Revised Initial Study/Mitigated Negative Declaration

Division of Oil, Gas, and Geothermal Resources

PROJECT TITLE
Rancho Grande Project

LEAD AGENCY
Department of Conservation
Division of Oil, Gas, and Geothermal Resources (Division)
801 K Street, MS 18-05
Sacramento, CA 95814-3530
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APPLICANT
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PROJECT DESCRIPTION AND LOCATION

Sojitz Energy Venture, Inc (Sojitz) is proposing the Rancho Grande Project, a project to drill eight (8) exploratory oil wells to depths exceeding 7,000 feet subsurface, over a three-year period. Two (2) wells will be drilled in 2013 and three (3) wells drilled in each of 2014 and 2015. If economical quantities of oil and natural gas are discovered in a well, Sojitz would install the necessary production equipment on that well's proposed project site as described in the Production Phase section of this Project Description. No hydraulic fracturing is proposed as part of this project. This Initial Study/Mitigated Negative Declaration is a revision of the Rancho Grande Project Initial Study/Negative Declaration (SCH 2012061074) that was circulated for public review between June 21, 2012 and July 23, 2012. The prior IS/MND only addressed the exploratory phase of the project. This revised IS/MND addresses the exploratory, production and plugging and abandonment of the project.

The surface locations for the proposed wells would be on land owned by the Tejon Ranch Corporation, located 7 miles southeast of Mettler, 28 miles south of Bakersfield in Kern County, California (Figure 1). Specific locations of wells are listed in Table 1.

The areas surrounding the proposed project sites consist of annual grasslands used for cattle and sheep grazing, and agricultural lands used for growing wine grapes, alfalfa, hay, and almonds. Existing surrounding land uses within and adjacent to the proposed project sites include cattle grazing, agricultural activities and oil and gas exploration and production activities. The primary access road to the project sites is the Edmonston Pumping Plant Road with each project site having an individual access road. Two of the proposed well sites would require an extension of the existing access road to the project site (Rancho

Grande 1-16 and Rancho Grande 1-22). The remaining project sites would be accessed via the existing access roads in the area.

Table 1
Site Specific Location of Ranch Grande I Wells

Well (Rancho Grande #X-X)	Section (w/ ¼ or ¼ -¼)	Township	Range	SBB&M	NAD 83	USGS 7.5 minute
1-3	3 SE ¼	10 N	19 W	SBB&M	34.97015/-118.88295	Grapevine
1-11	11 NE ¼	10 N	19 W	SBB&M	34.96897/-118.86488	Pastoria Creek
2-11	11 SW ¼ SW ¼	10 N	19 W	SBB&M	34.95873/-118.881933	Grapevine
1-15	15 NE ¼ NE ¼	10 N	19 W	SBB&M	34.95447/-118.88267	Grapevine
1-4	4 SW ¼ SE ¼	10 N	19 W	SBB&M	34.97281/-118.90955	Grapevine
1-9	9 NW ¼ NW ¼	10 N	19 W	SBB&M	34.96036/-118.91774	Grapevine
1-16	16 NW ¼ NW ¼	10 N	19 W	SBB&M	34.95369/-118.91744	Grapevine
1-22	22 SW ¼ NW ¼	10 N	19 W	SBB&M	34.93671/-118.89573	Grapevine

The proposed project sites are located in annual grasslands. Each of the proposed project sites would encompass an area of approximately 280 feet by 150 feet (42,000 square feet or 0.96 acres). As shown in Figure 2: Sojitz Rancho Grande Project Location Map, dirt ranch access roads are located throughout the ranch and would be used to access Rancho Grande sites 1-3, 1-11, 2-11, 1-15, 1-4, and 1-9. Access to the Rancho Grande 1-16 site would require constructing a new access road, 15 feet by 167 feet (2,505 square feet or .06 acre), to extend access from an existing dirt road located east of the proposed project site. Access to the Rancho Grande 1-22 site would require constructing a new access road, 15 feet by 340 feet (5,100 square feet or 0.12 acre) south of the proposed project site from the existing ranch road which runs parallel to Edmonston Pumping Plant Road. The proposed project would result in 7.86 acres of new surface disturbance to agricultural land as detailed in Table 2: Project Land Disturbance.

Table 2
Project Land Disturbance

Land Disturbance Activity	Size	Area
8 Project Sites @ 0.96/site	280’ x 150’	7.68 acres
Site 1-16 New Access Road	15’ x 167’	0.06 acres
Site 1-22 New Access Road	15’ x 340’	0.12 acres
	Total	**7.86 acres**

The proposed project is needed to develop additional oil and natural gas reserves in the State of California. The objective of the proposed project is to locate untapped oil and gas sources with potential for development. The proposed project includes three (3) phases: a site preparation phase, a drilling and testing phase and a production phase. A detailed description of each phase is presented below. Sojitz will

inform itself concerning, and fully comply with, all application of federal, state, regional and local laws, regulations and requirements in all project phases.

The terms "project site" and "project area" are used within this document. The term "project site" is used to define the proposed area of disturbance such as the proposed drill site, any new access road, etc. The term "project area" is used to define the area surrounding the proposed project sites.

The proposed wells have been granted confidential status from the Division. The records (including total depth, casing, and monthly production/injection reports) are not open for public inspection. To be considered for confidential status, a well must be classified as an exploratory well, or there must be extenuating circumstances. Extenuating circumstances include, but are not limited to active competitive leasing or mineral rights sales in the immediate vicinity of the well; governmental or judicial action delaying oil, gas, or geothermal development; natural disasters, or scarcity of materials or equipment. Onshore wells are granted confidentiality for a two-year period, with the possibility for extensions.

Site Preparation Phase

Site preparation activities for the proposed project sites would include clearing, grading, and compaction of soil. Once a proposed project well site has been cleared, it would be graded, watered and compacted to establish a level and solid foundation for the drilling rig. Written notification shall be given to the San Joaquin Valley Air Pollution Control District (SJVAPCD) at least 48 hours prior to beginning earthmoving operations. Typical equipment used for this project (in and beyond the site preparation phase) may include diesel drill rig, bulldozer, grader, loader, compacter, heavy-duty trucks, baker tanks, air compressors, pumps, and generators. Personnel will be notified prior to ground disturbing activities of the possibility of buried prehistoric or historic cultural deposits. Earthmoving activities at any of the proposed project sites will not exceed either the project limit of 5.0 acres nor involve movement, depositing, or relocation of more than 2,500 cubic yards per day of bulk materials on any three or more days. During the site preparation phase for the proposed Rancho Grande well sites, two (2) applications of water from a water truck would be applied to the ground surface per day to facilitate movement of heavy equipment and to effectively stabilize of dust emissions. Each water truck has a capacity of 1,488 gallons. Approximately 2,976 gallons of water would be applied to the well site surface on a daily basis. Each well site would take approximately three (3) days to construct. Therefore, 8,928 gallons of water would be applied to the ground surface during site preparation activities.

Drilling mud and cuttings shall be contained in above ground tanks. Soil will be stockpiled on site and used as backfill upon completion of drilling. The approximate depth to ground water is 550 feet (California Department of Water Resources Water Data Library 2012). Completing the site preparation process would require approximately three (3) days for each site.

Drilling and Testing Phase

Drilling equipment, including a 147-foot high drilling rig (Paul Graham Drilling Rig, triple drill rig, or equivalent) will be mobilized to the site and temporary facilities, equipment and materials necessary for the drilling operation will be set up and stored on site (i.e., drilling mud supplies, water, drilling materials and casing, crew support trailers, pumps and piping, portable generators, fuels and lubricants, etc.). During rig

mobilization/demobilization, when drilling equipment is moved on and off site, the maximum number of daily vehicle trips will be 35 (70 one-way trips) over the period of 2-5 days (in which this process is typically completed). The 35 vehicle round trips will include twenty five (25) heavy truck/semi round trips, eight (8) car / pickup truck roundtrips, one (1) crane and one (1) water truck round trip. Night lighting will be required and available only during the drilling phase. However, to the greatest extent possible night lighting will be directed inward and down to minimize off site impacts without compromising safety.

The drilling of each well will require the use of approximately 15,500 gallons of water on the first day of drilling, and 2,325 gallons of water from day 2 through day 17 of the drilling phase. Therefore, approximately 52,700 gallons of water would be used during the drilling phase of each well.

All hazardous materials such as diesel fuel will be stored according to applicable federal, state and local regulations. Portable tanks will be used for mixing and storing drilling fluids. All fluids will be disposed of in accordance with the requirements of the Central Valley Regional Water Quality Control Board (RWQCB). The solids that accumulate in the tanks will be reused if demonstrated to be nonhazardous. If any wastes test positive for hazardous material they would be disposed of at the North Star Energy's disposal site in Bakersfield, CA operated by Southern California Waste Water (SCWW) with a permitted capacity of 5,000 barrels per day (data obtained from SCWW on May 25, 2012).

Surface casing would be set, cemented, and blowout prevention equipment installed at each wellhead and tested. The amount of surface casing used depends upon factors such as expected well pressures, the depth of fresh water, and the competence of the strata in which the well casing will be cemented. Blowout prevention equipment is bolted to the surface casing. All successive drilling occurs through the blowout prevention equipment, which can be operated to control well pressures at any time. Blowout prevention equipment will be regulated by the Division. Division engineers will be notified for required tests and other operations (blowout prevention, surface casing integrity).

The Division's well construction standards have the fundamental purpose to ensure zonal isolation. Zonal isolation means that oil and gas coming up a well from the productive, underground geologic zone will not escape the well and migrate into other geologic zones, including zones that might contain fresh water. The estimated base of freshwater for the proposed wells ranges from 900 to 1,800 feet. Zonal isolation also means that the fluids that are put down a well for any purpose will stay in that zone and not migrate to another zone. To achieve zonal isolation, Division regulations require that a cement barrier be placed between the well and surrounding geologic strata or stratum. The cement bonds to the surrounding rock and well casing and forms a barrier against fluid migration. Cement barriers must meet certain standards for strength and integrity. If these cement barriers do not meet the standards, the Division requires the oil or gas operator to remediate the cement barrier. Metal casings, which can be several layers depending on the depth of a well, also separate the fluids going up and down a well bore from the surrounding geology. If the integrity of a well is compromised by ground movement or other mechanisms, the well operator must remediate the well to ensure zonal isolation. Well casing standards are prescribed in Title 14 CCR, Division 2, Chapter 4, Subchapter 1, Article 3, and Sections 1722.2 – 1722.4.

The approximate depth to ground water is 550 feet. Blowout prevention equipment is regulated by the Division. Sufficient weighted drilling fluid would be used to prevent any uncontrolled flow from each well and additional quantities of drilling fluid would be available at each site (Title 14, CCR section

1722.6). Drilling would continue until target depth is reached. Equipment, personnel and supply deliveries would continue through the course of the drilling program.

Once target depth is reached for a given well, the well will be fully tested, evaluated and either completed and produced or plugged and abandoned. A well would be tested with a flow line running to a portable test separator. Any produced gas will be flared in order to mitigate emissions of VOCs and liquids will be stored in a portable tank for transportation to an off-site facility. The operation of the flare is exempt from SJVAPCD permitting requirements; therefore, the sole purpose of operating the flare is to minimize emissions of methane and VOCs during the testing process. Any produced oil and liquids would be stored in a portable tank for transportation to Kern Oil and Refining in Bakersfield, California. Sojitz estimates that approximately seventeen (17) days would be required for drilling and approximately three (3) days would be required for testing operations for each of the proposed wells.

Equipment, personnel and supply deliveries would continue through the course of the drilling program. Drilling activities would operate 24 hours per day. Approximately 12-15 personnel would be on site at any given time during the drilling operations.

Production Phase

If economic quantities of oil or gas are discovered, a well will be completed and production equipment including a well head, pumping unit, one 500 Barrel Oil Tank and one 500 Barrel Produced Water Tank will be installed on site. No production phase structure on-site will exceed 25 feet in height. Production equipment will be painted in an earthen tone to blend in with the surrounding environments and prevent glare, and all production facilities storing fluids will have secondary containment as required by Title 14, CCR 1773.1. Completion of a well will require four (4) days and installation of production equipment will require approximately 7 days to complete per well. Sojitz anticipates 25 barrels of oil and 2 barrels of production water will be produced daily from each well. The oil will be transported offsite by truck and sold to the Kern Oil and Refining Company located at 7724 East Panama Lane, Bakersfield, California 93307. Sojitz estimates that 1 truck trip per 5 days will be required to transport oil to the Kern Oil and Refining Company from each well. Accordingly, assuming all eight wells go into production, Sojitz estimates that 10 truck trips per week will be required to transport the oil to the Kern Oil and Refining Company refinery. The production water will be transported offsite by truck to the Central Valley Waste Water LLC Class II Disposal Well, the SWCC-1 located in the South Belridge Oil Field for disposal. The SWCC-1 disposal well is located approximately 60 miles to the northwest of the proposed project site. Sojitz estimates 1 truck trip per month for each well to transport production water to the SWCC-1 disposal well. Each production site will be visited daily, which will yield a further daily pick-up truck round-trip.

Once a well stops producing, it will be plugged and abandoned in accordance with Title 14 CCR Sections 1723 – 1723.8. In this case, a Notice of Intention to abandon the well will be submitted to the Division for review and approval. During a typical well abandonment, recoverable casing will be salvaged from the well and the hole will be plugged with cement. The wellhead (and any other equipment) will be removed, the casing cut off 6 feet below ground surface, capped with a welded plate and the cellar backfilled. This process will utilize the same equipment that will be used for the completion phase and the process will be completed in four (4) days. The land contours of each well site would be re-established to near grade conditions as present at the time of project initiation. After all equipment is removed, the site would be

restored to its condition prior to construction of the well pad. Table 3 lists the estimated days it would take to complete each phase of the project at each site.

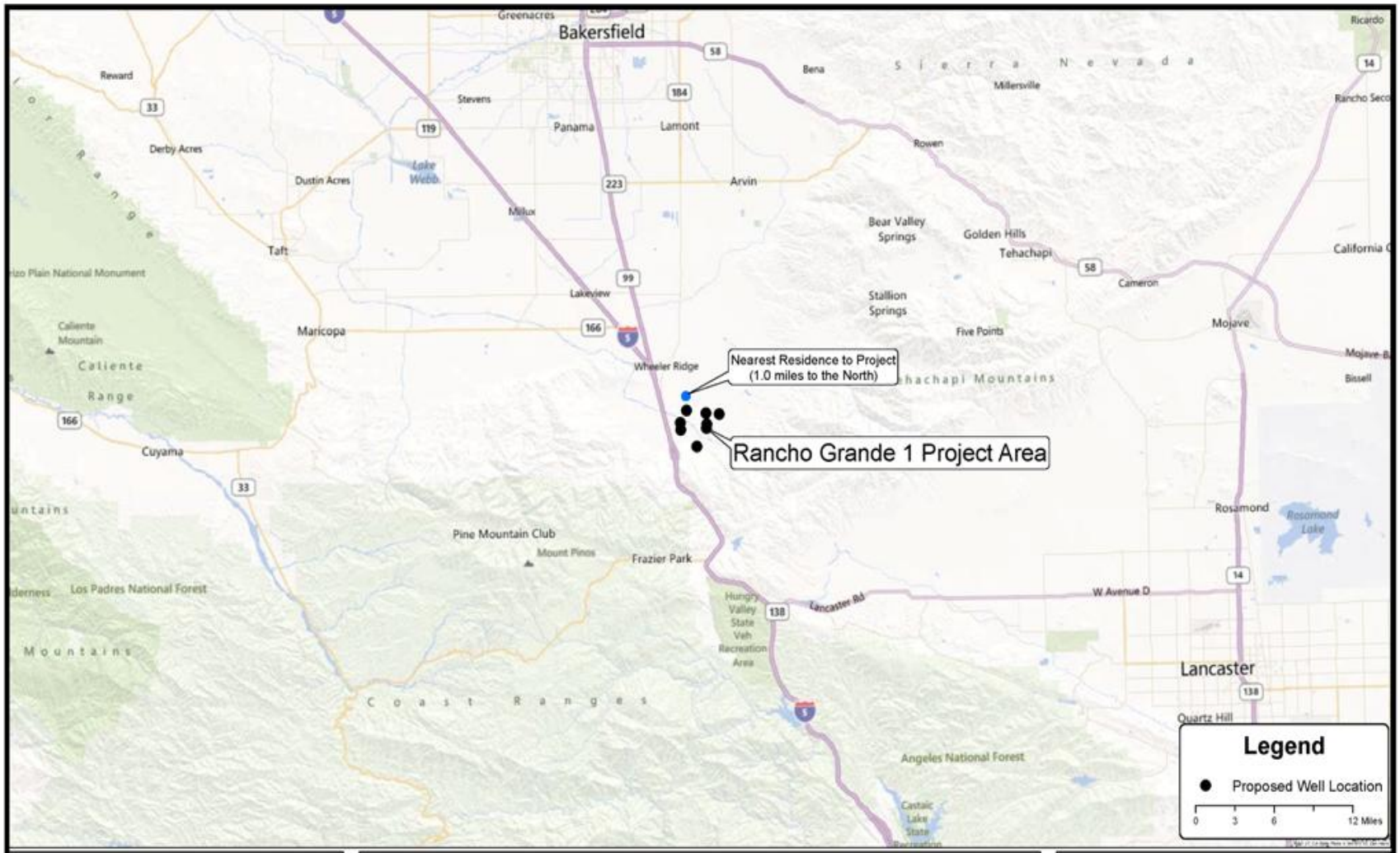
Table 3
Estimated Days to Complete Activity at Each Site

Activity	Days
Site Preparation	3
Drilling	17
Testing	3
Completion	4
Installation of Production Equipment	7
Plugging and Abandonment (at either end of testing or production phase)	4
Total days per site	**38**

MITIGATION MONITORING AND REPORTING PLAN

The proposed project incorporates Mitigation Measures designed to avoid or reduce environmental impacts to less-than-significant levels. Mitigation Measures are fully described in the following sections and are included in the Mitigation Monitoring and Reporting Plan (Attachment A).

Photographs representative of the proposed project sites are attached.



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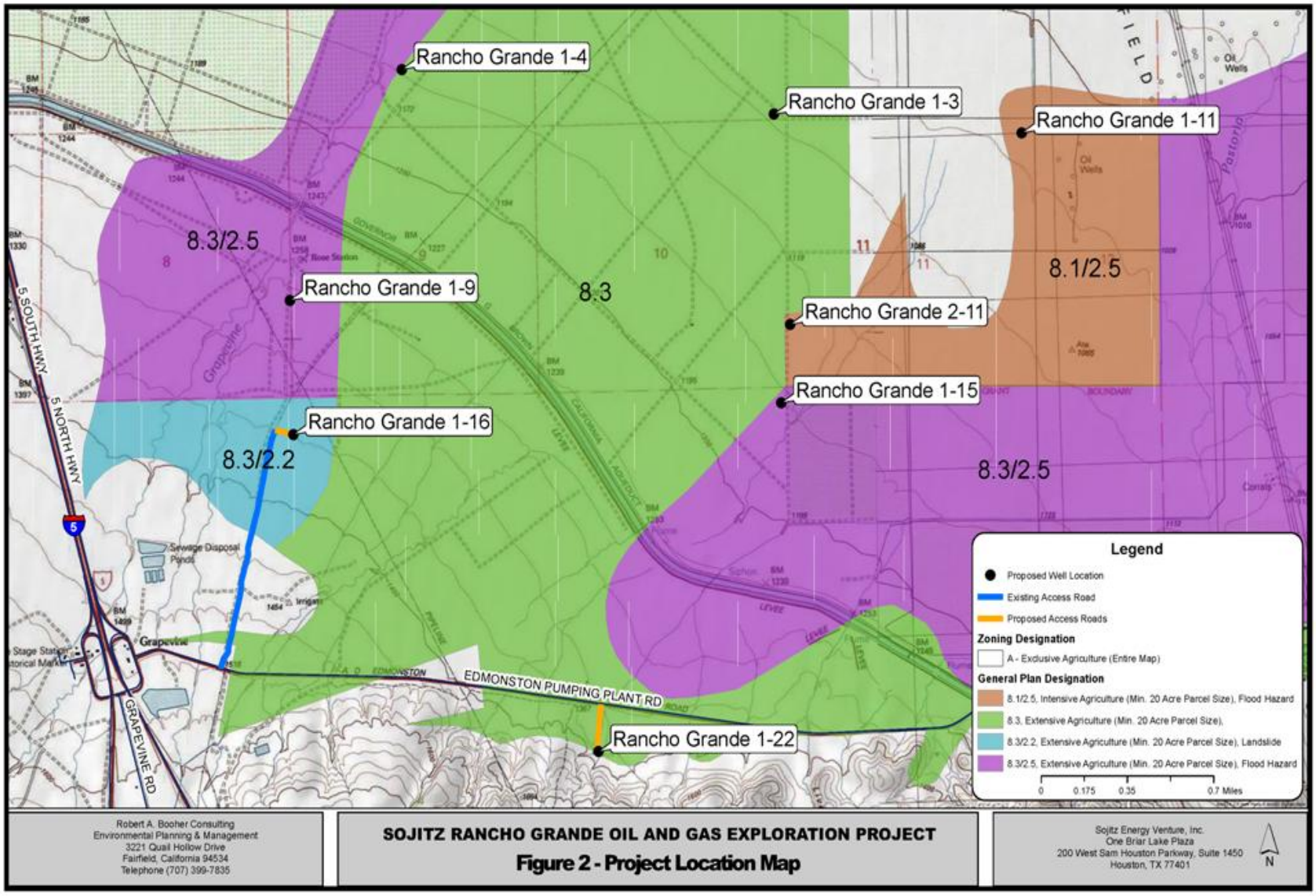
SOJITZ RANCHO GRANDE OIL AND GAS EXPLORATION PROJECT

Figure 1 - Project Vicinity Map

Sojitz Energy Venture, Inc.
One Briar Lake Plaza
200 West Sam Houston Parkway, Suite 1450
Houston, TX 77401


Rancho Grande 1-4
Rancho Grande 1-3
Rancho Grande 1-11
Rancho Grande 1-9
Rancho Grande 2-11
Rancho Grande 1-15
Rancho Grande 1-16
Rancho Grande 1-22
8.3/2.5
8.3
8.1/2.5
8.3/2.2
8.3/2.5
5 SOUTH HWY
5 NORTH HWY
GRAPEVINE RD
EDMONSTON PUMPING PLANT RD
Grapevine
Sewage Disposal Ponds
Oil Wells
Legend
Proposed Well Location
Existing Access Road
Proposed Access Roads
Zoning Designation
A - Exclusive Agriculture (Entire Map)
General Plan Designation
8.1/2.5, Intensive Agriculture (Min. 20 Acre Parcel Size), Flood Hazard
8.3, Extensive Agriculture (Min. 20 Acre Parcel Size),
8.3/2.2, Extensive Agriculture (Min. 20 Acre Parcel Size), Landslide
8.3/2.5, Extensive Agriculture (Min. 20 Acre Parcel Size), Flood Hazard
0 0.175 0.35 0.7 Miles
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SOJITZ RANCHO GRANDE OIL AND GAS EXPLORATION PROJECT
Figure 2 - Project Location Map
Sojitz Energy Venture, Inc.
One Briar Lake Plaza
200 West Sam Houston Parkway, Suite 1450
Houston, TX 77401
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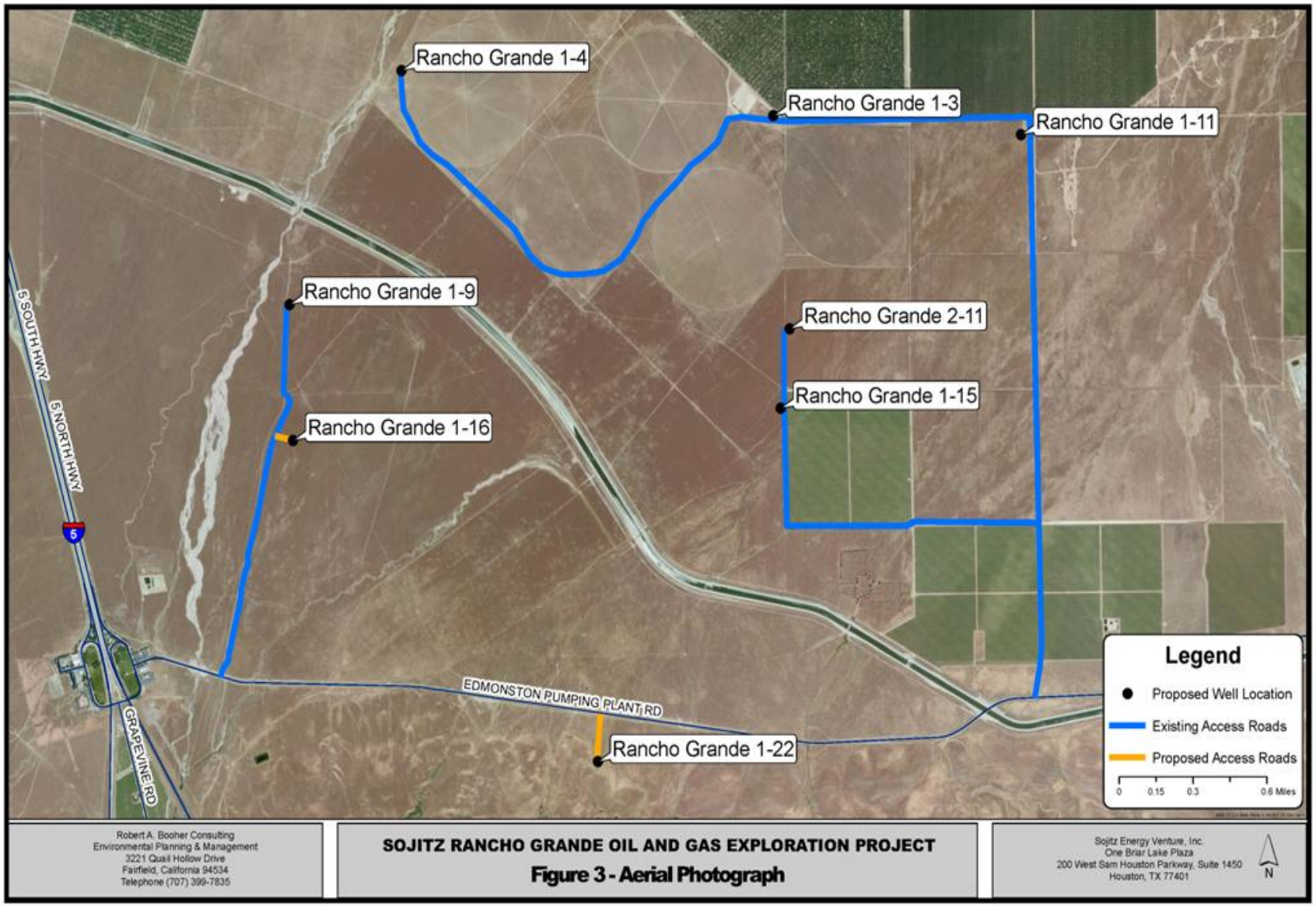
Rancho Grande 1-4
Rancho Grande 1-3
Rancho Grande 1-11
Rancho Grande 1-9
Rancho Grande 2-11
Rancho Grande 1-15
Rancho Grande 1-16
Rancho Grande 1-22
5 SOUTH HWY
5 NORTH HWY
5
GRAPEVINE RD
EDMONSTON PUMPING PLANT RD
Legend
Proposed Well Location
Existing Access Roads
Proposed Access Roads
0 0.15 0.3 0.6 Miles
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SOJITZ RANCHO GRANDE OIL AND GAS EXPLORATION PROJECT
Figure 3 - Aerial Photograph
Sojitz Energy Venture, Inc.
One Briar Lake Plaza
200 West Sam Houston Parkway, Suite 1450
Houston, TX 77401
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Photograph 1
Proposed Rancho Grande 1-3 well site. View looking west from east side of proposed well location.

Photograph 2
Proposed Rancho Grande 1-4 well site. View looking west from east side of proposed well location.

Photograph 3
Proposed Rancho Grande 1-9 well site. View looking south from north side of proposed well location.

Photograph 4
Proposed Rancho Grande 1-11 well site. View looking west from east side of proposed well location.

Photograph 5
Proposed Rancho Grande 2-11 well site. View looking east from west side of proposed well location.

Photograph 6
Proposed Rancho Grande 1-15 well site. View looking west from east side of proposed well location.

Photograph 7
Proposed Rancho Grande 1-16 well site. View looking south from north side of proposed well location.

Photograph 8
Proposed Rancho Grande 1-22 well site. View looking south of proposed well location.

GENERAL PLAN DESIGNATION

The proposed project is located on property designated as Intensive Agriculture (8.1), with the overlay zone of Flood Hazard (2.5) and Extensive Agriculture (8.3), with the overlay zones of Flood Hazard (2.5) and Landslide (2.2) on the Kern County General Plan land use map which lists uses such as mineral, aggregate, and petroleum exploration and extraction as acceptable uses. The proposed project is consistent with the land use and zoning designation for the area. The Kern County General Plan Land Use, Open Space and Conservation Element states that petroleum exploration and extraction are consistent uses with agricultural designations (see Figure 2).

ZONING

The proposed project area is zoned Exclusive Agriculture (A). The project is consistent with the Exclusive Agriculture (A) zoning designations per Kern County, California Municipal Code Chapters 19.12.020 and 19.98.020 which include oil and gas exploration as a permitted use (see Figure 2).

ENVIRONMENTAL ANALYSIS
Rancho Grande Project

ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
I. AESTHETICS				
Would the project:				
a. Have a substantial adverse effect on a scenic vista?	_____	_____	X	
b. Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?	_____	_____	_____	X
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	_____	_____	X	_____
d. Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	_____	_____	_____	X

Discussion: The proposed project sites are flat and consist primarily of annual grassland habitat. The proposed project sites are located within the 270,000 acre Tejon Ranch. Vast stretches of the Tejon Ranch remain in their natural state. Tejon Ranch is the largest working ranch in California. Cattle ranching, orchards, and vineyards are the primary agricultural activities on the Tejon Ranch. Six thousand acres are farmed in pistachios, almonds, alfalfa, and wine grapes. The Tejon Ranch supports a variety of wildlife, including deer, elk, antelope, wild pigs, wild turkey, black bear, bobcats, coyotes, squirrels, pigeons, doves, and quail. The Tejon Ranch works closely with the California Department of Fish and Wildlife in maintaining a hunting program. The Tejon Ranch has a state of the art Equestrian Center and has been the site for hundreds of film projects. The closest residential structures to any proposed project site are located along Lavel Road to the northwest of the proposed project sites, a mile or more from each proposed project site. The immediate area surrounding the proposed project sites has a mixture of grasslands, agriculture fields and other existing gas and oil production sites. Views from the proposed project sites include views of the Tehachapi Mountains to the south, the California Coastal Range to the west, the Sierra Nevada Range to the east and agricultural fields to the north. No designated scenic roadways are located adjacent to or in the vicinity of the proposed project sites. No significant scenic resources are located at or near the proposed project site. The project is consistent with polices in the Land Use, Open Space, and Conservation Element of the Kern County General Plan:

Policy 47 – Ensure that light and glare from discretionary new development projects are minimized in rural as well as urban areas.

Policy 48 – Encourage the use of low glare lighting to minimize nighttime glare effects on neighboring properties.

The project is consistent with land use and zoning designation for the area, and is, therefore, considered consistent with the associated visual resource for planning purposes and General Plan.

Ia. Views of agricultural lands used for growing wine grapes, alfalfa, hay, and almonds surrounding the proposed project sites would be considered scenic vistas from roadways and residences within the vicinity of the project sites. Views of these scenic vistas would be impacted due to the presence of project related equipment on a short-term basis during all project activities with the exception of production activities and on a long-term basis during production activities. However, as the proposed project sites are set back from Edmonston Pumping Plant Road and residential structures, and views of the project site will be partially blocked by surrounding hills, vineyards, almond orchards, alfalfa and hay fields, impacts to scenic vistas associated with these activities would be considered less than significant. The photo simulations presented in Figures 4 and 5 are intended to be representative of how drilling and production activities would appear from public roads in the vicinity of the proposed drill sites. Figure 4 is a photo simulation of how the drill rig and associated drilling equipment at the proposed Rancho Grande 1-22 project site would appear from Edmonston Pumping Plant Road. Figure 5 is a photo simulation of how the production facility at the proposed Rancho Grande 1-22 project site would appear from Edmonston Pumping Plant Road. Impacts would be less than significant.

Ib. The proposed project sites are not located adjacent to a state scenic highway. Therefore, the proposed project would not damage the scenic resources within a state scenic highway. No Impact.

Ic. Drilling the exploratory oil and gas well will temporarily change the existing quality and visual character at each of the proposed project sites due to the presence of a drilling rig 172 feet in height at each of the proposed project sites during drilling activities. However, impacts to the existing visual quality and character of the project area associated with drilling activities will be short-term lasting only approximately 17 days in length for each of the eight (8) wells.

If economic quantities of oil or gas are discovered, production equipment including a well head, pumping unit, one 500 Barrel Oil Tank and one 500 Barrel Produced Water Tank will be installed on site. This equipment is similar in size and shape to tanks and pumps associated with agricultural facilities and other oil and gas sites located throughout the project area. Additionally, no production phase structure on-site will be taller than 25 feet, the project site is set back from residential structures, and views of the project site will be partially blocked by surrounding hills, vineyards, almond orchards, alfalfa and hay fields.

Impacts to the existing visual quality and character of the proposed project sites and their surroundings will be less than significant.

Id. Night lighting will be used during the short-term drilling phase of the project which is expected to last 17 days for each of the eight (8) wells. Night lighting will not be used for any other phase of the project. The project is designed so night lighting would be directed downward and inward to minimize potential offsite impacts. Based upon the results of site visits conducted by Robert A. Booher Consulting (RAB Consulting), on September 14 and 15, 2011 and April 10 and 11, 2012, the nearest residence to the proposed project sites is located approximately 1.00 mile to the northwest of Rancho Grande 1-4 along Lavel Road. The closest residences to the proposed project sites may be impacted by the temporary presence of night lighting during the drilling phase. However, the drilling phase for each of the proposed wells is short term and temporary in nature approximately 17 days. Due to project design features (i.e. night lighting directed downward and inward), and because the project's proposed lighting will be minimal to maintain appropriate safety and security, the proposed project will not create a new source of substantial light that will adversely affect nighttime views in the area. No impact.

