Appendix A

Project Description Details

Project Description
North Central Valley Energy Center
San Joaquin County, California

Prepared for:

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FIGURES

TABLE

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1 Summary

North Central Valley Energy Storage, LLC (Applicant) proposes to develop, construct, and operate the North Central Valley Energy Center (Project) located in San Joaquin County, California. The site encompasses five Assessor's parcels with a combined acreage of approximately 84.14 acres. Two parcels are privately owned and three parcels are owned by Pacific Gas & Electric (PG&E), as shown in Table 1 Land Ownership.

Table 1. Land Ownership

APNs	Ownership	Acreage
09310024	Private	39.55
09310020	Private	17.73
09310004	PG&E	13.26
09310005	PG&E	10.00
09310016	PG&E	3.60
	Total	**84.14**

The Project consists of a 132-megawatt (MW) battery energy storage system (BESS), which will include battery storage containers and associated on-site support facilities including a project collector substation, inverters, collector lines, fencing, access roads, operations and maintenance building, a supervisory control and data acquisition (SCADA) system, and other ancillary facilities and equipment. The Project also includes a 115-kilovolt (kV) overhead generation transmission line (gen-tie line), to connect the BESS to the adjacent PG&E Bellota substation. An expansion of the Bellota substation footprint will be required to support grid interconnection of the Project. The Project site is shown on Figure 1, Project Location, Figure 2, Vicinity Map, and Figure 3, Zoning Map.

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2 Purpose, Need and Objectives

California's electric grid is a complex system providing reliable power to California residents. The State relies increasingly on renewable sources of energy such as solar, wind, geothermal, hydroelectricity, and biomass. California has installed 22,250 megawatts (MW) of utility-scale renewable energy systems and is home to some of the largest solar, wind, and geothermal power plants in the world.[1] Grid energy storage technologies provide for multiple applications, such as energy management, backup power, load leveling, frequency regulation, voltage support, and grid stabilization. Importantly, not every type of storage is suitable for every type of application, motivating the need for a portfolio strategy for energy storage technology.[2] As noted by the US Department of Energy, "energy storage can reduce the need for major new transmission grid construction upgrades as well as augment the performance of existing transmission and distribution assets." Furthermore, "energy storage will also play a significant role in emergency preparedness and increasing overall grid resilience" (USDOE, 2013).

Operation of the California electric grid involves management, regulatory oversight, and participation from numerous stakeholders. The grid is managed by the non-profit public benefit corporation California Independent System Operator (CAISO). While utilities still own transmission assets, CAISO controls the routing of electrons, maximizing transmission system efficiency and generation resources, and supervising maintenance of the lines. CAISO matches buyers and sellers of electricity, facilitating over 28,000 market transactions every day to ensure enough power is on hand to meet demand.[3]

Battery storage technology allows the energy generated by renewables to be stored and tapped when the need arises. The technology is advancing rapidly as a grid resource and will support system load balancing by CAISO when sun and wind resources are intermittently not available. Power from these renewable generation sources often is produced at different times of day, which may not align with peak use.[4]

The purpose of the Project is to provide critical grid balancing technology to enable greater renewable energy integration. The need for the Project is the known load balancing challenges faced by CAISO due to the intermittency of renewable energy such as wind and solar. The Project objectives include the following:

- Provide 132 MW battery energy storage system (BESS) to support CAISO grid balancing and enable greater integration of renewables on the California electric grid;
- Locate a BESS in close proximity to an existing electrical substation to minimize the length of any interconnection transmission line;
- Utilize disturbed and relatively flat land to minimize potential environmental impacts;
- Avoid locating the BESS in close proximity to a large number of sensitive receptors.

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1 California Energy Commission. "Toward A Clean Energy Future, 2018 Integrated Energy Policy Report Update, Volume I." August 2018.
2 US Department of Energy. "Grid Energy Storage." December 2013.
3 http://www.caiso.com/about/Pages/OurBusiness/Default.aspx
4 California Independent System Operator. "Advancing and Maximizing the Value of Energy Storage Technology: A California Roadmap." December 2014.

