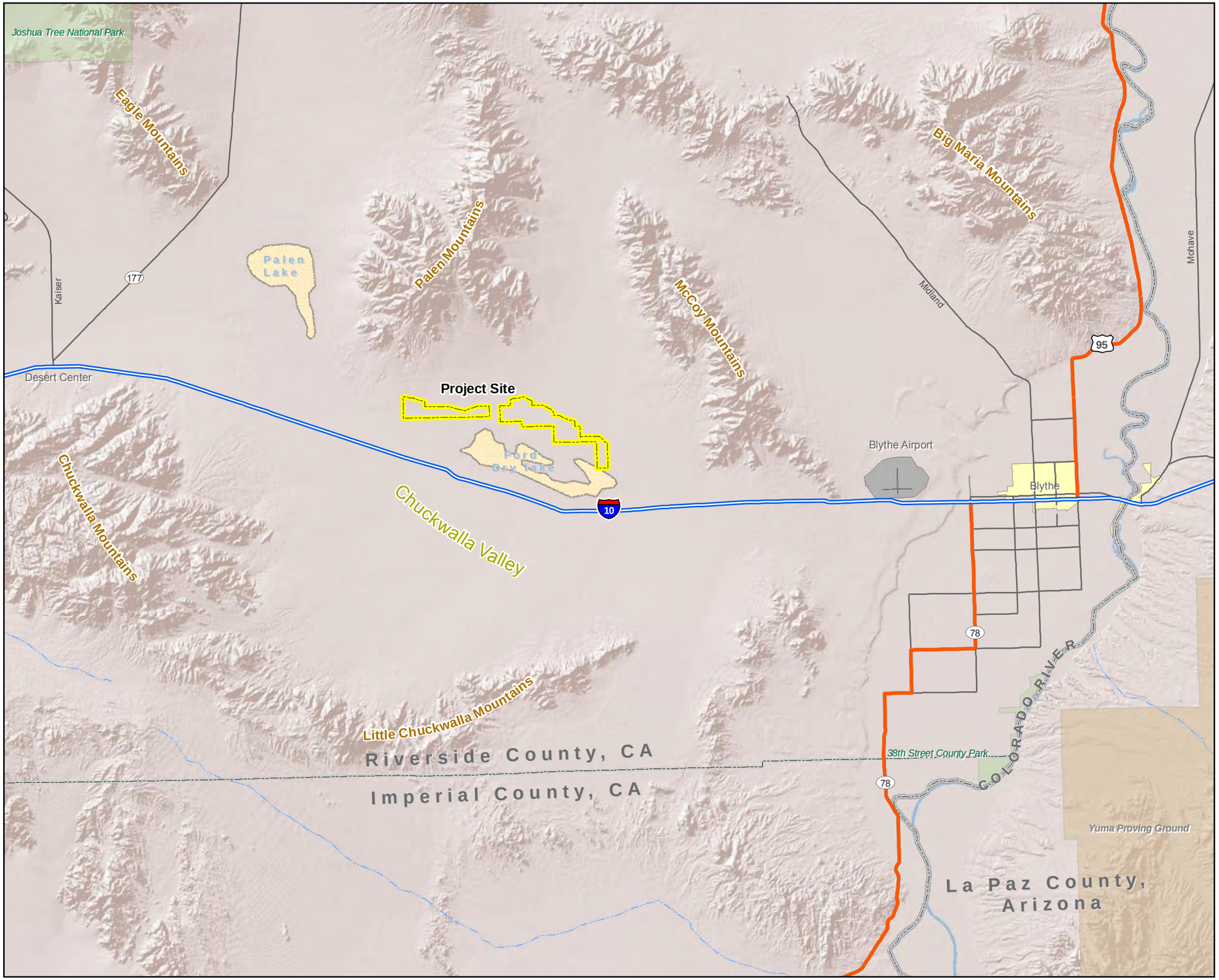
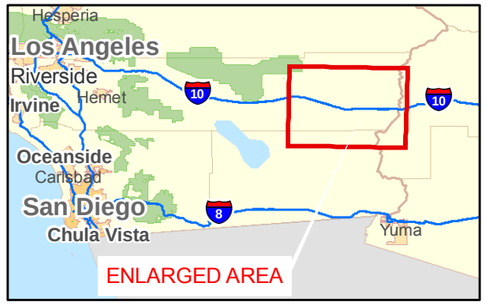


GENESIS SOLAR, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY, CALIFORNIA



Legend

- Project Site
- Interstate
- Highway
- Major Road
- Local Road
- County Boundary
- State Boundary
- Lake/River
- Lake Intermittent
- Parks (Regional)
- Military Installation
- Urban Areas
- Airport Area

N

0 2.5 5 7.5 10
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM

FIGURE 1-1
PROJECT LOCATION

TETRA TECH EC, INC.

Table 1-1. Requested BLM ROW

Section	Aliquot	Estimated Acres
Township 6S, Range 19E, San Bernardino Base & Meridian		
4	S ½ except wilderness	260
5	All except wilderness	550
6	SE ¼	160
7	N ½ NE ¼	80
8	NE ¼, N ½ NW ¼	240
9	N ½	320
10	All except wilderness	580
11	SW ¼	160
13	NW ¼ except wilderness; SW ¼	280
14	N ¾, NW ¼, N ¾, NE ¼	240
15	N ½ NW ¼ , N ½ NE ¼	160
24	W ½ N ½	160
	Subtotal, T6S, R19E	3, 190
Township 6S, Range 18E, San Bernardino Base & Meridian		
1	S ½ except wilderness	290
2	S ½ except wilderness	260
3	S ½	320
4	All except wilderness	580
	Subtotal, T6S, R18E	1,450
	Total ROW	4,640

1.2.1 Vegetation

The vegetation within the Project area is characterized as two main types: Sonoran Creosote Bush Scrub and Stabilized and Partially Stabilized Sand Dunes (Holland 1986); however, small areas of Chenopod Scrub, Desert Dry Wash Woodland, and Playa (dry lake bed) are found in the Project vicinity. Sonoran Creosote Bush Scrub represents the majority of the survey area, with Stabilized and Partially Stabilized Sand Dunes along the northern portions of the linear facility routes.

Sonoran Creosote Bush Scrub

Creosote Bush Scrub vegetation communities, common in the deserts of Southern California, typically consist of widely scattered shrubs, 0.5 to 3 meters tall and are characterized by the dominance of creosote bush (*Larrea tridentata*) and the lack of trees. Creosote bush scrub occurs mainly on well-drained secondary soils of slopes, fans, and valleys, rather than on sites with thin residual spoils or areas of high soil salinity (Holland and Keil 1995). Creosote bush scrub also occurs on desert pavement surfaces (Sawyer and Keeler-Wolf 1995). Growth occurs during spring, and many species of ephemeral herbs may flower in late March and April if winter rains are sufficient. Other less numerous species of annuals appear following summer thundershowers.

The dominant species in Creosote Bush Scrub are creosote bush, brittle brush (*Encelia farinosa*), and white bursage (*Ambrosia dumosa*). Cheesebush (*Hymenoclea salsola*), big galleta (*Hilaria rigida*), ironwood (*Olneya tesata*), blue palo verde (*Cercidium floridum*), catclaw (*Acacia greggii*), and smoketree (*Psorothanmus spinosa*) are often present in higher densities along ephemeral washes and arroyos. Creosote bush scrub, with its widely spaced shrubs, provides potential refuge, nesting, and roosting habitat for many desert wildlife species, including birds, reptiles, and mammals.

Stabilized and Partially Stabilized Sand Dunes

A heterogeneous mixture of sand dunes is located along portions of the linear facility route. There are also sandy areas present south of I-10 crossed by the transmission line route. These areas contain low dune formations of fine sand that contain widely spaced perennial shrubs, including creosote bush, white bursage, and galleta grass. Several sand-associated and other annuals are also abundant (e.g., sand verbena [*Abronia villosa*], birdcage primrose [*Oenothera deltoides*], desert marigold [*Baileya pauciradiata*], and narrow-leaved forget-me-not [*Cryptantha angustifolia*]). Although there are no coarse particles in the substrate of the dunes, the areas between the dunes that contain more shrubs may be partially stabilized by a light gravel layer. Drainage is largely by percolation, but where drainages end in the dunes, the sinks are dominated by blue palo verde, with understories of dense galleta grass.

1.2.2 Climate and Hydrology

The Project is located in the Colorado region of the Sonoran Desert. Summer temperatures routinely reach above 100ºF (June through September) and annual average precipitation in the Blythe, California, area is less than 4 inches. On average, August receives the most rainfall, although rainfall is also received in the winter months of December, January, and February (Western Regional Climate Center 2008).

The Chuckwalla Valley is a closed basin with two prominent playas: Palen Dry Lake and Ford Dry Lake. Water could theoretically flow from Palen Dry Lake to Ford Dry Lake if it accumulated to a great enough depth. However, under present climatic conditions such overflow is unlikely, so the watersheds to these collection points can be treated as independent. The Project is located in the Ford hydrologic area that is a closed basin with a drainage area of 440,729 acres, or about 690 square miles, of which, more than half is south of I-10 (California Department of Fish and Game, Biogeographic Information and Observation System 2009). The region's low precipitation rate, high evaporation rate, and very permeable soils in the local washes preclude the existence of perennial streams. Nevertheless, when rainfall and runoff do occur, flow in these washes can be substantial, often resulting in localized flash floods with significant potential for erosion.

1.2.3 Soil

The soils of the Project area were identified using the State Soil Geographic (STATSGO) database developed by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) (NRCS 2009a) for use in regional, multi-state, river basin, state, and multi-county resource planning. STATSGO spatial data were compiled by combining geologically and topographically related soil series found in county soil surveys into larger map units known as soil associations. These associations provide sufficient detail to establish the physical type and characteristics of soil in the Project area. Soil associations of the Project site are shown on Figure 1-2, and the soil types are described in Appendix A (NRCS 2009b). The western portion of the Project area is comprised of Hyder-Cipriano-Cherioni Association soil (map ID s1141) and the eastern portion is Rosita-Dune Land-Carista Association soil (map ID s1136). None of the soil identified in the Project area through these soil associations appears on the list of hydric soil compiled by NRCS (2009c) that are characteristic of wetlands for California.

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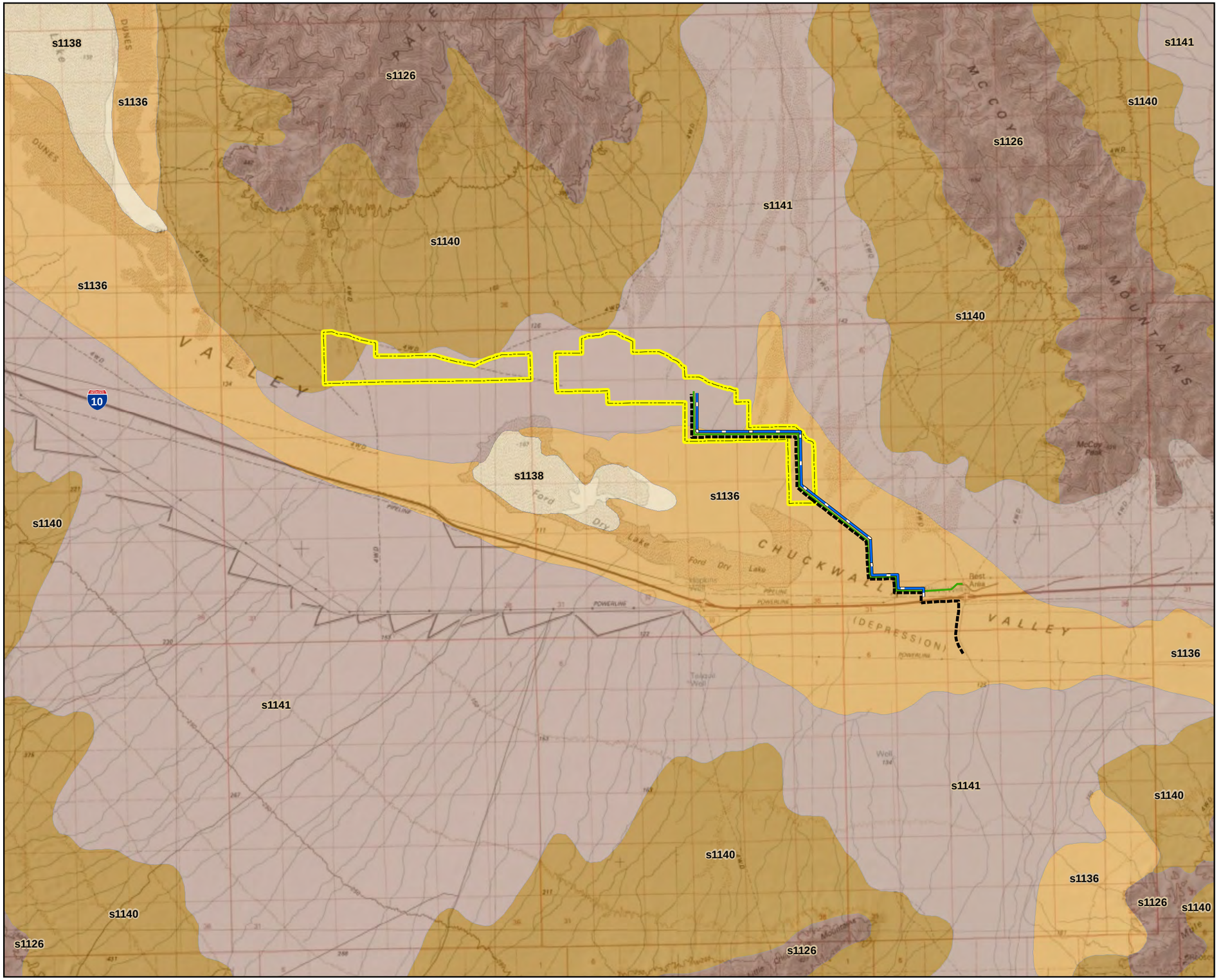

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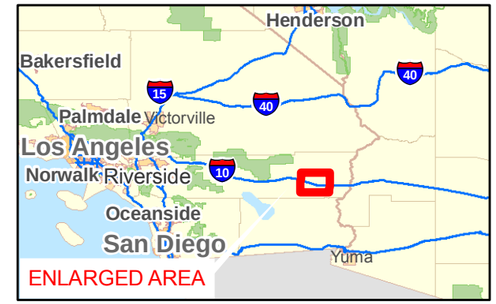
RIVERSIDE COUNTY,
CALIFORNIA



Legend

- Project Site
- Proposed Access
- Proposed Gas Line
- Proposed Transmission Interconnection

Regional Soil Associations

- s1126
- s1136
- s1138
- s1140
- s1141

N

0 1 2 3 4
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, NRCS

FIGURE 1-2
SOIL MAP

TETRA TECH EC, INC

2.0 METHODS

Several steps were taken to identify jurisdictional waters located within the Project disturbance area. First, a site reconnaissance survey and preliminary assessment of water features was conducted from April 6 to April 14, 2009 as part of general biological surveys. Second, prior to field surveys, high-resolution aerial photographs and the Ford Dry Lake and McCoy Spring United States Geological Survey (USGS) 7.5-Minute Quadrangle Maps were used for preliminary identification of potential wetland and water resources in the Project area. “Blue line” streams from USGS maps were overlaid onto aerial photos and potential drainage features were identified by topography and changes in vegetation cover which are indicative of a wash. Third, field surveys were conducted to verify potential wetland and water resources identified by preliminary mapping. Lastly, the delineation was revised in December 2009 using aerial photography to 1) evaluate field-verified drainages to include areas where several small drainages converge 2) evaluate areas downstream of the Project facility footprint that could potentially be affected by channels, and 3) evaluate the currently proposed linear corridor for potential impacts to drainages.

Field surveys to identify jurisdictional waters were conducted from June 30 through July 3, 2009. The total survey area delineated was approximately 3,123 acres and included the proposed disturbance area (1,890 acres), as well as a 500-foot buffer corridor for the linear facility routes. The preliminary data review and site reconnaissance survey identified numerous north-to-south-trending ephemeral drainages. These drainage features were examined in the field to determine if there were bed and bank features that would qualify as jurisdictional. In addition to visiting the potential drainage features identified by the aerial photos, 6 east-west transects averaging 2,500 feet apart were walked within the facility footprint. Transect spacing varied between 950 and 5,900 feet. The northern and southern boundaries of the Project Site were also surveyed to determine if and where drainage features were entering or leaving the site.

Data were recorded in the field at each point where an ephemeral wash was intersected, and drainage features were examined along their length to determine an average width. With the concurrence of the CDFG, isolated drainage features with less than a 3 feet average width and less than 6 inches average depth were not delineated (Kimberly Nicol, pers. comm.). Field verified washes were photographed and recorded using a global positioning device. General characteristics of the wash were recorded as well (including average channel width, evidence of flow, number of jurisdictional trees, and surrounding vegetation type). Each tree that was associated with delineated drainages with a cumulative trunk diameter of at least 4 inches at breast height (dbh) (1602 jurisdictional trees) was individually counted in the field. The exceptions are Wash 24-26 and Wash 31 which were counted utilizing high-resolution aerial photographs following the field survey. Data collected in the field were then incorporated into a geographic information system (GIS) database and data points were plotted on recent 2-foot resolution aerial photographs. Drainage features within the survey area were manually digitized using the field data as reference locations and incorporated into the GIS database.

Following the field surveys and discussions with CDFG and the California Energy Commission (CEC), an aerial photography-based assessment was conducted of potential drainage features downstream of the Project footprint and of the portions of the recently proposed linear alignment that were not covered during field surveys. These drainage features were identified on the basis of vegetation density and color, and the visibility of a possible streambed from an aerial photograph. Note that the existence of bed and bank features, and their dimensions if they do exist, cannot be accurately determined by aerial photography alone. For example, many of the areas that were initially thought to have bed and bank features within the plant site boundary based on looking at the aerial photos alone prior to the field visit turned out not to have such features in the field. Therefore the delineation of the downstream drainages is considered conservative.

Bed widths were estimated using field-verified data compared to aerial photographs. Lengths and acreages of potential downstream drainage features were calculated using Geographic Information System (GIS) mapping software. The number of trees associated with potential drainage features was counted using aerial photography. Areas downstream of linear facilities were not delineated outside of the 500 foot buffer because no downstream impacts are anticipated.

3.0 RESULTS

3.1 Ephemeral Washes

The entire study area is crossed by numerous ephemeral washes ranging from small, weakly expressed erosional features to broad (over 10 feet wide) channels. The active flow channels are generally devoid of vegetation and typically have a sandy-gravel substrate, although some washes also contained cobble and scattered larger rocks. Small- to medium-sized washes are common and widespread throughout the entire Project area. The larger washes tend to dissipate into smaller, more braided channels as they progress downslope. The majority of the channels terminate prior to reaching Ford Dry Lake as well-defined conveyance features diminish and transition into broad, shallow surface flow. All of the ephemeral washes identified in the Project area flow only in response to storm events. .

Twenty-nine drainages were recorded during field surveys in June 2009 (Appendix B, C). In December 2009, the new linear alignment was evaluated using high-resolution aerial photography, and two drainages were identified as crossing the revised linear alignment (Wash 30 and 31, Appendix B, C). Combined temporary and permanent impacts to drainages that cross Project facilities is 82.70 acres. Additionally, in December 2009, 30 potentially jurisdictional washes were identified downstream from the project facility footprint by examination of high resolution aerial photographs (Appendix B, D). Photographs of each of the field-verified drainage feature are provided in Appendix E. Several representative photographs of drainage features that did not qualify as jurisdictional are also provided in Appendix E.

The majority of washes identified throughout the study area are associated with creosote bush scrub habitat. Species such as white bursage are common in some medium to large-sized washes, especially in braided channels that contain slightly elevated areas intermixed with the active flow channels. The larger washes (typically over 6 feet) that contain sandy, gravelly substrate and well-defined banks typically include big galleta grass and scattered desert wash tree species such as ironwood and palo verde (Table 3-1).

Table 3-1. Ephemeral Wash Plant Species Observed during Surveys

Scientific Name	Common Name	Wetland Indicator[a]	Distribution[b]
Ambrosia dumosa	white bursage	NOL	Abundant
Asclepias erosa	desert milkweed	NOL	Sparse
Brassica tournefortii	mustard	NOL	Sparse
Cercidium floridum	blue palo verde	NOL	Sparse
Cryptantha angustifolia	forget-me-not	NOL	Common
Hilaria rigida	big galleta	NOL	Scattered
Hymenoclea salsola	cheesebush	NOL	Sparse
Krameria grayi	white rhatany	NOL	Scattered
Larrea tridentata	creosote bush	NOL	Abundant
Olneya tesota	ironwood	NOL	Sparse
Plantago ovata	plantago	NOL	Common
Prosopis glandulosa	honey mesquite	NOL	Sparse
Tamarix parviflora	tamarisk	FAC	Sparse
Psorothamus spinosus	smoketree	NOL	Sparse

a From National List of Plant Species that Occur in Wetlands, Region 0 [California] (Reed 1988).
FAC = Equally likely to occur in wetlands or nonwetlands.
NOL = Plant species is not included in the 1988 list and is considered to be an upland species = Not on 1988 List.
b Explanation of distribution terms used
Abundant = plants are widespread along the channel and with relatively high cover where present
Common = plants are widespread along the channel with moderate to low cover; occasional locally high cover
Scattered = plants have a patchy distribution throughout along the channel, cover ranges from sparse to locally high
Sparse = plants observed in a few locations with generally sparse cover, not common throughout along the channel

4.0 SUMMARY OF JURISDICTIONAL ASSESSMENT

4.1 Waters of the U.S.

Waters of the U.S. are defined as all navigable waters, including all:

- tidal waters
- interstate waters and wetlands
- other waters such as lakes, rivers, streams (perennial or intermittent), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds; the use, degradation, or destruction of which could affect interstate commerce
- impoundments of water mentioned above
- tributaries to waters mentioned above
- territorial seas
- wetlands adjacent to waters mentioned above

Waste treatment systems, including treatment ponds, are not Waters of the U.S. (33 Code of Federal Regulations Section 328.3). Based on the recent guidance issued from USACE Headquarters, jurisdictional Waters of the U.S. include traditional navigable waters (TNWs), all wetlands adjacent to TNWs, non-navigable tributaries of TNWs that are relatively permanent (i.e., tributaries that typically flow year-round or have continuous flow at least seasonally), and wetlands that directly abut such tributaries (USACE 2007). Additionally, jurisdiction is asserted over water bodies that are not relatively permanent if that body is determined to have a significant nexus with a TNW (USACE 2007).

Under the recent guidance, desert swales defined as "shallow features in the landscape that may convey water across upland areas during and following storm events," and erosional gullies are generally considered non-jurisdictional features because they are not tributaries nor do they have a significant nexus to a TNW (USACE 2007). In addition, all ephemeral drainages on and around the Project drain into Ford Dry Lake which is an isolated feature that does not meet the definition of a TNW under USACE regulations. Based on current interpretations of the Army Corps jurisdictional authority and the definition of Waters of the U.S., the ephemeral drainage features on site would not be subject to the USACE permit authority under the CWA (33 U.S.C.). In addition, no wetlands were found in the Project area. However, the USACE is ultimately responsible for jurisdictional determinations and this report has been prepared to provide the necessary information to assist the USACE with that determination.

Under the CWA Section 401, every applicant for a federal permit or license for any activity which may result in a discharge to a water body must obtain State Water Quality Certification (Certification) that the proposed activity will comply with state water quality standards. Most Certifications are issued in connection with USACE CWA Section 404 permits. If a 404 permit is not needed, a 401 Certification will not be required.

4.2 Waters of the State

In addition to federal regulation of wetlands and waters, the CDFG monitors streambed alteration to conserve, protect, and manage California's fish, wildlife, and native plant resources. The CDFG Code (Section 1602) requires any person, state, or local governmental agency, or public utility to notify the CDFG before beginning an activity that will substantially divert, obstruct, or change the natural flow of the bed, channel, or bank (including associated riparian vegetation) of a river, stream, or lake; use material from; or deposit material into a streambed prior to commencement of the activity. Streams include, but are not limited to, intermittent and ephemeral streams, rivers, creeks, dry washes, sloughs, blue-line streams, and watercourses with subsurface flow. If CDFG determines that the action could have an adverse affect on existing fish and wildlife resources, a Lake or Streambed Alteration Agreement is required.

Based on the above description and discussions with CDFG, we anticipate that CDFG will take jurisdiction over the Project drainage features (Washes 1-29) identified during field surveys. Additionally, as illustrated in Appendix B and summarized in Appendix C, certain drainages that cross project facilities could be considered components of a single, braided wash system consisting of several smaller drainages. As a result, these drainages were combined and the area was calculated using the banks of the outermost drainages as the boundaries of the combined wash (see Appendix C). The following washes were combined, and it is anticipated that CDFG will take jurisdiction over these combined areas:

- Washes 7 through 10
- Washes 14 through 19
- Washes 24 through 26

Areas downstream of the Project facility footprint that were delineated solely on aerial photographs are only considered potentially jurisdictional at this time. The Project drainage plan is currently being engineered and will be designed to minimize impacts to drainages delineated downstream of the Project footprint. Additionally, geomorphological studies are underway to assist in understanding the role of ephemeral drainages in sand transport and ultimately sand dune formation. The drainage design and geomorphological study will be available mid to late January 2010, respectively.

A Notification of Lake or Streambed Alteration will be submitted to the local office of the CDFG to confirm that these drainages are jurisdictional. If the CDFG intends to take jurisdiction over any of the drainages in the project area, a Streambed Alteration Agreement (SAA) will be prepared. The SAA will contain conditions to protect the affected resources.

5.0 FIELD BIOLOGISTS

Amy Bensted, Tetra Tech EC, Inc.

Nathan Mudry, Contributing Author, Environmental and GIS Services, LLC (eGIS)

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APPENDIX A

SOIL ASSOCIATIONS AND SERIES WITHIN THE PROJECT AREA

Soil Associations and Series Within the Project Area

Association s1126 - Tecopa-Rock outcrop-Lithic Torriorthents		
Soil Series	Slope (% grade)	Characteristics
Tecopa	15 to 75	The Tecopa series consists of very shallow soils formed in residuum and colluvium weathered from quartzite, schists, and gneiss (75 percent of surface is covered with gravel and cobble). Tecopa soils are on low hills and low mountain side slopes with a gradient of 15 to 75 percent. The mean annual precipitation is about 4 to 8 inches and the mean annual air temperature is about 60 degrees F. Vegetation is creosote bush, yucca, cacti, white bursage, Morman tea and blackbrush.
Rock outcrop		Rock outcrop is not a soil series name but a landform (geomorphic term) indicating that the underlying geologic parent material is exposed at the surface without any unconsolidated sediments or soils covering it. By definition, this landform does not have any associated soils.
Lithic Torriorthents		Lithic Torriorthent is not a soil series but a generic soil type whose “order” is Entisol (a young soil), suborder is “Orthent” (formed on recent erosional surfaces), great group is “Torriorthent” (dry or salty, arid locations), and has a “Lithic” descriptor meaning it has near-surface parent material. The Tecopa soil series is a Lithic Torriorthent type soil.

Association s1136 - Rositas-Dune land-Carsitas		
Soil Series	Slope (% grade)	Characteristics
Rositas	0 to 30	The Rositas series consists of very deep, somewhat excessively drained soils formed in sandy eolian material blown from recent alluvium. Rositas soils are on dunes and sand sheets. Somewhat excessively drained; negligible to medium runoff; rapid permeability. Rositas soils are used for growing citrus fruits, grapes, alfalfa, and truck crops. Native vegetation creosote bush, white bursage, desert buckwheat and mesquite.
Dune land		Dune land is not a soil series name but a landform (geomorphic term) indicating an aeolian collection of primarily sand-sized sediment. Due to the nature of this landform, soil formation does not commonly occur where an active dune exists.
Carsitas		Carsitas soils are nearly level to strongly sloping and are on alluvial fans, moderately steep valley fills and dissected remnants of alluvial fans, at elevations of about 220 feet below sea level to 800 feet above sea level. The climate is one of long, hot dry summers and short mild dry winters with an average annual precipitation of less than 5 inches. Torrential summer thundershowers occasionally produce enough runoff to flood the soil for brief periods. Vegetation is a sparse growth of creosote bush, white bursage, barrel cactus, mesquite, and palo verde. Where irrigation water is available, the soils are used for growing citrus fruits and grapes.

Association s1138 - Playas		
Soil Series	Slope (% grade)	Characteristics
Playa		Playa is not a soil series name but a landform (geomorphic term) indicating an ephemeral lake that is located at the low point of an internally drained basin, i.e., a watershed with no outlet. Due to the nature of this landform soil formation does not commonly occur where a playa exists.

Soil Associations and Series Within the Project Area

Association s1140 - Rillito-Gunsight		
Soil Series	Slope (% grade)	Characteristics
Rillito	0 to 5	The Rillito series consists of very deep, somewhat excessively drained soils that formed in mixed alluvium. Rillito soils are on fan terraces or stream terraces. Somewhat excessively drained; slow or medium runoff; moderate permeability. Vegetation is mainly creosote bush, desert sage, cacti, mesquite, palo verde, ironwood, and annual grasses and weeds.
Gunsight	1 to 40	The Gunsight series consists of very deep, somewhat excessively drained, strongly calcareous soils that formed in alluvium from mixed sources. Gunsight soils are on fan terraces or stream terraces. Somewhat excessively drained; medium runoff; moderate or moderately rapid permeability. The vegetation is creosotebush, ocotillo, paloverde, saguaro, cholla and triangle bursage.

Association s1141 - Vaiva-Quilotosa-Hyder-Cipriano-Cherioni		
Soil Series	Slope (% grade)	Characteristics
Vaiva	1 to 65	The Vaiva series consists of very shallow and shallow, well drained soils formed in slope alluvium from granite and gneiss. Vaiva soils are on hills and mountains with slopes of 1 to 65 percent. The mean annual precipitation is about 7 inches and the mean annual air temperature is about 71 degrees F. Vegetation is saguaro, littleleaf palo verde, creosote bush, ocotillo, ironwood, triangle bursage, staghorn cholla, spicebush, false mesquite, wolfberry, bush muhly, brittlebush and ratany.
Quilotosa	3 to 65	The Quilotosa series consists of very shallow and shallow, somewhat excessively drained soils that formed from granitic and metamorphic rocks. Quilotosa soils are on hills and mountains and have slopes of 3 to 65 percent. The mean annual precipitation is about 7 inches and the mean annual air temperature is about 70 degrees F. Vegetation is saguaro, littleleaf palo verde, brittlebush, creosote bush, ocotillo, ironwood, triangle bursage, white bursage, cholla, forbs and grasses.
Hyder	1 to 65	The Hyder series consists of very shallow to shallow, somewhat excessively drained soils that formed in alluvium from rhyolite and related volcanic rocks. Hyder soils are on mountains and hills. Somewhat excessively drained; medium to rapid runoff; moderate or moderately rapid permeability. The native vegetation is creosote bush, white bursage, brittlebush, buckhorn cholla, and littleleaf palo verde.
Cipriano	0 to 55	The Cipriano series consists of shallow and very shallow to hardpan, somewhat excessively drained soils that formed in fan alluvium from volcanic rock. Cipriano soils are on fan terraces. Somewhat excessively drained: slow to medium runoff; moderate permeability. Present vegetation is creosote bush, palo verde, stagholll and chainfi'uit eholla, saguaro, ocotillo, and triangle bursage with some fluffgrass and six weeks grama.
Cherioni	0 to 70	The Cherioni series consists of very shallow and shallow, somewhat excessively drained soils that formed in slope alluvium on volcanic bedrock. Cherioni soils are on fan terraces or hills. Somewhat excessively drained; medium to rapid runoff; moderate permeability. Present vegetation is creosote bush, palo verde, saguaro, cholla, ocotillo, triangleleaf bursage and ratany.

APPENDIX B

AERIAL AND FIELD SURVEY RESULTS MAPSHEETS

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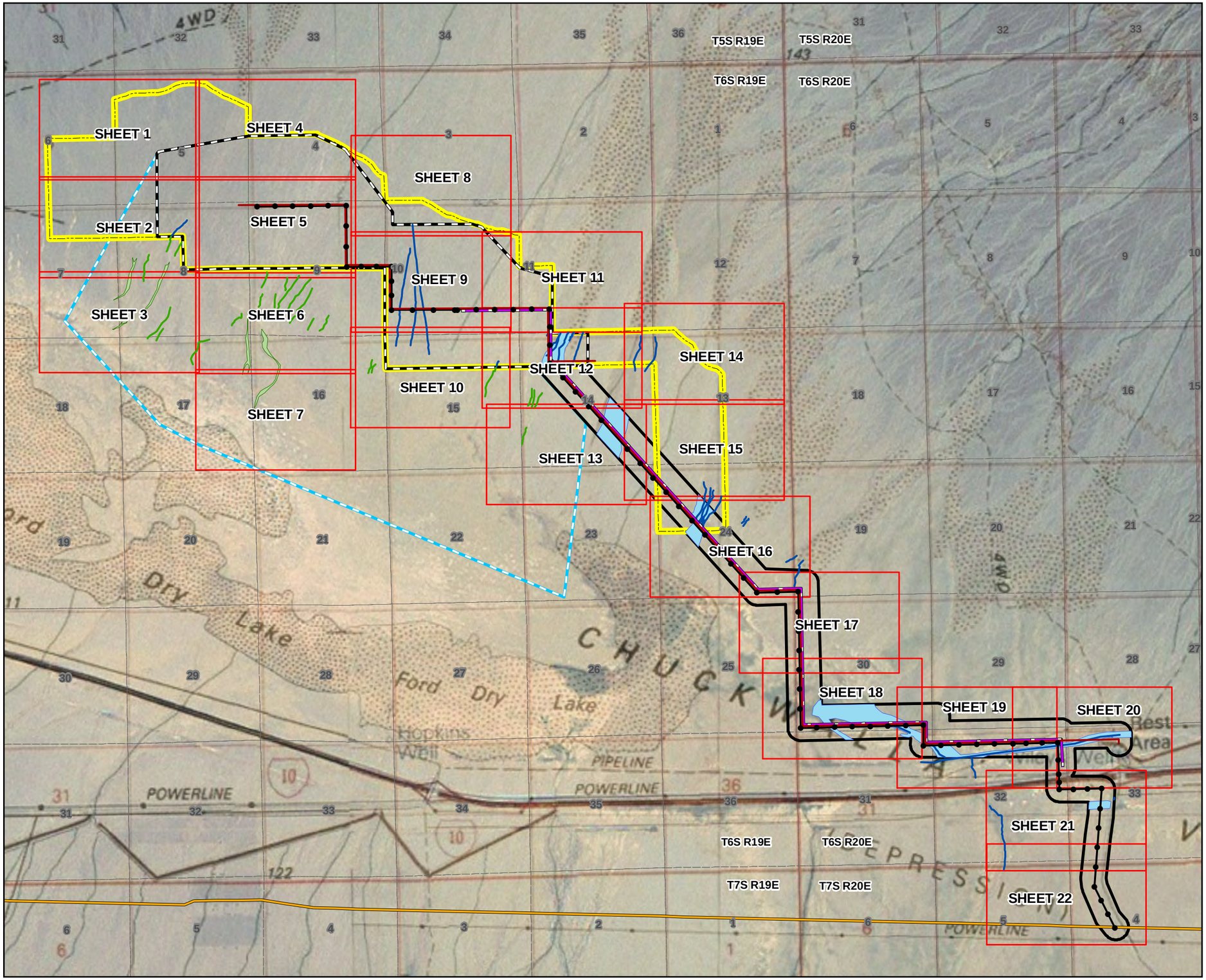

GENESIS SOLAR, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY,
CALIFORNIA

Legend

- Transmission Interconnect Structure
- Access Road
- Gas Line
- Transmission Interconnect
- Blythe Transmission Line
- BLM Requested ROW
- Facility Footprint
- Linear Facility Survey Area
- Section Line
- 1:4800 Detail Map Sheet
- June 2009 Field Verified Jurisdictional Waters of the State

December 2009 Aerial Map Survey

- Jurisdictional Waters of the State (Field Verified)

December 2009 - Aerial Map Survey

- Jurisdictional Waters of the State (Potential)
- Jurisdictional Waters of the State (Potential)
- Downstream Wash Evaluation Area (Aerial Mapping)

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, eGIS, TTEC

WATERS EVALUATION INDEX MAP

TETRA TECH EC, INC

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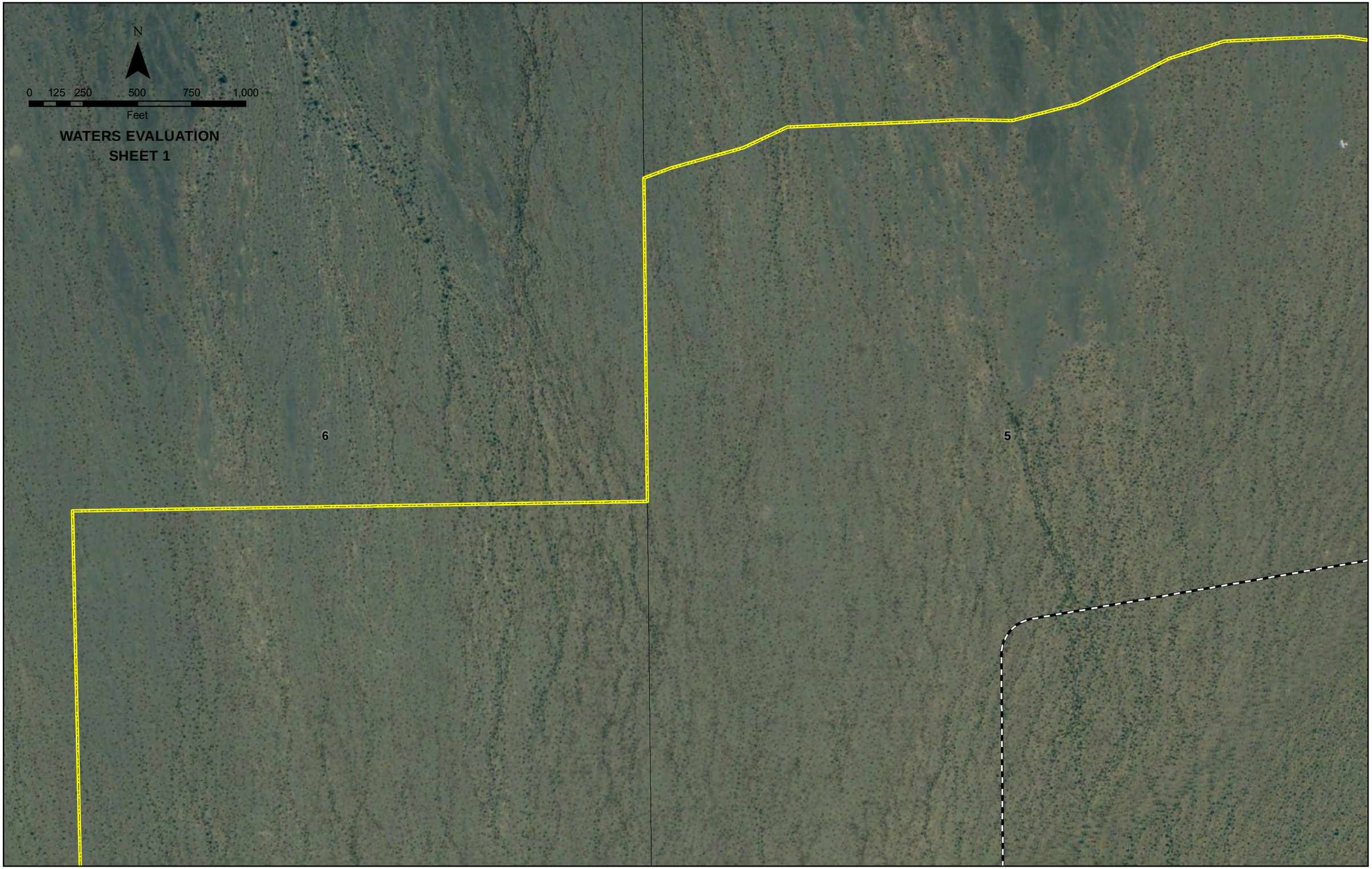

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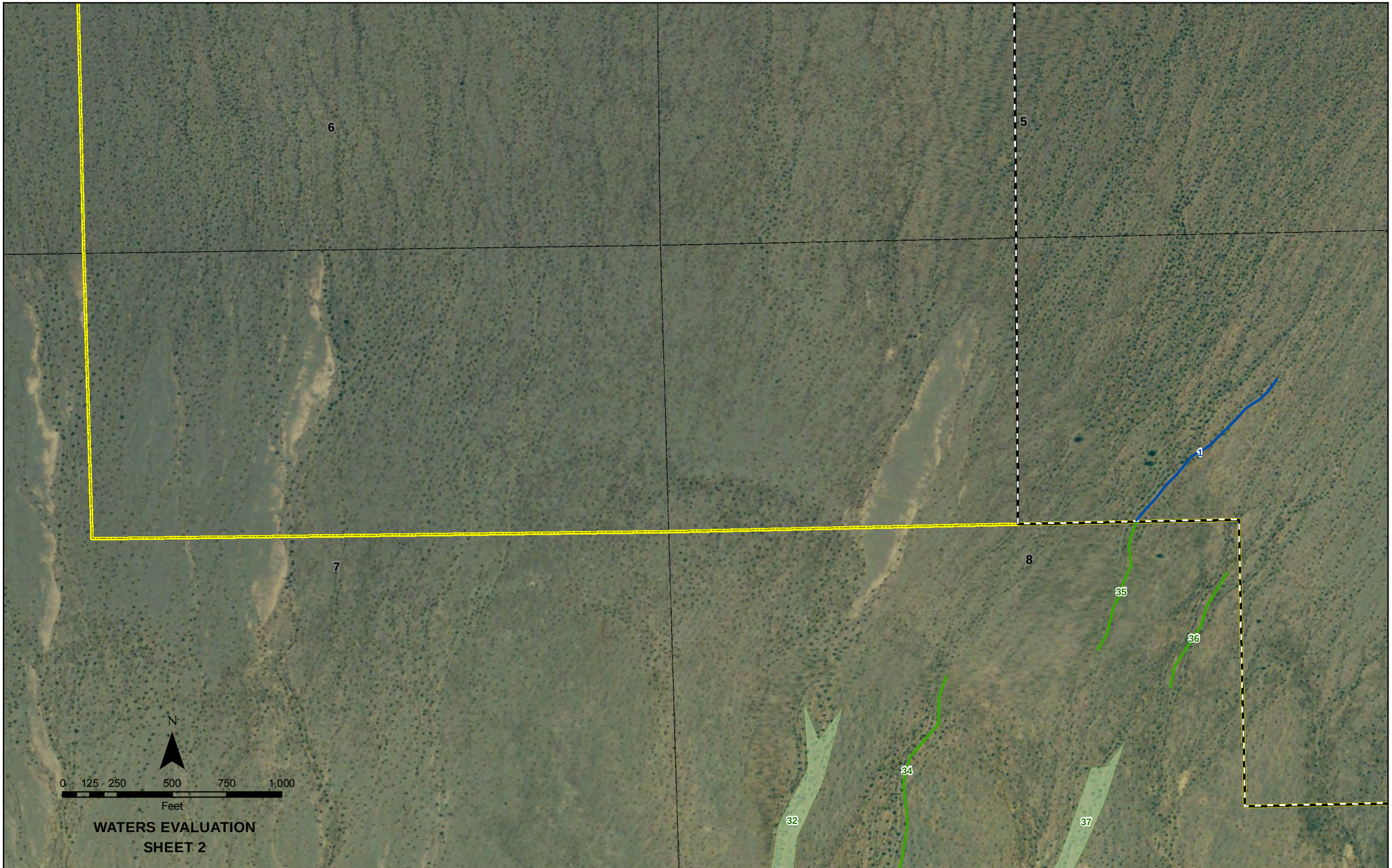

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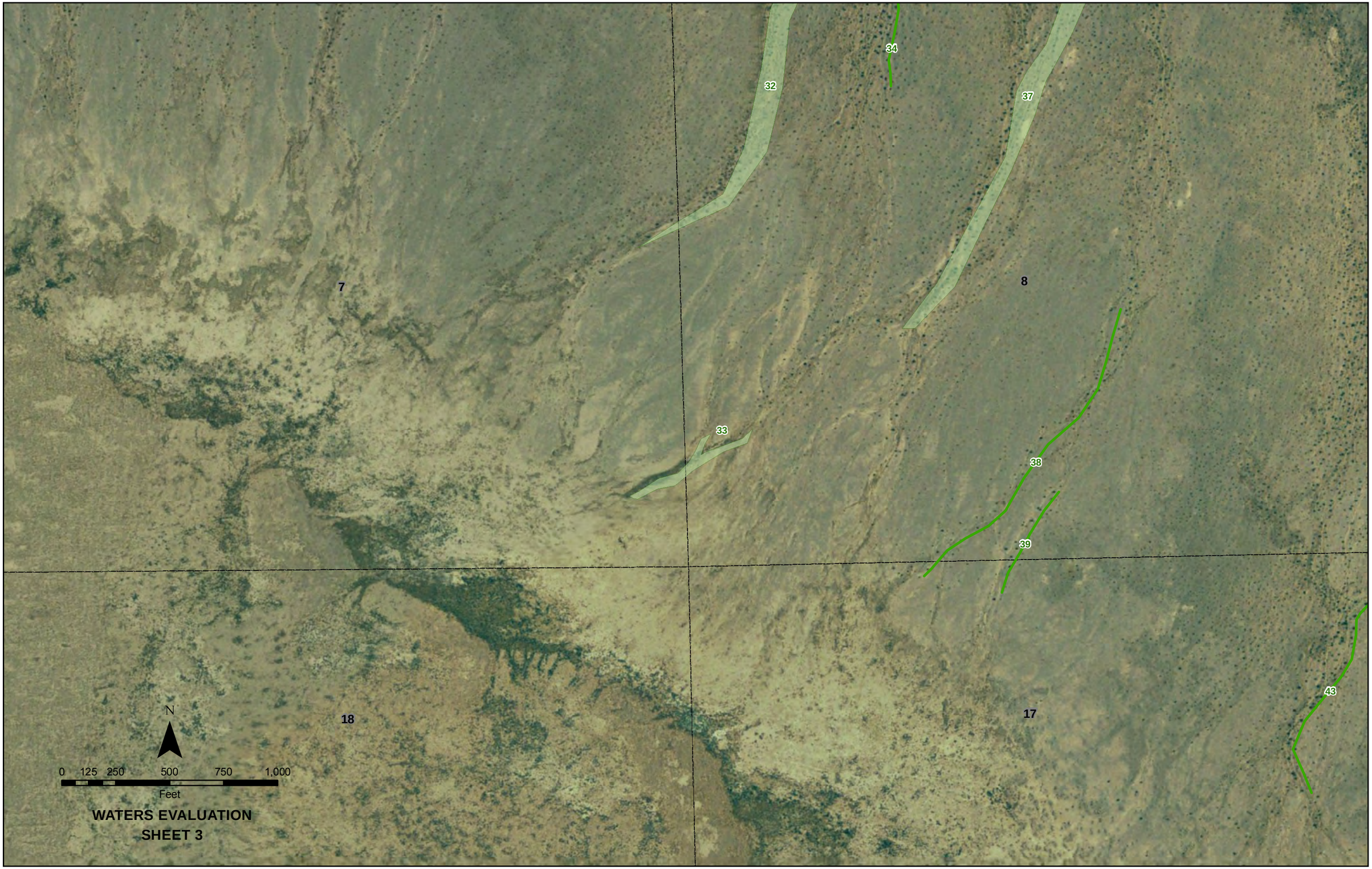

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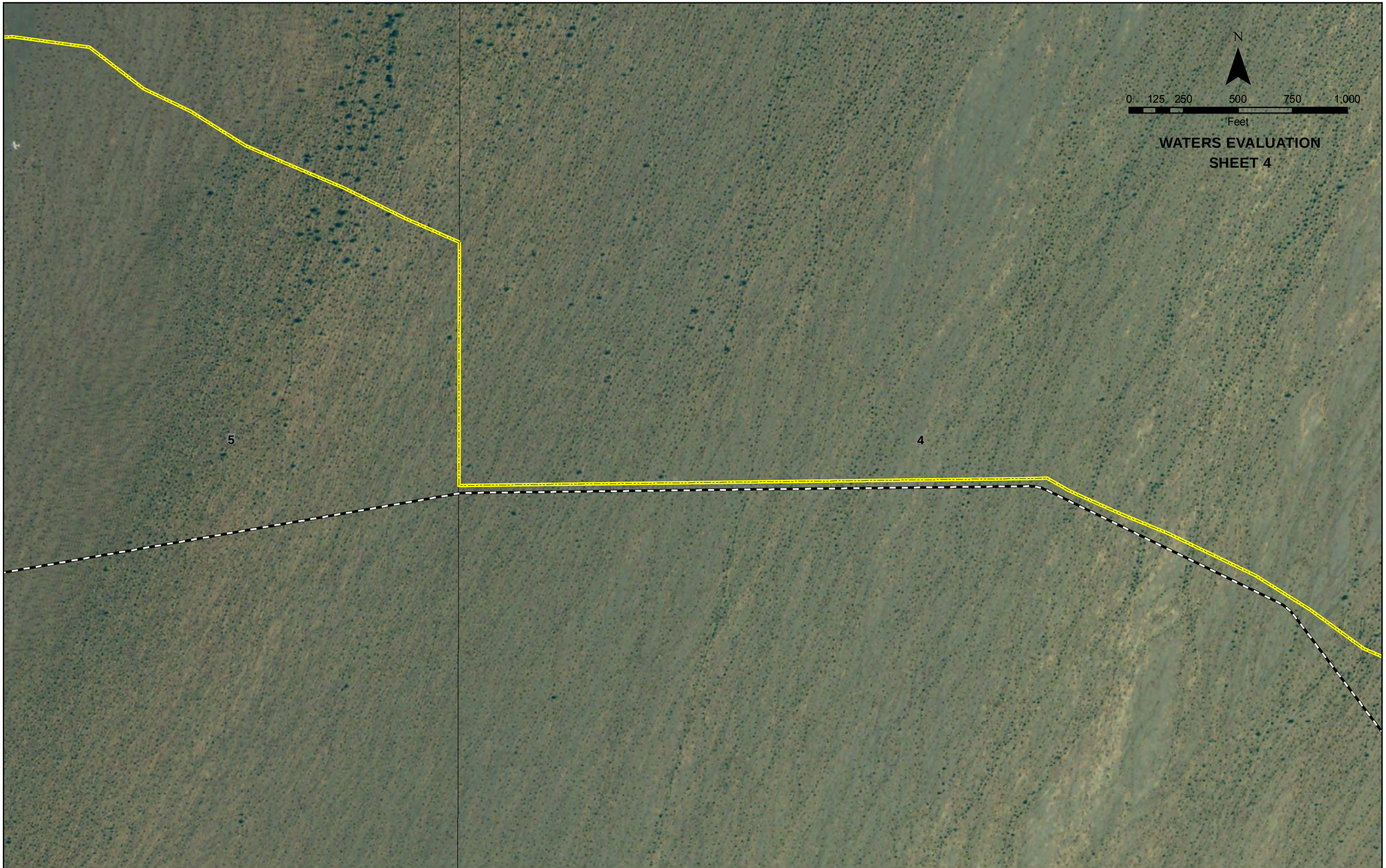

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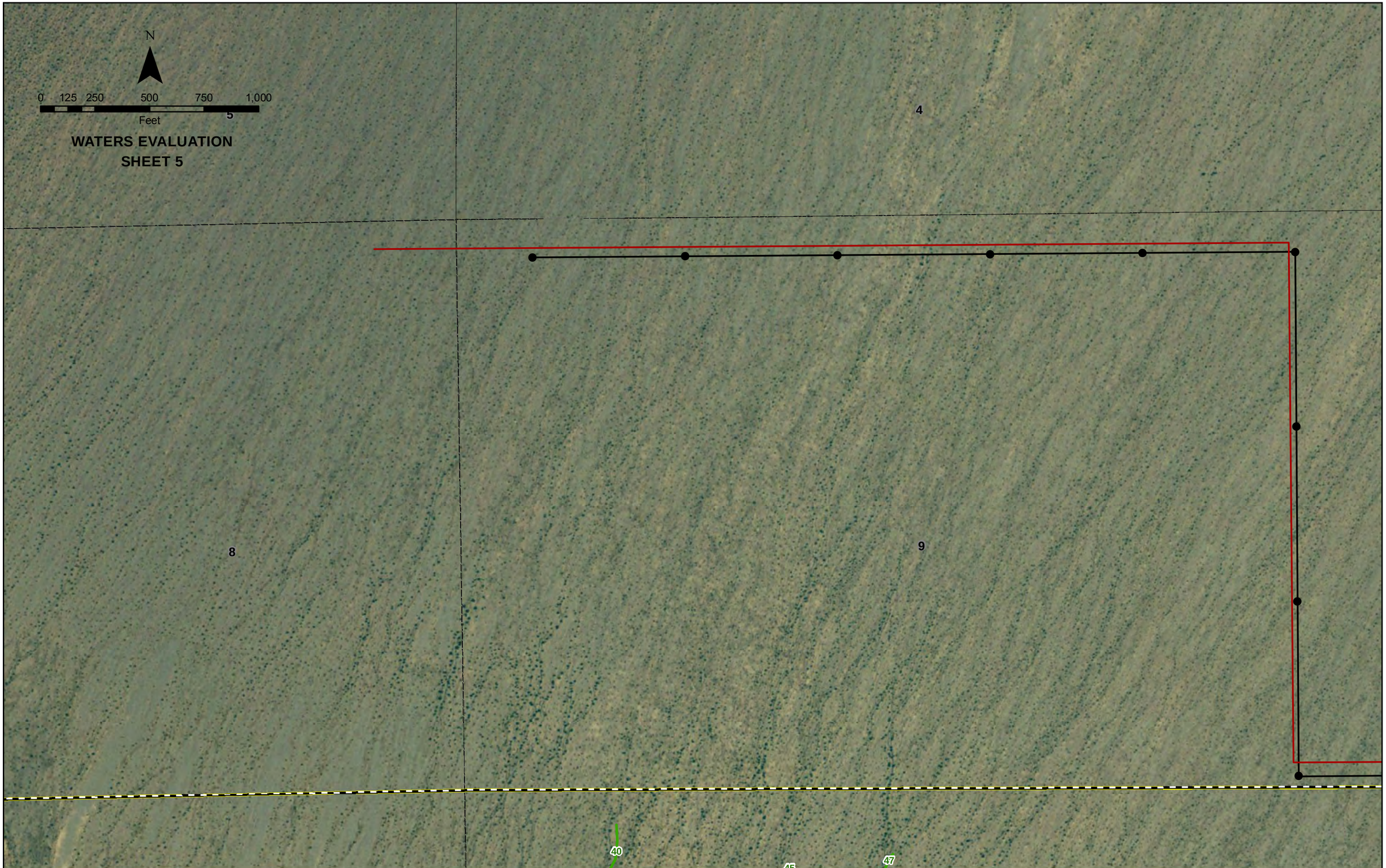

