Plan of Development

SILURIAN VALLEY WIND PROJECT

May 2011

Prepared for:

Bureau of Land Management
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Acronyms and Abbreviations

ACEC	Area of Critical Environmental Concern
APE	Area of Potential Effect
BLM	Bureau of Land Management
BMPs	best management practices
CARB	California Air Resources Board
CAISO	California Independent System Operator
CDFG	California Department of Fish and Game
CESA	California Endangered Species Act
CHU	Critical Habitat Unit
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
DOD	Department of Defense
DOI	Department of the Interior
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESCP	Erosion and Sediment Control Plan
FAA	Federal Aviation Administration
FO	Field Office
I	Interstate
kV	kilovolt
MDAB	Mojave Desert Air Basin
MDAQMD	Mojave Desert Air Quality Management District
MET	meteorological tower
mph	miles per hour
MTRs	Military Training Routes
MW	megawatt
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
OHV	off-highway vehicle
O&M	Operations and Maintenance

Pacific Wind	Pacific Wind Development, LLC
PM	particulate matter
POD	Plan of Development
rebar	reinforcement bar
RMP	Resource Management Plan
RPS	Renewable Portfolio Standard
ROW	right-of-way
SCADA	Supervisory Control and Data Acquisition
SB	Senate Bill
SWRCB	State Water Resources Control Board
SPCC	Spill Prevention, Control, and Countermeasures
SPTs	Standard Penetration Tests
SWPPP	Storm Water Pollution Prevention Plan
USFWS	U.S. Fish and Wildlife Service
VRM	Visual Resource Management
WTGs	wind turbine generators

1. Project Description

1.1 Introduction

Pacific Wind Development, LLC, (Pacific Wind), a subsidiary of Iberdrola Renewables, Inc., requests a right-of-way (ROW) grant to construct, operate, maintain, and decommission a wind energy generation facility with a maximum generating capacity of 200 megawatts (MW) in northeastern San Bernardino County, California. The proposed Silurian Valley Wind Energy project (the project) is within a 29,041 -acre ROW (the project ROW) on federal land under the jurisdiction of the U.S. Department of the Interior's (DOI's) Bureau of Land Management (BLM) within the Barstow Field Office (FO) area (Figure 1). Pacific Wind has prepared this Plan of Development (POD) as part of the ROW application for the project.

1.1.1 Type of Facility, Planned Uses, Generation Output

Pacific Wind proposes to construct a wind energy generation facility that would produce up to 200 MW of renewable energy using approximately 80 to 133 wind turbine generators (WTGs), ranging from 1.5 to 2.5 MW. All project components would be located on lands under the jurisdiction of the BLM; no private land would be impacted by the project.

1.1.2 Applicant's Proposed Schedule for the Project

The approximate schedule for the project is summarized below, with milestones for permitting, construction, and operation.

Permitting

- National Environmental Policy Act (NEPA) review conducted between July 2012 and January 2014
- Additional Permits obtained prior to February 2014
- ROW grant issued February 2014

Construction

- Pre-construction activity to begin 1st Quarter 2014
- Civil construction started March 2014
- Access roads completed May 2014
- WTG foundations completed June 2014
- Transmission line testing September 2014
- Interconnect energized October 2014
- Substantial completion November 2014
- Final completion December 2014

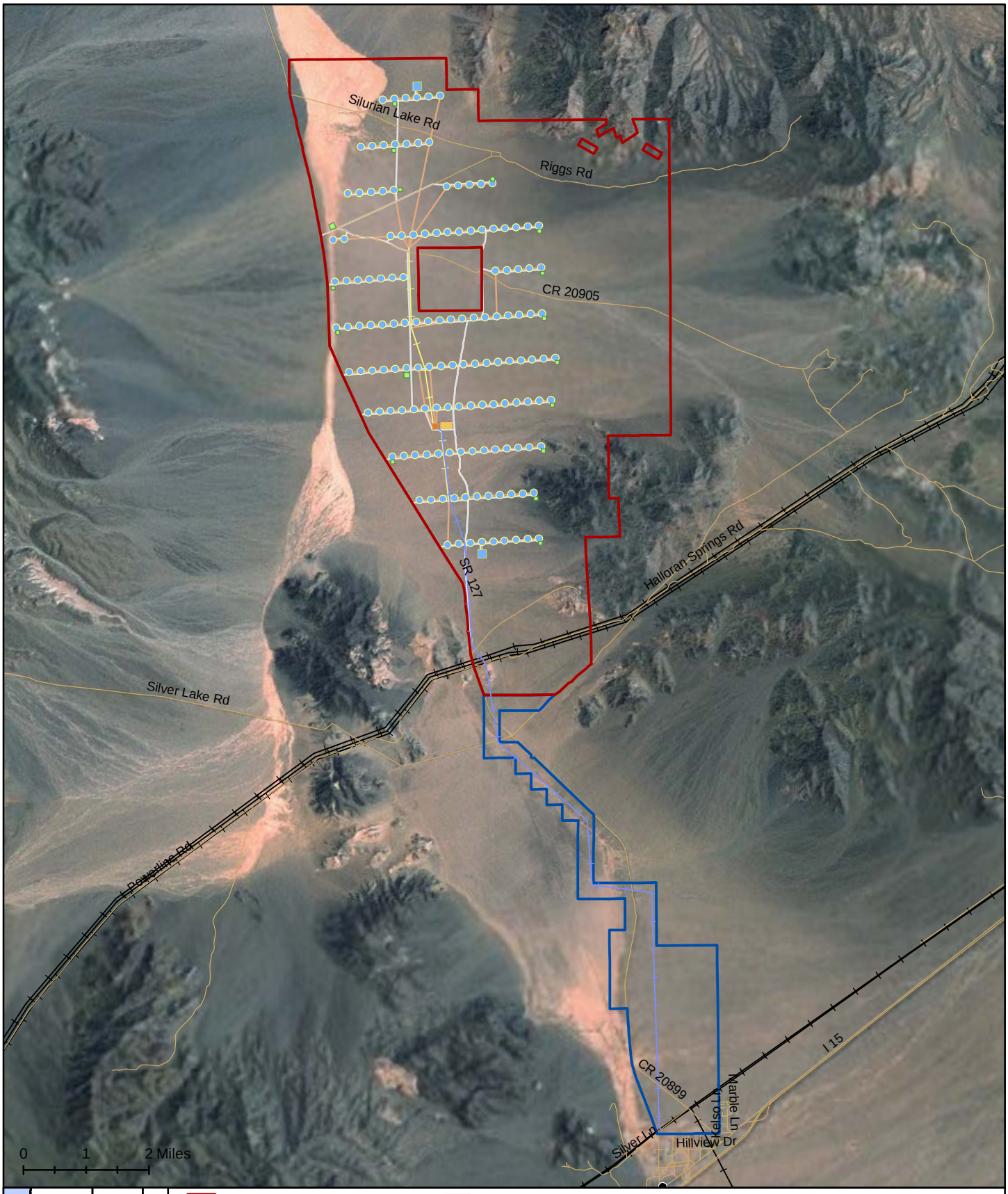

Figure 1
Project Overview
Silurian Wind Project
San Bernardino County, CA

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Modified Date: 5/12/2011

1.2 Purpose and Need for the Project

1.2.1 Applicant's Purpose

Pacific Wind proposes to develop a wind energy generation facility in San Bernardino County, California, on BLM-administered lands. The facility would help meet the requirements of various federal mandates for procuring energy from renewable sources. Additionally, the facility would help the state of California meet its Renewable Portfolio Standard (RPS) program goals. The RPS program is a state commitment to increase the proportion of energy generated from renewable sources to 20% by 2010 and to 33% by 2020.

1.2.2 Applicant's Need for the Proposed Action

The applicant's need for the proposed action is to comply with various federal and state laws, mandates, and regulations for increased development of renewable energy. At the federal level, these include:

- Secretarial Order 3283 Enhancing Renewable Energy Development on the Public Lands, signed January 16, 2009. Order 3283 facilitates the DOI's efforts to achieve the goal Congress established in Section 211 of the Energy Policy Act of 2005 to approve non-hydropower renewable energy projects on public lands with a generation capacity of at least 10,000 MW of electricity by 2015. Based on these federal policies, the BLM is obligated to consider the proposal expeditiously to accommodate the potential increase in power generation that, if approved, would begin on or before 2013.
- Secretarial Order 3285 Renewable Energy Development by the DOI, signed March 11, 2009. Order 3285 establishes development of renewable energy as a priority for the DOI and establishes a Departmental Task Force on Energy and Climate Change.

California's laws pertaining to renewable energy include:

- Senate Bill (SB) 1078, passed in September 2002, which set an RPS of 20% by 2020
- SB 107, passed in September 2006, which accelerated the RPS of 20% from 2020 to 2010
- Executive Order S-21-09, issued September 16, 2009, which set an RPS of 33% by 2020
- Senate Bill (SB) X1-2, signed by Gov. Edmund G. Brown Jr. in 2011, codifies 33% by 2020 RPS.

1.2.3 The BLM's Purpose and Need

The BLM's purpose and need for the wind energy project is to respond to Pacific Wind's application under Title V of the Federal Land Policy and Management Act (FLPMA; 43 USC 1761) for a ROW grant to construct, operate, and decommission a wind energy facility (and associated infrastructure) capable of producing up to 200 MW in compliance with FLPMA, BLM ROW regulations, and other applicable federal laws. The BLM would decide whether to approve, approve with modification, or deny issuance of a ROW grant to Pacific Wind for the proposed project. The decision the BLM would make is whether or not to grant a ROW and, if the ROW is granted, what terms and conditions would apply.

1.3 General Facility Description, Design, and Operation

This section describes the project, construction techniques, and permanent and temporary disturbances associated with construction and operation. Construction techniques and impacts are based on Pacific

Wind's preferred project; however, the sequencing of project construction would be similar for each of the alternatives referenced in Section 1.3.2.

1.3.1 Project Location, Land Ownership, and Jurisdiction

The project site is in northeastern San Bernardino County, California, in a rural area north of the town of Baker and east of Highway 127, on approximately 29,041acres of federal land administered by the BLM Barstow Field Office (FO). The project area is relatively flat (780 to 1,154 feet above mean sea level) and is dominated by creosote bush-scrub habitat. The project would be constructed entirely on BLM managed lands.

1.3.2 Legal Land Description of the Facility

The project would be located solely on lands administered by the BLM in San Bernardino, California. The legal land description of the project ROW is shown in Table 1-1.

Table 1-1 San Bernardino Meridian

T14N R8E	
Section	**Aliquot Parts**
1	N1/2 NW1/4, NE1/4, SE1/4, SE1/4 SW1/4
2	NE1/4 NE1/4
12	E1/2 W1/2, E1/2
13	E1/2, east of the Highway 127 Right-of-way
24	E1/2, east of the Highway 127 Right-of-way
T14N R9E	
Section	**Aliquot Parts**
7	All
18	All
19	All
T15N R8E	
Section	**Aliquot Parts**
1	NW1/4
2	All
4	All, east of the Highway 127 Right-of-way
9	All, east of the Highway 127 Right-of-way
14	All, northwest of the Hollow Hills Wilderness boundary
15	All, east of the Highway 127 Right-of-way
22	N1/2NE1/4, E1/2 NW1/4, E1/2SE1/4, S1/2 SE1/4 (west of the Highway 127 Right-of-way)
23	NW1/4 NW1/4, northwest of the Hollow Hills Wilderness boundary
26	NW1/4 (west of the Highway 127 Right-of-way), SW1/4 NE1/4 (west of the Highway 127 Right-of-way), NE1/4 SW1/4, SW1/4 (west of the Highway 127 Right-of-way)
27	NE1/4 NE1/4
35	E1/2 E1/2
T17N R8E	
Section	**Aliquot Parts**
31	All, east of the Highway 127 Right-of-way
32	All
33	W1/2, SE1/4

T16N R8E	
Section	**Aliquot Parts**
1	All (except private land)
2	All (except private land)
3	All
4	All
5	All
6	All, east of the Highway 127 Right-of-way
7	All, east of the Highway 127 Right-of-way
8	All
9	All
10	All
11	All
12	All
13	All
14	All
15	All
17	All
18	All, east of the Highway 127 Right-of-way
19	E1/2, east of the Highway 127 Right-of-way
23	All
24	All
25	All
26	All
29	W1/2, east of the Highway 127 Right-of-way
30	E1/2 E1/2, east of the Highway 127 Right-of-way
32	All, east of the Highway 127 Right-of-way
35	All

1.3.3 Total Acreage and General Dimensions of All Facilities and Components

Disturbance acreages for each project element are provided in Table 1-2.

Table 1-2 Conceptual or Projected Spatial Requirements by Project Element

	Dimensions			Disturbance (acres)	
Project Element	**Unit**	**Temporary**	**Permanent**	**Temporary**	**Permanent**
WTGs/Gravel Pads (80-133)	Square Feet	0	1,660'	0	<1
WTG Assembly Areas (80-133)	Square Feet	158,340	0	231-384	0
Staging Areas (15)	Length x Width	**	0	38	0
Crane Pads (80-133)	Length x Width	0	130'x95'	0	23-38
WTG Access Roads - New	Width	60'	16'-20'	223	60-74
WTG Access Roads - Existing	Width	60'	16'-20'	100	27-33
Central Staging Area (2)	Length x Width	**	0	10	0
Underground Collector Line	Width	24'	0	95	0
Overhead Collector Line (road)	Width	0	12'	0	6
Overhead Collector Line Structures	Length x Width	0	4'	**	**
Transmission Line (road)	Width	0	12'	0	19
Transmission Line Structures	Length x Width	40' x 40'	8'	**	**
Substation	Length x Width	0	**	0	5
O&M Building/Batch Facility	Length x Width	**	**	5	5
Permanent MET Tower (2)	Square Feet	2,500'	900'	0.07	0.04
TOTAL				703-856	145-180

Key:
' = Feet
O&M = Operations and Maintenance
WTG = wind turbine generator
** = to be determined

1.3.4 Number and Size of Wind Turbines

The project involves construction of approximately 80 to 133 WTGs. Each WTG would be approximately 400 to 480 feet tall at the maximum extension of the rotor blades ("tip height") and mounted on a reinforced concrete foundation. WTGs consist of three main aboveground components: the turbine tower, the nacelle, and the rotor. The turbine tower supports and provides access to the nacelle, which is the enclosure that houses the turbine's main shaft, gearbox, generator, brakes, bearings, cooling systems, and other components. The turbine rotor is composed of three turbine blades, which attach to the main shaft of the turbine via the hub. Dimensions for WTG pads as well as permanent and temporary disturbance acreages are shown in Table 1-2, above.

1.3.5 Wind Turbine Configuration and Layout

WTGs would be placed in turbine string lines running, generally, east–west. Access roads will parallel turbine strings and connect via north–south road(s). The location of each WTG was chosen to maximize that turbine's exposure to the prevailing winds and minimize the wake loss[1] for the entire project. Appendix A provides preliminary construction plans showing the placement of project elements,

[1] Wake loss refers to the turbulence created by each WTG as its blades spin in the wind. If WTGs are placed down-wind of each other, the amount of wake loss is high. Wake loss decreases the productivity of the site.

including WTGs. The project has been designed to best capture the wind resource of the project area and is highly sensitive to economies of scale. Maintaining this scale is an important component of meeting the project's purpose and need.

1.3.6 Transmission Lines, Substation, and Access Roads

Roads and transmission lines would be constructed or upgraded as needed to connect the project to existing infrastructure. Construction methods are described in Chapter 2, and a description of the electrical components is provided in Chapter 3. Electrical components would include:

- 34.5-kilovolt (kV) underground and overhead collection lines to transport power from the WTGs to an onsite project substation
- Project substation located on approximately 5 acres, which would include a main power transformer with oil containment
- 115-kV overhead transmission line, extending from the project substation approximately 10 miles southwest to the existing Baker substation
- Construction or enhancement of approximately 45 miles of access roads

As another option, Pacific Wind is considering a 230-kV overhead transmission line connecting the project substation to the existing Los Angeles Department of Water and Power 230-kV transmission line.

1.3.7 Ancillary Facilities (Administrative and Maintenance Facilities and Storage Sites)

An Operations & Maintenance (O&M) building and temporary batch facility would be co-located on approximately 10 acres within the project site (Figure 2). This area would include the O&M building, a small structure for spare parts storage, a covered parking garage for some maintenance vehicles, a graveled area for equipment construction and storage, and a temporary batch plant.

1.3.8 Temporary Construction Workspace, Yards, and Staging Areas

During construction, the following temporary work areas and facilities would be needed (Figure 2):

- WTG staging areas with up to a 200-foot radius
- Fifteen 2.5-acre staging areas at the end of turbine strings
- Two 5-acre central staging area
- Offices (trailers)
- Tool sheds/containers
- Chemical toilets
- Parking for construction equipment and vehicles

1.3.9 Water Usage, Amounts, and Sources during Construction and Operations

During construction, the project would use an estimated 18 million gallons of water (Table 1-3). Water would be obtained from permitted commercial or municipal sources, either off- or on-site. During construction, water would be used to mix concrete for WTG footings and for the project substation, interconnect station, and O&M building foundations. Water would also be required for dust control (see Section 2.14.1) and for compaction. Following construction, an estimated 900,000 gallons per year would be used for toilets, drinking water, and the septic system to serve the permanent O&M staff.

Table 1-3 Water Use Summary

Period of Project	Description of Water Use	Quantity of Water
Construction	Concrete for WTG footings and substation, interconnect station, and O&M building foundations; dust control; compaction	18 million gallons
Operation	Toilets, drinking water, septic system	900,000 gallons per year

1.3.10 Erosion Control and Stormwater Drainage

Pacific Wind would develop a site-specific Storm Water Pollution Prevention Plan (SWPPP) to prevent offsite migration of contaminated stormwater and soil erosion. Existing stormwater prevention systems would be kept in place and maintained throughout construction (see Section 2.13).

1.3.11 Vegetation Treatment, Weed Management, and Use of Herbicides

Details of proposed methods to manage site vegetation, including non-native invasive weed control and herbicide use, are provided in Section 2.6.

1.3.12 Waste and Hazardous Materials Management

Pacific Wind would develop a Waste Management Plan that would include best management practices (BMPs), pursuant to the revised BLM Wind Energy Program, Policies and BMPs provided in Instruction Memorandum No. 2009-043 (BLM 2008). The plan would address both hazardous and nonhazardous wastes. It would identify the waste that could be generated and address hazardous waste determination procedures, waste storage locations, waste-specific management and disposal requirements, inspection procedures, and waste minimization procedures.

Nonhazardous Waste

Most waste generated during operations would be nonhazardous. Nonhazardous solid waste generated would include wastes typically associated with O&M activities (e.g., rags, empty containers, broken and rusted metal, and machine parts). The project would generate waste water and sanitary waste from the O&M building. A septic field or above-ground sewage holding tank would be used to collect sanitary waste.

Hazardous Waste

Pacific Wind would develop a Hazardous Materials Management Plan to determine the proper storage, use, transport, and disposal of each hazardous material. The plan would include inspection procedures, storage requirements, storage quantity limits, inventory control, nonhazardous product substitutes, and disposal of excess materials. It would also identify requirements for notices to federal and local emergency response authorities, including emergency response plans.

Small amounts of hazardous materials would be used and stored on site for construction and O&M, including hydraulic control fluid and transformer oil. A Spill Prevention, Control, and Countermeasures (SPCC) plan would be developed in accordance with federal regulations to protect the environment from potential spills of petroleum products.

Key aspects of the Hazardous Materials Plan would be:

- Hazardous materials would be properly stored to prevent vandalism or unauthorized access

- Containment units would be installed in accordance with federal, state, and local regulations
- No hazardous material would be stored within 200 feet of an identified critical area
- Absorbent materials would be available on site for use in cleaning up small spills
- If building materials, chemicals, or general refuse were being used, stored, disposed of, or otherwise managed inappropriately, the contractor would correct such defects within 24 hours of detection or notification

Waste Management Plan

A Waste Management Plan would be completed by Pacific Wind and submitted to the BLM for approval. This plan would focus on nonhazardous waste resulting from construction of the proposed project. It would address waste stream composition including solid wastes, liquids, and wastewater; collection and recycling; and particulate transport pathways and management. The plan would also include protocols for identifying hazardous waste, solid waste minimization, inspection, locations for temporary waste storage, and any specific handling and disposal requirements, as appropriate.

1.3.13 Fire Protection

Pacific Wind would develop a Fire Management Plan as required by the revised BLM Wind Energy Program, Policies, and BMPs (BLM 2008).

1.3.14 Site Security and Fencing

Temporary fencing may be installed around excavations that present a hazard to the public to limit access during construction. Permanent fencing would be installed and maintained around the electrical substation. Turbine tower access doors would be locked to limit public access. So that public access and recreational use can continue to be allowed, the applicant does not expect to install fencing or impediments to vehicle travel or pedestrians at WTGs.

