

Appendix C

Avoidance and Minimization Measures

Appendix C. Avoidance and Minimization Measures

Tables Ap.C-1 (Applicant Proposed Avoidance and Minimization Measures) and Ap.C-2 (Pacific Gas and Electric Avoidance and Minimization Measures) list the avoidance and minimization measures (AMMs) that have been considered by Aera, PG&E, and SoCalGas within the design of the Project, electrical interconnection and natural gas pipeline, respectively, in order to reduce impacts.

Table Ap.C-1. Applicant Proposed Avoidance and Minimization Measures	
Number	Measure
Air Quality	
AQ-1	<p>Short-Term Construction Emissions.</p> <ul style="list-style-type: none"> a. During construction, use water trucks or sprinkler systems to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. The Project should water exposed unpaved traffic areas two to three times per day or as needed, and with increasing frequency when wind speed exceeds 15 miles per hour. Reclaimed water should be used if available and practicable. Soil binders may be used instead of water if practical. The amount of disturbed area will be minimized. Vehicle speeds on unpaved roads will be limited to 15 miles per hour or less. If stockpiling of fill material is required, soil stockpiled for more than two days will be covered, kept moist, or treated with soil binders to mitigate dust generation. Trucks transporting fill material to and from the site will be covered with a tarp from the point of origin, and at least six inches of freeboard space to the top of the container will be maintained. Gravel pads or shakers will be installed at external access points to prevent tracking mud onto public roads. After clearing, grading, earth moving, or excavation is completed, disturbed areas will be watered, re-vegetated, or otherwise controlled to mitigate dust generation. b. All non-exempt portable diesel-powered construction equipment will be registered with the state's portable equipment registration program OR will obtain a Santa Barbara County Air Pollution Control District permit. Fleet owners of mobile construction equipment are subject to the California Air Resource Board Regulation for In-use Off-road Diesel Vehicles (Title 13 California Code of Regulations, Chapter 9, § 2449), the purpose of which is to reduce diesel particulate matter and criteria pollutant emissions from in-use (existing) off-road diesel-fueled vehicles. For more information, please refer to the California Air Resources Board website at www.arb.ca.gov/msprog/ordiesel/ordiesel.htm. All commercial diesel vehicles are subject to Title 13, § 2485 of the California Code of Regulations, limiting engine idling time. Idling of heavy-duty diesel construction equipment and trucks during loading and unloading will be limited to five minutes; electric auxiliary power units will be used whenever possible. c. Diesel construction equipment will meet the California Air Resources Board Tier 4 Final emission standards for off-road heavy-duty diesel engines.
AQ-2	<p>Long-Term Operational Emissions.</p> <ul style="list-style-type: none"> a. During operations, use of water trucks or sprinkler systems to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. The Project should water exposed unpaved traffic areas three times per day unless conditions do not warrant such frequency (e.g. during rainy conditions, when the soil is otherwise moist, or when soil stabilizers are effectively eliminating the need for water applications in order to control dust), and with increasing frequency when wind speed exceeds 15 miles per hour. Reclaimed water should be used if available and practicable. Apply soil stabilizers once per month unless conditions do not warrant such frequency (e.g. when previously applied soil stabilizers are continuing to work effectively to control dust). The amount of disturbed area will be minimized. Vehicle speeds on unpaved roads will be limited to 15 miles per hour or less. b. In accordance with Santa Barbara County and Santa Barbara County Air Pollution Control District requirements, Aera will provide the required emission reduction credits for stationary source pollutants. c. Operation and Maintenance equipment will meet the California Air Resources Board Tier 4 Final emission standards for off-road heavy-duty diesel engines d. Emissions will be mitigated to less than significant or to the greatest extent feasible, if less than significant cannot be achieved.