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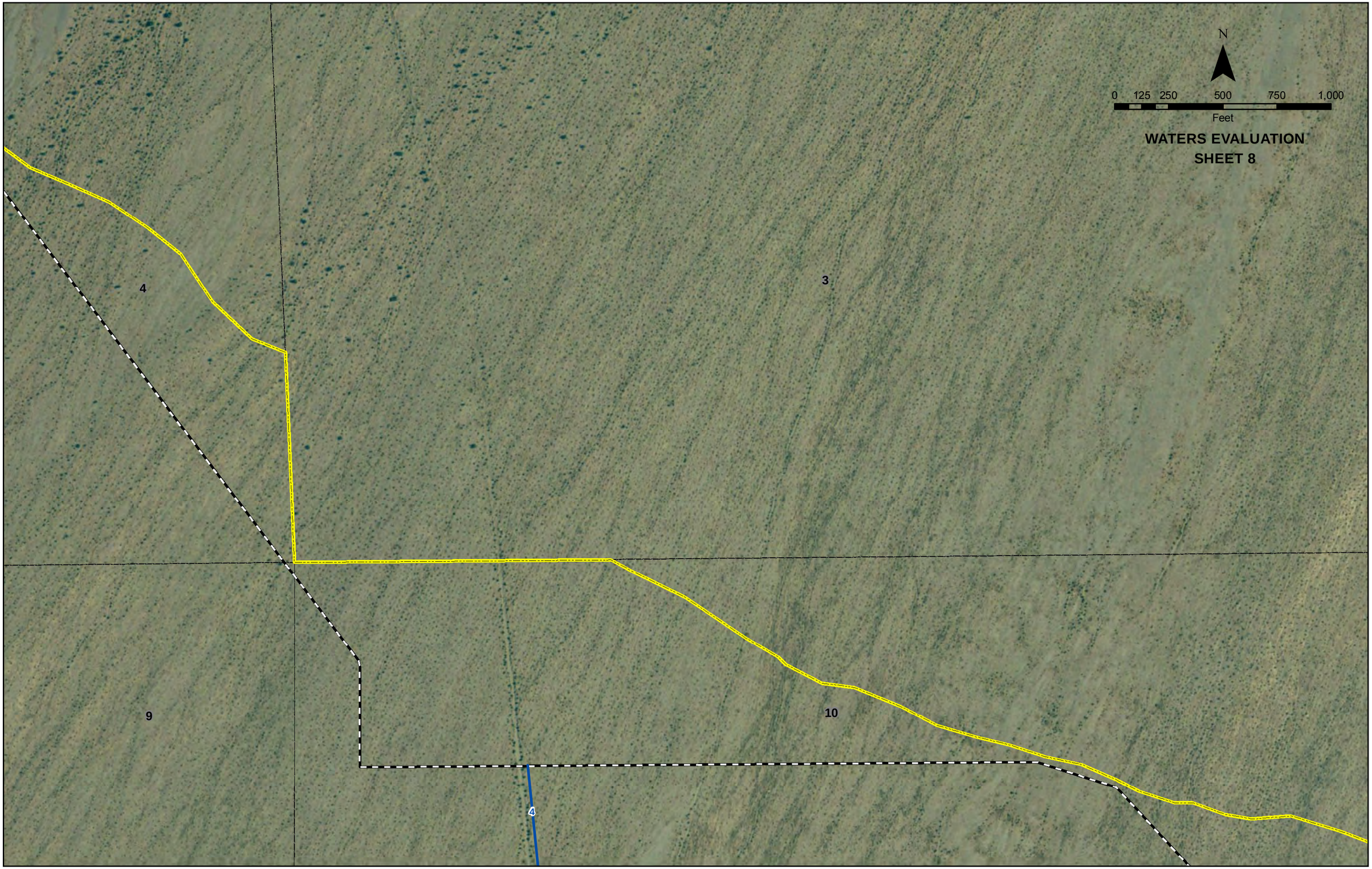

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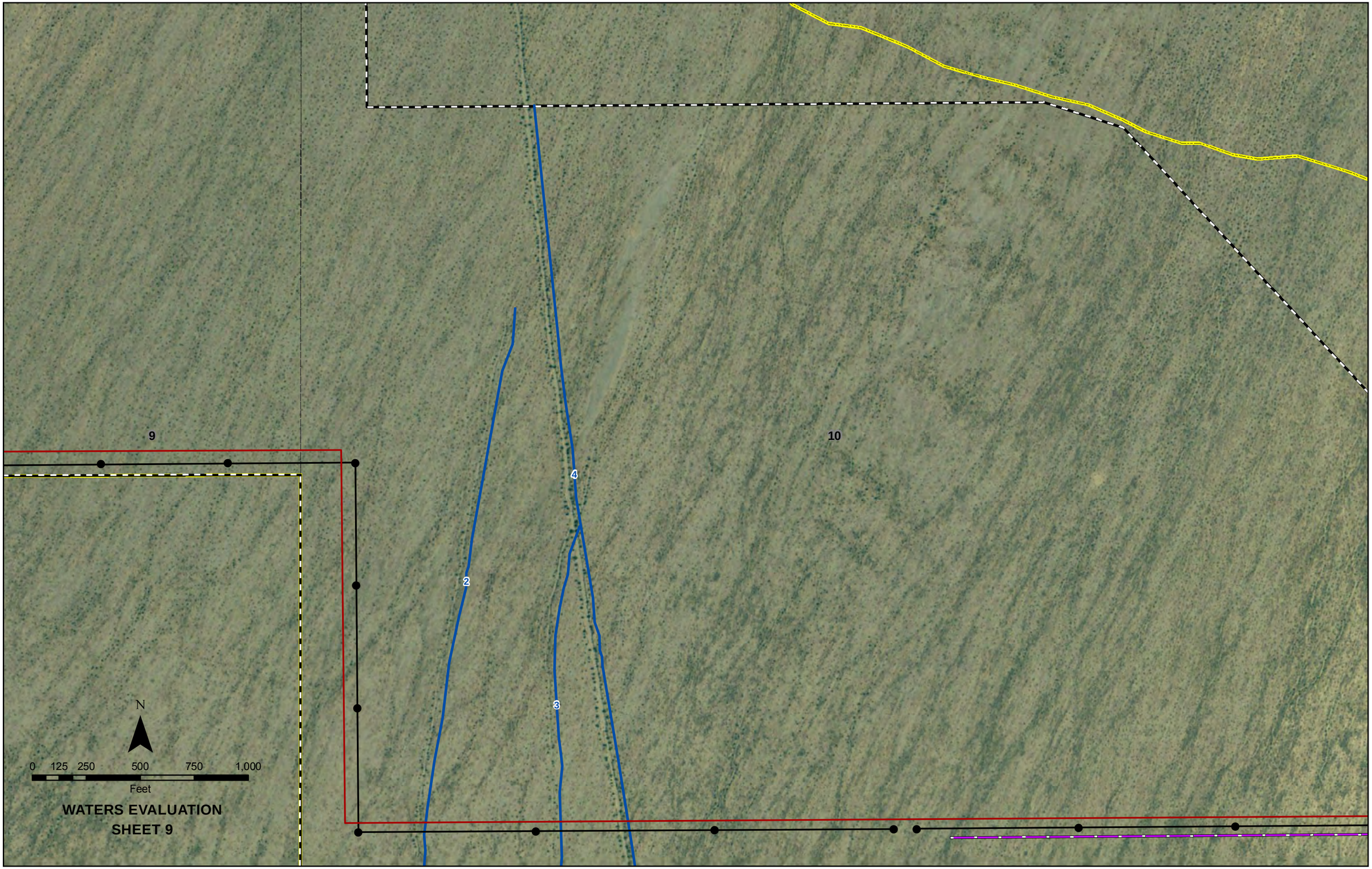

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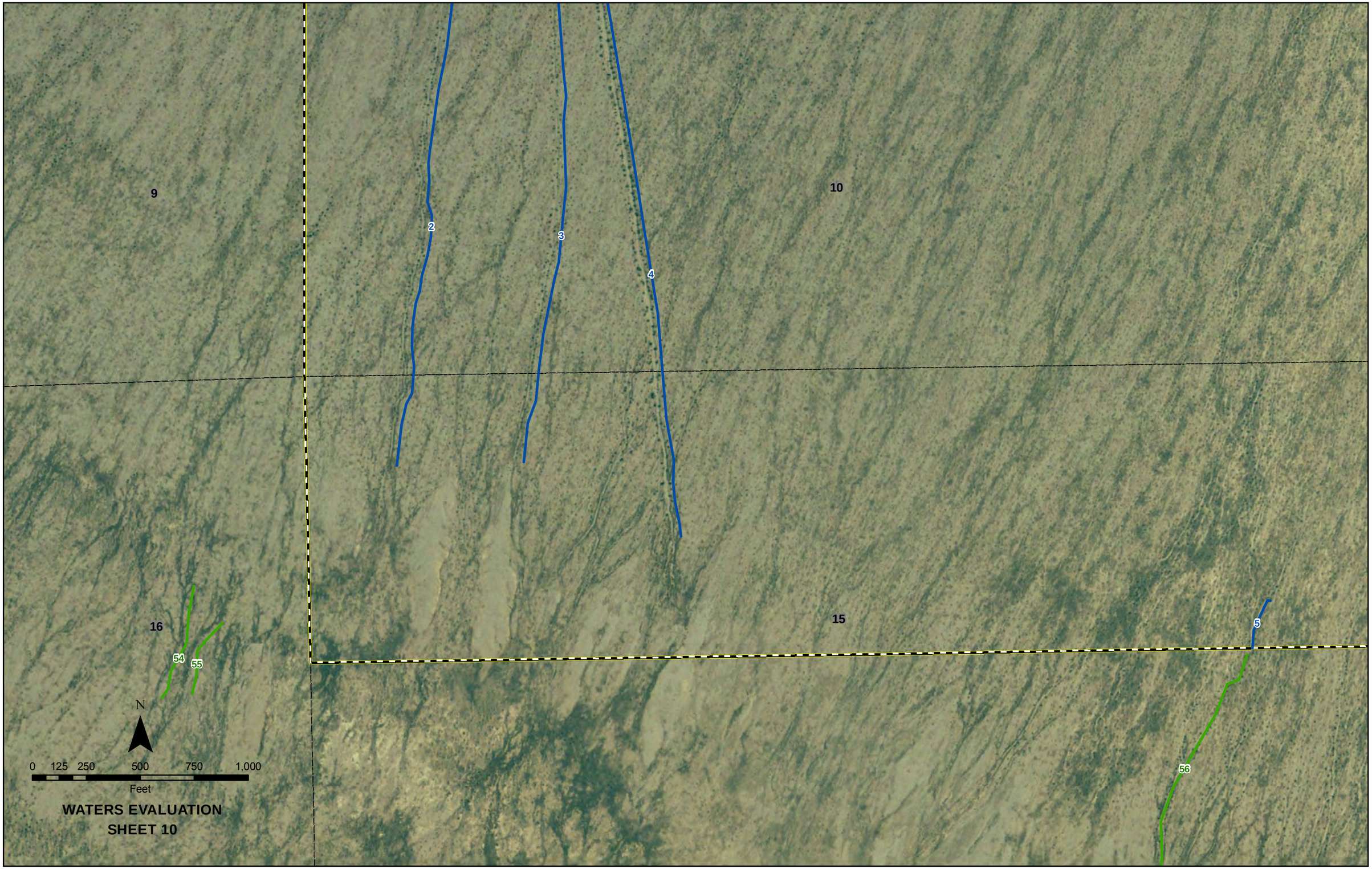

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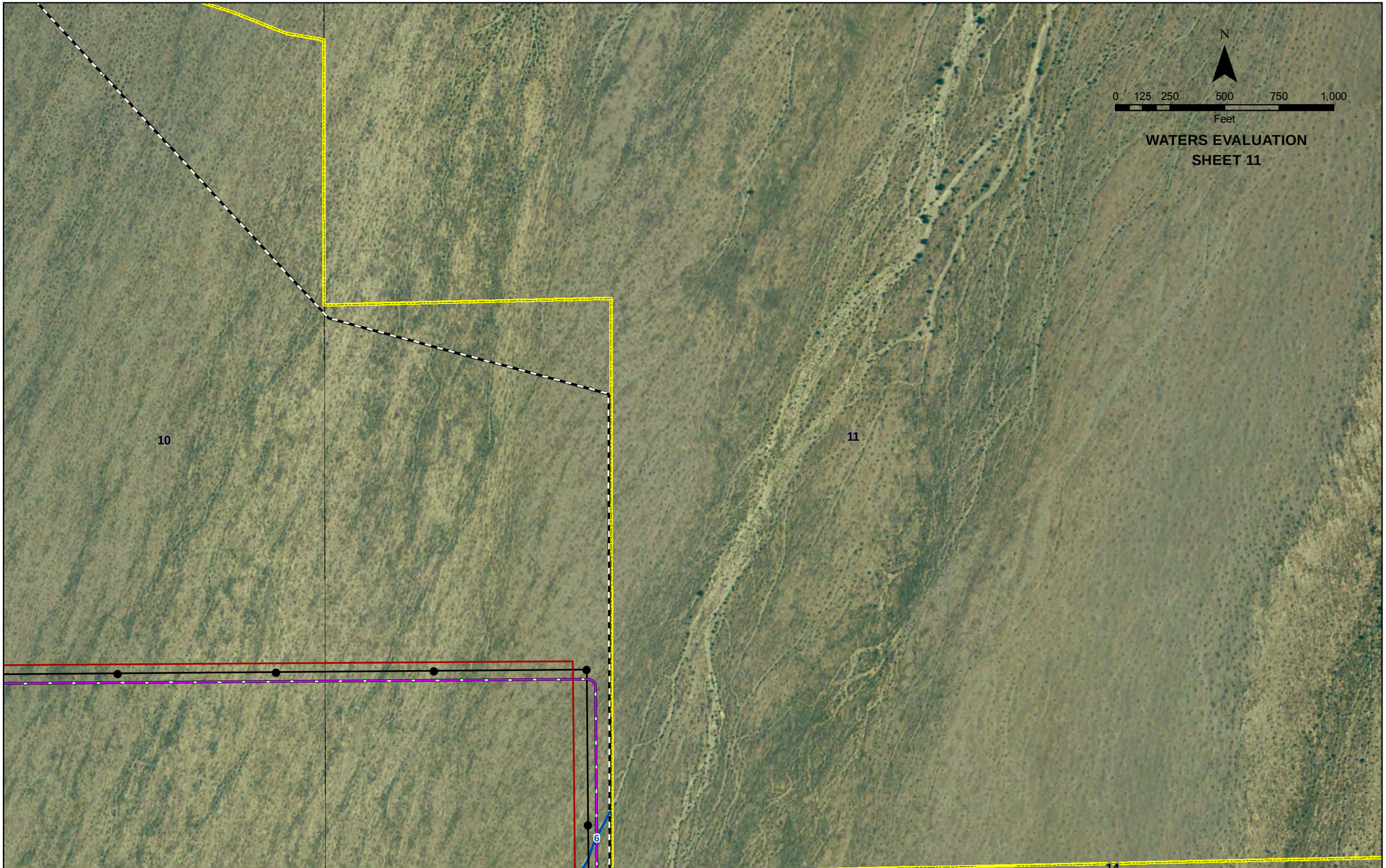

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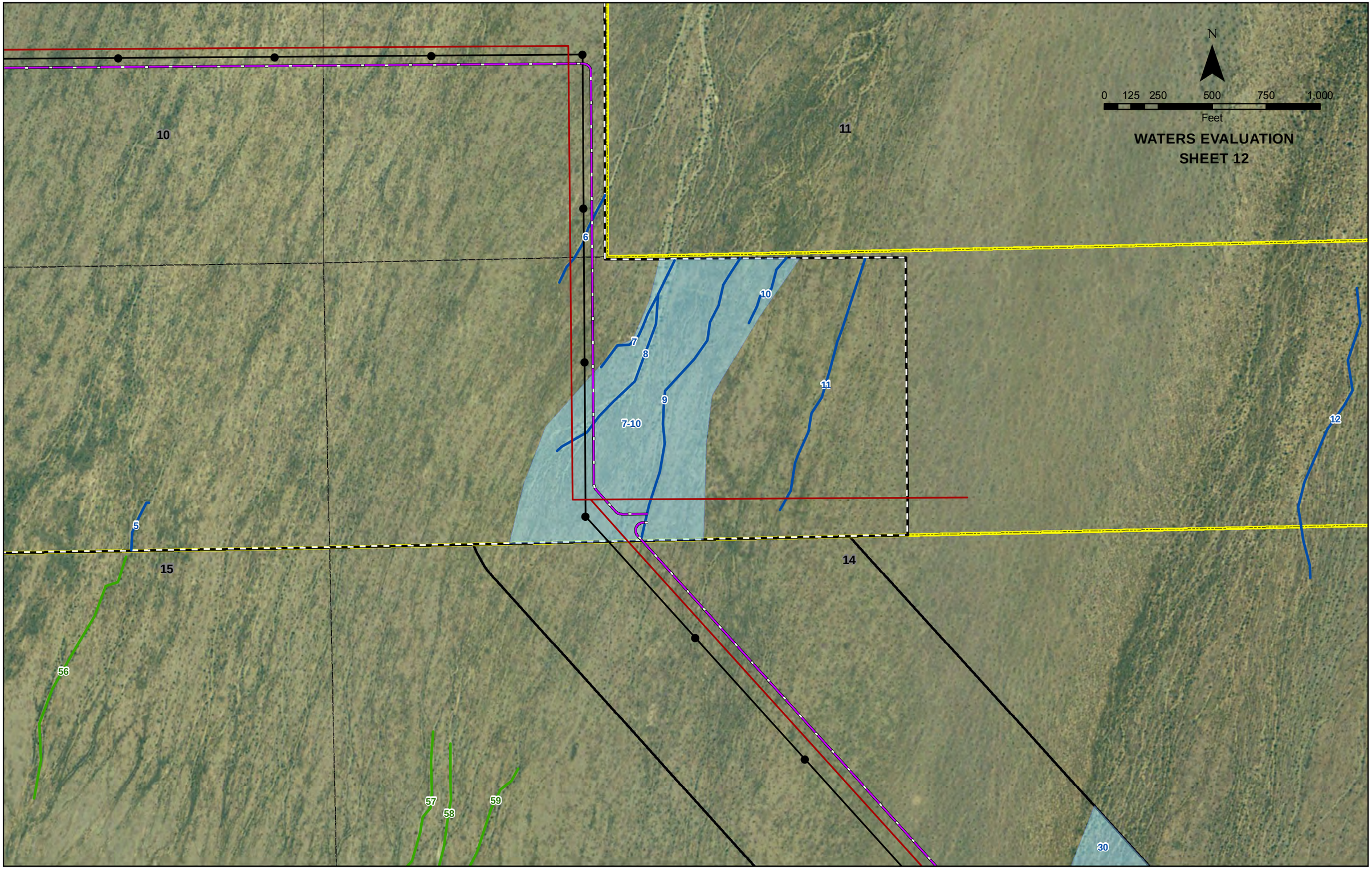

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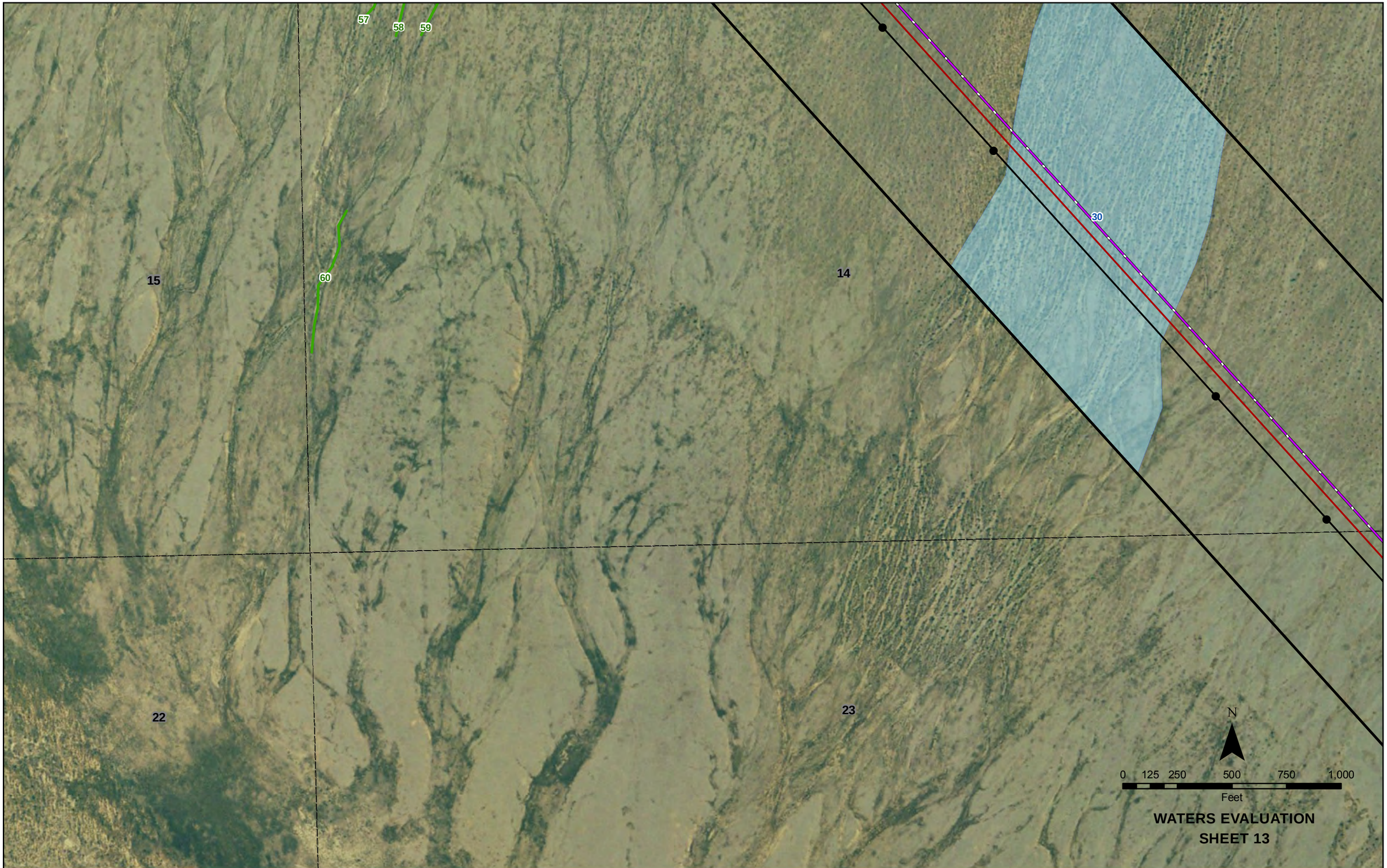

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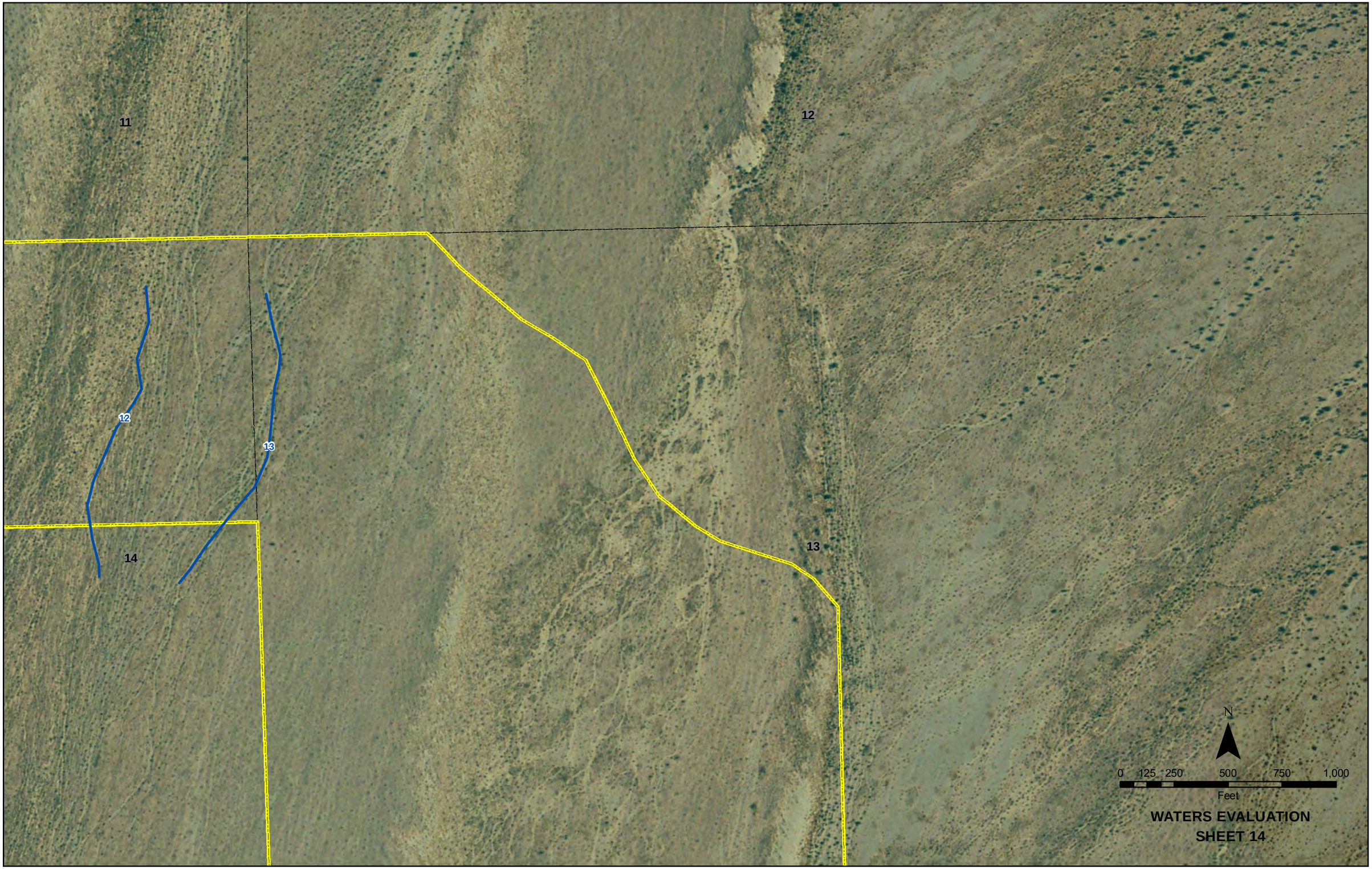

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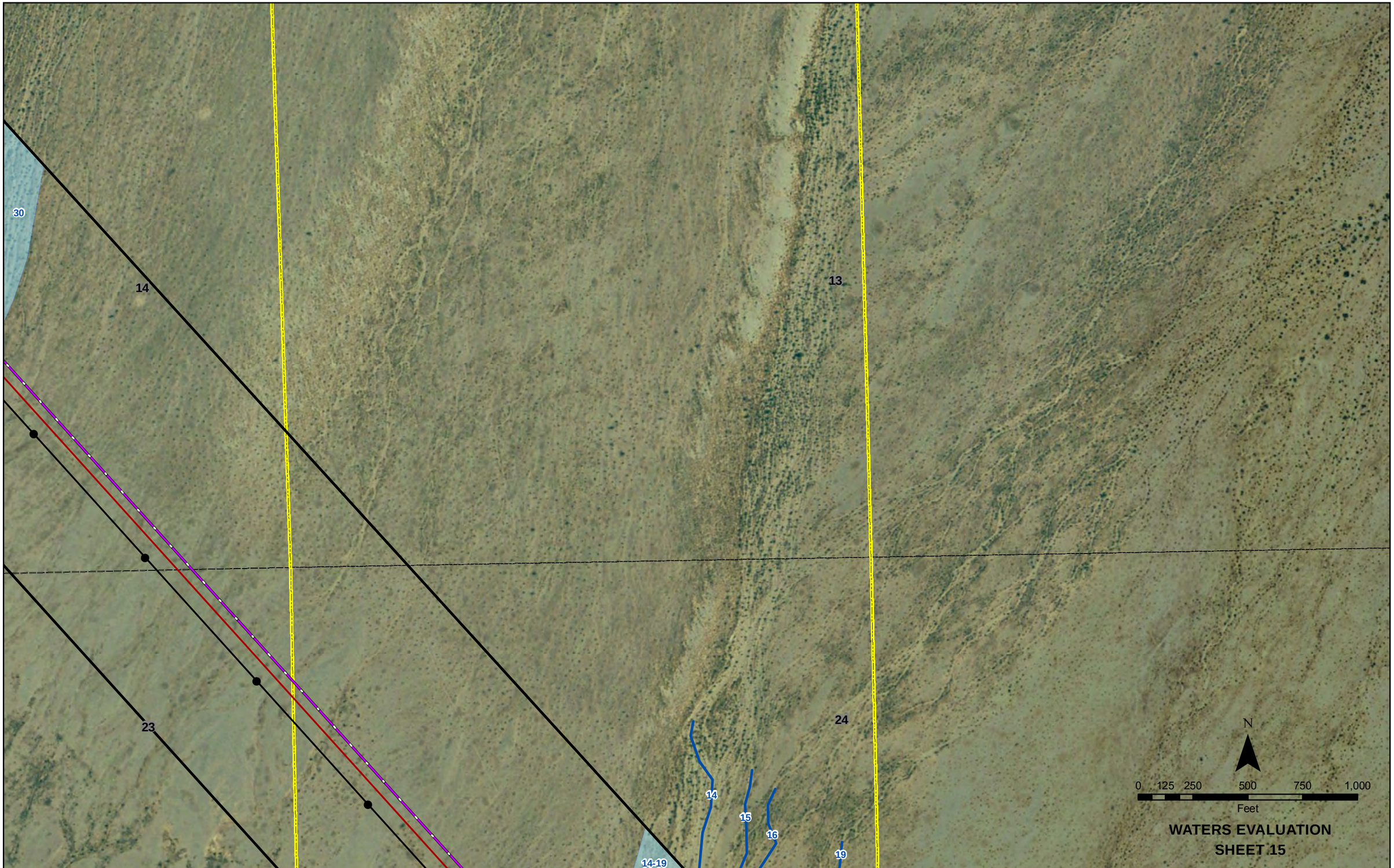

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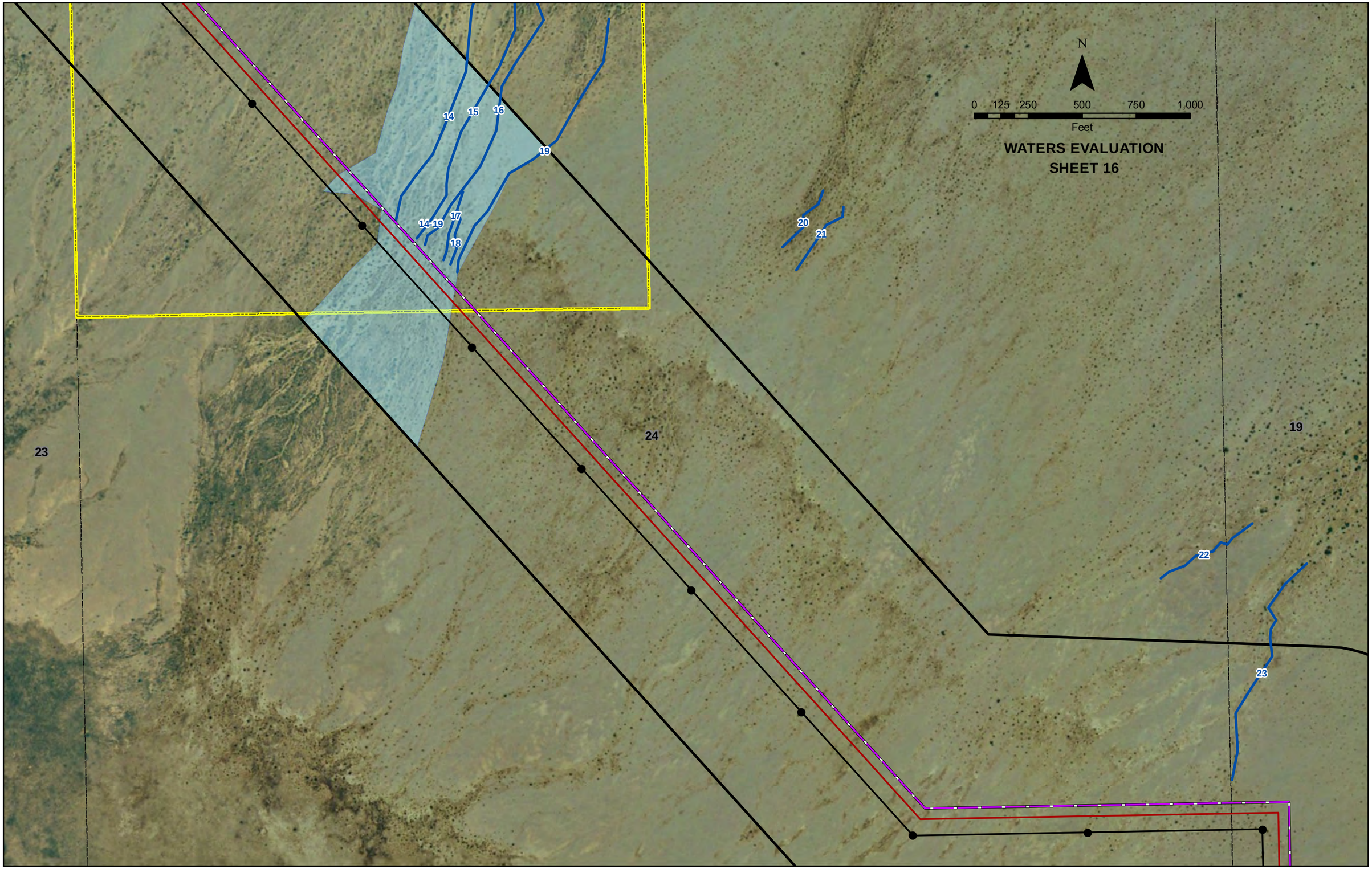

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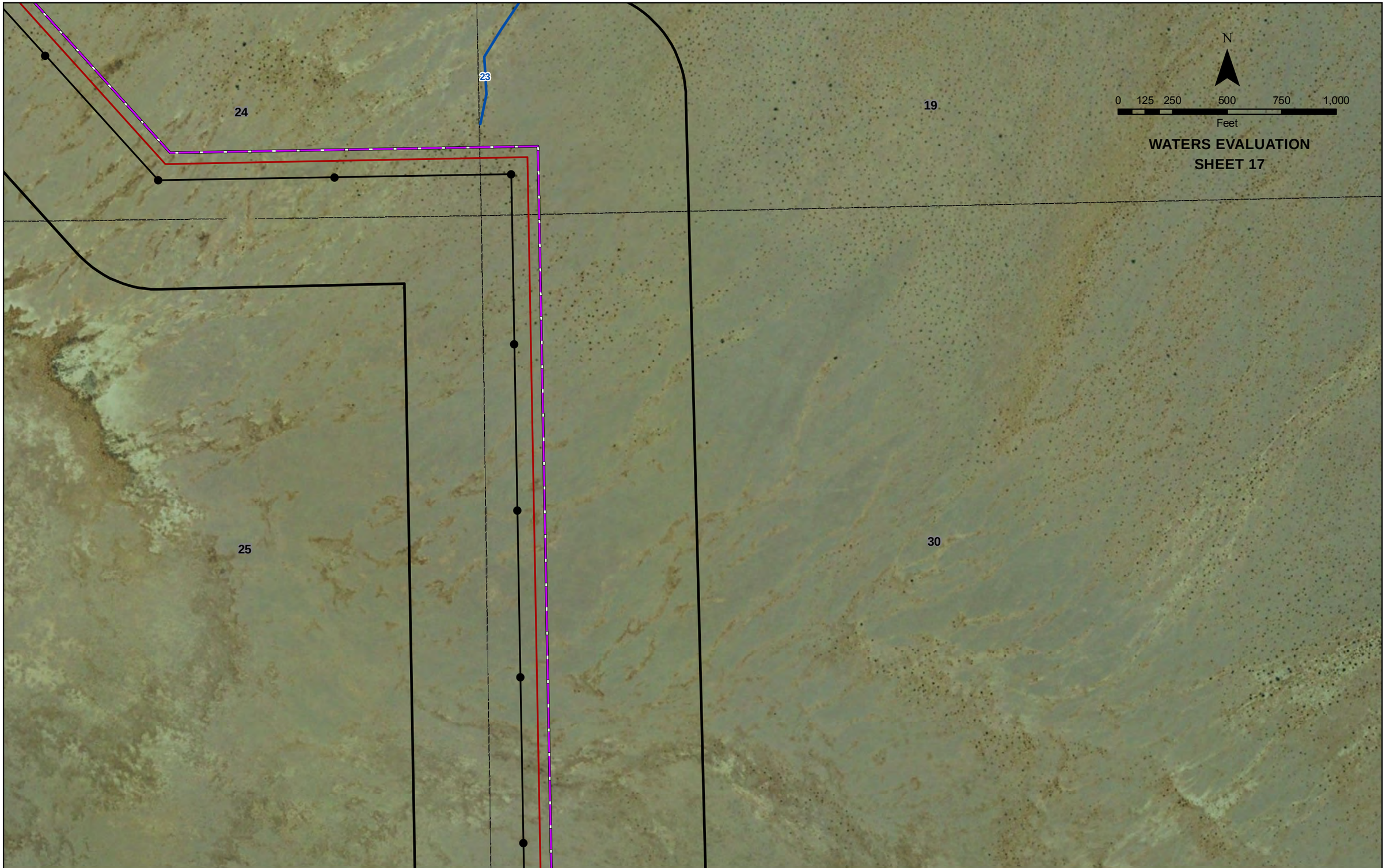

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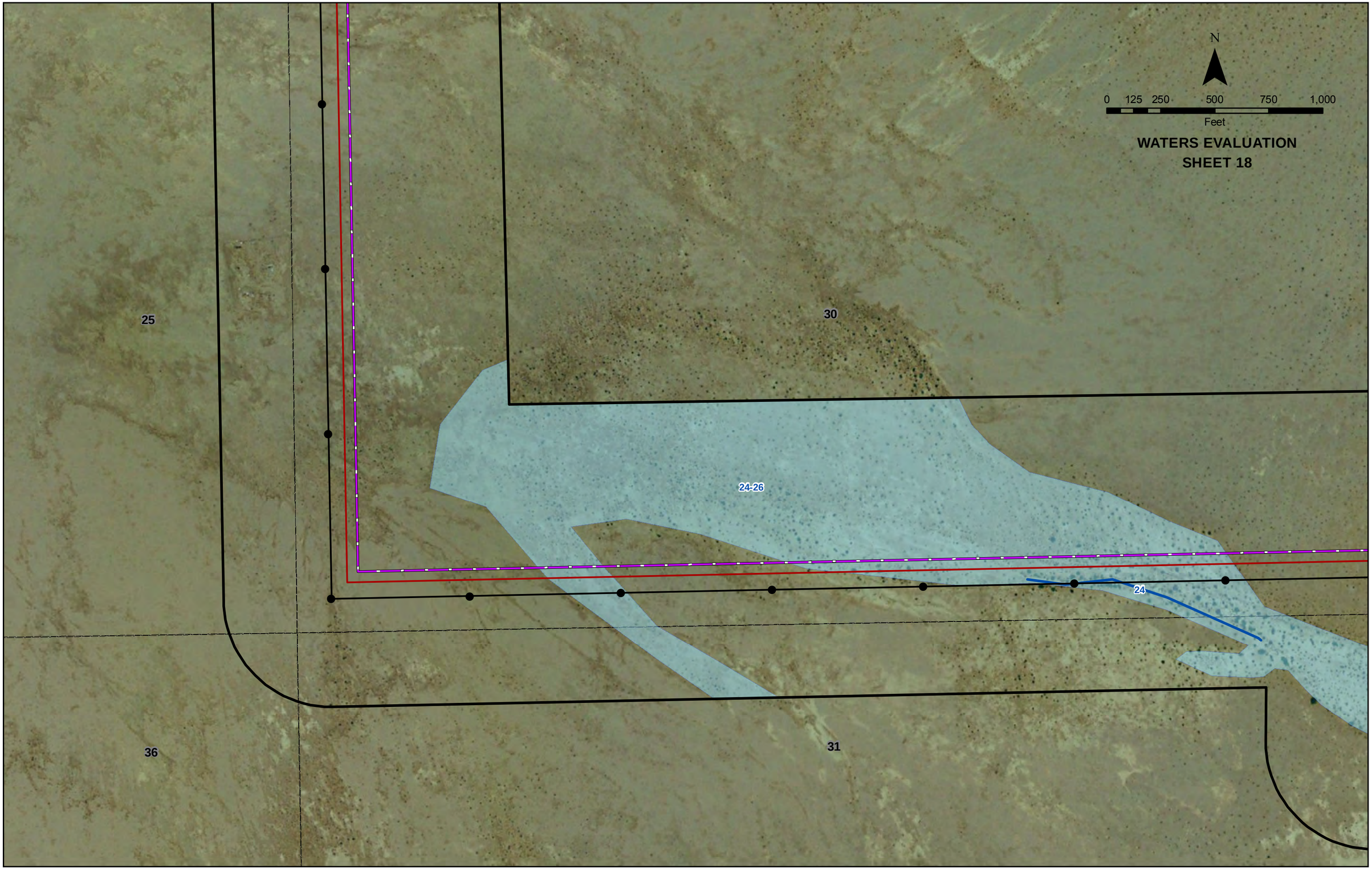

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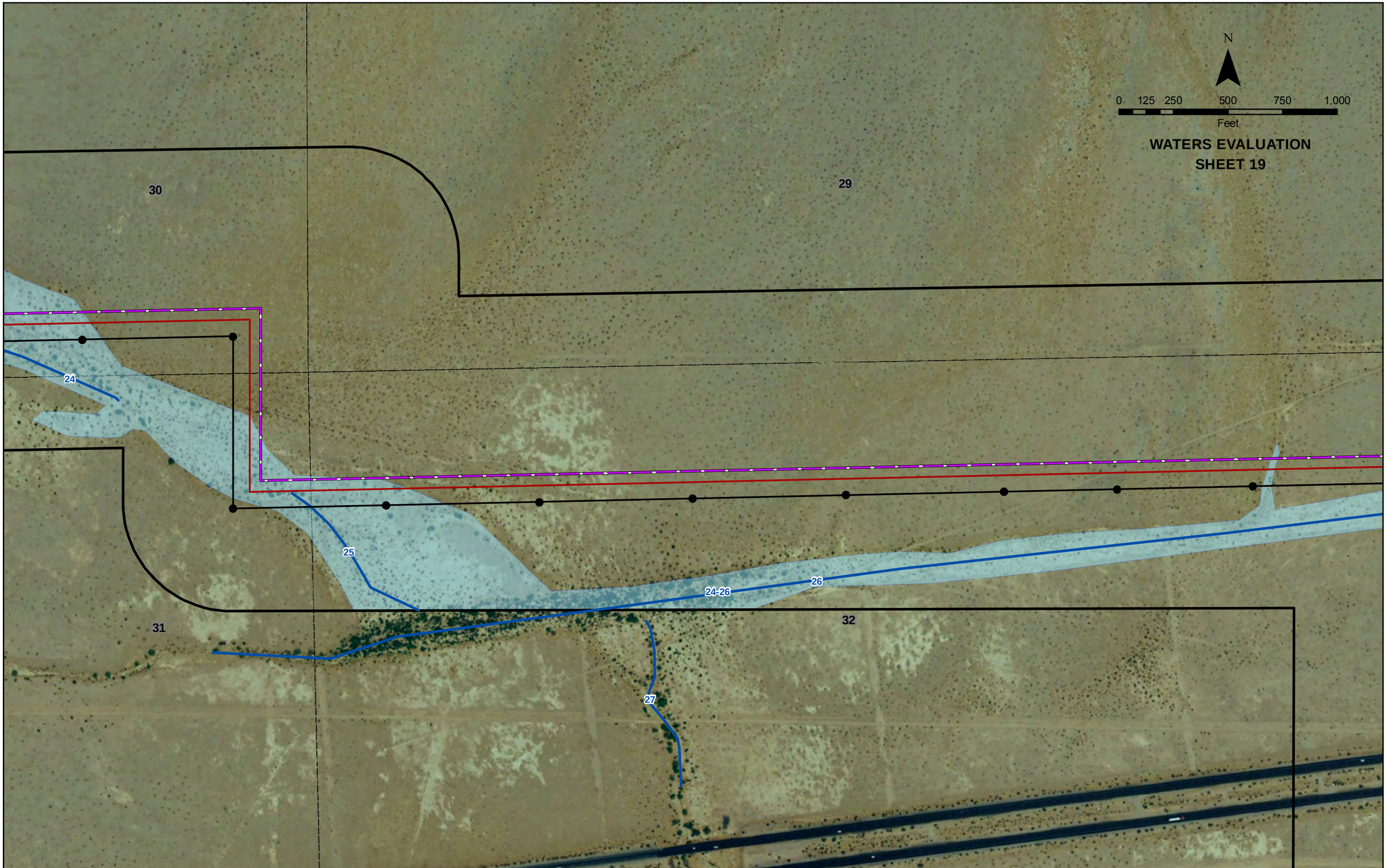

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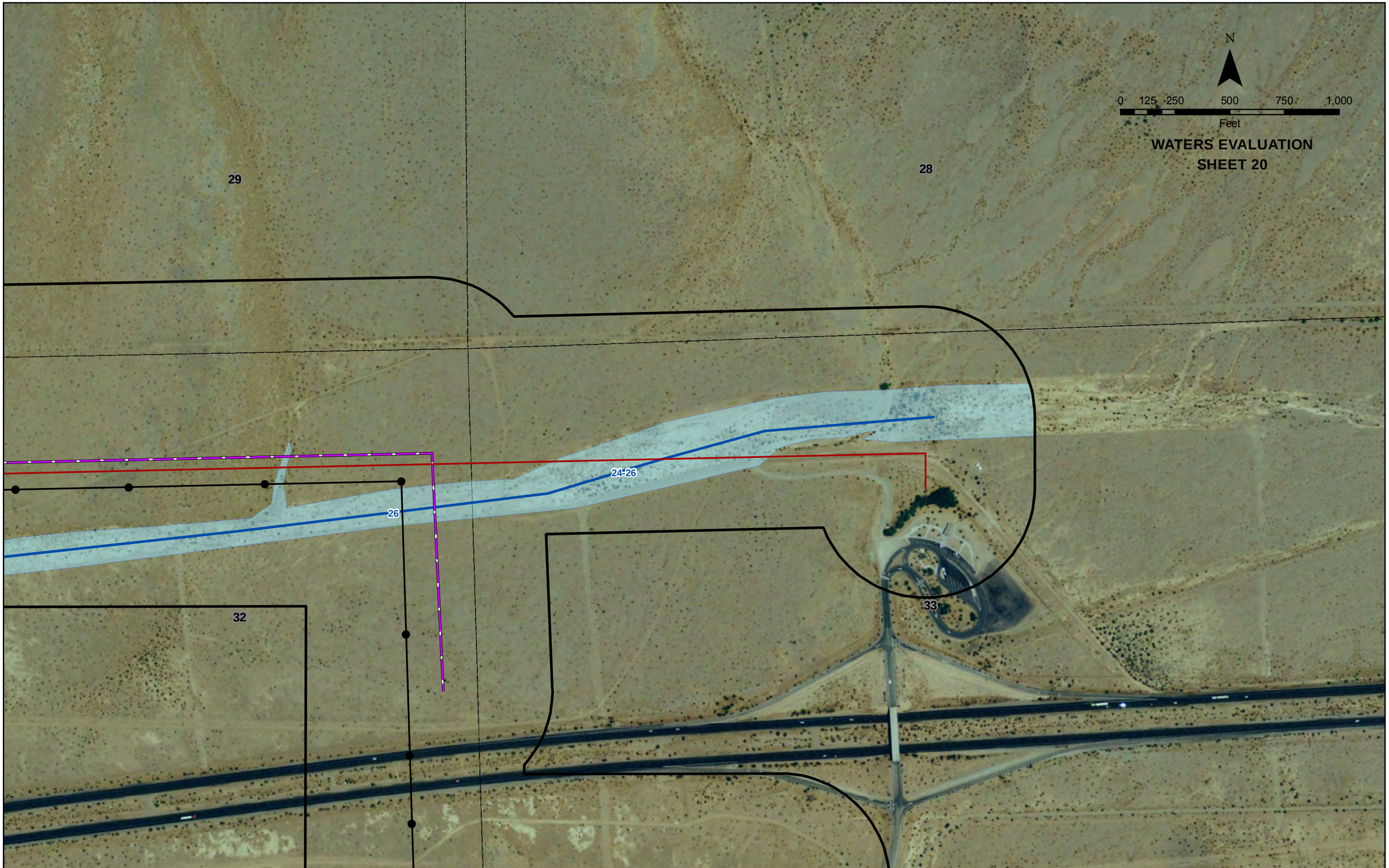

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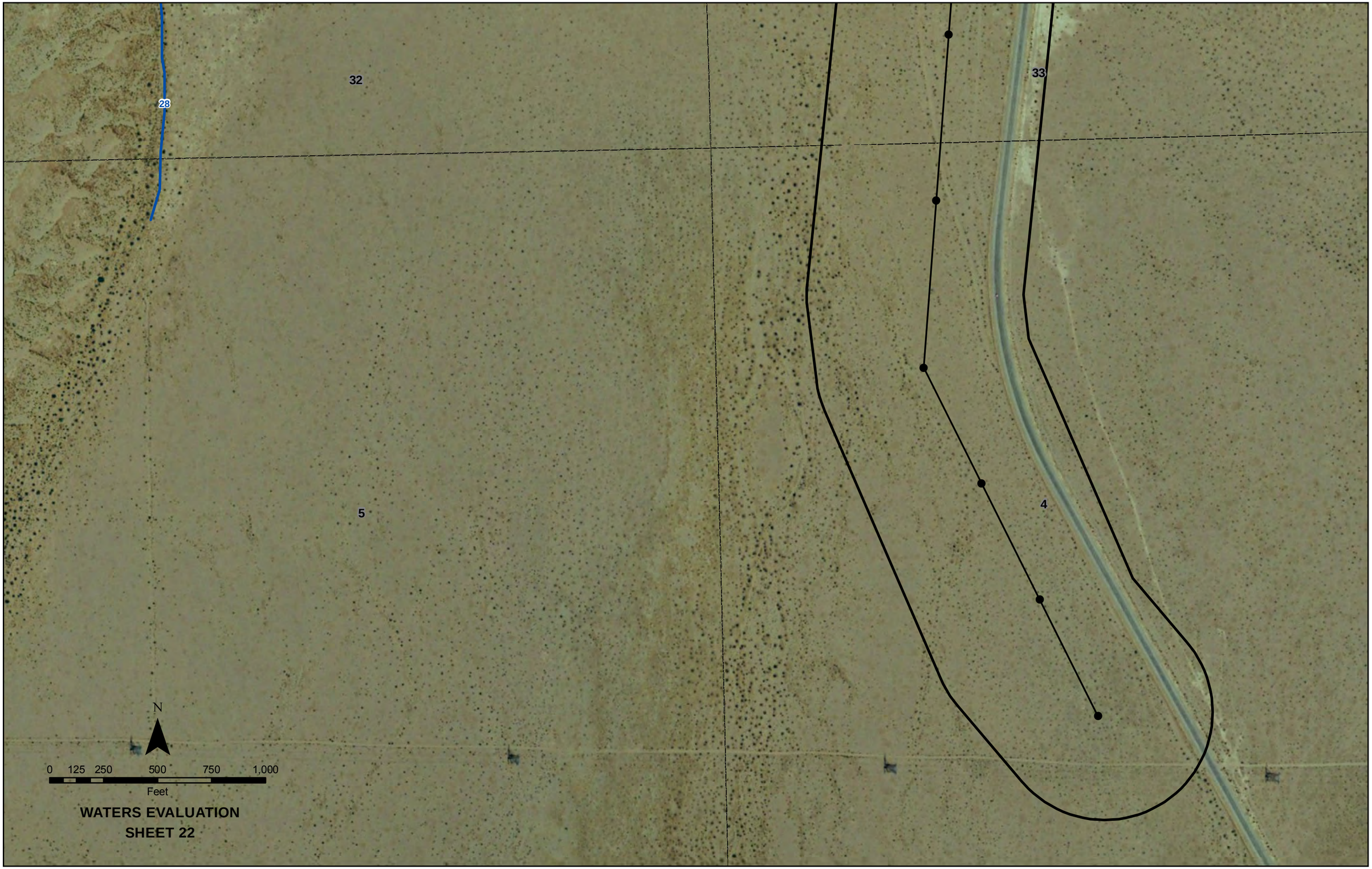

APPENDIX C

FIELD SURVEY DATA

Ephemeral Wash Field Data

Directly Impacted Washes

Map ID	Location	Average Bed Width (ft)	Average Bank Height (in.)	Impact Length (ft)	Impact Area (ft^2)	Acres	Species of 1602 Trees	Number of 1602 Trees	Notes
1	Project Footprint	10	6	909	9090	0.21	IW	2	Verified by field survey
2	Project Footprint	5	6	3886	19430	0.45		0	Verified by field survey
3	Project Footprint	3	6	2879	8637	0.20		0	Verified by field survey
4	Project Footprint	18	6	5388	96984	2.23		0	Verified by field survey; Old road
5	Project Footprint	7	6	214	1498	0.03		0	Verified by field survey
6	Project Footprint	8	6	451	3608	0.08		0	Verified by field survey
7-10	Project Footprint				910840	20.91	IW, PV	1-IW 1- PV	Based on aerial; Contains field verified washes 7-10
11	Project Footprint	3	6	1238	3714	0.09		0	Verified by field survey
12	No Longer in Project Area								No Longer in Project Area; Verified by field survey
13	No Longer in Project Area								No Longer in Project Area; Verified by field survey
14-19	T-Line, Gas Line and Access Road				946994	21.74	IW	1	Based on aerial; Contains field verified washes 14-19
20	No Longer in Project Area								No Longer in Project Area; Verified by field survey
21	No Longer in Project Area								No Longer in Project Area; Verified by field survey
22	No Longer in Project Area								No Longer in Project Area; Verified by field survey
23	T-Line, Gas Line and Access Road	25	12	674	16850	0.39	PV	7	Verified by field survey
24-26	T-Line, Gas Line and Access Road				4599936	105.60	PV	832	Based on aerial; Contains field verified washes 24-26; Tree count based on aerial
27	Now considered Downstream								Now considered downstream; Verified by field survey
28	No Longer in Project Area								No Longer in Project Area;

Map ID	Location	Average Bed Width (ft)	Average Bank Height (in.)	Impact Length (ft)	Impact Area (ft^2)	Acres	Species of 1602 Trees	Number of 1602 Trees	Notes
									Verified by field survey
29	Transmission Line	3	6	90	270	0.01		0	Verified by field survey; Man made from culvert under Wiley Well Rd.
30	T-Line, Gas Line and Access Road				1579486	36.26		0	Based on aerial, no field verification
31	Transmission Line				252648	5.80	HM	50	Based on aerial, no field verification
					Total	**188.18**		**1162**	

APPENDIX D

DOWNSTREAM WASH DATA

Downstream Washes

Map ID	Location	Average Bed Width (ft)	Average Bank Height (in.)	Length (ft)	Area (ft^2)	Acres	Species of 1602 Trees	Number of 1602 Trees	Notes
27	Downstream of Linears	20	18	807	16140	0.37	PV	28	Verified by field survey
32	Downstream of Footprint				160300.8	3.68		0	Based on aerial, no field verification
33	Downstream of Footprint				26136	0.6		0	Based on aerial, no field verification
34	Downstream of Footprint	5	--	1098	5490	0.13		0	Based on aerial, no field verification
35	Downstream of Footprint	10	--	619	6190	0.14		0	Based on aerial, no field verification
36	Downstream of Footprint	4	--	589	2356	0.05		0	Based on aerial, no field verification
37	Downstream of Footprint				162914.4	3.74		0	Based on aerial, no field verification
38	Downstream of Footprint	3	--	1586	4758	0.11		0	Based on aerial, no field verification
39	Downstream of Footprint	5	--	538	2690	0.06		0	Based on aerial, no field verification
40	Downstream of Footprint	3	--	654	1962	0.05		0	Based on aerial, no field verification
41	Downstream of Footprint	5	--	515	2575	0.06		0	Based on aerial, no field verification
42	Downstream of Footprint	4	--	686	2744	0.06		0	Based on aerial, no field verification
43	Downstream of Footprint	4	--	1405	5620	0.13		0	Based on aerial, no field verification
44	Downstream of Footprint				160300.8	3.68		0	Based on aerial, no field verification
45	Downstream of Footprint	3	--	516	1548	0.04		0	Based on aerial, no field verification
46	Downstream of Footprint	3	--	518	1554	0.04		0	Based on aerial, no field verification
47	Downstream of Footprint	3	--	1672	5016	0.12		0	Based on aerial, no field verification
48	Downstream of Footprint	3	--	1898	5694	0.13		0	Based on aerial, no field verification
49	Downstream of Footprint	3	--	1068	3204	0.07		0	Based on aerial, no field verification
50	Downstream of Footprint	3	--	634	1902	0.04		0	Based on aerial, no field verification
51	Downstream of Footprint	4	--	508	2032	0.05		0	Based on aerial, no field verification
52	Downstream of Footprint				320166	7.35		0	Based on aerial, no field verification
53	Downstream of Footprint	3	--	739	2217	0.05		0	Based on aerial, no field verification
54	Downstream of Footprint	3	--	550	1650	0.04		0	Based on aerial, no field verification
55	Downstream of Footprint	3	--	373	1119	0.03		0	Based on aerial, no field verification
56	Downstream of Footprint	7	--	1242	8694	0.20		0	Based on aerial, no field verification
57	Downstream of Footprint	5	--	717	3585	0.08		0	Based on aerial, no field verification
58	Downstream of Footprint	5	--	685	3425	0.08		0	Based on aerial, no field verification
59	Downstream of Footprint	4	--	632	2528	0.06		0	Based on aerial, no field verification
60	Downstream of Footprint	4	--	688	2752	0.06		0	Based on aerial, no field verification
					Total	**20.92**		**0**	

APPENDIX E

PHOTOGRAPH LOG

Wash 1

Wash 2

Wash 3

Wash 4 (Old Road)

Wash 5

Wash 6

Wash 7

Wash 8

Wash 9

Wash 10

Wash 11

Wash 12

Wash 13

Wash 14

Wash 15

Wash 16

Wash 17

Wash 18

Wash 19

Wash 20

Wash 21

Wash 22

Wash 23

Wash 24

Wash 25

Wash 26

Wash 27

Wash 28

Wash 29

No Data Collected

No Data Collected

No Data Collected

No Data Collected

No Data Collected

No Data Collected

ATTACHMENT 3

SITE MAPS ILLUSTRATING ASSESSOR'S PARCEL NUMBERS

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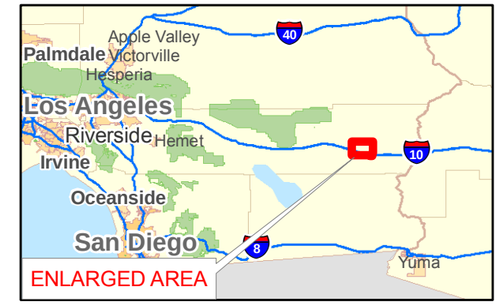
GENESIS SOLAR, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY, CALIFORNIA



Legend

- Proposed Access Road
- Proposed Gas Line
- Proposed Interconnect
- Blythe Energy Project Transmission Line
- Project Site
- Facility Footprint
- Proposed Transmission Interconnection 300' Buffer
- APN Lines

N

0 0.5 1 1.5 2
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, Riverside County, TTEC

PROPOSED PROJECT SITE LAND OWNERSHIP

TETRA TECH EC, INC.

