Renewable Energy Streamlining Program

Opportunities and Constraints Technical Study

Prepared for

County of
San Luis Obispo

February 2014

Aspen
Environmental Group

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List of Acronyms

AB	Assembly Bill
ALUP	Airport Land Use Plan
AML	Abandoned Mine Land
CA	Corrective Action
CBC	California Building Code
CDC	Center for Disease Control
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CESA	California Endangered Species Act
CMC	California Men's Colony
CNDDB	California Natural Diversity Database
COSE	Conservation and Open Space Element
CPAD	California Protected Areas Database
CPUC	California Public Utilities Commission
CREZ	Competitive Renewable Energy Zone
CRHR	California Register of Historic Resources
DG	Distributed generation
DIH	distribution interconnection handbook
DOC	California Department of Conservation
DTSC	California Department of Toxic Substance Control
EIR	Environmental Impact Report
EMF	electric and magnetic field
EPA	Environmental Protection Agency
ESA	Federal Endangered Species Act
FAA	Federal Aviation Administration
FEMP	Federal Energy Management Program
FERC	Federal Energy Regulatory Commission
FH	Flood Hazard
FMMP	Farmland Mapping and Monitoring Program
FWS	Fish and Wildlife Service
FY	fiscal year
GAP	Gap Analysis Project
GHG	greenhouse gas
GIS	Geographic Information Systems
HCP	Habitat Conservation Plan
IOU	investor-owned utility
KOP	Key Observation Point

LCC	Land Capability Classification
LCP	Local Coastal Program
LFG	landfill gas
LMOP	Landfill Methane Outreach Program
LOS	Level of Severity
LUC	Land Use Category
LUCE	Land Use and Circulation Elements
LUO	Land Use Ordinance
MSA	Metropolitan Statistical Area
MW	megawatt
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Plans
NCED	National Conservation Easement Database
NEM	net energy metering
NMFS	National Marine Fisheries Service
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
NREL	National Renewable Energy Laboratory
OCTS	Opportunities and Constraints Technical Study
OSHA	Occupational Safety and Health Administration
PG&E	Pacific Gas and Electric
POU	publicly owned utility
PPA	Power Purchase Agreement
PV	photovoltaic
RAM	Renewable Auction Mechanism
RCRA	Resource Conservation and Recovery Act
RE	renewable energy
REDA	renewable energy development area
RESP	Renewable Energy Streamlining Program
RETI	Renewable Energy Transmission Initiative
RMS	Resource Management System
RPS	Renewable Portfolio Standard
SCE	Southern California Edison
SDG&E	San Diego Gas & Electric
SRA	Sensitive Resource Area
URL	urban reserve lines
WECF	Wind Energy Conservation Facilities

1. Introduction

San Luis Obispo County (County) has undertaken the development of a Renewable Energy Streamlining Program (Program) to allow the County and renewable energy developers to make decisions about the feasibility of new projects in a streamlined and cost effective manner. The Program would implement existing direction from the County Board of Supervisors to "provide a framework for moving toward an energy future that transitions from traditional, non-renewable fossil fuel energy sources, to the production of environmentally sustainable, renewable energy supplies that do not degrade ecosystems." (COSE, General Plan, 5.1).

As part of the Program, the County has prepared this Opportunities and Constraints Technical Study (OCTS), which is intended to identify the County's renewable energy resources and to identify locations where development of these resources can most feasibly be streamlined. This OCTS serves as the basis for a subsequent effort in which the County would develop a streamlined permitting process and complete the required environmental review under the California Environmental Quality Act (CEQA) for renewable energy development within San Luis Obispo County.

The OCTS outlines key resource and infrastructure requirements for renewable energy development and key environmental considerations within the County. This information is then used to establish areas within the unincorporated County suitable for renewable energy development, and the available or most easily upgraded transmission and distribution lines that would connect the renewable energy facilities to the power grid.

This OCTS identifies preliminary renewable energy development areas (REDAs). To the extent practicable the REDAs:

- Capture the County's renewable energy resource potential;
- Have access to the electric transmission/distribution and other infrastructure (e.g., roads, water, etc.); and
- Minimize environmental impacts by avoidance of sensitive resources based on a set of environmental factors that provide either opportunities or constraints. The potential to mitigate environmental impacts in constrained areas would be defined at a programmatic level through performance standards to be developed for renewable energy project development in the new Renewable Energy Combining Designation and mitigation measures in the associated Program Environmental Impact Report (EIR).

The REDAs will be used as a basis for the definition and delineation of a new RE Combining Designation zoning overlay and the Project Description and alternatives in the Program EIR that would serve as the CEQA clearance document. With sufficient time and funds, it may be possible to permit renewable development in most areas of the County; however, the intent of the OCTS is to identify locations in the County that would result in the least environmental impacts, and so would present the best opportunities for simple and streamlined renewable energy development.

This OCTS is organized as follows:

- **Section 2, Energy Policy Framework** provides an overview of both State and local policies applicable to RE;
- **Section 3, Renewable Energy Development Areas** provides the conclusions of the OCTS and identifies the County REDAs;

- **Section 4, Renewable Energy Resources** provides background on the energy development requirements;
- **Section 5, Electric System Infrastructure** provides background regarding the transmission and distribution system in the County;
- **Section 6, Environmental Resource Analysis: Opportunities and Constraints** provides the detailed analysis supporting the environmental considerations that were used to define the REDAs;
- **Section 7, Next Steps** provides recommendations for use of the OCTS in future planning efforts; and
- **Section 8, Data Sources and References** provides a list of data sources and resources used to prepare the study.

The OCTS includes a large number of maps associated with the REDAs, the renewable energy requirements, infrastructure, and environmental resources. These maps are included in a separate appendix (Appendix A) for ease of review. They are intended to be used in conjunction with the write-up to demonstrate how the REDAs were developed.

The San Luis Obispo County Local Coastal Program (LCP) and associated Coastal Zone Land Use Ordinance have been adopted to guide and manage future growth of the County and to regulate land use in a manner that would encourage and support the orderly development and beneficial use of lands within the designated Coastal Zone, consistent with the California Coastal Act. At this time, the Coastal Zone is not included within the County's Renewable Energy Streamlining Program. An LCP amendment would be required to allow for renewable energy development in the Coastal Zone. Therefore, the LCP and Coastal Zone ordinance are considered policy and regulatory constraints to renewable energy development in the Coastal Zone within San Luis Obispo County. Although there are opportunities for renewable energy development available in the Coastal Zone and presented in maps and the REDAs, the scope of the County's Renewable Energy Streamlining Program does not include the coastal zone at this time.

2. Energy Policy Framework

Both California and the County have numerous policies designed to increase renewable energy development and reduce greenhouse gases. State and County policies focus on encouraging development by providing renewable energy targets and aim to facilitate the actual siting and procurement of renewable energy. Sections 2.1 through 2.3 provide a brief overview of these policies.

2.1 State Renewable Policies

In California, a number of existing and proposed policies drive renewable energy development, the primary of which is California's Renewable Portfolio Standard (RPS).

Renewable Portfolio Standard

California's RPS was established in 2002, accelerated in 2006, and expanded in 2011 and is the most aggressive RPS in the country. It requires investor-owned utilities (IOUs), publicly owned utilities (POUs) and other electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33% by 2020. The RPS is the primary driver for new utility-scale renewable energy development in California (CPUC, 2013).

As of the end of 2012, the IOUs reported that they served 19.6% of their electricity with RPS-eligible generation in 2012 (CPUC, 2013). RPS procurement requires the utilities to achieve a target of 20% from 2011 to 2013. According to the California Public Utilities Commission (CPUC), California is on track to meets its interim requirement of 25% renewable by 2016 and well positioned to meet 33% by 2020 (CPUC, 2013). With California's utilities on track to meet the RPS, the development of new renewable energy could slow. However, California's Senate and State Assembly passed Assembly Bill 327, signed into law in October 2013. This bill removes the RPS upper limit thereby providing the potential to increase renewable generation to more than 33%. While the RPS has not yet been raised, AB 327 indicates the governor's willingness to exceed the current RPS which may continue to drive developer interest.

In addition to the California RPS goals, other programs encourage development of customer-side renewable energy. The California Solar Initiative[1] and Self-Generation Incentive Program[2] incentivize customers to install renewable energy technologies to directly serve their electricity needs, or loads. This electricity may contribute to meeting California's RPS goals if a project meets the eligibility requirements established for the RPS. On-site projects also indirectly contribute to meeting the RPS by reducing the overall electricity demand in California.

Assembly Bill 32: Global Warming Solutions Act

In 2006, the Legislature passed the Global Warming Solutions Act which set into law the recommendation for reducing California's greenhouse gas emissions to 1990 levels by 2020. It directed

[1] The California Solar Initiative (CSI) is a solar rebate program that offers cash back to customers of the IOUs – Pacific Gas and Electric, Southern California Edison, and San Diego Gas & Electric. This program funds solar panels on existing homes, and on existing or new commercial, agricultural, governmental, and non-profit buildings. The CSI project has a goal to install approximately 2,000 MW of solar projects by 2016.

[2] The CPUC's Self-Generation Incentive Program (SGIP) provides incentives to support existing, new, and emerging distributed energy systems. The SGIP provides rebates for qualifying distributed energy systems installed on the customer's side of the utility meter.

the California Air Resources Board to begin developing actions to reduce greenhouse gases while preparing a scoping plan to identify how best to reach the 2020 limit. A key element of the Scoping Plan was to achieve a statewide renewables energy mix of 33%. The County's EnergyWise Plan provides a path for the County to achieve 1990 equivalent GHG emission levels by 2020.

Distributed Generation Policies

In California, renewable energy projects are considered either distributed (i.e., 20 megawatts (MW) or less) or utility-scale (over 20 MW). Distributed generation (DG) is also defined as localized energy generation interconnected on site or close to load. DG is generally constructed quickly with no new transmission infrastructure required and minimal environmental impacts. In the *Clean Energy Jobs Plan,* Governor Brown established a goal of 12,000 MW of localized energy development in California (Brown, 2008). The Plan identified solar systems of up to 2 MW that would be installed on roofs and other projects up to 20 MW in size that would be located on public and private property throughout the State. Utility-scale renewable development is defined as projects that are greater than 20 MW in size.

The OCTS assumes that projects up to 20 MW could be streamlined by the County. While it is possible that larger renewable projects could potentially be streamlined under certain circumstances, at this time the County is focusing its resources on streamlining projects consistent with the policies outlined in the Conservation and Open Space Element (see Section 2.3).

Projects likely to be streamlined would generally be located on fewer than 150 acres,[3] because they could be sited among other existing development, and could potentially be integrated into the grid with few transmission upgrades or could provide energy directly to a load. Candidate projects would likely fit within California's current procurement strategies described below. Candidate projects also could be either behind the meter installations designed to serve an on-site load such as a large industrial facility, or projects that produce energy for wholesale DG procurement.

Power Purchase Agreements

The economic feasibility of an energy project is contingent on having a Power Purchase Agreement (PPA) with a willing buyer. A PPA is a contract between an electricity generator and a purchaser of electricity. A renewable developer would be unlikely to develop a project without a willing purchaser for the energy. As California IOUs and publicly owned utilities move closer to reaching the 33% RPS goal, the number of available PPAs will likely decrease.

Since 2009, the number of viable renewable projects has increased significantly; all of which are competing for a decreasing RPS need (Douglas, 2012). This results in an imbalanced supply and demand for renewable energy which is forcing market consolidation and resulting in an increased amount of solar photovoltaic (PV) installations and wind energy to the disadvantage of other renewable technologies (Douglas, 2012). For example, the 2011 RPS solicitation by the IOUs received more than 3,000 pricing proposals (i.e., projects) of which only 2% were shortlisted for receiving a PPA. Both solar PV and wind energy projects offered very competitive bids to the IOUs (Douglas, 2012).

[3] Renewable energy technologies require a range of acreage per MW of energy. The Energy Commission Renewable Energy Calculator used the following acreage requirements (acres/MW) for its analysis: solar thermal and solar PV require 7.1 acres/MW; wind requires 40 acres/MW (but much of this land is not disturbed); geothermal requires 6 acres/MW; and biomass requires 2.5 acres/MW. Based on these acreage requirements, a 20-MW solar project would require approximately 140 acres of land.

Because the number of viable renewable energy projects has increased since 2009 and there is a decreasing RPS need, PPAs are becoming increasingly challenging to get, and this puts downward pressure on cost. This has opened up an opportunity for wholesale DG, in part because these projects should be easier to site and interconnect to the energy grid and because there are separate procurement methods for these smaller projects. The three primary market strategies for wholesale DG include the Renewable Auction Mechanism, IOU solar PV programs, and the Senate Bill 32 Feed-in-Tariff; these are summarized below.

- **Renewable Auction Mechanism (RAM).** In December 2012, the CPUC adopted the RAM to stimulate the development of wholesale renewable DG projects between 3 MW and 20 MW by lowering transaction costs. RAM is a streamlined contracting mechanism that uses an auction where renewable energy sellers that meet certain criteria can submit non-negotiable price bids. The buyer then selects winning sellers based on the lowest-priced bids and signs non-negotiable standard contracts with these sellers. RAM is intended to be the primary procurement means for projects in this size range.
- **IOU solar PV programs.** The CPUC authorized Pacific Gas and Electric (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric (SDG&E) to own and operate solar PV facilities and execute solar PV PPAs with independent power producers through a competitive process. The three programs were supposed to yield up to 1,100 MW in total; however, the programs were revised downward after other market strategies came into fruition.
- **Feed-in Tariff.** Assembly Bill 1969 (2007) created a renewable feed-in-tariff program for projects up to 1.5 MW to stimulate the development of small-scale renewable DG by streamlining the process for generators to sell power wholesale to IOUs through a standard contract. In 2012, the CPUC adopted a revised and larger program.

2.2 Financial Renewable Energy Policy Background

Federal Policy Background

Federal renewable energy plans and polices regarding financial incentives are wide ranging, from tax deductions to providing grants and loans to renewable developers. Additionally, there are policies requiring federal facilities and fleets to use renewable resources for electricity, heating, cooling, and other applications to. This is primarily regulated through the Federal Energy Management Program (FEMP), which provides assistance and resources to help federal agencies evaluate and implement renewable energy technologies. The Department of Housing and Urban Development (HUD) also offers financial assistance for home renewable energy projects.

More than two-dozen federal programs have been used to support brownfields redevelopment. These programs support the use of brownfield sites for renewable energy projects. EPA's Brownfields Program may be used to supplement investment in renewable energy site planning, preparation, construction, or capital equipment purchases. Renewable energy projects could benefit during the early stages of project planning and development from EPA assessment grants (up to $200,000) and cleanup grants (up to $200,000, typically with a 20% cost share requirement); renewable energy project developers may also be able to partner with recipients of EPA Revolving Loan Funds (capitalized up to $1 million). These funds can be used to make the site "shovel ready" for a renewable energy project, potentially incorporating elements of the final site requirements.

Several federal tax incentives can support siting of renewable energy facilities. In general, the goal of tax incentives is to channel private capital to certain areas, such as distressed communities, or to achieve a desired investment outcome, such as renewable energy development.

- *Business energy investment tax credits*: The federal government offers tax credit incentives to promote the development and deployment of renewable technologies.
- *Renewable energy bonus depreciation*: Many renewable energy projects are classified as "five-year property" under the IRS Modified Accelerated Cost Recovery System (MACRS), making total project costs depreciable over five years, with 50% "bonus" depreciation for eligible systems in the first year.
- *New Markets Tax Credits (NMTC)*: NMTCs were designed to stimulate investments and create jobs in distressed communities, often the location of brownfield properties.

State Policy Background

Within the State, the California Energy Commission's Emerging Renewables Program funds grid-connected, solar PV electricity systems under 30 kilowatts on homes and businesses in the IOUs' service areas, wind systems up to 50 kW in size, fuel cells (using a renewable fuel), and solar thermal electric generation. Since 2007, the Emerging Renewables Program has focused on providing incentives toward the purchase and installation of small wind systems and fuel cells using a renewable fuel. In addition, the CPUC has funded self-generation projects for businesses through the Self-Generation Incentive Program. The California Rule Home Mortgage Finance Authority Homebuyers Fund also offers financial assistance for home renewable energy projects.

The following briefly identifies several statewide tax incentive programs for renewable energy development:

- *Emerging Renewables Rebate Program*: offers rebates for the installation of grid-connected small wind and fuel cell renewable energy generating systems, including: small wind turbines (up to 50 kW), $250 per watt for the first 7.5 kW and $1.50 per watt for increments greater than 7.5 kW and less than 30 kW; and fuel cells (<30 kW) using renewable fuels, $3.00 per watt for systems less than 30 kW. Rebates for eligible systems installed on affordable housing projects are available at 25% above the standard rebate, up to 75% of the system total cost.
- *California Solar Initiative (CSI) – PV Incentives*: Offers cash back for installation of onsite PV systems from 1 kW up to 1 MW. Those with systems up to 5 MW may apply, but incentive payments will be prorated to 1 MW. For eligible solar systems equal to or greater than 50 kW, CSI provides performance-based incentives: a flat cents-per-kWh monthly payment for all metered output from eligible solar systems over the initial five years of operation.
- *Feed-In Tariffs*: Provides feed-in tariffs for the purchase of up to 500 MW of renewable generating capacity from qualifying renewable energy facilities less than 1.5 MW in size. Sellers receive a fixed base rate determined by the current Market Price Referent table for a period of 10, 15, or 20 years. These tariffs are intended for renewable electric generation that is not net metered and does not participate in commission-adopted incentive programs

The state also offers net metering for electricity generated using qualifying renewable energy sources. Publicly owned utilities may elect to provide co-energy metering. Customer-generators retain ownership of all renewable-energy credits (RECs). Technologies eligible for net metering are exempt from interconnection application and review fees. There is no charge for the system upgrades required for interconnection, but limits on system size do exist.

2.3 County Regulatory and Policy Framework

The County has made great strides toward planning for renewable energy. The most notable of these efforts include the Conservation and Open Space Element (COSE) of the County General Plan, and the Climate Action Plan, referred to as the EnergyWise Plan (adopted November 22, 2011). The COSE seeks to preserve and protect important natural and cultural resources, while balancing the needs of the natural and built environment, including renewable energy development (SLO County, 2010). The EnergyWise Plan, as part of the Community Wide GHG Reduction Strategy, includes goals to develop and use more renewable energy (SLO County, 2011). In addition, the County Land Use Ordinance (Title 22) sets out the specific mandatory criteria that must be satisfied when planning and developing renewable energy to achieve consistency with the general plan (SLO County, 2013).

Conservation and Open Space Element

The main impetus for the County's Renewable Energy Streamlining Program (RESP) is COSE Goal E6 (increase in renewable energy use), and in particular Policy E.6.8, wherein the County seeks to "designate and protect areas that contain renewable energy resources such as wind, solar, geothermal, and small hydroelectric." The main intent of this OCTS and the resultant RESP is to comply with Policy E.6.8 and its associated implementation strategies. Implementation Strategy E 6.8.1 (Mapping of resources) requires the "…[u]se of state, federal, or other available data to map areas that contain renewable energy resources." Through Implementation Strategy E 6.8.2, the County would "…[a]mend the Framework for Planning, the Area Plans, and the Land Use Ordinance (LUO) by establishing and applying a Renewable Energy (RE) combining designation based on the mapping in Energy Implementation Strategy 6.8.1." The RE designation and implementing LUO standards are to:

1. Encourage the development of renewable energy while maintaining a high level of environmental quality;
2. Avoid areas that are not appropriate for renewable energy due to existing incompatible uses; and
3. Protect areas of renewable energy resources, as well as existing and expanding renewable energy projects, from encroachment by incompatible land use categories and development.

The COSE also includes several other important energy-related policies and implementation strategies to further help facilitate renewable energy development, including:

- Policy E 6.2, Encourage and support the development of solar and wind power and other renewable energy systems as commercial energy enterprises.
  - Implementation Strategy E 6.2.1 (Review of large solar projects), Evaluate large-scale commercial solar projects (i.e., over 10 MW) to favor technologies that maximize the facility's power production and minimize the physical effects of the project. Physical effects include, but are not limited to, noise, area of land disturbance and water use.
  - Implementation Strategy E 6.2.2 (Encourage development of wind power facilities), Encourage the development of wind power in areas where wind speeds make commercial wind power feasible. Focus should be placed on locations near existing power facilities and existing transmission lines.
  - Implementation Strategy E 6.2.3 (Use of disturbed sites), Examine the potential for use of previously disturbed sites such as former mine sites, or disturbed urban areas such as parking lots.

- Implementation Strategy E 6.2.4 (Use of existing energy generating sites), Collaborate with local and State agencies and energy facility operators to develop renewable energy resources at existing energy generating sites.

- Policy E 6.6 (Distributed energy), Encourage distributed energy resources to increase the efficiency of the power and transmission system and use of local renewable fuel sources.
- Policy E 6.9 (Commercial Renewable Energy Facility Siting), Renewable energy is developed most effectively where sufficient renewable energy resources exist (e.g., solar energy requires a certain amount of sunlight to be efficient and wind energy requires a certain amount of wind.) In areas where renewable energy resources have been identified and mapped pursuant to Policy E6.8, renewable energy development is dependent on the mapped resource and shall be given high priority while balancing the protection of other environmental resources.

In addition, because renewable energy development requires connection of the power generation source into the electric grid system (either transmission or distribution lines), Policy E 7.1 (Non-Renewable Energy Facility Siting) must be considered when there is a potential need for transmission line siting. The Transmission Line Objectives of Implementation Strategy E 7.1.1 (Non-Renewable Energy facility design, siting, and operation standards) include:

- 26) Discourage land uses that may expose human populations to undue risk of human exposure to potential hazards of large transmission lines.
- 27) Discretionary development and proposed land divisions should follow the standards established by the California Energy Commission and CPUC for electric and magnetic field (EMF) exposure.
- 28) Evaluate proposals for new transmission lines for alternatives that significantly reduce their visibility and impacts to sensitive environmental resources.
- 29) As part of the siting analysis, proposals for new transmission line corridors should consider the following preferences to minimize impacts:
    a. First preference shall be for projects that upgrade or modify existing lines to meet increased demand. In such instances, the existing right-of-way should be maintained at its present width wherever possible.
    b. Second preference is for corridor consolidation with existing transmission lines, unless there are cumulative impacts that outweigh the benefits of consolidation. In such instances, the amount of additional right-of-way width to be acquired should be kept to the minimum area feasible for operation of the lines.
    c. The least preferred option is for transmission line projects that require entirely new corridors. In this instance, consideration shall first be given to using existing utility rights-of-way, including pipelines, railroads, and communication cables.

EnergyWise Plan

As discussed above under the State Policy Framework, the State of California RPS (see Section 2.1) was established to reduce greenhouse gas emissions that contribute to global climate change. The EnergyWise Plan (Plan) demonstrates the County's continued commitment to addressing the challenges of climate change by reducing local GHG emissions and preparing the County to adapt to a changing climate. The Plan outlines the County's approach to reducing GHG emissions through a number of goals, measures, and actions that provide a road map to achieving the County's GHG reduction target of 15% below baseline levels by 2020. With the Plan's Renewable Energy Goal, the County seeks to "…[i]ncrease

the production of renewable energy from small-scale and commercial scale renewable energy installations to account for 10% of total local energy use by 2020." Once again, this OCTS and the RESP effort will go a long way to achieving this goal of the Plan. Similar to the COSE, the Plan contains several reduction measures and their associated supporting actions, which are intended to facilitate renewable energy development and help the County meet its GHG reduction targets. These measures include:

- Renewable Energy 9 (Countywide Energy Collaborative), Build a collaborative network or organizational structure to work with the seven cities, other local and state agencies, IOUs, the California Energy Commission, and the CPUC to promote a wide range of energy efficiency and renewable programs.
- Renewable Energy 10 (Commercial-Scale Renewable Energy), Develop a comprehensive renewable energy strategy to encourage the commercial-scale installation of renewable energy projects within the County. Applicable Supporting Actions:
  - Use state, federal, or other available data to map areas that contain renewable energy resources by 2015.
  - Designate and protect areas that contain renewable energy resources such as wind, solar, geothermal, and small hydroelectric.
  - Amend the Land Use Ordinance to apply renewable energy overlay designations to areas identified in COSE Implementation Strategy E 6.8.1.
- Renewable Energy 11 (Small-Scale Renewable Energy), Implement a financing program to provide property owners with low-interest loans for the installation of renewable energy resources. Applicable Supporting Actions:
  - Revise County policies and regulations as needed to eliminate barriers to or unreasonable restrictions on the use of renewable energy.
  - Designate and protect areas that contain potential small-scale renewable energy resources such as wind, solar, geothermal, and small hydroelectric.
  - Amend the Land Use Ordinance to apply small-scale renewable energy overlay designations (see COSE Implementation Strategy E.6.8.1, Mapping of Resources).
  - Promote the development of sustainable energy sources and renewable energy projects through streamlined planning and development rules, codes, processing, and other incentives.
  - Collaborate with stakeholder groups, including business and property owners, wineries, and other agricultural operations, to increase awareness of renewable energy systems, to streamline the permitting process, and to identify incentives.
- Renewable Energy 12 (Renewable Energy Partnerships), Collaborate with local and state governmental agencies and energy facility operators to develop renewable energy sources at existing facilities.

Land Use Ordinance

The County Land Use Ordinance (Title 22 of the County Code) details the regulations established and adopted to implement the County General Plan, and to guide, manage, and regulate the future growth of the County in an orderly fashion. The LUO contains regulations and provisions that both allow and limit renewable energy development depending on the zoning designation of a particular area. Figure 6.8-1 provides a visual illustration of the County's Land Use Classifications.

Currently, electricity generation, which includes renewable energy, is allowable as follows:

- Electricity Generation – Except WECF (Wind Energy Conversion Facilities). Allowable use in AG (Agriculture), RL (Rural Lands), RR (Residential, Rural), CS (Commercial, Service), IND (Industrial), OS (Open Space), and PF (Public Facility) zoning designations; subject to the land use permit required by the specific use standards (Section 22.32).
- Electricity Generation – Wind Energy Conversion. Conditional use in AG, RL, RR, CS, IND, OS, PF; a Minor Use Permit Required (Section 22.62.050).

For purposes of this OCTS, the LUO provisions that may restrict or limit renewable energy power generation are not viewed as a constraint. The main purpose and intent of this OCTS is to focus on the physical opportunities and constraints related to electric system infrastructure, environmental resources, and existing on-the-ground land uses so that the County can amend the LUO accordingly (through the RESP) and allow for renewable energy development in appropriate locations (i.e., REDAs) by establishing the RE Combining Designation consistent with the COSE and EnergyWise Plan. In fact, as evidenced by the discussion above, these County planning and guidance documents recognize the need for LUO amendments to ensure that renewable energy development is consistent with the County's already established goals and policies. The County General Plan elements (i.e., COSE) and implementing documents (i.e., EnergyWise Plan) either directly prioritize, or directly and indirectly support, renewable energy development. For a specific listing of LUO sections that either allow or limit renewable energy development, please refer to the companion report prepared for this project, the *Renewable Energy Streamlining Program Regulatory and Policy Baseline Report*.

3. Renewable Energy Development Areas

This section presents the finding of the OCTS including identifying REDAs with high renewable energy resource availability, access to infrastructure, and reduced environmental conflicts. Section 3.1 provides the results of the environmental opportunities and constraints that are most likely to dictate where renewable energy can be streamlined, and that are quantifiable. Using this information, Section 3.2 provides the resulting REDAs.

3.1 Results: Environmental Screening and Infrastructure

Using the information described in Section 6, environmental opportunities and constraints were identified. Not all resources were used to identify opportunities and constraints because for some resources no constraints or opportunities were quantifiable such that they would help identify locations where renewable energy could be streamlined. For example, while geology would be an important feature to consider when engineering a project, it would not be a resource that would either preclude or encourage development. Geologic features such as fault lines would be addressed via adequate project-level engineering. Other resources, such as cultural resources, were not included in the development of REDAs because cultural resources are site specific, and there is no available data at the County scale to eliminate particular sites. It is not possible to know the exact location of most cultural resources so streamlining projects to completely avoid such resources is not possible. However, for these types of resources, best management practices and avoidance measures would be developed and recommended in the Program EIR.

The resources used to identify opportunities and constraints for renewable energy development include aesthetics, agricultural resources, biological resources, and land use. The location of existing infrastructure has also been included in the consideration of opportunities and constraints.

Note that the REDA maps and the following text narrative are intended to be used together. Based on the opportunities and constraints identified for each of the important resource areas (see Section 6), the County was divided into the following three ratings for renewable energy development:

- Most Likely Able to Streamline Renewable Energy
- Potentially Able to Streamline Renewable Energy
- Unlikely Able to Streamline Renewable Energy

These ratings are resource-specific and the factors used to determine the ratings are discussed in detail for each resource considered in developing the REDAs. Tables 3-1a and 3-1b provide acres in each Planning Area that were identified as most likely, potentially, or unlikely able to streamline a renewable energy project. Note that in March 2014, the 11 inland Planning Areas in Tables 3-1a and 3-1b were consolidated into four inland planning areas. Each of the inland planning areas is further divided into sub-areas that correspond to the boundaries of the 11 former inland planning areas. The boundaries of the four coastal Planning Areas (North Coast, Estero, San Luis Bay Coastal, South County Coastal) remain unchanged (County of San Luis Obispo, 2013a).

Table 3-1a. Acres of Environmental Opportunities and Constraints per Planning Area

Streamlining Potential	Naci-miento	Adelaida	San Luis Bay Inland	San Luis Obispo	Huasna-Lopez	Los Padres	Shandon-Carrizo	El Pomar–Estrella
Aesthetics								
Unlikely (red)	4,144	1,530c	4,314	9,948	14,824	97,324	83,022	0
Potentially (yellow)	37,174	169,905	53,388	92,449	62,610	47,390	441,441	58,057
Likely (green)	53,355	30,220	2,396	0	23,213	65,583	298,200	74,530
Agriculture								
Unlikely (red)	34,332	8,805	3,533	2,619	3,160	471	720	359
Potentially (yellow)	7,609	49,126	14,605	34,355	9,621	296	267,184	87,813
Likely (green)	51,087	121,542	20,403	30,320	57,205	900	554,348	37,905
Biological Resources								
Unlikely (red)	31,047	1,411	2,957	605	3,175	1,983	41,490	0
Potentially (yellow)	63,621	186,996	45,087	66,230	97,063	208,373	781,575	106,914
Likely (green)	0	13,261	11,973	5,207	388	0	479	25,707
Land Use								
Unlikely (red)	50,552	3,442	7,899	9,766	7,057	181,560	249,759	971
Likely (green)	38,973	195,482	38,582	53,178	92,885	28,441	549,096	115,497
Likely – with Limited CEQA Review (green)	4,797	815	13,317	16,915	112	0	21,378	19,627

Table 3-1b. Acres of Environmental Opportunities and Constraints per Planning Area

Streamlining Potential	Las Pilitas	Salinas River	South County Coastal	South County Inland	Estero	San Luis Bay Coastal	North Coast
Aesthetics							
Unlikely (red)	1,308	2,239	0	3,745	3,687	823	3,834
Potentially (yellow)	50,160	117,715	2,905	63,296	39,427	6,774	66,100
Likely (green)	14,800	15,189	14,277	19,629	0	1,521	18,893
Agriculture							
Unlikely (red)	937	1,488	3,765	1,334	2,802	382	50,467
Potentially (yellow)	11,731	57,917	5,436	45,471	20,397	2,922	20,702
Likely (green)	28,796	26,399	328	27,115	15,789	3,995	56,495
Biological Resources							
Unlikely (red)	912	0	0	0	4,061	418	50,318
Potentially (yellow)	64,921	105,686	15,397	38,578	36,660	6,713	38,291
Likely (green)	459	13,959	1,793	45,774	2,269	1,601	0
Land Use							
Unlikely (red)	7,621	20,676	9,665	4,665	6,597	1,812	52,051
Likely (green)	57,481	63,343	7,303	64,659	31,273	5,906	34,507

Table 3-1b. Acres of Environmental Opportunities and Constraints per Planning Area

Streamlining Potential	Las Pilitas	Salinas River	South County Coastal	South County Inland	Estero	San Luis Bay Coastal	North Coast
Likely – with Limited CEQA Review (green)	679	35,498	1,761	13,518	3,494	1,104	1,125

Aesthetics

The results of the aesthetics analysis are shown on Figure 3.1-1, Overview of Aesthetics Resources and described below.

Most Likely Able to Streamline Renewable Energy. For aesthetic resources, the majority of the County was considered an opportunity for development. This is because most small-scale renewable (5-10 MW) development would not be visible beyond the foreground views and would blend in with the background at greater distances.

Potentially Able to Streamline Renewable Energy. The officially designated State and County Scenic Highway corridors would be considered a potential opportunity for development. While some of the scenic corridors may be sufficiently sensitive such that they would not be appropriate for development, many of the areas may provide opportunities for development at a small scale of less than 5 MW for solar PV, for example. The County General Plan suggested scenic corridors and eligible State Scenic Highways would be considered a potential opportunity for development as well. These corridors have not yet been designated and warrant further study. They may provide opportunities for streamlining development at a larger scale, between 5 and 20 MW, when compared with officially designated corridors. Solar thermal and wind energy may not be streamlined even at this scale due to the height and therefore viewshed associated with the infrastructure.

Unlikely Able to Streamline Renewable Energy. The scenic County Sensitive Resource Areas (SRAs) were established as constraints to renewable development. The SRA designation is applied to the most critical visual resources in the County. Therefore, renewable energy development would not be appropriate in these areas.

Agriculture

The results of the agricultural resources analysis are shown on Figure 3.1-2, Overview of Agriculture Resources. Much of the County was a potential opportunity for development. This is because agricultural lands may be viable for renewable energy development especially at a small scale of 20 MW or less. Renewable energy development may be compatible with agricultural uses such as grazing that can co-occur with some renewable technologies such as wind turbines.

Most Likely Able to Streamline Renewable Energy. Areas where the soil is less productive for agriculture are identified as opportunities for development. Williamson Act lands have not been used to eliminate renewable energy development. As part of the Renewable Energy Streamlining Project, the County will evaluate and possibly update its Williamson Act rules of procedure to address the compatibility of small-scale renewable energy development with Williamson Act enrollment.

Potentially Able to Streamline Renewable Energy. Areas with the most productive agricultural lands in the County are identified as potential opportunities for development. Renewable Energy would not

necessarily be precluded, but there may be additional mitigation required for conversion of agricultural land.

Unlikely Able to Streamline Renewable Energy. Areas covered by conservation easements or that have other protected status that precludes development have been established as constraints to renewable energy development. Many of these areas overlap with areas identified as constraints by biological resources.

Biological Resources

The results of the biological resources analysis are shown on Figure 3.1-3, Overview of Biological Resources. Much of the County has one or more potential constraints for streamlining renewable energy development, from a biological resources perspective. Portions of the County have sensitive biological resources that may not preclude development of renewable energy, but would potentially require some additional biological surveys, permitting, and mitigation.

Most Likely Able to Streamline Renewable Energy. Areas with non-native vegetation types, including developed areas and areas with low kit fox mitigation ratios (per current County requirements) have been identified as opportunities for development. Some of these areas, in particular developed areas or areas mapped as barren, would be immediately suited for renewable energy development. Other areas, such as those identified as low kit fox mitigation areas would require some additional biological surveys and mitigation.

Potentially Able to Streamline Renewable Energy. Areas with high or moderate biological sensitivity would potentially be available for renewable energy development, but would likely require additional surveys and mitigation that would reduce the streamlining potential for such areas.

Unlikely Able to Streamline Renewable Energy. Areas that have been or are intended for preservation for unique biological values would not be open to renewable energy development and therefore stream-lining is not likely.

Land Use

The results of the land use analysis are shown on Figure 3.1-4. Development of renewable energy within the coastal zone is considered constrained at this time. The San Luis Obispo County Local Coastal Program (LCP) and associated Coastal Zone Land Use Ordinance have been adopted to guide and manage future growth of the County and to regulate land use in a manner that would encourage and support the orderly development and beneficial use of lands within the designated Coastal Zone, consistent with the California Coastal Act. Therefore, the LCP and Coastal Zone ordinance are considered policy and regulatory constraints to renewable energy development in the Coastal Zone. Although there are opportunities for renewable energy development available in the Coastal Zone and presented in maps and the REDAs, the scope of the County's Renewable Energy Streamlining Project does not include the coastal zone at this time. Prior to renewable energy development occurring in the County's Coastal Zone, an amendment to the LCP and Coastal Zone Land Use Ordinance would be required and the timing to complete this amendment process would extend beyond the County's timeframe for completion of the Renewable Energy Streamlining Program.

Most Likely Able to Streamline Renewable Energy. Areas currently being used for commercial purposes, airport, mixed use, and residential uses would be available for streamlining renewable energy. These areas likely would be available for renewable energy at a small scale such as parking structure roofs and on the roofs of larger commercial structures. Areas identified as agricultural, industrial,

institutional, and brownfield sites (as identified by EPA) would also be available for streamlining and would potentially be available for larger scale renewable energy development of up to 20 MW projects. Brownfield sites would be immediately available for development, but any cleanup of potentially contaminated sites would need to be considered. Energy extractive areas would also be potentially available for renewable energy development.

Unlikely Able to Streamline Renewable Energy. Streamlining renewable energy on areas that are used for recreation or open space would be challenging, because renewable energy development is considered contrary to the purposes for which such lands are used and designated (i.e., areas with natural environment not intended for human use).

Energy Infrastructure

The existing County energy infrastructure is shown on Figure 5.2-1. Many of the substations throughout the County have capacity for small renewable energy projects of less than 2 MW each. Such projects would likely require less than 20 acres of land and would likely be compatible in many areas of the County. The Atascadero and Mesa Substations have capacity for up to 4 MW of renewable energy each. The Oceano, Paso Robles, San Luis Obispo, and Templeton substations each have capacity for between 8 to 10 MW of renewable energy and larger projects would be able to interconnect easily. It should be noted that the electric system is dynamic and therefore the amount of MW available for interconnection at any given location will change over time. That said, integration impacts (i.e., renewable energy generation connection to the electric system) and costs for DG are lowest near urban areas and greater when installed near the end point of distribution lines. As energy storage is developed and integrated into small-scale systems, integration concerns would likely decrease.

3.2 Description of Each Proposed REDA

Having established resource-specific opportunities and constraints as described in Section 3.1 (and analyzed in Section 6), those data were then used to identify REDAs, as shown on Figure 3.1-5. The methodology used to determine the REDAs is as follows:

- As a starting point, the entire County is considered potentially available for renewable energy development. This analysis then eliminated all areas that were considered unlikely to provide for streamlined development, i.e., all areas identified as red for each environmental consideration.
- The analysis then identified locations where development could potentially be streamlined, i.e., locations identified as yellow for each environmental consideration.
- Locations not eliminated or identified as potentially able to streamline renewable energy were then identified as likely to be open for streamlined development, i.e., locations identified as green in Section 3.1.

The analysis identified multiple regions with different sensitivity levels for each environmental resource. In such instances, the most conservative designation was used for the location. The analysis then included brownfield sites as identified by the U.S. EPA RE-powering data. The EPA RE-powering data identifies locations that are already disturbed and potentially feasible for renewable development.

Figures 3.1-6a through 3.1-6l identify the REDAs available in each Planning Area. Some Planning Areas such as North Coast, Nacimiento, Los Padres, and portions of Shandon-Carrizo would have large portions of the Planning Areas that are excluded for streamlined renewable development. Other Planning Areas such as Adelaida, Estero, Salinas River, Las Pilitas, San Luis Obispo, San Luis Bay Inland, South County

Inland, Huasna-Lopez, and portions of Shandon-Carrizo would potentially be available to streamline development. In these areas, smaller projects could likely be streamlined with limited additional CEQA review and potentially additional mitigation. Portions of El Pomar–Estrella and small portions of Adelaida, South County Inland, and the RE-powering sites could be streamlined. Overall, the OCTS analysis concludes that the County has 54,320 acres of areas likely to be streamlined, 1,343,630 acres of land that could be potentially streamlined, and 726,100 acres of land that could not be streamlined. Table 3-2 identifies the acres of streamlined renewable energy potential in the Planning Areas.

Table 3-2. Planning Areas REDAs and Streamlining Potential

Streamlining Potential	Naci-miento	Adelaida	San Luis Bay Inland	San Luis Obispo	Huasna-Lopez	Los Padres	Shandon-Carrizo	El Pomar–Estrella
Likely (green)	4,467	910	0	0	2,593	1,752	16,422	18,178
Potentially (yellow)	36,346	188,500	44,207	52,432	77,333	18,335	522,440	113,230
Unlikely (red)	53,868	12,250	15,680	19,555	20,700	190,254	284,017	1,183
Streamlining Potential	**Las Pilitas**	**Salinas River**	**South County Coastal**	**South County Inland**	**Estero**	**San Luis Bay Coastal**	**North Coast**	
Likely (green)	7,340	34	297	2,326	0	0	0	
Potentially (yellow)	49,147	97,415	6,053	73,806	27,584	6,248	30,555	
Unlikely (red)	9,781	22,171	10,881	8,818	15,720	2,938	58,282	

4. Renewable Energy Resources

A number of different renewable energy resources are viable in San Luis Obispo County. The primary resources available in the County are solar and wind, but other renewable technologies are available at a smaller scale. The following section describes potential renewable energy resources. The majority of the data summarized below is from the National Renewable Energy Laboratory (NREL) *Renewable Electricity Futures Study: Volume 2 Renewable Electricity and Storage Technologies.* Other citations are provided as necessary.

4.1 Solar PV

4.1.1 Technology Description

Solar PV technologies convert sunlight directly into electricity by allowing solar photons to heat electrons from their ground state, producing a freed electron and a "hole" pair. The electron and the hole are then separated by an electric field within the PV cell and pulled toward positive and negative electrodes, generating direct current (DC) electricity. Multiple PV technologies are currently in use and under development, and the most widely developed PV technology is based on crystalline silicon cells and thin-film cells, including amorphous silicon and cadmium telluride.[4]

A typical PV module or panel includes several PV cells wired together and encapsulated. PV modules are connected electrically into a PV array. PV arrays generate DC electricity that is converted to alternating current (AC) electricity using an inverter. PV projects can be mounted on existing structures such as rooftops or parking structures or can be ground mounted, that is to say, free standing. Ground-mounted solar PV projects can use a fixed-tilt or tracking structure. Ground-mounted PV structures range between 4 feet and 30 feet in height depending on the technology used.

Larger solar PV projects would typically require an area with a slope of under 5%, although some technologies can accommodate greater slopes and small projects can be built on very steep slopes if necessary. Solar PV would typically require between 7-10 acres per MW of energy produced. Solar PV systems do not require water during operations other than for panel washing which is minimal, less than 5 gallons/megawatt hour (MWh).

[4] PV modules contain hazardous materials such as cadmium telluride. Cadmium telluride is a lung carcinogen and long-term exposure can cause detrimental effects to kidney and bone tissues. PV modules do not fail the federal hazardous waste criteria for toxicity but may be hazardous waste by California standards. Since 2012, the Department of Toxic Substance Control (DTSC) has been drafting and revising potential regulatory language to address PV modules. After several public comment periods, the DTSC proposed to amend the California Code of Regulations to designate both hazardous waste solar modules and non-hazardous waste solar modules as universal waste. The Department's goal is to limit the number of modules in California's landfills by managing the waste stream and recycling activities of solar modules. The Office of Administrative Law disapproved the proposed regulations in October 2013. No further update regarding the status of PV modules is available at this time: see Proposed Regulations: Proposed Standards for the Management of Hazardous Waste Solar Modules.

Photo credit: Emily Capello

4.1.2 Solar PV Resources in SLO County

San Luis Obispo County has ample solar resources as shown in Figure 4.1-1. The highest solar resource potential is near the Carrizo Plain; however, the entire eastern portion of the County has extremely high solar potential.

4.2 Solar Thermal

4.2.1 Technology Description

Solar thermal technologies use mirrors or lenses to focus sunlight onto a receiver that contains a working fluid such as an oil-based heat transfer fluid, molten salt, or water. This fluid transfers the thermal energy to a heat engine that drives an electrical generator. There are multiple types of solar thermal technologies. Developers in California are constructing and operating solar trough and solar power tower projects. Solar trough projects include a parabolic trough concentrator that uses a 1-axis tracking receiver to collect concentrated sunlight. Solar power towers use an array of tracking flat mirrors (heliostats) to focus sunlight onto a fixed central receiver. Additional technologies such as the Linear Fresnel system[5] and dish concentrators[6] have been proposed in California but have not yet been commercially viable.

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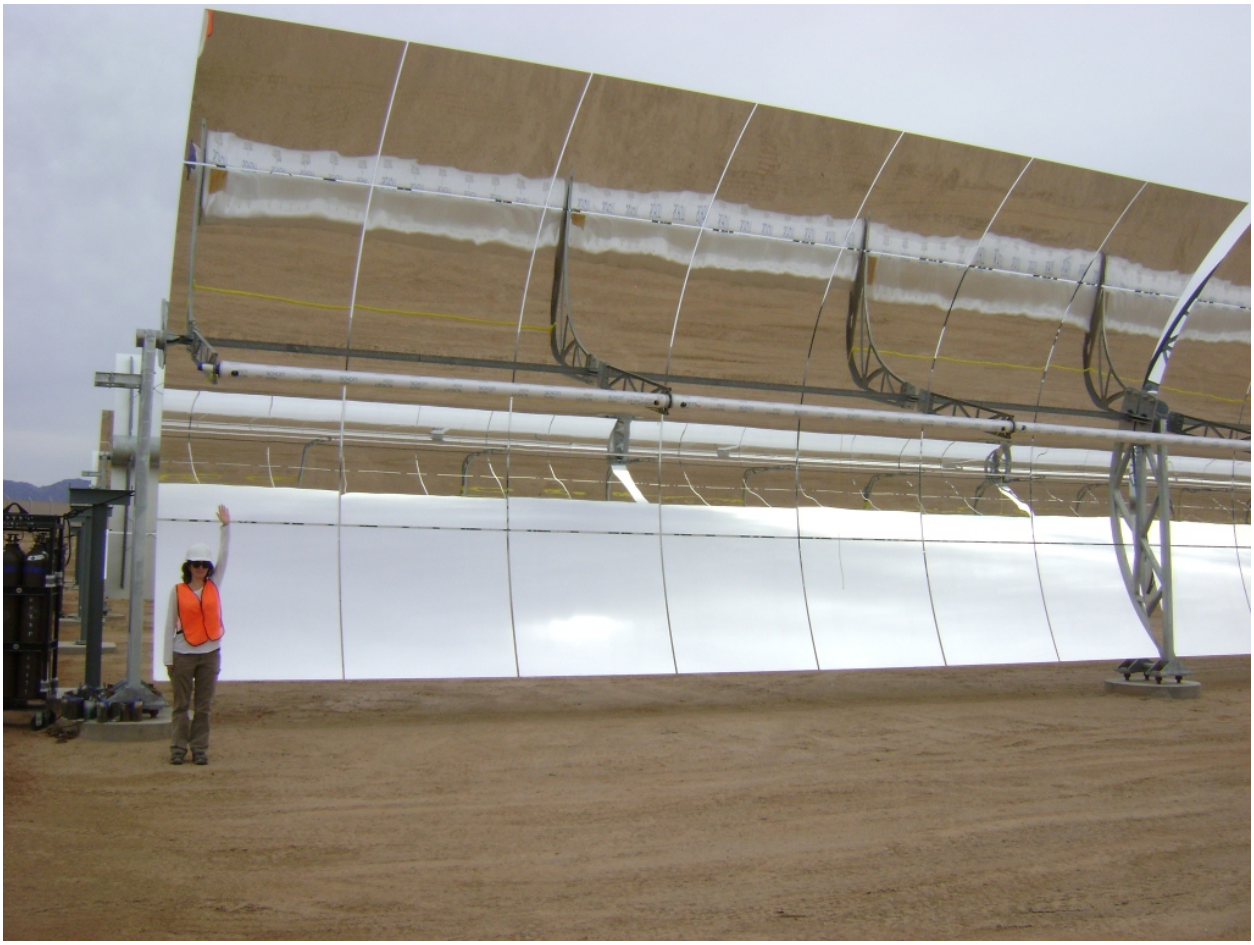
[5] A linear Fresnel system uses long rectangular, curved mirrors that reflect the sunlight on the receiver tube. In a linear Fresnel system, one receiver tube is positions above several mirrors to allow the mirrors greater mobility in tracking the sun (NREL, 2012).

[6] A dish/engine system uses a mirrored dish similar to a large satellite dish that directs and concentrates sunlight onto a thermal receiver that absorbs and collects the heat and transfers it to the engine generator. The most common type of heat engine is the Stirling engine (NREL, 2012).

Solar thermal technologies can have storage integrated into the system such that energy captured during the daytime can be run in the evening or when needed. Solar thermal technologies with more than 7 hours of storage are operating in Spain (Andasol 1 and 2). Solar thermal technologies can be developed at the DG level, although the majority of the solar thermal projects proposed in California have been at a utility scale. Solar thermal technologies have a variety of slope requirements, from less than 2% (solar trough) to up to 3% (solar power tower). As with solar PV, solar thermal technologies require a minimum of 7 acres per MW of electricity generated. Solar thermal technologies can vary in height from 30 feet (solar trough) to hundreds of feet tall (solar power tower).

Solar thermal technologies require water consumption for cooling (both wet- and dry-cooled) projects. Water consumed for wet-cooled solar thermal projects ranges from 800 gal/MWh to 1,000 gal/MWh. The use of dry-cooling or hybrid wet-dry cooling can reduce water by up to 97% based on system design and location.



Solar trough. Photo credit: Dr. Joel Pagel, USFWS

Solar power tower. Photo credit: Susan Lee

4.2.2 Solar Thermal Resources in SLO County

While all of San Luis Obispo County has high solar resources, only a small portion of the County has areas with sufficiently high solar potential combined with the appropriate slope to make solar thermal projects economically viable. This location centers around the Carrizo Plain, shown in Figure 4.1-1 as the area in dark red, but may be further reduced due to water constraints in this region. Over 8,900 acres of this area has already been developed with large-scale solar projects (the California Valley Solar Ranch and the Topaz Solar Farm) or would otherwise not be available for a renewable energy project because it is legislatively protected (Carrizo National Monument). While it is technically possible to build small-scale solar thermal projects in this area, such projects are less likely in the near future than solar PV due to economic and technological constraints.

4.3 Wind

4.3.1 Technology Description

Wind turbines, like windmills, are mounted on a tower to capture the most energy from the resource (NREL, 2012a). Turbines catch the wind's energy with their propeller-like blades; usually two or three blades are mounted on a shaft to form a rotor. The wind's force against the blade causes the rotor to spin like a propeller, and the turning shaft spins a generator to make electricity. Wind turbines can be used as stand-alone applications (e.g., for water pumping or communications), or can be combined with a PV system. For utility-scale applications, large numbers of wind turbines are built in various configura-

tions in the same general area to form a wind farm. Small wind systems have potential as distributed energy resources. Utility-scale turbines range from 50 kW to over 5 MW; the average wind turbine in the U.S. is rated at 1.5 MW (AWEA, 2012), but 2- and 3-MW turbines are also being used more frequently.

The electrical power output of a wind turbine is a function of wind speed. Wind speeds at 3-5 meters/ second (m/s) can be captured to produce energy. The speed at which the turbine is capable of producing its designed and rated power is usually between 12-15 m/s. Wind turbines are typically designed to shut down at speeds above 25-30 m/s to prevent damage to the generator.

Photo credit: Aspen Environmental Group

4.3.2 Wind Resources in SLO County

San Luis Obispo County wind resources are depicted in Figure 4.3-1. Most of the County has poor wind resource potential. Pockets of fair to good wind resource potential are found along the California coastal and transverse ranges, especially the Santa Lucia Mountains ridgelines running parallel to the coastline, near Diablo Canyon, and on the ridgelines near San Luis Obispo. Additional pockets of fair wind resource potential are found along the ridges near the San Luis Obispo-Kern Counties border.

4.4 Small Hydroelectric Facilities

4.4.1 Technology Description

Hydroelectric generation is not part of the County study but could be developed in the future so is included here for informational purposes. Hydroelectric facilities convert the potential energy stored in water behind a dam into mechanical energy as the water passes into a penstock and spins a turbine. The

turbine is connected to a generator which converts the mechanical energy into electrical energy. Hydroelectric facilities smaller than 30 MW count toward California's RPS goals. Small plants would likely have minimal footprints.

The two primary types of conventional hydroelectric facilities are dams and run-of-river projects. Dams raise the water level of a stream or river to an elevation necessary to create sufficient elevation difference and pressure and then release water in a controlled method.

Run-of-river hydroelectric facilities divert water from a natural water course and channel it through a turbine before returning it to the river or stream downstream of the turbine. Run-of-river hydroelectric facilities may include a small reservoir (dam) to create a hydraulic head (water pressure) for generating power.

Hydroelectric facilities are not considered likely projects to be streamlined because hydroelectric facilities are regulated by the Federal Energy Regulatory Commission (FERC) instead of the County. FERC issues three types of small/low-impact hydrological project exemption or licenses. The three types of exemptions include one for projects of up to 5 MW, projects on a man-made conduit, and for small hydroelectric projects up to 10 MW on pre-2005 dam or natural water feature.

4.4.2 Small Hydroelectric Resources in SLO County

San Luis Obispo County currently has several small hydroelectric projects, the biggest of which is the Lake Nacimiento 4.4 MW project. While there are few natural lakes that would potentially be available for energy generation, the County has proposed several reservoirs mainly in the northwest portion of the County that could be fitted with hydroelectric facilities. Existing dams might be potentially retrofitted for energy generation. One example is the Twitchell Dam which the Department of Energy estimates could produce 4.9 MW (DOE, 2012).

4.5 Biopower Technologies

4.5.1 Technology Description

Biopower generation is not part of the County study but could be developed in the future so is included here for informational purposes. Biomass technology directly burns (combusts) biomass in a furnace to produce steam used in a steam turbine generator. Biomass is made up of organic residues from plants and animals that are obtained primarily from harvesting and processing agriculture and forestry crops such as forest slash, urban wood waste, lumber waste, and agriculture wastes (Energy Commission, 2013a). Biomass facilities can either produce only electricity, or in a combined heat and power operation a portion of the stream is extracted to provide process heat (Energy Commission, 2013a). Almost all biomass and waste-fired power plants rely on direct combustion technology.

Other biotechnologies convert solid biomass to an intermediate gas or liquid that is then converted into energy. The biomethane conversion processes include thermal gasification, thermal pyrolysis (liquid product), and anaerobic digestion (a dedicated system or landfill process to produce a methane gas). A dedicated anaerobic digester system decomposes plant and animal matter to break down the matter into usable-sized molecules, converts this decomposed matter to organic acids, and converts the acids to methane gas used to produce energy (Energy Commission, 2013b). Landfill waste produces a significant amount of landfill gas, primarily methane that is collected in pipes, dewatered, and used to produce energy (Energy Commission, 2013c).

