PLAN OF DEVELOPMENT

Chuparosa Solar Project
AZA 38533

Prepared for

U.S. Department of the Interior

Bureau of Land Management

Safford Field Office

Submitted by

Chuparosa Solar LLC

(a wholly owned subsidiary of Primergy Solar LLC)

PRIMERGY

quinbrook infrastructure PARTNERS

Prepared by

ENERGY PROJECT SOLUTIONS

Updated June 2022

CONTENTS

Figures

Tables

ACRONYMS AND ABBREVIATIONS

1991 Safford RMP	1991 Safford District Resource Management Plan
AC	alternating current
AF	acre-feet
AFB	Air Force Base
APLIC	Avian Power Line Interaction Committee
Applicant	Chuparosa Solar, LLC
BESS	Battery Energy Storage System
BLM	Bureau of Land Management
BMPs	Best Management Practices
CdTe	cadmium telluride
DC	Direct current
DOI	Department of the Interior
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FTE	full-time-equivalent
gen-tie	generation tie
GW	gigawatts
HASP	Health and Safety Program
AZ- 77	Highway 77
ITC	Investment Tax Credit
kVA	kilovolt-ampere
kV	kilovolt
LGIA	Large Generator Interconnection Agreement
MW	Megawatt
NEMA	National Electric Manufacturers Association
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
PCS	Power Conversion Station
PEIS	Programmatic EIS
Project	Chuparosa Solar Project
PPAs	Power Purchase Agreements
PUP	Pesticide Use Proposal
PV	photovoltaic
PVCS	Photovoltaic Combining Switchgear
ROD	Record of Decision
ROW	right-of-way
RPS	Renewable Portfolio Standard
SDSs	Safety Data Sheets
SEZ	Solar Energy Zone
SOPs	Standard Operating Procedures
SRP	Salt River Project
SWPPP	Stormwater Pollution Prevention Plan
SCADA	supervisory control and data acquisition
SEGS	Solar Electric Generating System
Solar PEIS	Solar Energy Development in Six Southwestern States
UL	Underwriters Laboratory

UPS	uninterruptible power supply
USFWS	U.S. Fish and Wildlife Service
VMT	Vehicle Miles Traveled
VRM	Visual Resources Management
WEAP	Worker Education and Awareness Plan

SECTION 1
Project Description

1.1 Introduction

1.1.1 Type of Facility, Planned Uses, Generation Output

Chuparosa Solar LLC (Applicant), a wholly owned subsidiary of Primergy Solar LLC, proposes to construct, own, operate, and decommission the Chuparosa Solar Project (Project), consisting of up to a nominal[1] 300 megawatt (MW) alternating current (AC) solar photovoltaic (PV) power generating facility and 300 MW Battery Energy Storage System (BESS), approximate 3.54- mile 500 kV Generation Tie (gen-tie) Line to the Sugarloaf Substation and Ancillary facilities for the solar project (access roads, on site substation, operation & maintenance facility, etc.) on Department of the Interior (DOI), Bureau of Land Management (BLM)-administered land located in Navajo County, Arizona. The Project would be constructed using photovoltaic solar modules positioned as one-in-portrait configuration (long edge of panel perpendicular to the row) mounted on single-axis, horizontal tracker structures combined with an integrated BESS.

The Project would be located on approximately 3,618.50 acres of Variance land entirely within the approximately 6,725.20 acres of the BLM right-of-way (ROW) application (SF299) with serial number AZA 38533. The ROW application contains a larger area than required for the solar field to allow for adjustments in the facility layout to minimize environmental impacts, based on the National Environmental Policy Act (NEPA) analysis. Additionally, the project site is entirely within a Visual Resources Management (VRM) Class compatible with solar (VRM Class IV).

The power produced by the Project would be conveyed to the Salt River Project (SRP) transmission system. The Applicant has an active application with SRP for a Large Generator Interconnection Agreement (LGIA) to interconnect at the Sugarloaf Substation. The BLM grant for construction and operation of the Project would be partially assigned to SRP for construction and operation of related interconnection facilities and network upgrades.

Average annual energy production from a 300 MWAC Project would be approximately 930 GWh, which equates to the annual daytime electricity needs of approximately 57,000 US households(USEIA 2020) for the first year of operation. Solar electric power is produced during daylight hours when electricity demand is highest, and both availability and reliability would be further improved with coupled battery energy storage technology. The Project would generate greenhouse gas-free electricity that would annually offset approximately 659,075 metric tons of

[1] Nominal power refers to the nameplate or peak capacity of photovoltaic system.

carbon dioxide and other emissions that would result from producing an equivalent amount of electricity from fossil fuel-fired electric generators (USEPA 2020) .

1.1.2 Applicant's Schedule for the Project

The BLM would be the lead federal agency for approving the Project and would issue a ROW grant (SF-299) authorizing the use of BLM-administered lands for Project construction, operation, and decommissioning. The Project site is located entirely on "variance land" for solar power plant development, as defined in the Record of Decision (ROD) prepared for the Final Programmatic Environmental Impact Statement (EIS) for Solar Energy Development in Six Southwestern States (Solar PEIS). Federal agencies authorizing such projects are required to comply with the NEPA and other applicable laws. The completion of the NEPA process and issuance of a ROD is targeted for December 2023. Further detail on the Project schedule is provided in Table 1-1.

Prior to any activity on the Project site, required resource management plans would be developed and approved, and regulatory and permit conditions would be integrated into the final construction compliance documents. Project construction would begin once all applicable approvals, permits and the BLM Notice to Proceed (NTP) have been obtained. Construction is expected to occur over an approximately 15-18 month period and would include the major phases of site preparation, solar facility construction, including PV array assembly, electrical collection, and transmission system construction, and testing and commissioning. Construction is anticipated to commence in late spring 2023. The Project would be in operation for at least 35 years with the possibility of a subsequent repowering for additional years of operation.

TABLE 1-1 APPLICANT'S PROJECT SCHEDULE

Activity	Date
NEPA Process Initiated (NOI Issued)	October 2022
Pre-Construction Limited Notice to Proceed (LNTP Issued)	Q1-2023
BLM Permitting/NEPA Process Complete (ROD Issued)	December 2023
Construction Limited Notice to Proceed (LNTP Issued)	January 2024
Construction Commencement (NTP Issued)	September 2024
Testing and Commissioning	June 2025
Commercial Operation	December 2025

1.2 Proponent's Purpose and Need for the Project

1.2.1 Need for Renewable Energy

The United States has a greater solar energy resource potential than any other industrialized nation. The multiple benefits associated with developing this resource have been recognized repeatedly by both federal and state policymakers. Development of solar resources reduces reliance on foreign sources of fuel, promotes national security, diversifies energy portfolios, and contributes to the reduction of greenhouse gas emissions. The demand for power continues to grow in the Western United States. As older technology fossil-fuel plants reach the end of their useful lives, there is a need to replace them with clean, reliable resources. Recognizing this need, many Western states, including Arizona, have enacted legislation to encourage or mandate the development of renewable generation.

Arizona's Renewable Portfolio Standard (RPS) required that 15 percent of all electricity generated in Arizona be derived from renewable sources by 2025 (Arizona Corporate Commission n.d.). State government agencies were directed to take all appropriate actions to implement this target in all regulatory proceedings, including siting, permitting, and procurement for renewable energy power plants and transmission lines. The RPS in Arizona and other states has created a competitive market for contracts to sell renewable energy, with success determined on the basis of "least cost, best fit" criteria.

Existing RPS laws have resulted in requirements for utilities to increase their use of renewable energy. In order to achieve these goals, it is necessary to build new renewable energy facilities, including substantial solar energy facilities such as the proposed Project. The Applicant believes that the Project would generate electricity that is cost-competitive with electricity from other types of renewable projects.

The federal government has enacted legislation strongly encouraging the development of renewable energy. As part of an overall strategy to develop a diverse portfolio of domestic energy supplies for our future, the National Energy Policy of 2001 and the Energy Policy Act of 2005 (Public Law 109-58, August 8, 2005) encourage the development of renewable energy resources, which includes solar energy. Section 211 of the Energy Policy Act of 2005 encourages the approval of at least 10,000 MW of non-hydropower renewable energy production on public lands; this goal was met in 2012. In early 2009, the Secretary of the Interior issued Orders 3283 and 3285, making the production, development, and delivery of renewable energy top priorities for the Department of the Interior. Congress is also considering legislation that would implement greenhouse gas emissions requirements and/or national renewable portfolio standards.

Part of the government's efforts to promote renewable energy depend on the ultimate development of increasingly economical facilities that drive down the price of renewable energy, and ultimately enable it to compete in the marketplace with fossil fuel facilities.

1.2.2 Project Purpose and Need

The fundamental purpose of the Project is to construct a clean, renewable source of solar electricity that helps meet the region's growing demand for power and helps fulfill national and state renewable energy and greenhouse gas emission reduction goals. Solar energy provides a sustainable, renewable source of power that helps reduce fossil fuel dependence and greenhouse gas emissions. Considering the entire process, from raw material sourcing through end-of-life-cycle collection and recycling, 300 MWAC of additional generating capacity would produce a small fraction (~4%) of the greenhouse gas emissions of a similar capacity fossil fuel plant.

Specific Project objectives are:

- Establish a solar PV power-generating facility that is of sufficient size and configuration to produce approximately 300 MWAC of electricity in order to provide Arizona and neighboring states a significant new source of renewable energy.
- Produce and transmit electricity at a competitive cost.
- Initiate construction of the Project during calendar year 2024 in order to qualify for the federal solar Investment Tax Credit (ITC).
- Locate the facility in the rural part of Navajo County in proximity to an available connection to the existing electrical distribution infrastructure.
- Minimize environmental effects by:
  - Avoiding Exclusion Areas identified in the Solar PEIS ROD;
  - Using existing electrical distribution facilities, rights-of-way, roads and other existing infrastructure where practicable;
  - Minimizing water use during operation; and
  - Reducing greenhouse gas emissions.
- Using solar technology that is available, proven, efficient, and easily maintained, recyclable, and environmentally sound.

1.2.3 Power Market and Project Benefits

The Project would interconnect to the Salt River Project (SRP) existing Sugarloaf Substation. The interconnection would allow SRP and other utilities to purchase renewable energy generated by the Project under one or more Power Purchase Agreements (PPAs) to deliver energy from a (nominal) 300 MWAC generating facility.

The Project is well suited to arid environments because of the technology's low water consumption. This is a key consideration in Arizona and the Western United States, as the population grows, and water supplies become more constrained. PV solar technology, which converts sunlight directly into electrical energy, entails no thermal process, and therefore does not require process or cooling water to produce electricity. Water consumption during operations would consist of dust control and domestic use for on-site personnel and is between 95 and 99 percent less than concentrated solar projects that employ conventional steam turbines to generate electricity.

The Project would also create employment for Arizona residents. The Project is anticipated to create an average of 300 to 400 construction jobs at any given time and create up to 6 long-term full-time-equivalent (FTE) operational jobs. These jobs would in turn support many other jobs in the Arizona economy.

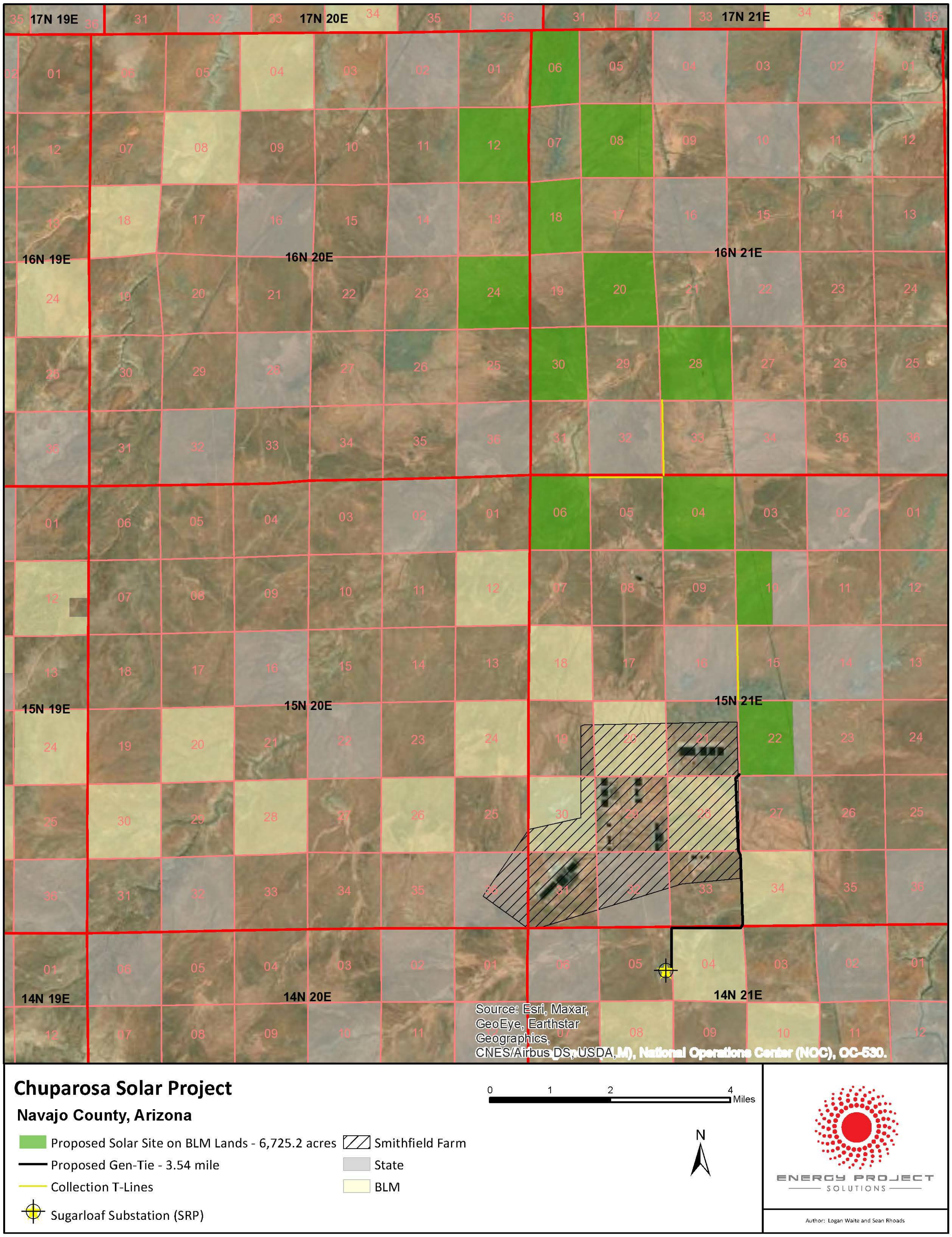
1.3 General Facility Description, Design, and Operation

1.3.1 Project Location, Land Ownership, and Jurisdiction

The Project site is located approximately 16 miles north of Snowflake, Arizona and approximately 3 miles north of SRP Sugarloaf Substation, and continues north along Highway 77 (AZ-77) towards Holbrook.

All lands for the proposed solar facilities are entirely on Variance land administered by the BLM as identified in the Solar PEIS Record of Decision (2012). Potential lands for development of a solar project to the south and west of the proposed site are occupied by existing ROW grants, while other variance land to the south and east are not in close proximity to existing transmission facilities and have additional resource constraints.

FIGURE 1-1 PROJECT LOCATION



1.3.2 Total Acreage and General Dimensions of All Facilities and Components

Table 1-2 lists Project facilities and the associated permanent and temporary disturbance acreages. Total temporary disturbance of the site would be approximately 13.7 acres while permanent disturbance acreage is yet to be determined within the approximately 6,725.20 acre right of way area. Project components are shown on Table 1-2. At this very early stage, these estimates are based on limited engineering design details[1].