Conclusion: Impacts to aesthetics will be less than significant.

Mitigation Measures: No significant impacts identified. No mitigation necessary.

References:

California Department of Transportation. *Officially Designated State Scenic Highways*
Website: www.dot.ca.gov/hg/lLandArch/scenic/shwy.htm

County of Kern. *2009 General Plan*
Website: http://co.kern.ca.us/planning/pdfs/kcgp/KCGP.pdf

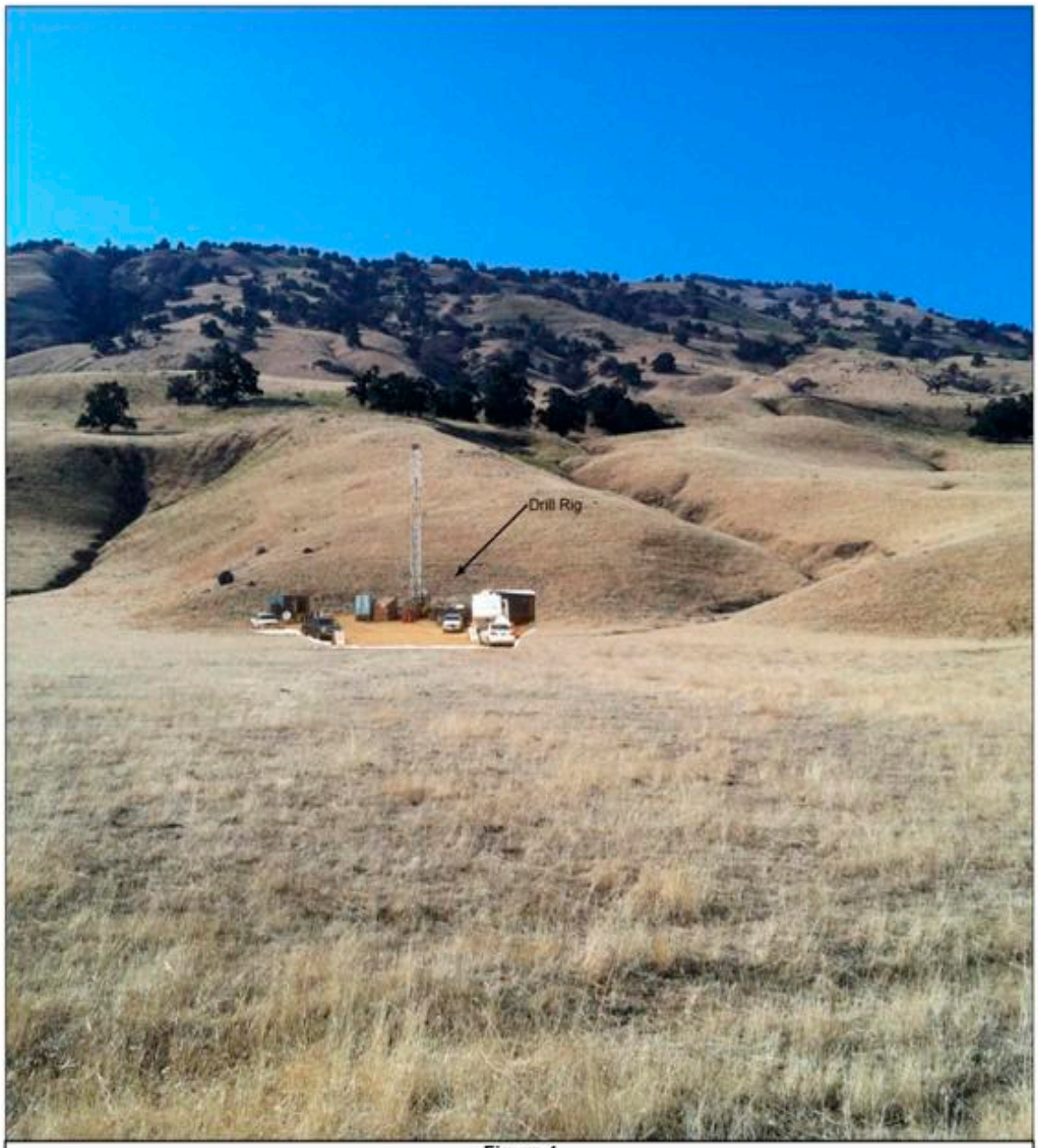

Figure 4
Rancho Grande I Oil and Gas Exploration Project
Photo Simulation of Drill Rig
View to the south of the proposed Rancho Grande 1-22 project site from Edmonston Pumping Plant Road
Approximately 0.16 Miles North of Well Site

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Figure 5
Rancho Grande 1 Oil and Gas Exploration Project
Photo Simulation of Production Facilities
View to the south of the proposed Rancho Grande 1-22 project site from Edmonston Pumping Plant Road
Approximately 0.16 Miles North of Well Site

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ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
II. AGRICULTURAL AND FOREST RESOURCES				
Would the project:				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	_____	_____	_____	X
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	_____	_____	_____	X
c. Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland, to non-agricultural use, or conversion of forestland to non-forest use?	_____	_____	X	_____
d. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)) or timberland (as defined by Public Resources Code section 4526)?	_____	_____	_____	X
e. Result in the loss of forest land or conversion of forest land to non-forest use?	_____	_____	_____	X

Discussion: The proposed project sites are located on annual grassland habitat. The project is consistent with land use and zoning designation for the area. The project is located on agricultural land identified in the General Plan as Intensive Agriculture (8.1) and Extensive Agriculture (8.3) with an overlay of Flood Hazard and Landslide. *Table 4: Land Use Designation* details the land use designation of the proposed eight project sites. All eight project sites are included in the Kern County Agriculture Preserve and all the proposed project sites are located on a parcel under a Williamson Act Contract. Furthermore, with the exception of Rancho Grande 1-4, the proposed project sites are identified on the California Department of Conservation Farmland Mapping and Monitoring Program (FMMP) as Grazing land. Rancho Grande 1-4 is located on lands designated as Vacant/Disturbed (FMMP, 2010).

Table 4
Land Use Designation

Rancho Grande	Current Land Use for each Site
1-3	Extensive Agriculture (8.3)
1-11	Intensive Agriculture (8.1), Flood Hazard (2.5)
2-11	Intensive Agriculture (8.1), Flood Hazard (2.5)
1-15	Extensive Agriculture (8.3), Flood Hazard (2.5)
1-4	Extensive Agriculture(8.3)
1-9	Extensive Agriculture (8.3), Flood Hazard (2.5)
1-16	Extensive Agriculture (8.3), Landslide (2.2)
1-22	Extensive Agriculture(8.3)

IIa. The project area is designated as a mixture of Prime Farmland, Unique Farmland, Grazing Land (lands with vegetation suitable for livestock) and Vacant / Disturbed on the State Important Farmland Map. Rancho Grande 1-4 is located on lands designated as Vacant/Disturbed and the remaining seven (7) proposed project sites are located on lands designated as Grazing Land. The Kern County Williamson Acts Lands Map indicates that all the proposed sites are currently under a Williamson Act Contract. The proposed project would convert 7.86 acres of grazing land zoned Exclusive Agriculture to non-agricultural use. Petroleum exploration and extraction is an allowed use under the Kern County Zoning Ordinance 19.12 for Exclusive Agriculture (A) and is permitted within Williamson Act contracted lands. Thus, there would be no impact to Prime Farmland, Unique Farmland or Farmland of Statewide Importance.

IIb. All eight (8) proposed project sites are subject to Williamson Act Contracts. The Williamson Act allows county governments to enter into contracts with private landowners who agree to restrict parcels of land to agricultural uses or open space uses for at least ten years. In return, landowners receive property tax assessments that are much lower than normal because they are based upon income derived from farming and open space use as opposed to fair market value of the property. The proposed project sites are located within 1,654.24 acres of Williamson Act contracted parcel. The project is zoned Exclusive Agriculture (A). The proposed project will be consistent with the Kern County Zoning Ordinance, Chapters 19.12.020 (Exclusive Agriculture (A) District) and 19.98.020 (Oil and Gas Production). Participating local governments adopt agricultural preserve standard uniform rules to administer Williamson Act contracts (Government Code Section 51231). The agricultural preserve rules adopted by the Kern County Board of Supervisors lists oil and gas drilling and production in accordance with the provisions of Kern County Zoning Ordinance, Chapter 19.98 (Oil and Gas Production) as a consistent use for lands within the agricultural preserve and subject to a Williamson Act contract. No impact.

IIc. The proposed project would not require the extension of public services and would not put pressure on adjacent agricultural lands to convert from agriculture to urban uses since other gas and petroleum facilities exist in the immediate vicinity. The project will convert to compatible use 7.86 acres within a 1,654.24 acre Williamson Act contracted parcel. The impact would be less than significant.

IId. No forest resources are located within the project site and the site is not zoned for timber harvest. There is no impact.

IIe. No forest resources are located within the project site and the site is not zoned for timber harvest. There is no impact.

Conclusion: Impacts to agricultural and forest resources will be less than significant.

Mitigation Measures: No significant impacts identified. No mitigation necessary.

References:

California Department of Conservation. *Farmland Mapping & Monitoring Program*.
Website: http://www.conservation.ca.gov/dlrp/fmmp/Pages/Index.aspx.

California Department of Conservation. *Williamson Act Program*.
Website: http://www.conservation.ca.gov/dlrp/lca/Pages/Index.aspx.

Kern County, *Agricultural Preserve Uniform Standard Rules*
Website: http://www.co.kern.ca.us/planning/pdfs/form80.pdf

ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
III. AIR QUALITY				
Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?	_____	_____	X	_____
b. Violate any air quality standard or contribute to an existing or projected air quality violation?	_____	X	_____	_____
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors?	_____	_____	X	_____
d. Expose sensitive receptors to substantial pollutant concentrations?	_____	_____	X	_____
e. Create objectionable odors affecting a substantial number of people?	_____	_____	X	_____

Discussion: The project site lies within the south central portion of the San Joaquin Valley Air Basin (SJVAB), which is the second largest air basin in the state. The SJVAB encompasses eight counties: San Joaquin, Stanislaus, and Merced; Madera, Fresno, Kings, and Tulare Counties and the valley portion of Kern County. The SJVAB is managed by the San Joaquin Valley Air Pollution Control District (SJVAPCD) and is defined by the Sierra Nevada Mountains in the east, the Coast Ranges in the west, and the Tehachapi Mountains in the south. The San Joaquin Valley opens to the Pacific Ocean at the Carquinez Straits, where the San Joaquin-Sacramento Delta empties into the San Francisco Bay. Although marine air generally flows into the basin from the San Joaquin River Delta, the region's topographic features restrict air movement through and out of the basin.

The air pollutants emitted into the ambient air by stationary and mobile sources are regulated by federal and state law. These regulated air pollutants are known as "criteria air pollutants" and are categorized into primary and secondary pollutants. Primary air pollutants are those that are emitted directly from sources. Carbon monoxide (CO), volatile organic compounds (VOC), nitrogen oxides (NO_X), sulfur dioxide (SO_2), coarse inhalable particulate matter (PM_{10}), fine inhalable particulate matter ($PM_{2.5}$), and lead (Pb) are primary air pollutants. VOC and NO_X go on to form secondary criteria pollutants through chemical and photochemical reactions in the atmosphere. Ozone (O_3) and nitrogen dioxide (NO_2) are the principal secondary pollutants. Other pollutants, such as carbon dioxide (CO_2), contribute to global climate change. A discussion of CO_2 and greenhouse gases is included in Section VII, Greenhouse Gas Emissions.

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. The SJVAPCD defines sensitive receptors as locations where there are human populations with a reasonable expectation of continuous human exposure according to the averaging period for the ambient air quality standards (AAQS). The most sensitive portions of the population are children, the elderly, the acutely ill, and the chronically ill, especially those with cardiorespiratory diseases. Residential areas are considered to be sensitive receptors to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Other sensitive receptors include retirement facilities, hospitals, and schools. The closest residences to the proposed project sites range from 1.0 to 3.0 miles (5,280 to 15,840 feet). The project would not create objectionable odors that would affect a substantial number of people as it is located in a remote, rural location so there are very few people and the distance from the well sites is adequate to dissipate any odor created.

The SJVAPCD has established Thresholds of Significance: Criteria for Determining Environmental Significance. These thresholds separate a project's short-term emissions from its long-term emissions. Short-term emissions are mainly related to the construction phase of the project and are recognized to be short in duration. Long-term emissions are primarily related to activities that would occur indefinitely as a result of project operations.

Conversion of an exploratory well into a producing well would result in operational emissions, which have the potential to contribute to the possible violation of an existing air quality standard or an existing or projected air quality violation. Sources of operational emissions include fugitive emissions from wells, some storage tanks, piping, compressors, separators, and loading racks and point source emissions from steam generators, some storage tanks, and internal combustion equipment installed as part of the operation of new wells, including thermally enhanced wells. Indirect operational emissions include vehicle trips associated with employees and contractors needed to operate and maintain the oil production operation and trucks to transport produced water and oil.

The installation of the above equipment is subject to permit requirements of the SJVAPCD. One major requirement is that new and modified equipment that has air contaminant emissions must satisfy the requirements of New Source Review (NSR). The main requirements of NSR are to require the installation of best available control technology to minimize emission increases from such equipment and to mitigate emission increases over certain thresholds by providing emission reductions either by limiting the use of existing equipment or by providing emission offsets.

These requirements are intended to allow for economic growth but not interfere with the SVAPCD's efforts to achieve or maintain attainment with ambient air quality standards.
As a result of compliance with SJVAPCD permit requirements, and implementation of the identified mitigation measures, project related impacts on air quality would be reduced to less than significant.

IIIa. The SJVAPCD has prepared an Air Quality Attainment Plan to enable the San Joaquin Valley to attain air quality standards by the earliest practicable date. Short-term emission impact is anticipated as part of the proposed project, but with measures included in the project it would be a less than significant impact. Particulate matter emissions can be expected to occur during the construction of each drill pad and from daily ingress and egress of vehicles on the unpaved access road. Earthmoving activities at each of the proposed project sites would not exceed the non-residential project limit of 5.0 or more acres and would not move, deposit, or relocate more than 2,500 cubic yards per day of bulk materials on at least three days. Therefore, a Dust Control Plan would not be required as specified in Regulation VIII, Rule 8021, and Section 6.3.1. The operator shall provide written notification to the SJVAPCD at least 48 hours prior to beginning earthmoving operations as required (Section 6.4.2). Construction also would produce exhaust emissions with transport of workers and machinery to and from each site as well as operation of equipment on-site. Typical equipment used for this project may include diesel drill rig, bulldozer, grader, loader, compacter, heavy-duty trucks, baker tanks, air compressors, pumps, and generators. The proposed project would not significantly conflict with or obstruct implementation of the SJVAPCD Air Quality Attainment Plan.

IIIb,c. RAB Consulting prepared emissions calculations to determine the quantity of following category of air pollutants:

- Criteria Air Pollutants (ROG, NOx, PM-10)
- Toxic Air Contaminants
- Greenhouse Gases (GHG)

The procedure for estimating these emissions and their significance is discussed below.

Criteria pollutant emissions were estimated using Road Construction Emissions Model (RCM), Version 7.1.3 software, which is recommended by the SJVAPCD for use in calculating air emissions for this type of project (Attachment B). Criteria pollutant emissions for the project were estimated based upon lists of equipment for each phase of the project provided by Sojitz. The duration of each phase per well in any year is as follows:

- Site Preparation 3 days
- Drilling 17 days
- Testing 3 days
- Completion 4 days
- Installation of Production Equipment 7 days
- Production 365 days
- Plugging and Abandonment 4 days

Equipment used for each phase of the project is summarized in Tables 5 through 11.

Table 5
Equipment List and Duration of Use for Site Preparation for Each Well Site

Equipment Type and Quantity of Each	Days of Operation	Hours Operation Daily	Maximum Daily Vehicle Trips	Mobilization and Demobilization Trips
Bulldozer (1)	3	8	0	2
Water Truck (1)	3	4 (2 water applications per day to control dust)	0	2
Passenger Car/Pickup Truck Roundtrips (2)	3	3 per vehicle trip	6	0
Heavy Truck/Semi (3)	2	2 per truck/semi trip	0	6
Grader (1)	1	8	0	0
Skip loader (1)	1	8	0	0
Roller (1)	2	8	0	0

Table 6*
Equipment Usage Drilling Phase for Each Well Site

Equipment Type and Number of Each	Days of Operation	Hours Operation Daily	Maximum Daily Vehicle Trips	Mobilization and Demobilization Trips
Loader Fork Lift (1)	10	1	0	0
Water Truck (1)	4	8	0	2
Drill Rig Motor (Internal Combustion Engine 2,500 horse power) (2)	10	8	0	0
Small Generators (2) – 45 horse power each	10	24	0	0
Crane (1)	0.25	3	0	0
Passenger Car/Pickup Truck Roundtrips (8)	17	3 per vehicle trip	24	0
Heavy Truck/Semi – Normal Operations (10)	17	4 per truck/semi trip	40	0
Heavy Truck/Semi – Mobilization and Demobilization of Equipment (25)	2	3 per truck/semi trip	0	75
Mud pump (500hp)	10	16	0	0
Draw works (500hp)	10	4.4	0	0
Generator (375hp)	10	24	0	0

*Note: The drilling phase for each well will last 17 days. However, the drill rig motors will only operate 10 days.

Table 7
Equipment Usage Testing Phase for Each Well Site

Equipment Type and Number of Each	Days of Operation	Hours Operation Daily	Maximum Daily Vehicle Trips	Mobilization And Demobilization Trips
Completion Rig Main Drive (450 hp)	3	12	0	2
Completion Rig Pump Motor (300 hp)	1.5	5	0	0
BOP Generator (31.5 hp)	3	12	0	0
Portable Baker Tank (2)	3	12	0	0
Semi Deliveries (Delivered from Bakersfield)	3 trips a well for 1 day	3 hours per trip	0	3
Pickup Truck Roundtrips (6)	3	1 per trip	6	0
Heavy Truck/Semi – Oil Deliveries and/or Water (2)	1	4 per trip	0	8
Production tank (1)	90	NA	0	0

Table 8
Equipment Usage for Completion Phase

Equipment Type and Number of Equipment	Operation Period	Hours Operation Daily
Completion Rig Main Drive (450 hp)	4 days	8 hours per day
Completion Rig Pump Motors (300 hp)	4 days	5 hours per day
Semi Deliveries (delivered from Bakersfield)	1 day	3 hours per trip
Pickup Truck Roundtrips (3)	4 days	1 per trip

Table 9
Equipment Usage for Installation of Production Equipment

Equipment Type and Number of Equipment	Duration (Days)	Daily Usage (hours/day)
Forklift (1)	7	12
Front End Loader (1)	7	12
Welding Truck (1)	7	12
Welder (1)	7	12
Side-Boom Crane (1)	7	12
Worker Transportation Cars/Light Trucks	7	3 trips/day
Heavy Duty Trucks/Semi	1	2 trips/day

Table 10
Equipment Usage for Production

Equipment Type and Number of Equipment	Duration (Days)	Daily Usage (hours/day)
500 Barrel Oil Tank (1)	365	24
500 Barrel Production Water (1)	365	24
Wellhead pumping unit – 49.6 hp IC Engine (1)	365	24
Worker Transportation Cars/Light Trucks	365	1 trip/day
Heavy Duty Trucks/Semi (Oil Transport) (1)	365	1 trip/5 days (0.2 trips/day)
Heavy Duty Trucks/Semi (Water Transport) (1)	365	1 trip/month (0.03 trips/day)

Table 11
Equipment Usage for Plugging and Abandonment Phase

Equipment Type and Number of Equipment	Operation Period	Hours Operation Daily
Completion Rig Main Drive (450 hp)	4 days	8 hours per day
Completion Rig Pump Motors (300 hp)	4 days	5 hours per day
Semi Deliveries (delivered from Bakersfield)	1 day	3 hours per trip
Pickup Truck Roundtrips (3)	4 days	1 per trip

Emissions of Criteria Air Pollutants

Table 12 summarizes the tons per year of criteria pollutant emissions that would be produced from preparation of a single well site and drilling a single well. Note that the total emissions represent a "not-to-exceed" emission rate since not all phases listed in Table 12 would occur in a single year. For example, if the well is determined to be non-producing, then only the first four (4) phases would be completed. If the well is found to be productive, then the production and final plugging and abandonment would most likely occur in subsequent years.

Sojitz has indicated that the eight wells will be drilled over a three year period. Two (2) wells will be drilled in 2013 and three (3) wells will be drilled in 2014 and 2015. Total criteria pollutant emissions calculations for each project year are presented in Table 13. As noted previously, these emissions represent "not-to-exceed" emissions since not all phases of all wells could be completed in a single year. In addition, as construction and production is shifted to later years, the emissions rates would decline since newer equipment and trucks typically have

lower emissions. Typically, emissions from newer equipment decline by 5% per year. This decline is partially due to statewide regulations resulting in decreases of tailpipe emissions for new vehicles and trucks and emission decreases from off-road in-use diesel equipment.

Table 12
Criteria Pollutant Emissions Calculations for Construction of Single Well Site and Drilling of Single Exploratory Well

Project Phase	ROG (ton/yr)	NOX (ton/yr)	PM-10 (ton/yr)
Site Prep[1]	0.04	0.04	0.04
Drilling Phase	0.1	1.2	0.04
Testing Phase[1]	0.04	0.04	0.04
Completion Phase[1]	0.04	0.04	0.04
Installation of Production Equipment[1]	0.04	0.1	0.04
Production	0.04	1.4	0.1
Plugging and Abandonment Phase[1]	0.04	0.04	0.04

1 – Emissions reported as 0.0 tons/year by the RCM Model are assumed to equal a maximum of 0.04 tons/yr

Table 13
Criteria Pollutant Emissions Calculations for each Project Year

Project Emissions Estimate	ROG (ton/yr)	NOX (ton/yr)	PM-10 (ton/yr)
2013 (2 wells)	1.4	5.72	0.68
2014 (3 wells)	2.1	8.58	1.02
2015 (3 wells)	2.1	8.58	1.02

Table 14
Comparison of Annual Emission Rates of Criteria Air Pollutants with SJVAPCD Significance Thresholds

Air Pollutant	Threshold of Significance (Ton/Yr)	Maximum Annual Project Emissions 2013	Maximum Annual Project Emissions 2014 & 2015
Reactive Organic Gas (ROG)	10	1.4	2.1
Nitrogen Oxides (NO_X)	10	5.72	8.58
Particulates (PM_{10})	15	0.68	1.02

The proposed project includes the use of equipment that may contribute to or violate air quality standards. The project will comply with SJVAPCD Regulation VIII Fugitive Dust Rules (in particular, Rule 8021-Construction, demolition, excavation, and extraction) and Rule 8031 – transportation of bulk materials which reduce effects of this project with regard to air quality to the level of less than significant.
All engines used shall be maintained in compliance with the U.S. Environmental Protection Agency (USEPA) and the California Air Resources Board engine standards. Mitigation measures are presented below and in attachment A.

SJVAPCD Rule 2280 Portable Equipment Registration for certain portable emissions units shall be required for well drilling, service or workover rigs, pumps, compressors, generators and field flares.

Project Impacts from Criteria Air Pollutants

SJVAPCD has established thresholds of significance[1] for several criteria air pollutants. The thresholds of significance are in terms of annual tons of PM_{10}, ROG and NOx. CEQA Guidelines Section 15064.7 expressly authorizes the adoption of thresholds of significance and these thresholds may be used by a lead agency to determine the significance of a project's impacts.

[1] SJVAPCD (2002) "Guide for Assessing and Mitigating Air Quality Impacts", Revised Jan. 10, 2002.

A comparison of project emissions with the adopted thresholds of significance is presented in Table 14. As data in this table shows, project emissions are below the thresholds of significance. Consequently, the project would not lead to significant air quality impacts.

Cumulative Impacts from Criteria Air Pollutants

The SJVAPCD's Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI) revised in 2002 provides guidance on evaluating cumulative air quality impacts.

> " Cumulative Impacts. Any proposed project that would individually have a significant air quality impact (See Section 4.3.2 – Threshold of Significance for Impacts from Project Operations) would also be considered to have a significant cumulative air quality impact." (GAMAQI p. 29)

Section 15064(h)(3) allows the lead agency to determine the project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program. As the air quality impacts of the proposed project are individually insignificant, and the proposed project is in compliance with SJVAPCD's approved emission reductions plans, the Division has determined that air quality impacts of the proposed project are not only individually insignificant, but also are not cumulatively considerable.

The San Joaquin Valley Basin is in non-attainment for ozone for federal and state air quality standards and PM10 for state standards. The SJVAB is in attainment with PM10 for federal standards.

To reduce emissions and bring the valley into compliance with ozone and PM-10 standards, the SJVAPCD adopted the 2007 Ozone Plan. This Plan was reviewed and approved by CARB and the federal EPA. This Plan sets forth specific requirements what will substantially lessen cumulative impacts from NOx and ROG emissions. The SJVAPCD is in the process of updating the ozone plan for the Revoked 1-hour ozone standard. However, the 2007 Ozone Plan is still in effect. Details of the Plan updates can be found at: http://www.valleyair.org/Air_Quality_Plans/Ozone_Plans.htm

Consistent with this Plan, SJVAPCD has adopted an aggressive set of policies, rules and regulations which includes the adoption of indirect source review (ISR) and the nation's most stringent limits on NOx emissions from boilers, heater and IC engines. The following rules are aimed at reducing emissions from oil and gas production:

Rule 4306 – Reduction of NOx from boilers, heaters and steam generators
Rule 4624 – Transfer of organic liquids
Rule 4702 – Limits on NOx emissions from IC engines

Collectively, these policies are reducing NOx and ROG emissions from stationary sources, including sources at oil production facilities. A detailed discussion and a chart showing the reduction in NOx emissions in the valley can be found at: http://www.valleyair.org/Air_Quality_Plans/Ozone_Plans.htm.

The current project complies with the 2007 Ozone Plan and with the above noted ~~r~~*R*ules. In addition, the project's emissions are below the SJVAPCD's Thresholds of Significance. Therefore, the project impacts both individually and cumulatively are less than significant.

IIId. The proposed project sites are located within an unincorporated area of Kern County. Scattered rural residences are located throughout the project area. The proposed project sites would be located away from rural residences. Rural residences are considered a sensitive receptor. The nearest residence to any proposed project site is one mile (5,280 feet) from the Rancho Grande 1-4 well site.

Criteria Air Pollutant Concentrations

Project activities will create pollutants that will be released to the localized area of the proposed project sites. However, these pollutants will greatly disperse prior to reaching a sensitive receptor. Due to the distance of the proposed project sites from the closest sensitive residential receptors, and the fact that project emissions are below the thresholds of significance, the project is not expected to subject sensitive receptors to substantial pollutant concentrations.

Short-Term Emissions and Project Impacts

The main short-term toxic air contaminant associated with the construction phase (site-preparation, drilling, testing and completion) of this project is diesel particulate matter (DPM) and fugitive organic emissions released from on-site equipment. The emission rates were previously calculated using the Roadway Model for individual phases of the project. The emission rates appear under "Exhaust PM-10" in the emissions summary provided in Attachment B. Overall short-term construction related emissions are summarized below

Table 16
Summary of Short-Term Emissions of DPM and Fugitive Organic Emissions from a Single Well

Short-Term DPM Emissions			
Project Phase	**DPM**	**Duration**	**Total**
	(lbs/day)	*(days)*	*(lbs)*
Site Preparation	0.8	3	2.4

Drilling	10	17	*170*
Testing	1.3	5	4 6.5
Completion	0.9	4	3.6
Production Equipment Installation	1.6	7	11.2
Plugging and Abandonment	0.9	5	4.5
TOTALS	15.5	41	198.2
Note: Exhaust PM-10 emission rates are calculated using the ROADWAY model.			

Short-Term Toxic Fugitive Organic Emissions (in pounds)	
Benzene	0.131
Ethyl Benzene	0.0837
n-Hexane	0.148
Toluene	0.124
Xylenes	0.120

Short-term impacts to public health were estimated on the basis of the facility risk prioritization score. The score is based on the AB-2588 Air Toxics Hotspots Information and Assessment Act of 1987. The spreadsheet for estimating the facility score was obtained from the SJVAPCD. The facility score is based on 198.2 lbs/yr of DPM. A score of 0.20 "Low" was calculated at the nearest residence 1.0 mile (1,610 meters) away from the proposed Rancho Grande 1-4 project site. The risk would be even lower at residences located beyond 1 mile. Given this low level or projected public health risk, a more refined risk analysis is not necessary. Since the facility prioritization score is well below 10, this indicates that short-term impacts associated with the proposed project would not lead to significant public health risks and that a detailed risk analysis is not required. A copy of the prioritization score is provided in Attachment B.

Long-Term Emissions of Toxic Air Pollutants and Project Impacts

The main long-term toxic air contaminant associated with the production phase of this project is diesel particulate matter (DPM) that would be released from the wellhead pumping unit. This unit has a single 49.6 hp internal combustion engine that would operate up to 24 hours per day, 7 days per week.

Emissions of total PM-10 from the engine were previously estimated (Attachment B) to equal 0.1 tons (200 pounds) per year for a single well. Based on a best-case scenario of 8 producing wells, emissions of total PM-10 for the project would be 1,600 lbs. per year.

In addition to DPM, trace amounts of fugitive organic emissions could be released. A summary of fugitive emissions is provided in the following assuming all 8 wells are in operation.

Pollutant	1-Well	8-Wells
	(lbs/yr)	(lbs/yr)
Benzene	0.131	1.048
Ethyl benzene	0.0837	0.6696
n-Hexane	0.148	1.184
Toluene	0.124	0.992
Xylenes	0.12	0.96

Impacts to public health were estimated on the basis of the facility risk prioritization score. The score is based on the AB 2588 Air Toxics Hotspots Information and Assessment Act of 1987. The spreadsheet for estimating the facility score was obtained from the SJVAPCD. The facility score is based on 200 lbs/yr of DPM. A score of 1.63 "Medium" was calculated at the nearest residence 1.0 mile (1,610 meters) away from the proposed Rancho Grande 1-4 project site. The risk would be even lower at residences located beyond 1 mile. A copy of the prioritization score is provided in Attachment B.

Since the facility prioritization score is well below 10, this indicates that operation of the wells would not lead to significant public health risks and that a detailed risk analysis is not required.

IIIe. The proposed project sites are located within an unincorporated area of Kern County. Scattered rural residences are located throughout the project area. Rural residences are considered a sensitive receptor. Since the nearest residence to any proposed project site is one mile (5,280 feet) from the Rancho Grande 1-4 project site, the proposed project sites would be located away from rural residences.

Project activities may create odors, but they would only be perceptible in close proximity to the project sites. In its GAMAQI document, the SJVAPCD indicates that any project with the potential to frequently expose members of the public to objectionable odors will be deemed to have a significant impact. Included in the GAMAQI is a list of facilities that are known to produce odors within the SJVAB, as follows below. If a project would result in sensitive receptor being located closer than the screening level distances, the SJVAPCD advises a more detailed analysis and contact with SJVAPCD's Compliance Division should be made.

Screening Levels for Potential Odor Sources

Odor Generator	Distance
Wastewater Treatment Facilities	2 miles
Sanitary Landfill	1 mile
Transfer Station	1 mile
Compositing Facility	1 mile
Petroleum Refinery	2 miles
Asphalt Batch Plant	1 mile
Chemical Manufacturing	1 mile

Fiberglass Manufacturing	1 mile
Painting/Coating Operations (e.g., auto body shop)	1 mile
Food Processing Facility	1 mile
Feed Lot/Dairy	1 mile
Rendering Plant	1 mile

Source: San Joaquin Valley Air Pollution Control District, 2002

Due to the distance of the proposed project sites from residences, the project is not expected to create objectionable odors that would be noticeable at these residences. As such, impacts from odors would be considered less than significant.

Conclusion: Mitigation measures and compliance with regulations and permit requirements shall reduce potential impacts to air quality to a level of less than significant.

Mitigation Measures: In order to reduce impacts to air quality to a less than significant level, the following mitigation measures will be implemented:

Air Quality 1 - All disturbed areas, including storage piles, which are not being actively used for construction purposes, shall be effectively stabilized using water.

Air Quality 2 - Unpaved access roads shall be effectively stabilized of dust emissions using water.

Air Quality 3 - All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions by using the application of water or by presoaking.

Air Quality 4 - When materials are transported off-site, all material shall be covered, effectively wetted to limit visible dust emissions, or at least six (6) inches of freeboard space from the top of the container shall be maintained.

Air Quality 5 - Following addition of materials to, or removal of materials from the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions by using sufficient water.

Air Quality 6 - Limit traffic speeds on unpaved access roads to 15 mph.

References:

San Joaquin Valley Air Pollution Control District, *Guide for Assessing and Mitigating Air Quality Impacts.*
Website: http://www.valleyair.org/transportation/ceqa_idx.htm

SJVAPCD Rules Website: http://www.valleyair.org/rules/1ruleslist.htm

California Environmental Quality Act (CEQA Guidelines)

California Environmental Protection Agency, *Air Toxics Hot Spots Program Risk Assessment Guidelines; The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment* (August 2003)

ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
IV. BIOLOGICAL RESOURCES				
Would the project:				
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	_____	X	_____	_____
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	_____	_____	_____	X
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	_____	_____	_____	X
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	_____	_____	_____	X
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	_____	_____	_____	X
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community, Conservation Plan, or other approved local, regional, or state habitat conservation plan?	_____	_____	_____	X

Discussion: A biological assessment report was prepared for the proposed project in April 2012, and is attached to this initial study/mitigated negative declaration (Attachment C). This report provides a detailed discussion of the biological resources present and potentially present within the project area. Field surveys were conducted to determine if special-status plant or animal species or suitable habitats occurred within the proposed project sites and access roads. Surveys also sought to determine if the proposed project would have an adverse effect on these species or habitats. No valley saltbush scrub, wetlands, streams, or other sensitive habitats were identified on the proposed sites, access roads or buffer areas.