4.5.2 Biomass and Biomethane Resources in SLO County

The County has multiple wastewater treatment plants and several landfills including the Cold Canyon Landfill and Chicago Grade Landfill located in unincorporated County land, and the Paso Robles Landfill located within the Paso Robles city limits and operated by the City. The City of San Luis Obispo Wastewater Treatment Plant has an existing 240 kW cogeneration plant that runs on a blended mix of natural gas and methane produced by the wastewater treatment plant digesters. Similar types of energy generation could be fitted to the existing facilities.

San Luis Obispo has the potential for future opportunities with additional bioenergy. In 2013, Cal Poly received a grant and an investment for a project aimed at developing processes that turn waste resources into algal biofuels (Cal Poly, 2013; DOE, 2013). The DOE has a goal of producing cost-competitive, drop-in biofuels by 2017 and algae biofuels by 2022 (DOE, 2013).

4.6 Energy Storage

Energy storage devices store energy during periods of low demand and discharge this energy during periods of high demand. In October 2013, the CPUC established an energy storage target of 1,325 MW for PG&E, SCE, and SDG&E. As stated by the CPUC, the benefits of storage include optimizing the grid by reducing the peak load, contributing to reliability of the grid, or deferring transmission and distribution upgrade investments (see Section 5); aiding in the integration of renewable energy; and aiding to reduce the greenhouse gas emissions to 80% by 2050 per California's goals (CPUC, 2013b).

There are many types of energy storage products ranging from multiple types of battery storage to compressed air or pumped-storage hydropower. Batteries provide an uninterrupted supply of electricity and can also increase power quality and reliability. Lead-acid batteries are currently the standard battery type used in energy storage applications, but many other types of batteries are near commercial readiness that would be better suited for renewable energy load and distribution requirements (Energy Commission, 2013d).

Compressed air energy storage uses pressurized air as an energy storage medium. An electric motor-driven compressor pressurizes the storage reservoir using energy during off-peak or low-use times and then the air is released from the reservoir through a turbine during on-peak or high-use hours to produce energy (Energy Commission, 2013d). Ideal locations for large compressed air energy storage reservoirs are empty aquifers, abandoned conventional hard rock mines, and abandoned hydraulically mined salt caverns (Energy Commission, 2013d).

Pumped-storage includes storing energy by pumping water from a lower elevation reservoir to a higher elevation reservoir using pumps that run during off-peak times. During high electricity demand times, the stored water is released through turbines that produce electricity.

4.7 Renewable Energy Resource Not Currently Available in the County

A number of additional renewable energy resources are not currently available in San Luis Obispo County. They are described briefly below.

4.7.1 Geothermal

Geothermal energy is heat from inside the earth. Geothermal power plants use steam produced from reservoirs of hot water found a few miles or more below the earth's surface to produce electricity

(NREL, 2012b). The steam rotates a turbine that activates a generator, which produces electricity. There are three types of geothermal power plants: dry steam, flash steam, and binary cycle. Geothermal plants provide steady and predictable baseload power (National Geothermal Collaborative, 2004).

Geothermal energy is limited to areas with reservoirs of steam or hot water, known as hydrothermal resources, which are often associated with volcanic and seismically active regions. There are no known geothermal resources in San Luis Obispo County. Low- to medium-geothermal springs are located near Paso Robles and elsewhere in the County that have been used to develop recreational hot springs and for heating purposes, but are not appropriate for renewable energy production.

4.7.2 Marine and Hydrokinetic Energy

Marine and hydrokinetic energy generate power from wave, tides, or currents in ocean and river waters. Wave energy systems can extract energy from surface waves or from pressure fluctuations below the water surface. Wave energy is an irregular and oscillating low-frequency energy source that must be converted prior to being available for the utility grid. Many wave energy devices have been invented but only a small portion of these have been tested and evaluated and fewer have been tested in the ocean (Energy Commission, 2013e). Although wave energy testing continues to be active in California and elsewhere, this technology is not yet commercially viable.

Tidal energy requires a barrage or dam built across the mouth of an estuary with a high tidal range. When the tide comes into shore, water is trapped behind the barrage and then as the tide drops, the water behind the barrage can be released to produce energy in a manner similar to regular hydroelectric power. In order for tidal power to work using current technologies a large tidal change is necessary and requires a very high initial investment. Tidal power is not feasible off the coast of California.

4.8 Summary of Renewable Resources in San Luis Obispo County

While a number of renewable energy types are potentially feasible in San Luis Obispo, the largest resource available is solar energy. Table 4-1 provides a summary of the information presented in Chapter 4 for the renewable resources available in the County, including the siting requirements.

Table 4-1. Summary of Renewable Energy Technologies and Requirements

Technology	Siting Requirements	Land Use Requirements	Potential Locations	Potential Sizes
Solar PV	▪ Insolation ▪ Slope	▪ 7 to 10 acres per MW	▪ Throughout the County ▪ Best solar potential is east of the Coastal Zone	▪ From rooftop or parking lot to several thousand acres
Solar Thermal	▪ Insolation ▪ Slope	▪ 7 to 10 acres per MW	▪ In the Carrizo Plain	▪ In San Luis Obispo, generally greater than 500 acres (50 MW)
Wind	▪ Wind Speed	▪ Up to 40 acres per MW ▪ Ground disturbance is much lower	▪ Along the peaks of the California coastal and transverse mountain ranges ▪ Near Diablo Canyon	▪ Small wind projects, generally limited to several turbines
Hydroelectric	▪ River ▪ Water conduit	▪ Incorporated into existing or future facilities	▪ Existing dams ▪ Future reservoirs	▪ Less than 10 MW
Bioenergy	▪ Wastewater treatment facilities ▪ Landfills	▪ Incorporated into existing facility	▪ At County wastewater treatments and landfills	▪ Less than 5 MW

5. Electric System Infrastructure and Demand

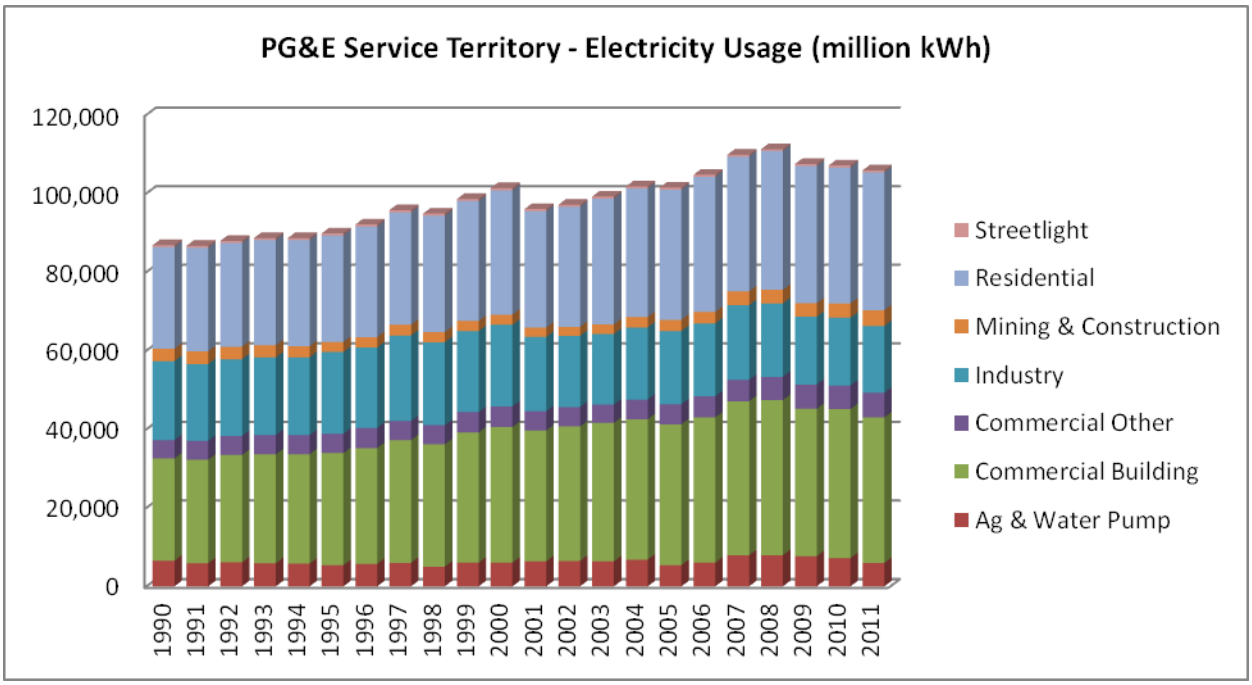
The electric system consists of the transmission and distribution networks. The distribution system of lines (conductors) interconnects homes, buildings, and other customer locations to the bulk electrical transmission system. The Renewable Energy Streamlining Program focuses on electric power generators that are or would be connected to the distribution network typically, but not necessarily, at the site of a customer. Electricity customers may be customer-generators with generation facilities that serve on-site, offsite, or both on-site and offsite loads.

5.1 Energy Demand

Demand for reliable electric service dictates the nature and extent of electric system infrastructure. California's electric service providers, including PG&E in San Luis Obispo County, are obligated by the Public Utilities Code to provide reliable service at a reasonable cost. The infrastructure is built with sufficient capacity to serve peak load for all customers including high demand users, with redundancies to ensure continuous service even during maintenance or accidental outages of portions of the system. Peak load is the maximum capacity demand (e.g., MW) at any instant, whereas electrical energy is quantified as the amount of power delivered over time (e.g., kWh).

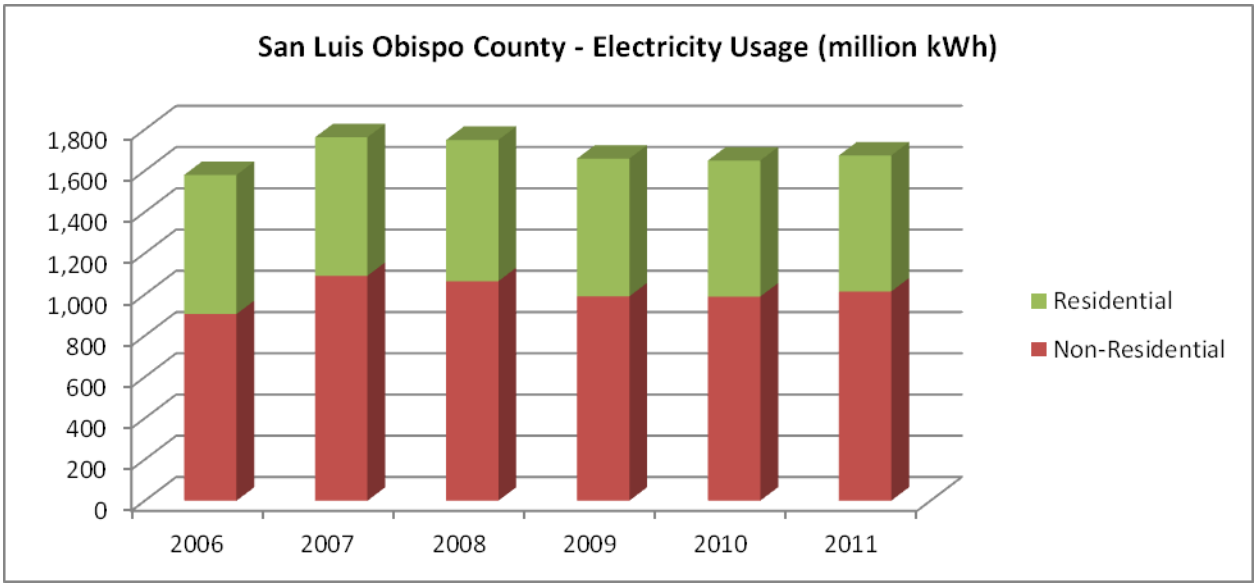
Customers within San Luis Obispo County use about 1.5% of PG&E's total demand.

Electricity Usage for Entire PG&E Service Territory

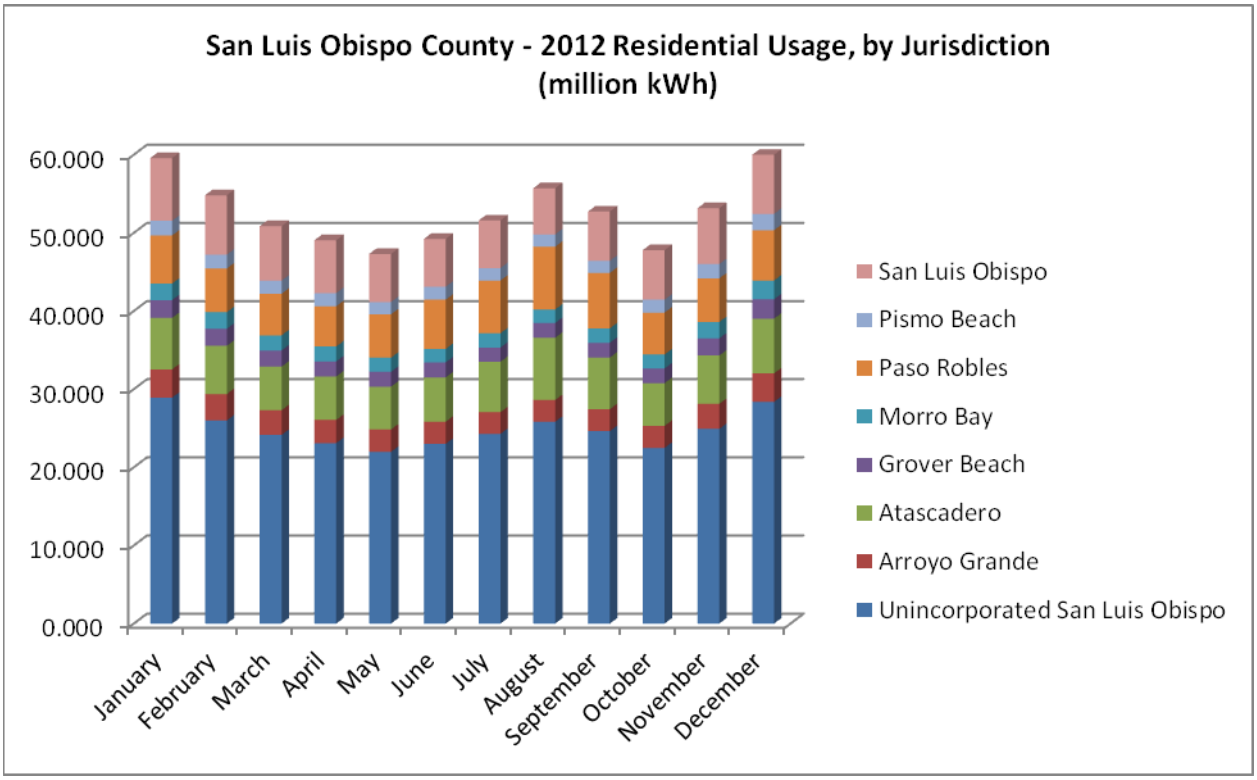


Source: CEC, Energy Almanac 2013.

Electricity Usage in San Luis Obispo County



Source: CEC, Energy Almanac 2013.



Source: CPUC, Residential Consumption Data 2013.

Electricity Demand by Existing Land Use Type

The major types of customers are residential, commercial, industrial, and agricultural, with the majority of demand coming from residential, commercial, and industrial. Mapping the existing land uses for these categories of potential customers shows the areas that are likely to have a greater demand for electric service and cause higher loads.

Build out of areas in the County's following existing Land Use Categories (LUC) will likely trigger a need for additional electric infrastructure: Commercial, Industrial (OP,CR,CS, IND); Institutional (PF); Extractive Resource Areas (EX, EX1). See Figure 6.8-1 for the LUC's.

The highest electrical loads would be expected to occur at existing commercial, light industrial, industrial sites, institutional uses (i.e., government buildings, schools, hospitals, etc.). See Figure 6.8-2 for existing land uses.

5.2 Electric Transmission Infrastructure in San Luis Obispo

Major Transmission Components and Loads

The transmission system within San Luis Obispo County is within the PG&E Los Padres division in the southwestern portion of PG&E's service territory (south of the Central Coast division). The system ties to the Fresno and Kern areas through the Gates and Midway Substations in the San Joaquin Valley, near Huron and Buttonwillow, respectively. Major components of the electric transmission and distribution infrastructure are shown in Figure 5.2-1.

Local customer demand is served through a network of 115 kV and 70 kV circuits. Power plants provided about 709 MW of reliable generation capacity to the local transmission system in 2012, including 680 MW from the Morro Bay Power Plant, set to close in the spring of 2014. While the closure of Morro Bay Power Plant will reduce the reliable generation capacity in San Luis Obispo County, the County still generates more energy than it uses and exports energy to the overall California grid. The 2,200 MW capacity of the Diablo Canyon nuclear power plant delivers energy to the statewide bulk transmission system at 500 kV. In PG&E's Los Padres division of the transmission system, the 2014 summer peak load is forecast to be 578 MW, and 2014 winter peak load is forecast to be 417 MW (CAISO, 2013a).

Transmission versus Distribution

The transmission and distribution network is owned by PG&E, the electrical corporation that is obligated to serve throughout San Luis Obispo County. Service voltages on distribution lines vary by utility and location in California. In San Luis Obispo County, the PG&E transmission network operates at 500 kV, 230 kV, 115 kV, and 70 kV, and these high-voltage lines are controlled by the California Independent System Operator (CAISO)[7]. The distribution network is the remainder of the system to the end user, or any part of the grid owned and controlled by PG&E at a service voltage below 60 kV (typically 21 kV or 12 kV).

[7] CAISO is a nonprofit public benefit corporation that manages the flow of electricity across the high-voltage, long-distance power lines that make up 80 percent of California's and a small portion of Nevada's power grid.

Transmission Network Constraints

California's primary north-south electric transmission corridor, Path 15, occurs east of San Luis Obispo County, between the Los Banos Substation in Merced County and the Gates Substation in Fresno County. This path roughly divides the California network into north and south. Portions of the system north of the Gates Substation are called "North of Path 15," and this is the part of California's transmission network that serves most of PG&E's northern California customers. The transmission system in and around San Luis Obispo County, including Gates Substation in Fresno County and the Midway Substation in Kern County fall outside of the "North of Path 15" zone.

Power generated in San Luis Obispo County and delivered to the PG&E transmission system occurs in a network zone called "ZP26," which is separate from both of the zones that are north of Path 15 or south of Path 15. Path 15 is a major transmission constraint between northern and southern California. Another major constraint exists between the San Joaquin Valley and the Los Angeles basin (Path 26). Because of these constraints, energy delivered to the grid around San Luis Obispo County tends to be valued less by PG&E than it would if it were delivered to PG&E north of Path 15 or to SCE south of Path 26. Power delivered closer to PG&E's major load centers in northern California is generally more valuable to PG&E.

Local Capacity Requirements

CAISO performs annual studies to identify the minimum local resource capacity required (Local Capacity Requirements) in each local area to meet established reliability criteria. Transmission system planners place a higher value on generating resources that can reliably deliver to certain transmission-constrained locales. The Greater Fresno Area and the Kern Area are regions within the transmission system that are subject to minimum Local Capacity Requirements to ensure that adequate resources exist in the area to serve the loads.

Power plants located in and providing capacity to San Luis Obispo County generally occur outside each of California's local capacity areas. However, the eastern edge of the county is within the Kern Local Reliability Area and therefore studied as part of this area by the CAISO. Power plants that provide generation capacity to the Carrizo Plains Substation would be inside the Kern Area for resource adequacy. Additionally, new generation connected to certain substations near the county border, including the Cuyama 70 kV Substation in Santa Barbara County, or the Temblor 115 kV Substation, near McKittrick in Kern County, would also fall inside the Kern Area for resource adequacy. The boundary of the Kern Local Reliability Area is shown in Figure 5.2-1.

Local Generation and Power Production

Major Power Plants

San Luis Obispo County is home to two major thermal power plants, new large solar power plants, and other smaller power plants (under 10 MW). The major power plants in San Luis Obispo County deliver energy to either the 500 kV system (e.g., 2,200 MW at Diablo Canyon) or the 230 kV system (e.g., 912 MW at Morro Bay). The transmission system connects each of these two coastal power plants to each other and to both the Gates Substation in Fresno County and the Midway Substation in Kern County. The new large solar power plants in the Carrizo Plain are connected to the 230 kV Morro Bay–Midway transmission line. Table 5-1 lists the existing power plants and generating capacities.

Table 5-1. San Luis Obispo County Power Plants and Biomass Energy Facilities

Power Plant Name	Primary Fuel	Nearest City	Online	Capacity (MW)	2012 Output (million kWh)
Morro Bay Power Plant	Natural Gas	Morro Bay	1955, 1963	912	205
Diablo Canyon	Nuclear	San Luis Obispo	1985	2,202	17,696
Topaz Solar Farms	Solar	California Valley	Under Const.	550	—
California Valley Solar Ranch	Solar	California Valley	2012, 2013	250	—
Meridian (Paso Robles Solar)	Solar	Paso Robles	2010	1.14	—
Santa Maria Refinery	Refinery Gas	Arroyo Grande	1995	5.5	—
Nacimiento Hydro Project	Hydroelectric	Bradley	1987	4.4	—
Lopez Lake Water Treatment Plant	Hydroelectric	Arroyo Grande	1984	0.12	—
Stenner Canyon (City of SLO)	Hydroelectric	San Luis Obispo	1985	0.78	—
City of SLO	Hydroelectric	Paso Robles	1985	0.68	—
Morro Bay WWTP	Digester Gas	Morro Bay	—	—	—
San Luis Obispo WRF	Digester Gas	San Luis Obispo	—	0.24	—
Cold Canyon Landfill	Landfill Gas	San Luis Obispo	1999	(used locally)	—
South San Luis Obispo WWTP	Digester Gas	Oceano	—	—	—
Paso Robles WWTP	Digester Gas	Paso Robles	—	—	—

Source: CEC, Energy Almanac 2013; California Biomass Collaborative. "—"= data not available.

Retail versus Wholesale

This study primarily discusses renewable energy generators that would be behind-the-meter, either customer-installed or for retail power that is electrically independent of the transmission system. The information here does not focus on utility-scale renewable energy development that would enter the wholesale power markets. Wholesale power producers are those that would be subject to FERC jurisdiction and/or would need to apply for an interconnection to the CAISO-controlled transmission system. Such projects would generally involve planning for transmission-grid impact, tend to be over 20 MW, and are more likely to trigger site-specific environmental review. Retail interconnection occurs when there is no export of power sales to the CAISO-controlled transmission system, and therefore, this scale of generation relies on serving the loads within the distribution system.

5.3 Electric Distribution System

Major Distribution System Components

The distribution system is fed by the statewide bulk transmission system. Within PG&E's Los Padres area that serves San Luis Obispo County, the primary transmission substations feeding the area's distribution network are PG&E's Mesa Substation in Nipomo and the Templeton Substation at 230 kV, and at 115 kV or 70 kV: San Luis Obispo, Mesa, Templeton, Paso Robles, Atascadero, and Divide (near Orcutt in Santa Barbara County). PG&E also has a proposal to install a new Estrella Substation at 230 kV to better serve the Paso Robles and Shandon Valley areas, along the Morro Bay-Gates 230 kV corridor (CAISO, 2013b). Major components of the electric distribution infrastructure are shown in Figure 5.2-1.

Distribution Substations and Circuits

Distribution substations convert the higher voltages of the transmission system to lower-voltage feeder circuits, typically at 21 kV or 12 kV. In some locations tertiary distribution circuits operate at other voltages, including 7.2 kV or 2.4 kV. From each transformer bank within a substation, multiple feeder

circuits may emanate. The feeder circuits serve subsequent transformers that further reduce the voltages to customer service levels (typically 120 or 240 volts).

The existing substations that provide distribution service within the County are listed in Table 5-2.

Table 5-2. Substations In Service within San Luis Obispo County

Substation	Transmission/ Distribution Service Voltages (kV)	Minimum Substation Bank Capacity (MW)	Substation Bank Peak Load (MW)	Sum of Circuits at 15% Peak Load (MW)
Atascadero	70/12	30.0	9.73	3.81
Baywood	70/12	16.0	4.74	0.74
Cambria	70/12	4.2	2.80	0.44
Cayucos	70/12	5.5	3.60	0.69
Cholame	70/21 & 70/12	12.5	4.79	1.44
California Men's Colony (CMC)	70/12	10.5	12.00	1.06
Diablo Canyon	500/12	75.0	8.00	1.74
Foothill	115/12	10.5	10.02	1.88
Goldtree	115/12	16.0	15.80	2.14
Mesa	230/12	11.6	7.65	3.44
Morro Bay	230/12	15.8	15.50	2.25
Oceano	115/12	30.0	30.00	8.69
Paso Robles	70/12	30.0	27.04	10.14
Perry	70/12	5.5	5.10	0.65
San Luis Obispo	115/12	43.7	34.65	9.16
San Miguel	70/12	16.0	7.00	1.92
Templeton	230/21	45.0	39.98	10.48

Source: PG&E Solar Photovoltaic (PV) and Renewable Auction Mechanism (RAM) Program Map, 2013; "—-"= data not available.
Note: PG&E's electric system is dynamic. Circuit configurations, particularly on the distribution system, can change for a variety of reasons (new loads, undergrounding projects, seasonal switching patterns, new circuits, voltage and reliability considerations, etc.). PG&E updates the map monthly. The data provided here is for November 2013. Please be aware that the same location may yield different circuit results over time.

Distributed Generation (DG)

The State of California, through Governor Brown's Clean Energy Jobs Plan, has a 2020 goal to develop 12,000 MW of localized generation across the state. The plan established a policy definition of localized energy or DG as projects that are generally 20 MW or less, interconnected on-site or close to load, that can be constructed quickly with no new transmission lines, and, typically, with little to no environmental impact (Navigant, 2013).

Interconnecting Generation to the Distribution System

The circuits of the distribution system can physically accommodate power plants up to about 20 MW. However, this capacity is constrained by the voltage serving the customer, and the capability of the generation to be properly designed for safe interconnection.

Interconnection can theoretically occur up to the following standard circuit capability limits (derived from PG&E DIH, 2013):

- At typical residential service levels up to 240 volts, generation is limited to about 20 kW.
  - Industrial-grade design specifications typically apply to generation over 100 kW to 400 kW.
  - Utility-grade specifications typically apply to generation above 400 kW and over 1 MW.
- Distribution circuits at 12 kV service voltage can provide capacity for generation up to 12 MW.
- Distribution circuits at 21 kV service voltage can provide capacity for generation up to 20 MW.

All generators that connect to the customer's electric system must apply to PG&E for an interconnection approval. PG&E then reviews customer and contractor information and the generator design to verify that the system meets PG&E's requirements for safe, uniform, and reliable service and industry-standard design specifications. Further information can be found in PG&E's distribution interconnection handbook (DIH) of 2003 with 2013 updates (PG&E, 2013).

Interconnection Options

PG&E provides three ways retail producers of power can interconnect to the distribution system. Two categories of smaller generators can use net energy metering (NEM), and larger DG (over 1 MW) must apply to interconnect under the CPUC-approved PG&E Tariff Electric Rule 21. The three options faced by each prospective small-scale generator are identified in Table 5-3.

Table 5-3. Interconnection Options for DG

PG&E Program Scope	Standard NEM for Small Customers	Expanded NEM for Larger Customers	Distributed Generation (DG) under Tariff Electric Rule 21
Customer Class	Residential and Small Commercial	Agricultural, Residential, Small Commercial, and Demand Rate customers	All types of customers
Generator Output	30 kW or less; solar or wind	Greater than 30 kW up to 1MW; solar or wind	Typically over 1 MW; limited by capability of distribution circuit
Criteria for Demand	Incidental export of power onto distribution lines allowed.	Commercial customers must have demand of at least 20 kW. Incidental export of power onto distribution lines allowed.	No export of power to PG&E distribution lines; meets load of the customer or circuit.

Source: PG&E DIH, with NEM program updates (PG&E, 2013) (http://www.pge.com/en/mybusiness/services/nonpge/generateownpower/netenergymetering.page).

Requests for Interconnection

PG&E reviews each generating facility interconnection request according to the CPUC-approved PG&E Tariff Electric Rule 21. Small-scale generation that creates a minimal impact on the distribution system generally does not require detailed interconnection study by PG&E. If the aggregate generation capacity for new small-scale generation falls under the current Rule 21 cutoff of 15% of the peak load of the circuit or substation, then the new generation passes for having a minimal impact. Generation that exceeds 15% of the circuit or substation capacity requires in-depth review (PG&E Rule 21).

Basis for 15% of Peak Load Threshold

New generation that overwhelms the load on the circuit can create an "island" of power that may lead to instability within the distribution system. To address this, PG&E conducts a higher level of review for generation over the 15% peak load threshold. PG&E describes the threshold methodology for screening interconnection over 15% of peak load in this way:

> *Peak load is monitored and recorded by PG&E for all distribution circuits. The minimum load hasn't traditionally been monitored, yet has been made available in recent years on a few installations via remote metering. Minimum load on radial circuits is typically 30% of the peak load. [. . .] Islanding becomes a power quality and protection concern when the maximum aggregate generation on a radial distribution circuit approaches 50% of the minimum load. Therefore, planning engineers use a 15% of peak load screen (50% of 30%) to quickly identify if the interconnection request poses a potential islanding and power quality concern. If the interconnection request and aggregated generation exceed 15% of peak load, PG&E can reevaluate this screen using minimum load if available as opposed to peak load. Failing this screen a second time would indicate that further study is necessary and special protection requirements may result to allow the interconnection.* (From PG&E DIH Update re: 2-20 MW 2013.)

Facilitating Growth of Localized Energy and DG

As noted above in Chapter 2.1, California's Clean Energy Jobs Plan would see development of 12,000 MW of localized generation across the state by 2020. Barriers to achieving this goal include installation costs, electrical integration impacts, and localized constraints (either environmental or electrical). The state's energy agencies are continually improving their understanding of how small-scale renewable energy affects operation of the grid.

Distributed Generation Integration Study for CEC (Navigant, July 2013)

The CEC is sponsoring ongoing studies for estimating the cost of integrating DG throughout the state on a large-scale basis to achieve the target of up to 12,000 MW by 2020. A primary concern is that utilities are receiving interconnection requests for projects in locations that cause significant system costs and impacts.

Preliminary study results from the CEC-sponsored efforts released August 2013 indicate some key findings. Namely, the cost of DG integration is highly dependent on where DG is installed. Integration impacts and costs are lower for DG installed in urban areas, and DG integration costs increase significantly as greater amounts of DG is installed near the end of distribution lines. The lowest costs of integrating DG are associated with 70% of DG located in urban areas than compared to building a majority of the DG in rural areas (Navigant, 2013).

Preliminary Local Distributed PV Market Study for CPUC (E3, March 2012)

The CPUC sponsored a preliminary study of "Local Distributed PV Technical Potential" (E3, 2012) to characterize the market for generation with an output that is consumed by local load on the feeder or substation where it is interconnected. The premise is that such "local distributed" generation would experience a less expensive and faster interconnection process than DG located remotely from load, provided that it targets high-value locations on the grid.

Determining the high-value locations within the distribution network depends on the capabilities of the network and the nature of localized loads. Studies on this issue are ongoing. For example, a January 31, 2013 CPUC stakeholder workshop reviewed the methodologies and assumptions developed for the March 2012 "Local Distributed PV Technical Potential" study, with a particular emphasis on the quantification of the locational benefits of DG (CPUC, 2013).

The market study in 2012 included a detailed assessment of statewide distribution substation- or feeder-level solar PV interconnection potential and costs. It found a technical potential for over 15,000 MW of local PV deployed across California, in configurations including residential rooftop, commercial rooftop,

small ground-mount, and larger ground-mount (up to 20 megawatts). The study determined a potential for 68 MW in San Luis Obispo County (E3, 2012). However, this study assumed that the generation along any feeder could approach 30% of peak load, which would require changing PG&E's interconnection practices to allow higher levels of distributed solar PV.

Summary of Localized Distribution System Opportunities

The electric system infrastructure provides the best opportunities for new localized energy when the generator of the electricity is matched well with a load.

This study shows the substation locations where the greatest levels of localized generation could be installed based on the peak loads of the circuits served by the substations. The basis for the capacity for new small-scale generation is that it would need to fall under the current Rule 21 cutoff of 15% of the peak load of the circuit. Based on the circuits identified, a potential of about 60 MW could be developed near the listed substations in and near San Luis Obispo County.

The existing substations and total capabilities of the loaded circuits within the 15% peak load limitation are shown in Table 5-2.

6. Environmental Resource Analysis: Opportunities and Constraints

This section provides a description of the types of environmental opportunities and constraints throughout San Luis Obispo County. The environmental resources selected for analysis are those that would be most likely to either provide an opportunity for renewable development or an on-the-ground constraint to the development of renewable energy. Not all the resources provide quantitative data regarding the existing sensitive environmental features. In such instances, the authors used qualitative information regarding the environmental resource to define opportunities and constraints. This information was then used to identify areas that would be potential renewable energy development areas.

The following resources are discussed:

- Aesthetics
- Biological Resources
- Geology and Soils
- Water Resources
- Mineral Resources
- Agriculture
- Cultural Resources
- Hazards and Hazardous Materials
- Land Use
- Socioeconomics and Fiscal Concerns

Two key resources discussed, agriculture and biological resources, present numerous variables all of which are used to analyze these resources. Because of the numerous ways to assess the value of and potential conflict with agricultural and biological resources, Section 6.2 and 6.3 rank these resources based on a subset of the variables. This ranking is then used to establish the REDAs presented in Section 3.

6.1 Aesthetics

Scenic resources include landscape patterns and features that are visually or aesthetically pleasing and that contribute affirmatively to the definition of a distinct community or region including, but not limited to, trees, rock outcroppings, and historic buildings. Scenic areas, open spaces, rural landscapes, vistas, country roads, and other factors interact to produce a net visual benefit for individuals or communities within the County. The consideration of scenic resources and aesthetics utilizes resource-specific quantitative and qualitative terminology. The following factors are important to the analysis of visual resources:

- **Key Observation Point (KOP):** Areas or a series of points on a travel route or at a public/private use area, where the view of a proposed activity would be most revealing.
- **Viewshed:** The landscape that can be directly seen under favorable atmospheric conditions, from a particular point/area or along a transportation corridor.
  - Foreground View: 0–1 mile.
  - Middleground View: 1–3 miles.
  - Background View: 3–5 miles.
- **Visual Contrast:** Opposition or unlikeness of different forms, lines, colors, or textures in a landscape. Generally, increased visual contrast within foreground distances would be more noticeable to viewers than increased visual contrast within background distances.
- **Visual Quality:** The relative worth of a landscape from a visual perception point of view.

Visual Sensitive Areas

The County's coastline is considered a sensitive visual resource. Coastal visual resources are addressed by the County's Local Coastal Program; specifically the Coastal Plan Policies, the area plans, and Coastal Zone LUO. The resources within the Coastal Zone are described for informational purposes only. The scope of the County's Renewable Energy Streamlining Project does not include the coastal zone at this time. These polices are discussed in Section 2.3. The following scenic resources are shown on Figure 6.1-1. It also includes the foreground and middleground viewshed buffers around scenic roadways, as described below.

- **Designated Scenic Vista:** A viewpoint that provides expansive views of a highly valued landscape for the benefit of the general public.
- **County Designated Scenic Highway:** Scenic highways are designated within the General Plan COSE and are corridor viewsheds from popular public roads and highways that have unique or outstanding scenic qualities. These scenic corridors are designated to conserve and enhance their scenic beauty.
- **County Sensitive Resource Area (SRA):** As identified within the General Plan Conservation and Open Space Element, an SRA designated for visual purposes defines an area with a combining designation or zoning overlay that are used to protect the visual quality of the area.
- **California Scenic Highway:** California's Scenic Highway Program serves to protect and enhance the natural scenic beauty of California highways and adjacent corridors, through special conservation treatment. Scenic corridors consist of land that is visible from the highway right-of-way, and is comprised primarily of scenic and natural features. Applicable ordinances, zoning, and planning policies are then activated to preserve the scenic quality of the corridor. These ordinances and policies make up the Corridor Protection Program.
- **County General Plan Suggested Scenic Corridor/Eligible State Scenic Highways:** These corridors have been proposed or are eligible for designation but have not yet been officially designated by either the County or Caltrans, separately. These corridors warrant additional study before determining which specific areas along those corridors merit protection and are officially designated as scenic corridors. As described below, proposed scenic corridors are weighed less in this analysis, but are considered as they could become designated in the future. Due to their proposed and eligible status, some level of visual quality along these corridors is expected. Because these corridors are not designated, the foreground and middleground viewshed areas are shown in Figure 6.1-1 in different colors than those associated with County and Caltrans designated scenic corridors.
- **Highway Corridor Design Standards:** The purpose of these standards is to protect public views of scenic vistas and backdrops containing varied topography including ridgelines and rock features, significant stands of trees and wild flowers, natural landmarks, historic buildings and pastoral settings.

Visual Impact Parameters

As shown in Figure 6.1-1, scenic resources (both designated and suggested/eligible) by both the County (via the General Plan COSE) and State are dispersed throughout the program area. In terms of analyzing aesthetic-based opportunities and constraints of renewable energy development within and proximate to these areas, one must consider the qualitative nature of visual resources. Unlike defined policy or physical limitations, this type of opportunity and constraint is primarily tied to either avoiding or reducing potential visual impacts from future renewable energy projects. Changes to visual conditions that could be perceived as either an opportunity or constraint are extremely site-specific, qualitative in nature, and would likely be evaluated for significance differently by each viewer. Because of the site-

specific nature of aesthetic resources, the following is intended to outline general assumptions of renewable energy installations and their potential impacts to visual quality:

- **Renewable Energy Type:**
  - DG (rooftop solar) components are typically of smaller size and lower profile and the installations are frequently spread out as opposed to a singular large-scale generation project dominating the visual character of any one location. Therefore, DG is considered to have the least visual impact.
  - Ground-mounted solar PV installations would result in the second lowest potential for visual impacts due to low profile. As such, intervening terrain, adjacent development, and site-specific screening can shield these installations from direct line of sight.
  - Larger-scale solar PV, solar thermal, and wind energy facilities typically result in the greatest potential for visual contrast impacts. Both solar thermal and wind energy facilities require vertical structures of heights that are likely to be seen in both foreground and middleground views from most KOPs. Screening techniques are not applicable to wind turbines and solar thermal receivers. Furthermore, solar thermal technology results in solar receiver brightness and glare impacts to foreground (and sometimes middleground) views. However, such glare is limited to daytime hours.
- **Distance and Viewshed:** The viewshed from any KOP, SRA, or scenic corridor would have unique, site-specific attributes that would limit the line-of-sight extent of the viewshed. Topography features are considered static with respect to how they may limit the distance of a view. However, development and vegetation can change over time, changing the influence on viewshed obstruction. As discussed above, DG and solar installations can be designed with visual screening to minimize visual contrast. While site-specific in nature, to develop a program-based analysis it is assumed that renewable energy installations developed within the foreground of any visually sensitive area would generate the greatest potential for visual contrast and impact. Performance standards may be incorporated to reduce the visual contrast of some types of renewable energy even within the foreground. Projects sited in the middleground would have the second least potential for visual contrast, and those developed in background view areas would have the least potential for impact. Figure 6.1-1 depicts foreground and middleground viewshed distances around all designated scenic resource areas. How individual installation attributes can influence visual contrast and change is described below.
- **Size, Massing,[8] and Scale:** The larger the footprint of each renewable energy facility, the greater the potential for visual impact. Smaller solar facilities can incorporate screening techniques, typically by vegetation and/or landscape berms, to minimize visual impacts from sensitive KOPs. However, large-scale wind and solar thermal facilities require large sites and result in vertical infrastructure, and some level of visual contrast is likely. The following provides a general analysis of renewable energy installations by scale:
  - 0–5 MW. This size facility would create the least potential for visual impact. Solar PV (including rooftop solar) facilities of this size would likely blend into the landform and existing viewshed. Furthermore, due to the low profile of solar PV installations, this scale allows for the greatest potential that visual screening can be utilized to reduce visual contrast. However, wind development of this size would still likely result in visual impact. To develop wind of this MW output, at least one or more turbines of noticeable height would likely be required. It is assumed solar thermal would not be developed at this scale. However, if it were, visual contrast impacts would be similar to wind due to the required receiving tower.

[8] Massing is an architectural term that refers to the general shape and size of a development.

- 5–20 MW. Both massing and acreage of renewable installations would increase for this output. Renewable development at this scale would have the second-lowest potential to result in visual impacts. For all technologies, development at this scale would potentially require development of rural areas. This would likely result in increased potential for visual contrast with open space and rural landscape. Wind energy facilities would require numerous turbines to create this output. Furthermore, development at this scale would likely require an on-site switchyard and other on-site transmission infrastructure.
- Greater than 20 MW. Visual impacts from renewable energy generating facilities producing this MW range would likely result in significant visual contrast at KOPs providing foreground and middleground views. Facilities this size would be considered to have the greatest potential for visual impact. The necessary acreage and infrastructure to produce this electrical generation would require large-scale installations, likely in rural areas, which would result in some level of visual contrast at KOPs with foreground and middleground views of the facility. However, impacts to background views would be strongly dependent on intervening terrain and other site-specific viewshed features.

Potential Opportunities

As shown in Figure 6.1-1, background view areas (those outside of any visual sensitive area) within the County would likely result in minimal impacts to visually sensitive areas and corridors regardless of the renewable technology or scale. This is due to their distance from designated scenic areas.

As discussed above, the middleground viewshed around designated sensitive areas provides locations where solar thermal, wind, and larger-scale PV installations (>20 MW) would have less potential for visual contrast as they would be distant from designated sensitive area KOPs. These middleground view opportunities would likely be for wind and solar thermal installations of less than 20 MW, with opportunities for larger MW generation facilities dependent upon site-specific visual analysis. Solar PV installations (>20 MW) provide excellent opportunity within these middleground viewsheds for visual screening to reduce or avoid potential visual contrast impacts.

Small-scale solar PV installations (<5 MW) could be sited almost anywhere within the County because visual screening is likely available to reduce such potential impacts. There is great opportunity to integrate these scale solar PV facilities within new construction or major renovations as part of the architectural design. As discussed above, DG is less visually intrusive compared with large-scale renewable facilities due to the ability to integrate renewable installations into buildings and other development, and due to the smaller scale. Thus, small-scale renewable development offers the greatest opportunity from a visual resources perspective. This opportunity includes rooftop solar and ground-mounted solar installations.

Ground-mounted solar installation opportunities are greatest at larger commercial, industrial, and institutional facilities, as major renovation and new construction budgets are typically at a level where incorporating renewable energy is economically feasible. For this to be an opportunity, it is critical for developers to consider renewable energy installations early in the design process. From a visual resources perspective, both existing and future developments can benefit by renewable energy consideration through an “Integrated Design” concept. In addition to extensive collaboration, integrated design involves approaching the entire building or development through a whole design approach. A building is viewed as an interdependent system, as opposed to an accumulation of its separate components (site, structure, systems, and use). Incorporating small-scale renewable installations to both offset electrical use and serve these types of facilities into the overall aesthetic of a building or

development would lead to increased considerations such as vegetative screening, façade color scheme, and site layout/orientation.

Finally, overall renewable energy development within the County contributes toward reducing the need to expand and develop conventional power plants, whose designs typically create visual impacts from industrial stacks, visual plumes, and overall heavy industrial aesthetic character.

Potential Constraints

Sensitive scenic resource areas within San Luis Obispo County where renewable energy project development may create visual impacts include coastal areas and those identified in Figure 6.1-1. These designated visual resource areas are important within the planning area and contribute to the County's sense of place. Therefore, any renewable energy project that creates significant visual impacts to designated scenic area viewsheds is considered a constraint. As shown in Figure 6.1-1, foreground viewshed areas of designated scenic vistas, SRAs, and scenic roadway corridors account for significant acreage scattered throughout the County.

While ground mounted solar PV facilities (less than 20 MW) would have a reduced constraint in these areas related to visual resource impacts, larger facilities of all generation type would likely result in visual contrast impacts to these designated scenic resources within foreground viewsheds. While site-specific evaluations may show no constraint within foreground viewshed areas, in general development of large-scale installations (regardless of technology type) should be discouraged within these areas.

Additionally, transmission infrastructure of 230 kV or greater typically results in overall visual contrast impacts when developed within a new utility corridor. The development of transmission infrastructure within existing utility-scale transmission corridors would have a reduced impact (constraint) as new lines would blend with existing transmission infrastructure.

While background viewshed areas shown on Figure 6.1-1 are found to have the least constraint related to aesthetic impacts of designated sensitive visual resources, the development of solar thermal and wind (regardless of scale) and solar PV (>20 MW) would likely result in overall visual contrast regardless of the location, with the extent of the impact depending on the land use character and visual sensitivity of the area. However, the background areas shown in Figure 6.1-1 are identified to have the least constraint to designated scenic area KOPs.

Policy constraints in the form of Scenic Highway Corridor Protection Program requirements (Caltrans), Local Coastal Plan amendments, and County General Plan COSE policies may occur from large-scale renewable energy development in foreground (and possibly middleground) viewshed areas. The extent of these determinations would depend on a number of factors, including technology used, size and scale, and specific location. As previously discussed, wind turbines and solar thermal receiving towers are typically of such height to result in visual contrast, while solar PV installations would have greater potential for screening (either natural or constructed) and a reduced constraint. However, overall compliance with applicable visual resource policies (particularly those contained in the County General Plan COSE, Chapter 9 Visual Resources) may be achieved through avoidance of siting future solar thermal and wind (regardless of scale), and solar PV (> 20 MW) within the foreground viewsheds of designated scenic areas identified in Figure 6.1-1. It is important to note that due to the site-specific nature of determining consistency with visual policy, project-level analysis would be required for those facilities sited within middleground and potentially background viewshed areas.

6.2 Agriculture

Agriculture is an important part of San Luis Obispo County's economy, and the preservation of agricultural land is major priority for the County (County Agriculture Element, 2010). The value of San Luis Obispo County's agricultural crops was $861,803,000 in 2012 (County Dept of Agriculture, 2012), and a recent study indicates that agriculture contributes $1.87 billion annually to the County's economy (Agricultural Impact Associates, 2013). The County's diverse agriculture production includes over 100 different crops, but fruit and vegetables are the largest sector economically (County Dept of Agriculture, 2012). The County's 20 highest value crops in 2012 are shown in Table 6.2-1.

Table 6.2-1. San Luis Obispo County's Highest Value Crops in 2012

1. Strawberries	$205,000,000	11. Napa Cabbage	$12,042,000
2. Wine Grapes (all)	$197,940,000	12. Rangeland Grazed	$10,200,000
3. Cattle/Calves	$69,492,000	13. Lemons	$9,064,000
4. Broccoli	$51,177,000	14. Celery	$8,676,000
5. Vegetable Transplants	$32,227,000	15. Cauliflower	$6,665,000
6. Cut Flowers	$23,821,000	16. Leaf Lettuce	$5,938,000
7. Indoor Decoratives	$20,772,000	17. Bell Peppers	$5,492,000
8. Avocados	$18,419,000	18. Alfalfa Hay	$4,211,000
9. Head Lettuce	$13,183,000	19. Grain Hay	$4,153,000
10. Outdoor Ornamentals	$12,750,000	20. Cabbage	$4,148,000

Source: County Dept of Agriculture, 2012.

The lands designated for agricultural use in the County's General Plan and Zoning Ordinance are shown in Figure 6.2-1 (County-designated Agricultural Land).

Opportunities and Constraints

Siting renewable energy projects in areas with valuable agricultural soils, strong agricultural infrastructure, and long-established agricultural communities could undermine the County's efforts to support agricultural preservation and a prosperous agricultural economy. However, as discussed in the Williamson Act section below, small-scale renewable energy production may be compatible with agricultural production in some cases. Ideally, renewable energy projects would not be sited on productive soils.

Limitations of Environmental Screening

The data used in this analysis was generated at a variety of scales by a variety of agencies and private organizations. This analysis is designed to be a screening tool to aid in future efforts to refine focal areas for renewable energy development. Project-level datasets, local experts, and unpublished data could provide additional site-specific information.

Farmland Context

The coastal area of the County has milder temperatures and typically supports a wider variety of agricultural crops than the areas farther inland, which have hotter, drier summers. In addition, some of the County's highest-value crops are grown on soils that are not classified as Prime under the systems described below under Important Farmland. The current distribution of high-value crops in the County is related to a number of factors, including natural resources, climate, land use and access to transportation networks. Conversion of land that is used to grow high-value crops would have greater

economic effects than conversion of land that is used for lower value crops or grazing, particularly because cultivation of higher-value crops tends to be more labor-intensive. However, this analysis is largely based on the quality of agricultural soils.

Important Farmland

County agricultural zoning is shown in Figure 6.2-1. There are 1,392,186 acres[9] designated for agricultural use under the County's General Plan and zoning ordinances.

Important farmland is designated in a variety of ways by a variety of agencies. The primary methods of classifying farmland for this study is the County's designation and mapping of Important Agricultural Soils that takes into account both Federal and State farmland classifications as described below. The Important Agricultural Soils map below shows both areas that should be avoided by renewable energy developers (e.g., Prime Farmlands) and areas that may be appropriate sites for development (i.e., areas with less productive agricultural soils).

County of San Luis Obispo Important Agricultural Soils. The County's Conservation and Open Space Element designates Important Agricultural Soils and includes several goals and policies related to conserving these soils. Designated Important Agricultural Soils mapped in Figure SL-1 and listed in Table SL-2 of the Conservation and Open Space Element. Figure 6.2-2a shows designated Important Agricultural Soils throughout the County. Figure 6.2-2b shows the County's designated Important Agricultural broken down by category. The County classifies soil types as follows:

- **Prime Farmland**. The County's Conservation and Open Space Element defines Prime Farmland using both federal and state definitions of land that are considered "prime" lands for farming. The United States Department of Agriculture (USDA) Natural Resource Conservation Services (NRCS) has defined these lands as "prime farmland" in the Code of Federal Regulations for Agriculture (http://www.access.gpo.gov/nara/cfr/waisidx_00/7cfr657_00.html). The State of California also defines lands that are "prime" for farming as "prime agricultural land." Prime Agricultural Soils are defined in the Agriculture Element and the Land Use and Coastal Zone Land Use Ordinance.
- **Farmland of Statewide Importance**. Farmland of Statewide Importance is defined by USDA NRCS in the Code of Federal Regulations for Agriculture. Like Prime Farmland, this category is based on physical and chemical properties of the soil, not whether land is irrigated.
- **Other Productive Soils**. This category includes Unique Farmland, as defined by the USDA NRCS in the Code of Federal Regulations for Agriculture. Most soils must all have a soil slope of 30% or less and all must meet at least two of the following three criteria: (1) Storie Index rating is fair, good or excellent; (2) Irrigated Capability Class is 1-6; (3) More than 3% of the soil type is in irrigated/permanent crop use as of 2008. Criteria 1 and 2 are based upon information from the Web Soil Survey. Criterion 3 is based upon GIS cropland mapping by the San Luis Obispo County Agriculture Department.

[9] This acreage represents zoning designations only. The number of acres designated for agriculture does not exactly equal any particular characterization of agricultural soil quality.

- **Highly Productive Rangeland Soils**. These soils meet all of the following criteria as identified on the Web Soil Survey: (1) Produce forage that is equivalent to 60% or more of the maximum normal year forage production for that soil survey area; (2) Majority of the forage produced is herbaceous; (3) Slope is less than 30% (except select soil types).

The acreage of Important Agricultural Soils is shown in Table 6.2-7.

Table 6.2-2. San Luis Obispo County Important Agricultural Soils

Category	Acres
Prime Farmland	320,016
Statewide Importance	92,092
Highly Productive Range Soils	114,581
Other Productive Soils	223,695
Total	750,384

Williamson Act Lands

Background. The Williamson Act (California Land Conservation Act of 1965) enables participating local governments, to enter into land conservation contracts with private landowners restricting specific parcels of land to agricultural uses for a minimum term of ten years in return for reduced property tax assessments.

The Williamson Act program is locally administered by counties (and some cities) to ensure compliance with the Williamson Act (Government Code 51200 – 51207), local uniform rules and individual contracts. The California State Department of Conservation (DOC) provides guidance and oversight to local governments to ensure consistency with the government code. Starting in 1972, the state provided counties with partial replacement of foregone local property tax revenues (Open Space Subvention Act). These subvention payments were suspended in 2009 due to state level budget constraints.

Establishment of an agricultural preserve is a prerequisite for landowners to enter into a land conservation contract with the county. A land conservation contract is a contract entered into by and between the property owner and lien holders (if any) and the county to restrict the use of the land for agricultural and compatible uses for a minimum term of 10 years or more. Each year the contract automatically renews unless a notice of non-renewal is served on the county or city, a public acquisition occurs or an application for cancellation is approved. In return, the land is taxed based on the income generated from the agricultural use of the land as opposed to its unrestricted market value.

Local program eligibility is based on acreage, soil type, intensity of agricultural use, and irrigated or non-irrigated status. Minimum acreage requirements for contracts within prime-land preserves start at 10 acres for Class 1 & 2 irrigated crop land, 20 acres for irrigated orchards and vineyards on lesser quality soil, and 40 acres for irrigated class 3 & 4 soils with crops such as irrigated alfalfa. Dry farm land requires 160 acres and grazing land requires a minimum of 320 acres to qualify for an agricultural preserve and contract. County Williamson Act land is shown in Figure 6.2-3.

A significant amount of land in the county is under long standing land conservation contract, much of it from the early to mid-1970s. Although the acreage fluctuates from year to year as new contracts are entered into and some terminate due to non-renewal or public acquisition, as of January 1, 2013, there were 786,483 acres enrolled in Williamson Act contracts in San Luis Obispo County, (County Assessor, 2013). This represents approximately 37% of the land in the County (not including State and Federal land).

Due to abuses of the program in some localities, a significant revision to the Williamson Act known as the Laird Bill was passed in 2004 which tightened up permissible land uses on contracted land. Land owners violating these new provisions can be subject to significant fines if structures and land uses are found to be in “material breach.”

Constraints on Williamson Act Lands. Renewable energy projects have significant siting constraints because they must locate close to sub-stations with capacity to accept additional electrical generation and also need to locate close to appropriately sized electric distribution lines, otherwise the cost of the infrastructure to feed electricity into the grid is prohibitive.

Most of the land in close proximity to these sub-stations is zoned agriculture and much of that is under land conservation contract. Electric generating plants not being allowed on contracted land, Williamson Act contracted land can be a constraint to renewable energy development. Table 2 of the County's Rules of Procedure To Implement The Land Conservation Act of 1965 govern what land uses are considered compatible uses for lands subject to land conservation contracts. Table 2 does not allow *Electric Generating Plants* on contracted land while *Public Utility Facilities* are allowable. The definitions of both land uses are located in Chapter 22.80 of the Land Use Ordinance. "Electric Generating Plants" typically involve large scale plants whose purpose is to <u>produce</u> electricity. "Public Utility Facilities" involve the <u>distribution</u> of voltage, power lines and transformers being prime examples.