TABLE 1-2 SUMMARY OF PERMANENT AND TEMPORARY DISTURBANCE

Disturbance Type	Acres of Disturbance[1]	Notes
Permanent Disturbance – Vegetation Removed		
Operation and Maintenance Facilities	2.3	Includes the administrative buildings, storage, parking, and a water tank.
Substation	5	A fenced, graveled area where the power generated by the solar facility is transformed to a higher voltage. The area contains equipment including circuit breakers and transformers.
Access Roads for Solar Field	TBD	Covered with gravel base or compacted soil.
Solar Facility Utility Corridors[2]	88.5	Utility corridors would typically be located adjacent to access roads and would vary in width depending upon the number of underground circuits.
Water Storage Tanks or Ponds[3]	TBD	Temporary water storage tanks or ponds.
Equipment Areas	1.4	Equipment areas include PCSs (transformers and inverters) within the solar facility footprint.
BESS Area	30	Battery energy storage system area
Gen-tie Lines and Access Roads to Gen-tie Lines	8.7	Each pole would have up to a 30-foot vegetation clearance area. Spur roads would be graded and covered with gravel base or compacted soil.
Total	**TBD**	
Permanent Disturbance – Vegetation Maintained		
Solar Arrays (Drive and Crush)	TBD	Drive and crush areas in the solar arrays. After construction, this vegetation will grow back and then be maintained to a height of approximately 18-24 inches.
Temporary Disturbance		
Laydown Area for Gen-Tie Line	3.2	The laydown area would be located near AZ-77
Gen-Tie Line Conductor Stringing and Pulling	10.5	8 stringing and pulling sites; two 100-foot by 120-foot sites at each site

TABLE 1-2 SUMMARY OF PERMANENT AND TEMPORARY DISTURBANCE

Disturbance Type	Acres of Disturbance[1]	Notes
Total	**13.7**	
GRAND TOTAL	**~3,900**	

Notes:

1. All values presented are approximate and subject to change per final engineering.
2. 34.5 kV collection lines may alternatively be installed on overhead lines, utility trays, or a combination of several methods may be employed.
3. Although the water storage tanks or ponds are temporary and will be removed following construction, the impact will be permanent. The areas where tanks or ponds are located may either be restored, or filled, reclaimed, and developed with solar panels.

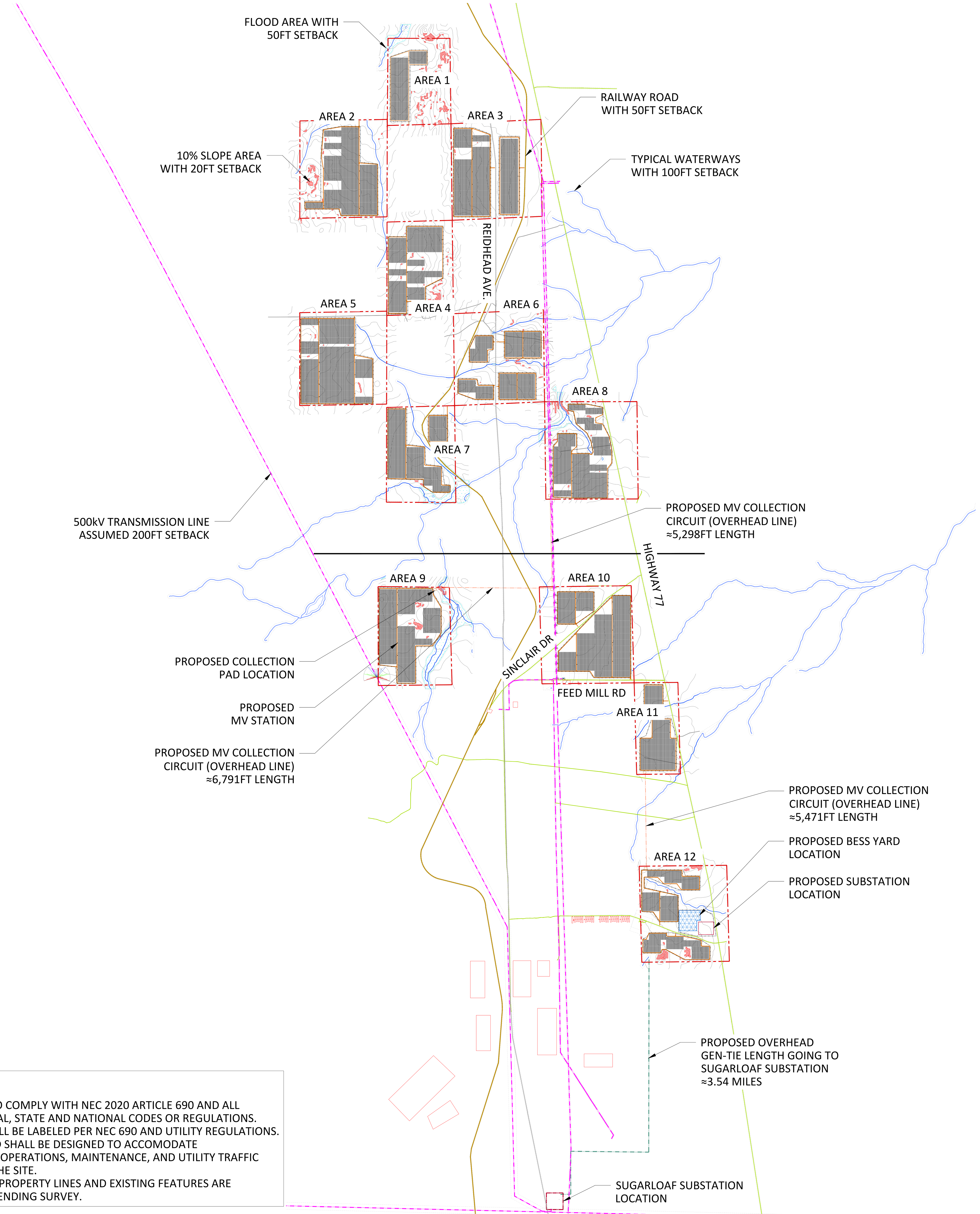
1.3.3 Project Elements

The Project would include the following primary elements:

Solar Field

- Solar arrays consisting of solar photovoltaic modules in the one-in-portrait panel configuration mounted on single-axis, horizontal tracker mounting systems supported by driven steel posts or other embedded foundation design. The type of PV modules will be either traditional panels, which capture sunlight from one side of the panel, or bifacial panels, which can absorb light from both sides of the panels, including energy reflected from the ground surface.
- Direct current (DC) collection system and Power Conversion Stations (PCSs) to collect power from the solar arrays
- Overhead and underground 34.5 kV AC collection system to convey electricity from the PCSs to the Photovoltaic Combining Switchgear (PVCSs) and ultimately to the on-site substation
- 300 MW BESS likely 3 to 5-hour battery systems
- One on-site substation hosting on-site ringbus switchyard. Figure 1-2.
- On-site microwave and wireless systems collect and send data to the supervisory control and data acquisition (SCADA) system
- Meteorological stations would be installed in the solar field

Figure 1-2 Project Site Map



LEGEND

- SITE BOUNDARY
- PUBLIC ROAD
- INTERIOR ROAD AND PERIMETER ROAD
- DIRT ROAD
- EXISTING OVERHEAD LINE
- MV COLLECTION PROPOSED OVERHEAD LINE
- PROPOSED OVERHEAD GEN-TIE
- RAILWAY ROAD
- WATERWAYS
- HIGH SLOPE AREAS
- FLOOD AREAS
- PROPOSED EQUIPMENT LOCATION (BESS)
- SITE PRIMARY DWELLINGS
- SHADE IMPACT
- SUBSTATION LOCATION
- MV COLLECTION PAD

2 VICINITY MAP
SCALE: N.T.S.

LATITUDE, LONGITUDE: 34.680336° -110.112079°
EASTING, NORTHING: 716409.361 FT E, 1338961.708 FT N
COORDINATE SYSTEM: NAD83 Arizona State Planes, East Zone, US Foot

AREA	APN	SECTION	ACREAGE
1	110-08-009	T16N, R21E	408.09
3			640.00
4			470.07
6			640.00
8			640.00 Less Hwy 77
7			509.52 Less Road
2	110-07-008	T16N20E	640.00
5			640.00
10	110-03-016	T15N 21E	640.00
9			537.52
11			320.00
12			640.00 Less Hwy 77
TOTAL			6725.20

SYSTEM SPECIFICATIONS:

DC CAPACITY = 514.83 MWp
AC CAPACITY = 344.40 MWac @ 40°C

INVERTER DC/AC RATIO = 1.50

POI LIMIT = 300 MWac

PV MODULE SPECIFICATIONS:

SPR-P6-545-UPP-V2 BIFACIAL MODULES

ELECTRICAL CHARACTERISTICS (STC):
RATED POWER = 545W
OPEN CIRCUIT VOLTAGE = 46.9V
SHORT CIRCUIT CURRENT = 14.64A
VOLTAGE AT MAX. POWER = 39.1V
CURRENT AT MAX. POWER = 13.96A
MODULE EFFICIENCY = 20.96%

DIMENSIONS:
L = 2384mm, W = 1092mm

MV STATION SPECIFICATIONS:

4.20 MV PER MV STATION

INVERTER SPECIFICATIONS:

POWER ELECTRONICS
FS4200MU CE (4.20 MW @ 40°C)

INVERTER POWER ACTOR = 1.0

MOUNTING SYSTEM SPECIFICATION:

ARRAY TECHNOLOGY
DURATRACK HZ v3

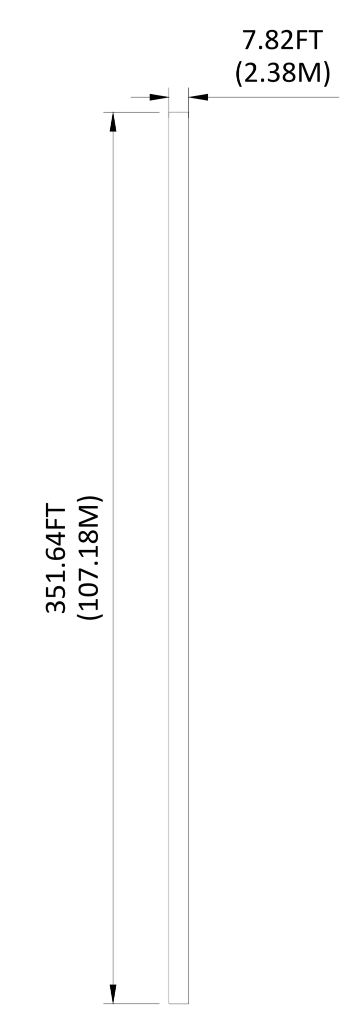
90 MODULES PER TRACKER
30 MODULES PER STRING
3 STRINGS PER TRACKER
TRACKING RANGE: ±52°
Azimuth = 0°

TABLE DIMENSIONS:
L = 107.18m, W = 2.384m
TABLE SPACING (N-S) = 1.5m
PITCH =9.15m
GCR (W/PITCH) = 0.25

EQUIPMENT QUANTITIES

TOTAL NO. OF MODULES: 944,640
TOTAL NO. OF STRINGS: 31,488
TOTAL NO. OF 3 STRING TRACKERS: 10,496
TOTAL NO. OF MV STATIONS: 82

TOTAL NO. OF 32 TRACKER ROWS: 328



3 TYPICAL TABLE
SCALE: N.T.S.

N

1 ARRAY LAYOUT
SCALE: 1" = 300'

GENERAL NOTES:

1. INSTALLATION TO COMPLY WITH NEC 2020 ARTICLE 690 AND ALL APPLICABLE LOCAL, STATE AND NATIONAL CODES OR REGULATIONS.
2. EQUIPMENT SHALL BE LABELED PER NEC 690 AND UTILITY REGULATIONS.
3. 20' ACCESS ROAD SHALL BE DESIGNED TO ACCOMODATE CONSTRUCTION, OPERATIONS, MAINTENANCE, AND UTILITY TRAFFIC THROUGHOUT THE SITE.
4. DIMENSIONS TO PROPERTY LINES AND EXISTING FEATURES ARE APPROXIMATE PENDING SURVEY.

PRELIMINARY
NOT FOR CONSTRUCTION

ENGINEER'S STAMP

REVISIONS

REV	DESCRIPTION	DB	CB	DATE
A	PROPOSAL	RA	JS	06-20-22

terabase
Terabase Energy, Inc.
BERKELEY, CA 94708 USA
+1 (415) 763-7181
info@terabase.energy

CUSTOMER
PRIMERGY

SITE
CHUPAROSA SOLAR
NAVAJO COUNTY
ARIZONA, USA

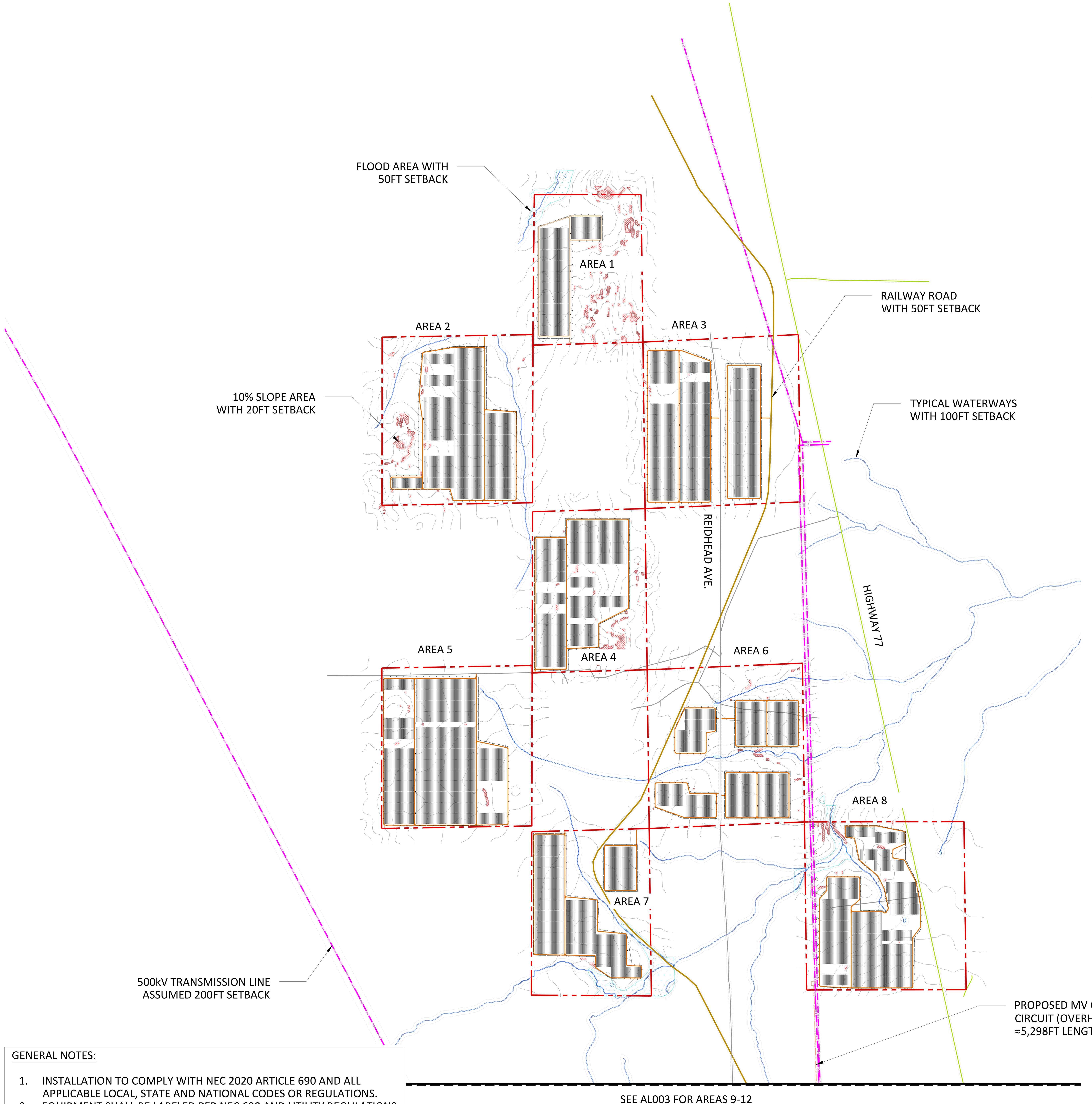
SPR-P6-545-UPP, 1.50 ILR, 514.8MWdc
ARRAY LAYOUT