1.3.15 Electrical Components, New Equipment, and System Upgrades

The electrical system would consist of the following components:

- Individual step-up transformers at each WTG
- A 34.5-kV underground and overhead electrical system
- A project substation
- An overhead 115-kV transmission line
- Interconnection with the existing Baker substation

1.3.16 Interconnection to the Electrical Grid

The project would interconnect with Southern California Edison's existing Baker substation. As another option, Pacific Wind is considering a 230-kV overhead transmission line connecting the project substation to the existing Los Angeles Department of Water and Power 230-kV transmission line.

1.3.17 Spill Prevention and Containment for Construction and Operation

An SPCC plan would be developed and would include training requirements and appropriate spill response actions for each material or waste stream. Secondary containment for hazardous materials

regulated by the governing agency would be provided. Fuel would only be stored on site for as long as it was needed, to limit risk of spillage. In case of an accidental spill of hazardous materials, documentation would be kept and provided to the BLM and other federal or state agencies, such as the U.S. Environmental Protection Agency (EPA), as required. The SPCC plan would be available for onsite review by representatives of the EPA during normal working hours. Portable sanitation facilities would be serviced by a licensed hauler and disposed of at a municipal sewage treatment facility. All temporary sanitation facilities would be removed at the end of construction.

1.3.18 Health and Safety Program

Pacific Wind would develop a thorough site-specific safety program to mitigate and eliminate injuries and to protect workers and the general public. Pursuant to the revised BLM Wind Energy Program, Policies and BMPs (BLM 2008), the health and safety program would:

- Identify all federal and state occupational safety standards applicable to the project
- Establish safe work practices for each task, including requirements for personal protective equipment, Occupational Safety and Health Administration standard practices for safe use of explosives and blasting agents, and measures for reducing occupational electric and magnetic field exposure
- Establish fire safety evacuation procedures
- Define safety performance standards
- Develop and implement a program to identify hazard training requirements for each major task and procedures for providing the required training
- Comply with a mutually agreeable setback requirement for WTGs from roads
- Identify requirements for temporary fencing around pertinent project facilities and measures to be taken during operations to limit public access to hazardous facilities

Additional precautions, such as consulting with local planning authorities about increased traffic during construction and planning the project to comply with Federal Aviation Administration (FAA) regulations, would also be undertaken as part of the health and safety program.

1.4 Other Federal, State, and Local Agency Permit Requirements

Other permits and approvals may be required for this project (Table 1-4). Additional studies would be conducted to confirm permit requirements.

Table 1-4 Permits and Approvals that may be Required to Construct the Project

Regulatory Authority	Permit, Approval, or Report	Permit Description	Comments
Federal			
BLM	2920 – (geotechnical testing permit)	Permit needed to perform geotechnical testing on the site.	
	SF 299 – Application for Transportation and Utility Systems and Facilities on Federal Lands (ROW authorization permit)	This permit serves all energy facilities.	This application starts the process to gain ROW on BLM land. SF 299 has been filed and amended..
	EIS	An evaluation of the project's effects on natural and human resources to determine the potential for significant impacts.	
	Fieldwork Authorization	Pursuant to Sec. 302(b) of P.L. 94-579, October 21, 1976, 43 U.S.C. 1732, and Sec. 4 of P.L. 96-95, October 31, 1979, 16 U.S.C. 470cc. Requires that applicant (cultural resources contractor) hold an active Cultural Use Permit issued by the BLM's California State Office.	
	NHPA Section 106 Review (36 CFR 800)	This act requires all federal agencies to consider the effect of their actions on historic properties (those listed in or eligible for inclusion in the NRHP). Applies to any federal undertaking, funding, license, or permit. The Advisory Council on Historic Preservation, the California State Historic Preservation Officer, the Tribal Historic Preservation Officer(s), and other consulting parties advise and assist the BLM in this effort.	The Advisory Council on Historic Preservation is provided an opportunity to comment if there might be adverse effects to [an] NRHP-eligible site or [public] controversy.
	NHPA Section 110; EO11593	The BLM, following the guidance and standards set by the Secretary of the Interior, would determine the appropriate approach for addressing cultural resources on BLM lands.	1. Archeological contractor needs to complete Class I inventory (e.g., file search for sites within APE).
			2. Archeological contractor needs to complete Class III survey of APE.
	POD	Plan for construction and operation of energy facilities must be completed prior to construction. Plan provides full project description including applicant information, site location, maps, and proposed operating plan. This POD is not finalized until completion of the NEPA document.	This document.

Table 1-4 Permits and Approvals that may be Required to Construct the Project

Regulatory Authority	Permit, Approval, or Report	Permit Description	Comments
Federal Aviation Administration	Form 7460 – Notice of Proposed Construction or Alteration	Required for erecting structures in excess of 200 feet tall.	
USFWS	Endangered Species Act Section 7 Consultation	The BLM must consult with USFWS if it proposes an "action" that may affect listed species or their designated habitat	This consultation will be contingent upon desert tortoise survey results.
Army Corps of Engineers	Section 401/404 Permit(s)	Applies if the project involves removal or placement of fill (i.e., soil, sediment, or most other material) in or near water bodies of the U.S. If a nationwide permit applies, no permit application is required.	Can be avoided if project remains outside of regulated waters and does not otherwise impact them.
State			
California Department of Game and Fish (CDFG)	2081 – Endangered Species Incidental Take Permit	The Applicant consults with CDFG about species protected under the CESA. Would require site surveys by qualified wildlife biologists.	Discussions need to be initiated with CDFG about permitting for species listed under CESA. CESA permitting can likely be completed at the same time as USFWS permitting/consultation. Although these are separate processes, a Consistency Determination could be issued to accommodate both permitting.
	California Fish and Game Code 1600 Streambed Alteration Agreement	Applies if streams are impacted from construction of the project.	Avoided if project remains outside the top of bed and banks of state jurisdictional streams. Avoidance is expected given the project's current design but will be verified through appropriate field surveys.
Mojave Desert Air Quality Management District	Permits to Construct and Operate		
California Department of Transportation	Hauling Truck and Other Overload Permits	Required for construction hauling.	

Table 1-4 Permits and Approvals that may be Required to Construct the Project

Regulatory Authority	Permit, Approval, or Report	Permit Description	Comments
State Water Resources Control Board	NPDES Construction Activities Storm Water General Permit	Required for land disturbance of greater than 5 acres. Permit application needs applicant information; project description, including size of area to be affected; and other environmental permits associated with the project.	As part of the general permit, a Storm Water Pollution Prevention Plan would be required.
California State Water Quality Control Board	Storm Water Discharge Permit	Required for construction site over 5 acres. Authorization to be covered under the NPDES Construction Permit and approval of a Storm Water Pollution Prevention Plan.	
Local			
San Bernardino County	CEQA	Public agency with approving authority must identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible.	
	Building Permit	Authorizes the construction of a structure within the county.	
	Grading Permit	A grading permit is required for an excavation greater than 2 feet in depth or a fill 1 foot or more in thickness.	
	Conditional Use Permit, Major Variance from Height Ordinance		

1.5 Financial and Technical Capability of Applicant

Pacific Wind is a subsidiary of Iberdrola Renewables, Inc. (Iberdrola). Iberdrola develops, builds, and operates renewable energy projects throughout North America and in 23 countries worldwide. Iberdrola currently operates more than 4,600 MW of wind power in 16 states across the U.S. and has been the second largest provider of wind power in the U.S. since entering the market in 2006.

Westwood Professional Services, Inc., has been contracted by Pacific Wind to provide preliminary engineering services for this project. As of the submittal date of this POD, a construction company, specific for this project, has not been retained by Pacific Wind.

Pacific Wind has contracted with Sapphos Environmental, Inc. and ASM Affiliates to conduct environmental and cultural resource surveys, respectively, for the proposed ROW.

2. Construction of Facilities

2.1 Wind Turbine Design, Layout, Installation, and Construction Processes Including Timetable and Sequence of Construction

2.1.1 Design, Layout, and Installation

Preliminary civil engineering designs for the project are provided in Appendix A. A general description of the project is provided in Section 1.4. Final project design, including final selection of WTG and project layout, will take place during the final phase of project permitting.

2.1.2 Construction Process Timetable and Sequence

Proposed major construction milestones are provided in Table 2-1. This schedule is preliminary and subject to change depending on a number of factors, including market conditions and equipment availability.

Table 2-1 Project Construction Schedule Major Milestones

Activity	Date
ROW Granted/Other permits obtained	February 2014
Begin construction/mobilize to site	March 2014
Assemble/erect wind turbine generators	June 2014
Interconnect ready to energize	October 2014
Finalize construction	December 2014

Construction of the project, from mobilization to the site to final completion, is expected to occur during a single build season, from the second to the fourth quarter of 2014. No construction phasing is proposed. Construction would proceed following receipt of all permits and agency approvals and would include the following activities, listed in approximate order of occurrence (some construction activities would occur simultaneously):

- Completing existing road upgrades and construction of new roads
- Surveying, staking, and general site work for the substation and interconnect site
- Excavating and constructing (for example, placing concrete) for WTG foundations
- Trenching and installation of underground electrical system
- Constructing the overhead collector line and transmission line
- Assembling and erecting WTGs
- Testing and commissioning of WTGs
- Restoring and reclaiming temporarily disturbed areas

Additional details of project construction activities are provided in Section 1.4.

2.2 Geotechnical Studies

Pacific Wind would conduct detailed geotechnical investigations to determine the final WTG foundation design, road design, and underground electrical system trenching requirements. Geotechnical investigations would be conducted before finalizing the engineering design. The locations and construction methods that would be used for these additional investigations would be detailed in a separate report.

Preliminary geotechnical analyses may be performed prior to more detailed investigations. Geotechnical investigations use various drilling and sampling techniques. Drilling techniques that could be used on site are described below. Samples would be analyzed to determine geological composition and soil and rock characteristics, most notably rock strength and ground density, which are critical elements in determining WTG foundation type. Representative methods used for preliminary investigations are described below, and similar techniques would be used for additional geotechnical investigations.

- **Tricone drilling** is a reverse circulation drilling technique that uses revolving grinders to penetrate the ground. This method produces small rock chips rather than a solid core sample, and is most effective in soft ground. The chips are collected continuously as the drill advances into the ground.
- **Split spoon sampling** is a sampling technique used to obtain a single core of subsurface material by drilling a metal tube into the ground. Once the core is extracted the tube can be "split," or opened vertically, exposing the sample, which is then analyzed using a standard penetration test.
- **SPT** is a common geotechnical test that uses a thick-walled sample tub of a predetermined size, which is driven into the ground at the bottom of a borehole using a slide hammer of a specific standardized weight. The test measures the number of blows needed for the tube to penetrate each 6 inches of ground, and provides an indication of ground density.
- **Geo barrel Coring**. This is the drilling technique used for the majority of boring locations because subsurface geology comprises soft, weak rock in most areas of the project site. The geo barrel enables collection of continuous samples.
- **Coring using a carbide drill bit**. This is a drilling technique used for boring locations on the project site, where sub-surface geology comprises areas of hard rock. This method also enables continuous samples to be collected and analyzed.

Results of the investigation will be used to refine project design and will thus be needed before the environmental review process for the project can be completed. Therefore, the detailed geotechnical investigation will undergo separate, independent environmental review and is not further addressed in this document.

2.2.1 Micrositing

Either prior to or in conjunction with the comprehensive geotechnical investigation, the locations of project elements would be evaluated to identify the most suitable locations within previously surveyed areas. Factors affecting WTG locations include potential for wind exposure and spacing between WTGs (for maximizing electric energy generation), distance from roads and property boundaries (for safety and noise considerations), and, when feasible, avoidance or reduction of potential environmental effects (such as visual impacts) or impacts on sensitive cultural or biological resources.

To begin micrositing, each location would be evaluated for construction suitability based on the factors described previously. A survey crew would locate and stake all project elements. If the location of any project element were determined to have a substantial adverse impact on the environment or to pose obstacles to construction, an alternate location might be evaluated, marked, and located via global positioning system (GPS) coordinates. Additional details of surveying and staking are provided in Section 2.5.

2.3 Access and Transportation System, Component Delivery, and Worker Access

Existing highway infrastructure would be used to deliver project components to the project site.

Pacific Wind's site plan uses Interstate 15, State Route 127, and new access roads. Primary access during construction and operations would be State Route 127 from the north and south. This route could require radius improvements and other upgrades. Details of road construction are provided in Section 2.7.1. Figure 2 depicts the current access road layout.

Pacific Wind would ensure compliance with BLM's road and safety standards. Pacific Wind would develop a Transportation Plan addressing the logistics and safety issues associated with transportation of WTG components, main assembly cranes, and other large pieces of equipment. All required permits such as the California Department of Transportation hauling truck permits would be obtained. California State and San Bernardino County restrictions would be identified and addressed. The Transportation Plan would identify hazards associated with truck traffic and other traffic flow, and provide measures to mitigate these hazards, such as flaggers, passing lanes, and barriers. The plan would establish a maximum speed limit of 25 miles per hour on the project site. The speed limit would be enforced to promote safety, reduce the potential for impacts on wildlife (such as those resulting from collisions), and limit generation of airborne dust. Dust control measures are further discussed in Section 2.13.1.

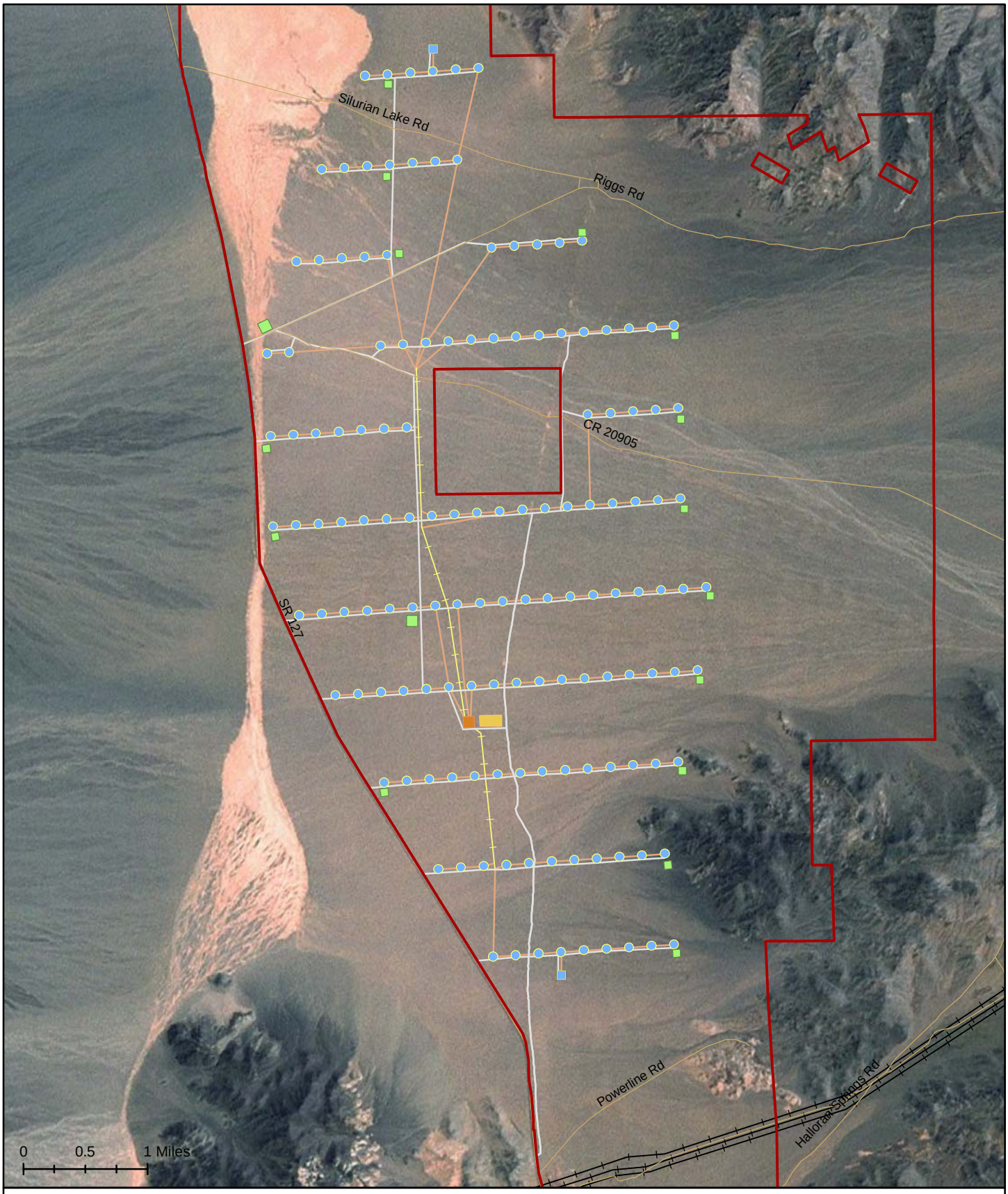

Figure 2
Project Access Roads
Silurian Wind Project
San Bernardino County, CA

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Modified Date: 5/12/2011

2.4 Construction Work Force, Vehicles, Equipment, and Timeframes

Construction would generally occur between 6 a.m. and 10 p.m., five or six days per week, for the duration of construction. Additional hours might be necessary to make up schedule deficiencies or to complete critical construction activities. For example, night work could be anticipated during WTG erection to allow for completion in low-wind conditions. During construction, workers would park in the construction (central) staging area.

The onsite construction workforce would consist of laborers (skilled and unskilled), craftsmen, supervisory personnel, support personnel, and construction management personnel. The construction workforce is expected to reach a peak of up to 300 onsite personnel.

Table 2-2 Typical Construction Equipment

Construction Equipment	Use
Excavator	Clearing
Bulldozers	Moving fill, clearing, grading
Multiple graders	Cutting subgrade and final grade
Off-road dump trucks	Moving cut or fill material
Compactor	Subgrade
Smooth drum vibrating compactor	Final subgrade and final grade
Large rubber tire rollers	Final grade
Belly dump trailers on tractors	Placing base material
Large excavator	Digging foundation hole
Water truck or other vehicle	Dust control/compaction
Track hoe	WTG foundation construction
Truck-mounted hydraulic jackhammer	WTG foundation construction
Loader	Backfilling
Small sheepsfoot roller	Compaction of each lift for backfill
Telescopic forklift	Moving and lowering steel into hole; assembling
40–60-ton crane	Lowering anchoring assembly
Graders (maintainers)	Cutting subgrade and final grade on pad; leveling and clearing work along trench line and leveling at completion of backfill
Larger trencher machine	Trenching
Padding machine	Placing cable bedding above and below cable
Remote dual drum compactor	Compacting the trench line in lifts
Smooth drum roller	Final compaction on top
Vertical drill rig	Drilling
Concrete truck or dry mix machine	Placing concrete
Rotating boom derrick	Holding pole level and in place, in preparation for concrete
Pulling trailers and pulling trucks	Guiding the cable
Boom trucks with man baskets	Providing worker access to cables
Rubber tire backhoe	Excavation and loading truck
Vibrating roller	Compaction
Small compaction machine	Compacting around foundation
Cranes (multiple sizes)	Setting breakers, placing transformers, lifting structures
Man lifts	Connecting steel electrical structures and installing overhead equipment
Jumping jack	Compaction following placement of foundation (in small areas)

2.5 Site Preparation, Surveying, and Staking

Following micrositing, but prior to construction, a licensed surveyor would conduct a land survey of the project site. Site surveying would be completed to delineate the construction sites, including WTG locations, pad boundaries, substation and O&M facility boundaries, and access road and underground electrical collection system centerlines. Transmission line surveying would delineate the transmission line ROW centerline and boundaries, transmission line tower locations, and access road centerlines. Construction exclusion areas, including cultural resources sites and environmentally sensitive areas (see Chapter 5), would be field-delineated to ensure avoidance during construction in consultation with BLM and Pacific Wind. Typical staking frequency is outlined below.

New access roads would be staked for horizontal and vertical alignment. Stakes would also be used to identify other linear elements (e.g., culverts or guard rails). Signage would be placed at intervals along the road to notify the public about the presence of construction.

WTG locations would be indicated by a stake at the center point, with outer stakes 100 to 200 feet outside of the center point to guide excavations.
Meteorological (MET) tower center points would be staked

Electrical collection centerline would be staked.

Transmission line centerline and structure locations would be staked.

Substation boundaries would be staked. Additional staking for pads, fencing, and grading within the boundaries would be provided to facilitate construction.

O&M building boundaries would be staked. Additional staking for pads, fencing, and grading within the boundaries would be provided to facilitate construction.

Temporary construction areas would include the construction staging area, crane path, and batch plant site. Boundaries would be staked.