Since most of the renewable energy projects the county is likely to see in the near future are solar projects, discussion of solar projects on Williamson Act land is warranted. In 2008, representatives from solar companies looking to develop large scale solar projects in the Carrizo plain in the eastern area of the county began contacting staff about how solar projects could be sited on Williamson Act contracted land. When presented with specific proposals to locate solar projects on contracted land, after considerable research and discussion with the DOC, the Department of Planning and Building guided land owners through the options for avoiding and removing land from contract provided in the Williamson Act and Local Rules of Procedure:

- avoiding property that is under Land Conservation Contract (selecting alternate sites on non-contracted land),
- filing a Notice of Nonrenewal and allowing the 10 year term to run on the contract before applying for a project,
- submitting applications for Cancellation, subject to stringent findings and approval by the Board of Supervisors as well as cancellation fees

The above options constituted the policy of the Department of Planning and Building at that time.

- **Nonrenewal.** The most common (and preferred) method of withdrawing from a Williamson Act contract is filing a notice of non-renewal, which can be initiated by either the contracting agency or the landowner. Under this process, the contract is ended after a nine-year nonrenewal period during which taxes gradually increase every year. This process is a relatively simple and inexpensive way to remove land from contract, however it just takes a long time to complete.
- **Cancellation of Williamson Act Contracts.** Cancellation of Williamson Act contracts is discouraged by the California Land Conservation Act of 1965 and the State Department of Conservation. The cancellation process is to be used only infrequently and under unusual circumstances. It is also a procedurally complicated, time consuming and expensive method to seek termination of contracts. Processing fees are high due to the complexity of the analysis, the need to prepare detailed staff reports and conduct public hearings and the time it takes to administer the cancellation process in general. If a cancellation request is tentatively approved by the Board of Supervisors, the applicant must pay a cancellation penalty fee (collected by the county and transmitted to the state) amounting to 12-1/2 percent of the appraised value of the property as if it were not subject to contract within one year after tentative approval of cancellation.

- **Public Acquisition.** The Williamson Act provides another avenue for removing land from land conservation contract called "Public Acquisition." This process is only available to public agencies acquiring land through eminent domain or voluntary donation or sale by private landowners to a public agency (acquisition in lieu of eminent domain). The DOC requires notification, a referral package with a detailed project description and findings from the Government Code. Although land can be removed from land conservation contract upon conveyance to a public agency without having to "run the contract term," this process is generally not available to private land owners or developers of renewable energy projects.

Protected Areas

Protected Areas are shown in Figure 6.2-4. Local, State, and federal public lands that are protected for their recreation, habitat, and scenic values are generally off-limits to renewable energy development. In addition to these public lands, there are private lands that are similarly off-limits. Non-profits and mitigation banks manage private preserves created for particular environmental purposes. Some of these private protected lands are being conserved specifically to offset the impacts of previous development projects. These protected lands may be preserved in full fee (all property rights held by one owner) or as conservation easements. Conservation easements are partial interests in land that allow easement holders (usually land trusts or public agencies) to restrict land uses on private properties. A landowner sells or donates the rights to use their property in certain ways (e.g., subdivide and develop, convert to non-agricultural use) and these rights are permanently severed from the underlying title to the property. All future owners are bound by the original conservation easement restrictions.

There are conservation easements, including agricultural preservation easements, throughout the County. Just one of these easements, Hearst Ranch, covers approximately 80,000 acres. Because the conservation easements are on private land, they are more difficult to track than public protected lands. In California, conservation easements created using any public funds are supposed to be tracked in the statewide conservation easement registry, but this registry holds basic information for only a small percentage of the easements in California. As of 2001, all conservation easements are also supposed to be indexed by County Recorders.[10] An online search of San Luis Obispo County records found 305 indexed conservation easements created between 1998 and 2013. Data for the protected areas map also came from the following sources:

- **National Conservation Easement Database (NCED)**. NCED is the first national database on conservation easement information. It includes records from land trusts and public agencies throughout the United States. [http://www.conservationeasement.us]
- **California Protected Areas Database (CPAD).** CPAD is a GIS inventory of all fee-protected (excludes conservation easements) open space in California. It includes both public lands and land owned by non-governmental organizations. [http://www.calands.org]
- **Wildlife Conservation Board Approved Projects** (via BIOS)
- **The Nature Conservancy (TNC)** – private dataset shared by TNC
- **Land Conservancy of San Luis Obispo County** – private dataset shared by Land Conservancy

[10] California Government Code § 27,255 (West Supp., 2008).

Ranking and Summary Analysis and Conclusions

Because of the numerous ways to assess the value of and potential conflict with agricultural resources, this study provides a ranking analysis for agriculture that is then used to establish REDAs. The analysis uses a subset of the key data described above to determine the areas in the County where there would be the highest and lowest conflict with agricultural resources. These areas are shown in Figure 6.2-9. The datasets used for this analysis are:

- Protected area data (from Figure 6.2-4)
- The County's Important Agricultural Soils data
- Williamson Act enrollment data

"No Go" Areas

These are areas covered by conservation easements or that have other protected status that precludes development, including renewable energy development.

Lower Conflict Areas

These areas have agricultural lands with soils that have been classified as less valuable for crop production. This category includes:

- Land not designated as Important Agricultural Soils; and
- Any land that is solely classified as Highly Productive Rangeland Soils in the County's Important Agricultural Soils map.

Higher Conflict Areas

These areas have the most productive agricultural lands in County. Renewable Energy would not necessarily be precluded, but there might be additional agricultural resources mitigation required for conversion of agricultural land in high conflict areas. This category includes:

- Important Agricultural Soils designated as having Prime Farmland or Farmland of Statewide Importance, or Other Productive Soils.

Williamson Act Overlay

Enrollment in the Williamson Act restricts the types of development that are allowed on agricultural land. Because there are over 786,483 acres of Williamson Act lands in the County, this is a major potential obstacle to renewable energy development (County Assessor, 2013). As noted above, the County is in the process of revising its Williamson Act policies to more specifically address particular situations in which some forms of small-scale renewable energy development may be compatible with Williamson Act enrollment. In addition, some of the County's Williamson Act lands are in the non-renewal process, meaning Williamson Act contracts will be ending within the next nine years. Figure 6.2-6 highlights locations where areas with lower agricultural resources conflicts are not enrolled in Williamson Act contracts or are enrolled in contracts that are not being renewed.

6.3 Biological Resources

The principal goals of this section were to develop a set of site screening tools to identify potential opportunities or constraints to siting renewable energy facilities from a biological perspective. Evaluating impacts to biological resources is an important consideration in siting renewable energy projects. Projects located in areas supporting sensitive biological resources may be inconsistent with adopted land use plans, subject to intense public scrutiny, often require extensive regulatory coordination, and may incur extensive mitigation requirements. Development in areas supporting species protected under the federal or California Endangered Species Acts (ESA/CESA) may result in lengthy consultation with wildlife agencies including the US Fish and Wildlife Service (FWS), the National Oceanic and Atmospheric Administration's (NOAA's) National Marine Fisheries Service (NMFS), and the California Department of Fish and Wildlife (CDFW).

Identifying Biological Opportunities and Constraints

Identifying opportunities and constraints for renewable energy development emphasizes minimizing impacts to sensitive species, habitat essential to their survival, and important migratory or movement corridors. Ideally, development would be sited in previously disturbed lands in or adjacent to developed areas.

Biological opportunities are defined as sites that do not support or have a low potential to support sensitive species or their habitat. Brownfield sites including industrial facilities, developed lands, or other previously disturbed lands would be considered opportunities for development.

Biological constraints include factors such as the presence of wetlands, concentrations of threatened or endangered species, critical habitat, or important migratory corridors. Certain vegetation communities would also be considered a biological constraint. Riparian and serpentine-associated assemblages are of limited distribution in California and support a number of rare endemic species. California annual grasslands, while not formally considered a sensitive habitat by the State, may provide important habitat for sensitive biological resources such as San Joaquin kit fox, giant kangaroo rat, or vernal pools.

Methods

Categories were selected to serve as proxies for areas of high biological sensitivity. Each category was mapped using publically available data and described in the following sections. These categories include:

- Designated critical habitat for species listed under the ESA
- Available occurrence data for species listed under ESA and CESA
- Sensitive vegetation and habitats, including waters and wetlands
- Migratory and movement corridors for wildlife, including important migratory bird stopovers
- Habitat Conservation Plans (HCPs) and other biological considerations. These include HCPs and conservation easements in unincorporated San Luis Obispo County as well as areas identified by the County and other agencies as sensitive, often with specific mitigation requirements for development.

Publically available GIS datasets were obtained from various sources including the CDFW, County of San Luis Obispo, FWS, California Energy Commission, and others. Datasets were grouped according to the biological sensitivity categories identified above and maps were developed to identify the geographic extent of each resource, as applicable. The following subsections describe these datasets in greater detail and identify specific limitations to available data.

In addition to the constraints described below, Figure 6.3-6 shows protected areas that are off-limits to renewable energy development because they are protected (in full fee or through conservation easements) specifically to preserve habitat or agricultural land. The data used for Figure 6.3-6 are described in more detail in Section 6.2 (Agriculture).

Limitations of Environmental Screening

The datasets underlying this analysis exist at a variety of spatial and temporal scales, accuracies, and geographic scopes. Few of the datasets offer current, comprehensive coverage for the entire County, which limits the power of the data to precisely define site-specific opportunities or constraints. The datasets should be considered on a landscape level as a screening tool to aid efforts to refine focal areas for renewable energy development. Project-level datasets, local experts, field studies, and unpublished data would provide additional site-specific information, but these are beyond the scope of the current exercise. This screening process is not intended to identify the scale or magnitude of potential impacts to biological resources resulting from development of renewable energy projects in San Luis Obispo County.

Critical Habitat

Critical habitat is a federal designation to provide essential habitat for listed species. It is comprised of one or more areas essential for the conservation of a species listed as threatened or endangered under the ESA. Critical habitat often includes areas that are not occupied by the species for which it was designated, but includes land that provide specific functions (i.e., sand transport, connectivity, dispersal areas) necessary for the species' recovery.

Critical habitat may be designated for a single species or a group of species. Critical habitat often includes land that does not support habitat or provide any of the primary constituent elements required by the target species to survive and breed. These areas may include developed or disturbed sites that could be available for small scale development. However, for the purposes of this study all critical habitat units are considered a constraint.

Data: Figure 6.3-1 identifies designated all critical habitat units in San Luis Obispo County as of October 2013. These data were obtained from the USFWS, and are current as of September 2013.

- California condor
- California red-legged frog
- California tiger salamander
- Morro Bay kangaroo rat
- Tidewater goby
- Western snowy plover
- La Graciosa thistle
- Longhorn fairy shrimp
- Morro shoulderband snail
- Purple amole
- Vernal pool fairy shrimp

Constraints: While development is not precluded from designated critical habitat, these areas have been afforded legal protection which requires developers to consult with the FWS if the project would affect critical habitat or any listed species. Critical habitat units support important habitat and often support more than one listed species. RE development within these biologically sensitive areas typically require extensive biological surveys to document the distribution of the target species, a longer permitting timeframe to allow for consultation under Section 7 or Section 10 of the ESA, and extensive mitigation to offset project impacts to listed species.

The amount of designated critical habitat in San Luis Obispo County is limited, despite the large number of listed species. Most of the northwest, northeast, and southeast portions of the County do not include designated critical habitat; however, many of these areas are, nonetheless, occupied by listed species.

Listed or Fully Protected Species

Over 50 species listed under the ESA or CESA are known to occur or have the potential to occur in San Luis Obispo County. Some of these include Morro shoulderband snail, vernal pool fairy shrimp, San Joaquin kit fox, Nelson's antelope squirrel, giant kangaroo rat, blunt-nosed leopard lizard, California tiger salamander, California condor, and several plants. Listed species are used in this analysis as a proxy for all sensitive species.

Data and Limitations: Figure 6.3-2 illustrates occurrence records for listed species in San Luis Obispo County. These records are from the CDFW's California Natural Diversity Database (CNDDB), survey results (as available through online CDFW BIOS portal), and biological survey data from recent projects in the County. Figure 6.3-2 also shows the ranges of several listed species where these data were available. Species range data was obtained through CDFW's California Wildlife Habitat Relationship System, NMFS steelhead distribution data, and County data on Pismo clarkia range and prime habitat. Figure 6.3-2 includes areas where a 2006 negotiated court injunction has restricted pesticide use to minimize impacts to California red-legged frog.

It is important to note that listed species in the County are not restricted to the locations of occurrence records and distributions shown on Figure 6.3-2. Most areas of the County have not been systematically or recently surveyed and where biological surveys have occurred, results are not always available. Further, a given species range or distribution are scientific estimates based on known occurrence records and expected habitat associated. Actual ranges of species often change as scientists gather greater data on the distribution of a species. Range expansions and contractions for many species occur naturally and in response to anthropogenic causes. In some instances a species range can rapidly expand to unoccupied lands that border core populations. Therefore, Figure 6.3-2 is a guide to help refine identification of the most appropriate areas for renewable energy development. Listed species occurrence data are best considered in conjunction with sensitive vegetation and habitats (see Figures 6.3-3 and 6.4-4). Together, these datasets help to identify the most sensitive areas within the County, with respect to biological resources.

Constraints: Where sensitive species are present, there are greater regulatory restrictions, greater mitigation requirements, and extended permitting timeframes (for impacts to listed species requiring take authorization) for renewable energy projects. Seasonal restrictions on construction and operation activities, biological monitoring, and extensive compensatory land acquisition are examples of mitigation often required of projects that impact listed and other special-status species.

Renewable energy technologies (e.g., solar, wind, and geothermal) have different potential impacts to sensitive species. Wind energy development has the potential for considerably higher impacts to birds and bats than terrestrial species, as the footprint of these developments is usually small. Depending on fencing configurations, wind developments may have minor impacts to terrestrial species and potentially little impact to aquatic species if waterways are avoided via strategic placement of turbines and roads. However, bird and bat mortality via collision with turbines is well documented, and placement of a wind farm in or near a migratory corridor can result in significant mortality. Some solar developments generally present less risk to birds and bats, although birds may mistake the reflective photovoltaic panels for water resulting in collisions. Solar developments may have a relatively large footprint and many terrestrial species, including special-status species, are sometimes excluded from solar developments. Therefore, a given renewable energy technology may have substantially different impacts to special-status species at a given location.

Based on the data used in this analysis, listed species are more prevalent in the coastal portion of the County. However, many sensitive grassland-associated species occur in the eastern areas of the County

adjacent to the San Joaquin Valley. The area with fewest records in the dataset used for this analysis is generally the northern portion of the County, although it is within the range of and supports typical habitat for several listed species.

Sensitive Vegetation and Habitats

Sensitive vegetation and habitats are a conservation priority for local, State, and federal regulatory agencies because they have limited distribution and support a suite of sensitive plants and wildlife. For this analysis, sensitive habitats are also used as a proxy for sensitive biological resources.

Data and Limitations: The California Gap Analysis Project (GAP), conducted by the Biogeography Lab at the University of California, Santa Barbara and coordinated through the USGS Biological Resources Division, was initiated in 1990 to 1) develop new GIS databases of land-cover, wildlife habitats, predicted distributions of native wildlife species, and land stewardship and management in California; 2) identify land-cover types and wildlife species that are inadequately represented in existing biodiversity management areas (i.e., the "gaps"); and 3) make all GAP information available to users to encourage and facilitate its use so that resource managers may be more effective stewards of California's biological heritage (Davis et al., 1998). Although last updated in 2002, this dataset provides comprehensive vegetation data for the entire County. This dataset was developed using satellite imagery, infrared photography, and miscellaneous maps and field verification. The minimum mapping unit for upland landcover was 100 ha (247 acres) and 40 ha (99 acres) for wetlands. Although the scale of this dataset does not allow detailed site-specific analysis, it is useful for this planning-level screening assessment to show the general distribution of vegetation in the County. Sensitive habitats, including general riparian areas, wetlands, and oak woodlands, are highlighted in the GAP dataset shown on Figure 6.3-3. This assessment also considers California annual grassland as a sensitive habitat where this habitat type overlays the distribution of listed species. This vegetation type is common and widespread throughout the state, and is dominated by nonnative and invasive plants, in San Luis Obispo County grasslands provide habitat for some of the most sensitive species including San Joaquin kit fox, giant kangaroo rat, Nelson's antelope squirrel, blunt-nosed leopard lizard, Swainson's hawk, and burrowing owl.

In addition to the GAP vegetation data, the following sensitive vegetation communities have been mapped in the CNDDB and are shown on Figure 6.3-4. Note that the vegetation classification systems and vegetation mapping scales used for the GAP data and the CNDDB data are different, and the CNDDB data are not a comprehensive identification of sensitive vegetation throughout the County. Therefore, sensitive vegetation data from the CNDDB are shown for informational purposes, but the analysis focuses on sensitive vegetation communities in the GAP dataset because that data is available County-wide.

- Central Dune Scrub
- Central Foredunes
- Central Maritime Chaparral
- Coastal Brackish Marsh
- Coastal and Valley Freshwater Marsh
- Monterey Pine Forest
- Northern Claypan Vernal Pool
- Northern Coastal Salt Marsh
- Northern Interior Cypress Forest
- Serpentine Bunchgrass
- Valley Needlegrass Grassland
- Valley Oak Woodland
- Valley Sink Scrub

Figure 6.3-4 also identifies the locations of the following landforms and habitats. These are sensitive because they are limited in distribution and support suites of rare and endemic species.

- Streams, rivers, and water bodies (US Geological Survey's National Hydrography Dataset)
- Serpentine soils (San Luis Obispo County data) – proxy for rare plants

- Vernal pool habitats (CDFW data)
- San Joaquin Valley edge habitats (USFWS *Recovery Plan for Upland Species of the San Joaquin Valley, California*)

The edge habitats shown on Figure 6.3-4 are linkage areas on the fringe of the San Joaquin Valley and adjacent valleys to the west identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS, 1998). These areas were identified in the plan as areas that could support the goal to maintain linkages of natural lands around the fringe of the Valley and elsewhere for San Joaquin kit fox and other listed and sensitive species. Target species for these linkages include Hoover's woolly-star, blunt-nosed leopard lizard, giant kangaroo rat, San Joaquin antelope squirrel, short-nosed kangaroo rat, San Joaquin kit fox, California jewel flower, Jared's peppergrass, Lost Hills saltbush, oil neststraw, San Joaquin woolly-threads, Tulare grasshopper mouse, San Joaquin Le Conte's thrasher, Bakersfield cactus, Comanche Point layia, Tejon poppy, Vasek's clarkia, and Kern mallow. Areas identified as linkages are of higher biological sensitivity, as they help to maintain genetic flow between populations and minimize effects of habitat fragmentation, which is a factor in the population declines of many species in California.

The data on Figures 6.3-3 and 6.3-4 do not provide a complete depiction of the distribution of sensitive vegetation and habitats across San Luis Obispo County. Much of the data were mapped coarsely from aerial photography on a geographic scale with large minimum mapping units and little or no field verification. A renewable energy development on natural lands would typically require site-specific vegetation mapping in addition to other biological studies, and most sites would require a delineation of jurisdictional waters to support permitting.

Opportunities and Constraints: Renewable energy development should be sited to avoid sensitive vegetation and habitats to the extent possible. These areas often support higher concentrations of listed and other special-status species. Wetlands and waters (streams, creeks, ponds, lakes, etc.) are regulated under the Clean Water Act and the California Fish and Game Code. Impacts to these waters would require a project applicant to obtain all applicable permits. Specific vegetation types, such as oak woodlands, are also afforded protection at the County level and additional mitigation requirements apply to projects that impact these habitats. Areas identified as Barren, Cropland, Dryland Grain Crops, Orchard and Vineyard, and Urban in the GAP dataset may provide opportunities for renewable energy development, as they are less likely to support sensitive resources. See Section 6.2 (Agriculture) for more discussion of agricultural areas.

Sensitive vegetation and habitats occur throughout San Luis Obispo County, as shown on Figures 6.3-3 and 6.3-4. The largest blocks of non-sensitive habitat occur within chaparral communities in the mountainous areas of the county, as well as areas mapped as cropland. However, many sites within areas mapped as sensitive habitat on Figure 6.3-3 may not support sensitive species or even habitat, due to large minimum mapping units or landcover changes since the dataset was produced.

Migration and Wildlife Movement

Migratory pathways are routes used by species during migration, particularly in the fall and spring. Bird and bat migratory pathways often span thousands of miles and follow specific topographic features such as canyons and mountains ranges. In topographically open areas, migratory pathways may be broad and less concentrated. Riparian and wetland areas, annual grasslands, and fallow agricultural fields are particularly important as foraging and stopover sites for migrating and wintering birds in San Luis Obispo County.

Wildlife corridors facilitate movement between habitats that would otherwise be isolated. These corridors include habitat linkages between natural areas, greenbelts, and refuge systems. They can divert wildlife across permanent physical barriers to aid dispersal (e.g., underpasses and ramps that help wildlife cross highways and dams) (Haas, 2000; Simberloff et al., 1992). Noss (1987) suggests several benefits of corridors, including the promotion of species richness and diversity, decreased probability of extinction, maintenance of genetic variation, increased mix of habitat and successional stages, and alternative refugia from large disturbances.

Data and Limitations: Figure 6.3-5 identifies some important areas for wildlife movement. Important Bird Areas are areas identified by Audubon California as critical terrestrial and inland water habitats for birds, particularly habitat that supports rare, threatened or endangered birds or exceptionally large congregations of shorebirds or waterfowl. Missing linkages are areas identified through the Missing Linkages collaboration process that are important to maintain or reinstate habitat connectivity throughout California. Linkages identified in this dataset include ones that are large, regional connections between habitat blocks meant to facilitate animal movement and other essential functions; narrow, impacted, or otherwise tenuous linkages connecting two or more habitat blocks; and highly impacted linkages that currently provide little to no connectivity function (due to intervening development, roadways, etc.) but based on location are considered critical to restoring connectivity function (Penrod et al., 2001).

Essential Connectivity Areas and Natural Landscape Blocks were identified in the *California Essential Habitat Connectivity Project* (Spencer et al., 2010). Natural Landscape Blocks are large, relatively natural habitat blocks that support native biodiversity and Essential Connectivity Areas are essential for ecological connectivity between them.

Both the Missing Linkages and the California Essential Habitat Connectivity projects were developed at coarse scale and are focused on ecological integrity. The areas identified are broad-scale regional connectivity areas, and individual potential development sites within these identified areas may or may not significantly interfere with habitat connectivity.

Constraints: The magnitude of impacts from development within a designated wildlife corridor is a function of the proposed technology and what species benefit from the preservation of a designated wildlife or movement corridor. For example, the size of a corridor varies greatly based on the ecology or behavior of a given species. Some species including giant kangaroo rats are considered corridor dwellers in that they spend their entire life history within their home range. Dispersal or gene flow occurs as the population ebbs and flows or as young animals disperse to breed with animals in adjacent territories. Disruption of lands that provide connectivity to species with this ecology would likely be restricted or pose increased regulatory permitting and mitigation costs. Other species such as San Joaquin kit fox are capable of long distance dispersal; while the preservation of suitable habitat is essential for this species, some land uses such as wind farms may be compatible.

Birds and bats are vulnerable to collisions with wind turbines, and wind developments sited in or near migratory pathways are likely to result in substantial mortality of migrants. Similarly, wind turbines placed in or near areas of high bird or bat concentration, such as lakes, wetlands, waterways, and associated riparian habitat are also more likely to result in significant mortality. These areas may experience high mortality year-round as both resident and migrating individuals encounter turbines in the paths between foraging and nesting or roosting sites. Wind developments typically have a smaller disturbance footprint within a given project site, as disturbance is limited to turbine foundations, access roads, and appurtenant facilities. However for some terrestrial species wind development may pose less of a constraint to movement that compared to some solar technologies. Solar developments usually disturb an entire site

and have a larger footprint than wind developments. Solar developments may have more detrimental impacts to terrestrial wildlife movement than bird and bat movement.

The majority of the County is in the general vicinity of one or more linkage areas identified via the Missing Linkages and the California Essential Habitat Connectivity projects, although portions of the northeast and southwest areas of the County appear to be less sensitive with regard to connectivity. Important Bird Areas occur in various locations, but none are identified in the northeastern portion of the County.

Conservation Plans and Other Biological Considerations

Several areas within San Luis Obispo County are covered by Habitat Conservation Plans (HCPs), conservation easements or reserves, or have otherwise been designated as environmentally sensitive areas by various agencies or entities. Many of these have development restrictions or prohibitions, and where development may be possible, specific mitigation would be required in compliance with the affected designation.

Data and Limitations: Figure 6.3-6 identifies planning designations for environmentally sensitive areas in the County. The Renewable Energy Transmission Initiative (RETI) is a statewide initiative to help identify the transmission projects needed to accommodate renewable energy goals, support future energy policy, and facilitate transmission corridor designation and transmission and generation siting and permitting. The effort is a collaboration headed by the California Energy Commission (CEC) and includes CEC, CPUC, the California Independent System Operator, publicly owned utilities, and other stakeholders. One component of the RETI was to identify areas that could best support utility scale renewable energy development with fewest environmental constraints; these areas were called Competitive Renewable Energy Zones (CREZs). To identify CREZs, the RETI team undertook a screening exercise similar to that being conducted in this report. The focus of the data used to develop CREZs was on renewable energy developments much larger than those considered in this report. Environmental restrictions data developed for the RETI project are shown on Figure 6.3-6.

RETI environmental yellow areas are general zones of sensitivity for renewable energy projects based on environmental sensitivity and other land use/management constraints. In RETI yellow areas, existing restrictions are intended to limit potential renewable development. Environmental yellow areas include BLM Areas of Critical Environmental Concern; USFWS designated Critical Habitat for federally listed endangered and threatened species; special wildlife management areas identified in BLM's West Mojave Resource Management Plan, i.e., Desert Wildlife Management Areas and Mojave Ground Squirrel Conservation Areas; lands purchased by private funds and donated to BLM, specifically the California Desert Acquisition Project by The Wildlands Conservancy; and “Proposed and Potential Conservation Reserves” in HCPs and NCCPs (Black & Veatch, 2008).

Specialty reserves in the San Joaquin Valley are natural lands targeted for protection to maintain wildlife values in and near the San Joaquin Valley, as identified by the USFWS in the *1998 Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS, 1998). This dataset identifies general locations of lands targeted for specialty preserves in the Recovery Plan, including one small area that straddles the border between San Luis Obispo and Santa Barbara Counties.

As described above under Aesthetics, SRAs are environmentally sensitive areas, as designated in the San Luis Obispo County General Plan. There are 25 SRAs in the County that were designated for sensitive biological resources; these are shown on Figure 6.3-6.

Kit fox mitigation ratio areas are standard mitigation ratios for projects within San Joaquin kit fox habitat in San Luis Obispo County. The ratios are based on the results of previous kit fox habitat evaluations, with higher ratios assigned to known occupied areas and higher quality habitat. Mitigation is required by the County for impacts to kit fox habitat. Ratios range from 1:1 to 4:1, with higher mitigation ratios required for impacts to areas occupied by kit fox and supporting higher quality habitats. These mitigation requirements are assigned to projects during the County's CEQA process. As shown on Figure 6.3-6, most of the eastern portion of the County is within kit fox habitat with associated mitigation ratios.

Conservation easements shown on Figure 6.3-6 include all projects approved by the Wildlife Conservation Board from its inception in 1949 to present (2013). Additional conservation easements and ecological reserves occur in the County, and many of these are included in Figure 6.3-6. Stakeholders should be consulted for additional spatial information to create a more comprehensive set of data identifying conservation easements and ecological reserves in San Luis Obispo County.

Figure 6.3-6 also identifies boundaries of HCPs. There is currently one HCP in San Luis Obispo County, the Los Osos HCP.

Constraints: Lands within ecological reserves and conservation easements would generally be unavailable for development, and development should be focused outside of any conservation plan boundaries or County-designated sensitive resource areas to avoid environmentally sensitive resources. Most areas shown on Figure 6.3-6 should be avoided; however, development could occur in some areas of the east County that are within San Joaquin kit fox range. Barring other constraints, development in these areas would have mandatory compensatory mitigation requirements at the ratio identified on Figure 6.3-6.

Areas of the County that are least constrained by conservation plans and other biological considerations included in the dataset for this analysis include mountainous areas in the northwest, extreme northeast, and southwest.

Analysis and Conclusions

Because of the numerous ways to assess the value of and potential conflict with biological resources, this study provides a ranking analysis that is then used to establish REDAs. The biological resources data described above were assessed in terms of sensitivity and a ranking system was developed that utilizes a subset of these data. The ranking system is intended to roughly identify areas of high, moderate, and low sensitivity, and "no go" areas for renewable energy development, with respect to biological resources. Figure 6.3-7 presents the results of this analysis. The following describes the data associated with each ranking, and a rationale for each dataset's inclusion in its particular rank. Anywhere that data of different sensitivity rankings overlap, the higher sensitivity prevails. For example, if an area is ranked moderate for the vegetation type present, but is also within critical habitat for a listed species, that area would be ranked as high sensitivity.

"No Go" Areas

"No go" areas are lands within the County's jurisdiction that are precluded from development. These are conservation lands and easements, and specialty preserves. These lands have been or are intended for preservation for unique biological values and renewable energy development is considered to be excluded from these areas.

High Sensitivity Areas

Areas ranked as high sensitivity would not be precluded from renewable energy development, but would be most likely to support sensitive biological resources and have additional permitting, survey, and mitigation requirements. The following are considered high sensitivity:

- **Critical habitat for listed species.** Would generally require consultation with the FWS and higher mitigation requirements.
- **Serpentine soils.** Used as a proxy for rare plants.
- **Vernal pools.** Vernal pools are sensitive habitats/landforms.
- **Sensitive native vegetation types in GAP dataset.** The GAP dataset is used because it has complete, County-wide coverage. Sensitive native vegetation types in this dataset are blue oak woodland, blue oak-foothill pine, coastal oak woodland, coastal scrub, freshwater emergent wetland, lacustrine (lake), saline emergent wetland, valley oak woodland, and valley-foothill riparian. Mitigation requirements for impacts to these communities are typically higher than for common vegetation. Although annual grasslands in the County often support sensitive species, this vegetation type was not identified as sensitive at this level of analysis because information on sensitive species habitat is captured in the County kit fox mitigation ratio structure also included in this analysis.
- **Audubon Important Bird Areas.** Identifies general areas important for migrating and breeding birds.
- **Kit fox mitigation – 4:1.** Areas requiring mitigation at a 4:1 ratio (4 acres conserved for every 1 acre developed) support known populations and high-quality habitat for this listed species. The San Joaquin kit fox is often considered an umbrella species as it routinely co-occurs with other sensitive species, and conservation actions targeted at the kit fox indirectly protect a suite of other rare species.
- **Water bodies and streams (NHD dataset).** A 400-foot buffer around these features was selected to include the water feature and an approximation of the associated upland area that provides wildlife habitat. Many aquatic species such as California tiger salamander and California red-legged frog utilize upland habitats in proximity to streams for portions of their life cycles, and birds and terrestrial species often concentrate near waterways. This buffer size is consistent with effective riparian buffer sizes reported in the literature (Hawes and Smith, 2005).
- **San Luis Obispo County Sensitive Resource Areas.** SRAs identified for biological resources values are already considered high sensitivity by the County.

Moderate Sensitivity Areas

Moderate sensitivity areas may support sensitive biological resources, but the level of sensitivity is generally lower than those areas ranked as high. Additional mitigation or permitting may still be required, but in general moderate areas are considered less constrained by biological resources than high sensitivity areas. The following are considered moderate sensitivity:

- **Essential connectivity habitat and natural landscape blocks.** These datasets are mapped at a very broad scale, and individual sites within these may or may not significantly facilitate wildlife movement.
- **Non-sensitive native vegetation types in GAP dataset.** These communities have value in that they provide habitat, but are generally widespread enough that they have not been identified as rare and worthy of consideration by CDFW. These include alkali desert scrub, chamise–redshank chaparral, closed-cone pine-cypress, juniper, mixed chaparral, montane hardwood, montane hardwood-conifer, pinyon-juniper, ponderosa pine, and sagebrush. Although not a native vegetation type, annual grass-

land is also considered moderately sensitive because of the suite of rare species associated with this vegetation in San Luis Obispo County.

- **Kit fox mitigation – 3:1 and 2:1.** These areas may or may not support kit fox, and are generally considered to have moderate quality habitat.

Low Sensitivity Areas

Areas ranked as low sensitivity are most appropriate for renewable energy development from a biological resources perspective, because they are least likely to contain sensitive resources. The following are considered low sensitivity:

- **Non-native vegetation types in GAP dataset.** These are least likely to support sensitive biological resources, and include areas mapped as barren, cropland, dryland grain crops, orchard and vineyard, and urban.
- **Kit fox mitigation – 1:1.** These areas are within the range of the San Joaquin kit fox, but are least sensitive for this species based on previous analysis conducted by the County.

6.4 Cultural Resources

The Cultural Resources section of this OCTS outlines key environmental and logistical issues regarding potential impacts to cultural resources associated with the development of renewable energy in the County. Unlike other issue areas, because cultural resources are site specific and there is no available data at the County scale to eliminate particular sites, it is not possible to know the exact location of most cultural resources so identifying opportunities and constraints is not possible. Therefore, this section presents an overview of cultural resources issues with regard to RE development.

Cultural resources can reflect the history, diversity, and culture of the region and people who created them. They are unique in that they are often the only remaining evidence of the activity that occurred historically. Once destroyed, cultural resources cannot be made again, and they cannot provide any more information about past activities. Thus, there are several federal, State, and local laws and guidelines that require the consideration of renewable energy development effects on cultural resources.

Cultural resources are classified by their origins and are considered in this OCTS as follows:

- **Prehistoric Resources:** Prehistoric archaeological resources are associated with the initial human use and occupation of the San Luis Obispo County region prior to prolonged European contact. In San Luis Obispo County, the prehistoric period began over 12,000 years ago and extended through the eighteenth century until about 1772 when the Spanish Mission at San Luis Obispo was established.
- **Historic Resources:** Historic period resources are associated with Euro-American exploration and settlement of the area and the beginning of a written historical record for the region, and can include any historic resource that is at least 50 years old, including built-environment resources such as structures, or portions of structures. Built-environment resources are a type of historic period resource and are architectural in nature.

Ethnographic resources are another type of cultural resource, and are resources that are of importance to a specific group of people (e.g., Native Americans, Hispanics, Mormons, or African-Americans) and are sometimes also referred to as traditional cultural properties. The identification of ethnographic resources is best accomplished through archival research and consultation with those groups who derive cultural importance from the place, and, ideally, ethnography of those groups of concern. Because ethnographic resources encompass a broad range of resource types, such as prehistoric and historic archaeological sites, ceremonial areas, traditional collection areas, or places of political, religious, or historical importance, and standard field archaeology methods are not an appropriate approach to the identification of such resources, a discussion of ethnographic resources is not included in this OCTS.

Policy Framework

There are several State and local laws, regulations, and guidelines applicable to cultural resources that must be considered in the development of renewable energy projects. These laws, regulations, and guidelines can either result in opportunities or constraints to renewable energy development.

The principal State law relating to considering the impacts on historic and archaeological properties is CEQA (Sections 21083.2 and 21084.1) and the implementing guidelines (CEQA Guidelines Section 15064.5), as well as Public Resources Code Section 5020 et seq. The primary function and purpose of these laws and guidelines are to identify, analyze, and disclose potential adverse impacts to historical resources, which include all resources listed in or formally determined eligible for the California Register of Historic Resources (CRHR) or local registers.

In practice, resources unevaluated for the CRHR are treated as potentially significant. In addition to meeting specific criteria for CRHR eligibility, cultural resources must also retain most of the original characteristics of the property (i.e., its integrity) such that it continues to convey the period of historical significance for which the resource is important. The CRHR criteria are similar to criteria for federal law (i.e., the National Historic Preservation Act), and are tied to CEQA, as any resource that meets the criteria and retains its integrity is considered a historical resource under CEQA.

CEQA also address the protection and preservation of historic and prehistoric human remains. These remains may consist of historic-period burials or cemeteries, and Native American remains that occur as isolated features or in archaeological site contexts. Native American-sanctified cemeteries, places of worship, ceremonial and religious sites, or sacred shrines situated on public property must be protected from vandalism and damage.

Thus, CEQA and the associated regulations and guidelines could constrain or provide opportunities for renewable energy development depending on the potential for the occurrence of cultural resources at a project site. That is, for a project site with a low potential for cultural resources, certain laws, regulations, and guidelines would provide an opportunity for renewable energy development, while a project site with a high potential for cultural resources is more likely to be constrained by these factors. The results of site-specific cultural surveys would provide direct evidence as to which and how specific laws, regulations, and guidelines would contribute to the opportunities or constraints for renewable energy development. A renewable energy developer should be aware that the more ground-disturbance associated with a project, the more likely it is that cultural resources would be discovered during surveys or during earth-moving activities.

Another constraint that could result from applicable cultural resource laws and guidelines includes the adequacy and timeliness of previous surveys of the project area. A cultural resources survey is generally considered applicable for the same project area if it was conducted within 5 years of the current project; surveys older than 5 years should be conducted again. Additionally, if a survey does not meet professional standards (e.g., poor site documentation, insufficient ground-surface visibility) it should be updated. Local Native American tribes, identified by the Native American Heritage Commission (NAHC) as having a potential interest in a project, should be notified concerning the results of the archaeological survey and consulted regarding the presence of any sites identified in Sacred Lands File by the NAHC. Consultation with Native Americans is also required for certain actions (e.g., changes to a general plan). Native American consultation could present an opportunity or a constraint to a developer depending on the involvement of interested parties, the types of archaeological resources in the area, and the potential for buried resources.

General Assumptions

Cultural resources have a site-specific nature. That is, the identification and evaluation of cultural resources can only be accomplished through pedestrian survey of a project area because each and every cultural resource site is unique in its location, preservation of artifacts and features, and extent of its boundaries. With technological developments, especially in Geographic Information Systems (GIS), cultural resource data is becoming more useful for large-scale planning purposes. Archaeological site records in California are housed at 11 independently run, regional depositories, and these Information Centers are currently in the process of digitizing the site records and reports, and plotting the location of sites and surveys in GIS programs. GIS analysis of this data, once it is entirely digitized and operational (estimated to be accomplished in four to eight years [CHRIS, 2013]), would provide a myriad of opportunities for querying the data, such that correlations between sites and environmental variables can provide a predictive power with a high degree of confidence in those predictions.

There are methods for predicting the potential for cultural resources, and such an analysis could consist of known digitized archaeological site GIS data correlated with various data sets, such as distance to water, ecotone boundaries, slope, soil type, geologic contexts, and elevation. While the individual GIS layers for these data sets are mostly available, the synthesis of these layers relating to cultural resources has not been conducted for purposes of inclusion in this OCTS. However, the conclusions derived herein do provide a reasonable approximation of the potential for cultural resources.

Cultural Resource Sensitivity

This OCTS identifies areas that may be suitable for renewable energy development based on environmental and policy constraints, and possible steps that could be taken to minimize renewable energy development impacts on cultural resources. Knowledge of the specific location of cultural resources is a task that can only be accomplished by a "feet-on-the-ground" survey for such resources. However, there are variables that facilitate educated predictions as to the locations of prehistoric, historic, or built-environment resources. A description of the various data sets included and the rationale behind using the data in developing the sensitivity maps follows.

A total of 12 maps were made for the cultural resources; eight associated with prehistoric resources and four associated with historic and built-environment resources. The maps are broken into four sub-areas of San Luis Obispo County in order clearly delineate sensitivity areas: north coastal region, south coastal region, north inland region, and south inland region. These maps identify areas that may contain sensitive cultural resources. The maps are not intended to define the specific location of any cultural resources, but rather as a tool to help site renewable energy facilities in locations that are less likely to contain cultural resources.

Prehistoric Sensitivity

The maps of prehistoric resource sensitivity are separated into two different categories. The first set of maps (i.e., Figures 6.4-1a, 6.4-1b, 6.4-1c, and 6.4-1d) identify the data sets that were used in developing the second set of maps (i.e., Figures 6.4-2a, 6.4-2b, 6.4-2c, and 6.4-2d), which indicate the areas sensitive for cultural resources.

The primary source used for the cultural resource portion of the OCTS is a predictive model for prehistoric villages developed by Neal (2007) for the Santa Ynez River Valley. This study was used because it was the predictive model located closest to the San Luis Obispo County region. Many of the variables that Neal analyzed could be extrapolated to a project area. Predictive models, such as the one generated by Neal (2007), are complicated data sets that use GIS, multiple variables and known site record data to create a degree of predictive power about the potential location of cultural resources.

Three data sets and archaeological sensitivity areas developed by San Luis Obispo County were used to develop the maps:

- Named streams and water bodies;
- Ecotone boundaries; and
- Slope.

One of the data layers identifies County designated archaeological sensitive areas. This data set was developed by the County for planning purposes; however, the methodology used in development of this data set is not currently known. Neal (2007), among others (e.g., Horne, 1981 and Tainter, 1971), found that access to reliable, potable water is a critical factor in predicting the location of prehistoric

archaeological sites. Research conducted by Neal (2007) in the Santa Ynez River Valley indicated that most village sites were located within 800 meters of permanent water sources. Thus, the maps include a data layer from the National Hydrological Database with an 800-meter buffer around all "named" streams. Only named streams were used because it was assumed that the non-named streams and water bodies were likely to be more ephemeral in nature, as well as the fact that including all streams, named and unnamed, resulted in almost the entire County being included in this data layer.

Neal (2007) also found a correlation, albeit a weak one, between village location and 200 meters of an ecotone boundary, i.e., the boundary between two different vegetation zones (e.g., Great Basin Sage-brush and Coast Live Oak). In order to visualize this data, GAP data of vegetation zones from the University of California-Santa Barbara Biogeography Lab were plotted, and a 200-meter buffer between the different zones was applied.

The final data set used was slope. Neal (2007) found that most sites in the Santa Ynez River Valley were located on a slope of less than 15°. Research conducted in Western Colorado (Kvamme, 1985) found that most village sites were located on a 16.1% (9°) slope or lower, and that no sites were located higher than 40% slope (21.8°). Therefore, areas with a slope of less than 16.1% were included as areas where sites were likely to occur. Areas with slopes of between 16.2% and 40% are areas where sites may be located but are unlikely to occur. The areas with slopes above 40% were identified as areas where sites are unlikely to occur. This data from Colorado was included in order to provide a more comprehensive data set than just 15° slope.

The second set of maps shows the intersection of the data sets identified in the first set of maps, high-lighting those areas of the County that are most sensitive for cultural resources. This second set of maps shows the areas that are within 800 meters of water, within 200 meters of an ecotone, *and* located on land with less than 16.1% slope.

Historic and Built-Environment Sensitivity

The historic and built-environment sensitivity maps include three major data sets:

- In the San Luis Obispo County General Plan historic sites are designated as areas of unique historical significance for land use planning purposes. The San Luis Obispo Historic Site (H) designations include the following locations:
  - Adelaida Cemetery
  - Adelaida School (1917)
  - Adobe Barn – Los Berros
  - Arthur Beale House Nitwit Ridge (Cambria)
  - Avila Valley Historic Site
  - The Bank of Cambria
  - Banning School (El Chorro Park)
  - Bethel Lutheran Church (Templeton)
  - Bianchini House (Cambria)
  - The Bluebird Motel (Cambria)
  - The Brambles Restaurant (Cambria)
  - The Bucket of Blood Saloon (Cambria)
  - C.H. Philips House (Templeton)
  - Camozzi's (Cambria)
  - Canet Adobe (Estero)
  - Captain James Cass House Complex (Cayucos)
  - Carroll's Blacksmith Shop (Cambria)
  - Los Osos Schoolhouse
  - The Lull House (Cambria0
  - Lyman House (Cuesta Grade)
  - Marre House (c. 1932)(Avila Beach0
  - Geneseo School
  - Mission San Miguel Archangel
  - Mission Santa Margarita de Cortona Asistencia
  - Octagon Barn (SLO)
  - The Olallieberry Inn (Cambria)
  - The Old Santa Rosa Chapel (Cambria)
  - Old St. Joseph's Church (Nipomo)
  - Pacific Crest Railroad Depot Site (Nipomo)
  - The Paul Squib House (Cambria)
  - Port San Luis Lighthouse (1890)
  - Porter Ranchhouse (1890)
  - Pozo Saloon
  - Price Adobe (Pismo Beach)

- Cayucos Pier
- Chandler House-Webster (Creston)
- Coffee T. Rice House (Oceano)
- Creston Cemetery
- Creston Community Church
- Dana Adobe (Nipomo)
- Dana Home (Nipomo)
- Eight-Mile House & Stagecoach Road (Cuesta Grade)
- Estrella Adobe Church
- The 1st Presbyterian Church (Cambria)
- Hansen Barn (Bishop Peak)
- Hearst Castle (San Simeon)
- Hearst Ranch Headquarters (San Simeon)
- Heart's Ease (Taylor House)(Cambria)
- Huasna School (1907)
- Ian's Restaurant (Cambria)
- Independence School (SLO)
- J. F. MacGillivray Residence (c. 1879)(Adelaida)
- The Leffingwell House (Cambria)
- Linne School
- Louis Maggetti House (Cambria)
- Los Berros Schoolhouse
- Rancho Huasna (Issac Sparks Adobe) (1850)
- The Red House (Cambria)
- Rigdon Hall Restaurant (Cambria)
- Rinconada School
- Rios Caledonia Adobe – San Miguel
- Robin's Restaurant (Cambria)
- Rotta Winery (Adelaida)
- Runels Home – Dana Street (Nipomo)
- San Marcos Cemetery (c. 1889) (Adelaida)
- The Sebastian Store (San Simeon)
- Soto's Market (Cambria)
- Southern Pacific Railroad Depot (Oceano)
- Spooner Residence (Montana de Oro)
- Tar Springs Ranch (Huasna)
- Temple of the People (Halcyon)
- The Thorndyke House (Cambria)
- Tognazzini General Store (Edna)
- Van Gordon Archaeological Site (Cambria)
- Vasquez-Hollister Adobe (Cuesta College)
- Willow Creek Cemetery (c. 1911) (Adelaida)
- York Mountain Winery (1882-1890)

The El Camino Real is the first Spanish road constructed to connect the missions from San Diego up the coast to those in the Bay Area. This route is included because of its historical significance and the potential for historic sites to be located in close proximity to the historic road.

- All named streams and water bodies because access to water was not only important for prehistoric peoples, but also for European and American settlers. Also, reservoirs are included which could contain historic dams or associated infrastructure.

Conclusions

Regions most sensitive for prehistoric resources are those regions within 800 meters of a permanent water source (or in this case, a named stream or water body), and also within 200 meters of an ecotone boundary. Slope is not as significant a factor in the location of prehistoric sites because almost the entire County has a slope of less than 16.1°. Historic sites are most likely to occur in those areas near historic roads, and near sources of water.

6.5 Geology and Soils

This section discusses how geological-based hazards (such as earthquakes, landslides, etc.) and geologic formations can influence the siting of renewable energy facilities. Two of the direct effects of an earthquake include the rupture of the ground surface along the trend or location of a fault, and ground shaking that results from fault movement. Other geologic hazards that may occur in response to an earthquake include liquefaction, seismic settlement, landslide, tsunami, and seiche. Public hazards related to seismic events also include slope failure, flooding from dam or levee failure, fires, and structural damage.

It should be noted that renewable energy facilities themselves are not habitable structures. While smaller installations (such as rooftop solar) are typically sited atop or immediately adjacent to occupied structures and large-scale renewable facilities often have on-site operations and maintenance structures, the construction and design of each installation will incorporate geotechnical engineering to determine the seismic design parameters. Standard geotechnical engineering practices and adherence to seismic building code requirements minimizes any siting considerations of renewable energy facilities with respect to fault locations or seismic events. This also applies to any necessary transmission infrastructure.

For a discussion of soils related to agricultural and other uses, please refer to Sections 6.2 (Agriculture) and 6.8 (Land Use). Furthermore, as discussed in Section 4.7 (Renewable Energy Resource Not Currently Available in the County), while San Luis Obispo County has some minor geothermal resources, they are not sufficient for energy generation.

The following defines terms are used in this discussion:

- **Active Fault:** A fault that is likely to have another earthquake sometime in the future. Faults are commonly considered to be active if there has been movement observed or evidence of seismic activity during the last 10,000 years.
- **Fault Rupture:** Fault rupture refers to displacement of the ground surface along a fault trace. Rupture of the ground surface along a fault trace typically occurs during earthquakes of approximately magnitude 5 or greater. Fault rupture can endanger life and property if structures or lifeline facilities are constructed on, or cross over, a fault.
- **Groundshaking:** The motion that occurs in response to local and regional earthquakes.
- **Liquefaction and Seismic Settlement:** Liquefaction is the sudden loss of soil strength due to a rapid increase in soil pore water pressures resulting from groundshaking during an earthquake. Seismic settlement is the reduction of volume within a saturated or unsaturated soil mass due to groundshaking during a seismic event.
- **Landslides and Slope Instability**: Landslides and slope instability can occur as a result of wet weather, weak soils, improper grading, improper drainage, steep slopes, adverse geologic structure, earthquakes, or a combination of these factors. Slope instability can occur in the form of creep, slumps, large progressive translation or rotational failures, rockfall, debris flows, or erosion.
- **Rock Outcroppings:** A significant number or sized portion(s) of bedrock or other stratum protruding above the surface of the surrounding land.

With respect to soils, this section focuses on how seismic events can impact subsurface conditions and result in liquefaction and seismic settlement. During a seismic event, fault rupture or strong ground shaking may compromise renewable energy installations and transmission infrastructure. Additionally, these facilities could be compromised if sited on soil subject to liquefaction or other slope instability.

These facilities could also be impacted if sited adjacent to steep slopes subject to landslides. Figure 6.5-1 shows the locations of these geological features within the County. As shown, the topography of western San Luis Obispo County accounts for slopes capable of landslide risk, while the easternmost portion of the County contains the largest stretch of designated seismic hazard area. Rock outcroppings are located primarily within the central portions of the County.

Potential Opportunities

Structures in seismically active areas, such as California and specifically San Luis Obispo County, are designed and retrofitted to resist seismic forces resulting from earthquakes. The California Building Code (CBC), Title 24, Part 2 provides building codes and standards for design and construction of structures in California. The CBC is based on the International and Uniform Building Codes with the addition of more extensive structural seismic provisions. As renewable energy and transmission infrastructure development could be sited within designated seismic zones (as identified by the California Geological Survey and/or San Luis Obispo County), provisions for design should follow the requirements of Chapter 16 of the CBC, which contains definitions of seismic sources and the procedure used to calculate seismic forces on structures.

One opportunity is that small-scale distributed generation installations (particularly rooftop solar) can piggyback on already constructed or planned structures with seismically approved designs (i.e., to recent building code standards). Depending on the age of the building, rooftop solar on already constructed buildings would not be subject to any additional geotechnical engineering. Furthermore, as shown in Figure 6.5-1, the large areas of flatland across central and northeast San Luis Obispo County with less seismic hazard potential may be ideal for larger-scale renewable development.

Potential Constraints

The County acknowledges that areas of known landslide activity are generally not suitable for residential development. Renewable energy development should also be avoided in areas of known slope instability or high landslide risk when possible. However, because stand-alone renewable facilities would not necessarily induce residential growth, development of renewable installations within areas of landslide risk (refer to Figure 6.5-1) would require siting considerations appropriate for those areas to minimize the risk of upset from seismic and rain events. As stated earlier, standard geotechnical engineering practices and adherence to seismic building code requirements minimizes any siting considerations of renewable energy facilities with respect to fault locations or seismic events. This also applies to any necessary transmission infrastructure. Therefore, while worth mentioning, this is more a siting consideration than development constraint.

As shown in Figure 6.5-1, central San Luis Obispo County provides large areas of flatland with less potential for landslide and other seismic hazards. While these areas may be ideal for large-scale renewable development, it is also assumed that renewable facilities would not be constructed over rock outcroppings as they can limit size and feasibility of site design/construction as well as access. As shown in Figure 6.5-1, significant areas of rock outcroppings occur within the south central portion of the County.

6.6 Hazards and Hazardous Materials

This section discusses how past, existing, and future land uses that manufacture, generate, treat, store, use, or dispose of toxic substances in significant quantities may influence siting of renewable energy development. Additionally, this discussion considers several naturally occurring hazards. For geological-based hazards (such as earthquakes, landslides, etc.), please refer to section 6.5, Geology and Soils.

The following defines terms and hazardous site classifications are used in this discussion:

- **Contaminated Site:** A site that is either contaminated or believed contaminated with some level of toxic substances. These types of sites typically include industrial properties, military bases and other defense installations, landfills, and smaller commercial uses (gas stations, dry cleaners, etc.).
- **Superfund Site:** Superfund is the name given to the environmental program established by the U.S. Environmental Protection Agency (EPA) to address abandoned hazardous waste sites. The program allows the EPA to clean up such sites and to compel responsible parties to perform cleanups or reimburse the EPA for such cleanups. A Superfund site refers to a parcel that has been designated as requiring, or is currently undergoing, site remediation through the Superfund program**.**
  - Abandoned Mine Land (AML) Site: Includes all abandoned hardrock mines and mineral processing sites listed in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS). Abandoned mine sites are included on the National Priorities List (NPL) of Superfund sites.
- **Brownfield Sites:** A brownfield site is a property where expansion, redevelopment, or reuse of the site may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. These sites are designated both federally by the EPA and at the State level by the DTSC. DTSC typically considers brownfield sites to be often idle or underused, contributing to both urban blight and urban sprawl. However, brownfield sites are not limited to urban areas, but instead define a site that had been previously contaminated at some level.
  - Resource Conservation and Recovery Act (RCRA) Sites. As designated by EPA, these facilities are considered brownfield sites that are commercial, industrial, and federal facilities that treat, store, or dispose of hazardous wastes that require cleanup of the contamination under the RCRA Corrective Action (CA) Program.
  - California DTSC Cleanup Program. The DTSC Cleanup Program list includes sites cleaned up under the Program's oversight and, generally, does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents sites with active land use restrictions.
- **Landfill Methane Outreach Program (LMOP) Site:** The EPA's LMOP is a voluntary assistance program that helps to reduce methane emissions from landfills by encouraging the recovery and beneficial use of landfill gas as an energy resource. Landfill gas contains methane, a potent greenhouse gas that can be captured and used to fuel power plants, manufacturing facilities, vehicles, homes, and more. The LMOP promotes the use of landfill gas as a renewable, green energy resource. LMOP screens landfills to determine if they are candidates for landfill gas energy projects or have potential for landfill gas energy projects. In addition, it tracks landfills with energy projects that are operational, under construction, or shut down.
- **RE-Powering Mapper**: The EPA has developed an online siting and mapping tool encouraging renewable energy development on current and formerly contaminated lands, landfills, and mine sites

when it is aligned with the community's vision for the site. This initiative identifies the renewable energy potential of these sites and provides other useful resources for communities, developers, industry, State and local governments, or anyone interested in reusing these sites for renewable energy development. This mapping tool includes more than 66,000 EPA- and State-tracked sites, comprising over 35 million acres. Types of sites currently mapped include Superfund, RCRA corrective action, abandoned mines, landfills, and brownfields. Renewable energy technologies analyzed and mapped include solar, wind, biomass, and geothermal.

