

## 1.0 Executive Summary

### 1.1 Project Overview

The City of Palmdale proposes to construct, own, and operate the 570 MW Palmdale Hybrid Power Project (PHPP or Project) and commence commercial operation in the summer of 2013. The PHPP plant site is located south of East Avenue M<sup>1</sup> (E Ave M) in the northernmost areas of the City of Palmdale. The 377-acre plant site is part of an approximately 600-acre City-owned property that is bounded by Sierra Highway to the west, E Ave M to the north, and U.S. Air Force Plant 42 on the south and east. (See Figure 1-1 at the end of this section).

The PHPP consists of a hybrid of natural gas-fired combined-cycle generating equipment integrated with solar thermal generating equipment. The combined-cycle equipment utilizes two natural gas-fired combustion turbine generators (CTG), two heat recovery steam generators (HRSG), and one steam turbine generator (STG). The solar thermal equipment utilizes arrays of parabolic collectors to heat a high-temperature working fluid. The hot working fluid is used to boil water to generate steam. The combined-cycle equipment is integrated thermally with the solar equipment at the HRSG and both utilize the single STG that is part of the Project. The solar thermal input will provide approximately 10 percent of the peak power generated by the facility during the time of day when electrical demand is highest.

The Project will be fueled with natural gas delivered via a new natural gas pipeline. The Southern California Gas Company (SCG) will design and construct the approximately 8.7-mile pipeline in existing street rights-of-way (ROW) within the City of Palmdale (see Figure 1-2, which shows all Project linear facilities). Reclaimed water for the Project's cooling tower makeup and other industrial uses will be supplied from the City of Palmdale Water Reclamation Plant (PWRP) located south of the plant site through a new 7.4-mile pipeline. The pipeline will be installed in existing City street ROWs almost entirely within the City of Palmdale; a small portion of the pipeline near the PWRP is in unincorporated Los Angeles County.

The Project's backup cooling water supply also will be reclaimed water. A regional reclaimed water "backbone" system is planned, linking the City of Palmdale with the City of Lancaster, both of whose wastewater treatment plants will produce tertiary treated reclaimed water. In the event of an outage in the Palmdale treatment plant's reclaimed water production system, the PHPP will utilize the regional backbone system to provide a source of reclaimed water to serve as a backup for the Project's cooling water supply. Based on the current planned route of the backbone, no additional Project-specific pipeline will be required.

The PHPP will be a zero liquid discharge (ZLD) design; no offsite industrial liquid waste discharge will occur. Brine (cooling water blowdown) from the Project will be processed to solid waste and disposed at an appropriately permitted offsite disposal facility. During Project operations, potable water for drinking, sanitary uses, showers, etc. will be obtained from the Los Angeles County Waterworks District No. 40. LA County Waterworks District No. 40 has a pipeline that terminates on East Ave M, a short distance west of

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<sup>1</sup> Many of the Streets in Palmdale also have names commemorating the City's connection with aviation history. For example, East Avenue M is also known as Columbia Avenue and 10<sup>th</sup> Street East is also called Challenger Way.

the plant site's northern boundary. The Project will construct a 1.0-mile pipeline along E Ave M from the power plant to the existing water pipeline. Portable sanitary facilities and bottled water will be used during Project construction.

Sanitary wastewater will be disposed by connecting to the Los Angeles County Sanitation District's sewer system. The County Sanitation District has an existing 12-inch sewer line that runs along E Ave L. The Project will connect to the existing sewer line at an existing manhole located at E Ave L and 10<sup>th</sup> St E, approximately 1.0 mile north of the plant site.

The proposed interconnection point for the PHPP with the Southern California Edison (SCE) electrical transmission system is at SCE's existing Vincent Substation south of Palmdale. Although the Vincent Substation is approximately 11 miles south-southwest of the PHPP plant site as the crow flies, to accommodate the needs of Palmdale's aviation community, a circuitous transmission line route that is 35.6 miles long is planned that extends north and east from the plant site, then south and back to the west (see Figure 1-2). The Project's transmission system will be constructed in two segments, as briefly summarized below.