2.6 Site Preparation, Vegetation Removal, and Treatment

Vegetation Removal

Vegetation would be cleared or cut immediately prior to construction. Removing vegetation immediately before construction at a given location would limit the potential for soil erosion and minimize the size of temporary disturbance areas. Additional details of measures to prevent erosion are provided in Section 2.12. A draft Revegetation Plan would be developed and submitted to the BLM for review and incorporated as part of the NEPA document.

Non-native invasive Weed Control

Non-native invasive weeds are plants that interfere with BLM land management objectives, as they may invade disturbed areas such as construction sites and may continue to invade for many years following the initial ground-disturbing activity. Construction equipment is a known weed vector and can transport weeds to previously weed-free areas or cause rapid increase of weeds that are already established.

A Non-native Invasive Weed Control Plan would be developed and submitted to the BLM for review and approval prior to the start of construction. This plan would focus on transport trailers and trucks coming from locations with harmful weed species. In compliance with the revised BLM Wind Energy Program Policies and BMPs (BLM 2008), this plan would address monitoring as well as educating personnel about weed identification, methods of spreading weeds, and methods for treating infestations. It would also describe additional precautionary actions stipulated by the BLM, such as use of certified weed-free mulch and seed, and a controlled inspection and cleaning area if trucks and equipment would be arriving on site from locations with known invasive species problems. Any herbicides used would be non-persistent and immobile, and would be applied only in accordance with label and application permit directions. Herbicides used would be subject to BLM Standard Operating Procedures and would be taken from the BLM list of approved herbicide formulations. Pacific Wind would coordinate weed control activities with the BLM Range Specialist.

The BLM requires that an Integrated Pest Management Plan be developed to ensure that applications are conducted within the framework of BLM and DOI policies and include only the use of EPA-registered pesticides.

2.6.1 Clearing and Grubbing

Mechanical clearing and grubbing would precede construction of all new project elements. Within temporary workspaces, vegetation would be maintained at a maximum height of 6 inches for site maintenance and fire-risk management. Vegetative debris would be piled or shredded and distributed in place in accordance with the BLM approved Revegetation Plan. If vegetation clearing is to occur within the avian breeding season, clearing restrictions, in terms of seasonal restrictions regarding nesting birds, will be considered early in the scheduling process and appropriate BMPs will be implemented. Erosion control measures would be employed in areas susceptible to erosion.

2.7 Site Grading and Excavation

As described in Section 2.6.1, site clearing and grading would be done immediately prior to construction activities to minimize the amount of topsoil exposed at any one time. The project environmental review will consider in detail potential effects on sensitive resources, which could include cultural and biological resources. BLM-approved monitors will be present on site during construction to minimize potential adverse effects on these resources.

Roads would typically be designed to have grades lower than 10%; however, site topography might require areas with grades greater than 10%. Where grades must be greater than 10%, erosion control measures would be implemented. Examples of these measures are presented in Section 2.13. Typically, excavation by backhoe/excavator would be done for the WTG and O&M facility foundations, and for the underground collection system, although a trencher could also be used to install the underground system.

2.7.1 Access Roads

Access road construction would begin with site preparation, including the construction of access entryways from public roads. Project design would account for terrain, access, and other engineering requirements (including safety of construction and maintenance activities), but would generally follow these criteria:

- General dimensions of access roads and crane paths as given in Table 1-2
- Approximately 30 miles of new and 15 miles of existing (enhanced) access roads

- Turning radius for WTG part delivery would be approximately 135 feet
- Road surfaces would be engineered for loading
- Speed limit would be 25 mph on all access roads

Roads would be constructed in multiple phases, starting with rough grading and leveling. Once rough grading was completed, base rock would be trucked in, as required, (from an offsite source) and spread and compacted to create a road base. Upon completion of heavy construction, a final pass would be made with the grading equipment to level road surfaces, and more capping rock would be spread and compacted if needed to repair damage from construction traffic. Side ditches would be excavated as needed to allow for natural drainage of water away from the road surface and to reduce the potential for erosion. Excavated soil and rock would be used for road construction or distributed on site.

Roads would be constructed in the following sequence:

1. Stake centerline, and boundaries of roads as necessary for construction.
2. Install temporary stabilization features, such as silt fences, straw wattles, and other controls, at the limits of construction.
3. Clear and grub area associated with road.
4. Separate and stockpile topsoil for later use.
5. Grade roads to slopes/design indicated on construction drawings.
6. Compact sub-grade.
7. Install aggregate road surface.
8. Re-vegetate disturbed areas associated with roadway corridor, according to Revegetation Plan that will be prepared and approved by BLM
9. Remove temporary stabilization measures once final stabilization/re-vegetation is established.

2.7.2 Foundation Excavation

Typical WTG foundations would be concrete with steel reinforcement bar (rebar) using a spread footing (a wide shallow foundation) 7 to 12 feet deep. Actual foundation design would depend on soil and subsurface conditions as determined during the geotechnical investigations. A reinforced concrete pedestal would be mounted on the foundation to hold the tower. Concrete would be supplied from an onsite batch plant located within the construction staging area, which would receive materials from offsite or onsite sources. The concrete footing would be covered with 6 to 8 feet of compacted backfill and 4 to 6 inches of topsoil, depending on soil conditions. Onsite quarries may be required.

The construction process for the tower foundations could vary, depending on engineering requirements and soil conditions. A typical process follows:

1. Clear and grub surveyed WTG location.
2. Excavate foundation hole.
3. Loosen rock, if necessary.

4. Complete excavation of foundation hole.
5. Install and set outer forms; place 3–4-inch-thick concrete base mat.
6. Construct rebar mat and pedestal anchor bolt cage, install foundation forms.
7. Place base foundation concrete.
8. Assemble forms in place for pedestal, place concrete for pedestal.
9. Backfill, re-grade, and prepare WTG erection area by clearing up to a 200-foot radius area graded to a 2 to 5% slope to promote drainage.

Temporary disturbance areas around turbine foundations will be restored according to the BLM-approved Revegetation Plan prepared by Pacific Wind.

2.8 Gravel, Aggregate, and Concrete Needs and Sources

Gravel, aggregate, and concrete would be needed for various project elements. Gravel would be needed primarily for the footprint areas surrounding the substation and WTGs, as well as for any permanent parking areas and roads. Aggregate would primarily be used for concrete.

Upon completion of the final engineering design, sources and amounts of gravel, aggregate, and concrete would be identified. It is anticipated that these materials would be obtained from onsite or offsite permitted sources.

2.9 Wind Turbine Assembly and Construction

WTG components consist of the tower sections, nacelle, hub and blades, and controller. Construction would involve establishing a temporary work area at each WTG site for delivery, staging, and assembly of components (see Table 1-2 for general dimensions of temporary work areas). Additionally, a crane pad would be constructed to facilitate lifting the components into place. When construction is complete, the crane pad may be retained for O&M functions, and would be used if replacement or repair of a major project component were required. The crane pad would also be used for parking maintenance vehicles. WTGs would occupy a permanent gravel pad (in addition to the crane pad) within the temporary work area.

2.10 Electrical Construction Activities

Underground collector lines and an overhead collector lines would run through the project site to the substation located in the center of the project ROW.

Underground Collector

Pacific Wind would install a 34.5-kV underground electrical collection system that would connect each WTG to the substation using 2-to-3-feet-wide and 3-to-4-feet-deep trenches. Trenches would typically be excavated with a trenching machine, excavator or backhoe; however, if competent rock were encountered at shallow depth, it would be necessary to jackhammer rock locally or drill and blast sections to open up a trench. In locations where two or more sets of underground lines converged, underground vaults and/or pad-mounted switch panels would be used to tie the lines together into one or more sets of larger feeder conductors. These large conductors, called "home runs," would be buried in the same manner as the individual conductors, with additional spacing from other conductors.

Installation of the electrical collection cables would involve disturbance of up to 24-foot-wide corridors adjacent to roads. It is Pacific Wind Development's intent to collocate the collector system with the

access roads where feasible and to the greatest extent possible. After installation of the underground electrical collection system was complete and final grading had taken place, the disturbed areas would be restored and reseeded.

Overhead Collector and Transmission

A 34.5-kV overhead collector line approximately 5 miles in length would connect the underground electrical collection system to the project substation. From the project substation, an overhead 115-kV transmission line, approximately 10 miles in length, would interconnect with the existing Baker substation. Another option being considered is an approximate 5-mile overhead 230-kV transmission line extending from the project substation to the existing adjacent 230-kV Los Angeles Department of Water and Power transmission line. It is assumed that the overhead transmission line would be placed on wooden H-frame structures, wooden or steel monopoles, or lattice towers, depending on the spans required and availability of components at the time of construction.

Project Substation

The electrical substation would be located on an approximate 5-acre graveled site and include the following typical construction activities:

- Survey/stake site
- Clear/grub site
- Grade site
- Construct concrete foundations for substation equipment
- Install base gravel across site
- Install substation components, including circuit breakers, power transformers, bus and insulators, disconnect switches, relays, battery and charger, surge arrestors, alternating and direct current supplies, control house, metering equipment, Supervisory Control and Data Acquisition (SCADA) system (the computer system monitoring and controlling the wind farm), grounding, associated control wiring, and fencing.

2.11 Aviation Lighting (Wind Turbines, Transmission)

A FAA Form 7460, Notice of Proposed Construction or Alteration, would be submitted to the FAA to identify any required air safety measures. Pacific Wind would comply with the FAA's aircraft safety lighting requirements for structures greater than 200 feet tall. In compliance with recent FAA guidance for wind energy projects, L-864 red flashing lights with a minimum intensity of 2,000 candelas would be installed on selected WTGs and operated at night to alert aviators to the presence of the project. FAA safety lights would be installed on towers while the nacelle was on the ground.

2.12 Site Stabilization, Protection, and Reclamation Practices

Construction has the potential to affect surface waters, particularly during site clearing and grading activities when vegetation is removed and/or disturbed. The effects are triggered by activities that result in soil exposure, which increases the potential for erosion. Erosion may cause pollutants and sediment to enter down-slope water bodies during periods of precipitation. Erosion potential would be greatest during construction, when large areas of soil would be disturbed.

Pursuant to guidelines given in the revised BLM Wind Energy Policies and BMPs (BLM 2008), Pacific Wind would implement the following site stabilization, protection, and reclamation practices:

- Limiting construction disturbance by clearly identifying and minimizing work areas
- Using existing roads in lieu of building new roads, when feasible
- Minimizing the overall number and size/length of project elements
- Minimizing vegetation removal

2.12.1 Site Stabilization: Erosion and Sediment Control

To minimize impacts to water quality, erosion and sediment control measures would be implemented. Construction activities would incorporate the following general practices:

- Sequencing construction activities with the installation of erosion and sediment control measures
- Installing straw mulching and re-planting vegetation in disturbed areas
- Retaining original vegetation where possible
- Directing stormwater runoff away from denuded areas
- Minimizing constructed slope steepness and length to keep runoff velocities low
- Protecting slopes susceptible to erosion by installing erosion controls such as straw bale barriers and gravel bags
- Stabilizing non-active areas following completion of construction

During construction, erosion would be controlled and sediment retained on site by implementation of BMPs. BMPs would be developed by considering site-specific drainage, topography, soil type, and other variables as appropriate for the construction season. Sediment control measures would include use of straw bale barriers, and silt fences, to reduce sedimentation and installation of barriers such as sediment traps, berms, ponds, and dams to direct and collect sediment and prevent it from entering waterways. Drainage pipes and inlets/outlets would be protected using engineered ditches and sloped aprons (contoured concrete structures that direct water flow) around rip-rap pipes. In vulnerable areas such as steep slopes and areas with erosion-susceptible soil, a multitude of techniques would be employed to control erosion and runoff. Where sediment barrier devices were used, BMPs would vary by drainage area as follows:

- Drainage areas less than or equal to 2 acres – temporary diversions, filter fabric, or straw bale barriers
- Drainage areas greater than 2 acres and less than or equal to 5 acres – sediment traps
- Drainage areas greater than 5 acres and less than or equal to 150 acres – sediment basins

Pumping suspended or re-suspended sediment can result in pollution of water bodies from sedimentation and contaminated runoff. Therefore, water pumped from the site would be treated by temporary sedimentation basins or other appropriate practices.

An Erosion and Sediment Control Plan (ESCP) would be prepared and approved by BLM before construction activities began. The ESCP would describe details and locations of conveyance systems, detention BMPs, and erosion and sediment control facilities. ESCPs are a component of Stormwater Pollution and Prevention Plans (SWPPPs), which are discussed in Section 2.13.2. The ESCP for the project would be prepared in accordance with applicable erosion and sediment control statutes and would incorporate erosion and sediment control measures required by agency permits.

2.12.2 Site Protection: Stormwater Control

Point and non-point stormwater discharges would be managed in accordance with the SWPPP and with NPDES permits. A detailed construction SWPPP would be developed and approved by BLM prior to the start of construction to minimize the potential for discharge of pollutants during construction. Site-specific BMPs would be identified for the project area and designed to meet appropriate regulatory requirements. They would include both temporary and permanent BMPs that would be implemented through the construction and operation phases. BMPs for controlling pollutants and runoff typically include the methods described below.

Diverting flow around a disturbed area reduces erosion and sediment transfer when a disturbed area cannot be stabilized immediately. Diverting runoff from the disturbed area also prevents pollutants from leaving the disturbed area.

Managing overland flow or "sheet flow" involves temporary and permanent measures to limit runoff and sediment transfer, such as silt and straw fencing, planting of grass seed or ground cover, or installation of lawn cover (sodding).

Maintaining permanent drainageways involves stabilizing areas of concentrated flow by seeding and sodding, constructing grassed waterways, or using geotextiles to construct rock- and concrete-lined waterways.

Protecting inlets involves construction of catch basins, culverts, and other conveyance structures to prevent pollutants from contaminating water bodies. Local agencies responsible for maintaining water quality typically require that all storm drain inlets be protected by using straw bales, filter fabric, or an equivalent barrier.

Preventing tracking involves ensuring that transporting sediment onto roadways via vehicles and construction equipment, or "tracking," is minimized, because tracked sediment carries a high risk of subsequently contaminating water bodies. These pollutants would be controlled by using wheel washes and installing sediment collection devices alongside roadways.

2.12.3 Inspection and Compliance Monitoring

Site Inspections

During construction, Pacific Wind would conduct site inspections every 14 days, as well as within 24 hours after 0.5 inches of rain had fallen. The onsite project manager would conduct the rainfall inspection or notify the site inspector that a rain event causing runoff had occurred and an inspection would be needed. Portions of the site that had been temporarily or permanently stabilized would be inspected once each calendar month until the Notice of Termination was submitted. The inspections could be reduced to once per month when runoff was unlikely due to winter conditions.

Pacific Wind would conduct inspections as specified in the SWPPP. Inspectors might include contractor personnel or other qualified individuals. Inspectors would be listed in the project contact information section of the Delegation section of the SWPPP. The following would be completed during each inspection:

- Record date and time of inspection.
- Record name of person(s) conducting inspection and their qualifications.
- Record rainfall events since most recent inspection.
- Inspect the site for excess erosion and sedimentation.
- Inspect the site for debris, trash, and spills.
- Inspect temporary erosion and sedimentation control devices.
- Inspect construction entrances for sediment tracking onto paved streets.
- Inspect the adjacent streets, curb, and gutter for sediment, litter, and construction debris.
- Inspect site runoff outfall or discharge areas.
- Record findings of inspection, including recommendations for corrective actions.
- Record corrective actions taken (including dates, times, and party completing maintenance activities.
- Certify/sign inspection reports.

Maintenance of BMPs

Pacific Wind or its agent/contractor would be responsible for operation, maintenance, and inspection of temporary and permanent water quality management BMPs, as well as all erosion prevention and sediment control BMPs, for the duration of construction. The controls in place would be maintained to ensure compliance with the SWPPP.

Criteria used to determine whether the erosion and sediment control devices required maintenance, repair, or replacement would be:

1. If sediment control devices such as silt fence or fiber rolls (wattles) were filled to 1/3 of the height of the control device, the contractor would remove all sediment within seven days of detection or notification.
2. If inlet/culvert protection devices appeared plugged with sediment, were filled to 1/3 capacity, or were surrounded by standing water, the contractor would remove the sediment and clean or replace the filter within seven days of detection or notification.
3. If a gravel construction entrance were filled with sediment or otherwise failing, the contractor would either replace the entrance or add gravel within seven days of detection or notification.
4. If sediment were observed on roads, the contractor would remove the sediment within three days of detection or notification.
5. If sediment were observed on roads, in surface waters, or on other properties, the contractor would identify the source and discharge location of the sediment and implement additional erosion and sediment controls at those locations to prevent future discharges. Sediment would be retrieved within seven days from surface waters unless additional regulatory approvals were

needed. The operator would be responsible for contacting all local, regional, state, and federal authorities to obtain any applicable permits prior to conducting any work to remove sediment that had been discharged from the site.

6. If excessive sediment or debris were observed at the flared end section outfalls, the contractor would determine the source and discharge locations of such materials. If the discharge had occurred on the property, the contractor would remove the sediments and debris within seven days of notification and correct the source of such materials.

2.12.4 Revegetation Plan

Pacific Wind would develop, and BLM shall approve, a Restoration Plan for restoration of all areas temporarily disturbed by the project. This plan would be implemented immediately following completion of construction for those areas disturbed during construction, including temporary roads, staging areas, and transmission line corridors. The plan may include, but not be limited to, the following provisions:

- Restoration of all areas of disturbed soil using weed-free native grasses, forbs, shrubs, and topsoil salvaged from all excavations and construction activities
- Re-vegetation with the site seed mix within 30 days of completion of final grade and surface
- Specification of the proper seasons and timing of restoration and reclamation activities to facilitate success

In addition, the plan would include procedures for annual reporting and an implementation and monitoring schedule. The plan would also prescribe specific success criteria and contingencies for not meeting success criteria.

2.12.4.1 Site Reclamation

Decommissioning would be completed in compliance with the revised BLM Wind Energy Policies and BMPs (BLM 2008) specific to decommissioning, as summarized below:

- Prior to the termination of the ROW authorization, a Decommissioning Plan would be developed for approval by the BLM. The plan would include site reclamation and monitoring.
- All management plans, BMPs, and other stipulations developed for the construction phase would be applied for similar activities during decommissioning.
- All WTGs and other project structures would be removed from the site.
- Where available, topsoil from all decommissioning activities would be salvaged and reapplied during final reclamation.All areas of disturbed soil would be reclaimed using weed-free native shrubs, grasses, and forbs.
- All vegetation cover, composition, and diversity would be restored using seeds and plants of appropriate local provenance to restore disturbed areas to original conditions consistent with the existing ecological setting.

3. Related Facilities and Systems

3.1 Transmission System Interconnect

3.1.1 Existing and Proposed Transmission System

Electrical Collection System

The project would use a 34.5-kV underground electrical collection system that would include lines between WTGs in buried trenches and connect to a 34.5-kV overhead collector line that would lead to a project substation (Figure 3a). The trenches would be approximately 2 to 3 feet wide and 3 to 4 feet deep. Where two or more sets of underground lines converged, underground vaults or pad-mounted switch panels would be used to tie the lines together into one or more sets of feeder conductors. Large conductors (home runs) would be buried in the same manner as described above, with additional spacing from other conductors. The amount of spacing between trenches would depend on final design, but typically ranges from 5 to 10 feet. After installation of the underground electrical collection system was complete and final grading had taken place, the disturbed areas would be restored consistent with the BLM approved Revegetation Plan. See Table 1-2 for anticipated temporary and permanent disturbance acreages and dimensions.