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3 Project Setting

The Project is located in unincorporated San Joaquin County, approximately 15 miles east of the City of Stockton, California, and approximately 1.5 miles south of State Route 26 (see Figure 1, Project Location). The Project site abuts the boundary of PG&E's Bellota substation along Flood Road. The Project site is comprised of five Assessor's parcels with a combined acreage of approximately 84.14 acres. The climate of the Project region is typical of the Central Valley of California, with hot dry summers and cool, mild winters. Precipitation averages approximately 12 inches, and rainfall occurs mostly in the months of December and January.

3.1 Land Use

The Project site is located on the eastern edge of the San Joaquin Valley, where croplands of the valley floor transition to the rangelands of the inner Sierra Ranges to the west. The site was historically and currently is used for grazing.

Site access is currently provided via Flood Road frontage on the northern property border of the Project Site. The Project Site is surrounded to the west and south with similarly zoned agricultural lands with active row crop farming operations. To the north of the Project Site, there are additional livestock operations, and to the east and adjacent to the property is PG&E's Bellota substation. There are also several residences located in close proximity to the Project Site. The natural communities that were historically present have been substantially altered as a result of grazing and agricultural production activities.

3.2 Topography & Hydrologic Features

The Project Site consists of a low-lying hills and drainages that bisect the property from northeast to southwest. Elevations range from approximately 130 feet above mean sea level to approximately 175 feet above mean sea level.

There is a system of drainages that bisect the Project site from northeast to southwest. Surface runoff from the eastern portion of the site generally flows to these drainages. Surface runoff from the western portion of the Project site generally sheet flows off of the property to the west. Potter Creek is located approximately 0.45 miles to the northwest of the site.

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4 Project Characteristics

The Project is designed to absorb or output up to 132 megawatts of electricity and will consist of several battery storage containers, with associated on-site additional support facilities consisting of a project collector substation, inverters, collector lines, fencing, access roads, operations and maintenance building, supervisory control, a SCADA system and other ancillary facilities or equipment. The Project also includes a 115-kV overhead gen-tie line, which would extend to the adjacent PG&E Bellota substation. An expansion of the existing Bellota substation footprint will be required to adequately interconnect the Project.

4.1 Battery Energy Storage System

The BESS batteries would be housed either in a walk-in style enclosure or enclosed in an outdoor-rated container to house the batteries, racks, cooling system, direct-current disconnect, small auxiliary power transformer, communications rack, fire panel, and other ancillary equipment. In the case of the walk-in style enclosure, the batteries would be housed in metal-framed, steel structures or shipping containers. The structure height would be about 20 feet. For the walk-in style enclosure, the BESS structure would also have a fire rating in conformance with the San Joaquin County standards and specialized fire suppression systems installed for the battery rooms. The structure may also have an HVAC system for optimal performance and safety of the BESS. Power for the HVAC system, lighting, and other electrical systems would be provided through a connection to the on-site station service transformer with connection lines installed above and/or below ground.

In the case of the walk-in style enclosure, the batteries would be housed in open-air-style racking (similar to computer racking), 8 to 10 feet in height, and would require heating, ventilation, and air conditioning ("HVAC"). The associated inverters, transformers, and switchgear would be located adjacent to the BESS structure on concrete pads.

One individual battery unit would be approximately 150 square feet in size, and up to 300 totally battery units would be installed at the facility. One individual inverter unit would be approximately 130 square feet and up to 50 total inverters would be installed.

The BESS would be unstaffed and would include remote operational control and inspections/maintenance performed as necessary. The BESS would be uninhabited with no bathroom facilities, running water, or office space. The Project operations would also be monitored remotely through the SCADA system, although periodic inspections and maintenance activities would occur.

4.2 Project Collector Substation

The Project collector substation would be the termination point of the collection system of 34.5-kV alternating current electricity. The power to and from the BESS would be passed through a final interconnection step-up transformer to convert it between 34.5 kV and 115 kV. The open-air Project substation is anticipated to be constructed adjacent to the BESS facilities. The footprint of the on-site Project collector substation would be approximately one (1) acre in size. The specific size and equipment for the substation will be finalized at the detailed engineering stages as the Project progresses. It will be assumed that the local distribution utility will have nearby suitable distribution lines to provide the Project location with auxiliary power as required. If no distribution supply is available nearby, the requirements for an auxiliary generator will be determined once the layout of the facility is reviewed. The collector substation footprint would be approximately 11,000 square feet.