0 0.5' 1'
IF BAR IS NOT ONE FOOT, DRAWING IS NOT TO SCALE

OPPORTUNITY	DATE	DESIGNED BY	CHECKED BY
2022-00041	18MAY22	RA	CA

PROJECT	FORMAT	SHEET
22DT-002-01	ARCH-D	AL001

2022-00041_22DT-002-01_CHUPAROSA_AL_REVA (1.50 DCAC RATIO)-A.DWG 6/20/2022 12:57 PM



LEGEND

- SITE BOUNDARY
- PUBLIC ROAD
- INTERIOR ROAD AND PERIMETER ROAD
- DIRT ROAD
- EXISTING OVERHEAD LINE
- MV COLLECTION PROPOSED OVERHEAD LINE
- RAILWAY ROAD
- WATERWAYS
- HIGH SLOPE AREAS
- FLOOD AREAS
- MV COLLECTION PAD

AREA	APN	SECTION	ACREAGE
1	110-08-009	T16N, R21E	408.09
3			640.00
4			470.07
6			640.00
8			640.00 Less Hwy 77
7			509.52 Less Road
2	110-07-008	T16N20E	640.00
5			640.00
TOTAL			4587.68

GENERAL NOTES:

1. INSTALLATION TO COMPLY WITH NEC 2020 ARTICLE 690 AND ALL APPLICABLE LOCAL, STATE AND NATIONAL CODES OR REGULATIONS.
2. EQUIPMENT SHALL BE LABELED PER NEC 690 AND UTILITY REGULATIONS.
3. 20' ACCESS ROAD SHALL BE DESIGNED TO ACCOMODATE CONSTRUCTION, OPERATIONS, MAINTENANCE, AND UTILITY TRAFFIC THROUGHOUT THE SITE.
4. DIMENSIONS TO PROPERTY LINES AND EXISTING FEATURES ARE APPROXIMATE PENDING SURVEY.

N

1 ARRAY LAYOUT
SCALE: 1"=170'

2 VICINITY MAP
SCALE: N.T.S.

LATITUDE, LONGITUDE: 34.680336° -110.112079°
EASTING, NORTHING: 716409.361 FT E, 1338961.708 FT N
COORDINATE SYSTEM: NAD83 Arizona State Planes, East Zone, US Foot

SYSTEM SPECIFICATIONS:

DC CAPACITY = 514.83 MWp
AC CAPACITY = 344.40 MWac @ 40°C

INVERTER DC/AC RATIO = 1.50

POI LIMIT = 300 MWac

EQUIPMENT QUANTITIES

TOTAL NO. OF MODULES: 944,640
TOTAL NO. OF STRINGS: 31,488
TOTAL NO. OF 3 STRING TRACKERS: 10,496
TOTAL NO. OF MV STATIONS: 82

TOTAL NO. OF 32 TRACKER ROWS: 328

PV MODULE SPECIFICATIONS:

SPR-P6-545-UPP-V2 BIFACIAL MODULES

ELECTRICAL CHARACTERISTICS (STC):
RATED POWER = 545W
OPEN CIRCUIT VOLTAGE = 46.9V
SHORT CIRCUIT CURRENT = 14.64A
VOLTAGE AT MAX. POWER = 39.1V
CURRENT AT MAX. POWER = 13.96A
MODULE EFFICIENCY = 20.96%

DIMENSIONS:
L = 2384mm, W = 1092mm

MV STATION SPECIFICATIONS:

4.20 MV PER MV STATION

INVERTER SPECIFICATIONS:

POWER ELECTRONICS
FS4200MU CE (4.20 MW @ 40°C)

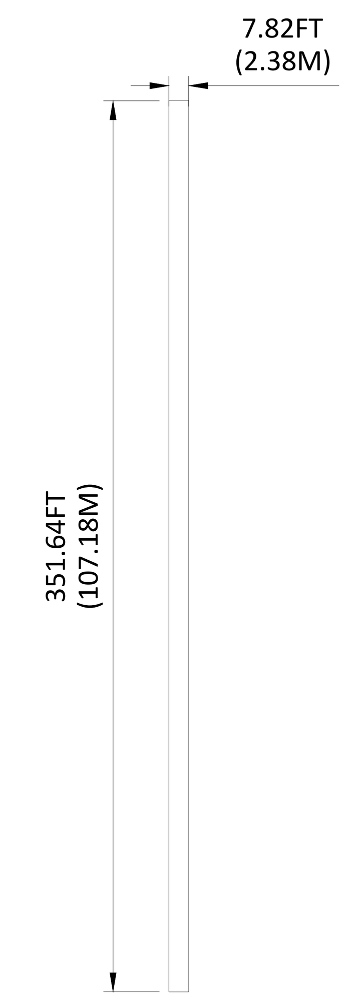
INVERTER POWER ACTOR = 1.0

MOUNTING SYSTEM SPECIFICATION:

ARRAY TECHNOLOGY
DURATRACK HZ v3

90 MODULES PER TRACKER
30 MODULES PER STRING
3 STRINGS PER TRACKER
TRACKING RANGE: ±52°
Azimuth = 0°

TABLE DIMENSIONS:
L = 107.18m, W = 2.384m
TABLE SPACING (N-S) = 1.5m
PITCH =9.15m
GCR (W/PITCH) = 0.25



3 TYPICAL TABLE
SCALE: N.T.S.

PRELIMINARY
NOT FOR CONSTRUCTION

ENGINEER'S STAMP

REVISIONS

REV	DESCRIPTION	DB	CB	DATE
A	PROPOSAL	RA	JS	06-20-22

terabase
Terabase Energy, Inc.
BERKELEY, CA 94708 USA
+1 (415) 763-7181
info@terabase.energy

CUSTOMER
PRIMERGY

SITE
CHUPAROSA SOLAR
NAVAJO COUNTY
ARIZONA, USA

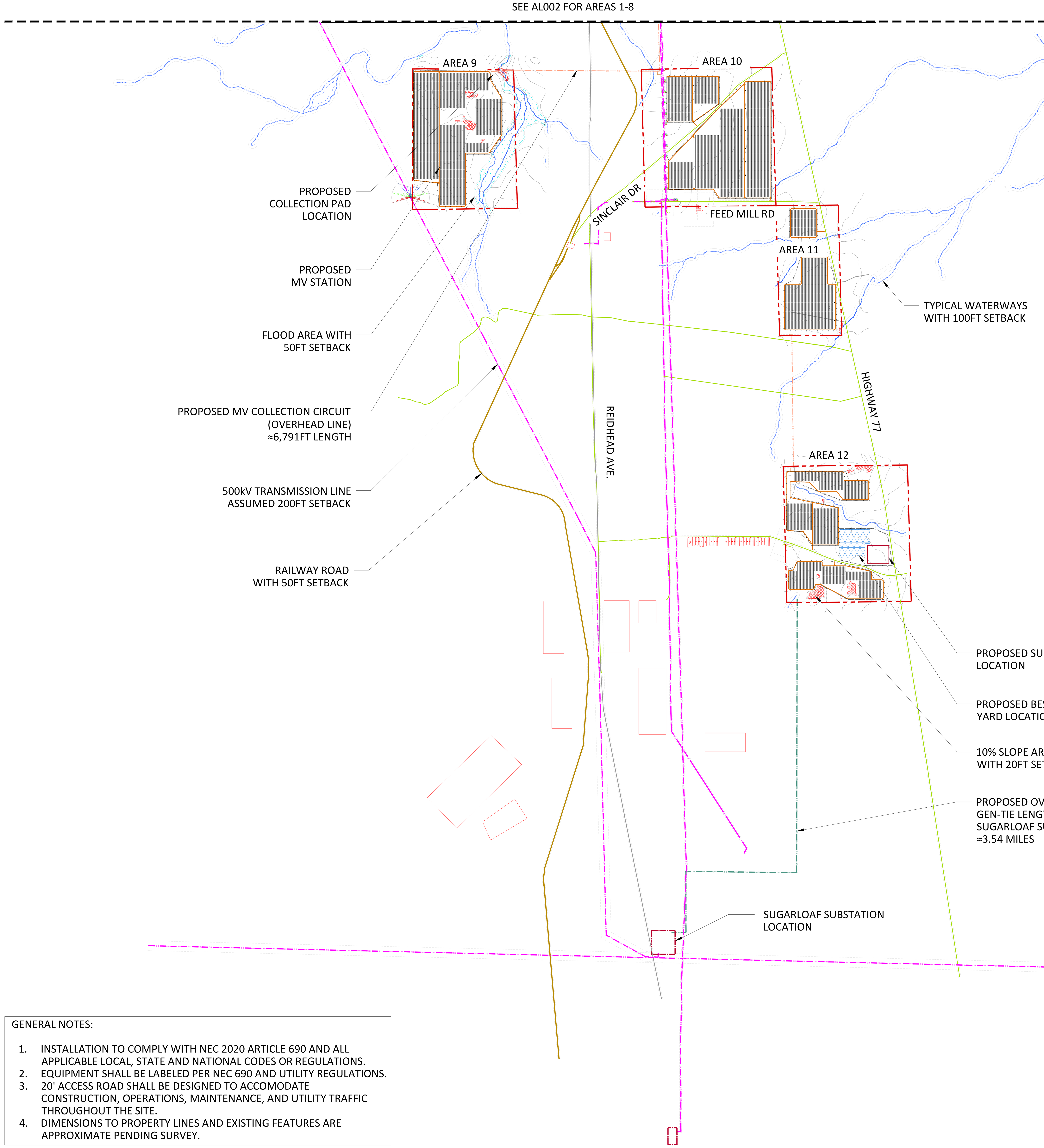
SPR-P6-545-UPP, 1.50 ILR, 514.8MWdc
ARRAY LAYOUT (1 OF 2)

0 0.5' 1'
IF BAR IS NOT ONE FOOT, DRAWING IS NOT TO SCALE

OPPORTUNITY	DATE	DESIGNED BY	CHECKED BY
2022-00041	18MAY22	RA	CA

PROJECT	FORMAT	SHEET
22DT-002-01	ARCH-D	AL002

2022-00041_22DT-002-01_CHUPAROSA_AL_REVA (1.50 DCAC RATIO)-A.DWG 6/20/2022 12:57 PM



LEGEND

- SITE BOUNDARY
- PUBLIC ROAD
- INTERIOR ROAD AND PERIMETER ROAD
- DIRT ROAD
- EXISTING OVERHEAD LINE
- MV COLLECTION PROPOSED OVERHEAD LINE
- PROPOSED OVERHEAD GEN-TIE
- RAILWAY ROAD
- WATERWAYS
- HIGH SLOPE AREAS
- FLOOD AREAS
- PROPOSED EQUIPMENT LOCATION (BESS)
- SITE PRIMARY DWELLINGS
- SHADE IMPACT
- SUBSTATION LOCATION
- MV COLLECTION PAD

AREA	APN	SECTION	ACREAGE
9	110-03-016	T15N 21E	537.52
10			640.00
11			320.00
12			640.00 Less Hwy 77
TOTAL			2137.52

N

1 ARRAY LAYOUT
SCALE: 1" = 200'

GENERAL NOTES:

1. INSTALLATION TO COMPLY WITH NEC 2020 ARTICLE 690 AND ALL APPLICABLE LOCAL, STATE AND NATIONAL CODES OR REGULATIONS.
2. EQUIPMENT SHALL BE LABELED PER NEC 690 AND UTILITY REGULATIONS.
3. 20' ACCESS ROAD SHALL BE DESIGNED TO ACCOMODATE CONSTRUCTION, OPERATIONS, MAINTENANCE, AND UTILITY TRAFFIC THROUGHOUT THE SITE.
4. DIMENSIONS TO PROPERTY LINES AND EXISTING FEATURES ARE APPROXIMATE PENDING SURVEY.

2 VICINITY MAP
SCALE: N.T.S.

LATITUDE, LONGITUDE: 34.680336° -110.112079°
EASTING, NORTHING: 716409.361 FT E, 1338961.708 FT N
COORDINATE SYSTEM: NAD83 Arizona State Planes, East Zone, US Foot

SYSTEM SPECIFICATIONS:

DC CAPACITY = 514.83 MWp
AC CAPACITY = 344.40 MWac @ 40°C

INVERTER DC/AC RATIO = 1.50

POI LIMIT = 300 MWac

PV MODULE SPECIFICATIONS:

SPR-P6-545-UPP-V2 BIFACIAL MODULES

ELECTRICAL CHARACTERISTICS (STC):
RATED POWER = 545W
OPEN CIRCUIT VOLTAGE = 46.9V
SHORT CIRCUIT CURRENT = 14.64A
VOLTAGE AT MAX. POWER = 39.1V
CURRENT AT MAX. POWER = 13.96A
MODULE EFFICIENCY = 20.96%

DIMENSIONS:
L = 2384mm, W = 1092mm

MV STATION SPECIFICATIONS:

4.20 MV PER MV STATION

INVERTER SPECIFICATIONS:

POWER ELECTRONICS
FS4200MU CE (4.20 MW @ 40°C)

INVERTER POWER ACTOR = 1.0

MOUNTING SYSTEM SPECIFICATION:

ARRAY TECHNOLOGY
DURATRACK HZ v3

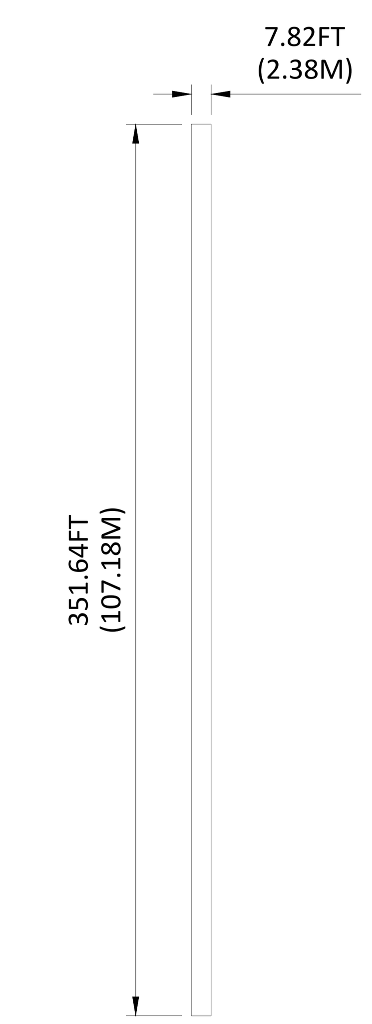
90 MODULES PER TRACKER
30 MODULES PER STRING
3 STRINGS PER TRACKER
TRACKING RANGE: ±52°
Azimuth = 0°