On September 14 and 15, 2011 and April 10 and 11, 2012, RAB Consulting conducted biological and botanical surveys of the proposed project area including the proposed well sites and access road as well as buffer areas to identify known or potential habitat for special-status wildlife and plant species. RAB Consulting found no sensitive plant or animal species present within any of the proposed project sites, proposed access roads, or a 250-foot buffer area around each proposed project sites. However, habitat that could potentially support sensitive species was observed. Special-status species potentially occurring in the proposed project area and locations where these species could potentially occur are presented in Table 17.

Table 17
Special-Status Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur in Project Area
Mammals					
San Joaquin antelope squirrel	*Ammospermophilus nelsoni*	-	CT	Found in western San Joaquin Valley from 200 to 1,200 feet elevation. Found on dry sparsely vegetated loam soils. Dig burrows or use kangaroo rat burrows. Require widely scattered shrubs, forbs, and grasses in broken terrain with gullies and washes.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffers areas. No potential burrows for this species were observed within the proposed well sites or proposed access roads to Rancho Grande 1-16 and 1-22. Potential burrows were observed within the buffer area of the proposed Ranch Grande 1-4, 1-16, and 1-22. However, potential habitat had an overall lack of bushes and shrubs, a component of the antelope squirrels habitat. No individual antelope squirrels or signs of their activity observed during surveys. This species has been documented approximately 0.9 miles west of the proposed Rancho Grande 1-16 well site (CDFW 2011) (see Figure 6).
Pallid bat	*Antrozous pallidus*	-	CSC	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in dry	Potentially present. Suitable foraging habitat for this species is present within the proposed project sites and

Table 17
Special-Status Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur in Project Area
				habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	buffer areas. However, no maternity or nesting sites observed during biological surveys. This species has not been documented within the proposed project area (CDFW 2011) (see Figure 6).
Giant kangaroo rat	*Dipodomys ingens*	FE	CE	Prefer annual grassland on gentle slopes of generally less than 10°, with friable, sandy-loam soils. However, most remaining populations are found on poorer, marginal habitats which include shrub communities on a variety of soil types and on slopes up to about 22°. Giant kangaroo rats develop burrow systems with one to five or more separate openings. Utilize two types of burrow: 1) a vertical shaft with a circular opening and no dirt apron, and 2) a larger, more horizontally-opening shaft, usually wider than high with a well-worn path leading from the mouth.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffers areas. No potential burrows for this species were observed within the proposed well sites or proposed access roads to Rancho Grande 1-16 and 1-22. Potential burrows were observed within the buffer area of the proposed Ranch Grande 1-4, 1-16, and 1-22. No individual giant kangaroo rats observed during surveys. This species has not been documented within the proposed project area (CDFW 2011) (see Figure 6).
Tipton kangaroo rat	*Dipodomys nitratoides*	FE	CE	Found in saltbush scrub and sink scrub communities in the Tulare Lake Basin of the southern San Joaquin Valley. Require soft friable soils which escape seasonal flooding. Dig burrows in elevated soil mounds at bases of shrubs.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffers areas. No potential burrows for this species were observed within the proposed well sites or proposed access roads to Rancho Grande 1-16 and 1-22. Potential burrows were observed within the buffer area of the proposed Ranch Grande 1-4, 1-16, and 1-22. No individual Tipton kangaroo rats observed during surveys. This species has been documented in the immediate vicinity of the proposed Rancho Grande 1-9 well site (CDFW 2011) (see Figure 6).

Table 17
Special-Status Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur in Project Area
Tehachapi pocket mouse	*Perognathus alticolus inexpectatus*	-	CSC	Arid annual grassland and desert shrub communities. Also found in fallow grain fields and in Russian thistle. Burrows for cover and nesting. Aestivates and hibernates during extreme weather. Forages on open ground and under shrubs.	No potential. The proposed project sites are outside of the elevational range of this species.
American badger	*Taxidea taxus*	-	CSC	Found in drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Require uncultivated ground. Prey on burrowing rodents. The American badger digs their own burrows.	Potentially present. Suitable habitat for this species was observed within annual grassland habitat within the proposed project sites and buffer areas. No potential burrows for this species were observed within the biological survey area. No individual American badgers or signs of their activity observed during surveys. This species has been documented in the immediate vicinity of the proposed Rancho Grande 1-4, 1-9, and 1-16 well sites (CDFW 2011) (see Figure 6).
San Joaquin kit fox	*Vulpes macrotis mutica*	FE	CT	Inhabit annual grasslands or grassy open stages with scattered shrubby vegetation. Require loose-textured sandy soils for burrowing, and a suitable prey base.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffer areas. No potential burrows for this species were observed within the biological survey area. No individual San Joaquin kit foxes or signs of their activity observed during surveys. This species has been documented in the immediate vicinity of the Rancho Grande 1-22 (CDFW 2011) (see Figure 6).
Birds					
Tricolored blackbird	*Agelaius tricolor*	-	CSC	Highly colonial species. Most numerous in Central Valley and Vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few kilometers of their colony.	No potential. No suitable habitat found within the project sites or buffer areas.
Grasshopper sparrow	*Ammodramus savannarum*	-	CSC	Found in dense grasslands on rolling hills, lowland plains, in valleys, and on hillsides on lower mountain	Potentially present. Suitable habitat for this species was observed within the proposed well project sites and buffer

Table 17
Special-Status Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur in Project Area
				slopes. Favors native grasslands with a mix of grasses, forbs, and scattered shrubs.	areas. No individual grasshopper sparrows or nest sites observed during surveys. This species has not been documented in the proposed project area (CDFW 2011) (see Figure 6).
Golden eagle	*Aquila chrysaetos*	-	CFP	Golden eagles are found in open and semi-open habitats from sea level to 3,600 meters elevation. Habitat types that they inhabit include tundra, shrublands, grasslands, woodland-brushlands, and coniferous forests. Most golden eagles are found in mountainous areas, but they also nest in wetland, riparian and estuarine habitats.	No potential. No suitable habitat found within the project sites or buffer areas. Additionally, the proposed project sites are outside of the elevational range of this species.
Long-eared owl	*Asio otus*	-	CSC	Riparian bottomlands grown to tall willows and cottonwoods. Also found in belts of live oaks paralleling stream courses. Require adjacent open land with the presence of mice and old nests of crows, hawks, or magpies for breeding.	No potential. No suitable habitat found within the project sites or buffer areas.
Burrowing owl	*Athene cunicularia*	-	CSC	Open grasslands, prairies, farmlands, and deserts.	Potentially present. Suitable habitat for this species was observed within the proposed well project sites and buffer areas. No potential burrows that were of appropriate size for use by this species were observed during biological surveys. This species has not been documented within the proposed project area (CDFW 2011) (see Figure 6).
Southwestern willow flycatcher	*Empidonax traillii extimus*	FE	CE	Riparian woodlands in southern California.	No potential. No suitable habitat found within the project sites or buffer areas.
Bald eagle	*Haliaeetus leucocephalus*	Delisted	CE/CFP	Nests and winters near ocean shores, lake margins and rivers. Nests in large, old-growth, or dominant live trees with open branches, especially Ponderosa pine. Roosts communally in winter.	No potential. No suitable habitat found within the project sites or buffer areas.
California condor	*Gymnogyps californianus*	FE	CE, Fully protected	Found as a recently reintroduced species primarily in the mountains of Ventura, Santa Barbara,	Potentially present. Suitable foraging habitat for this species was observed within the proposed project sites and

Table 17
Special-Status Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur in Project Area
				and Los Angeles counties. However, individuals are known to be wide ranging and have even been seen soaring over the Tehachapi Mountains and southern Sierra Nevada. The species is strictly a scavenger and may travel up to 35 miles or more from roost sites in search of carrion. Most foraging occurs in open habitats that facilitate landings and takeoffs. Traditional roost sites are on cliffs or ledges, but snags and trees in old growth coniferous forest may also be used.	buffer areas. No potential nesting habitat for this species is present within the project sites or buffer areas. No individual California condors observed during surveys. This species has not been documented in the proposed project area (CDFW 2011) (see Figure 6).
Invertebrates					
Vernal pool fairy shrimp	*Branchinecta lynchii*	FT	-	Found in short-lived seasonal cool-water vernal pools with low to moderate dissolved solids.	No potential. No suitable habitat found within the project sites or buffer areas.
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FT	-	Occurs only in the Central Valley of California, in association with blue elderberry (*Sambucus mexicana*). Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for stressed elderberry shrubs.	No potential. No suitable habitat (elderberry bushes) found within the project sites or buffer areas.
Amphibians and Reptiles					
Tehachapi slender salamander	*Batrachoseps stebbinsi*	-	CT	Valley foothill hardwood-conifer and valley-foothill riparian habitats in the Piute and Tehachapi Mountains of Kern County. Prefers wet talus slopes or log-strewn hillsides with a steep, north facing exposure.	No potential. No suitable habitat found within the project sites or buffer areas.
Western pond turtle	*Emys marmorata*	-	CSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Require basking sites and suitable upland habitat (sandy banks or grassy open fields) for egg-laying.	No potential. No suitable habitat found within the project sites or buffer areas.
Yellow-blotched salamander	*Ensatina eschscholtzii croceator*	-	CSC	Forests and well shaded canyons, as well as oak woodlands and old chaparral. Require surface objects such as logs, boards,	No potential. No suitable habitat found within the project sites or buffer areas.

Table 17
Special-Status Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur in Project Area
				and rocks. Also require old rodent burros or other underground retreats.	
Blunt-nosed leopard lizard	*Gambelia sila*	FE	CE, Fully Protected	Resident of sparsely vegetated alkali and desert scrub habitats, in areas of low topographic relief. Seeks cover in mammal burrows, under shrubs or structures such as fence posts. They do not excavate their own burrows.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffers areas. No potential burrows for this species were observed within the proposed well sites or proposed access roads to Rancho Grande 1-16 and 1-22. Potential burrows were observed within the buffer area of the proposed Ranch Grande 1-4, 1-16, and 1-22. No individual blunt-nosed leopard lizards observed during surveys. This species has been documented in the immediate vicinity of the Rancho Grande 1-22, Rancho Grande 2-11, and Rancho Grande 1-15 well site (CDFW 2011) (see Figure 6).
Coast horned lizard	*Phrynosoma blainvillii*	-	CSC	Inhabits coastal sage scrub and chaparral in arid and semiarid climate conditions. Prefers friable, rocky, or shallow sandy soils.	No potential. No suitable habitat found within the project sites or buffer areas.
California red-legged frog	*Rana draytonii*	FT	CSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11 to 20 weeks of permanent water for larval development. Must have access to aestivation habitat, consisting of small mammal burrows and moist leaf litter.	No potential. No suitable habitat found within the project sites or buffer areas.
Plants					
Horn's milk vetch	*Astragalus hornii var. hornii*	-	List 1B	Meadows, seeps, playas, and lake margins. Elevational range: 60 to 850 meters. Blooming period: May through October.	No potential. No suitable habitat found within the project sites or buffer areas.
Round-leaved filaree	*California macrophylla*	-	List 1B	Cismontane woodland, valley and Foothill Grassland on clay soils. Elevational range: 15 to 1,200 meters. Blooming period: March through May.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffer areas. This species was not observed during biological surveys. This

Table 17
Special-Status Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur in Project Area
					species has not been documented in the project area (CDFW 2011) (see Figure 6).
Palmer's mariposa lily	*Calochortus palmeri var. palmeri*	-	List 1B	Chaparral, lower montane coniferous forest, meadows, and seeps. Elevational range: 1,000 to 2,390 meters. Blooming period: April through July.	No potential. No suitable habitat found within the project sites or buffer areas. Additionally, the proposed project sites are outside of the elevational range of this species.
Lemmon's jewelflower	*Caulanthus coulteri var. lemmonii*	-	List 1B	Pinyon and juniper woodland, valley and foothill grassland. Elevational range: 80 to 1,220 meters. Blooming period: March through May.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffer areas. This species was not observed during biological surveys. This species has not been documented in the project area (CDFW 2011) (see Figure 6).
Tehachapi buckwheat	*Eriogonum callistum*	-	List 1B	Chaparral. Elevational range: 1,400 to 1,500 meters. Blooming period: May through July.	No potential. No suitable habitat found within the project sites or buffer areas. Additionally, the proposed project sites are outside of the elevational range of this species.
Fort Tejon woolly sunflower	*Eriophyllum lanatum var. hallii*	-	List 1B	Chaparral and cismontane woodland. Elevational range: 1,065 to 1,500 meters. Blooming period: May through July.	No potential. No suitable habitat found within the project sites or buffer areas. Additionally, the proposed project sites are outside of the elevational range of this species.
Tejon poppy	*Eschscholzia lemmonii ssp. kernensis*	-	List 1B	Chenopod scrub and valley and foothill grasslands. Elevational range: 160 to 1,000 meters. Blooming period: March through May.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffer areas. This species was not observed during biological surveys. This species has not been documented in the project area (CDFW 2011) (see Figure 6).
Comanche Point layia	*Layia leucopappa*	-	List 1B	Chenopod scrub and valley and foothill grassland. Elevational range: 100 to 350 meters. Blooming period: March through April.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffer areas. This species was not observed during biological surveys. This species has not been documented in the project area (CDFW 2011) (see Figure 6).
Calico monkeyflower	*Mimulus pictus*	-	List 1B	Broadleaved upland forest and Cismontane woodland.	No potential. No suitable habitat found within the

Table 17
Special-Status Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur in Project Area
				Elevational range: 100 to 1,300 meters. Blooming period: March through May.	project sites or buffer areas.
Tehachapi monardella	*Monardella linoides ssp. oblonga*	-	List 1B	Lower montane coniferous forest, pinyon and juniper woodland, and upper montane coniferous forest. Elevational range: 900 to 2,470 meters. Blooming period: June through August.	No potential. No suitable habitat found within the project sites or buffer areas. Additionally, the proposed project sites are outside of the elevational range of this species.
Baja navarretia	*Navarretia peninsularis*	-	List 1B	Chaparral, lower montane coniferous forest, meadows, seeps, and pinyon and juniper woodland. Elevational range: 1,500 to 2,300 meters. Blooming period: June through August.	No potential. No suitable habitat found within the project sites or buffer areas. Additionally, the proposed project sites are outside of the elevational range of this species.
Piute Mountains navarretia	*Navarretia setiloba*	-	List 1B	Cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland. Elevational range: 305 to 2,100 meters. Blooming period: April through July.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffer areas. This species was not observed during biological surveys. This species has been documented approximately 2.0 miles southeast of the proposed Rancho Grande 1-15 well site (CDFW 2011) (see Figure 6).
Robbin's nemacladus	*Nemacladus secundiflorus var. robbinsii*	-	List 1B	Chaparral and valley and foothill grassland. Elevational range: 350 to 1,700 meters. Blooming period: April through June.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffer areas. This species was not observed during biological surveys. This species has not been documented in the project area (CDFW 2011) (see Figure 6).
Bakersfield cactus	*Opuntia treleasei*	FE	CE, List 1B	Chenopod scrub, cismontane woodland, and valley and foothill grassland. Elevational range: 120 to 1,140 meters. Blooming period: April through May.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffer areas. This species was not observed during biological surveys. This species has not been documented in the project area (CDFW 2011) (see Figure 6).
San Bernardino aster	*Symphyotrichum defoliatum*	-	List 1B	Cismontane woodland, coastal scrub, lower montane coniferous forest, meadows, seeps, marshes, swamps, and valley and	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffer areas.

Table 17
Special-Status Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur in Project Area
				foothill grassland. Elevational range: 2 to 2,040 meters. Blooming period: July through November.	This species was not observed during biological surveys. This species has not been documented in the project area (CDFW 2011) (see Figure 6).
Sensitive Habitats					
Southern Cottonwood Willow Riparian Forest (not present)					
Valley Needlegrass Grassland (not present)					
Valley Oak Woodland (not present)					

Status Codes:

Federal
FE = Federally listed as Endangered
FT = Federally listed as Threatened
FC = Federal Candidate species

State
CE = California listed as Endangered
CT = California listed as Threatened
CR = California listed as Rare
CFP = California Fully Protected

The wildlife species observed during biological surveys are listed in Table 17 and the plant species observed during surveys are listed in Table 18.

Table 18
Wildlife Observed During Field Surveys

Common Name	Scientific Name	Common Name	Scientific Name
Domesticated cattle	*Bos tauras*	Domesticated sheep	*Ovis aries*
Coyote	*Canis latrans*	House sparrow	*Passer domesticus*
Turkey vulture	*Cathartes aura*	Western meadowlark	*Sturnella neglecta*
American crow	*Corvus brachyrhynchos*	Common side-blotched lizard	*Uta stansburiana*
Common raven	*Corvus corax*	Mourning dove	*Zenaida macroura*
Black-tailed jackrabbit	*Lepus californicus*		

Table 19
Plant Species Observed During Field Surveys

Common Name	Scientific Name	Common Name	Scientific Name
Blow wives	*Achyrachaena mollis*	California poppy	*Eschscholzia californica*
Fiddleneck	*Amsinckia intermedia*	Hare barley	*Hordeum leporinum*
Ranchers fireweed	*Amsinckia menziesii*	Hill lotus	*Lotus humistratus*
Mt. Diablo locoweed	*Astragalus oxyphysus*	Common mallow	*Malva neglecta* Wallr
Slender wild oats	*Avena barbata*	Horehound	*Marrubium vulgare*
Wild oat	*Avena fatua* L.	Pineapple-weed	*Matricaria matricariodes*
Black mustard	*Brassica nigra* [L.] Koch	Alfalfa	*Medicago sativa*
Soft chess brome	*Bromus hordeaceus*	Almonds	*Prunus dulcis*
Red brome	*Bromus madritensis ssp. rubens*	Perennial sowthistle	*Sonchus arvensis* L.
Rip-gut brome	*Bromus rigidus* Roth	Spiny sowthistle	*Sonchus asper* [L.] Hill
Red maids	*Calandrinia ciliata*	Annual sowthistle	*Sonchus oleraceus* L.
Shepherd's-purse	*Capsella bursa-pastoris*	Lacepod	*Thysanocarpus curvipes*
Turkey mullein	*Croton setigerus*	Vinegar weed	*Trichostema lanceolatum*
Broadleaf filaree	*Erodium botrys*	Red clover	*Trifolium pratense*
Redstem filaree	*Erodium cicutarium*	Wine grape	*Vitis vinifera*

Results from biological surveys for the proposed project are presented below:

San Joaquin Kit Fox - Surveyors did not observe burrows that were of adequate size for potential use by San Joaquin kit foxes during biological surveys. There were no "active signs" (i.e., adult and puppy scat, prey remains, tracks, fur, etc.) of use by San Joaquin kit fox observed. San Joaquin kit foxes have been documented in the immediate vicinity of the Rancho Grande 1-22 as shown on Figure 6.

American Badger - Surveyors did not observe burrows that were of adequate size for potential use by American badgers during biological surveys. There were no "active signs" (i.e., scat, prey remains, tracks, fur, etc.) of use by American badgers observed during biological surveys. This species has been documented in the immediate vicinity of the proposed Rancho Grande 1-4, 1-9, and 1-16 well sites as shown on Figure 6.

Sensitive Small Mammal Species - Surveyors did not observe **San Joaquin antelope squirrels** during biological surveys within the project area. Surveyors searched for burrows and scat of this species and were vigilant for sightings (and listened for vocalizations), but found no

evidence of the San Joaquin antelope squirrel *A. nelsoni* during biological surveys. Surveyors did not observe burrows appropriate for use by this species within the proposed project sites during biological surveys. Potential burrows that could be utilized by this species were observed within the buffer area of the proposed Ranch Grande 1-4, 1-16, and 1-22 well sites. However, these potential burrows were greater than 50 feet in distance from these project sites. No individual squirrels were observed during biological surveys. Ground cover within the proposed project sites and buffer areas was deemed lower in quality due to a lack of shrub cover. This species has been documented approximately 0.9 miles west of the proposed Rancho Grande 1-16 well site (CDFW 2011) as illustrated on Figure 6.

Surveyors found no evidence (i.e., precinct mounds, vertical and pit cache holes, scats, tracks, tail drags, etc.) of **giant kangaroo rats** (recent and/or past use) within the proposed project sites or buffer areas during biological surveys. Surveyors observed potential burrows that could be utilized by this species within the buffer areas of the proposed Rancho Grande 1-4, 1-16, and 1-22 well sites. These burrows were greater than 50 feet in distance from these proposed project sites. Surveyors found appropriate vegetative communities for this species (i.e., annual grassland habitat) within the proposed project sites and buffer areas. As shown on Figure 6, this species has not been documented within the project or area (CDFW 2011).

Surveyors found no evidence (i.e., pit cache holes, scats, tracks, tail drags, etc.) of **Tipton kangaroo rats** within the proposed project sites or buffer areas during biological surveys. Surveyors observed potential burrows that could be utilized by this species within the buffer areas of the proposed Rancho Grande 1-4, 1-16, and 1-22 well sites. These burrows were greater than 50 feet in distance from these proposed project sites. Surveyors found no evidence (i.e., vertical and pit cache holes, scats, tracks, tail drags, etc.) of this species adjacent to these potential burrows. However, biologist did find appropriate vegetative communities for this species (i.e., annual grassland habitat) within the proposed project sites and buffer areas. Furthermore, this species has been documented in the immediate vicinity of the proposed Rancho Grande 1-9 well site (CDFW 2011) as shown on Figure 6.

Surveyors observed potential foraging habitat for the **Pallid Bat** within all areas surveyed during biological surveys. However, surveyors did not observe any known or potential maternity or nesting sites during biological surveys. No individual pallid bats were observed during biological surveys. Furthermore, this species has not been documented within the project area (CDFW 2011) as shown on Figure 6. This species may forage intermittently throughout the project area, but is not expected to nest.

Blunt-Nosed Leopard Lizard - Surveyors observed potential habitat for this species within annual grassland habitat in the proposed project sites and buffer areas during biological surveys. Surveyors did not observe burrows appropriate for use by this species within any of the proposed project sites. Potential burrows that could be utilized by this species were observed within the buffer areas of the proposed Rancho Grande 1-4, 1-16, and 1-22. However, these burrows were greater than 50 feet in distance from these proposed project sites. Surveyors evaluated the proposed project sites as being unsuitable in their current state for BNLLs because of a lack of suitable small mammal burrows. As such, additional protocol level surveys were not conducted and are not required. This species has been documented in the immediate vicinity of the Rancho

Grande 1-22, Rancho Grande 2-11, and Rancho Grande 1-15 well sites (CDFW 2011) as shown on Figure 6.

Sensitive Avian Species - Suitable habitat for **burrowing owls** was observed in annual grassland habitat within the proposed project sites and buffer areas during biological surveys. However, no known or potential burrows that could be used by this species for nesting activities were observed during biological surveys. No burrowing owls were observed during biological surveys, and this species has not been documented previously within the project area (CDFW 2011) as illustrated on Figure 6.

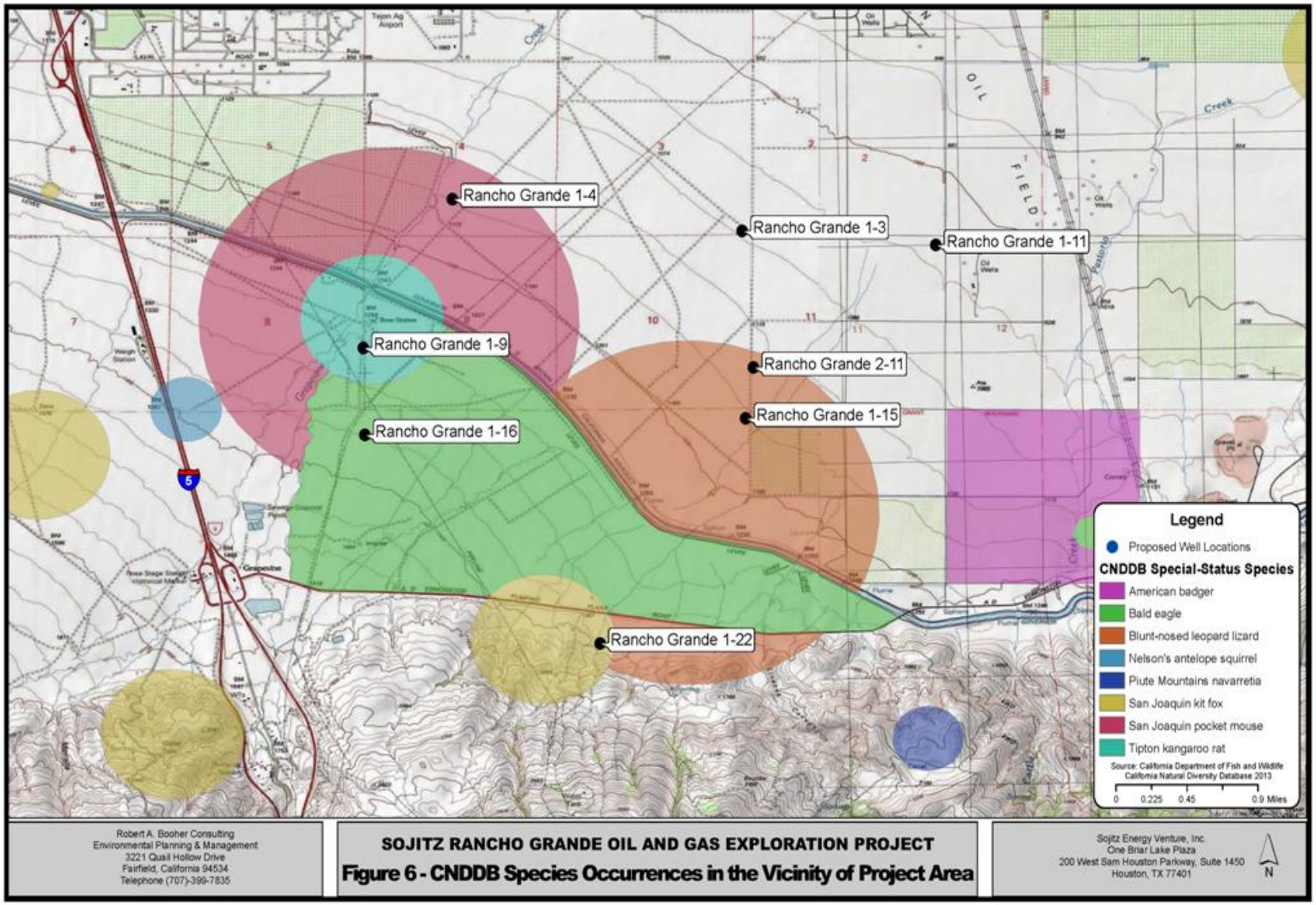
Potential nesting and foraging habitat for **grasshopper sparrows** was observed within the proposed project sites and buffer areas during biological surveys. However, no nesting sites (active or inactive) were observed for this species during biological surveys. Furthermore, no individual grasshopper sparrows were observed during biological surveys. Nor have grasshopper sparrows been documented within the project area (CDFW 2011).

The California condor typically nests in chaparral, conifer forest, or oak woodland communities. Historically, condors nested on bare ground in caves and crevices, behind rock slabs, or on large ledges or potholes on high sandstone cliffs in isolated, extremely steep, rugged areas. Cavities in giant sequoia (*Sequoiadendron giganteum*) and redwood (*Sequoia sempervirens*) have also been documented. Nest sites are often surrounded by dense brush. Nest sites also have the following requirements:

- Entrances large enough for the adults to fit through;
- Ceiling height of at least 14.8 inches at the egg position;
- Floors fairly level with some loose surface substrate;
- Nest space unconstricted for incubating adults; and
- A nearby landing point.

Most foraging occurs in open terrain of foothills, grasslands, potreros with chaparral areas, or oak savannah habitats. Historically, foraging also occurred on beaches and large rivers along the Pacific California condors are opportunistic scavengers, feeding exclusively on the carcasses of dead animals. Typical foraging behavior includes long-distance reconnaissance flights, lengthy circling flights over a carcass, and hours of waiting at a roost or on the ground near a carcass. California condors travel up to 150 miles in a single day in search of food. They typically fly at a height of approximately 600 feet while in search of carrion. However, they have been recorded at heights of 15,000 feet while in flight. Water is required for drinking and bathing.

Suitable foraging habitat for California condors was observed within the proposed project sites and buffer areas during biological surveys. However, no potential nesting habitat (cliffs at higher elevations or old growth forest) was observed during biological surveys. This raptor species may, however, forage intermittently within the project area. No condor sightings have been documented in the immediate area of the proposed project sites, and no individual condors were observed during field surveys.


Rancho Grande 1-4
Rancho Grande 1-3
Rancho Grande 1-11
Rancho Grande 1-9
Rancho Grande 2-11
Rancho Grande 1-15
Rancho Grande 1-16
Rancho Grande 1-22
Legend
Proposed Well Locations
CNDDB Special-Status Species
American badger
Bald eagle
Blunt-nosed leopard lizard
Nelson's antelope squirrel
Piute Mountains navarretia
San Joaquin kit fox
San Joaquin pocket mouse
Tipton kangaroo rat
Source: California Department of Fish and Wildlife
California Natural Diversity Database 2013
0 0.225 0.45 0.9 Miles
Robert A. Booher Consulting
Environmental Planning & Management
3221 Quail Hollow Drive
Fairfield, California 94534
Telephone (707)-399-7835
SOJITZ RANCHO GRANDE OIL AND GAS EXPLORATION PROJECT
Figure 6 - CNDDB Species Occurrences in the Vicinity of Project Area
Sojitz Energy Venture, Inc.
One Briar Lake Plaza
200 West Sam Houston Parkway, Suite 1450
Houston, TX 77401
N

A number of **avian species** protected under the Federal Migratory Bird Treaty Act were observed foraging during biological surveys. No active or inactive nesting sites were observed during biological surveys. The potential exists that avian species, including those listed in Table 16, may nest in nut trees and grape vines within the buffer areas of the proposed Rancho Grande 1-3 and 1-15 well sites. However, it is unlikely that nesting takes place in these orchards due to the agricultural nature of these areas (active maintenance of trees and vines for production). Therefore, these avian species are not expected to nest in the buffer areas of these project sites, and no avoidance measures are required as part of the proposed project.

Special-Status Plants – No special-status plant species were identified during course of botanical surveys within the project sites and buffer areas. Surveys were conducted during the appropriate blooming period of one (1) of the eight (8) targeted special-status plant species identified in Table 19 as potentially occurring within the project sites and areas. The annual grassland habitat found within the project sites and buffer areas is disturbed due to ongoing cattle grazing activities, and the likelihood of special-status plant species occurring within the proposed project sites is unlikely. Additionally, non-native weedy grassland species within the project sites and buffer areas likely out compete special-status species that could occur within the project sites and buffer areas.

Habitat Types – Habitat types observed during field surveys are described further below:

Ruderal/Disturbed

This habitat type was observed within and along the edges of existing access roads adjacent to the proposed project sites proposed for use during project activities. This vegetative community was also observed adjacent to wine/almond orchards and alfalfa fields with the buffer areas of the proposed Rancho Grande 1-3, 1-4, and 1-15 well sites during biological surveys. Common plant species found in this community were composed primarily of weedy non-native and native species. Vegetative species observed included slender wild oats (*Avena barbata*), wild oat (*Avena fatua* L.), black mustard (*Brassica nigra* [L.] Koch), soft chess brome (*Bromus hordeaceus*), rip-gut brome (*Bromus rigidus* Roth), common mallow (*Malva neglecta* Wallr.), pineapple-weed (*Matricaria matricariodes*), alfalfa (*Medicago sativa*), perennial sowthistle (*Sonchus arvensis* L.), spiny sowthistle (*Sonchus asper* [L.] Hill), and annual sowthistle (*Sonchus oleraceus* L.).

Wildlife use of this community is limited due to the monocultural and weedy nature of plant species present. Although the diversity of wildlife is limited, species that do occur in the habitat type are often abundant and well adapted to the presence of humans.

Non-Native Annual Grassland

Non-native annual grassland was observed within all of the proposed well sites, the proposed access roads to Rancho Grande 1-16 and 1-22 and within the buffer areas of the proposed well sites and access road. Common species found in this vegetative community were composed of introduced grasses and broadleaf weedy species. Plant species observed during field surveys included blow wives (*Achyrachaena mollis*), fiddleneck (*Amsinckia intermedia*), ranchers

fireweed (*Amsinckia menziesii*), Mt. Diablo locoweed (*Astragalus oxyphysus*), slender wild oats (*Avena barbata*), wild oat (*Avena fatua* L.), black mustard (*Brassica nigra* [L.] Koch), soft chess brome (*Bromus hordeaceus*), red brome (*Bromus madritensis ssp. rubens*), rip-gut brome (*Bromus rigidus* Roth), red maids (*Calandrinia ciliata*), shepherd's-purse (*Capsella bursa-pastoris*), turkey mullein (*Croton setigerus*), redstem filaree (*Erodium cicutarium*), broadleaf filaree (*Erodium botrys*), California poppy (*Eschscholzia californica*), hare barley (*Hordeum leporinum*), hill lotus (*Lotus humistratus*), horehound (*Marrubium vulgare*), lacepod (*Thysanocarpus curvipes*), vinegar weed (*Trichostema lanceolatum*), and red clover (*Trifolium pratense*).

Wildlife species observed in this community during field surveys included domesticated cattle (*Bos tauras*), coyote (*Canis latrans*), turkey vulture (*Cathartes aura*), American crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), Black-tailed jackrabbit (*Lepus californicus*), Domesticated sheep (*Ovis aries*), house sparrow (*Passer domesticus*), western meadowlark (*Sturnella neglecta*), common side-blotched lizard (*Uta stansburiana*), and mourning dove (*Zenaida macroura*).

Agricultural Lands

An alfalfa field was observed east of the proposed Rancho Grande 1-4 well site within the buffer area. Wildlife use of this vegetative community is limited due to the mono-cultural nature of alfalfa crops and plant species. Although the diversity of wildlife is limited, species that do occur in the area are often abundant and well adapted to the presence of humans.