4.3 Operations and Maintenance

The operations and maintenance building would be approximately 2,500 square feet and is expected to be collocated with the collector substation or BESS. It is anticipated that a maximum of three permanent staff employees would use the operations and maintenance building for ongoing facility monitoring, equipment storage, and repairs. The operations and maintenance building is expected to be a prefabricated commercial structure. Permanent restroom facilities with septic tanks and/or portable toilets would be used for sanitary purposes at the operations and maintenance building, and a permanent water source in the form of trucked water, well water, or bottled water would be provided for the staff. The proposed building would include the requisite number of parking spaces for staff members' vehicles and operations and maintenance equipment. It is likely that temporary office buildings (e.g., portable trailers) will be required during construction.

The Project operations would also be monitored remotely through the SCADA system, and periodic inspections and maintenance activities would occur.

4.4 Generation Transmission Line

The proposed gen-tie will carry load to and from the Project collector substation and the Bellota substation located entirely upon the Project site. The gen-tie line would extend approximately 1,000 feet to the east from the facility's on-site switchyard. The 115-kV gen-tie line would include concrete or steel pole structures up to 150 feet tall and spaced approximately every 500 feet. The poles would carry one conductor per phase, one Optical Ground Wire (OPGW), and allow the line to maintain a minimum 30-foot vertical clearance to the ground. The number and height of the poles, as well as the type of conductor and OPGW, will be finalized during detailed design. The right-of-way is expected to consist of a width of up to 100 feet for the maintenance road and gen-tie line.

4.5 Perimeter Fence, Signage, and Lighting

The perimeter of the Project would be enclosed by a 6-foot-tall to 8-foot-tall perimeter security fence. Access into the Project would be provided through a drive-through gate along Flood Road. The main purpose of the fence is to prevent unauthorized access to the site.

A small sign at the main entrance would be installed. The sign would be no larger than 8 feet by 4 feet and read "North Central Valley Energy Center," or similar. In addition, required safety signs to identify high voltage within the facility, as well as provide information for emergency services, would be installed on the fence near the entrance and at the gates.

Low-elevation (<14-foot), controlled security lighting would be installed at the primary access gate along Flood Road, the Project substation, and the entrance to the BESS structure. The lighting would only be switched on when personnel enter the area through a manual activation (switch). Lighting would be only in areas where it is required for safety, security, or operations, and would be directed on site and include shielding as necessary to minimize illumination of the night sky or potential impacts to surrounding viewers.

4.6 Decommissioning

In general, the BESS would be recycled at the expiration of the Project's life. Most parts of the proposed system are recyclable. Batteries include lithium-ion, which degrades but can be recycled or repurposed. Site structures would include steel or wood and concrete. All of these materials can be recycled. Concrete from deconstruction would be recycled. Local recyclers are available. Metal and scrap equipment and parts that do not have free flowing oil may be sent for salvage.

Fuel, hydraulic fluids, and oils would be transferred directly to a tanker truck from the respective tanks and vessels. Storage tanks and vessels would be rinsed and transferred to tanker trucks. Other items that are not feasible to remove at the point of generation, such as smaller container lubricants, paints, thinners, solvents, cleaners, batteries, and sealants would be kept in a locked utility structure with integral secondary containment that meets Certified Unified Program Agencies and Resource Conservation and Recovery Act requirements for hazardous waste storage until removal for proper disposal and recycling. It is anticipated that all oils and batteries would be recycled at an appropriate facility. Site personnel involved in handling these materials would be trained to properly handle them. Containers used to store hazardous materials would be inspected regularly for any signs of failure or leakage. Additional procedures would be specified in a hazardous materials business plan closure plan submitted to the Certified Unified Program Agencies. Transportation of the removed hazardous materials would comply with regulations for transporting hazardous materials, including those set by the Department of Transportation, the U.S. Environmental Protection Agency, California Department of Toxic Substances Control, California Highway Patrol, and California State Fire Marshal.