Potential Opportunities

Siting renewable energy on contaminated land can provide an economically viable reuse for sites with significant cleanup costs or low real estate development demand that would otherwise lay idle, providing additional tax revenue. Many contaminated land sites have onsite infrastructure including transmission lines, substations, roads, rail, river or ocean port access, and buildings that can be reused or upgraded at a lower cost than building new infrastructure. Contaminated land sites may have compatible zoning or a simplified process for acquiring zoning variance/change. Both the EPA and DTSC have programs designed to empower states, communities, and other stakeholders in redevelopment to work together in a timely manner to prevent, assess, safely clean up, and sustainably reuse contaminated sites.

When considering how contaminated sites can provide opportunities for siting renewable energy installations, this analysis utilized the EPA RE-Powering Mapper system,[11] EPA's RE-Powering Mapper makes it possible to view information about renewable energy potential on federal- and State-identified contaminated lands, landfills, and mine sites. This system utilizes EPA and DTSC contaminated site data and applies a methodology to determine renewable energy potential (EPA, 2013). Figure 6.6-1 shows the locations of sites on San Luis Obispo County lands that were identified by the EPA RE-Powering Mapper as having positive potential for renewable energy development. As shown in Figure 6.6-1, EPA's RE-Powering mapper has identified a number of sites within the County boundary, with the majority being DTSC cleanup program sites. As indicated, all RE-Mapper sites have been designated as viable for off-grid development. Approximately half of the sites have also been designated as viable sites for large-scale and/or utility level solar PV and wind development for grid integration. These sites represent the key renewable energy development opportunities with respect to reuse of hazardous sites.

Acreage is not a screening criterion utilized by the RE-Powering Mapper system for off-grid solar because such systems are typically used to power a single property or local area, and are not constrained by limited acreage. While off-grid sites are identified on Figure 6.6-1, these sites do not identify all existing industrial uses (brownfield sites) where off-grid technology could be utilized. The sites identified on Figure 6.6-1 only indicate those sites EPA has designated (as discussed above). Therefore, Figure 6.6-1 does not include many existing industrial facilities that could implement off-grid renewable development. For example, an industrial complex owner could install PV panels to supplement the electricity provided to the facility from traditional sources. Depending on the scale, these systems may or may not need to be interconnected to the existing utility grid (and thus subject to utility regulations or policies). However, an off-grid system could be designed to only power or supplement a given load (e.g., a water pump, water treatment or cooling system, or the facility itself) and would not require interconnection. These facilities are assumed to be 1 MW or less. While the potential opportunities for

[11] The EPA's RE-Powering Mapper is available at http://www.epa.gov/oswercpa/rd_mapping_tool.htm#i_map. This tool is available in both Google Earth and via GIS shapefiles and is updated regularly. While this study does not provide specific detail about each potential disturbed site, details regarding the renewable energy potential, distance from infrastructure, and other data is provided for each potential site.

developing small off-grid renewable facilities at these types of active brownfield sites are considered high, these locations are not shown on Figure 6.6-1 as they are not available in the EPA RE-Mapper database, and are potentially too abundant to determine.

In addition to reuse of contaminated sites and installing renewable installations to assist powering brownfield sites, overall renewable energy development contributes toward reducing the need to expand and develop conventional power plants.

Potential Constraints

When evaluating potential constraints to future renewable development, hazards in the form of environmental considerations during construction are the primary focus. The construction of renewable energy facilities on previously undisturbed soil has the potential to create health hazards within San Luis Obispo County. While not a constraint, it is an environmental consideration for future large-scale utility developers, particularly for projects in rural areas. The entire County is designated by the Center for Disease Control (CDC) as being an "endemic" area for valley fever (CDC, 2013). Valley fever is caused by *Coccidioides*, a fungus that lives in soil throughout California. Inhaling the airborne fungal spores can cause a respiratory infection called coccidioidomycosis, which is also known as "cocci" or "valley fever." Earthmoving activities into previously undisturbed soil can increase the potential for fungus exposure. When constructing both the Topaz Solar Farm and California Valley Solar Ranch, 28 construction workers were sickened by valley fever. Watering of work areas for dust suppression would help contain the possible exposure to valley fever spores to within the project site. The use of respirators by construction workers compliant with Occupational Safety and Health Administration (OSHA) regulations in conjunction with regular soil testing for valley fever spores would reduce the impact of this consideration.

In addition to Valley Fever, naturally occurring asbestos could pose health hazard risks to on-site workers and adjacent areas throughout San Luis Obispo County. The term refers to the mineral as a natural component of soils or rocks as opposed to asbestos in commercial products, mining, or processing operations. Naturally occurring asbestos can be released from rocks or soils by routine human activities, such as construction, or natural weathering processes. If naturally occurring asbestos is not disturbed and fibers are not released into the air, then it is not a health risk. This risk would be greatest during construction activities of renewable energy installations greater than 5 MW and transmission infrastructure greater than 230 kV, this is due to the overall disturbance area of such larger scale projects and the increased number of on-site workers. Similar to valley fever spores, exposing naturally occurring asbestos is an environmental concern. Mitigation strategies identical to those utilized for valley fever would reduce the potential impact of naturally occurring asbestos, those being watering for dust suppression and adherence to OSHA regulations.

6.7 Water Resources

Water resources in the County include groundwater basins, hydrologic resources, and water supply and infrastructure. Multiple County policies seek to preserve and sustain important water resources. Additionally, increases in density or development are required to consider where critical resource levels exist, including adequate water for development. According to the County Land Use Element, a major issue related to quality of life and the historical character and livability in San Luis Obispo includes the limited rainfall and recharge of groundwater basins and surface reservoirs and the multiple groundwater basins in critical or overdraft conditions. As such, the impact of land use patterns and water consumption should be recognized.

Environmental Considerations

Groundwater Basins

San Luis Obispo County has 19 groundwater basins; three of which extend into adjoining counties. The majority of the groundwater basins are small and located along the coast of San Luis Obispo County. The largest groundwater basin both in physical size and in storage capacity is the Paso Robles Area Sub-basin of the Salinas Valley Groundwater Basin.

The County RMS provides a comprehensive biennial summary of the state of the County's natural and man-made resources to help inform the public, County staff, and decision makers about resource and infrastructure issues. As described in Section 6.2, Agriculture, the RMS uses three alert levels called LOS to identify resource deficiencies:

- **LOS I** is the first alert level and occurs when sufficient lead time exists either to expand the capacity of the resource, or to decrease the rate at which the resource is being depleted. For water supply, LOS I occurs when water demand over the next nine years equals or exceeds the estimated dependable supply.
- **LOS II** identifies the crucial point at which some moderation of the rate of resource use must occur to prevent exceeding the resource capacity. For water supply, LOS II occurs when projected water demand over the next seven years equals or exceeds the estimated dependable supply.
- **LOS III** occurs when the demand for the resource equals or exceeds its supply and is the most critical level of concern. The County should take a series of actions to address resource deficiencies before Level III is reached. For water supply, LOS III occurs when projected water demand equals or exceeds the estimated dependable supply.

The RMS Resources Summary Report makes a distinction between "recommended" levels of severity and levels of severity that have been "certified" by the County Board of Supervisors to identify differing levels of resource deficiencies. For groundwater considerations, all levels of severity are originally recommended by a service provider or by the Water Resource Advisory Committee[12] and should be taken as a general indicator of declining resource availability. The LOS certification process includes the completion of a Resource Capacity Study and is subject to public hearings.

[12] The Water Resource Advisory Committee is a committee made up of Supervisorial Districts, cities, Community Service Districts, Resource Conservation Districts, water agencies and institutions, and members representing agriculture, the environment, and development. The purpose of the committee is to advise the County Board of Supervisors about policy decisions relating to water resources within the County Flood Control and Water Conservation District, to recommend specific water resource programs, and to recommend methods of financing water resources programs.

The 2010-2012 Resource Management System's Resource Summary Report identified three groundwater basins as having a certified LOS III: the Los Osos, Paso Robles, and Nipomo Mesa groundwater basins. The Paso Robles Groundwater Basin includes one hydrologically distinct sub-basin, the Atascadero Sub-basin, identified as having a certified LOS I. These basins are identified in Figure 6.7-1. Three additional groundwater basins, the Cuyama Valley, Morro-Chorro, and North Coast have a recommended LOS III and the San Luis Creek has a recommended LOS I.

The County's General Plan Land Use Element and COSE contain policies that address water, including the various LOS. The Land Use Element calls for actions at LOS II and LOS III such as:

- Enacting restrictions on further land development in the area that is affected by the resource problem;
- Adjusting land use categories so that they will accommodate no more than the population which can be served by the remaining available resource, or redirecting growth to communities or areas that have available resource capacity; and
- Establishing a moratorium on land development or other appropriate measures in the area that is affected by the resource problem.

The COSE contains policies such as rejections of General Plan amendment or land division approvals that increase the density or intensity of non-agricultural uses in rural areas with a certified LOS II or III for water supply. Additionally, the COSE recommends avoiding a net increase in non-agriculture water use in groundwater basins that are recommended or certified as LOS II or III for water supply, and places limitations on further land divisions in these areas until plans are in place and funded to ensure that the safe yield will not be exceeded.

Hydrologic Features

This section discusses both natural and man-made water bodies and features. Figure 6.7-2 identifies hydrologic and water resources throughout San Luis Obispo County. San Luis Obispo County is traversed by a number of named and unnamed streams. The major streams are, from north to south, Nacimiento River, Salinas River, San Luis Obispo Creek, Arroyo Grande Creek, Cuyama River, and Santa Maria River. These streams feed several large lakes throughout the County, with the largest being Lake Nacimiento in the northern portion of the County. Water demand in the County is met primarily by local ground water and by surface water impounded in Salinas Reservoir (Santa Margarita Lake), Lopez Reservoir, and Whale Rock Reservoir. A number of new reservoirs are proposed within the northwest section of the County.

Potential Opportunities

There are two types of development opportunities related to water resources. Groundwater basins with certified LOS III may provide opportunities for renewable energy projects where the amount of water used is minimal, such as small wind projects or solar PV projects. Secondly, some hydrological features in the County would be appropriate for small-scale renewable energy projects.

The three groundwater basins with certified LOS III (see Figure 6.7-1) could provide opportunities for renewable energy development because although water is required during the construction of any development for uses such as grading, cement mixing, and dust control; once construction is completed, the operational use of water decreases dramatically for some renewable resources.

Wind energy generation requires minimal operational water, primarily for workers and other minor uses. The technology itself does not require the use of water. Solar PV technologies require minor amounts of

water for operational activities such as panel washing. But, as highlighted in Section 4.1, the amount of water varies between 0 and 5 gallons per MWh per day. As San Luis Obispo continues the long-term planning for water-scarce regions, renewable energy provides potential opportunities for development.

Hydroelectric facilities could be sited within new dams required for future reservoir sites. While the generation potential from these facilities would likely be limited, as water drawn from these future reservoirs would not be continuous, there is potential for integration into facility design. Additionally, hydroelectric facility development potential also exists along naturally occurring streams and rivers. Hydroelectric facilities would not be streamlined by the County because they are regulated by FERC; see Section 4.4.

Wind turbine development potential exists within and along the shores of both natural lakes and man-made reservoirs. Due to the size of larger lakes and reservoirs (see Figure 6.7-2), typical wind speed and frequency across these water bodies may be at levels sufficient for wind installations. Wind condition requirements and further details on wind turbine technology are discussed in Section 4.3, Wind.

Potential Constraints

While some renewable technologies present opportunities for development in water-scarce areas, some technologies such as solar thermal and biomass may require larger amounts of water during the energy generation process.

Flood zones, flood control regulations, and standards are typically proposed to provide appropriate level of flood protection for residential developments. However, wherever feasible, renewable energy development should not be sited within areas that have a Flood Hazard (FH) combining designation (FEMA 100-year flood zones) per the San Luis Obispo County General Plan. Additionally, development of transmission or stand-alone renewable energy facilities within wetlands should be avoided or minimized to avoid sensitive biological resources found in wetlands; see Section 6.3. As shown in Figure 6.7-3, designated wetland areas within the County are primarily limited to the central coastline south of Morro Bay and estuaries of coastal streams between Cayucos and the Monterey County line.

6.8 Land Use

Most of the land area within San Luis Obispo County is used for rural and agricultural uses, and the population is concentrated in the western portion of the County towards the coast and along the Highway 101 corridor. Part II (The Area Plans) of the Land Use and Circulation Elements of the San Luis Obispo County General Plan divides the inland area of the county into four planning areas: Carrizo, North County, San Luis Obispo, and South County. Each of these planning areas has its own area plan that refines the general policies of Framework for Planning (Part I of the Land Use and Circulation Elements) into separate land use issues and policies for each area. Each of the four inland planning areas is further divided into sub-areas that correspond to the boundaries of the 11 former inland planning areas that in March 2014 were consolidated into the four existing planning areas (County of San Luis Obispo, 2013a). The planning areas and their sub-areas are shown in Figure 6.8-1. The Coastal Zone is also divided into four planning areas. The four inland planning areas are described below:

- **Carrizo Planning Area**. Located in the southeastern portion of the County, this largely rural and open space area is devoted almost exclusively to the agricultural uses of dry farming and rangeland. Most of the population in the Carrizo planning area is located in its one village area, California Valley, with a population of 356 people.
- **North County Planning Area**. Approximately 95% of the North County area is designated Agriculture, Rural Lands, and Open Space. Much of the new development is increasingly oriented to commuter and retirement living, light industry, service businesses and tourism in the area around the cities of El Paso de Robles (Paso Robles) and Atascadero.
- **San Luis Obispo Planning Area**. Located in the central western portion of the County and inland from the Coastal Zone, the San Luis Obispo Planning Area includes a compact urban center around the City of San Luis Obispo, surrounded by open agricultural lands.
- **South County Planning Area**. The South County planning area generally consists of the land south and east of San Luis Obispo to the Santa Barbara county line, between the Coastal Zone and the Carrizo Plain. Land uses within this large area are diverse, ranging from urban and suburban development in the incorporated cities and older town sites, to rural residential and agricultural uses in the foothill and Nipomo Mesa areas, and the scenic and natural characteristics of the coastal ridges and Los Padres National Forest.

Land Use Compatibilities

Identifying compatible land uses and consistency with adopted land use policies are important factors in the successful siting of renewable energy generation facilities. As shown on Figure 6.8-1, much of the County is designated Agriculture (AG), Rural Lands (RL) and Open Space (OS) by the San Luis Obispo General Plan (2010). One of the primary principles of the County is to preserve and protect these natural, scenic, and agricultural resources. The General Plan states that the County hopes to strategically focus future growth away from rural areas and limited resources, closer to existing and planned job centers and public facilities where sustainable resources are available (County of San Luis Obispo, 2010). Development of renewable energy is also important to the County, which could include careful development of renewable energy in appropriate rural areas.

Table 6.8-1 indicates the acreages of land use categories within the rural unincorporated portions of each inland planning area. Land use categories in unincorporated areas within village and urban reserve lines (URL) of each inland planning area are more developed with more Residential, Commercial, and Industrial uses.

Each land use category allows certain uses that distinguish it from others, although many uses are allowed within more than one category. A new land use or development may be allowed within a particular land use category if it is listed within an allowable or special use group in Article 2 of the Land Use Ordinance (Title 22 of the San Luis Obispo County Code; Allowable Land Uses and Permit Requirements). Further limitations on uses may be imposed by standards in Articles 9 and 10 of the Land Use Ordinance. Uses in areas within the Coastal Zone are dictated by the Coastal Zone Land Use Ordinance (Title 23 of the San Luis Obispo County Code). Table 6.8-2 shows the land use categories that currently allow for development of electric generating plants in Titles 22 and 23.

Table 6.8-1. Land Use Designations by Planning Areas (Rural Portions)

Land Use Category	Carrizo (acres)	San Luis Obispo (acres)	North County (acres)	South County (acres)	Totals (acres)
Agriculture	289,092	42,273	727,932	223,157	1,282,454
Rural Lands	162,957	17,210	109,205	100,214	389,586
Recreation	0	6,091	4,126	5,605	15,822
Open Space	11,182	213	104,820	94,868	211,083
Residential Rural	0	2,127	20,581	14,563	37,271
Residential Suburban	0	987	445	3,048	4,480
Residential Single Family	0	0	22	0	22
Commercial Retail	1	0	16	5	22
Commercial Service	1	0	90	59	150
Industrial	0	0	20	30	50
Public Facilities	0	3,877	26,234*	241	30,352
Dalidio Ranch	0	0	0	0	0
Total Acres	463,233	72,778	993,491	441,790	1,971,292

Source: San Luis Obispo County, 2013a.
*The Camp Roberts Military reservation, which occupies 26,146 acres, is designated Public Facilities. If any portion of Camp Roberts reverts to private ownership in the future, a Land Use Element amendment will be required to remove the Public Facilities category and designate the property Agriculture, in recognition of the land's potential for sustaining grazing and other more intensive agricultural uses.

Table 6.8-2. Land Use Categories and Allowances for Electric Generating Plants

	Land Use Category													
Use Group	Agriculture – Prime Soils	Agriculture – Non-Prime Soils	Rural Lands	Recreation	Residential Rural	Residential Suburban	Residential Single-Family	Residential Multi-Family	Office & Professional	Commercial Retail	Commercial Service	Industrial	Public Facilities	Open Space
Electricity Generation, except WECF,* Inland Planning Areas	A2	A2	A2	—	—	—	—	—	—	—	A2	A2	A2	A2
Electricity Generation, WECF,* Inland Planning Areas	MUP	MUP	MUP	—	—	—	—	—	—	—	MUP	MUP	MUP	MUP
Electric Generating Plants, Coastal Zone	—	S-20	S-20	S-20	S-20	—	—	—	—	—	S-20	S-20-P	S-20-P	—

Source: County of San Luis Obispo, 2013a and 2013b.

*"Wind Energy Conservation Facilities" (WECF) means any device which converts wind energy to a form of usable energy. WECF producing electricity are included here; those used for direct climate control, water pumping or other conversion to mechanical or thermal power, are included under "Agricultural Accessory Structures." Transmission lines located off the site of the power plant are included under "Pipelines and Transmission Lines." Electrical substations are included under "Public Utility Facilities."
A2 = Allowable use, subject to the land use permit required by the specific use standards. Procedure is in Land Use Ordinance, Section 22.30.
MUP = Conditional use – Minor Use Permit required. Procedure is in Land Use Ordinance, Section 22.62.050.
S = Special use, allowable subject to special standards and/or processing requirements, unless otherwise limited by a specific planning area standard.
20 = Applicable Coastal Zone Land Use Ordinance is Section 23.08.300 (Electric Generating Plants).
P = Principally permitted use, a use to be encouraged and that has priority over non-principally permitted uses, but not over agriculture or coastal dependent uses.

Table 6.8-3 indicates area and community plans where, according to Title 22, Articles 9 and 10, electricity generation is not allowable in certain land use categories and areas in which that use would otherwise be allowable according to Table 6.8-2.

Table 6.8-3. Restrictions on Electricity Generation in Otherwise Allowable Use Areas

Sub-Area	Section	Reference	Goal, Policy, Program or Standard
North County Planning Area			
Heritage Ranch Village	Title 22, Article 10	22.104.030.C	Open Space (OS) land use designations: Does not allow electricity generation, which would otherwise be an allowable use (allows public utility facilities and pipelines and transmission lines)
Heritage Ranch Village	Title 22, Article 10	22.104.030.E	Residential Rural (RR) land use designations: Does not allow electricity generation, which would otherwise be an allowable use (also does not allow public utility facilities and pipelines and transmission lines)
Shandon sub-area, Highway 46 between Shandon and Cholame	Title 22, Article 9	22.94.090.C.1	Commercial Service (CS): Does not allow electricity generation, which would otherwise be an allowable use. (also does not allow Pipelines & Transmission Lines, Public Utility Facilities
Shandon sub-area, West Centre and Highway 46	Title 22, Article 9	22.94.090.C.2	Commercial Service (CS): Does not allow electricity generation, which would otherwise be an allowable use. (also does not allow Pipelines & Transmission Lines, Public Utility Facilities
Salinas River sub-area, industrial uses in Wellsona Road area	Title 22, Article 9	22.94.082.E	Industrial (IND): Does not allow electricity generation, which would otherwise be an allowable use. (also does not allow Pipelines & Transmission Lines, Public Utility Facilities)
Salinas River sub-area, Spanish Camp area and Almira Park area	Title 22, Article 9	22.94.082.G	Residential Rural (RR): Does not allow electricity generation, which would otherwise be an allowable use. (also does not allow Pipelines & Transmission Lines, Public Utility Facilities)
Salinas River sub-area, Wellsona Road area and other commercial service properties	Title 22, Article 9	22.94.082.C–E	Commercial Retail (CS): Does not allow electricity generation, which would otherwise be an allowable use. (also does not allow Pipelines & Transmission Lines, Public Utility Facilities)
Oak Shores Village	Title 22, Article 10	22.104.040.C	Open Space (OS) land use designations: Does not allow electricity generation, which would otherwise be an allowable use (also does not allow pipelines and transmission)
San Miguel Community	Title 22, Article 10	22.104.060.D	Industrial (IND) land use designations: does not allow electricity generation, which would otherwise be an allowable use. (also does not allow public utility facilities or pipelines and transmission lines)
San Miguel Community, N Street – Adjacent to RMF	Title 22, Article 10	22.104.060.C	Commercial Service (CS) land use designation: does not allow electricity generation, which would otherwise be an allowable use. (also does not allow public utility facilities or pipelines and transmission lines)
San Luis Obispo Planning Area			

Table 6.8-3. Restrictions on Electricity Generation in Otherwise Allowable Use Areas

Sub-Area	Section	Reference	Goal, Policy, Program or Standard
Edna and Buckley Roads	Title 22, Article 9	22.96.050.C	Industrial (IND): Does not allow electricity generation, which would otherwise be an allowable use. (also does not allow Pipelines & Transmission Lines, Public Utility Facilities)
Irish Hills	Title 22, Article 9	22.96.050.B.1	Rural Lands (RL): Does not allow electricity generation, which would otherwise be an allowable use. (also does not allow Pipelines & Transmission Lines, Public Utility Facilities)
O'Connor Way / West Foothill area	Title 22, Article 9	22.96.050.E.2	Residential Rural (RR): Does not allow electricity generation, which would otherwise be an allowable use. (also does not allow Pipelines & Transmission Lines, Public Utility Facilities)
San Luis urban area	Title 22, Article 9	22.96.060, Allowable Land Uses and Permit Requirements	San Luis Obispo Urban Area: Does not allow electricity generation, which would otherwise be an allowable use. (allows Pipelines & Transmission Lines but does not allow Public Utility Facilities)
West of Bear Valley Estates (Tract 502)	Title 22, Article 9	22.96.050.E.3	Residential Rural (RR): Does not allow electricity generation, which would otherwise be an allowable use. (also does not allow Pipelines & Transmission Lines, Public Utility Facilities)
South County Planning Area			
San Luis Bay (south) sub-area, Tiffany Rancho Road area and Northwest of Tiffany Ranch Road area	Title 22, Article 9	22.98.062.B	Residential Rural (RR): Does not allow electricity generation, which would otherwise be an allowable use. (also does not allow Pipelines & Transmission Lines, Public Utility Facilities)
South County sub-area, Nipomo Mesa and Santa Maria (Oso Flaco) Valleys	Title 22, Article 9	22.98.072.A.1	Agriculture (AG): Does not allow electricity generation, which would otherwise be an allowable use. (also does not allow Pipelines & Transmission Lines, Public Utility Facilities)
South County sub-area, North west corner of Willow and Via Concha	Title 22, Article 9	22.98.072.F	Public Facilities (PF) land use designations: does not allow for electricity generation, which would otherwise be an allowable use. (also does not allow pipelines and transmissions lines or public utility facilities).

In addition to land use zoning and General Plan designations, Figure 6.8-2 illustrates existing land uses within the County. Table 6.8-4 lists the approximate acreage of each of the existing uses shown in Figure 6.8-2.

Table 6.8-4. Existing Land Uses in San Luis Obispo County

Existing Land Use	Acreage
Residential	105,530 acres
Commercial	3,140 acres
Industrial – Light	2,355 acres
Industrial – Heavy	1,529 acres
Public Facilities/Institutional	43,516 acres
Agriculture	1,330,103 acres
Recreation/Open Space	615,923 acres
Road	2,306 acres
Total Acres	2,104,402 acres

Land Use Opportunities

Renewable energy development may be collocated with existing heavy industrial facilities, light industrial facilities (e.g., water treatment and pumping facilities), institutional uses (e.g., government buildings, schools, hospitals, etc.), low- to high-density commercial, and medium- to high-density residential land uses. Some land use designations, as shown in Table 6.8-2, currently allow for renewable energy development while others may provide future siting opportunities. Components of renewable energy technologies can be incorporated into building and development design, thereby reducing the potential to disrupt existing land uses or change the land use character of an area. As discussed above, Figure 6.8-1 shows designated land uses and Figure 6.8-2 shows existing land uses.

Residential. Although not an allowable use in Table 6.8-1, depending on the type of renewable energy generation technology, facilities such as solar PV could be sited with residential communities, especially if they are planned for in the initial design of medium- to high-density developments. In rural areas with low density residential development, small solar PV, rooftop solar, and ground-mounted solar or wind energy systems may be compatible with existing development depending on the size and design.

Constraints on renewable energy development in residential areas are discussed below.

Low- to High-Density Commercial. Although not an allowable use in Table 6.8-1, commercial facilities tend to have hardscape surfaces such as parking lots that could support solar PV. Commercial uses provide an opportunity for renewable energy siting, especially if incorporated into the initial planning and design of the commercial development.

Rural portions of the North County planning area also include areas that allow for more intensive development. An example is the Wellsona Area, which consists of 107 acres of land designated Commercial Service and Industrial.

Unless an economic development program is organized, the General Plan predicts that the southwestern part of the County within the South County planning area will be dependent upon the Five Cities area and Santa Maria for future growth incentives, commercial services, and employment opportunities. Development in the Five Cities area within the County would provide an opportunity for renewable energy siting.

Public Facilities and Institutional Uses. Development of renewable energy facilities with public and institutional uses (e.g., government buildings, schools, hospitals, etc.) would be a collocation opportunity, especially for solar PV projects. Like commercial uses, public facilities tend to have large hardscape surfaces.

Because the trade area of San Luis Obispo is region-wide, the General Plan predicts that continued economic development may lead to larger regional facilities locating in the San Luis Obispo planning area. The City of San Luis Obispo may accommodate most commercial and industrial facilities needing urban services or having large numbers of customers or employees. Other less intensive uses may locate within the designated urban reserve area adjacent and to the south of the city, depending on water availability and industrial support facilities such as the airport and an adequate road network. This area is referred to in the General Plan as the "airport area." Substantially increased industrial activity in the "airport area" appears to be dependent upon obtaining supplemental water. While care must be taken when siting renewable energy near airports (see the discussion under Land Use Conflicts below), if sited appropriately, renewable energy may be compatible with airport areas.

In the North County planning area, especially within the El Pomar–Estrella sub-area, construction of grape processing, equipment storage, and winery facilities accounts for a significant portion of local economic activity. In addition, the Salinas River sub-area has industrial and commercial expansion and the presence of major state government facilities (County of San Luis Obispo, 2013a). The Atascadero State Hospital is also located within the North County planning area. There are plans for construction of a dedicated government facility in the North County planning area, which would provide an opportunity for collocation of solar or other renewable generation technologies, depending on land availability.

Industrial. Both light industrial (e.g., water treatment and pumping facilities) and heavy industrial uses provide an opportunity for collocation of renewable energy facilities due to similar land uses and the potential for hardscape surfaces. For instance, electricity to pump water is expensive, so collocating with renewable generation to help with pumping needs is attractive to water treatment and pumping facili-

ties. The South County planning area contains Twitchell Dam, a flood control and water conservation facility in the Santa Maria Valley, and several extractive sites for sand, gravel, and rock. Oil exploration has been conducted around Huasna Valley. Collocation in areas adjacent to existing power generation is discussed below.

Brownfield sites including industrial facilities, developed lands, or other previously disturbed lands such as oil fields would be considered opportunities for development. For instance, remediation and redevelopment of Avila Point, which is still in the preliminary planning stage, may provide an opportunity for renewable energy siting. Environmental review, including preparation of an EIR, will address the Local Coastal Plan, Specific Plan, and zoning at a programmatic level, and the EIR could also include provisions for small-scale renewable energy development depending on renewable energy potential. Opportunities and constraints regarding the development of contaminated brownfield sites are discussed in Section 6.6, Hazards and Hazardous Materials.

Agriculture. Depending on the type of renewable energy technology, allowable use, and Williamson Act land preserve status, siting projects on agricultural land could result in a dual use of an already disturbed site and could be an opportunity for renewable energy development. Opportunities and constraints on agricultural lands are discussed in Section 6.2, Agriculture.

Airport Land Use Plan (ALUP) Areas. Figure 6.8-1 depicts the locations of airports and air fields throughout the County. Siting of renewable energy facilities within ALUP areas would co-locate compatible industrial land uses and existing infrastructure.

ALUPs are state-mandated plans intended to ensure that new development around an airport does not result in conflicts with the normal operation of the airport. The area plans for San Luis Obispo County are prepared to be consistent with the ALUP and do not allow urban densities of dwellings in clear zones, or under the runway take-off or approach zones, and disclosure of the airport operations is provided to property owners through recorded notices called “avigation” easements (County of San Luis Obispo, 2013). Constraints regarding certain technologies and Federal Aviation Administration (FAA) regulations are discussed below.

Areas Adjacent to Existing Power Generation. Given the availability of existing transmission and transportation infrastructure and similar industrial land uses, collocation of renewable energy facilities with existing power generation facilities or adjacent to existing substations is considered an opportunity for development. Figures 6.8-1 and 6.8-2 show existing power plants, pumping stations, metering stations, switching stations, substations, and transmission lines within the County.

Although the Carrizo planning area is almost entirely rural, open space, and agriculture, the 550 MW Topaz Solar Project (under construction) and the 250 MW California Valley Solar Ranch are both located in the Carrizo planning area near State Route 58. The solar projects are an existing industrial land use and both have associated substations where they interconnect into the regional electric grid at the PG&E Solar-Midway 230 kV transmission line. Water is supplied from groundwater wells in the area and is also trucked to the project sites. Much of the available area in the Carrizo Plain is used by the two large projects. However, if there is unused capacity available for interconnection to the Solar-Midway transmission line, there may be opportunities for smaller nearby projects that could take advantage of the existing infrastructure provided by these projects.

PG&E’s Diablo Canyon Nuclear Power Plant is located on 750 acres at Avila Beach and connects into the regional electric grid by the Path 15 500 kV transmission line. Although located at the coast, Diablo Canyon Nuclear Power Plant (EX) is a combining designation within the San Luis Obispo planning area. This designation includes the location of the power plant and the surrounding buffer area of the PG&E lease

site. Under this EX designation, the power plant operations should not be expanded beyond the present property nor should future development of adjacent lands encroach into this area so as to hinder the operating capabilities of the plant (County of San Luis Obispo, 2013). Collocation of a renewable energy facility within or adjacent to the current combining designation that would not hinder plant operations is considered a potential opportunity for development.

Land Use Constraints

Land use constraints associated with renewable energy development primarily arise due to conflicts with existing land uses and due to policy, regulatory, and zoning restrictions, as described below.

Existing Land Uses

Change to Land Use Character – Rural, Open Space, and Agriculture Uses. As mentioned above, much of the County consists of Agriculture (AG), Open Space (OS), and Rural Lands (RL). It is a priority of the County to preserve and protect natural resources within OS designations and the agricultural lands within the AG designations. According to the adopted Framework for Planning (Inland), the purpose of the AG designation is to recognize and protect land characterized by prime agricultural soils and agriculturally productive lands; the purpose the OS designation is to identify and retain natural and environmentally fragile areas; and the purpose of the RL designation is to encourage and maintain rural development at low densities to maximize the preservation of open space. Other rural uses in RL could be compatible, such as small-scale farming, but rural residences are the primary land use (County of San Luis Obispo, 2013a).

Development of utility-scale renewable energy facilities could change the character of areas dominated by AG, OS and RL designations to a more intense land use. However, small-scale solar and wind energy systems within AG and RL designations would not result in a change of the land use character. Section 6.2 (Agriculture) and Section 6.3 (Biological Resources) discuss renewable energy development on agricultural lands and open space easements, including the potential for careful development of renewable energy in appropriate areas.

Sensitive Receptors – Residential Uses. Renewable energy development that would occur near residences or other sensitive receptors, such as schools or hospitals, would be sensitive to impacts of renewable energy development based on the type of technology. Construction, operational visual impacts, and property value concerns could cause community opposition to a project. Table 6.8-2 also indicates that electric generating facilities currently are not an allowable use within Residential land use categories.

Zoning, Regulatory and Policy Constraints

Coastal Zone. Given potential visual impacts and the introduction of an industrial land use, the type of renewable energy development within the Local Coastal Plan Boundary (see Figure 6.8-2) may be limited by policy constraints of the Coastal Zone LUO (Title 23 of the San Luis Obispo County Code). Electric Generating Plants with a generating capacity of greater than 50 MW and related facilities cannot be sited within designated areas of the Coastal Zone which have been identified pursuant to Public Resources Code Section 30413. New development projects, including smaller scale renewable energy facilities, can be developed but they must be consistent with the Land Use Element and Local Coastal Plan, and would likely be subject to a Local Coastal Plan Amendment. According to Title 23, Section 23.10.033, no new use of land, buildings, division of land, or other development can be approved or established unless the proposed use or division is determined to be allowable in the land use category

where the proposed site is located, pursuant to provisions in the Coastal Zone LUO. Table 6.8-2 lists the land use categories that allow for development of electric generating plants, subject to special standards and/or processing requirements. Opportunities for renewable energy development may be available in certain areas such as disturbed areas or incorporated with new development within the Coastal Zone.

Federal Aviation Administration (FAA) Regulations. As discussed above, renewable energy facilities within ALUP areas would collocate with compatible industrial land uses and existing infrastructure. However, FAA regulations will limit use of certain renewable technologies in close proximity to airports due to the potential for safety hazards, such as glint/glare from solar panels and the height of wind turbines and electrical infrastructure.

6.9 Mineral Resources

Mineral resources provide both an opportunity and a constraint for renewable energy siting. While siting of renewable energy on active or potential future mine sites must be done carefully to avoid interference with active operations, renewable energy can coincide with mining operations or be a profitable reuse option for former sites.

The EPA is encouraging renewable energy development on current or former mine sites when such development would be aligned with the community's vision of the site. The EPA RE-Powering America's Land website provides tools for identifying potential renewable energy development on mining sites. The EPA also has an Abandoned Mine Lands Team that provides communities with technical support and resources to explore innovative reuse opportunities on former mine lands. As part of the RE-Powering project, the EPA identifies several examples of renewable energy projects on mines including:

- renewable energy projects on active mines where the project is sited on a portion of the tailings area;
- renewable energy projects developed on former mine sites with the goal of powering or partially powering the site cleanup and remediation activities; and
- renewable energy projects developed on former mine sites as a commercial venture (EPA, 2012).

The County Land Use and Circulation Elements of the General Plan Framework has a combined designation that identifies areas with characteristics that are of public value and where the careful review of any project is needed to protect those characteristics. The Energy or Extractive (EX) Combining Designation recognizes the importance of continuing availability of mineral and energy resources by avoiding land use decisions which may inhibit the continuing viability of energy and extractive operations and result in unnecessary or premature termination of use of such resources. EX applies to areas where oil, gas, or mineral extraction occurs, is proposed, or where petroleum or mineral resources are identified (see Figure 6.9-1). The purpose of the EX Combining Designation is also to protect energy production areas from encroaching urban development or other incompatible land uses that may hinder their continued operation. The Extractive Resource Area (EX1) Combining Designation is used to identify areas of the county which the California Department of Conservation's Division of Mines and Geology has classified as containing or being highly likely to contain significant mineral deposits. The purpose of this combining designation is to protect existing resource extraction operations from encroachment by incompatible land uses that could hinder resource extraction. It should be noted that many of the existing surface mines in the County are not located in areas with the EX or EX1 Combining Designation.

Within the County, there are multiple EX Combining Designations, the majority centered in the North County Area including the Klau Mine EX, Lime Mountain Mine EX, Sand and Gravel Quarries, Standard Oil Company Tank Farm EX, Navaho Creek EX1, and the Salinas River and La Panza Granitics EX1. The San Luis Obispo Area also includes the Diablo Canyon Nuclear Power Plant EX, and the South County Area includes the Price Canyon/Ormonde Road Oilfield EX and the Alamo Creek EX1.

Opportunities

As illustrated in Figure 6.9-1, many existing mines and energy extractive areas would potentially provide opportunities for development of renewable energy either in conjunction with the active running of the mine or as a potential part of remediation of the mine site. The majority of mining sites are located in the western and central parts of the County and would need careful technical review prior to development of renewable energy. As highlighted in Section 6.6, Hazards and Hazardous Materials, the EPA has an existing program to help direct renewable energy development to contaminated sites, including mines.

Constraints

While mines provide opportunities for the development of renewable energy, they also provide potential constraints. Through the combining designation, County policy specifically protects mineral resources, and prior to the use of such areas for renewable energy the developer would need to determine that its project would not hinder continued operation of existing or potential future mines.

6.10 Fiscal/Socioeconomic Factors

Socioeconomic Baseline

County Demographics

Table 6.10-1 identifies current and projected population growth within San Luis Obispo County as a whole. In 2010 the unincorporated portions of the County comprised 43.8% of the total population. It is assumed a similar ratio between incorporated and unincorporated population currently exists. Projected growth of the entire County is expected to be greatest between the years 2020 and 2030.

Table 6.10-1. Population Profile and Projections for San Luis Obispo County[1]

Area	2010 Population	2020 Projected	2030 Projected	2040 Projected
San Luis Obispo County	269,637	286,940	309,288	334,377
Arroyo Grande	17,078	18,407	19,591	20,928
Atascadero	26,986	28,003	30,109	32,486
Grover Beach	12,967	13,432	13,999	14,638
Morro Bay	10,073	10,244	10,778	11,381
Paso Robles	29,624	32,137	36,112	40,596
Pismo Beach	7,642	7,954	8,545	9,211
San Luis Obispo	43,937	45,969	47,622	49,487
Incorporated Total	148,307	156,145	166,755	178,727
Unincorporated Area	104,324	113,789	125,467	138,644

[1] "Mid" growth projections shown per San Luis Obispo County 2040 Population, Housing & Employment Forecast (Table 17)
Source: SLOCOG, 2011

Economy and Employment Trends

Table 6.10-2 summarizes civilian workforce occupations and industry types in San Luis Obispo County. The County's economy is primarily a business and service economy. Health services and educational facilities, agriculture, and tourism are also major industries within the County. The small size of the County's communities, scattered along the beaches, coastal hills, and mountains of the Santa Lucia range, provides a wide variety of coastal and inland hill ecologies to support many kinds of agriculture and tourist businesses.

Table 6.10-2. San Luis Obispo County Employment and Industry – 2012

Industry	Percent of Workers/Industry
Total Employed	127,708
Total Unemployed	8,812 (6.9%)
Occupation	
Management, business, science, and arts	46,230 (36.2%)
Service	25,286 (19.8%)
Sales and office occupations	33,076 (25.9%)
Natural resources, construction, and maintenance	12,643 (9.9%)
Production, transportation, and material moving	10,472 (8.2%)
Industry	
Agriculture, forestry, fishing, hunting, and mining	3.5%

Table 6.10-2. San Luis Obispo County Employment and Industry – 2012

Industry	Percent of Workers/Industry
Construction	6.1%
Manufacturing	6.7%
Wholesale trade	2.2%
Retail trade	13.1%
Transportation, warehousing, and utilities	5.8%
Information	1.9%
Finance, insurance, real estate, and rental and leasing	4.9%
Professional, scientific, management, administrative, and waste management services	11.6%
Educational, health, and social services	23.1%
Arts, entertainment, recreation, accommodation, and food services	11.6%
Other services (except public administration)	3.8%
Public administration	5.5%

Source: US Census, 2013

Table 6.10-3 summarizes the employment projections between 2010 and 2020 by industry type within the San Luis Obispo–Paso Robles (San Luis Obispo County) Metropolitan Statistical Area (MSA). Employment growth projections supply a good indicator for overall projected development of the County. As shown in Table 6.10-3, the areas of largest growth are expected to be in the Mining, Lodging, and Construction; Finance and Insurance; Professional and Business Services; Information; and Trade, Transportation, and Utilities industries. The areas of lowest growth are projected to be in the Federal and State Government, Manufacturing, and Farm industries.

Table 6.10-3. Industry Employment Projections for 2010-2020, San Luis Obispo–Paso Robles MSA, San Luis Obispo County

	Annual Average Employment		Employment Change	
Industry Title	2010	2020	Numerical	Percent
Self-Employment	10,100	11,200	1,100	10.9
Private Household Workers	1,000	1,200	200	20.0
Total Farm	4,700	5,000	300	6.4
Mining, Lodging, and Construction	4,900	7,100	2,200	44.9
Manufacturing	5,800	6,200	400	6.9
Trade, Transportation, and Utilities	19,100	23,700	4,600	24.1
Information	1,200	1,500	300	25.0
Finance and Insurance	6,200	7,300	1,100	35.3
Professional and Business Services	9,800	12,400	2,600	26.5
Educational Services, Health Care, and Social Assistance	11,500	13,200	1,700	14.8
Leisure and Hospitality	14,800	17,700	2,900	19.6
Other Services	4,600	5,200	600	13.0
Total Non-Government Employment	112,500	132,000	19,500	17.3
Federal Government	700	700	0	0.0
State Government	9,600	10,300	700	7.3
Local Government	10,600	11,800	1,200	11.3
Total Government Employment	20,900	22,800	1,900	9.1

Source: EDD, 2013

San Luis Obispo County Revenues

Table 6.10-4 identifies the financing sources for San Luis Obispo County, as proposed for the fiscal year (FY) 2012-2013. As shown, intergovernmental revenues and taxation are the largest County funding source, while licenses and permits accounts for only 2% of the County's annual revenue.

Table 6.10-4. Government Revenue for San Luis Obispo County Proposed Budget FY 2012-2013

Revenue	Amount	Percent
State and Federal Aid	$206,536,000	44
Taxes	150,208,000	32
Other Financing Sources	46,940,000	10
Charges for Services	28,164,000	6
Balances Carried Forward From Prior Year	23,470,000	5
Licenses and Permits	9,388,000	2
Fines and Forfeitures	4,694,000	1
Total Revenue	$469,400,000	100.00

Source: SLO County, 2013

Potential Opportunities

The RESP is ultimately intended to directly and indirectly result in socioeconomic and fiscal opportunities related to future renewable energy project development by minimizing current County policy restrictions. For the purposes of this OCTS, the following discussion focuses on the opportunities and constraints created by existing policies to help guide ways the RESP can help maximize socioeconomic and fiscal opportunities and decrease existing policy constraints.

Fiscal Opportunities

Fiscal opportunities for future renewable development within the County are limited to incentives and programs designed to offset construction and operating costs of renewable energy installations. These incentives are applicable to both residential and utility scale developers, with the incentive or program typically targeting these scales differently. Section 2.2, County Regulatory and Policy Framework, identifies the applicable existing policies and land use designations including General Plan, Land Use Ordinance, and similar codes that incentivize, promote, allow, and/or limit renewable energy development within San Luis Obispo County. The County General Plan Economic Element includes policies that would support the streamlining of renewable energy development:

- **Policy EE 2.2** – Consider strategies to enable agriculture to remain economically viable such as continuing to allow non-agricultural activities and uses in rural areas where supportive of agricultural uses, avoiding land use conflicts and consistent with the General Plan.

  Where an agricultural use does not by itself generate adequate income to support the landowner, supplemental small business activities that occupy a small portion of the site may help preserve a farm or ranch. Existing County plans, policies, and ordinances allow such supplemental business activities, but limit their type and scale so that they do not diminish the site's agricultural potential or result in considerable land use conflicts with nearby agricultural activities.

- **Policy EE 4.6** – Continue working toward improved predictability and competitiveness by simplifying and streamlining land use procedures and considering provision of incentives for development to locate where encouraged by general plan policies.

The County's Strategic Growth Principles include policies and implementing strategies that would support the streamlining of renewable energy development:

- **Principle 9: Make development decisions predictable, fair and cost-effective.**

  Policies

  - 1. Minimize administrative delays and costs to fee payers in the administration of the Land Use Element.
  - 2. Expedite development review procedures and provide incentives, such as reduced fees for facilities and other project-related costs, for projects that implement these principles.
  - 3. Encourage public participation in planning and development review, and consider the needs of all affected persons.
  - 4. Use easy-to-understand language and media to convey proposals and ideas clearly.

  Implementing Strategies

  - 1. Simplify and illustrate zoning and design standards within the Land Use Ordinance or similar document in order to make them clear and understandable, for example, through use of a "formbased" code.
  - 2. Identify suitable locations for strategic growth projects that are consistent with these principles to be eligible for expedited review.
  - 3. Convene a task force of staff and stakeholders to streamline the permit process to implement strategic growth policies.
  - 4. Explore whether the use of master environmental impact reports (EIRs) for community plan updates would benefit communities and developers. The Master EIR concept should include addressing impacts at a project level, including on- and off-site mitigation measures, for any strategic growth or expansion site.

In addition, the following EnergyWise Plan reduction measures and their associated supporting actions are intended to facilitate renewable energy development in the County:

- Renewable Energy 9 (Countywide Energy Collaborative), Build a collaborative network or organizational structure to work with the seven cities, other local and state agencies, investor-owned utilities, the California Energy Commission, and the CPUC to promote a wide range of energy efficiency and renewable programs. Applicable Supporting Actions:
  - Evaluate a local "feed in tariff" for renewable energy DG
  - Evaluate the development of a Community Choice Aggregation program with the incorporated cities in San Luis Obispo County to procure up to 50% of the region's electricity use from renewable resources by 2020.
- Renewable Energy 12 (Renewable Energy Partnerships), Collaborate with local and State governmental agencies and energy facility operators to develop renewable energy sources at existing facilities. Applicable Supporting Action:

- Seek funding and low-interest loan opportunities for local and state agencies to purchase and install renewable energy systems, with a goal of achieving 10% of total local and State agency energy use from on-site renewable energy installations by 2020.

Socioeconomic Opportunities

Renewable energy opportunities within San Luis Obispo County relate to future population and industry growth. These socioeconomic factors influence overall demand for electricity, which directly relates to future renewable energy project development with the County. Based on the information provided in Tables 6.10-1 through 6.10-3, continued population and economic growth projected for the County would result in continued electricity demand.

As shown in Table 6.10-1, low steady growth is forecasted for the County. This continued population growth indicates that demand will continue to rise. As shown in Tables 6.10-2 and 6.10-3, the County has significant opportunity for development of institutional renewable installations. As shown, the County contains and has good projected growth in educational, government, and hotel facilities. These types of facilities are often excellent for siting distributed generation. Additionally, as shown in Table 6.10-3, the County shows strong growth expectations in mining. This growth is critical as these facilities are likely inland, of large scale, and offer expanses of disturbed or previously disturbed land. However, renewable development at mining locations would be limited to exhausted pits and adjacent areas not slated for mining. Overall population and business growth within San Luis Obispo County would also have a great influence on overall electrical demand, which influences opportunities within the County to develop larger scale renewable facilities. A discussion of energy demand within the County is provided in Section 5.1, Energy Demand.

Potential Constraints

Fiscal constraints are primarily related to San Luis Obispo County's ability to provide direct funding assistance and other direct financial incentives to renewable developers. Furthermore, tax based incentives could result in the loss of revenue, but would depend on how direct and indirect spending in the County would offset such a loss. As shown in Table 6.10-4, while licenses and permits account for only 2% of the County's annual revenue, federal and State aid supply the County with the majority of revenue. Should the County seek federal or State aid to fund renewable energy project loans or other financial offset programs, this would further increase the County's reliance on federal and State aid as a budget tool. Furthermore, Table 6.10-4 shows that 32% of the County's annual revenue comes from taxation. While property tax only accounts for a portion of tax revenue, County-level programs and incentives reducing or exempting property taxation to renewable energy developments could decrease this revenue stream. This assumes that renewable energy installations, from residential rooftop solar to utility scale, increase the property value and would generate additional property tax revenue to the County.

One primary socioeconomic constraint for renewable energy development in San Luis Obispo County is that a significant portion of the projected population and industry growth is assumed to occur within incorporated areas near the coastline. This geography is problematic for rooftop and other small-scale solar development within these more densely populated urban areas. However, the extent of this constraint is unknown. As shown in Table 6.10-1, the unincorporated portions of the County comprised 38.7% of the total population in 2010. This is compared to 39.7% projected in 2020, 40.6% in 2030, and 41.5% in 2040 (extrapolated from data shown in Table 6.10-1). These projections do indicate, however, that slow but steady uniform population growth within areas under County jurisdiction is expected to occur.

7. Next Steps

As described in Section 3.2, a number of REDAs are available to streamline development throughout the County. REDAs would also be used to develop the description of the proposed project and alternatives for the County's RESP that would be analyzed in the Program EIR. Some of the REDAs would be available for development with streamlined review for small scale projects. Other REDAs would require some additional CEQA review, and may require cultural or biological surveys and potential mitigation and/or permit requirements, especially for larger projects. However, the REDAs would also help developers know what requirements to expect at the site and anticipate the costs of the development. Types of mitigation and performance standards would be discussed in the Program EIR.