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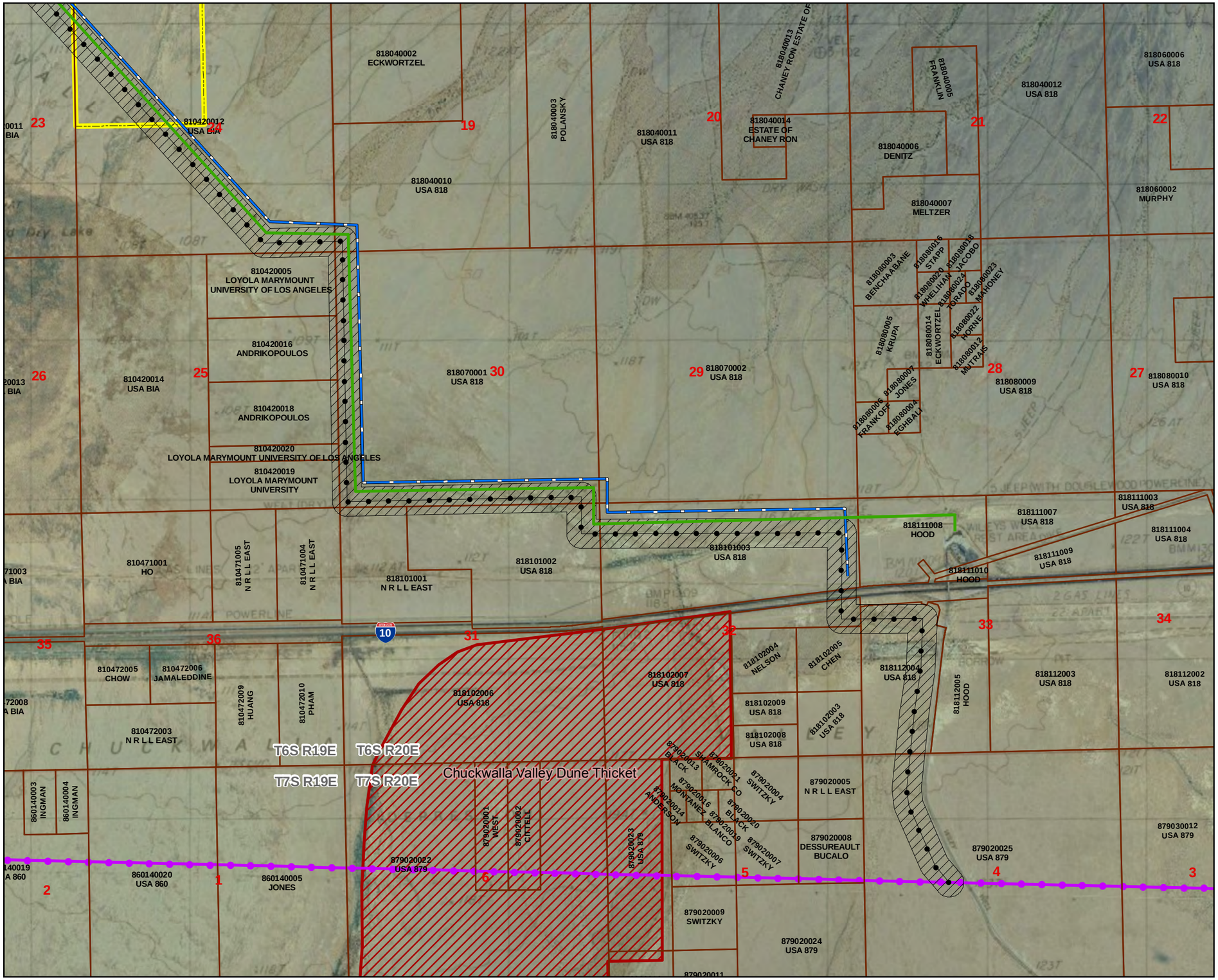
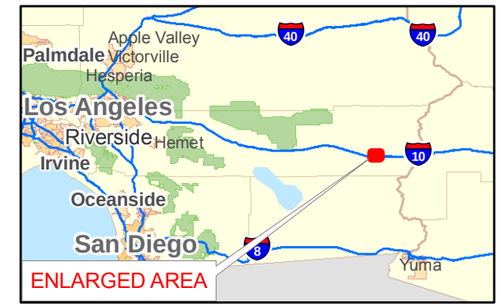


GENESIS SOLAR, LLC

GENESIS SOLAR ENERGY PROJECT
RIVERSIDE COUNTY, CALIFORNIA



Legend

- Proposed Access Road
- Proposed Gas Line
- Proposed Interconnect
- Blythe Energy Project Transmission Line
- Project Site
- Proposed Transmission Interconnection 300' Buffer
- APN Lines
- Area of Critical Environmental Concern

N

0 0.25 0.5 0.75 1
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, Riverside County, TTEC

PROPOSED LINEAR ROUTE LAND OWNERSHIP

TETRA TECH EC, INC.

ATTACHMENT 4

DRAINAGE, EROSION, AND SEDIMENT CONTROL PLAN
(AFC APPENDIX A)

WorleyParsons

resources & energy

GENESIS SOLAR, LLC

GENESIS SOLAR ENERGY PROJECT

DRAINAGE, EROSION AND SEDIMENT CONTROL PLAN

19 August 2009

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GENESIS SOLAR LLC
GENESIS SOLAR ENERGY PROJECT
DRAINAGE, EROSION AND SEDIMENT CONTROL PLAN

GENESIS SOLAR ENERGY PROJECT

REV	DESCRIPTION	ORIG	REVIEW	WORLEY-PARSONS APPROVAL	DATE	CLIENT APPROVAL	DATE
1	Issued for UseAs Draft	J Forrest	B Anders	J Foster	19-Aug–09	N/A	

CONTENTS

1. INTRODUCTION 4
2. PURPOSE 4
3. CONCEPTUAL DRAINAGE STUDY 4
4. STORMWATER POLLUTION PREVENTION PLAN 6
5. GEOMORPHOLOGY STUDY 7
6. WATER QUALITY OBJECTIVES 8
7. OPERATIONAL BEST MANAGEMENT PRACTICES 9
8. REFERENCES 13

APPENDICIES

APPENDIX A: CONCEPTUAL DRAINAGE STUDY

APPENDIX B: STORMWATER POLLUTION PREVENTION PLAN

1. INTRODUCTION

Genesis Solar, LLC, is proposing a Solar Thermal Power Generating Project to be built near Ford Dry Lake in Riverside County, State of California. The Project site will be located in the Colorado Desert between the communities of Blythe, CA (approximately 24 miles east) and Desert Center, CA (approximately 27 miles west).

The Project site covers approximately 1,800 acres of Federal land managed by the Bureau of Land Management (BLM). Surrounding land uses to the Site include Interstate 10 (I-10) to the south, the Palen McCoy Wilderness to the north, the Palen Dry Lake Area of Critical Environmental Concern (ACEC) to the west and open (unrestricted access) lands to the east. Most of the land near the Site is managed by BLM and there is no California State Land in the vicinity, but there are private holdings in the area.

2. PURPOSE

The purpose of the Drainage, Erosion and Sediment Control Plan (DESCP) is to address the drainage, erosion and sediment control requirements to support construction and operation of the Genesis Solar Energy Project ("Project").

This has been undertaken as outlined in the following sections:

- Conceptual Drainage Study (**Section 3** and **Appendix A**);
- Stormwater Pollution Prevention Plan (SWPPP) (**Section 4** and **Appendix B**);
- Geomorphology Investigation (**Section 5**);
- Water Quality Investigation (**Section 6**); and
- Operational Best Management Practices (BMPs) (**Section 7**).

The DESCP has been developed based on the current understanding of site conditions and the mitigation requirements of the regulatory agencies. The on site grading and drainage design are directly interrelated, and adjustments to each will be made during the detailed design phase. The conceptual design can and should be adjusted during the detailed design to provide for the most efficient engineering solutions that provide for storm water quality control and treatment in compliance with the relevant laws, ordinances, regulations and standards (LORS).

3. CONCEPTUAL DRAINAGE STUDY

A conceptual drainage study was prepared by WorleyParsons to evaluate existing grading and drainage patterns associated with pre-developed conditions and the future post development

grading requirements and drainage flows through and around the Project site (refer **Appendix A**). The objective of the study was to ensure the solar thermal development minimizes its overall impact within the Project site and on the downstream properties and drainage system.

The conceptual drainage study includes:

- Pre Development Drainage Conditions
- Post Development Drainage Conditions
- Post Development Grading Conditions

4. STORMWATER POLLUTION PREVENTION PLAN

A preliminary Stormwater Pollution Prevention Plan (SWPPP) has been prepared to meet the requirements of General Permit No. CAS000002 (Permit) issued by the State of California, State Water Resources Control Board (SWRCB) for construction activity (refer **Appendix B**).

The SWPPP contains Best Management Practices (BMP) for:

- Erosion Control;
- Sediment Control;
- Wind Erosion;
- Tracking Control;
- Non-stormwater discharges; and
- Waste Management.

The scope of this SWPPP covers all activities associated with the construction of the Project. The selected Contractor will be responsible for performing temporary storm water management and erosion control during construction of the Project using existing and new control measures described within the SWPPP. The selected Contractor will also install all necessary permanent erosion controls and storm water management measures at the Site.

5. GEOMORPHOLOGY STUDY

The Project site is in a desert fluvial drainage system where there are rare intense events that form and alter the drainage features. During a storm event, the ephemeral streams will transport sediment downstream, until the sediment drops out of the system due to gravity, velocity of the water flow or other impediments. The following investigation was included in the Section 5.5 (Geological Hazards) of the Project's Application for Certification submitted to the California Energy Commission (CEC) in August 2009, and a summary is provided below. In

addition, the SWPPP contains information on the BMPs to cater for the erosion susceptibility on the Project site.

Physiographically, the Project site lies near the toe of alluvial fans emanating from the Palen Mountains to the north and the McCoy Mountains to the east. The eastern portion of the Site is underlain by a broad valley-axial drainage that extends southward between these mountains and drains to the Ford Dry Lake playa located about 1 mile south of the Site.

Geophysical investigations conducted at the Project site indicate that the electrical conductivity of the underlying sediments (an indicator of the amount of fine grained sediment and the salinity of the groundwater) shows a similar profile across the Project site area. In addition, seismic reflection profiling suggests that the shallow alluvium has similar properties across the Project site. Based on a site-specific subsurface investigation, the Site is underlain by alluvium consisting of interbedded and intermixed dense sand and gravel, and hard silt and clay to a depth of approximately 245 to 275 feet below ground surface (bgs) (approximately 125 feet above mean sea level [amsl]). These sediments are heterogeneous both laterally and vertically, though the valley axial alluvium beneath the eastern portion of the Site is expected to be more laterally continuous.

Deposits in the valley axial drainage that underlies the majority of the eastern part of the Site are characterized by a north south trending fabric in aerial photography and possess a generally subdued bar and swale topography generally lacking water erosional features, indicative of a depositional surface. These deposits represent the distal portion of the valley axial drainage that enters Ford Dry Lake from the northeast. Very few small washes are continuous across the eastern part of the Site. Surfaces on the valley axial deposits display no to incipient desert pavement development, and no carbonate accumulation in the soil. Evidence of competing wind erosion, including lag deposits and small mounds next to bushes were also noted; however, the dominant processes appear to be alluvial. The morphology and lack of soil development are consistent with depositional surfaces that are at most a few hundred years old, suggesting a prograding alluvial apron.

Subsurface stratification consists of silty sand beds with silt laminations spaced about 1 cm apart in silty sand deposits in the down slope portions of the site, which is consistent with the formation of silt crusts after sheet floods. Also observed were cross bedded silty sand beds about 8 to 10 cm thick and massive silty sand with gravel just upslope of the site. The recurrence interval of floods leaving these deposits is not known. Floods reaching Ford Dry Lake and filling the lakebed are reported to occur about once every 10 years. If each of these beds represents 10 years of accumulation, they would be indicative of deposition rates of 1m/1,000 years in the down slope portions of the site and up to 10 times that in the upslope portions of the site. However, beneath the upslope portions of the site that are closer to the fan intersection points, the locus of deposition would be more likely to change from one flood event to the next, so the deposition rates are probably less.

The Riverside County General Plan, Safety Element (Riverside County, 2008), indicates the Site is in an area with moderate potential for wind erosion, the off-site linears are in areas with moderate to high potential for wind erosion. Soil characteristics at the Project site allow for the potential for wind and water erosion, and significant sediment transport currently occurs across

the valley axial drainage that crosses the majority of the proposed plant site. Limited sand and & erosion also occurs between depositional episodes.

Soil erosion from wind and water during construction activities is further evaluated in Section 5.6 (Agriculture and Soils) of the AFC and included in the SWPPP. Under current conditions, the soil loss is estimated to be about one ton per year from the Site and areas of off-site linears associated with the Project. Construction activities without implementation of BMPs would result in a potential for soil loss of about 1,400 tons. The implementation of BMPs is expected to reduce water and wind erosion of soils during construction to less than significant levels.

6. WATER QUALITY OBJECTIVES

Riverside County produced a Stormwater Quality Best Management Practice Design Handbook in July 2006 to provide design procedures for structural BMPs for new development and redevelopment within Riverside County. The method for determining the design volume for the capture and treatment of the initial and more frequent run-off surges that convey the greatest amount of pollutants is based on capturing 85 percent of the total annual run-off. The Riverside County Hydrology Manual recommends a drawdown time of 48 hours, consistent with the California Best Management Practice Handbook. A preliminary calculation is provided below as this analysis was not included in the conceptual drainage design study.

The run-off coefficient (C) is determined as follows:

$C = 0.858i^3 – 0.78i^2 + 0.774i + 0.04$

i = the watershed imperviousness ratio (0.40 as per the SWPPP)

Therefore; C = 0.0549 – 0.1248 + 0.3096 +0.04 = 0.2797

Per the California BMP Handbook for New Development and Redevelopment, the “Urban Run-off Quality Management Approach”, the Maximized Detention Volume (Po) is determined as follows:

$Po = (a)(C)(P_6)$ - in watershed-inches

Per the same section 5.5.1 of the BMP Handbook, a (regression constant) = 1.963 for a 48 hour draw down.

P_6 (mean annual run-off producing rainfall depths) = 0.5” (per BMP Handbook table Thermal Airport is 0.47)

Thus:

Po = (1.963)(0.2797)(0.47) = 0.2580”

To get the “capture volume of the BMP” Po is multiplied by the drainage area of each 125 MW module

= (900 Acres)(0.2580”) = 232 Acre-Inches **= 19.4** Acre-Feet (AF)

This "BMP Handbook" method of retention capture shows that the 49 or 66 AF of detention required for each 125MW unit will provide adequate volume within the detention pond to satisfy the retention requirements, and indicates that the Riverside County / California BMP methodology should be followed for the detailed design of the retention basins for the Project site. Details of the detention pond will need to be determined during detailed design that allow retention (capture) of a minimum of 19.4 AF of water, and provide for infiltration of that flow within 48 hours.

7. OPERATIONAL BEST MANAGEMENT PRACTICES

Industrial activities with the potential to impact storm water discharges are required to obtain a NPDES permit for those discharges. In California, an Industrial Storm Water General Permit, Order 97-03-DWQ (General Industrial Permit CAS 000001) may be issued to regulate discharges associated with ten broad categories of industrial activities, including electrical power generating facilities. The General Industrial Permit requires the implementation of BMPs that will protect water quality. This is achieved by undertaking an Industrial SWPPP and monitoring plan. Through compliance with the General Industrial Permit, all potential pollutants generated during the industrial phase will be sufficiently mitigated such that water quality standards will not be violated.

Prior to commercial operation, Genesis Solar LLC will develop a SWPPP for operation of the Project site, and implemented to meet the National Pollutant Discharge Elimination System (NPDES) requirements.

The following is list of BMPs that shall be included in the Industrial SWPPP. The relevance of each item will be assessed when the Industrial SWPPP will be developed and may include additional site specific processes.

1) EROSION AND SEDIMENT CONTROL

Erosion and sediment control includes practices to prevent soil particles from being detached and reaching storm drains. BMP measures may include:

- ES-1: *"Implement erosion and sediment control. This shall cover all areas that are not covered by an impervious surface (i.e. areas covered by concrete, asphalt, crushed stone or equivalent"*.
- ES-2: *"Maintain erosion/sediment controls to achieve optimal performance during storm events*".

Erosion and Sediment Control may include temporary or permanent measures to stabilize the soil surface by covering or binding soil particles or preventing the concentration of run off by water or wind erosion. This may include periodically treating dirt roads and exposed surfaces with dust palliatives as needed.

Runoff velocities will be minimized by strategically placing BMPs which may include gravel berms, stone filters, check dams, detention structures and vegetation throughout the project site and in the re-routed offsite drainage channels to provide areas for sediment deposition and to promote the sheet flow of storm water prior to leaving the project site boundary. Native materials (rock and gravel) would be used for the construction of stone filters and check dams when available. Armoured drop structures will be used in channels to maintain a slope of less than 0.5%. Slopes may armoured as required using rip rap or gabions.

The rerouted ephemeral washes and the detention area will be designed to accommodate flow from a 100-year storm event. The rerouted ephemeral drainage line may also contain a low flow meandering channel within the larger drainage channel however this would be co-ordinated with the needs of flora and fauna to be protected and the requirements of the rerouted wash to reflect the natural drainage patterns.

The outlet of the re-routed washes into the downstream native system will also be designed to minimize any erosion and sediment impacts. As the soil has high erodability, there will be sediment in the stormwater at the outlet, which will be released into the natural drainage system on slope of less than 0.5%. This will include ensuring there is adequate transition between the two systems, preventing sediment deposition at the outlet causing local flooding impacts.

The power block area will be graded with moderate slopes to direct runoff and divert storm water to retention areas.

By its nature, a solar thermal project must keep dust to a minimum, as a film on the mirrors of the solar array will reduce their efficiency for power production. Dust control will be achieved by a combination of soil stabilizers. Operational controls designed to control dust will reduce the overall soil erosion in the area.

2) GOOD HOUSEKEEPING

Good Housekeeping measures aim to maintain a clean and orderly facility. BMP measures may include:

- HOUSE-1: *"Inspect weekly all outdoor areas associated with industrial activity, storm water discharge locations, drainage areas, conveyance systems, waste handling/disposal areas and perimeter areas impacted by off facility materials or storm water run on. Any identified debris, wastes and spilled, tracked or leaked materials shall be cleaned and disposed of properly".*
- HOUSE-2: "*Implement procedures to reduce or prevent material tracking".*
- HOUSE-3: *"Cover all stored industrial materials which can be readily mobilized by contact with storm water.*
- HOUSE-4: *"Contain all stored non-solid industrial materials that can be transported or dispersed via wind dissipation or contact with storm water".*

- HOUSE-5: *"Divert storm water or authorized non-storm water flows from non industrial areas from contact with industrial areas".*

3) PREVENTATIVE MEASURES

Preventative measures minimize the potential spills and leaks from facility equipment, outdoor systems and material handling. BMP measures may include:

- PM-1: *"Identify all equipment and systems used outdoors that may spill or leak pollutants".*
- PM-2: *"Inspect weekly each of the identified equipment and systems to detect leaks or identify conditions that may result in the development of leaks. Weekly inspections may be suspended during periods when there is no outdoor exposure of the equipment and systems"*
- PM-3: *"Establish a schedule to perform maintenance of identified equipment and systems. The schedule shall either be periodic or based upon more appropriate intervals such as hours of use, mileage, age etc".*
- PM-4: *"Establish procedures for prompt maintenance and repair of equipment and systems when inspections detect leaks or when conditions exist that may result in the development of spills or leaks"*

4) SPILL RESPONSE PROCEEDURES

Spill response procedures address incidents of spills or leaked material based upon the quantities and location of significant materials. BMP measures may include:

- SPILL-1: *"Develop and implement spill response procedures. Spill response shall be designed to prevent spilled materials from discharging from the facility via the storm drain system. Spilled materials shall be cleaned promptly and disposed of properly".*
- SPILL-2: *"Identify and describe all necessary and appropriate spill response equipment, location of spill response equipment and spill response equipment maintenance procedures".*
- SPILL-3: *"Identity and train appropriate spill personnel".*

5) MATERIAL HANDLING/WASTE MANAGEMENT

Material handling practices will minimize exposure of water materials to storm water. BMP measures may include:

- MAT/WASTE-1: *"Prevent or minimize handling of materials or wastes that can be readily mobilized by contact with storm water during a storm event".*
- MAT/WASTE-2: *"Contain non-solid materials or wastes that can be dispersed via wind erosion during handling"*

- MAT/WASTE-3: *"Cover waste disposal containers when not in use"*
- MAT/WASTE-4: *"Clean all spills of materials/wastes that occur during handling in accordance with the spill response procedures required in SPILL-1".*
- MAT/WASTE-5: *"Inspect and clean daily any outdoor material/waste handling equipment or containers that can be contaminated by contact with industrial materials or wastes".*

6) EMPLOYEE TRAINING PROGRAM

The employee training program ensures adequate training for the personnel responsible for implementing the SWPPP, monitoring program, and other compliance activities in the General Industrial Permit. BMP measures may include:

- TRAIN-1: *"Prepare or acquire appropriate training manuals or training material".*
- TRAIN-2: *"Identify which personnel shall be trained, their responsibilities and type of training they shall receive".*
- TRAIN-3: *"Provide training schedule"*.
- TRAIN-4: *"Maintain documentation of all completed training classes and the personnel who received training".*

7) RECORD KEEPING AND QUALITY ASSURANCE

Compliance activities shall be completed properly, documented and maintained. BMP measures may include:

- REC-1: *"Keep and maintain records of inspections, spills, BMP related maintenance activities, corrective actions, visual observations etc"*
- REC-2: *"Develop and implement management procedures to ensure that appropriate staff implements all elements of the SWPPP and Monitoring Program"*

8) VISUAL INSPECTIONS

Periodic visual inspections are required to ensure that the SWPPP addresses any significant changes to the facilities operations or BMP implementation procedures. BMP measures may include:

- INSPECT-1: *"Conduct a minimum of four quarterly visual inspections or all areas of the industrial activity and associated potential pollutant source. The annual comprehensive evaluation may substitute one of the quarterly inspections".*
- INSPECT-2: *"Implement any corrective actions and/or SWPPP revisions resulting from the inspection".*

- INSPECT-3: *"Prepare a summary and status of the corrective actions and SWPPP revisions resulting from the inspections. Include this summary in the Annual Report".*
- INSPECT-4: *"Certify in the Annual report that each quarterly visual inspection was completed".*

8. REFERENCES

1) Conceptual Drainage Study for Genesis Solar Energy Project, WorleyParsons Group Inc, August 19th 2009.

2) Preliminary Stormwater Pollution Prevention Plan for Genesis Solar Energy Project, WorleyParsons Group Inc, July 31st 2009.

3) California BMP Handbook for New Development and Redevelopment, the "Urban Runoff Quality Management Approach"

4) Riverside County Stormwater Quality Best Management Practice Design Handbook, Riverside County Flood Control and Water Conservation District, July 21 2006

5) Hydrology Manual, Riverside County Flood Control and Water Conservation District, April 1978

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APPENDIX A – CONCEPTUAL DRAINAGE STUDY

GENESIS SOLAR ENERGY PROJECT

CONCEPTUAL DRAINAGE STUDY

RIVERSIDE COUNTY

CALIFORNIA

Prepared By:

WorleyParsons Group, Inc.

August 19th 2009

WorleyParsons

resources & energy

NOTICE

The information presented in this document was compiled and interpreted exclusively for the purposes of a conceptual drainage study for Genesis Solar Energy Project. WorleyParsons provided this report for Genesis Solar, LLC for the purpose noted above.

WorleyParsons has exercised reasonable skill, care, and diligence to assess the information acquired during the preparation of this report, but makes no guarantees or warranties as to the accuracy or completeness of this information. The information contained in this report is based upon, and limited by, the circumstances and conditions acknowledged herein, and upon information available at the time of its preparation. The information provided by others is believed to be accurate but cannot be guaranteed.

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GENSIS SOLAR ENERGY PROJECT

REV	DESCRIPTION	ORIG	REVIEW	WORLEY-PARSONS APPROVAL	DATE	CLIENT APPROVAL	DATE
0	Issued for Use	J Forrest	J Bravo	J Foster	19-Jan–09	N/A	
1	Issued for Use	J Forrest	J Bravo	J Foster	19-Aug–09	N/A	

TABLE OF CONTENTS

I. PROJECT LOCATION 2
II. PROJECT DESCRIPTION 4
III. OBJECTIVE 5
IV. DRAINAGE SUMMARY 6
V. HYDROLOGY 7
A. RAINFALL 7
B. SOILS 7
C. HYRDOLOGIC LOSSES 8
D. PRE DEVELOPED CONDITIONS 8
E. POST DEVELOPED CONDITIONS 9
VI. HYDRAULICS 11
A. SUMMARY 11
B. DESIGN CONSIDERATIONS 11
1. DESIGN STORM FREQUENCY 11
2. DESIGN STORM DURATION 11
3. MINOR LOSSES 11
C. CROSS SECTIONS 11

LIST OF TABLES

Table 1: 100 year, 24 hour Pre Developed and Post Development Flows 6
Table 2: Soil Types 7
Table 3: Pre Developed Conditions, Sub-basin Areas 8
Table 4: Post Developed Conditions, Sub Basin Areas 9

LIST OF FIGURES

Figure 1: Site Location Map 3

APPENDICES

Appendix A – Flood Map
Appendix B – Rainfall Precipitation
Appendix C – Soil Classification
Appendix D – Pre Developed Conditions
Appendix E – Post Developed Conditions

I. PROJECT LOCATION

Genesis Solar, LLC, is proposing to construct, own and operate the Genesis Solar Energy Project (herein "Project") on approximately an 1,800-acre site near Ford Dry Lake in Riverside County, California (refer **Figure 1**). The Project Site ("Site") will be located in the Colorado Desert between the communities of Blythe, CA (approximately 24 miles east) and Desert Center, CA (approximately 27 miles west). The Project is a concentrated solar power (CSP) electric generating facility that will use a proven parabolic trough solar thermal technology.

The Site covers approximately 1,800 acres of Federal land managed by the Bureau of Land Management (BLM). Surrounding land uses to the Site include Interstate 10 (I-10) to the south, the Palen McCoy Wilderness to the north, the Palen Dry Lake Area of Critical Environmental Concern (ACEC) to the west and open (unrestricted access) lands to the east. Most of the land near the Site is managed by BLM and there is no California State Land in the vicinity, but there are substantial private holdings.

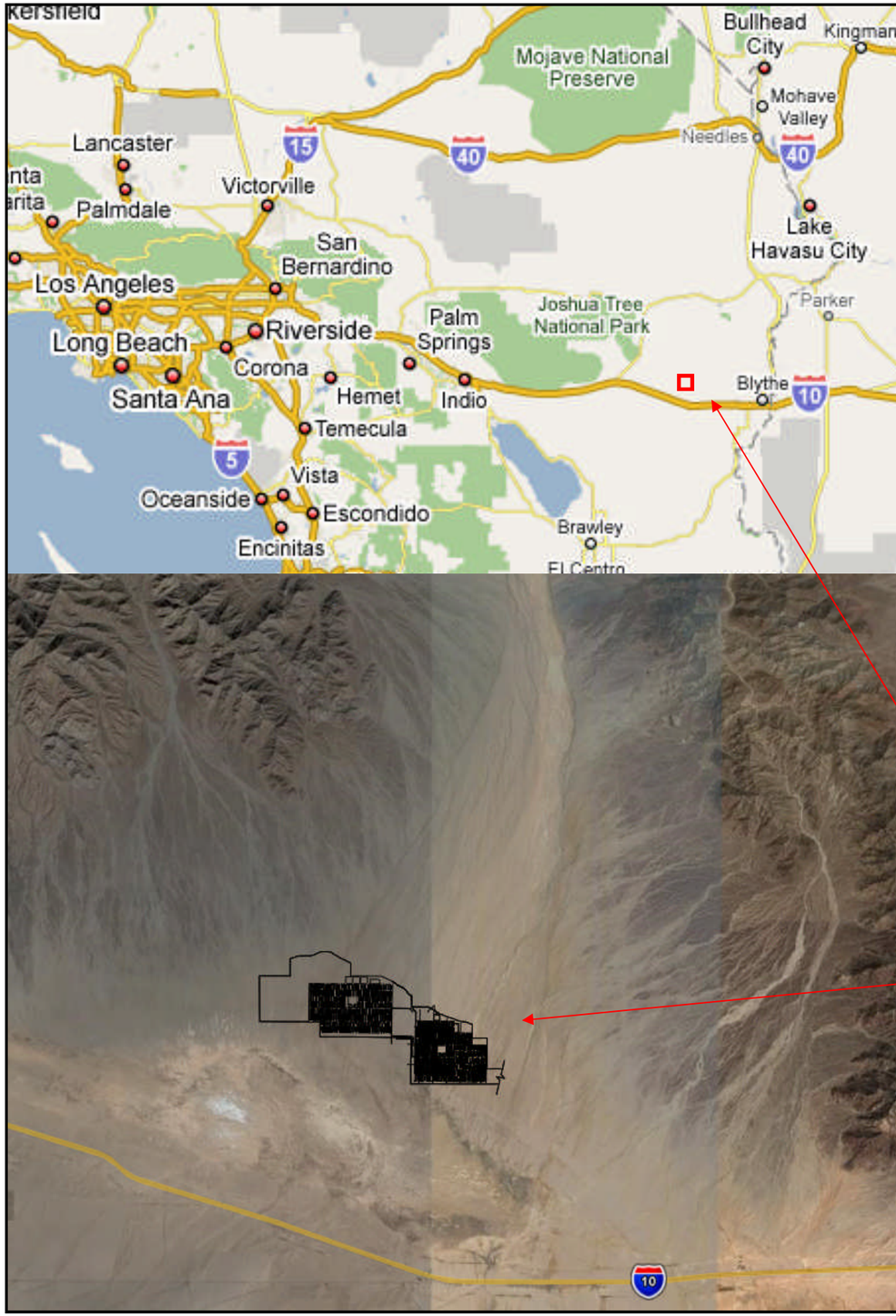
The Site is situated within the Chuckwalla Valley and is relatively flat. The Site generally slopes from north to south with elevations of approximately 400 to 370 feet above mean sea level. The Site is occupied by a community of low creosote and bursage scrub vegetation and includes portions of the Ford Dry Lake and McCoy Spring USGS topographic maps.

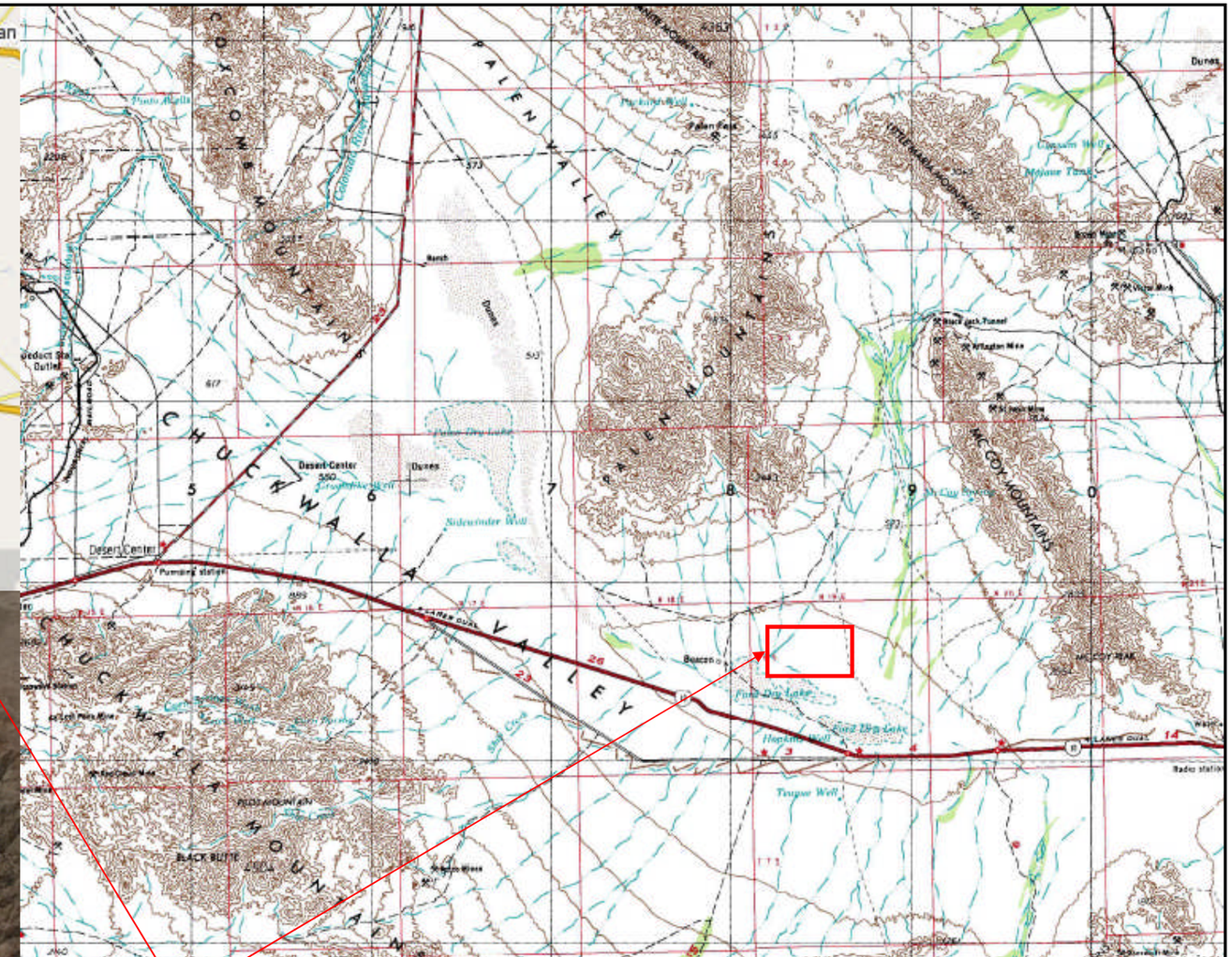
Natural drainage across the Project site is episodic, shallow and occurs over a broad area primarily as sheet flow or in shallow washes.

The Site has been historically used for both off-highway vehicles and sheep grazing; however neither activity currently occurs.

The Site is to be found within "RIVERSIDE COUNTY AND INCORPORATED AREAS" within FEMA (Federal Emergency Management Agency); however there are no flood insurance maps provided for this area (refer **Appendix A**). As outlined in **Section V A**, there is only 3.51 inches of rain precipitation in a 100 year, 24 hour storm event. Coupled with an annual evaporation rate of over 100 inches in the region, flooding is not expected to be a major issue in this area.

There is an additional proposed Site within Project Genesis (near McCoy Wash); however it is not included as part of this conceptual drainage study.





Approximate Site Location

Not to Scale

Sources: 2009 Google Maps, 2007 Google Earth, USGS Salton Sea (11S) Topographic Map 1969

N W E S

CONCEPTUAL DRAINAGE STUDY GENESIS SOLAR LLC GENESIS SOLAR ENERGY PROJECT	WorleyParsons resources & energy		
SITE LOCATION MAPS	08/2009	JF	1

II. PROJECT DESCRIPTION

Genesis Solar, LLC is proposing to develop a 250-megawatt (MW) solar thermal power generating project, using concentrated solar power (CSP) technology. There will be two 125 MW units on site to provide 250 MW of power ("Units 1 and 2") (refer **Appendix D,** Drawing GENI-1-DW-112-726-003).

Each unit contains solar fields, power block and stormwater control facilities. There is an additional area between the two units which shall be used for evaporation ponds and a land treatment unit (LTU). In addition, there shall be ancillary facilities constructed and operated on site, including an onsite substation, administration and warehouse buildings. A short transmission line shall be constructed from the Site south across the I-10 to connect with the 230kV Blythe Transmission Line.

The Site shall be graded to create level solar pad elevations with approximate balanced cut and fill, therefore existing vegetation and debris shall be removed.

Off-site storm water flows are sourced from a large area to the north of the Site (approximately 91,627 acres) (refer **Section V D** for further information). Due to the magnitude and type of terrain, a main concern is the presence of storm flushed flood events. In order to address this concern, the runoff originated by the upstream areas will be diverted around Units 1 and 2 using berms and channels capable of conveying flows for a 100 year, 24 hour storm event (refer **Section V E** for further information).

On-site storm water run off within the solar fields will sheet flow into smaller drainage swales, aligned north to south and located adjacent to the plant interior roads. The swales shall divert flows into a detention basin (one for each unit), situated in the lower elevation areas of each unit. The detention basins shall attenuate the post developed 100 year, 24 hour storm event run off from each unit, and discharge at the pre developed 100 year, 24 hour storm event flow rate into the natural drainage system downstream. The detention basins will also have emergency spillways to discharge runoff generated due to major rainfall events in excess of the 100 year storm. Emergency spillways will discharge into the proposed peripheral drainage channel, diverting the excessive flow away from the site.

Detail design of the peripheral channels and detention basins will be included with the final drainage design.

III. OBJECTIVE

The hydrologic and hydraulic conditions associated with the development of approximately 1,500 acres for the Project are conceptually addressed in this study; Unit 1 is the area east of the evaporation pond / LTU area, and Unit 2 is the area west of the evaporation pond / LTU area.

This conceptual drainage study addresses existing drainage patterns associated with pre-developed conditions and the future post development drainage flows through and around the Site. The objective of the study is to ensure the solar power plant development does not impact on the downstream drainage system and properties. This objective was achieved by undertaking the follow activities:

- Determine the drainage watershed boundary for the Project site (including off-site sources);
- Determine the quantity of stormwater run-off entering the Project site;
- Determine the quantity of stormwater run-off within the Project site under pre-developed conditions;
- Determine the quantity of stormwater run-off within the Project site under post-developed conditions;
- Evaluate the difference in stormwater run-off quantities between pre-developed and post developed conditions and estimate the required size of on-site detention basins;
- Determine the alignment and sizing of drainage channels within the Project site to facilitate stormwater run-off; and
- Determine the preliminary grading requirements on-site to facilitate the storm water run-off into the drainage channels and detention basin(s).

In order to accomplish this, hydrology calculations are performed using TR-55 (SCS Method) to determine the rate of pre and post development stormwater run-on and run-off in the watershed.

The USDA Natural Resources Conservation Service and Riverside Hydrology manual are used to classify soil characteristics, expected soil types and other design criteria necessary for use with the TR-55 calculations. Offsite flows are to be determined using the watershed boundaries from available state watershed information, contour intervals, and available soils mapping information. The watershed is then further broken down into sub-basins as required to determine the flow from the ephemeral washes as they approach the Site. Nodes shall be placed at appropriate locations to evaluate the pre and post development stormwater flows, and to ensure that the Site post-development discharge is kept or below the pre-developed discharge.

IV. DRAINAGE SUMMARY

Drainage modeling and calculations were performed using Bentley PondPack Ver. 10.1. The objective of not exceeding the pre-developed flows at the points of interest were accomplished (refer to **Table 1**). Detention basins shall be designed to ensure that the Site post-development discharge is kept at or below the pre-developed discharge.

Table 1: 100 year, 24 hour Pre Developed and Post Development Flows

	Pre Developed Flow (cfs)	Post Developed Flow (cfs)
UNIT 1		
Outlet	519	1295
Detention Basin	N/A	Less than 519 (require a minimum estimated detention basin size of 66 ac-ft)
UNIT 2		
Outlet	419	1127
Detention Basin	N/A	Less than 419 (require a minimum estimated detention basin size of 49 ac-ft)

cfs = cubic feet per second

N/A = not applicable

V. HYDROLOGY

The hydrology analysis was performed and analyzed as set forth in the Riverside Hydrology Manual. USDA Natural Resources Conservation Service (NRCS formerly SCS) Technical release 55 (TR-55) is used to assign curve numbers (CN) in calculating runoff. TR-55 is also used to compute time of concentration. Time of concentration is based on sheet flow, shallow concentrate, and channel flow.

As outlined in **Section II**, the Site will predominantly use channels to convey runoff through and around the project. For large drainage areas, the Riverside County Hydrology Manual requires using the (NRCS/SCS) Unit Hydrograph Methodology for drainage calculation.

A. RAINFALL

In the 100 year, 24 hour storm event, 3.51 inches of rainfall shall fall (refer to **Appendix B**). Based on the Site location, the (NRCS/SCS) Type II rainfall distribution was used when performing calculations.

B. SOILS

Soil classification was made using data from USDA Natural Resources Conservation Service (refer to **Appendix C**). The soil type within the pre-developed watershed and post-developed watershed is listed in **Table 2**. The areas of the pre-development and post-development watersheds vary, as outlined in **Table 3** and **4**, due to the perimeter road berm and channels, diverting upstream 100 year flows around the Site**.**

Table 2: Soil Types

Soil Type	Off-site Watershed Areas (acres)	On-site Unit 1 Pre and Post Development Watershed Area (acres)	On-site Unit 2 Pre and Post Development Watershed Area (acres)
A	698	0	117
B	32,561	0	0
C	8,705	0	0
D	49,732	792	579
TOTAL	**91,696**	**792**	**696**

The soil on site is classified as typical durorthids, loamy-skeletal mixed, hyperthermic and shallow, and typical torripsamments, mixed, hyperthermic. A soil list for the watershed is included in **Appendix C**.

C. HYDROLOGIC LOSSES

With the hydrologic soil group established, hydrologic losses can be computed using (NRCS/SCS) runoff curve numbers (CN) found by using TR-55 runoff curve numbers (refer to **Appendix C**). The sub-region and associated curve numbers are input into PondPack, which calculates a weighted CN for the total area to be used for the runoff computations. The hydrologic cover type was assumed to be desert shrub and allocated as "fair" for pre development (CN of 86) and "poor" for post development conditions (CN of 88).

D. PRE DEVELOPED CONDITIONS

In desert regions, catchment boundaries and distribution of drainage may shift over time based on the ground conditions, intensity of the storm event, velocity of the flow and sediment transportation. The boundary selected for this study was based on existing information. The pre-developed drainage plans (refer to **Appendix D**) were prepared to estimate the runoff for all drainage areas at the Site. The total watershed area is 93,182 acres, of which 91,627 is off-site. The watershed was divided into three upstream sub-basins (sub basin 1, 2 and 3) and two onsite sub-basins (sub basin A and B). The area of each sub basin is show in **Table 3**.

Table 3: Pre Developed Conditions, Sub-basin Areas

SUB-BASIN NUMBER	**AREA** (Acre)
1	17,910
2	10,990
3	62,795
A (Unit 1)	792
B (Unit 2)	696
TOTAL	**93,182**

Drainage was estimated using USGS quadrangle maps. It is assumed that flows are unimpeded at all crossings structures that exist. This assumption is conservative because it does not take into account any storage or reduction in peak flows that may be associated with an undersized crossing structure.

The calculations of the 100 year, 24 hour storm flows under pre-developed conditions for off-site and on-site areas are summarized in **Appendix D**. The 100 year, 24 hour storm flows were calculated using PondPack software. The software generates required runoff hydrographs for each of the drainage area separately, rainfall distribution used in this calculation is Type II 24 hour rainfall and the 100 year rainfall events were obtained from

NOAA Atlas 2 Rainfall Depth – Duration – Frequency Maps reproduced for the Riverside area (refer to **Appendix B**).

E. POST DEVELOPED CONDITIONS

The post-developed drainage plans are located in **Appendix E**. The total watershed area under post-developed conditions is approximately 1,488 acres (Units 1 and 2 only). As outlined in **Section II**, flows from offsite shall be diverted in three channels:

- Flows from the sub-basin 1 (north-western) will be diverted through a channel on the west side of Unit 1;
- Flows from sub-basin 2 (north) will be diverted through a channel between Unit 1 and 2; and
- Flows from sub-basin 3 (north-eastern) will be diverted though a channel along the east side of Unit 2.

Then, all these three main channels will divert flows downstream of the Site following its existing drainage path, causing no impact to the Site. The main purposes of the diversion are to prevent interaction with off-site stormwater and onsite stormwater which will:

- Allow natural groundwater recharge of the off-site stormwater with no contact with the changed flow conditions of the on-site water;
- Protect the Site infrastructure from flash flood events, which have the potential to damage the solar parabolic troughs;
- Control treatment of the on-site flows from the solar collector array (location of heat transfer fluid within the solar parabolic troughs);
- Protect the Site from upstream sediment loading;
- Control on-site flows in detention basin to ensure there is no increase in post developed flow discharging from the site, minimizing the impact on downstream drainage features (lake playas etc), and
- Maximize the developable area within the solar field.

In addition, detention basins have included in the model to capture all run off from Unit 1 and 2. There are no culverts or crossing structures required in the model. The sub areas for post developed conditions are shown in **Table 4**.

Table 4: Post Developed Conditions, Sub Basin Areas

SUB-BASIN NUMBER	**AREA** (Acre)
A	792
B	696
TOTAL	**1,488**

There is an increase in impervious area on Site due to:

- Paved Access Roads (around the Site and connecting to off-site existing roadways);
- Administration Building;
- Warehouse; and
- Power Block.

It has been assumed that each of the parabolic troughs will freely drain onto the ground. The ground surface may be slightly more impervious in post developed conditions due to the footings of the parabolic trough blocks.

The calculations of the 100 year, 24 hour storm event flows under post-developed conditions are summarized in **Appendix E**. The 100 year storm flows were calculated using PondPack software. The minimum preliminary volumes required for the detention basins are 66 acre-feet for Unit 1 and 49 acre-feet for Unit 2. Further specifics for the detention pond (i.e. outlet design, risers, and spillway structures) shall be undertaken during detailed design, occurring in a later phase of this project.

VI. HYDRAULICS

A. SUMMARY

Channels were designed using open channel flow criteria.

B. DESIGN CONSIDERATIONS

1. DESIGN STORM FREQUENCY

100 year, 24 hour event with the water surface contained within all channels.

2. DESIGN STORM DURATION

The goal in the storm drain design is to convey the maximum peak flow for a given design storm. This involves choosing a storm with the same duration as the time-of-concentration for the watershed (critical duration). As the storm is passed down the collection system, the time-of-concentration at each point downstream of the headwater sheds will increase according to shed minimum time-of-concentration plus travel time in structures.

3. MINOR LOSSES

A Manning's roughness coefficient n value of 0.030 was assumed for the channels. This assumed n value will take into account any re-vegetation of the drainage channels, however this will be reassessed during detailed design to ensure the coefficient reflects any operational best management practices installed in the channel (i.e. armoring).

C. CROSS SECTIONS

Preliminary channel cross sections are shown on the Conceptual Grading Plan (refer to **Appendix E**). The width and depth of the channels vary depending on location. Further specifics for the channels (i.e. individual cross sections, material selection, compaction, stabilization) shall be undertaken during detailed design, occurring in a later phase of this project.

The channels and diversion berms will be sized sufficiently to pass the anticipated flows and entrained sediment volumes, will be armored as necessary for erosion protection using natural gravel derived during Site grading activities, and will be maintained periodically or after major storm events as needed to sustain their proper function.