Table Ap.C-1. Applicant Proposed Avoidance and Minimization Measures	
Number	Measure
AQ-3	<p>Odors.</p> <ul style="list-style-type: none"> a. In order to mitigate odor releases from tanks due to hatch release, Aera will set up the vapor recovery system to notify the operator when the tank pressure is within ten percent of the tank relief pressure. Additionally, personal hydrogen sulfide monitors and wind socks that will be deployed onsite for employee safety will further mitigate the risk of objectionable odors leaving the Project site. b. The operator will develop an Odor Minimization Plan which will address potential odors from oil field equipment and measures to reduce or eliminate these odors. The Plan will address issues such as facility information, buffer zones, signs with contact information, logs of odor complaints, protocol for handling odor complaints and odor event investigation and methods instituted to prevent re-occurrence.
AQ-4	<p>Greenhouse Gas Emissions. Aera will implement a program to quantify, and where practicable and feasible, to reduce emissions. Operational stationary and mobile greenhouse gas emissions levels (including achieved reductions) will be quantified and reported to the California Air Resources Board as required. Greenhouse gas emissions exceeding the Santa Barbara County CEQA Greenhouse Gas significance threshold will be reduced, where practicable and feasible, through onsite reductions and/or offsite reduction programs approved by the County. Emissions off-sets or purchases required to satisfy California Assembly Bill 32 requirements will be completed according to the California Air Resource Board Cap-and-Trade Program requirements.</p>
Hazardous Materials/Risk of Upset	
HAZ-1	<p>Aera Environmental Health and Safety Program. During construction and operation of the facilities, Aera will be responsible for implementation of a site-specific Environmental Health and Safety Program. The program will include training to orient workers and contractors to the safety procedures that are to be implemented on-site.</p>
HAZ-2	<p>Built-In Safety Devices. The design and engineering of the facilities will include control systems to be installed on applicable equipment, piping, valves, tanks, etc. Aera will maintain records documenting that all facilities are built to specification and that all temporary systems equipped with safety devices are functional.</p>
HAZ-3	<p>Inspection and Maintenance Program. Aera will implement an inspection and maintenance program during Project operations to assure good operating condition and inspected and tested at regular intervals in accordance with California Department of Conservation Division of Oil, Gas and Geothermal Resources (Assembly Bill 1960) requirements and good oilfield practices. Records showing the present status and history of each well safety device installed will be maintained by Aera personnel, including dates, details and the results of inspections, tests and repairs. These records will be kept on-site for documentation and reference purposes.</p>
HAZ-4	<p>Emergency Response Plan. Prior to operations on-site, a site-specific Emergency Response Plan will be developed by Aera in order to provide for the safety of employees, customers, and the general public, as well as the protection of property in the event of a major emergency. The Emergency Response Plan will include detailed measures regarding response procedures and required notifications to 911, the Santa Barbara County Hazardous Materials Unit, the State Office of Emergency Services and all personnel working at the facility at the time in the event of a hazardous materials release/emergency shut-down. In accordance with the Emergency Response Plan, Aera personnel will inspect and maintain records of emergency response equipment at regular intervals to ensure that equipment is available and in good working order. These records will be kept on-site for documentation and reference purposes.</p>
HAZ-5	<p>Operational Hazardous Materials Management/Transportation (Business) Plan. A site-specific Operational Hazardous Materials Management/Transportation (Business) Plan will be developed by Aera to comply with State and Federal regulations contained within the Resource Conservation and Recovery Act policies. The Business Plan will specify liquid and solid waste handling procedures for personnel responsible for handling or hauling materials and wastes generated on-site. The Business Plan will be routed to the Santa Barbara County Environmental Health Services for review prior to Project operations.</p>

Table Ap.C-1. Applicant Proposed Avoidance and Minimization Measures	
Number	Measure
HAZ-6	Spill Contingency Plan. In accordance with Assembly Bill 1960, prior to operations on-site Aera will develop a site-specific Spill Contingency Plan. The Spill Contingency Plan will include information such as emergency contact telephone numbers, available personal safety equipment, a quick action checklist for use during initial stages of a spill response and a list of required local, State and Federal agency notifications. Additionally, the plan will include a map of the production facilities which will label and identify tanks, equipment, pipelines, access roads for emergency response, sumps and catch basins, and volume of tanks and storage containers. Further, a list will be provided of all chemicals for which a Material Safety Data Sheet are required and their location. In accordance with the Spill Contingency Plan, Aera personnel will maintain records of spill response equipment at regular intervals to ensure that equipment is available. These records will be kept on-site for documentation and reference purposes.
HAZ-7	Spill Prevention, Control, & Countermeasures Plan. As outlined within Code of Federal Regulations 40 Section 112.9 (Spill Prevention, Control, and Countermeasure Plan Requirements for onshore oil production facilities) and Section 112.10 (Spill Prevention, Control, and Countermeasure Plan requirements for onshore oil drilling and workover facilities), prior to operations on-site Aera Energy LLC will develop a Spill Prevention Control and Countermeasures to mirror the Spill Contingency Plan and include specific prevention controls included within the design of the facility to ensure that potential releases will not flow into waterways. Aera Energy LLC will conduct regular inspections of these drainages. Aera Energy LLC will maintain records documenting the results of these inspections. The plan will also include countermeasures in the planning stages as far as engineering controls where adequate containment of an oil release will be provided. Additionally, the plan will address and document the regularity of inspections to verify that the equipment is functioning properly and make repairs promptly as necessary.
HAZ-8	Beneficial Re-use Plan. In order to address on-site and off-site reuse of petroleum-hydrocarbon containing soil encountered during initial grading and site preparation activities, Aera has developed a Beneficial Re-use Plan (Appendix K). At each Re-Use Source Site, excavated soil with total petroleum hydrocarbon concentrations in excess of concentrations specified by the Santa Barbara County Environmental Health Services Lease Restoration Program, will be either transported and processed on-site at the Re-Use Site for preparation for use as on-site road material, transported to Aera Energy LLC's Belridge road-mix facility for re-use, or disposed off-site at the Santa Maria Regional Landfill under the Non-Hazardous Impacted Soil program.
HAZ-9	Vehicle Impact Protection. Vehicle impact protection will be installed at piping as needed and at well sites in order to prevent unanticipated release of materials during loading/unloading.
HAZ-10	Loading/Unloading Supervision. Truck flow and loading rack supervision will be required by Aera for loading and unloading of crude oil.
HAZ-11	Site Security. Aera will provide site security and video surveillance of the Project site.