PHPP transmission line Segment 1 involves the construction of approximately 23.7 miles of 230-kV transmission line in new and existing rights-of way (ROW) between the PHPP plant site and SCE's Pearblossom Substation. The route extends northward and eastward, then southward and finally back to the southwest. PHPP transmission line Segment 2 involves installation on new poles of an 11.9-mile double-circuit 230-kV line; the new line will be parallel to existing transmission lines in an existing ROW extending westward from the Pearblossom Substation to the Vincent Substation. Most of Segment 1 is within the City of Palmdale; the rest of Segment 1 and all of Segment 2 are in unincorporated Los Angeles County.

The Project owner and Applicant submitting this Application for Certification (AFC) is the City of Palmdale, a municipal corporation in the State of California. The PHPP is expected to supply power to the rapidly growing southern California market. The City has contracted with Inland Energy, Inc. to develop the Project.

## 1.2 Project Location and Description

The PHPP address is 950 E Ave M, Palmdale, California. The Project site is located on an approximately 377-acre parcel west of the northwest corner of Air Force Plant 42 and east of the intersection of Sierra Highway and E Ave M. The site is in a portion of the southwestern Mojave Desert known as the Antelope Valley, approximately 40 miles northeast of Los Angeles.

The PHPP will be developed on a vacant and undeveloped site in an industrial area of the City of Palmdale. The site is relatively flat, with elevations ranging from approximately 2,493 feet to 2,535 feet above sea level. The main population base of the community of Palmdale is approximately four miles to the south. The site currently includes multiple parcels already owned by the City of Palmdale.

Project construction is expected to begin in 2011 and be completed in 27 months, so that commercial operation can begin in the summer of 2013. The power generation facilities will be owned and operated by the City of Palmdale, the electric transmission facilities will be owned and operated by SCE, and the natural gas supply pipeline will be owned and operated by SCG. The reclaimed water supply will be provided by the City of Palmdale. The backup reclaimed water supply and sanitary wastewater disposal pipelines will be owned and operated by the Los Angeles County Sanitation Districts.

### 1.3 Project Alternatives

In developing the PHPP, a variety of alternatives were considered of different types - alternative plant sites, alternative linear facilities routes, plant design alternatives, and alternative power generation technologies. As discussed below, the alternatives were evaluated in their relationship to environmental, technological, public policy and economic considerations. Additionally, the alternatives were evaluated to their relationship with the Project objectives. Project objectives are summarized as follows:

- Provide an efficient, reliable and environmentally sound power generating facility to meet future electrical power needs of the rapidly growing City of Palmdale and surrounding areas, as well as provide additional generating capacity for the region and California.
- Locate the facility within the boundaries of the City of Palmdale and under City ownership and control. The City can, thereby, increase its level of assurance that residential, commercial, and industrial power needs in the City can be met, while at the same time supplying power to the regional grid.
- Use solar technology to generate a portion of the facility's power output and thereby support the State of California's goal of increasing the percentage of renewable energy in the state's electricity mix.
- Integrate the solar component of the Project and its combined-cycle component in a way that maximizes the synergies between the two technologies to increase Project efficiency.
- Site the facility in a location zoned and planned for industrial use in an industrial area and with ready access both to adequate supplies of non-potable water to meet the facility's process water needs and to a natural gas pipeline that can supply the Project without requiring significant modifications to the regional gas supply system.

None of the feasible alternative site, routes, or technologies evaluated would provide significant environmental advantage over the proposed Project approach, and thus these alternatives were rejected.

### 1.4 Environmental Information

This AFC has been prepared in accordance with current CEC power plant citing regulations and addresses each of 17 specified environmental topical areas. The following paragraphs briefly summarize, in alphabetical order, the information contained in Section 5.0 of the AFC for each topical area.