TABLE DIMENSIONS:
L = 107.18m, W = 2.384m
TABLE SPACING (N-S) = 1.5m
PITCH =9.15m
GCR (W/PITCH) = 0.25

EQUIPMENT QUANTITIES

TOTAL NO. OF MODULES: 944,640
TOTAL NO. OF STRINGS: 31,488
TOTAL NO. OF 3 STRING TRACKERS: 10,496
TOTAL NO. OF MV STATIONS: 82

TOTAL NO. OF 32 TRACKER ROWS: 328



3 TYPICAL TABLE
SCALE: N.T.S.

PRELIMINARY
NOT FOR CONSTRUCTION

ENGINEER'S STAMP

REVISIONS

REV	DESCRIPTION	DB	CB	DATE
A	PROPOSAL	RA	JS	06-20-22

terabase
Terabase Energy, Inc.
BERKELEY, CA 94708 USA
+1 (415) 763-7181
info@terabase.energy

CUSTOMER
PRIMERGY

SITE
CHUPAROSA SOLAR
NAVAJO COUNTY
ARIZONA, USA

SPR-P6-545-UPP, 1.50 ILR, 514.8MWdc
ARRAY LAYOUT (2 OF 2)

0 0.5' 1'
IF BAR IS NOT ONE FOOT, DRAWING IS NOT TO SCALE

OPPORTUNITY	DATE	DESIGNED BY	CHECKED BY
2022-00041	18MAY22	RA	CA

PROJECT	FORMAT	SHEET
22DT-002-01	ARCH-D	AL003

2022-00041_22DT-002-01_CHUPAROSA_AL_REVA (1.50 DCAC RATIO)-A.DWG 6/20/2022 12:57 PM

Infrastructure and Ancillary Systems

- A roadway system consisting of internal and perimeter roadways consisting of a compacted soil base, or where needed aggregate or compacted native soil surface
- Access roads along Project gen-tie lines, constructed in accordance for use by SRP to be up to 20 feet wide with an aggregate surface
- Redundant telecommunication systems and cables installed in tandem with the gen-tie line routes as required by SRP's Interconnection Handbook
- Operations and maintenance (O&M) facilities, including administrative buildings, warehouses, parking, water tank, and pipelines for water delivery.
- Project security using a combination of perimeter security fencing, controlled access gates, on-site security patrols, lighting, electronic security systems and/or remote monitoring

Gen-Tie/Transmission System

- Gen-tie lines extending from the Project substation(s) to the SRP Sugarloaf Substation, consisting of one 500 kV circuit . The ROW width needed for the gen-tie lines will be 200-foot-wide for an individual 500kV ROW.

Construction

- Temporary construction mobilization and laydown areas within the Project site, which would contain construction trailers, construction workforce parking, above ground water tanks and fuel storage tanks, materials receiving, and materials storage (graded/compacted earth).
- Temporary meteorological stations would be installed on the Project site during the Pre-Construction LNTP period.

Interconnection

Improvements to SRP facilities are expected to be required to support interconnection for the Project.

1.3.4 Project Design and Facilities

The Project would be designed in accordance with federal, state, and industrial standards, including American Society of Mechanical Engineers standards, National Electrical Safety Code, International Energy Conservation Code, International Building Code, Uniform Plumbing Code, Uniform Mechanical Code, National Fire Protection Association, and Occupational Safety and Health Administration regulations.

1.3.4.1 Solar Panels and Arrays

Materials commonly used for solar PV modules include monocrystalline silicon, polycrystalline silicon, amorphous silicon, cadmium telluride (CdTe), and copper indium selenide/sulfide. The Project would utilize high-efficiency commercially available solar PV modules that are Underwriters Laboratory (UL)-listed or approved by another nationally recognized testing laboratory. The Project would use monocrystalline or polycrystalline silicon solar PV modules in the one-in-portrait configuration mounted on single-axis, horizontal tracker mounting systems.

The type of PV modules will be either traditional panels, which capture sunlight from one side of the panel, or bifacial panels, which can absorb light from both sides of the panels, including energy reflected from the ground surface. Bifacial panels passively absorb light on both sides. Absorption of reflected light will not interfere with vegetation growth under panels (were it to occur). No heat or light is radiated back from the panels. Generally, traditional panels use polycrystalline materials, and bifacial panels use monocrystalline cells. Both types can have antireflective coating added to reduce glare.

With a horizontal tracker mounting system, the panel arrays would be arranged in north-south oriented rows and drive motors would rotate the horizontally mounted solar panels from east to west to follow the sun (on a single axis) throughout the day. A typical panel array layout using horizontal trackers is shown in Figure 1-3. The highest point for a horizontal tracker would be achieved during the morning and evening hours when the trackers are tilted at their maximum angle and would be a maximum of 15 feet above the ground surface depending on the grade where the posts are installed (Figure 1-4). When solar modules are roughly parallel to the ground, the overall height of the tracker unit would be a maximum of 8 feet above the ground surface depending on the grade where the posts are installed. At the most perpendicular to the ground surface, 18 inches to 4 feet of space would remain between the bottom of the panel and the ground. The panels would be this close to the ground for less than 45 minutes per day as the majority of the day the panels are tracking at shallow angles, and at night the trackers stow flat.

FIGURE 1-3 TYPICAL SOLAR ARRAY CONFIGURATIONS

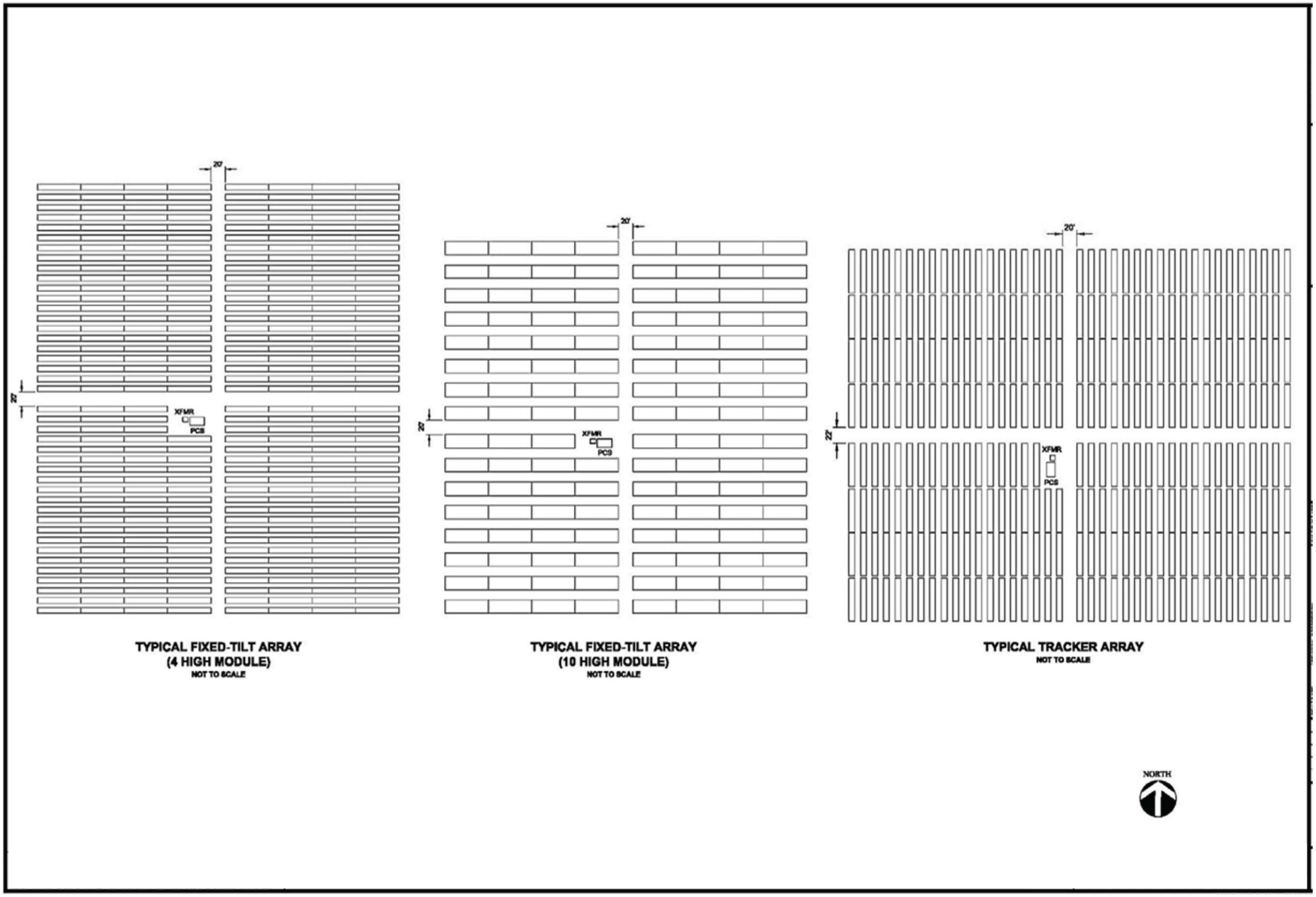
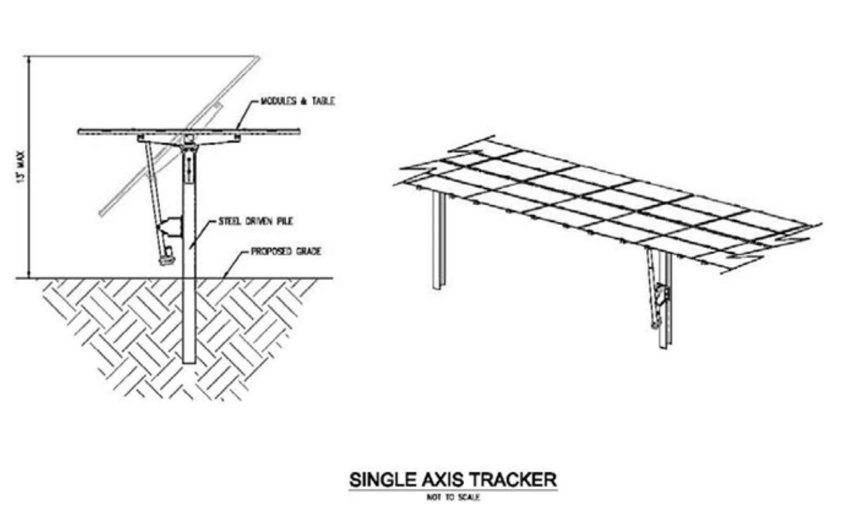


FIGURE 1-4 TYPICAL MOUNTING SYSTEM



The vertical supports for the tracker racking system consists of foundations that may include driven posts (wide flange I-beam) approximately 6 to 8 inches across and 6 to 12 feet deep, concrete piers approximately 18 to 24 inches in diameter and 6 to 8 feet deep, or screw piles. The preferred mounting configuration would use directly embedded driven posts; concrete piers would be used only if subsurface conditions do not support driven posts.

In this type of system, each tracker panel array would be powered by a low-voltage solar-powered drive motor. The motors and actuator are mounted to one of the driven posts and would not require separate foundations for mounting. Hydraulic drive systems would not be used. The motors only would be operated for a few seconds every 5 to 10 minutes during daylight conditions to move the panels in approximately 1-degree increments. The sound from the tracker motors would be less than 70 decibels at a distance of 3 feet. This would equate to less than 30 decibels at 50 feet.

Meteorological Stations

Temporary meteorological stations would be installed prior to construction during the Pre-Construction LNTP period to obtain local meteorological information to maximize the efficiency of proposed solar power plant operations in the vicinity. The temporary meteorological stations and albedometers would be removed prior to initiation of solar facility construction.

Permanent meteorological stations would be installed on the Project site, which would monitor wind speed and communicate with the tracker units. This would allow for the trackers to rotate to a flat position during high wind activity.

Emergency Backup Power

If horizontal trackers are used, each PCS would be equipped with emergency backup power required to rotate the tracker units to their stow position in the unlikely event of high winds and a loss of the primary electrical connection from the Project to SRP transmission system. The emergency back-up power system would consist of a 15 kilovolt-ampere (kVA) battery-based uninterruptible power supply (UPS) at each PCS.

1.3.4.2 Electrical Collection System

DC Collection System to AC Transformers

PV modules convert sunlight into DC electricity. One or more combiner boxes would be located in the arrays to collect the DC electricity from PV modules. The electricity would be delivered through underground cables to a PCS, which contains an inverter that changes the DC electricity to AC electricity and a medium-voltage transformer that steps up the voltage to 34.5 kV. Each array would have a PCS. Each PCS also would contain communication equipment to wirelessly communicate with the tracker units to control operation and detect anomalous conditions. All electrical equipment would be housed in protective enclosures on concrete pads. The enclosures would be painted colors determined by the BLM.

34.5 kV Collection System

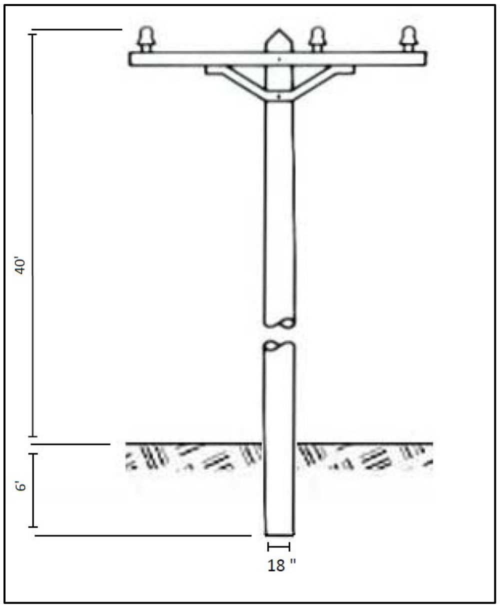
The 34.5 kV collection system would convey the converted electricity from the PCSs to the PVCSs and then onto on-site substation, where the electricity would be stepped up to 500 kV for delivery to SRP transmission grid. The 34.5 kV collection system could comprise overhead lines, utility trays, underground in parallel, or underground in a duct bank, or a combination of several methods. The cables from the medium-voltage transformers/PCSs to the PVCSs could be installed underground using 35 kV-rated medium voltage cables listed for direct buried applications. Underground 34.5 kV cables would be installed to comply with the minimum burial depth in accordance with the National Electrical Code. The widths of the utility corridors would vary depending upon the method selected but would be the greatest for circuits installed underground in parallel.

From the PVCSs to the on-site substation, the 34.5 kV collection system would be installed overhead. Overhead 34.5 kV collector lines would be installed as double circuit lines on wood poles with post insulators (typical of medium voltage installations in electric distribution systems). Pole height would be up to 40 feet above grade (Figure 1-5).

Substation

A 5-acre 500 kV substation would be developed within the Project site. Individual 34.5 kV collection systems would feed approximately 10 arrays each. The substation would be constructed based on applicable electrical safety codes. The substation would be separately fenced to provide increased security around the medium and high voltage electrical equipment. The substation would include an estimated 3 high-voltage circuit breakers and between 19 and 22 medium-voltage circuit breakers. The substation area would include a transformer containment area, a microwave tower, a control house, and one or more transformers. Containment measures for all substation equipment would be provided in accordance with Environmental Protection Agency 40 CFR Part 112 and all applicable codes required by the local, state, and federal governing authorities. The transformer containment area would be lined with an impermeable membrane covered with gravel and would include a drain with a normally closed drain valve. Transformers would be provided with secondary oil containment equal to 110 percent of the volume of oil present in the transformer in addition to the volume of rainwater for a 25-year, 24-hour rainfall event.