APPENDICES

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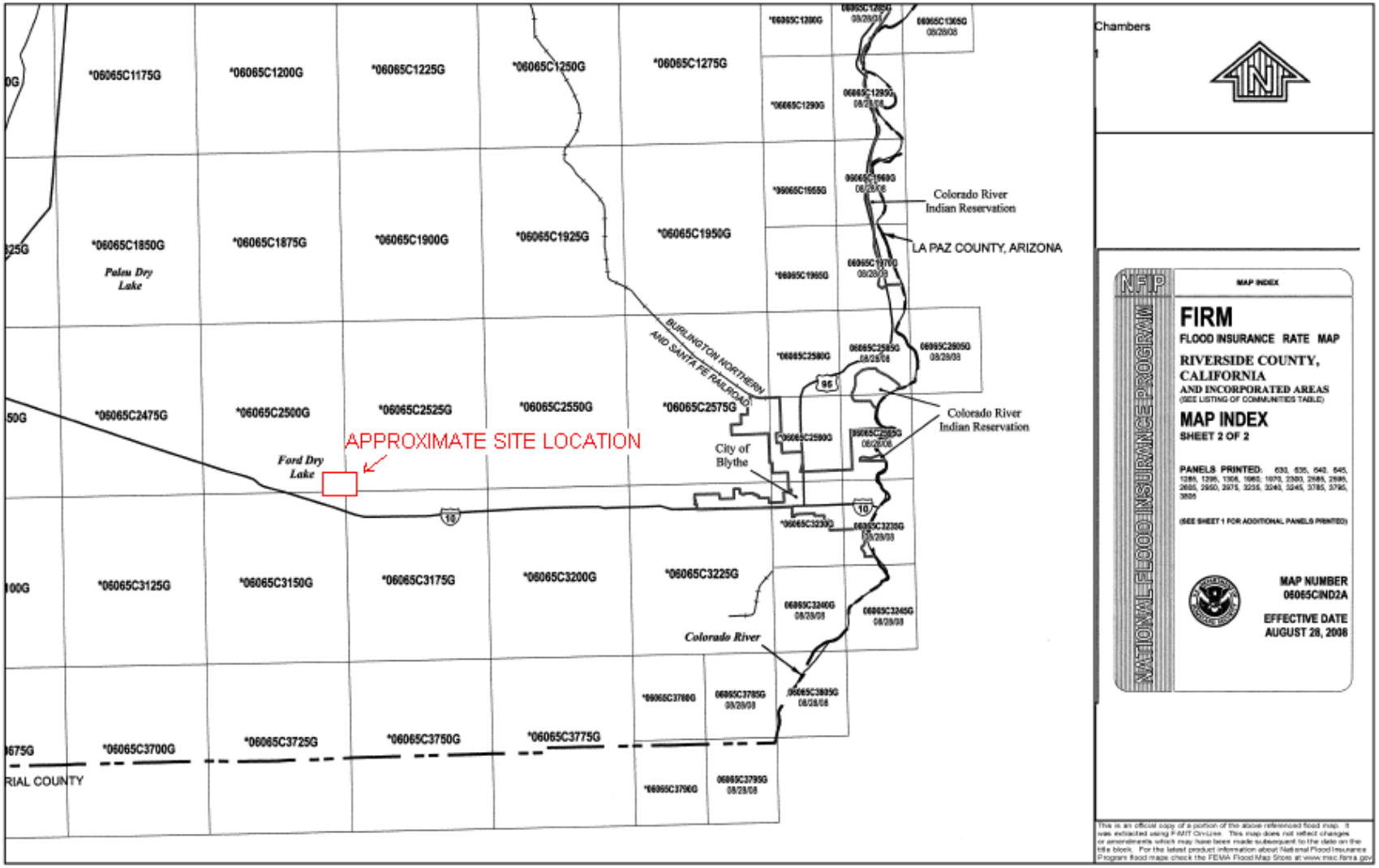
APPENDIX A – FLOOD MAP



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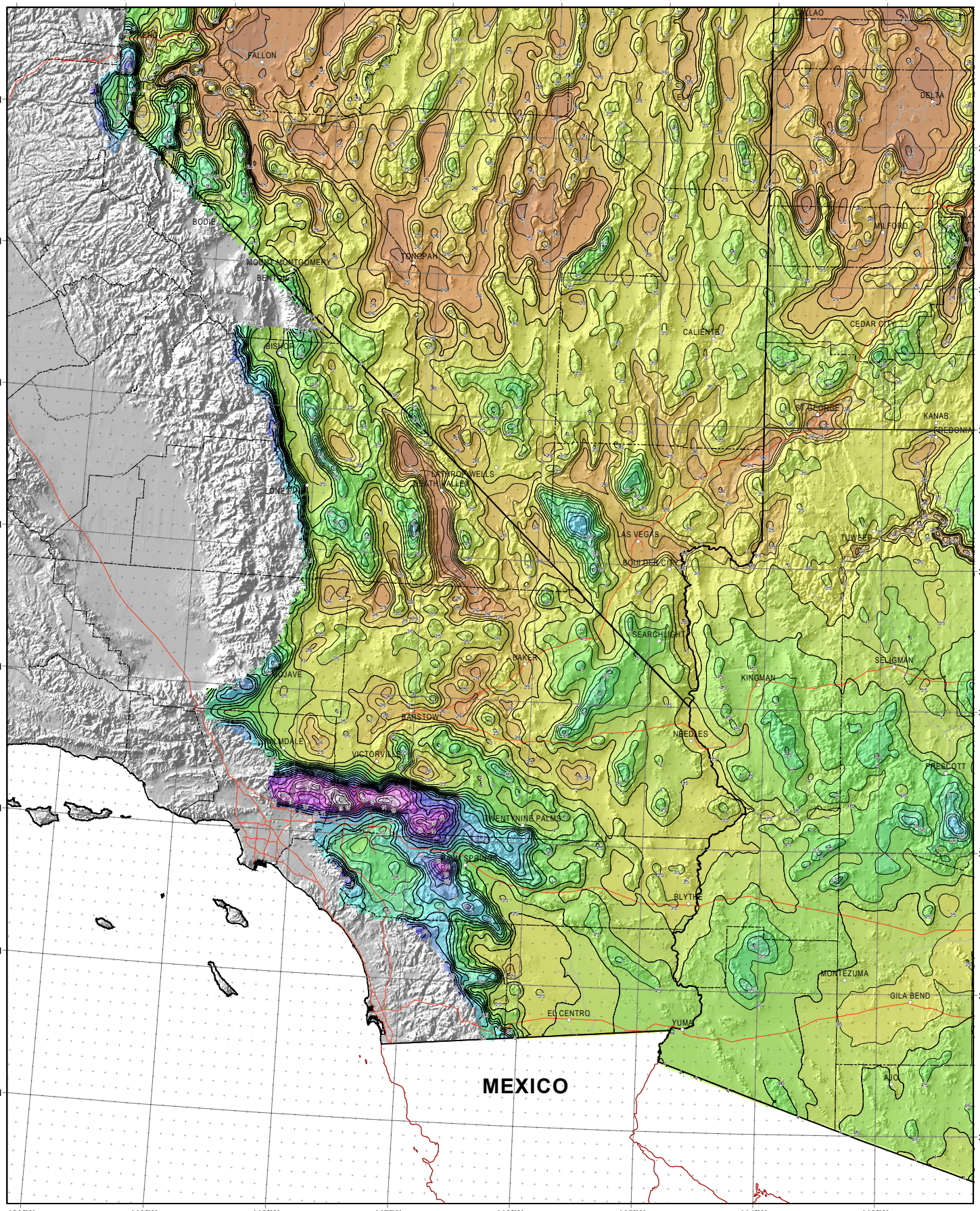
APPENDIX B – RAINFALL PRECIPITATION



SOUTHEASTERN CALIFORNIA

NOAA Atlas 14, Volume 1, Version 4
Semiarid Southwestern United States

Prepared by U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE
OFFICE OF HYDROLOGIC DEVELOPMENT
HYDROMETEOROLOGICAL DESIGN STUDIES CENTER
June 2006

SCALE 1:2,000,000
(when printed/viewed at ANSI C size)
0 10 20 30 40 50 Miles
0 5 10 20 30 40 50 60 70 Kilometers

Isopluvials of 24 hour precipitation (inches) with Average Recurrence Interval of 100 years

See NOAA Atlas 14 documentation for factors to convert to Annual Exceedance Probabilities for all estimates below 25 years

N

Inches

1.53 - 1.60	2.61 - 2.80	5.01 - 5.50	9.01 - 10.00	15.01 - 16.00
1.61 - 1.80	2.81 - 3.00	5.51 - 6.00	10.01 - 11.00	16.01 - 17.00
1.81 - 2.00	3.01 - 3.50	6.01 - 6.50	11.01 - 12.00	17.01 - 18.00
2.01 - 2.20	3.51 - 4.00	6.51 - 7.00	12.01 - 13.00	18.01 - 19.00
2.21 - 2.40	4.01 - 4.50	7.01 - 8.00	13.01 - 14.00	
2.41 - 2.60	4.51 - 5.00	8.01 - 9.00	14.01 - 15.00	

Projection: Lambert Conformal Conic; Datum NAD83; Standard Parallels: 38° and 45°; Central Meridian 112°.

APPENDIX C – SOIL CLASSIFICATION

Curve Number (CN) Determination

The SCS Curve Number Method uses a coil cover complex number (CN) for computing excess precipitation. The CN is related to hydrologic soil group (A, B, C, or D), land use, treatment class (cover), and antecedent moisture condition. The soil group is determined from published soil maps for the area (usually published by the NRCS (SCS))

The definitions of the hydrologic soil groups are:

> *Group A – Low run off potential. Soils having a high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well drained sands or gravels. These soils have a high rate of water transmission.*
>
> *Group B – Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well drained sandy-loam soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.*
>
> *Group C – Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of silty loam soils with a layer than impedes downward movement of water, or soils with moderately fine to fine texture. These soils have a slow rate of water transmission.*
>
> *Group D – High run off potential. Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission.*

The Hydrologic Soil Classifications were obtained from:

SSURGO – Soil Survey Geographic Data Base U.S. Department of Agriculture, Natural Resources Conservation Service.

Specific Soil taxonomy for the watershed is shown in the following maps.

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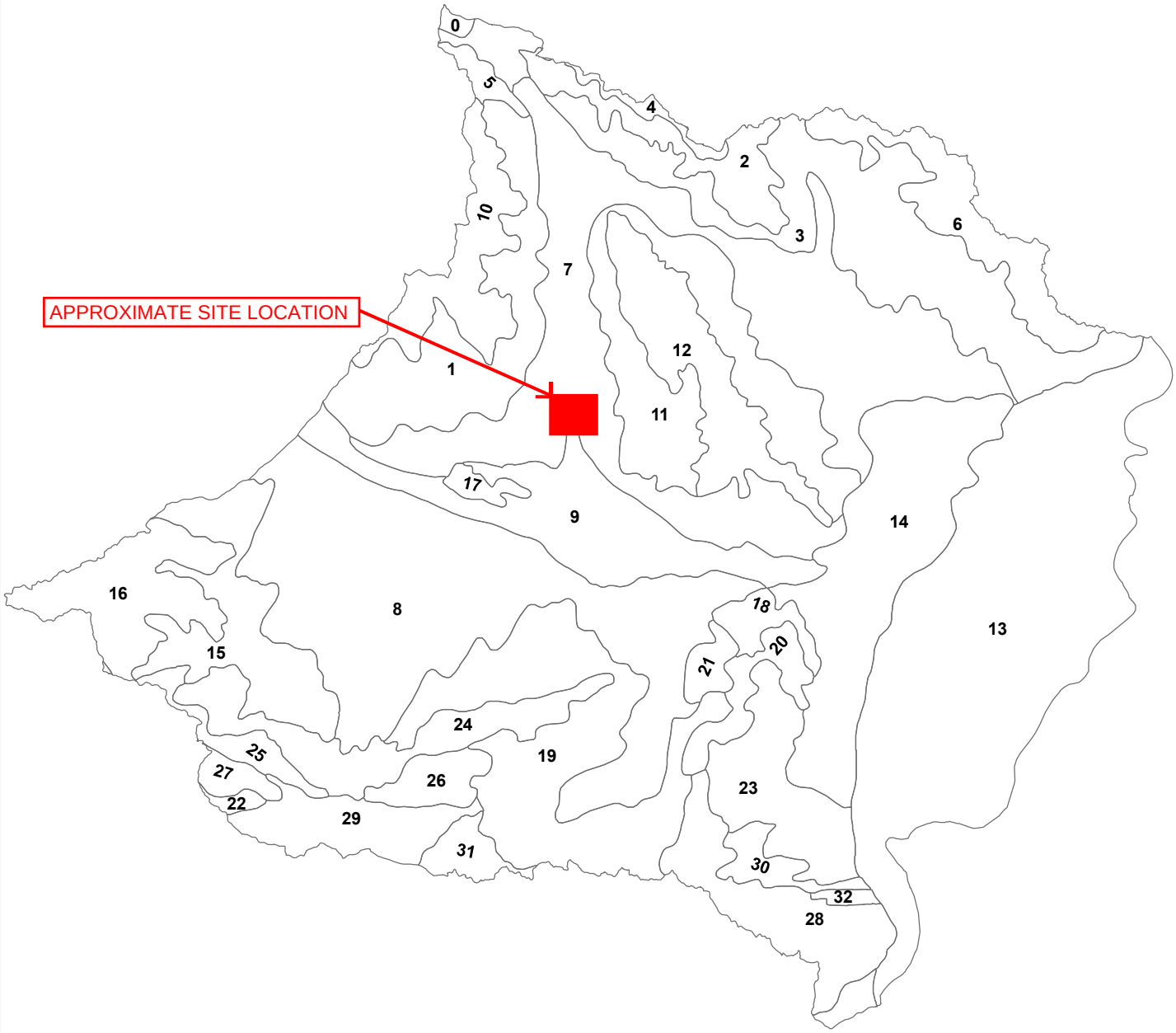
CONCEPTUAL DRAINAGE STUDY

SOIL TAXONOMY MAP

SOURCE: http://soils.usda.gov/technical/classification/taxonomy/



FID	soil_tax_2
0	LITHIC TORRIORTHENTS
1	TYPIC CALCIORTHIDS, LOAMY-SKELETAL, MIXED, HYPERTHERMIC
2	TYPIC CAMBORTHIDS, LOAMY-SKELETAL, MIXED, HYPERTHERMIC
3	TYPIC CALCIORTHIDS, LOAMY-SKELETAL, MIXED, HYPERTHERMIC
4	LITHIC TORRIORTHENTS, LOAMY-SKELETAL, MIXED (CALCAREOUS), THERMIC
5	TYPIC CAMBORTHIDS, LOAMY-SKELETAL, MIXED, HYPERTHERMIC
6	LITHIC TORRIORTHENTS, LOAMY-SKELETAL, MIXED (CALCAREOUS), THERMIC
7	TYPIC DURORTHIDS, LOAMY-SKELETAL, MIXED, HYPERTHERMIC, SHALLOW
8	TYPIC DURORTHIDS, LOAMY-SKELETAL, MIXED, HYPERTHERMIC, SHALLOW
9	TYPIC TORRIPSAMMENTS, MIXED, HYPERTHERMIC
10	LITHIC TORRIORTHENTS, LOAMY-SKELETAL, MIXED (CALCAREOUS), THERMIC
11	TYPIC CALCIORTHIDS, LOAMY-SKELETAL, MIXED, HYPERTHERMIC
12	LITHIC TORRIORTHENTS, LOAMY-SKELETAL, MIXED (CALCAREOUS), THERMIC
13	TYPIC TORRIFLUVENTS, FINE-SILTY OVER SANDY OR SANDY-SKELETAL, MIXED (CALCAREOUS), HYPERTHERMIC
14	TYPIC TORRIORTHENTS, COARSE-LOAMY, MIXED (CALCAREOUS), HYPERTHERMIC
15	TYPIC CALCIORTHIDS, LOAMY-SKELETAL, MIXED, HYPERTHERMIC
16	LITHIC TORRIORTHENTS, LOAMY-SKELETAL, MIXED (CALCAREOUS), THERMIC
17	
18	TYPIC CALCIORTHIDS, LOAMY-SKELETAL, MIXED, HYPERTHERMIC
19	TYPIC CALCIORTHIDS, LOAMY-SKELETAL, MIXED, HYPERTHERMIC
20	LITHIC TORRIORTHENTS, LOAMY-SKELETAL, MIXED (CALCAREOUS), THERMIC
21	TYPIC TORRIPSAMMENTS, MIXED, HYPERTHERMIC
22	TYPIC CALCIORTHIDS, LOAMY-SKELETAL, MIXED, HYPERTHERMIC
23	TYPIC CALCIORTHIDS, LOAMY-SKELETAL, MIXED, HYPERTHERMIC
24	LITHIC TORRIORTHENTS, LOAMY-SKELETAL, MIXED (CALCAREOUS), THERMIC
25	LITHIC TORRIORTHENTS, LOAMY-SKELETAL, MIXED (CALCAREOUS), THERMIC
26	LITHIC TORRIORTHENTS, LOAMY-SKELETAL, MIXED (CALCAREOUS), HYPERTHERMIC
27	
28	LITHIC TORRIORTHENTS, LOAMY-SKELETAL, MIXED (CALCAREOUS), THERMIC
29	TYPIC DURORTHIDS, LOAMY-SKELETAL, MIXED, HYPERTHERMIC, SHALLOW
30	TYPIC TORRIPSAMMENTS, MIXED, HYPERTHERMIC
31	LITHIC TORRIORTHENTS, LOAMY-SKELETAL, MIXED (CALCAREOUS), HYPERTHERMIC
32	TYPIC CALCIORTHIDS, LOAMY-SKELETAL, MIXED, HYPERTHERMIC

GENESIS SOLAR ENERGY PROJECT
CONCEPTUAL DRAINAGE STUDY

SOIL TAXONOMY LIST

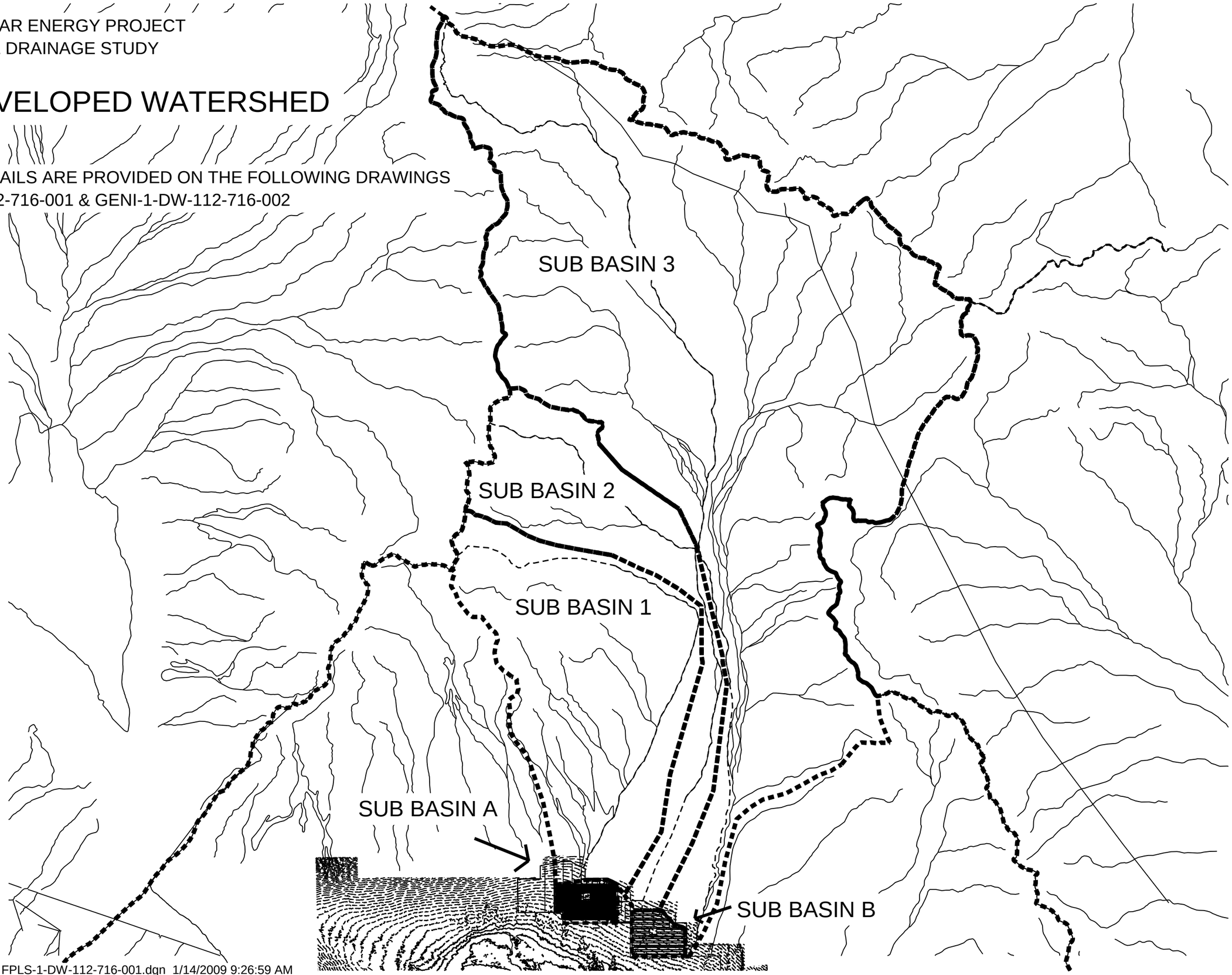
SOURCE: http://soils.usda.gov/technical/classification/taxonomy/

APPENDIX D – PRE-DEVELOPED CONDITIONS

GENESIS SOLAR ENERGY PROJECT
CONCEPTUAL DRAINAGE STUDY

PRE DEVELOPED WATERSHED

FURTHER DETAILS ARE PROVIDED ON THE FOLLOWING DRAWINGS
GENI-1-DW-112-716-001 & GENI-1-DW-112-716-002



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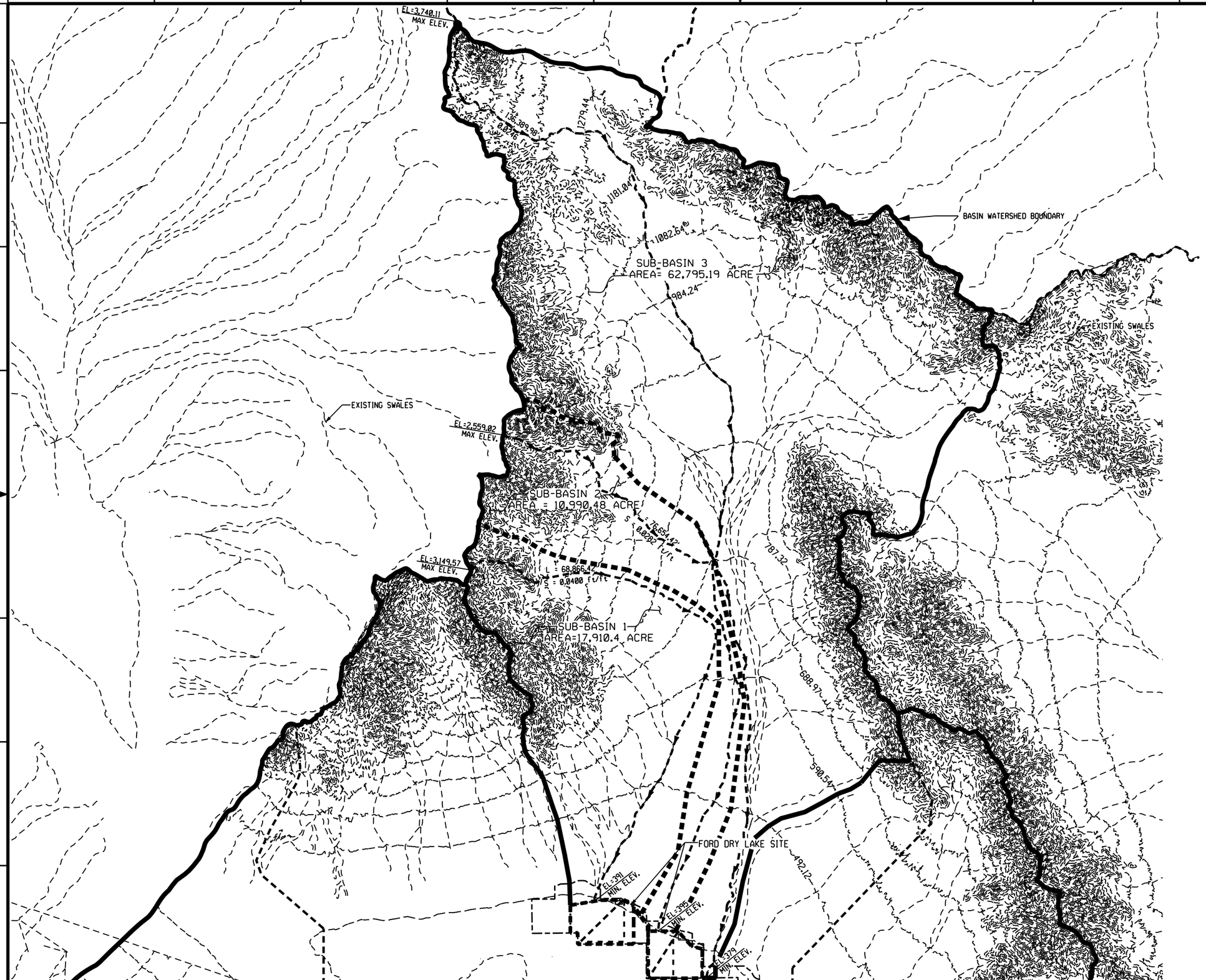

LEGEND

- LONGEST WATER COURSE WITHIN SUB-BASIN AREA
- BASIN WATERSHED BOUNDARY PERTAINING TO FORD FRY LAKE PROJECT SITE
- SUB-BASIN WATERSHED BOUNDARY

N

0 5000 10000 15000 20000
1" = 5000 FT

REV	DATE	DESCRIPTION	CHECKED	DRAWN	CHECKED	LEAD DESIGNER	ENGINEER/TECH SPECIALIST	PROJECT ENGINEERING MANAGER	PROJECT MANAGER
1			CM	JD	CM	JB	RH	JB	BP

CLIENT PRIMARY STATUS — DATE — LOC: REPRESENTS GENERAL DESIGN CONCEPTS BASED ON ASSUMPTIONS. REVIEWED NOT CHECKED.

CLIENT APPROVED STATUS — DATE — LOC: REPRESENTS REVIEWED AND APPROVED DESIGN. ANY PORTION MARKED "HOLD" RETAINS PRELIMINARY STATUS.

ORIGINATING PERSONNEL

DRAWN BY: C. MAHER
CHECKED BY: J. DAHLGREN
LEAD DESIGNER: C. MAHER
ENGINEER/TECH SPECIALIST: J. DAHLGREN
PROJECT ENGINEERING MANAGER: J. BRAVO
PROJECT MANAGER: B. PIETRUCHA

PROFESSIONAL ENGINEER'S SEAL

Zero Harm — Leadership, No Incidents, Safe Behavior

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resources & energy

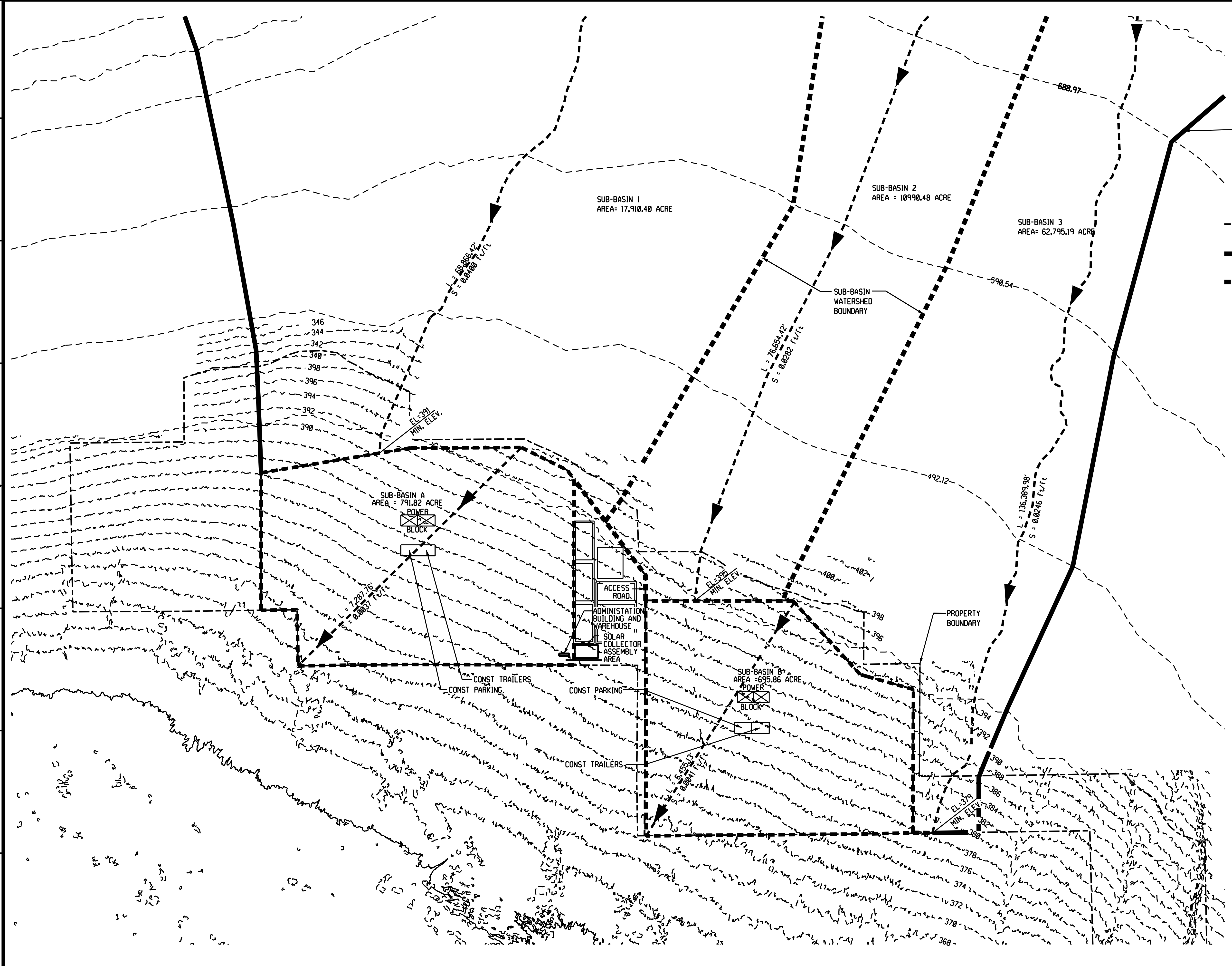
CLIENT/PROJECT TITLE

GENESIS SOLAR LLC
GENESIS SOLAR ENERGY PROJECT

PRE-DEVELOPMENT
DRAINAGE PLAN DRAWING
DRAWING 1 OF 2

SCALE: 1"=5000'
DRAWING SIZE: ARCH D (36" x 24")
WORLEYPARSONS DWG. NO.: GENI-1-DW-112-726-001
REV: 1

FILE NAME: $$$$ACADSPEC$$$$$$$$$$$$$$$$ $$$$$TIME$$$$$ $$$$$DATE$$$$$



LEGEND

- LONGEST WATER COURSE WITHIN SUB-BASIN AREA
- BASIN WATERSHED BOUNDARY PERTAINING TO FORD FRY LAKE PROJECT SITE
- SUB-BASIN WATERSHED BOUNDARY

N

0 1000 2000 3000 4000
1" = 1000 FT

REV	DATE	DESCRIPTION	DRAWN	CHECKED	LEAD DESIGNER	ENGINEER/TECH SPEC	LEAD DWG CHECKER	PROJ ENGR MANAGER	PROJECT MANAGER
0	08 19 09		CM	JD	CM	JB	RH	JB	BP

PRELIMINARY STATUS DATE — REPRESENTS GENERAL DESIGN CONCEPTS BASED ON ASSUMPTIONS. REVIEWED NOT CHECKED.
LOE
APPROVED STATUS DATE — REPRESENTS REVIEWED AND APPROVED DESIGN, ANY PORTION MARKED "HOLD" RETAINS PRELIMINARY STATUS.
LOE

ORIGINATING PERSONNEL
DRAWN BY: C. MAHER
CHECKED BY: J. DAHLGREN
LEAD DESIGNER: C. MAHER
ENGINEER/TECH SPECIALIST: J. DAHLGREN
PROJECT ENGINEERING MANAGER: J. BRAVO
PROJECT MANAGER: B. PIETRUCHA

PROFESSIONAL ENGINEER'S SEAL
ORIGINALLY PREPARED UNDER THE RESPONSIBLE SUPERVISION OF
PE: STATE:
LIC. NO.: DATE:

Zero Harm — Leadership, No Incidents, Safe Behavior

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CLIENT/PROJECT TITLE
GENESIS SOLAR LLC
GENESIS SOLAR ENERGY PROJECT

PRE-DEVELOPMENT
DRAINAGE PLAN DRAWING
DRAWING 2 OF 2

SCALE 1"=1000'
DRAWING SIZE ARCH D (36" x 24")
WORLEYPARSONS DWG. NO. GENI-1-DW-112-726-002
REV 1

FILE NAME:$$$$DGNSPEC$$$$$$$$$$$$$$ $$$$DATE$$$$ $$$$TIME$$$$

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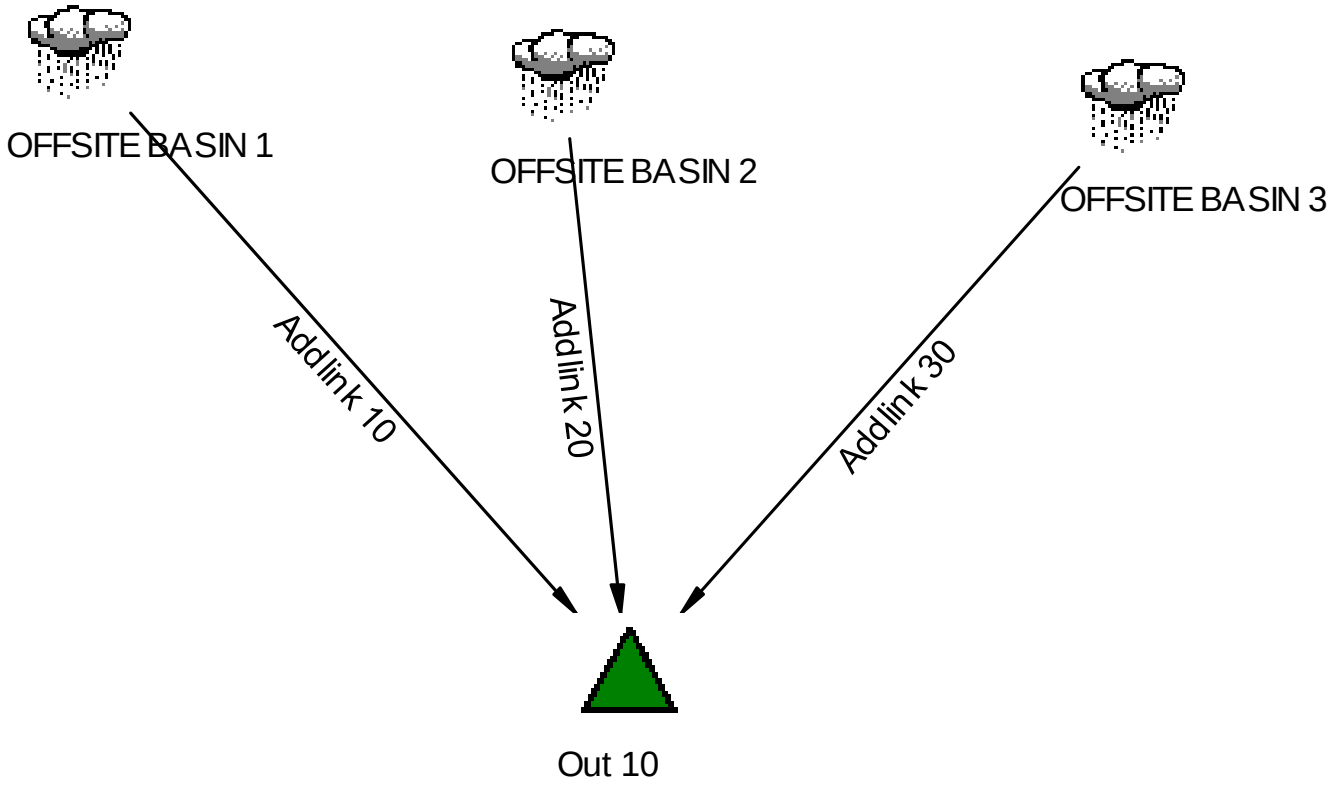
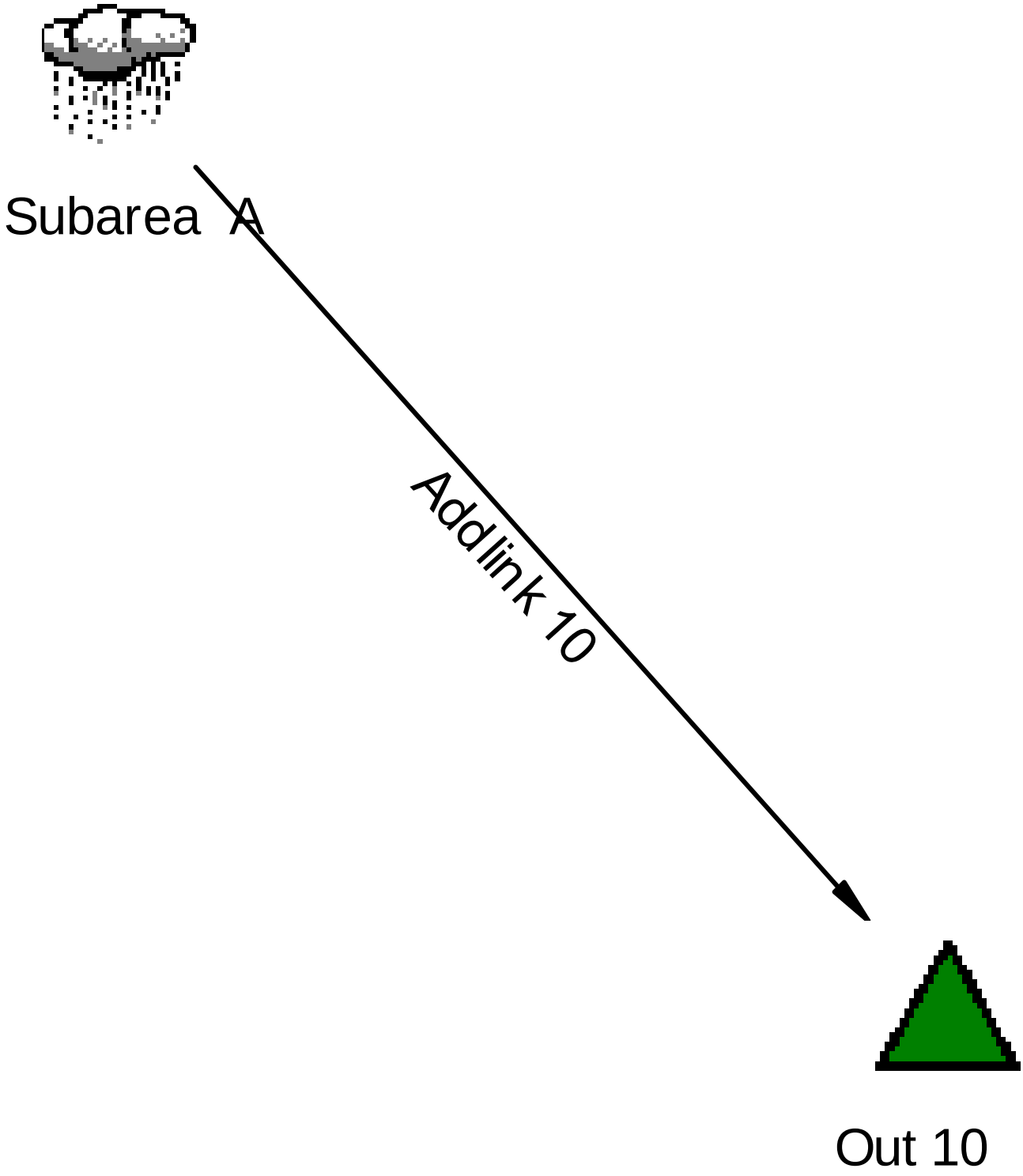
PRE DEVELOPED PONDPACK MODEL - OFF SITE FLOWS



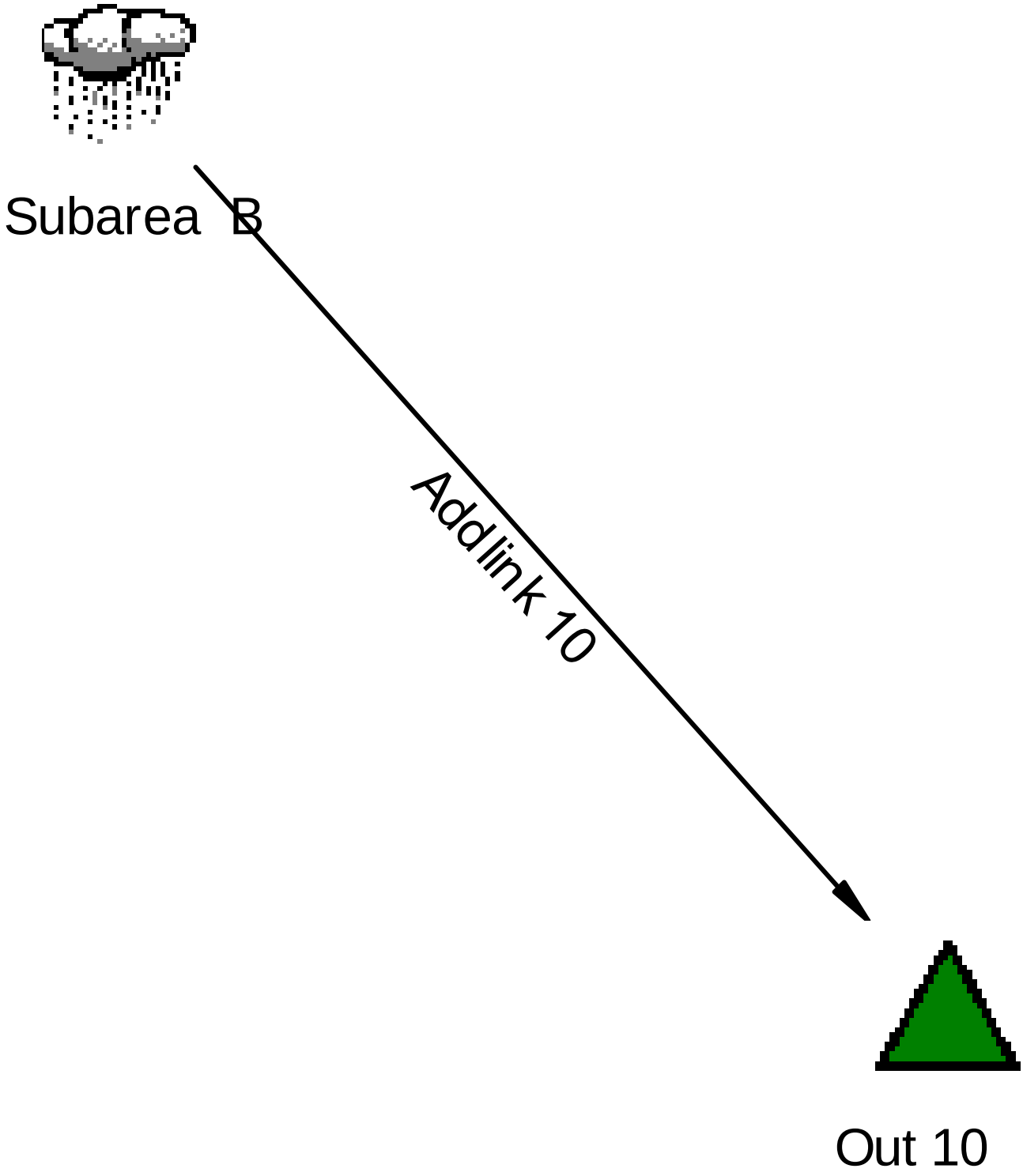
GENESIS SOLAR ENERGY PROJECT
CONCEPTUAL DRAINAGE STUDY

PRE DEVELOPED PONDPACK MODEL - UNIT 1



GENESIS SOLAR ENERGY PROJECT
CONCEPTUAL DRAINAGE STUDY

PRE DEVELOPED PONDPACK MODEL - UNIT 2



JOB NO. 52004606
August 19, 2009

GENESIS SOLAR ENERGY PROJECT

MASTER DESIGN STORM SUMMARY

100-YR, 24-HR EVENT
PRE-DEVELOPMENT CONDITIONS
OFFSITE DRAINAGE FLOWS
FOR SUB-BASINS 1, 2, AND 3

Network Storm Collection: Ford Dry Lake

Return Event	Total Depth in	Rainfall Type	RNF ID
Pre100	3.5100	Synthetic Curve	Type II 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion ;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Max Qpeak hrs	Qpeak cfs	Max WSEL ft	Pond Storage ac-ft
OFFSITE BASIN 1	AREA	100	2562.192		15.8000	4070.86		
OFFSITE BASIN 2	AREA	100	1709.932		17.5500	2203.46		
OFFSITE BASIN 3	AREA	100	8604.637		21.9500	6469.52		
*OUT 10	JCT	100	12876.770		17.9500	10022.25		

JOB NO. 52004606
August 19, 2009

GENESIS SOLAR ENERGY PROJECT

MASTER DESIGN STORM SUMMARY

100-YR, 24-HR EVENT
PRE-DEVELOPMENT CONDITIONS
ONSITE DRAINAGE FLOWS
FOR SUB-BASIN A

Network Storm Collection: Ford Dry Lake

Return Event	Total Depth in	Rainfall Type	RNF ID
Pre100	3.5100	Synthetic Curve	Type II 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion ;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Max Qpeak cfs
*OUT 10	JCT	100	139.043		13.2000	518.63
SUBAREA A	AREA	100	139.043		13.2000	518.63

JOB NO. 52004606
August 19, 2009

GENESIS SOLAR ENERGY PROJECT

MASTER DESIGN STORM SUMMARY

100-YR, 24-HR EVENT
PRE-DEVELOPMENT CONDITIONS
ONSITE DRAINAGE FLOWS
FOR SUB-BASIN B

Network Storm Collection: Ford Dry Lake

Return Event	Total Depth in	Rainfall Type	RNF ID
Pre100	3.5100	Synthetic Curve	Type II 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion ;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Max Qpeak cfs
*OUT 10	JCT	100	99.546		13.0500	419.21
SUBAREA B	AREA	100	99.546		13.0500	419.21

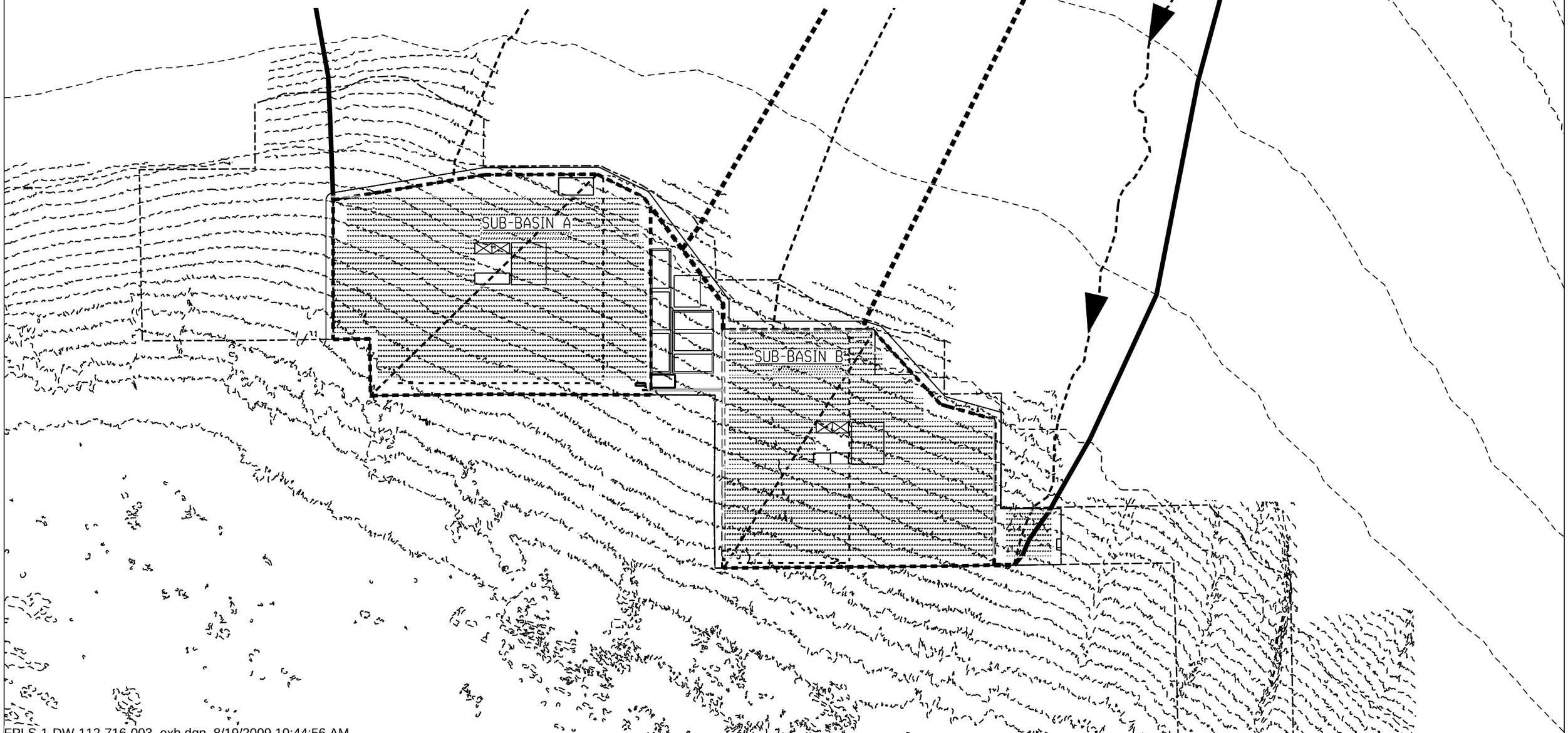
APPENDIX E – POST-DEVELOPED CONDITIONS

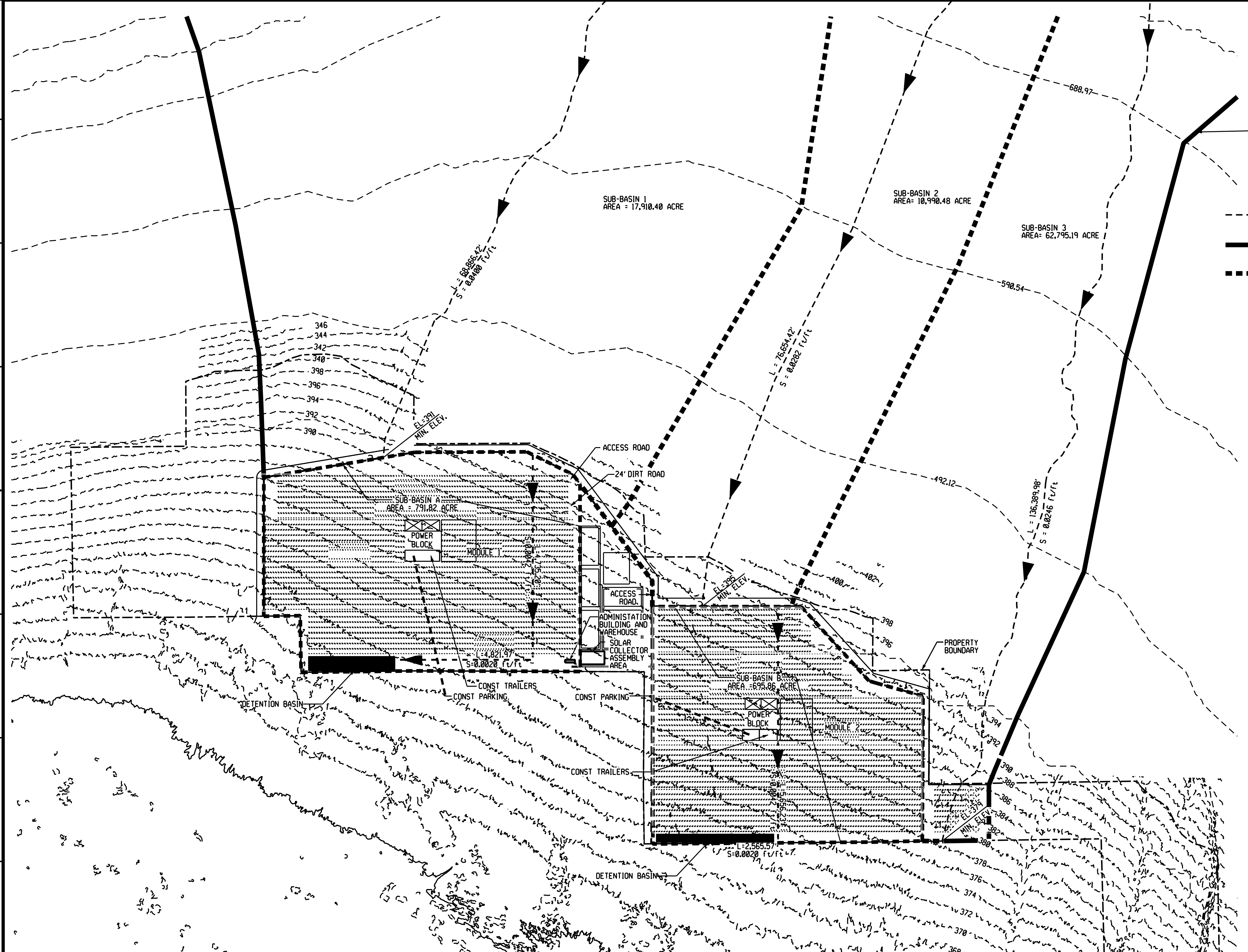
GENESIS SOLAR ENERGY PROJECT
CONCEPTUAL DRAINAGE STUDY

POST DEVELOPED WATERSHED

OFFSITE RUN OFF DIVERTED IN CHANNELS AROUND / THROUGH THE SITE

FURTHER DETAILS ARE PROVIED ON THE FOLLWING DRAWINGS:
GENI-1-DW-112-716-003 & GENI-1-DW-112-716-004





REV	DATE	DESCRIPTION	DRAWN	CHECKED	LEAD DESIGNER	ENGINEER/TECH SPEC	LEAD DISC ENGINEER	PROJ ENGR MANAGER	PROJECT MANAGER
1	08 19 09	ISSUED FOR PERMITTING	CM	JD	CM	JB	RH	JB	BP

PRELIMINARY STATUS — DATE — REPRESENTS GENERAL DESIGN CONCEPTS BASED ON ASSUMPTIONS. REVIEWED NOT CHECKED.
LOE

APPROVED STATUS — DATE — REPRESENTS REVIEWED AND APPROVED DESIGN. ANY PORTION MARKED "HOLD" RETAINS PRELIMINARY STATUS.
LOE

ORIGINATING PERSONNEL

DRAWN BY: C. MAHER
CHECKED BY: J. DAHLGREN
LEAD DESIGNER: C. MAHER
ENGINEER/TECH SPECIALIST: J. DAHLGREN
PROJECT ENGINEERING MANAGER: J. BRAVO
PROJECT MANAGER: B. PIETRUCHA

PROFESSIONAL ENGINEER'S SEAL

ORIGINALLY PREPARED UNDER THE RESPONSIBLE SUPERVISION OF
PE: STATE:
LIC. NO.: DATE:

Zero Harm — Leadership, No Incidents, Safe Behavior

WorleyParsons
resources & energy

CLIENT/PROJECT TITLE
GENESIS SOLAR LLC
GENESIS SOLAR ENERGY PROJECT

POST-DEVELOPMENT
DRAINAGE PLAN DRAWING 1
DRAWING 1 OF 1

SCALE: 1"=1000'
DRAWING SIZE: ARCH D (36" x 24")
WORLEYPARSONS DWG. NO.: GENI-1-DW-112-726-003
REV: 1

FILE NAME:$$$$DGNSPEC$$$$$$$$$$$$$$
$$$$DATE$$$$ $$$$TIME$$$$

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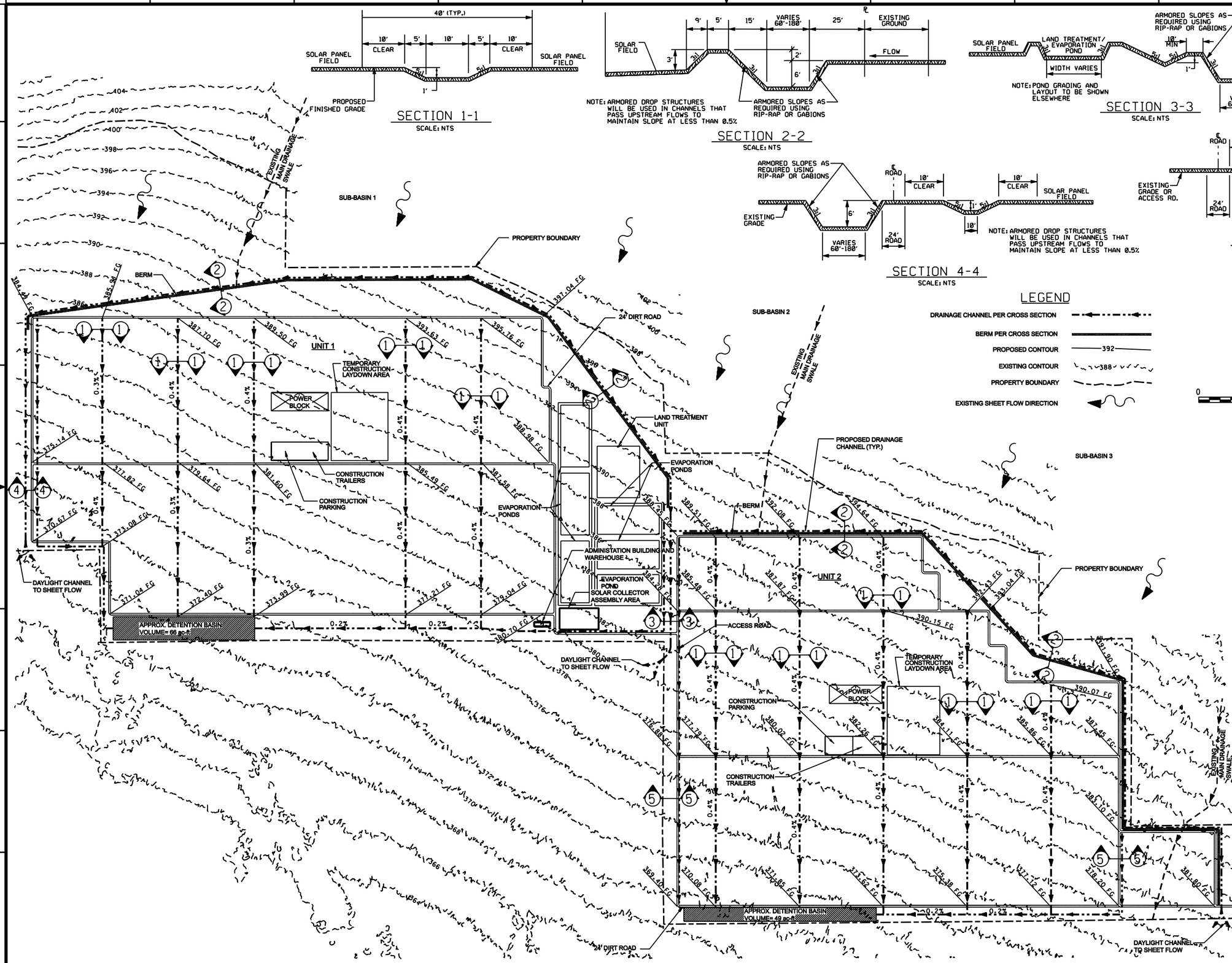

REV	DATE	DESCRIPTION	DRAWN	CHECKED	LEAD DESIGNER	ENGINEER/TECH SPECIALIST	PROJECT ENGINEERING MANAGER	PROJECT MANAGER
1	08 19 09		JD	JD	JD	JB	JB	BP

PRELIMINARY STATUS — DATE — REPRESENTS GENERAL DESIGN CONCEPTS BASED ON ASSUMPTIONS. REVIEWED NOT CHECKED.