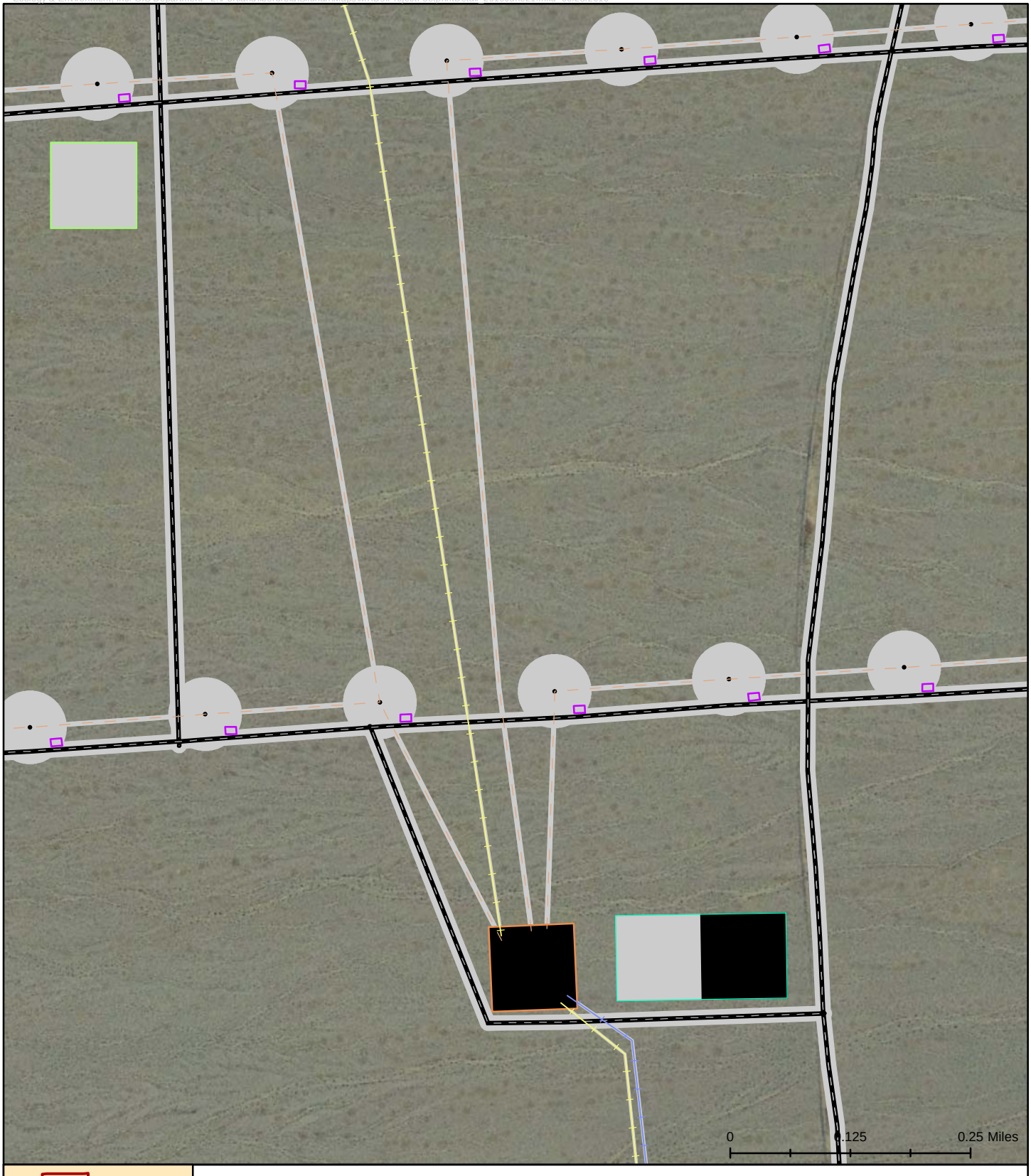
Substation

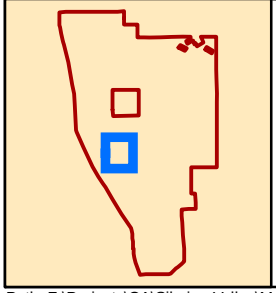
The underground electrical collection system would connect to a 34.5-kV overhead collector line, which would connect to the project substation. The substation would include a main power transformer with oil containment. The substation, which would be constructed in the center of the project area, would be needed to increase the voltage of the 34.5-kV overhead collector line to the 115 kV required for interconnection. A 115-kV overhead transmission line, approximately 10 miles in length, would extend from the project substation south to the existing Baker substation. Pacific Wind is also considering, as an option, an overhead 230-kV transmission line interconnect with the existing Los Angeles Department of Water and Power 230-kV transmission line. It is assumed that the project would use two grounding switches instead of four grounding transformers. The grounding system would be designed in accordance with all applicable codes and standards to protect equipment and personnel from available fault currents.

Please refer to Table 1-2 for general dimensions of the project substation and anticipated temporary and permanent disturbance acreages associated with the substation.

Transmission Lines

In addition to the underground and overhead electrical collection system, one overhead transmission line (115 kV) would be constructed. The 115-kV overhead transmission line would connect the project substation to the existing Baker substation (Figure 3b). Installation of the overhead transmission line would involve clearing areas where the transmission ROW does not follow existing roads and at each transmission tower. A road would be graded, only as needed, to facilitate equipment access for construction (refer to Table 1-2 for anticipated disturbance acreages).





Crane Pad
Substation
O&M - Batch Facility
Staging Area
Permanent Impacts
Temporary Impacts

New Access Roads
Transmission Line
Overhead Collector Line
Underground Collector Line
Existing Transmission Line

Figure 3
Detailed Project Components
Silurian Wind Project
San Bernardino County, CA

Path: Z:\Projects\CA\Silurian Valley\MapDocuments\Report Figures\POD\Project Footprint Detail.mxd

Modified Date: 4/28/2011

A vehicle-mounted power auger or backhoe may be used to excavate holes for placement of steel foundations or towers. In rocky areas, the holes might require excavation by a blasting. Concrete and anchor bolt foundations may be used for some of the transmission towers, or they could be direct buried. At these sites, cast-in-place footings would be installed by placing reinforcing steel and anchor bolt clusters into the foundation hole, positioning the anchor bolt cluster, and encasing it in concrete. Spoil material would be used for fill where suitable. Foundation excavation and installation would require access to these sites for construction equipment. Where concrete was required, the concrete chutes would be washed in a depression created within the transmission line work area. After the chute had been washed into the hole, the excavated soil would be replaced and the area restored consistent with the BLM approved Restoration Plan.

The transmission towers may be erected using a crane or a backhoe with a claw attachment. The installation equipment would depend on the site conditions and type of tower being installed. After the transmission line towers were erected, they would be outfitted with brackets, insulators, and conductors.

After construction of the overhead transmission lines, temporary work areas would be reseeded. An overland path would remain for inspection and maintenance.

3.1.2 Status of Power Purchase Agreements

Pacific Wind has not yet finalized a Power Purchase Agreement for the Silurian Valley Wind Project. This is expected to take place in 2011-2012.

3.1.3 Status of Interconnect Agreement

Pacific Wind submitted an interconnect request to the California Independent Systems Operator (CAISO) on December 2, 2010. This request was for 200 MW of wind energy to be connected to Southern California Edison's (SCE's) Baker Substation at 115 kV. The process for CAISO's analysis will include a Phase I study, which is expected to be complete in the fourth quarter of 2011. The Phase II Study will follow and is expected to be complete in 2012. The extent of upgrades that may be required to the Baker substation are not known at this time, but will be evaluated when results of the studies are received.

3.1.4 General Design and Construction Standards

The project would be designed in accordance with applicable federal and industrial standards, including, but not limited to:

- American National Standards Institute
- American Society of Mechanical Engineers
- American Concrete Institute
- Americans Institute of Steel Construction
- International Building Code
- Institute for Electrical and Electronic Engineers
- International Energy Conservation Code
- National Electric Safety Code
- National Electric Testing Association
- National Fire Protection Association

- Occupational Safety and Health Administration
- Uniform Mechanical Code

Construction would be performed in accordance with the applicable federal codes and standards listed above and all applicable state and local codes.

3.2 Meteorological Towers

Pacific Wind would construct two approximately 80-meter (263-foot) permanent MET towers, consisting of a guyless pole or lattice tower secured by a concrete foundation (see Table 1-2 for disturbance calculations). The MET towers would be equipped with multiple sensors (anemometers) to measure ambient weather conditions and to evaluate the performance of the WTGs. One MET tower would be sited at the end of a string of turbines near the northwest boundary of the project. The other MET tower would be sited in the southern portion of the project area (see Figure 1). The MET towers would be located within 500 feet of a WTG and would include two sets of mast instrumentation at various heights and applicable FAA safety lighting.

The following tasks are expected for MET tower installation:

- Survey and stake site
- Clear and grub site
- Grade site
- Install foundations by excavating, placing concrete, placing rebar, placing forms.
- Install grounding equipment
- Install communications and electrical lines
- Erect MET towers

3.3. Communications System Requirements during Construction and Operation

Fiber optic communication lines would follow the electrical collector system. The communication lines would link each WTG and MET tower to the project substation and O&M facility, which would house the SCADA system. During the operations phase, the SCADA system would allow individual WTGs and other project elements to be monitored and controlled both on site (in the O&M facility) through the central host computer and from remote locations. SCADA design, specifications, installation guidelines, and field routing approval would be required from the turbine supplier.

Hard-wired (land-line) systems for operational use would be installed during completion of electrical construction activities. Additional fiber optic lines would be required for the operational phase of the project, capable of transmitting data to Pacific Wind or regional utilities. During construction, cellular or satellite communication technology may be used for both internet and telephone systems.

4. Operations and Maintenance

4.1 Operations and Facility Maintenance Needs

The operations phase of the project would involve management of power production and maintenance of WTGs, METs, access roads, and transmission line. Up to 12 fulltime employees would supervise the O&M activities.

WTGs receive routine maintenance, consisting of visual inspections and grease, electrical, and mechanical maintenance. These onsite maintenance checks would be completed with a standard 4x4 truck and mobile equipment.

4.2 Maintenance Activities, Including Road Maintenance

Routine maintenance would be necessary to maximize performance and address potential operational problems. Project O&M protocol would be established to specify routine maintenance and inspection activities in accordance with the program developed by the WTG manufacturer. Scheduled mechanical and electrical maintenance would be conducted as required on each WTG. O&M personnel would perform routine maintenance, including replacing lubricating fluids periodically, checking parts for wear, and downloading data from recording chips in anemometers.

Each WTG would be monitored continuously, and all monitoring data would be available to Pacific Wind via a communications link. This remote communication would use the SCADA system, which would continuously monitor the wind energy facility's key operations and provide an alarm when aberrant conditions were detected. Using information acquired from the monitoring system, staff at the control center would direct any necessary maintenance. The SCADA system could also be used to remotely shut down a WTG, if necessary.

All roads, pads, and trenched areas would be inspected regularly and maintained to minimize erosion. Project staff would maintain site as required by the ROW agreement. Maintenance of some project infrastructure (roads, power lines, and substation) might be contracted to local service providers.

4.3 Operations Workforce, Equipment, and Ground Transportation

The project would be in operation continuously. The O&M team would staff the project during core operating hours, 8 hours per day, five days per week, from 8 a.m. to 5 p.m., with weekend shifts and extended hours as required. O&M would require up to 12 personnel throughout the life of the project. The project's central SCADA system would stay online at all times. The project would require asset management and project planning, preventive and corrective maintenance of the WTGs, preventive and corrective maintenance of the electrical collection system and substation, and direct operations dispatch to ensure continuing plant and transmission system safety and reliability.

Optimization software would remotely scan each WTG daily to ensure that operations were proceeding efficiently. Any problems would be promptly reported to O&M personnel, who would perform both routine maintenance and most major repairs.

All WTGs, collection and communications lines, substations, and the transmission line would be operated in a safe manner according to standard industry operation procedures. Additional personnel would be used to test and maintain the electrical collection system and substation on a recurring basis,

but these infrequent duties would be likely to be allocated to electrical subcontractors or local utility crews. Additionally, all pads and roads would be regularly inspected. Access roads would be maintained during O&M to prevent off-road detours due to ruts, mud holes, or landslides.

During normal O&M, daily traffic on the site would involve two service vehicles. Water would be applied as necessary to roads for dust abatement.

5. Environmental Considerations

5.1 General Description of Site Characteristics and Potential Environmental Issues

As described in Section 1, Project Description, the project site is situated on a relatively flat valley floor dominated by creosote bush-scrub habitat. The elevation is 780 to 1,154 feet above mean sea level. The project ROW is under the jurisdiction of the BLM's Barstow FO, which administers public lands in accordance with the California Desert Conservation Area (CDCA) plan, as amended (BLM 1980). The area is unpopulated, and is used for various forms of outdoor recreation including camping, hiking, off-highway vehicle (OHV) riding, and wildlife viewing (BLM 1980).

5.1.1 Protected or Special-Status Species and Habitats

The Mojave Desert Floristic Province, which includes the Silurian Valley, contains a diverse assemblage of ecological communities. At lower elevations (up to 1,500 meters), creosote bush (*Larrea tridentada*) and burro weed (*Ambrosia dumosa)* dominate 70% of the Mojave Desert, with densities of these species typically dictated by water availability. The Mojave Desert supports many endemic species, including desert tortoise (*Gopherus agassizii*), Mojave fringed-toed lizards (*Uma scoparia*), Joshua trees (*Yucca brevifolia*), several species of cacti, and other desert-adapted plants (CNPS 1990).

Several plant and animal species that occur or may occur at the project site are classified as threatened or endangered by the federal government (the U.S. Fish and Wildlife Service [USFWS]) or the state (the California Department of Fish and Game [CDFG]), or are otherwise categorized as being of elevated conservation concern. Such species include CDFG "species of special concern" and "fully protected" species and BLM "sensitive" species. Collectively, these species are referred to herein as "special status species."

The California Natural Diversity Database (CNDDB) maintained by the CDFG identifies plant species that are sensitive, rare, threatened, or endangered. This list was consulted to investigate the potential presence of any such species within the project area (Table 5-1), and it was confirmed that there are no known occurrences of federally listed plants within the project site.

Table 5-1 Special Status Plant and Wildlife Species that May Occur within the Project Area

Scientific Name	Common Name	Federal and State Status[1]	Potential to Occur On Site[2]	Comments on Habitat and Occurrence[3]
Gopherus agassizii	Desert Tortoise	FT, ST	High	A majority of the site is suitable habitat for the desert tortoise.
Lanius ludovicianus	Loggerhead Shrike	SC	Moderate	In open ground within areas of short vegetation.
Uma scoparia	Mojave Fringe-toed Lizard	SC, S	Moderate	Sparsely vegetated arid areas, adapted to wind-blown sand and dunes.

Table 5-1 Special Status Plant and Wildlife Species that May Occur within the Project Area

Scientific Name	Common Name	Federal and State Status[1]	Potential to Occur On Site[2]	Comments on Habitat and Occurrence[3]
Aquila chrysaetos	Golden Eagle	SC	Moderate	Prefers open terrain (grasslands, deserts, savannah, and early successional stages of forest and shrub habitats) for hunting. Nests in mountainous areas.
Androstephium breviflorum	Small-flowered Androstephium	CNPS 2	Low	Creosote scrub.
Spermophilus mohavensis	Mohave Ground Squirrel	SC, ST	Low	Poor quality habitat for Mohave ground squirrel occurs in the project area.
Athene cunicularia	Burrowing Owl	SC	Low	In low densities in desert habitats but can occur in much higher densities near agricultural lands where rodent and insect prey tend to be more abundant.
Toxostoma lecontei	Le Conte's Thrasher	SC	Low	This species requires areas with an accumulated leaf litter under most plants as cover.

Notes:
[1]ST = State threatened species
SC = State species of special concern
FT = Federal threatened
S = BLM sensitive

In California, special status plants are rated using the following California Native Plant Society (CNPS) status codes:
1A – plants presumed extinct in California
1B – plants rare and endangered in California and elsewhere
2 – plants rare, threatened, or endangered in California, but more common elsewhere
3 – plants about which more information is needed (a review list)
4 – plants of limited distribution (a watch list)

CNPS Threat Extension codes:
1 = seriously endangered in California
2 = fairly endangered in California
3 = not very endangered in California

[2]Potential for Onsite Occurrence:
Low – species range overlaps with project area and marginally suitable habitat in project area
Moderate – species range overlaps with project area, suitable habitat present in project area, and species known to occur in habitat similar to habitat in project area
High – highly suitable habitat present in project area, or known populations exist in project area
[4]Information on habitats and life history based on CH2MHill 2008, BLM 1980

5.1.1.1 Desert Tortoise

Although not identified in the CNDDB, the site is located within suitable habitat for the desert tortoise. The desert tortoise was recognized as a threatened species under the federal Endangered Species Act (ESA) in 1990 and under the California Endangered Species Act (CESA) in 1989. The desert tortoise is widely distributed throughout the Mojave, Sonoran, and Colorado deserts and is found in the California desert from below sea level to elevations of at least 7,300 feet. The most favorable habitats occur at elevations of approximately 1,000 to 3,000 feet.

The desert tortoise is an herbivore, feeding mainly on annual forbs and grasses. The highest tortoise densities are achieved in desert washes and creosote bush communities with extensive annual wildflower blooms. The Mojave population of desert tortoise generally avoids very steep rocky areas and prefers open plains of creosote bush. The species also requires friable soils for burrow and nest construction. Typically, the tortoise will excavate a burrow under bushes or overhanging soil or rock formations and will occasionally dig into the open soil. Burrows are essential to their survival, especially in extremely hot weather when direct sun can kill a tortoise in 1 hour or less (Marlow 1979).

A preliminary site assessment was conducted in December 2007. During that site visit, a degraded burrow, potentially that of a desert tortoise, was observed in an ephemeral wash adjacent to, and in some areas parallel to, the original proposed MET tower access route. The degraded burrow was several hundred feet from the proposed MET tower location and it is not anticipated that it would be affected during tower installation because the wash is too sandy to use as an access route. A second degraded burrow, potentially that of a desert tortoise, was observed along the 100-foot-wide buffer transect at the southeast corner of the MET tower location. The site does not occur within any critical habitat. The Ivanpah Desert Tortoise Critical Habitat Unit is approximately 7 miles west of the site.

Because a majority of the site contains suitable habitat for the desert tortoise and degraded burrows were observed, it is anticipated that the desert tortoise has a high probability of occurrence on the project site. Pre-construction and construction activities and project operations will adhere to agency requirements for areas with desert tortoise (BLM 2002a, 2002b; FWS 2008).

5.1.1.2 Loggerhead Shrike

The CDFG recognizes the loggerhead shrike (*Lanius ludovicianus*) as a federal species of concern and California species of special concern. Loggerhead shrikes are common residents and winter visitors of California foothills and lowlands. This species can be found within open habitat types, including sage scrub, non-native grasslands, chaparral, riparian, croplands, and areas characterized by open scattered trees and shrubs. Fences, posts, or other potential perches are typically present in their habitat. The loggerhead shrike forages for large insects and small reptiles, birds, and mammals over open ground within areas of short vegetation, usually impaling prey on thorns, barbed wire, or sharp twigs to cache for later feeding.

No CNDDB records occur for this species in the project area, and none were observed during the field survey. Marginal foraging and nesting habitat occurs within the project area. Therefore, potential for this species to occur in or near the project area is moderate.

5.1.1.3 Mojave Fringe-toed Lizard

The CDFG recognizes the Mojave fringe-toed lizard *(Uma scoparia)* as a state species of special concern. Habitat for this species is typically desert environments with fine, loose sediment and dry lakebeds, banks, and washes. Mojave fringe-toed lizards are diurnal and activity is temperature-dependent. This species hibernates typically from November to February.

No CNDDB records occur for this species in the project area, however due to available habitat, the potential for this species to occur in or near the project area is moderate.

5.1.1.4 Golden Eagle

The golden eagle (*Aquila chrysaetos*) is recognized as a California species of special concern by CDFG and is also protected by the Bald and Golden Eagle Protection Act. Habitat for this species is typically rolling foothills, mountain areas, and desert. Golden eagles need open terrain for hunting and prefer

grasslands, deserts, savannah, and early successional stages of forest and shrub habitats. This species typically prefers to nest in rugged, open habitats with canyons and escarpments, and uses overhanging ledges and cliffs and large trees as cover.

No CNDDB records occur for this species at the project site; however, because suitable habitat for golden eagle occurs at the project site, it is anticipated that this species has a moderate potential to occur.

5.1.1.5 Small-flowered Androstephium

Only one federal or state special-status plant species, the small-flowered androstephium (Androstephium breviflorum), was identified by the CNDDB query. Physical evidence of the highly developed and historically disturbed nature of the study area was evident throughout and minimizes the likelihood that other special-status plants occur at the site. These physical characteristics include graded, compacted, eroded soils and roadways. Because of these disturbances within the study area, the project site does not provide suitable conditions for establishment of special-status plant species.

The small-flowered androstephium (Androstephium breviflorum) is recognized as a CNPS List 2 species. CNPS List 2 plants are rare, threatened, or endangered in California but are more common elsewhere. Except for being common beyond the boundaries of California, List 2 plants would have appeared on List 1B. From the federal perspective, plants common in other states or countries are not eligible for consideration under the provisions of the Endangered Species Act. Small-flowered androstephium is primarily found in Mojavean desert scrub and desert dune habitats and bajadas from 886 to 5,249 ft (270 m to 1600 m) in elevation.

Two occurrences of this species were identified by the CNDDB search; however these occurrences were well outside of the project area. Habitat conditions for this species do not exist in the project area, and it is believed that this species has a very low probability of occurring at the site.