Table Ap.C-1. Applicant Proposed Avoidance and Minimization Measures	
Number	Measure
Water Resources	
WATER-1	<p>Spill Prevention, Control, and Countermeasures Plan and Storm Water Pollution Prevention Plan. The Project will comply with approved facilities-approved Spill Prevention, Control, and Countermeasures Plan, and the Project-specific construction Storm Water Pollution Prevention Plan, including:</p> <ol style="list-style-type: none"> All fueling of vehicles and heavy equipment will occur in designated areas. Designated areas will include spill containment devices (e.g., drain pans) and absorbent materials to clean up spills; Vehicles and equipment will be maintained properly to prevent leakage of hydrocarbons and other fluids. Vehicle engine maintenance will occur in designated areas, which will include spill containment devices and absorbent materials to clean up spills; Any accidental spill of hydrocarbons or other fluids that may occur at the work site will be cleaned immediately. Spill containment devices and absorbent materials will be maintained on the work site for this purpose. The Governor's Office of Emergency Services will be notified immediately in the event of a reportable quantity accidental spill to ensure proper notification, clean up, and disposal of waste; Waste and debris generated during construction will be stored in designated waste collection areas and containers away from drainage features, and will be disposed of regularly; Convenient, portable sanitary/septic facilities will be provided during construction activities. These facilities will be well maintained and serviced, and wastes will be treated and disposed of in accordance with state and local requirements; Storm water pollution prevention best management practices will be used around the construction area perimeters during construction and around any construction operations that could potentially generate storm water pollution, according to the project specific construction storm water best management practice plan, or surface water quality management plan, as required; Runoff will be conveyed to prevent erosion from slopes and channels and directed to Project detention basins; and Disturbed slopes will be re-vegetated with appropriate native or drought tolerant vegetation. A Storm Water Pollution Prevention Plan will be implemented for all applicable Project activities. Erosion and sediment controls (e.g., silt fences, straw wattles, mulching, and hydroseeding) will be installed properly and maintained regularly. Other Best Management Practices will also be implemented as necessary and/or as required by Project permits
WATER-2	<p>Channel Crossings. Permanent channel crossings will be stabilized and energy dissipaters such as rip rap will be used at the outlet of storm drains, culverts or channels that enter unlined channels to minimize erosion potential.</p>
WATER-3	<p>DOGGR Permits. The Project will produce non-potable water from the relatively high salinity hydrocarbon-bearing upper Sisquoc formation sands as a water source for steam production and then re-inject that water back into the formation following separation from other produced fluids. Aera Energy LLC will coordinate with the California Division of Oil, Gas, and Geothermal Resources Underground Injection Control program to obtain any required permits for that activity.</p>
Biological Resources	
BIO-1	<p>Agency Permitting. Prior to the Project component's initiation of activities requiring permit coverage, all applicable permits, including California Department of Fish and Wildlife, U.S. Army Corps of Engineers, Regional Water Quality Control Board, and Santa Barbara County permits, will be obtained, as necessary. Avoidance, minimization, and/or mitigation measures required by these agencies will be incorporated into the Project.</p>
BIO-2	<p>Oak Tree Protection. The Project Oak Tree Protection Plan, provided within Appendix F-1.M, will be submitted to the County for review and approval. The approved Plan will be incorporated into the Project. At no time will oak trees be removed as part of off-site natural gas pipeline or electrical transmission line activities. A certified arborist will oversee trimming of oak tree limbs that have the potential to be impacted as a result of vehicle or equipment usage associated with off-site activities.</p>

Table Ap.C-1. Applicant Proposed Avoidance and Minimization Measures	
Number	Measure
BIO-3	<p>Oak Tree Replacement. The Project will implement an Oak Tree Replacement Plan for oak trees that will be removed. The Project Oak Tree Replacement Plan, provided in Appendix F-1.N, will be submitted to Santa Barbara County for approval. Following approval, the Plan will be implemented to mitigate oak tree removals. The Plan prescribes that each removed mature live oak tree six inches in diameter at breast height or greater than, will be mitigated using any combination of the following replacement alternatives:</p> <ol style="list-style-type: none"> a. For every mature live oak tree removed, ten acorns or ten one gallon saplings or smaller containers that support a longer taproot, will be planted within the Planting Area. Saplings may include those salvaged from the Project disturbance areas (10:1 - acorns or young saplings), and/or b. For every mature live oak tree removed, three 15 gallon saplings will be planted within the Planting Area (3:1 - 15 gallon saplings), and/or c. For every mature live oak tree removed, ten naturally occurring oak tree saplings between six inches and six feet tall will be protected and nurtured within Planting Area or in the Project site (10:1 - sapling/nurture trees), and/or d. Mature oak trees identified within the Project disturbance area and proposed for removal, will be transplanted to the Planting Area in order to salvage the tree. (1:1 - transplanted mature oak trees), and/or e. Some portion of off-site planting and nurturing, in other conservation or restoration areas such as La Purisima, or in burn areas of public lands, as agreed to by the County, may also be considered as mitigation for on-site removals.
BIO-4	<p>Dust Control Measures. During construction activities and periods of high vehicle/equipment traffic along unpaved roads and work areas, dust control methods to minimize dust impacts to surrounding vegetation will be implemented for all on-site and off-site Project activities, as necessary. Dust control methods include, but are not limited to, the following:</p> <ol style="list-style-type: none"> a. Light water spray or soil stabilizer application on stockpiles; b. Watering or stabilizing soil on vehicle movement surface areas to prevent the generation of fugitive dust; c. Reducing vehicle speed; and d. Suspending earth moving or other dust-producing activities during periods of high winds or when dust control measures are not able to prevent visible dust plumes.
BIO-5	<p>Fuel Management Plan. The Fuel Management Plan for the Project site, provided as Appendix F-1.A, will be submitted to the County for review and approval. The approved Plan will be incorporated into the Project and implemented by Aera Energy.</p>
BIO-6	<p>Environmental Sensitivity Orientation. A Project-specific environmental sensitivity orientation will be prepared for the Project and each project component (i.e., natural gas pipeline, electrical transmission lines) by a biologist familiar with the Project region and incorporated into site-specific training that will be required for Project personnel working on-site. The purpose of the orientation is to educate Project personnel on local special-status wildlife species that may occur within the Project area and to provide an overview of the avoidance and minimization measures to be adhered to during the Project. In addition, personnel will be briefed on the reporting process in the event that an inadvertent injury should occur to a special-status species during construction or operations.</p>
BIO-7	<p>Delineation of Project Disturbance Limits. Prior to initial grading or construction, Project disturbance limits will be delineated in the field, under the guidance of a qualified biologist, using high visibility fencing or flagging to avoid impacts to special-status plant populations and other adjacent sensitive habitat areas. The use of heavy equipment and vehicles will be limited to the proposed work areas, existing roadways, and defined staging areas/access points.</p>