Nut orchards (almond) were observed within the northern buffer area of the Rancho Grande 1-3 well site, and wine grapes were observed planted east of the proposed Rancho Grande 1-15 well site in the buffer area. Nut and grape orchards are mono-cultural in nature. Trees/vines in this habitat type contain open understories to facilitate harvest. Orchards are planted in uniform patterns and are intensively managed. They are usually established as sapling trees and vines. As trees/vines become old, damaged, or diseased, they are usually replaced. The understory of orchards are managed to prevent understory growth, and as such, herbaceous vegetation was minimal or lacking in this habitat type. Plant species observed in this habitat type included Common wild oats (*Avena fatua*), black mustard (*Brassica nigra*), soft brome (*Bromus hordeaceus*), common mallow (*Malva neglecta* Wallr.), almond (*Prunus dulcis*), and grapes. Orchards have historically been planted on deep fertile soils, which once supported productive and diverse natural habitats. Larger and more diverse populations of wildlife were also supported by these native habitats. Some species of birds and mammals have adapted to the orchard habitats and many have become "agricultural pests," which have resulted in various efforts to reduce crop losses. Wildlife, such as black tailed deer (*Odocoileus hemionus*) and black-tailed jackrabbit (*Lepus californicus*), forage on the trees and vines, while others, such as squirrel (*Sciurus* spp.) and numerous birds, feed on nuts and grapes. Some wildlife (e.g., mourning dove [*Zenaida macroura*], California quail [*Callipepla californica*]) are more passive in their use of orchards for cover and nesting sites. Orchards can be especially beneficial to wildlife during inclement weather or hot summer periods. Many wildlife species act as biological control agents by feeding on weed seeds and insect pests.

The biological assessment conducted for the proposed project found that no special-status animal or plant species were present within the proposed project sites or buffer areas. However, suitable habitat for sensitive plant and animal species was observed within the proposed project sites and buffer areas. No riparian, wetland, stream, vernal pool, or other sensitive community types were observed during the biological assessment.

Direct mortality or injury to common wildlife and plant populations could occur during ground disturbance activities associated with implementation of the proposed project. Small vertebrate, invertebrate, and plant species are particularly prone to impact during project implementation because they are much less to non-mobile, and cannot easily move out of the path of project activities. Other more mobile wildlife species, such as most birds and larger mammals, can avoid project-related activities by moving to other adjacent areas temporarily. Increased human activity and vehicle traffic in the vicinity may disturb some wildlife species. However, common wildlife species have likely become acclimated to on-going agricultural activities. Because common wildlife species found in the project area are locally and regionally common, potential impacts to these resources are considered less than significant. Therefore, no avoidance or minimization measures are proposed.

Implementation of the proposed project has the potential to impact nesting special-status avian species by causing abandonment of nests, nesting colony sites, and the destruction of active nest sites. Grasshopper sparrows have the potential to nest within the annual grassland habitat within the proposed project sites and buffer areas during implementation of the proposed project. In addition, other nesting migratory bird species protected by the Federal Migratory Bird Treaty Act and state and federal protection acts may be present within the project buffer areas during project activities. Impacts could include direct disturbance of active nesting sites during project implementation, or indirect disturbance due to noise impacts from human presence and use of construction and drilling equipment. No nesting avian species were identified during field surveys of the project sites and buffer areas. However, in the unlikely event that bird species could establish nests in the project site or buffer area in the future, measures included as recommendations in the attached biological assessment report will be implemented as mitigation measures.

Implementation of the proposed project could potentially impact individual and nesting burrowing owls should they become established within the proposed project sites and buffer areas prior to project implementation. Impacts to these species could occur through crushing by construction equipment during the construction of the proposed well sites and the proposed access roads to the Rancho Grande 1-16 and 1-22 well sites. Actively nesting burrowing owls could also be affected due to noise and vibration from project activities if nests are located closer than 250 feet to the proposed well sites and proposed access roads; project related noise and vibration could cause the abandonment of active nest sites. However, in the unlikely event that burrowing owls become established in the project site or buffer area in the future, measures included as recommendations in the attached biological assessment report will be implemented as mitigation measures.

Traffic, consisting predominantly of ranching vehicles and equipment within the project area varies from sporadic to moderate. A short-term increase in vehicle traffic is anticipated during

project implementation (site prep, drilling, equipment, and plugging and abandonment) and less so during the production phase. This will result in a short-term increase in associated noise, which may cause temporary disturbance to wildlife species. More tolerant species may adapt to and even take advantage of close human contact. Increased vehicular traffic could cause direct mortality to these species or impede normal activities such as dispersal (Luckenbach 1975, Weinstein 1978). Species intolerant of human activities may use the project sites less when humans are regularly present in the area (Bushnel 1978, Lee and Griffith 1977). Those species observed at or near the project sites appear to have acclimated to ongoing activities.

Direct mortality or injury to sensitive animal populations could occur if earth-moving activities are not confined to approved construction, access roads, and staging areas (assuming that sensitive animal populations are established in the construction zone during project implementation).

The project would not interfere with movements of wildlife species or with established native resident or migratory wildlife corridors. Native resident and/or migratory fish and known native wildlife nursery sites are not present within the project sites or areas.

IVa. The biological assessment found no sensitive plant or animal species present within the proposed project sites or within the 250-foot buffer area around the proposed project sites and access roads. Those species observed at or near the proposed project site or buffers of the proposed project sites appear to have acclimated to ongoing activities. However, to ensure there are no impacts to sensitive plants or sensitive animal species, Sojitz will be required to implement measures that were included in the biological assessment report as mitigation measures.

IVb. No riparian, wetland, stream, vernal pool, or other natural or sensitive community types were observed within the footprint of the proposed project sites, existing or proposed access roads, or buffer areas during the biological assessment. Therefore, the proposed project sites would not have any substantial adverse effect on sensitive natural communities.

IVc. No federally protected wetland habitat was observed within the footprint of the proposed project sites, existing or proposed access roads, or buffer areas during the biological assessment. Therefore, the proposed project sites would not have any substantial adverse effect on federally protected wetlands.

IVd. The proposed project sites would not interfere with movement of any wildlife species or with established native resident or migratory wildlife corridors. Native resident and/or migratory fish and known native wildlife nursery sites are not present within the proposed project sites or area. No impact.

IVe. The project as proposed would not conflict with any local policies or ordinances protecting biological resources or local tree preservation policies/ordinances. No native trees are present within the proposed project sites. The project will be in compliance with applicable policies and ordinances. No impacts are anticipated. As

discussed above, land uses of this type (exploratory well drilling) are allowed if appropriate mitigation measures are implemented during project implementation (see the discussion in IV.a), and applicable agencies are consulted.

IVf. There are no adopted Habitat Conservation Plans, Natural Community Conservation Plans or other approved local, regional, or state habitat conservation plans in the project areas. No conflict is anticipated with any conservation plans.

Conclusion: No sensitive plant or animal species are present within the proposed project site or access roads or the buffers of the proposed project site and access roads; however, measures included in the biological assessment report will be implemented as mitigation measures to reduce potential impacts to biological resources to a level of less than significant.

Mitigation Measures: In order to reduce potential impacts to biological resources to a less than significant level, the following mitigation measures will be implemented:

Biological 1 - As close to beginning of construction as possible, but not more than 14 days prior to construction, a qualified biologist shall conduct a final pre-construction survey of the construction zone to insure that no special-status wildlife species have recently occupied the sites. A qualified biologist shall be present immediately prior to construction activities that have potential to impact sensitive species (i.e., well site preparation, access road grading, etc.) to identify and protect potentially sensitive resources.

Biological 2 - Project site boundaries shall be clearly delineated by stakes, flagging and /or rope or cord to minimize inadvertent degradation or loss of adjacent habitat during construction and drilling operations. Staff and/or its contractors shall post signs and/or place fence around the site to restrict access of vehicles and equipment unrelated to drilling operations.

Biological 3 - A biological monitor shall be present during initial ground disturbance and site construction activities.

Biological 4 - If San Joaquin kit foxes become established within the proposed project site or buffer area prior to project implementation, Sojitz will implement the measures contained in the United States Fish and Wildlife Service's (USFWS) "Standardized recommendations for protection of the San Joaquin kit fox prior to or during ground disturbance" (USFWS 2011). Sojitz will implement the following measures:

a. If kit fox dens have become established within 200 feet of the construction area prior to project implementation that may be indirectly impacted by construction activities exclusion zones shall be established prior to construction by a qualified biologist and dens shall not be disturbed in any way. Exclusion zone fencing should include untreated wood particle-board, silt fencing, orange construction fencing or other fencing as approved by the USFWS and CDFW[2]. Exclusion

[2] The California Department of Fish and Game (CDFG) changed its name to the California Department of Fish and Wildlife (CDFW) on January 1, 2013.

zones shall be roughly circular with a radius of the following distances measured outward from entrance; potential den 50 feet, and known den 100 feet. Fencing must contain openings for kit fox ingress/egress and keeps humans and equipment out. If a natal/pupping den is discovered within a project site or within 200 feet of the project site, the USFWS and CDFW shall be immediately notified and under no circumstances should the den be disturbed or destroyed without prior authorization. If the preconstruction survey reveals an active natal pupping or new information, the project applicant should contact the USFWS and CDFW immediately to obtain the necessary take authorization/permit. If the take authorization/permit has already been issued, then the biologist may proceed with den destruction within the project boundary, except natal/pupping den which may not be destroyed while occupied. A take authorization/permit is required to destroy these dens even after they are vacated. Protective exclusion zones can be placed around all known and potential dens which occur outside the project footprint.

b. San Joaquin Kit fox exclusion zone barriers shall be maintained until all construction and drilling activities have been completed, and then removed. If specified exclusion zones cannot be observed for any reason, USFWS and CDFW shall be contacted for guidance prior to ground disturbing activities at or near the subject den. In the event that USFWS and CDFW concur that an occupied San Joaquin kit fox den would be unavoidably destroyed by a planned project action, procedures detailed in the USFWS Standardized Recommendations for protection of the San Joaquin Kit Fox (USFWS 2011) shall be implemented. Den excavation shall be undertaken only by a qualified biologist pursuant to USFWS and CDFW authorization and direction for excavation of kit fox dens.

c. In the event that a San Joaquin kit fox is injured or killed, the incident shall immediately be reported to the project biologist. The project biologist shall contact CDFW immediately in the case of a dead, injured or entrapped kit fox. The CDFW contact for immediate assistance is State Dispatch at (916)445-0045. They will contact the local warden or CDFW Central Region office at (559) 243-4014. The USFWS should be contacted at Endangered Species Division, (916) 414-6620 or (916) 414-6600. The USFWS and CDFW shall be notified in writing within three (3) working days of the accidental death or injury to a San Joaquin kit fox during project related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The USFWS contact is the Chief of the Division of Endangered Species, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-1846. The CDFW contact is the Central Region office (559) 243-4014. New sightings of kit fox shall be reported to the CNDDB. A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed will also be provided to the USFWS as well.

d. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar

structures with a diameter of 4 inches or greater that are stored at a construction site for one or more overnight periods shall be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe shall not be moved until the USFWS and CDFW has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.

e. Limited destruction of kit fox dens may be allowed, if avoidance is not a reasonable alternative, provided the following procedures are observed. Destruction of any known or natal/pupping kit fox den requires take authorization/permit from the USFWS and CDFW. Destruction of the den shall be accomplished by careful excavation until it is certain that no kit foxes are inside. The den shall be fully excavated, filled with dirt and compacted to ensure that kit foxes cannot reenter or use the den during the construction period. If at any point during excavation, a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described above shall be resumed. Destruction of the den may be completed when in the judgment of the biologist, the animal has escaped, without further disturbance, from the partially destroyed den. Occupied dens cannot be destroyed until the pups and adults have vacated and then only after consultation with the USFWS and CDFW. Known dens occurring within the footprint of the activity must be monitored for three (3) days with tracking medium or an infra-red beam camera to determine the current use. If no kit fox activity is observed during this period, the den should be destroyed immediately to preclude subsequent use. If kit fox activity is observed at the den during this period, the den should be monitored for at least five (5) consecutive days from the time of the observation to allow any resident animal to move to another den during its normal activity. Use of the den can be discouraged during this period by partially plugging its entrances(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied may the den be excavated under the direction of the biologist. If the animal is still present after five (5) or more consecutive days of plugging and monitoring, the den may have to be excavated when, in the judgment of a biologist, it is temporarily vacant, for example during the animal's normal foraging activities. The USFWS and CDFW encourage hand excavation, but realize that soil conditions may necessitate the use of excavating equipment. However, extreme caution must be exercised. For potential dens, if a take authorization/permit has been obtained, den destruction may proceed without monitoring, unless other restrictions were issued with the take authorization/permit. If no take authorization/permit has been issued, then potential dens shall be monitored as if they were known dens. If any den was considered to be a potential den, but is later determined during monitoring or destruction to be currently, or previously used by kit fox (e.g., if kit fox sign is found inside), then all construction activities shall cease and the USFWS and CDFW shall be notified immediately.

Biological 5 - Suitable sensitive species small mammal burrows shall be avoided by 50 feet.

Biological 6 - The burrowing owl nesting season begins as early as February 1 and continues through August 31. If burrowing owls are located or become established within the project site or exclusion areas at the time of the final pre-activity biological survey and are using burrows within the project site or exclusion area, a qualified biologist will consult with CDFW; the following measures shall be implemented:

a. Sojitz will follow recommendations included in CDFW's Staff Report on Burrowing Owl Mitigation (CDFW 2012) including avoidance of occupied burrows by implementation of a no-construction zone of a minimum distance of 500 meters, unless a qualified biologist approved by CDFW verifies through non-invasive methods that either: 1) the birds have not begun egg laying and incubation; or 2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

b. On-site passive relocation of burrowing owls shall be implemented if owls are using the burrows after August 31. Passive relocation is defined as encouraging owls to move from occupied burrows to alternate natural or artificial burrows that are beyond 150 feet from the impact zone and that are within or contiguous to a minimum of 6.5 acres of foraging habitat for each pair of relocated owls. Relocation of owls shall only be implemented during the non-breeding season.

c. Owls shall be excluded from burrows in the immediate impact zone and within a 150 feet exclusion zone by installing one-way doors in burrow entrances. One-way doors shall be left in place 48 hours to insure owls have left the burrow before excavation. One alternate natural or artificial burrow shall be provided for each burrow that will be excavated in the project impact zone.

d. The project area shall be monitored daily for one week to confirm owl use of alternate burrows before excavating burrows in the immediate impact zone. Whenever possible, burrows shall be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe or burlap bags shall be inserted into burrow tunnels to prevent tunnel collapse while soil is excavated around that portion of a tunnel.

Biological 7 - In order to avoid or reduce potential impacts to grasshopper sparrows and migratory avian species, Sojitz shall conduct pre-construction nesting surveys for special-status avian species within a given project site and buffer area during the appropriate survey periods for each species. Surveys shall follow required CDFW and USFWS protocols where required. Where special-status bird nest sites are identified or suspected to occur during pre-construction surveys, a qualified biologist shall establish the following buffer zones around nest sites, and no disturbance activities shall occur within these buffer zones until young birds have fledged:

Grasshopper Sparrow
Grasshopper sparrows typically nests and rears young from April through August. In order to avoid and minimize impacts on grasshopper sparrow, a 250-foot buffer shall be established around active nests. No project related activities would be allowed to occur within this buffer until young have fledged or the species are no longer attempting to nest. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

Other Migratory Bird Species
Migratory bird species typically nest and rear young from February through August. In order to avoid and minimize impacts on migratory bird species, a 250-foot buffer shall be established around active nesting sites when project activities shall occur during their active nesting period. No project-related activities shall occur within this zone. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

Biological 8 - A project representative shall establish restrictions on project-related traffic to approved project areas, storage areas, staging and parking areas via signage. Off-road traffic outside of designated project areas shall be prohibited. Project-related traffic shall observe a 15 mph speed limit in all project areas except on County roads and State and federal highways to avoid impacts to special-status wildlife species.

Biological 9 - Project activities during the drilling phase of the proposed project shall be scheduled to avoid evening hours, as feasible, to avoid special-status wildlife species that are active in the nighttime.

Biological 10 - All vehicle operators shall check under vehicles and equipment before moving them if they have remained parked and shut off for 30 minutes or longer.

Biological 11 - Hazardous materials, fuels, lubricants, and solvents that spill accidentally during project-related activities shall be cleaned up and removed from the project as soon as possible according to applicable federal, state and local regulations.

Biological 12 - All equipment storage and parking during site development and operation shall be confined to the project sites or to previously disturbed off site areas that are not suitable habitat for listed species.

Biological 13 - An Environmental Awareness Program shall be conducted to orient all employees involved in construction and drilling operations. The program shall consist of a brief presentation in which biologists knowledgeable of endangered species biology and legislative protection shall explain endangered species concerns. The program shall include a discussion of special-status plants and sensitive wildlife species. Species biology, habitat needs, status under the Endangered Species Act (ESA) and California ESA, and measures

being taken for the protection of these species and their habitats as a part of the project shall be discussed.

Biological 14 - If wildlife proof barricade fencing is not used at the proposed well sites, all excavated steep-walled holes or trenches in excess of three feet in depth shall be provided with one or more escape ramps constructed of earth fill to prevent entrapment of endangered species or other animals during the construction phase. Ramps shall be located at no greater than 1,000-foot intervals (for pipelines etc.) and at not less than a 45-degree angles. Trenches shall be inspected for entrapped wildlife each morning prior to onset of construction activities and immediately prior to the end of each working day. Before such holes or trenches are filled they shall be inspected thoroughly for entrapped animals. Any animals discovered shall be allowed to escape voluntarily without harassment before construction activities resume, or removed from the trench or hole by a qualified biologist and allowed to escape unimpeded.

Biological 15 - All construction pipes, culverts, or similar structures stored at a construction site overnight having a diameter of four inches or greater shall be inspected thoroughly for wildlife species before being buried, capped, or otherwise used or moved in any way. Pipes laid in trenches overnight shall be capped. If during construction a wildlife species is discovered inside a pipe, that section of pipe shall not be moved or, if necessary, moved only once to remove it from the path of construction activity, until the wildlife species has escaped.

Biological 16 - All food-related trash items such as wrappers, cans, bottles or food scraps generated during construction or during subsequent operation shall be disposed of only in closed containers and regularly removed from the project sites. Food items may attract wildlife species onto a project site, consequently exposing such animals to increased risk of injury or mortality. No deliberate feeding of wildlife shall be allowed.

Biological 17 - To prevent harassment or mortality of wildlife species via predation, or destruction of their dens or nests, no domestic pets shall be permitted on-site.

Biological 18 - Use of rodenticides and herbicides on the project sites shall be permitted only as part of a USFWS and CDFW approved management plan unless such use is otherwise approved on a case-by-case basis. This is necessary to prevent primary or secondary poisoning of endangered species using adjacent habitats or depletion of prey upon which sensitive wildlife may depend.

References:

Robert A. Booher Consulting, *Biological Assessment Sojitz Energy Venture, Inc, Rancho Grande Oil and Gas Exploration Project Kern County, California* **(**April 2012)

United State Fish and Wildlife Service, *Standardized recommendation for protection of the San Joaquin kit fox prior to or during ground disturbance* (USFWS 2011)

California Department of Fish and Wildlife, *Staff Report on Burrowing Owl Mitigation* (CDFW 2012).

California Department of Fish and Wildlife**.** *Conservation and Mitigation Banks in California Approved by the Department of Fish and Wildlife***.**
Website: http://www.dfg.ca.gov/habcon/conplan/mitbank/catalogue/

United States Fish and Wildlife Service. *Conservation Plans and Agreements Database*.
Website: http://ecos.fws.gov/conserv_plans/public.jsp

United State Fish and Wildlife Service, *Standardized recommendation for protection of the San Joaquin kit fox prior to or during ground disturbance*, (USFWS 2011)

California Department of Fish and Wildlife, *Staff Report on Burrowing Owl Mitigation* (CDFW 2012).

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United States Fish and Wildlife Service. *Conservation Plans and Agreements Database*.
Website: http://ecos.fws.gov/conserv_plans/public.jsp
United States Code. 1918. Migratory Bird Treaty Act. 16 U.S.C. §§ 703–712. Revised August 2006.

ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
V. CULTURAL RESOURCES				
Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	_____	X	_____	
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	_____	X	_____	
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	_____	X	_____	
d. Disturb any human remains, including those interred outside of formal cemeteries?	_____	X	_____	_____

Discussion: ASM Affiliates, Inc. (ASM) conducted a cultural resources record and information search of the proposed project sites in September 2011. The Phase I survey fieldwork was conducted on September 15, 2011, with parallel transects spaced at 15-meter intervals walked across the well pad study areas. The field methods employed included intensive, on-foot examination of the ground surface for evidence of archaeological sites, in the form of artifacts, surface features (such as bedrock mortars or historical mining equipment), and archaeological indicators (e.g., organically enriched midden soil or burnt animal bone) following the California Office of Historic Preservation Instructions for Recording Historic Resources, using DPR 523 forms. The results of the Phase I survey fieldwork is presented in Table 20.

Table 20
Results from Phase 1 Survey

Well Name (Project Site)	Survey Results
RG 1-3	This pad is located on the open flats of the valley floor, near ongoing agricultural activities, with access provided by existing dirt roads. The pad area is in grasslands and had been disked and mowed. No cultural resources were observed.
RG 1-4	On the open flats of the valley floor in grasslands, with access from an existing dirt road. The pad is adjacent to a former alfalfa field and appears to have been disked and, possibly, plowed in the past. No cultural resources were observed.
RG 1-9	This pad is located about 300 m south of Rose Station, in grasslands on the open flats of the valley floor. A dirt road provides access to the pad. Rose Station is outside of the study area and was not recorded; the pad location is at least 150 m south of any visible remains of this historical locale. No cultural resources were observed
RG 1-11	Located along an existing dirt road on the open flats of the valley floor, in grasslands. A pistachio orchard is present to the north, and the pad area may have been cultivated in the past. No cultural resources were observed.
RG 1-16	Located in grasslands on the open flats of the valley floor. It is accessed by an existing dirt two-track road. No cultural resources were observed.
RG 2-11	This pad is located on the east side of an existing dirt road, in grasslands in the open flats of the valley floor. No cultural resources were observed.
RG 1-15	This pad is on the west side of an existing dirt road, across from an orchard. It is on the open flats of the valley floor, in grasslands. No cultural resources were observed.
RG 1-22	This pad is located on an alluvial fan/toeslope of the Tehachapi Mountains, immediately above the valley floor. It is accessed by Edmonston Pumping Plant Road. The pad is in grasslands and has been heavily grazed by cattle. No cultural resources were observed.

The cultural resources record and information search for the project area was conducted with the Southern San Joaquin Valley Information Center (SSJVIC) of the California Historical Resources Information System at the California State University, Bakersfield. The archival records search was completed to determine: (1) if prehistoric or historical archaeological sites had previously been recorded within the study areas, (2) if the project area had been systematically surveyed by archaeologists prior to the initiation of this field study, and (3) whether the general region encompassing the project was known to contain archaeological sites and to thereby be archaeologically sensitive. Records examined included archaeological site files and maps, the National Register of Historic Places, Historic Property Data File, California Inventory of Historic Resources, and the California Points of Historic Interest.

The Southern San Joaquin Valley Information Center record search revealed that one of the proposed project well sites has been subject to archaeological survey, but no cultural resources have been recorded within any of the proposed project site boundaries. Three (3) cultural resources had been recorded in four previous surveys within one mile of the proposed project sites.

Table 21
Previous Surveys within One Mile Radius of Study Area

IC Report #	Year	Author	Title
KE-319	1977	Chavez	An Archaeological Reconnaissance of the Proposed Pipeline Route from the Elk Hills Naval Petroleum Reserves to the Redlands Facilities, California
KE-945	1995	LSA Associates	Results of a Windshield Survey in the Wheeler Ridge Area of the Tejon Ranch Near Grapevine, Kern County, California
KE-2858	2010	Chambers Group	Cultural Resources Survey, Southern California Gas Company Pipeline Replacement Project Between Grapevine and Gorman, Kern and Los Angeles Counties, California
KE-2860	2004	Compass Rose	Negative Archaeological Survey Report, Project Number 05-05-57: 616

One of these previous studies, KE-319, covered one of the eight proposed project sites, Rancho Grande 1-11. No cultural resources were recorded within or adjacent to this proposed project site, or in its vicinity during this study. The three (3) cultural resources that have been recorded within a one-mile radius of the proposed eight (8) project sites are as follows:

P-15-10845 (CA-KER-6306) – This site consists of a widely scattered series of bedrock mortars, covering approximately 5,000 square meters. The site is roughly 1,500 meters east of the proposed Rancho Grande 1-22 project site.

P-15-10846 (KER-6307) – This site consists of four bedrock milling features (bedrock mortars and cupules) with associated imported quartzite cobbles and core-cobble tools. It is about 1,700 meters east of the proposed Rancho Grande 1-22 project site.

Rose Station - This historical site is California Historical Landmark #300. It is located about 2 miles northeast of the mouth of Grapevine Canyon, on Grapevine Creek. It was first settled by Euro-Americans around 1856, by Juan Marmolejo. Originally it was known as *Rancho Canoa* in reference to the animal watering troughs there. Eventually it was taken over by J. V. Rosemyer and then sold to others. During the 1870s, it was an important stage stop and the principal Euro-American settlement at the south end of the San Joaquin Valley, but with the establishment of the railroad, its importance diminished. The property was purchased by the Tejon Ranch in 1912. A Yokuts village, known as *Wuwupai*, is said to have been at this same location. There is no archaeological site (historical or prehistoric) recorded for this spot, and it appears to have never been visited by an archaeologist, but its location is shown on the USGS topographical quadrangle. Proposed Rancho Grande 1-9 project site is approximately 300 meters south of its mapped location.

Va. The records search and Native American Consultation did not identify any cultural or historic resources at the proposed project sites. Based on these results, the proposed project is not anticipated to affect any historical resources; however during construction activities cultural or historic resources may be unearthed. Compliance with mitigation measures would reduce the potential impact to a less than significant level.

Vb. The records search and Native American Consultation did not identify any cultural or historic resources at the proposed project sites. The proposed project would include notification of personnel prior to ground disturbing activities of the possibility of buried prehistoric or historic cultural deposits. In the unlikely event prehistoric or historical cultural deposits are observed, compliance with mitigation measures would reduce the potential impact to a less than significant level.

Vc. The records search and Native American Consultation did not identify any cultural or historic resources at the proposed project sites. The proposed project would include notification of personnel prior to ground disturbing activities of the possibility of buried prehistoric or historic cultural deposits. In the unlikely event prehistoric or historical cultural deposits are observed, compliance with mitigation measures would reduce the potential impact to a less than significant level.

Vd. The records search and Native American Consultation did not identify any cultural or historic resources at the proposed project sites. In the unlikely event human remains are encountered, compliance with mitigation measures would reduce the potential impact to a less than significant level.

Conclusion: No impact to cultural resources. No cultural or historical resources were identified at the proposed project sites. In the unlikely event that such resources are unearthed during construction activities; the following mitigation measures and compliance with statute and regulations would reduce potential impacts to cultural resources to a level of less than significant, and should be required.

Mitigation Measures: In order to reduce potential impacts to cultural resources to a less than significant level, the following mitigation measures will be implemented:

Cultural 1 – In the unlikely event archeological resources are identified on a project site, all ground disturbing activities will cease and a qualified archaeologist will be retained by Sojitz to assess the significance of any find. The archeologist will have the authority to stop or divert the construction excavation as necessary. The archaeologist will evaluate the find in conformance with section 15064.5 of CEQA. A plan to mitigate any adverse impacts will be prepared by the archaeologist and contain procedures to follow. Work may proceed on the site once evaluation of the find is complete.

Cultural 2 – In the unlikely event paleontological resources are identified on a project site, a qualified paleontologist will be retained by Sojitz to assess the significance of any find and will have the authority to stop or divert the construction excavation as necessary. A plan to mitigate any adverse impacts will be prepared by the paleontologist and contain

procedures to follow. Work may proceed on the site once evaluation of the find is complete.

Cultural 3 – In the unlikely event human remains are discovered during construction of a project site, site personnel will contact the County Coroner and stop work as required by Public Resources Code §5097.98-99 and Health and Safety Code §7050.5. If the remains are determined to be Native American, the County Coroner will notify the NAHC in accordance with PRC §5097.98. Sojitz shall, in consultation with the identified descendants of the remains and/or NAHC, identify the appropriate measures for treatment or disposition of the remains.

References:

California Public Resources Code 5097.98-99, 15064.5

California Health and Safety Code §7050.5

ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
VI. GEOLOGY AND SOILS				
Would the project:				
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Landslides?	_____	_____	_____	X
ii. Strong seismic ground shaking?	_____	_____	_____	X
iii. Seismic-related ground failure, including liquefaction?	_____	_____	_____	X
b. Result in substantial soil erosion or the loss of topsoil?	_____	_____	_____	X
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as result of the project, and potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	_____	_____	_____	X
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1194), creating substantial risks to life or property?	_____	_____	_____	X
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	_____	_____	_____	X

Discussion: The proposed exploratory wells are located on annual grassland habitat that is used for grazing. Several dirt access roads exist within the vicinity of the proposed project sites which provide access for local farmers. Land use designation for Rancho Grande 1-16 includes a designation overlay for landslide; however, topography at this proposed project site is flat. There is no significant change in topography for approximately 1.0 mile to the south and no change in topography in other directions. Additionally, no evidence of historical landslides was observed during site visits. No buildings or structures are currently present or proposed on the any of the proposed project sites. During ongoing production activities, the proposed project sites would be un-manned.

VIa. The proposed project would not expose people or structures to potential adverse effects from landslides as the project topography is flat with slopes that average less than two (2)

percent, including proposed Rancho Grande 1-16 which includes a designation overlay for landslide on some small scale geomorphology maps. As discussed, there is no significant change in topography for approximately 1.0 mile to the south and no change in topography in other directions. Additionally, no evidence of historical landslides or colluvium was observed during site visits. In general, landslides are more common where slopes are steep and rocks are weak or unstable, conditions which are not present in the project area.

As shown on the following fault map, the closest known fault to the proposed project sites is Pleito Thrust fault which is in the immediate vicinity of the proposed Rancho Grande 1-22, the Wheeler Ridge fault (3.1 miles northwest of Rancho Grande 1-4), and the Spring Fault (formerly unnamed, 2 miles to the northeast of Rancho Grande 1-11). The last recorded earthquake along the Wheeler Ridge fault was on April 8, 2012, with a magnitude of 1.8. Faults outside the immediate vicinity include White Wolf Fault 10.9 miles north of the most northerly location, Rancho Grande 1-3, and Garlock Fault Zone 6.9 miles south of Rancho Grande 1-22. The earthquakes in this area have historically been of low magnitude. No structures would be constructed for human habitation.

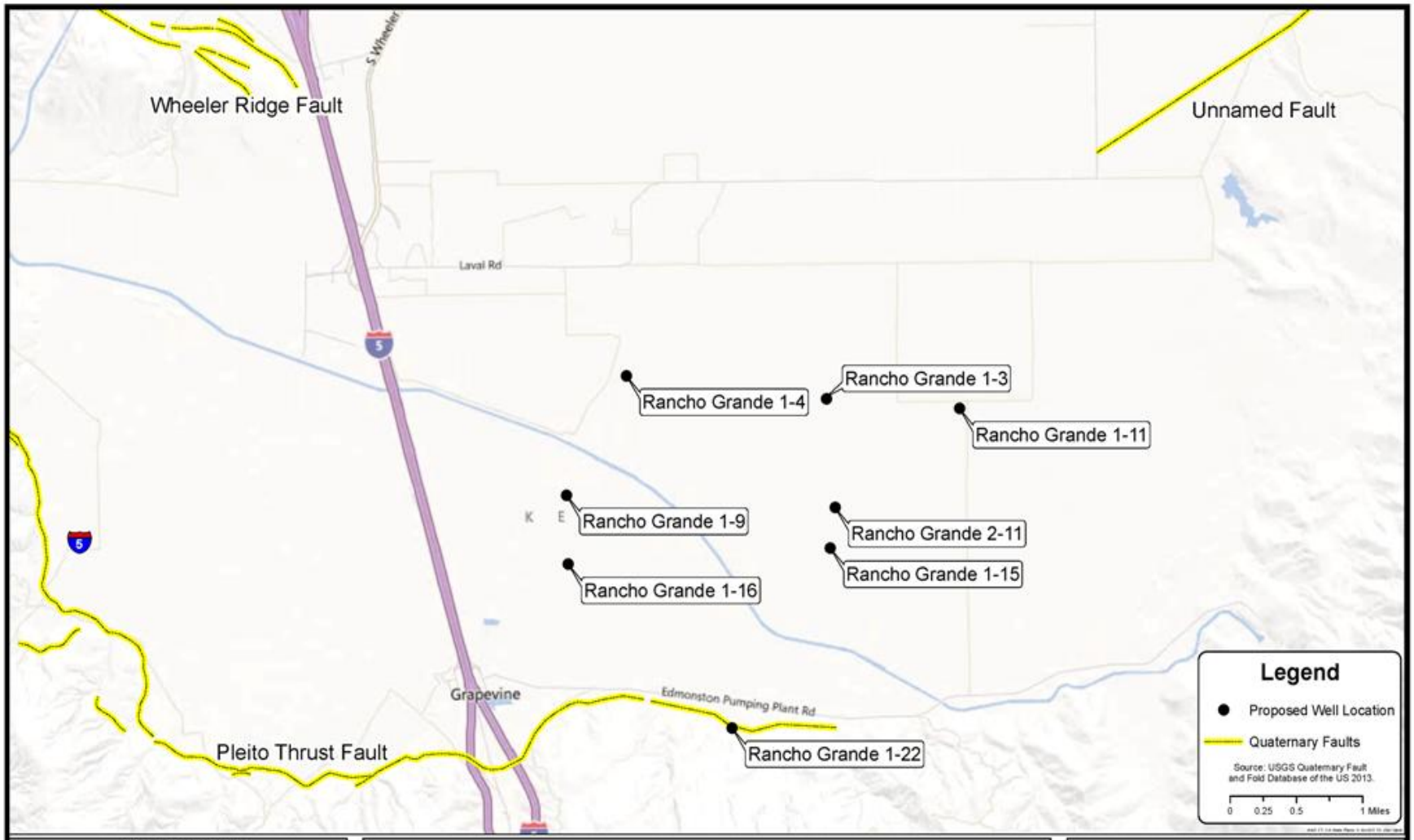
The proposed drill rig, a large capacity deep drilling rig, has a low center of gravity with heavy base sub-structures that up to smaller top member. This design, with low center of gravity, along with support cables used to additionally stabilize the tower, effectively allows the rig to with stand shaking and movement without falling over.