FIGURE 1-5 TYPICAL 34.5 KV DISTRIBUTION POLE



1.3.4.3 Energy Storage

A 300 MW AC-coupled BESS would be located within the Project site. The battery system would be installed in an area near the project substation and each battery system unit would be housed in protective enclosures on concrete pads/piles. The enclosures would be painted colors determined by the BLM. Battery storage would be used during periods of excess generation to store power until the customer, or the system determines release of the power to be more valuable. Alternatively, if a DC-coupled system is utilized, each battery system would be installed at an inverter.

1.3.4.4 Operations and Maintenance Building

An O&M building would be located on the Project site. This building would be painted colors determined by the BLM and would house administrative, operation, maintenance equipment, and personnel. Signage may be located in the area of the O&M building. The building, monitoring systems, and lighting would likely be powered by solar power, with a minimum 12-hour battery storage unit, and a 250 to 300 kVA diesel generator as backup if a permanent drop of power from existing distribution lines is not feasible.

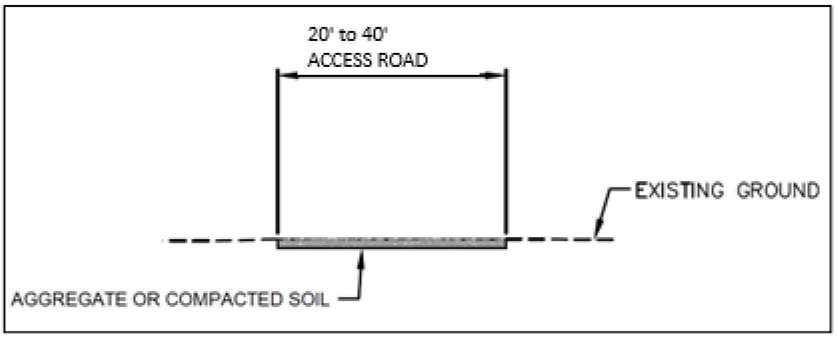
1.3.4.5 Site Security and Fencing

Security at the Project site would be achieved by fencing, lighting, security patrols, and electronic security systems. The Project site would be monitored 24 hours per day, seven days per week during all phases. Lighting would be provided at the O&M building, substation, and Project entrance gate. The solar field and support facilities perimeter would be secured with chain link security fencing. Controlled access gates would be located at the Project site entrance. The perimeter fence would be an approximately 6- to 7-foot-high chain link fence with 1-foot-high barbed-wire security strands at the top (the security fence in proximity to the gen-tie line would be properly grounded. Breakaway fencing would be used at drainages.

1.3.4.6 Site Access Road

A primary access road would provide access to the Project site, and perimeter and internal access roads would provide access to equipment and facilities throughout the Project site. A typical access road would be constructed as shown in Figure 1-6 with a compacted soil base, or aggregate, if needed. The Project site access road would be up to 20 feet wide. The AZ 77 Access Route would serve as the primary access to the Project site. This route would be accessible from the US 180 E / W Hopi Dr off ramp directly off I-40.

FIGURE 1-6 TYPICAL ACCESS ROAD DESIGN



1.3.4.7 Internal Project-Related Roads

Project-related roads within the Project site would include the perimeter road and solar field access roads. Similar to the disturbance that would occur from other Project components (based on the assumption that all acreage within the fenced perimeter would be disturbed), the acreage identified for roads also is considered to be permanent disturbance.

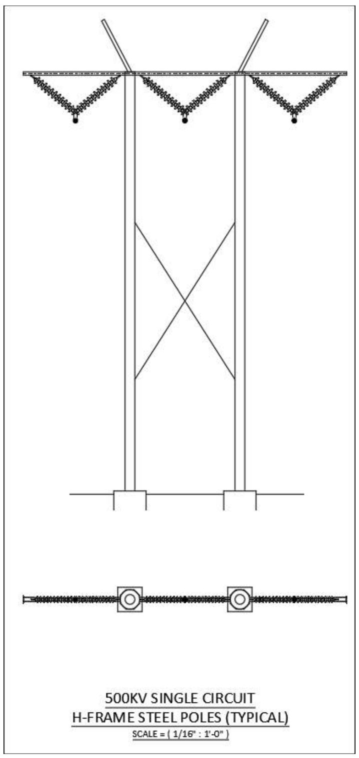
A perimeter road would be located just inside the Project site's perimeter fence and within the solar field area around specific blocks of equipment. The perimeter road would be constructed to allow access by maintenance and security personnel. The perimeter road would be approximately 20 feet wide. Within the solar field, new access ways would be built to provide vehicle access to the solar equipment (PV modules, inverters, transformers) for operation and maintenance activities. The internal access ways would be approximately 20 feet wide.

1.3.5 500 kV Gen-Tie Transmission Lines

The Project would require the construction of an approximately 3.54-mile 500 kV circuit and telecommunications system (fiber optic system data) for interconnection to the utility transmission grid system at the Sugarloaf Substation. The exact routing is still to be determined but could potentially be placed entirely on BLM lands connecting the Project site to the Sugarloaf Substation. Access to the gen-tie lines would be provided either by a new 20-foot-wide gen-tie road along the length of the gen-tie line or spur roads to each pole from existing roads. The overhead line and telecommunications system (fiber optic system data) would be installed per local and national electrical code requirements. Structures would be galvanized steel with a dull gray appearance similar to existing steel poles installed adjacent to the Project site and would be used to support interconnection to the SRP transmission system. Poles would typically range from 150 to 190 feet tall, depending upon the location along the gen-tie line. Typical transmission structures are shown in Figure 1-7.

All overhead electrical lines would be designed and installed in accordance with the Institute of Electrical and Electronics Engineers (IEEE) and National Electrical Safety Code (NESC) or ANSI Standard C2. The Applicant also would prepare a Bird and Bat Conservation Strategy to address potential impacts to birds and bats during the construction, operations, and maintenance phases of the Project.

FIGURE 1-7 TYPICAL GEN-TIE SUPPORT POLES FOR 500 kV LINES



1.3.6 Interconnection Facilities

The following improvements are expected to be required to support interconnection for the Project:

- Interconnection with SRP for delivery of 300 MWAC via 500 kV gen-tie lines to SRP Sugarloaf Substation.

  Interconnection Facilities
  - o 500 kV dead-end structure, transmission getaway, and a transition structure at the Sugarloaf Substation
  - o Lead line protection relays compatible with dual SEL-311-LSRP line protection relays
  - o Metering/communications lines and equipment owned by SRP at the Project site

Network Upgrades
  - To be determined

- Access road(s) to service the above-referenced interconnection routes and facilities

1.3.7 Water Facilities

The source of water needed for the Project is under development and could include either purchasing from a commercial source or user with an existing appropriation and trucking to the site or purchasing an existing appropriation and accessing the water through new groundwater wells.

1.3.7.1 Temporary

Water would be pumped to 1-acre (0.4 hectare) temporary storage ponds or tanks across the construction site. The storage tanks or ponds would be encircled by an earthen berm comprised of on-site material fill with a liner and would be approximately 3 feet (0.9 meter) deep. Each pond would hold approximately 1 million gallons (3.8 million liters) of water. The water would be pumped through temporary 8-inch (20-centimeter) diameter high-density polyethylene (HDPE) pipe laid on the ground surface to each tank or pond. The additional temporary water facilities needed on the Project site would vary depending upon the source of the water as follows:

1. If water is trucked in, the trucks would arrive at the O&M building area and water would flow via gravity or via a diesel-powered 10 horsepower (7.5 kilowatt) pump to reach the ponds.

2. Purchasing water from an existing appropriation and accessing the water from groundwater would require two groundwater wells that are up to 1,500 feet deep constructed within the Project site boundary to serve the Project during construction and decommissioning. Water would flow via gravity from the wells to the temporary ponds. A temporary well would be located within the Project site, which would be decommissioned following construction. The second well would be permanent (described below) and would ideally be located near the O&M building area. The vertical turbine pumps for each well would be powered temporarily by a 750 kW (1,005 hp) diesel generator.

1.3.7.2 Permanent

The permanent water facilities needed on the Project site would vary depending upon the source of the water as follows:

1. Whether water is trucked in or pumped from a groundwater well, a large water storage tank would be located in the O&M building area to store water for ongoing use. A 40 hp water pump (up to 135 gallons per minute) would pump water from the water storage around the O&M building.

2. If water is pumped from the permanent groundwater well at the administrative and maintenance area as intended, the vertical turbine pump would typically be powered by the solar field. A 400 hp backup generator would be available to operate up to 300 hours a year

in the unlikely loss of the primary electrical connection from the Project to the SRP transmission system.

1.3.8 Wastewater

A permanent sewage holding tank, to be pumped at regular intervals, will be used to maintain the O&M building that will be present for the life of the Project.

1.3.9 Lighting

Permanent lighting would be provided at the O&M building, within the substation(s), and at the Project entry gate. Small domestic fixtures would also be placed at other electrical equipment as required by applicable codes. Lighting for facilities and associated infrastructure would be down-shielded to keep light within the boundaries of the Project site and the minimum amount and intensity necessary for the intended use. Night lighting would be controlled or reduced using directed lighting, shielding, and/or reduced lumen intensity. The Applicant would prepare a Lighting Management Plan for construction and operation of the Project.

1.3.10 Waste and Hazardous Materials Management

The primary wastes generated at the Project during construction, operation, and maintenance would be nonhazardous solid and liquid wastes, although some limited quantities of hazardous materials would be used and stored on site. The Applicant would prepare a Hazardous Materials and Waste Management Plan, as well as a Spill Prevention and Emergency Response Plan, which would address waste and hazardous materials management, including Best Management Practices (BMPs) related to storage, spill response, transportation, and handling of materials and wastes. Table 1-3 lists the hazardous materials anticipated that would be stored and used on site. Safety Data Sheets (SDSs) for each of these materials would be provided in the Spill Prevention and Emergency Response Plan.

TABLE 1-3 HAZARDOUS MATERIALS THAT MAY BE USED

Hazardous Material	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Gas and Diesel Fuel (for equipment)	Fuel is likely to be stored in and dispensed from aboveground tanks.	Would be managed in accordance with the Spill Prevention and Emergency Response Plan.
Mineral Insulating Oil	Carbon steel transformers; total on site inventory is to be determined at a later time as the design progresses.	Used only in transformers, secondary containment for each transformer would be managed in accordance with the Spill Prevention and Emergency Response Plan.
Batteries, lead acid based and/or lithium ion	Battery-based emergency back-up power at each of the PCS.	Sufficient cooling capacity to maintain ambient temperatures appropriate for the selected battery would be provided.
Propane	Generator-based emergency back-up power at each of the PCS shelters (or one centralized generator))	Would be managed in accordance with the Spill Prevention and Emergency Response Plan.
Herbicide (e.g., glyphosate)	Brought on site by licensed contractor, used immediately in accordance with an approved Pesticide Use Plan (PUP).	No mixing would occur on site and no herbicides would be stored on site.

The Project would produce wastes including defective or broken electrical materials, empty containers, the typical refuse generated by workers and small office operations, and other miscellaneous solid wastes. Nonhazardous wastes could be disposed of at any landfill. Hazardous materials would be disposed of at an appropriate facility in accordance with all regulations. The types of wastes and their estimated quantities are discussed below and summarized in Table 1-4. Batteries would be used during construction in vehicles and equipment, and during operation and maintenance in the BESS, in addition to vehicles and equipment used during operations. Spent batteries would be sent off-site to be recycled. No battery waste would be stored in piles or warehouses on-site. If a battery cannot be recycled, such as due to damage, the battery would be transported off-site and properly disposed of at an appropriate facility.

TABLE 1-4 WASTES POTENTIALLY GENERATED BY THE PROJECT

Waste	Origin	Composition	Estimated Quantity		Classification	Disposal
			Construction	Operations [1]		
Scrap wood, steel, glass, plastic, paper	Construction activities	Normal refuse	800 tons	N/A	Nonhazardous	Recycle and/or dispose of in industrial or municipal landfill
Scrap metals	Construction activities	Parts, containers	8 tons	N/A	Nonhazardous	Recycle and/or dispose of in industrial or municipal landfill
Empty hazardous material containers	Operation and maintenance of plant	Drums, containers, totes [2]	N/A	3.3 ton	Hazardous and nonhazardous solids	Containers <5 gal would be disposed as normal refuse. Containers >5 gal would be returned to vendors for recycling or reconditioning.
Waste oil filters	Construction equipment and vehicles	Solids	1,680 lbs	N/A	Used Oil	Recycle at a permitted Treatment, Storage, and Disposal Facility (TSDF)
Oily rags, oil sorbent excluding lube oil flushes	Cleanup of small spills	Hydrocarbons	N/A	335 cubic ft	Used Oil	Recycle or dispose at a permitted TSDF
Spent lead acid batteries	Construction machinery	Heavy metals	34 units	N/A	Hazardous	Store no more than 10 batteries (up to 1 year)-recycle off site.
Spent batteries	Solar facility equipment	Metals	N/A	4,800 lbs	Universal waste solids	Recycle or dispose off-site in accordance with manufacturer's specifications at the time of disposal
Waste oil	Equipment, vehicles	Hydrocarbons	N/A	1,680 gallons	Used Oil	Dispose at a permitted TSDF
Sanitary waste	Portable toilet holding tanks	Solids and liquids	N/A	39,000 gallons	Nonhazardous liquid	Remove by contracted sanitary service

[1] Annually

[2] Containers include <5-gallon containers and 55-gallon drums or totes

1.3.11 Fire Protection

The Applicant would prepare and implement a Fire Management Plan. The Project's fire protection water system used during operation would likely be supplied from a water storage tank. If a water tank is used, one electric and one diesel-fueled backup firewater pump would deliver water to the fire protection water-piping network. For the battery enclosures, additional fire suppression systems will be incorporated into the design based on current fire code requirements for energy storage systems. The electrical equipment enclosures that house the inverters and transformers would be either metal or concrete structures. Any fire that could occur would be contained within the enclosures, which would be designed to meet National Electric Manufacturers Association (NEMA) 1 or NEMA 3R IP44 standards for electrical enclosures (heavy duty sealed design to withstand harsh outdoor environmental conditions).

1.3.12 Health and Safety Program

The Applicant would require that all employees and contractors adhere to appropriate health and safety plans and emergency response plans. All construction and operations contractors would be required to operate under a Health and Safety Program (HASP) that meets industry standards. All site personnel would be required to go through a new hire orientation and follow a Worker Education and Awareness Plan (WEAP), which would address Project-specific safety, health, and environmental concerns.

1.3.13 Stormwater Management

Major existing FEMA-designated floodplains on the Project site would be avoided where feasible, with the exception of roadway crossings, and the Project would be designed and engineered to maintain the existing hydrology. Runoff generated on the Project site would be conveyed as sheet flow across the site, maintaining as much of the natural grade of the terrain as possible. The soil is very permeable so following the natural terrain would allow for maximum infiltration thereby reducing runoff. Drainage channels or detention basins may be installed per the results of a hydrology study.

1.3.14 Vegetation Management

The Project would be constructed with drive and crush methods that preserve some vegetation and natural drainages. Project roads and the O&M building area, and substation area would remain free of vegetation. Vegetation in the solar field would be maintained per requirements and mitigation measures established through the NEPA environmental review process.

The Applicant would prepare an Integrated Weed Management Plan for the Project that follows the interagency guidance Partners Against Weeds (BLM 1996) for an active weed management program. Invasive and noxious weed control would be managed in accordance with the BLM-approved Integrated Weed Management Plan for the Project. A Pesticide Use Proposal (PUP) would be prepared and approved by the BLM prior to receiving a NTP.