#### 1.4.1 Air Quality

The Palmdale Project is classified as a major source (>100 tons per year) of nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), and particulate matter (PM/PM<sub>10</sub>/PM<sub>2.5</sub>). Therefore, the Project will also be required to obtain a Prevention of Significant Deterioration (PSD) permit. The Project's combined-cycle equipment will be fueled with clean burning natural gas and will employ Best Available Control Technology (BACT) to control air emissions. This control technology will include selective catalytic reduction (SCR) systems and dry low-NO<sub>x</sub> combustors to reduce NO<sub>x</sub> emissions and oxidation catalysts for control of CO and volatile organic compounds (VOCs). The Project will also employ General Electric's (GE's) advanced Rapid Start Process, to significantly reduce emissions during startup of the combined-cycle power plant.

An Air Quality Impact Analysis (AQIA) was performed for the Project with respect to applicable PSD increments, National Ambient Air Quality Standards (NAAQS), and California Ambient Air Quality Standards (CAAQS) for construction, commissioning, and operation. Air dispersion modeling of expected Project emissions during construction, commissioning, and operations demonstrate that the Project will not cause or

contribute to exceedances of the ambient air quality standards, with the potential exceptions as described below. Air quality and visibility impacts were also assessed at the sensitive (Class I) Wilderness Areas within 100 kilometers of the PHPP.

During construction, concentrations of CO and sulfur dioxide (SO<sub>2</sub>) will be below the NAAQS/CAAQS. Initially, some potential for exceedances of the 1-hour NO<sub>2</sub> CAAQS was modeled to occur during early morning hours of the construction phase, primarily in the winter, when low mechanical mixing heights and low wind speed result in high modeled concentrations. However, this potential impact will be mitigated by limiting construction to daylight hours during specific times of the year. The PM<sub>10</sub> maximum 24-hour and annual average concentrations during construction were also modeled to exceed the CAAQS (but will not exceed the NAAQS) when the maximum background concentrations are added to the Project contribution. This exceedance is because the background values of PM<sub>10</sub> in this area already exceed the CAAQS prior to addition of the Project impacts. Although construction is a temporary activity, mitigation strategies will be put into place during construction to minimize particulate impacts. Control measures during construction will include application of water or chemical stabilizers to control dust, and measures that minimize construction equipment exhaust emissions where feasible. The restriction of construction hours mentioned above will also reduce PM<sub>10</sub> impacts. Lastly, the PM<sub>10</sub> emission reductions (offsets) that will be required for operation will also be in place prior to the start of construction. With these mitigation measures, the air quality impacts during construction will not be significant.

During operation of the Project, total concentrations of air pollutants (maximum modeled concentrations plus existing background values), will be below the PSD increments, NAAQS and CAAQS for all pollutants and averaging times, except for PM<sub>10</sub>. Similar to construction, the PM<sub>10</sub> concentration exceeds the CAAQS when background is added since the background values are already over the PM<sub>10</sub> CAAQS. As mitigation, the PHPP Applicant will offset NO<sub>x</sub> and VOC emissions as precursors to ozone, as well as PM<sub>10</sub> emissions. The Applicant will secure Emission Reduction Credits to satisfy these requirements.

An AQIA and an analysis of air quality related values (AQRVs, such as visibility and acid deposition), was performed for PSD Class I areas within 100 kilometers of the PHPP site. These analyses conclude that the PHPP will have no significant impact on the air quality or AQRVs in these areas.

### **1.4.2 Biological Resources**

The biological resources evaluation of the Project involved both literature research and a variety of field surveys. These included general vegetation and wildlife surveys as well as protocol-level surveys for a number of special-status wildlife species (i.e., the desert tortoise and burrowing owl) and special status plants. Impacts on desert tortoise would be minimal; mitigation would be required for impacts to burrowing owl (one burrowing owl was found in the survey), and Mohave ground squirrel (no survey was conducted within the last year, so the species' presence is assumed even though none were found during protocol surveys in 2006).