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5 Construction Activities

Construction would be primarily composed of the following activities:

- **Site Preparation:** The site would be prepared for construction. For example, rough grading may be performed where required to accommodate the support structures and access roads. Retention basins would be created for hydrologic control (see Figure 4). Access roads would be gravel or aggregate base depending on the final site geotechnical report. A temporary staging area would be constructed to hold materials and construction equipment. The total limits of ground disturbance would cover approximately 14.85 acres.
- **Fencing:** A 6- to 8-foot perimeter security fence would be installed. Trash would be removed from the fencing as required. An approximately 8-foot-high perimeter security fence topped with approximately 1 foot of barbed wire would be installed around the PG&E switchyard.
- **Undergrounds:** Buried conduit, buried cable, and buried ground conductors will be installed following site preparation and before installation of foundation pads for major equipment and shipping containers.
- **Electrical Work:** A substation pad for the step-up transformer would be poured, followed by the installation of the medium-voltage stations, wiring of the modules through combiner boxes, and construction of the Project substation and grid interconnection. The medium-voltage stations would sit on concrete foundations or driven piles, pending final design.

The Project is anticipated to be built over an approximately 12-month period from the onset of site preparation activities through testing and commissioning of the facility. It is anticipated that construction crews will work 8 or 10 hours per day, with work occurring Monday through Friday. Overtime and weekend work would be used only as necessary to meet scheduled milestones or accelerate schedule and would comply with applicable California labor laws.

5.1 Traffic

Delivery of material and supplies would reach the site through on-road truck delivery through State Route 26. The majority of the truck deliveries would be for the containers with batteries as well as any aggregate material that may be required for site preparation. The heaviest delivery loads to the site would consist of rock truck deliveries, concrete trucks, and the generator step-up transformer. Typically, the rock is delivered in “bottom dump trucks” or “transfer trucks” with six axles. Low-bed transport trucks would transport the construction equipment to the site as needed. The size of the low-bed trucks (axles for weight distribution) would depend on the equipment transported.

5.2 Water Use

Water consumption during construction will be required for dust suppression and earthwork. An estimated maximum of 50,000 gallons per day during peak water use may be needed for dust suppression and earthwork; however, the majority of construction activities would require minimal water use. Construction and operational water would be provided by on-site or off-site groundwater through an improved existing well, a new well to be permitted and drilled (if necessary), or through off-site source delivered by truck. An on-site diesel generator may be used to power pumps for well water use during construction. In addition, during construction, water pumped directly into 2,000–4,000-gallon water trucks may be stored in up to three temporary, overhead, approximately 12,000-gallon water storage towers/tanks (up to 16 feet tall) to assist in the availability of water for trucks and to expedite filling. Operational water demand would include a maximum of 30 gallons per day intermittently (approximately 10 gallons per day per person), and only when O&M workers are present on site. O&M workers would not be present on site every day; therefore, on days when no O&M workers are present, operational water use would be negligible.

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6 PG&E Bellota Substation Expansion

In order to accommodate the interconnection of the Project, PG&E has determined that a small expansion to the existing Bellota substation, approximately 2 acres in size, will be required. The specifications and layout of the required facilities would be engineered, constructed (or caused to be constructed), owned, and maintained by PG&E.

Construction of this substation expansion would be primarily composed of the following activities:

- **Site Preparation***:* Rough grading may be performed where required to accommodate the support structures and access roads. Installation of a retaining structure may be required in some areas to accomplish final grades within the extents of PG&E property. Retention basin(s) and/or perimeter drainage ditches would be created for hydrologic control. A temporary staging area would be constructed to hold materials and construction equipment within the Project Site or internal to the approximately 18-acre PG&E switchyard development footprint.
- **Fencing***:* An approximately 11 foot tall pre-cast concrete security wall and foundations would be installed.
- **Foundation Construction and Aboveground Equipment Installation***:* Following site preparation, construction of the switchyard equipment foundations and the ground grid will commence. Foundation construction will commence with excavation activities that will be accomplished primarily by backhoes and drill rigs. Forms, reinforcing steel, and concrete will then be installed, as appropriate, to build the foundations. Once the foundation work has been finished, placement of major equipment on their respective foundations or structures, inclusive of anchoring in their final position and wiring of the equipment controls and protection devices, will be completed. This work will be accomplished by delivering equipment to the site on flatbed trucks and lifting it into place using cranes.
- **Cleanup**: All areas that are temporarily disturbed by construction activities will be restored to preconstruction conditions, to the extent practical, following the completion of construction.