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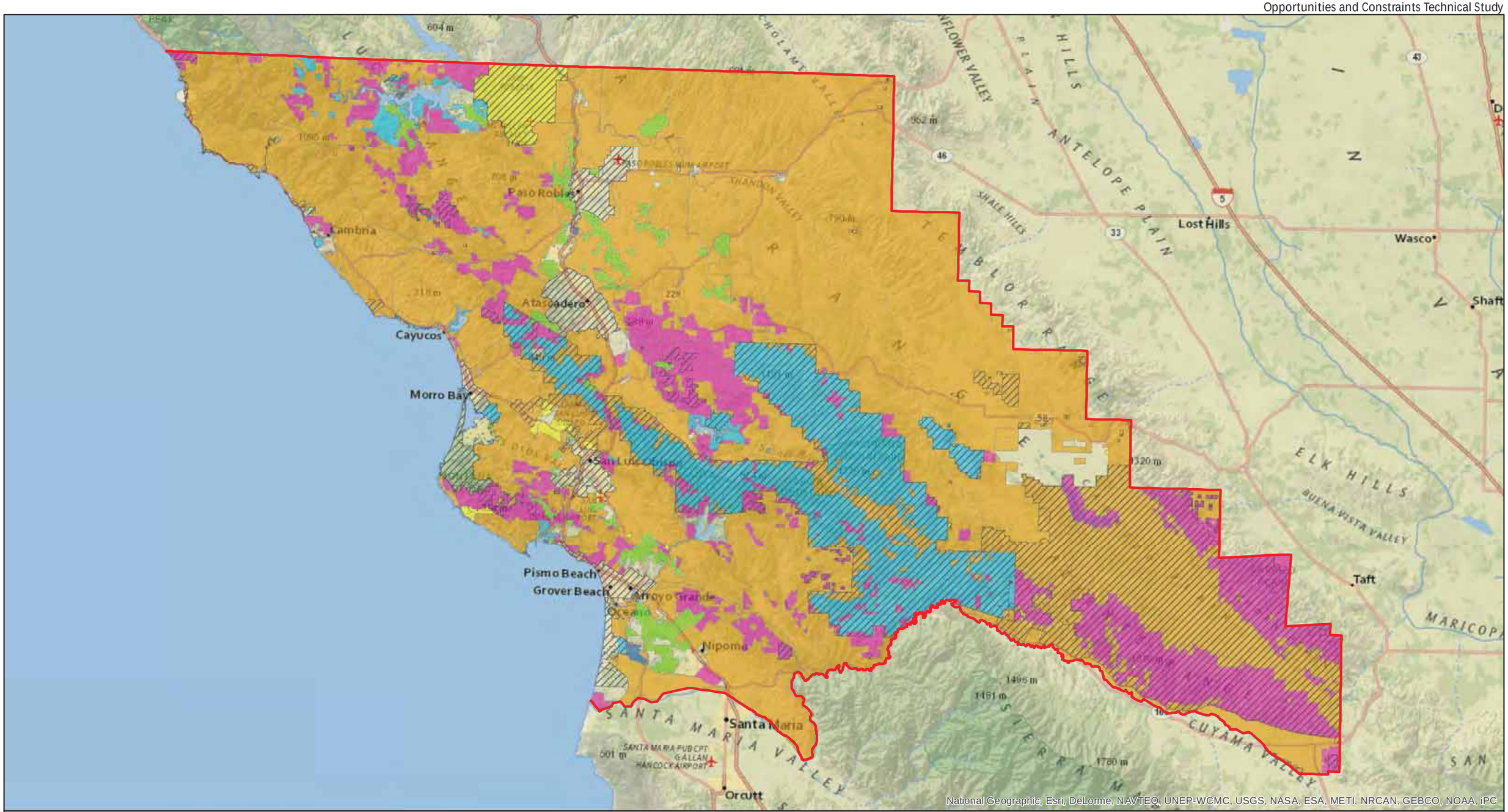


Aspen Environmental Group

0 7.5 15 Miles

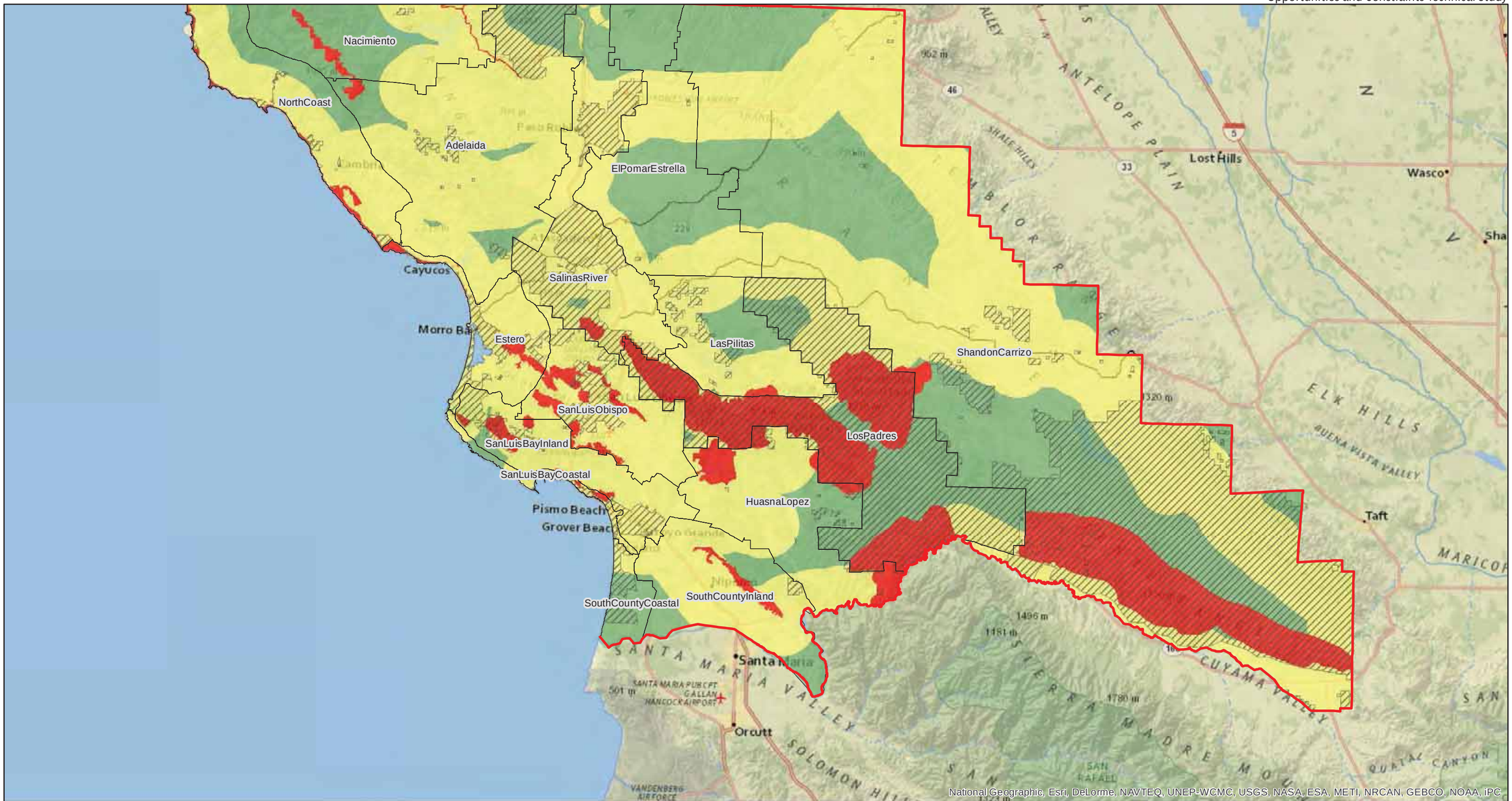
Source: San Luis Obispo County, 2013

Land Use Class

- AG
- CS
- IND
- OS
- PF
- RL
- RR
- Areas not under County Jurisdiction
- San Luis Obispo County Line

Figure 2.2-1

San Luis Obispo County
Land Use Designations



Aspen Environmental Group

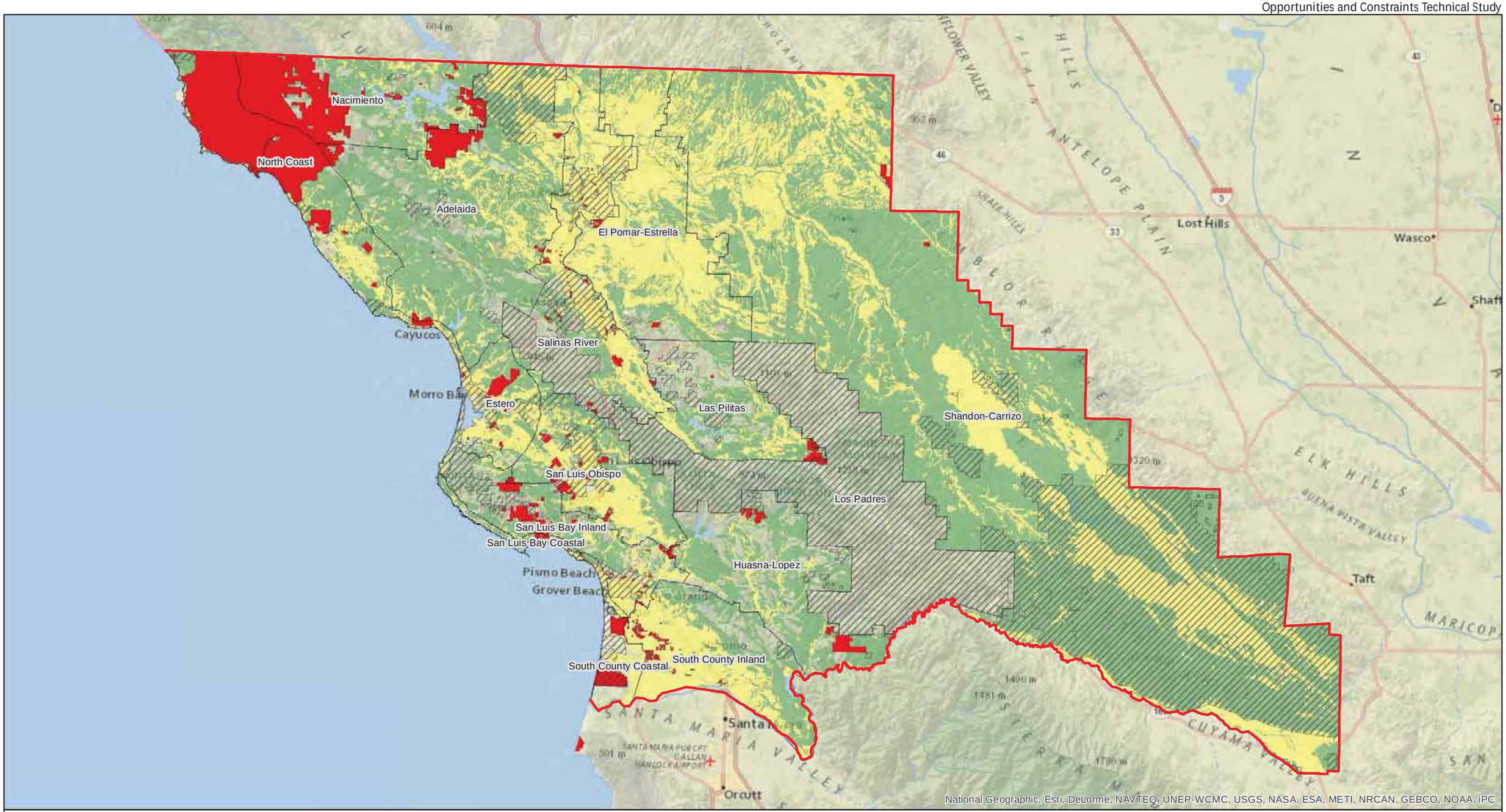
0 7.5 15 Miles

Source: CalTrans, 2013; San Luis Obispo County 2013; Aspen 2013

- Unlikely to Streamline Renewable Energy
- Potentially Able to Streamline Renewable Energy
- Most Likely Able to Streamline Renewable Energy
- San Luis Obispo County Line
- Areas not under County Jurisdiction
- Planning Area

Figure 3.1-1

Overview of Aesthetic Resources



Aspen Environmental Group

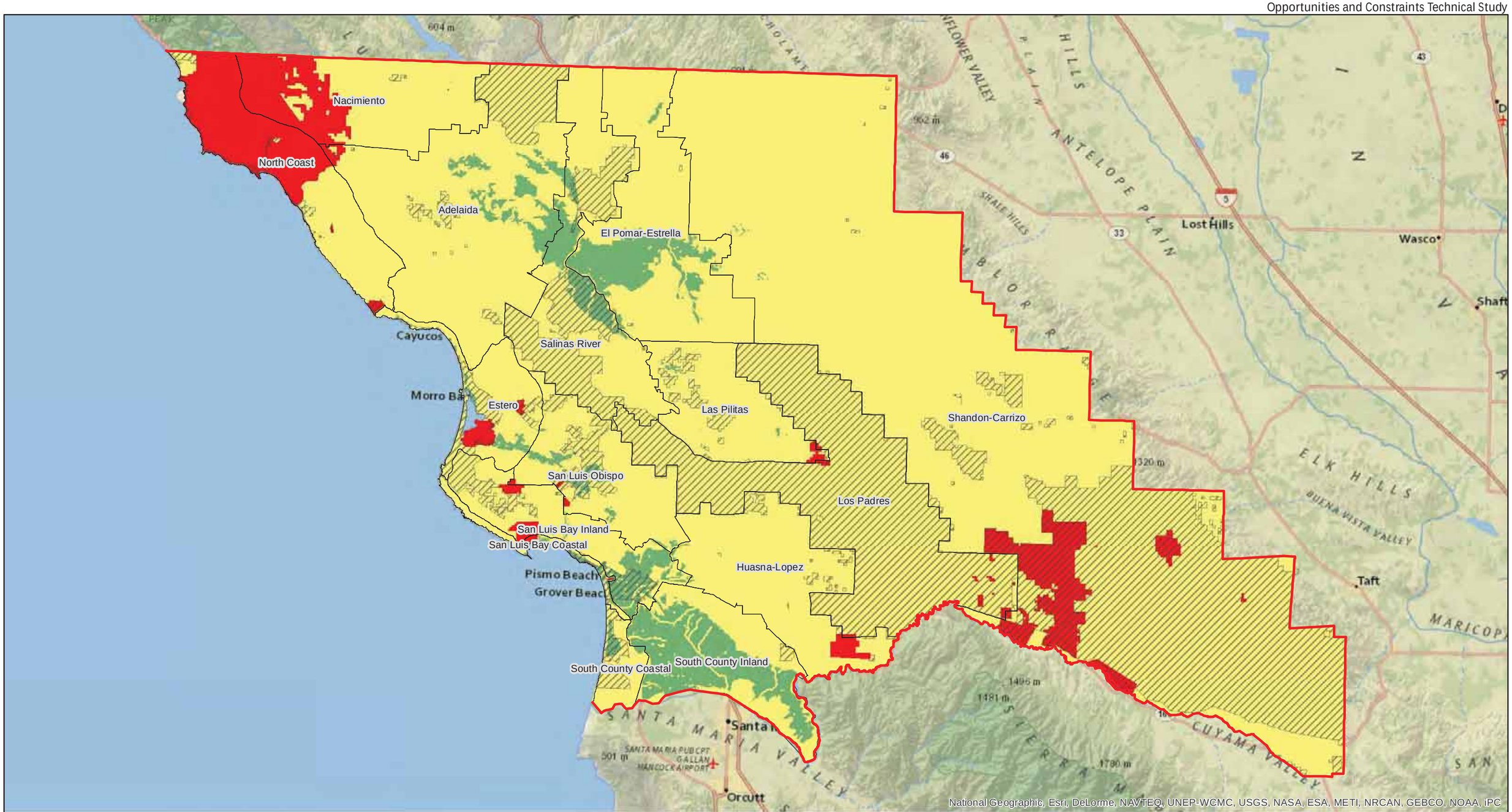
0 7.5 15 Miles

Source: DWR, 2013; Aspen, 2013; San Luis Obispo County, 2013

Unlikely Able to Streamline Renewable Energy
Potentially Able to Streamline Renewable Energy
Most Likely Able to Streamline Renewable Energy
Planning Area
Areas not under County Jurisdiction
San Luis Obispo County Line

Figure 3.1-2

Overview of Agricultural Resources



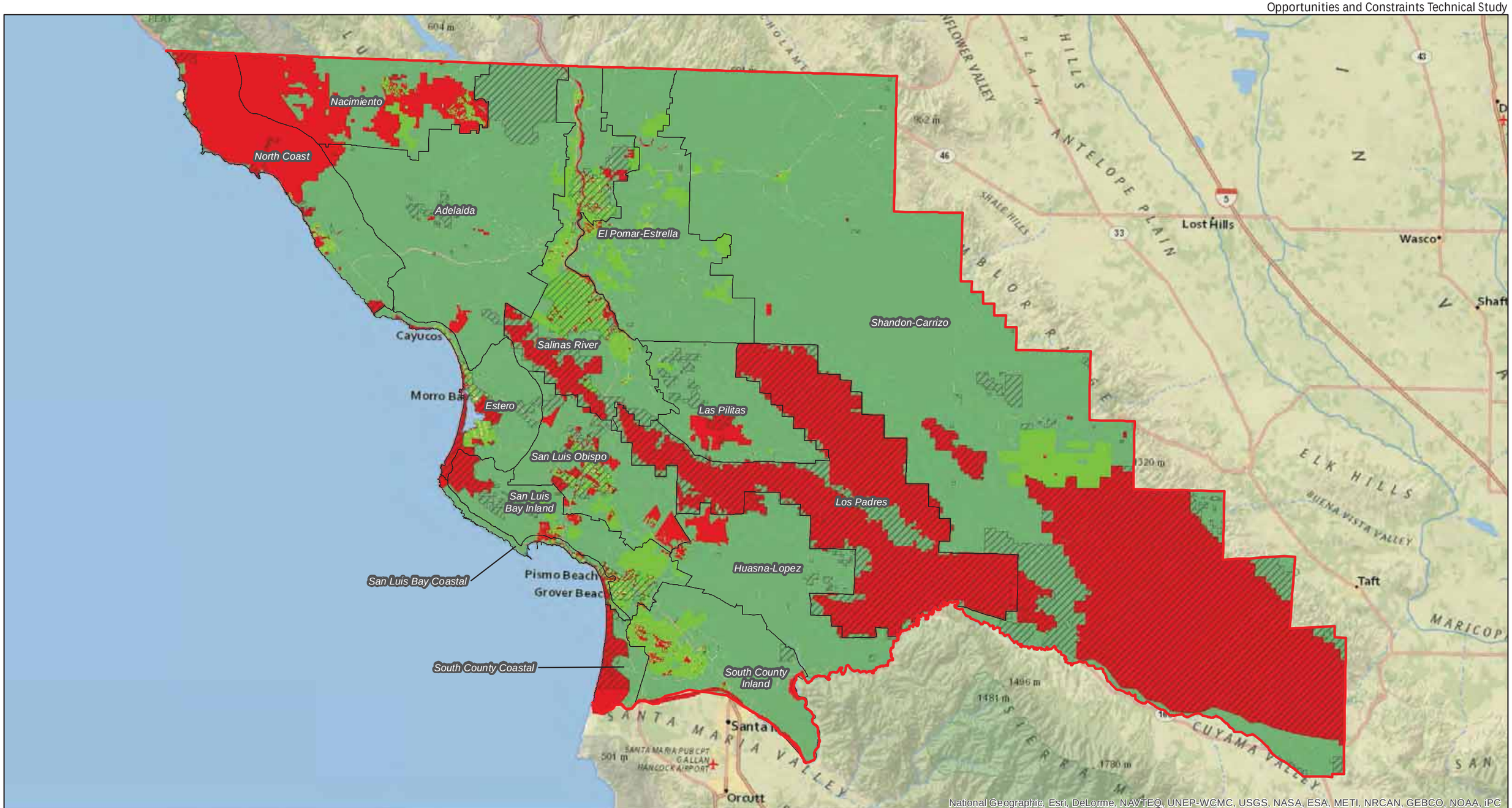
Aspen Environmental Group

0 7.5 15 Miles

Unlikely Able to Streamline Renewable Energy
Potentially Able to Streamline Renewable Energy
Most Likely Able to Streamline Renewable Energy
Planning Area
Areas not under County Jurisdiction
San Luis Obispo County Line

Figure 3.1-3

Overview of Biological Resources



Aspen Environmental Group

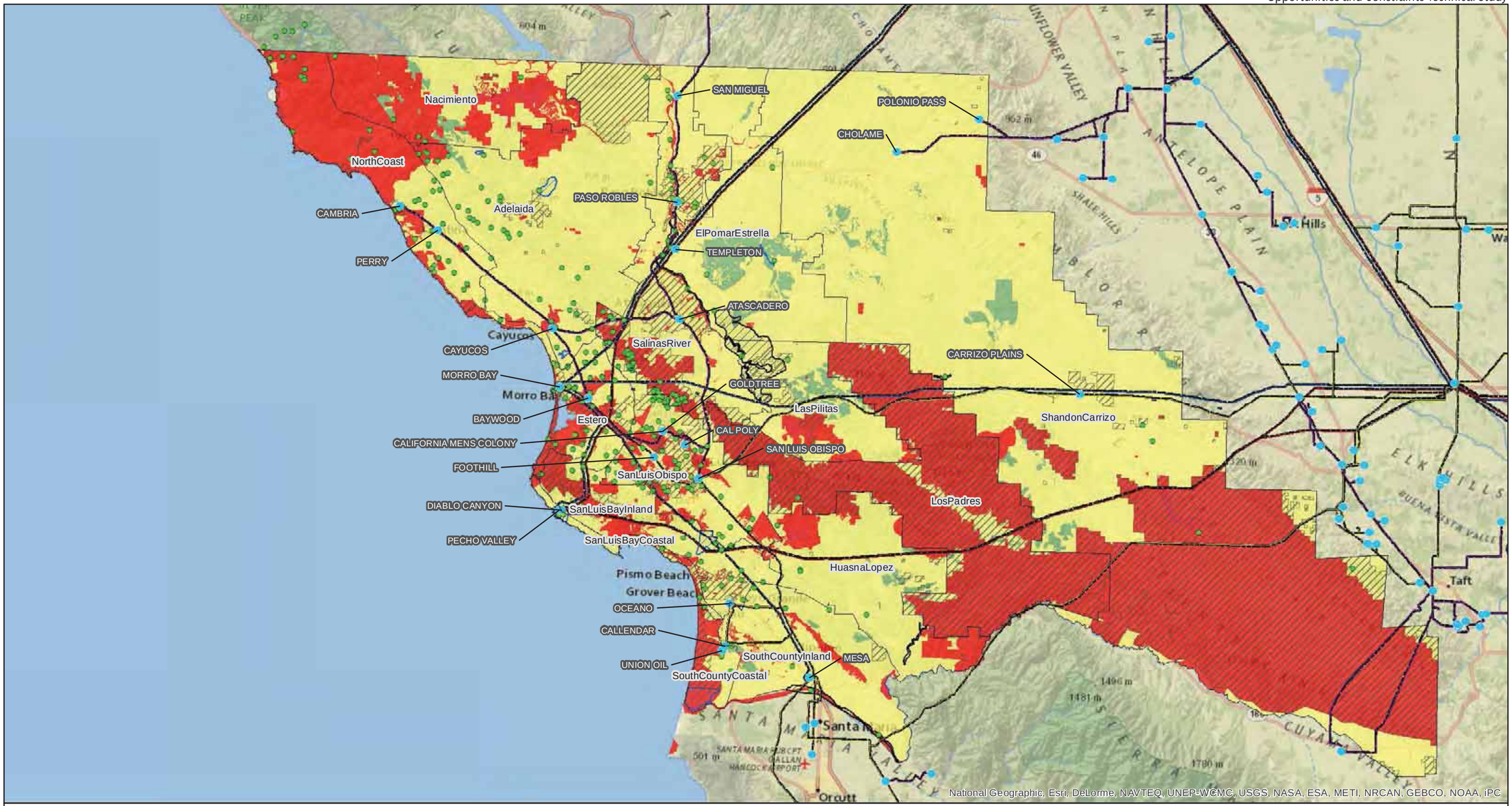
0 7.5 15 Miles

- Unlikely Able to Streamline Renewable Energy
- Most Likely Able to Streamline Renewable Energy
- Able to Streamline Renewable Energy at Smaller Scale
- Planning Area
- Areas not under County Jurisdiction
- San Luis Obispo County Line

Source: CEC, 2013; Platts, 2013; EPA, 2013; San Luis Obispo County, 2013; SLO COG, 2013

Figure 3.1-4

Overview of Land Use



Aspen Environmental Group

0 7.5 15 Miles

Transmission Line, Voltage (CEC, 2013)

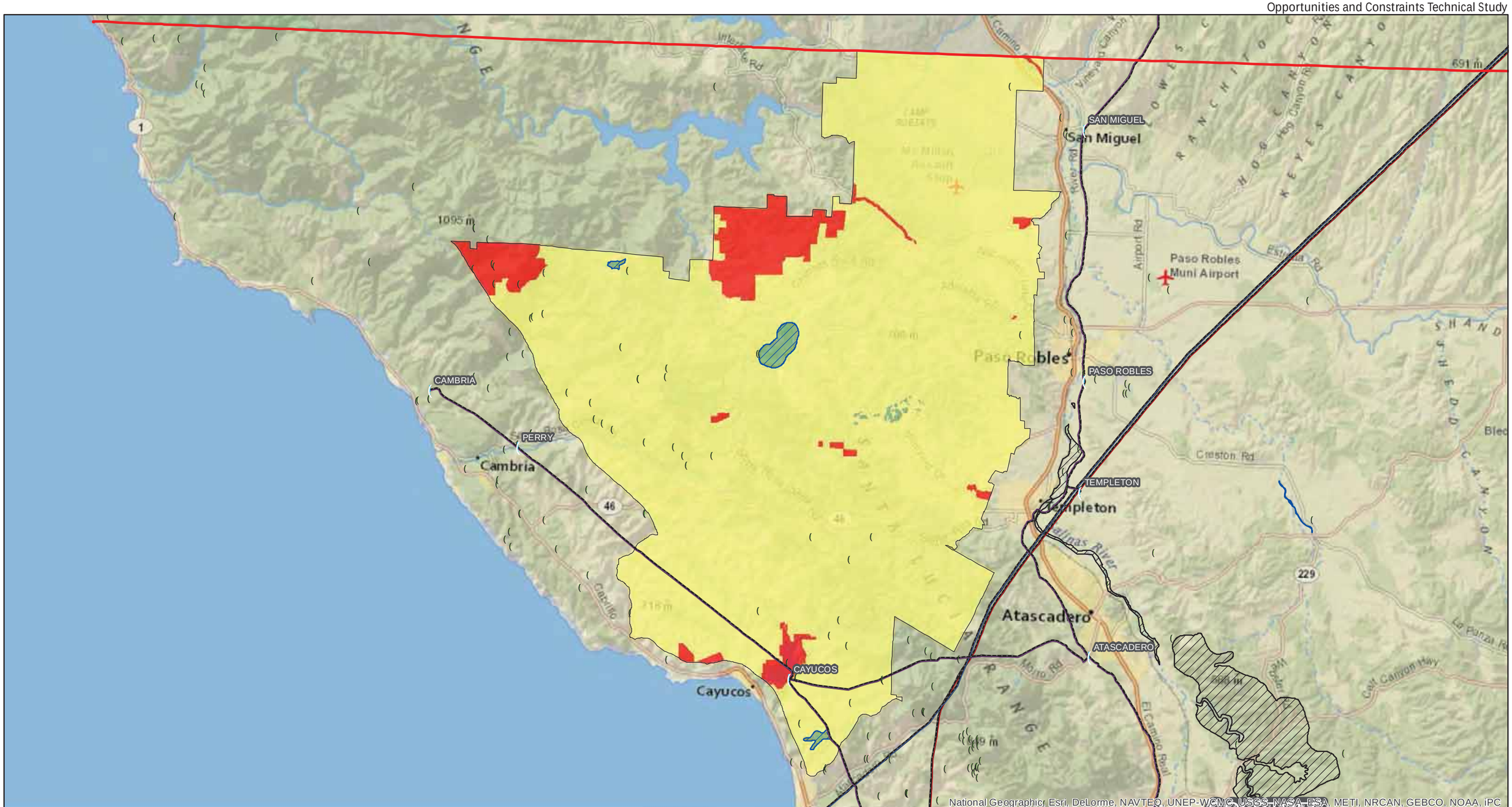
- 500 kV
- 230 kV
- 115 kV
- 70 kV

- Unlikely Able to Streamline Renewable Energy
- Potentially Able to Streamline Renewable Energy
- Most Likely Able to Streamline Renewable Energy

- Mines and Other Disturbed Sites
- Substation
- Planning Area
- Areas not under County Jurisdiction
- Energy Extractive Area *
- Energy Extractive Resource Area **

Figure 3.1-5

Renewable Energy Development Areas - County Wide



Aspen Environmental Group

0 3 6 Miles

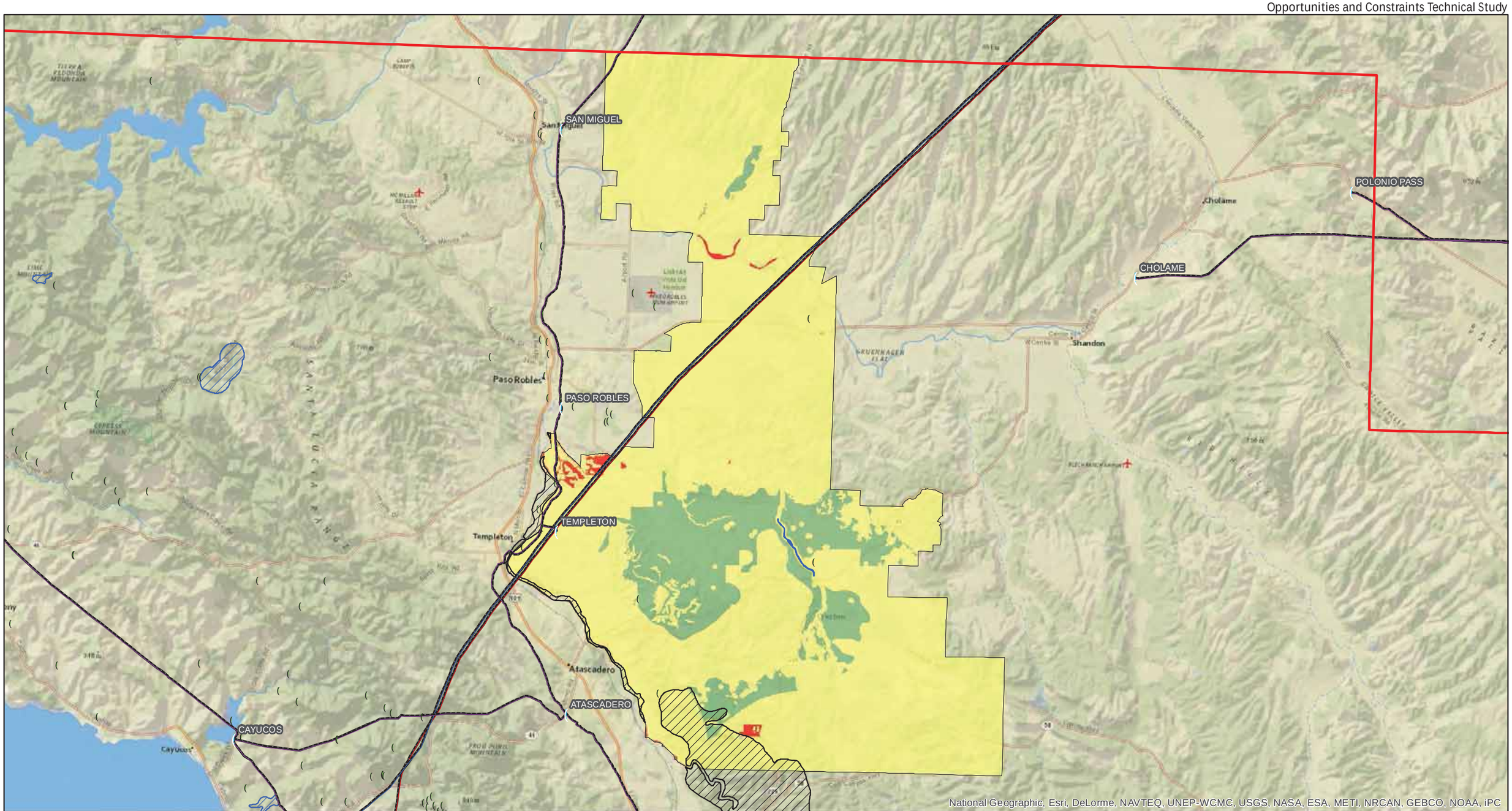
Transmission Line, Voltage (CEC, 2013)

- 500 kV
- 230 kV
- 115 kV
- 70 kV

- Unlikely Able to Streamline Renewable Energy
- Potentially Able to Streamline Renewable Energy
- Most Likely Able to Streamline Renewable Energy
- Mines and Other Disturbed Sites
- Substation
- San Luis Obispo County Line
- Planning Area
- Energy Extractive Area *
- Energy Extractive Resource Area **

Figure 3.1-6a

Renewable Energy Development Areas - Adelaida Planning Area



Aspen Environmental Group

0 2.5 5 Miles

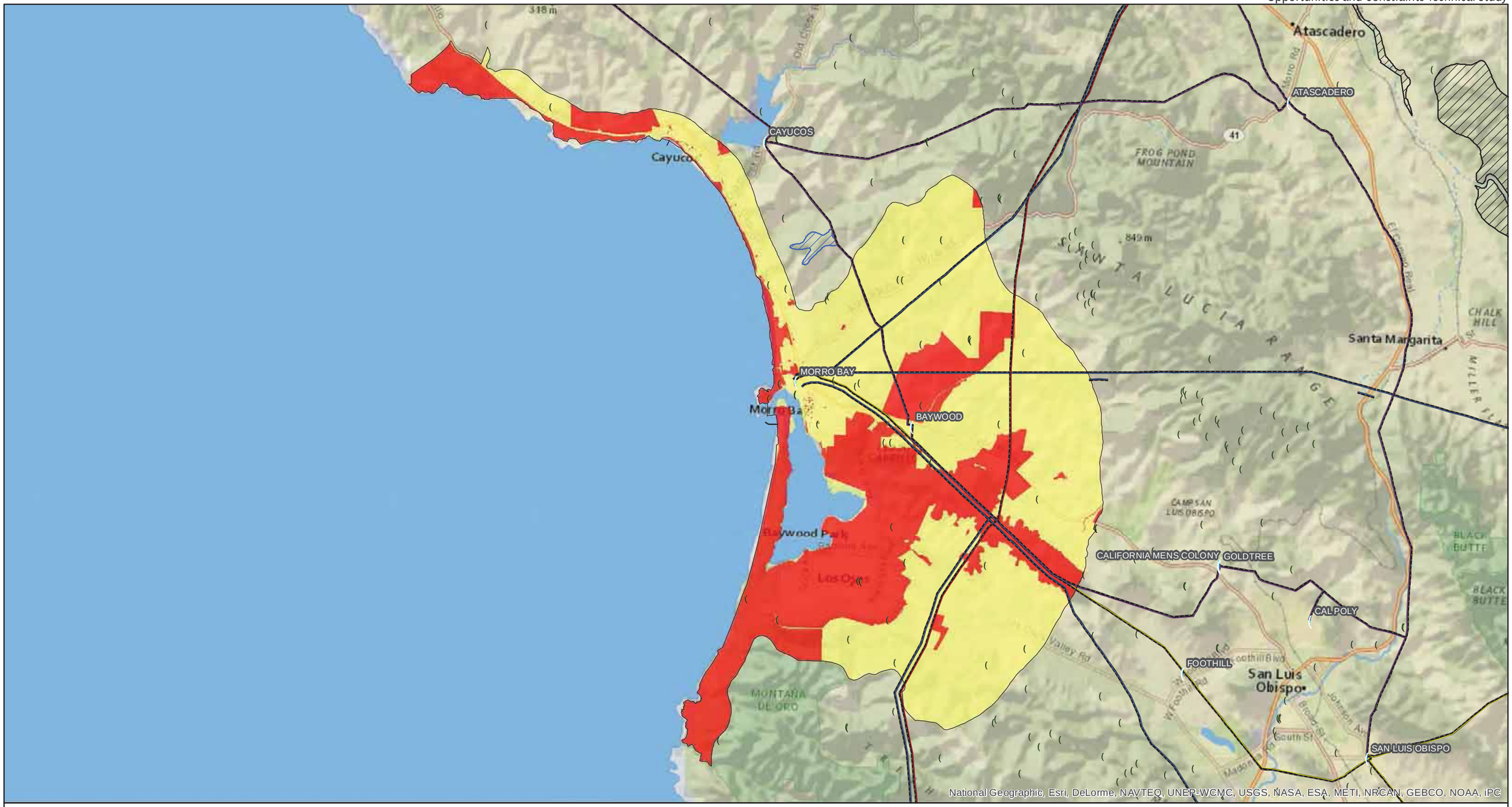
Transmission Line, Voltage (CEC, 2013)

- 500 kV
- 230 kV
- 115 kV
- 70 kV

- Unlikely Able to Streamline Renewable Energy
- Potentially Able to Streamline Renewable Energy
- Most Likely Able to Streamline Renewable Energy
- Mines and Other Disturbed Sites
- Substation
- San Luis Obispo County Line
- Planning Area
- Energy Extractive Area *
- Energy Extractive Resource Area **

Figure 3.1-6b

Renewable Energy Development Areas - El Pomar/Estrella Planning Area



Aspen Environmental Group

0 1.5 3 Miles

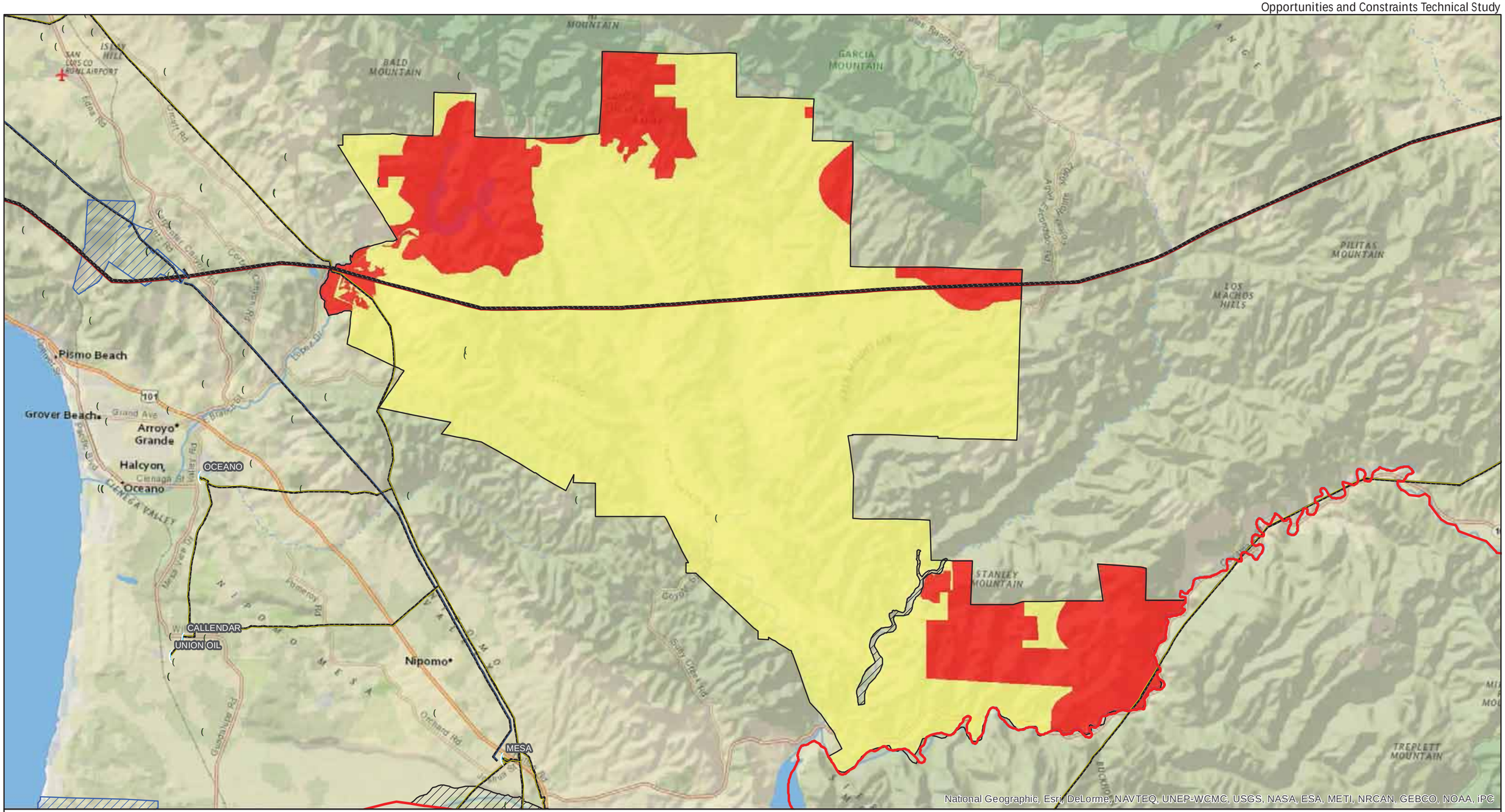
Transmission Line, Voltage (CEC, 2013)

- 500 kV
- 230 kV
- 115 kV
- 70 kV

- Unlikely Able to Streamline Renewable Energy
- Potentially Able to Streamline Renewable Energy
- Most Likely Able to Streamline Renewable Energy
- Mines and Other Disturbed Sites
- Substation
- San Luis Obispo County Line
- Planning Area
- Energy Extractive Area *
- Energy Extractive Resource Area **

Figure 3.1-6c

Renewable Energy Development Areas - Estero Planning Area



Aspen Environmental Group

0 2 4 Miles

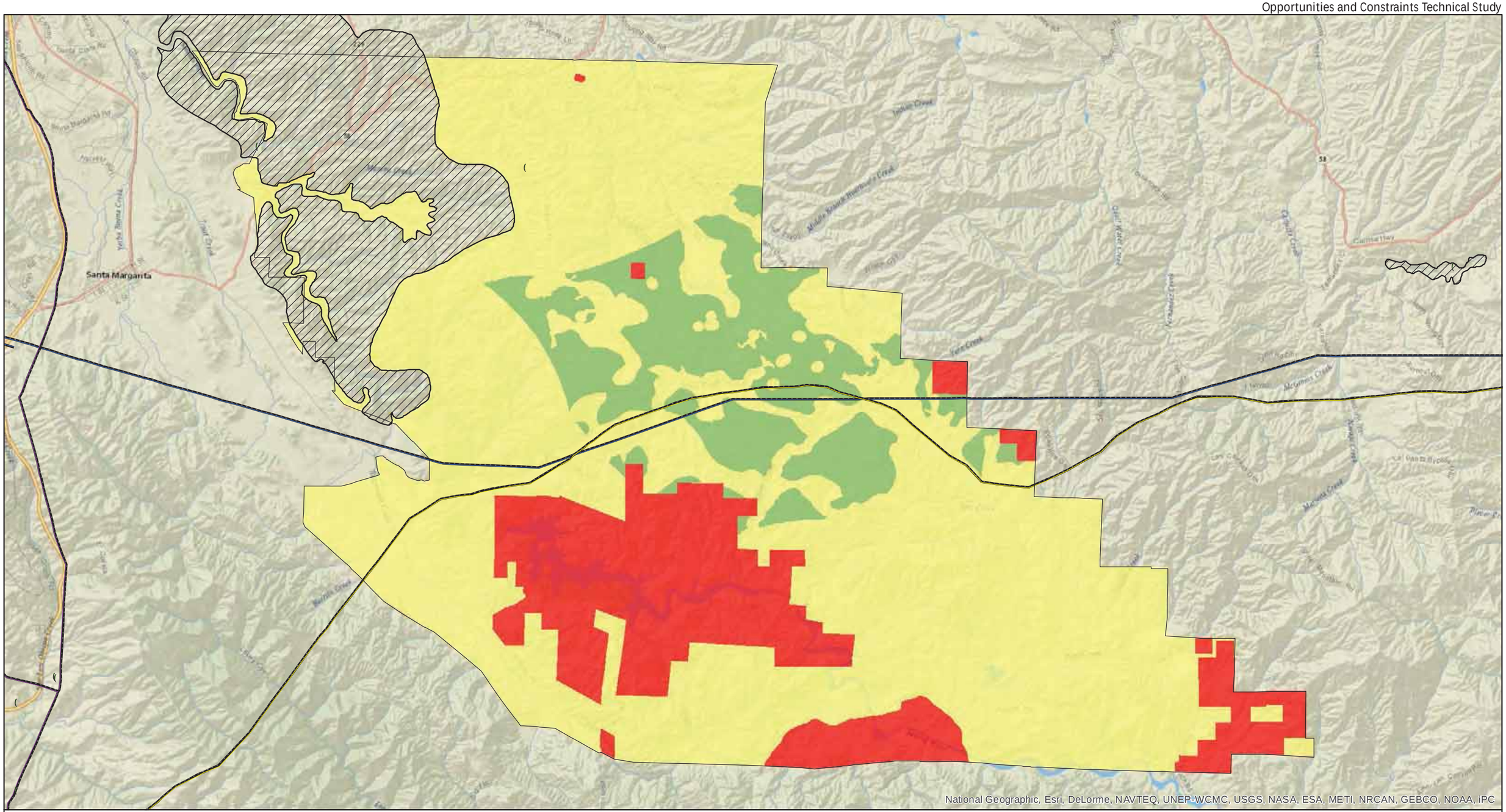
Transmission Line, Voltage (CEC, 2013)

- 500 kV
- 230 kV
- 115 kV
- 70 kV

- Unlikely Able to Streamline Renewable Energy
- Potentially Able to Streamline Renewable Energy
- Most Likely Able to Streamline Renewable Energy
- Mines and Other Disturbed Sites
- Substation
- San Luis Obispo County Line
- Huasna-Lopez Planning Area
- Energy Extractive Area *
- Energy Extractive Resource Area **

Figure 3.1-6d

Renewable Energy Development Areas - Huasna-Lopez Planning Area



Aspen Environmental Group

0 1 2 Miles

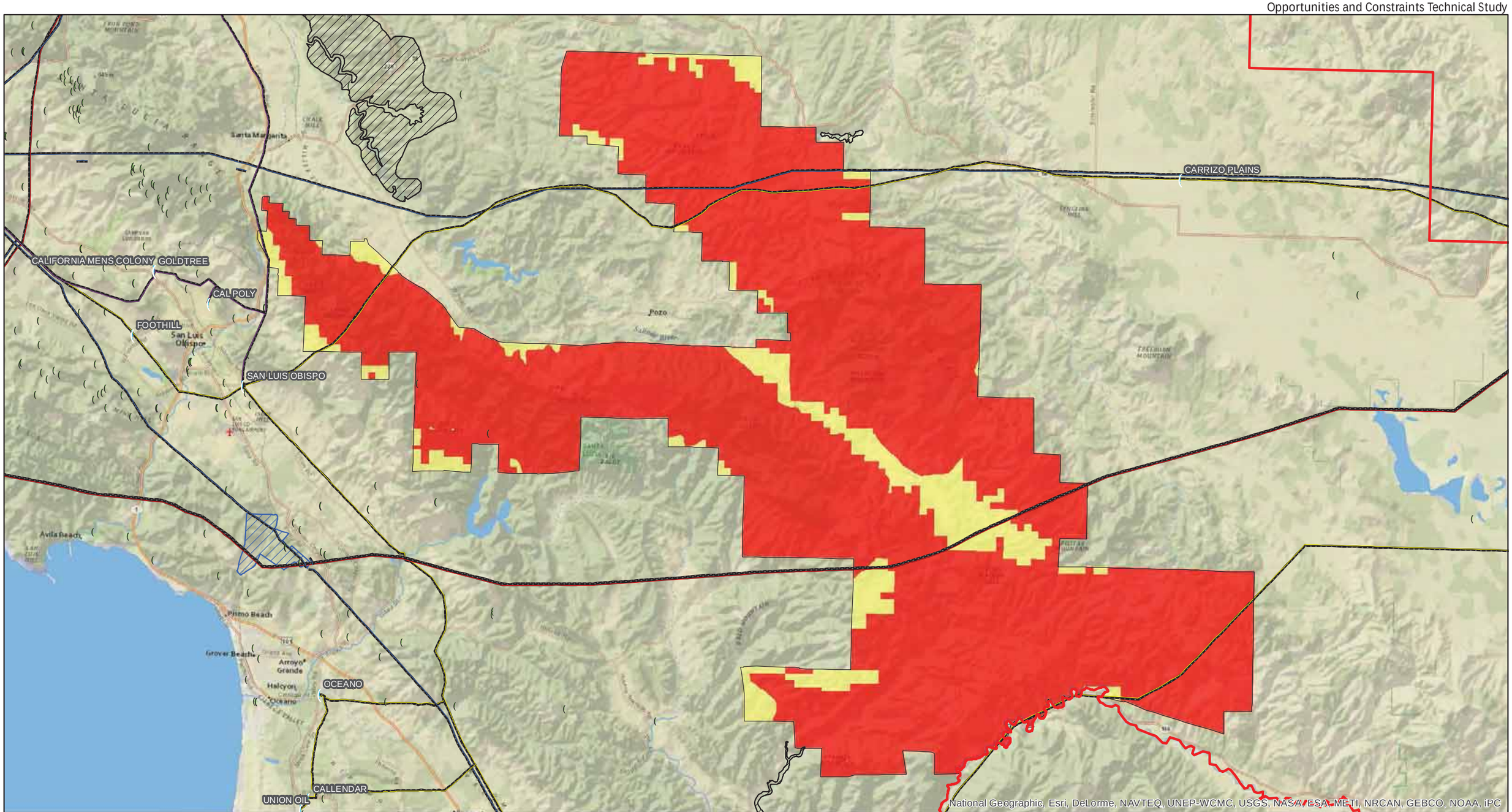
Transmission Line, Voltage (CEC, 2013)

- 500 kV
- 230 kV
- 115 kV
- 70 kV

- Unlikely Able to Streamline Renewable Energy
- Potentially Able to Streamline Renewable Energy
- Most Likely Able to Streamline Renewable Energy
- Mines and Other Disturbed Sites
- Substation
- San Luis Obispo County Line
- Planning Area
- Energy Extractive Area *
- Energy Extractive Resource Area **

Figure 3.1-6e

Renewable Energy Development Areas - Las Pilitas Planning Area



Aspen Environmental Group

0 3 6 Miles

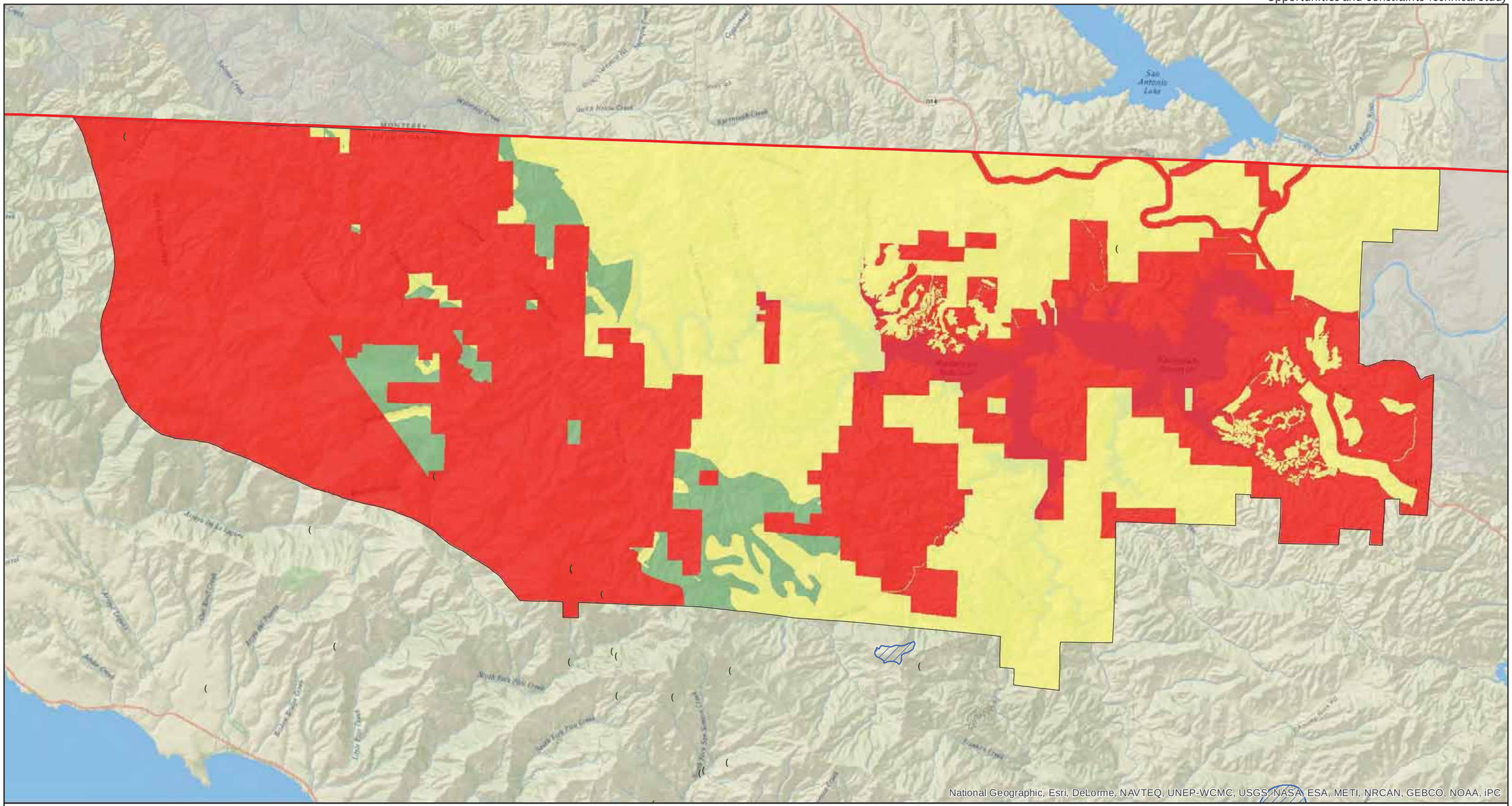
Transmission Line, Voltage (CEC, 2013)

- 500 kV
- 230 kV
- 115 kV
- 70 kV

- Unlikely Able to Streamline Renewable Energy
- Potentially Able to Streamline Renewable Energy
- Most Likely Able to Streamline Renewable Energy
- Mines and Other Disturbed Sites
- Substation
- San Luis Obispo County Line
- Planning Area
- Energy Extractive Area *
- Energy Extractive Resource Area **

Figure 3.1-6f

Renewable Energy Development Areas - Los Padres Planning Area



Aspen Environmental Group

0 1 2 Miles

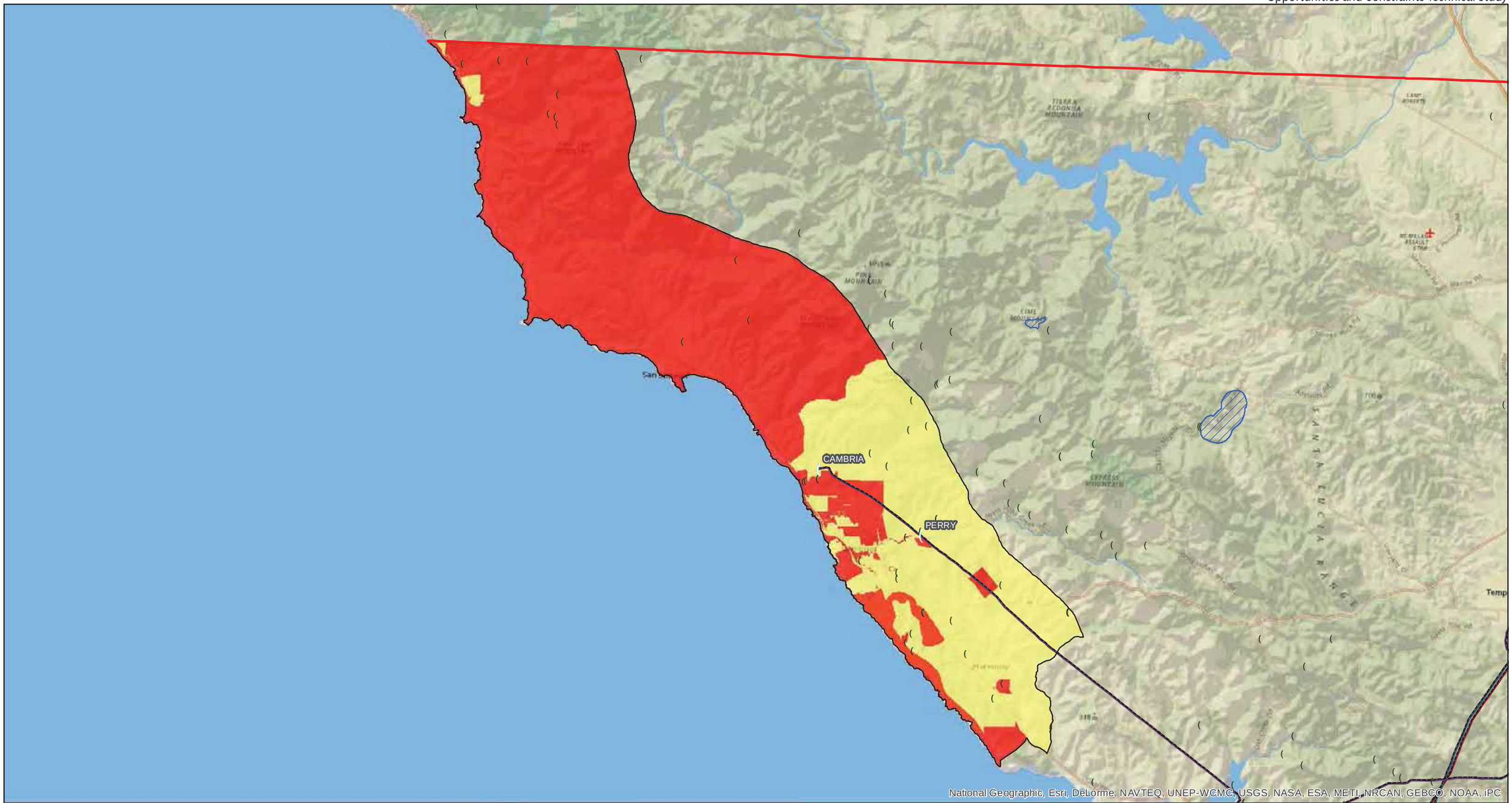
Transmission Line, Voltage (CEC, 2013)

- 500 kV
- 115 kV
- 230 kV
- 70 kV

- Unlikely Able to Streamline Renewable Energy
- Potentially Able to Streamline Renewable Energy
- Most Likely Able to Streamline Renewable Energy
- Mines and Other Disturbed Sites
- Substation
- San Luis Obispo County Line
- Planning Area
- Energy Extractive Area *
- Energy Extractive Resource Area **