Habitat compensation-based mitigation approaches will ensure that Project impacts on biological resources will be less than significant. This will involve replacement of lost special-status species habitat (e.g., Mohave ground squirrel) by acquisition and conservation of equivalent habitat at different locations. Compensatory mitigation acreage requirements will be determined through discussions with the California Department of Fish and Game (CDFG).

Mitigation of impacts to nesting and migratory birds will require conducting at least one pre-construction survey for nesting birds and implementation of avoidance measures if nesting birds are identified.

Mitigation for additional special status species with a low potential to occur onsite will require pre-construction surveys and construction monitoring. To comply with the City of Palmdale's Native Desert Vegetation Ordinance, Joshua trees, which are plentiful on the plant site, will be used for landscaping of the site.

### **1.4.3 Cultural Resources**

A records search and review of previous investigations in the Project area and systematic pedestrian surveys performed for the Project identified no significant cultural resources at the PHPP plant site or along the Project's linear facilities. Project implementation will have no significant impacts on any known cultural resources. In the event that unexpected cultural resources are encountered, Project construction activities will be halted in the immediate vicinity of the find so its significance can be evaluated by the Project's designated cultural resources specialist and appropriate measures taken to mitigate potential adverse impacts to a significant find.

### **1.4.4 Geologic Resources and Hazards**

The Project area is subject to moderate to severe ground shaking from nearby and distant earthquakes. The Project site is in Seismic Zone 4, the zone with the highest potential for seismic ground shaking. Project structures will be designed to meet the stringent seismic design standards established for Seismic Zone 4. Segment 2 of the transmission line route crosses two designated Alquist-Priolo Earthquake Fault Zones (the San Andreas and the Llano). However, the Project's transmission structures will merely replace existing transmission structures in the same existing SCE ROW. Project foundations will be designed in accordance with geotechnical study recommendations with respect to collapsible soil conditions and liquefaction hazards. No major unique geologic or physical features have been identified in the Project areas. Project impacts on geologic hazards and resources are considered less than significant.

### **1.4.5 Hazardous Materials Handling**

The PHPP will be designed, constructed, operated, and maintained to ensure the safe use and storage of hazardous materials. Accident prevention and mitigation measures will be implemented, including risk management plans, hazards assessments, process management systems, release prevention and emergency response programs, employee training, and adherence to sound professional engineering standards and operating procedures.

Hazardous materials will be used and stored onsite during operations, including aqueous ammonia for the air pollution control system and the heat transfer fluid (HTF) used in the solar component of the Project. Analysis of potential accidental releases of hazardous materials (ammonia) shows that the Project will not pose a significant risk to areas outside the boundaries of the PHPP site. With implementation of planned mitigation measures, the Project's hazardous materials-related impacts will be less than significant.

### **1.4.6 Land Use**

The PHPP plant site is located in an area planned for industrial and commercial use. The City of Palmdale has land use jurisdiction over the entire plant site and most of the linear facilities routes, except for portions of the transmission line route and reclaimed water pipeline that are in unincorporated areas of Los Angeles County. General Plan Amendment and zone changes are planned by the City to change the plant site's land use designation from Specific Plan to Industrial and zoning from Specific Plan to M-2 General Industrial.

Land uses along Segment 1 of the transmission line route and the various Project pipeline routes are largely undeveloped. Project transmission line Segment 2 utilizes existing SCE transmission line ROWs that currently contain transmission lines, and thus there will be no change in land use. No significant adverse land use impacts are expected.

### **1.4.7 Noise**

The Project is in an industrial area with few noise-sensitive land uses in the immediate vicinity. The nearest existing residential area is approximately 600 feet north of E Ave L and east of 10<sup>th</sup> St E, over 1.5 miles from the center of the PHPP plant site, although there are a few scattered residences in the area north of the site closer to E Ave M. With the noise attenuation measures incorporated into the Project design, impacts at noise-sensitive receptors will be less than significant. Noise from Project construction activities will be short-term and also will not adversely affect noise-sensitive land uses.