APPROVED STATUS — DATE — REPRESENTS REVIEWED AND APPROVED DESIGN. ANY PORTION MARKED "HOLD" RETAINS PRELIMINARY STATUS.

ORIGINATING PERSONNEL

DRAWN BY: J. DAHLGREN
CHECKED BY: J. DAHLGREN
LEAD DESIGNER: J. DAHLGREN
ENGINEER/TECH SPECIALIST: J. BRAVO
PROJECT ENGINEERING MANAGER: J. BRAVO
PROJECT MANAGER: B. PIETRUCHA

PROFESSIONAL ENGINEER'S SEAL

Zero Harm — Leadership, No Incidents, Safe Behavior

WorleyParsons resources & energy

CLIENT/PROJECT TITLE

GENESIS SOLAR LLC
GENESIS SOLAR ENERGY PROJECT

CONCEPTUAL
GRADING PLAN
DRAWING 1 OF 1

SCALE: 1"=600'
DRAWING SIZE: ARCH D (36" x 24")
WORLEYPARSONS DWG. NO.: GENI-1-DW-112-726-004
REV: 1

FILE NAME: $$$$DGNSPEC$$$$$$$$$$$$$$$$ $$$$$TIME$$$$ $$$$$DATE$$$$

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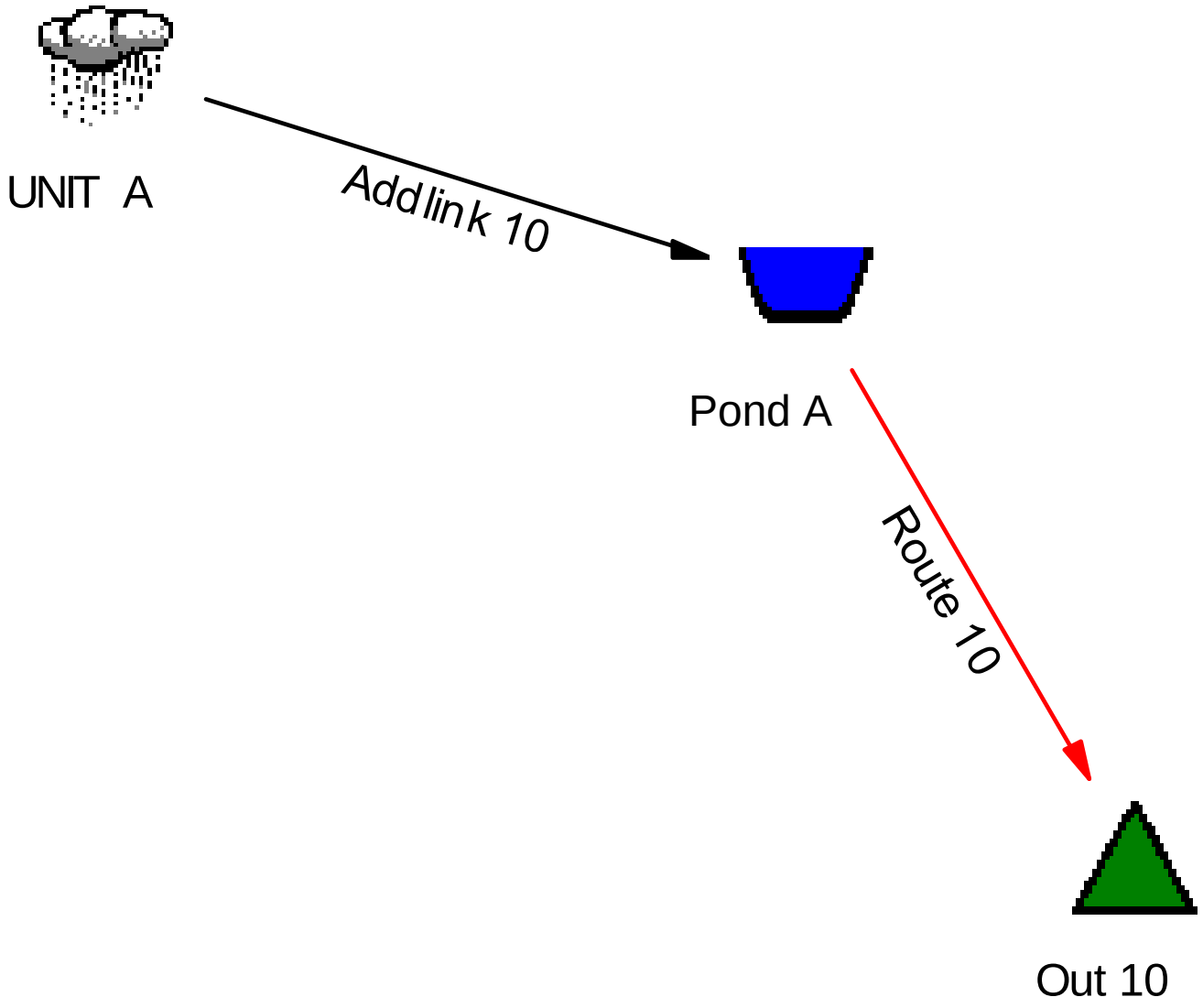
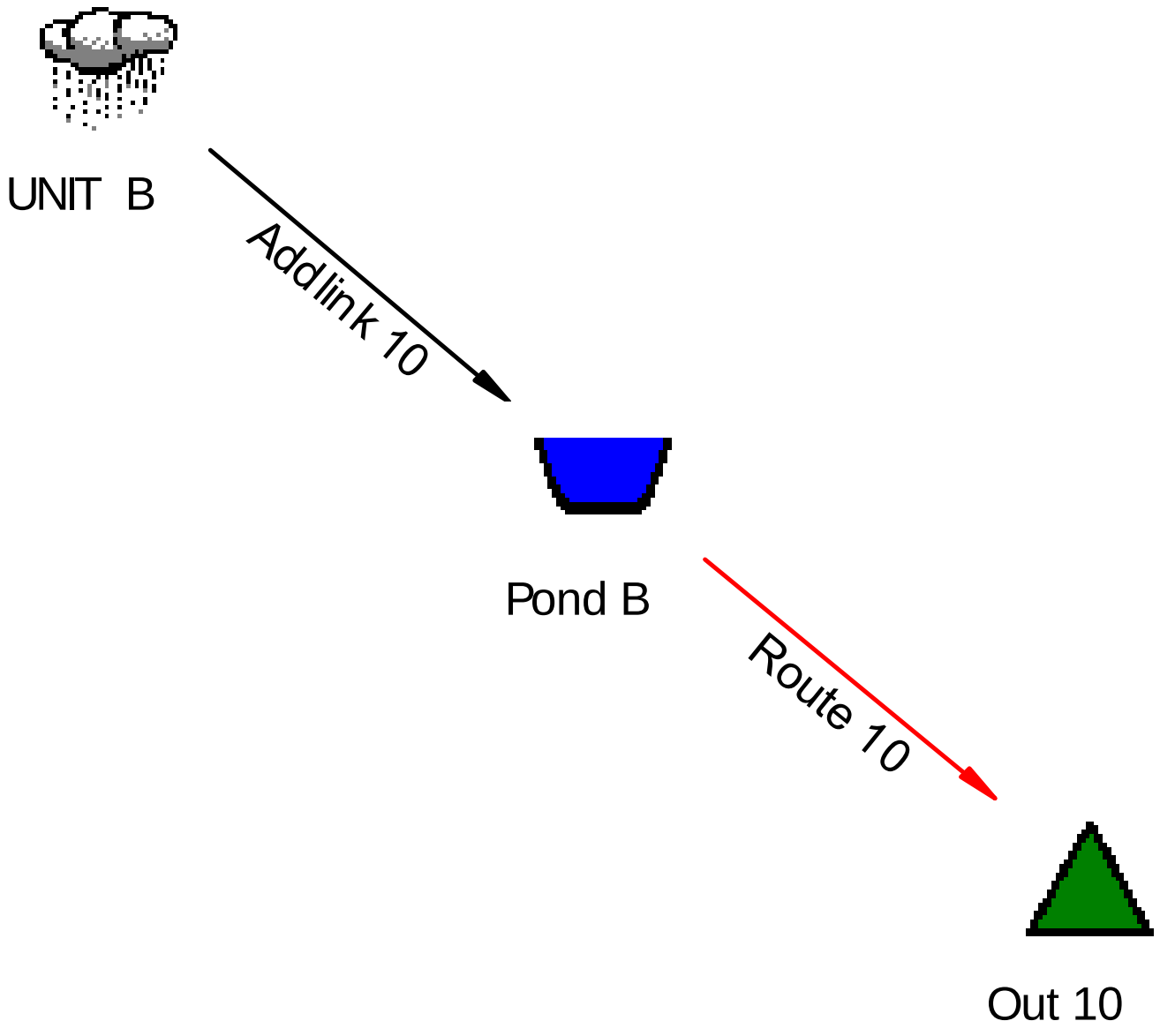
GENESIS SOLAR ENERGY PROJECT
CONCEPTUAL DRAINAGE STUDY

POST DEVELOPED PONDPACK MODEL - UNIT 1



GENESIS SOLAR ENERGY PROJECT
CONCEPTUAL DRAINAGE STUDY

POST DEVELOPED PONDPACK MODEL - UNIT 2



JOB NO. 52004606
August 19, 2009

GENESIS SOLAR ENERGY PROJECT

MASTER DESIGN STORM SUMMARY

100-YR, 24-HR EVENT
POST-DEVELOPMENT CONDITIONS
ONSITE DRAINAGE FLOWS
FOR SUB-BASIN A

Network Storm Collection: Ford Dry Lake

Return Event	Total Depth in	Rainfall Type	RNF ID
Dev100	3.5100	Synthetic Curve	Type II 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion ;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Max Qpeak cfs
*OUT 10	JCT	100	150.302		12.2500	1295.00
SUBAREA A	AREA	100	150.302		12.2500	1295.00

==========
JOB TITLE
==========

Project Date: 1/12/2009
Project Engineer: Juan Bravo, P.E.
Project Title: FORD DRY LAKE (Onsite Subarea A)
Project Comments:
The purpose of these calculations, is to determine the amount of runoff produced in a 100-yr, 24-hr storm event by the onsite tributary drainage area correspondent to the Subarea A (or Unit A) for the Ford Dry Lake Project when developed. Also, to determine the volume of detention required to minimized downstream impact.

Table of Contents

POND A..... Target Outflow Volume Estimates 0.01

********** HYDROGRAPHS **********

POND A..... 100
Hydrograph 1.01

DETENTION STORAGE ESTIMATES -- Target Peak Outflow Rate

Return Events	Peak In (cfs)	Target (cfs)	Lower (ac-ft)	Linear (ac-ft)	Curvlinr (ac-ft)	Upper (ac-ft)	Total (ac-ft)
100	1295.002	518.629	30.033	41.711	65.753	84.636	150.302

CALCULATION TIME RANGES

Return	Lower		Linear		Curvilinear		Upper		Total	
Events	From (hrs)	To (hrs)	From (hrs)	To (hrs)	From (hrs)	To (hrs)	From (hrs)	To (hrs)	From (hrs)	To (hrs)
100	11.93	12.77	11.60	12.77	5.90	12.77	5.90	12.77	5.90	26.10

```
INFLOW HYDROGRAPH...
HYG file =
HYG ID   = POND A       IN
HYG Tag  = Dev100
-----------------------------------
Peak Discharge =      1295.00 cfs
Time to Peak   =      12.2500 hrs
HYG Volume     =      150.302 ac-ft
-----------------------------------
```

HYDROGRAPH ORDINATES (cfs)
Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
5.9000	.00	.00	.01	.02	.05
6.1500	.08	.14	.22	.31	.43
6.4000	.56	.72	.88	1.06	1.26
6.6500	1.46	1.67	1.89	2.12	2.35
6.9000	2.58	2.82	3.06	3.31	3.56
7.1500	3.82	4.07	4.33	4.60	4.86
7.4000	5.13	5.40	5.67	5.94	6.22
7.6500	6.49	6.77	7.06	7.34	7.63
7.9000	7.91	8.20	8.49	8.79	9.08
8.1500	9.39	9.71	10.04	10.38	10.75
8.4000	11.15	11.56	12.01	12.48	12.97
8.6500	13.49	14.03	14.59	15.17	15.77
8.9000	16.39	17.03	17.69	18.37	19.06
9.1500	19.75	20.45	21.13	21.82	22.47
9.4000	23.11	23.72	24.31	24.88	25.43
9.6500	25.99	26.55	27.14	27.76	28.45
9.9000	29.17	29.99	30.86	31.79	32.82
10.1500	33.88	35.05	36.27	37.57	38.95
10.4000	40.38	41.93	43.52	45.21	46.99
10.6500	48.85	50.85	52.92	55.18	57.54
10.9000	60.05	62.72	65.47	68.50	71.63
11.1500	75.03	78.74	82.67	87.24	92.03
11.4000	97.50	103.46	109.99	118.58	128.28
11.6500	145.68	169.49	205.19	263.71	334.80
11.9000	450.38	578.42	737.86	897.95	1058.61
12.1500	1175.62	1273.18	1295.00	1286.85	1235.90
12.4000	1154.56	1060.57	953.01	848.68	752.03
12.6500	668.59	594.32	535.22	480.22	434.95
12.9000	394.13	358.27	328.53	301.02	279.09
13.1500	258.83	241.58	226.60	212.85	201.55
13.4000	190.88	181.77	173.48	165.91	159.28

HYDROGRAPH ORDINATES (cfs)
Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
13.6500	152.93	147.27	141.85	136.77	132.07
13.9000	127.51	123.60	119.87	116.59	113.58
14.1500	110.74	108.12	105.57	103.24	101.06
14.4000	99.03	97.22	95.50	94.00	92.58
14.6500	91.27	90.05	88.88	87.79	86.72
14.9000	85.70	84.72	83.76	82.82	81.90
15.1500	81.01	80.11	79.23	78.35	77.48
15.4000	76.60	75.73	74.87	74.01	73.15
15.6500	72.30	71.44	70.59	69.74	68.89
15.9000	68.03	67.17	66.31	65.46	64.61
16.1500	63.77	62.95	62.18	61.43	60.73
16.4000	60.08	59.46	58.90	58.37	57.89
16.6500	57.43	57.01	56.61	56.22	55.85
16.9000	55.49	55.14	54.80	54.47	54.14
17.1500	53.81	53.49	53.17	52.85	52.54
17.4000	52.23	51.92	51.61	51.31	51.00
17.6500	50.69	50.38	50.07	49.77	49.46
17.9000	49.15	48.85	48.54	48.24	47.93
18.1500	47.63	47.32	47.01	46.70	46.39
18.4000	46.08	45.78	45.47	45.16	44.85
18.6500	44.55	44.24	43.93	43.62	43.31
18.9000	43.00	42.69	42.38	42.07	41.76
19.1500	41.45	41.14	40.83	40.53	40.21
19.4000	39.90	39.59	39.28	38.96	38.65
19.6500	38.34	38.03	37.72	37.41	37.10
19.9000	36.79	36.48	36.16	35.85	35.54
20.1500	35.24	34.94	34.67	34.40	34.17
20.4000	33.94	33.74	33.57	33.40	33.26
20.6500	33.13	33.01	32.91	32.81	32.72
20.9000	32.63	32.55	32.47	32.40	32.32
21.1500	32.25	32.19	32.12	32.05	31.99
21.4000	31.92	31.86	31.80	31.74	31.67
21.6500	31.61	31.55	31.49	31.43	31.37
21.9000	31.31	31.25	31.18	31.12	31.06
22.1500	31.00	30.94	30.88	30.82	30.76
22.4000	30.70	30.64	30.58	30.52	30.46
22.6500	30.40	30.33	30.27	30.21	30.15
22.9000	30.09	30.03	29.97	29.91	29.85
23.1500	29.78	29.72	29.66	29.60	29.54
23.4000	29.48	29.42	29.36	29.30	29.23
23.6500	29.17	29.11	29.05	28.99	28.93
23.9000	28.87	28.81	28.64	28.42	27.82
24.1500	26.98	25.68	23.89	21.84	19.43
24.4000	17.00	14.59	12.33	10.21	8.48
24.6500	6.89	5.73	4.70	3.88	3.22

HYDROGRAPH ORDINATES (cfs)
Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
24.9000	2.62	2.18	1.79	1.47	1.21
25.1500	.99	.82	.66	.55	.44
25.4000	.36	.29	.23	.19	.15
25.6500	.12	.09	.07	.05	.03
25.9000	.02	.01	.01	.00	.00

CURVILINEAR OUTFLOW ESTIMATE...

Peak Discharge = 518.63 cfs
Time to Peak = 12.7384 hrs

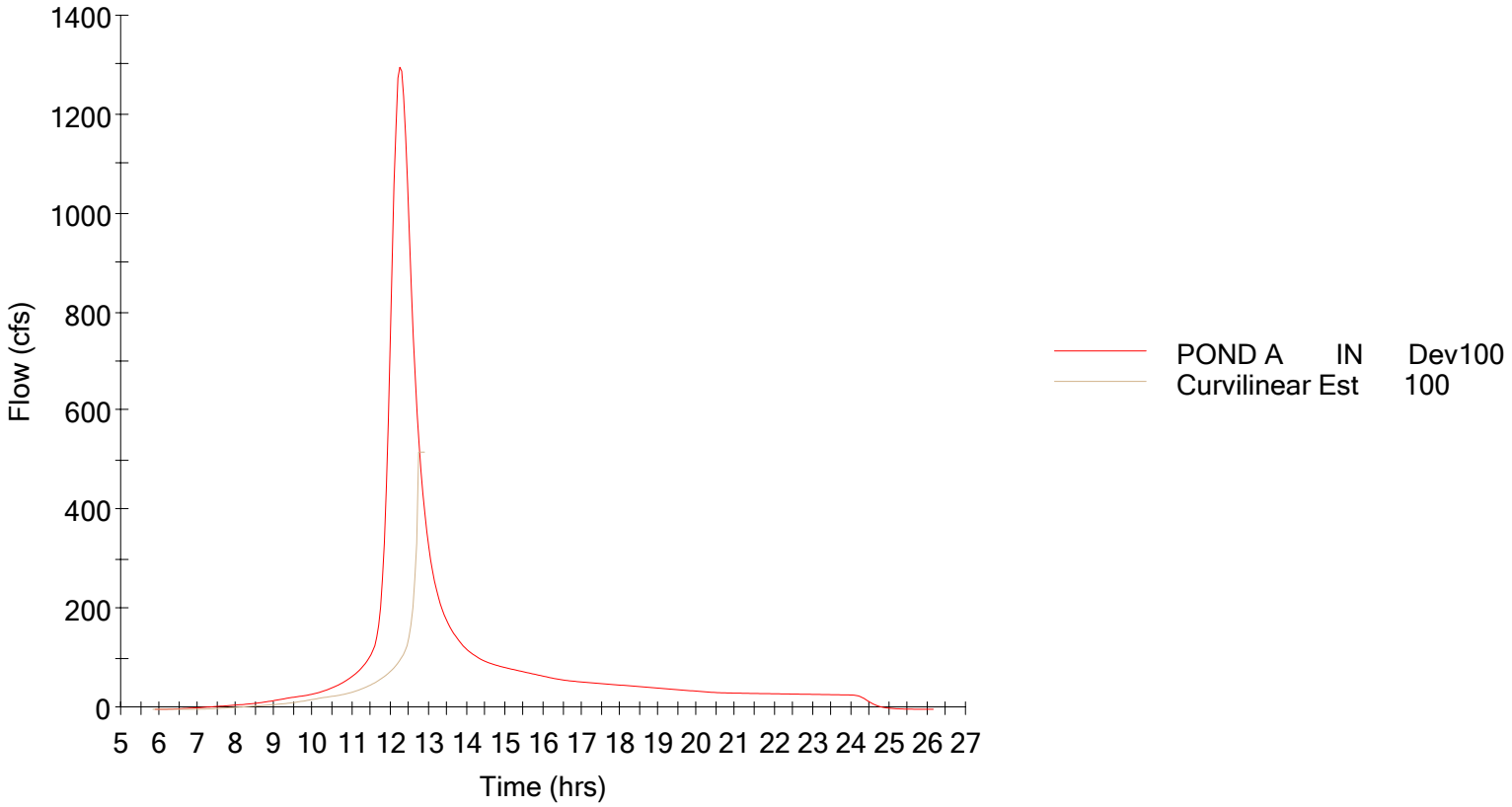
HYDROGRAPH ORDINATES (cfs)
Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
5.8384	.00	.00	.00	.00	.00
6.0884	.00	.00	.00	.00	.00
6.3384	.00	.00	.00	.00	.00
6.5884	.00	.00	.00	.00	.00
6.8384	.01	.02	.05	.08	.14
7.0884	.22	.31	.43	.56	.72
7.3384	.88	1.06	1.26	1.46	1.67
7.5884	1.89	2.12	2.35	2.58	2.82
7.8384	3.06	3.31	3.56	3.82	4.07
8.0884	4.33	4.60	4.86	5.13	5.40
8.3384	5.67	5.94	6.22	6.49	6.77
8.5884	7.06	7.34	7.63	7.91	8.20
8.8384	8.49	8.79	9.08	9.39	9.71
9.0884	10.04	10.38	10.75	11.15	11.56
9.3384	12.01	12.48	12.97	13.49	14.03
9.5884	14.59	15.17	15.77	16.39	17.03
9.8384	17.69	18.37	19.06	19.75	20.45
10.0884	21.13	21.82	22.47	23.11	23.72
10.3384	24.31	24.88	25.43	25.99	26.55
10.5884	27.14	27.76	28.45	29.17	29.99
10.8384	30.86	31.79	32.82	33.88	35.05
11.0884	36.27	37.57	38.95	40.38	41.93
11.3384	43.52	45.21	46.99	48.85	50.85
11.5884	52.92	55.18	57.54	60.05	62.72
11.8384	65.47	68.50	71.63	75.03	78.74
12.0884	82.67	87.24	92.03	97.50	103.46
12.3384	109.99	118.58	128.28	145.68	169.49
12.5884	205.19	263.71	334.80	518.63	518.63
12.8384	518.63	518.63			

Index of Starting Page Numbers for ID Names

----- P -----
POND A... 0.01, 1.01

Hydrograph
Curvilinear Est 100



JOB NO. 52004606
August19, 2009

GENESIS SOLAR ENERGY PROJECT

MASTER DESIGN STORM SUMMARY

100-YR, 24-HR EVENT
POST-DEVELOPMENT CONDITIONS
ONSITE DRAINAGE FLOWS
FOR SUB-BASIN B

Network Storm Collection: Ford Dry Lake

Return Event	Total Depth in	Rainfall Type	RNF ID
Dev100	3.5100	Synthetic Curve	Type II 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion ;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Max Qpeak cfs
*OUT 10	JCT	100	112.794		12.2000	1127.07
UNIT B	AREA	100	112.794		12.2000	1127.07

==========
JOB TITLE
==========

Project Date: 1/12/2009
Project Engineer: Juan Bravo, P.E.
Project Title: FORD DRY LAKE (Onsite Subarea B)
Project Comments:
The purpose of these calculations, is to determine the amount of runoff produced in a 100-yr, 24-hr storm event by the onsite tributary drainage area correspondent to the Subarea B for the Ford Dry Lake Project when developed. Also, to determine the amount of volume needed to detain to minimized downstream impact

Table of Contents

POND B..... Target Outflow Volume Estimates 0.01

********** HYDROGRAPHS **********

POND B..... 100
Hydrograph 1.01

DETENTION STORAGE ESTIMATES -- Target Peak Outflow Rate

Return Events	Peak In (cfs)	Target (cfs)	Lower (ac-ft)	Linear (ac-ft)	Curvlinr (ac-ft)	Upper (ac-ft)	Total (ac-ft)
100	1127.070	419.212	23.320	31.901	48.377	59.997	112.794

CALCULATION TIME RANGES

Return	Lower		Linear		Curvilinear		Upper		Total	
Events	From (hrs)	To (hrs)	From (hrs)	To (hrs)	From (hrs)	To (hrs)	From (hrs)	To (hrs)	From (hrs)	To (hrs)
100	11.90	12.63	11.65	12.63	7.50	12.63	7.50	12.63	7.50	25.65

```
INFLOW HYDROGRAPH...
HYG file =
HYG ID   = POND B       IN
HYG Tag  = Dev100
-----------------------------------
Peak Discharge =      1127.07 cfs
Time to Peak   =      12.2000 hrs
HYG Volume     =      112.794 ac-ft
-----------------------------------
```

HYDROGRAPH ORDINATES (cfs)
Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
7.5000	.00	.00	.01	.03	.07
7.7500	.12	.20	.30	.42	.56
8.0000	.71	.88	1.05	1.24	1.44
8.2500	1.65	1.87	2.10	2.35	2.60
8.5000	2.88	3.16	3.46	3.78	4.11
8.7500	4.45	4.80	5.17	5.56	5.96
9.0000	6.37	6.79	7.23	7.67	8.12
9.2500	8.56	9.00	9.43	9.86	10.27
9.5000	10.67	11.06	11.46	11.86	12.29
9.7500	12.73	13.21	13.74	14.32	14.92
10.0000	15.58	16.28	17.02	17.79	18.62
10.2500	19.51	20.44	21.41	22.47	23.57
10.5000	24.73	25.94	27.23	28.58	30.01
10.7500	31.53	33.19	34.94	36.80	38.80
11.0000	40.92	43.16	45.52	48.13	50.99
11.2500	54.12	57.57	61.56	65.90	70.60
11.5000	75.81	82.80	92.89	107.44	131.59
11.7500	171.50	229.07	307.48	425.12	572.42
12.0000	734.73	903.04	1029.33	1104.09	1127.07
12.2500	1090.90	1005.43	903.01	791.68	684.81
12.5000	595.31	518.76	454.34	402.26	357.65
12.7500	318.89	285.56	259.16	236.51	217.14
13.0000	200.87	187.55	175.81	165.45	156.52
13.2500	148.77	141.78	135.47	129.86	124.72
13.5000	120.01	115.73	112.09	108.79	105.75
13.7500	102.91	100.26	97.72	95.28	92.96
14.0000	90.75	88.61	86.53	84.55	82.69
14.2500	80.95	79.32	77.88	76.58	75.39
14.5000	74.30	73.33	72.42	71.55	70.74
14.7500	69.95	69.19	68.45	67.73	67.01
15.0000	66.31	65.62	64.93	64.24	63.55

HYDROGRAPH ORDINATES (cfs)
Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
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15.5000	59.46	58.78	58.10	57.42	56.73
15.7500	56.05	55.36	54.67	53.99	53.30
16.0000	52.61	51.92	51.24	50.58	49.94
16.2500	49.35	48.79	48.28	47.82	47.41
16.5000	47.03	46.68	46.36	46.05	45.76
16.7500	45.47	45.20	44.94	44.67	44.42
17.0000	44.16	43.91	43.66	43.41	43.17
17.2500	42.92	42.67	42.43	42.18	41.94
17.5000	41.69	41.45	41.20	40.96	40.71
17.7500	40.46	40.22	39.97	39.73	39.48
18.0000	39.23	38.98	38.74	38.49	38.24
18.2500	37.99	37.74	37.49	37.24	37.00
18.5000	36.75	36.50	36.25	36.00	35.75
18.7500	35.50	35.25	35.00	34.75	34.49
19.0000	34.24	33.99	33.74	33.49	33.24
19.2500	32.98	32.73	32.48	32.23	31.97
19.5000	31.72	31.47	31.21	30.96	30.70
19.7500	30.45	30.20	29.94	29.69	29.43
20.0000	29.18	28.93	28.68	28.44	28.21
20.2500	28.00	27.81	27.64	27.49	27.36
20.5000	27.25	27.15	27.06	26.99	26.91
20.7500	26.85	26.78	26.72	26.67	26.61
21.0000	26.56	26.51	26.46	26.40	26.35
21.2500	26.31	26.26	26.21	26.16	26.11
21.5000	26.06	26.01	25.96	25.92	25.87
21.7500	25.82	25.77	25.72	25.67	25.63
22.0000	25.58	25.53	25.48	25.43	25.38
22.2500	25.33	25.29	25.24	25.19	25.14
22.5000	25.09	25.04	24.99	24.94	24.90
22.7500	24.85	24.80	24.75	24.70	24.65
23.0000	24.60	24.55	24.50	24.45	24.40
23.2500	24.36	24.31	24.26	24.21	24.16
23.5000	24.11	24.06	24.01	23.96	23.91
23.7500	23.86	23.81	23.76	23.71	23.66
24.0000	23.53	23.22	22.66	21.40	19.64
24.2500	17.47	14.97	12.47	10.12	7.99
24.5000	6.26	4.93	3.86	3.01	2.38
24.7500	1.87	1.46	1.13	.90	.70
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25.5000	.02	.01	.00	.00	

CURVILINEAR OUTFLOW ESTIMATE...

Peak Discharge = 419.21 cfs
Time to Peak = 12.5862 hrs

HYDROGRAPH ORDINATES (cfs)
Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
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7.9362	.00	.00	.00	.00	.00
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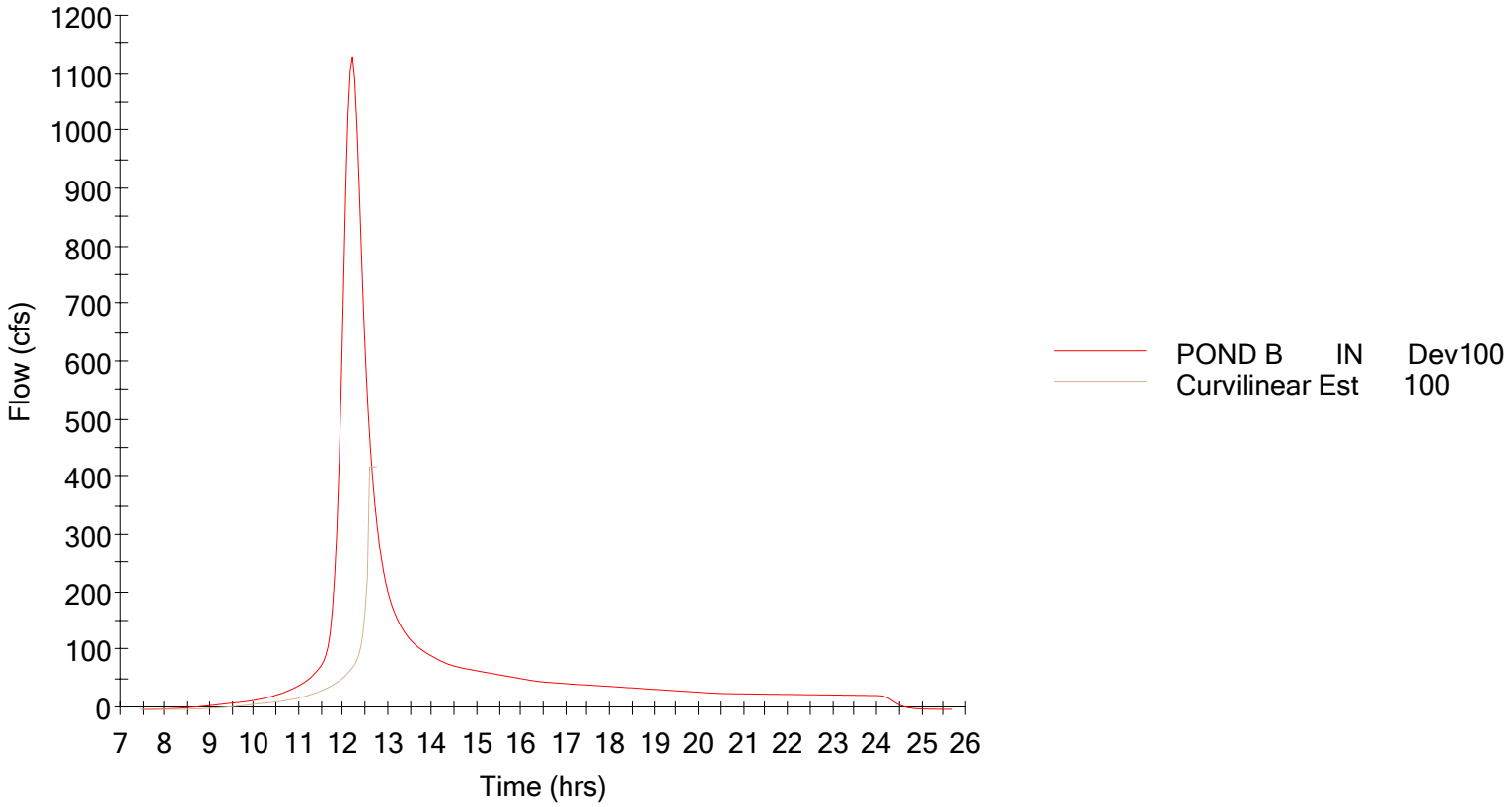
8.4362	.07	.12	.20	.30	.42
8.6862	.56	.71	.88	1.05	1.24
8.9362	1.44	1.65	1.87	2.10	2.35
9.1862	2.60	2.88	3.16	3.46	3.78
9.4362	4.11	4.45	4.80	5.17	5.56
9.6862	5.96	6.37	6.79	7.23	7.67
9.9362	8.12	8.56	9.00	9.43	9.86
10.1862	10.27	10.67	11.06	11.46	11.86
10.4362	12.29	12.73	13.21	13.74	14.32
10.6862	14.92	15.58	16.28	17.02	17.79
10.9362	18.62	19.51	20.44	21.41	22.47
11.1862	23.57	24.73	25.94	27.23	28.58
11.4362	30.01	31.53	33.19	34.94	36.80
11.6862	38.80	40.92	43.16	45.52	48.13
11.9362	50.99	54.12	57.57	61.56	65.90
12.1862	70.60	75.81	82.80	92.89	107.44
12.4362	131.59	171.50	229.07	419.21	419.21
12.6862	419.21	419.21			

Index of Starting Page Numbers for ID Names

----- P -----
POND B... 0.01, 1.01

Hydrograph
Curvilinear Est 100



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resources & energy

APPENDIX B – PRELIMINARY STORMWATER POLLUTION PREVENTION PLAN

PRELIMINARY
STORMWATER POLLUTION
PREVENTION PLAN

FOR

GENESIS SOLAR ENERGY PROJECT

Prepared For:

GENESIS SOLAR, LLC
700 Universe Boulevard
Juno Beach, FL 33408

Contractor:

To Be Determined

SWPPP Prepared By:

WorleyParsons Group Inc.
2330 E. Bidwell Street, Suite 150
Folsom, CA 95630

SWPPP Preparation Date:

August 19th 2009

Estimated Project Dates:
Start of Construction: *To Be Determined*
Completion of Construction: *To Be Determined*

WDID NO.: (*To Be Determined*)

TABLE OF CONTENTS

1. SWPPP CERTIFICATIONS AND APPROVALS 1
1.1 NOTICE TO CONTRACTOR 1
1.2 CERTIFICATION BY ENGINEER OR AUTHORIZED DESIGNEE (PREPARER) 2
1.3 OWNER APPROVAL AND CERTIFICATION OF SWPPP 3
1.4 CONTRACTORS APPROVAL AND CERTIFICATION OF SWPPP 4
1.5 ANNUAL COMPLIANCE CERTIFICATION 5
1.6 LOCATION OF SWPPP 5
2. SWPPP AMENDMENTS 6
2.1 SWPPP AMENDMENTS 6
2.2 SWPPP AMENDMENT CERTIFICATION 7
2.3 SWPPP AMENDMENT LOG 8
3. INTRODUCTION AND PROJECT DESCRIPTION 9
3.1 PROJECT INFORMATION AND BACKGROUND 9
3.2 UNIQUE SITE FEATURES 10
3.3 CONSTRUCTION SITE ESTIMATES 12
3.4 PROJECT SCHEDULE/WATER POLLUTION CONTROL SCHEDULE 13
3.5 CONTACT INFORMATION / LIST OF RESPONSIBLE PARTIES 14
4. REFERENCES 15
5. BODY OF SWPPP 16
5.1 OBJECTIVES 16
5.2 SCOPE 16
5.3 PROJECT ACTIVITIES 17
5.4 VICINITY MAP 18
5.5 POLLUTANT SOURCE IDENTIFICATION 18
5.6 EXISTING (PRE-CONSTRUCTION) CONTROL MEASURES 19
5.7 NATURE OF FILL MATERIAL AND EXISTING DATA DESCRIBING THE SOIL 19
5.8 BMP SELECTION 19
5.8.1 Erosion Control 20
5.8.2 Sediment Control 22
5.8.3 Wind Control 24
5.8.4 Tracking Control 25
5.8.5 Non-Storm Water Discharges 26
5.8.6 Waste Management and Materials Pollution Control 28
5.9 WATER POLLUTION CONTROL DRAWINGS 31

5.10 CONSTRUCTION BMP MAINTENANCE, INSPECTION AND REPAIR 32
5.11 POST CONSTRUCTION STORM WATER MANAGEMENT 33
5.11.1 Post Construction Control Practices 33
5.11.2 Operation/Maintenance after Project Completion 33
5.12 TRAINING 33
5.13 OTHER PLANS / PERMITS 34
6. MONITORING PROGRAM AND REPORTS 35
6.1 SITE INSPECTIONS 35
6.2 DISCHARGE REPORTING 35
6.3 RECORD KEEPING AND REPORTS 36
6.4 SAMPLING AND ANALYSIS PLAN FOR SEDIMENT 36
6.5 SAMPLING AND ANALYSIS PLAN FOR NON-VISIBLE POLLUTANTS 37
6.5.1 Scope Monitoring Activities 37
6.5.2 Monitoring Strategy 37
6.5.3 Monitoring Preparations 38
6.5.4 Analytical Constituents 39
6.5.5 Sample Collection and Handling 40
6.5.6 Sample Analysis 43
6.5.7 Quality Assurance / Quality Control 45
6.5.8 Data Management and Reporting 45
6.5.9 Data Evaluation 45
6.5.10 Change of Conditions 45

ATTACHMENTS

ATTACHMENT 1 VICINITY MAP
ATTACHMENT 2 WATER POLLUTION CONTROL DRAWINGS
ATTACHMENT 3 BMP CONSIDERATION CHECKLIST
ATTACHMENT 4 RUN-OFF CALCUATIONS AND SEDIMENT BASIN SIZING CALCULATIONS
ATTACHMENT 5 NOTICE OF INTENT
ATTACHMENT 6 PROGRAM FOR MAINTENANCE, INSPECTION, AND REPAIR OF CONSTRUCTION SITE BMPS
ATTACHMENT 7 STORM WATER QUALITY CONSTRUCTION SITE INSPECTION CHECKLIST
ATTACHMENT 8 TRAINED CONTRACTOR PERSONNEL LOG

ATTACHMENT 9	SUBCONTRACTOR NOTIFICATION LETTER AND NOTIFICATION LOG
ATTACHMENT 10	NOTICE OF NON-COMPLIANCE
ATTACHMENT 11	ANNUAL CERTIFICATION OF COMPLIANCE FORM
ATTACHMENT 12	OTHER PLANS AND PERMITS
ATTACHMENT 13	BMPS SELECTED FOR THE PROJECT
ATTACHMENT 14	SAMPLING ACTIVITY LOG
ATTACHMENT 15	DISCHARGE REPORTING LOG
ATTACHMENT 16	CHANGE OF INFORMATION FORM
ATTACHMENT 17	NOTICE OF TERMINATION

ACRONYMS

BMP	BEST MANAGEMENT PRACTICE
CCR	CALIFORNIA CODE OF REGULATIONS
CFR	CODE OF FEDERAL REGULATIONS
EPA	ENVIRONMENTAL PROTECTION AGENCY
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MSDS	MATERIAL SAFETY DATA SHEETS
RWQCB	REGIONAL WATER QUALITY CONTROL BOARD
SAP	SAMPLING AND ANAYLSIS PLAN
SWPPM	STORMWATER POLLUTION PREVENTION MANAGER
SWPPP	STORMWATER POLLUTION PREVENTION PLAN
SWRCB	STATE WATER RESOURCES CONTROL BOARD
TBD	TO BE DETERMINED
USDA	UNITED STATES DEPARTMENT OF AGRICULTURE
WDR	WASTE DISCHARGE REQUIREMENTS

1. SWPPP CERTIFICATIONS AND APPROVALS

1.1 Notice to Contractor

This is a living document and a tool to be used to assist the Owner/contractor in complying with stormwater quality regulations, and is required to be amended as necessary.

The burden of comprehensive compliance rests solely with the project Owner/developer. WorleyParsons does not guarantee compliance or assume any responsibility for failure to comply with the State General Permit as a result of using the information provided herein. The information contained in this report is based upon, and limited by, the circumstances and conditions acknowledged herein, and upon information available at the time of its preparation.

1.2 Certification by Engineer or Authorized Designee (Preparer)

Project Name: **Genesis Solar Energy Project**

Project Number: _____

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations".

Preparer's Name: Bob Anders

Signature: _____

Title: Professional Engineer

Date: _____

Telephone Number(s): (916) 817 3973

1.3 Owner Approval and Certification of SWPPP

Owners (or Authorized Representative)
Approval and Certification of the
Stormwater Pollution Prevention Plan

Project Name: **Genesis Solar Energy Project**

Project Number: _____

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations".

Name: _____

Signature: _____

Title: _____

Date: _____

Telephone Number(s): _____

1.4 Contractors Approval and Certification of SWPPP

General Contractor
Approval and Certification of Implementing
Storm Water Pollution Prevention Plan

Project Name: **Genesis Solar Energy Project**

Project Number: _____

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations".

Name: _____

Signature: _____

Title: _____

Date: _____

Telephone Number(s): _____

1.5 Annual Compliance Certification

By July 1 of each year, the Owner shall complete an Annual Certification of Compliance stating compliance with the terms and conditions of the General Permit (Permit) and the Storm Water Pollution Prevention Plan (SWPPP). The blank Annual Certification of Compliance Form is included in **Attachment 11**. Completed Annual Certifications of Compliance and Approvals can be found in the following pages.

A copy of the certification shall be filed at the owner's office, but does not have to be submitted to the Regional Water Quality Control Board (RWQCB), Colorado River Basin Region 7.

1.6 Location of SWPPP

A copy of the SWPPP shall be kept at the construction site during the construction activity and made available upon request to representatives of the California RWQCB or the general public (public access pursuant to Section 308(b) of the Federal Clean Water Act).

2. SWPPP AMENDMENTS

2.1 SWPPP Amendments

This SWPPP shall be amended:

- Whenever there is a change in construction or operations which may affect the discharge of pollutants to surface waters, groundwater(s) or a municipal storm or sewer system;
- If any Condition of the Permits is violated or the general objective of reducing or eliminating pollutants in storm water discharges has not been achieved. If the RWQCB determines that the Permit violation has occurred, the SWPPP shall be amended and implemented within 14-calendar days after notification by the RWQCB;
- Annually, prior to the defined rainy season; and
- When deemed necessary by the Owner.

The following items will be included in each amendment:

- Who requested the amendment;
- The location of proposed change;
- The reason for change;
- The original Best Management Practice (BMP) proposed, if any; and
- The new BMP proposed.

The amendments for this SWPPP, along with the Owner's Certification and the Owner approval, can be found in the following pages.

2.2 SWPPP AMENDMENT CERTIFICATION

SWPPP AMENDMENT NO._____

Project Name: **Genesis Solar Energy Project**

Project Number: _____

PREPARER CERTIFICATION OF THE STORMWATER POLLUTION PREVENTION PLAN AMENDMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations".

Preparer's Signature Date

Preparer's Name and Title Telephone Number

OWNER (OR AUTHORIZED REPRESENTATIVE) APPROVAL OF THE STORMWATER POLLUTION PREVENTION PLAN AMENDMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations".

Owner (or Authorized Representative) Signature Date

Name and Title Telephone Number

2.3 SWPPP AMENDMENT LOG

SWPPP amendment(s) prepared and approved as discussed in **Section 2.1** and **2.2** shall be documented in the Amendment Log, which shall be kept in the SWPPP.

Project Name: **Genesis Solar Energy Project**

Project Number: _____

Amendment No.	Date	Brief Description of Amendment	Prepared By

3. INTRODUCTION AND PROJECT DESCRIPTION

3.1 Project Information and Background

Name of Facility:	Genesis Solar Energy Project
Address:	*To Be Determined* XXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXX
Type of Facility:	Solar Power Plant
Owner/Operator:	Genesis Solar, LLC 700 Universe Boulevard Juno Beach, FL, 33408
Contractor:	*To Be Determined*

Genesis Solar, LLC is proposing to develop a 250-megawatt (MW) solar thermal power generating project, using concentrated solar power (CSP) technology. The Project Site ("Site") will be located in the Colorado Desert between the communities of Blythe, CA (approximately 24 miles east) and Desert Center, CA (approximately 27 miles west).

The Site covers approximately 1,800 acres of Federal land managed by the Bureau of Land Management (BLM). Surrounding land uses to the Site include Interstate 10 (I-10) to the south, the Palen McCoy Wilderness to the north, the Palen Dry Lake Area of Critical Environmental Concern (ACEC) to the west and open (unrestricted access) lands to the east.

Most of the land near the Site is managed by BLM and there is no California State Land in the vicinity, but there are private holdings. The Site is in California State Water Resources Control Board District 7, under the authority of the Colorado River Regional Water Quality Control Board

The Site is situated within the Chuckwalla Valley and is relatively flat. The Site generally slopes from north to south with elevations of approximately 400 to 370 feet above mean sea level. The Site is comprised of low creosote scrub vegetation and includes portions of the Ford Dry Lake Lakebed.

The Site has been historically used for both off-highway vehicles and sheep grazing; however neither activity currently occurs.

The site improvements shall include two 125 MW units, where each unit will include solar fields, power block, evaporation ponds, a bioremediation land treatment unit and stormwater control facilities. In addition, there shall be ancillary facilities constructed and operated on site, including an onsite substation, administration and warehouse buildings. A short transmission line shall be constructed from the Site south across the I-10 to connect with the 230kV Blythe Transmission Line.

Onsite groundwater will be used for water supply. The Site is located within the Chuckwalla Valley Groundwater Basin (Basin No. 7-5), which has a surface area of 940 mi^2 (2,435 km^2) (Tetra Tech and

WorleyParsons 2009). The basin is bounded by consolidated rocks of the Chuckwalla, Little Chuckwalla, and Mule mountains on the south, of the Eagle Mountains on the west, of the Mule and McCoy mountains on the east, and Coxcomb, Granite, Palen, and Little Maria mountains on the north (Tetra Tech and WorleyParsons 2009).

Evaporation ponds will contain the process wastewater and the sanitary wastewater from sinks, toilets, showers, other sanitary facilities will be discharged to a septic tank system.

3.2 Unique Site Features

Average rainfall in the project area is around 5 to 6 inches annually, but a single rainstorm, particularly during the monsoon season from mid-July to the end of August, can bring 1 to 3 inches of rain in a few hours. Extreme events in the nearby area have recorded over 10 inches of rain in 24 hours. The vast majority of the time, the area is dry and devoid of any surface flow anywhere in either project area. Evaporation potential is around 90 to 100 inches annually. The Federal Emergency Management Agency (FEMA) has not mapped the site for presence of floodplains.

The Site is also located within the Colorado River Drainage Basin, within the Chuckwalla Valley Basin. There are no perennial streams in Chuckwalla Valley. Water runoff occurs only in response to infrequent intense rain storms. Much of the area is subject to inundation either by sheet flow or flow confined to an expansive network of ephemeral washes. Palen, Ford, and several smaller dry lakes are found in topographic low-points. The entire area drains first to these two dry lakes, and then to groundwater. During large rainfall events, Ford Dry Lake will retain water for days or weeks.