Figure 3.1-6g

Renewable Energy Development Areas - Nacimiento Planning Area



Aspen Environmental Group

0 2.5 5 Miles

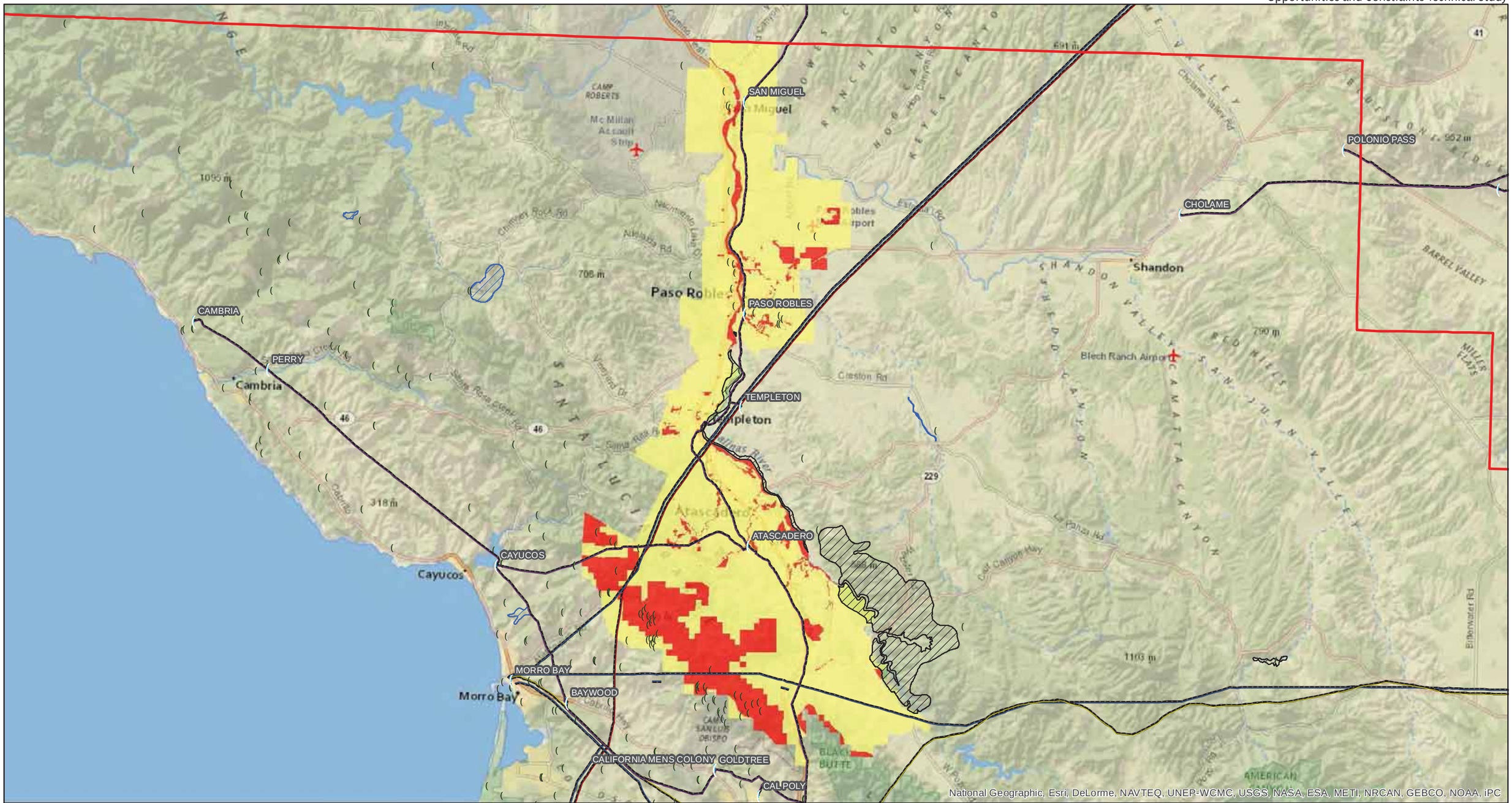
Transmission Line, Voltage (CEC, 2013)

- 500 kV
- 230 kV
- 115 kV
- 70 kV

- Unlikely Able to Streamline Renewable Energy
- Potentially Able to Streamline Renewable Energy
- Most Likely Able to Streamline Renewable Energy
- Mines and Other Disturbed Sites
- Substation
- San Luis Obispo County Line
- North Coast Planning Area
- Energy Extractive Area *
- Energy Extractive Resource Area **

Figure 3.1-6h

Renewable Energy Development Areas - North Coast Planning Area



Aspen Environmental Group

0 3.5 7 Miles

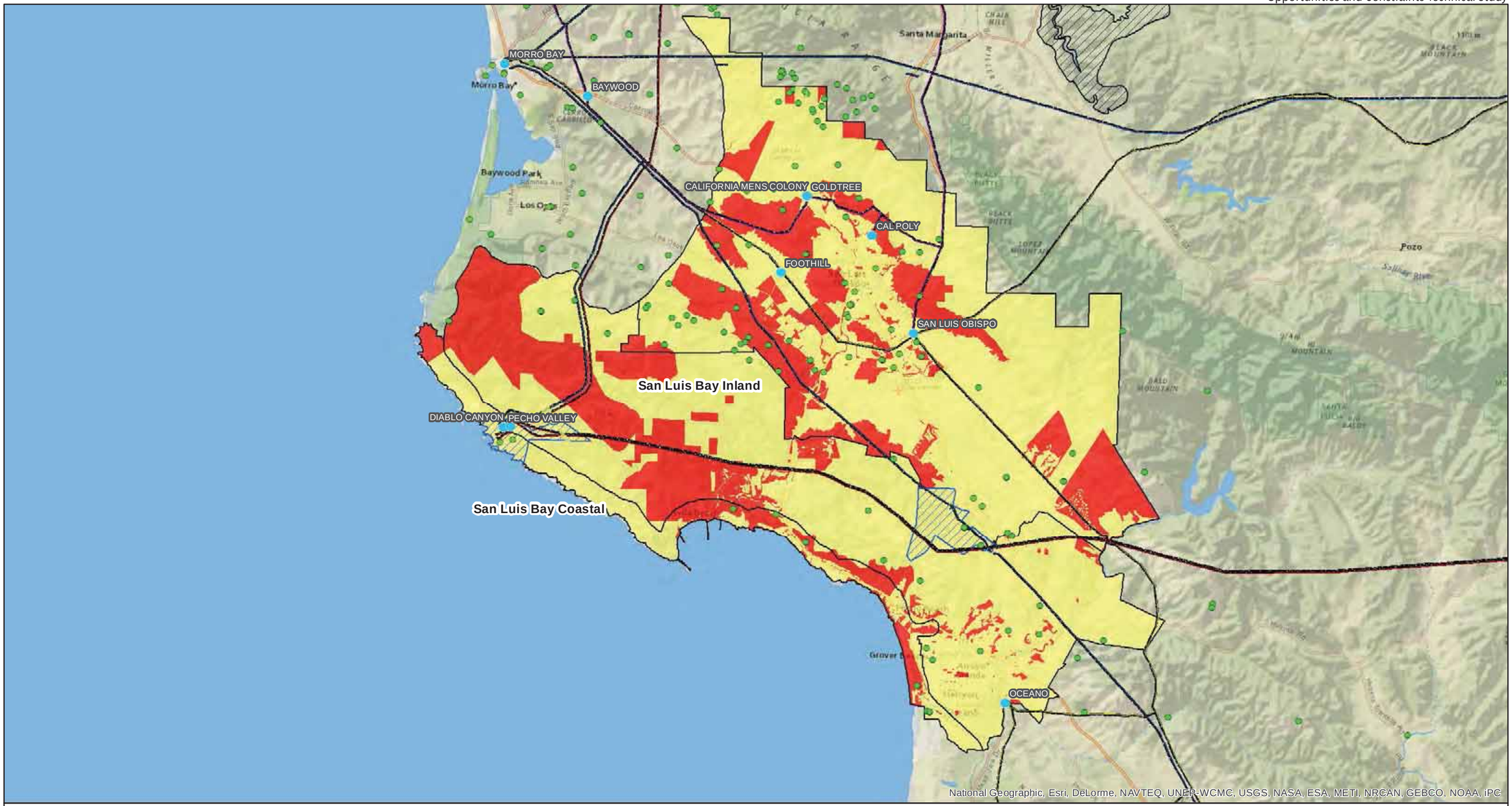
Transmission Line, Voltage (CEC, 2013)

- 500 kV
- 230 kV
- 115 kV
- 70 kV

- Unlikely Able to Streamline Renewable Energy
- Potentially Able to Streamline Renewable Energy
- Most Likely Able to Streamline Renewable Energy
- Mines and Other Disturbed Sites
- Substation
- San Luis Obispo County Line
- Planning Area
- Energy Extractive Area *
- Energy Extractive Resource Area **

Figure 3.1-6i

Renewable Energy Development Areas - Salinas River Planning Area



Aspen Environmental Group

0 2.5 5 Miles

Transmission Line, Voltage (CEC, 2013)

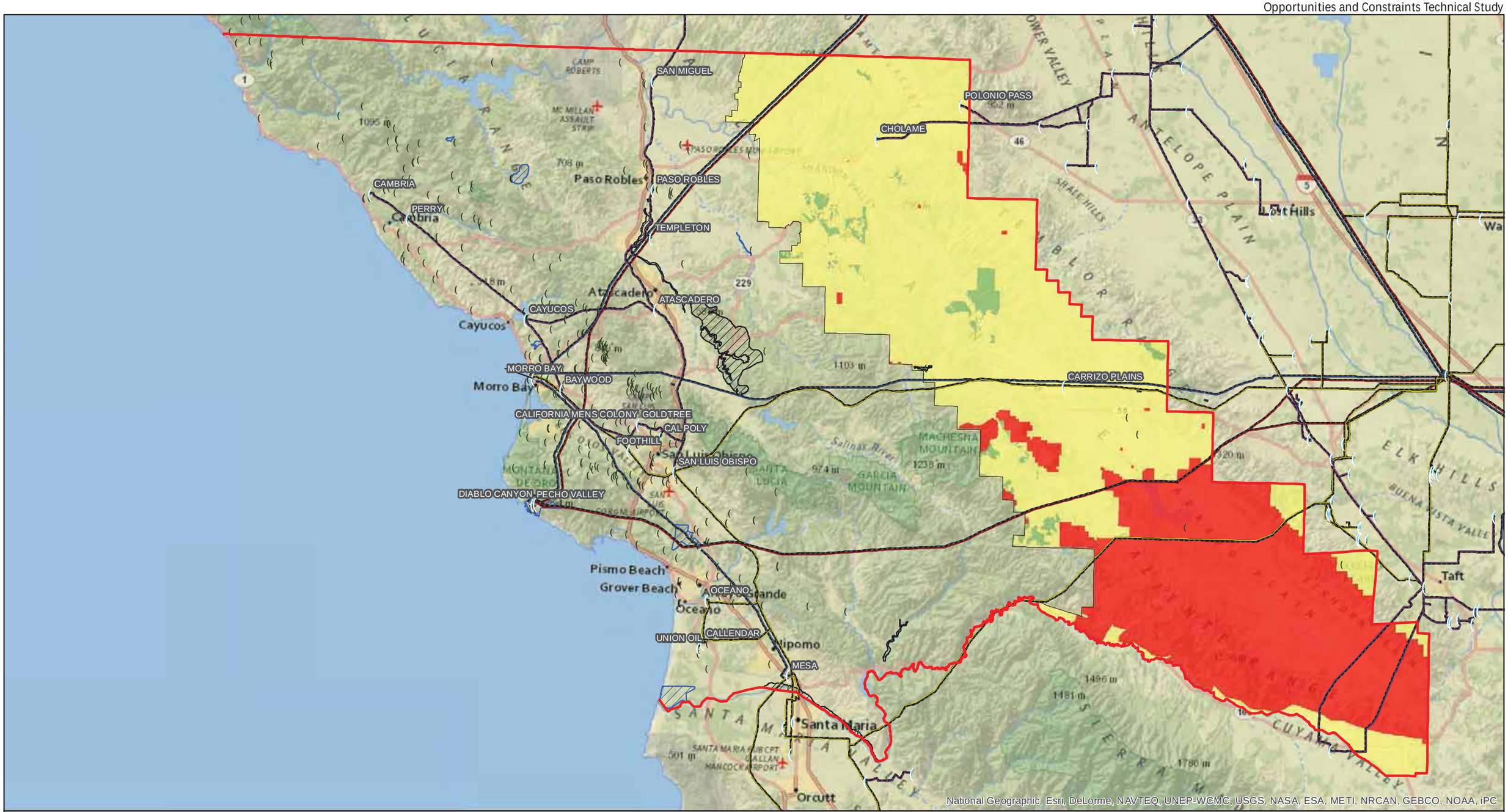
- 500 kV
- 115 kV
- 230 kV
- 70 kV

- Unlikely Able to Streamline Renewable Energy
- Potentially Able to Streamline Renewable Energy
- Most Likely Able to Streamline Renewable Energy

- Mines and Other Disturbed Sites
- Substation
- San Luis Obispo County Line
- San Luis Obispo Planning Area
- Energy Extractive Area *
- Energy Extractive Resource Area **

Figure 3.1-6j

Renewable Energy Development Areas - San Luis Obispo Planning Area



Aspen Environmental Group

0 7.5 15 Miles

Transmission Line, Voltage (CEC, 2013)

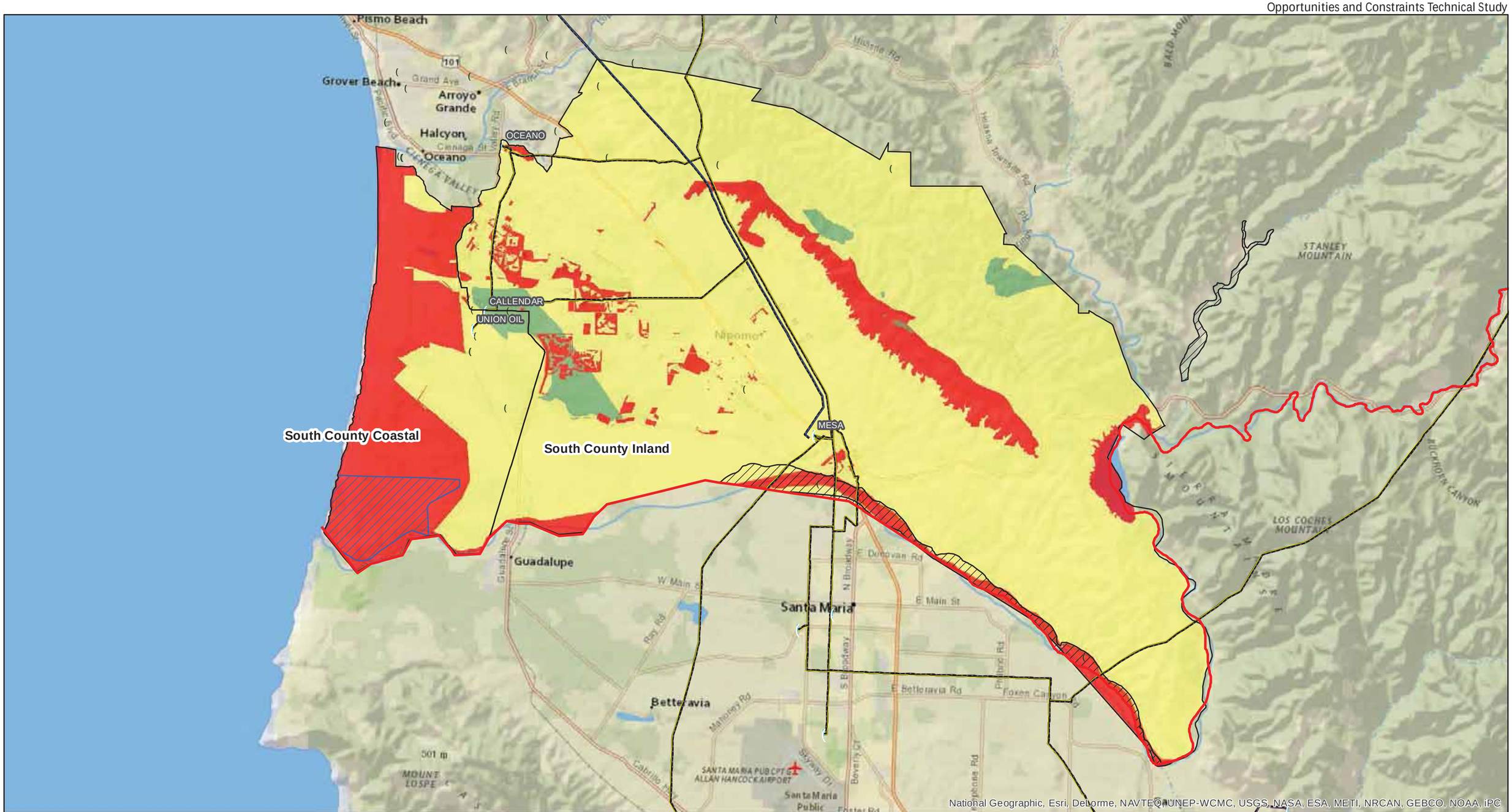
- 500 kV
- 230 kV
- 115 kV
- 70 kV

- Unlikely Able to Streamline Renewable Energy
- Potentially Able to Streamline Renewable Energy
- Most Likely Able to Streamline Renewable Energy

- Mines and Other Disturbed Sites
- Substation
- San Luis Obispo County Line
- Planning Area
- Energy Extractive Area *
- Energy Extractive Resource Area **

Figure 3.1-6k

Renewable Energy Development Areas - Shandon-Carrizo Planning Area



Aspen Environmental Group

0 2 4 Miles

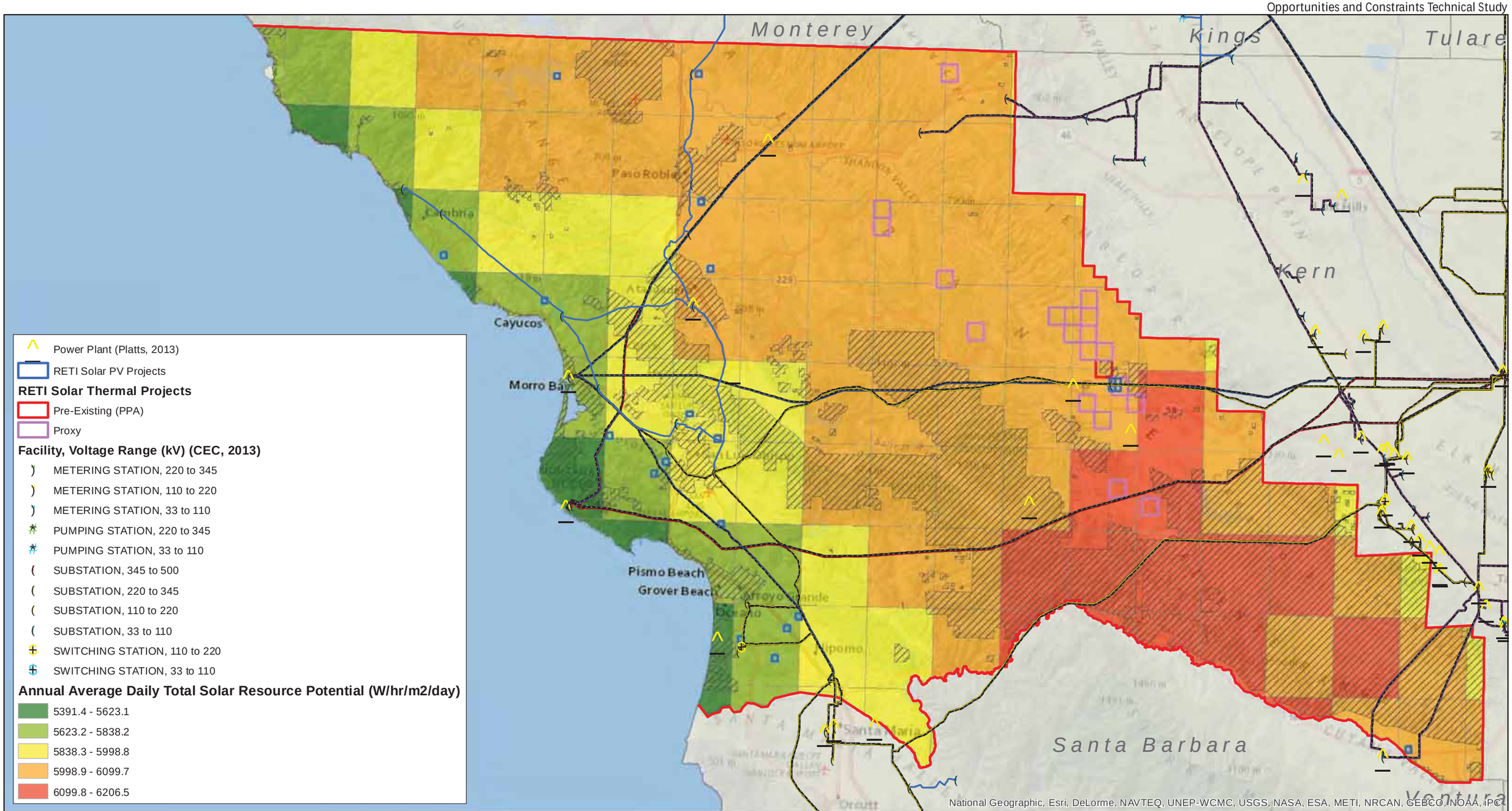
Transmission Line, Voltage (CEC, 2013)

- 500 kV
- 230 kV
- 115 kV
- 70 kV

- Unlikely Able to Streamline Renewable Energy
- Potentially Able to Streamline Renewable Energy
- Most Likely Able to Streamline Renewable Energy
- Mines and Other Disturbed Sites
- Substation
- San Luis Obispo County Line
- South County Planning Area
- Energy Extractive Area *
- Energy Extractive Resource Area **

Figure 3.1-6l

Renewable Energy Development Areas - South County Planning Area



Aspen Environmental Group

0 7 14 Miles

Source: CEC, 2013; Platts, 2013; RETI, 2013; NREL, 2013

Transmission Line, Voltage

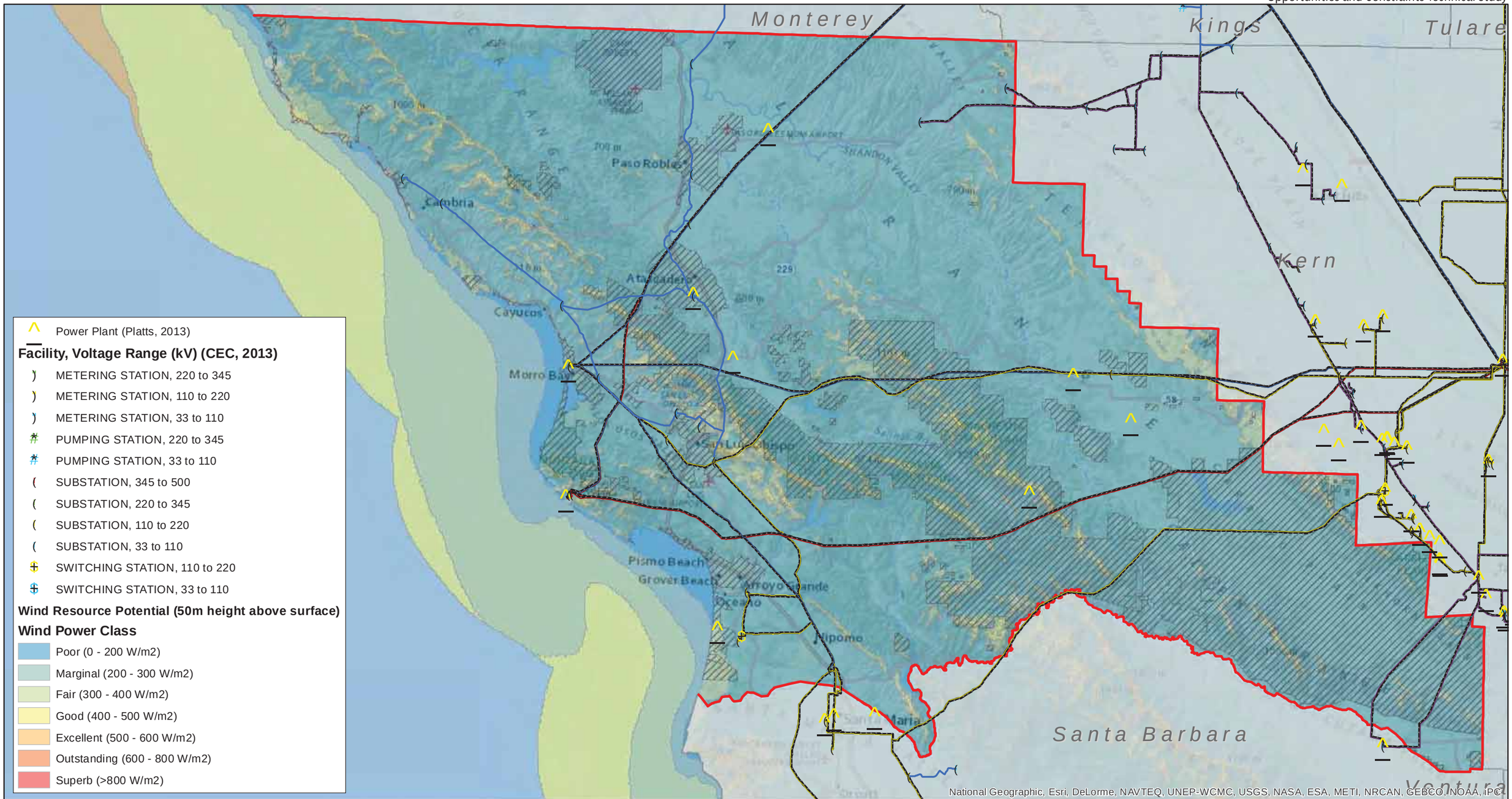
- 500 kV
- 230 kV
- 115 kV
- 70 kV
- 66 kV
- 60 kV

Areas not under County Jurisdiction

San Luis Obispo County Line

Figure 4.1-1

San Luis Obispo County
Solar Resources



Aspen Environmental Group

0 7.5 15 Miles

Source: CEC, 2013; Platts, 2013; NREL, 2013

Transmission Line, Voltage

- 500 kV
- 230 kV
- 115 kV
- 70 kV
- 66 kV
- 60 kV

Areas not under County Jurisdiction

San Luis Obispo County Line

Figure 4.3-1

San Luis Obispo County
Wind Resources

Aspen Environmental Group

0 7.5 15 Miles

Source: CEC, 2013; Platts, 2013

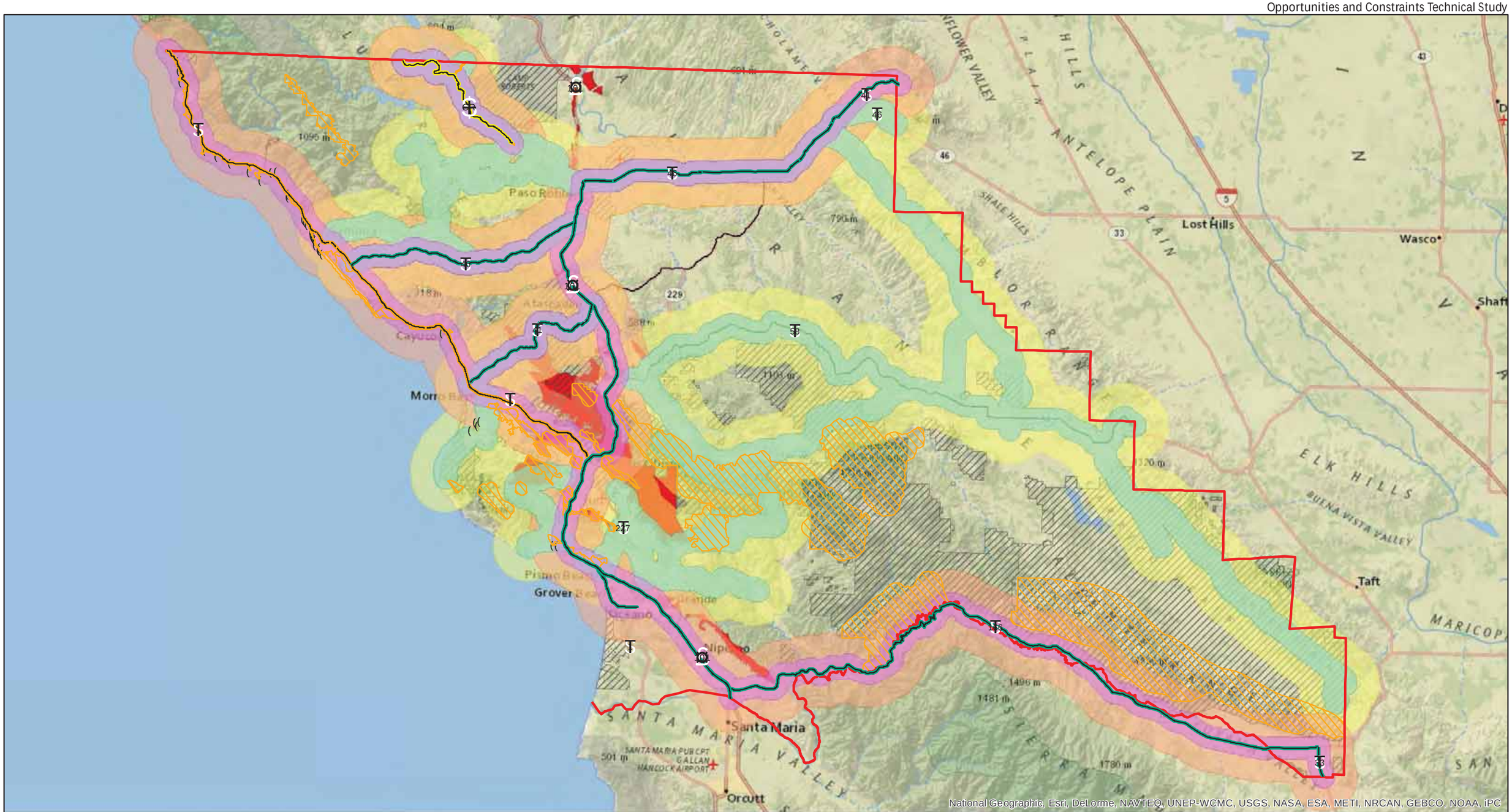
Transmission Line, Voltage (CEC, 2013)

- 500 kV
- 230 kV
- 115 kV
- 70 kV

- Kern Local Reliability Area (CEC, 2013)
- Areas not under County Jurisdiction
- San Luis Obispo County Line

Figure 5.2-1

San Luis Obispo County Transmission System



Aspen Environmental Group

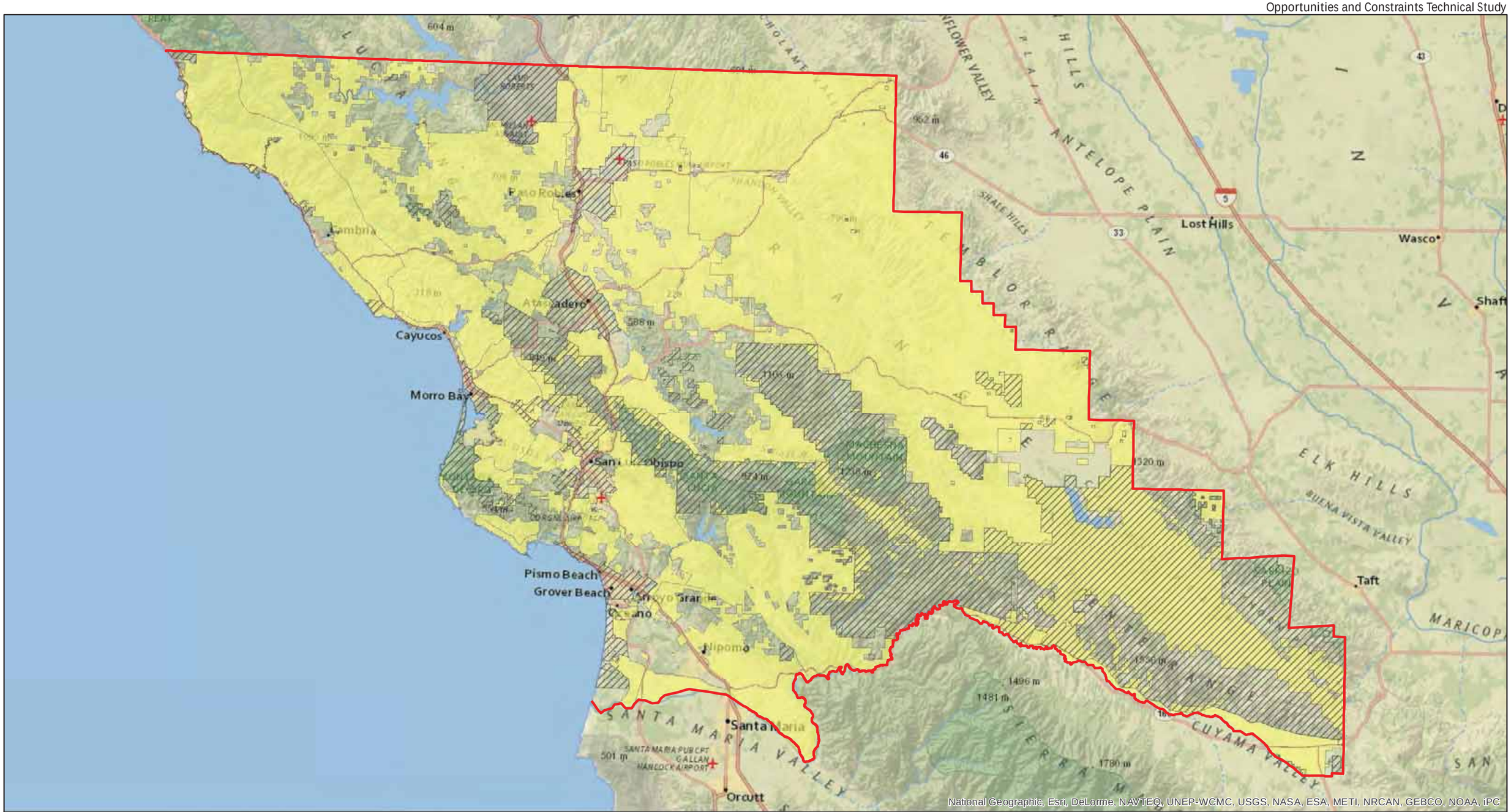
0 7.5 15 Miles

- Officially Designated State Scenic Highways
- Officially Designated County Scenic Highways
- Eligible State Scenic Highways - Not Officially Designated
- State and County Scenic Highways - Foreground View
- State and County Scenic Highways - Middleground View
- County General Plan Suggested Scenic Corridors
- County-Suggested Scenic Corridors - Foreground View
- County-Suggested Scenic Corridors - Middleground View
- Highway Corridor Design Standard areas
- Designated Scenic Vistas
- San Luis Obispo County Line
- Scenic County Sensitive Resource Area
- Areas not under County Jurisdiction

Source: CalTrans, 2013; San Luis Obispo County 2013; Aspen 2013

Figure 6.1-1

San Luis Obispo County Aesthetic Resources



Aspen Environmental Group

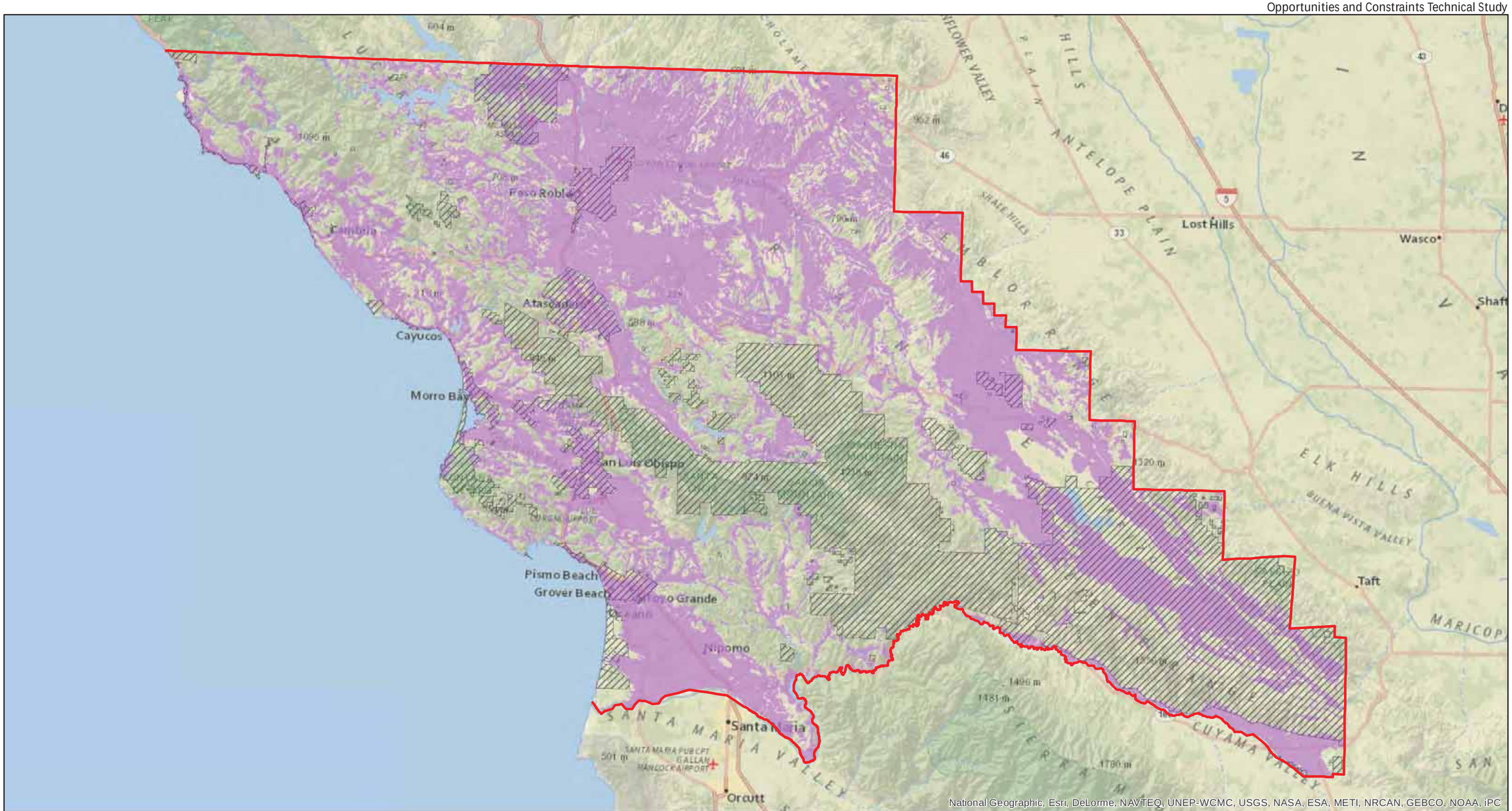
0 7.5 15 Miles

Source: San Luis Obispo County, 2013

County-Designated Agricultural Lands
Areas not under County Jurisdiction
San Luis Obispo County Line

Figure 6.2-1

San Luis Obispo County
Agricultural Designations



Aspen Environmental Group

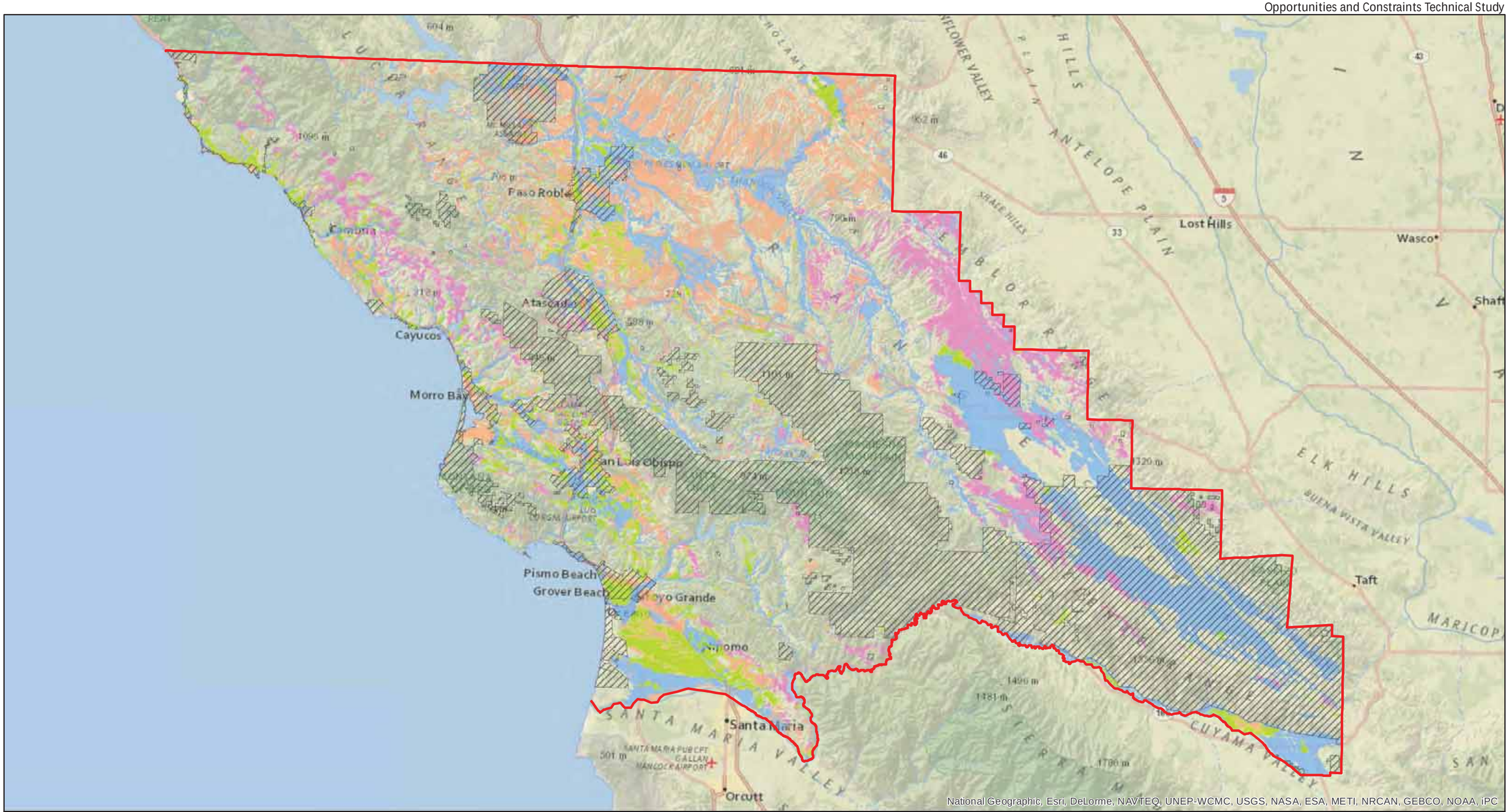
0 7.5 15 Miles

Source: COSE, 2013

Important Agricultural Soils
Areas not under County Jurisdiction
San Luis Obispo County Line

Figure 6.2-2a

San Luis Obispo County
Important Agricultural Soils



Aspen Environmental Group

0 7.5 15 Miles

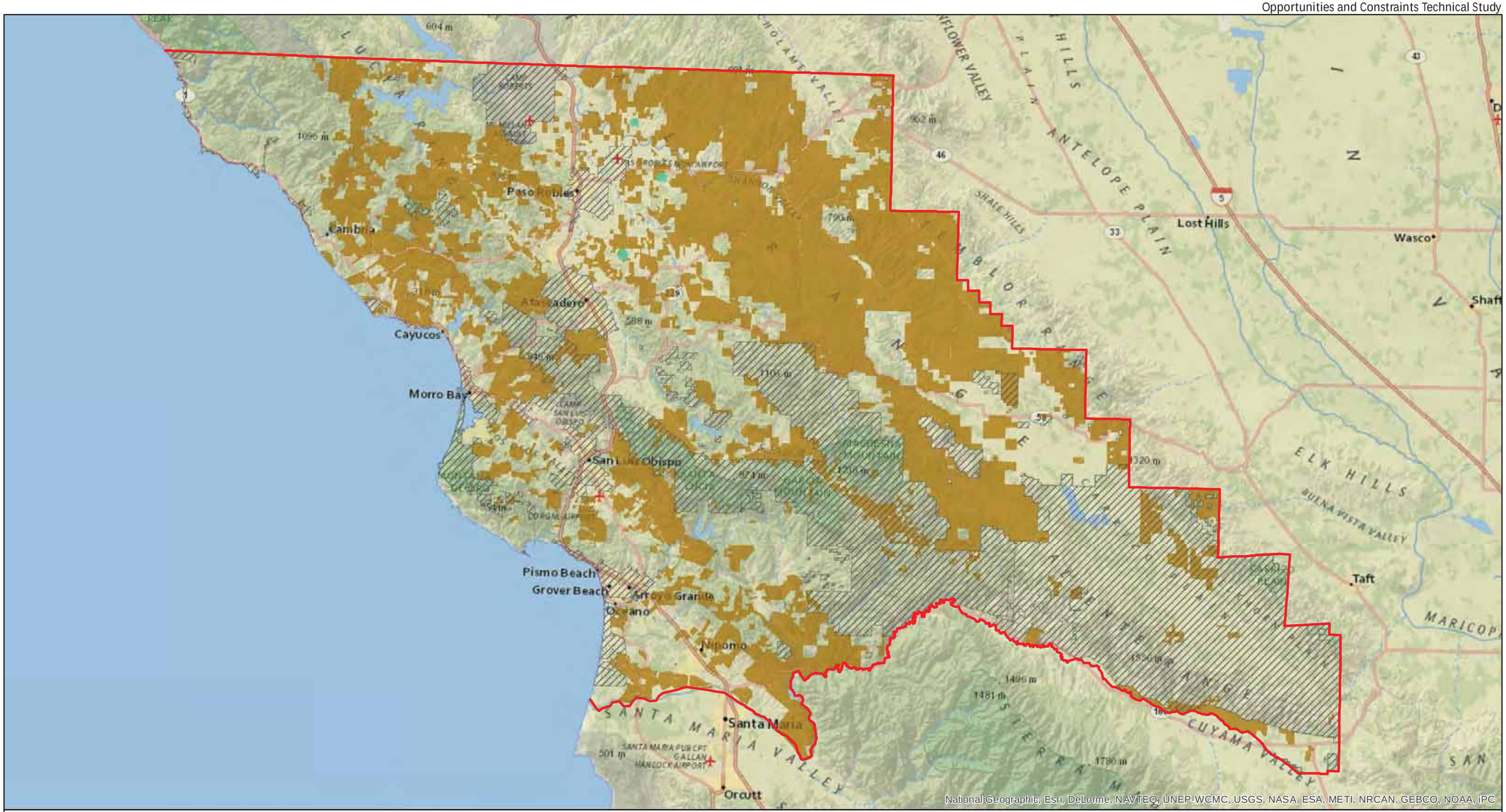
Source: COSE

Important Agricultural Soils
- Prime Farmland
- Statewide Importance
- Highly Productive Range Soils
- Other Productive Soils

- Areas not under County Jurisdiction
- San Luis Obispo County Line

Figure 6.2-2b

San Luis Obispo County
Important Agricultural Soils - Differentiated



Aspen Environmental Group

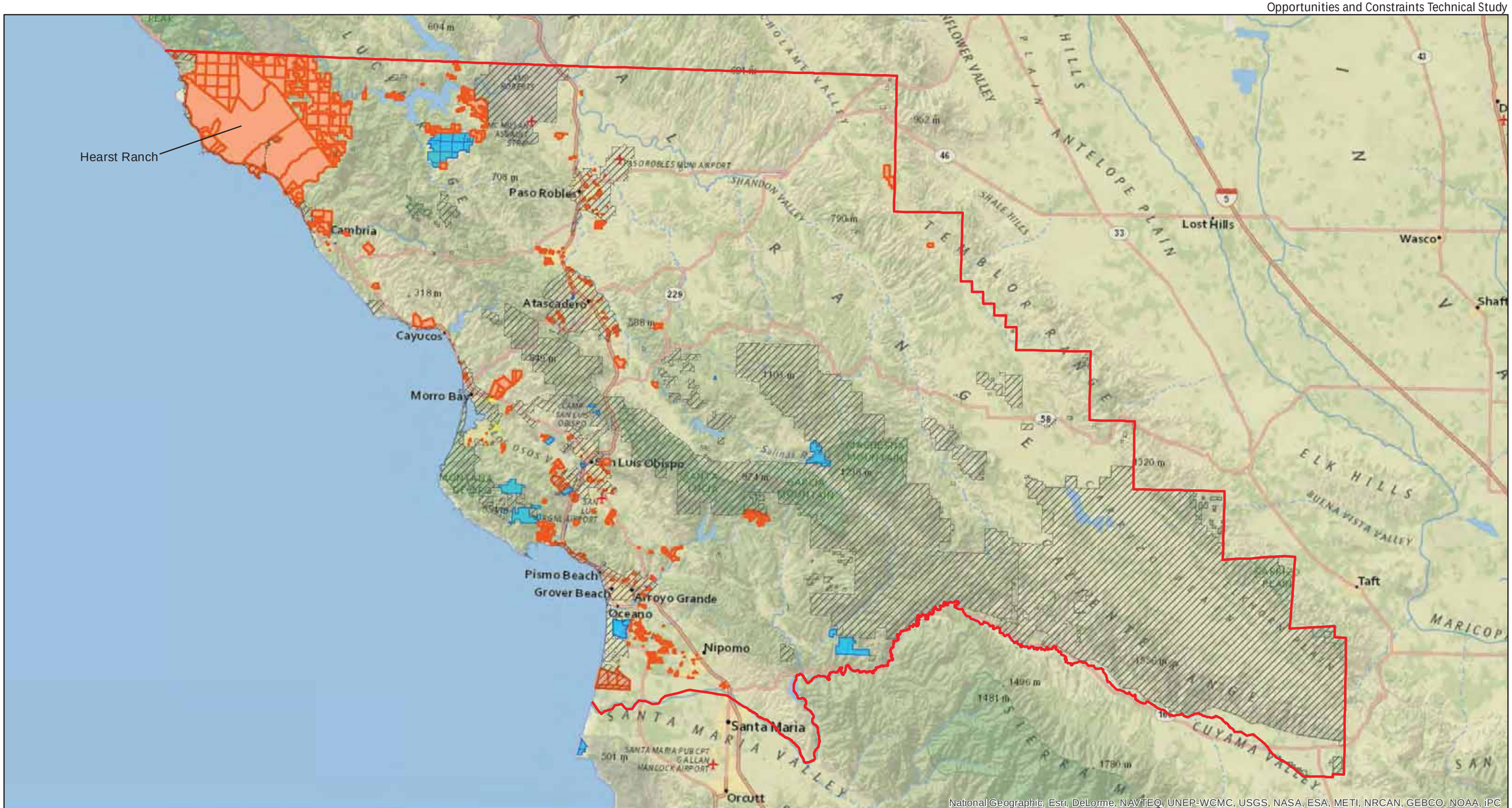
0 7.5 15 Miles

Source: San Luis Obispo County 2013

Farmland Security Zone Lands
Williamson Act Lands
Areas not under County Jurisdiction
San Luis Obispo County Line

Figure 6.2-3

San Luis Obispo County
Williamson Act Lands



Aspen Environmental Group

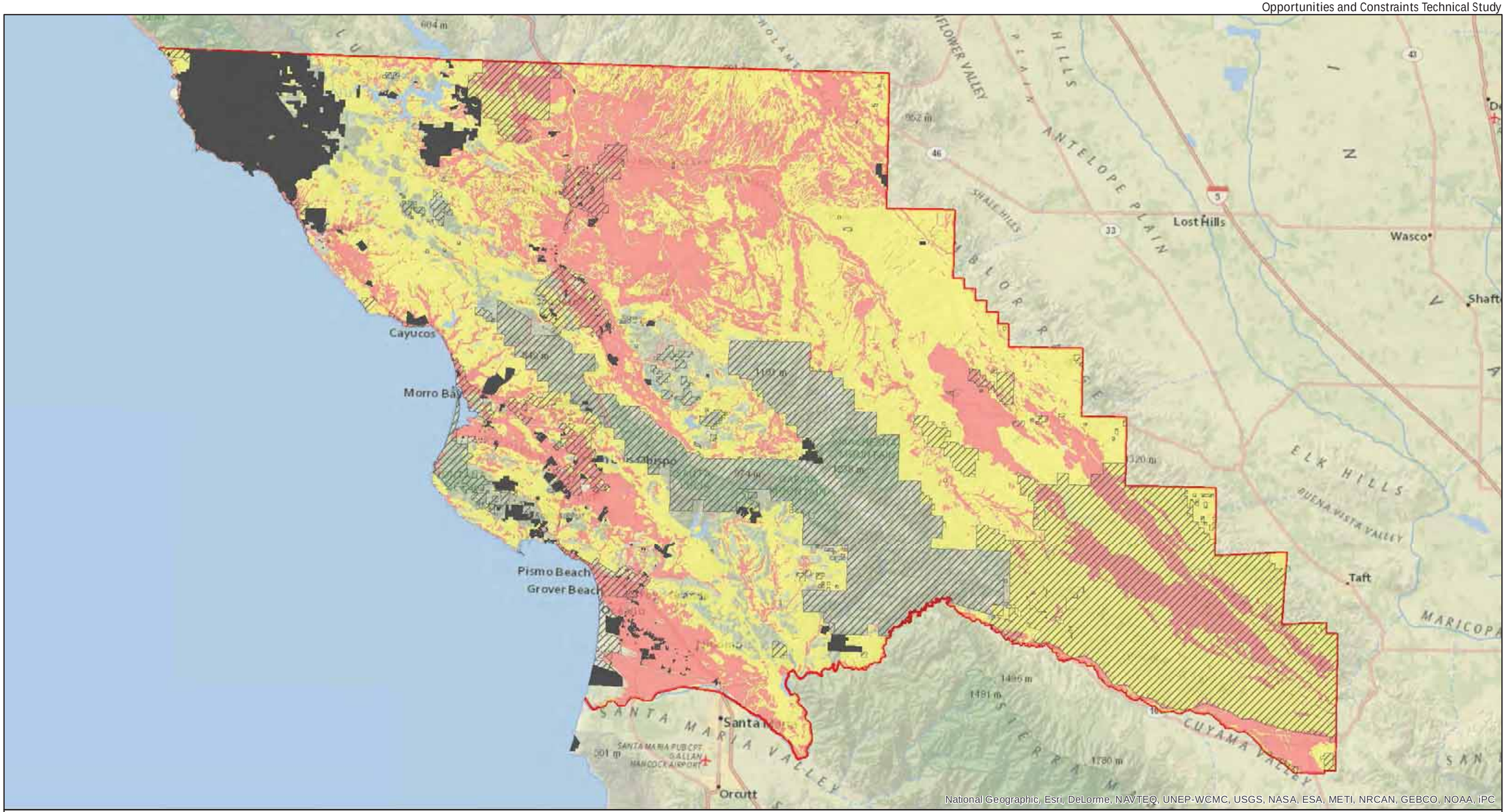
0 7.5 15 Miles

NCED Conservation Easements
Conservation Easements - SLO County Recorder
Land Conservancy/TNC Easements
Areas not under County Jurisdiction
San Luis Obispo County Line