### **1.4.8 Paleontological Resources**

One significant fossil locality was discovered in the Project area during Project paleontological investigations. To mitigate potential impacts to below significance, this locality will be salvaged (collected) for further study and analysis prior to the start of ground disturbance associated with construction of the PHPP transmission line. All significant fossils recovered will be processed and permanently curated in an approved repository or museum. Employee training and professional paleontologist monitoring in areas of high paleontological sensitivity will ensure that any unknown fossils that may be encountered would not be adversely impacted. Operation of the PHPP will not result in an adverse impact to paleontological resources because no substantial new ground disturbance is expected. Overall Project paleontological resources impacts will be less than significant.

### **1.4.9 Public Health**

A health risk assessment was conducted to determine the potential impacts from Project emissions of hazardous air pollutants. Health risks were evaluated at sensitive receptors (groups of individuals that may be more susceptible than the population at large to health risks due to exposure to toxic air contaminants, such as schools, day care facilities, convalescent homes, and hospitals). Analysis showed that all health risks are expected to be below the significance criteria of 1-in-one-million for cancer risk and 1.0 for non-cancer chronic and acute health impacts.

### **1.4.10 Socioeconomics**

PHPP construction and operation will have less than significant socioeconomic impacts. Minimal immigration to the Palmdale area of construction workers and dependents is expected during construction because of the large construction work force available in southern California. Thus, there would be minimal population growth that could adversely affect public services, such as local schools, law enforcement, fire protection, etc. The Project's small operations work force (36 workers) will not cause population growth that could adversely affect local services. Project construction and operation will have a positive fiscal impact (sales tax and property tax revenues) on local jurisdictions, as well as positive effects in terms of short-term construction job opportunities, construction and operations phase payrolls, and purchases of materials and supplies from local businesses. The Project is not expected to have adverse environmental justice impacts (disproportionate significant adverse impacts on low-income or minority populations).

#### **1.4.11 Soils**

The Project site is vacant and undeveloped. The plant site is situated on a large alluvial fan and is relatively flat. According to a 2007 preliminary geotechnical study of the plant site, the plant site is underlain by alluvial soil deposits, generally comprised of alternating layers of various combinations of sand and silt. The PHPP will not cause significant impacts to agriculture; no valuable farmland will be adversely affected.

Erosion impacts could result from soil movement and disturbance in the areas of Project construction activities and from storm water runoff at the construction site as well as the operating facilities. With the implementation of Best Management Practices (BMP) in construction-phase and operation-phase Storm Water Pollution Prevention Plans (SWPPP) and the CEC-mandated Drainage, Erosion, and Sediment Control Plan (DESCP), soil erosion impacts will be less than significant.

#### **1.4.12 Traffic and Transportation**

Peak Project construction will involve a work force of approximately 760 workers whose commuting vehicles will temporarily increase traffic volumes on local roadways. All roadways except E Ave M and Sierra Highway are forecast to continue operating at their existing without-Project Level of Service (LOS) during peak Project construction; Sierra Highway is forecast to experience a limited degradation in LOS assuming Year 2009 conditions (from LOS C to LOS D), but will still continue to operate acceptably. With implementation of planned mitigation measures (signalization of the intersections of 10<sup>th</sup> St E and E Ave M and E Ave L), impacts will be less than significant. Long-term traffic associated with PHPP operation would include a small workforce (36 people) and thus, minimal traffic volumes and resulting impacts.

Analysis of turbulence from the Project HRSG stacks and potential glare from the solar mirror collection array indicate that no significant impacts are expected on aviation operations at Air Force Plant 42. See Section 1.4.14 below regarding the potential impacts from visible plumes.