The substation expansion is anticipated to be built over an approximately 12-month period from the onset of site preparation activities through testing and commissioning. It is anticipated that construction crews will work 8 or 10 hours per day, with work occurring Monday through Friday. Overtime and weekend work would be used only as necessary to meet schedule, electrical clearance, and safety requirements, and would comply with applicable California labor laws.

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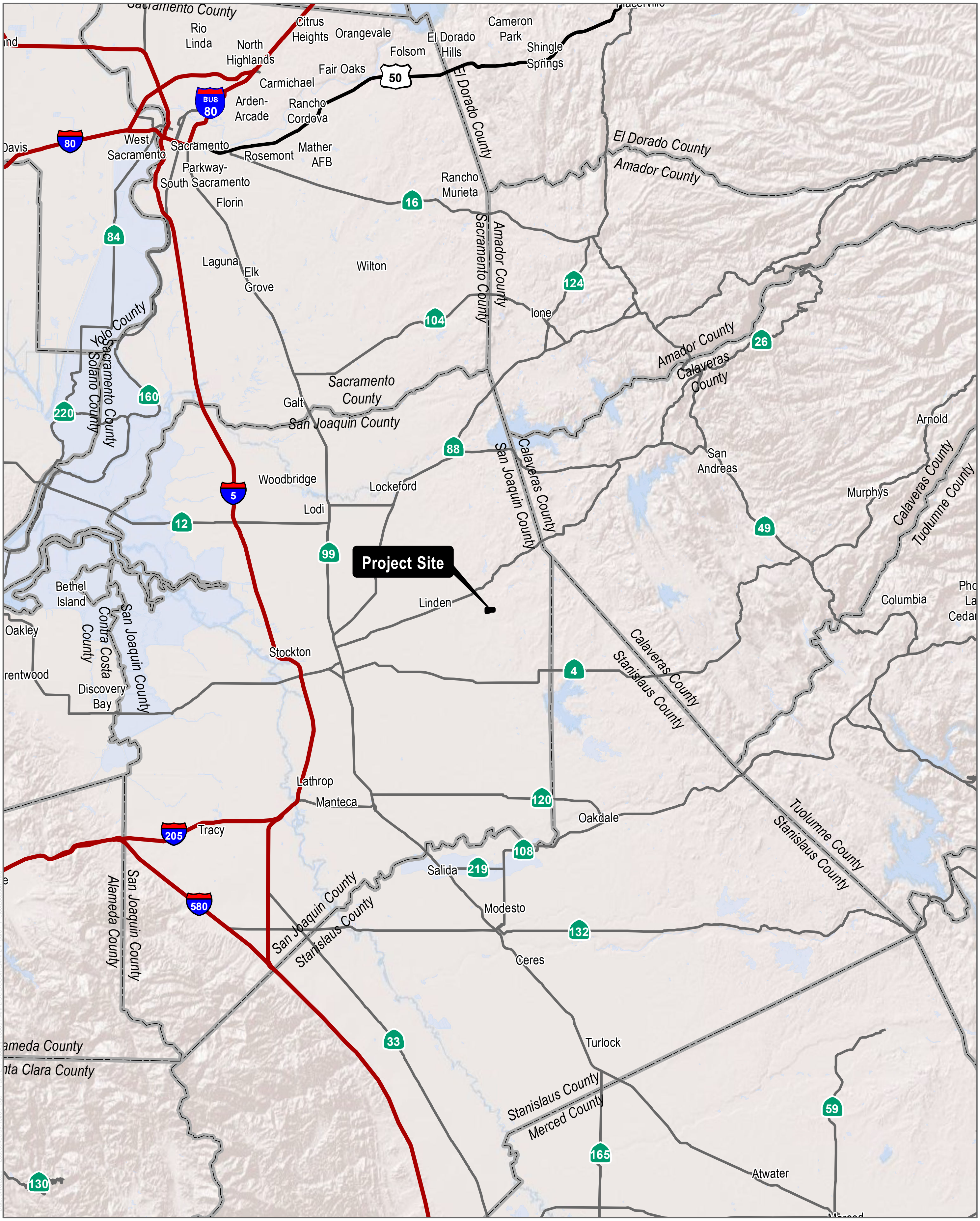