Table Ap.C-1. Applicant Proposed Avoidance and Minimization Measures

Number	Measure
BIO-8	<p>Pre-Activity Surveys.</p> <p><i>Project site.</i> Pre-activity surveys will be conducted prior to initial grading, excavation, and vegetation removal activities within two weeks of planned work. Pre-activity surveys will be completed by a qualified biologist experienced with regional wildlife and plant species. These surveys will consist of the following activities:</p> <ol style="list-style-type: none"> a. Woodrat nest destruction using hand tools to knock down nests and deter animals out of the immediate work area. Woodrat nest destruction will first be approved by the California Department of Fish and Wildlife by written or verbal approval; b. Large burrows in which display signs of badger or owls, will be, scoped, and dusted around the entrance for three consecutive days to determine if the burrow is active. All active and non-active American badger burrows will be avoided to the greatest extent possible; however, if the burrow cannot be avoided and the burrow is active, then the burrow will be closed by collapsing the soil around the entrance to deter the badgers out of the work area. If the burrow is an active natal den during the breeding season (February through August), then that burrow will be avoided until the pups have grown and left the burrow. All active burrowing owl burrows will be avoided within a 300 foot buffer. The California Department of Fish and Wildlife will be contacted to determine additional minimization measures for natal dens, if necessary. In the event a burrow is being used by a burrowing owl, the burrow will be avoided until the California Department of Fish and Wildlife is notified to determine appropriate avoidance and minimization measures; c. Biologists will place cover boards in the work area to attract reptiles using the area. The cover boards will be checked immediately prior to ground disturbing activities to capture and relocate reptiles to adjacent suitable habitat and out of harm's way. Raking of sandy soils within the immediate work areas will also be incorporated into pre-activity surveys to help observe, capture, and relocate reptiles that may lie just under the soil surface; d. Biologists will identify, flag, and map with a global positioning unit any special-status plant species identified in the work area. These plant populations will be avoided to the extent practicable; however, if avoidance is not practicable, a revegetation/relocation plan will be implemented. <p><i>Natural gas pipeline.</i> Pre-activity surveys will be conducted prior to initial excavation, trenching, Jack and Bore and horizontal directional drilling activities where applicable. Pre-activity surveys will consist of the following:</p> <ol style="list-style-type: none"> e. A qualified biologist with experience identifying special-status plants and associated habitats will conduct a pre-activity survey of all proposed work areas, including preliminary staging and laydown areas, prior to any ground disturbing activities. Any special-status plant populations encountered will be flagged and avoided to the greatest extent possible. These areas will be avoided for staging or stockpiling of material or soil when feasible. Observations of special-status species will be reported to the California Department of Fish and Wildlife and/or U.S. Fish and Wildlife. <p><i>Electrical transmission line.</i> Pre-activity surveys will be conducted prior to initial ground disturbance activities. Pre-activity surveys will consist of the following:</p> <ol style="list-style-type: none"> f. A qualified biologist with experience identifying special-status plants and associated habitats shall conduct a pre-activity survey of all work areas, including staging and laydown areas, prior to any ground disturbing activities. The surveys shall be conducted within appropriate blooming periods for potentially occurring special-status plants. Any special-status plant populations encountered shall be avoided; however, if they cannot be avoided, a relocation and monitoring plan shall be prepared and approved by the appropriate regulatory agency prior to any disturbance to the plants. Observations of special-status species shall be reported to the California Department of Fish and Wildlife and/or U.S. Fish and Wildlife, as required; and g. A qualified Biologist with experience identifying American badger and burrowing owl and their potential burrows shall conduct a pre-activity survey prior to initial work activities. Potential badger and burrowing owl burrows will be avoided with a 50 foot buffer. If a burrow is identified within the immediate work area, the California Department of Fish and Wildlife will be contacted for further guidance on appropriate protective measures during Project activities.