#### **1.4.13 Transmission System Safety and Nuisance**

The electrical effects of high-voltage transmission lines fall into two broad categories: corona effects and field effects. Corona is the ionization of the air that occurs at the surface of the energized conductor and attachment hardware due to very high electric field strength during certain conditions. Field effects are the voltages and currents that may be induced in nearby conducting objects and stem from a transmission line's inherent electric and magnetic fields (EMF). Analysis indicates that Project construction and operations, including interconnection with SCE's transmission system, are not expected to result in significant increases in EMF levels or audible noise, and no significant impacts are expected with respect to communications or aviation safety.

#### **1.4.14 Visual Resources**

The Project's impacts on visual resources are expected to be less than significant. The presence of the PHPP facilities will not create a substantial change in the visual quality of the landscape, since the plant site does not contain significant scenic resources and its overall level of scenic quality is considered moderate. The Project's conceptual landscaping plan will utilize desert vegetation, including transplanting of Joshua trees from the site's interior to locations along E Ave M, along the site entrance road, and near the administration building. Impacts along the transmission line route also will be less than significant.

Visible vapor plumes from the Project are expected to occur infrequently and mainly at night or during periods of precipitation during the winter. For visible plumes that occur during the day, they will tend to be relatively small in dimensions and will tend to occur in the early morning or late afternoon when

temperatures are lower and humidity is higher. Although infrequent, the need for a plume abated cooling tower is still being considered due to the presence of these plumes.

### **1.4.15 Waste Management**

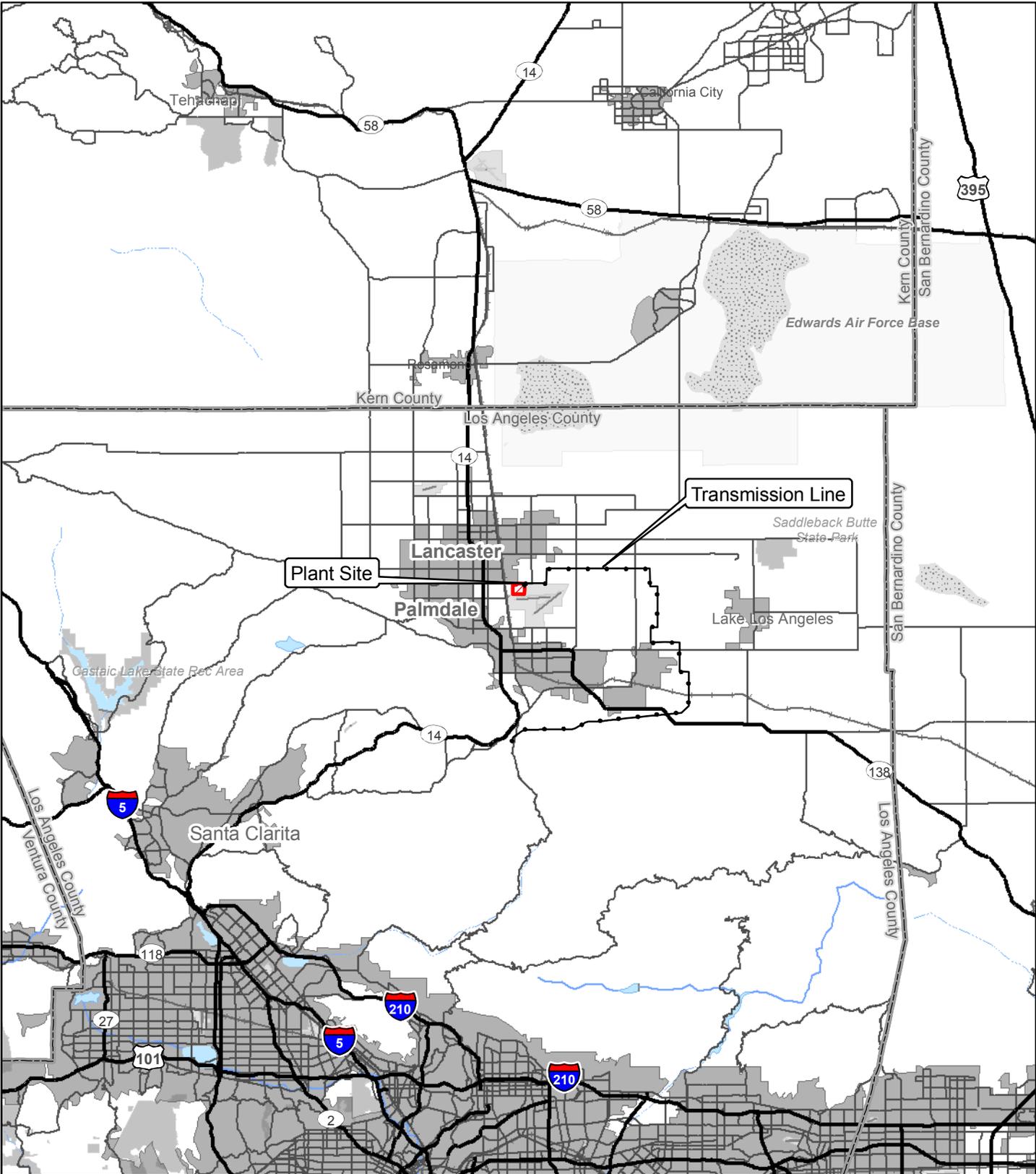
Project construction and operations will generate non-hazardous solid and liquid wastes (e.g., sanitary wastewater, residual solids from treatment of cooling water blowdown from the ZLD system), and small quantities of hazardous waste (e.g., spent catalyst from the SCR system and used hydraulic fluids, oils and grease). To the extent practicable, waste materials will be recycled. Project procedures and personnel training will ensure that waste generation is minimized and that wastes generated are managed appropriately. Disposal of Project wastes will not significantly affect the capacity of available non-hazardous or hazardous waste disposal facilities.