Chemical controls, notably herbicides would be one of the methods employed to control weeds throughout the site. Pest control may also be required, including control of rodents and insects inside of the buildings and electrical equipment enclosures. The PUP prepared for the Project would provide the exact specifications involved with herbicide application including the type of herbicide(s) proposed for use, method of application, and quantities of herbicide. Herbicide use would be conducted in accordance with BLM Manual 9011: Chemical Pest Control and BLM Handbook H-9011-1: Chemical Pest Control, and as covered under the RODs for the BLM's Programmatic EIS (PEIS) for Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on BLM Managed Lands in 17 Western States (BLM 2016), which is tiered from the

PEIS for Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States (BLM 2007). Standard Operating Procedures (SOPs) from the Vegetation Treatments PEIS (BLM 2016), would be incorporated into the Integrated Weed Management Plan and implemented.

1.4 Alternatives

Alternative technologies and Project layouts will be defined by BLM staff in accordance with the NEPA process. Alternatives considered and carried forward for full environmental comparison in the BLM's NEPA process may also include:

1. **Proposed Action:** The 300 MWAC PV Project would consist of single-axis, horizontal trackers, BESS, and gen-tie lines. The solar field would disturb approximately 3,618.5 acres within an approximately 6,725.20-acre ROW.
2. **No Action Alternative:** The ROW application would be denied.
3. **Resource Avoidance Alternative:** An alternative that avoids areas with environmental resource conflicts.

BLM staff will determine which alternatives to carry forward for analysis in the NEPA process.

1.5 Other Permits and Authorizations

Table 1-5 provides a list of federal, state, and local permits, authorizations, or inter-agency consultations that may be required for the Project.

TABLE 1-5 FEDERAL, STATE, AND LOCAL PERMITS AND AUTHORIZATIONS

I. Federal Permits, Authorizations, or Inter-Agency Consultations
U.S. Department of the Interior, BLM
• ROW grant under Title V of Federal Land Policy and Management Act
• Environmental Impact Statement (EIS) and Record of Decision to support issuance of ROW grant
• Pesticide Use Permit
U.S. Department of the Interior, BLM and State Historic Preservation Office/Advisory Council on Historic Preservation
• BLM/ State Historic Preservation Office, National Historic Preservation Act Section 106 Consultation
U.S. Department of the Interior, Fish and Wildlife Service
• Endangered Species Act Section 7 Consultation and Biological Opinion/Incidental Take Statement
United States Federal Aviation Association
• Notice of Proposed Construction or Alteration and Obstruction Evaluation
U.S. Army Corps of Engineers
• Permit for the discharge of dredged and/or fill material into waters of the United States under Section 404 of the Clean Water Act

II. State of Arizona Permits or Authorizations
Arizona State Historic Preservation Office
• BLM/State Historic Preservation Office, National Historic Preservation Act Section 106 Consultation
Arizona Game and Fish
• Implementation of terms and conditions of the Biological Opinion
• Scientific Collection Permit (for subcontractor)
Arizona Department of Environmental Quality
• Coverage under National Pollutant Discharge Elimination System Construction Stormwater General Permit
• Surface Area Disturbance/Dust Mitigation Control Plan
• Section 401 of the Clean Water Act Water Quality Certification
• Stormwater Construction General Permit (CGP)
• Industrial Stormwater Multi-Sector General Permit (MSGP)
• Pesticide General Permit
• Working in Waters Permit
• Wastewater Discharge Permits
• Holding Tanks Permits
Arizona Corporation Commission
• Certificate of Environmental Compatibility
Arizona Department of Transportation
• Encroachment Permit for facilities, such as transmission lines
• Arizona State Hazardous Materials Permit
III. Navajo County Permits
Navajo County Department of Air Quality
• Dust Control Permit
Navajo County Flood Control
• Drainage and floodplain requirement
Navajo County Public Works
• Right of Way Use Permits
Navajo County Planning and Zoning Department
• Grading Permit
• Building Permit
• Special Use Permit

1.6 Financial and Technical Capability of the Applicant

1.6.1 Primergy Solar LLC and Chuparosa Solar LLC Ownership History

Chuparosa Solar LLC is wholly owned by Primergy Solar LLC (Primergy Solar). Primergy Solar is a portfolio company of Quinbrook Infrastructure Partners. Primergy Solar is a developer of multiple utility scale solar and storage projects, including Gemini Solar Project in Clark County, Nevada, currently the largest solar + battery storage project in the US. The Primergy Solar team has collectively constructed and managed over 2 GW of solar assets. The Primergy Solar team possess the technical ability to construct, operate, maintain and decommission the Project.

1.6.2 Quinbrook Infrastructure Partners

Primergy Solar is a wholly owned subsidiary of Quinbrook Infrastructure Partners (Quinbrook), a specialist investment manager focused exclusively on low carbon infrastructure investment. Quinbrook operates in the US, UK, and Australia, and has invested more than $28 billion in 19 GW of energy infrastructure assets, with a focus on utility-scale wind, solar, and battery storage. Quinbrook has successfully raised $1.7 billion in 2019 for its Low Carbon Power Fund, which is earmarked for investment in three US ventures including Primergy Solar.

SECTION 2
Construction of the Facilities

2.1 Overview

Construction is expected to occur over a 15- to 18-month period and would include the major phases of mobilization, site preparation, solar facility construction including PV array assembly, electrical collection and transmission system construction, and testing and commissioning. The Applicant is planning to commence construction in the third quarter of 2024. Some aspects of construction would need to be coordinated with SRP, including but not limited to interconnection to the Sugarloaf Substation.

2.2 Temporary Construction Workspace, Laydown and Mobilization Areas

Staging and laydown areas would be needed for construction of the solar facility and gen-tie lines. A 5-acre temporary construction mobilization and laydown area located within the Project site and an up to 15-acre temporary staging area located adjacent to Highway AZ 77, to serve the gen-tie lines, would include temporary construction trailers with administrative offices, construction worker parking, temporary water service and fire water supply holding tanks, temporary construction power services, tool sheds and containers, as well as a laydown area for construction equipment and material delivery and storage.

Temporary construction areas would be located at each gen-tie tower or pole location and at locations required for conductor stringing and pulling operations to accommodate construction of the gen-tie. Up to a 200-foot by 200-foot temporary laydown or staging area would be required at each 500 kV tower or pole location for equipment, towers, and hardware. Poles at turning points would need a pulling and a stringing site. Each pulling and stringing area would be approximately 100 feet by 120 feet.

2.3 Construction Phases

2.3.1 Site Preparation

2.3.1.1 Land Surveying and Staking

Geotechnical investigation and environmental clearance surveys would be performed at the Project site prior to commencement of construction activities. Prior to construction, the limits of construction disturbance areas would be determined by surveying, and where necessary, flagging and staking. Where necessary, the limits of the gen-tie ROW also would be flagged.

All construction activities would be confined to these areas to prevent unnecessary impacts on sensitive areas. These areas, which would include buffers established to protect biological resources, also would be staked and flagged. The locations of underground utilities, if any, would be located and staked and flagged in order to guide construction activities.

2.3.1.2 Clearance Surveys and Fencing

Prior to major vegetation removal and grading, fencing would be installed around the perimeter of the construction area to prevent wildlife from moving onto the Project site from adjacent areas.

2.3.1.3 Vegetation Removal and Treatment

Vegetation would be permanently cleared from roadways, access ways, and where concrete foundations are used for the battery storage containers, PCS containers, substation, and O&M facilities. Removal of vegetation would be minimized to the extent reasonably practicable.

2.3.1.4 Site Clearing, Grading, and Excavation

The project will use a mowed approach to minimize grading of the project area.

All earthwork required to install access roads, equipment pads, and foundations for Project-related buildings would be balanced on site. Trenching would be required for placement of underground 34.5 kV collector lines. The solar field would require a positive natural terrain slope of less than 5 percent.

The drive and crush technique would be used generally to prepare the surface of the solar field for post and PV panel installation. The drive and crush method would involve driving over the vegetation but maintaining the seed back and roots to allow regrowth of native vegetation.

Drive and crush would be implemented utilizing skid steer vehicles or other tracked vehicles and minimizing the construction passes during installation would encourage continued viability of the native plant community. Construction would be accomplished through use of equipment selected to minimize width of footprint, minimize weight of equipment and ground pressure, and allow extended reach across multiple solar array rows. In areas where the terrain is not suitable for drive and crush, conventional cut and fill grading would be used.

Within the solar field, some grading would be required for roads and access ways between the solar arrays, and for electrical equipment pads. In general, the design standard for the roads and access ways within the solar field would be consistent with the amount and type of use they would receive. The substation would require a graded site to create a relatively flat surface for proper operation, with approximately 1 percent maximum slope in either direction.

2.3.1.5 Gravel, Aggregate, and Concrete Needs

Concrete would be poured in place for equipment and building foundations, fence footing and miscellaneous small pads. Aggregate material would be used for the trench backfill, parking lot and substation area (and if determined necessary, for the perimeter road and access roads). Riprap material may be required for erosion control. The substation interior within the fence would be covered with aggregate surfacing for safe operation. The Project access route and gen-tie line spur roads would typically be constructed or improved by compacting soil. Internal perimeter and access roads are generally not anticipated to require gravel.

2.3.1.6 Road System Construction

The Project site access route would be improved to serve Project traffic. Preconstruction activities for the interior access and perimeter roads would include meeting any necessary flora salvage requirements. The construction entrance and exit gates would be established. The Project's main access point would be graded and constructed in order to facilitate entry to the Project site. Within the solar field, some grading would be required for roads and access ways between the solar arrays.

The gen-tie lines and spur roads would be located adjacent to or crossing existing transmission corridors granted to SRP. Any temporary or permanent crossings under existing transmission lines would be coordinated and approved with SRP or the line owner. In addition, the use of all existing permitted roads would be coordinated with SRP or other owner.

Some portions of the gen-tie line access roads and access road options pass within designated floodplains. Roadways within the designated FEMA floodplains would be constructed per the guidelines outlined in Chapter 9 of *Low Volume Roads Engineering, Best Management Practices Field Guide* (2003), as approved by the BLM.

2.3.2 Solar Facility Construction

2.3.2.1 PV Solar Array Assembly and Construction

Prior to any construction in PV equipment areas, the clearance and site preparation steps for those areas would be completed. Within each area designated for PV equipment, the construction sequence would follow a generally consecutive order:

1. The construction of the solar field would proceed by array. Within each array, materials for each row of PV modules would be staged next to that row. Prepare trenches for underground cable;
2. Install underground cable;
3. Backfill trenches;
4. Install steel posts and table frames;
5. Install PV modules;
6. Install concrete footings for inverters, transformers, and substation equipment;
7. Install inverter and transformer equipment;
8. Perform electrical terminations; and
9. Inspect, test, and commission equipment.

Cable trenches would be used to provide underground connection of Project equipment. Trenches would contain electrical conductors for power generation and fiber optic cables for equipment communication. Trenches would vary between 2 to 3 feet wide and 2 to 3 feet deep depending on the number of conductors and voltage of equipment to comply with applicable electrical codes.

The assembled solar equipment would be installed on steel posts to which steel table frames would be attached. Trucks would be used to transport the PV modules to the solar field, and skid steers (lightweight tracked vehicles) would bring the modules into the rows. A small mobile crane may be used to assist construction workers in setting the solar modules on the driven steel posts. Final solar field assembly would require small cranes, tractors, and forklifts.

2.3.2.2 Substation Construction

The substation would be constructed in compliance with applicable electrical safety codes. Substation construction would consist of site grading, concrete equipment foundation forming and pouring, crane-placed electrical and structural equipment, underground and overhead cabling and cable termination, ground grid trenching and termination, control building erection, and installation of all associated systems including, but not limited to heating, ventilating, and air conditioning (HVAC) system components; distribution panels; lighting; communication and control equipment; and lightning protection.

The substation area would be excavated to a depth of 10 feet. A copper grounding grid designed to meet the requirements of IEEE 80, "IEEE Guide for Safety in AC Substation Grounding," would be installed and the foundations for transformers and metal structures would be prepared.

After installation of the grounding grid, the area would be backfilled, compacted, and leveled followed by the application of 6 inches of aggregate rock base. Equipment installation of the transformers, breakers, buswork and metal dead-end structures would follow. A pre-fabricated control house would be installed to house the electronic components required of the substation equipment.

2.3.3 Electrical Collection and Transmission System Construction

2.3.3.1 Overview

Electrical construction would consist primarily of the following elements:

1. **Equipment**: Installation of all electrical equipment including BESS containers, DC/DC combiner boxes, PCS containers (including inverters and transformers), circuit breakers, disconnect switches, switchgear and distribution panels, lighting, communication, control, and SCADA equipment.
2. **Cables**: Installation of all cables necessary to energize the Project equipment including instrument control wiring. High, medium, and low voltage cables would be routed via cable trays, above-grade conduits, below-grade conduit in duct bank, and overhead structures.
3. **Grounding**: All equipment and structures would be grounded as necessary. Within the solar field, an appropriate grounding system would be engineered and constructed in order to maintain personnel safety and equipment protection.

4. **Telecommunications**: Multiple communication systems would be required for the Project to properly operate, including T1 internet cables, fiber optic, microwave, and telephone. All communications would be installed during electrical construction.

2.3.3.2 Standard Transmission Line Construction Techniques

The Project would include an overhead 500 kV gen-tie line. Standard transmission line construction techniques would be used to construct the collector and gen-tie lines. Primary stages in transmission line construction are foundation installation, tower installation, and conductor stringing. In general, little to no grading is expected to be required for these areas. Typical equipment expected to be used for transmission line construction includes: backhoe, truck-mounted tower hole auger, forklift, crane, line truck with air compressor, various pickup and flatbed trucks, conductor reel and tower trailers, bucket trucks, and truck-mounted tensioner and puller.

The steel towers or monopoles used for the gen-tie would be supported by steel-reinforced poured pier concrete foundations suitable for the sandy soils conditions at the site. These foundations are constructed by auguring a cylindrical hole using a truck-mounted drilling rig. Reinforcing steel and anchor bolt cages would be installed in the hole and then the hole would be backfilled with concrete. Steel foundations would range in size from approximately 4 to 7 feet in diameter, and in depth from 12 to 30 feet.

The 34.5 kV collection system may be installed on overhead lines, instead of trenched underground or in a tray system. Wood or metal poles used for the overhead 34.5 kV collector line would be embedded into the ground to a depth of at least 10 percent of the pole height plus 2 feet. Installation of wood or metal poles is anticipated to require auguring holes approximately 2 feet in diameter and 6 feet deep. Aggregate or high strength backfill would be used to stabilize the installed poles. Angle points on the 34.5 kV collection line could require steel poles supported by steel-reinforced poured pier concrete foundations.

Poles for the 500 kV gen-tie lines and 34.5 kV collection system (if installed overhead) would be placed onto their foundations (for wood, placed into their holes) using backhoes or heavy lifter vehicles for the smaller, lighter poles, or a crane for longer poles. The poles would be supported, as necessary, during backfilling or bolting to the foundation to ensure correct pole seating.

It is anticipated that conductor stringing would be conducted one phase at a time, with all equipment in the same operational place until all phases of that operation are strung.

Ground rods would be hammered into the earth with a jackhammer device attached to a small excavator (such as a Bobcat). Typically, the rods are 8 to 12 feet long and can be longer if needed by joining multiple rods. For the 34.5 kV poles, a 3-foot square by 2-foot-deep area would be excavated to expose the ground rod for connection to the plant's grounding grid.