Project oil field equipment, including temporary drilling equipment during the drilling phase and the well head/pumping unit, one (1) 500BBL oil tank and one (1) 500BBL produced water tank in the production phase is designed to meet American Petroleum Institute (API) Standards as well the California Building Code (CBC) in particular Title 24, Part 2, Chapter 17. Section 1708 details structural testing for seismic resistance and seismic design category as determined in CBC Section 1613. Section 1708.4 outlines specific design compliance by referring to American Society of Civil Engineers (ASCE) ASCE 7 Chapter 13 (13.2.1 & 13.2.2) specifications and recommendations. Both API and ASCE have adopted the same recommendations regarding seismic design.

Kern County Building Code of Regulations provides oil field permit exemptions under section 17.08.060 providing compliance with API standards.

Additionally, in the event of an earthquake, the emergency response plan will be implemented to address potential releases of petroleum, produced water and other fluids. Accordingly, the proposed project will not expose people or structures to potential adverse effects from landslides, strong seismic ground shaking, or seismic-related ground failure (including liquefaction).

VIb. Because each of the proposed project sites is located in a flat area, the proposed project would not result in substantial soil erosion or loss of topsoil. Existing drainage patterns would be maintained within each of the proposed project sites.



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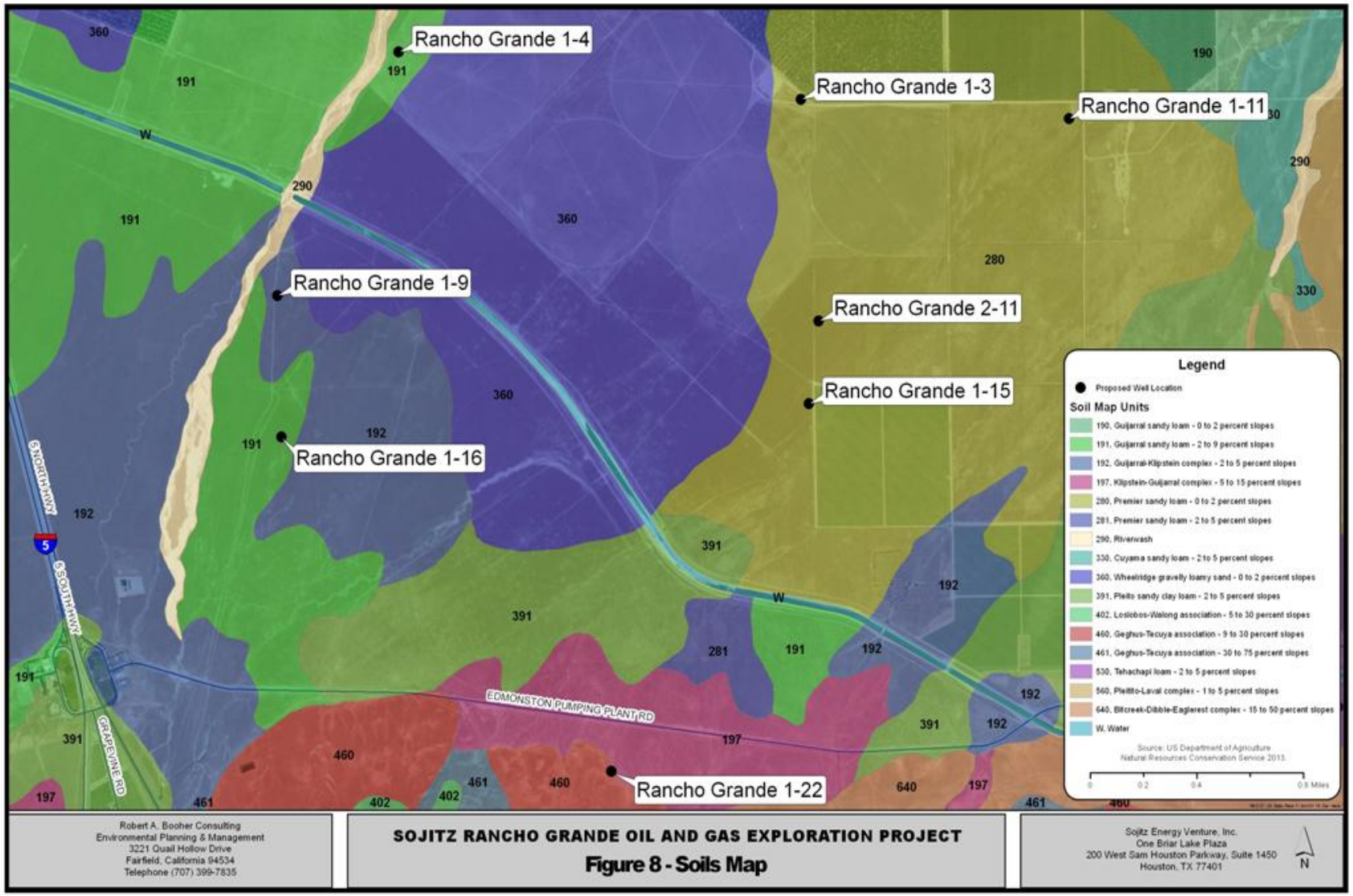
SOJITZ RANCHO GRANDE OIL AND GAS EXPLORATION PROJECT

Figure 7 - Fault Map

Sojitz Energy Venture, Inc.
One Briar Lake Plaza
200 West Sam Houston Parkway, Suite 1450
Houston, TX 77401


Rancho Grande 1-4
Rancho Grande 1-3
Rancho Grande 1-11
Rancho Grande 1-9
Rancho Grande 2-11
Rancho Grande 1-15
Rancho Grande 1-16
Rancho Grande 1-22
EDMONSTON PUMPING PLANT RD
GRAPEVINE RD
S NORTH HWY
S SOUTH HWY
Legend
Proposed Well Location
Soil Map Units
190, Guijarral sandy loam - 0 to 2 percent slopes
191, Guijarral sandy loam - 2 to 9 percent slopes
192, Guijarral-Klipstein complex - 2 to 5 percent slopes
197, Klipstein-Guijarral complex - 5 to 15 percent slopes
280, Premier sandy loam - 0 to 2 percent slopes
281, Premier sandy loam - 2 to 5 percent slopes
290, Riverwash
330, Cuyama sandy loam - 2 to 5 percent slopes
360, Wheelridge gravelly loamy sand - 0 to 2 percent slopes
391, Pleito sandy clay loam - 2 to 5 percent slopes
402, Loslobos-Walong association - 5 to 30 percent slopes
460, Geghus-Tecuya association - 9 to 30 percent slopes
461, Geghus-Tecuya association - 30 to 75 percent slopes
530, Tehachapi loam - 2 to 5 percent slopes
560, Pleitito-Laval complex - 1 to 5 percent slopes
640, Bitcreek-Dibble-Eaglerest complex - 15 to 50 percent slopes
W, Water
Source: US Department of Agriculture
Natural Resources Conservation Service 2013
0 0.2 0.4 0.8 Miles
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SOJITZ RANCHO GRANDE OIL AND GAS EXPLORATION PROJECT
Figure 8 - Soils Map
Sojitz Energy Venture, Inc.
One Briar Lake Plaza
200 West Sam Houston Parkway, Suite 1450
Houston, TX 77401
N

VIc. Any potential for subsidence resulting from the proposed project would be either as a result of groundwater overdraft or oil and gas fluid withdrawal.

Groundwater overdraft subsidence is caused by aquifer-system compaction due to the lowering of ground-water levels by sustained ground-water overdraft. However, water for the proposed project will be purchased from Tejon Ranch surface water entitlements. Accordingly, water use during each of these phases will have no impact on subsidence as a result of groundwater overdraft.

Oil and Gas fluid withdrawal subsidence is related to fluid withdrawal from oil and gas fields. Subsidence related to fluid withdrawal in oil and gas operations will not be an issue due to the character and depth of the formation. The proposed exploratory wells will be drilled to target shale and sandstone formations at a depth greater than 7,000 feet. Shale and sandstone formations have porosity and permeability that allows fluids to flow through the formation in such a manner that structural stability is maintained. Unlike some areas of shallow oil and water extraction (less than 2000 feet below ground surface (bgs)) in some of the softer diatomite deposits, the formations targeted here have structural strength that is not hydration dependent for structural stability. Accordingly, based on the depth of each of the wells and the geological formation of the target location, the wells will have no impact on subsidence due to oil and gas fluid withdrawal.

Topography in the proposed project area is flat. Additionally, no evidence of historical landslides or mudslides was observed during site visits. No buildings or structures are currently present or proposed on the any of the proposed project sites. During ongoing production activities, the proposed project sites would be un-manned. Therefore, no impacts are expected.

VId. The proposed project sites are underlain by a series of sandy loams which are classified as B-Class, well drained soils on flood plains and recent alluvial fans. The Premier Sandy Loam, Guijarral Sandy Loam, Guijarral-Klipstein Complex and Geghus-Tecuya Association are all sandy loams located within the proposed project sites. These sandy loam soils have moderate to rapid permeability without expansive properties. Due to the loamy content of the soils along with proper moisture conditioning during compaction activities, these soils are not considered expansive. Therefore, there will be no impacts due to expansive soils.

VIe. The proposed project does not involve the construction of any facilities requiring the use of septic tanks or any waste disposal systems. Production water is the only potential wastewater that would be generated during project activities, and production water will be transported offsite by truck to the Central Valley Waste Water LLC Class II Disposal Well, the SWCC-1 located in the South Belridge Oil Field. The SWCC-1 disposal well is located approximately 60 miles to the northwest of the proposed project site. Sojitz anticipates that 2 barrels (84 gallons) of production water a day would be generated at each of the well sites that are put into production.

Conclusion: No impacts to geology and soils.

Mitigation Measures: No impacts identified. No mitigation necessary.

References:

United States Department of Agriculture, Natural Resources Conservation Service, Soil Survey of Kern County, Northwestern Part.
Website: http://soildatamart.nrcs.usda.gov/manuscripts/CA666/0/kern.pdf

Department of Conservation, California Geological Survey, Probabilistic Seismic Hazards Mapping Ground Motion Page.
Website: http://redirect.conservation.ca.gov/cgs/rghm/pshamap/pshamap.asp

Department of Conservation, California Geological Survey, Alquist-Priolo Earthquake Fault Zone Maps.
Website: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

Department of Conservation, California Geological Survey, Index to Landslide Maps in California.
Website: http://www.conservation.ca.gov/cgs/rghm/landslides/Pages/ls_index.aspx

USGS Earthquake Hazards Program, California-Nevada Fault Map, website address: http://earthquake.usgs.gov/earthquakes/recenteqscanv/FaultMaps/119-35.html.

ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
VII. GREENHOUSE GAS EMISSIONS				
Would the project:				
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	_____	X	_____	_____
b. Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	_____	X	_____	_____

Discussion: Global warming refers to an increase in the earth's average temperature as a result of increased concentration of greenhouse gases (GHG) in the atmosphere. GHGs include any gas that absorbs infrared radiation in the atmosphere. GHGs include water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), halogenated fluorocarbons (HCFCs), ozone (O_3), perfluorinated carbons (PFCs), hydrofluorocarbons (HFCs), and sulfur hexafluoride (SF_6).

Over the past decades, there is growing evidence of increase temperatures and increased concentrations of GHGs in the atmosphere. In response to the possibility that the increased temperatures are a result of human activity, the California Environmental Protection Agency (CalEPA), California Air Resources Board (CARB) and local governments have enacted regulations aimed at curbing GHG emissions. Several of these regulations are listed below.

- Revisions to the Clean Air Act (USEPA) affecting Title V and Prevention of Significant Deterioration (PSD) Sources (Tailoring Rule)
- Mandatory Reporting of GHG Emissions (CalEPA and CARB)
- CEQA Guidelines (California SB 97)
- Statewide GHG Reductions (California AB-32)

The current project would be exempt from permit requirements under the Title V or PSD programs as the annual emissions of criteria air pollutants are below 100 tons per year. The project would also be exempt from mandatory state and federal reporting since annual emissions are below 25,000 tons per year.

The project is subject to CEQA Guidelines and the implementation of these Guidelines is through the SJVAPCD. On December 17, 2009, SJVAPCD formally issued District Policy addressing GHG emission impacts from stationary sources.

Rather than issue thresholds of significance, the District policy stresses performance based standards (BPS). Projects implementing BPS would be determined to have less than significant individual and cumulative impact on global warming. BPS is defined as the most effective

achieved in practice means of reducing or limiting GHG emissions from a given source. SJVAPCD has established a set of BPS for a variety of sources; however, compression ignition engines are not included in the current list.

VIIa,b.

Project Level GHG Emissions

To assess the significance of project's GHG emissions, annual emissions were estimated for various project phases. A breakdown of emissions is presented in Table 22. With the exception of emissions during the production phase, all other emissions are temporary and would occur only for a few days (3 to 17 days depending on the phase).

Table 22
Greenhouse Gas Emissions Calculations
for the Proposed Project

	CO_2		CO_2 *(e)*/CO_2	CO_2(e)	
Project Phase	**1 Well** *(ton/yr)*	**8 Wells** *(ton/yr)*	**Ratio**[1]	**1 Well** *(ton/yr)*	**8 Wells** *(ton/yr)*
Site Prep	3.7	29.6	1.0034	3.71	29.7
Drilling Phase	231.2	1,849.6	1.0034	232.0	1,855.8
Testing Phase	6.4	51.2	1.0034	6.42	51.4
Completion Phase	3.9	31.2	1.0034	3.91	31.3
Installation of Production Equipment	11.5	92.0	1.0034	11.54	92.3
Production Phase	111.0	888.0	1.0034	111.4	891.0
Plugging and Abandonment Phase	3.9	31.2	1.0034	3.91	31.3
Project Totals	**371.6**	**2,972.8**		**372.89**	**2,982.9**

[1]*See Attachment B for calculation of the CO_2 (e)/CO_2 ratio*

Project Level Impacts

The SJVAPCD has not developed thresholds of significance for GHG emissions. The project is, however, subject to CEQA Guidelines and the implementation of these Guidelines is through the SJVAPCD and Kern County. On December 17, 2009, SJVAPCD formally issued District Policy addressing GHG emission impacts from stationary sources. The policy covers long-term (post construction) emissions.

Rather than issue thresholds of significance, the District Policy emphasizes performance based standards (BPS). Projects implementing BPS would be determined to have less than significant individual and cumulative impact on global warming. BPS is defined as the most effective achieved in practice means of

reducing or limiting GHG emissions from a given source.

SJVAPCD has established a set of BPS for a variety of sources; however, compression ignition engines are not included in the current list. Since BPS have not been established for diesel engines, the District Policy is to require emissions from stationary sources be reduced by 29% as compared to business as usual. For the current project, the only source of long-term GHG emissions is a single 49.6 hp well head/pumping unit. This source would release 75.5 tons/yr of GHG per engine or 604 tons/year from all eight (8) wells. A 29% reduction requires that 175 tons of GHG emissions be mitigated.

In order to comply with this requirement, the applicant will secure GHG credits equal to 175 tons of GHG emissions. With the use of GHG credits, the project would be determined to have less than significant impact as noted in the District's Policy.

Cumulative Impacts

As noted previously, the project has agreed to reduce emissions by 29%. The 29% reduction is in compliance with the SJVAPCD's December 17, 2009 Policy reducing GHG emissions from stationary sources. Compliance with this policy means that impacts from this project will be individually and cumulatively insignificant (Page 9 of the District Policy). This conclusion is further confirmed under Section 15064 (h)(3) of the CEQA Guidelines that state "A lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program….".

Compliance with the above noted District Policy also means that the mitigation proposed for the current project is consistent with ARB's AB-32 Scoping Plan as noted in Page 5 of District's Policy. Since project CO_2(e) emissions are below 25,000 metric tons/year, this project would also be exempt from Cap and Trade regulations. Ref: Title 17 CCR Section 95812 of the Final Regulation Order available at:

http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm

Conclusion: Mitigation measure and compliance with the above noted District Policy shall reduce potential impacts to greenhouse gas generation to a level of less than significant.

Mitigation Measures: In order to reduce impacts to greenhouse gas to a less than significant level, the following mitigation measure will be implemented:

Greenhouse Gas 1 – . Sojitz will secure 22 metric tons of CO_2(e) GHG credits for each producing well commencing on September 1, 2014, and each September 1, thereafter until Sojitz supplies permanent GHG reductions or complies with

SJVAPCD established best performance standards. All credits surrendered shall be demonstrated by the submittal of documentation to the Division, on or before September 1, as discussed above.

References:

San Joaquin Valley Unified Air Pollution Control District, Final Draft *Addressing Greenhouse Gas Emission Impacts Under the California Environmental Quality Act. (*December 2009*)*
Website: http://www.valleyair.org/programs/CCAP/12-17-09/1%20CCAP%20-%20FINAL%20CEQA%20GHG%20Staff%20Report%20-%20Dec%2017%202009.pdf

San Joaquin Valley Unified Air Pollution Control District, *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA,(*December 2009)
Website: http://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdfGas Emissions under the California Environmental Quality Act"

San Joaquin Valley Unified Air Pollution Control District, *Rule 2280 Portable Equipment Registration*
Website: http://www.valleyair.org/rules/1ruleslist.htm

USEPA Standards for Non-Road Diesel Engines
The engines must comply with federal 40 CFR 1068 requirements. Tier 3 and older engines must comply with 40 CFR 89. Newer engines (Tier 4) must comply with 40 CFR 1039. We note that compliance with these requirements is handled by the engine manufacturer before the engines can be sold in California.

CARB Standards
The engines must meet CARB standards as regulated in the California Code of Regulations, Sections 2421 to 2427 of Title 13, Division 3, Chapter 9, Article 4.

ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
VIII. HAZARDS & HAZARDOUS MATERIALS *Would the project:*				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	_____	X	_____	_____
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	_____	X	_____	_____
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	_____	_____	_____	X
d. Be located on a site which is included on a list of hazardous materials compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment?	_____	_____	_____	X
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	_____	_____	_____	X
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	_____	_____	X	_____
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	_____	_____	_____	X

h. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	_____	_____	_____	X

Discussion: The proposed project sites are primarily used for agricultural purposes and ranchland. Project activities, with the exception of production, require minimal transportation, use or storage of hazardous materials including fuels, oils, lubricants, hydraulic fluids and solvents used at the proposed project site. All hazardous materials will be transported and stored according to applicable federal, state, and local regulations. Portable tanks will be used for mixing and storing drilling fluids. All fluids will be disposed of in accordance with the requirements of the Central Valley Regional Water Quality Control Board (RWQCB).

If economic quantities of oil or gas are discovered, a well will be completed and production equipment including a well head, pumping unit, one 500 Barrel Oil Tank and one 500 Barrel Produced Water Tank will be installed on site. Production equipment will be painted in an earthen tone to blend in with the surrounding environments and prevent glare. All production facilities storing fluids will have secondary containment as required CCR Section 1773.1. Completion of a well will require four (4) days and installation of production equipment will require approximately 7 days to complete per well. Sojitz anticipates 25 barrels of oil and 2 barrels of production water will be produced daily from each well. The oil will be transported offsite by truck approximately 23 miles north and sold to the Kern Oil and Refining Company located at 7724 East Panama Lane, Bakersfield, California 93307. Sojitz estimates that 1 truck trip per 5 days will be required to transport oil to the Kern Oil and Refining Company from each well. Accordingly, assuming all eight wells go into production, Sojitz estimates that 10 truck trips per week will be required to transport the oil to the Kern Oil and Refining Company refinery. The production water will be transported offsite by truck to the Central Valley Waste Water LLC Class II Disposal Well, the SWCC-1 located in the South Belridge Oil Field for disposal. The SWCC-1 disposal well is located approximately 60 miles to the northwest of the proposed project site. Sojtiz estimates 1 truck trip per 3 months to transport production water to the SWCC-1 disposal well from each well. Accordingly, assuming all eight wells go into production, Sojtiz estimates 1 truck trip per month to transport production water to the SWCC-1 disposal well. Each production site will be inspected daily.

VIIIa. There is potential for accidental releases of hazardous materials during project operations, also including a potential for an accidental release during drilling operations if there were a blowout; however, as required by Division regulations (CCR Section1722.2-1724.10) surface casing will be set, cemented, and blowout prevention equipment will be installed at each of the wellheads and tested to minimize the potential releases associated with blowouts. Potential impacts associated with the accidental release of these materials depend on the quantity and type, the location where it is used, the toxicity or other hazardous characteristics of the material, and whether it is transported, stored, and used in a solid, liquid, or

gaseous form. A Spill Contingency Plan shall be required in accordance with CCR Section1772.9.

With the implementation of the standard preventive and mitigation measures presented below, the proposed project will not impact the public or the environment through the routine transport, use, or disposal of hazardous materials.

VIIIb. See VIIIa.

VIIIc. No existing or proposed schools are located within one-quarter mile of the proposed project sites. The closest school to the proposed project sites is the El Tejon Elementary School located at 4337 Lebec Road, Lebec, California and is approximately 7 miles south of the proposed project sites. Therefore, the proposed project will not have the potential to emit hazardous emissions or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. There is no impact.

VIIId. The proposed project sites are not located on the listed hazardous material sites compiled pursuant to Government Code Section 65962.5. Therefore, the proposed project would not create a significant hazard to the public or environment.

VIIIe,f. The nearest public airport is the Bakersfield Municipal Airport (2000 S Union Ave., Bakersfield, CA 93307) located approximately 24 miles north of the proposed project sites. The closest private airstrip occurs approximately 1 mile north of the proposed Rancho Grande 1-4. This private airstrip is owned by Tejon Agricultural Partners. The airstrip is rarely used and then only for agricultural purposes. The proposed wells are not in the flight path for the landing strip. Therefore, the proposed project site will not result in a safety hazards for people residing or working in the project area related to public airport activities.

VIIIg. Implementation of the proposed project will not impair or physically interfere with the implementation of any existing and/or adopted emergency response plans or emergency evacuation plans for the local area.

VIIIh. According to CalFire, three of the proposed sites are located within the State Area of Responsibility and are in a Moderate Fire Hazard Severity area (Rancho Grande 1-9, 1-16 and 1-22). The remaining proposed project sites are located in the Local Area of Responsibility and are located in a Local Responsibility Area unzoned designation. The proposed project is not located in wildland areas or in urban areas adjacent to wildlands. Therefore, the proposed project would not increase fire risk in wildland areas or urban areas adjacent to wildland areas. Fire protection is provided by the Kern County Fire Department Station 55 located at 5441 Dennis McCarthy Road, Mettler, California. No permanent structures are proposed as part of the project.

Conclusion: Mitigation measures shall reduce any potential impacts relative to hazards and hazardous materials to a level of less than significant.

Mitigation Measures: The following mitigation measures will be implemented to avoid and/or minimize potential impacts resulting from hazards or hazardous materials:

Hazards 1 - All hazardous materials such as diesel fuel shall be stored according to the California Code of Regulations (CCR) Title 22, 23, 26 & 27 and California Fire Codes (CFR) Title 24 and Kern County hazardous materials ordinance and Material Safety Data Sheets shall be on the site. Waste materials shall be managed properly in accordance with requirements that comply with, or are authorized by, the Code of Federal Regulations (40 CFR) and refined in California through CCR, Title 14, 22, 23, 26 & 27. Training shall be provided to all personnel involved in handling of hazardous materials/waste.

Hazards 2 - In order to minimize potential impacts associated with a blowout, Sojitz shall comply with CCR Title 14, Division 2, Chapter 4, Articles 3 and 4, specifically Article 4, Sections 1941-1942. Requirements for well casing design and blowout prevention equipment are regulated by the Division. Division engineers shall be notified for required tests and other operations.

Hazards 3 - A Spill Contingency Plan shall be required in accordance with CCR Section 1772.9 and a copy of the plan shall be kept on site. The plan shall discuss methods to avoid and/or minimize impacts in the event of a release. The purpose of the plan shall be to ensure that adequate containment will be provided to control accidental spills, that adequate spill response equipment and absorbents will be readily available, and that personnel will be properly trained in how to control and clean up any spills.

Hazards 4 - All above ground storage tanks will be located within a bermed area which provides a storage volume of at least 110% of the storage volume of the largest tank. Daily inspections of the above ground storage tanks will be conducted and an inspection log will be maintained for review by regulatory agency personnel. The inspection log will also document corrective actions taken, if necessary.

Hazards 5 - Fluid disposal shall follow RWQCB regulations (CCR Title 23 Waters).

Hazards 6 - If project development uncovers any previously unknown oil, gas, or injection wells, the Division shall be notified. If unrecorded wells are uncovered during excavation or grading, remedial plugging operations may be required.

References:

Central Valley Regional Water Quality Control Board, *Laws and Regulations*
Website: http://www.waterboards.ca.gov/centralvalley/laws_regulations/

California State Water Resources Control Board, *Geotracker*
Website: http://geotracker.waterboards.ca.gov

California Department of Forestry and Fire Protection, *Kern County FHSZ Maps*
Website: http://www.fire.ca.gov/fire_prevention/fhsz_maps/fhsz_maps_kern.php and

California Department of Conservation, Division of Oil, Gas, and Geothermal Resources, *Publications: Laws and Regulations*
Website: http://www.conservation.ca.gov/dog/pubs_stats/Pages/law_regulations.aspx

California Code Regulations
Website: *http://www.oal.ca.gov/ccr.htm*

(http://www.envirostor.dtsc.ca.gov/public/search.asp?cmd=search&reporttype=CORTESE&site_type=CSITES,OPEN,FUDS,CLOSE&status=ACT,BKLG,COM&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST).

ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
IX. HYDROLOGY AND WATER QUALITY				
Would the project:				
a. Violate any water quality standards or waste discharge standards?	_____	_____	_____	X
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	_____	_____	_____	X
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on-or off-site?	_____	_____	_____	X
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or off-site?	_____	_____	_____	X
e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	_____	X	_____	_____
f. Otherwise substantially degrade water quality?	_____	_____	_____	X
g. Place housing within a 100-year flood hazard area?	_____	_____	_____	X
h. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	_____	_____	X	_____
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	_____	_____	_____	X
j. Inundation by mudflow?	_____	_____	_____	X

Discussion: The proposed project sites fall within the Arvin-Wheeler Ridge Watershed. The watershed supports a variety of water uses including municipal and agricultural supply systems and recreation. Surface water in many areas is intimately connected with the ground water, thereby having a profound effect on local groundwater supplies. No hydraulic fracturing is proposed as part of this project. The proposed project would not alter current drainage patterns in the project area. All water required during implementation of exploratory drilling would be purchased from the Tejon Ranch.

IXa. The project area does not conflict with applicable water quality and waste discharge standards relating to hydrology and water quality. The project will comply with all requirements established by the CVRWQCB. The solids that accumulate in the mud ~~pits/~~tanks can be reused if it is demonstrated that they are nonhazardous. If any wastes test positive for hazardous material they would be disposed of in the appropriate licensed site. These waste materials would be disposed of at a North Star Energy's disposal site in Bakersfield, CA operated by Southern California Waste Water (SCWW) with a permitted capacity of 5,000 barrels per day (data obtained from SCWW on May 25, 2012).

Based upon the California Department of Water Resources Water Data Library 2012, the documented depth in the area to the first encountered groundwater is 550 feet. As a result, groundwater is not expected to be encountered during site preparation or other project surface activity and operations. The project will not cause direct or indirect wastewater discharges that will result in an exposure to levels of hazardous materials that will adversely affect human health, wildlife or plant species.

IXb. Sojitz shall follow all applicable statutes and regulations; therefore, the project will not degrade groundwater quality or interfere with groundwater recharge, or deplete groundwater resources in a manner that will cause water-related hazards such as subsidence. Water will be purchased from Tejon Ranch and no new entitlements will be required. In compliance with Division regulations, California Code of Regulations (CCR) Title 14 Division 2, Chapter 4, Articles 3, Sojitz shall install and cement surface casing to prevent blowouts and contamination of fresh water aquifers. Division regulations specify that the base of fresh water must be protected with cemented casing to prevent any contamination from migrating fluids encountered in oil and gas zones. The regulations also specify that oil and gas zones must be protected with cemented casing to prevent any contamination from infiltrating water. Division engineers review the drilling and completion operations to ensure these requirements have been met. Based upon the California Department of Water Resources Water Data Library 2012, the documented depth in the area to the first encountered groundwater is 550 feet. Produced water generated during the production phase of the project will be transported offsite by truck to the SCCW Commercial Disposal well in the South Belridge Oil Field for proper disposal. Therefore, the project will not be expected to substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there will be a net deficit in aquifer volume or a lowering of the local groundwater table level.

IXc-d. Even though the proposed area of disturbance exceeds 1.0 acre and compliance with the General Permit to Discharge Storm Water with Construction Activity (WQ Order No. 99-08-DWQ) is required, the project will not alter the current drainage pattern of the proposed project in a manner that will promote flooding, erosion or siltation either on or off the site. The project will maintain existing agricultural drainage patterns. The project will create minimal runoff as the total area of the proposed project sites is 7.86 acres in size and flat. However, as there are no existing or planned stormwater drainage systems, the capacity of these systems cannot be exceeded.

IXe. There are no existing or planned stormwater drainage systems; therefore the capacity of these systems cannot be exceeded. The total area of disturbance is greater than one (1) acre; however, Sojitz will use a Notice Of Intent (NOI) to submit an erosivity waiver certification for the proposed project sites. Accordingly, Sojitz will not be required to prepare and submit a Storm Water Pollution Prevention Plan to comply with the terms of the General Permit to Discharge Storm Water with Construction Activity (WQ Order No. 2009-0009 DWQ).

IXf. See IXa-e.

IXg,h. Table 23 details the location of each of the proposed project sites in relation to the 100-year floodplain. Three of the proposed project sites are located within the Overlay zone for Flood Hazard (Rancho Grande 1-11, 2-11 and 1-9). The proposed project does not include construction of housing within a 100-year flood hazard area. (Map ID 06029C2675E, Date 09/26/2008, www.fema.gov). No permanent structures are proposed. Portable drilling equipment would be temporarily located on the proposed project sites during the drilling phase and a well head / pumping unit and 2 500 barrel tanks would be installed for the production phase. A project specific emergency response plan would be prepared for each well site that addresses evacuation of equipment and personnel in the event of a threat of flooding. Accordingly, there are no structures which would impede or redirect flood flows.

Table 23
Floodplain Status

Rancho Grande Well #	100-Year Floodplain
1-3	Not in Floodplain
1-11	Area subject to 1% annual chance flood; no Base Flood Elevations determined
2-11	Area subject to 1% annual chance flood; no Base Flood Elevations determined
1-15	Area subject to 1% annual chance flood; no Base Flood Elevations determined
1-4	Not in Floodplain

1-9	Area subject to 1% annual chance flood; no Base Flood Elevations determined
1-16	Area subject to 1% annual chance flood; no Base Flood Elevations determined
1-22	Not in Floodplain

IXi. The closest dam to the proposed project sites is the Brite Valley Dam and it is located 23 miles to the northeast of the proposed project sites. The California Aqueduct is located 0.33 miles north of the proposed Rancho Grande 1-9 project site. Accordingly, the project as proposed will not expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

IXj. No evidence of past mudflows was observed within or adjacent to the proposed project area. The proposed project would not be impacted by mudflow due to the topography of the area. There would be no impact.

Conclusion: Mitigation measures shall reduce any potential impacts relative to hydrology and water quality to a level of less than significant.

Mitigation Measures: The following mitigation measure will be implemented to reduce any potential impacts relative to hydrology and water quality:

Hydrology 1 – Sojitz will provide a copy of the submitted NOI and verification of an approved erosivity waiver from the SWRCB to the Division.

References:

Calflora, *Watersheds in Kern County*
Website: http://www.calflora.org/app/wgh?page=wcprofile&cc=KRN

California Department of Resources, Recycle, and Recovery, *Active Landfills Profile*
Website: www.calrecycle.ca.gov

California Department of Water Resources, *Water Data Library*
Website: http://www.water.ca.gov/waterdatalibrary/

Federal Emergency Management Agency, *Map Service Center, Map ID 06029C3125E*
Website: http://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping

Kern Council of Government, *Flood Plain & Dam Inundation Areas –*
Website: http://www.kerncog.org/maps/MEAR_atlas/21FloodPlainandDamInnundationAreas.pdf)

ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
X. LAND USE AND PLANNING *Would the project:*				
a. Physically divide an established community?	_____	_____	_____	X
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	_____	_____	_____	X
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	_____	_____	_____	X

Discussion: Primary land use for the proposed project area is ranching and farming. Additional land uses within and adjacent to the proposed project area include drilling, production and transportation of oil and natural gas. Table 4 in Section II, Agricultural and Forest Resources details the General Plan designations and the zoning for the proposed project. The proposed project is located on property designated as and as Intensive Agriculture (8.1), with the overlay zone of Flood Hazard (2.5) and as Extensive Agriculture (8.3), with the overlay zones of Flood Hazard (2.5), Landslide (2.2) on the Kern County General Plan land use map which lists uses such as mineral, aggregate, and petroleum exploration and extraction as acceptable uses. The proposed project is consistent with the land use and zoning designation for the area. The Kern County General Plan Land Use, Open Space and Conservation Element states that petroleum exploration and extraction are consistent uses with agricultural designations.

The proposed project area is zoned Exclusive Agriculture (A). The project is consistent with the Exclusive Agriculture (A) zoning designations per Kern County, California Municipal Code Chapters 19.12.020 and 19.98.020 which include oil and gas exploration as a permitted use. The proposed project is consistent with existing land uses.

Xa. The proposed project sites would not physically divide an established community because the proposed project sites are located in un-incorporated agricultural areas.