5.1.1.6 Mohave Ground Squirrel

The USFWS recognizes the Mohave ground squirrel (*Spermophilus mohavensis*) as a federal species of concern. CDFG recognizes the Mohave ground squirrel as a California threatened species. The squirrel is restricted to the Mojave Desert in San Bernardino, Los Angeles, Kern, and Inyo counties (Gustafson 1993). This species ranges from near Palmdale on the southwest to Lucerne Valley on the southeast, Olancha on the northwest, and the Avawatz Mountains on the northeast (Gustafson 1993). This species prefers open desert scrub, alkali scrub, and Joshua tree woodland with sandy to gravelly soils; it uses burrows for nesting at the base of shrubs for cover.

The Mohave ground squirrel feeds in annual grasslands or sparse scrub habitat. This species is active only in the spring and summer, when it feeds eagerly on the leaves and seeds of native shrubs and annual plants such as winterfat (*Krascheninnikovia lanata*), spiny hopsage (*Grayia spinosa*), and saltbush (*Atriplex* sp.; Leitner and Leitner 1998, Tortoise Tracks 1999). By midsummer, the squirrels aestivate in their underground nests and allow body temperature, heart rate, and metabolism to fall drastically (Tortoise Tracks 1999).

A CNDDB query did not identify Mohave ground squirrels as potentially occurring within a 1-mile radius of the project area. Neither the squirrels nor signs of them were detected during the field survey. Poor quality habitat for Mohave ground squirrel occurs in the project area. Because suitable conditions for this species are not present on the project site, it has a low potential for occurrence.

5.1.1.7 Burrowing Owl

The burrowing owl (*Athene cunicularia*) is a federal species of concern and a California species of special concern. This species is widespread throughout the western U.S., but has declined in most areas of California because of habitat modification, poisoning of its prey, and introduced nest predators. The burrowing owl is diurnal and usually nonmigratory in this portion of its range. It excavates nests in friable soils of abandoned burrows made by ground squirrels, kit fox, desert tortoise, and other wildlife. It is found in low densities in desert habitats but can occur in much higher densities near agricultural lands where rodent and insect prey tend to be more abundant.

The project area supports marginal suitable habitat for the burrowing owl. No CNDDB records occur for this species in the project area, and neither individuals nor burrows that could accommodate them were observed during the field reconnaissance survey. Therefore, the probability for this species to occur within the project area is low.

5.1.1.8 Le Conte's Thrasher

The CDFG recognizes the Le Conte's thrasher (*Toxostoma lecontei*) as a California species of special concern. This species is a desert resident that inhabits areas with sparse desert scrub, alkali desert scrub, and desert succulent scrub habitats with open desert washes (CDFG 2004). It can be found year-round throughout much of the Mojave and Colorado deserts of California. The Le Conte's thrasher population densities are among the lowest of passerine (perching) birds, estimated at less than five birds per square mile in optimal habitat. This low population density decreases the probability of their detection during field surveys. The Le Conte's thrasher feeds on seeds, insects, small lizards, and other small vertebrates. This species requires areas with an accumulated leaf litter under most plants as cover for its mostly arthropod prey (BLM undated).

No CNDDB records occur for this species within the study area, and no Le Conte's thrashers were observed during the field surveys. The project area might provide limited suitable habitat for the Le Conte's thrasher and limited cover or nesting sites. However, microhabitat requirements for this species are very limited within the project area and in the vicinity; therefore, the probability for this species to occur within or adjacent to the project area is low.

5.1.2 Special Land Use Designations

The project is located wholly within land under BLM jurisdiction. It is also located adjacent to land with special management designations. The CDCA plan, as amended, was developed as a management guide for public lands within the California desert, including those administered by the Barstow FO. The CDCA plan outlines management uses and designates protected areas within the plan area for BLM sensitive species (BLM 1980). Important federal-protected areas in the vicinity of the project area are described below. Figure 4 depicts identified special land use areas in relation to the project area.

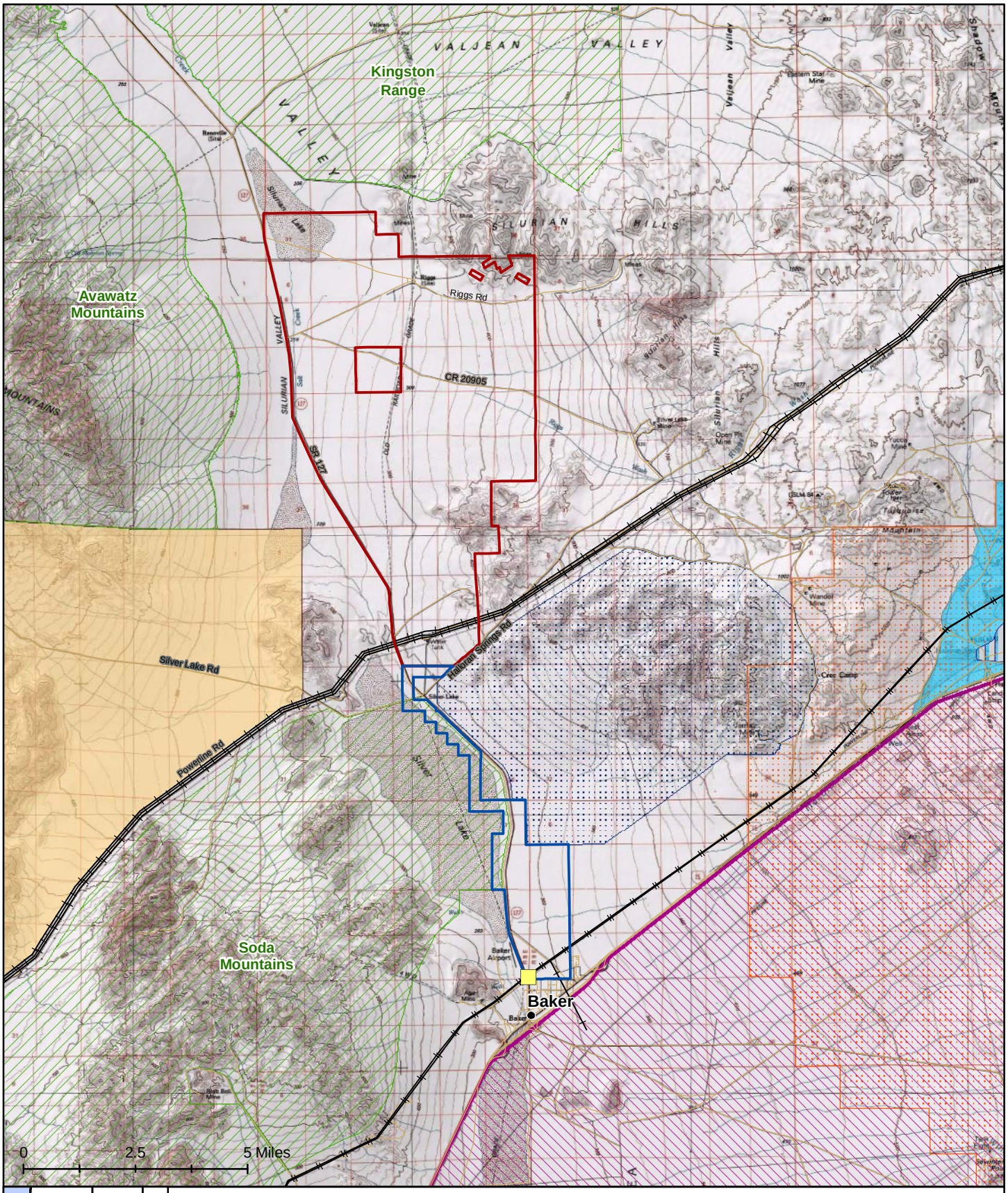
USFWS Critical Habitat Units. USFWS Critical Habitat Units (CHU) are managed for the recovery of species federally listed as either threatened or endangered. The project ROW is adjacent to a desert tortoise CHU.

Department of Interior National Preserves. The National Park Service manages the 1.6 million acre-Mojave National Preserve, located south and east of Interstate 15. The project ROW is adjacent to the preserve.

BLM Areas of Critical Environmental Concern (ACECs). ACECs are managed for the protection of specific sensitive resources or habitats. The project site is adjacent to two ACECs. The Salt Creek Hills ACEC is 13 miles to the north of the site, and the Halloran Wash ACEC is 15 miles to the southeast.

Wilderness Areas. The California Desert Protection Act was established in 1994 to preserve certain desert lands. Wilderness Areas are first proposed as Wilderness Study Areas, before they are reviewed by Congress and officially designated. The project ROW is not located within a Wilderness Area. One Wilderness Area, Hollow Hills, is located to the east of the project ROW. The project ROW (specifically the transmission line component) lies on the fringe of the Soda Mountains Wilderness Study Area. The Kingston Range Wilderness Study Area and Avawatz Mountains Wilderness Study Area are located to the north and west of the project ROW, respectively.

USFWS Desert Wildlife Management Areas (DWMAs). DWMAs are sub-regions of recovery units, areas selected to protect evolutionary significant desert tortoise (Mojave) population units. The nearest DWMA is 10 miles to the northeast of the project ROW.



Project Boundary
Project Boundary - Transmission
Hollow Hills Wilderness
Wilderness Study Area
East Mohave National Scenic Area
Desert Tortoise Critical Habitat
Halloran Wash ACEC
Shadow Valley DWMA
Ft. Irwin
Baker Substation
Existing Transmission Line

Figure 4
Project Vicinity
Silurian Wind Project
San Bernardino County, CA

Path: \\Porgis01\gis data\Projects\CA\Silurian Valley\MapDocuments\Report Figures\POD\Vicinity Map.mxd

Modified Date: 5/12/2011

5.1.3 Cultural and Historic Resource Sites and Values

Human occupation of the Mojave Desert dates to as early as 12,000 years ago, and provides some of the earliest evidence of human occupation in North America. General archaeological site types recorded within San Bernardino County include historic roads, trails, bridges, buildings, engineering features, Native American villages, temporary camp sites, rock shelters, milling stations, lithic scatters, quarry sites, pottery scatters, cemeteries, cremation sites, petroglyphs, and pictographs. The project ROW is also adjacent to a portion of the Old Spanish Trail, which was used by early explorers and traders from 1829 to 1848 to link Los Angeles, California, and Santa Fe, New Mexico.

While only an estimated 15% of San Bernardino County's 20,000 square miles has been surveyed for cultural resources, more than 11,000 prehistoric archaeological sites and over 2,000 historic structures have been documented within the county. Many of these sites are on private lands under the jurisdiction of the county. The preponderance of prehistoric and historic sites throughout the county, and the fact that most areas have not yet been systematically surveyed, indicates a high potential for finding previously unknown cultural resources.

There are currently 122 properties within San Bernardino County on the California Points of Historic Interest list, 39 on the California Historical Landmarks list, 413 that are eligible for the NRHP, and 49 that are listed on the NRHP. Because properties eligible for the NRHP are also eligible for the California Register of Historic Resources (CRHR), 481 properties (excluding California Points of Historic Interest) are eligible for, or on, the CRHR.

5.1.4 Native American Tribal Concerns

BLM will conduct a consultation program with Native American tribes, groups, or traditional cultural practitioners with traditional ties to the project area. Formal consultation under Section 7 of the National Historic Preservation Act between BLM and federally recognized tribes will take place as part of the NEPA process. The purpose of this program will be to determine whether traditional cultural properties exist in the project site.

5.1.5 Recreation and Off-Highway Vehicle Conflicts

OHV use on the project ROW is limited to BLM-designated "open" routes using street-legal vehicles. OHV users typically recreate in the Dumont Dunes Off-Highway Vehicle Area, a BLM-designated "open" area directly north of the project site. This area is used primarily for OHV recreation and camping and attracts about 120,000 visitors each year.

5.1.6 Visual Resource Management Designations

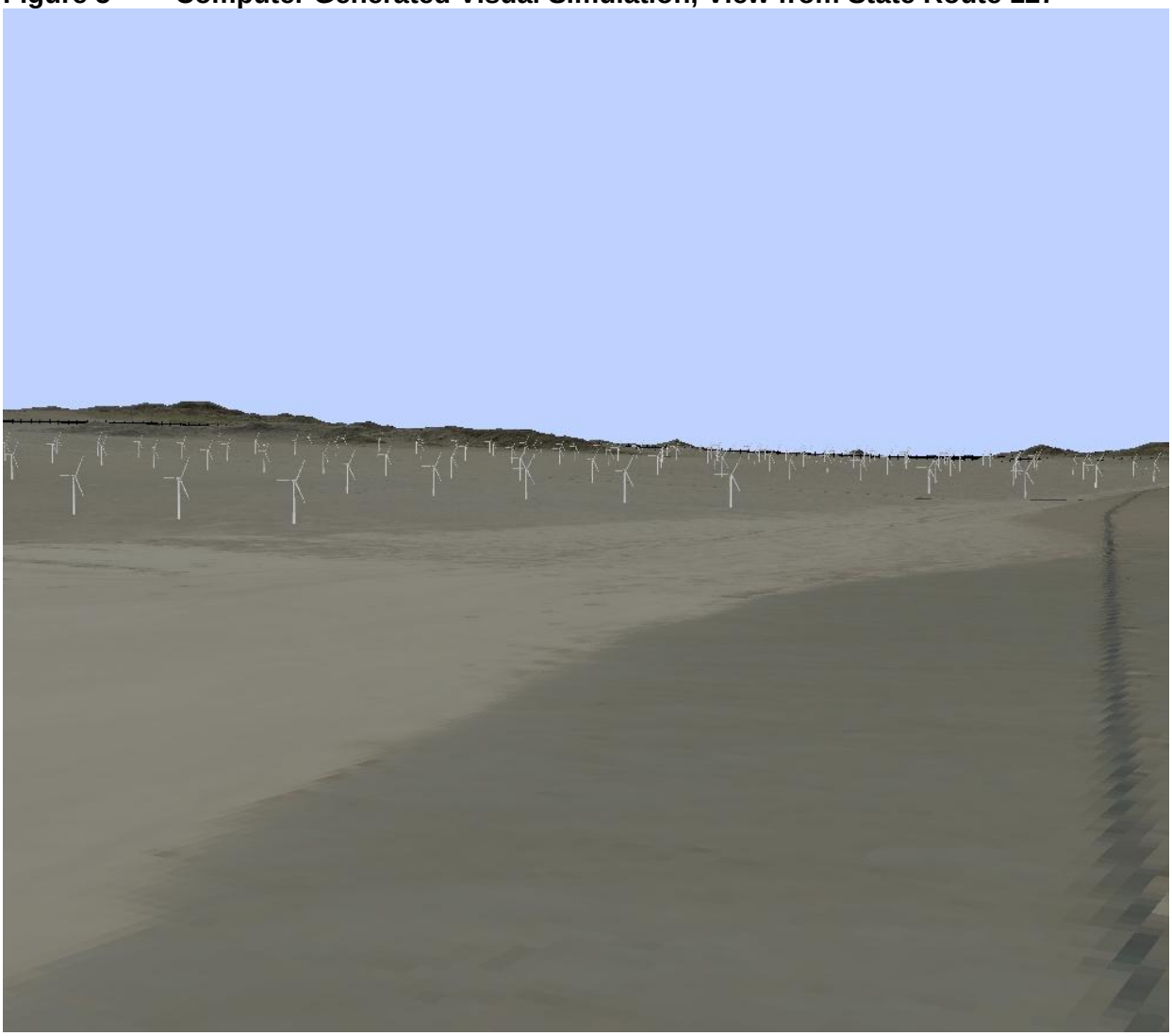
All lands within the project area are categorized according to the BLM's Visual Resource Management (VRM) classification system. The overarching goal of the VRM system is to ensure that any development or changes in the landscape of the decision area achieve the scenic goals and objectives of the assigned VRM class. The BLM objectives for the VRM classes are:

- **Class I.** To preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention.
- **Class II.** To retain the existing character of the landscape. The level of change to the characteristic landscape should be low.
- **Class III.** To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.

- **Class IV.** To provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high (BLM 2009).

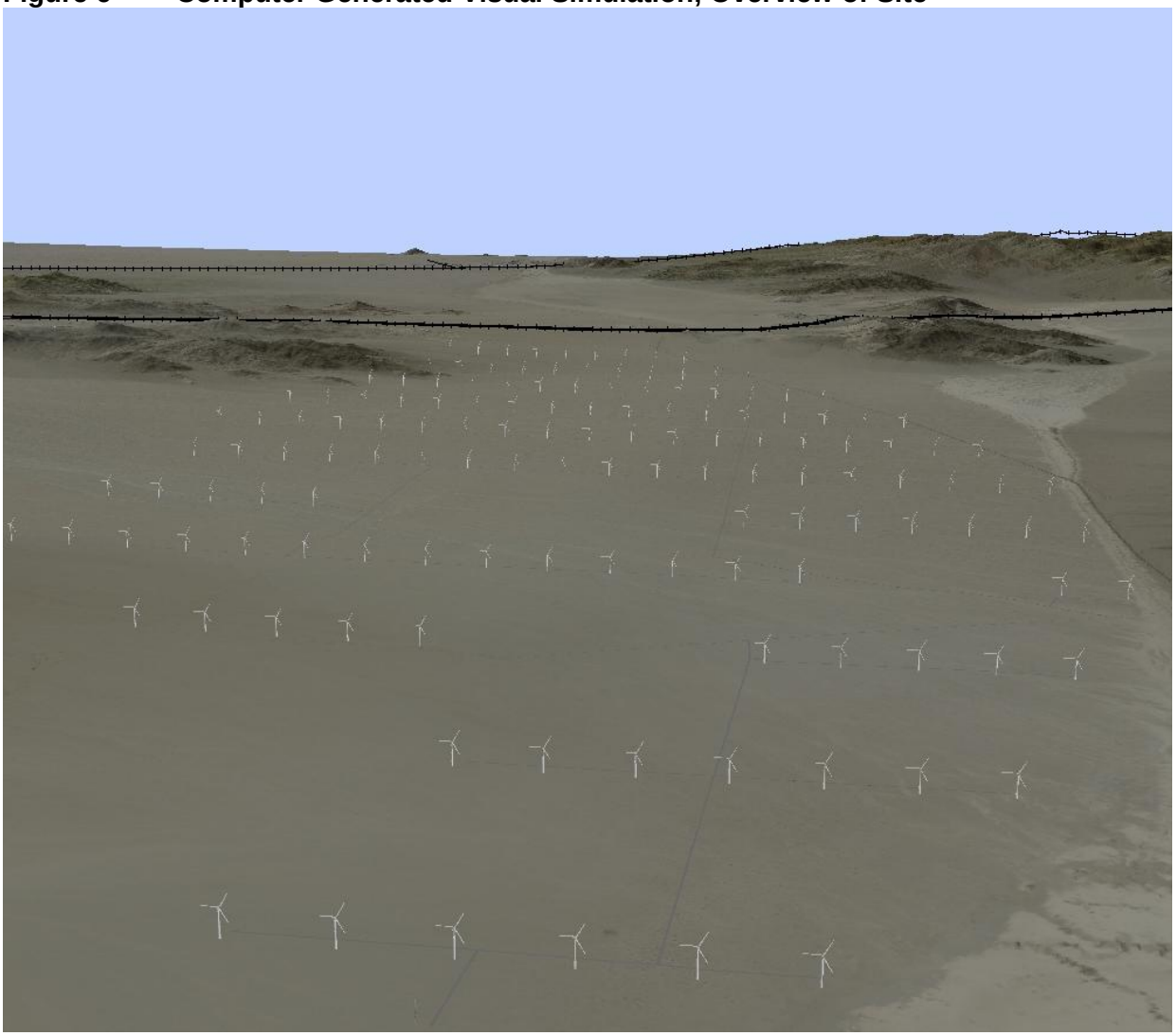
The BLM does not currently have a VRM designation for the project area. Computer generated visual simulations of the project site are depicted in Figures 5 and 6.

Figure 5 Computer Generated Visual Simulation, View from State Route 127



Note: View from State Route 127, northwestern corner of project site, looking south east

Figure 6 Computer Generated Visual Simulation, Overview of Site



Note: Overview of project site, looking south

5.1.7 Aviation and/or Military Issues

5.1.7.1 Airports

No major commercial airport is located near the project site. The regional airport in the vicinity is the Baker Airport (35° 17' 06" N, 116° 04' 51" W), 12 miles south of the project ROW. Department of Defense (DOD) airports in the vicinity of the project are Bicycle Lake (35° 16' 51" N, 116° 37' 48" W), 29 miles southwest of the project ROW, and Goldstone (35° 21' 02" N, 116° 53' 20" W), 42 miles west of the project ROW.

5.1.7.2 Military Use

Fort Irwin is approximately 37 miles northeast of Barstow, California, in the High Mojave Desert. The 640,000-acre installation houses the National Training Center and one of the heavy maneuver Combat Training Centers. Among its various training activities, Fort Irwin is the only training facility suitable for force-on-force and live-fire training of heavy brigade-sized military forces in the U.S. The base also shares a boundary to the west with the National Aeronautics and Space Administration (NASA) Goldstone Deep Space Communications Complex, which houses one of NASA's three deep space communication complexes (Fort Irwin Wind EA).