2.3.4 Testing and Commissioning

Commissioning involves visual, mechanical, and electrical inspections that start on both DC and AC ends of the solar system. Upon completion of AC and DC inspections, the inverter is energized so that testing of operations can be completed. Testing and inspections of solar equipment and facilities would begin as soon as construction is complete and may occur on a rolling basis if parts of the Project site are completed. Once inspections and commissioning is completed, the system can be connected to the grid and operations would begin.

2.4 Site Stabilization and Protection

Appropriate water erosion and dust-control measures would be implemented to prevent an increased dust and sediment load to ephemeral washes around the construction site and to comply with Navajo County dust control requirements. Dust during construction would be controlled and minimized by applying water and/or BLM-approved palliatives.

The Applicant would employ BMPs to protect the soil surface by covering or binding soil particles. The Project would incorporate erosion-control measures required by regulatory agency permits and contract documents as well as other measures selected by the contractor. Project-specific BMPs would be designed by the contractor and included in the Project Stormwater Pollution Prevention Plan (SWPPP).

2.5 Construction Water Use and Dust Control

2.5.1 Water Use

An estimated 950 acre-feet (AF) of water would be required over the Project construction period for construction-related activities, including dust control. The construction water use estimate is based on the median water use of other solar power plant installations in the desert areas of Arizona and neighboring states. Actual water use varies widely at different facilities depending on weather, soil, and vegetation conditions encountered during construction. The source of water needed for construction is under development but would be similar to those described for the Project operation and maintenance and could include purchasing from a commercial source or user with an existing appropriation and trucking to the site or purchasing an existing appropriation and accessing the water through new groundwater wells (Refer to Section 1.3.8: Water for details on the infrastructure installed). If the trucking option is selected, 4,000-gallon (15,142 liter) capacity trucks would be needed to deliver water to the Project site at the O&M area in the northwest corner of the Project throughout the construction period.

2.5.2 Dust Palliatives

If dust palliatives are used in place of water for the Project, the total amount of water needed during construction would be reduced. The Applicant may opt to use such palliatives, as authorized by the BLM for the Project. The soil binder/dust palliatives that are proposed for the Project, and which the BLM previously has allowed are:

- Road Bond 1000
- For roads and heavy traffic areas: Soil Cement
- For non-traffic areas on finer soils: Formulated Soil Binder FSB 1000

- For non-traffic areas on sandier/rockier soils: Plas-Tex
- Alternatives as approved by the BLM

2.6 Wastewater

Wastewater generated during construction would include sanitary waste from portable toilets. This waste would be collected by a contracted sanitary disposal service and transported to a licensed disposal facility.

2.7 Workforce, Schedule, Equipment, and Materials

The on-site construction workforce would consist of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel. The on-site construction workforce is anticipated to be an average of 300 to 400 construction workers with a peak of up to 500 workers at any given time. Most construction staff and workers would commute daily to the jobsite, primarily from within Navajo County.

Construction generally would occur between 5:00 a.m. and 5:00 p.m. and may occur 7 days a week. Additional hours may be necessary to make up schedule deficiencies, or to complete critical construction activities. For instance, during hot weather, it may be necessary to start work earlier (e.g., at 3:00 a.m.) to avoid work during high ambient temperatures. Further, construction requirements would require some night-time activity for installation, service or electrical connection, inspection and testing activities. Nighttime or evening/dawn construction activities, if required, would be performed with temporary lighting.

Construction activities would follow a generally consecutive order, however, most construction activities associated with each construction component would overlap to some degree and would include the following:

1. Construction or improvements to the primary access road;
2. Installation of security fencing;
3. Installation of BMPs and erosion control measures;
4. Site preparation activities and construction of the gen-tie and internal access roads, laydown areas, substation and equipment concrete pad, and distribution line (if feasible);
5. Construction of drainage control features;
6. Installation of posts and tracker structures;
7. PV module assembly;
8. Installation of electrical collection system, PCSs, PVCSs, and substations; and
9. Testing and commissioning.

Table 2-1 through Table 2-3, below, provides a description of the on-site equipment expected to be used for solar panel array and collection system construction (Table 2-1), substation construction

(Table 2-2), and gen-tie line construction (Table 2-3). The quantities of each piece of equipment needed will be determined as the project development timeline approaches constructions. Actual construction equipment details may vary.

TABLE 2-1 ESTIMATED ON-SITE EQUIPMENT FOR SOLAR PANEL ARRAY AND COLLECTION SYSTEM CONSTRUCTION

Equipment Description	Horsepower	Fuel Type
Install Fencing		
Rough Terrain Forklift	75	Diesel
Delivery/Work Trucks	200	Diesel
Install BMP Measures (Part of Site Preparation)		
Rough Terrain Forklift	75	Diesel
Delivery / Work Trucks	200	Diesel
Site Prep – Solar Arrays		
Truck, Pick-Up (Survey Crew)	180	Gas
Grader	200	Diesel
Backhoe/Front Loader	120	Diesel
Tractor / Disc	210	Diesel
Scraper	265	Diesel
Compactor	120	Diesel
Water Truck	175	Diesel
Site Prep – Roads		
Grader	200	Diesel
Backhoe/Front Loader	120	Diesel
Compactor	120	Diesel
Water Truck	175	Diesel
Dump Truck	235	Diesel
Post Installation		
Delivery / Work Trucks	200	Diesel
Post Machine	45	Diesel
Rough Terrain Forklift	75	Diesel
Install Support Structure		
Rough Terrain Forklift	75	Diesel
Delivery / Work Trucks	200	Diesel
Install Inverters and Switchgear & sub-structure		
Crane	125	Diesel
Backhoe/Front End Loader	120	Diesel
Delivery / Work Trucks	200	Diesel
DC and AC Wire Installation (underground)		
Backhoe/Front Loader	120	Diesel
Crawling Trencher	100	Diesel
Mini-Excavator	42	Diesel
Delivery / Work Trucks	200	Diesel
DC and AC Wire Installation (aboveground)		
Rough Terrain Forklift	75	Diesel
Delivery / Work Trucks	200	Diesel
Module Installation		
Rough Terrain Forklift	75	Diesel

TABLE 2-1 ESTIMATED ON-SITE EQUIPMENT FOR SOLAR PANEL ARRAY AND COLLECTION SYSTEM CONSTRUCTION

Equipment Description	Horsepower	Fuel Type
Delivery / Work Trucks	200	Diesel
Operations and Maintenance Building		
Rough Terrain Forklift	75	Diesel
Manlift	110	Diesel
Misc. (Across Project Site)		
Crane, Hydraulic, Rough Terrain	125	Diesel
Delivery: Truck, Semi, Tractor	310	Diesel
Delivery: Truck, Flatbed, 1 Ton	180	Diesel
Forklift, less than 5 Ton	75	Diesel
Forklift, greater than 5 Ton	85	Diesel
Motor, Auxiliary Generator Power for trailers	24	Diesel
Trailer, Office, 40’	N/A	N/A
Trailer, Office, 20’	N/A	N/A
Skid Steers	75	Diesel
AWD Gator/Cart	15	Diesel
Water Truck	175	Diesel
Delivery / Work Trucks	200	Diesel
Electrical Generators/Pumps	50	Diesel

TABLE 2-2 ESTIMATED ON-SITE EQUIPMENT FOR SUBSTATION CONSTRUCTION

Equipment Description	Horsepower	Fuel Type
Steel Structures		
Boom Truck - 33 Ton	290	Diesel
Manlift	110	Diesel
Material Delivery - Hwy Tractor w 40’ Flat	220	Diesel
Insulators, Bus, & Electrical Equipment		
Boom Truck	220	Diesel
Manlift	110	Diesel
Welder Truck	210	Diesel
Material Delivery - Hwy Tractor w 40’ Flat	310	Diesel
Material Delivery - Heavy Haul	300	Diesel
Crane	500	Diesel
Control Wiring		
Boom Truck	220	Diesel
Manlift	110	Diesel
1 ton crew vehicle	260	Diesel
Fiber Splicer Van	180	Gas
Test Equipment Van	180	Gas
Rough Terrain Forklift	75	Diesel

TABLE 2-3 ESTIMATED ON-SITE EQUIPMENT FOR MILE OF GEN-TIE LINE CONSTRUCTION

Equipment Description	Horsepower	Fuel Type
Install BMP Measures (Part of Site Preparation)		
Rough Terrain Forklift	75	Diesel
Delivery / Work Trucks	200	Diesel
Site Prep – Roads		
Grader	200	Diesel
Backhoe/Front Loader	120	Diesel
Compactor	120	Diesel
Water Truck	175	Diesel
Dump Truck	235	Diesel
Steel (Hauling, Shake-Out, Assembly and Erection)		
Crane, Hydraulic, 150/300 Ton	250	Diesel
Crane, Hydraulic, Rough Terrain, 25 Ton	125	Diesel
Truck, Flatbed w/Boom, 12 Ton	235	Diesel
Truck, Crew Cab, Flatbed, 1 Ton	180	Gas
Truck, Semi Tractor	310	Diesel
Trailer, Flatbed, 40’	N/A	N/A
Water Truck	175	Diesel
Motor, Auxiliary Power	5	Gas
Compressor, Air	75	Gas
Conductor / Shield Wire / OPGW (Stringing, Sagging, Deadending and Clipping)		
Truck, Flatbed, w/ Bucket	235	Diesel

TABLE 2-3 ESTIMATED ON-SITE EQUIPMENT FOR MILE OF GEN-TIE LINE CONSTRUCTION

Equipment Description	Horsepower	Fuel Type
Tension Machine, Conductor	135	Diesel
Tension Machine, Static	135	Diesel
Truck, Sock Line, Puller, 3 Drum	310	Diesel
Truck, Wire Puller, 1 Drum	310	Diesel
Truck, Semi, Tractor	310	Diesel
Water Truck	175	Diesel
Truck, Crew Cab, Flatbed, 1 Ton	180	Gas
Back Hoe, w/ Bucket	85	Diesel
Truck, Mechanics	260	Diesel
Crane, Hydraulic, Rough Terrain	125	Diesel
Motor, Auxiliary Power	5	Gas
Cleanup		
Truck, Flatbed, w/ Bucket, 5 Ton	235	Diesel
Excavator, Bucket Type	165	Diesel
Truck, Semi, Tractor	310	Diesel
Truck, Dump, 10 Ton	235	Diesel
Motor Grader	110	Diesel
Truck, Flatbed	210	Diesel
Truck, Pick-Up	210	Diesel
Motor, Auxiliary Power	5	Gas

2.8 Construction Traffic

Typical construction traffic would consist of trucks transporting construction equipment and materials to and from the Project site and vehicles of construction employees commuting during the construction period. Most construction staff and workers would commute daily to the jobsite from within Navajo County. All traffic would use I-40 and AZ 77 to access the site. Prior to the start of construction, the Applicant would prepare a Traffic and Transportation Plan to address Project-related traffic.

2.9 Construction Power

A temporary overhead line from existing facilities crossing the site would be installed during construction to provide power to the laydown areas, if feasible. Alternatively, diesel generators may be used to provide temporary construction and operation power.

2.10 Site Restoration

The Applicant would prepare and implement a Site Restoration Plan. This plan would be implemented immediately after construction for the areas that are temporarily disturbed, such as portions of the gen-tie lines that involve disturbance.

SECTION 3
Related Facilities and Systems

3.1 Transmission System Interconnect

3.1.1 Proposed Transmission System

The overhead 500 kV gen-tie lines would be installed as described in Section 2.5.1 and would transmit power generated by the Project from the Project substation to the existing SRP Sugarloaf Substation.

3.1.2 Ancillary Facilities

To be determined.

3.1.3 Status of Power Purchase Agreements

The Applicant intends to sell power from the Project in accordance with a PPA to be negotiated with one or more utilities.

3.1.4 Status of Interconnection Agreement

Of the power produced by the Project, 300 MWAC would be conveyed to the SRP transmission system. The Project sponsor has submitted applications with SRP for an LGIA to interconnect 300 MWAC at the Sugarloaf Substation.

3.1.5 General Construction Standards

Construction would be conducted in accordance with the federal codes listed above and all applicable state and local codes. Local Navajo County codes would include Ordinance 01-19 – Outdoor Fire Ordinance, Title 22 – Buildings and Construction, Title 24 – Water, Sewage and Other Utilities and 2015 IRC and IBC – Electrical, Plumbing and Mechanical Codes.

3.2 Gas Supply Systems

The Project would not require a natural gas supply system.

3.3 Other Related Systems – Communication System Requirements

Multiple communication systems would be used for construction and operation. These items would include telephone, fiber optics, and T1 internet. The Applicant expects to utilize existing wired or wireless telecommunications facilities. In the event that these facilities are not available in the Project vicinity, the Applicant would install hard-wired (land-line) systems as part of the electrical construction activities or would supplement with small aperture (less than 1 meter) satellite communications gear.

SECTION 4
Operation and Maintenance

4.1 Workforce and Schedule

The facility would operate 7 days a week. Up to 6 people would be directly employed on the Project site. It is expected operations staff would be located within the O&M building or off-site, with site visits occurring daily for security, maintenance, and repairs.

4.2 Maintenance Protocol

A plant operation and maintenance program, typical of a project this size, would be implemented to control the quality of operation and maintenance. The frequency and type of maintenance is described in Table 4-1. During the first year of operation, the frequency of inspections would be increased to address settling and electrical termination torque (e.g., inspections shown as semi-annually are performed quarterly, inspections shown as annual are performed semi-annually). Vegetation across the Project site is trimmed to a height that allows it to maintain its habitat functions, except where vegetation must be kept cleared such as within the substation.

To maintain generation performance, PV array washing may occur up to 24 hours per day (including nighttime panel washing), with approximately two panel washes anticipated per year. The Project would not use process gas or other fuels for the power generation process. At designated intervals, approximately every 10 to 15 years, major equipment maintenance would be performed. Operation and maintenance procedures would be consistent with industry standards practices maintaining useful life of plant components.

4.3 Operational Modes

The Project is expected to have an annual equivalent plant availability of 92 to 98 percent. It would be possible for plant availability to exceed 98 percent for a given 12-month period.

The facility would be operated in one of the following modes:

1. Maximum continuous output for as many hours per year as sunlight is available.
2. Small portions of the facility may be temporarily shut down for maintenance and repairs, as necessary.
3. Only in the case of a transmission system disconnect would the facility encounter a full shutdown.