Table Ap.C-1. Applicant Proposed Avoidance and Minimization Measures	
Number	Measure
BIO-9	Straight-awned Spineflower Avoidance or Revegetation/Relocation Plan. Project activities will avoid special-status species populations identified within the Project site to the extent practicable; however, where straight-awned spineflower has been identified within the Project grading footprint and in any other cases where Project activities cannot avoid straight-awned spineflower, an agency approved revegetation plan will be implemented. The revegetation plan will provide guidelines for seed collection and topsoil salvage to ensure impacts to the population are reduced to the greatest extent possible. The plan will also incorporate monitoring and reporting methods for revegetated/ populations to ensure success.
BIO-10	Revegetation Plan. Project activities that require the temporary removal of vegetation for cut/fill slopes, above-ground pipeline installation, and on-site electrical transmission line installation activities will be revegetated per a County-approved revegetation plan. The plan will be prepared and submitted to the appropriate regulatory agencies for approval. The revegetation plan will incorporate goals, implementation methods, and maintenance and monitoring measures to ensure successful revegetation of native plant communities. Preliminary staging and laydown yards utilized for the proposed natural gas pipeline installation that are zoned for development will be hydro-seeded upon completion of construction activities.
BIO-11	Nesting Bird Surveys. In the event that the Project site and each project component (i.e., natural gas pipeline, electrical transmission lines) initial ground disturbing and vegetation removal activities are scheduled during the nesting bird season (March 15 through September 15), a nesting bird survey will be completed by a qualified biologist with experience in bird identification and nest searching within 24 hours of disturbance activities. No active nests of native bird species protected by the Migratory Bird Treaty Act will be removed by Project activities and appropriate buffers will be incorporated into the Project plans to ensure the protection of the nest. Buffers will be delineated by a qualified biologist based on an appropriate distance to minimize disturbance to the active nest, a standard of 300 feet for passerines and 500 feet for raptors, or as required by Project permits. These buffers may be minimized by a qualified biologist on a case-by-case basis, and consistent with permit conditions, where birds are not impacted by Project activities.
BIO-12	Spill Response Plan. A Spill Response Plan will be prepared prior to Project activities and will be implemented for the life of the Project. The Plan will include appropriate measures for containment of spills, agency notifications, clean-up protocols, and procedures for restoring lay down areas and other impacted areas to pre-disturbance conditions. Spill containment equipment will be available on-site during all Project drilling and fuel handling activities. The Plan will also include protocols for locating equipment at least 50 feet from stream channels and other standing water, and inspecting and maintaining equipment to prevent leaks.
BIO-13	A Drilling Fluid Release Contingency Plan. This plan will be prepared for all horizontal directional drilling operations during the installation of the natural gas pipeline and will be prepared with special emphasis on stream crossings. This plan will include appropriate measures for containment of spills, agency notifications, clean-up protocols, and procedures for restoring lay down areas and other impacted areas to pre-disturbance conditions. Spill containment equipment will be available on-site during all drilling and fuel handling activities. A qualified Biologist knowledgeable in horizontal directional drilling operations will be onsite during horizontal directional drilling operations along actively flowing streams or ponded water to document any spill or drilling fluid release and provide additional guidance to protect biological resources in the event of a spill or drilling fluid release. In the event that a spill or drilling fluid release occurs within a stream corridor, all work will be halted and the spill will be contained using the procedures outlined in the Project-specific Drilling Fluid Release Contingency Plan.
BIO-14	Removal of Trash. All food-related items and trash will be contained in trash bins with lids and will be removed from the work areas at the end of each working day.

Table Ap.C-1. Applicant Proposed Avoidance and Minimization Measures	
Number	Measure
BIO-15	<p>Amphibian Avoidance.</p> <p><i>Project site.</i> To minimize impacts to migrating amphibians that travel to aquatic breeding grounds during rainy nights (i.e., spadefoot, California red-legged frog, California tiger salamander), vehicle travel within the Project site will be avoided during rainy nights to the extent practicable. In the event that vehicles must travel the roads within the Project area, speeds will be reduced. In the event a California red-legged frog or California tiger salamander is identified in a road, the U.S. Fish and Wildlife Service will be contacted immediately for further direction.</p> <p><i>Natural gas pipeline.</i> To avoid impacts to migrating amphibians to aquatic breeding grounds, construction activities between the intersection of E Clark Ave/Telephone Road and Clark Ave/Dominion Road will be completed during the daylight hours and dry weather, to the greatest extent possible thereby avoiding wet weather, when California tiger salamanders are most active. A qualified biologist will complete a pre-activity survey prior to work that follows a rainy night, to ensure no California tiger salamander are present within the work areas. Training will be provided to the crew and crew supervisors to recognize, report, and avoid California tiger salamander. In the event a California tiger salamander is observed in the work area, the work in the immediate area of the California tiger salamander will temporarily cease until agency notification is complete.</p> <p><i>Electrical transmission line.</i> Construction activities will be completed during the daylight hours, to the greatest extent possible for the electrical transmission line construction off-site. Project activities shall avoid rainy nights, when California tiger salamanders are most active. A qualified biologist shall complete a pre-activity survey prior to work that follows a rainy night, to ensure no California tiger salamanders are present within the work areas. Training will be provided to the crew and crew supervisors to recognize, report, and avoid California tiger salamanders. A biologist will be on-site or on-call during all construction activities to respond to questions or incidents. In the event a California tiger salamander is observed in the work area, the work shall cease and the U.S. Fish and Wildlife Service will be immediately contacted for further direction.</p>
BIO-16	<p>CTS Habitat Mitigation. Aera proposes to provide mitigation for the permanent removal and temporary disturbance of upland habitat based on mitigation ratios developed to reflect the potential occurrence of California tiger salamander within the acreage that would be impacted by Project activities. Mitigation includes the following:</p> <p>Temporary Impacts</p> <ul style="list-style-type: none"> • Two acres of mitigation for every one acre classified as high habitat value; • 0.5 acre of mitigation for every one acre classified as moderate habitat value; • 0.1 acre of mitigation for every one acre classified as low habitat value; <p>Permanent Impacts</p> <ul style="list-style-type: none"> • Four acres of mitigation for every one acre classified as high habitat value; • Two acres of mitigation for every one acre classified as moderate habitat value; or • One acre of mitigation for every one acre classified as low habitat value.