Source: San Luis Obispo County, 2012; The Nature Conservancy (TNC), 2012; SLO County Land Conservancy, 2012; NCED, 2013

Figure 6.2-4

San Luis Obispo County Protected Areas



Aspen Environmental Group

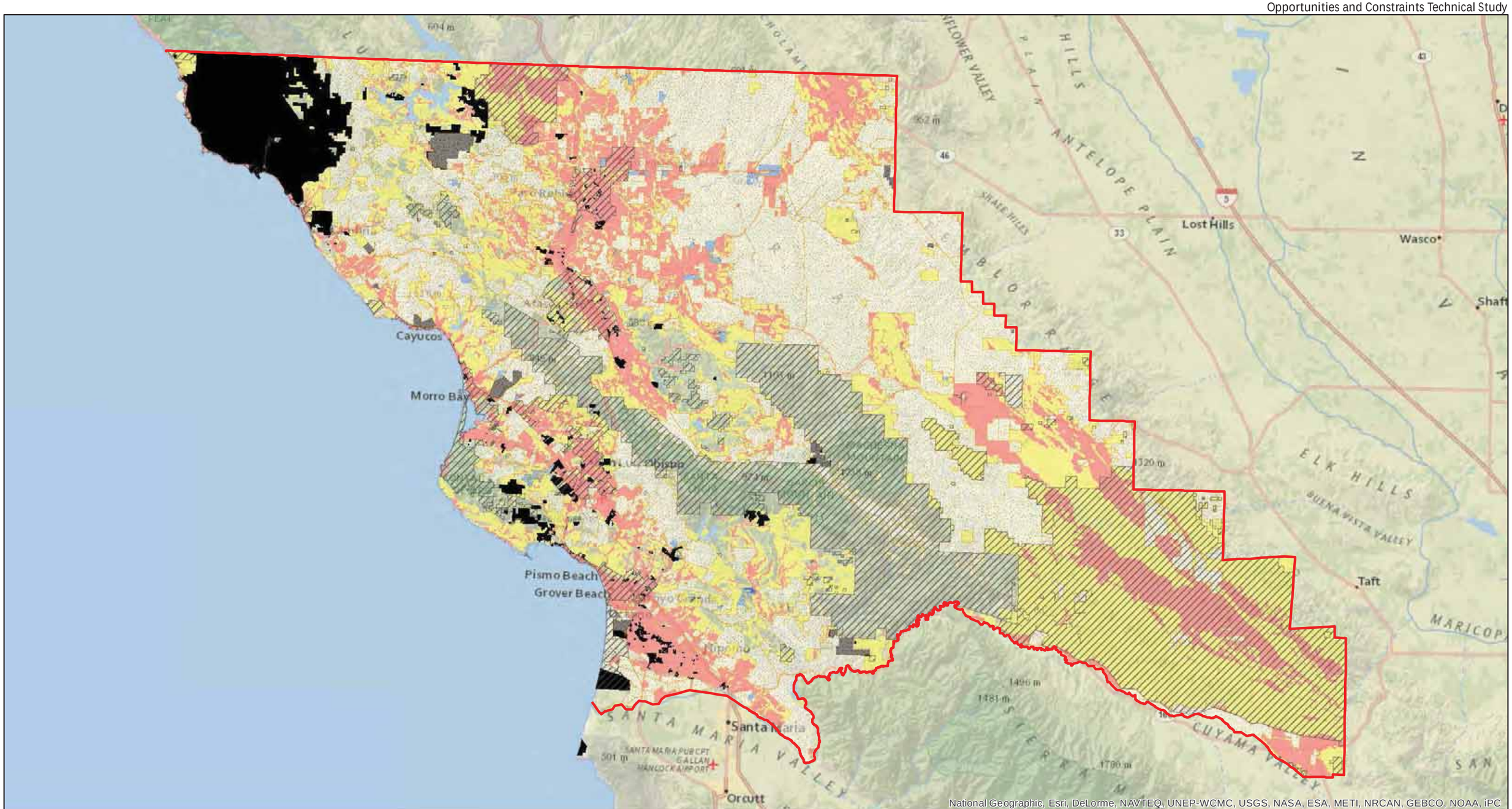
0 7.5 15 Miles

Higher Conflict
Lower Conflict
Protected Areas
Areas not under County Jurisdiction
San Luis Obispo County Line

Source: DWR, 2013; Aspen, 2013; San Luis Obispo County, 2013

Figure 6.2-5

San Luis Obispo County
Conflict with Agricultural Resources



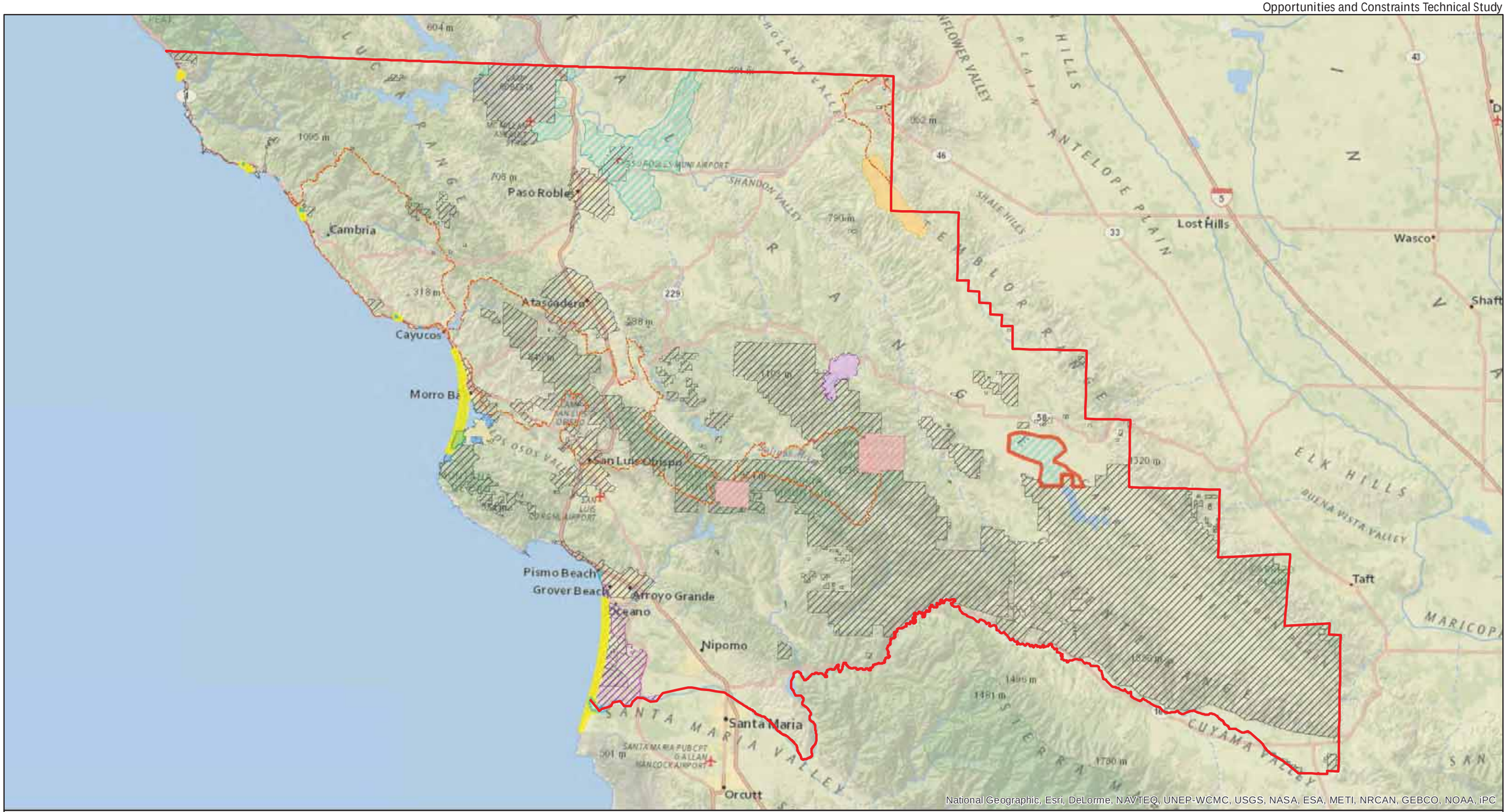
Aspen Environmental Group

0 7.5 15 Miles

- Williamson Act Lands
- Higher Conflict w/o Williamson Act
- Lower Conflict w/o Williamson Act
- Williamson Acts Land (Non-renewal)
- Protected Areas
- Areas not under County Jurisdiction
- San Luis Obispo County Line

Figure 6.2-6

San Luis Obispo County
Conflict with Agricultural Resources
Conflict Level and Williamson Act Enrollment



Aspen Environmental Group

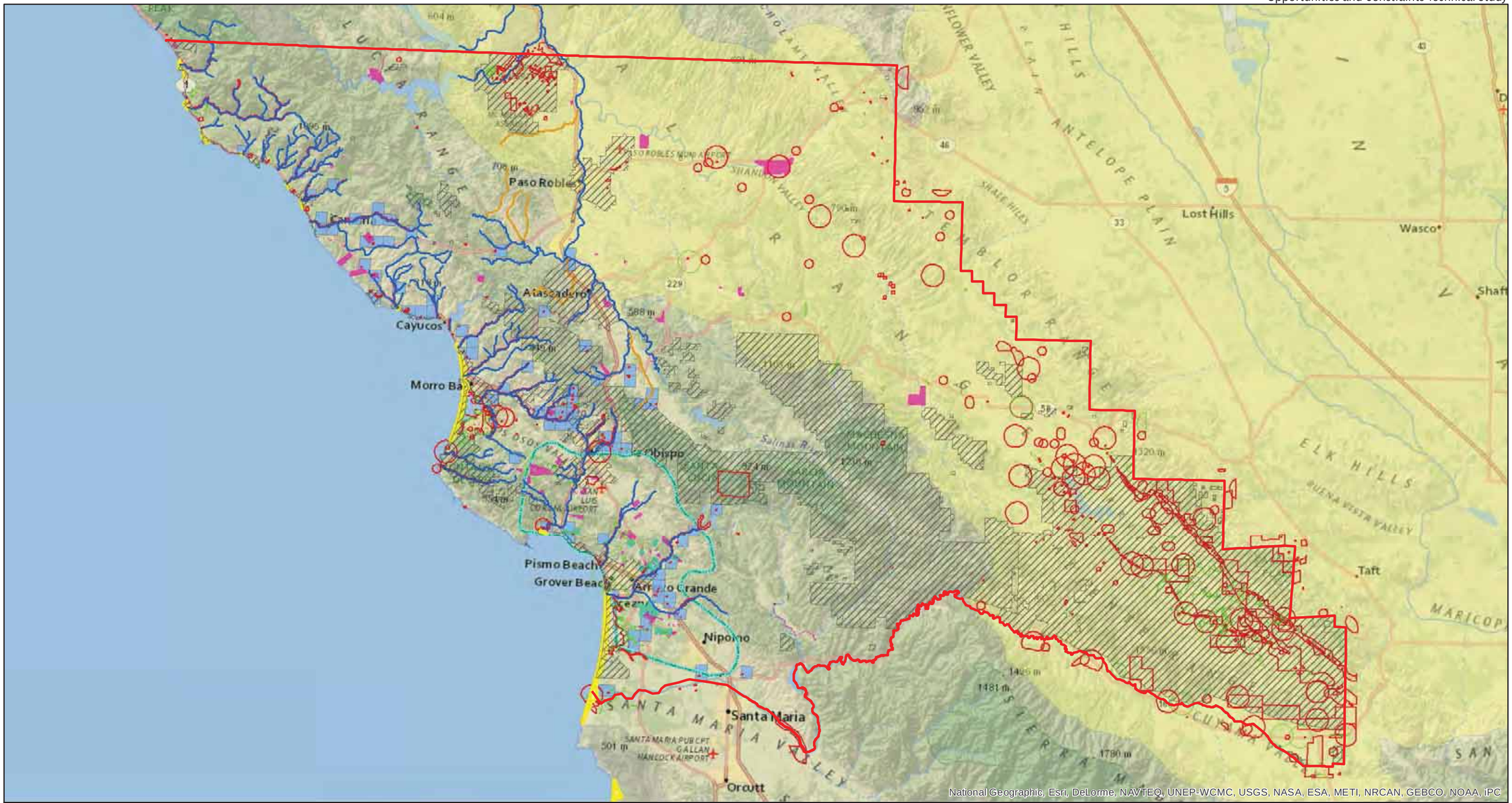
0 7.5 15 Miles

Source: USFWS, 2013

- Tidewater Goby
- La Graciosa thistle
- Longhorn fairy shrimp
- Morro shoulderband (=Banded dune) snail
- Purple amole
- Vernal pool fairy shrimp
- California Condor
- California Red-legged Frog
- California Tiger Salamander
- Morro Bay Kangaroo Rat
- Western Snowy Plover
- Areas not under County Jurisdiction
- San Luis Obispo County Line

Figure 6.3-1

Critical Habitat in San Luis Obispo County



Aspen Environmental Group

0 7.5 15 Miles

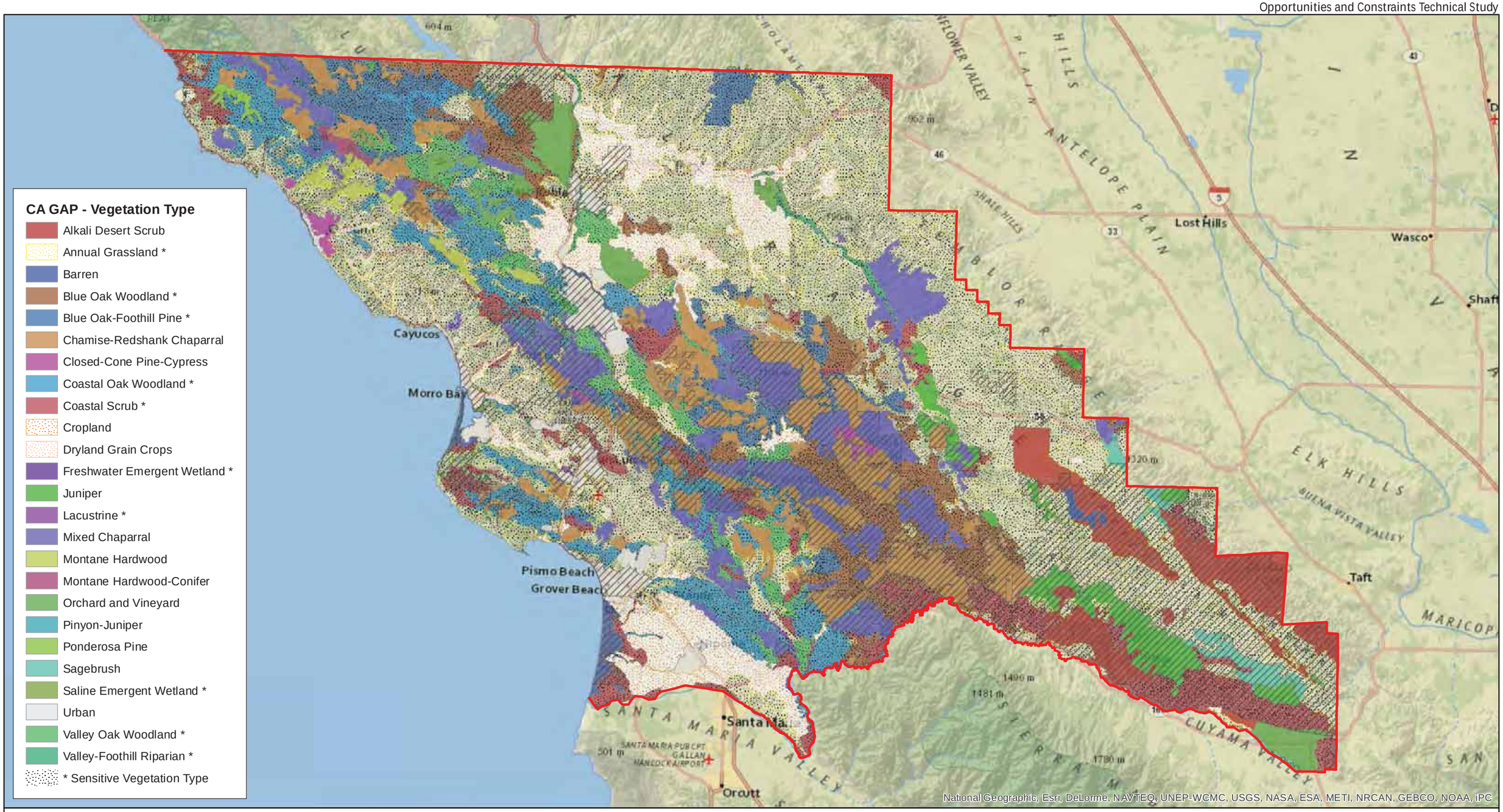
Steelhead Presence (NMFS)
- Yes
- Likely

CNDDB
- Sensitive Plant Occurrence
- Sensitive Wildlife Occurrence
- Studies with findings of sensitive species
- Pismo Clarkia Prime Habitat
- Pismo Clarkia Habitat
- Red-legged Frog: Areas of Restricted Pesticide Use
- Western Snowy Plover
- Kit fox range (CWHR, 2008)
- Areas not under County Jurisdiction
- San Luis Obispo County Line

Source: CNDDB, Sept. 2013; CWHR, 2008; San Luis Obispo County, 2013; NMFS, 2005; USFWS, 2013

Figure 6.3-2

Listed Species In San Luis Obispo County



Aspen Environmental Group

0 7.5 15 Miles

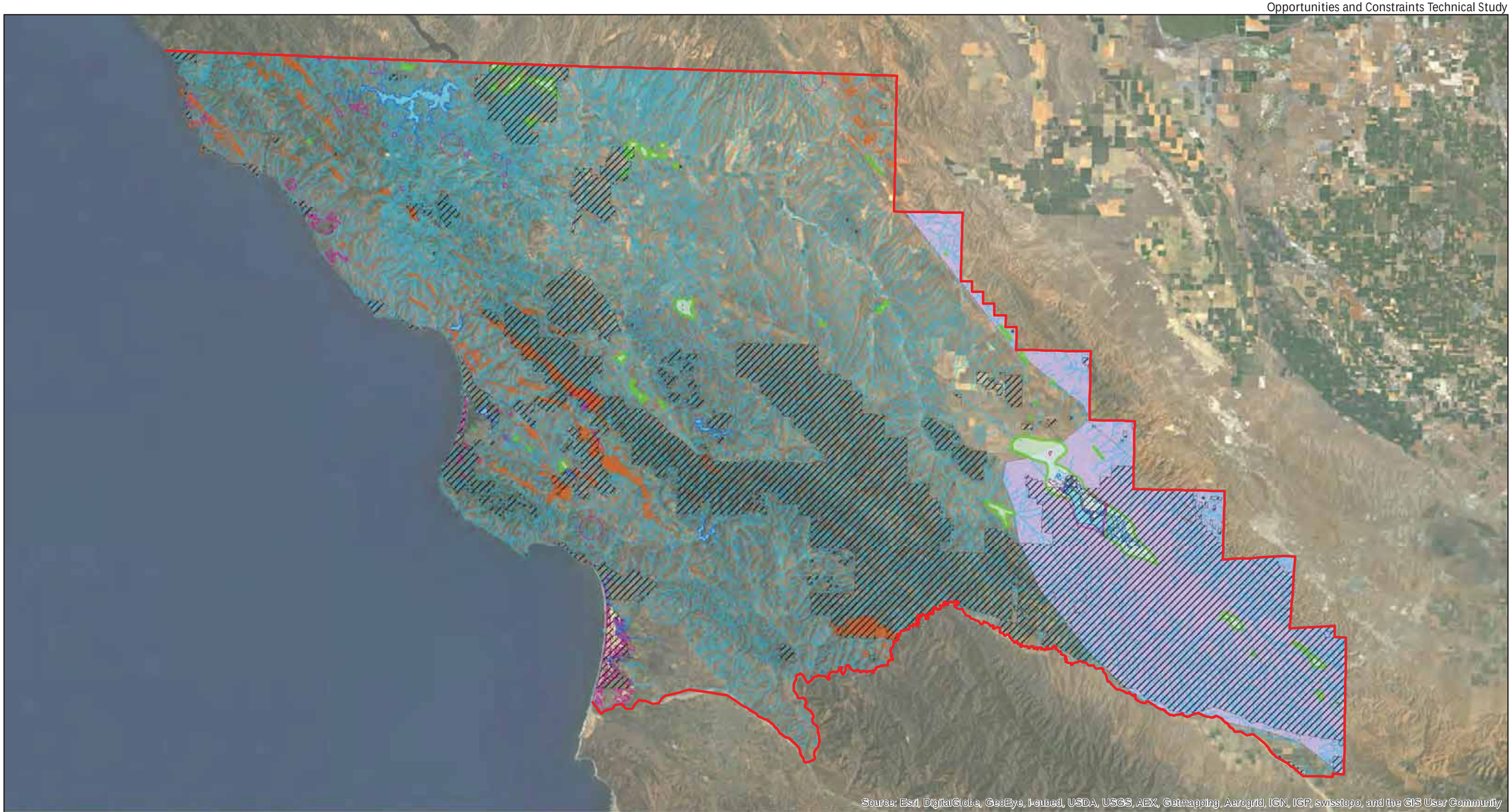
Source: UCSB, 2002

Areas not under County Jurisdiction

San Luis Obispo County Line

Figure 6.3-3

San Luis Obispo County
Vegetation Types



Aspen Environmental Group

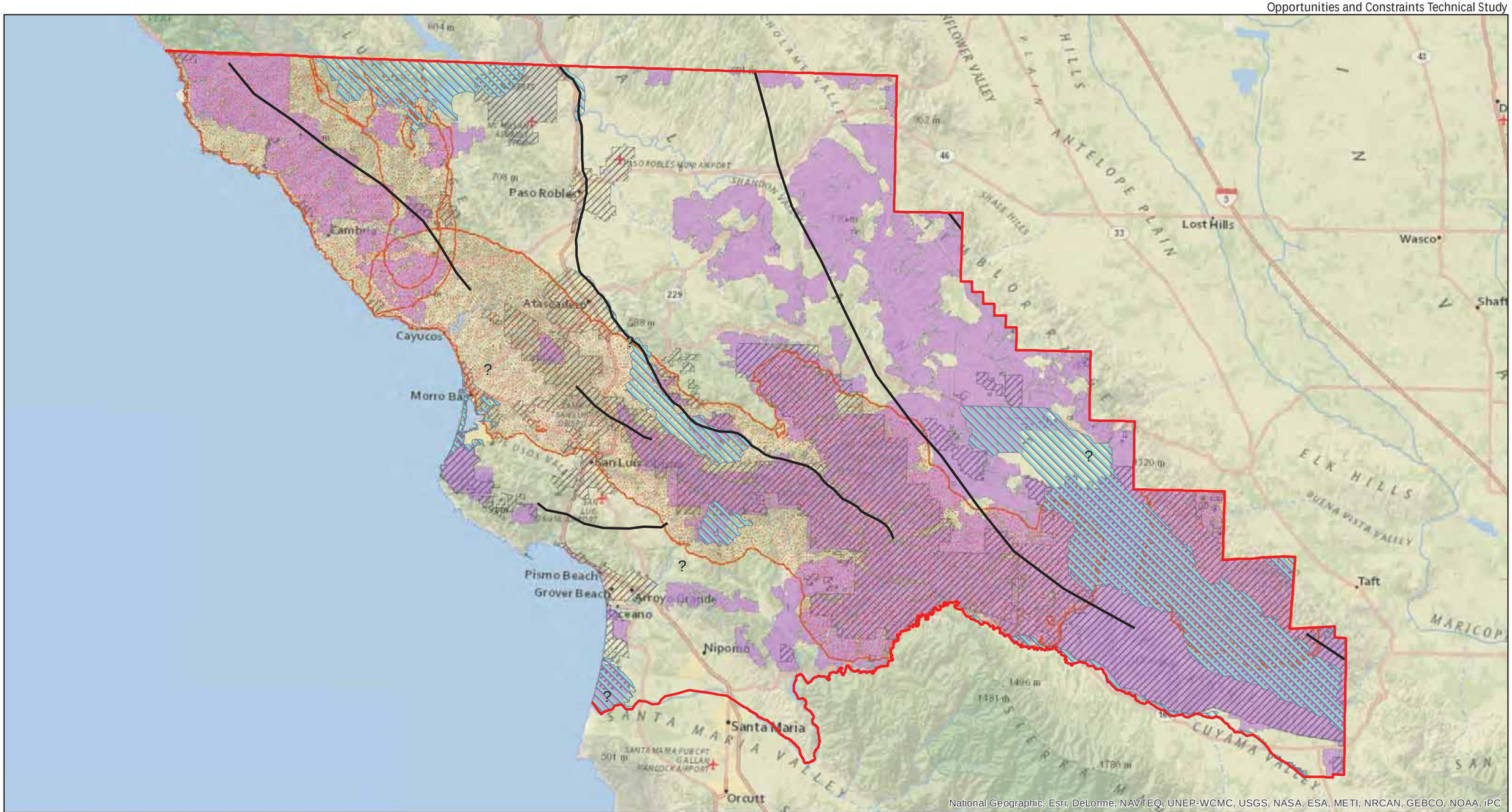
0 7.5 15 Miles

Stream / River
Waterbody
Serpentine Soils
Sensitive Community (CNDDB)
Vernal Pool Habitat
Edge Existing Habitats - San Joaquin Valley
Areas not under County Jurisdiction
San Luis Obispo County Line

Source: CNDDB, Sept. 2013; USGS, 2013; USFWS, 2013

Figure 6.3-4

San Luis Obispo County
Sensitive Vegetation and Habitats



Aspen Environmental Group

0 7.5 15 Miles

? Important Bird Area, California Audubon (2004)

Important Bird Area, California Audubon (2008)

Missing Linkages in California's Landscape

California Essential Habitat Connectivity

Essential Connectivity Area

Natural Landscape Blocks

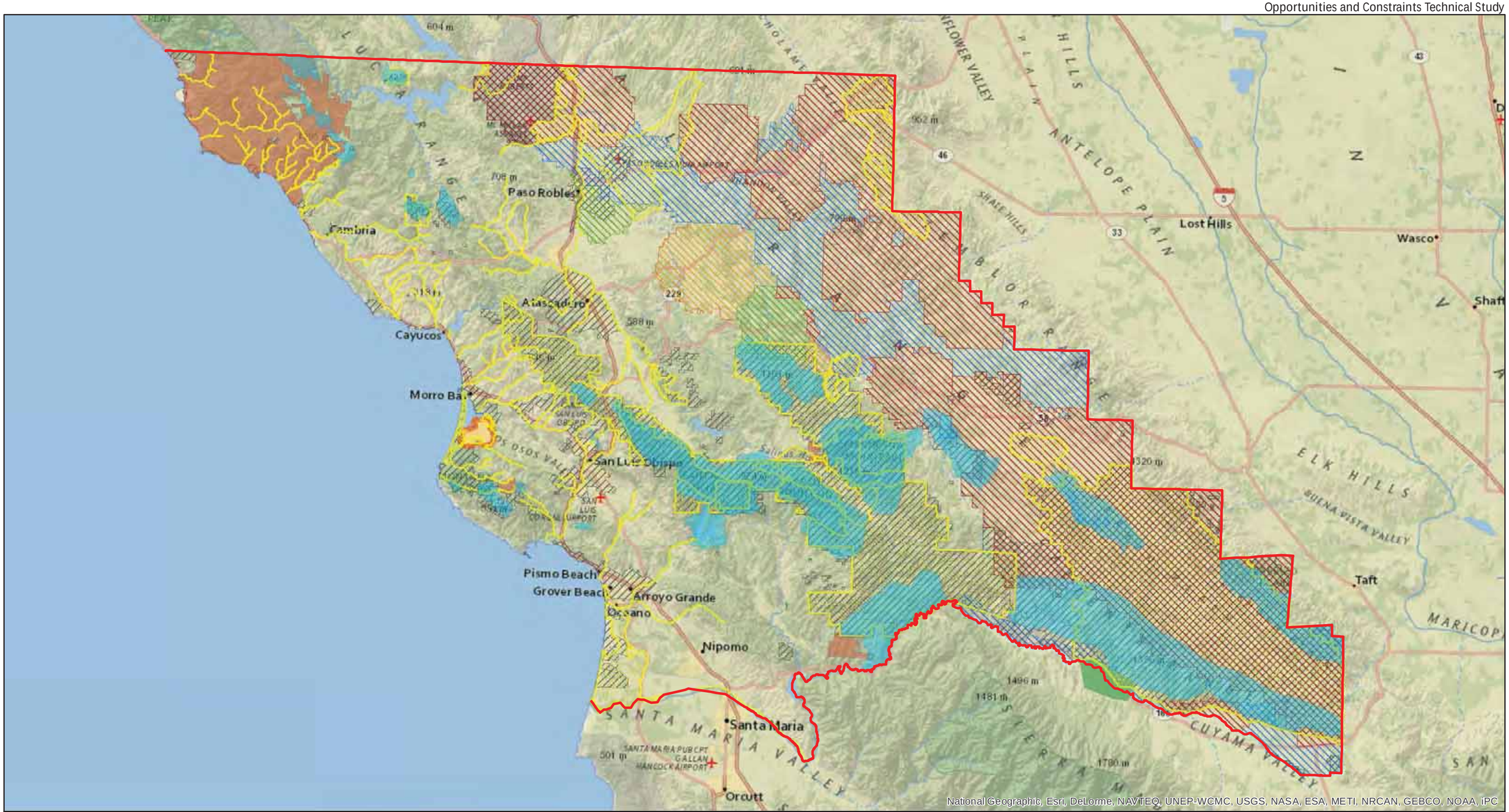
Areas not under County Jurisdiction

San Luis Obispo County Line

Source: National Audubon Society, 2004, 2008; CDFG, 2001, 2010

Figure 6.3-5

Migration and Wildlife Movement In San Luis Obispo County



Aspen Environmental Group

0 7.5 15 Miles

Source: RETI, 2009; San Luis Obispo County, 2013; USFWS, 2013

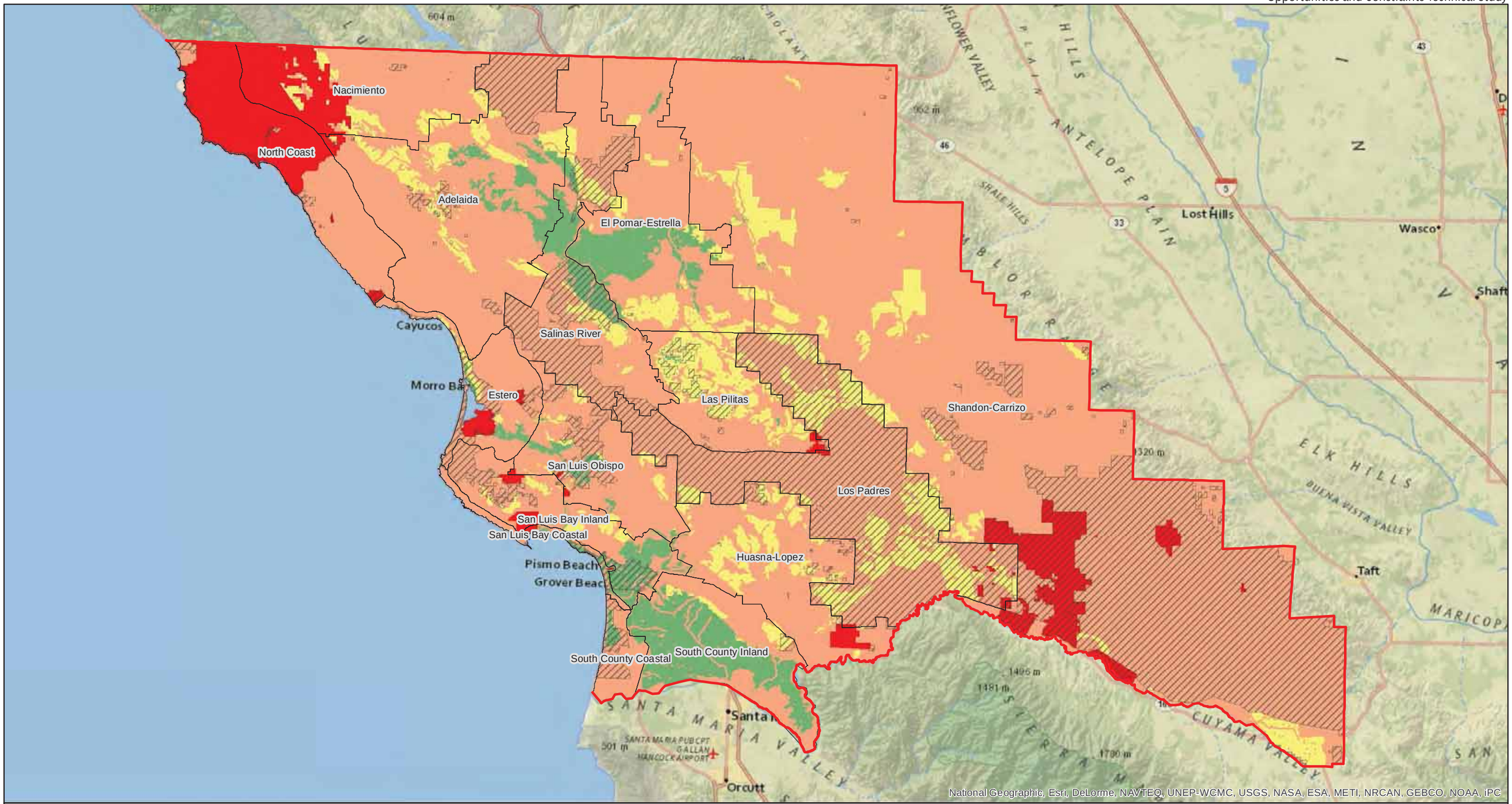
- Specialty Reserve - San Joaquin Valley
- Biological Sensitive Resource Area
- Conservation Easement
- Conservation Plan Boundary

Kit Fox Mitigation Ratio
- 1:1
- 2:1
- 3:1
- 4:1

- Environmental Yellow Area (RETI)
- Areas not under County Jurisdiction
- San Luis Obispo County Line

Figure 6.3-6

Conservation Plans and Other Biological Considerations in San Luis Obispo County



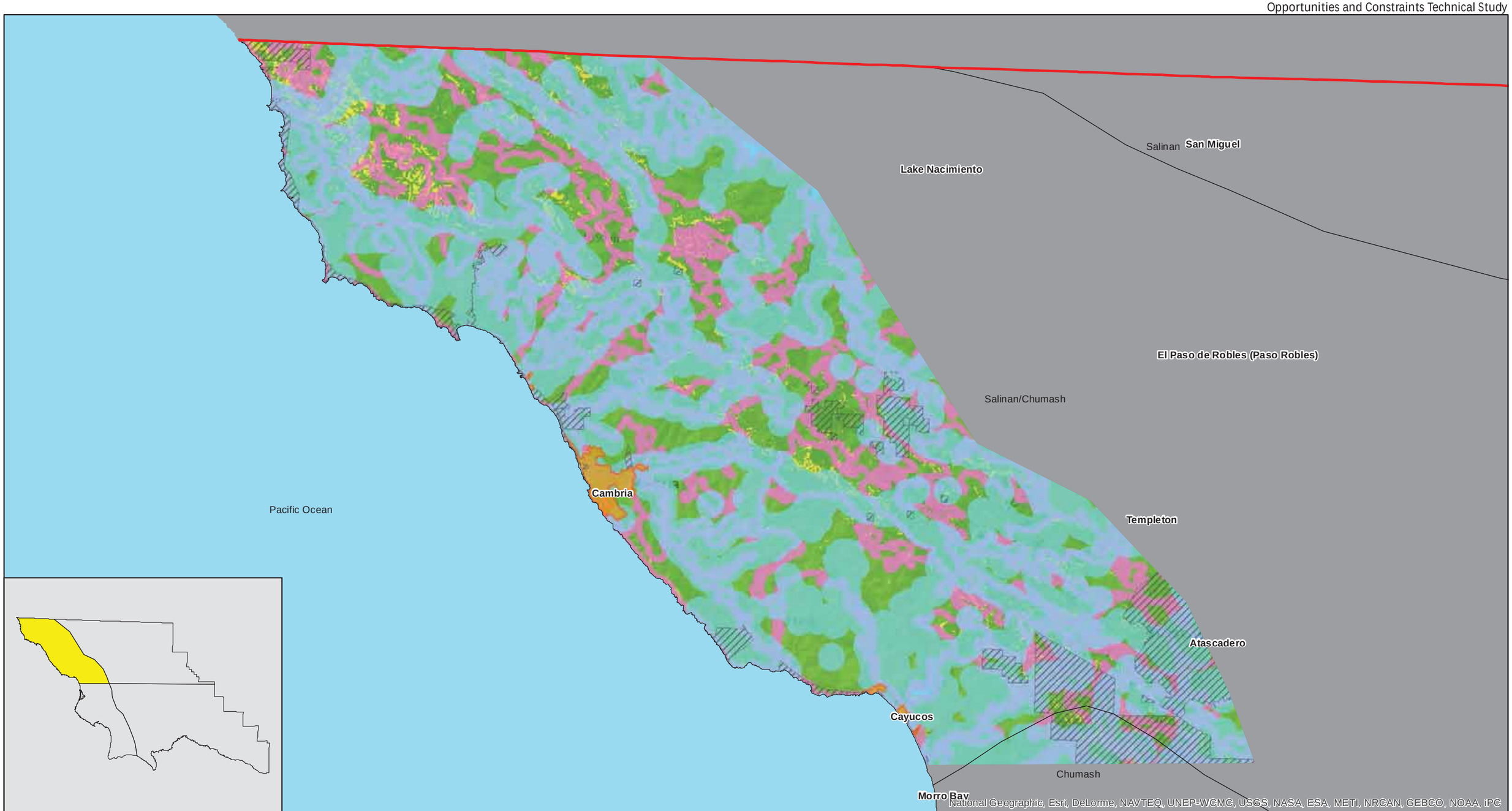
Aspen Environmental Group

0 7.5 15 Miles

"No Go" Area
High Sensitivity
Moderate Sensitivity
Low Sensitivity
Planning Area
Areas not under County Jurisdiction
San Luis Obispo County Line

Figure 6.3-7

Biological Resources Sensitivity Rankings



Aspen Environmental Group

0 3.5 7 Miles

Native American Tribal Boundary
SLO County-Designated Archaeological Sensitive Areas
800m buffer around significant water sources
200m buffer along vegetation boundaries

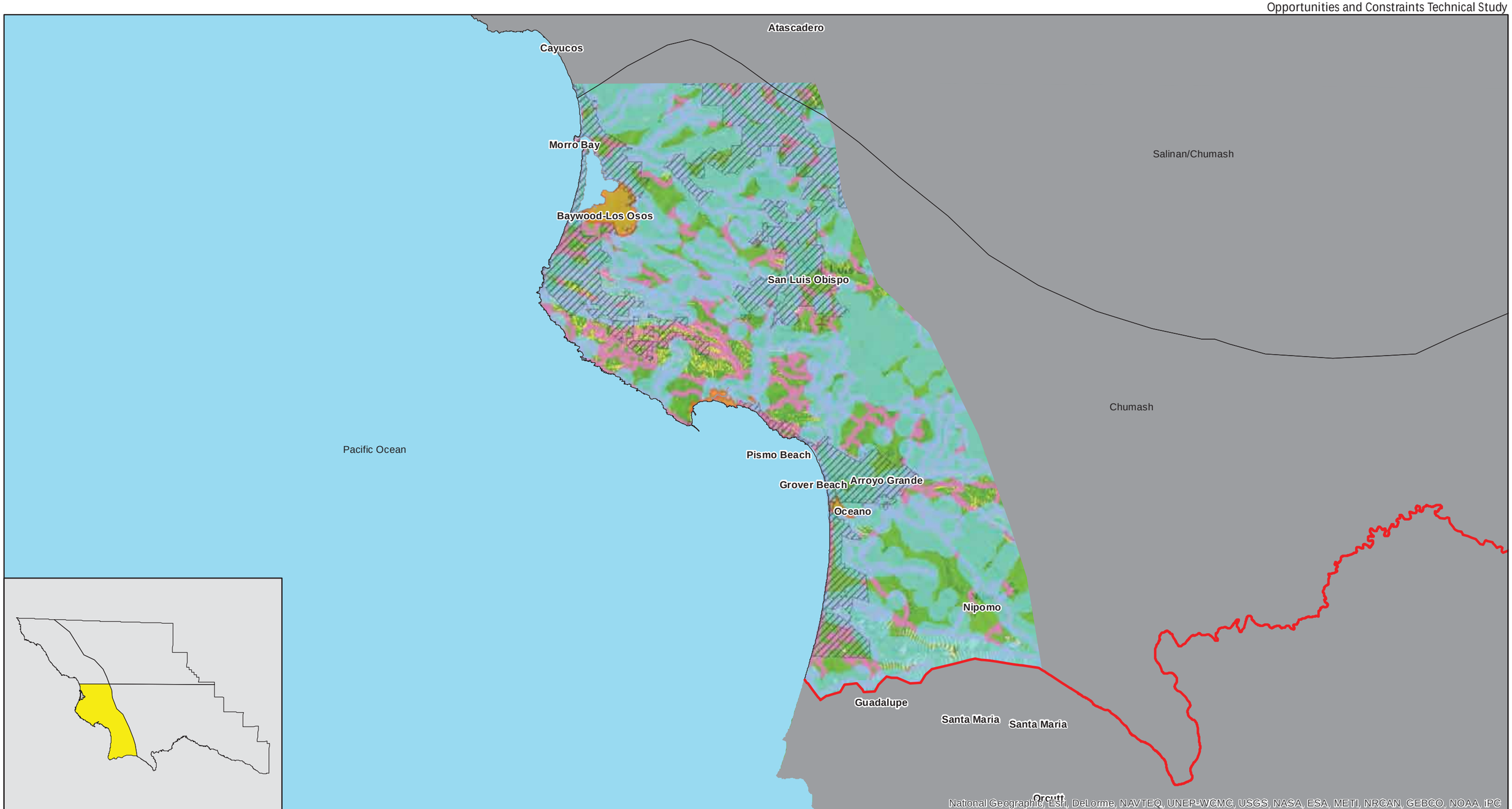
Percent Slope
0 - 16.1
16.1 - 40
40 - 49

Outside of Sub-Region
Areas not under County Jurisdiction
San Luis Obispo County Line

Souce: San Luis Obispo County, 2013; USGS, 2013

Figure 6.4-1a

San Luis Obispo County
Prehistoric Resource Sensitivity
Coastal Region - North



Aspen Environmental Group

0 5 10 Miles

Native American Tribal Boundary
SLO County-Designated Archaeological Sensitive Areas
800m buffer around significant water sources
200m buffer along vegetation boundaries

Percent Slope
0 - 16.1
16.1 - 40
40 - 49

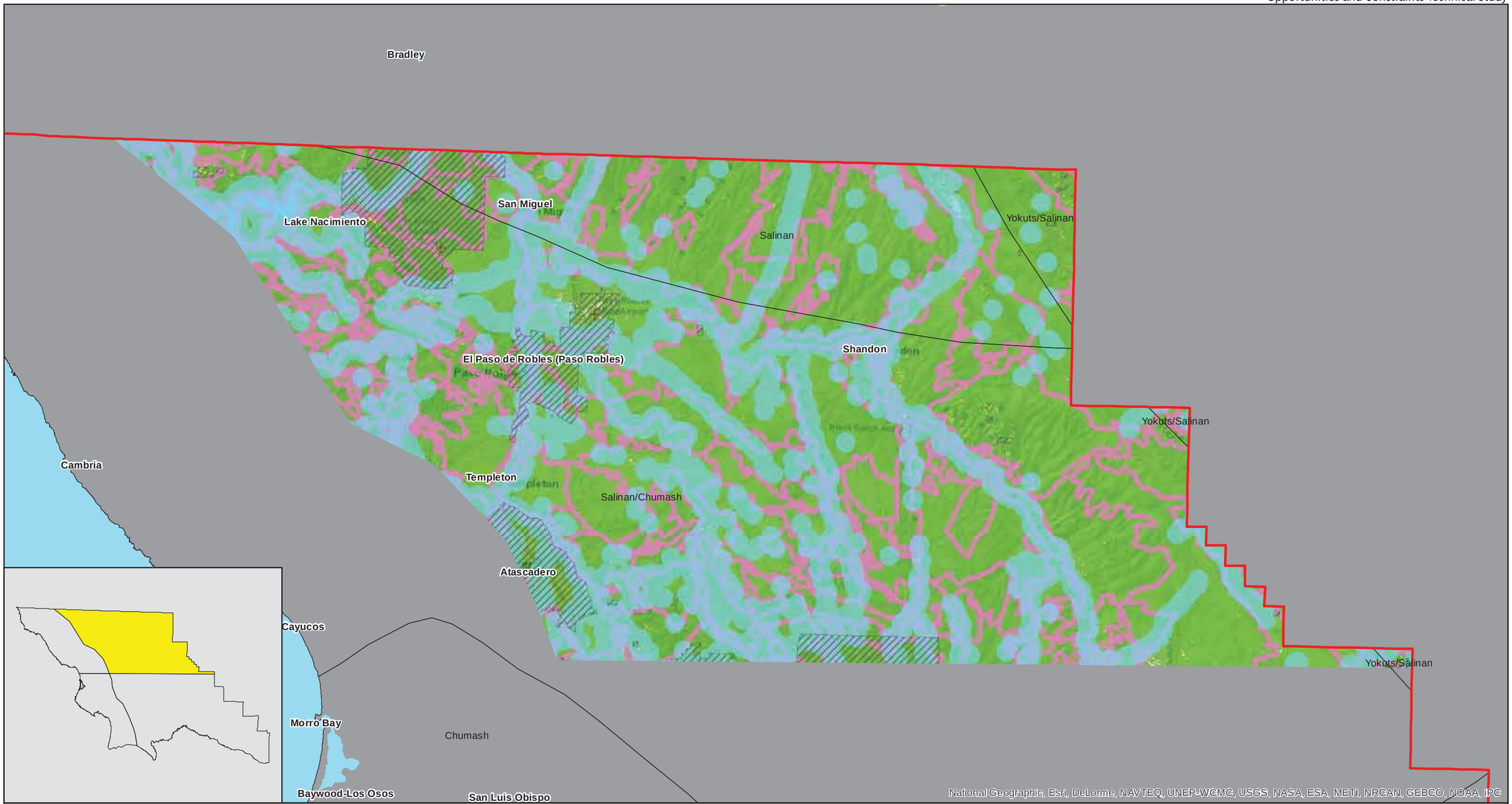
Outside of Sub-Region
Areas not under County Jurisdiction
San Luis Obispo County Line

Souce: San Luis Obispo County, 2013; USGS, 2013

Figure 6.4-1b

San Luis Obispo County
Prehistoric Resource Sensitivity
Coastal Region - South

Draft



Aspen Environmental Group

0 5 10 Miles

Native American Tribal Boundary
SLO County-Designated Archaeological Sensitive Areas
800m buffer around significant water sources
200m buffer along vegetation boundaries

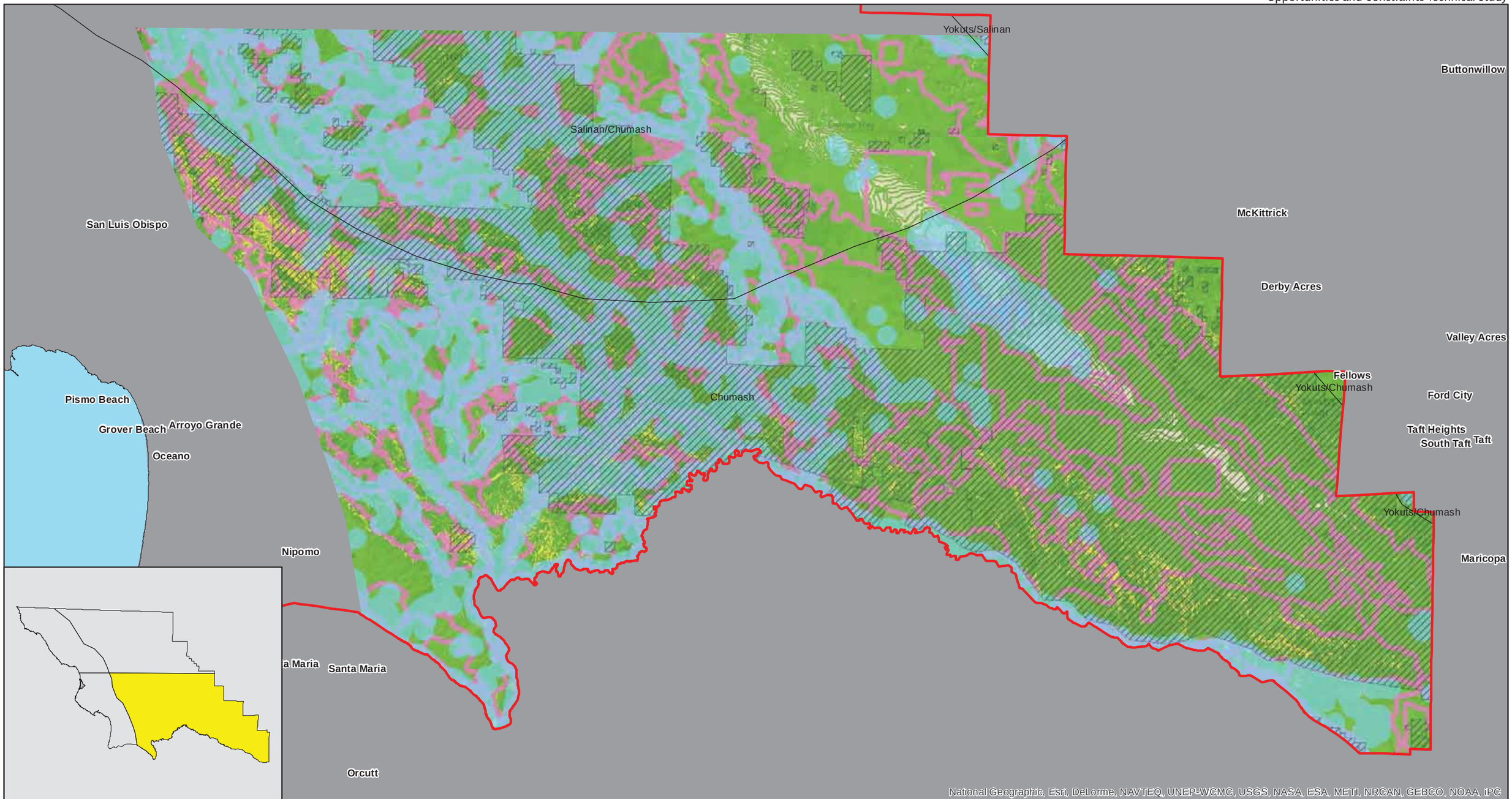
Percent Slope
0 - 16.1
16.1 - 40
40 - 49

Outside of Sub-Region
Areas not under County Jurisdiction
San Luis Obispo County Line

Souce: San Luis Obispo County, 2013; USGS, 2013

Figure 6.4-1c

San Luis Obispo County
Prehistoric Resource Sensitivity
Inland Region - North



Aspen Environmental Group

0 5 10 Miles

Souce: San Luis Obispo County, 2013; USGS, 2013

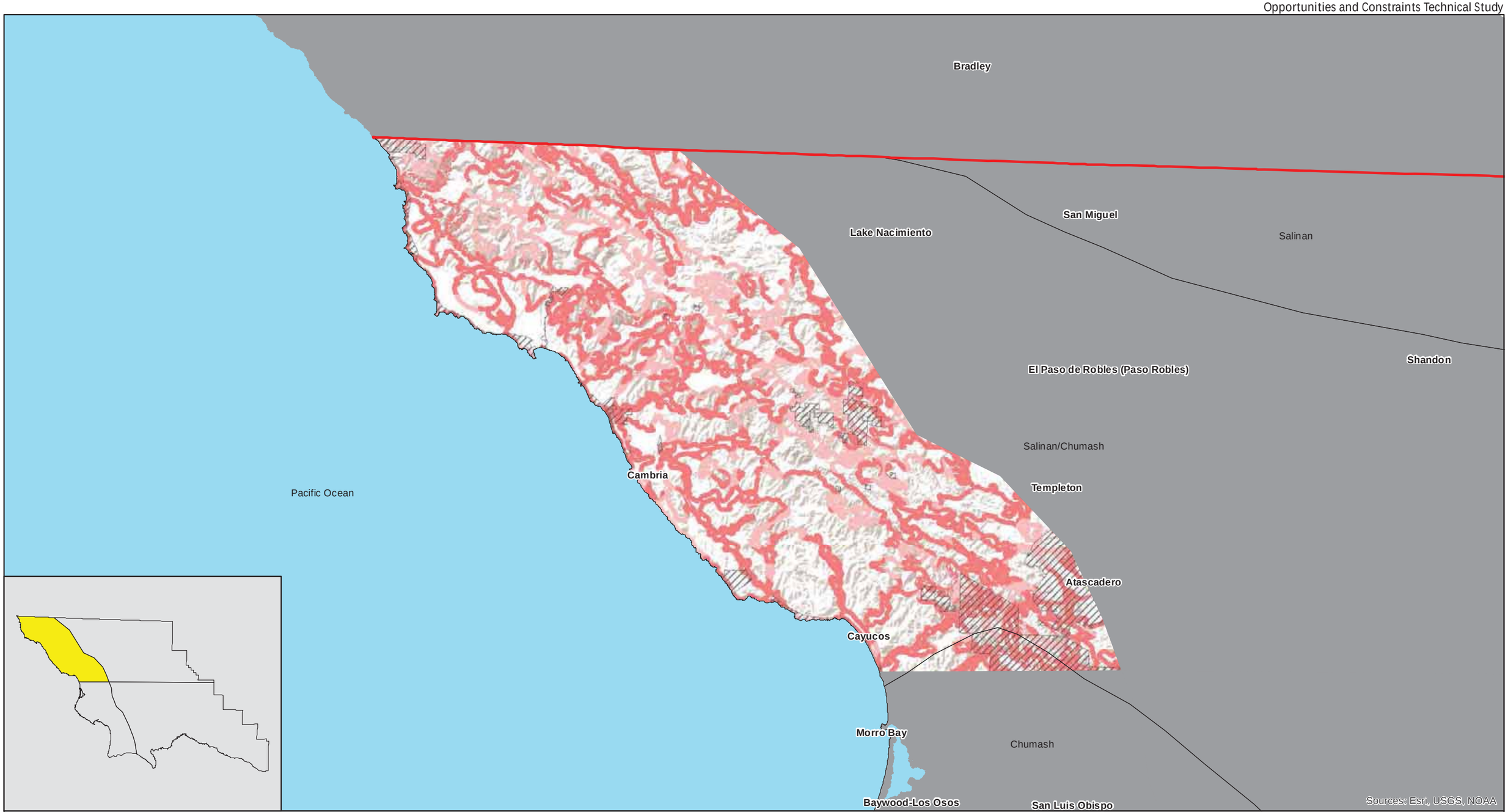
Native American Tribal Boundary
SLO County-Designated Archaeological Sensitive Areas
800m buffer around significant water sources
200m buffer along vegetation boundaries