TABLE 4-1 ROUTINE MAINTENANCE PROTOCOL

Equipment	Maintenance Interval	Task
PV Modules	Quarterly	• Visually inspect panels for breakage and secure mounting • Visually inspect modules for discoloration • Visually inspect wiring for connections and secure mounting • Visually inspect mounting structure for rust and erosion around foundations • Manually clean localized debris from bird droppings, etc.
	Semi-Annually	• Clean modules if determined necessary
Inverters	Semi-annually	• Perform temperature checks on breakers and electrical terminations • Visual inspection of all major components and wiring harnesses for discoloration or damage • Measure all low voltage power supply levels • Inspect/remove any dust/debris inside cabinet • Inspect door seals • Check proper fan operation • Inspect and clean (replace if necessary) filters • Check electrical termination torque • Check the operation of all safety devices (e-stop, door switches, ground fault detection)
	Annually	• Check all nuts, bolts and connections for torque and heat discoloration • Calibrate control board and sensors • Inspect air conditioning units for proper operation
Medium voltage transformers	Semi-annually	• Perform temperature check • Inspect door seals • Record all gauge readings • Clean any dirt/debris from low voltage compartment
Substation transformers	Semi-annually	• Inspect access doors/seals • Inspect electronics enclosure and sensor wiring • Record all gauge readings
	Annually	• Inspect fans for proper operation • Calibrate temperature and pressure sensors • Pull oil sample for oil screening and dissolved gas analysis.
Breakers and switchgear	Semi-annually	• Inspect for discoloration of equipment and terminations • Inspect door seals
	Annually	• Check open/close operation
Overhead transmission lines	Annually (and after heavy rains)	• Inspect guy wires and tower angle • Visual inspection of supports/insulators • Visual inspection for discoloration at terminations

TABLE 4-1 ROUTINE MAINTENANCE PROTOCOL

Equipment	Maintenance Interval	Task
Roadways	Annually (and after heavy rain)	• Inspect access ways and roads that cross drainage paths for erosion
Vegetation	Semi-annually in all areas but will likely be an on-going activity	• Non-native and noxious weed inspections would be conducted in accordance with the BLM-approved Integrated Weed Management • Apply herbicides as necessary to control noxious weeds
	Every 3 years	• Mowing and hand trimming as needed to reduce vegetation height to 18 to 24 inches (46 to 61 centimeters). Mowing will be staggered and continuous with any one area being mowed around once every 3 to 5 years
Water Well	Annually	• Visual inspection • Pressure test
Operations and Maintenance Building	Semi-annually	• Check smoke detectors • Apply pesticides as necessary to control rodents and insects
	Annually	• Check weather stripping and door/window operation • Check emergency lighting • Inspect electrical service panel
Backup Power	Annually	• Visually inspect backup power system • Perform functional test of backup power system
Fencing	Quarterly (and after heavy rain)	• Inspect fence or vandalism and erosion at base

4.4 Water Use and Dust Control

Project operation would require up to 9 AF of water per year. The operational water use estimate is based on the median water use of other solar power plant installations in the desert areas of Arizona and neighboring states. Actual water use varies widely at different facilities depending on weather, soil, and vegetation conditions. The Project would not require significant amounts of water for panel washings.

Operation and maintenance would require the use of vehicles and equipment including crane trucks for minor equipment maintenance. Additional maintenance equipment would include forklifts, manlifts, and chemical application equipment for weed abatement and soil stabilizer treatment in the bioremediation area. Pick-up trucks would be in periodic on the site. No heavy equipment would be used during normal plant operation.

Dust during operation and maintenance would be controlled and minimized by applying BLM-approved palliatives (See Section 2.4, *Site Stabilization and Protection*). Water would only be used for occasional ground disturbing maintenance activities. Vegetation, including weeds, would be managed in accordance with the Site Restoration Plan and Integrated Weed Management Plan, which includes integrated pest management and weed control, as described in Section 1.3.14, *Vegetation Management*.

SECTION 5

Decommissioning and Site Reclamation

Decommissioning and site reclamation of the Project area after the solar generating facility permanently ceases operation would be conducted according to the Decommissioning and Site Reclamation Plan. Permanent closure would occur as a result of facility age, damage beyond repair to the facility, economic conditions, or other reasons. During decommissioning and reclamation, the installed power generation equipment and structures would be removed from the Project site and the roads obliterated. The area would be stabilized and revegetated, as required pursuant to the ROW grant. The ROW requested from the BLM is anticipated to be at least 30 years in duration. The ROW may, if granted, be extended, subject to the discretion of the BLM. The extension of the ROW may be subject to additional review under NEPA.

SECTION 6
Environmental Considerations

6.1 Site Characteristics and Potential Environmental Issues

The Project site is located within a variance area as analyzed in the Solar PEIS. This indicates that, based on the program-level review in the Solar PEIS, the Project site does not contain any major constraints to utility-scale solar energy development; such development would be permitted subject to site-specific conditions of approval.

A detailed analysis of site characteristics and environmental considerations will be provided in the NEPA document for the Project. The ROW application area is located approximately 7.8 miles south of the only designated Area of Critical Environmental Concern (ACEC) in the area. The Tanner Wash ACEC is a Colorado River Tributary running East-West north of Joseph City, Arizona, that usually remains dry. It encompasses a total of 4,650 acres and is composed of 950 acres of Federal land, 1,280 acres of State Trust land, and 2,420 acres of private land.

The ROW application area is designated as a National Park Service Identified High Potential Conflict Area, which warrants further discussion with the BLM to develop any appropriate mitigation measures. Two utility scale wind projects in the vicinity, Dry Lake I & II, a total of 61 turbines and 4.2 MW capacity, are located in close proximity on lands under this same designation. Other previously undiscovered archaeological resources may also be located in the Project area. The federally threatened Little Colorado Spinedace habitat of Chevelon Creek is located approximately 20 miles west of the north edge of the project boundary, however there are no creeks/streams/rivers within the proximity of the site.

The Project site is located entirely within an existing VRM Class compatible with solar development, VRM Class IV.

The project site is also located adjacent to an industrial pig farming operation.

An evaluation of these and other environmental resource areas to be covered in the NEPA analysis include, but are not limited to:

- Air Resources
- Acoustics
- Cultural Resources
- Native American Religious Concerns
- Wildlife; Migratory Birds; Threatened, Endangered, and Candidate Animal Species

- Vegetation; Invasive and Noxious Weeds
- Geology, Soils, and Mineral Resources
- Public Health and Safety (e.g., hazards and hazardous materials)
- Land Use (e.g., lands and access, other utility ROWs, military and civilian aviation, other federal lands managed by the Bureau of Reclamation, and areas of critical environmental concern)
- Paleontological Resources
- Recreation
- Socioeconomics and Environmental Justice
- Transportation
- Visual Resources
- Water Resources

6.2 Other Uses Near the Project Site

The nearest airport is Holbrook Municipal Airport, located 7.7 miles north of the Project site. While the Project site is not located under any military airspace or in a Department of Defense (DoD) Consultation Area, it is approximately 94 miles southeast of Army Guard Camp Navajo. Given that distance, Project elements would not affect the approach or departure corridors for runways at the base. Because the Project would not construct facilities taller than 200 feet, it would not require FAA evaluation of safety hazards. Consultation with DoD would occur during the NEPA process. It is noted similar solar PV facilities have been installed in the vicinity without major restrictions imposed by DoD.

6.3 Design Features

The BLM's decision in the Solar PEIS ROD includes amending land use plans in the six-state study area with: (1) programmatic design features that would be required for all utility-scale solar energy projects on BLM-administered lands; and (2) Solar Energy Zone (SEZ)-specific design features that would be required for projects in individual SEZs. The Applicant will incorporate the following management plans to be prepared for BLM approval. These plans will be prepared subsequent to issuance of a ROD supporting the issuance of a ROW grant for the Project:

- Bird and Bat Conservation Strategy
- Decommissioning and Site Reclamation Plan
- Dust Control and Air Quality Plan
- Spill Prevention and Emergency Response Plan
- Health and Safety Plan
    - Emergency Action Plan

  - Hazardous Materials and Waste Management Plan
  - Fire Protection and Prevention Plan
- Groundwater Monitoring and Reporting Plan (if needed)
- Flagging, Fencing and Signage Plan
- Lighting Management Plan
- Litter Policing Program
- Integrated Weed Management Plan
- Raven Management Plan
- Site Restoration Plan and Integrated Weed Management Plan
- Stormwater Pollution Prevention Plan
- Site Drainage Plan
- Traffic and Transportation Plan
- Environmental Construction Compliance Monitoring Program
- Worker Environmental Awareness Program (WEAP)

6.4 Mitigation Measures

The following are preliminary Applicant-proposed mitigation measures. These measures are subject to change based on the findings of site-specific technical analyses, the NEPA analysis, and BLM's decision in the project's ROD.

6.4.1 Migratory Birds

- If construction occurs during breeding season, a qualified biologist will survey the area for nests prior to commencement of construction activities. This shall include burrowing and ground-nesting species, in addition to those nesting in vegetation. If any active nests (containing eggs or young) are found, an appropriate buffer around the nest will be avoided until the young birds fledge.

- During construction in migratory bird season, the authorized biologist will clear ahead of the construction crews and flag and monitor any active nests found. If active nests are found within the construction zone, construction will only occur outside the buffer zone, until the nest is inactive.

6.4.2 Cultural Resources

- In consultation with BLM and with SHPO concurrence, any areas which contain cultural resources of significance or whose eligibility for inclusion on the National Register of Historic Places (NRHP) is unevaluated, will be avoided, mitigated, or "treated" and recorded as appropriate. Applicant employees, contractors, and suppliers will be reminded that all cultural resources are protected and if uncovered, the resource shall be left in place, work will cease, and notification will be made to the Applicant representative and the appropriate BLM authorized office, with written confirmation to follow, immediately upon such discovery.

- If construction occurs in proximity to an NRHP-eligible cultural resource site, Applicant will have an authorized cultural monitor on-site during the activity.

5.4.3 Reclamation

- Also refer to Section 1.3.14, *Vegetation Management*. For areas that have required clearing and/or grading work, restoration and reclamation procedures will be based on site-specific requirements and techniques commonly employed at the time the area is to be reclaimed and will include regrading, top soiling, and revegetating all disturbed areas.

- After construction is complete, disturbed work areas will be graded to the approximate original contour, and the area will be revegetated with BLM-approved seed mixtures. Most post-construction work will entail scarifying soils to reduce compaction and reseeding. Since only certain areas along the total Project alignment will be temporarily disturbed, a specific Site Restoration Plan will be prepared that describes the recommendations for each area.

6.4.4 Weed Management

Noxious weeds within the construction area are to be addressed by the initiation of mitigation measures in consultation with the BLM noxious weed management specialists. The BLM will require ROW monitoring and noxious weed abatement prior to and following construction. The Applicant will develop a project-specific Integrated Weed Management Plan and Site Restoration Plan prior to issuing any permits or undertaking construction. The Integrated Weed Management Plan and Site Restoration Plan will include preventive measures, treatment methods, and monitoring activities. At a minimum, the Integrated Weed Management Plan shall include the following preventive measures:

- All contractor vehicles and equipment will arrive at the work site clean and weed free.

- Prior to allowing access to vehicles and equipment in the ROW or ancillary facilities, an inspector will ensure that vehicles and equipment are free of soil and debris capable of transporting noxious weed seeds, roots, or rhizomes.

- The distribution line ROW and ancillary facilities will be inspected for noxious weeds prior to vegetation clearing on the ROW and ancillary facilities. Any infestations will be recorded for reference in clearing the ROW and ancillary facilities for construction and for post-construction monitoring.

- The contractor will implement the reclamation of disturbed lands following construction as outlined in the Site Restoration Plan.

- Continuing revegetation efforts will ensure adequate vegetative cover to prevent the invasion of noxious weeds.

- The contractor will ensure that straw bales used within the Project site for sediment barrier installations or mulch distribution are certified weed-free.

- Equipment will not be sprayed with pre-emergent chemicals as a preventive measure, as these chemicals target a wide range of vegetation. As a result, the use of such chemicals could affect the success of revegetation efforts.

6.4.5 Air Quality

- Water will be applied to the ground during the construction and use of the Project area, access roads, and other disturbed areas as necessary to control dust.

- If required by Navajo County, a fugitive dust permit from the Navajo County will be obtained prior to construction, and requisite dust control measures and BMPs will be implemented during construction and operation of the Project.

6.4.6 Fire Protection

- All Federal, State, and County laws, ordinances, rules, and regulations that pertain to prevention, pre-suppression, and suppression of fire will be strictly adhered to. All personnel will be advised of their responsibilities under the applicable fire laws and regulations. It will be the responsibility of the construction crews to notify the agencies when a project-related fire occurs within or adjacent to the construction area.

- The construction crews will be responsible for any fire started, in or out of the Project site, by their employees or operations during construction. The contractor will be responsible for fire suppression and rehabilitation. The crews will take aggressive action to prevent and suppress fires on and adjacent to the Project site and will use their workers and equipment on the project for fighting fires within the Project site.

SECTION 7
References

Arizona Corporation Commission. N.d. Renewable Energy Standard & Tariff. Arizona Corporation Commission. https://www.azcc.gov/utilities/electric/renewable-energy-standard-and-tariff

Avian Power Line Interaction Committee (APLIC), 2006. Suggested Practices for Avian Protection on Power Lines. [http://www.aplic.org/uploads/files/2643/SuggestedPractices2006(LR-2).pdf].

Bureau of Land Management (BLM). 1996. Partners Against Weeds, An Action Plan for the Bureau of Land Management. January 1996.BLM, 2012. Approved Resource Management Plan Amendments/Record of Decision (ROD) for Solar Energy Development in Six Southwestern States. October 2012. [solareis.anl.gov/documents/docs/Solar_PEIS_ROD.pdf].

BLM, 1994. Record of Decision for the Approval of the Safford Resource Management Plan and Environmental Impact Statement. July, 1994. https://eplanning.blm.gov/public_projects/lup/81813/110479/135298/Safford_RMP_Partial_ROD_II_July-1994.pdf

BLM. 2007. Vegetation Treatments Using Herbicides on Bureau of Land Management Land in 17 Western States. Final EIS, Washington: U.S. Department of the Interior.

BLM, 2012. Approved Resource Management Plan Amendments/Record of Decision (ROD) for Solar Energy Development in Six Southwestern States. October 2012. [Solareis.anl.gov/documents/docs/Solar_PEIS_ROD.pdf].

BLM. 2016. Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on Bureau of Land Management's Land in 17 Western States. Final EIS, Washington: U.S. Department of the Interior.

Keller PE, Gordon, and Sherar, James PE. 2003. Low-Volume Roads Engineering, Best Management Practices Field Guide.

The National Map and USGS. 2017. "The National Atlas: Federal and Indian Land Areas." Redlands, CA: Esri, December 21.

USEIA. 2020. How much electricity does an American home use? October 9. [https://www.eia.gov/tools/faqs/faq.php?id=97&t=3]

USEIA. 2019. Southwestern states have better solar resources and high solar PV capacity factors. June 12. https://www.eia.gov/todayinenergy/detail.php?id=39832

USEPA. 2020. Greenhouse Gas Equivalencies Calculator. March. [https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator]

USGS. 2020. “National Hydrography Dataset.”

USGS. 2020. “National Hydrography Dataset.”

USGS. 2018. “Protected Areas Database of the United States (PAD-US) Version 2.0.” September.

Vivid. 2018. “Aerial Imagery.” April 21.

ATTACHMENT A
Legal Description of Project Components

Legal Land Description

The Project site and gen-tie lines are located on the properties identified as follows. The current routing of the gen-tie lines is preliminary and subject to final engineering.

Project Site

Gila-Salt River Meridian, Arizona
T. 15 N., R. 21 E.,
sec. 4;
sec. 6;
sec. 10, W ½ ;
sec. 22, W ½ ; NW ¼ of NE ¼ ; SW ¼ of NE ¼ ; NW ¼ of SE ¼ ; SW ¼
T. 16 N., R. 20 E.,
sec. 12 ;
sec. 24 ;
T. 16 N., R. 21 E.,
sec. 06 ;
sec. 08 ;
sec. 18 ;
sec. 20 ;
sec. 28 ;
sec. 30

Gen-Tie Line

Gila-Salt River Meridian, Arizona
T. 15N., R. 21 E.,
sec. 28, NE ¼ of NE ¼ ; SE ¼ of NE ¼ ; NE ¼ of SE ¼ ; SE ¼ of SE ¼ ;
sec. 34, NW ¼ of NW ¼ ; SW ¼ of NW ¼ ; NW ¼ of SW ¼ ; SW ¼ of SW ¼
T. 14N., R. 21 E.,
sec. 04, NE ¼ of NE ¼ ; NW ¼ of NE ¼ ; SW ¼ of NE ¼ ; SE ¼ of NW ¼ ; NE ¼ of SW ¼ ; NW ¼ of SW ¼