Xb. The proposed project is consistent with the land use and zoning designation for the area, and is therefore considered consistent with associated agricultural resource planning purposes and General Plan requirements. The proposed project is consistent with the Land Use, Open Space and Conservation Element, Chapter 1, Figure 3 (Land Use Designation), 1.9 (Resource), Map Provisions Resource, Map Code 2.2 (Landslide), 2.5 (Flood Hazard), 8.1 (Intensive Agriculture), 8.3 (Extensive Agriculture), and Energy

Element, Chapter 5, Petroleum Resources and Development 5.3, of the Kern County General Plan. Additionally, the project is consistent with agricultural usage in accordance with the Kern County Zoning Ordinance, Chapter 19.12 (Exclusive Agriculture) A District, 19.12.020 (Permitted Uses) and Chapter 19.98 (Oil and Gas Production) Section 19.98.020 (Unrestricted Drilling).

Xc. There are no adopted Habitat Conservation Plans, Natural Community Conservation Plans or other approved local, regional, or state habitat conservation plans in the project areas.

Conclusion: No impact to land use and planning.

Mitigation Measures: No impacts identified. No mitigation necessary.

References:

Kern County *General Plan 2009*
Website: http://pcd.kerndsa.com/planning/planning-documents/general-plans

Kern County, Zoning Ordinance
Website: http://www.co.kern.ca.us/planning/pdfs/KCZOJul12.pdf

California Department of Fish and Wildlife**.** *Conservation and Mitigation Banks in California Approved by the Department of Fish and Wildlife***.**
Website: http://www.dfg.ca.gov/habcon/conplan/mitbank/catalogue/

United States Fish and Wildlife Service. *Conservation Plans and Agreements Database*.
Website: http://ecos.fws.gov/conserv_plans/public.jsp

ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
XI. MINERAL RESOURCES				
Would the project:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	_____	_____	_____	X
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	_____	_____	_____	X

Discussion: Mineral resources in Kern County include limestone, silica, borate, clay, shale gypsum, gold, sand and gravel. The Surface Mining and Reclamation Act (SMARA) (Public Resources Code, Division 2, Chapter 9, Section 2710 et seq.) mandates a two-phased mineral resource conservation processes called classification and designation to assist lead agencies in developing policies and procedures to protect and develop mineral resources.

Classification is the process of identifying lands containing significant mineral deposits based solely on geologic factors, and without regard for present land use or land ownership. Classification of mineral lands is done by the California Geological Survey (CGS). The designation phase is completed by the State Mining and Geology Board and is based upon the classification report. Designation is the formal recognition of areas containing mineral deposits of regional or statewide significance that should be considered for protection from incompatible land uses with mineral extraction.

Mapped mineral lands are classified under designation as Mineral Resource Zones (MRZ). The MRZ zone classifications are based upon the geologic appraisal of the classification phase. The project sites are not within any areas designated by the SMGB as a Mineral Resource Zone.

Kern County, including the general project area, serves as an important regional source of oil and natural gas. Natural gas facilities and transmission pipelines are located throughout the general project area. The proposed project sites are located 0.75 miles south and west of the Tejon Gas Field designated by the Division. According to Division record, within one mile of the proposed project sites there are 27 active wells, 3 idle wells, 9 new wells, 3 plugged or abandoned wells and 53 wells of unknown status. The nearest new well is the Rancho Grande South Pastoria 1-2 which is located approximately 0.48 miles north of the project area (see Figure 7). No other mineral resources have been identified within the proposed project area.

The objective of this project is to identify and develop further mineral resources. If successful, its impacts will enhance rather than negatively impact the realization of the values and policies

protected by this specific issue area. If the project is not successful, the well or wells will be plugged and abandoned, and the site restored, with no negative impact.

The proposed project is consistent with the Kern County Land Use, Open Space and Conservation Element of the Kern County General Plan. The Kern County General Plan Land Use, Open Space and Conservation Element states that petroleum exploration and extraction are consistent uses with agricultural designations. Additionally, the project is consistent with agricultural usage in accordance with the Kern County Ordinance Code (July 2003), Chapter 19.98 "Oil and Gas Production."

XIa,b. The proposed project would not result in the loss of availability of a known mineral resource, or the loss of a locally important mineral resource recovery site.

Conclusion: No impact to mineral resources.

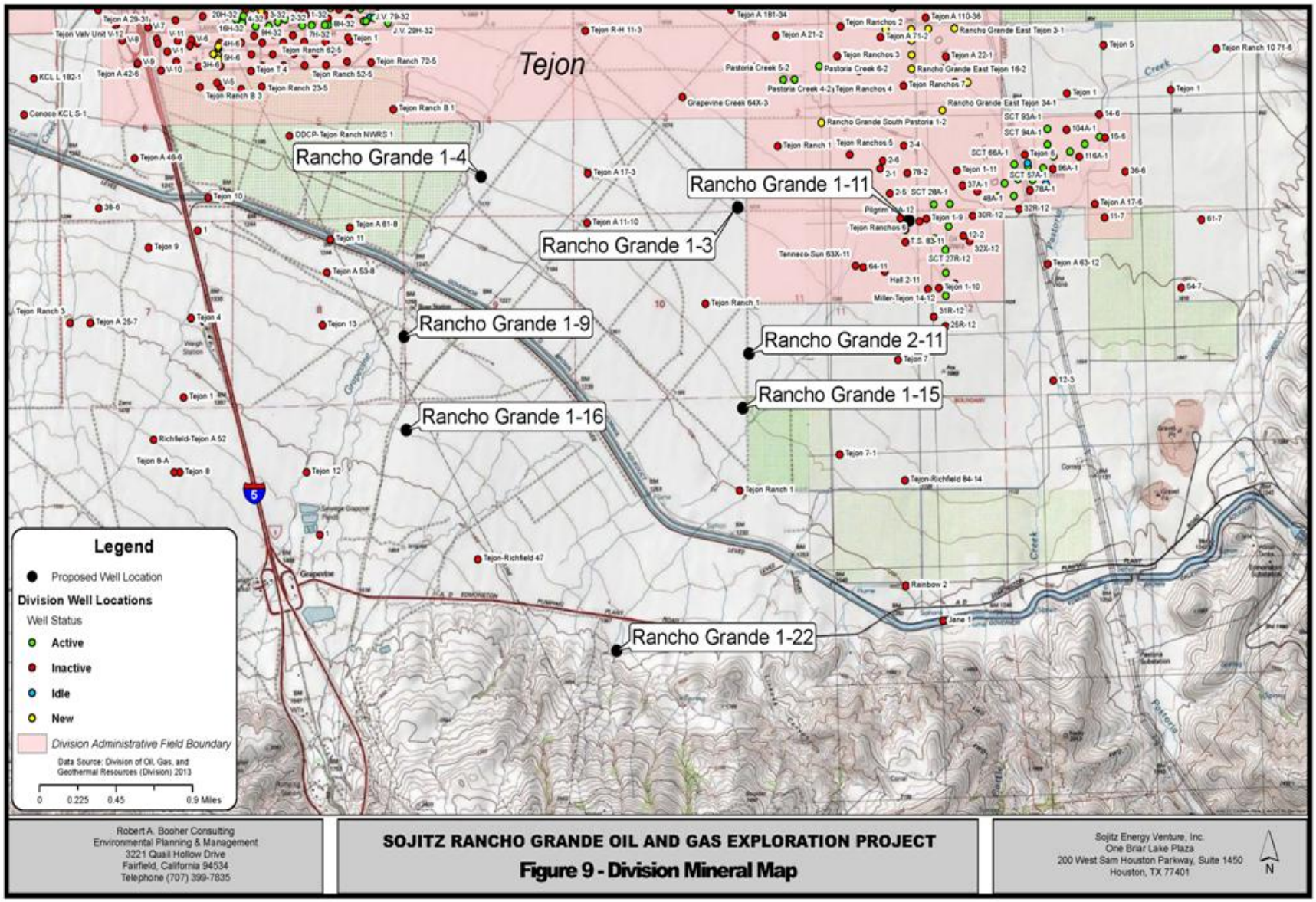
Mitigation Measures: No impacts identified. No mitigation necessary.

References:

Guidelines for Classification and Designation of Mineral Lands
Website: http://www.conservation.ca.gov/smgb/Guidelines/Documents/ClassDesig.pdf

Kern County *General Plan 2009*
Website: http://pcd.kerndsa.com/planning/planning-documents/general-plans

Kern County, Zoning Ordinance
Website: http://www.co.kern.ca.us/planning/pdfs/KCZOJul12.pdf



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SOJITZ RANCHO GRANDE OIL AND GAS EXPLORATION PROJECT

Figure 9 - Division Mineral Map

Sojitz Energy Venture, Inc.
One Briar Lake Plaza
200 West Sam Houston Parkway, Suite 1450
Houston, TX 77401

ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
XII. NOISE				
Would the project:				
a. Exposure of people to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	_____	_____	X	___
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	_____	_____	X	_____
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	_____	_____	_____	X
d. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	_____	_____	_____	X
e. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	_____	_____	_____	X

Discussion: The proposed project is consistent with existing land uses in the project area and areas immediately adjoining the project parcels.

Drilling, testing and completion activities will result in short term noise impacts and would use the following types of equipment: drilling equipment, truck-mounted crane, pumps, pneumatic tools, loaders, and a variety of miscellaneous equipment including air compressors. The number and type of equipment used during drilling, testing and completion activities will vary from day to day.

The U.S. EPA has found that the noisiest equipment types operating at construction sites typically range from 88 dBA to 101 dBA at a distance of 50 feet. *Table 24: Noise Levels Generated by Construction Equipment* below lists noise levels typically generated by construction equipment; however, not all equipment listed will be used during the proposed project.

Table 24
Noise Level Generated by Construction Equipment

Type of Equipment	Typical Sound Level (dBA at 50 feet)
Pump	76
Generator	76
Air Compressor	81
Concrete Mixer (truck)	85
Pneumatic Tools	85
Backhoe	85
Excavator	86
Dozer	87
Front-End Loader	88
Dump Truck	88
Jack Hammer	88
Scraper	88
Pavers	89
Pile Driver	101

Sources: *U.S. Environmental Protection Agency, 1974; Noise Control for Building and Manufacturing Plants, BBN Layman Miller Lecture Notes, 1987.*

In order to determine typical sound levels associated with oil and gas well drilling operations, Robert A. Booher Consulting retained the services of Bollard and Brennan, Inc. an acoustical engineering firm to conduct a sound survey on August 5, 2004 of Nabors Drilling USA Rig #473, a triple drill rig. Sojitz anticipates using the same or equivalent drilling rig for its proposed project. There were no barriers between the drilling rig and the location where noise levels were recorded. Noise was measured continuously for a 24 hour period and a measurement was taken every hour.

Bollard and Brennan used a Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meter to record noise level measurements. The meter was calibrated before and after use with an LDL Model CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

In order to quantify the noise level generation of the drill rig, noise level measurements were recorded at 12 locations surrounding the drill rig during normal operating conditions. Bollard & Brennan, Inc. field observations indicate that there are a number of noise sources associated with drill rig operations including power generators, mud pits, and the drill tower itself. However, of all these noise sources, the generators were identified as the dominant noise producing component. The highest noise level recorded by Bollard and Brennan, Inc. was 91 dBA and the measurement was recorded 50 feet from the generator fans.

Based on the data in Table 24 and the result of the Bollard & Brennan, Inc. survey, equipment associated with the construction of drill site and drilling would produce maximum sound levels

of 87 dBA at a distance of 50 feet from a proposed project drill site during construction and 91 dBA during drilling. The closest residences to the proposed project sites are approximately 1.0 mile (5,280 feet) away. Accordingly, the following noise calculation will be based upon the drill rig only and no other piece of equipment as the drill rig results in the highest noise level.

Noise levels for the drilling phase at the closest residence to each of the proposed project sites were calculated using the equation below and the calculated noise levels are presented in Table 26 (www.animations.physics.unsw.edu).

Representative Drilling Phase Calculation (based on RG Well #1-3)

$L_1 = L_2 + 20\log_{10}(R_2/R_1)$
$L_2 = L_1 - 20\log_{10}(R_2/R_1)$
$L_2 = 91 – 20\log_{10} (10{,}032'/50')$
$L_2 = 91 – 46$
$\mathbf{L_2 = 45}$ **dBA**

L_1 = Sound level at Object 1, the dosimeter of the noise source (91 dBA)
L_2 = Estimated sound Level at Object 2, the nearest residence
R_1 = Distance from the source of noise to the northwest dosimeter (50 feet)
R_2 = Distance from the source of noise to the nearest residence (10,032 feet, Rancho Grande 1-3)

Production activities will result in long term noise impacts. In order to quantify these impacts, RAB Consulting conducted a sound survey at the Sojitz Gump Trust site located south of the proposed project site in Rio Viejo Oil Field in Kern County, California. At the time of the survey, a 24' Weatherford P15-122-64 pump jack with a natural gas/propane 49.6 hp Waukesha engine, model F-1197, Serial #B451, RPM range 850-1200 was operating on site. Sojitz will install like or equivalent equipment at each of the proposed project sites. The sound meter used was an Extech Instruments, model 407780 integration sound level meter, range 30-130 dB datalogger. The results of the survey are presented in Table 25.

Table 25
Sound Survey Measurements (dBA)

Direction From Unit	50 feet from unit	100 feet from unit	200 feet from unit
North	73.8	69.4	62.2
South	75.8	70.8	60.4
East	73.7	68.2	63.6
West (directly facing the engine)	83.7	70.5	62.7

Based on the data in Table 25, the maximum sound level resulting from production activities will be 83.7 dBA at a distance of 50 feet from a proposed project site.

Noise levels during production at the closest residence to each of the proposed project sites were calculated using the equation below and the calculated noise levels are presented in Table 26 (www.animations.physics.unsw.edu).

Representative Production Phase Calculation (based on RG Well #1-3)

$L_1 = L_2 + 20\log_{10} (R_2/R_1)$
$L_2 = L_1 - 20\log_{10} (R_2/R_1)$
$L_2 = 83.7 – 20\log_{10} (10{,}032'/50')$
$L_2 = 83.7 – 46.0$
$L_2 =$ **37.7 dBA**

$\Delta L = L_1 – L_2$
L_1 = Sound level at Object 1, the dosimeter due west of the noise source (83.7 dBA).
L_2 = Estimated sound Level at Object 2, the nearest residence
R_1 = Distance from the source of noise to the south dosimeter (50 feet)
R_2 = Distance from the source of noise to the nearest residence (10,032 feet)

Table 26
Estimated Noise Level at Nearest Residence

Rancho Grande Well	Distance to Nearest Residence (feet)	Noise Level at Nearest Residence During Drilling (dbA)	Noise Level at Nearest Residence During Production (dbA)
1-3	10,032	45	38
1-11	15,312	41	34
2-11	13,200	43	36
3-11	15,840	41	34
1-4	5,280	51	44
1-9	10,560	45	37
1-16	7,920	47	40
1-22	10,032	45	38

Note: Values in the above Table are rounded up to the nearest decimal

XIIa. Based upon the results presented above, the outdoor noise level at the nearest residence is expected to be 51 dBA during drilling activities and 44 dBA during production. The proposed project will be in compliance with the Noise Control Ordinance in the Kern County Code (Section 8.36.020 et seq.) and with Kern County General Plan Noise Element. The Noise Control Ordinance in the Kern County Code (Section 8.36.020 et seq.) prohibits a variety of nuisance noises but does not specifically mention construction or related noise. The Kern County General Plan Noise Element establishes a 65 dBA maximum Day-Night Average Noise Level (Ldn) as being considered consistent with residential uses or development. Accordingly, noise impacts at the nearest residence throughout the life of the project are well within regulatory limits for residential uses.

State and federal standards set by the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) regulate worker exposure time to sound levels above 90 decibels. However, the outdoor noise level at the edge of a proposed project site is expected to be 82 dBA [$L_2 = 91 – 20\log_{10} (140'/50')$] during drilling activities and 75 dBA [$L_2 = 83.7 – 20\log_{10} (140'/50')$] during production. Accordingly, farm personnel working in the vicinity of each of the project sites would not be exposed to sound levels exceeding state or federal standards. Therefore people will not be exposed to noise levels in excess of applicable standards.

XIIb. Vibration is oscillating motion of structures or the ground. The rumbling sound caused by the vibration in the ground is called ground-borne vibration. The proposed project is expected to create ground-borne vibration as a result of project activities (e.g. during drilling and production activities). Two elements need to be generally concerned regarding ground-borne vibration impacts: damage to buildings and annoyance to humans.

One of the accepted measurements for evaluating building damage associated with ground-borne vibration is peak particle velocity (PPV). According to the U.S. Department of Transportation, Surface Transportation Board (2009), "PPV is the maximum instantaneous positive or negative peak of the vibration signal, measured as distance per time (inches per second). PPV has been used historically to evaluate shock wave type vibrations from actions like blasting, pile driving and mining activities and their relationship to building damage." Table 27 shows effects of construction vibrations on buildings.

Table 27*
Effects of Construction Vibration

Peak Particle Velocity (in/sec)	Effects on Buildings
< 0.05	No effect on buildings
0.1 to 0.5	Minimal potential for damage to weak and sensitive structures
0.5 to 1.0	Threshold at which there is a risk of architectural damage to buildings with plastered ceilings and walls. Some risk to ancient monuments and ruins.
1.0 to 2.0	U.S. Bureau of Mines data indicates that blasting vibrations in this range will not harm most buildings. Most construction vibration limits are in this range.
>3.0	Potential for architectural damage and possible minor structural damage.

*Modified from Vibration at http://www.drnoise.com/PDF_files/Vibration%20Primer.pdf

In order to estimate ground-borne vibration impacts associated with the proposed project activities, RAB Consulting retained the services of Gasch Geophyiscal Services, Inc. (GGSI) to conduct a ground vibration monitoring study of a triple rig operating near Lost Hills, California. Sojitz will use the same or equivalent drilling rig. The proposed study used Instantel vibration monitoring instruments and all units were calibrated according to manufacturer's specifications. A 3-component tri-axial geophone was utilized to record vibration levels in the longitudinal (toward the source), transverse (horizontally orthogonal to the longitudinal direction), and vertical (up and down) directions. Measurements were recorded on two sides (north side and south side) of the drill rig. The power system including mud pumps, water and fuel storage and compressors were located on the north side of the drill rig. The catwalk and other minor transient vibration generating equipment were located on the south side of the drill rig. The results of the study are presented in Table 28.

Table 28*
Vibration Monitoring Study Results

Distance from Drill Hole (feet)	Transverse Direction (in/sec)	Vertical Direction	Longitudinal Direction
87 feet north	0.0550	0.105	0.0600
152 feet north	0.0400	0.0300	0.0200
225 feet north	0.0150	0.01000	0.01000
321 feet north	0.01000	0.01000	0.01000
105 feet south	0.0150	0.01000	0.01000
188 feet south	0.0150	0.0150	0.01000
335 feet south	0.01000	0.01000	0.01000

*Gasch Geophysical Services, Inc. Vibration Monitoring of a Large Drill Rig, December 2012.

GGSI recorded a PPV of 0.105 inches/second at 87 feet during drilling activities associated with a triple rig. The following calculation was used to determine the PPV (in/sec) at the nearest residence to the proposed project site.

$$PPV_{equipment} = PPVref\,(25/D)^{n}$$

Where:

$PPV_{equipment}$ = peak particle velocity in in/sec of the equipment adjusted for the distance
PPV_{ref} = reference vibration level in in/sec at 87 feet (drill rig)
D = distance from equipment to the nearest residence in feet
n = 1.5 (the value related to the attenuation rate through the ground)

$$PPV = 0.105(87/10{,}032)^{1.5} = 0.00008 \text{ in/sec (Rancho Grande 1-3 site)}$$

PPV at the closest residence to each of the proposed project sites were calculated using the equation above and the calculated PPV levels are presented in Table 29.

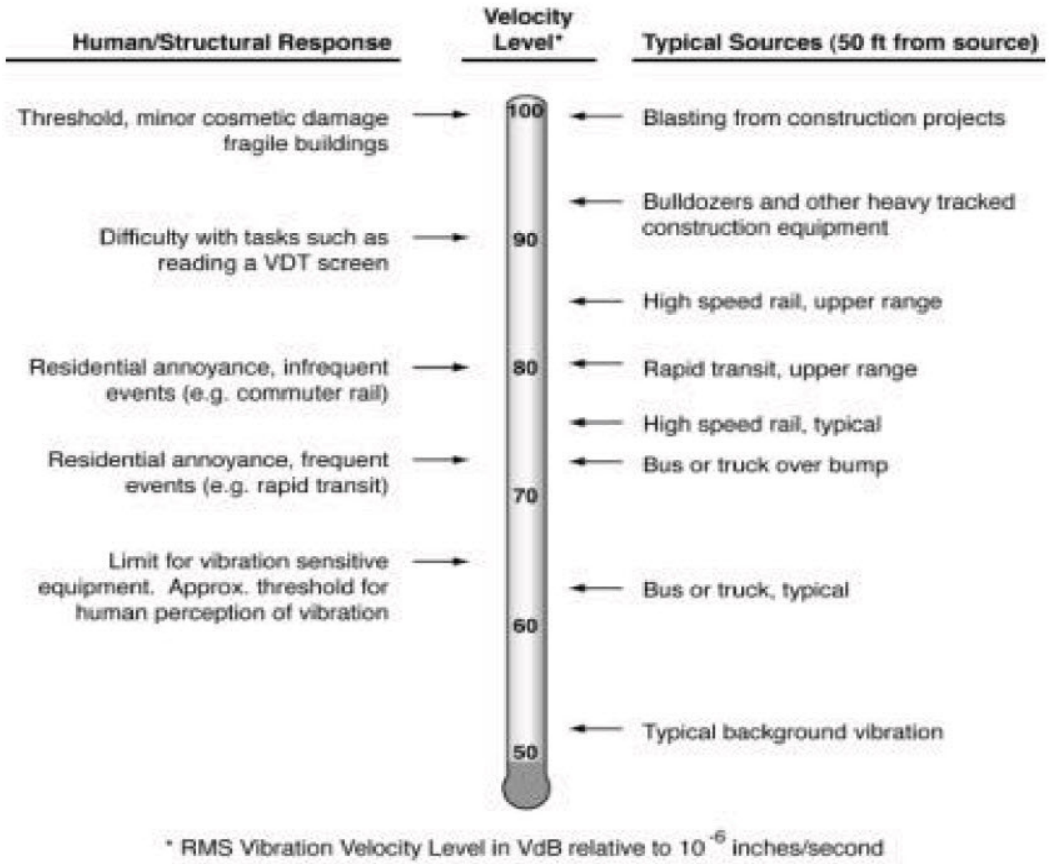
Table 29
Estimated Peak Particle Velocity (PPV) at Nearest Residence

Rancho Grande Well	Peak Particle Velocity (in/sec)
1-3	0.00008
1-11	0.00004
2-11	0.00006
3-11	0.00004
1-4	0.00022
1-9	0.00008
1-16	0.00012
1-22	0.00008

The estimated PPV at the nearest residences is lower than the PPV of 0.05 in/sec that may cause effects on buildings as shown in (Table 27). Therefore, the estimated ground-borne vibration generated by the proposed project will have less than significant impact to structures.

Another widely accepted source of measurements, as an alternative to using PPV, for evaluating human annoyance associated with ground-borne vibration is root-mean-square (rms) amplitude. According to the U.S. Department of Transportation, Federal Transit Administration (2006), "It takes some time for human body to respond to vibration signals. In a sense, the human body responds to an average vibration amplitude. Because the net average of a vibration is zero, the root mean square (rms) amplitude is used to describe the "smoothed" vibration amplitude. The root mean square of a signal is the square root of the average of the squared amplitude of the signal. The average is typically calculated over a one-second period." The rms, connoted as vibration decibels (VdB) on a log scale, is used to evaluate human annoyance against ground-borne vibration. Figure 8 shows the human/structural response to different levels of ground-borne vibration velocity levels.

Figure 8
Human/Structural Response to Different Levels of Ground-Bourne Vibration Velocity Levels



According to the U.S. Department of Transportation, Federal Transit Administration (2006), the background vibration velocity level in residential areas is usually 50 VdB or lower well below the threshold of perception for humans which is around 65 VdB. The range of interest is from approximately 50 VdB to 100 VdB." Although the *CEQA Guidelines* do not specifically define the levels at which ground-borne vibration is considered "excessive.", Table 30 is an example to show the human response to different levels of ground-borne noise and vibration.

Table 30
Human response to different levels of ground-borne noise and vibration

Vib. Velocity Level	Noise Level		Human Response
	Low Freq1	Mid Freq2	
65 VdB	25 dBA	40 dBA	Approximate threshold of perception for many humans. Low-frequency sound usually inaudible, mid-frequency sound excessive for quiet sleeping areas.
75 VdB	35 dBA	50 dBA	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find transit vibration at this level annoying. Low-frequency noise acceptable for sleeping areas, mid-frequency noise annoying in most quiet occupied areas.
85 VdB	45 dBA	60 dBA	Vibration acceptable only if there are an infrequent number of events per day. Low-frequency noise annoying for sleeping areas, mid-frequency noise annoying even for infrequent events with institutional land uses such as schools and churches.

Notes:
1. Approximate noise level when vibration spectrum peak is near 30 Hz.
2. Approximate noise level when vibration spectrum peak is near 60 Hz.

In order to estimate ground-borne vibration impacts to humans by the proposed project activities, the velocity level in decibels, Lv (VdB) at the nearest residence to each of the proposed project sites was calculated using the following equation:

$Lv = 20 \times \log_{10}(v/v_{ref})$

Where:

Lv = velocity level in decibels (VdB)
v = RMS velocity amplitude = PPV/Crest Factor
v_{ref} = reference velocity amplitude (1×10^{-6})

Crest Factor is defined as the ratio of the PPV amplitude to the RMS velocity amplitude. To calculate the RMS velocity amplitude, a crest factor of 4 for random ground vibration was used.

RMS velocity amplitude = PPV/Crest Factor = 0.00008/4= 0.00002 (Rancho Grande 1-3)

Vibration velocity levels for the proposed project site is calculated below:

$Lv = 20 \times \log_{10}(0.00002/1 \times 10^{-6}) = 26.0$ VdB

Table 31
Estimated Vibration Velocity Levels (VdB) at Nearest Residence

Rancho Grande Well	Vibration Velocity Level (VdB)
1-3	26.0
1-11	20.0
2-11	26.0
3-11	20.0
1-4	34.8
1-9	26.0
1-16	29.5
1-22	26.0

The calculated vibration velocity at the nearest residences is lower than the threshold of perception for humans of 65 VdB as shown in Table 30. Therefore, the estimated ground-borne vibration generated by the proposed project will have less than significant impact to structures.

XIIc. The site preparation, drilling, testing and completion phases of the proposed project are short term and temporary in nature. The production phase of the proposed project will continue through the life of each well. Based upon the results presented above, the average outdoor noise level at a proposed project site is expected to be 51 dBA during drilling activities and 44 dBA during production at the nearest residence. There will be no increase in the permanent ambient noise levels in the project vicinity.

XIId,e. The proposed project sites are not located within an airport land use plan or within two miles of a public airport or public use airport. The proposed sites are within 1 mile of an agricultural use airstrip; however, drilling noise is consistent with the other agricultural equipment in use in the area. Therefore, the project would not expose people to excessive noise levels.

Conclusion: Impacts will be less than significant.

Mitigation Measures: No significant impacts identified. No mitigation necessary.

References:

U.S. Environmental Protection Agency, *1974; Noise Control for Building and Manufacturing Plants*, BBN Layman Miller Lecture Notes, 1987.

California Department of Transportation, Noise, Vibration, and Hazardous Waste Management Office (2004) *Transportation and Construction Induced Vibration Guidance Manual*. Prepared by Jones & Stokes, Sacramento, CA

Kern County *General Plan 2009*
Website: http://pcd.kerndsa.com/planning/planning-documents/general-plans

Kern County, Zoning Ordinance
Website: http://www.co.kern.ca.us/planning/pdfs/KCZOJul12.pdf

U.S. Department of Transportation, Surface Transportation Board (2009*) Northern Rail Extension Final Environmental Impact Statement, Appendix J – Noise and Vibration, for STB Finance Docket No. 35468, Alaska Railroad Corporation – Petition for Exemption – To Construct and Operate a Rail Line Between North Pole, Alaska and Delta Junction, Alaska*.

U.S. Department of Transportation, Federal Transit Administration (2006) *Transit Noise and Vibration Impact Assessment.* FTA-VA-90-1003-06

Vibration at http://www.drnoise.com/PDF_files/Vibration%20Primer.pdf

ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
XIII. POPULATION AND HOUSING				
Would the project:				
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension or roads or other infrastructure?	_____	_____	_____	X
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	_____	_____	_____	X
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	_____	_____	_____	X

Discussion: The proposed project sites are located in an unincorporated area of southern Kern County. The closest community to the proposed project sites is Mettler, which is located 7.00 miles to the northwest. The project area is used primarily for ranchland, farming and oil and gas production. The closest residence to the proposed Rancho Grande 1-4 project site is located 1.0 mile (5,280 feet) to the northwest.

XIIIa. Sojitz project personnel, drilling company employees and other support personnel currently reside within the cities of Orland, Rio Vista, Woodland and Bakersfield. The activity of the employees at the facility will primarily be handled by the local employees in the Bakersfield area. Accordingly, the proposed project would not induce population growth in the project area.

XIIIb,c. The project does not propose to displace or relocate any existing housing or persons. Therefore, no persons will be displaced nor housing be constructed elsewhere during project implementation.

Conclusion: No impact.

Mitigation Measures: No impacts identified. No mitigation necessary.

References:
Kern County *General Plan 2009*
Website: http://pcd.kerndsa.com/planning/planning-documents/general-plans

ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
XIV. PUBLIC SERVICES				
Would the project:				
a. result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	_____	_____	_____	X
Police protection?	_____	_____	_____	X
Schools?	_____	_____	_____	X
Parks?	_____	_____	_____	X
Other public facilities?	_____	_____	_____	X

Discussion: Distances from the proposed project site to the nearest cities and public or private facilities are listed in Table 32.

Table 32: Approximate Location of Proposed Project Sites to Public and Private Facilities

Type	Miles	Direction
City/Town		
Mettler	7	NW
Lebec	4	S
Lamont	19	N
Bakersfield	28	N
Frazier Park	8	SW
Public Facilities		
Schools		
El Tejon Elementary	7	S
Health Facilities		
Arvin Medical Clinic	16.5	N
Bakersfield Medical Center, Frazier Park	8.36	SW

Airports		
Bakersfield Municipal Airport	24	N
Private Airstrips		
Tejon Agricultural Airport	1	NW
Child Care Centers		
The Lion's Club, Frazier Park	8.35	SW
Fire Stations		
Mettler Fire Station (55)	2.7	N
Police/Sheriff Stations		
Kern County Sheriff's Office (Lamont)	19	N

Source: Kern County, 2012.
Note: Measurements were taken from the project site closest to each private and public facility.

XIVa. As illustrated, the proposed project sites are located in an unincorporated area of southern Kern County. The closest community to the proposed project sites is Mettler, which is located 7.0 miles to the northwest. T he Kern County Sheriff's Department, Lamont Substation provides law enforcement services in the project area and its main office located at 12202 Main Street, Lamont, CA 93241 is 19 miles to the north of the proposed project sites. Fire protection is provided by the Kern County Fire Department and its Fire Station No. 55 located at 5441 Dennis McCarthy Road, Mettler, California is 2.7 miles from the proposed project sites. No cities, schools, parks, or other public facilities are located in the general vicinity of the proposed project sites. No existing or proposed schools are located within one-quarter mile of the proposed project sites. The nearest school (El Tejon Elementary School, 4337 Lebec Road, Lebec, California) is 7 miles south of the proposed project sites. The proposed project sites are not located within two miles of a public airport, public use airport, or private airstrip. The nearest public airport is the Bakersfield Municipal Airport (2000 S Union Ave., Bakersfield, CA 93307) located approximately 24 miles north of the proposed project sites. The closest private airstrip (Tejon Ag Airport) occurs approximately 1.0 mile northwest of the proposed well site Rancho Grande 1-4. Therefore, implementation of the proposed project is not expected to interfere with or adversely affect fire protection, police protection, school, airports, park, or other public services or facilities in the project area.

Conclusion: No impact.

Mitigation Measures: No impacts identified. No mitigation necessary.

References:
Kern County Online Mapping System
Website: http://maps.co.kern.ca.us/imf/imf.jsp?site=krn_pub

ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
XV. RECREATION				
Would the project:				
a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	_____	_____	_____	X

Discussion: The proposed project area and well sites are located on private land that is used primarily for ranchland, farming and oil and gas production. This land does not provide recreational activities to the public.

XVa. There are no recreational facilities within the project area. The proposed project would not require the use of recreational resources and would not create the need for new recreational facilities. Therefore, no impacts to recreational facilities are expected.

Conclusion: No impact.

Mitigation Measures: No impacts identified. No mitigation necessary.

References:
Kern County Online Mapping System
Website: http://maps.co.kern.ca.us/imf/imf.jsp?site=krn_pub

ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
XVI. TRANSPORTATION/TRAFFIC				
Would the project:				
a. Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e. result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections?	_____	_____	X	_____
b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	_____	_____	X	_____
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	_____	_____	_____	X
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	_____	_____	_____	X
e. Result in inadequate emergency access?	_____	_____	_____	X
f. Result in inadequate parking capacity?	_____	_____	_____	X
g. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	_____	_____	_____	X

Discussion: California Interstate Highway I-5 would serve as the main access roadway to the project area. There are additional dirt and/or gravel roads that serve as farm access roads in the proposed project area that have limited public access.

XVIa. As reflected in Table 33, the maximum number of daily vehicle trips will be 35 (70 one way trips) over a combined period of 2 days, during the mobilization/ demobilization when drilling equipment is moved on and off site. The

35 vehicle round trips will include twenty five (25) heavy truck/semi round trips, eight (8) car / pickup truck roundtrips, one (1) crane and one (1) water truck round trip.