The Site shall be graded to create level solar pad elevations with approximate balanced cut and fill, therefore existing vegetation and debris shall be removed. Due to the magnitude and type of terrain, a main concern is the presence of storm flushed flood events. In order to address this concern, the runoff originated by the upstream areas will be diverted around the 125MW units (“unit”) using berms and channels capable of conveying flows for a 100 year, 24 hour storm event.

On-site storm water run off within the solar fields will sheet flow into smaller drainage swales, aligned north to south and located adjacent to the plant interior roads. The swales shall divert flows into a detention basin (one for each unit), situated in the lower elevation areas of each unit. The detention basins shall attenuate the post developed 100 year, 24 hour storm event run off from each unit, and discharge at the pre developed 100 year, 24 hour storm event flow rate into the natural drainage system downstream. The detention basins will also have emergency spillways to discharge runoff generated due to major rainfall events in excess of the 100 year storm. Emergency spillways will discharge into the proposed peripheral drainage channel, diverting the excessive flow away from the Site.

The Riverside County General Plan, Safety Element (Riverside County, 2008), indicates the Site is in an area with moderate potential for wind erosion, the off-site linears are in areas with moderate to high potential for wind erosion. Soil characteristics at the Project site allow for the potential for wind and water erosion, and significant sediment transport currently occurs across the valley axial drainage that crosses the majority of the proposed plant site. Limited sand and & erosion also occurs between depositional episodes.

Soil erosion from wind and water during construction activities is address in Section 5.6 (Agriculture and Soils) of the AFC, and summarized below. Under current conditions, the soil loss is estimated to be about one ton per year from the Site and areas of off-site linears associated with the Project (refer to below table). Construction activities without implementation of BMPs would result in a potential for soil loss of about 1,400 tons.

			Estimates Using RUSLE2[a]		
Feature (acreage)[b]	**Activity**	**Duration[c] (months)**	**Soil Loss (tons) without BMPs**	**Soil Loss (tons) with BMPs**	**Soil Loss (tons/yr) No Project**
Project Site	Grading	6	330.8	5.198	1.148
(1,800 acres total, 1,350 acres to be graded)	Construction	19[d]	1047.4	16.458	--
Roads (15.76 acres)	Grading & Construction	3	1.931	0.0303	0.0134
Transmission Lines	Grading	2	0.0041	0.000064	0.00043
(9.18 acres for construction; 0.05 acre for pole footprints)	Construction	4	1.499	0.0236	--
Natural Gas Pipeline	Grading	2	0.238	0.0037	0.00247
(36.36 acres for construction; 2.91 acres for trench)	Construction	3	4.454	0.0699	--
Project Soil Loss Estimates	**All activities listed above**		**1386.3**	**21.78**	**1.16**

Notes:

a Soil losses (tons/acre/year) are estimated using RUSLE2 software. (NCRS 2002)
The soil characteristics were estimated using RUSLE2 soil profiles corresponding to the mapped soil unit
Estimates of actual soil losses use the RSLE2 soil loss times the duration and affected area.
The No Project Alternative estimate does not have a specific duration, and loss is given in tons/year.

b Project Acreages based on the assumption that 75 % of the project site will be graded.
Other areas based project disturbance table for acreage outside the project footprint.

c Duration of activities based upon assumptions in the Plan of Development (Genesis Solar, LLC, 2009)

d 19 months per 125 MW Unit, total of 37 months for entire project

RUSLE2 Assumptions:
100-ft slope length, 2% slope
Construction and Grading: soil losses assume the following inputs: Management – bare ground; Contouring – None, rows up and down hill; Diversion/terracing – None; Strips and Barriers – None.
Construction and Grading with BMP soil losses assume the following inputs: Management – Silt fence; Contouring – Perfect, no row grade; Diversion/terracing – None; Strips and Barriers- 2 fences, 1 at end of slope.
No Project soil losses assume the following inputs: Management – Dense grass, not harvested; Contouring – None, rows up and down hill; Diversion/terracing – None; Strips and Barriers – None.

Given the proximity of an Army Air base during WWII and previous mining activities, there is the potential for unexploded ordnance and mining waste dumping, although no evidence of either was seen in a casual drive-through.

3.3 Construction Site Estimates

The following are estimates of the construction site:

Construction site area [1]	1,800	Acres
Percentage impervious area before construction [2]	30	%
Percentage impervious area after construction [3]	40	%
Anticipated storm water flow onto the construction site [4]	0	cfs

(1) Conceptual drainage report only included 1,500 acres in the two units as there was no change in land use between the two models (other 300 acres).
(2) Current surface is desert shrub with no development – however they are group D soils (clays) therefore will have high potential of runoff, therefore assume there is some imperviousness – refer discussion in below section.
(3) This includes the roads (access roads and between the solar fields), parabolic trough footings, power block, administration buildings, control buildings, and parking areas. Refer discussion in below section.
(4) A berm shall be construction initially around the site to prevent run-on

The drainage study for the project site was based on TR-55 method with curve numbers (CN). The major factors that determine CN are the hydrologic soil type, cover type, hydrologic condition and antecedent runoff conditions (USDA 1986).

The project site is mainly comprised of Group D type soils (WorleyParsons 2009). Before construction, the land was considered fair desert shrub with a CN of 86 and post construction, the land was considered poor desert shrub with a CN of 88. The formula to compare fraction impervious to Group D CNs is (Hydrology and Earth System Sciences 2009):

$$CN = 0.188 Impf + 80.205$$

Therefore the fraction impervious for a CN of 86 is 30% and the fraction impervious for a CN of 88 is 40%. This is consistent with the TR-55 manual which presents similar fraction impervious values for the same CN values when applied to a residential lot (1/3 acre) (USDA 1986).

Desert shrub is considered to contain major plants include salt bush, greasewood, creosote bush, black brush, bursage, palo verde, mesquite and cactus (USDA 1986). The CN and fraction impervious values are high for a agriculture landscape as Group D soils have high runoff potential. Group D soils have very low infiltration rates when thoroughly wetted as the soil types include clay loam, silty clay loam, sandy clay, silty clay, or clay (USDA 1986). “Poor” surface cover means there are factors that impair infiltration and tend to increase runoff. “Good” surface cover means there are factors that encourage average and better than average infiltration and tend to decrease runoff (USDA 1986).

It is assumed that all rainfall on the construction site shall flow towards the low point of the site. In the 100 year, 24 hour storm event, 3.51 inches of rainfall shall fall (WorleyParsons 2009). The retention basin/temporary sediment basin has been sized to cater for this event (refer **Attachment 4**).

3.4 Project Schedule/Water Pollution Control Schedule

The following is a potential schedule of construction activities sequenced with the implementation of construction BMPs. Genesis Solar, LLC proposes a 25-month construction schedule, which is shown and anticipates commencing commercial operation of the site in 2014.

Estimated Start Date	Estimated Finish Date	Construction Activity
August 1	October 1	Rainy Season (Southern California Desert Area) A
November 1	May 1	Rainy Season (Southern California Desert Area) B
TBD	TBD	SWPPP Approved
TBD	TBD	Mobilization
TBD	TBD	Project Start Date
TBD	TBD	Delineate and mark the boundaries of the construction zone
TBD	TBD	Berm Construction
TBD	TBD	Construct Material/Waste Storage Facilities
TBD	TBD	Construct Stabilized Construction Entrance/Exit
TBD	TBD	Install/Maintain Temporary Sediment Controls
TBD	TBD	Install/Maintain Temporary Soil Stabilization
TBD	TBD	Install Pre-Rainy Season Temporary Controls
TBD	TBD	Install Sediment Basin / Retention Basin / Ponds
TBD	TBD	Grading – strip top soil
		(BMPs for Sediment/Erosion Control)
TBD	TBD	Assemble and erect parabolic troughs
		Power block construction
TBD	TBD	Construct Reinforced concrete foundations
TBD	TBD	Paving
TBD	TBD	Trench gas line corridor
TBD	TBD	Building Construction
		(Waste Management and Materials Pollution Control BMPs)
TBD	TBD	Commissioning and Testing

3.5 Contact Information / List of Responsible Parties

The Contractor Storm Water Pollution Prevention Manager (SWPPM) assigned to this project is:

Name: _____

Telephone Number: _____

Contractor's Company Name: _____

Contractor's Company Address: _____

The SWPPM shall have primary responsibility and significant authority for the implementation, maintenance, inspection and amendments to the approved SWPPP. The SWPPM will be available at all times throughout the duration of the project. Duties of the SWPPM include but are not limited to:

- Ensuring full compliance with the SWPPP and the Permit
- Implementing all elements of the SWPPP, including but not limited to:
    - Implementation of prompt and effective erosion and sediment control measures;
    - Implementing all non-storm water management, and materials and waste management activities such as: monitoring discharges (dewatering, diversion devices); general site clean-up; vehicle and equipment cleaning, fueling and maintenance; spill control; ensuring that no materials other than storm water are discharged in quantities which will have an adverse effect on receiving waters or storm drain systems; etc.
- Pre-storm inspections;
- Storm event inspections;
- Post-storm inspections;
- Routine inspections as specified in the project's specifications or described in the SWPPP
- Updates/Amendments to the SWPPP, as needed;
- Preparing annual compliance certification for Owner's, or Owner's authorized representative, signature;
- Ensuring elimination of all unauthorized discharges;
- The SWPPM shall be assigned authority by the Contractor to mobilize crews in order to make immediate repairs to the control measures;
- Coordinate with the Contractor to assure all of the necessary corrections/repairs are made immediately, and that the project complies with the SWPPP, the Permit and approved plans at all times; and
- Submitting Notices of Discharge and reports of Illicit Connections or Illegal Discharges.

4. REFERENCES

The following documents are made a part of this SWPPP by reference:

- State Water Resources Control Board (SWRCB) Order No. 99-08-DWQ, NPDES General Permit No. CAS000002 ("General Permit"), WDRs for Discharges of Storm Water Runoff Associated with Construction Activity, August 19, 1999.
- Modification of SWRCB Order 99-08-DWQ, NPDES General Permit No. CAS000002 ("General Permit"), WDRs for Discharges of Storm Water Runoff Associated with Construction Activity to include Small Construction Activity (One to Five Acres).
- SWRCB Resolution No. 2001-046, "Modification of Water Quality Order 99-08-DWQ SWRCB NPDES General Permit For Storm Water Discharges Associated With Construction Activity (CGP)," to amend the monitoring provisions of the General Permit for sampling and analysis requirements.
- California Storm Water BMP Handbook – Construction, January 2003;
- Storm Water Management for Construction Activities – Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92-005, October 1992.
- Hydrology and Earth Sciences (2009), Staged cost optimization of urban storm drainage systems based on hydraulic performance in a changing environment, published 9th April 2009 http://www.hydrol-earth-syst-sci.net/13/481/2009/hess-13-481-2009.pdf
- Tetra Tech Inc, (2009), Phase I Environmental Site Assessment – Genesis Solar Energy Project, prepared for Genesis Solar LLC, August 2009, 90 pages
- Tetra Tech and WorleyParsons (2009), Plan of Development, Submitted by Genesis Solar, LLC, dated June 2009
- United States Department of Agriculture (USDA) (1986), Urban Hydrology for small watershed – TR-55, Natural Resources Conservative Service, June 1986
- WorleyParsons (2009), Conceptual Drainage Study, Project Genesis Ford Dry Lake, dated January 19th, 2009

5. BODY OF SWPPP

5.1 Objectives

This SWPPP has six main objectives:

- Identify all pollutant sources, including sources of sediment that may affect the quality of storm water discharges associated with construction activity (storm water discharges) from the construction site;
- Identify non-stormwater discharges;
- Identify, construct, implement in accordance with a time schedule, and maintain BMPs to reduce or eliminate pollutants in storm water discharges and authorized non-storm water discharges from the construction site during construction;
- Develop a maintenance schedule for BMPs installed during construction designed to reduce or eliminate pollutants after construction is completed (post-construction BMPs);
- Identify a sampling and analysis strategy and sampling schedule for discharges from construction activity which discharge directly into water bodies listed on Attachment 3 of the Permit (Clean Water Act Section 303(d) [303(d)] Water Bodies listed for Sedimentation) [refer to **Attachment 12**]; and
- For all construction activity, identify a sampling and analysis strategy and sampling schedule for discharges that have been discovered through visual monitoring to be potentially contaminated by pollutants not visually detectable in the runoff.

This SWPPP conforms to the required elements of the General Permit No. CAS000002 (Permit) issued by the State of California, State Water Resources Control Board (SWRCB). This SWPPP will be modified and amended to reflect any amendments to the Permit or any changes in construction or operations that may affect the discharge of pollutants from the construction site to surface waters or groundwater. The SWPPP will also be amended if it is in violation of any condition of the Permit or has not achieved the general objective of reducing pollutants in storm water discharges. The SWPPP shall be readily available onsite for the duration of the project.

5.2 Scope

The scope of this SWPPP covers all activities associated with the construction of the Genesis Solar Energy Project. The selected Contractor will be responsible for performing temporary storm water management and erosion control during construction of the Genesis Solar Energy Project using existing and new control measures described within this plan. The selected Contractor will also install all necessary permanent erosion controls and storm water management measures at the Site.

The Construction Contractor(s) will be required to sign the appropriate certification statements and keep the SWPPP on file in their project construction office. This SWPPP will not be final until adopted and certified by the Construction Contractor(s).

5.3 Project Activities

The construction phases of the Genesis Solar Energy Project as they pertain to stormwater management are expected to be as follows:

- **Preparation -** A temporary staging area will be established including fenced parking, covered trash disposal facilities, construction trailers, a laydown area, and sufficient portable toilets and potable water for the construction staff.
- **Site Disturbance** - Once all areas are appropriately staked and signed and access to the site has been established, grading activities will occur over an extensive portion of site. Grading will commence with rough grading activities, including grubbing, clearing, moisture conditioning, bulk grading, and initial compaction. The first ground-disturbing activities to take place will be the initial clearing and grading required to prepare the site for the storm water drainage structure construction and equipment foundation pads. Temporary drainage ditches and berms will also be designed around construction work areas, soil stockpile areas, and excavation areas to minimize the amount of potential pollutant or sediment-laden surface water runoff.
- **Site Grading** - The solar pad grading of the proposed site will have an average slope of 1 to 3 percent on the north-south direction. Each solar pad will be graded with the intent of balancing the cut-and-fill as much as possible to minimize earth movement on the site. Drainage diversion channels and protective berms will also be developed with a balance of cut and fill earthwork.
- **Site Drainage** - The post-development sediment/retention basin at the discharge points will provide storm water pollution prevention BMP controls along with retention time to reduce the peak off-site discharge to match pre-development conditions. The road berm will also be constructed to provide site protection from storm water run-on during a 100-year return storm event. The toe of the western protective berm slope may be armored with soil cement cover and rip rap to provide for slope erosion protection during a heavy storm event.
- **Internal Road System** - A primary access road will be constructed to the power block area. This road will be 24 feet wide and paved with imported asphalt concrete material. Auxiliary roads will be 24 feet wide and use compacted native materials or gravel surface.
- **Power Plant Construction** - The two 125 MW units will require concrete to support the load of various structures both in the solar field and within the power block. Foundation construction will involve excavation, form, and rebar work preceding a number of concrete pours. Electrical connections to each mirror assembly will be placed underground by means of an open-cut trench, or (if code and operational considerations allow) placed on grade between adjacent mirrors. The final construction activities will include switchyard installation, site paving, and control system installation and programming.
- **Restoration of Temporary Disturbance** - All temporarily disturbed areas will be restored to their preconstruction conditions, as required by the BLM. Temporary access roads used during construction will also be regraded and restored to pre-existing function and grade. BLM-approved seed mixes will be applied to temporarily disturbed areas, as required. No fertilizer

will be used during stabilization or rehabilitation activities unless authorized by the BLM. No vegetation will be restored or encouraged within the solar field because of the fire hazard. Vegetation within the bioremediation area will be controlled to prevent containment from being compromised. When construction of storm water management structures is complete, contours will be carefully restored to the extent feasible.

5.4 Vicinity Map

The construction project vicinity map(s) showing the project location, surface water boundaries, geographic features, construction site perimeter, and general topography, is located in **Attachment 1**.

The Construction Site is within open desert lands. Existing offsite drainage or receiving waters will not be impacted by construction activities pertaining to this SWPPP.

5.5 Pollutant Source Identification

The following is a list of construction materials that may be used and activities that may be performed that will have the potential to contribute pollutants, other than sediment, to storm water runoff. Control practices for each activity are identified in the **Section 5.8:**

- Vehicle fluids, including oil, grease, petroleum, and coolants;
- Asphaltic emulsions associated with asphalt-concrete paving operations;
- Cement materials associated with Portland cement concrete (PCC);
- Base, subbase and aggregate material;
- Joint and curing compounds;
- Concrete curing compounds;
- Paints;
- Solvents, thinners and acids;
- Spent batteries;
- BMP materials such as sandbags and fencing;
- Treated lumber (materials and waste);
- PCC rubble; and
- General litter.

Construction activities that have the potential to contribute sediment to storm water discharges include:

- Clear and grub operations;
- Grading operations;

- Paving operations;
- Boring operations;
- Delivery/transportation operations;
- Utility trenching and containment excavation operations;
- Foundation/structure construction operations;
- Vehicle and equipment cleaning, fueling and maintenance; and
- Painting.

5.6 Existing (Pre-Construction) Control Measures

There shall be no existing control measures on the Site. The Site has a desert landscape therefore erosion and sediment control will be required from the commencement of construction.

5.7 Nature of Fill Material and Existing Data describing the Soil

The Site's past use was for off-highway vehicles and sheep grazing however these have not occurred for a while. A Phase I Environmental Site Assessment (ESA) was conducted between November 2008 and July 2009 (Tetra Tech 2009). There was no evidence of any hazardous wastes and substances, storage tanks or solid waste accumulations, therefore there soil contamination is not expected at the site and there should not be any existing site features that may contribute pollutants to the surface waters.

Soil classification was made using data from United States Department of Agriculture (USDA) Natural Resources Conservation Service. The USDA soil survey classified the soil on Site as typical durorthids, loamy-skeletal mixed, hyperthermic and shallow, and typical torripsamments, mixed, hyperthermic (WorleyParsons 2009). It is within Soil Group D, which is (WorleyParsons 2009):

> *High run off potential. Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission.*

5.8 BMP Selection

Attachment 3 lists all BMPs that have been selected for potential implementation in this project. Actual BMPs will be selected based on need during implementation of the project (i.e., based on the materials actually used and the activities actually conducted).

Narrative descriptions of BMPs to be used during the project are listed by category in each of the following SWPPP sections. **Attachment 13** includes copies of the fact sheets of all the BMPs selected for this project.

5.8.1 Erosion Control

Erosion control, also referred to as soil stabilization, consists of source control measures that are designed to prevent soil particles from detaching and becoming transported in storm water runoff. Erosion control BMPs protect the soil surface by covering and/or binding soil particles. This project will incorporate erosion control measures required by the contract documents, and other measures selected by the Contractor and/or SWPPP Manager from the BMPs identified in this SWPPP. At a minimum, this project will implement the following practices for temporary and final erosion control:

Year-round:

- SWPPM to monitor the weather using National Weather Service reports to track conditions and alert crews to the onset of rainfall events.
- Preserve existing vegetation where required and when feasible. Conduct clearing and grading only in areas necessary for project activities and equipment traffic. Install temporary fencing prior to construction along the boundaries of the construction zone to clearly mark this zone, preventing vehicles or personnel for straying onto adjacent habitat.
- Within designated site development areas, all vegetation will be removed. Areas to remain undisturbed shall be clearly marked and existing foliage will remain in place to anchor the soil reducing the potential for erosion. All cut vegetation is to mulched, buried, burned or composted onsite to limit waste disposal. In areas of substantial grading, native vegetation may be harvested for possible reuse to obtain long-term soil stabilization.
- Sequence construction activities with the installation of both erosion control and sediment control measures. Arrange the construction schedule as much as practicable to leave existing vegetation undisturbed until immediately prior to grading.
- Protect slopes susceptible to erosion by installing controls.
- Stabilize non-active areas as soon as feasible after construction is complete and no later than 14 days after construction in that portion of the site has temporarily or permanently ceased. Reapply as necessary to maintain effectiveness.
- Place covers over stockpiles prior to forecasted storm events and during windy conditions. Place sediment controls (fiber rolls or gravel bags) around the perimeter of stockpiled materials year-round.
- Apply temporary erosion control to remaining active and non-active areas as from the California Storm water BMPs Handbook – Construction as required by the contract documents or as necessary based on the judgment of the Contractor and/or SWPPM. Reapply as necessary to maintain effectiveness
- Maintain sufficient erosion control materials onsite to allow implementation in conformance with General Permit requirements and as described in this SWPPP. This includes implementation requirements for active areas and non-active areas that require deployment before the onset of rain.
- Repair and reapply BMPs in areas where erosion is evident as soon as possible.

- At completion of construction, apply permanent erosion control to all remaining disturbed soil areas.

During the rainy season:

- Implement temporary erosion control measures at regular intervals throughout the defined rainy season and as needed determined by site conditions.
- Control erosion in concentrated flow paths by applying erosion control blankets, erosion control seeding, and lining swales as required in the contract documents.
- Inspect and stabilize disturbed areas with temporary or permanent erosion control measures before rain events.

During the non-rainy season:

- Conduct construction activities that will have an impact on waters of the United States during the dry season to the extent feasible to minimize erosion.

The following BMPs have been selected for Erosion Control:

- EC-1, Scheduling
- EC-2, Preservation of Existing Vegetation
- EC-3, Hydraulic Mulch
- EC-6, Straw Mulch
- EC-7, Geotextiles, Plastic Covers and Erosion Control Blankets/Mats
- EC-9, Earth Dikes and Drainage Swales
- EC-11, Slope Drains

EC-1, EC-2 Scheduling and Preservation of Existing Vegetation

The project schedule will sequence construction activities with the installation of both soil stabilization and sediment control measures. BMPs will be deployed in a sequence to follow the progress of grading and construction. The construction schedule will be arranged as much as practicable to leave existing vegetation undisturbed until immediately prior to grading.

EC-3, EC-6 Hydraulic Mulch and Straw Mulch

Straw mulch may be applied to all bare areas around the perimeter to the Site and may also be applied to the disturbed areas adjacent to excavations and on shallow slopes surrounding the Site, and used to cover exposed soil and stockpiled material areas.

EC-7 Geotextiles, Plastic Covers and Erosion Control Blankets/Mats

Polyethylene covers may be used to cover exposed soil (including the berm) and stockpiled material areas. Covers will be placed over stockpiles prior to forecast storm events, and anchored to prevent damage by wind.

EC-9 Earth Dikes and Drainage Swales

Earth dikes or swales may be used to intercept and divert sediment-laden storm water to the sediment basin or sediment traps to avoid sheet flow over the Site.

EC-11 Slope Drains

Slope drains may be used to intercept and direct surface runoff or groundwater into stabilized watercourses or sediment traps.

5.8.2 Sediment Control

Sediment controls are structural measures that are intended to complement and enhance the soil stabilization (erosion control) measures and reduce sediment discharges from construction areas. Sediment controls are designed to intercept and settle out soil particles that have been detached and transported by the force of water. This project will incorporate minimum temporary sediment control requirements, temporary sediment control measures required by the contract documents, and other measures selected by the Contractor, SWPPM, or Owner.

Sediment control BMPs will be installed at all appropriate locations along the Site perimeter at all times during the rainy season. During the non-rainy season, the sediment basin or trap shall be used to capture the sediment discharges. At a minimum, this project will implement the following practices for temporary sediment control:

Year round:

- The power block area will be graded with moderate slopes to direct runoff and diverted stormwater to an infiltration/evaporation area before overflowing through native stone rip-rap to reinstate natural sheet flow conditions. Relatively small rock filters and local diversion berms through the sites will discourage water from concentrating to maintain sheet flow. The diversions ditches and infiltration/evaporation areas will be designed to pass flow from a 100 year storm event to prevent damage to the power block and cooling tower areas; the design will also include in its calculations stormwater run-on to the site.
- Maintain the following temporary sediment control materials onsite: silt fence materials, gravel bags for linear barriers, and fiber rolls in sufficient quantities throughout the project to implement temporary sediment controls in the event of predicted rain and to respond to failures or emergencies, in conformance with General Permit requirements and as described in this SWPPP.

- Install gravel filter berms at the base of slopes adjacent to delineated sensitive areas (i.e., wetlands, dry washes) – if any.
- Native onsite stones/rocks will be used in construction of gravel filter berms or check dams.

During the rainy season:

- During the rainy season, implement temporary sediment controls at the draining perimeter of disturbed soil areas, at the toe of slopes, and at outfall areas.

During the non-rainy season:

- During the non-rainy season, implement temporary sediment controls at the draining perimeter of disturbed soil areas.

The following BMPs have been selected for Sediment Control:

- SE-1, Silt Fence
- SE-2, Sediment Basin
- SE-3, Sediment Trap
- SE-4, Check Dams
- SE-5, Fiber Rolls
- SE-7. Street Sweeping and Vacuuming
- SE-8, Sandbag Barrier

SE-1 Silt Fence

Silt fences shall be installed along the perimeter of the construction site to intercept sediment laden run off and run on. Silt fences will also be placed around the base of temporary stockpiles areas.

SE-2 Sediment Basin

A sediment basin shall be constructed in the location of the future detention basin and may be used in association with drainage swales and slope drains located along each side of the property to retain runoff and allow excessive sediment to settle prior to discharge. If the basin is not dry within 72 hours, it must be pumped dry. If it fills over capacity, there may be localized flooding however this shall be monitored by the Contractor and SWPPM to ensure surrounding properties are not impacted. Refer to **Attachment 4** for calculations of the required basin size.

SE-3 Sediment Traps

If the sediment basin is not used, sediment traps shall be constructed to collect, intercept and trap sediment-laden runoff.

SE-4 Check Dams

Check dams (small barrier constructed of rock, gravel bags, sandbags, fiber rolls, or reusable products, placed across a constructed swale or drainage ditch) are only be used in small open channels that drain less than 10 acres, and where stormwater runoff velocities exceed 5 ft/s.

SE-5 Fiber Rolls

Fiber rolls shall be placed along the perimeter of the Site to intercept runoff and provide removal of sediment from the runoff.

SE-7 Street Sweeping and Vacuuming

Street sweeping and vacuuming is required to remove the sediment from the public and private roadways, typically at the point of egress.

SE-8 Sandbag Barriers

Sandbag barriers may be placed at the toe of slopes or stockpiles, at sediment traps at culvert/pipe outlets and along the perimeter of the Site as a linear sediment control measure

5.8.3 Wind Control

Wind Controls are required to prevent the transportation of soil from soil-disturbed areas of the Site, offsite by wind. At a minimum, this project will implement the following practices for wind control:

Year-round:

- Potable water will be applied to disturbed soil areas of the Site as needed to control dust and maintain optimum moisture levels for compaction. The water will be applied using water trucks.
- During windy conditions (forecast or actual wind conditions of approximately 20 mph or greater), dust control will be applied to disturbed areas, including haul roads to adequately control wind erosion.
- Suspend excavation and grading during periods of high winds.
- Cover all trucks hauling soil and other loose material or maintain at least 2 feet of freeboard

The following BMPs have been selected to control dust from the construction site:

- WE-1, Wind Erosion Control

WE-1 Wind Erosion Control

Project soils will be disturbed and exposed during dates allocated in the Construction Schedule. Water applications will be concentrated during the late summer and early fall months.

Wind Erosion Control and Water Conservation Practices BMPs will be implemented to provide dust control while at the same time preventing storm water runoff. Water application rates will be minimized as necessary to prevent runoff and ponding and water equipment leaks will be repaired immediately.

Stockpile management using silt fences, sand bag barriers and plastic covers will be implemented to prevent wind dispersal of sediment from stockpiles.

5.8.4 Tracking Control

Tracking controls are required to prevent sediment from the construction site, tracking onto public or private roadways. At a minimum, this project will implement the following practices for wind control.

Year-round

- Maintain all public roadways free from dust, dirt and debris caused by construction activities.
- Clearly mark the driving areas within the site for limited speed to control dust

The following BMPs have been selected to reduce sediment tracking from the construction site onto private or public roads:

- TC-1, Stabilized Construction Entrance/Exit
- TC-2, Stabilized Construction Roadway
- TC-3. Entrance/Outlet Tire Wash

TC-1 Stabilized Construction Entrance/Exit

A stabilized construction entrance/exit will be constructed and maintained at construction site entrances and exits as shown on the WPCDs. A stabilized construction entrance/exit may also be constructed at the equipment yard, water filling area for water trucks, and project office location.

The Site entrance/exit will be stabilized to reduce tracking of sediment as a result of construction traffic. The entrance will be designated and graded to prevent runoff from leaving the Site. Stabilization material will be 3- to 6-inch crushed aggregate. The entrance will be flared where it meets the existing road to provide an adequate turning radius. The Site entrance/exit shall only be installed to reduce tracking of sediment during dirt-hauling activities that extend over a one-week time period.

TC-2 Stabilized Construction Roadway

The construction roadway through the Site will also be designated and stabilized to prevent erosion and to control tracking of mud and soil material onto adjacent roads. The roadway will be clearly

marked for limited speed to control dust. On site vehicle speed shall be limited to 10 miles per hour (mph). Refer to the WPCDs for entrance/exit and construction roadway locations (**Attachment 2**). Aggregate may be placed as a stabilization material, if needed. A regular maintenance program will be conducted to replace sediment-clogged stabilization material with new stabilization material.

TC-3 Entrance/Outlet Tire Wash

The tire wash is located at the stabilized construction access points to remove sediment from the tires and undercarriages. This can be used in co-ordination with the stabilized construction entrance/exit and street sweeping BMP's to reduce the use of tire wash water, and is generally only required when there is mud caked onto the ties and undercarriages.

5.8.5 Non-Storm Water Discharges

Non-stormwater discharges consist of all discharges which do not originate from precipitation events (i.e. stormwater). At a minimum, this project will implement the following practices for non-stormwater discharge.

Year-round:

- Dispose of Portland cement concrete and asphalt concrete waste in accordance with NS-3.
- Regularly inspect vehicles and equipment for signs of leaks. Have vehicles and equipment on a regular maintenance schedule.
- Place drip pans or absorbent materials under paving equipment when not in use. Park paving equipment over plastic to prevent soil contamination.
- Locate staging areas for construction equipment so that spills of oil grease or other petroleum by-products will not be discarded into watercourses or sensitive habitat. Protect the staging area with berms and/or dikes to prevent run-on, runoff, and to contain spills.
- Fuel, clean, and maintain vehicles and other equipment only within designated areas.
- A dedicated fueling area will be protected with berms and/or dikes to prevent run-on, runoff, and to contain spills. Self-propelled vehicles will be fueled offsite or at the temporary fueling area. Fuel trucks will be used for onsite fueling, whether at the temporary fueling area or for mobile fueling elsewhere on the site. Drip pans will be used for mobile fueling. Each fuel truck will be equipped with absorbent spill cleanup materials and a spill containment boom at all times.
- Drip pans or absorbent pads will be used for vehicle and equipment maintenance activities that involve grease, oil, solvents, or other vehicle fluids.
- Machinery will be properly maintained and cleaned to prevent spills and leaks.
- Inform workers of the importance of preventing spills and measures to take should a spill occur. Clean up spills immediately in accordance with applicable local, state, or federal regulations. Such spills will be reported in the post-construction compliance reports.

- Use proper storage and handling techniques for concrete curing compounds.
- Clean offsite vehicles that regularly enter and leave the site.
- Inspect all vehicles and equipment for leaks before coming onsite.

The following BMPs have been selected for non-storm water discharges:

- NS-1, Water Conservation Practices
- NS-2, Dewatering Practices
- NS-3, Paving and Grinding Operations
- NS-6; Illicit Connection / Discharge
- NS-8, Vehicle and Equipment Cleaning
- NS-9, Vehicle and Equipment Fueling
- NS-10, Vehicle and Equipment Maintenance
- NS-12, Concrete Curing
- NS-13, Concrete Finishing

NS-1 Water Conservation Practices

Water application rates will be minimized as necessary to prevent runoff and ponding. Water equipment leaks will be repaired immediately. The water truck filling area will be stabilized.

NS-2 Dewatering Practices

Dewatering may be required to remove stormwater runoff in the basin for longer than 72 hours (refer to BMP SE-2) or for maintenance purposes (removal of sediment is required when the storage volume is reduced by one-half.

NS-3 Paving and Grinding Operations

The project will include placement of paving. Estimated paving operation dates are shown on the construction schedule in **Section 3.4**. BMP NS-3, Paving and Grinding Operations will be implemented to prevent paving materials from being discharged into the sediment basin.

NS-6 Illicit Connection / Discharge

The contractor will implement the Illegal Connection/Illegal Discharge Detection Reporting BMP throughout the duration of the project.

NS-8, NS-9, NS-10 Vehicle and Equipment Operations

Several types of vehicles and equipment will be used onsite throughout the project, including graders, scrapers, excavators, loaders, paving equipment, rollers, trucks and trailers, backhoes, forklifts, generators and compressors. BMPs NS-9, Vehicle and Equipment Fueling, and NS-10, Vehicle and Equipment Maintenance will be utilized to prevent discharges of fuel and other vehicle fluids. Except for concrete washout, vehicle cleaning will not be performed onsite.

A temporary fueling area shall be established in the laydown area, protected with berms and dikes to prevent runoff and to contain spills. All wheeled vehicles shall be fueled offsite or at the temporary fueling area. Fuel trucks, each equipped with a spill clean-up kit including absorbent spill clean-up materials, shall be used for all onsite fueling, whether at the temporary fueling area or for mobile fueling elsewhere on the site. Drip pans shall be used during all mobile fueling. The fueling truck shall be parked on the paved fueling area during overnight storage.

Drip pans or absorbent pads will be used for all vehicle and equipment maintenance activities that involve grease, oil, solvents, or other vehicle fluids.

All vehicle maintenance and mobile fueling operations will be conducted at least 50 feet away from the sediment basin and drainage facilities and on a level graded area.

NS-12, NS-13 Concrete Curing and Finishing

Excess cure water and water from high pressure blasting will be collected and disposed of, and should not be allowed to enter into the sediment basin. Wet blankets will be used wherever possible to eliminate excess cure water.

5.8.6 Waste Management and Materials Pollution Control

Waste management consists of implementing procedural and structural BMP's for collecting, handling, storing and disposing of wastes generated by a construction project to prevent release of waste materials into stormwater discharges. At a minimum, this project will implement the following practices waste management.

Year-round:

- Prevent discharges of construction materials during delivery, storage, and use.
- Handle and dispose of hazardous wastes in accordance with applicable laws, ordinances, regulations, and standards, including licensing, personnel training, accumulation limits and times, and reporting and recordkeeping.
- Store only enough products required to do the job.
- Keep products in their original containers with the original manufacturer's label.
- Follow manufacturers' recommendations for the storage, use and disposal of all materials.

- Undertake spill prevention and cleanup and report spills of toxic or hazardous materials to the Project Manager (or designee), regardless of the size.
- Report spills of hazardous materials that exceed their reportable quantities to all appropriate local, state and federal government agencies.
- Place covers over stockpiles prior to forecasted storm events and during windy conditions.
- Place sediment controls at the foot of stockpiled materials.
- Load solid wastes directly into trucks for offsite disposal. When onsite storage is necessary, store solid wastes in watertight covered dumpsters in the general storage area.
- Have licensed waste hauler remove solid waste at least weekly and dispose of offsite.
- Provide weekly maintenance for portable toilets by a licensed sanitary service and dispose of wastes offsite.
- Locate portable toilets away from concentrated flow paths and traffic flow.
- Anchor portable toilets during periods of heavy winds.

The following BMPs have been selected for waste management and materials pollution control:

- WM-1, Material Delivery and Storage
- WM-2, Material Use
- WM-3, Stockpile Management
- WM-4, Spill Prevention and Control
- WM-5, Solid Waste Management
- WM-6, Hazardous Waste Management
- WM-8, Concrete Waste Management
- WM-9, Sanitary/Septic Waste Management
- WM-10, Liquid Waste Management

WM-1, WM-2 Material Delivery, Storage and Use

In general, BMPs shall be implemented to help prevent discharges of construction materials during delivery, storage, and use. The general material storage area shall be located in the laydown area as shown on the WPCDs. A sandbag barrier, swale or berm shall be provided around the storage area to prevent run-on from adjacent areas.

Watertight containers will be used to store hand tools, small parts, and most construction materials that can be carried by hand, such as paint cans, solvents and grease.

If hazardous materials are being stored, a separate covered storage/containment facility shall be constructed adjacent to the shipping containers to provide storage for larger items such as drums and

items shipped or stored on pallets. Liquids, petroleum products and substances listed in 40 CFR 110, 117 and 302 shall be contained. This containment volume shall contain rainfall from the 24-hr, 25 year storm event, plus the greater of 10% of the aggregate volumes of all containers or 100% capacity of the largest container within the boundary.

Very large items, such as framing materials, steel and stockpiled lumber, will be stored in the open in the general storage area. Such materials will be elevated with wood blocks to minimize contact with run-on.

Spill clean-up materials shall be maintained and stored in the storage area. Material safety data sheets (MSDS), a material inventory, and emergency contact numbers shall be posted in the area.

WM-3 Stockpile Management

BMP WM-3, Stockpile Management will be implemented to reduce or eliminate pollution of storm water from stockpiles of soil and paving materials such as portland cement concrete, rubble, asphalt concrete, asphalt concrete rubble, aggregate base, aggregate sub-base, pre-mixed aggregate and asphalt binder (so called “cold mix” asphalt), or other stockpiled materials. Stockpiles shall be surrounded with sediment controls. Plastic covers shall be used to cover exposed soil stockpiled material areas.

WM-4 Spill Prevention and Control

BMP WM-4, Spill Prevention and Control will be implemented to contain and clean-up spills and prevent material discharges to the storm drain system.

Employees and subcontractors shall be familiar with potential environmental impacts resulting from the materials they are handling. Good Housekeeping practices shall be implemented to control spills including the use of secondary containment, and designating specific areas for equipment maintenance. This practice will be applied to all solid and liquid materials, including, but not limited to: fuels, lubricants, other petroleum distillates, paints, solvents, cement, mortar, soil stabilizers, and fertilizers. In addition, this practice will be applied to storage areas for chemicals and/or hazardous substances, fuel areas, and vehicles/equipment transporting and handling chemicals and other hazardous substances.

WM-5 Solid Waste Management

BMP WM-5, Solid Waste Management BMPs shall be implemented, if applicable to minimize storm water contact with waste materials and prevent waste discharges. Solid wastes include wood refuse, metal and glass containers, protective plastic coverings discarded bags, and other discarded materials and rubbish. Solid wastes will be loaded directly onto trucks for offsite disposal. When onsite storage is necessary, solid wastes will be collected and stored in watertight dumpsters in the general storage area of the laydown area. Solid waste will be removed and disposed offsite at least weekly.

Liquid wastes, if applicable, will be stored in the covered containment area discussed above for materials storage.

WM-6 Hazardous Waste Management

BMP WM-6, Hazardous Waste Management BMPs shall be implemented, if applicable to minimize storm water contact with waste materials and prevent waste discharges.

Any solid or liquid hazardous wastes shall be stored in appropriate and clearly marked containers in the covered containment area and segregated from other waste and non-waste materials. Wastes shall be stored in sealed containers constructed of a suitable material and shall be labeled as required by Title 22 CCR, Division 4.5 and 49 CFR Parts 172, 173, 178, and 179. All hazardous waste shall be stored, transported, and disposed as required in Title 22 CCR, Division 4.5 and 49 CFR 261-263.

WM-8 Concrete Waste Management

Discharges from concrete placement will consist of rinse water and residual concrete (PCC, aggregates, admixture, and water). Estimated pour dates are shown on the project construction schedule and shall not be conducted during or immediately prior to rainfall events.

Concrete waste management will be implemented in accordance with contract documents and the Concrete Waste Management BMP. Concrete washout facilities will be maintained at the laydown area and designed in accordance with project plans and specifications. All excess concrete and concrete washout slurries shall be discharged to the washout facility for drying. BMP maintenance, waste disposal, and BMP removal shall be conducted as described in the Concrete Waste Management BMP.

WM-9 Sanitary/Septic Waste Management

The contractor shall implement the Sanitary and Septic Waste Management BMP. Portable toilets shall be located and maintained at the laydown area for the duration of the project. Specific locations are shown on the WPCDs. Weekly maintenance shall be provided by a licensed contractor and wastes shall be disposed offsite. The toilets shall be located away from concentrated flow paths and traffic flow.

5.9 Water Pollution Control Drawings

Implementation and location of BMPs are shown on the water pollution control drawings (WPCDs) in **Attachment 2**.

5.10 Construction BMP Maintenance, Inspection and Repair

Site inspections shall be conducted by the Contractor at the following minimum frequencies:

- Prior to a forecast storm;
- After a rain event that causes runoff from the construction site;
- At 24-hour intervals during extended rain events;
- Weekly during the rainy season;
- Every two weeks during the non-rainy season; and
- At any other time(s) or intervals of time specified in the Contract documents.

Completed inspection checklists shall be submitted to the Engineer within 24 hours of inspection. Copies of the completed checklists will be kept with the SWPPP. A tracking or follow-up procedure shall follow any inspection that identifies deficiencies in BMPs. A program for Maintenance, Inspection and Repair of BMPs shall be provided in **Attachment 6** of this SWPPP. In accordance with this program, the following activities shall be undertaken:

- All year round:
    - Weather reports will be monitored to track conditions and alert crews to the onset of rainfall events.
    - Disturbed soil areas will be stabilized with temporary erosion control or with permanent erosion control as soon as possible after rough grading is complete.
    - Wind Controls BMP's
    - Tracking Control BMP's
    - Non-Stormwater Discharges BMP's
    - Waste Management BMPs

- During the rainy season:
    - Disturbed areas will be stabilized with temporary or permanent erosion control before rain events.
    - Disturbed areas that are substantially complete will be stabilized with permanent erosion control (soil stabilization) and vegetation (if within seeding window for seed establishment).
    - Prior to forecast storm events, temporary erosion control BMPs will be deployed and inspected.

- During the non rainy season, the construction schedule will be arranged as much as practicable to leave existing vegetation undisturbed until immediately prior to rough grading.

5.11 Post Construction Storm Water Management

5.11.1 Post Construction Control Practices

The Owner shall be responsible for ensuring all construction activity is completed as permitted, to implement permanent pollution prevention practices and to maintain permanent structural controls.

The following are the post-construction erosion and sediment control BMPs that are to be used at this construction site after all construction is complete, but are not limited to:

- Permanent sediment basin for stormwater capture
- Vegetation shall remain on Site to reduce erosion and sediment run off
- Removal of debris
- Removal of temporary BMP measures (if necessary)

5.11.2 Operation/Maintenance after Project Completion

The post-construction BMPs that are described above will be funded and maintained by Genesis Solar, LLC.

5.12 Training

Section 3.5 shows the name of the contractor's SWPPM. This person has received training as described in **Attachment 8.**

Contractor/Subcontractors shall train his/her employees regarding implementing and maintenance of the stormwater management practices and controls described in this SWPPP. Onsite construction personnel will have the responsibility for installation and maintenance of on-site BMPs.

The training log showing formal and informal training of various personnel is shown in **Attachment 8.** Training records shall be updated, documented and reported in the SWPPP quarterly. Documentation of new training shall be submitted to the Engineer within 24-hours of training.

Ongoing, formal training sessions shall be selected from one of the following organizations:

- State of California RWQCB;
- IECA, ABAG and/or AGC sponsored training;
- USEPA sponsored training;
- Recognized municipal stakeholder organizations throughout California; and
- Professional organizations and societies in the building and construction field

Informal training shall include tailgate site briefings to be conducted bi-weekly and address the following topics:

- Erosion Control BMPs;

- Sediment Control BMPs;
- Tracking and Wind Erosion Control BMPs;
- Non-Storm water BMPs;
- Waste Management and Materials Pollution Control BMPs;
- Emergency Procedures specific to the construction site storm water management; and
- Sampling and Analysis.

Other personnel attending tailgate training shall document attendance using the form in **Attachment 8**.

This SWPPP was prepared by WorleyParsons, under the direction of Mr. Bob Anders, a registered Professional Civil Engineer in the State of California. Mr. Anders has over 20 years of experience in the preparation of numerous project-specific Storm water Pollution Prevention Plans (SWPPPs).

All contractors and subcontractors shall be notified of the requirement for storm water management measures during the project. A list of contractors shall be maintained and included in the SWPPP. If subcontractors change during the project, the list shall be updated accordingly. The subcontractor notification letter and log is included as **Attachment 9**.

5.13 Other Plans / Permits

Following is a list of the plans and permits included in **Attachment 12**.

- State Water Resources Control Board (SWRCB) Resolution No. 99-08-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002, Waste Discharge Requirements (WDRs) for Discharges of Storm Water Runoff Associated with Construction Activity, August 1999, and amendments.

6. MONITORING PROGRAM AND REPORTS

6.1 Site Inspections

Site inspections shall be conducted by the Contractor's SWPPM or other approved trained staff at the following minimum frequencies:

- Prior to a forecast storm;
- After a rain event that causes runoff from the construction site;
- At 24-hour intervals during extended rain events;
- Weekly during the rainy season;
- Every 2 weeks during the non-rainy season; and
- At any other time(s) or intervals of time specified in the Contract documents.

The results of all inspections and assessments shall be documented, a copy shall be provided to the Engineer within 24 hours of the inspection, and copies of the completed inspection checklists shall be maintained with the SWPPP. Site inspections conducted for monitoring purposes shall be performed using the inspection checklist shown in **Attachment 7.**

The name(s) and contact number(s) of the assigned inspection personnel are listed below and their training qualifications are provided in **Attachment 8.**

Assigned Inspector: Contact Phone No.:

Alternate Inspector: Contact Phone No.:

6.2 Discharge Reporting

If a discharge occurs or if the project receives a written notice of non-compliance, the Contractor will immediately notify the Owner and will file a written report to the Owner within 7 days of the discharge or notice. The Owner is responsible for filing a written report to the RWQCB within 30 days or identification of non-compliance.

Discharges requiring reporting include:

- Discharge of hazardous substances above the reportable quantities in 40 CFR 110.3, 117.3 or 302.4;
- Storm water runoff containing hazardous substances from spills discharged to a waterway or storm drain system;
- Where water quality sample results indicate elevated levels of non-visible pollutants;
- Discharges that may endanger health or the environment; and

The report to the Engineer will contain the following items (refer to **Attachment 10** for the Non-Compliance form):

- The date, time, location, nature of operation, and type of unauthorized discharge, including the cause or nature of the notice or order;
- The control measures (BMPs) deployed before the discharge event, or prior to receiving notice or order;
- The date of deployment and type of control measures (BMPs) deployed after the discharge event, or after receiving the notice or order, including additional measures installed or planned to reduce or prevent re-occurrence; and
- An implementation and maintenance schedule for any affected BMPs.

Corrective measures will be implemented immediately following the non-compliance and all discharges documented recorded in the Discharge Reporting Log in **Attachment 15**.

The Regional Board's address is:

California Regional Water Quality Control Board
Colorado River Basin Region 7
73-720 Fred Warring, Suite 100
Palm Desert, CA, 92260

6.3 Record Keeping and Reports

Upon completion of the project's construction and termination of coverage under the General Permit, all records shall be retained by the Owner/operator with a copy of the final Plan. The Owner shall retain records of all monitoring inspections, compliance certification, and non-compliance reports for a period of three years as part of the SWPPP.

If the ownership of a portion of the project is transferred, a Change of Information form must be submitted to the RWQCB with a revised site map, and name, address and phone number of the new owners. A copy of the Change of Information Form is in **Attachment 16**.

Please note that the Owner/Developer is subject to the annual fee until a Notice of Termination is filed and approved with the RWQCB. A copy of the form can be found in Attachment 17 of this SWPPP.

6.4 Sampling and Analysis Plan for Sediment

Sampling and analysis plans for sediment are only required if the construction site directly discharges into a water body listed for sedimentation/siltation pursuant to the Clean Water Act, Section 303(d).

The Site is located within the Colorado River Drainage Basin and the Colorado River (Imperial Reservoir to California-Mexican Border) is listed in the Clean Water Act, Section 303(d) for selenium only. However that section of the river is not in the vicinity of the construction nor listed for sediment/siltation therefore a sampling and analysis plan for sediment is not required.

6.5 Sampling and Analysis Plan for Non-Visible Pollutants

This Sampling and Analysis Plan (SAP) for Non-Visible Pollutants describes the sampling and analysis strategy and schedule for monitoring non-visible pollutants in storm water discharges from the Site, in accordance with the requirements of Section B of the General Permit, including SWRCB Resolution 2001-046.

6.5.1 Scope Monitoring Activities

The construction materials, wastes, or activities, as identified in **Section 5.5** are potential sources of non-visible pollutants to storm water discharges from the project.

Sampling for non-visible pollutants will be conducted when (1) a breach, leakage, malfunction, or spill is observed; and (2) the leak or spill has not been cleaned up prior to the rain event; and (3) there is the potential for discharge of non-visible pollutants to surface water/groundwater or drainage system through direct contact between the potential contaminant source and storm water.

The most effective way to avoid the sampling and analysis requirements, and to ensure permit compliance, is to avoid the exposure of construction materials to precipitation and stormwater runoff.

6.5.2 Monitoring Strategy

Sampling Strategy

In conformance with the U.S. Environmental Protection Agency definition, a minimum of 72 hours of dry weather will be used to distinguish between separate rain events. Collection of discharge samples for non-visible pollutant monitoring will be triggered when any of the following conditions are observed during the required inspections conducted before or during rain events:

- Materials or wastes containing potential non-visible pollutants are not stored under watertight conditions. Watertight conditions are defined as (1) storage in a watertight container, (2) storage under a watertight roof or within a building, or (3) protected by temporary cover and containment that prevents storm water contact and runoff from the storage area.
- Materials or wastes containing potential non-visible pollutants are stored under watertight conditions, but (1) a breach, malfunction, leakage, or spill is observed, (2) the leak or spill is not cleaned up prior to the rain event, and (3) there is the potential for discharge of non-visible pollutants to surface waters or groundwaters.
- An operational activity, including but not limited to those in **Section 5.5**, with the potential to contribute non-visible pollutants (1) was occurring during or within 24 hours prior to the rain event, (2) applicable BMPs were observed to be breached, malfunctioning, or improperly implemented, and (3) there is the potential for discharge of non-visible pollutants to surface waters or a storm sewer system.
- Soil amendments that have the potential to change the chemical properties, engineering properties, or erosion resistance of the soil have been applied, and there is the potential for discharge of non-visible pollutants to surface waters or ground waters.

If sampling for non-visible pollutant(s) is needed, the storm water samples and a sufficiently large uncontaminated background sample will be collected during the first two hours of discharge from rain events that result in a sufficient discharge for sample collection. Samples will be collected during daylight hours (sunrise to sunset) and will be collected regardless of the time of year, status of the construction site, or day of the week.

Sampling Locations

Sampling locations will be based on proximity to planned non-visible pollutant storage, occurrence or use; accessibility for sampling, personnel safety; and other factors in accordance with the applicable requirements in the Permit. Samples of discharge shall be collected at the designated sampling locations for observed breaches, malfunctions, leakages, spills, operational areas, soil amendment application areas, and historical site usage areas that triggered the sampling event.. Additional sampling locations, if any, will be based on field conditions.

Designated sampling locations are:

- _____
- _____

6.5.3 Monitoring Preparations

Samples on the Site will be collected by the following contractor sampling personnel:

Name: _____

Telephone Number: _____

Alternative Name (s): _____

Alternates Telephone Number: _____

Prior to the rainy season, all sampling personnel and alternates will review the SAP. Qualifications of designated Contractor personnel describing environmental sampling training and experience are provided in **Attachment 8**.

An adequate stock of monitoring supplies and equipment for monitoring non-visible pollutants will be available on the Site prior to a sampling event. Monitoring supplies and equipment will be stored in a cool-temperature environment that will not come into contact with rain or direct sunlight. Sampling personnel will be available to collect samples in accordance with the sampling schedule.

Supplies maintained at the Site will include, but are not limited to, nitrile gloves, sample collection equipment, coolers, appropriate number and volume of sample bottles, identification labels, re-sealable storage bags, paper towels, personal rain gear, ice, Sampling Activity Log forms, and Chain of Custody (COC) forms. The Contractor will obtain and maintain the field-testing instruments for analyzing samples in the field by Contractor sampling personnel.

Safety practices for sample collection will be in accordance with the approved Site-Specific Health and Safety Plan dated TBD.

6.5.4 Analytical Constituents

Table 1 lists a range of sources and types of potential non-visible pollutants which may be applicable on the Site and the associated water quality indicator constituent(s) for that pollutant.