### **1.4.16 Water Resources**

Project impacts on water resources will be less than significant. Reclaimed water, obtained from the Palmdale Water Reclamation Plant through a new 7.4-mile pipeline, will be used for the Project's cooling tower makeup and other industrial uses. The PHPP will be a zero liquid discharge design; no offsite industrial liquid waste discharge will occur. Brine (cooling water blowdown) from the Project will be processed to solid waste and disposed at an appropriately permitted offsite disposal facility. With implementation of BMPs, including drainage and erosion control measures, during construction and operation that are included in the Project's SWPPPs and DESC (see Section 1.4.11, Soils above), surface water quality impacts will be minor.

### **1.4.17 Worker Safety**

Project construction and operations phase activities may expose workers to physical and chemical hazards. Worker exposure to such hazards will be minimized by adherence to appropriate engineering design standards and criteria and to sound construction, operations, and maintenance practices. The Project also will implement appropriate safety and administrative procedures, safety training, use of personal protective equipment, and compliance with applicable health and safety-related regulations. Site-specific Fire Protection and Prevention and Emergency Action Plans will also be implemented during both construction and operations. With implementation of the safety programs, no significant worker safety impacts are expected.



**Map Location**



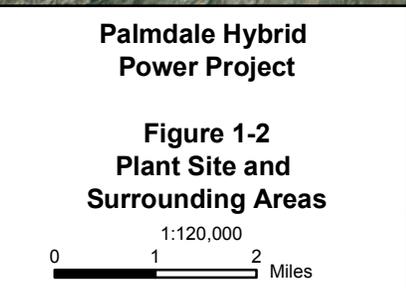
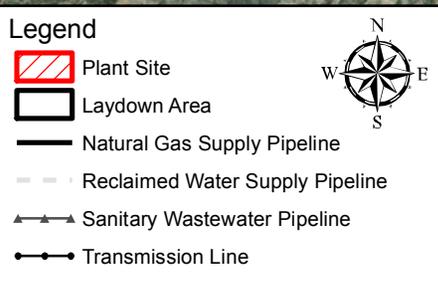
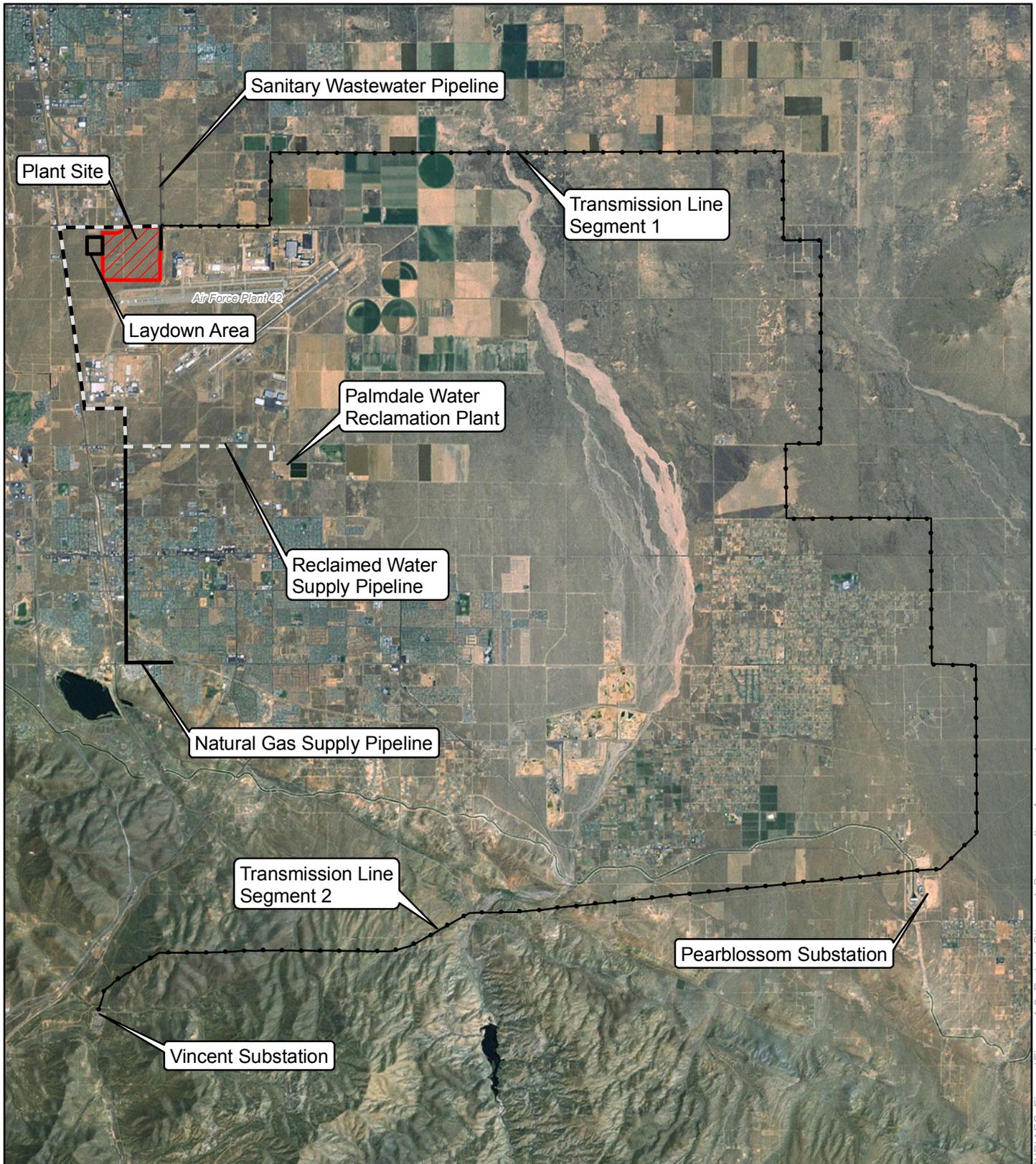
**Palmdale Hybrid Power Project**

**Figure 1-1 Regional Map**

1:600,000



Project: 10855-002  
Date: July 2008



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