Table 33
Maximum Daily Vehicle Trip Generation during the Drilling Phase

Vehicle Type / Number	**One Way Trips**
Crane / 1	2
Water Truck / 1	2
Car and Pickup Trucks Roundtrips / 8	16
Heavy Truck/Semi - Mobilization and Demobilization of Equipment / 25	50
Maximum Total Daily Trips	**70**

Interstate Highway 5 is designed to carry a capacity of up to 7,700 cars per hour in the vicinity of the proposed project sites (Caltrans Website 2011 - http://www.dot.ca.gov/). RAB Consulting reviewed traffic counts from 2009 conducted by Caltrans at the intersection of I-5 and Lebec Road to quantify the average annual daily traffic (AADT) levels. The intersection of I-5 and Lebec Road is 1.50 miles south of the proposed project sites (and the point where traffic created by the proposed project sites would affect local traffic the greatest) According to Caltrans, the AADT for this roadway segment is 69,000 vehicles (Caltrans Website 2011 - http://traffic-counts.dot.ca.gov/index.htm). Interstate 5 reaches approximately 92% of capacity on an average day during the year. Traffic counts were obtained from the Cal Trans website referenced above. Peak volume for the month with the heaviest flow is 75,000. Average volume for a month is 69,000. Dividing the average volume for a month by the highest volume month equals 92%. Accordingly, each of the proposed project sites that would use I-5 for access would contribute a maximum of 70 additional vehicles trips per day during the proposed project. Vehicle trips to each project site would increase the roadway capacity a maximum of 0.10% (70/69,000) during project implementation. Based on the additional maximum daily increase of 0.10% on Interstate 5, and the short term and temporary nature of the drilling phase of the proposed project, the drilling phase vehicle traffic will not represent a significant impact.

The maximum number of daily vehicle trips during the production phase of the proposed project will be 4 (8 one way trips) assuming all eight (8) wells are producing (see “Production Phase,” Project Description, page 5). The production phase is the longest phase of the project. The 4 vehicle round trips will include one (1) operator pickup truck roundtrip, two (2) heavy truck/semi round trip (oil transportation) and one (1) heavy truck/semi round trip (water transportation).

Table 34
Maximum Daily Vehicle Trip Generation during the Production Phase of Eight (8) Wells

Vehicle Type / Number	**One Way Trips**
Operator Pickup Truck Roundtrips / 1	2
Heavy Truck/Semi - Oil Transportation / 2	4
Heavy Truck/Semi - Water Transportation / 1	2
Maximum Total Daily Trips	**8**

Interstate Highway 5 is designed to carry a capacity of up to 7,700 cars per hour in the vicinity of the proposed project sites (Caltrans Website 2011 - http://www.dot.ca.gov/). RAB Consulting reviewed traffic counts from 2009 conducted by Caltrans at the intersection of I-5 and Lebec Road to quantify the average annual daily traffic (AADT) levels. The intersection of I-5 and Lebec Road is 1.50 miles south of the proposed project sites (and the point where traffic created by the proposed project sites would affect local traffic the greatest) According to Caltrans, the AADT for this roadway segment is 69,000 vehicles (Caltrans Website 2011 - http://traffic-counts.dot.ca.gov/index.htm). Interstate 5 reaches approximately 92% of capacity on an average day during the year. Traffic counts were obtained from the Cal Trans website referenced above. Peak volume for the month with the heaviest flow is 75,000. Average volume for a month is 69,000. Dividing the average volume for a month by the highest volume month equals 92%. Accordingly, each of the proposed project sites that would use I-5 for access would contribute a maximum of 8 additional vehicles trips per day during the proposed project. Vehicle trips to each project site would increase the roadway capacity a maximum of 0.01% (8/69,000) during project implementation. Based on the additional maximum daily increase of 0.01% on Interstate 5, the proposed project will not significantly increase vehicle traffic of the roadways during the production phase of the proposed project.

XVIb. The General Plan classifies roadway Level of Service (LOS) for rural and unincorporated areas of the County with a rating of A, B, C, D, E, or F with A representing the best LOS, and F representing the worst LOS. LOS ratings are defined briefly below:

LOS A - Conditions of free flow. Speed is controlled by drivers' desires, speed limits, or physical roadway conditions, not other vehicles.

LOS B - Conditions of stable flow. Operating speeds beginning to be restricted, but little or no restrictions on maneuverability.

LOS C - Conditions of stable flow. Speeds and maneuverability somewhat restricted. Occasional back-ups behind left-turning vehicles at intersections.

LOS D - Conditions approach unstable flow. Tolerable speeds can be maintained, but temporary restrictions may cause extensive delays. Speeds may decline to as low as 40% of free flow speeds. Little freedom to maneuver; comfort and convenience low.

LOS E - Unstable flow with stoppages of momentary duration. Average travel speeds decline to one-third the free flow speeds or lower, and traffic volumes approach capacity. Maneuverability severely limited.

LOS F - Forced Flow. Represents jammed conditions. Intersection operates below capacity with several delays; may block upstream intersections.

The Kern County General Plan Circulation element establishes LOS D as the minimum acceptable standard for principal arterial roadways. The segment of Interstate Highway I-5 through the project area is classified as LOS C & D (Kern County General Plan, Circulation Element, and Caltrans Website 2011 - http://www.dot.ca.gov/). The increase in traffic trips due to the project are not considered to be a significant impact to the established LOS ratings since the additional traffic from the project when added to the current traffic on Interstate 5 will not alter the Level of Service ratings on the interstate or increase traffic so as to cause the interstate to be reclassified to an unacceptable LOS rating.

XVIc. The project should have no impact on air traffic patterns. The proposed project sites do not occur within the immediate vicinity of any public airstrips as the nearest public airport is the Bakersfield Municipal Airport (2000 S Union Ave., Bakersfield, CA 93307) located 24 miles to the north of the proposed project sites. A private agricultural landing strip is located 1.5 miles northwest of the proposed project sites and the proposed project will not interfere with the traffic patterns of aircraft using this facility due to the layout of the landing strip and the location of the proposed project sites. The project will be less than 200 feet above ground level and will be more than 10,000 feet from an airport with a runway of 3,200 feet. In addition, the project area is not located in an airport influence area.

XVId. No public roads will be constructed or improved as part of this project. Therefore, the project is not expected to increase the hazards due to a design feature or incompatible uses of a roadway.

XVIe. The proposed project sites have adequate emergency access.

XVIf. The proposed project sites will have adequate parking for workers and equipment required to drill and produce each well. The proposed project will not use any public parking and will not result in inadequate parking capacity.

XVIg. Drilling and producing an exploratory oil and gas well will not affect pedestrian or bicycle circulation as no public roadways will be altered or improved during project activities. The proposed project will have restricted access; accordingly, bicyclists and pedestrians will not have access to each of the proposed project sites.

Additionally, the proposed project is in a remote area and pedestrians and bicyclists are not common in this area.

Conclusion: Impacts will be less than significant.

Mitigation Measures: No significant impacts identified. No mitigation necessary.

References:

California Department of Transportation, Caltrans Website 2011
Website: http://traffic-counts.dot.ca.gov/index.htm

Kern County *General Plan 2009*

Website: http://pcd.kerndsa.com/planning/planning-documents/general-plans

ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
XVII. UTILITY AND SERVICE SYSTEMS				
Would the project:				
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	_____	_____	_____	X
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	_____	_____	_____	X
c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	_____	_____	_____	X
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or new or expended entitlements needed?	_____	_____	_____	X
e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	_____	_____	_____	X
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	_____	_____	_____	X

Discussion: No utility or service systems expansion will be required to support the drilling or operation of the exploratory wells, or other aspects of the project.

XVIIa. The project does not conflict with applicable water quality and waste discharge standards relating to water quality. Production water is the only potential wastewater that would be generated during project activities, and production water will be transported offsite by truck to the Central Valley Waste Water LLC Class II Disposal Well, the SWCC-1 located in the South Belridge Oil Field. The SWCC-1 disposal well is located approximately 60 miles to the northwest of the proposed project site. This disposal well is permitted to receive up to 5,000 bbls per day of fluids including

production water for disposal. Sojitz anticipates that 2 barrels (84 gallons) of production water a day would be generated at each of the well sites that are put into production. Accordingly the proposed project will not exceed wastewater treatment requirements of the CVRWQCB.

XVIIb. The project as proposed will not require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities and, therefore, no such construction or expansion which could cause significant environmental effects.

XVIIc. The project will create negligible runoff as each of the proposed project sites is 0.96 acres in size, topography is flat. Accordingly, the proposed project will not require or result in the construction of new storm water drainage facilities or expansion of existing facilities and, therefore, no such construction or expansion which could cause significant environmental effects.

XVIId. Water would be purchased from Tejon Ranch, and no new entitlements would be required. There is no impact anticipated on water supplies.

XVIIe. See XVIIb.

XVIIf. Sojitz does not anticipate any non-hazardous solid waste to be produced during project activities; however, if any non-hazardous solid waste is produced it will be disposed at the Kern County Waste Management Bena Landfill, located at 2951 Neumarkel Road, Bakersfield, California 93307. The Kern County Waste Management Bena Landfill is located approximately 27 miles to the northeast of the proposed project site. This landfill is permitted to receive up to 4,500 tons/day. The minimal amount of waste generated during the proposed project will not exceed capacity of waste disposal facilities.

Conclusion: No Impact.

Mitigation Measures: No impacts identified. No mitigation necessary.

References:

California Department of Resources, Recycle, and Recovery, *Active Landfills Profile*
Website: www.calrecycle.ca.gov/SWFaciliates/Landfills/

ISSUES	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE				
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	_____	X	_____	_____
b. Does the project have impacts that are individually limited, but cumulatively considerable ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	_____	_____	X	_____
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	_____	_____	_____	X

XVIIIa. Impacts on the Environment and Special Status Species

With the incorporation of required mitigation measures as outlined in this initial study, the project does not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory.

XVIIIb. Cumulative Impacts

CEQA Guidelines state that a Lead Agency shall consider whether the cumulative impact of a project is significant and whether the effects of the project are cumulatively considerable (CCR 15065). The assessment of the significance of the cumulative effects of the project must, therefore, be conducted in connection with the effects of past projects, other current projects, and probable future projects.

Past, Present and Reasonably Foreseeable Future Projects

The proposed project is not a part of any larger, planned development.

The proposed project sites are located 0.75 miles south and west of the Tejon Gas Field designated by the Division. According to Division record, within one mile of the proposed project sites there are 27 active wells, 3 idle wells, 9 new wells, 3 plugged or abandoned wells and 53 wells of unknown status. The nearest new well is the Rancho Grande South Pastoria 1-2 which is located approximately 0.48 miles north of the proposed project sites. According to Division records, no other oil and gas wells are currently being permitted within 2 miles of the proposed project sites.

A review of Kern County Planning Department Notice of Preparation records failed to identify any proposed project within one mile of the proposed project sites.

Potential Cumulative Impacts

Based upon the results of the initial study, it was determined that there would be no impacts associated with Geology and Soil, Hydrology and Water Quality, Land Use and Planning, Mineral Resources, Vibration, Population and Housing, Public Services, Recreation and Utility and Service Systems. Accordingly, the proposed project would not result in cumulative impacts to Geology and Soil, Hydrology and Water Quality, Land Use and Planning, Mineral Resources, Population and Housing, Public Services, Recreation and Utility and Service Systems.

The following is a discussion of cumulative impacts that could result from the proposed project in conjunction with past, present, and reasonably foreseeable future projects as described above. The term “cumulatively considerable", for the purposes of this analysis, means the effects of a project are considerable when viewed in connection with effects of past projects, effects of other current projects, and effects of reasonably foreseeable/probable future projects.

Aesthetics

Project related drilling activities viewed in conjunction with existing oil and gas activities and/or reasonably foreseeable projects could result in potential cumulative impacts that could degrade the visual existing character of the area and its surrounding. Nine new wells planned within the project area but which have not yet been drilled were identified in a review of Division records. However, it is our understanding that these wells would not be drilled at the same time as the proposed wells. Additionally, drilling activities are short-term and temporary in nature. Accordingly, short term impacts would not be cumulatively considerable impact.

Likewise, production activities viewed in conjunction with existing oil and gas operations in the project area could cumulatively degrade the visual existing character

of the area and its surroundings. However, the proposed production facilities are set back from existing public roads and will be partially screened from existing roads by surrounding hills, vineyards, almond orchards, alfalfa, and hay fields. Additionally, as production equipment is similar in size and shape to tanks and pumps associated with other oil and gas sites located throughout the project area, there is no considerable change to the visual existing character of the area and its surroundings. Additionally, production equipment will be painted in earth tones. No cumulatively considerable impact associated with aesthetics has been identified.

Agriculture and Forest Resources

No forest resources are located within the project area; accordingly, there will be no cumulative impact to forest resources.

The proposed project is located in an area used primarily for agricultural purposes. However, 27 active wells, 3 idle wells, 9 new wells, 3 plugged and abandoned wells and 53 wells of unknown status are located within one (1) mile of the proposed project sites. A review of aerial photographs indicate that fifty seven (57) of these sites have been restored and the twenty nine (29) remaining sites with the exception of the nine (9) new well sites occupy approximately 13.3 acres. Accordingly, when combined with 7.86 acres of agricultural land disturbed by the proposed project, 21.2 acres of agricultural land/annual grassland habitat will be cumulatively impacted within a one (1) mile radius of the proposed project sites. This represents a cumulative impact of 1.05% to agricultural land and annual grassland habitat within a one (1) mile radius of the proposed project sites. Accordingly, the project will not have a cumulatively considerable effect on agricultural resources.

Air Quality

The SJVAPCD's Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI) revised in 2002 provides guidance on evaluating cumulative air quality impacts.

> " Cumulative Impacts. Any proposed project that would individually have a significant air quality impact (See Section 4.3.2 – Threshold of Significance for Impacts from Project Operations) would also be considered to have a significant cumulative air quality impact." (GAMAQI p. 29)

Section 15064(h)(3) allows the lead agency to determine the project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program. As the air quality impacts of the proposed project are individually insignificant, and the proposed project is in compliance with SJVAPCD's approved emission reductions plans, the Division has determined that air quality impacts of the proposed project are not only individually insignificant, but also are not cumulatively considerable.

The San Joaquin Valley Basin is in non-attainment for ozone for federal and state air quality standards and PM10 for state standards. The SJVAB is in attainment with PM10 for federal standards. To reduce emissions and bring the valley into compliance with ozone and PM-10 standards, the SJVAPCD adopted the 2007 Ozone Plan. This Plan was reviewed and approved by CARB and the federal EPA. This Plan sets forth specific requirements what will substantially lessen cumulative impacts from NOx and ROG emissions. The SJVAPCD is in the process of updating the ozone plan for the Revoked 1-hour ozone standard. However, the 2007 Ozone Plan is still in effect. Details of the Plan updates can be found at: http://www.valleyair.org/Air_Quality_Plans/Ozone_Plans.htm

Consistent with this Plan, SJVAPCD has adopted an aggressive set of policies, rules and regulations which includes the adoption of indirect source review (ISR) and the nation's most stringent limits on NOx emissions from boilers, heater and IC engines. The following rules are aimed at reducing emissions from oil and gas production:

Rule 4306 – Reduction of NOx from boilers, heaters and steam generators
Rule 4624 – Transfer of organic liquids
Rule 4702 – Limits on NOx emissions from IC engines

Collectively, these policies are reducing NOx and ROG emissions from stationary sources, including sources at oil production facilities. A detailed discussion and a chart showing the reduction in NOx emissions in the valley can be found at: http://www.valleyair.org/Air_Quality_Plans/Ozone_Plans.htm.

The current project complies with the 2007 Ozone Plan and with the above noted rules. In addition, the project's emissions are below the SJVAPCD's Thresholds of Significance. Therefore, the project impacts both individually and cumulatively are less than significant.

Biological Resources

The biological assessment found no sensitive plant or animal species present within the proposed project sites or within the 250-foot buffer area around the proposed project sites and access roads. No riparian, wetland, stream, vernal pool, federally protected wetland habitat or other natural or sensitive community types were observed within the footprint of the proposed project sites, existing or proposed access roads, or buffer areas during the biological assessment. The proposed project sites would not interfere with movement of any wildlife species or with established native resident or migratory wildlife corridors. Native resident and/or migratory fish and known native wildlife nursery sites are not present within the proposed project sites or area. The project as proposed would not conflict with any local policies or ordinances protecting biological resources or local tree preservation policies/ordinances.

As previously stated approximately 13.3 acres of grassland have been impacted as a result previous and existing oil and gas well within one mile of the proposed project

sites. Accordingly, when combined with 7.86 acres of agricultural land disturbed by the proposed project, 21.2 acres of annual grassland habitat will be cumulatively impacted within a one (1) mile radius of the proposed project sites. This represents a cumulative impact of 1.05% to agricultural land/ annual grassland habitat within a one (1) mile radius of the proposed project sites. Accordingly, the project will not have a cumulatively considerable effect on biological resources.

Cultural Resources

The cultural resources records search and Native American Consultation did not identify any cultural or historic resources within the proposed project sites. Three resources were recorded within a one mile of the proposed project sites; however, these resources will not be impacted. Additionally, existing oil and gas well sites and agricultural sites identified within the vicinity of the proposed project site have been previously disturbed. Accordingly, there will be no cumulative impact to cultural resources.

Greenhouse Gas Emissions

As noted previously, the project has agreed to reduce emissions by 29%. The 29% reduction is in compliance with the SJVAPCD's December 17, 2009 Policy reducing GHG emissions from stationary sources. Compliance with this policy means that impacts from this project will be individually and cumulatively insignificant (Page 9 of the District Policy). This conclusion is further confirmed under Section 15064 (h)(3) of the CEQA Guidelines that state "A lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program….".

Compliance with the above noted District Policy also means that the mitigation proposed for the current project is consistent with ARB's AB-32 Scoping Plan as noted in Page 5 of District's Policy. Since project CO_2(e) emissions are below 25,000 metric tons/year, this project would also be exempt from Cap and Trade regulations. Ref: Title 17 CCR Section 95812 of the Final Regulation Order available at:

http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm

Hazards and Hazardous Materials:

The proposed project includes the transportation and storage of hazardous materials including fuels, oils, lubricants, hydraulic fluids, and solvents. All hazardous materials, such as diesel fuel, will be transported and stored according to applicable federal, state, and local regulations. In the event of a hazardous materials spill at a proposed project site, impacts would be localized, not extending beyond the specific site. If a spill occurs at another oil and gas well site location, resulting impacts would also be localized. The closest producing oil and gas facility to any proposed project

site is located 2,535 feet northeast of the proposed Rancho Grande 1-4 project site and the closest residence to any proposed project site is located approximately 5,280 feet northwest of the proposed Rancho Grande 1-4 project site. Accordingly, no cumulative impacts are anticipated.

Noise

The geographic scope of the cumulative noise analysis consists of the immediate project vicinity (adjacent parcels) and surrounding sensitive receptors. Noise impacts associated with the proposed project would result in short term impacts associated with project activities prior to the ongoing production phase and long term impacts associated with production phase of the project.

The Division identified nine other planned oil and gas projects (new wells) in the vicinity of the proposed project as well as multiple existing oil and gas wells. Even though other planned and approved projects would be required to evaluate short and long-term noise impacts and implement mitigation, as necessary, it is reasonable to assume that the planned projects would have similar impacts as compared to the proposed project. However, the Division understands that the proposed project and planned projects would not be drilled at the same time. Accordingly, there would be no short term cumulative impact associated with the proposed project.

Long term impacts associated with equipment associated with the production phase, existing production equipment and production equipment associated with planned projects would result in minimal cumulative impacts.

However, noise is a highly localized phenomenon, and the other existing and planned projects are expected to be located a considerable distance from the proposed project sites. The closest existing well is located 1,056 feet from the proposed Rancho Grande 1-11 project site. It is also important to keep in mind that because decibels are logarithmic ratios, they cannot be manipulated in the same way as arithmetic numbers. Addition of decibels produces such results as 70 dB + 70 dB = 73 dB. Thus, if a single production facility produced a sound level of 73 dB and another identical facility was located adjacent to the first site, the two production sites would produce a total sound level of 73 dB. This is twice as much acoustic energy, however, with only a three dB change. As a second example of decibel addition, if one production site produces a sound level of 70 dB and the other 60 dB, the combined sound level will be 70.4 dB. When the difference between two sound levels is greater than 10 decibels, the lesser sound is negligible in terms of affecting the total level. It is therefore reasonable to conclude that project generated noise would not combine with noise from other projects in a manner resulting in cumulatively considerable noise impacts.

The combined cumulative impact of noise from the proposed project would not result in cumulative noise levels in excess of 51 dBA at any sensitive receptor. Implementation of the proposed project would not exceed noise thresholds; therefore,

the project would not contribute in a cumulatively considerable manner to noise impacts.

Transportation

California Interstate Highway I-5 will provide primary access to the proposed project sites. The segment of California Interstate Highway I-5 through the project area is classified as LOS C and D. The Kern County General Plan Circulation element establishes LOS D as the minimum acceptable standard for principal arterial roadways. The increase in traffic trips due to the project are not considered to be a significant impact to the established LOS ratings since the additional traffic from the project when added to the current traffic on California Interstate Highway I-5 will not alter the Level of Service ratings on the roadway or increase traffic so as to cause the roadway to be reclassified to an unacceptable LOS rating. As no planned, pending, or recently approved projects have been identified, there would be no increase to traffic volume or the LOS ratings for California Interstate Highway I-5. Accordingly, there would be no cumulative impact.

XVIIIc. Impacts on Humans

The analyses of environmental issues contained in this Initial Study indicate that the project is not expected to have a substantial impact on human beings, either directly or indirectly. Mitigation measures have been incorporated into the project to reduce all potentially significant impacts to less than significant.

ENVIRONMENTAL DETERMINATION

On the basis of this initial evaluation:

I find that the proposed project COULD NOT have a significant effect on the environment, and a **NEGATIVE DECLARATION** will be prepared. ____

I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A **MITIGATED NEGATIVE DECLARATION** will be prepared. __X__

I find that the proposed project MAY have a significant effect on the environment, and an **ENVIRONMENTAL IMPACT REPORT** is required. ____

I find that the proposed project MAY have a significant effect on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets, if the effect is a "potentially significant impact" or "potentially significant unless mitigated." An **ENVIRONMENTAL IMPACT REPORT** is required, but it must analyze only the effects that remain to be addressed. ____

I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier **EIR** or **NEGATIVE DECLARATION** pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier **EIR** or **NEGATIVE DECLARATION**, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required. ____

Signature: _____ Date: 11/15/13
State Oil and Gas Supervisor

DOCUMENT RECIPENTS

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Mr. Shelton Gray Ca Regional Water Quality Control Board 1685 E Street Fresno, CA 93706	Mr. Vahagn Nahabedian Black Hawk Oil Company, LLC 420 Bryant Circle, Suite D Ojai, CA 93023
Ms. Julie Vance California Department of Fish and Game 1234 E. Shaw Avenue Fresno, CA 93710	Mrs. Mary Halpin Irani Engineering, Inc 2625 Fair Oaks Blvd, Ste 10 Sacramento, CA 95864
Beale Memorial Library 701 Truxton Avenue Bakersfield, CA 93301	Tejon Ranch Corporation P.O. Box 1000 Lebec, California 93243
Mr. Thomas Leeman U.S. Fish and Wildlife Service Sacramento Fish and Wildlife Office 2800 Cottage Way, W-2605 Sacramento, CA 95825-1846	Dr. Gordon Nipp Sierra Club Kern-Kaweah Chapter P.O. Box 3357 Bakersfield, CA 93385 Dr. Tom Williams Sierra Club Angeles Chapter California Fracking Group 3435 Wilshire Blvd. Los Angeles, CA 90010

Rancho Grande Exploratory Oil and Gas Project MITIGATION MONITORING AND REPORTING PLAN						
Environmental Impact	**Mitigation Measures**	**Timing of Monitoring Requirement**	**Responsibility for Compliance**	**Method for Compliance**	**Enforcement**	**Checkoff Date/ Initials**
III. Air Quality						
b) Violate any air quality standard or contribute to an existing or projected air quality violation?	Air Quality 1.All disturbed areas, including storage piles, which are not being actively used for construction purposes, shall be effectively stabilized using water.	Ongoing during project activities.	Division and Sojitz.	Inspection by environmental monitor.	Require as condition of approval.	
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors?	Air Quality 2. Unpaved access roads shall be effectively stabilized of dust emissions using water.	Ongoing during project activities.	Division and Sojitz.	Inspection by environmental monitor.	Require as condition of approval.	
	Air Quality 3. All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions by using the application of water or by presoaking.	Ongoing during project activities.	Division and Sojitz.	Inspection by environmental monitor.	Require as condition of approval.	
	Air Quality 4. When materials are transported off-site, all material shall be covered, effectively wetted to limit visible dust emissions, or at least six (6) inches of freeboard space from the top of the container shall be maintained.	Ongoing during project activities.	Division and Sojitz.	Inspection by environmental monitor.	Require as condition of approval.	
	Air Quality 5. Following addition of materials to, or removal of materials from the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions by using sufficient water.	Ongoing during project activities.	Division and Sojitz.	Inspection by environmental monitor.	Require as condition of approval.	
	Air Quality 6. Limit of traffic speeds on unpaved access roads to 15mph.	Ongoing during project activities.	Division and Sojitz.	Inspection by environmental monitor.	Require as condition of approval.	

Rancho Grande Exploratory Oil and Gas Project MITIGATION MONITORING AND REPORTING PLAN						
Environmental Impact	**Mitigation Measures**	**Timing of Monitoring Requirement**	**Responsibility for Compliance**	**Method for Compliance**	**Enforcement**	**Checkoff Date/ Initials**
IV. Biological Resources						
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations or by the California Dept. of Fish & Game or US Fish & Wildlife Service?	Biological 1. As close to beginning of project activities as possible, but not more than 14 days prior to project activities, a qualified biologist shall conduct a final pre-construction survey of the proposed well site to insure that no special-status wildlife species have recently occupied the project site or buffer. A qualified biologist shall be present immediately prior to project activities that have potential to impact sensitive species to identify and protect potentially sensitive resources.	Prior to initiation of construction activities.	Division and Sojitz.	Submission of pre-activity biological clearance to Division.	Require as condition of approval.	
	Biological 2 - Project site boundaries shall be clearly delineated by stakes, flagging and /or rope or cord to minimize inadvertent degradation or loss of adjacent habitat during construction and drilling operations. Staff and/or its contractors shall post signs and/or place fence around the site to restrict access of vehicles and equipment unrelated to drilling operations.	Ongoing during project activities.	Division and Sojitz.	Site inspection by environmental monitor.	Require as condition of approval.	
	Biological 3 - A biological monitor shall be present during initial ground disturbance and site construction activities.	Ongoing during initial ground disturbance and construction.	Division and Sojitz.	Site inspection by environmental monitor.	Require as condition of approval.	
	Biological 4. If San Joaquin kit foxes become established within the proposed project site or buffer area prior to project implementation, Sojitz will implement the measures contained in the	Ongoing during project activities.	Division and Sojitz.	Site inspection by environmental monitor.	Require as condition of approval.	

Environmental Impact	Mitigation Measures	Timing of Monitoring Requirement	Responsibility for Compliance	Method for Compliance	Enforcement	Checkoff Date/ Initials
	United States Fish and Wildlife Service's (USFWS) "Standardized recommendations for protection of the San Joaquin kit fox prior to or during ground disturbance" (USFWS 2011). Sojitz will implement the following measures: a. If kit fox dens have become established within 200 feet of the construction area prior to project implementation that may be indirectly impacted by construction activities exclusion zones shall be established prior to construction by a qualified biologist and dens shall not be disturbed in any way. Exclusion zone fencing should include untreated wood particle-board, silt fencing, orange construction fencing or other fencing as approved by the USFWS and CDFW. Exclusion zones shall be roughly circular with a radius of the following distances measured outward from entrance; potential den 50 feet, and known den 100 feet. Fencing must contain openings for kit fox ingress/egress and keeps humans and equipment out. If a natal/pupping den is discovered within a project site or within 200 feet of the project site, the USFWS and CDFW shall be immediately notified and under no circumstances should the den be disturbed or destroyed without prior authorization. If the preconstruction survey reveals an active natal pupping or new information, the project applicant should contact the USFWS and CDFW immediately to obtain the necessary take authorization/permit. If the take authorization/permit has already been issued, then the biologist may proceed with den		.			

Environmental Impact	Mitigation Measures	Timing of Monitoring Requirement	Responsibility for Compliance	Method for Compliance	Enforcement	Checkoff Date/ Initials
	destruction within the project boundary, except natal/pupping den which may not be destroyed while occupied. A take authorization/permit is required to destroy these dens even after they are vacated. Protective exclusion zones can be placed around all known and potential dens which occur outside the project footprint. b. San Joaquin Kit fox exclusion zone barriers shall be maintained until all construction and drilling activities have been completed, and then removed. If specified exclusion zones cannot be observed for any reason, USFWS and CDFW shall be contacted for guidance prior to ground disturbing activities at or near the subject den. In the event that USFWS and CDFW concur that an occupied San Joaquin kit fox den would be unavoidably destroyed by a planned project action, procedures detailed in the USFWS Standardized Recommendations for protection of the San Joaquin Kit Fox (USFWS 2011) shall be implemented. Den excavation shall be undertaken only by a qualified biologist pursuant to USFWS and CDFW authorization and direction for excavation of kit fox dens. c. In the event that a San Joaquin kit fox is injured or killed, the incident shall immediately be reported to the project biologist. The project biologist shall contact CDFW immediately in the case of a dead, injured or entrapped kit fox. The CDFW contact for immediate assistance is State Dispatch at (916)445-0045. They will					

Environmental Impact	Mitigation Measures	Timing of Monitoring Requirement	Responsibility for Compliance	Method for Compliance	Enforcement	Checkoff Date/ Initials
	contact the local warden or the CDFW Central Region office at (559) 243-4014. The USFWS should be contacted at Endangered Species Division, (916) 414-6620 or (916) 414-6600. The USFWS and CDFW shall be notified in writing within three (3) working days of the accidental death or injury to a San Joaquin kit fox during project related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The USFWS contact is the Chief of the Division of Endangered Species, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-1846. The CDFW the Central Region office (559) 243-4014. New sightings of kit fox shall be reported to the CNDDB. A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed will also be provided to the USFWS as well. d. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4 inches or greater that are stored at a construction site for one or more overnight periods shall be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe shall not be moved until the USFWS and CDFW has been consulted. If necessary, and under the direct supervision of					

Environmental Impact	Mitigation Measures	Timing of Monitoring Requirement	Responsibility for Compliance	Method for Compliance	Enforcement	Checkoff Date/ Initials
	the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped. e. Limited destruction of kit fox dens may be allowed, if avoidance is not a reasonable alternative, provided the following procedures are observed. Destruction of any known or natal/pupping kit fox den requires take authorization/permit from the USFWS and CDFW. Destruction of the den shall be accomplished by careful excavation until it is certain that no kit foxes are inside. The den shall be fully excavated, filled with dirt and compacted to ensure that kit foxes cannot reenter or use the den during the construction period. If at any point during excavation, a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described above shall be resumed. Destruction of the den may be completed when in the judgment of the biologist, the animal has escaped, without further disturbance, from the partially destroyed den. Natal or pupping dens which are occupied cannot be destroyed until the pups and adults have vacated and then only after consultation with the USFWS and CDFW. Known dens occurring within the footprint of the activity must be monitored for three (3) days with tracking medium or an infra-red beam camera to determine the current use. If no kit fox activity is observed during this period, the den should be destroyed immediately to preclude subsequent use. If kit					

Environmental Impact	Mitigation Measures	Timing of Monitoring Requirement	Responsibility for Compliance	Method for Compliance	Enforcement	Checkoff Date/ Initials
	fox activity is observed at the den during this period, the den should be monitored for at least five (5) consecutive days from the time of the observation to allow any resident animal to move to another den during its normal activity. Use of the den can be discouraged during this period by partially plugging its entrances(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied may the den be excavated under the direction of the biologist. If the animal is still present after five (5) or more consecutive days of plugging and monitoring, the den may have to be excavated when, in the judgment of a biologist, it is temporarily vacant, for example during the animal's normal foraging activities. The USFWS and CDFW encourage hand excavation, but realize that soil conditions may necessitate the use of excavating equipment. However, extreme caution must be exercised. For potential dens, if a take authorization/permit has been obtained, den destruction may proceed without monitoring, unless other restrictions were issued with the take authorization/permit. If no take authorization/permit has been issued, then potential dens shall be monitored as if they were known dens. If any den was considered to be a potential den, but is later determined during monitoring or destruction to be currently, or previously used by kit fox (e.g., if kit fox sign is found inside), then all construction activities shall cease and the USFWS and CDFW shall be notified					

Environmental Impact	Mitigation Measures	Timing of Monitoring Requirement	Responsibility for Compliance	Method for Compliance	Enforcement	Checkoff Date/ Initials
	immediately.					
	Biological 5. Suitable sensitive species small mammal burrows shall be avoided by 50 feet.	Ongoing during project activities	Division and Sojitz	Site inspection by environmental monitor	Require as condition of approval	
	Biological 6. The burrowing owl nesting season begins as early as February 1 and continues through August 31. If burrowing owls are located or become established within the project site or exclusion areas at the time of the final pre-activity biological survey and are using burrows within the project site or exclusion area, a qualified biologist will consult with CDFW; the following measures shall be implemented: a. Sojitz will follow recommendations included in CDFG's Staff Report on Burrowing Owl Mitigation (CDFG 2012) including avoidance of occupied burrows by implementation of a no-construction zone of a minimum distance of 500 meters, unless a qualified biologist approved by CDFW verifies through non-invasive methods that either : 1) the birds have not begun egg laying and incubation; or 2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival. b. On-site passive relocation of burrowing owls shall be implemented if owls are using the burrows after August 31. Passive relocation is defined as encouraging owls to	Ongoing during project activities	Division and Sojitz	Submission of pre-activity biological clearance to Division.	Require as condition of approval	

Environmental Impact	Mitigation Measures	Timing of Monitoring Requirement	Responsibility for Compliance	Method for Compliance	Enforcement	Checkoff Date/ Initials
	move from occupied burrows to alternate natural or artificial burrows that are beyond 150 feet from the impact zone and that are within or contiguous to a minimum of 6.5 acres of foraging habitat for each pair of relocated owls. Relocation of owls shall only be implemented during the non-breeding season. c. Owls shall be excluded from burrows in the immediate impact zone and within a 150 feet exclusion zone by installing one-way doors in burrow entrances. One-way doors shall be left in place 48 hours to insure owls have left the burrow before excavation. One alternate natural or artificial burrow shall be provided for each burrow that will be excavated in the project impact zone. d. The project area shall be monitored daily for one week to confirm owl use of alternate burrows before excavating burrows in the immediate impact zone. Whenever possible, burrows shall be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe or burlap bags shall be inserted into burrow tunnels to prevent tunnel collapse while soil is excavated around that portion of a tunnel.			.		
	Biological 7 - In order to avoid or reduce potential impacts to grasshopper sparrows and migratory avian species, Sojitz shall conduct pre-construction nesting surveys for special-status avian species within a given project site and	Ongoing during project activities	Division and Sojitz	Submission of pre-activity biological clearance to Division.	Require as condition of approval	

Environmental Impact	Mitigation Measures	Timing of Monitoring Requirement	Responsibility for Compliance	Method for Compliance	Enforcement	Checkoff Date/ Initials
	buffer area during the appropriate survey periods for each species. Surveys shall follow required CDFW and USFWS protocols where required. Where special-status bird nest sites are identified or suspected to occur during pre-construction surveys, a qualified biologist shall establish the following buffer zones around nest sites, and no disturbance activities shall occur within these buffer zones until young birds have fledged: <u>Grasshopper Sparrow</u> Grasshopper sparrows typically nests and rears young from April through August. In order to avoid and minimize impacts on grasshopper sparrow, a 250-foot buffer shall be established around active nests. No project related activities would be allowed to occur within this buffer until young have fledged or the species are no longer attempting to nest. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests. <u>Other Migratory Bird Species</u> Migratory bird species typically nest and rear young from February through August. In order to avoid and minimize impacts on migratory bird species, a 250-foot buffer shall be established around active nesting sites when project activities shall occur during their active nesting period. No project-related activities shall occur within this zone. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.					