Table 1: Sources and Types of potential non-visible pollutants

Category	Possible Products	Potential Pollutants
Adhesives	Adhesives, Glues Resins, Epoxy Synthetics Caulks, Sealers, Putty, Sealing Agent Coal Tars (Naphtha, Pitch)	Phenolics, Formaldehydes Phenolics, Formaldehydes Asbestos, Phelolics Formaldehydes Benzene, Phelols, Naphthalene
Cleaners	Polishes (Metal, Ceramic, Tile) Etching Agents Cleaners, Ammonia, Lye, Caustic Sodas Bleaching Agents Chromate Salts	Metals Metals Acidity/Alkalinity Acidity/Alkalinity Chromium
Plumbing	Solder (Lead, Tin), Flux (Zinc Chloride) Pipe Fitting (Cut Shavings) Galvanized Metals (Nails, Fences) Electric Wiring	Lead, Copper, Zinc, Tin Copper Zinc Copper, Lead
Painting	Paint Thinner, Acetone, MEK, Stripper Paints, Lacquers, Varnish, Enamels Turpentine, Gum Spirit, Solvents Sanding, Stripping Paints (Pigments), Dyes	VOC's Metals, Phenolics, Mineral Spirits VOC's Metals Metals
Woods	Sawdust Particle Board Dusts (Formaldehyde) Treated Woods	Solid Waste Formaldehyde Copper, Creosote
Masonry & Concrete	Dusts (Brick, Cement) Colored Chalks (Pigments) Glazing Compounds Cleaning Surfaces	Acidity, Sediments Metals Asbestos Acidity
Floors and Walls	Flashing Drywall Tile Cutting (Ceramic Dust) Adhesives[l]	Copper, Aluminum Dusts Minerals
Air Conditioning and Heating	Insulation Coolant Reservoirs Adhesives	Asbestos Freon
Yard Operations and Maintenance	Vehicle and Machinery Maintenance Gasoline, Oils, Additives Marking Paints (Sprays) Grading, Earth Moving Portable Toilets Fire Hazard Control (Herbicides) Health and Safety Wash Waters	Oil, Grease, Coolants Benzene & Derivatives, Oils & Grease Vinyl Chloride, Metals Erosion (Sediments) BOD, Disinfectants (Spills) Sodium Arsenite, Di-nitro Compounds, Rodenticides Insecticides, Herbicides, Concrete, Greases, BOD

Landscaping & Earth Moving	Planting, Plant Maintenance Excavation, Tilling Masonry & Concrete Trees & Shrubs Exposing Natural Lime or Mineral Deposits Soil Additives Re-vegetation of Graded Areas	Pesticides, Herbicides, Nutrients, Erosion (Sediments) Solid Wastes Acidity/Alkalinity, Metals Aluminum Sulfate, Sulfur Fertilizers
Materials Storage	Waste Storage (Used Oils, Solvents, Etc.) Hazardous Waste Containment Raw Material Piles	Spills, Leaks, Polluted discharge Spills, Leaks, Polluted discharge Dusts, Sediments, Polluted Discharge

6.5.5 Sample Collection and Handling

Sample Collection Procedures

Grab samples shall be collected and preserved in accordance with the methods identified in **Table 3**, "Sample Collection, Preservation and Analysis for Monitoring Non-Visible Pollutants." Only personnel trained in proper water quality sampling shall collect samples. Include copies of training records in **Attachment 8**.

Samples shall be collected by placing a separate laboratory-provided sample container directly into a stream of water downgradient and within close proximity to the potential non-visible pollutant discharge location. This separate laboratory-provided sample container shall be used to collect water, which shall be transferred to sample bottles for laboratory analysis. The upgradient and uncontaminated background samples shall be collected first prior to collecting the downgradient to minimize cross-contamination. The sampling personnel shall collect the water upgradient of where they are standing. Once the separate laboratory-provided sample container is filled, the water sample shall be poured directly into sample bottles provided by the laboratory for the analyte(s) being monitored.

To maintain sample integrity and prevent cross-contamination, sampling collection personnel shall:

- Wear a clean pair of nitrile gloves prior to the collection and handling of each sample at each location;
- Not contaminate the inside of the sample bottle by not allowing it to come into contact with any material other than the water sample;
- Discard sample bottles or sample lids that have been dropped onto the ground prior to sample collection;
- Not leave the cooler lid open for an extended period of time once samples are placed inside;
- Not sample near a running vehicle where exhaust fumes may impact the sample;
- Not touch the exposed end of a sampling tube, if applicable;
- Avoid allowing rainwater to drip from rain gear or other surfaces into sample bottles;
- Not eat, smoke, or drink during sample collection;

- Not sneeze or cough in the direction of an open sample bottle;
- Minimize the exposure of the samples to direct sunlight, as sunlight may cause biochemical transformation of the sample to take place;
- Decontaminate sampling equipment prior to sample collection using a TSP-soapy water wash, distilled water rinse, and final rinse with distilled water; and
- Dispose of decontamination water/soaps appropriately (i.e., not discharge to the storm drain system or receiving water).

Sample Handling Procedures

Immediately following collection, sample bottles for laboratory analytical testing will be capped, labeled, documented on a Chain of Custody form provided by the analytical laboratory, sealed in a re-sealable storage bag, placed in an ice-chilled cooler, at as near to 4 degrees Celsius as practicable, and delivered within 24 hours to the following California state-certified laboratory:

Laboratory Name _____

Address _____

Telephone Number _____

Point of Contact _____

Immediately following collection, samples for field analysis shall be tested in accordance with the field instrument manufacturer's instructions and results recorded on the Sampling Activity Log.

Sample Documentation Procedures

All original data documented on sample bottle identification labels, COC forms, Sampling Activity Logs, and Inspection Checklists shall be recorded using waterproof ink. These shall be considered accountable documents. If an error is made on an accountable document, the individual shall make corrections by lining through the error and entering the correct information. The erroneous information shall not be obliterated. All corrections shall be initialed and dated. Copies of the COC form and Sampling Activity Log are provided in **Attachment 14.**

Duplicate samples shall be identified consistent with the numbering system for other samples to prevent the laboratory from identifying duplicate samples. Duplicate samples shall be identified in the Sampling Activity Logs.

Sampling and field analysis activities shall be documented using the following:

- **Sample Bottle Identification Labels**: Sampling personnel shall attach an identification label to each sample bottle. At a minimum, the following information shall be recorded on the label, as appropriate:
    - Project name
    - Project number

- Unique sample identification code ~ SSSSSYYMMDDHHmmTT where:
  - SSSSS = sampling point number (e.g., CCUP1, CCDN2)
  - YY = last two digits of the year (e.g. 06)
  - MM = month (01-12)
  - DD = day (01-31)
  - HH = hour sample collected (00-23)
  - mm = minute sample collected (00-59)
  - TT = Type or QA/QC Identifier (if applicable)
  - G = grab
  - FS = field duplicate
  - For example, the sample number for a grab sample collected at Station CCUP1 collected at 4:15PM on December 8, 2006 would be: CCUP10612081615G
- Collection date/time (No time applied to QA/QC samples)
- Analysis constituent
- Initials of person who collected the sample

- **Sampling Activity Logs:** A log of sampling events shall identify:
  - Sampling date;
  - Separate times for collected samples and QA/QC samples recorded to the nearest minute;
  - Unique sample identification number and location;
  - Analysis constituent;
  - Names of sampling personnel;
  - Weather conditions (including precipitation amount);
  - Field analysis results; and
  - Other pertinent data.
- **COC Forms:** All samples to be analyzed by a laboratory will be accompanied by a COC form provided by the laboratory. Only the sample collectors will sign the COC form over to the laboratory. COC procedures will be strictly adhered to for QA/QC purposes.
- **Stormwater Quality Construction Inspection Checklists:** When applicable, the contractor's Storm water inspector will document on the checklist that samples for non-visible pollutants were taken during a rain event.

6.5.6 Sample Analysis

Samples shall be analyzed for the applicable constituents listed in **Table 1.** **Table 2** lists potential analytical methods which may be applicable to this Site.

For samples collected for field analysis, collection, analysis and equipment calibration will be in accordance with the field instrument manufacturer's specifications.

The following field instrument(s) will be used to analyze the following constituents:

Field Instrument	**Constituent**

The instrument(s) will be maintained in accordance with manufacturer's instructions. The instrument(s) will be calibrated before each sampling and analysis event. Maintenance and calibration records will be maintained with the SWPPP.

Table 2: Sample Collection, Preservation and Analysis for Monitoring Non-Visible Pollutants

Constituent	Analytical Method	Minimum Sample Volume	Sample Bottle	Sample Preservation	Reporting Limit	Maximum Holding Time
VOCs-Solvents	EPA 8260B	3 x 40 mL	VOA-glass	Store at 4°C, HCl to pH<2	1 ug/L	14 days
PAHs	EPA 8270C	1 x 1 L	Glass-Amber	Store at 4°C	10 ug/L	7 days
pH	EPA 150.1	1 x 100 mL	Polypropylene	None	Unitless	Immediate
TDS	EPA 160.1	1 x 100 mL	Polypropylene	None	ppm	Immediate
Alkalinity	SM 2320B	1 x 250 mL	Polypropylene	Store at 4°C	1 mg/L	14 days
TPH as gasoline	EPA 8015B	3 x 40 mL	VOA-glass	Store at 4°C, HCl to pH<2	50 ug/L	14 days
TPH as diesel	EPA 8015BB	1 x 1 L	Glass-Amber	Store at 4°C	50 ug/L	14 days
Metals (Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, Se, Na, Th, Va, Zn	EPA 6010B/7470A	1 x 250 mL	Polypropylene	Store at 4°C, HNO_4 to pH<2	0.1 mg/L	6 months

Notes: C – Degrees Celsius
EPA – Environmental Protection Agency
TPH – Total Petroleum Hydrocarbons
HCl – Hydrogen Chloride
H2SO4 – Hydrogen Sulfide
HNO3 – Nitric Acid
L – liter
mg/L – milligrams per liter
ug/L – micrograms per liter
mL – milliliter
PAHs – Polyaromatic hydrcarbons
VOCs – Volatile Organic Compound
VOA – volatile organic analysis

6.5.7 Quality Assurance / Quality Control

For an initial verification of laboratory or field analysis, duplicate samples will be collected at a rate of 10 percent or 1 duplicate per sampling event. The duplicate sample will be collected, handled, and analyzed using the same protocols as primary samples. A duplicate sample will be collected at each location immediately after the primary sample has been collected. Duplicates will be collected where contamination is likely, not on the background sample. Duplicate samples will not influence any evaluations or conclusions; however, they will be used as a check on laboratory quality assurance.

6.5.8 Data Management and Reporting

A copy of all water quality analytical results and QA/QC data will be included in the onsite SWPPP within 5 days of sampling (for field analyses) and within 30 days (for laboratory analyses). Lab reports and COCs will be reviewed for consistency between lab methods, sample identifications, dates, and times for both primary samples and QA/QC samples. All data, including COC forms and Sampling Activity Logs, shall be kept with the SWPPP.

6.5.9 Data Evaluation

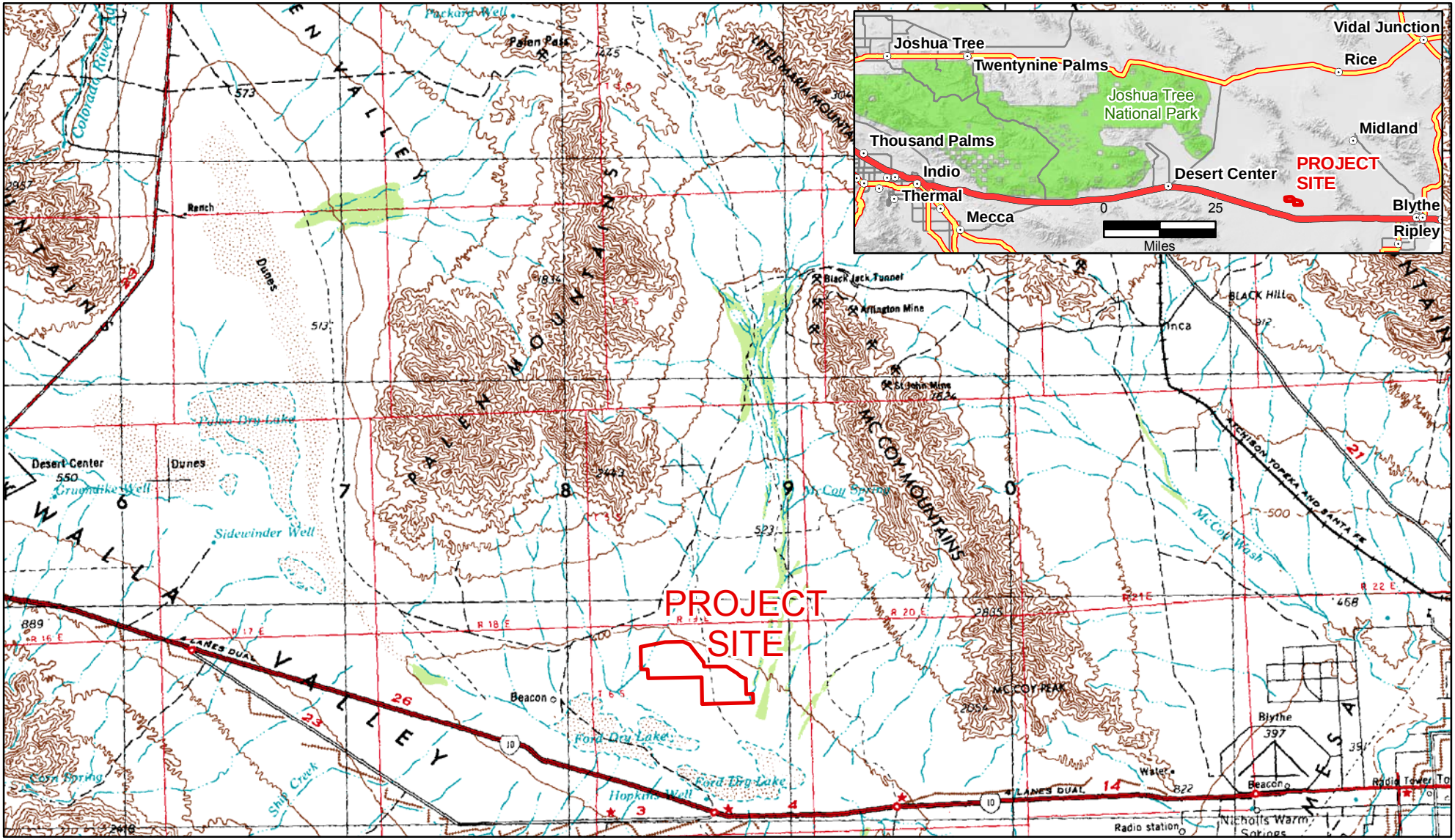
An evaluation of the water quality sample analytical results, including figures with sample locations, the water quality analytical results, and the QA/QC data, will be included in the onsite SWPPP.

If the runoff/downgradient sample shows an increased level of the tested analyte relative to the background sample, the BMPs, site conditions, and surrounding influences will be assessed to determine the probable cause for the increase. As determined by the site and data evaluation, appropriate BMPs will be repaired or modified to mitigate discharges of non-visual pollutant concentrations. Any revisions to the BMPs will be recorded as an amendment to the SWPPP.

6.5.10 Change of Conditions

Whenever SWPPP monitoring, pursuant to Section B of the General Permit, indicates a change in site conditions that might affect the appropriateness of sampling locations or introduce additional non-visible pollutants of concern, testing protocols will be revised accordingly. All such revisions will be recorded as amendments to the SWPPP.

ATTACHMENT 1 – LOCATION MAPS



SOURCE:
USGS 250K Quad Sheet, Salton Sea
All locations approximate

N
W E
S

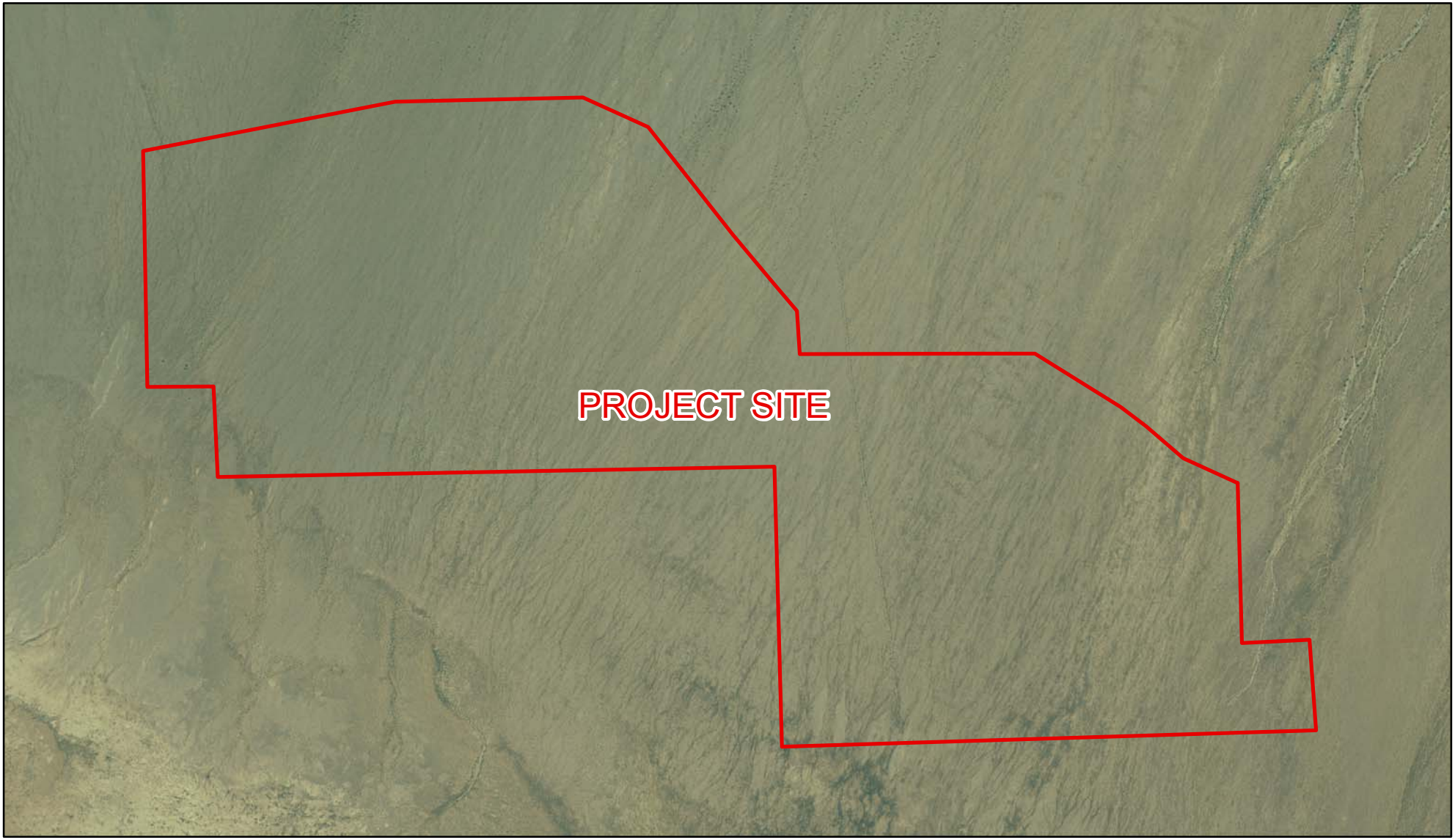
0 5
Miles

GENESIS SOLAR ENERGY PROJECT

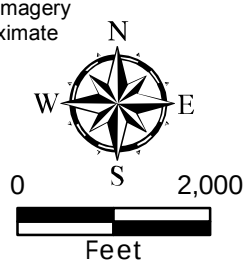
WorleyParsons
resources & energy

SWL	JF	7/2009
52004617	1	

SITE VICINITY MAP



SOURCE:
2005 USDA NAIP Imagery
All locations approximate



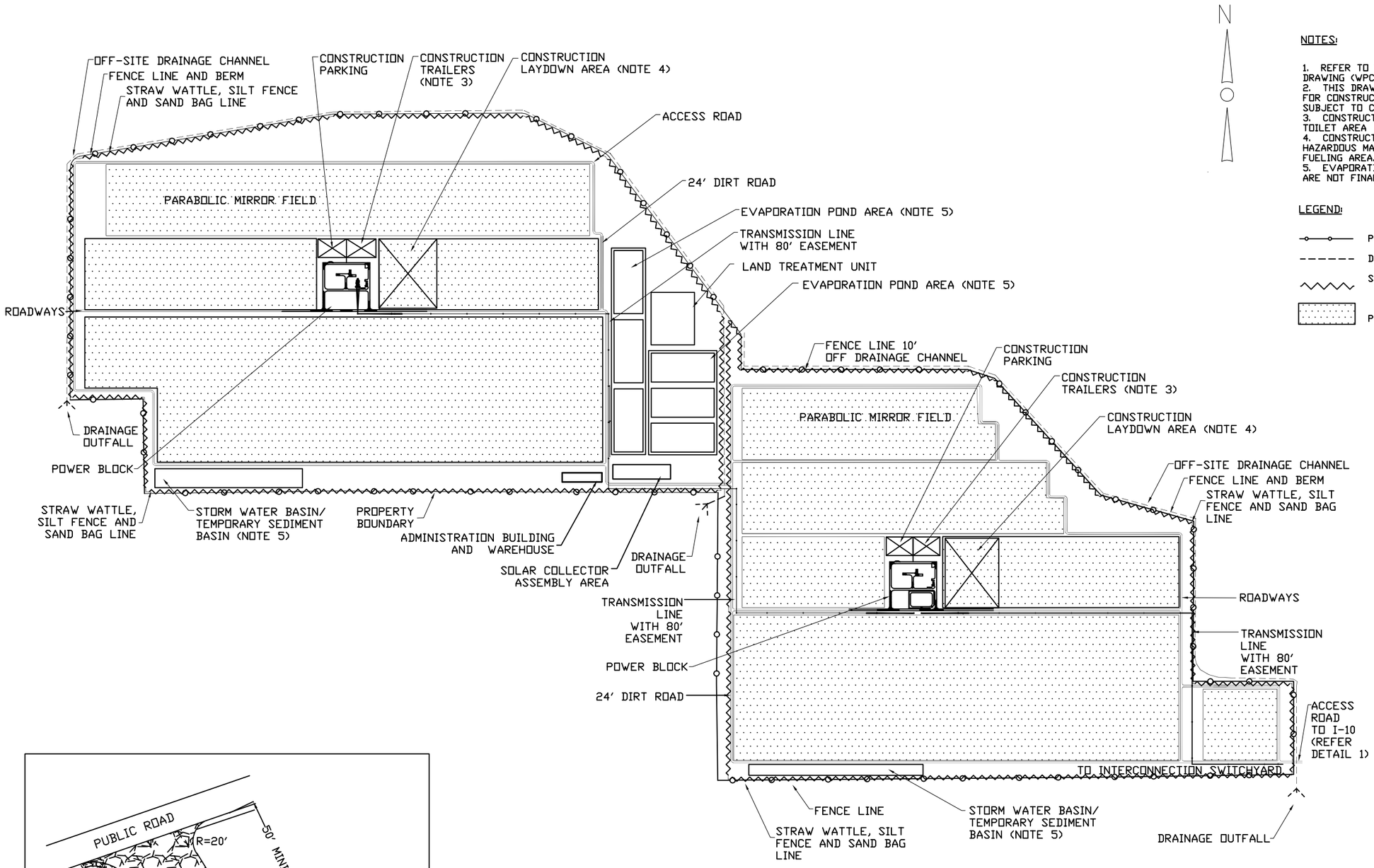
GENESIS SOLAR ENERGY PROJECT

WorleyParsons
resources & energy

SITE LOCATION MAP

SWL	JF	7/2009
52004617		2

ATTACHMENT 2 – WATER POLLUTION CONTROL DIAGRAMS

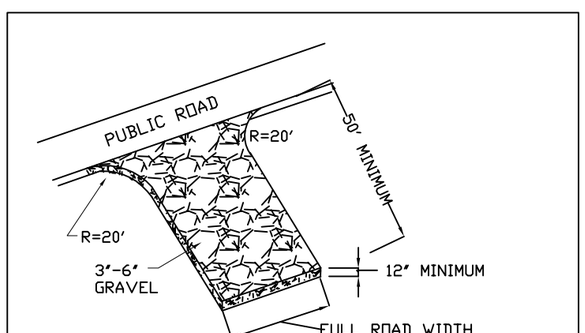


NOTES:

1. REFER TO WATER POLLUTION CONTROL DRAWING (WPCD) 2 FOR EROSION CONTROL NOTES
2. THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION - PRIMARY SITE LAYOUT IS SUBJECT TO CHANGE
3. CONSTRUCTION TRAILERS INCLUDES PORTABLE TOILET AREA
4. CONSTRUCTION LAYDOWN AREA INCLUDES HAZARDOUS MATERIAL STORAGE, VEHICLE STORAGE AND FUELING AREA.
5. EVAPORATION POND AND DETENTION BASIN SIZES ARE NOT FINALIZED

LEGEND:

- PROPERTY BOUNDARY
- DRAINAGE LINE
- STRAW WATTLE, SILT FENCE AND SAND BAG LINE
- PARABOLIC TROUGH MIRROR FIELD



DETAIL 1 | CONSTRUCTION ENTRANCE/EXIT

1000 FEET 0 FEET 1000 FEET 2000 FEET 3000 FEET

REV	DATE	DESCRIPTION	DRAWN	CHECKED	LEAD DESIGNER	ENGINEER/ TECH SPEC	LEAD DISC ENGINEER	PROJ ENGR MANAGER	PROJECT MANAGER

PRELIMINARY STATUS — DATE — REPRESENTS GENERAL DESIGN CONCEPTS BASED ON ASSUMPTIONS. REVIEWED NOT CHECKED.
L.DE J. FOSTER 05/18/2009

APPROVED STATUS — DATE — REPRESENTS REVIEWED AND APPROVED DESIGN. ANY PORTION MARKED "HELD" RETAINS PRELIMINARY STATUS.
L.DE

ORIGINATING PERSONNEL
DRAWN BY
CHECKED BY
LEAD DESIGNER: P. LOUEN
ENGINEER/TECH SPECIALIST: T. ROBERTSON
PROJECT ENGINEERING MANAGER: J. FOSTER
PROJECT MANAGER: B. PIETRUCHA

PROFESSIONAL ENGINEER'S SEAL

Zero Harm — Leadership No Incidents Safe Behavior

ORIGINALLY PREPARED UNDER THE RESPONSIBLE SUPERVISION OF
PE: STATE:
LIC. NO.: DATE:

WorleyParsons resources & energy

CLIENT/PROJECT TITLE
GENESIS SOLAR LLC
GENESIS SOLAR ENERGY PROJECT

EROSION CONTROL PLAN

SCALE
DRAWING SIZE ARCH D (36" x 24")
WORLEYPARSONS DWG. NO. WPDC 1
REV A

WPDC1.dwg 6-09-09 - 11:44

GENERAL NOTES:

1. IMPLEMENTATION OF BEST MANAGEMENT PRACTICE (BMP) IS AN ACTIVE TASK THAT REQUIRES FLEXIBILITY AND COMMITMENT BY THE CONTRACTOR. THE EROSION CONTROL PLAN IS INTENDED TO PROVIDE GUIDANCE TO THE CONTRACTOR. THE LOCATION AND TYPES OF BMPS SHOWN ARE GUIDELINES ONLY. IT IS THE CONTRACTORS RESPONSIBILITY TO IMPLEMENT PRACTICES THAT COMPLY WITH THE NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM, GENERAL PERMIT FOR CONSTRUCTION ACTIVITIES.

2. BMP CONTROLS MUST BE MAINTAINED BY THE CONTRACTOR THROUGHOUT CONSTRUCTION UNTIL SUCH TIME THAT THE PROJECT HAS BEEN STABILIZED AND ACCEPTED BY THE LOCAL AGENCY.

3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PREVENT DISCHARGE OF SEDIMENT FROM THE SITE TO ANY WATERCOURSE, DRAINAGE SYSTEM OR NEIGHBORING PROPERTY.

4. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLY WITH LOCAL, STATE AND FEDERAL WASTE DISCHARGE REQUIREMENTS RELATING TO STORM WATER RUN OFF ASSOCIATED WITH CONSTRUCTION ACTIVITY.

5. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLY . WITH THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE PROJECT. A COPY OF THE SWPPP SHALL BE LOCATED AT THE CONSTRUCTION SITE AT ALL TIMES.

6. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO UNDERTAKE SITE INSPECTIONS PRIOR TO A FORECAST STORM, AFTER A RAINFALL EVENT THAT CAUSES RUNOFF, AT 24 HOUR INTERVALS DURING EXTENDED RAINFALL EVENTS, WEEKLY DURING THE RAINFALL SEASON, FORTNIGHTLY DURING THE NON-RAINY SEASON AND AT ANY OTHER TIME(S) OR INTERVALS SPECIFIED IN CONTRACT DOCUMENTS.

7. ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES MUST BE CAPABLE OF BEING PLACED WITHIN 24 HOURS.

8. STRAW MULCH MAY BE PLACED ON ALL BARE AREAS AROUND THE PERIMETER TO THE SITE AND MAY ALSO BE APPLIED TO THE DISTURBED AREAS ADJACENT TO EXCAVATIONS, ON SHALLOW SLOPES SURROUNDING THE SITE AND USED TO COVER EXPOSED SOIL AND STOCKPILED MATERIAL AREAS.

9. ALL STOCKPILES SHALL BE COVERED (OR CAPABLE OF BEING COVERED WITHIN 24 HOURS) WITH STRAW MULCH OR PLASTIC SHEETING. ALL SOIL STOCKPILES SHALL HAVE SILT FENCES AT THE TOE OF THE MATERIAL.

10. EARTH DIKES OR SWALES MAY BE USED TO INTERCEPT AND DIVERT SEDIMENT LADEN WATER TO THE SEDIMENT BASIN OR SEDIMENT TRAPS.

11. SILT FENCES, STRAW WATTLE AND SAND BAGS SHALL BE INSTALLED AROUND THE PERIMETER TO INTERCEPT SEDIMENT LADEN RUNOFF BEFORE IT ENTERS THE OFF-SITE DRAINAGE CHANNELS. FIBER ROLLS MAY ALSO BE USED.

12. THE SEDIMENT BASIN SHALL BE PUMPED DRY IF IT IS NOT DRY WITHIN 72 HOURS AFTER A RAINFALL EVENT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MANAGE ANY LOCALIZED FLOODING.

13. CHECK DAMS TO BE USED IN SMALL ONSITE OPEN CHANNELS IF DRAIN LESS THAN 10 ACRES AND STORM WATER VELOCITIES EXCEED 5 FEET PER SECOND.

14. IT IS THE CONTRACTORS RESPONSIBILITY TO IMPLEMENT SAFETY MEASURES ONSITE.

15. ONSITE VEHICLE SPEED SHALL BE LIMITED TO 10 MILES PER HOUR.

16. DUST CONTROL WILL BE APPLIED TO DISTURBED AREAS IN FORECAST OR ACTUAL WIND SPEEDS OF 20 MILES PER HOUR OR GREATER.

17. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE ESTABLISHED WITH 3 TO 6 INCH CRUSHED AGGREGATE. THE STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL EXTEND A MINIMUM OF 50 FEET INTO THE PROJECT CONSTRUCTION SITE WITH A FLARED ENTRANCE TO MEET THE EXISTING ROADS AS NECESSARY.

18. TRASH / GENERAL LITTER SHALL BE REMOVED ON A REGULAR BASIS BY THE CONTRACTOR.

19. THE LAYDOWN AREA IN THE CONSTRUCTION SITE INCLUDES PORTABLE TOILETS, MATERIAL STORAGE, FUELING AREA AND VEHICLE STORAGE.

20. SAMPLING AND ANALYSIS OF NON-VISIBLE POLLUTANTS SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE SWPPP.

REV	DATE	DESCRIPTION	DRAWN	CHECKED	LEAD DESIGNER	ENGINEER/ TECH SPEC	LEAD DISC ENGINEER	PROJ ENGR MANAGER	PROJECT MANAGER

PRELIMINARY STATUS — DATE — REPRESENTS GENERAL DESIGN CONCEPTS BASED ON ASSUMPTIONS. REVIEWED NOT CHECKED.
LDE J. FOSTER 05/18/2009

APPROVED STATUS — DATE — REPRESENTS REVIEWED AND APPROVED DESIGN. ANY PORTION MARKED "HELD" RETAINS PRELIMINARY STATUS.
LDE

ORIGINATING PERSONNEL — PROFESSIONAL ENGINEER'S SEAL

DRAWN BY
CHECKED BY
LEAD DESIGNER: P. LOUEN
ENGINEER/TECH SPECIALIST: T. ROBERTSON
PROJECT ENGINEERING MANAGER: J. FOSTER
PROJECT MANAGER: B. PIETRUCHA

Zero Harm — Leadership, No Incidents, Safe Behavior

ORIGINALLY PREPARED UNDER THE RESPONSIBLE SUPERVISION OF
PE:_____ STATE:_____
LIC. NO:_____ DATE:_____

WorleyParsons resources & energy

CLIENT/PROJECT TITLE
GENESIS SOLAR LLC
GENESIS SOLAR ENERGY PROJECT

EROSION CONTROL NOTES

SCALE
DRAWING SIZE: ARCH D (36" x 24")
WORLEYPARSONS DWG. NO.: WPDC 2
REV: A

WPCD.dwg 17-Aug-2009 - 08:35

ATTACHMENT 3 – BMP CONSIDERATION CHECKLIST

CONSTRUCTION SITE BMPs
CONSIDERATION CHECKLIST

The BMPs listed here should be considered for every project. Those BMPs that are not included in the SWPPP must be checked as "Not Used" with a brief statement describing why it is not being used.

EROSION CONTROL BMPs

BMP No.	BMP	CONSIDERED FOR PROJECT	CHECK IF USED	CHECK IF NOT USED	IF NOT USED, STATE REASON
EC-1	Scheduling	X	X		
EC-2	Preservation of Existing Vegetation	X	X		
EC-3	Hydraulic Mulch	X	X		
EC-4	Hydroseeding	X		X	Hydroseeing will not establish in the ground conditions. Use Hydraulic mulch and/or straw wattle instead.
EC-5	Soil Binders	X		X	Hydraulic mulch and/or straw mulch used instead
EC-6	Straw Mulch	X	X		
EC-7	Geotextiles & Mats	X	X		
EC-8	Wood Mulching	X		X	Hydraulic mulch and/or straw mulch used
EC-9	Earth Dikes & Drainage Swales	X	X		
EC-10	Velocity Dissipation Devices	X		X	Not required for project
EC-11	Slope Drains	X	X		
EC-12	Streambank Stabilization	X		X	Not required for project
EC-13	Polyacrylamide	X		X	Hydraulic mulch and/or straw mulch used

CONSTRUCTION SITE BMPs
CONSIDERATION CHECKLIST

The BMPs listed here should be considered for every project. Those BMPs that are not included in the SWPPP must be checked as "Not Used" with a brief statement describing why it is not being used.

SEDIMENT CONTROL BMPs					
BMP No.	**BMP**	**CONSIDERED FOR PROJECT**	**CHECK IF USED**	**CHECK IF NOT USED**	**IF NOT USED, STATE REASON**
SE-1	Silt Fence	X	X		
SE-2	Sediment Basin	X	X		
SE-3	Sediment Trap	X	X		
SE-4	Check Dam	X	X		Only if velocities are higher than 5 ft/s in the small channels
SE-5	Fiber Rolls	X	X		
SE-6	Gravel Bag Berm	X		X	Not required for project
SE-7	Street Sweeping and Vacuuming	X	X		
SE-8	Sand Bag Barrier	X	X		
SE-9	Straw Bale Barrier	X		X	Not required for project
SE-10	Storm Drain Inlet Protection	X		X	Not required for project
SE-11	Chemical Treatment	X		X	Not required for project
WIND EROSION CONTROL BMPs					
WE-1	Wind Erosion Control	X	X		
TRACKING CONTROL BMPs					
TR-1	Stabilized Construction Entrance/Exit	X	X		
TR-2	Stabilized Construction Roadway	X	X		
TR-3	Entrance/Outlet Tire Wash	X	X		Construction entrance/exit with street sweeping may be sufficient if there is no caked on mud to tires and undercarriages of trucks

CONSTRUCTION SITE BMPs
CONSIDERATION CHECKLIST

The BMPs listed here should be considered for every project. Those BMPs that are not included in the SWPPP must be checked as "Not Used" with a brief statement describing why it is not being used.

NON-STORM WATER MANAGEMENT BMPs

BMP No.	BMP	CONSIDERED FOR PROJECT	CHECK IF USED	CHECK IF NOT USED	IF NOT USED, STATE REASON
NS-1	Water Conservation Practices	X	X		
NS-2	Dewatering Operations	X	X		
NS-3	Paving and Grinding Operations	X	X		
NS-4	Temporary Stream Crossing	X		X	Not applicable to this project because no streams to cross
NS-5	Clear Water Diversion	X		X	Not applicable to this project because there are no upstream diversions
NS-6	Illicit Connection/ Discharge	X	X		
NS-7	Potable Water/Irrigation	X		X	
NS-8	Vehicle and Equipment Cleaning	X	X		
NS-9	Vehicle and Equipment Fueling	X	X		
NS-10	Vehicle and Equipment Maintenance	X	X		
NS-11	Pile Driving Operations	X		X	Not applicable as there will be no pile driving operations during construction
NS-12	Concrete Curing	X	X		
NS-13	Concrete Finishing	X	X		
NS-14	Material and Equipment Use Over Water			X	Not applicable because there is no construction over water
NS-15	Demolition Adjacent to Water			X	Not applicable because there is no demolition during this phase of the project
NS-16	Temporary Batch Plants			X	Not applicable as a batch plant is not to be used on site

CONSTRUCTION SITE BMPs
CONSIDERATION CHECKLIST

The BMPs listed here should be considered for every project. Those BMPs that are not included in the SWPPP must be checked as "Not Used" with a brief statement describing why it is not being used.

WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL BMPs

BMP No.	BMP	CONSIDERED FOR PROJECT	CHECK IF USED	CHECK IF NOT USED	IF NOT USED, STATE REASON
WM-1	Material Delivery and Storage	X	X		
WM-2	Material Use	X	X		
WM-3	Stockpile Management	X	X		
WM-4	Spill Prevention and Control	X	X		
WM-5	Solid Waste Management	X	X		
WM-6	Hazardous Waste Management	X	X		
WM-7	Contaminated Soil Management	X		X	Not applicable to this project because there is no known contaminated soil on site
WM-8	Concrete Waste Management	X	X		
WM-9	Sanitary/Septic Waste Management	X	X		
WM-10	Liquid Waste Management	X	X		

ATTACHMENT 4 – RUN-OFF CALCULATIONS AND SEDIMENT BASIN SIZING

WORKSHEET FOR RUN-OFF COEFFICIENT CALCULATIONS

Total Site Area	=	1800	Acres	(A)

Existing Site Conditions

Impervious Site Area [1]	=	0.00	Acres	(B)
Impervious Site Area Runoff Coefficient [2, 4]	=	.95		(C)
Pervious Site Area [3]	=	1,800	Acres	(D)
Pervious Site Area Runoff Coefficient	=	0.35		(E)
Existing Site Area Runoff Coefficient $\frac{(B \times C) + (D \times E)}{(A)}$	=	0.35		(F)

Proposed Site Conditions (after construction)

Run Off Area[5]	=	1,800	Acres	(G)
Impervious Site Area [1]	=	300	Acres	(H)
Impervious Site Area Runoff Coefficient [2]	=	.95		(I)
Pervious Site Area (A) [3]		1,400	Acres	(J)
Pervious Site Area Runoff Coefficient (A)		0.35		(K)
Pervious Site Area (B) [3]	=	100	Acres	(L)
Pervious Site Area Runoff Coefficient (B)[4]	=	0.10		(M)
Proposed Site Area Runoff Coefficient $\frac{(H \times I) + (J \times K) + (L \times M)}{(G)}$	=	0.45		(N)

1. Includes paved areas, areas covered by buildings, foundations in the solar field and other impervious surfaces.
2. Use 0.95 unless lower or higher runoff coefficient can be verified.
3. Includes areas of vegetation (desert shrub), most unpaved or uncovered soil surfaces, and other pervious areas. Higher runoff coefficient as clay soils therefore runoff expected.
4. Detention Basins, Evaporation Ponds, Land Farm Units that should not have any runoff

FROM BMP SE-2; SEDIMENT BASIN SIZING

Option 2:

Sediment Basin(s), as measured from the bottom of the basin to the principle outlet, shall have at least a capacity equivalent to 3,600 cubic feet of storage per acre draining into the sediment basin. The length of the basin shall be more than twice the width of the basin. The depth must not be less than 3 ft nor greater than 5 ft….

Property Area = 1800 acres
Required Storage = $3{,}600 \frac{\text{cubic feet}}{\text{acre}} \times 1800 \text{ acres}$
= 6,480,000 cubic feet

If depth of 5 feet, Area = 1,296,000 square feet
= 29.75 acres

The temporary sediment basin shall be in the place of the two proposed retention basin. The retention basin has been sized to cater for the 1 in 100 year rain fall event, where 100% of the run off will flow into the basin. The required volume of the retention basins are 66 acre-feet and 49 acre-feet for the two 125 units. This is a total of 115 acre-feet which is equivalent to 5,009,400 cubit feet. Therefore using Option-2, some additional capacity would be required to cater for the sediment basin.

Option 3:

Sediment basin(s) shall be designed using the standard equation:

As = 1.2Q/Vs

Where:
As = Minimum surface area for trapping soil particles of a certain size
Vs = settling velocity of the design particle size chosen
Q = C I A

Where:
C = runoff coefficient
I = precipitation intensity for a 10 year, 6 hour rain event
A = Area draining in to the sediment basin in acres

A = 1,800 Acres
C = 0.45
I = 1.4 in/hr (from NOAA Atlas 2, Volume 11)

Q = 0.45 x 1.4 x 1,800
= 1134 ft^3/sec

Settling Velocity - This is the velocity of water flow at which the water no longer has the energy necessary to transport a specific sediment size. As clays are very fine grain size, the fine silt sized 0.01mm shall be used for the calculation.

Use Typical Value: Vs = 0.0001 m/s
= 0.0003 ft/s

As = 1.2 x (1134)/(0.0003)
= 4,356,000 ft^2
= 104 acres

Option 3 of 104 acres is significantly larger than Option 2's 30 acres, therefore Option 2 shall be used for sizing the sediment basin(s) on site. The sediment basin will be cleaned out as required under SE-2 to prevent accumulation of sediment impacting on its functionality.

ATTACHMENT 5 – NOTICE OF INTENT

Linda S Adams
Secretary for
Environmental Protection

State Water Resources Control Board

Division of Water Quality
1001 I Street • Sacramento, California 95814 • (916) 341-5537
Mailing Address: P.O. Box 1977 • Sacramento, California • 95812-1977
FAX (916) 341-5543 • Internet Address: http://www.waterboards.ca.gov/water_issues/programs/stormwater/

Arnold Schwarzenegger
Governor

CHECKLIST FOR SUBMITTING A NOTICE OF INTENT

In order for the State Water Resources Control Board to expeditiously process your Notice of Intent (NOI), the following items must be submitted to either of the addresses indicated below:

1._____ NOI (please keep a copy for your files) with all applicable sections completed and original signature of the landowner or signatory agent;

2._____ Check made out to the "State Water Resources Control Board"
See reverse for listing of fees by acre. The fee is based on the "Total Acres to be Disturbed" for the life of the project.

3. _____ Site Map of the facility (see NOI instructions). DO NOT SEND BLUEPRINTS

U.S. Postal Service Address

State Water Resources Control Board
Division of Water Quality
Attn: Storm Water Section
P.O. Box 1977
Sacramento, CA 95812-1977

Overnight Mailing Address

State Water Resources Control Board
Division Of Water Quality
Attn: Storm Water, 15th Floor
1001 I Street
Sacramento, CA 95814

NOIs are processed in the order they are received. A NOI receipt letter will be mailed to the land owner within approximately two weeks. Incomplete NOI submittals will be returned to the landowner's address within the same timeframe and will specify the reason(s) for return. If you need a receipt letter by a specific date (for example, to provide to a local agency), we advise that you submit your NOI thirty (30) days prior to the date the receipt letter is needed.

Please do not call us to verify your NOI status. A copy of your NOI receipt letter will be available on our web page within twenty-four (24) hours of processing. Go to:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/databases.shtml
to retrieve an electronic copy of your NOI receipt letter. If you have any questions regarding this matter, please contact us at (916) 341-5537.

Construction Annual Fees by Acre

Partial Acreage rounded to nearest whole number

Acres	Fee	21% Surcharge	Total Fee	Acres	Fee	21% Surcharge	Total Fee
0	$238	$50	$288	51	$1,462	$307	$1,769
1	$262	$55	$317	52	$1,486	$312	$1,798
2	$286	$60	$346	53	$1,510	$317	$1,827
3	$310	$65	$375	54	$1,534	$322	$1,856
4	$334	$70	$404	55	$1,558	$327	$1,885
5	$358	$75	$433	56	$1,582	$332	$1,914
6	$382	$80	$462	57	$1,606	$337	$1,943
7	$406	$85	$491	58	$1,630	$342	$1,972
8	$430	$90	$520	59	$1,654	$347	$2,001
9	$454	$95	$549	60	$1,678	$352	$2,030
10	$478	$100	$578	61	$1,702	$357	$2,059
11	$502	$105	$607	62	$1,726	$362	$2,088
12	$526	$110	$636	63	$1,750	$368	$2,118
13	$550	$116	$666	64	$1,774	$373	$2,147
14	$574	$121	$695	65	$1,798	$378	$2,176
15	$598	$126	$724	66	$1,822	$383	$2,205
16	$622	$131	$753	67	$1,846	$388	$2,234
17	$646	$136	$782	68	$1,870	$393	$2,263
18	$670	$141	$811	69	$1,894	$398	$2,292
19	$694	$146	$840	70	$1,918	$403	$2,321
20	$718	$151	$869	71	$1,942	$408	$2,350
21	$742	$156	$898	72	$1,966	$413	$2,379
22	$766	$161	$927	73	$1,990	$418	$2,408
23	$790	$166	$956	74	$2,014	$423	$2,437
24	$814	$171	$985	75	$2,038	$428	$2,466
25	$838	$176	$1,014	76	$2,062	$433	$2,495
26	$862	$181	$1,043	77	$2,086	$438	$2,524
27	$886	$186	$1,072	78	$2,110	$443	$2,553
28	$910	$191	$1,101	79	$2,134	$448	$2,582
29	$934	$196	$1,130	80	$2,158	$453	$2,611
30	$958	$201	$1,159	81	$2,182	$458	$2,640
31	$982	$206	$1,188	82	$2,206	$463	$2,669
32	$1,006	$211	$1,217	83	$2,230	$468	$2,698
33	$1,030	$216	$1,246	84	$2,254	$473	$2,727
34	$1,054	$221	$1,275	85	$2,278	$478	$2,756
35	$1,078	$226	$1,304	86	$2,302	$483	$2,785
36	$1,102	$231	$1,333	87	$2,326	$488	$2,814
37	$1,126	$236	$1,362	88	$2,350	$494	$2,844
38	$1,150	$242	$1,392	89	$2,374	$499	$2,873
39	$1,174	$247	$1,421	90	$2,398	$504	$2,902
40	$1,198	$252	$1,450	91	$2,422	$509	$2,931
41	$1,222	$257	$1,479	92	$2,446	$514	$2,960
42	$1,246	$262	$1,508	93	$2,470	$519	$2,989
43	$1,270	$267	$1,537	94	$2,494	$524	$3,018
44	$1,294	$272	$1,566	95	$2,518	$529	$3,047
45	$1,318	$277	$1,595	96	$2,542	$534	$3,076
46	$1,342	$282	$1,624	97	$2,566	$539	$3,105
47	$1,366	$287	$1,653	98	$2,590	$544	$3,134
48	$1,390	$292	$1,682	99	$2,614	$549	$3,163
49	$1,414	$297	$1,711	>100	$2,618	$550	$3,168
50	$1,438	$302	$1,740				

NOTICE OF INTENT (NOI) TO COMPLY WITH THE TERMS OF THE GENERAL PERMIT TO DISCHARGE STORM WATER ASSOCIATED WITH CONSTRUCTION ACTIVITY

GENERAL INSTRUCTIONS

Who Must Submit

Discharges of storm water associated with construction that results in the disturbance of one acre or more of land must apply for coverage under the General Construction Activities Storm Water Permit (General Permit). Construction activity which is a part of a larger common area of development or sale must also be permitted. (For example, if 4 acres of a 20-acre subdivision is disturbed by construction activities, and the remaining 16 acres is to be developed at a future date, the property owner must obtain a General Storm Water Permit for the 4-acre project). Construction activity includes, but is not limited to: clearing, grading, demolition, excavation, construction of new structures, and reconstruction of existing facilities involving removal and replacement that results in soil disturbance. This includes construction access roads, staging areas, storage areas, stockpiles, and any off-site areas which receive run-off from the construction project such as discharge points into a receiving water. Construction activity does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

The owner of the land where the construction activity is occurring is responsible for obtaining a permit. Owners may obtain coverage under the General Permit by filing a NOI in accordance with the following instructions. Coverage for construction activity conducted on easements (e.g., pipeline construction) or on nearby properties by agreement or permission, or by an owner or lessee of a mineral estate (oil, gas, geothermal, aggregate, precious metals, and/or industrial minerals) entitled to conduct the activities, shall be obtained by the entity responsible for the construction activity. Linear construction projects which will have construction activity occurring in one or more than one Region should contact the State Water Resources Control Board at the number listed below prior to submitting an NOI application for specific information related to the use of the NOI form.

Construction Activity Not Covered By This General Permit

Storm water discharges in the Lake Tahoe Hydrologic Unit will be regulated by a separate permit(s) adopted by the California Regional Water Quality Control Board, Lahontan Region, and will not be covered under the State Water Resources Control Board's (SWRCB) General Permit. Storm water discharges on Indian Lands will be regulated by the U.S. Environmental Protection Agency.

Where to Apply

The NOI form, vicinity map, and appropriate fee must be mailed to the SWRCB at the following address:

State Water Resources Control Board
Division of Water Quality
Attn: Storm Water Permit Unit
P.O. Box 1977
Sacramento, CA 95812-1977

When to Apply

Property owners proposing to conduct construction activities subject to this General Permit must file a Notice of Intent prior to the commencement of construction activity.

Fees

The total annual fee is the current base fee plus applicable surcharges for all construction sites submitting an NOI. Checks should be made payable to: SWRCB.

Completing the Notice of Intent (NOI)

The submittal to obtain coverage under the General Permit must include a completed NOI Form (Notice of Intent, attached), a vicinity map, and the appropriate annual fee. The NOI must be completely and accurately filled out; the vicinity map and annual fee must be included with the NOI or the submittal is considered incomplete and will be rejected. A construction site is considered to be covered by the General Permit upon filing a complete NOI submittal, and implementation of a defensible Storm Water Pollution Prevention Plan (SWPPP). Upon receipt of a complete NOI submittal, each discharger will be sent a receipt letter containing the waste discharger's identification (WDID) number.

Questions?

If you have any questions on completing the NOI please call the SWRCB at (916) 341-5537.

NOI-LINE-BY-LINE INSTRUCTIONS

Please type or print when completing the NOI Form and vicinity map.

SECTION I--NOI STATUS

Mark one of the two boxes at the top portion of the NOI. Check box 1 if the NOI is being completed for new construction. Check box 2 if the NOI is being submitted to report changes for a construction site already covered by the General Permit. An example of a change that warrants a resubmittal of the NOI is a change of total area of the construction site. The permit is non-transferable, a change of ownership requires a Notice of Termination (NOT) submittal and a new NOI. Complete only those portions of the NOI that apply to the changes (the NOI must always be signed). If box 2 is checked, the WDID number must be included.

SECTION II--PROPERTY OWNER

Enter the construction site owner's official or legal name and address; contact person (if other than owner), title, and telephone number.

SECTION III--DEVELOPER / CONTRACTOR INFORMATION

Enter the name of the developer's (or general contractor's) official or legal name, address, contact person, title, and telephone number. The contact person should be someone who is familiar with the construction site and is responsible for compliance and oversight of the general permit.

SECTION IV-CONSTRUCTION PROJECT INFORMATION

Enter the project name, site address, county, city, (or nearest city if construction is occurring in an unincorporated area), zip code, and telephone number (if any) of the construction site. Include an emergency contact telephone or pager number. Construction site information should include latitude and longitude designations, tract numbers, and/or mile post markers, if applicable. The site contact person should be someone who is familiar with the project, site plans, SWPPP, and monitoring program. All NOIs must be accompanied by a vicinity map.

Part A: Enter the total size in acres of all areas associated with construction activity, including all access roads.

Part B: Enter the total size in acres of the area to be disturbed by construction activity and the percentage of the area listed in Part A above that this represents.

Part C: Enter the percentage of the site that is impervious (areas where water cannot soak into the ground, such as concrete, asphalt, rooftops, etc.) before and after construction.

Part D: Include tract numbers, if available.

Part E: Enter the mile post marker number at the project site location.

Part F: Indicate whether the construction site is part of a larger common plan of development or sale. For example, if the construction activity is occurring on a two-acre site which is within a development that is one acre or greater, answer yes.

Part G: Enter the name of the development (e.g. "Quail Ridge Subdivision", "Orange Valley Estates", etc.).

Part H: Indicate when construction will begin (month, day, year). When a NOI is being submitted due to a change in ownership, the commencement date should be the date the new ownership took effect.

Part I: Indicate the percentage of the total project area to be mass graded.

Part J: Enter the estimated completion dates for the mass grading activities and for the project completion.

Part K: Indicate the type(s) of construction taking place. For example, “Transportation” should be checked for the construction of roads; “Utility” should be checked for installation of sewer, electric, or telephone systems. Include a description of the major construction activities, (e.g., 20 single family homes, a supermarket, an office building, a factory, etc.)

SECTION V--BILLING ADDRESS

To continue coverage under the General Permit, the annual fee must be paid. Indicate where the annual fee invoice should be mailed by checking one of the following boxes:

Owner: sent to the owners address as it appears in Section II.

Developer/Contractor: sent to the developer's address as it appears in Section III.

Other: sent to a different address and enter that address in the spaces provided.

SECTION VI--REGULATORY STATUS

Indicate whether or not the site is subject to local erosion/sediment control ordinances. Indicate whether the erosion/sediment control plan designed to comply with the ordinance addresses the construction of infrastructure and structures in addition to grading. Identify the name and telephone number of the local agency, if applicable.

SECTION VII--RECEIVING WATER INFORMATION

Part A: Indicate whether the storm water runoff from the construction site discharges indirectly to waters of the United States, directly to waters of the United States, or to a separate storm drain system.

Indirect discharges include discharges that may flow overland across adjacent properties or rights-of-way prior to discharging into waters of the United States.

Enter the name of the owner/operator of the relevant storm drain system, if applicable. Storm water discharges directly to waters of the United States will typically have an outfall structure directly from the facility to a river, lake, creek, stream, bay, ocean, etc. Discharges to separate storm sewer systems are those that discharge to a collection system operated by municipalities, flood control districts, utilities, or similar entities.