SOURCE: ESRI 2020

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0 27,500 55,000 Feet

FIGURE 1

Project Location

North Central Valley Energy Center

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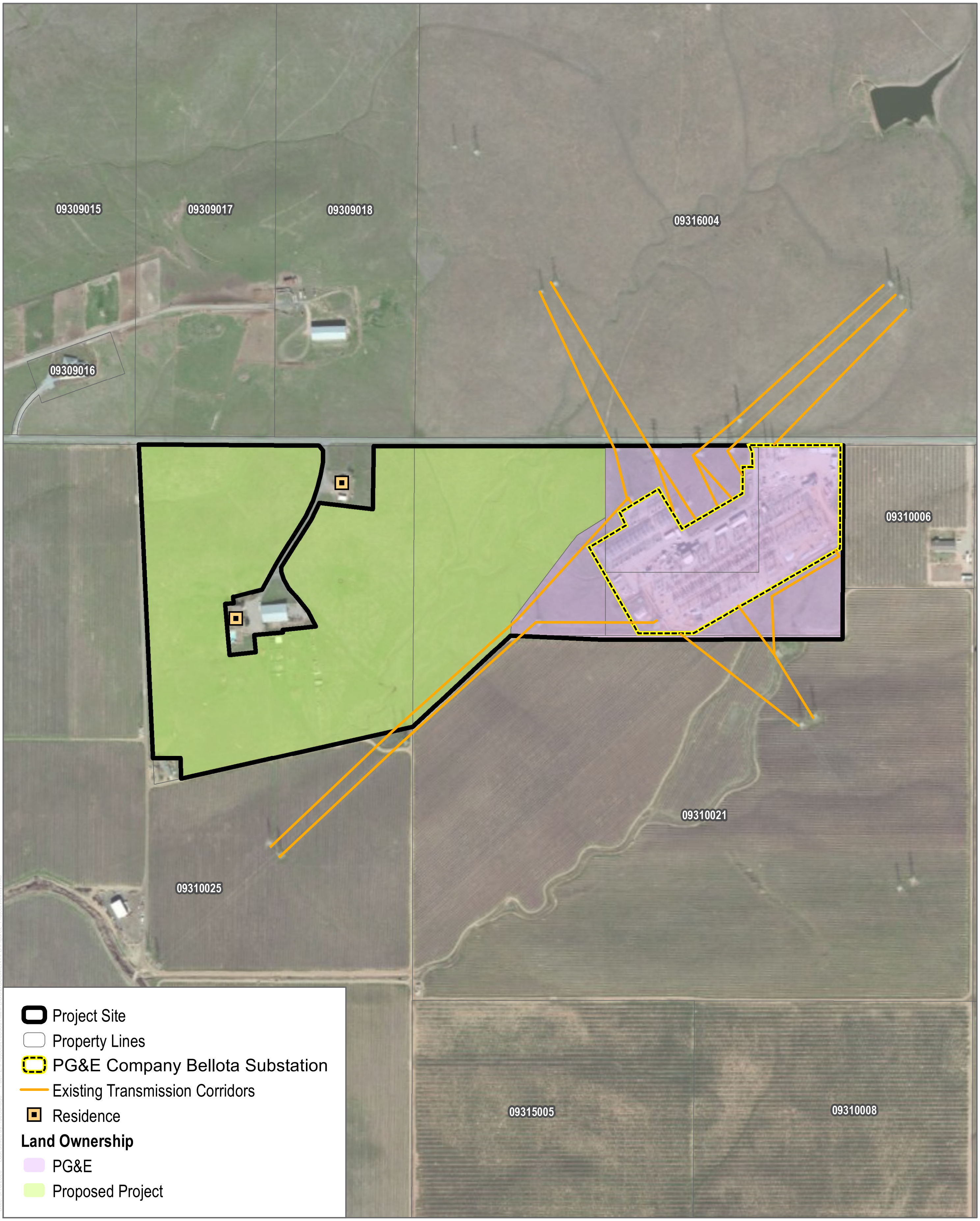