The Department of Defense (DOD) Preliminary Screening Tool was used to identify potential impacts of the project on military operations, long-range radar systems, and weather radar systems (FAA 2009). The project would not likely impact Air Defense or Homeland Security long-range radar systems. Furthermore, the DOD Preliminary Screening Tool suggests the project would not likely impact Weather System Radar 1988 Doppler operations, as the turbines are likely to be located outside of the radar line of sight. Confirmation of the likelihood of these potential impacts would require an aeronautical study.

Pacific Wind received a letter from the DOD dated June 9, 2010, requesting a Conflict Analysis for the project site. The DOD cleared the proposed Silurian Valley Wind Project in August 2010; however, this was for the original ROW which consisted of approximately 6,600 acres. Pacific Wind Development has requested further study of the new proposed ROW of 29,041 acres from the DOD and results of this study are pending.

5.1.8 Other Environmental Considerations

5.1.8.1 Air Quality

The project is located within the Mojave Desert Air Basin (MDAB), which is managed by the Mojave Desert Air Quality Management District (MDAQMD). Within the MDAB, airborne pollutants transported from the west heavily influence the air quality. The National Ambient Air Quality Standards classify the MDAB as attainment/unclassified for all air pollutants, except for particulate matter with a diameter of less than 10 micrometers (PM_{10}) and ozone. The California Ambient Air Quality Standards designate the MDAB as nonattainment for PM_{10}.

5.1.8.2 Noise

The project site is on public lands with no residential or commercial uses nearby. Therefore, there are no sensitive noise receptors in the area. Noise from wind facility operation would be limited to low-level vibration and noise from turbine blades, and some short-term noise during maintenance and decommissioning activities. In addition, noise generated during construction could temporarily disturb recreational users and wildlife.

Because wind turbines would be sited away from residences and other populated areas, operational noise would be a minimal issue in the project area. WTG operations are typically indistinguishable from background noise (the wind itself), and noise from construction activities would be expected to be in the normal noise range for industrial construction sites.

6. Maps and Drawings

6.1 Maps with Footprint of Wind Facility (7.5 min topographic maps or equivalent to include references to Public Land Survey system)

- Figure 1 – Project Overview

6.2 Initial design drawings of wind facility layout and installation, electrical facilities, and ancillary facilities. These initial design drawings will typically be a 30% Engineering and Civil Design package to adequately describe the proposed project and evaluate the design considerations for soils, drainage, and watershed management.

- Appendix A – Preliminary Civil Construction Plans
- Figure 2 – Access Roads
- Figure 3 – Detailed Project Components

6.3 Initial Site Grading Plan

- Appendix A – Preliminary Civil Construction Plans

6.4 Maps with Transmission Facilities, Substations, Distribution, Communications

- Figure 3 – Detailed Project Components

6.5 Access and Transportation Maps

- Figure 2 – Access Roads

6.6 Preliminary Visual Resource Evaluation and Visual Resource Simulations

- Figure 5 – Computer Generated Visual Simulation
- Figure 6 – Computer Generated Visual Simulation

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APPENDIX A

Preliminary Civil Construction Plans

for

Wind Turbine Generators, Access Roads, Drainage and Erosion Control

for

Silurian Valley Wind Farm

San Bernardino County, CA

NO.	DATE	REVISION	SHEETS
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Sheet List Table	
Sheet Number	Sheet Title
1	COVER
2	OVERALL
3	DETAILS
4	DETAILS
5	CIVIL SITE PLAN
6	CIVIL SITE PLAN
7	CIVIL SITE PLAN
8	CIVIL SITE PLAN
9	CIVIL SITE PLAN
10	CIVIL SITE PLAN
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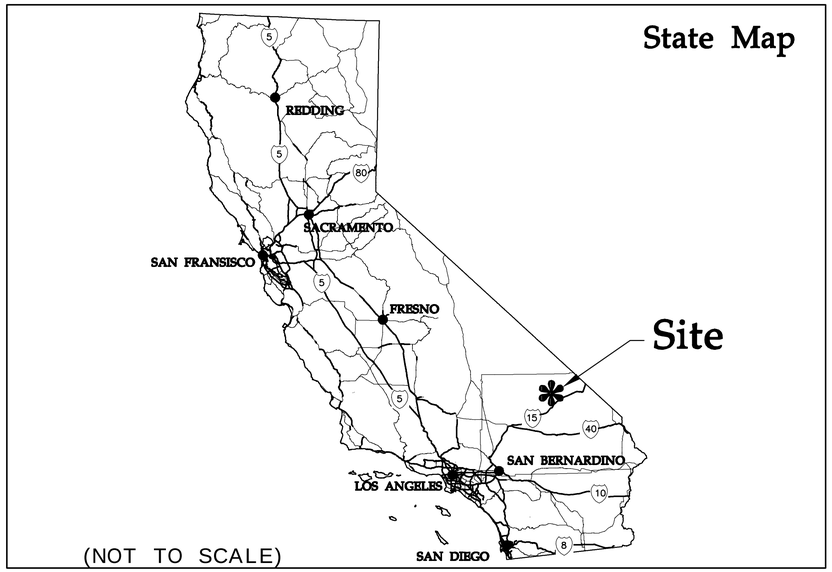
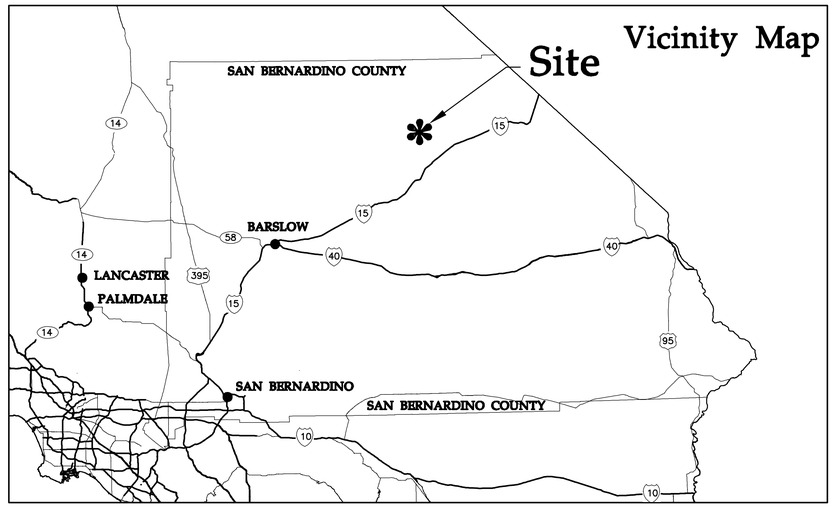
13	CIVIL SITE PLAN
14	CIVIL SITE PLAN





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Revisions:

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San Bernardino County, CA

Cover

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Date: 06/25/10
Sheet: 1 OF 14

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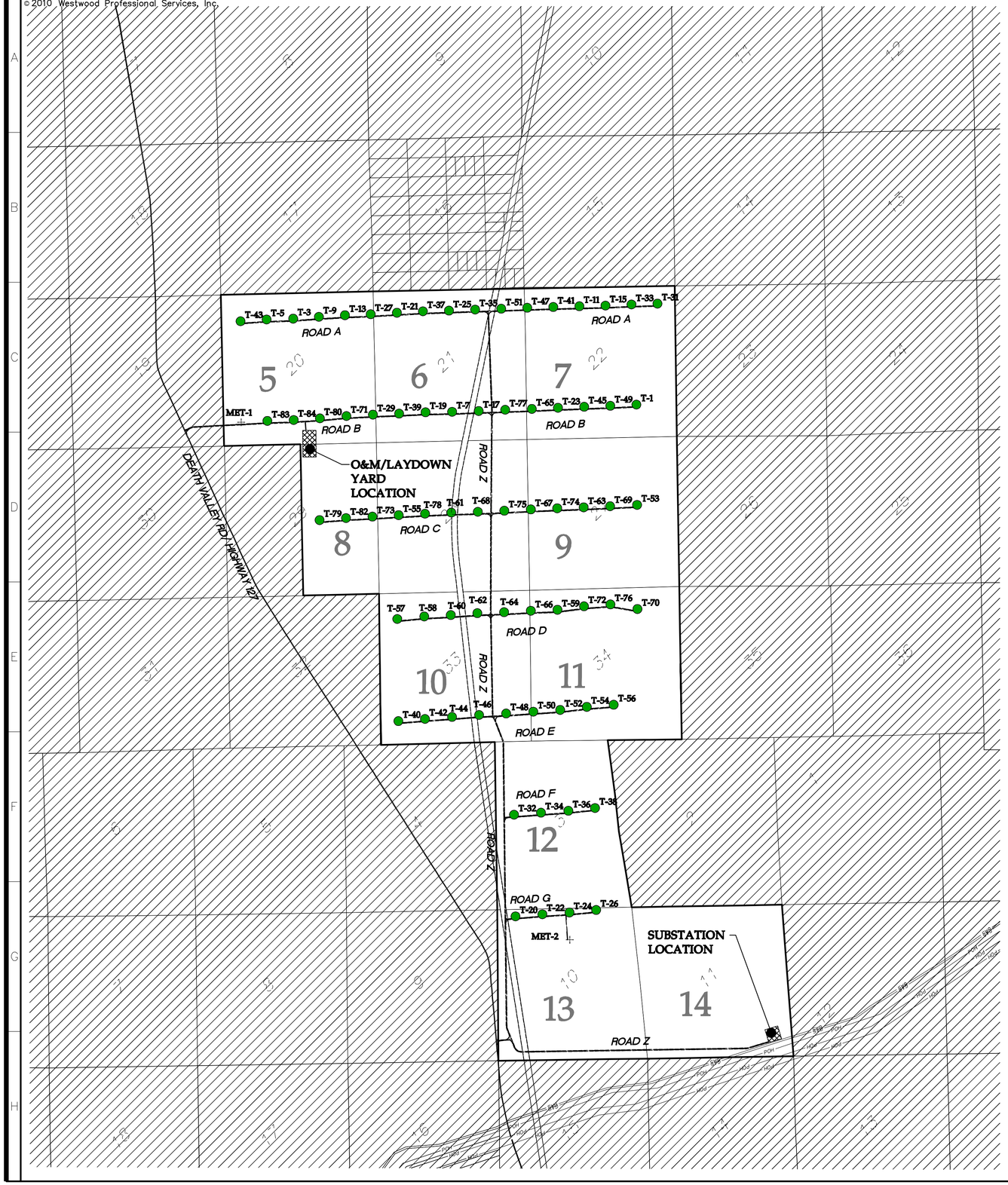

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LEGEND:

- TURBINE LOCATION
- T-XX TURBINE NUMBER
- PROPOSED ROADS
- DENOTES AREA OUTSIDE PROJECT
- DENOTES SECTION NUMBER
- 13 DENOTES SHEET NUMBER

Silurian Valley Wind Farm

San Bernardino County, CA

Overall

0' 2000' 4000' 6000'

30% Completion
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Date: 06/25/10
Sheet: 2 OF 14

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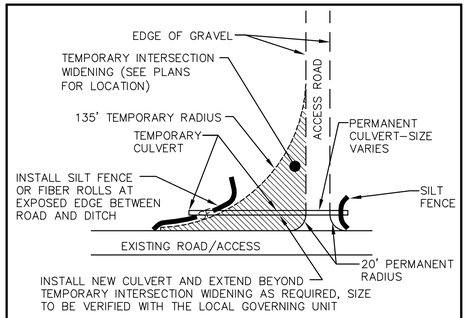
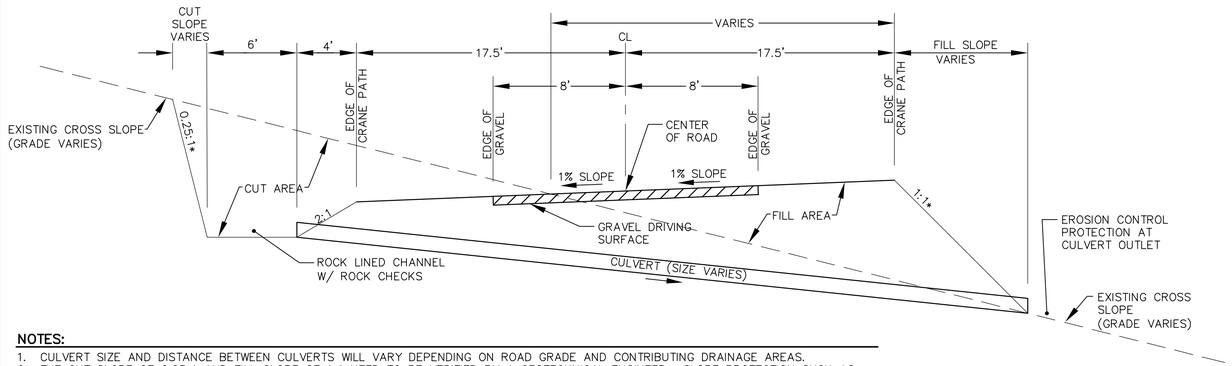


NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND SILT FENCE SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

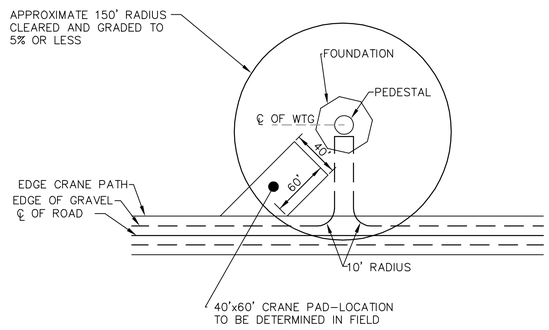
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 01/02/08 RD06



NOTES:

1. CULVERT SIZE AND DISTANCE BETWEEN CULVERTS WILL VARY DEPENDING ON ROAD GRADE AND CONTRIBUTING DRAINAGE AREAS.
2. THE CUT SLOPE OF 0.25:1 AND FILL SLOPE OF 1:1 NEED TO BE VERIFIED BY A GEOTECHNICAL ENGINEER. SLOPE PROTECTION SUCH AS ROCK GABIONS, TURF REINFORCMENT MAT, OR GROUTED RIP RAP MAY BE NEEDED TO PROTECT SLOPE.
3. A CROWNED ROAD SECTION WITHOUT DITCHING MAYBE USED FOR ROADS ON THE TOPS OF RIDGES OR ON GENTLER SLOPES.

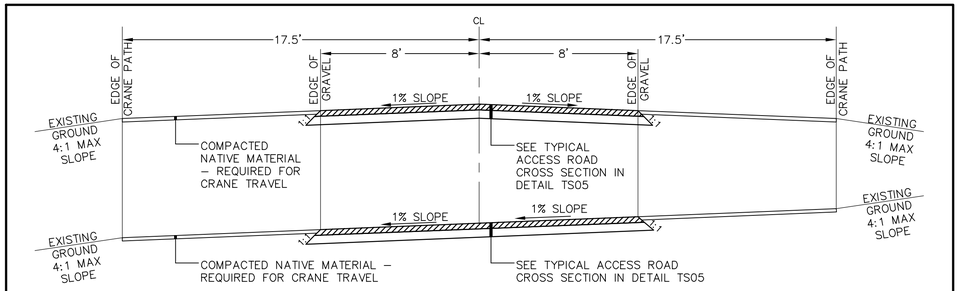
Westwood	SIDE CUT TYPICAL ACCESS ROAD	LAST REVISED: 02/04/10 SD01



NOTE:

1. CRANE PAD LOCATION & SIZE TO BE DETERMINED BY CONTRACTOR.
2. DISTANCE BETWEEN CENTER OF TURBINE AND EGDE OF GRAVEL ROAD VARIES BY TURBINE SITE.
3. MINOR DISTURBANCES OUTSIDE OF THE 150' RADUIS MAY OCCUR DURING THE TURBINE ERECTION PROCESS.

Westwood	TYPICAL WTG SITE – PLAN VIEW	LAST REVISED: 03/30/10 TS02



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS–SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 1.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood	RIDGE LINE TYPICAL ACCESS ROAD	LAST REVISED: 04/08/09 RD01

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San Bernardino County, CA

Details

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Date: 06/25/10
Sheet: 3 OF 14

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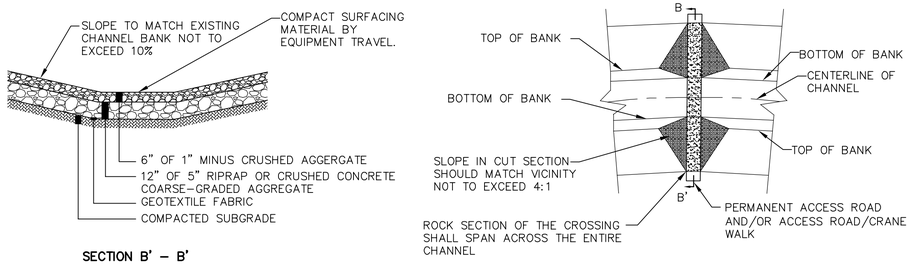


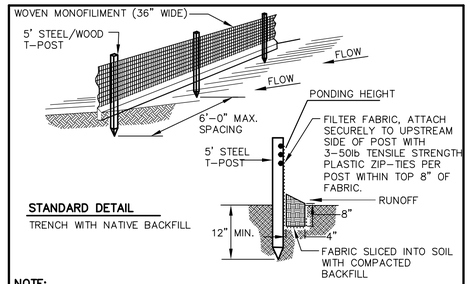
SECTION B' – B'
PROFILE ALONG CENTERLINE OF ROCK CHANNEL CROSSING
NOT TO SCALE

PLAN VIEW OF ROCK CHANNEL CROSSING
NOT TO SCALE

NOTE:

1. CHANNEL SLOPES TO BE MODIFIED TEMPORARILY DURING CONSTRUCTION TO ALLOW FOR ADEQUATE TURBINE COMPONENT DELIVERY AND RESTORE TO FINAL CONDITIONS UPON SITE RESTORATION.
2. CROSSINGS SHALL HAVE THE TOP-MOST SURFACE LAYER A MINIMUM OF 2.5 INCHES BELOW THE STREAM CHANNEL BOTTOM.
3. THE ACCESS ROAD SHALL CROSS THE DITCH AT A 90° ANGLE.
4. THE TOP BED OF THE ROCK CHANNEL CROSSING SHALL CONFORM TO THE EXISTING DITCH CROSS SECTIONAL SLOPES.
5. MATERIAL THICKNESSES MAY BE FIELD ADJUSTED TO ACHIEVE SUFFICIENT BEARING CAPACITIES AS ARE NECESSARY FOR ANTICIPATED ROAD USE.

	TYPICAL TURBINE ACCESS ROAD LOW WATER CROSSING	LAST REVISED: 04/08/09
Westwood		RD16

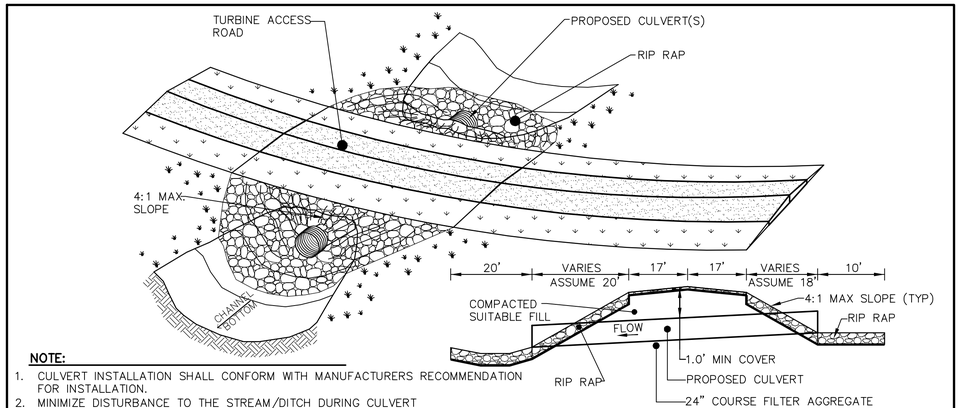


STANDARD DETAIL
TRENCH WITH NATIVE BACKFILL

NOTE:

1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN ACCUMULATED TO 1/3 THE HEIGHT OF THE FABRIC OR MORE.
2. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
4. ALL ENDS OF THE SILT FENCE SHALL BE WRAPPED UPSLOPE SO THE ELEVATION OF THE BOTTOM OF FABRIC IS HIGHER THAN "PONDING HEIGHT".