Table Ap.C-1. Applicant Proposed Avoidance and Minimization Measures	
Number	Measure
Geologic Processes	
GEO-1	<p>Geologic Hazards Recommendations. Aera Energy LLC will implement the following during Project construction and operations:</p> <ol style="list-style-type: none"> a. If structures are proposed in areas of possible landsliding, subsurface exploration will be performed to confirm the presence and geometry of the landslide deposits, to evaluate the stability of the materials; b. If landslide deposits are confirmed and their natural stability is found to be inadequate, Aera will either avoid those areas or implement measures recommended by a geotechnical engineer, such as removal and replacement with compacted fill, providing structural support, or compacted-fill buttressing; c. Areas of colluvium on slopes above proposed developments will be removed or supported; d. The overexcavation and remedial grading will be planned to remove existing artificial fill and colluvial soils beneath proposed structures and areas of development; e. Proposed cut slopes will be graded at inclinations of 2 horizontal to 1 vertical (2H:1V) or flatter; unless steeper inclinations are approved in the Grading Plan review. f. Site-specific geotechnical exploration and analyses will be conducted as needed to determine the potential for liquefaction, seismic settlement, and hydroconsolidation; g. A Project-specific grading and erosion control plan will be designed to minimize erosion and sedimentation; h. Geotechnical sampling and testing will be performed as necessary to confirm the presence or absence of expansive soil materials at the Project site; and i. Aera Energy LLC will adhere to recommendations detailed in both Fugro Consultants, Inc.'s December 2013 Phase I Services, Preliminary Geotechnical Engineering Study, East Cat Canyon Oil Field, Sisquoc Area, Santa Barbara County, California and Fugro Consultants, Inc.'s January 2014 Preliminary Geologic Hazards Evaluation, East Cat Canyon Oil Field, Sisquoc Area, Santa Barbara County, California (Appendix S).

Table Ap.C-1. Applicant Proposed Avoidance and Minimization Measures	
Number	Measure
Cultural Resources	
CUL-1	<p>Cultural and Paleontological Resource Monitoring Plan. Prior to ground-disturbing activities on the Project site and each project component (i.e., natural gas pipeline, electrical transmission lines), a Worker Education Program shall be designed and implemented for all Project personnel who may encounter and/or alter historical resources or unique archaeological properties, including construction supervisors and field personnel. The Program shall include the following:</p> <ol style="list-style-type: none"> A pre-construction workshop shall be conducted by a County-qualified archaeologist and a Santa Ynez Band of Chumash Indians (SYBCI) tribal representative funded by the applicant. Attendees shall include the applicant, archaeologist, SYBCI representative, construction supervisors, and heavy equipment operators to ensure that all parties understand the cultural resources monitoring program and their respective roles and responsibilities. All construction and/or landscaping personnel who would work on the site during any phase of ground disturbance in archaeologically sensitive portions of the project area shall be required to attend the workshop. The names of all personnel who attend the workshop shall be recorded and shall be issued hardhat stickers denoting that they have received workshop training. This workshop content shall be captured and provided to any new employees or subcontractors that may be needed during ground-disturbance construction activities. Names of newly trained personnel shall be recorded and issued appropriate hardhat stickers. The workshop shall review the following: types of archaeological resources that may be uncovered; provide examples of common archaeological artifacts and other cultural materials to examine; describe why monitoring is required; what makes an archaeological resource significant; identify monitoring procedures; what would temporarily halt construction and for how long; describe a reasonable worst-case resource discovery scenario (i.e., discovery of intact human remains or an unknown, intact, substantial midden deposit); and describe reporting requirements and the responsibilities of the construction supervisor and crew. Examples of archaeological artifacts (e.g., ground and chipped stone tools) and other cultural materials (soils containing evidence of food refuse, localized activity areas such as roasting pits) that may be reasonably encountered during construction shall be illustrated on posters that are shown at the workshop. The posters shall remain in construction worker break room or similar common onsite areas where they may be accessible for reference as necessary. The workshop shall make attendees aware of prohibited activities, including vehicle use in protected areas, and educate construction workers about the inappropriateness of unauthorized collecting of artifacts that can result in impacts on cultural resources.
CUL-2	<p>Prior to ground-disturbing activities at the Project site and at each project component (i.e., natural gas pipeline, electrical transmission lines), a Cultural Resources Management Plan (CRMP) shall be prepared that specifies policies and procedures to manage and protect known and unknown cultural resources on the entire Project site. This shall include:</p> <ol style="list-style-type: none"> A register of all recorded sites, their mapped location, and associated site records; Procedures to ensure that exposed resources are adequately protected from inadvertent disturbances including illicit artifact collection; A monitoring plan to be followed during all ground disturbance activities, including routine monitoring protocols; and, Discovery plans including treatment plans for discovery of any human remains.
CUL-3	<p>Proposed ground disturbances within previously undisturbed areas of high and moderate archaeological sensitivity shall be addressed by a High and Moderate Archaeological Sensitivity Area Monitoring Plan. The Plan shall be developed jointly by a County-qualified archaeologist and a SYBCI representative as a result of additional site visits and review of proposed Project grading plans. The resulting Plan shall identify specific areas within the previously defined High and Moderate Archaeological Sensitivity Areas that shall be monitored by the Project archaeologist and SYBCI representative.</p> <p>The Final High and Moderate Archaeological Sensitivity Area Monitoring Plan approved by the SYBCI representative shall be reviewed and approved by the County prior to issuance of land use clearance for grading.</p>