SOURCE: Esri Aerial Imagery 2020

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0 300 600 Feet

FIGURE 2

Vicinity Map

North Central Valley Energy Center

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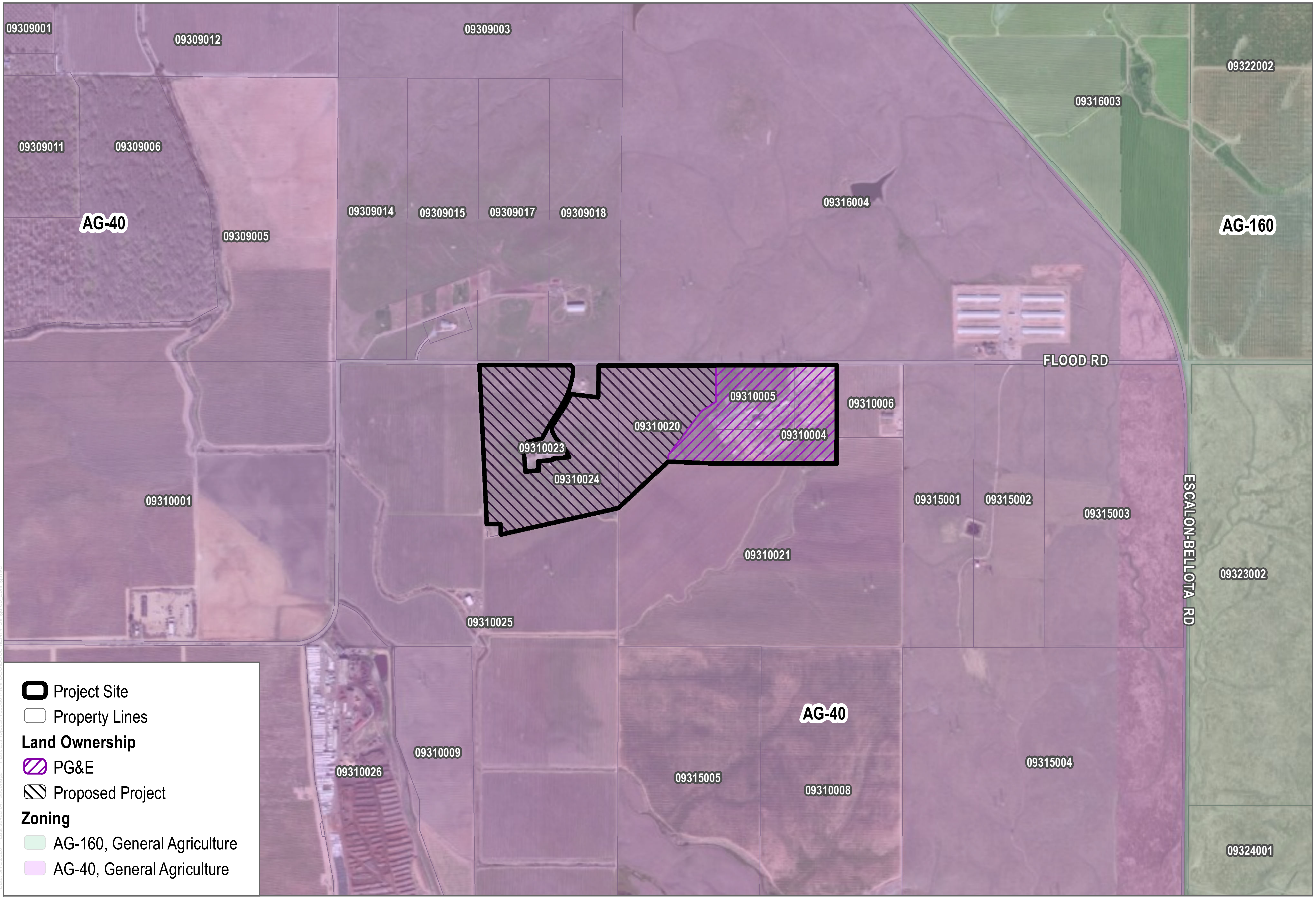