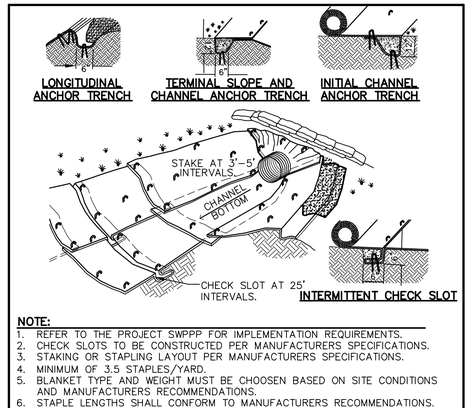
	SILT FENCE	LAST REVISED: 11/24/08
Westwood		GD03



NOTE:

1. CULVERT INSTALLATION SHALL CONFORM WITH MANUFACTURERS RECOMMENDATION FOR INSTALLATION.
2. MINIMIZE DISTURBANCE TO THE STREAM/DITCH DURING CULVERT INSTALLATION/REMOVAL.
3. RESTORE DISTURBED AREA TO NATIVE CONDITIONS IN ACCORDANCE WITH THE SWPPP.

	TYPICAL TURBINE ACCESS ROAD STREAM CROSSING	LAST REVISED: 04/08/09
Westwood		RD12



NOTE:

1. REFER TO THE PROJECT SWPPP FOR IMPLEMENTATION REQUIREMENTS.
2. CHECK SLOTS TO BE CONSTRUCTED PER MANUFACTURERS SPECIFICATIONS.
3. STAKING OR STAPLING LAYOUT PER MANUFACTURERS SPECIFICATIONS.
4. MINIMUM OF 3.5 STAPLES/YARD.
5. BLANKET TYPE AND WEIGHT MUST BE CHOOSEN BASED ON SITE CONDITIONS AND MANUFACTURERS RECOMMENDATIONS.
6. STAPLE LENGTHS SHALL CONFORM TO MANUFACTURERS RECOMMENDATIONS.
7. EROSION CONTROL BLANKETS SHALL EXTEND TO THE EDGE OF THE DISTURBANCE LIMITS.

	TEMPORARY EROSION BLANKETS TURF REINFORCEMENT MATS FOR CHANNELS	LAST REVISED: 03/03/08
Westwood		GD22

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Sheet: 4 OF 14

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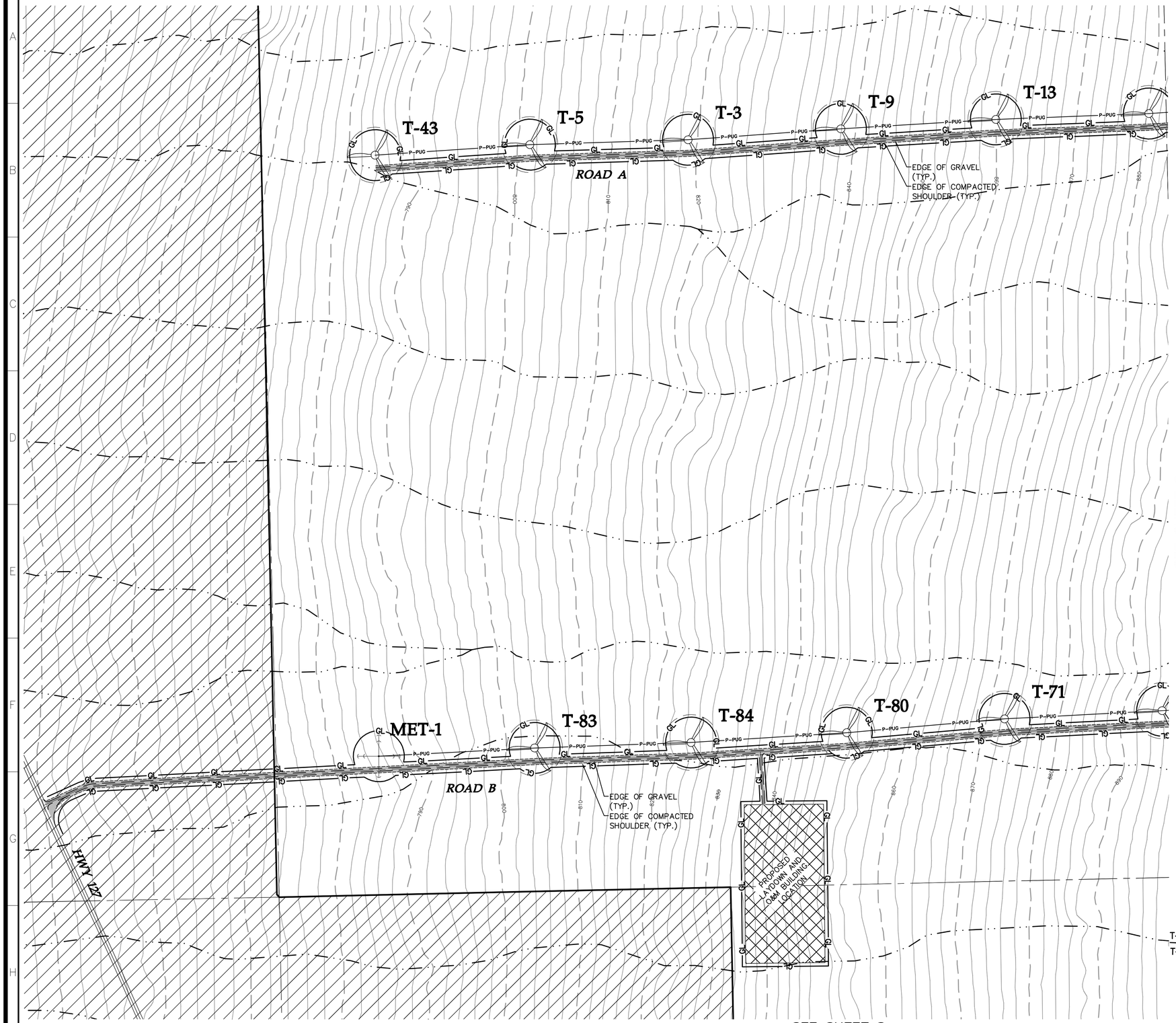

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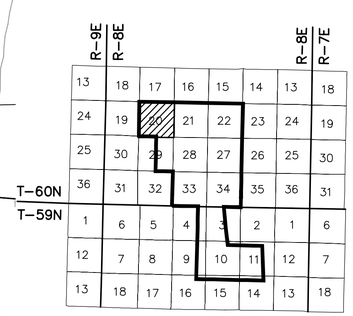

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0' 300' 600' 900'

Silurian Valley Wind Farm

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Civil Site Plan

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Sheet: 5 OF 14

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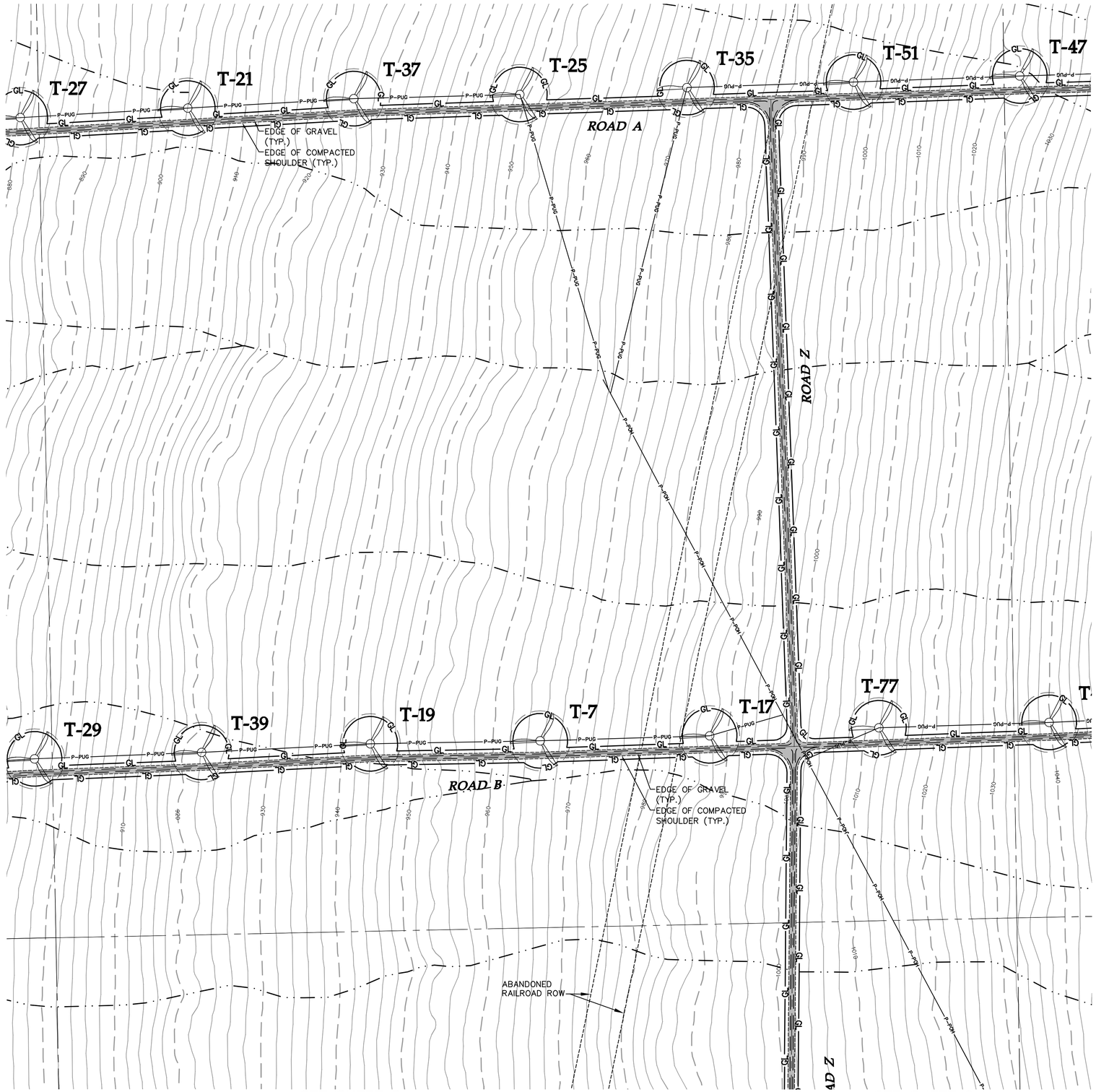

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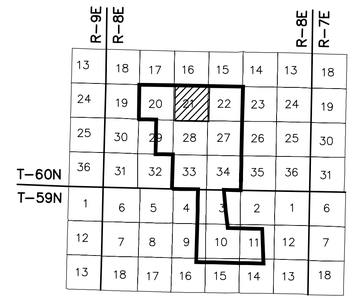

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Sheet: 6 OF 14

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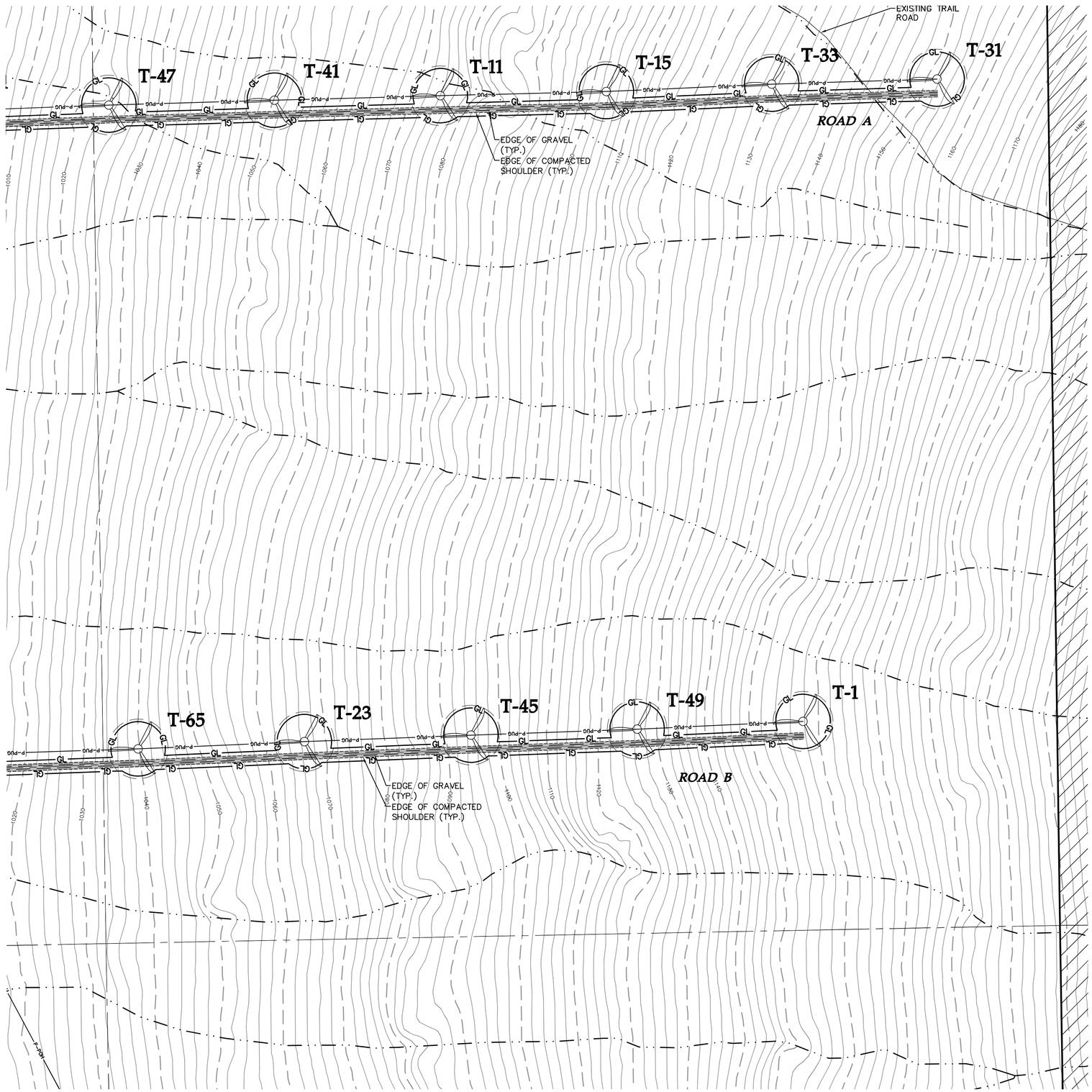

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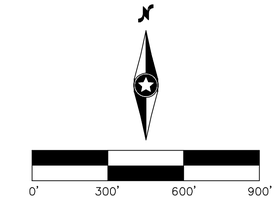

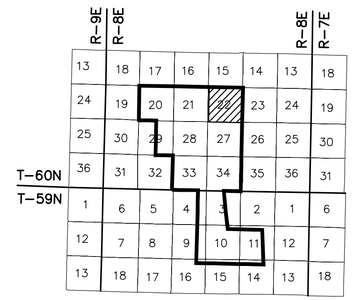

Silurian Valley Wind Farm

San Bernardino County, CA

Civil Site Plan

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Sheet: 7 OF 14

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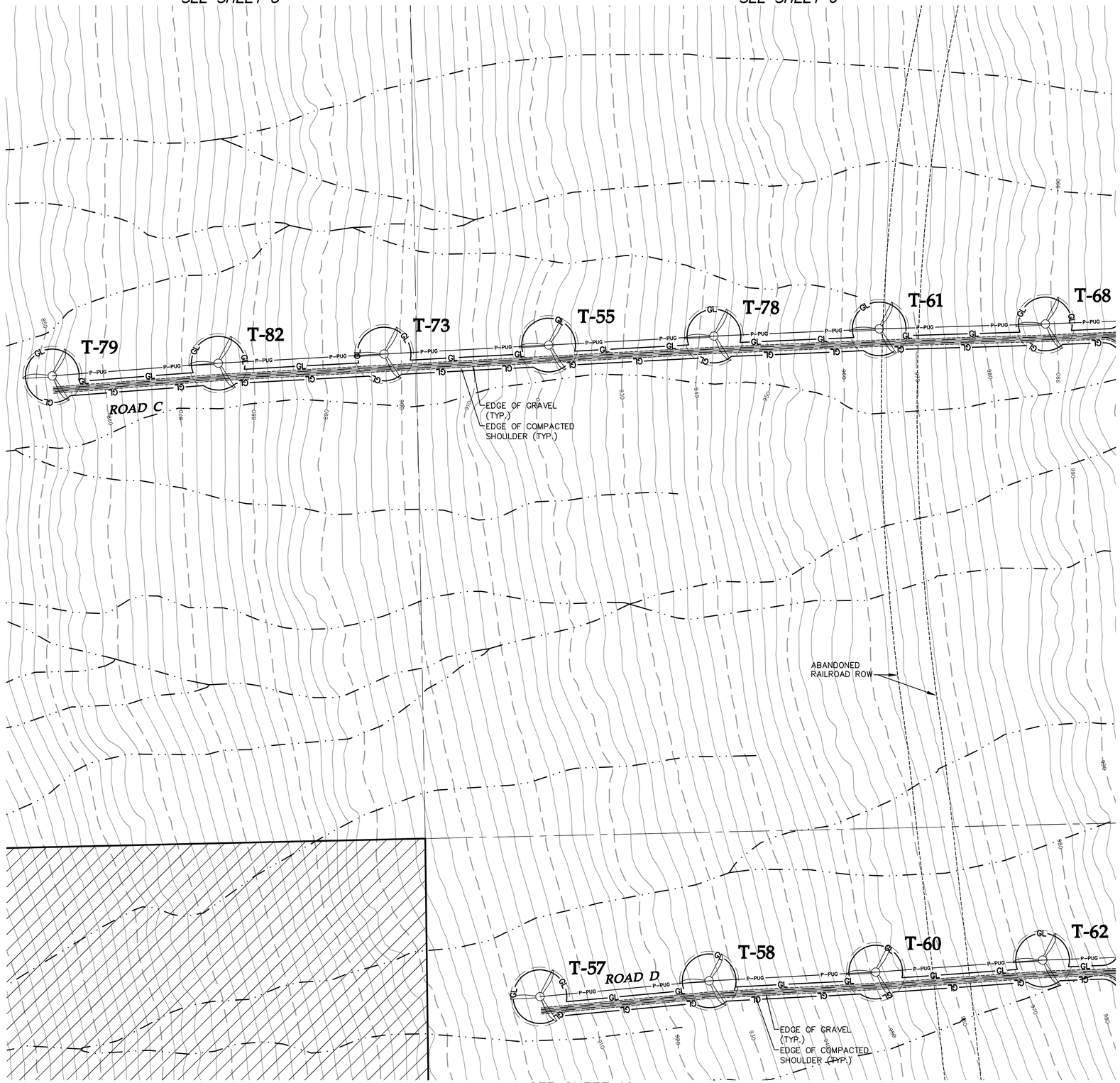
SEE SHEET 5

SEE SHEET 6



SEE SHEET 9

SEE SHEET 10

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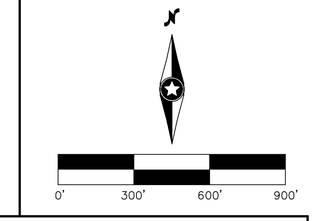