Table Ap.C-1. Applicant Proposed Avoidance and Minimization Measures	
Number	Measure
CUL-4	If previously unrecorded archaeological sites are encountered during ground disturbing activities during construction monitoring within any of the high, moderate, or low archaeological sensitivity areas, all work shall temporarily cease within 50 feet of the discovery and activity redirected until the archaeological monitor and SYBCI representative can document and assess the find, and mitigate any potentially significant impacts. Work shall be allowed to continue in the area of the find once the archaeologist, SYBCI representative, and Aera have identified and implemented appropriate mitigation measures.
CUL-5	In the event that human remains and any related artifacts are encountered, all work shall temporarily cease within 100 feet of the discovery. The Santa Barbara County coroner shall be notified immediately pursuant to Public Resources Code 5097.98. The SYBCI shall be notified to identify a Most Likely Descendant who shall work with Aera to determine the appropriate disposition of the remains in an area that shall ensure any future disturbances are avoided.
CUL-6	<p>Avoidance of Cultural or Historic Resources During Natural Gas Import Pipeline Installation.</p> <ul style="list-style-type: none"> a. The natural gas import pipeline is planned to be located within the west side of Dominion Road in the area within 0.25 mile (1,320 feet) of SCGP-1 and the Roadamite area, in accordance with the Garcia and Associates' Review of a Previously Completed Records Search and Phase I Cultural Resources Survey and Evaluation for the Gas Pipeline Route in Support of the East Cat Canyon Oil Field Redevelopment Project, Santa Barbara County, California (2014b). No ground disturbing activities are planned to occur on the east side of Dominion Road within 0.25 mile (1,320 feet) of SCGP-1 and the Roadamite area. b. Archaeological monitoring will occur within 0.25 mile (1,320 feet) of SCGP-1 and the Roadamite area of the Project Site to ensure no previously unidentified resources are discovered during construction. c. If avoidance of SCGP-1 is not feasible or in the event of the discovery of unanticipated cultural resources that are eligible or potentially eligible for the California Register of Historic Resources are found during construction, then Phase II testing (excavation) of the area will be required to evaluate archaeological sites for significance in accordance with the California Register of Historic Resources.
CUL-7	<p>Avoidance of Cultural or Historic Resources During Electrical Line Route Installation. A 50-foot buffer will be staked around the resource boundary (PGE-1 and PGE-ISO-1). A qualified archaeologist will provide cultural resources awareness training for construction personnel prior to the start of work. Construction personnel will be briefed on laws that protect cultural resources and procedures to be followed in the event that unique archaeological resource, historical resource, or human remains are encountered during construction.</p>

Table Ap.C-1. Applicant Proposed Avoidance and Minimization Measures	
Number	Measure
Fire Protection	
FIRE- 1	<p>Master Fire Protection Plan. All recommended measures included within the Master Fire Protection Plan (Collings, 2014) will be incorporated into the Project design. These measures include, but are not limited to, the following:</p> <ul style="list-style-type: none"> a. The central processing facility area will be provided with a dedicated fire protection system; b. The facility includes a minimum of 76,500 gallon tank for dedicated fire protection water storage; c. The central processing facility hydrants and monitors will be hard piped and supplied by a new eight inch dedicated fire service water supply line/looped system; d. The pressurized hydrant piping system includes new hydrants as indicated Master Fire Protection Plan Sheets-1 through -5; are spaced not to exceed 500-foot intervals (300 feet in noted areas near buildings), and with a minimum fire flow of 750 gallons per minute; e. The application of the foam solution will be accomplished by on-site foam delivery systems; f. The emergency access roads will meet Santa Barbara County Fire Department requirements; g. Brush and vegetation clearance will be maintained in accordance with Santa Barbara County Fire Department Standard Code 6 (Clearances); h. Produced crude loading will comply with California Fire Code Section 3406.5; i. Electrical grounding or bonding will be provided in accordance with sections 6.5.4.1 through 6.5.4.5 of National Fire Protection Association Code 30; j. A means to quickly shut down the facility in the event of an emergency will be provided; k. Accessible, well-labeled emergency gas line shutoff valves on supply lines to all gas fired equipment at the site will be provided; l. Portable Fire Extinguishers with a minimum rating of 20-A:B:C will be provided where required by Santa Barbara County Fire Department, at a maximum of 75 feet between extinguisher locations; m. Premises identification at the main gate entrance to the facility will be in accordance with Santa Barbara County Fire Department Standard 2; n. All new tanks holding hazardous, toxic, flammable or combustible liquids will be provided with National Fire Protection Association Code 704, , with markings located where they can be readily seen by the Santa Barbara County Fire Department on approach from fire department access roads; o. National Fire Protection Association Code 13 compliant monitored fire sprinkler systems in the control, warehouse, shop and office buildings will be installed; p. A fire sprinkler fire alarm monitoring system, which has central station water flow alarm monitoring service, will be installed and maintained for automatic fire department notification; q. The steam generator site will be provided with portable fire extinguishers in accordance with California Fire Code and Santa Barbara County Fire Department requirements; and r. A pre-incident plan will be developed and provided to Santa Barbara County Fire Department.
Noise	
NOISE-1	Temporary Acoustical Barriers at WP1. During drilling operations at WP1, a temporary acoustical barrier at least 16 feet in height should be installed along the north and west sides of the pad. In addition, 16-foot high acoustical barriers should be installed along the north, south, and west sides of the generator, along four sides of the drawworks, and the north, south, and west sides of the mud pumps.
NOISE-2	Temporary Acoustical Barriers at WP50. During drilling operations at WP50, temporary acoustical barriers at least 16 feet in height should be installed along the northwest and southwest sides of the generator and drawworks, and the southwest and southeast sides of the mud pumps.
NOISE-3	Temporary Acoustical Barriers at WP56. During drilling operations at WP56, a temporary acoustical barrier at least 16 feet in height should be installed along the south and east sides of the pad. In addition, 16 foot high acoustical barriers should be installed along the south and east sides of the generator and mud pumps, and the four sides of the drawworks.
NOISE-4	Temporary Acoustical Barriers at WP17A. During drilling operations at WP17A, a temporary acoustical barrier at least 16 feet in height should be installed along the south and east sides of the pad. In addition, 16 foot high acoustical barriers should be installed along the south and east sides of the generator, the south, east and west sides of the drawworks, and the south side of the mud pumps.
NOISE-5	Pre-Drilling Noise Modeling. Before the commencement of drilling operations at the remaining well pads, create drilling noise models to determine the mitigation measures, if any, required at each pad to ensure a less than significant impact.