SOURCE: San Joaquin County 2017, DigitalGlobe 2020

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FIGURE 3

Zoning Map

North Central Valley Energy Center

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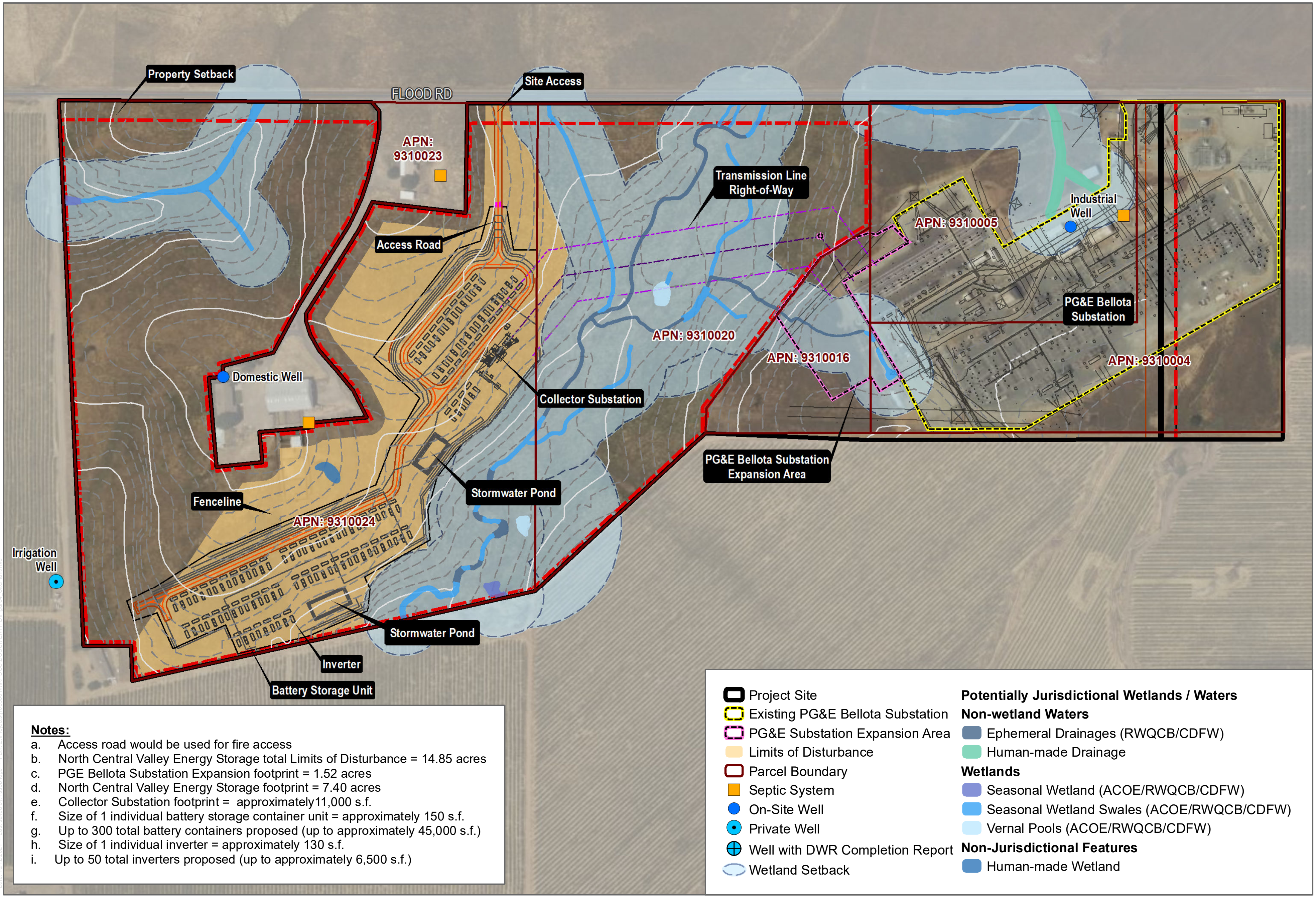

Notes:

a. Access road would be used for fire access
b. North Central Valley Energy Storage total Limits of Disturbance = 14.85 acres
c. PGE Bellota Substation Expansion footprint = 1.52 acres
d. North Central Valley Energy Storage footprint = 7.40 acres
e. Collector Substation footprint = approximately11,000 s.f.
f. Size of 1 individual battery storage container unit = approximately 150 s.f.
g. Up to 300 total battery containers proposed (up to approximately 45,000 s.f.)
h. Size of 1 individual inverter = approximately 130 s.f.
i. Up to 50 total inverters proposed (up to approximately 6,500 s.f.)

SOURCE: Bing Maps 2020, Burns & McDonnell 2021

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0 175 350 Feet

FIGURE 4

Site Plan

North Central Valley Energy Center

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