Percent Slope
0 - 16.1
16.1 - 40
40 - 49

Outside of Sub-Region
Areas not under County Jurisdiction
San Luis Obispo County Line

Figure 6.4-1d

San Luis Obispo County
Prehistoric Resource Sensitivity
Inland Region - South



Aspen Environmental Group

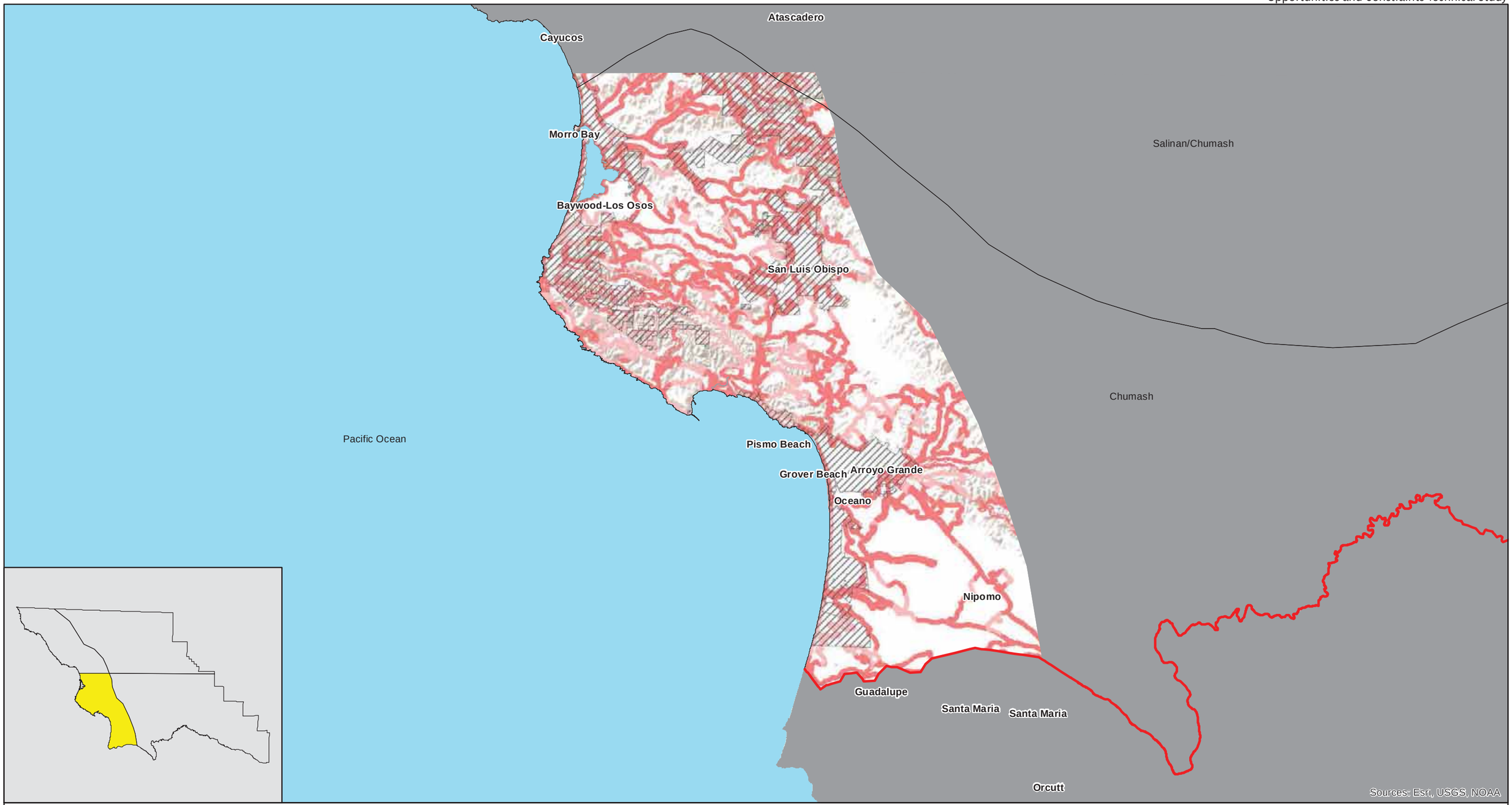
0 5 10 Miles

Areas of Prehistoric Archaeological Sensitivity
Ecotone-Low Slope Intersection
Native American Tribal Boundary
Outside of Sub-Region
Areas not under County Jurisdiction
San Luis Obispo County Line

Source: San Luis Obispo County, 2013; USGS, 2013; Aspen 2013

Figure 6.4-2a

San Luis Obispo County
Prehistoric Resource Sensitivity
Coastal Region - North



Aspen Environmental Group

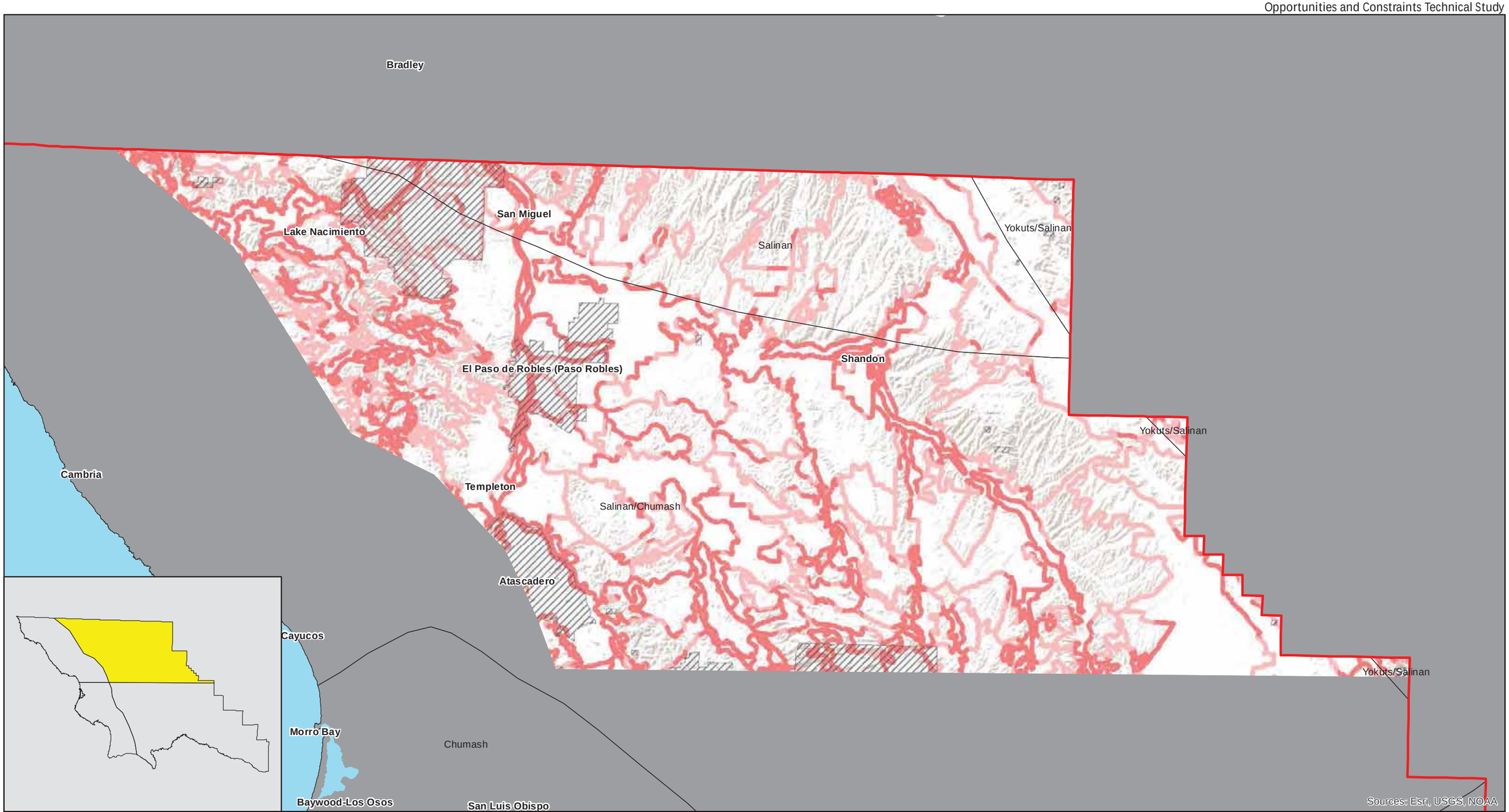
0 5 10 Miles

Source: San Luis Obispo County, 2013; USGS, 2013; Aspen 2013

Areas of Prehistoric Archaeological Sensitivity
Ecotone-Low Slope Intersection
Native American Tribal Boundary
Outside of Sub-Region
Areas not under County Jurisdiction
San Luis Obispo County Line

Figure 6.4-2b

San Luis Obispo County
Prehistoric Resource Sensitivity
Coastal Region - South



Aspen Environmental Group

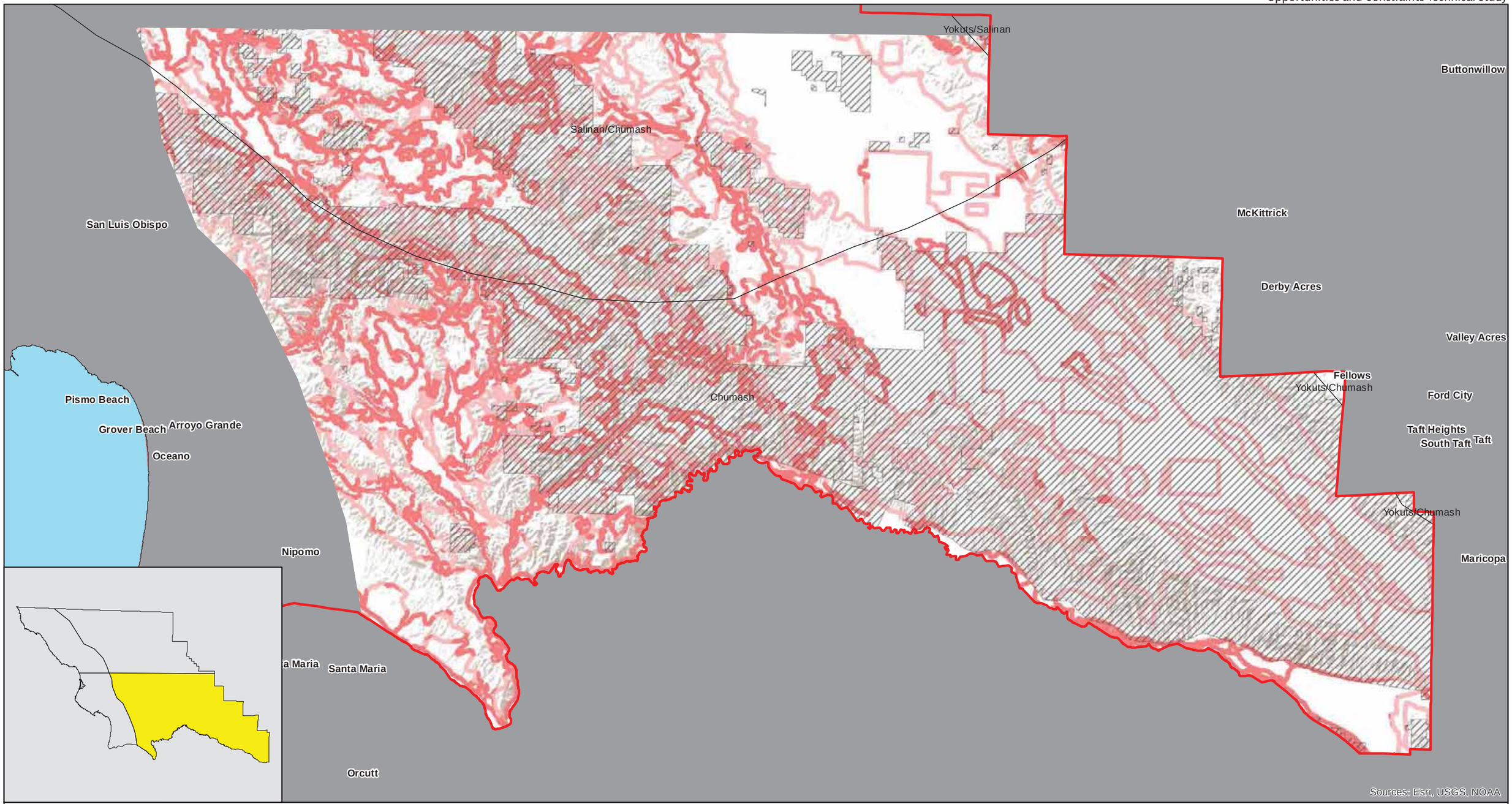
0 5 10 Miles

Source: San Luis Obispo County, 2013; USGS, 2013; Aspen 2013

Areas of Prehistoric Archaeological Sensitivity
Ecotone-Low Slope Intersection
Native American Tribal Boundary
Outside of Sub-Region
Areas not under County Jurisdiction
San Luis Obispo County Line

Figure 6.4-2c

San Luis Obispo County
Prehistoric Resource Sensitivity
Inland Region - North



Aspen Environmental Group

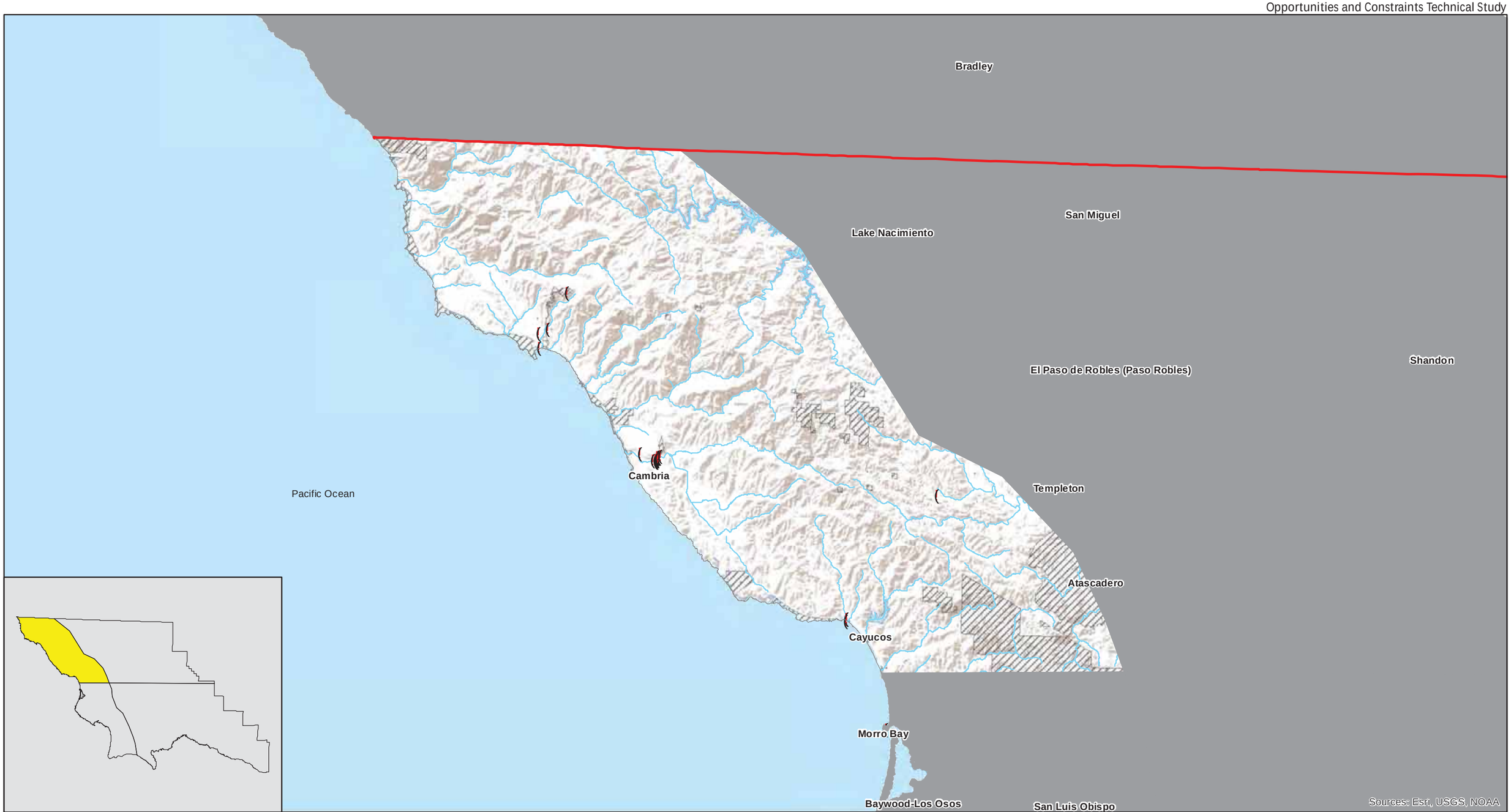
0 5 10 Miles

Areas of Prehistoric Archaeological Sensitivity
Ecotone-Low Slope Intersection
Native American Tribal Boundary
Outside of Sub-Region
Areas not under County Jurisdiction
San Luis Obispo County Line

Source: San Luis Obispo County, 2013; USGS, 2013; Aspen 2013

Figure 6.4-2d

San Luis Obispo County
Prehistoric Resource Sensitivity
Inland Region - South



Aspen Environmental Group

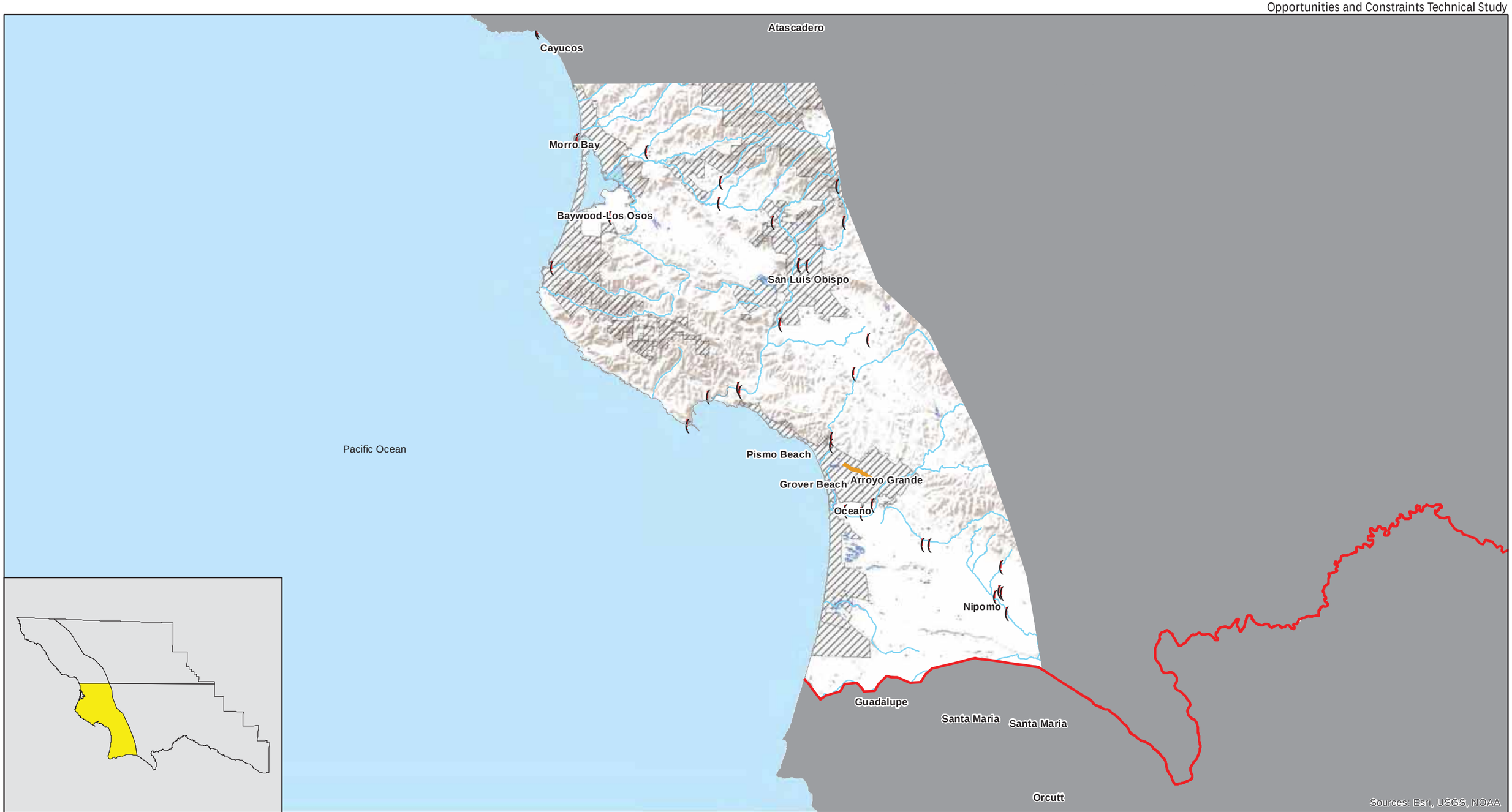
0 5 10 Miles

San Luis Obispo County Historic Point
El Camino Real
Named Stream
Waterbody
Outside of Sub-Region
Areas not under County Jurisdiction
San Luis Obispo County Line

Source: San Luis Obispo County, 2013; USGS, 2013

Figure 6.4-3a

San Luis Obispo County
Historic and Built Environment Resource Sensitivity
Coastal Region - North



Aspen Environmental Group

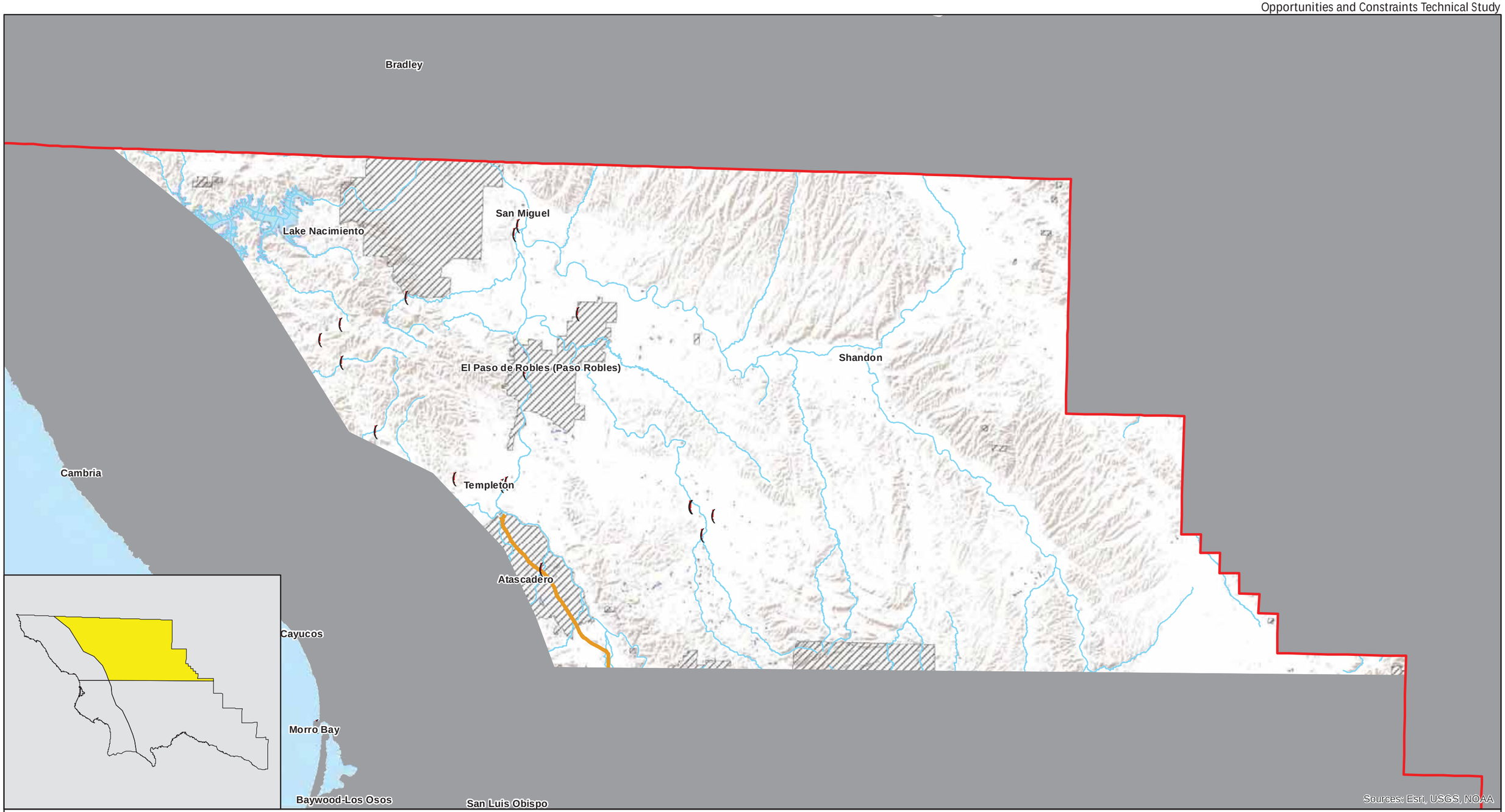
0 5 10 Miles

San Luis Obispo County Historic Point
El Camino Real
Named Stream
Waterbody
Outside of Sub-Region
Areas not under County Jurisdiction
San Luis Obispo County Line

Source: San Luis Obispo County, 2013; USGS, 2013

Figure 6.4-3b

San Luis Obispo County
Historic and Built Environment Resource Sensitivity
Coastal Region - South



Aspen Environmental Group

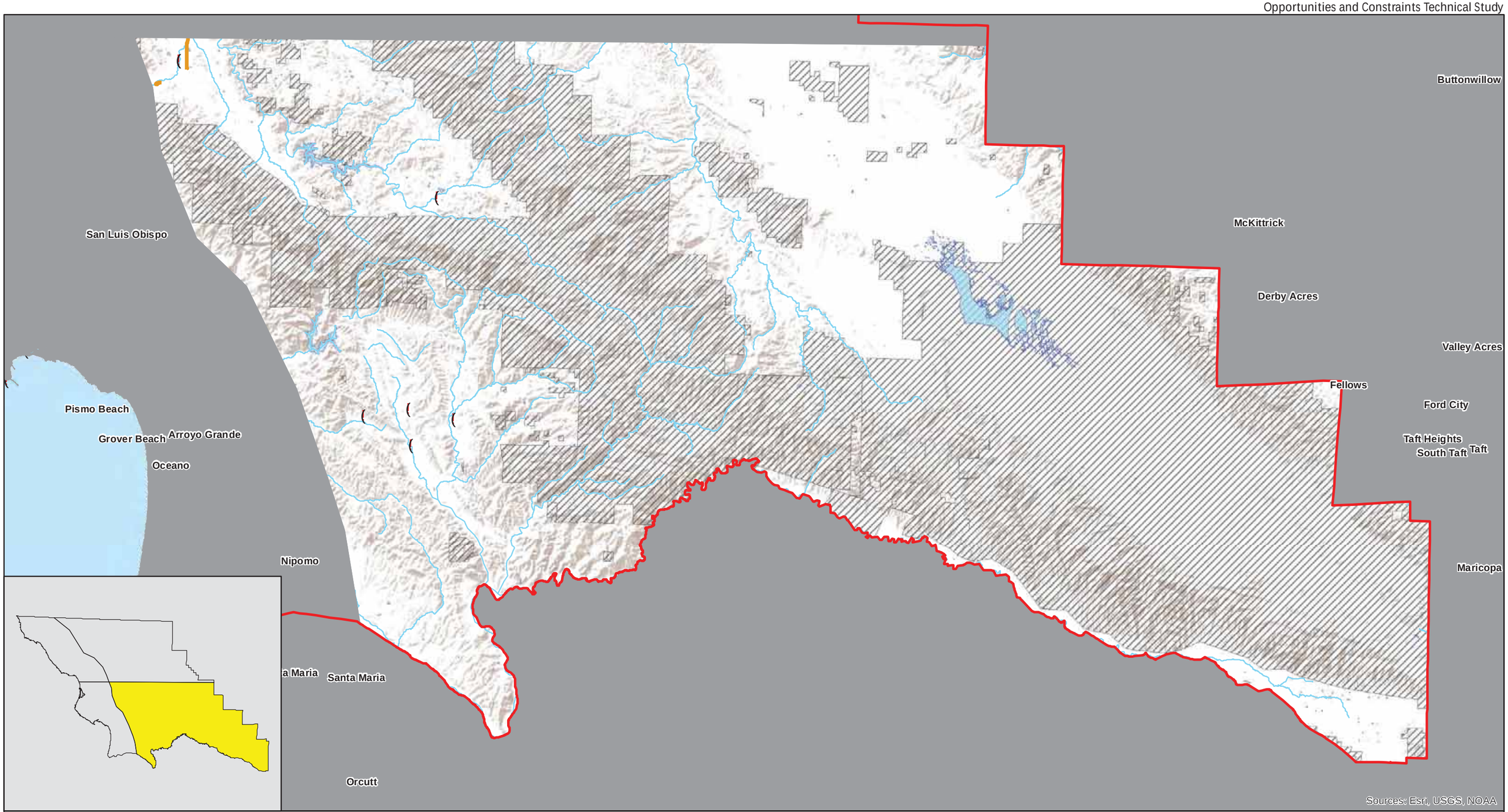
0 5 10 Miles

San Luis Obispo County Historic Point
El Camino Real
Named Stream
Waterbody
Outside of Sub-Region
Areas not under County Jurisdiction
San Luis Obispo County Line

Source: San Luis Obispo County, 2013; USGS, 2013

Figure 6.4-3c

San Luis Obispo County
Historic and Built Environment Resource Sensitivity
Inland Region - North



Aspen Environmental Group

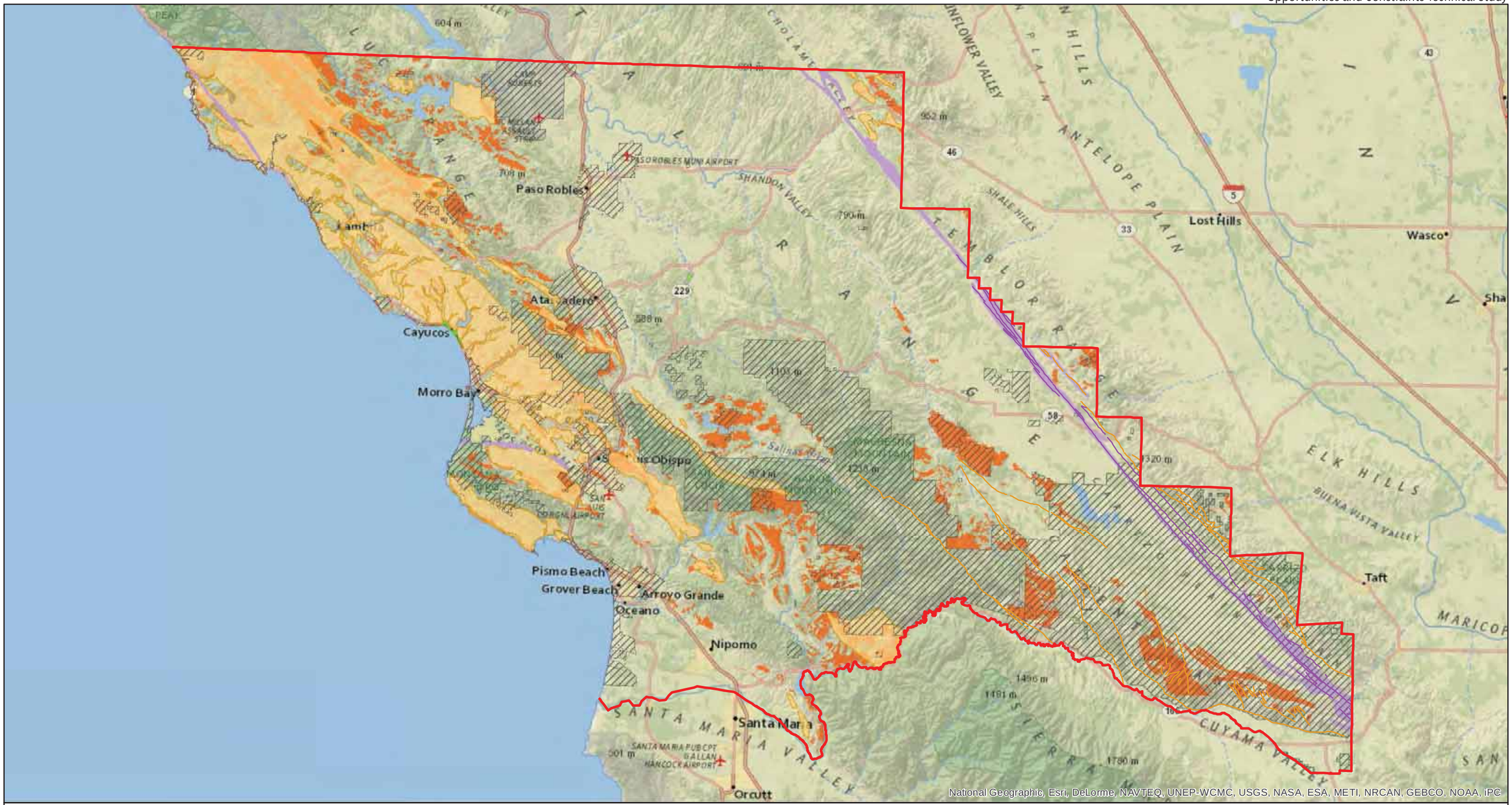
0 5 10 Miles

San Luis Obispo County Historic Point
El Camino Real
Named Stream
Waterbody
Outside of Sub-Region
Areas not under County Jurisdiction
San Luis Obispo County Line

Source: San Luis Obispo County, 2013; USGS, 2013

Figure 6.4-3d

San Luis Obispo County
Historic and Built Environment Resource Sensitivity
Inland Region - South



Aspen Environmental Group

0 7.5 15 Miles

Active Fault
Potentially Active Fault
Seismic Hazard Area
Landslide Risk Area
Liquefaction Risk Area
Rock Outcrop
Areas not under County Jurisdiction
San Luis Obispo County Line

Source: USDA/NRCS, 2013; San Luis Obispo County, 2013

Figure 6.5-1

San Luis Obispo County
Geologic Resources

Aspen Environmental Group

0 7.5 15 Miles

Re-Powering Screening Program

- AML
- California DTSC Cleanup Program
- Landfill Methane Outreach Program
- RCRA
- Superfund

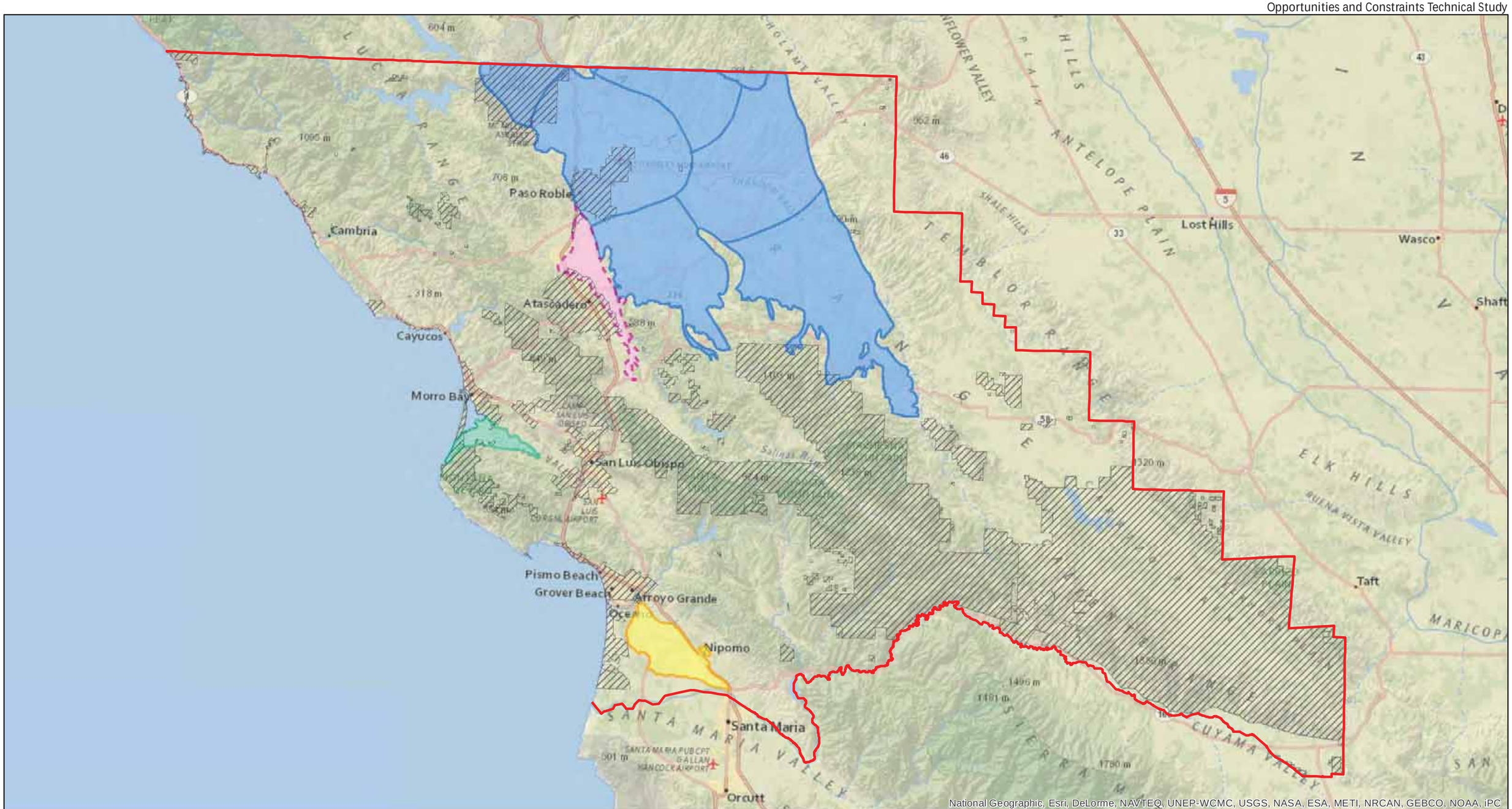
Source: EPA, 2013

Denotes project has been sited for:
1 = PV, Utility-scale and off-grid
2 = PV, Large-scale and off-grid
3 = Wind, Utility scale and off-grid
4 = Wind, Large-scale and off-grid
No # = Off-grid solar PV only

- Areas not under County Jurisdiction
- San Luis Obispo County Line

Figure 6.6-1

San Luis Obispo County
Hazards and Hazardous Materials



Aspen Environmental Group

0 7.5 15 Miles

Source: San Luis Obispo County, 2013

Certified Severity Index Level III
- Paso Robles Groundwater Basin
- Nipomo Mesa Water Conservation Area
- Los Osos Groundwater Basin

Certified Severity Index Level I
- Atascadero Sub-Basin
- Areas not under County Jurisdiction
- San Luis Obispo County Line

Figure 6.7-1

San Luis Obispo County
Groundwater Basins Severity Index

Aspen Environmental Group

0 7.5 15 Miles

Named Stream or River
Unnamed Stream
Waterbody
Wetland
Proposed Reservoir
Areas not under County Jurisdiction
San Luis Obispo County Line

Source: San Luis Obispo County, 2013; USGS, 2013

Figure 6.7-2

San Luis Obispo County
Hydrology and Water Quality Resources

Aspen Environmental Group

0 7.5 15 Miles

Source: FEMA, 2008

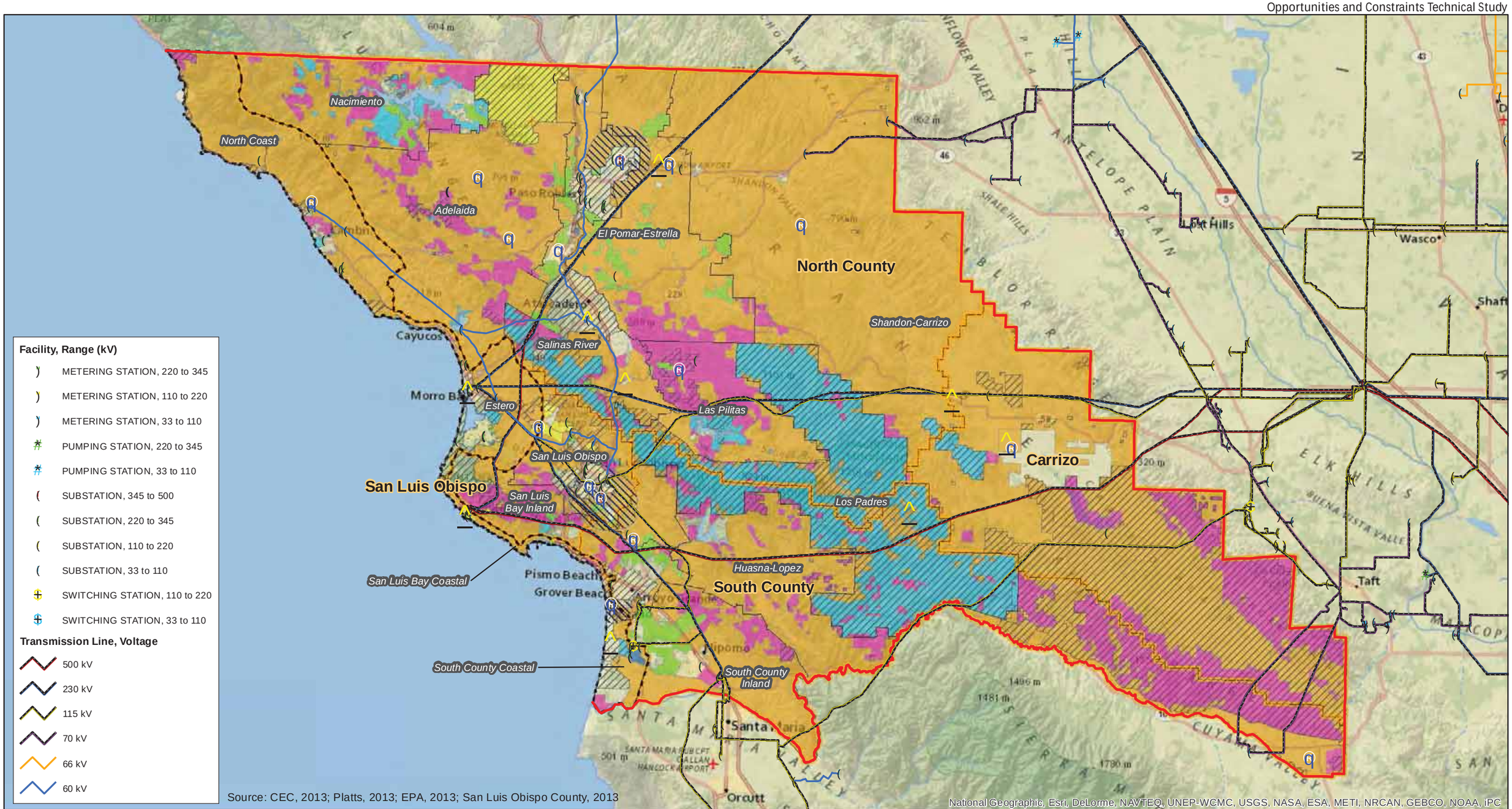
2008 FEMA Flood Zones

- 100-year flood
- 500-year flood

- Areas not under County Jurisdiction
- San Luis Obispo County Line

Figure 6.7-2

San Luis Obispo County
FEMA Flood Hazard Zones



Aspen Environmental Group

0 7.5 15 Miles

Power Plant (Platts, 2013)
Airport
Airport Review Area

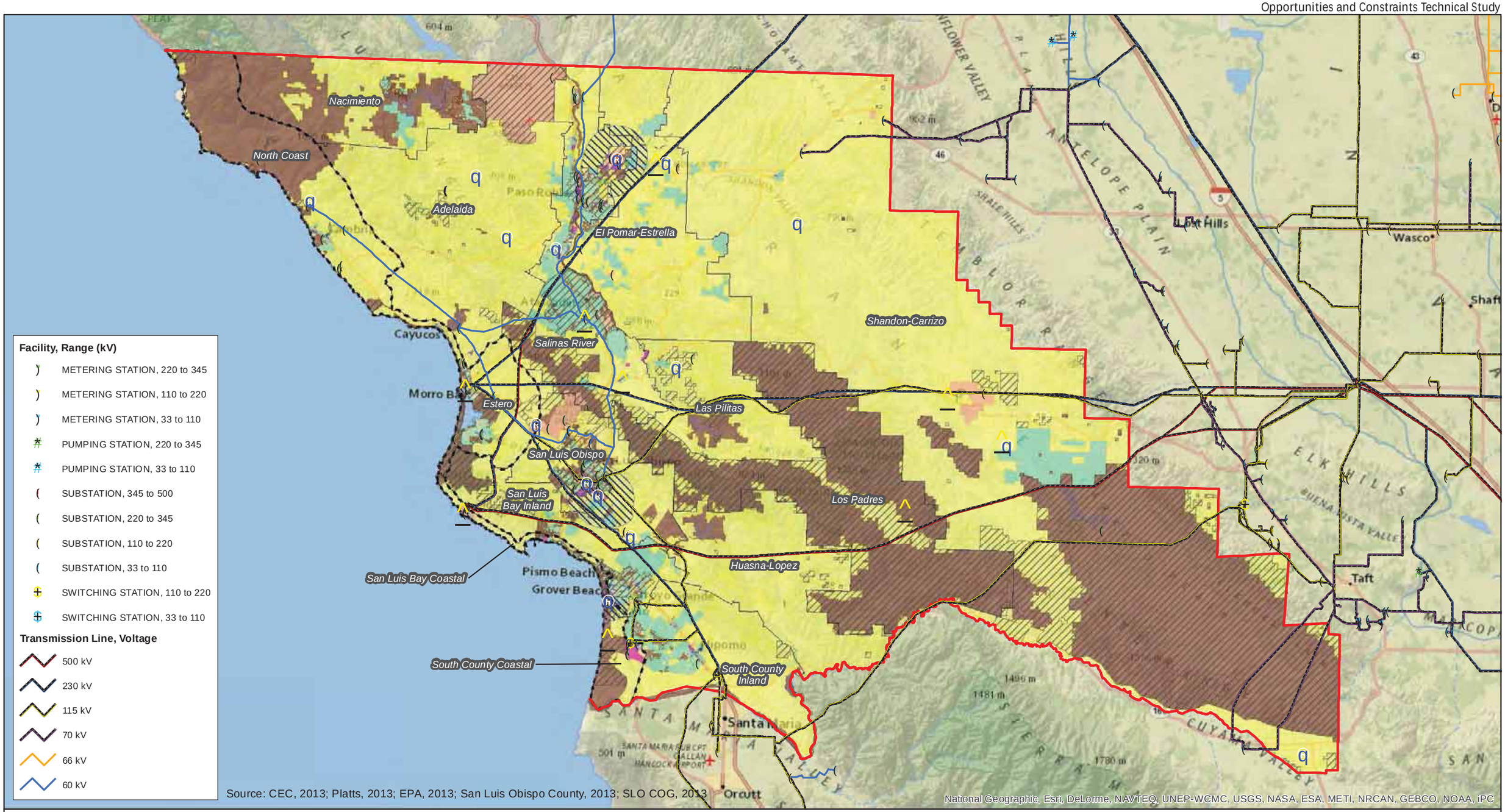
Re-Powering Screening Program
- AML
- California DTSC Cleanup Program
- Landfill Methane Outreach Program
- RCRA
- Superfund

Land Use Class
- AG
- CS
- IND
- OS
- PF
- RL
- RR

SLO County Local Coastal Plan Boundary
Existing Planning Area
Proposed Planning Area
Areas not under County Jurisdiction
San Luis Obispo County Line

Figure 6.8-1

San Luis Obispo County
Land Use Designations



Aspen Environmental Group

0 7.5 15 Miles

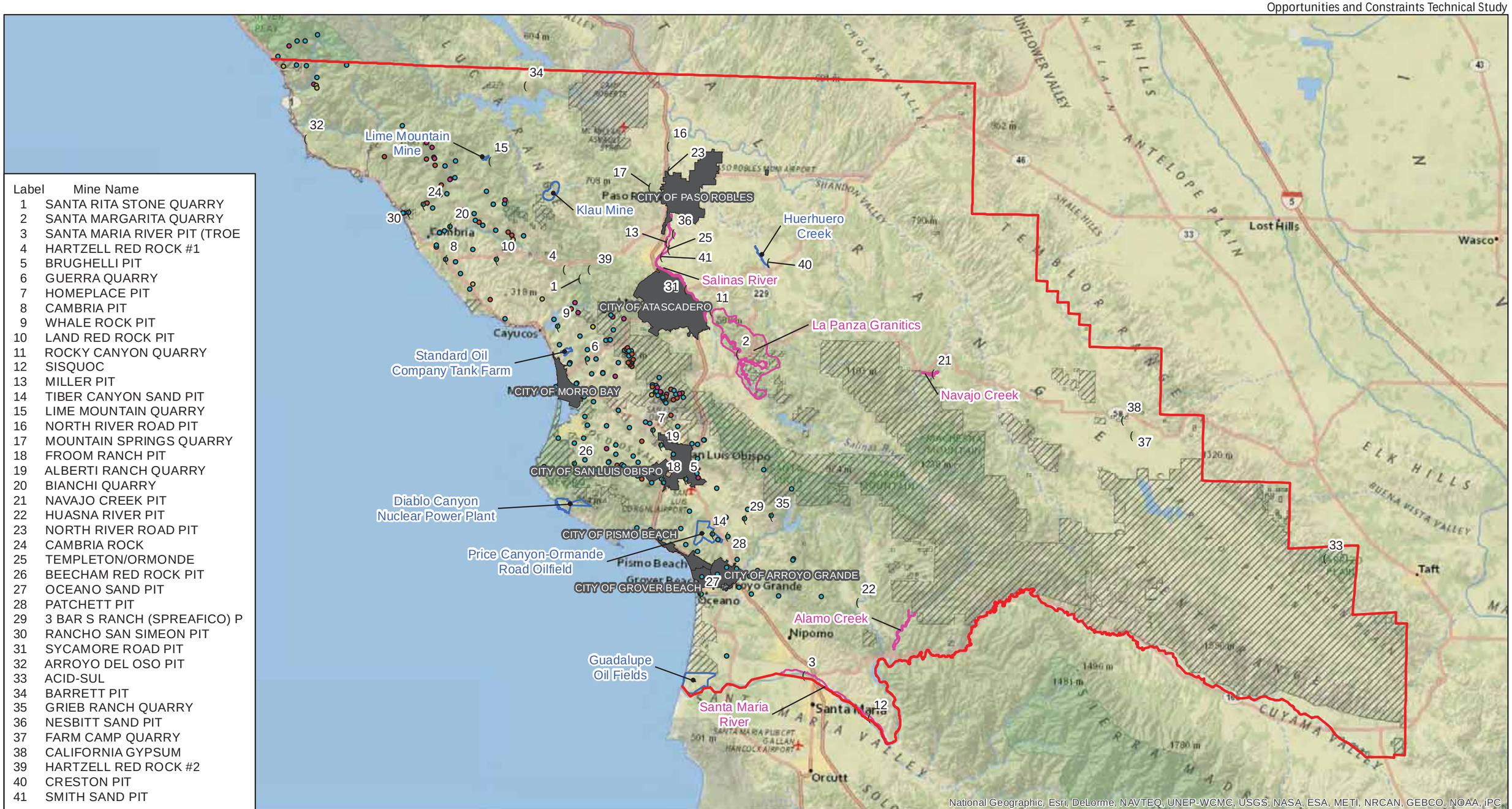
Power Plant (Platts, 2013)
Airport
Airport Review Area
SLO County Local Coastal Plan Boundary
Planning Area

Re-Powering Screening Program
- AML
- California DTSC Cleanup Program
- Landfill Methane Outreach Program
- RCRA
- Superfund

Generalized Land Use Class
- Agriculture
- Commercial
- Industrial - Heavy
- Industrial - Light
- Institutional and Public Facilities
- Mixed Use: Commercial/Residential/Public Facility
- Recreation, Open Space
- Residential
- Areas not under County Jurisdiction
- San Luis Obispo County Line

Figure 6.8-2

San Luis Obispo County
Existing Land Uses



Label	Mine Name
1	SANTA RITA STONE QUARRY
2	SANTA MARGARITA QUARRY
3	SANTA MARIA RIVER PIT (TROE
4	HARTZELL RED ROCK #1
5	BRUGHELLI PIT
6	GUERRA QUARRY
7	HOMEPLACE PIT
8	CAMBRIA PIT
9	WHALE ROCK PIT
10	LAND RED ROCK PIT
11	ROCKY CANYON QUARRY
12	SISQUOC
13	MILLER PIT
14	TIBER CANYON SAND PIT
15	LIME MOUNTAIN QUARRY
16	NORTH RIVER ROAD PIT
17	MOUNTAIN SPRINGS QUARRY
18	FROOM RANCH PIT
19	ALBERTI RANCH QUARRY
20	BIANCHI QUARRY
21	NAVAJO CREEK PIT
22	HUASNA RIVER PIT
23	NORTH RIVER ROAD PIT
24	CAMBRIA ROCK
25	TEMPLETON/ORMONDE
26	BEECHAM RED ROCK PIT
27	OCEANO SAND PIT
28	PATCHETT PIT
29	3 BAR S RANCH (SPREAFICO) P
30	RANCHO SAN SIMEON PIT
31	SYCAMORE ROAD PIT
32	ARROYO DEL OSO PIT
33	ACID-SUL
34	BARRETT PIT
35	GRIEB RANCH QUARRY
36	NESBITT SAND PIT
37	FARM CAMP QUARRY
38	CALIFORNIA GYPSUM
39	HARTZELL RED ROCK #2
40	CRESTON PIT
41	SMITH SAND PIT

Aspen Environmental Group

0 8 16 Miles

(County Mines

EPA Mines - Type

- GEOTHERMAL
- PLACER
- SURF-UNDERG
- SURFACE
- UNDERGROUND
- UNKNOWN

Energy Extractive Area *

Energy Extractive Resource Area **

City Limits

Areas not under County Jurisdiction

San Luis Obispo County Line

* Active mines containing mineral deposits of statewide significance
** Existing or proposed oil, gas, or mineral extraction, or existing or proposed energy-producing facilities

Figure 6.9-1

San Luis Obispo County Mineral Resources

Draft