Table Ap.C-1. Applicant Proposed Avoidance and Minimization Measures	
Number	Measure
NOISE-6	WP16A and WP17A Drilling/Construction. Avoid concurrent grading operations at WP16A and drilling operations at WP17A.
Aesthetics/Visual Resources	
AEST-1	Neutral Paint Coloring for Permanent Facilities. Permanent structures and equipment within the Aera Oil Field will be painted and maintained with muted, natural colors to blend in with the existing visual character of the Project area. The natural gas pipeline and auxiliary equipment will be painted Desert Sand or White.
AEST-2	Project Landscaping. In accordance with County of Santa Barbara Comprehensive Plan Land Use Element Visual Resource Policies, Aera will implement a landscaping plan for the central processing facility within the design package for the East Cat Canyon Oil Field Redevelopment Project. The landscaping plan will include a conceptual planting schedule that includes landscaping of trees, shrubbery and groundcover for erosion control. All Project landscaping will consist of drought-tolerant native and/or low-water use/Mediterranean type species. In accordance with County of Santa Barbara design requirements, Project landscaping will adequately screen the Project site from surrounding land uses. The landscaping plan will include drought tolerant natives and compatible species requiring minimal irrigation.
AEST-3	Night Lighting and Glare Reduction. Temporary construction lighting will be kept to the minimum feasible consistent with safety needs to minimize ambient light emissions during construction. To the extent practicable, nighttime lighting will be directed downward and light shields installed to reduce ambient lighting to adjacent properties and habitats.
Greenhouse Gas	
GHG-1	<p>As local GHG mitigation for our East Cat Canyon Project, Aera proposes to perform a one-time, approximately ¼-inch deep application of certified compost on 110 acres of grassland within the proposed Conservation Area. This practice, commonly referred to as ‘carbon farming’, sequesters carbon from the atmosphere, while at the same time, enhances grassland agricultural productivity. Areas within the Conservation Area suitable for carbon farming were selected using Global Information Systems (GIS) based on the following criteria:</p> <ul style="list-style-type: none"> • Slopes less than 25 percent; • Existing grassland habitat; and • Greater than 100 feet from National Wetlands Inventory (NWI) channels. <p>The proposed carbon farming mitigation plan will comply with American Carbon Registry and Cachuma Resource Conservation District guidelines. These guidelines include:</p> <ul style="list-style-type: none"> • Application area criteria; • Compost selection from a certified supplier (Agromin, Engle and Gray) and application rates; • Soil sampling (baseline and post-application); and • Reporting requirements. <p>The Compost Planner (http://bfuels.nrel.colostate.edu/compost/Home/Index) was used to determine the resulting carbon reductions. This carbon farming project would create 473.7 tonnes of CO₂e reductions per year, or 9474 tonnes over the 20 year mitigation project lifetime.</p>
GHG-2	<p>Aera will purchase and donate, or donate the funds for purchasing, three new, all-electric passenger vans: one for the Boys and Girls Clubs of Santa Maria Valley, one for Girl’s Inc., in Carpentaria, and one for the Santa Maria Valley YMCA. The electric vans will be used in lieu of the existing gas-powered vans currently used to shuttle (mostly children and young adults) to various community service activities and programs. Together, these electric vans would create 109.7 Metric Tons of CO₂e emissions offsets.</p> <p>These offsets would be created through purchase and provided only after the East Cat Canyon Project EIR has been certified, after all Project permits have been issued, after all permit conditions have been found by Aera to be satisfactory, and only if/when Aera initiates construction of the Project. Aera expects that these purchases will be eligible for the California state electric vehicle purchase credit.</p>

Table Ap.C-2. Pacific Gas and Electric Avoidance and Minimization Measure	
Number	Measure
Greenhouse Gas	
GHG-3 (PG&E)	Diesel fueled off-road construction equipment with 50 horsepower or greater engines shall meet U.S. Environmental Protection Agency (EPA) and California Air Resources Board (CARB) Tier 1 engine standards. This APM is not applicable to equipment permitted by the local air quality district or certified through CARB's Statewide Portable Equipment Registration Program, or single specialized equipment that will be used for less than five total days.