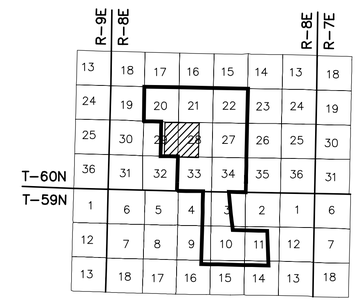

Silurian Valley Wind Farm

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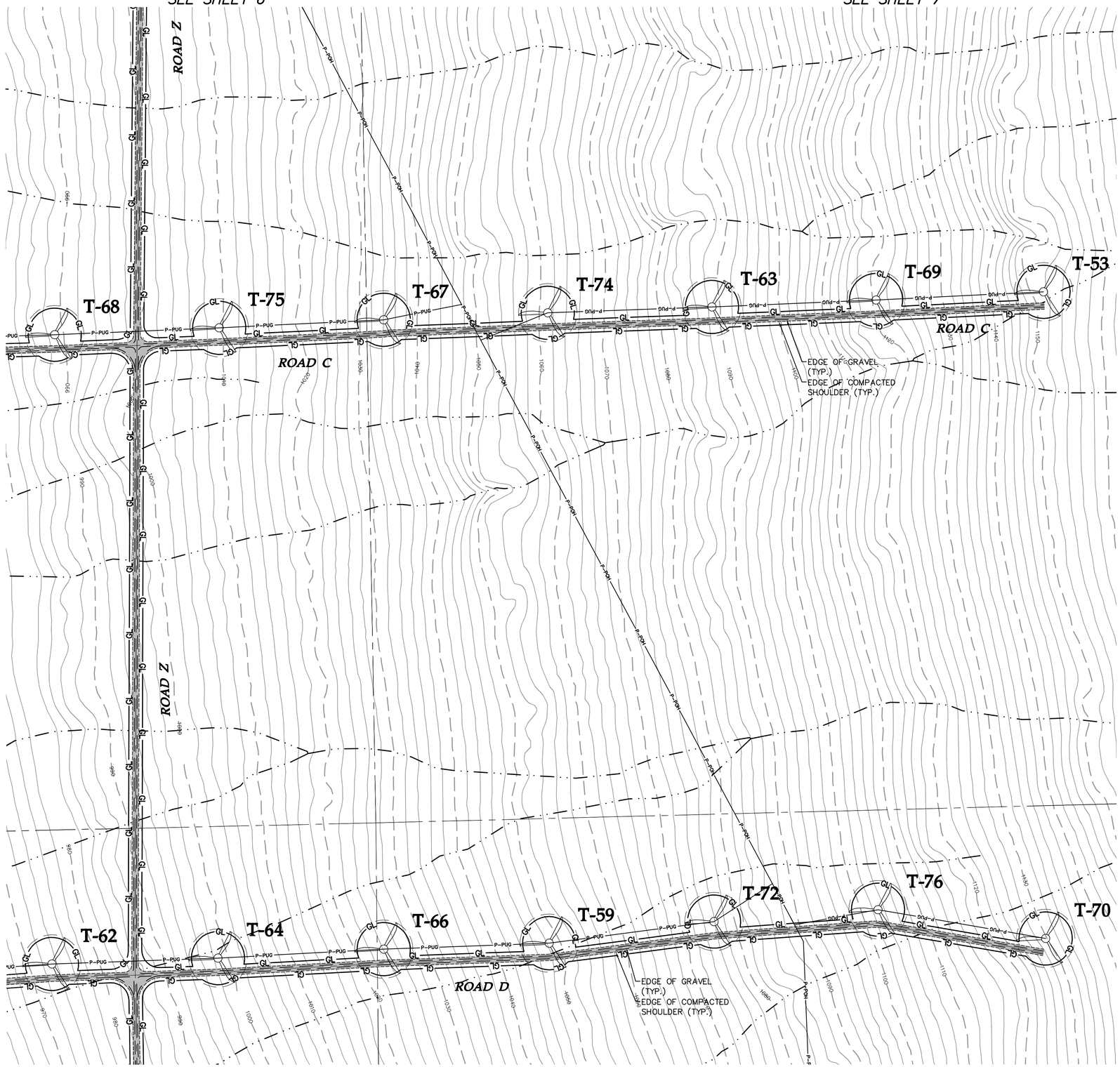
SEE SHEET 6

SEE SHEET 7

SEE SHEET 8

SEE SHEET 11



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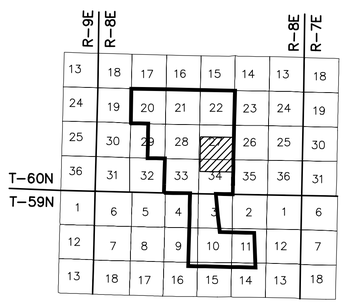
Civil Site Plan



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Sheet: 9 OF 14

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LEGEND:

- TURBINE LOCATION
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- OUTSIDE OF PROJECT BOUNDARY

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7699 Anagram Drive
Eden Prairie, MN 55344

PHONE 952-937-5150
FAX 952-937-5822
TOLL FREE 1-888-937-5150

www.westwoodps.com

Designed: CJC
Checked: CJC
Drawn: DJW
Record Drawing by/date:

Revisions:

#	DATE	DESCRIPTION

Prepared for:

IBERDROLA RENEWABLES
1125 Northwest Couch, Suite 700
Portland, Oregon 97209

N

0' 300' 600' 900'

R-9E	R-8E					R-8E	R-7E
13	18	17	16	15	14	13	18
24	19	20	21	22	23	24	19
25	30	29	28	27	26	25	30
36	31	32	33	34	35	36	31
1	6	5	4	3	2	1	6
12	7	8	9	10	11	12	7
13	18	17	16	15	14	13	18

T-60N
T-59N

Silurian Valley Wind Farm

San Bernardino County, CA

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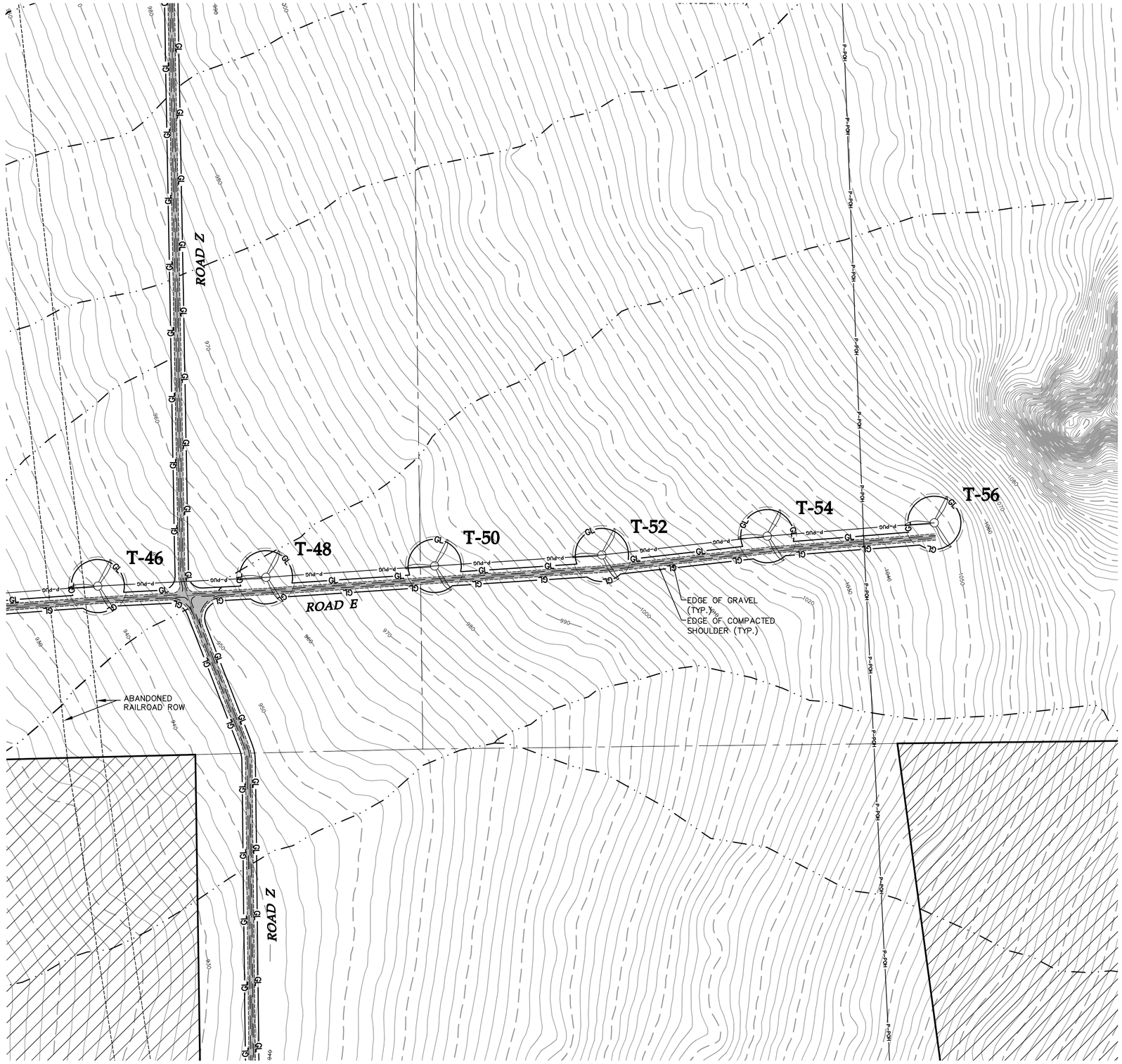
SEE SHEET 9



SEE SHEET 10

SEE SHEET 12

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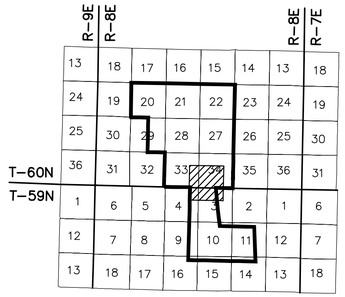

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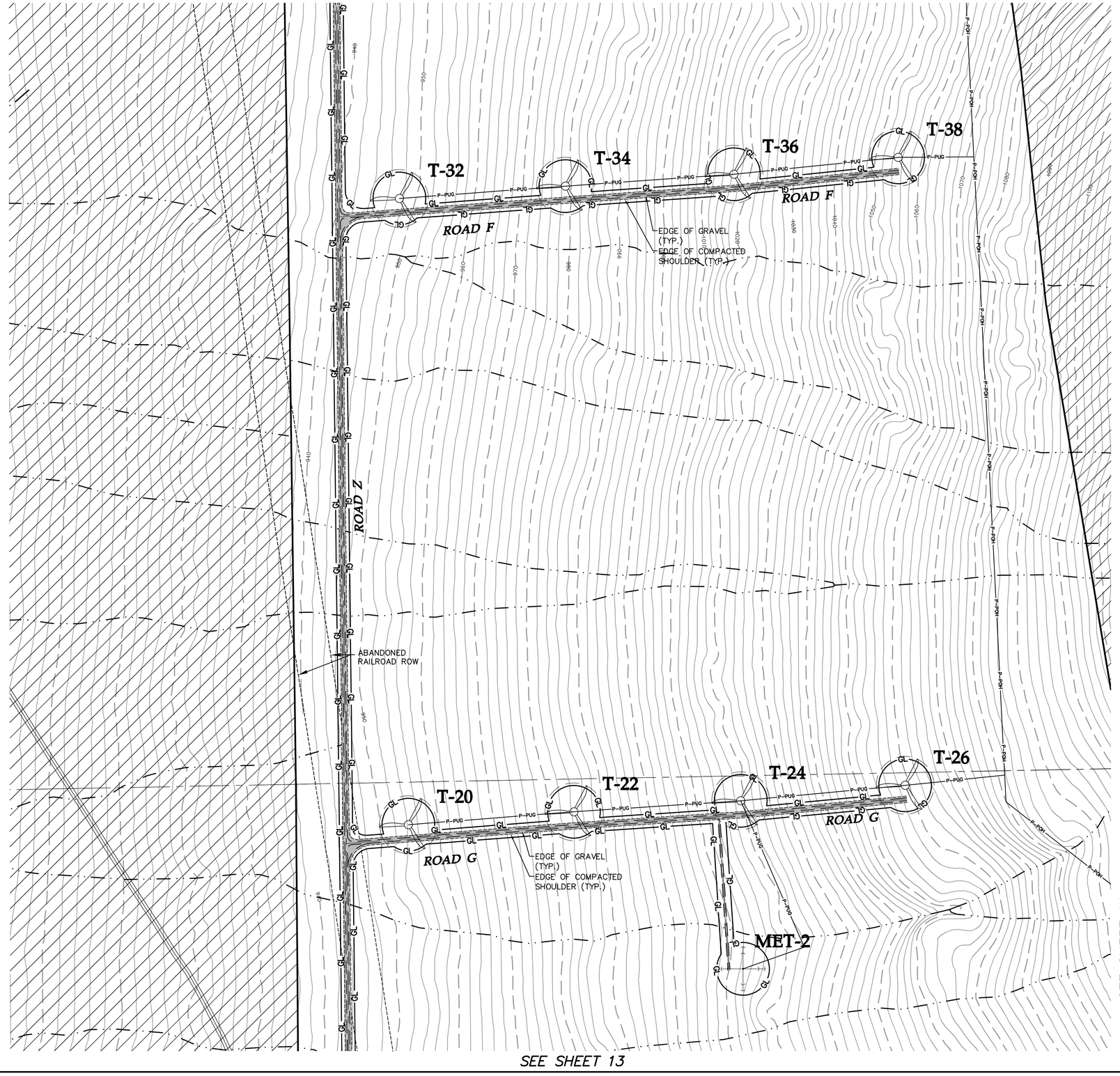

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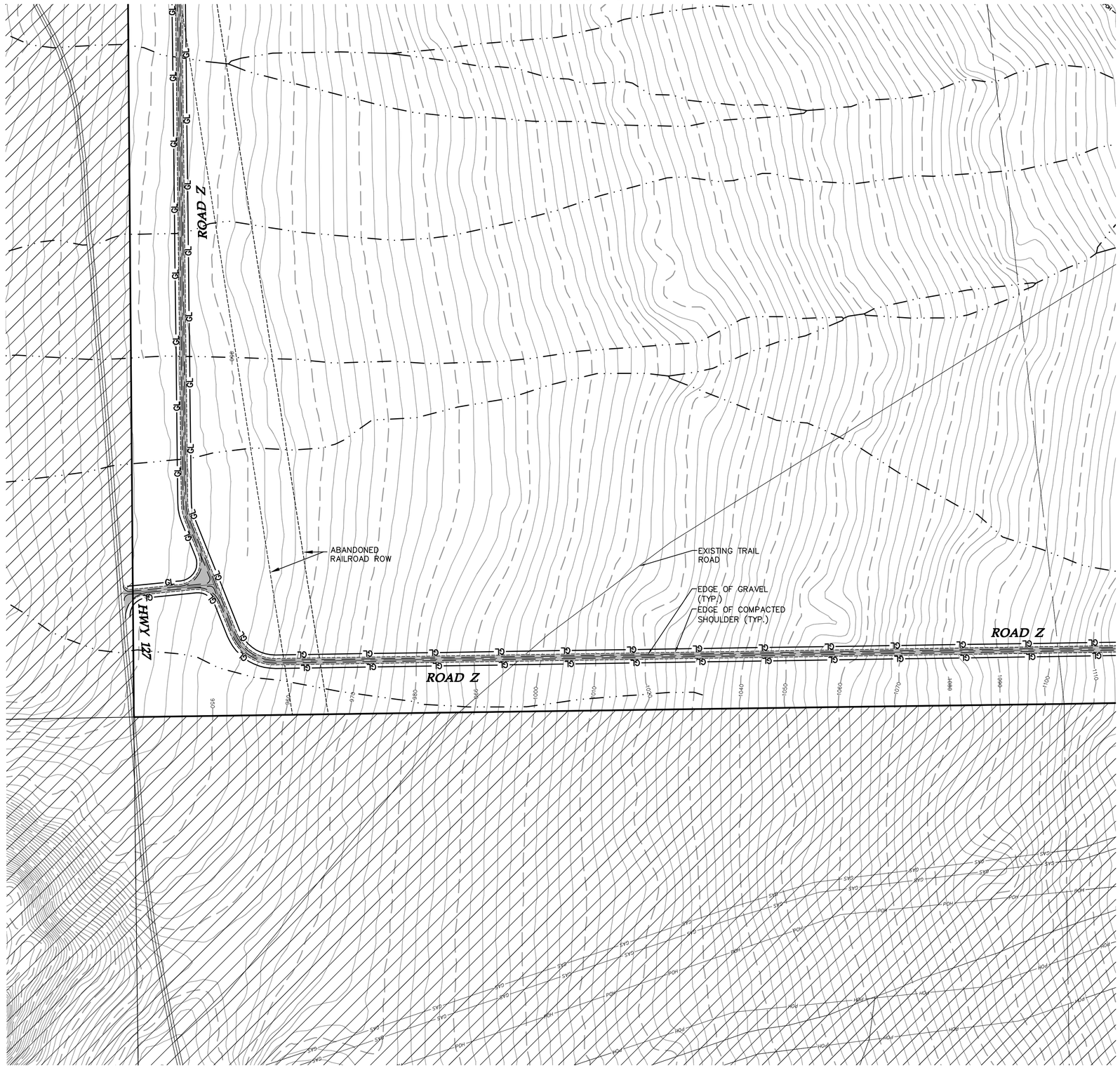

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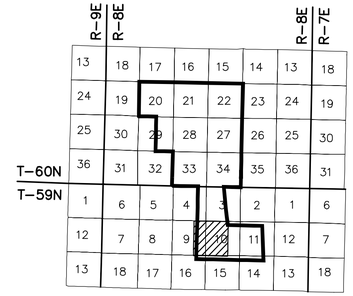

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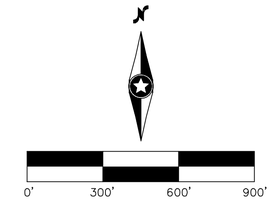

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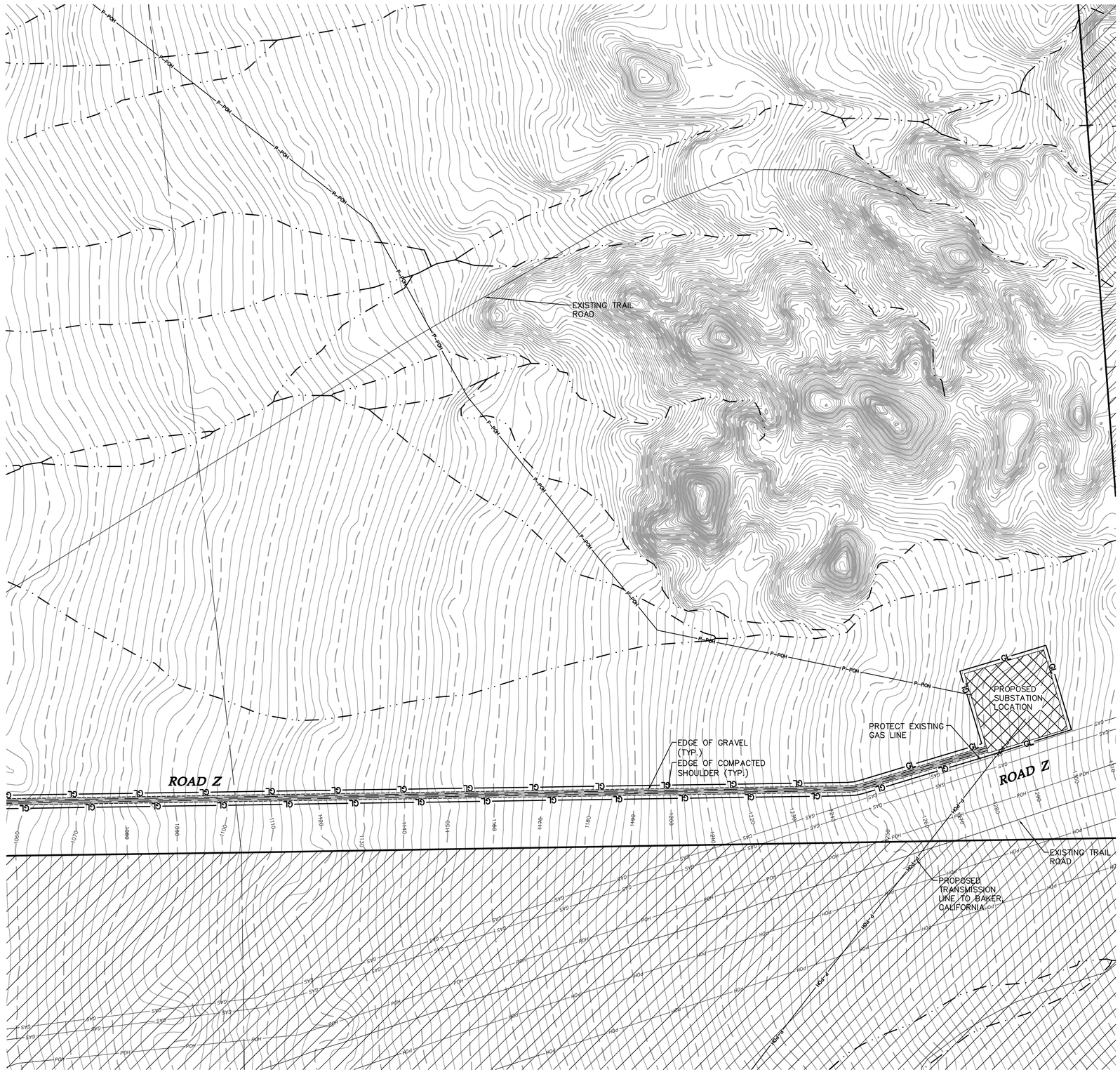

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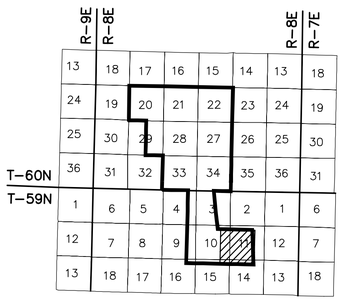

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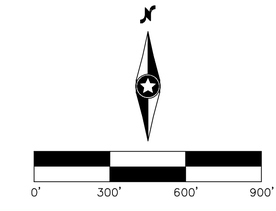

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