Part B: Enter the name of the receiving water. Regardless of point of discharge, the owner must determine the receiving water for the construction site's storm water discharge. Enter the name of the receiving water.

SECTION VIII--IMPLEMENTATION OF NPDES PERMIT REQUIREMENTS

Part A: Indicate the status of the SWPPP, date prepared, or availability for review. Also indicate if a tentative construction schedule has been included in the SWPPP (the inclusion of a construction activity schedule is a mandatory SWPPP requirement).

Part B: Provide information concerning the status of the development of a monitoring program, a component of the SWPPP which outlines an inspection and maintenance schedule for the proposed Best Management Practices (BMPs). Provide name and phone number of program preparer.

Part C: Provide the name and phone numbers of the responsible party or parties designated to insure compliance with all elements of the General Permit and SWPPP.

SECTION IX--VICINITY MAP AND FEE

Provide a “to scale” or "to approximate scale" drawing of the construction site and the immediate surrounding area. Whenever possible, limit the map to an 8.5” x 11’ or 11" x 17" sheet of paper. At a minimum, the map must show the site perimeter, the geographic features surrounding the site, and general topography, and a north arrow. The map must also include the location of the construction project in relation to named streets, roads, intersections, or landmarks. A NOI containing a map which does not clearly indicate the location of the construction project will be rejected. Do not submit blueprints unless they meet the above referenced size limits.

SECTION X--CERTIFICATIONS

This section must be completed by the owner or signatory agent of the construction site*. The certification provides assurances that the NOI and vicinity map were completed in an accurate and complete fashion and with the knowledge that penalties exist for providing false information. Certification also requires the owner to comply with the provisions in the General Permit.

* For a corporation: a responsible corporate officer (or authorized individual). For a partnership or sole proprietorship: a general partner or the proprietor, respectively. For a municipality, State, Federal, or other public agency: either a principal executive officer, ranking elected official, or duly authorized representative.

Attachment 2

State Water Resources Control Board

NOTICE OF INTENT

TO COMPLY WITH THE TERMS OF THE
GENERAL PERMIT TO DISCHARGE STORM WATER
ASSOCIATED WITH CONSTRUCTION ACTIVITY (WQ ORDER No. 99-08-DWQ)

I. NOI STATUS (SEE INSTRUCTIONS)

MARK ONLY ONE ITEM 1. ☐ New Construction 2. ☐ Change of Information for WDID# _____

II. PROPERTY OWNER

Name	Contact Person		
Mailing Address	Title		
City	State	Zip	Phone

Owner Type (*check one*) 1.[ ] Private Individual 2.[ ]Business 3.[ ]Municipal 4.[ ]State 5.[ ]Federal 6.[ ]Other

III. DEVELOPER/CONTRACTOR INFORMATION

Developer/Contractor	Contact Person		
Mailing Address	Title		
City	State	Zip	Phone

IV. CONSTRUCTION PROJECT INFORMATION

Site/Project Name	Site Contact Person		
Physical Address/Location	Latitude _____°	Longitude _____°	County
City (or nearest City)	Zip	Site Phone Number	Emergency Phone Number

A. Total size of construction site area: _____ Acres

B. Total area to be disturbed: _____ Acres (% of total _____)

C. Percent of site imperviousness (including rooftops):

Before Construction: _____%

After Construction: _____%

D. Tract Number(s): _____, _____

E. Mile Post Marker: _____

F. Is the construction site part of a larger common plan of development or sale?

☐ YES ☐ NO

G. Name of plan or development:

H. Construction commencement date: _____/_____/_____

I. % of site to be mass graded: _____

J. Projected construction dates:

Complete grading: _____/_____/_____ Complete project: _____/_____/_____

K. Type of Construction (Check all that apply):

1. ☐ Residential 2. ☐ Commercial 3. ☐ Industrial 4. ☐ Reconstruction 5. ☐ Transportation

6. ☐ Utility Description: _____ 7. ☐ Other (Please List): _____

V. BILLING INFORMATION

SEND BILL TO: ☐ OWNER (as in II. above)	Name	Contact Person	
☐ DEVELOPER (as in III. above)	Mailing Address	Phone/Fax	
☐ OTHER (enter information at right)	City	State	Zip

VI. REGULATORY STATUS

A. Has a local agency approved a required erosion/sediment control plan?..... ☐ YES ☐ NO

Does the erosion/sediment control plan address construction activities such as infrastructure and structures?..... ☐ YES ☐ NO

Name of local agency: _____ Phone: _____

B. Is this project or any part thereof, subject to conditions imposed under a CWA Section 404 permit of 401 Water Quality Certification?..... ☐ YES ☐ No

If yes, provide details: _____

VII. RECEIVING WATER INFORMATION

A. Does the storm water runoff from the construction site discharge to (Check all that apply):

1. ☐ **Indirectly to waters of the U.S.**

2. ☐ **Storm drain system - Enter owner's name:**_____

3. ☐ **Directly to waters of U.S. (e.g. , river, lake, creek, stream, bay, ocean, etc.)**

B. Name of receiving water: (river, lake, creek, stream, bay, ocean): _____

VIII. IMPLEMENTATION OF NPDES PERMIT REQUIREMENTS

A. STORM WATER POLLUTION PREVENTION PLAN (SWPPP) (check one)

☐ A SWPPP has been prepared for this facility and is available for review: Date Prepared: ____/____/____ Date Amended: ____/____/____

☐ A SWPPP will be prepared and ready for review by (enter date): ____/____/____

☐ A tentative schedule has been included in the SWPPP for activities such as grading, street construction, home construction, etc.

B. MONITORING PROGRAM

☐ A monitoring and maintenance schedule has been developed that includes inspection of the construction BMPs before anticipated storm events and after actual storm events and is available for review.

If checked above: A qualified person has been assigned responsibility for pre-storm and post-storm BMP inspections to identify effectiveness and necessary repairs or design changes..... ☐ YES ☐ NO

Name: _____ Phone: _____

C. PERMIT COMPLIANCE RESPONSIBILITY

A qualified person has been assigned responsibility to ensure full compliance with the Permit, and to implement all elements of the Storm Water Pollution Prevention Plan including:

1. Preparing an annual compliance evaluation..... ☐ YES ☐ NO

Name: _____ Phone: _____

2. Eliminating all unauthorized discharges..... ☐ YES ☐ NO

IX. VICINITY MAP AND FEE (must show site location in relation to nearest named streets, intersections, etc.)

Have you included a vicinity map with this submittal? ..... ☐ YES ☐ NO

Have you included payment of the annual fee with this submittal?..... ☐ YES ☐ NO

X. CERTIFICATIONS

"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. In addition, I certify that I have read the entire General Permit, including all attachments, and agree to comply with and be bound by all of the provisions, requirements, and prohibitions of the permit, including the development and implementation of a Storm Water Pollution Prevention Plan and a Monitoring Program Plan will be complied with."

Printed Name: _____

Signature: _____ **Date:** _____

Title: _____

ATTACHMENT 6 - PROGRAM FOR MAINTENANCE, INSPECTION, AND REPAIR OF CONSTRUCTION SITE BMPS

The contractor shall use the following guidelines for maintenance, inspection, and repair of BMPs identified in the SWPPP		
BEST MANAGEMENT PRACTICES (BMPs)	**INSPECTION FREQUENCY (all controls)**	**MAINTENANCE/REPAIR PROGRAM**
TEMPORARY EROSION CONTROL BMPs		
EC-1 – Scheduling		■ Verify that work is progressing in accordance with the construction schedule. ■ Amend the schedule when changes are warranted ■ Amend the schedule prior to the rainy season to show updated information on the deployment and implementation of construction BMPs.
EC-3 – Hydraulic Mulch	Prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.	■ Areas where erosion is evident shall be repaired and BMPs re-applied as soon as possible. Care should be exercised to minimize damage to protected areas while making repairs, as any area damaged will require re-application of BMPs. ■ Maintain an unbroken, temporary mulched ground cover throughout the period of construction when the soils are not being reworked.
EC-6 – Straw Mulch	Prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.	■ Areas where erosion is evident shall be repaired and BMPs re-applied as soon as possible. Care should be exercised to minimize damage to protected areas while making repairs, as any area damaged will require re-application of BMPs. ■ Straw needs to last long enough to achieve erosion control objectives. ■ Maintain an unbroken, temporary mulched ground while disturbed soil areas are inactive. ■ Repair any damaged ground cover and re-mulch exposed areas. ■ Reapplication of straw mulch may be required to maintain effective soil stabilization over disturbed areas and slopes.

The contractor shall use the following guidelines for maintenance, inspection, and repair of BMPs identified in the SWPPP		
BEST MANAGEMENT PRACTICES (BMPs)	**INSPECTION FREQUENCY (all controls)**	**MAINTENANCE/REPAIR PROGRAM**
EC-7 – Geotextiles and Mats	Prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.	■ Areas where erosion is evident shall be repaired and BMPs reapplied as soon as possible. Care should be exercised to minimize damage to protected areas while making repairs, as any area damaged will require re-application of BMPs. ■ If washout or breakage occurs, re-install the material after repairing the damage to the slope or channel. ■ Check that all lap joints are secure.
EC-9 – Earth Dikes and Drainage Swales	Prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.	■ Inspect ditches and berms for washouts. ■ Replace lost riprap or soil stabilizers as needed. ■ Inspect embankments, and beds of ditches and berms for erosion and accumulation of debris and sediment. Remove debris and sediment and repair linings and embankments as needed. ■ Temporary conveyances should be completely removed as soon as the surrounding drainage area has been stabilized or at the completion of construction.
EC-11 – Slope Drains	Prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.	■ Repair damage from outlet erosion and downstream scour. ■ Remove debris from inlet and repair undercutting at inlet if required. ■ Repair leaks in pipes. ■ Remove built up of sediment from inlet and outlet. ■ Install additional pipe anchors if the pipe has moved.

The contractor shall use the following guidelines for maintenance, inspection, and repair of BMPs identified in the SWPPP		
BEST MANAGEMENT PRACTICES (BMPs)	**INSPECTION FREQUENCY (all controls)**	**MAINTENANCE/REPAIR PROGRAM**
TEMPORARY SEDIMENT CONTROL BMPs		
SE-1 – Silt Fence	Prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.	■ Repair undercut silt fences. ■ Repair or replace split, torn, slumping or weathered fabric. The lifespan of the silt fence fabric is generally 5 to 8 months. ■ Silt fences that are damaged and become unsuitable for the intended purpose should be removed from the site of work, disposed of, replaced with new silt fence. ■ Sediments that accumulate in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated. ■ Silt fences should be left in place until the upstream area is permanently stabilized. Until then, the silt fence must be inspected and maintained. ■ Holes, depressions, or other ground disturbance caused by the removal of the silt fences should be backfilled and repaired.
SE-2 – Sediment Basin	Prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.	■ Examine basin banks for seepage and structural soundness. ■ Check inlet for any damage or obstructions. Repair damage and remove obstructions as needed. ■ Check inlet areas for erosion and stabilize if required. ■ Check fencing for damage and repair as needed. ■ Remove standing water from the basin within 72 hours after accumulation. ■ Sediment should be removed when the sediment accumulation reaches one-half of the volume. Sediment removed during maintenance may be incorporated. ■ To minimize vector production, the accumulation of live and dead floating vegetation in basins should be removed during every inspection.

The contractor shall use the following guidelines for maintenance, inspection, and repair of BMPs identified in the SWPPP		
BEST MANAGEMENT PRACTICES (BMPs)	**INSPECTION FREQUENCY (all controls)**	**MAINTENANCE/REPAIR PROGRAM**
SE-3 – Sediment Trap	Prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.	■ Inspect outlet area for erosion and stabilize if required. ■ Inspect trap banks for seepage and structural soundness, repair as needed. ■ Inspect outlet area structure and spillway for any damage or obstructions. Repair damage and remove obstructions as needed. ■ Inspect fencing for damage and repair as needed. ■ Inspect the sediment trap for area of standing water during each visit. Corrective measures should be taken if the BMP does not dewater completely in 72 hours or less to prevent vector production. ■ Sediments that accumulate in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated. ■ Remove vegetation from the sediment trap when first detected to prevent pools of standing water and subsequent vector production. ■ BMPs that require dewatering shall be continuously attended while dewatering takes place.
SE-4 – Check Dams	Prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.	■ Replace missing rock, bags, bales etc. Replace bags or bales that have degraded or become damaged. ■ Sediments that accumulate in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated. If BMP is used as a grade control structure only, then sediment removal is not required as long as the system continues to control the grade.

The contractor shall use the following guidelines for maintenance, inspection, and repair of BMPs identified in the SWPPP		
BEST MANAGEMENT PRACTICES (BMPs)	**INSPECTION FREQUENCY (all controls)**	**MAINTENANCE/REPAIR PROGRAM**
SE-5 – Fiber Rolls	Prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.	■ Replace or repair split, torn, unraveling or slumping fiber rolls. ■ Sediments that accumulate in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated.
SE-7 – Street Sweeping and Vacuuming	Prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season. When actively in use, points of ingress and egress must be inspected daily	■ When tracked or spilled sediment is observed outside the construction limits, it must be removed at least daily. ■ Be careful not to sweep up any unknown substance or any object that may be potentially hazardous.
SE-8 Sand Bag Barriers	Prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.	■ Reshape or replace sand bags as needed. ■ Repair washouts or other damage as needed. ■ Sediments that accumulate in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated. ■ Remove sand bag berms when no longer needed. Remove sediment accumulation and clean-re-grade and stabilize area. Remove sediment should be incorporated in the project or disposed of.
WIND EROSION CONTROL BMPs		
WE-1 – Wind Erosion Control	Prior to the commencement of the activities and while activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season.	■ Check areas protected to ensure coverage. ■ Most dust control measures require frequent, often daily, or multiple times per day attention.
TRACKING CONTROL BMPs		

The contractor shall use the following guidelines for maintenance, inspection, and repair of BMPs identified in the SWPPP		
BEST MANAGEMENT PRACTICES (BMPs)	**INSPECTION FREQUENCY (all controls)**	**MAINTENANCE/REPAIR PROGRAM**
TC-3 – Entrance/Outlet Tire Wash	Prior to the commencement of the activities and while activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season.	■ Remove accumulated sediment from wash rack and / or sediment trap to maintain system performance. ■ Inspect routinely for damage and repair as needed.
NON-STORM WATER MANAGEMENT BMPs		
NS-2 – Dewatering Operations	Prior to the commencement of the activities and while activities associated with the BMP are under way	■ Maintain surrounding features such as safety fencing and vegetation
NS-3 – Paving and Grinding Operations	Prior to the commencement of the activities and while activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season.	■ Keep ample supplies of drip pans or absorbent materials onsite. ■ Inspect and maintain machinery to minimize leaks and drips.
NS-8 - Vehicle and Equipment Cleaning	Prior to the commencement of the activities and while activities associated with the BMP are under way	■ Ensure that employees and subcontractors implement appropriate measures for containment ■ Maintain berm integrity
NS-9 - Vehicle and Equipment Fueling	Equipment should be inspected daily for leaks.	■ Leaks should be repaired immediately or problem vehicles or equipment should be removed from the Site. ■ Keep ample supplies of spill cleanup materials onsite. ■ Immediately cleanup spills and properly dispose of contaminated soil and cleanup materials.
NS-10 - Vehicle and Equipment Maintenance	Prior to the commencement of the activities and while activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season.	■ Keep ample supplies of spill cleanup materials onsite. ■ Maintain waste fluid containers in leak proof condition. ■ Vehicles and equipment should be inspected on each day of use. Leaks should be repaired immediately or the problem vehicles or equipment should be removed from the Site. ■ Inspect equipment for damaged hoses and leaky gaskets routinely. Repair or replace as needed.

The contractor shall use the following guidelines for maintenance, inspection, and repair of BMPs identified in the SWPPP		
BEST MANAGEMENT PRACTICES (BMPs)	**INSPECTION FREQUENCY (all controls)**	**MAINTENANCE/REPAIR PROGRAM**
NS-12 – Concrete Curing	Prior to the commencement of the activities and while activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season.	■ Ensure that employees and subcontractors implement appropriate measures for storage, handling, and use of curing compounds. ■ Inspect cure containers and spraying equipment for leaks.
NS-13 – Concrete Finishing	Prior to the commencement of the activities and while activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season.	■ Sweep or vacuum up debris from sandblasting at the end of the shift. ■ At the end of each work shift, remove and contain liquid and solid waste from containment structures, if any, and from the general work area.
WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL BMPs		
WM-1 – Material Delivery and Storage	Prior to the commencement of the activities and while activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season.	■ Spot check employees and subcontractors throughout the job to ensure appropriate practices are being employed.
WM-3- Stockpile Management	Prior to the commencement of the activities and while activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season.	■ Repair and/or replace perimeter controls and covers as needed to keep them functioning properly.
WM-4- Spill Prevention and Control	Prior to the commencement of the activities and while activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season.	■ Keep ample supplies of spill control and cleanup materials onsite, near storage, unloading and maintenance areas. ■ Update your spill prevention and control plan and stock materials as changes occur in the types of chemicals onsite.
WM-5- Solid Waste Management	Prior to the commencement of the activities and while activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season.	■ Arrange for regular waste collection.

The contractor shall use the following guidelines for maintenance, inspection, and repair of BMPs identified in the SWPPP		
BEST MANAGEMENT PRACTICES (BMPs)	**INSPECTION FREQUENCY (all controls)**	**MAINTENANCE/REPAIR PROGRAM**
WM-6- Hazardous Waste Management	Prior to the commencement of the activities and while activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season.	■ Hazardous waste should be regularly collected. ■ A foreman or construction supervisor should monitor onsite hazardous waste storage and disposal procedures. ■ Waste storage areas should be kept clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. ■ Perimeter controls, containment structures, covers and liners should be repaired or replaced as needed to maintain proper function. ■ Hazardous spills should be cleaned up and reported in conformance with applicable MSDS and the instructions posted at the Site. ■ A copy of the hazardous waste manifest should be provided.
WM-8- Concrete Waste Management	Prior to the commencement of the activities and while activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season.	■ Temporary concrete washout facilities should be maintained to provide adequate holding capacity within a minimum freeboard of 4 in. from above grade facilities and 12 in. for below grade facilities. Maintain temporary concrete washout facilities should include removing and disposing of hardened concrete and returning the facilities to a functional condition. Hardened concrete materials should be removed and disposed of. ■ Washout facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.
WM-9- Sanitary/ Septic Waste Management	Prior to the commencement of the activities and while activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season.	■ Arrange for regular waste collection. ■ If high winds are expected, portable sanitary facilities must be secured with spikes or weighed down to prevent over turning.

ATTACHMENT 7 - STORM WATER QUALITY CONSTRUCTION SITE INSPECTION CHECKLIST

INSPECTION CHECKLIST

GENERAL INFORMATION

Project Name	**Genesis Solar Energy Project**			
Project No				
Contractor				
Inspector's Name				
Inspector's Title				
Signature				
Date of Inspection				
Inspection Type (Check Applicable)	❒ Prior to forecast rain		❒ After a rain event	
	❒ 24-hr intervals during extended rain		❒ Other _____	
Season (Check Applicable)	❒ Rainy		❒ Non-Rainy	
Storm Data	Storm Start Date & Time:		Storm Duration (hrs):	
	Time elapsed since last storm (Circle Applicable Units)	Min. Hr. Days	Approximate Rainfall Amount (inches)	

PROJECT AREA SUMMARY AND DISTURBED SOIL AREA (DSA) SIZE

Total Project Area _____ Acres

Field Estimate of Active DSAs _____ Acres

Field Estimate of Non-Active DSAs _____ Acres

INSPECTION OF BMPs

BMP / REQUIREMENT	Yes	No	N/A	Corrective Action
Preservation of Existing Vegetation				
Is temporary fencing provided to preserve vegetation in areas where no construction activity is planned?				
Location:				
Location:				
Location:				
Location:				
Erosion Control				
Does the applied temporary erosion control provide 100% coverage for the affected areas?				
Are any non-vegetated areas that may require temporary erosion control?				
Is the area where erosion controls are used required free from visible erosion?				
Location:				
Location:				
Location:				
Location:				
Temporary Linear Sediment Barriers (Silt Fence, Fiber Rolls, Sandbag Barriers, etc.)				
Are temporary linear sediment barriers properly installed, functional and maintained?				
Are temporary linear sediment barriers free of accumulated litter?				
Is the built-up sediment less than 1/3 the height of the barrier?				
Are cross barriers installed where necessary and properly spaced?				
Location:				
Location:				
Location:				
Location:				
Location:				
Desilting Basins				
Are basins maintained to provide required retention/detention?				
Are basin controls (inlets, outlets, diversions, weirs, spillways and racks) in working order?				
Location:				
Location:				
Location:				
Stockpiles				
Are all locations of temporary stockpiles, including soil, hazardous waste, and construction materials in approved areas?				

INSPECTION OF BMPs

BMP / REQUIREMENT	Yes	No	N/A	Corrective Action
Are stockpiles protected from run-on, run-off from adjacent areas and from winds?				
Are stockpiles located at least 50 ft from concentrated flows, downstream drainage courses and storm drain inlets?				
Are required covers and/or perimeter controls in place?				
Location:				
Location:				
Location:				
Tracking Control				
Are points of ingress/egress to public/private roads inspected, swept, and vacuumed daily?				
Are all paved areas free of visible sediment tracking or other particulate matter?				
Is rock at Temporary Construction Entrance(s) 12-inches or more in thickness?				
Does sediment need to be removed from the rock, or does the rock need to be replaced?				
For Type 2 Construction Entrance, does sediment need to be removed from ribbed plates?				
Location:				
Location:				
Location:				
Wind Erosion Control				
Is dust control implemented?				
Location:				
Location:				
Location:				
Vehicle & Equipment Fueling, Cleaning, and Maintenance				
Are vehicle and equipment fueling, cleaning and maintenance areas reasonably clean and free of spills, leaks, or any other deleterious material?				
Are vehicle and equipment fueling, cleaning and maintenance activities performed on an impermeable surface in dedicated areas?				
If no, are drip pans used?				
Are dedicated fueling, cleaning, and maintenance areas located at least 15 m away from downstream drainage facilities and watercourses, and protected from run-on and runoff?				
Is wash water contained for infiltration/ evaporation and disposed of outside the highway right of way?				
Is on-site cleaning limited to washing with water (no soap, soaps substitutes, solvents, or steam)?				
On each day of use, are vehicles and equipment inspected for leaks and if necessary, repaired?				
Location:				
Location:				

INSPECTION OF BMPs

BMP / REQUIREMENT	Yes	No	N/A	Corrective Action
Location:				
Waste Management & Materials Pollution Control				
Are material storage areas and washout areas protected from run-on and runoff, and located at least 50 ft from concentrated flows and downstream drainage facilities?				
Are all material handling and storage areas clean; organized; free of spills, leaks, or any other deleterious material; and stocked with appropriate clean-up supplies?				
Are liquid materials, hazardous materials, and hazardous wastes stored in temporary containment facilities?				
Are bagged and boxed materials stored on pallets?				
Are hazardous materials and wastes stored in appropriate, labeled containers?				
Are proper storage, clean-up, and spill-reporting procedures for hazardous materials and wastes posted in open, conspicuous and accessible locations adjacent to storage areas?				
Are temporary containment facilities free of spills and rainwater?				
Are temporary containment facilities and bagged/boxed materials covered?				
Are temporary concrete washout facilities designated and being used?				
Are temporary concrete washout facilities functional for receiving and containing concrete waste and are concrete residues prevented from entering the drainage system?				
Do temporary concrete washout facilities provide sufficient volume and freeboard for planned concrete operations?				
Are the temporary concrete washout facilities' PVC liners free from punctures and holes?				
Are concrete wastes, including residues from cutting and grinding, contained and disposed of off-site or in concrete washout facilities?				
Are spills from mobile equipment fueling and maintenance properly contained and cleaned up?				
Is the site free of litter?				
Are trash receptacles provided in the Contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods?				
Is litter from work areas within the construction limits of the project site collected and placed in watertight dumpsters?				
Are waste management receptacles free of leaks?				
Are the contents of waste management receptacles properly protected from contact with storm water or from being dislodged by winds?				
Are waste management receptacles filled at or beyond capacity?				
Location:				
Location:				
Location:				
Illicit Connection/Illegal Discharge Detection and Reporting				
Is there any evidence of illicit discharges or illegal dumping on the project site?				

INSPECTION OF BMPs

BMP / REQUIREMENT	Yes	No	N/A	Corrective Action
If yes, has the Engineer been notified?				
Location:				
Location:				
Location:				
Discharge Points				
Are discharge points and discharge flows free from noticeable pollutants?				
Are discharge points free of any significant erosion or sediment transport?				
Location:				
Location:				
Location:				
WPCP/SWPPP Update				
Do the WPCP/SWPPP, Project Schedule/Water Pollution Control Schedule and WPCDs adequately reflect the current site conditions and contractor operations?				
Are all BMPs shown on the WPCDs installed in the proper location(s) and according to the details for the plan?				
Location:				
Location:				
Location:				
General				
Are there any other potential water pollution control concerns at the site?				
Location:				
Location:				
Location:				
Storm Water Monitoring				
Were there any BMPs not properly implemented, or breaches, malfunctions, leakages or spills observed, which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water?				
Did storm water contact stored materials or waste and resulted in a discharge from the construction site? (Materials not in watertight containers, etc.)				
If yes, were samples for non-visually detectable pollutants collected pursuant to the sampling and analysis plan during rain events?				

ATTACHMENT 8 - TRAINED CONTRACTOR PERSONNEL LOG

STORM WATER MANAGEMENT TRAINING LOG

Project Name: **Genesis Solar Energy Project**

Project Number/Location: _____

Storm Water Management Topic: (check as appropriate)

- ❑ Erosion Control
- ❑ Sediment Control
- ❑ Wind Erosion Control
- ❑ Tracking Control
- ❑ Non-storm water management
- ❑ Waste Management and Materials Pollution Control
- ❑ Storm Water Sampling

Specific Training Objective: _____

Location: _____ Date: _____

Instructor: _____ Telephone: _____

Course Length (hours): _____

Attendee Roster (attach additional forms if necessary)

Name	Company	Phone

COMMENTS:

_____

_____

_____

ATTACHMENT 9 - SUBCONTRACTOR NOTIFICATION LETTER AND NOTIFICATION LOG

SWPPP NOTIFICATION

Company
Address
City, State, ZIP

Date

Dear Sir/Madam,

Please be advised that the California State Water Resources Control Board has adopted the General Permit (General Permit) for Storm Water Discharges Associated with Construction Activity (CAS000002). The goal of these permits is prevent the discharge of pollutants associated with construction activity from entering the storm drain system, ground and surface waters.

Genesis Solar, LLC has developed a Storm Water Pollution Prevention Plan (SWPPP) in order to implement the requirements of the Permits.

As a subcontractor, you are required to comply with the SWPPP and the Permits for any work that you perform on site. Any person or group who violates any condition of the Permits may be subject to substantial penalties in accordance with state and federal law. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP and the Permits. A copy of the Permits and the SWPPP are available for your review at the construction office. Please contact me if you have further questions.

Sincerely,

Name
Title

SUBCONTRACTOR NOTIFICATION LOG

Project Name: **Genesis Solar Energy Project**

Project Number/Location: _____

SUBCONTRACTOR COMPANY NAME	CONTACT NAME	ADDRESS	PHONE NUMBER	PAGER/ FIELD PHONE	DATE NOTIFICATION LETTER SENT	TYPE OF WORK

ATTACHMENT 10 - NOTICE OF NON COMPLIANCE

To: Date:

Subject: **Notice of Discharge**

Project Name: **Genesis Solar Energy Project**

Project Number: _____

IN ACCORDANCE WITH THE STATEWIDE PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY, THE FOLLOWING INSTANCE OF DISCHARGE IS NOTED:

Date, time, and location of discharge
Insert description and date of event

Nature of the operation that caused the discharge
Insert description of operation

Initial assessment of any impact cause by the discharge
Insert assessment

Existing BMP(s) in place prior to discharge event
List BMPs in place

Date of deployment and type of BMPs deployed after the discharge.
BMPs deployed after the discharge (with dates)

Steps taken or planned to reduce, eliminate and/or prevent recurrence of the discharge
Insert steps taken to prevent recurrence

Implementation and maintenance schedule for any affected BMPs

Insert implementation and maintenance schedule

If further information or a modification to the above schedule is required, notify the contact person below.

Name of Contact Person	Title
Company	Telephone Number
Signature	Date

ATTACHMENT 11 - ANNUAL CERTIFICATION OF COMPLIANCE FORM

ANNUAL CERTIFICATION OF COMPLIANCE FORM

Project Name: **Genesis Solar Energy Project**

Project Number: _____

Company Name: _____

Address: _____

Construction Start Date: _____ **Completion Date:** _____

This project is in compliance with the General Permit and this SWPPP (check yes or no) ___ **YES** ___ **NO**

Description of Work:

description of work

Work Now in Progress:

work in progress

Work Planned for Next 12 Months:

work planned

"I certify under penalty of law that, during the past 12 months, the construction activities are in compliance with the requirements of the General Permit and this SWPPP. This Certification is based upon the site inspections required in Section B, Item 3 of the General Permit. This document was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

_____ _____
Owner (or Authorized Representative) Signature Date

_____ _____
Name and Title Telephone Number

ATTACHMENT 12 - OTHER PLANS AND PERMITS

ATTACHMENT 12 TO CONTAIN THE STATE WATER RESOURCES CONTROL BOARD GENERAL PERMIT DOCUMENT – WILL BE PROVIDED IN FINAL SWPPP

ATTACHMENT 13 - BMPS SELECTED FOR THE PROJECT

ATTACHMENT 13 TO CONTAIN THE CALIFORNIA STORMWATER BEST MANAGEMENT PRACTICE HANDBOOK (CONSTRUCTION) FACT SHEETS FOR THE FOLLOWING BMP'S

EROSION CONTROL (EC): 1, 2, 3, 6, 7, 9 and 11
SEDIMENT CONTROL (SC): 1, 2, 3, 4, 5, 7 and 8
WIND EROSION (WE): 1
TRACKING CONTROL (TR): 1, 2 and 3
NON STORMWATER DISCHARGES (NS): 1, 2, 3, 6, 8, 9, 10, 12 and 13
WASTE MANAGEMENT (WM); 1, 2, 3, 4, 5, 6, 8, 9 and 10

ATTACHMENT 14 - SAMPLING ACTIVITY LOG

SAMPLING ACTIVITY LOG

RAIN EVENT GENERAL INFORMATION

Project Name	**Genesis Solar Energy Project**			
Project Number				
Contractor				
Sampler's Name				
Signature				
Date of Sampling				
Season (Check Applicable)	❒ Rainy		❒ Non-Rainy	
Storm Data	Storm Start Date & Time:		Storm Duration (hrs):	
	Time elapsed since last storm (Circle Applicable Units)	Min. Hr. Days	Approximate Rainfall Amount (inches)	

For rainfall information: http://cdec.water.ca.gov/weather.html or http://www.wrh.noaa.gov/wrhq/nwspage.html

SAMPLE LOG

Sample Identification	Sample Location	Sample Collection Date and Time

Specific sample locations descriptions may include: 100 ft upstream from discharge at eastern boundary, runoff from northern waste storage area, downgradient of inlet located near the intersection of A Street and B avenue, etc.

FIELD ANALYSIS

❑Yes ❑ No

Sample Identification	Test	Result

ATTACHMENT 15 - DISCHARGE REPORTING LOG

DISCHARGE REPORTING LOG

Project Name: **Genesis Solar Energy Project**

Project Number:

Date	Material(s) Discharged	Estimated Quantity	Observed By

ATTACHMENT 16 – CHANGE OF OWNERSHIP FORM

NEW OWNER INFORMATION AND CHANGE OF INFORMATION (COI) FORM FOR THE GENERAL CONSTRUCTION PERMIT NO. CAS000002

Owners Name: _____ Date: _____

WDID No.: _____ Date of Last NOI Change: _____

Prepared By: _____ Signature of Preparer: _____

	Area Transferred (acres)[1] column 1	Area Remaining (acres)[2] column 2	Lot/Tract Numbers Transferred	Contact Person and Company Name of NewOwner(s)	Address(es) of the New Owner(s)	Phone # of New Owner	Is Const/Post Construction Complete? Yes/No	Date of Ownership Transfer
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

[1]Use approximate area (in acres) if no exact figure is available.

[2]Calculate running total in this column as follows:

Enter in column 2, line 1, the area from NOI minus the area in column 1.

Enter in column 2, line 2, the area in column 2, line 1, minus the area in line 2, column 1.

Enter in column 2, line 3, the area in column 2, line 2, minus the area in line 3, column 1, and so forth.

ATTACHMENT 17 – NOTICE OF TERMINATION FORM

State Water Resources Control Board

Division of Water Quality

1001 I Street • Sacramento, California 95814 • (916) 341-5537
Mailing Address: P.O. Box 1977 • Sacramento, California • 95812-1977
FAX (916) 341-5543 • Internet Address: http://www.waterboards.ca.gov/stormwtr/index.html

Linda S. Adams
Secretary for Environmental Protection

Arnold Schwarzenegger
Governor

To: Storm Water Permit Holder

RE: NOTICE OF TERMINATION OF COVERAGE UNDER THE GENERAL **CONSTRUCTION** STORM WATER PERMIT (GENERAL PERMIT)

In order for us to terminate your coverage under the General Permit, please complete and submit the enclosed Notice of Termination (NOT) your local Regional Water Quality Control Board (RWQCB). Refer to the last page of the NOT packet for RWQCB locations.

Submittal of a NOT does not guarantee termination and outstanding invoices are still valid. If your NOT is denied, you will be required to continue complying with the requirements of the General Permit and all outstanding invoice(s) are due. You will be notified of your NOT status by the RWQCB or State Water Resources Control Board. Approval of your Notice of Termination does not relieve you from paying any applicable outstanding invoices.

Should you have any questions regarding this matter, please contact your local RWQCB at the number listed on the back page of the NOT package, or the Storm Water Unit at (916) 341-5537.

Sincerely,

Storm Water Unit
Division of Water Quality

Enclosure

SEND TO YOUR LOCAL RWQCB FOR APPROVAL

State of California
State Water Resources Control Board

NOTICE OF TERMINATION

OF COVERAGE UNDER THE NPDES GENERAL PERMIT NO. CAS000002
FOR DISCHARGES OF STORM WATER
ASSOCIATED WITH CONSTRUCTION ACTIVITY

Submission of this Notice of Termination constitutes notice that the owner (and his/her agent) of the site identified on this form is no longer authorized to discharge storm water associated with construction activity by NPDES General Permit No. CAS000002.

I. WDID NO.

II. OWNER

COMPANY NAME _____ CONTACT PERSON

STREET ADDRESS _____ TITLE

CITY _____ STATE _____ ZIP _____ PHONE

III. CONSTRUCTION SITE INFORMATION

A. DEVELOPER NAME _____ CONTACT PERSON

STREET ADDRESS _____ TITLE

CITY _____ CA _____ ZIP _____ PHONE

B. SITE ADDRESS _____ COUNTY _____

CITY _____ CA _____ ZIP _____ PHONE

IV. BASIS OF TERMINATION

_____ 1. The construction project is complete and the following conditions have been met.

- All elements of the Storm Water Pollution Prevention Plan have been completed.
- Construction materials and waste have been disposed of properly.
- The site is in compliance with all local storm water management requirements.
- A post-construction storm water operation and management plan is in place.

Date of project completion _____/_____/_____

_____ 2. Construction activities have been suspended, either temporarily _____ or indefinitely _____ and the following conditions have been met.

- All elements of the Storm Water Pollution Prevention Plan have been completed.
- Construction materials and waste have been disposed of properly.
- All denuded areas and other areas of potential erosion are stabilized.
- An operation and maintenance plan for erosion and sediment control is in place.
- The site is in compliance with all local storm water management requirements.

SEND TO YOUR LOCAL RWQCB FOR APPROVAL

Date of suspension _____/_____/_____ Expected start up date _____/_____/_____

_____ 3. Site can not discharge storm water to waters of the United States (check one).

_____ All storm water is retained on site.

_____ All storm water is discharged to evaporation or percolation ponds offsite.

_____ 4. Discharge of storm water from the site is now subject to another NPDES general permit or an individual NPDES permit.

NPDES Permit No._____ Date coverage began _____/_____/_____

_____ 5. There is a new owner of the identified site. Date of owner transfer _____/_____/_____

Was the new owner notified of the General Permit requirements? YES ____ NO ____

NEW OWNER INFORMATION

COMPANY NAME _____ CONTACT PERSON

STREET ADDRESS _____ TITLE

CITY _____ STATE _____ ZIP _____ PHONE

V. EXPLANATION OF BASIS OF TERMINATION (Attach site photographs - see instructions).

VI. CERTIFICATION:

I certify under penalty of law that all storm water discharges associated with construction activity from the identified site that are authorized by NPDES General Permit No. CAS000002 have been eliminated or that I am no longer the owner of the site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge storm water associated with construction activity under the general permit, and that discharging pollutants in storm water associated with construction activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this Notice of Termination does not release an owner from liability for any violations of the general permit or the Clean Water Act.

PRINTED NAME _____ TITLE

SIGNATURE: _____ DATE _____/_____/_____

REGIONAL WATER BOARD USE ONLY

This Notice of Termination has been reviewed, and I recommend termination of coverage under the subject NPDES general permit.

Printed Name _____ Region No. _____

Signature _____ Date _____/_____/_____

NOT effective date:

Date: ____/____/____

State of California
State Water Resources Control Board

INSTRUCTIONS FOR COMPLETING NOTICE OF TERMINATION FOR CONSTRUCTION ACTIVITY

Who May File

Dischargers who are presently covered under NPDES General Permit No. CAS000002 for discharge of storm water associated with construction activity may submit a Notice of Termination when they meet one of the following criteria.

1. The construction project has been completed and the following conditions have been met: all elements of the Stormwater Pollution Prevention Plan have been completed; construction materials and equipment maintenance waste have been disposed of properly; the site is in compliance with all local storm water management requirements including erosion/sediment control requirements and the appropriate use permits have been obtained; and a post-construction storm water operation and management plan is in place.

2. Construction activities have been suspended, either temporarily or indefinitely and the following conditions have been: all elements of the Stormwater Pollution Prevention Plan have been completed; construction materials and equipment maintenance waste have been disposed of properly; all denuded areas and other areas of potential erosion are stabilized; an operation and maintenance plan for erosion and sediment control is in place; and the site is in compliance with all local storm water management requirements including erosion/sediment control requirements.
   The date construction activities were suspended, and the expected date construction activities will start up again should be provided.

3. Construction site can not discharge storm water to waters of the United States. Please indicate if all storm water is retained on site or if storm water is collected offsite.

4. Discharge of construction storm water from the site is now subject to another NPDES general permit or an individual NPDES permit. The general permit or individual permit NPDES number and date coverage began should be provided.

5. There is a new owner of the identified site. If ownership or operation of the facility has been transferred then the previous owner must submit a Notice of Termination and the new owner must submit a Notice of Intent for coverage under the general permit. The date of transfer and information on the new owner should be provided. Note that the previous owner may be liable for discharge from the site until the new owner files a Notice of Intent for coverage under the general permit.

Where to File

Submit the Notice of Termination to the Executive Officer of the Regional Water Quality Control Board responsible for the area in which the facility is located. See attached. Submittal of a NOT does not guarantee termination and outstanding invoices are still valid. If the Executive Officer, or his designated staff, agrees with the basis of termination, the Notice of Termination will be transmitted to the State Water Board for processing at which time it will be determined if any outstanding invoices are still valid. Approval of your Notice of Termination does not relieve you from paying any applicable outstanding invoices. If the Executive Officer, or his designated staff, does not agree with the basis of termination, the Notice of Termination will be returned. The Regional Water Board may also inspect your site prior to accepting the basis of termination.

LINE-BY-LINE INSTRUCTIONS

All necessary information must be provided on the form. Type or print in the appropriate areas only. Submit additional information, if necessary, on a separate sheet of paper.

SECTION I--WDID NO.

The WDID No. is a number assigned to each discharger covered under the General Permit. If you do not know your WDID No., please call the State Water Board or Regional Water Board and request it prior to submittal of the Notice of Termination.

SECTION II--OWNER

Enter the owner of the construction site's official or legal name (This should correspond with the name on the Notice of Intent submitted for the site), address of the owner, contact person, and contact person's title and telephone number.

SECTION III--CONSTRUCTION SITE INFORMATION

In Part A, enter the name of the developer (or general contractor), address, contact person, and contact person's title and telephone number. The contact person should be the construction site manager completely familiar with the construction site and charged with compliance and oversight of the general permit. This information should correspond with information on the Notice of Intent submitted for the site.

In Part B, enter the address, county, and telephone number (if any) of the construction site. Construction sites that do not have a street address must attach a legal description of the site.

SECTION IV--BASIS OF TERMINATION

Check the category which best defines the basis of your termination request. See the discussion of the criteria in the Who May File section of these instructions. Provide dates and other information requested. Use the space under Explanation of Basis of Termination heading.

SECTION V--EXPLANATION OF BASIS OF TERMINATION

Please explain the basis or reasons why you believe your construction site is not required to comply with the General Permit. To support your explanation, provide a site map and photograph of your site.

SECTION VI--CERTIFICATION

This section must be completed by the owner of the site.

The Notice of Termination must be signed by:

For a Corporation: a responsible corporate officer

For a Partnership or Sole Proprietorship: a general partner or the proprietor, respectively.

For a Municipality, State, or other Non-Federal Public Agency: either a principal executive officer or ranking elected official.

For a Federal Agency: either the chief or senior executive officer of the agency.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARDS

NORTH COAST REGION (1)
5550 Skylane Blvd, Ste. A
Santa Rose, CA 95403
(707) 576-2220 FAX: (707)523-0135
http://www.waterboards.ca.gov/rwqcb1

SAN FRANCISCO BAY REGION (2)
1515 Clay Street, Ste. 1400
Oakland, CA 94612
(510) 622-2300 FAX: (510) 622-2640
http://www.waterboards.ca.gov/rwqcb2

CENTRAL COAST REGION (3)
895 Aerovista Place, Ste 101
San Luis Obispo, CA 93401
(805) 549-3147 FAX: (805) 543-0397
http://www.waterboards.ca.gov/rwqcb3

LOS ANGELES REGION (4)
320 W. 4th Street, Ste. 200
Los Angeles, CA 90013
(213) 576-6600 FAX: (213) 576-6640
http://www.waterboards.ca.gov/rwqcb4

CENTRAL VALLEY REGION (5S)
11020 Sun Center Dr., #200
Rancho Cordova, CA 95670-6114
(916) 464-3291 FAX: (916) 464-4645
http:www.waterboards.ca.gov/rwqcb5

FRESNO BRANCH OFFICE (5F)
1685 E St.
Fresno, CA 93706
(559) 445-5116 FAX: (559) 445-5910
http://www.waterboards.ca.gov/rwqcb5

REDDING BRANCH OFFICE (5R)
415 Knollcrest Drive, Ste. 100
Redding, CA 96002
(530) 224-4845 FAX: (530) 224-4857
http://www.waterboards.ca.gov/rwqcb5

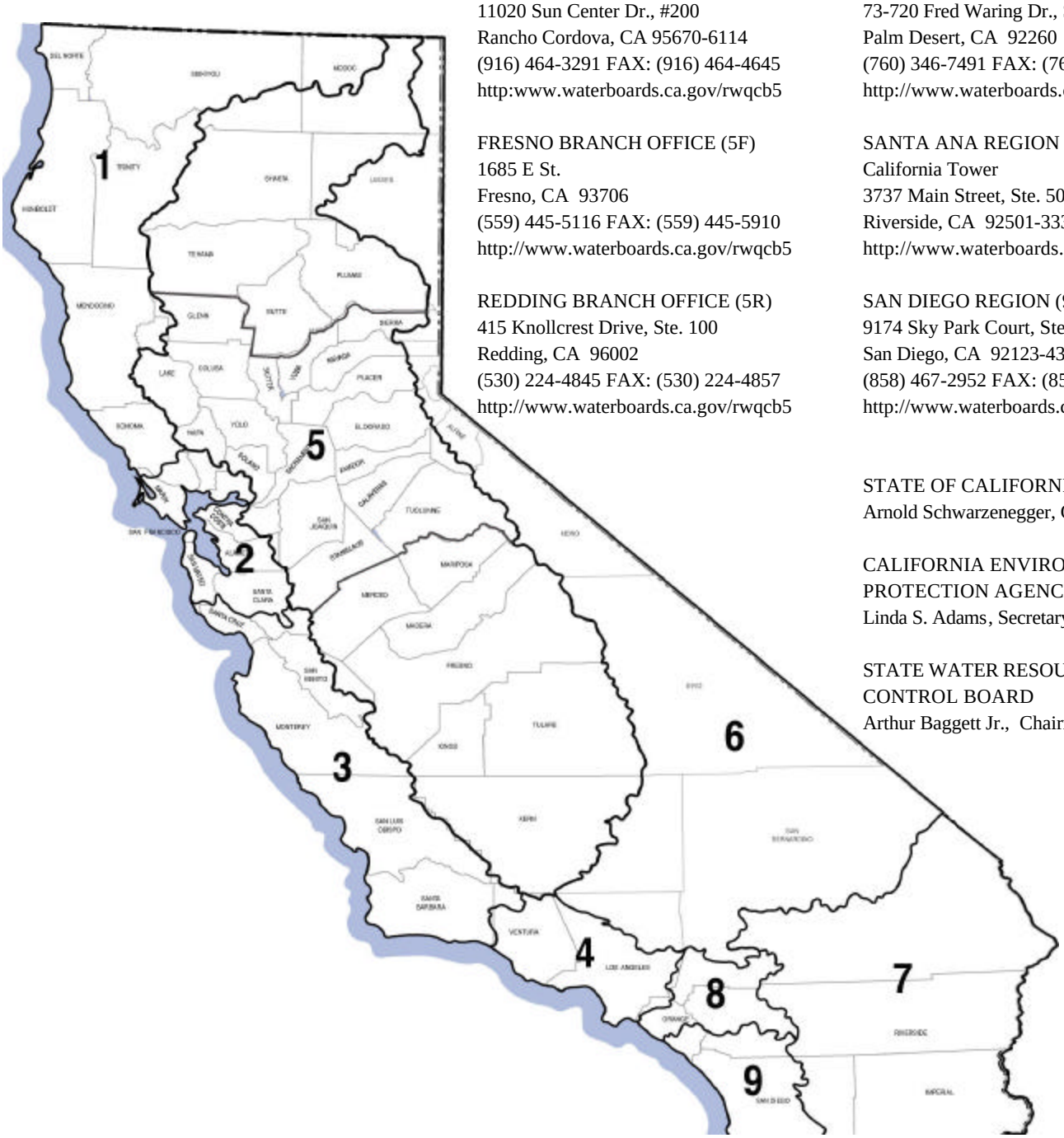
LAHONTAN REGION (6 SLT)
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150
(530) 542-5400 FAX: (530) 544-2271
http://www.waterboards.ca.gov/rwqcb6

VICTORVILLE OFFICE (6V)
14440 Civic Drive, Ste. 200
Victorville, CA 92392-2383
(760) 241-6583 FAX: (760) 241-7308
http://www.waterboards.ca.gov/rwqcb6

COLORADO RIVER BASIN REGION (7)
73-720 Fred Waring Dr., Ste. 100
Palm Desert, CA 92260
(760) 346-7491 FAX: (760) 341-6820
http://www.waterboards.ca.gov/rwqcb7

SANTA ANA REGION (8)
California Tower
3737 Main Street, Ste. 500
Riverside, CA 92501-3339
http://www.waterboards.ca.gov/rwqcb8

SAN DIEGO REGION (9)
9174 Sky Park Court, Ste. 100
San Diego, CA 92123-4340
(858) 467-2952 FAX: (858) 571-6972
http://www.waterboards.ca.gov/rwqcb9



STATE OF CALIFORNIA
Arnold Schwarzenegger, Governor

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
Linda S. Adams, Secretary

STATE WATER RESOURCES CONTROL BOARD
Arthur Baggett Jr., Chairman

ATTACHMENT 5

SUPPLEMENTAL RESPONSE TO ITEM 12B

Attachment 5. Supplemental Response to Item 12B.

Avoidance and Minimization Measures

Vegetation will be uniformly and permanently removed from the solar field footprint, main access road, staging areas, gas pipeline, and transmission pole foundations. The loss of individuals that cannot be avoided will be mitigated through off-site compensation measures. However, there will be areas outside of the Project footprint, but still within the areas of possible construction disturbance, where avoidance and minimization of impacts to special-status plant species may be practicable using the following measures, which will be augmented, as necessary, in the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP):

- The construction contractor(s)/crew(s) will be informed about the biological constraints of the project. All construction personnel who work on the Project will attend a worker education program, developed and presented by a project biologist prior to the commencement of construction activity. This Worker Environmental Awareness Program (WEAP) will be included in the BRMIMP.
- Special-status plant populations and any Environmentally Sensitive Areas (ESAs) will be flagged to indicate avoidance. Exclusion fencing may be necessary. This fencing should be bright enough to be highly visible to construction equipment operators so that the population can be avoided. Construction crews and contractors will be responsible for working around all flagged special-status species and ESAs to the extent feasible.
- Spoils will be stockpiled in designated, disturbed areas lacking native vegetation and lacking populations of exotic species.
- All surface disturbing activities, including blading, will be limited to that area essential for Project construction. Equipment laydown sites and staging areas will be sited in areas that are otherwise disturbed. The anticipated impact zones will be delineated with stakes and flagging prior to construction to minimize impacts to natural resources. Construction-related activities outside of the impact zones will be avoided.
- Existing roads will be utilized wherever possible to avoid unnecessary impacts. New and existing roads that are planned for either construction or widening will not extend beyond the planned impact area. All vehicles passing or turning around will do so within the planned impact area or in previously disturbed areas. Where new access is required outside of existing roads or the construction zone, the route will be clearly marked (*i.e.*, flagged and/or staked) prior to the onset of construction.
- Construction vehicle speed limits will be designated for routes used in conjunction with the Project. The speed limit will not exceed 20 mph, but may be lowered in biologically sensitive areas.
- Construction activity will be monitored by a qualified biologist to ensure compliance with avoidance and minimization measures. The monitor will have the authority to halt construction activities if necessary to ensure that impacts to significant biological resources are avoided.

- A detailed Weed Management Plan will be developed by the Applicant and will include measures to control the spread of noxious weeds during construction, operation, and decommissioning. Herbicides, if used, will be used according to the label instructions. No applications should be made when wind speed exceeds 10 miles per hour. Herbicide application should not be made within 100 feet of special-status plants when wind speeds are greater than 5 miles per hour. To minimize herbicide application drift, the contractor shall use low nozzle pressure, applying a coarse spray.
- To control fugitive dust, areas of construction activities will be watered periodically, as necessary by a designated water truck. Water should not be applied in quantities where pooling occurs and persists.
- Service trucks will be provided with fire extinguishers and spill containment equipment, such as adsorbents. Refueling and maintenance of vehicles and equipment will occur only in designated areas that are either bermed or covered with concrete or asphalt to control potential spills. In the event a spill contaminates soil, the soil will be containerized and disposed of as a hazardous waste.
- During construction, impacts to washes will be avoided or minimized. Natural hydrology on the linear facilities will be maintained through the construction period.

ATTACHMENT 6

SUPPLEMENTAL RESPONSE TO ITEM 12C

Attachment 6. Supplemental Response to Item 12C.

Compensation Measures

a. Off-Site Compensation Through Restoration

Off-site habitat acquisition for all Project compensation requirements will include habitat for special-status plant species that are known to occur at the site, if these plants cannot be avoided. Restoration of areas temporarily disturbed during construction will be addressed in the Genesis Revegetation Plan, currently in preparation. This plan will use the following approach:

In order to accommodate the specific features of the desert that make revegetation difficult – namely lack of predictable rainfall, lack of an "A" soil horizon, and the difficulty of re-establishing a soil community of micro-organisms - components of the Revegetation Plan include the following:

- Quantitative identification of the baseline herbaceous perennial and woody perennial species community. These surveys will provide quantitative information on perennial species that will be affected, including density, size and relative health. The quantitative transects used in these surveys will also provide comparative information against which to compare the success of the future revegetation efforts.
- Soil salvage and replacement on areas to be revegetated.
- Final site preparation and grading to ensure maintenance of site hydrology and include features that will enhance germination and growth of native species.
- Vertical mulching and other techniques to promote a hospitable environment for germination and growth.
- Seeding and/or planting of seedlings of locally occurring colonizing species.
- Development of a soil micro-community by inoculation of mycorrhizal fungi and planting species that develop a mycorrhizal net.
- Weed control.
- Initial irrigation, if necessary.
- A realistic schedule of regrowth of native species, and remedial measures, if needed.

Species to be used for revegetation will include perennial species that occur in the existing mature native communities on the Project, colonizing species, and species that encourage soil building (e.g., mycorrhizal nets, faunal communities). Annual species in the adjacent native community will naturally revegetate the area due to the typical mechanisms of seed transport (e.g., wind, water, rodents, and attachment to fur and/or feathers). As such, they will not be included in the seed mix.

b. Off-Site Compensation Through Acquisition/Protection

To compensate for any permanent impacts to special-status plant species affected by the Project, the Applicant will provide compensation funds to a designated organization (To Be Determined), mostly likely in the form of an escrow account. These funds will be

used for purchase, enhancement, administration, maintenance, long-term management, and implementation of management plan objectives for special-status plant habitat. These compensation funds and habitat will most likely coincide with compensation required for desert tortoise, Mojave fringe-toed lizard habitat (sand dunes) and/or streambed alteration. The compensation ratio and acreage that will require habitat compensation have not yet been determined. Approval to purchase mitigation lands will be contingent on said lands being suitable to support the above listed species.

c. Off-Site Compensation Through Transplanting or Propagating and Planting

The Genesis Revegetation Plan, currently in preparation, will include plant salvage and transplantation of species and seedlings that can be reliably transplanted. Species will include special-status species or species protected by the CDNPA. Propagation is not proposed.