Environmental Impact	Mitigation Measures	Timing of Monitoring Requirement	Responsibility for Compliance	Method for Compliance	Enforcement	Checkoff Date/ Initials
	Biological 8. A project representative shall establish restrictions on project-related traffic to approved project areas, storage areas, staging and parking areas via signage. Off-road traffic outside of designated project areas shall be prohibited. Project-related traffic shall observe a 15 mph speed limit in all project areas except on county roads and state and federal highways to avoid impacts to special-status and common wildlife species.	Ongoing during project activities.	Division and Sojitz	Site inspection by environmental monitor.	Require as condition of approval.	
	Biological 9 - Project activities during the drilling phase of the proposed project shall be scheduled to avoid evening hours, as feasible, to avoid special-status wildlife species that are active in the nighttime.	Ongoing during project activities.	Division and Sojitz.	Site inspection by environmental monitor	Require as condition of approval.	
	Biological 10 - All vehicle operators shall check under vehicles and equipment before moving them if they have remained parked and shut off for 30 minutes or longer.	Ongoing during project activities.	Division and Sojitz	Inspections by environmental monitor.	Require as condition of approval.	
	Biological 11 - Hazardous materials, fuels, lubricants, and solvents that spill accidentally during project-related activities shall be cleaned up and removed from the project as soon as possible according to applicable federal, state and local regulations.	Ongoing during project activities.	Division and Sojitz.	Inspections by environmental monitor.	Require as condition of approval.	
	Biological 12 - All equipment storage and parking during site development and operation shall be confined to the project sites or to previously disturbed off site areas that are not suitable habitat for listed species.	Ongoing during project activities.	Division and Sojitz.	Site inspection by environmental monitor.	Require as condition of approval.	

Environmental Impact	Mitigation Measures	Timing of Monitoring Requirement	Responsibility for Compliance	Method for Compliance	Enforcement	Checkoff Date/ Initials
	Biological 13 - An Environmental Awareness Program shall be conducted to orient all employees involved in construction and drilling operations. The program shall consist of a brief presentation in which biologists knowledgeable of endangered species biology and legislative protection shall explain endangered species concerns. The program shall include a discussion of special-status plants and sensitive wildlife species. Species biology, habitat needs, status under the Endangered Species Act (ESA) and California ESA, and measures being taken for the protection of these species and their habitats as a part of the project shall be discussed.	Prior to initiation of construction activities.	Division and Sojitz.	Sign in sheets for Environmental Awareness Training will be provided to the Division upon completion.	Require as condition of approval.	
	Biological 14 - If wildlife proof barricade fencing is not used at the proposed well sites, all excavated steep-walled holes or trenches in excess of three feet in depth shall be provided with one or more escape ramps constructed of earth fill to prevent entrapment of endangered species or other animals during the construction phase. Ramps shall be located at no greater than 1,000-foot intervals (for pipelines etc.) and at not less than a 45-degree angles. Trenches shall be inspected for entrapped wildlife each morning prior to onset of construction activities and immediately prior to the end of each working day. Before such holes or trenches are filled they shall be inspected thoroughly for entrapped animals. Any animals discovered shall be allowed to escape voluntarily without harassment before construction activities resume, or removed from the trench or hole by a qualified biologist and allowed to escape unimpeded.	Ongoing during project activities.	Division and Sojitz.	Site inspection by environmental monitor.	Require as condition of approval.	

Environmental Impact	Mitigation Measures	Timing of Monitoring Requirement	Responsibility for Compliance	Method for Compliance	Enforcement	Checkoff Date/ Initials
	Biological 15 - All construction pipes, culverts, or similar structures stored at a construction site overnight having a diameter of four inches or greater shall be inspected thoroughly for wildlife species before being buried, capped, or otherwise used or moved in any way. Pipes laid in trenches overnight shall be capped. If during construction a wildlife species is discovered inside a pipe, that section of pipe shall not be moved or, if necessary, moved only once to remove it from the path of construction activity, until the wildlife species has escaped.	Ongoing during project activities.	Division and Sojitz.	Site inspection by environmental monitor.	Require as condition of approval.	
	Biological 16 - All food-related trash items such as wrappers, cans, bottles or food scraps generated during construction or during subsequent operation shall be disposed of only in closed containers and regularly removed from the project sites. Food items may attract wildlife species onto a project site, consequently exposing such animals to increased risk of injury or mortality. No deliberate feeding of wildlife shall be allowed.	Ongoing during project activities.	Division and Sojitz.	Provide trash containers. Site inspection by environmental monitor.	Require as condition of approval.	
	Biological 17 - To prevent harassment or mortality of wildlife species via predation, or destruction of their dens or nests, no domestic pets shall be permitted on-site.	Ongoing during project activities.	Division and Sojitz.	Site inspection by environmental monitor.	Require as condition of approval.	
	Biological 18 - Use of rodenticides and herbicides on the project sites shall be permitted only as part of a USFWS and CDFW approved management plan unless such use is otherwise approved on a case-by-case basis. This is necessary to prevent primary or secondary poisoning of endangered species using adjacent habitats or depletion of prey	Ongoing during project activities.	Division and Sojitz.	Site inspection by environmental monitor.	Require as condition of approval.	

Environmental Impact	Mitigation Measures	Timing of Monitoring Requirement	Responsibility for Compliance	Method for Compliance	Enforcement	Checkoff Date/ Initials
	upon which sensitive wildlife may depend.					
V. Cultural Resources						
a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5? b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5? c. Directly or indirectly destroy a unique paleontological resources or site or unique geologic feature?	Cultural -1. In the unlikely event archeological resources are identified on the project site, all ground disturbing activities will cease and a qualified archaeologist will be retained by Sojitz to assess the significance of any find. The archeologist will have the authority to stop or divert the construction excavation as necessary. The archaeologist will evaluate the find in conformance with section 15064.5 of CEQA. A plan to mitigate any adverse impacts will be prepared by the archaeologist and contain procedures to follow. Work may proceed on the site once evaluation of the find is complete.	Ongoing during project activities.	Division and Sojitz.	Include archeological awareness in environmental awareness training.	Require as condition of approval.	
d. Disturb any human remains, including those interred outside of formal cemeteries?	Cultural 2 – In the unlikely event paleontological resources are identified on the project site, a qualified paleontologist will be retained by Sojitz to assess the significance of any find and will have the authority to stop or divert the construction excavation as necessary. A plan to mitigate any adverse impacts will be prepared by the paleontologist and contain procedures to follow. Work may proceed on the site once evaluation of the find is complete.	Ongoing during project activities.	Division and Sojitz.	Include paleontological awareness in environmental awareness training.	Require as condition of approval.	
	Cultural 3 – In the unlikely event human remains are discovered during construction of the site, site personnel will contact the County Coroner and	Ongoing during project activities.	Division and Sojitz.	Include archeological awareness in environmental awareness training.	Require as condition of approval.	

Environmental Impact	Mitigation Measures	Timing of Monitoring Requirement	Responsibility for Compliance	Method for Compliance	Enforcement	Checkoff Date/ Initials
	stop work as required by Public Resources Code §5097.98-99 and Health and Safety Code §7050.5. If the remains are determined to be Native American, the County Coroner will notify the NAHC in accordance with PRC §5097.98. Sojitz shall, in consultation with the identified descendants of the remains and/or NAHC, identify the appropriate measures for treatment or disposition of the remains.					
VII. Greenhouse Gas Emissions						
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? b. Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	Greenhouse Gas 1. Sojitz will secure 22 metric tons of CO_2(e)GHG credits for each producing well commencing on September 1, 2014, and each September 1, thereafter until Sojitz supplies permanent GHG reductions or complies with SJVAPCD established best performance standards. All credits surrendered shall be demonstrated by the submittal of documentation to the Division, on or before September 1, as discussed above.	September 1, 2014 and annually thereafter.	Division and Sojitz.	Provide Division documentation that CO_{2e} GHG credits have been surrendered to SJVAPCD.	Require as condition of approval.	
VIII. Hazards & Hazardous Materials						
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? b. Create a significant hazard to public or the environment through reasonably foreseeable upset and accident conditions involving the	Hazards 1. All hazardous materials such as diesel fuel shall be stored according to the California Code of Regulations (CCR) Title 22, 23, 26 & 27 and California Fire Codes (CFR) Title 24 and Kern County hazardous materials ordinance and Material Safety Data Sheets shall be on each site. Waste materials shall be managed properly in accordance with requirements that comply with or given authority by the Code of Federal Regulations (40 CFR) and refined in California	Ongoing during project activities.	Division and Sojitz.	Include handling of hazardous materials/wastes training in environmental awareness training. Inspection by environmental monitor.	Require as condition of approval.	

Environmental Impact	Mitigation Measures	Timing of Monitoring Requirement	Responsibility for Compliance	Method for Compliance	Enforcement	Checkoff Date/ Initials
release of hazardous materials into the environment?	through CCR, Title 14, 22, 23, 26 & 27. Training shall be provided to all personnel involved in handling of hazardous materials/waste.					
	Hazards 2. In order to minimize potential impacts associated with a blowout, Sojitz shall comply with CCR Title 14, Division 2, Chapter 4, Articles 3 and 4, specifically Article 4, 1941-1942. Requirements for well casing design and blowout prevention equipment are regulated by Division. Division engineers shall be notified for required tests and other operations.	Ongoing during drilling and testing activities for each well.	Division and Sojitz.	Inspection by Division.	Require as a condition of approval.	
	Hazards 3. A Spill Contingency Plan shall be required in accordance with CCR § 1772.9 and a copy of the plan shall be kept on site. The plan shall discuss methods to avoid and/or minimize impacts in the event of a release. The purpose of the plan shall be to ensure that adequate containment would be provided to control accidental spills, that adequate spill response equipment and absorbents would be readily available, and that personnel would be properly trained in how to control and clean up any spills.	Prior to construction activities.	Division and Sojitz.	Spill Contingency Plan will be kept on site.	Require as a condition of approval.	
	Hazards 4 - All above ground storage tanks will be located within a bermed area which provides a storage volume of at least 110% of the storage volume of the largest tank. Daily inspections of the above ground storage tanks will be conducted and an inspection log will be maintained for review by regulatory agency personnel. The inspection log will also document corrective actions taken, if necessary.	Ongoing during project activities.	Division and Sojitz.	Inspection of environmental monitor.	Require as a condition of approval.	

Rancho Grande Exploratory Oil and Gas Project MITIGATION MONITORING AND REPORTING PLAN						
Environmental Impact	**Mitigation Measures**	**Timing of Monitoring Requirement**	**Responsibility for Compliance**	**Method for Compliance**	**Enforcement**	**Checkoff Date/ Initials**
	Hazards 5. Fluid disposal shall follow RWQCB regulations (CCR Title 23 Waters).	Ongoing during project activities.	Division and Sojitz.	Inspection by environmental monitor	Require as a condition of approval.	
	Hazards 6. If project development uncovers any previously unknown oil, gas, or injection wells, the Division shall be notified. If unrecorded wells are uncovered during excavation or grading, remedial plugging operations may be required.	Ongoing during project activities.	Division and Sojitz.	Inspection by environmental monitor and notification of Division if unknown wells discovered. Except as where otherwise noted, the environmental monitor shall verify the mitigation measures and send documentation to the Division's CEQA Unit at 801 K Street, MS 18-05, Sacramento, CA 95841	Require as a condition of approval.	
IX. Hydrology and Water Quality						
e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	Hydrology 1. Sojitz will provide a copy of the submitted NOI and verification of an approved erosivity waiver from the SWRCB to the Division prior to initiation of the project.	Prior to construction activities.	Division and Sojitz	Provide Division documentation of NOI and approved erosivity waiver.	Require as a condition of approval	

Attachment 1

Copies of Emission Reports and Input Data for Site Preparation
Based on the Road Construction Model

Road Construction Emissions Model, Version 7.1.3

Emission Estimates for -> Sojitz RG 1 Site Prep Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	CO2 (lbs/day)
Grubbing/Land Clearing	1.5	6.5	15.5	6.7	0.7	6.0	1.9	0.7	1.2	1,319.6
Grading/Excavation	0.9	4.8	12.3	6.6	0.6	6.0	1.7	0.5	1.2	1,863.5
Drainage/Utilities/Sub-Grade	1.5	7.0	14.2	6.8	0.8	6.0	2.0	0.7	1.2	1,343.0
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (pounds/day)	1.5	7.0	15.5	6.8	0.8	6.0	2.0	0.7	1.2	1,863.5
Total (tons/construction project)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3

Notes: Project Start Year -> 2013
Project Length (months) -> 0
Total Project Area (acres) -> 1
Maximum Area Disturbed/Day (acres) -> 1
Total Soil Imported/Exported (yd^3/day)-> 60

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Emission Estimates for -> Sojitz RG 1 Site Prep Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	Total PM10 (kgs/day)	Exhaust PM10 (kgs/day)	Fugitive Dust PM10 (kgs/day)	Total PM2.5 (kgs/day)	Exhaust PM2.5 (kgs/day)	Fugitive Dust PM2.5 (kgs/day)	CO2 (kgs/day)
Grubbing/Land Clearing	0.7	2.9	7.1	3.1	0.3	2.7	0.9	0.3	0.6	599.8
Grading/Excavation	0.4	2.2	5.6	3.0	0.3	2.7	0.8	0.2	0.6	847.0
Drainage/Utilities/Sub-Grade	0.7	3.2	6.5	3.1	0.4	2.7	0.9	0.3	0.6	610.4
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (kilograms/day)	0.7	3.2	7.1	3.1	0.4	2.7	0.9	0.3	0.6	847.0
Total (megagrams/construction project)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0

Notes: Project Start Year -> 2013
Project Length (months) -> 0
Total Project Area (hectares) -> 0
Maximum Area Disturbed/Day (hectares) -> 0
Total Soil Imported/Exported ($meters^3$/day)-> 46

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sume of exhaust and fugitive dust emissions shown in columns K and L.

Road Construction Emissions Model
Data Entry Worksheet

Version 7.1.3

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C25.

Input Type

Project Name	Sojitz RG 1 Site Prep	
Construction Start Year	2013	Enter a Year between 2009 and 2025 (inclusive)
Project Type	1	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	0.1	months
Predominant Soil/Site Type: Enter 1, 2, or 3	2	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length		miles
Total Project Area	0.6	acres
Maximum Area Disturbed/Day	0.6	acres
Water Trucks Used?	1	1. Yes 2. No
Soil Imported	0.0	yd^3/day
Soil Exported	60.0	yd^3/day
Average Truck Capacity	20.0	yd^3 (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of Construction Months	Program Calculated Months	2005	%	2006	%	2007	%
Grubbing/Land Clearing	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	0.07	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Paving		0.02	0.00	0.00	0.00	0.00	0.00	0.00
Totals	0.20	0.13						

Please note: You have entered a different number of months than the project length shown in cell C13.

Hauling emission default values can be overridden in cells C45 through C46.

Soil Hauling Emissions

User Input	User Override of Soil Hauling Defaults	Default Values
Miles/round trip	50.00	30
Round trips/day	6.00	3
Vehicle miles traveled/day (calculated)		300

Hauling Emissions	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate (grams/mile)	0.40	11.32	1.78	0.35	0.26	1716.84
Emission rate (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day	0.3	7.5	1.2	0.2	0.2	1134.5
Tons per contruction period	0.00	0.01	0.00	0.00	0.00	0.83

Worker commute default values can be overridden in cells C60 through C65.

Worker Commute Emissions

	User Override of Worker Commute Default Values	Default Values
Miles/ one-way trip	25.00	20
One-way trips/day	6.00	2
No. of employees: Grubbing/Land Clearing	2.00	3
No. of employees: Grading/Excavation		15
No. of employees: Drainage/Utilities/Sub-Grade		13
No. of employees: Paving		9

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.204	0.283	2.490	0.047	0.020	443.262
Emission rate - Grading/Excavation (grams/mile)	0.204	0.283	2.490	0.047	0.020	443.262
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.204	0.283	2.490	0.045	0.020	443.262
Emission rate - Paving (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Grubbing/Land Clearing (grams/trip)	0.678	0.455	5.753	0.004	0.004	95.442
Emission rate - Grading/Excavation (grams/trip)	0.678	0.455	5.753	0.004	0.004	95.442
Emission rate - Draining/Utilities/Sub-Grade (gr/trip)	0.678	0.455	5.753	0.004	0.004	95.442
Emission rate - Paving (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Grubbing/Land Clearing	0.171	0.211	1.949	0.032	0.014	297.950
Tons per const. Period - Grub/Land Clear	0.000	0.000	0.002	0.000	0.000	0.328
Pounds per day - Grading/Excavation	0.171	0.211	1.949	0.032	0.014	297.950
Tons per const. Period - Grading/Excavation	0.000	0.000	0.001	0.000	0.000	0.218
Pounds per day - Drainage/Utilities/Sub-Grade	0.171	0.211	1.949	0.030	0.014	297.950
Tons per const. Period - Drain/Util/Sub-Grade	0.000	0.000	0.001	0.000	0.000	0.109
Pounds per day - Paving	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Paving	0.000	0.000	0.000	0.000	0.000	0.000
tons per construction period	0.000	0.000	0.004	0.000	0.000	0.655

Water truck default values can be overriden in cells C91 through C93 and E91 through E93.

Water Truck Emissions	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Day	Default Values Miles Traveled/Day
Grubbing/Land Clearing - Exhaust	1.00	1	20.00	40
Grading/Excavation - Exhaust		1		40
Drainage/Utilities/Subgrade		1		40

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.40	11.32	1.78	0.35	0.26	1716.84
Emission rate - Grading/Excavation (grams/mile)	0.40	11.32	1.78	0.35	0.26	1716.84
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.40	11.32	1.78	0.35	0.26	1716.84
Pounds per day - Grubbing/Land Clearing	0.02	0.50	0.08	0.02	0.01	75.63
Tons per const. Period - Grub/Land Clear	0.00	0.00	0.00	0.00	0.00	0.06
Pound per day - Grading/Excavation	0.04	1.00	0.16	0.03	0.02	151.26
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.11
Pound per day - Drainage/Utilities/Subgrade	0.04	1.00	0.16	0.03	0.02	151.26
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.06

Fugitive dust default values can be overridden in cells C110 through C112.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing		0.6	6.0	0.0	1.2	0.0
Fugitive Dust - Grading/Excavation		0.6	6.0	0.0	1.2	0.0
Fugitive Dust - Drainage/Utilities/Subgrade		0.6	6.0	0.0	1.2	0.0

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Rubber Tired Dozers	1.35	4.43	14.83	0.69	0.64	946.02
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing	pounds per day	1.4	4.4	14.8	0.7	0.6	946.0
	Grubbing/Land Clearing	tons per phase	0.0	0.0	0.0	0.0	0.0	1.0

Grading/Excavation	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
	0	Cranes	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.00	3	Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
0.00		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
1.00	2	Rollers	0.41	1.51	3.59	0.27	0.25	279.78
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	0.4	1.5	3.6	0.3	0.2	279.8
	Grading	tons per phase	0.0	0.0	0.0	0.0	0.0	0.2

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
1.00	1	Graders	1.13	3.49	11.12	0.62	0.57	672.89
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Skid Steer Loaders	0.15	1.41	1.87	0.11	0.11	220.88
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	1.3	4.9	13.0	0.7	0.7	893.8
	Drainage	tons per phase	0.0	0.0	0.0	0.0	0.0	0.3

Paving	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Pavers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
0.00	3	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Paving	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions all Phases (tons per construction period) =>			0.0	0.0	0.0	0.0	0.0	1.6

Equipment default values for horsepower and hours/day can be overridden in cells C289 through C322 and E289 through E322.

Equipment		Default Values Horsepower		Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		106		8
Bore/Drill Rigs		206		8
Cement and Mortar Mixers		10		8
Concrete/Industrial Saws		64		8
Cranes		226		8
Crawler Tractors		208		8
Crushing/Proc. Equipment		142		8
Excavators		163		8
Forklifts		89		8
Generator Sets	0.00	66	0.00	8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400		8
Other Construction Equipment	0.00	172	0.00	8
Other General Industrial Equipment	0.00	88	0.00	8
Other Material Handling Equipment		167		8
Pavers		126		8
Paving Equipment	0.00	131		8
Plate Compactors		8		8
Pressure Washers		26		8
Pumps	0.00	53	24.00	8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		20		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		45		8

END OF DATA ENTRY SHEET

Attachment 2

Copies of Emission Reports and Input Data for Drilling
Based on the Road Construction Model

Road Construction Emissions Model, Version 7.1.3

Emission Estimates for -> Sojitz RG 1 Drilling Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	CO2 (lbs/day)
Grubbing/Land Clearing	24.9	199.8	324.6	10.0	10.0	-	8.7	8.7	-	50,533.3
Grading/Excavation	6.3	65.8	24.6	1.6	1.6	-	0.9	0.9	-	11,934.5
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (pounds/day)	24.9	199.8	324.6	10.0	10.0	-	8.7	8.7	-	50,533.3
Total (tons/construction project)	0.1	0.7	1.2	0.0	0.0	-	0.0	0.0	-	186.1

Notes: Project Start Year -> 2013
Project Length (months) -> 1
Total Project Area (acres) -> 1
Maximum Area Disturbed/Day (acres) -> 0
Total Soil Imported/Exported (yd^3/day)-> 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Emission Estimates for -> Sojitz RG 1 Drilling Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	Total PM10 (kgs/day)	Exhaust PM10 (kgs/day)	Fugitive Dust PM10 (kgs/day)	Total PM2.5 (kgs/day)	Exhaust PM2.5 (kgs/day)	Fugitive Dust PM2.5 (kgs/day)	CO2 (kgs/day)
Grubbing/Land Clearing	11.3	90.8	147.5	4.5	4.5	-	3.9	3.9	-	22,969.7
Grading/Excavation	2.9	29.9	11.2	0.7	0.7	-	0.4	0.4	-	5,424.8
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (kilograms/day)	11.3	90.8	147.5	4.5	4.5	-	3.9	3.9	-	22,969.7
Total (megagrams/construction project)	0.1	0.7	1.1	0.0	0.0	-	0.0	0.0	-	168.8

Notes: Project Start Year -> 2013
Project Length (months) -> 1
Total Project Area (hectares) -> 0
Maximum Area Disturbed/Day (hectares) -> 0
Total Soil Imported/Exported ($meters^3$/day)-> 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sume of exhaust and fugitive dust emissions shown in columns K and L.

Road Construction Emissions Model
Data Entry Worksheet

Version 7.1.3

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C25.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name	Sojitz RG 1 Drilling	
Construction Start Year	2013	Enter a Year between 2009 and 2025 (inclusive)
Project Type	1	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	0.6	months
Predominant Soil/Site Type: Enter 1, 2, or 3	2	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length		miles
Total Project Area	0.6	acres
Maximum Area Disturbed/Day	0.0	acres
Water Trucks Used?	1	1. Yes 2. No
Soil Imported	0.0	yd^3/day
Soil Exported	0.0	yd^3/day
Average Truck Capacity	20.0	yd^3 (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of Construction Months	Program Calculated Months	2005	%	2006	%	2007	%
Grubbing/Land Clearing	0.33	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	0.01	0.26	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade		0.17	0.00	0.00	0.00	0.00	0.00	0.00
Paving		0.09	0.00	0.00	0.00	0.00	0.00	0.00
Totals	0.34	0.57						

Please note: You have entered a different number of months than the project length shown in cell C13.

Hauling emission default values can be overridden in cells C45 through C46.

Soil Hauling Emissions

User Input	User Override of Soil Hauling Defaults	Default Values
Miles/round trip	50.00	30
Round trips/day	11.50	0
Vehicle miles traveled/day (calculated)		575

Hauling Emissions	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate (grams/mile)	0.40	11.32	1.78	0.35	0.26	1716.84
Emission rate (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day	0.5	14.3	2.3	0.4	0.3	2174.4
Tons per contruction period	0.00	0.00	0.00	0.00	0.00	0.20

Worker commute default values can be overridden in cells C60 through C65.

Worker Commute Emissions

	User Override of Worker Commute Default Values	Default Values
Miles/ one-way trip	25.00	20
One-way trips/day	48.00	2
No. of employees: Grubbing/Land Clearing	8.00	0
No. of employees: Grading/Excavation		0
No. of employees: Drainage/Utilities/Sub-Grade		0
No. of employees: Paving		0

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.204	0.283	2.490	0.047	0.020	443.262
Emission rate - Grading/Excavation (grams/mile)	0.204	0.283	2.490	0.047	0.020	443.262
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Paving (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Grubbing/Land Clearing (grams/trip)	0.678	0.455	5.753	0.004	0.004	95.442
Emission rate - Grading/Excavation (grams/trip)	0.678	0.455	5.753	0.004	0.004	95.442
Emission rate - Draining/Utilities/Sub-Grade (gr/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Paving (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Grubbing/Land Clearing	5.457	6.747	62.383	1.011	0.434	9534.394
Tons per const. Period - Grub/Land Clear	0.020	0.025	0.229	0.004	0.002	34.959
Pounds per day - Grading/Excavation	5.457	6.747	62.383	1.011	0.434	9534.394
Tons per const. Period - Grading/Excavation	0.001	0.001	0.006	0.000	0.000	0.874
Pounds per day - Drainage/Utilities/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Drain/Util/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Paving	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Paving	0.000	0.000	0.000	0.000	0.000	0.000
tons per construction period	0.021	0.025	0.234	0.004	0.002	35.833

Water truck default values can be overriden in cells C91 through C93 and E91 through E93.

Water Truck Emissions	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Day	Default Values Miles Traveled/Day
Grubbing/Land Clearing - Exhaust	1.00	0	20.00	0
Grading/Excavation - Exhaust		0		0
Drainage/Utilities/Subgrade		0		0

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.40	11.32	1.78	0.35	0.26	1716.84
Emission rate - Grading/Excavation (grams/mile)	0.40	11.32	1.78	0.35	0.26	1716.84
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grubbing/Land Clearing	0.02	0.50	0.08	0.02	0.01	75.63
Tons per const. Period - Grub/Land Clear	0.00	0.00	0.00	0.00	0.00	0.01
Pound per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00
Pound per day - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00

Fugitive dust default values can be overridden in cells C110 through C112.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing		0	0.0	0.0	0.0	0.0
Fugitive Dust - Grading/Excavation		0	0.0	0.0	0.0	0.0
Fugitive Dust - Drainage/Utilities/Subgrade		0	0.0	0.0	0.0	0.0

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
2.00		Bore/Drill Rigs	7.56	93.02	187.00	4.48	4.12	23153.45
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
	0	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Excavators	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Forklifts	0.03	0.11	0.29	0.02	0.02	20.68
1.00		Generator Sets	4.40	17.67	58.23	1.68	1.54	8336.73
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Other Construction Equipment	0.57	5.80	8.55	0.28	0.26	1054.31
2.00		Other General Industrial Equipment	2.64	4.63	9.18	0.90	0.83	947.67
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Pumps	4.23	16.08	54.06	1.57	1.45	7410.43
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
0.00		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing	pounds per day	19.4	137.3	317.3	8.9	8.2	40923.3
	Grubbing/Land Clearing	tons per phase	0.1	0.5	1.2	0.0	0.0	150.1

Grading/Excavation	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
1.00	0	Cranes	0.31	1.13	3.51	0.16	0.15	225.67
	0	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	0	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	0	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	0.3	1.1	3.5	0.2	0.1	225.7
	Grading	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
	0	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
	0	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	0	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	0	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Drainage	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0

Paving	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Pavers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Paving	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions all Phases (tons per construction period) =>			0.1	0.5	1.2	0.0	0.0	150.1

Equipment default values for horsepower and hours/day can be overridden in cells C289 through C322 and E289 through E322.

Equipment		Default Values Horsepower		Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		106		8
Bore/Drill Rigs	2500.00	206	8.00	8
Cement and Mortar Mixers		10		8
Concrete/Industrial Saws		64		8
Cranes		226	3.00	8
Crawler Tractors		208		8
Crushing/Proc. Equipment		142		8
Excavators		163		8
Forklifts		89	1.00	8
Generator Sets	375.00	66	24.00	8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400		8
Other Construction Equipment	500.00	172	4.40	8
Other General Industrial Equipment	45.00	88	24.00	8
Other Material Handling Equipment		167		8
Pavers		126		8
Paving Equipment		131		8
Plate Compactors		8		8
Pressure Washers		26		8
Pumps	500.00	53	16.00	8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		20		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		45		8

4000

END OF DATA ENTRY SHEET

Attachment 3

Copies of Emission Reports and Input Data for Testing
Based on the Road Construction Model

Road Construction Emissions Model, Version 7.1.3

Emission Estimates for -> Sojitz RG 1 Testing Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	CO2 (lbs/day)
Grubbing/Land Clearing	3.4	23.2	29.3	1.3	1.3	-	1.2	1.2	-	3,857.0
Grading/Excavation	1.8	11.0	24.2	0.8	0.8	-	0.6	0.6	-	4,363.2
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (pounds/day)	3.4	23.2	29.3	1.3	1.3	-	1.2	1.2	-	4,363.2
Total (tons/construction project)	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	-	6.6

Notes: Project Start Year -> 2013
Project Length (months) -> 0
Total Project Area (acres) -> 1
Maximum Area Disturbed/Day (acres) -> 0
Total Soil Imported/Exported (yd^3/day)-> 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Emission Estimates for -> Sojitz RG 1 Testing Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	Total PM10 (kgs/day)	Exhaust PM10 (kgs/day)	Fugitive Dust PM10 (kgs/day)	Total PM2.5 (kgs/day)	Exhaust PM2.5 (kgs/day)	Fugitive Dust PM2.5 (kgs/day)	CO2 (kgs/day)
Grubbing/Land Clearing	1.5	10.5	13.3	0.6	0.6	-	0.5	0.5	-	1,753.2
Grading/Excavation	0.8	5.0	11.0	0.4	0.4	-	0.3	0.3	-	1,983.3
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (kilograms/day)	1.5	10.5	13.3	0.6	0.6	-	0.5	0.5	-	1,983.3
Total (megagrams/construction project)	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	-	6.0

Notes: Project Start Year -> 2013
Project Length (months) -> 0
Total Project Area (hectares) -> 0
Maximum Area Disturbed/Day (hectares) -> 0
Total Soil Imported/Exported (meters^3/day)-> 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sume of exhaust and fugitive dust emissions shown in columns K and L.

Road Construction Emissions Model
Data Entry Worksheet

Version 7.1.3

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C25.

Input Type

Project Name	Sojitz RG 1 Testing	
Construction Start Year	2013	Enter a Year between 2009 and 2025 (inclusive)
Project Type	1	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	0.1	months
Predominant Soil/Site Type: Enter 1, 2, or 3	2	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length		miles
Total Project Area	0.6	acres
Maximum Area Disturbed/Day	0.0	acres
Water Trucks Used?	2	1. Yes 2. No
Soil Imported	0.0	yd^3/day
Soil Exported	0.0	yd^3/day
Average Truck Capacity	20.0	yd^3 (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of Construction Months	Program Calculated Months	2005	%	2006	%	2007	%
Grubbing/Land Clearing	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade		0.03	0.00	0.00	0.00	0.00	0.00	0.00
Paving		0.02	0.00	0.00	0.00	0.00	0.00	0.00
Totals	0.15	0.10						

Please note: You have entered a different number of months than the project length shown in cell C13.

Hauling emission default values can be overridden in cells C45 through C46.

Soil Hauling Emissions

User Input	User Override of Soil Hauling Defaults	Default Values
Miles/round trip	50.00	30
Round trips/day	11.00	0
Vehicle miles traveled/day (calculated)		550

Hauling Emissions	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate (grams/mile)	0.40	11.32	1.78	0.35	0.26	1716.84
Emission rate (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day	0.5	13.7	2.2	0.4	0.3	2079.9
Tons per contruction period	0.00	0.01	0.00	0.00	0.00	1.14

Worker commute default values can be overridden in cells C60 through C65.

Worker Commute Emissions

	User Override of Worker Commute Default Values	Default Values
Miles/ one-way trip	25.00	20
One-way trips/day	6.00	2
No. of employees: Grubbing/Land Clearing	6.00	0
No. of employees: Grading/Excavation		0
No. of employees: Drainage/Utilities/Sub-Grade		0
No. of employees: Paving		0

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.204	0.283	2.490	0.047	0.020	443.262
Emission rate - Grading/Excavation (grams/mile)	0.204	0.283	2.490	0.047	0.020	443.262
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Paving (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Grubbing/Land Clearing (grams/trip)	0.678	0.455	5.753	0.004	0.004	95.442
Emission rate - Grading/Excavation (grams/trip)	0.678	0.455	5.753	0.004	0.004	95.442
Emission rate - Draining/Utilities/Sub-Grade (gr/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Paving (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Grubbing/Land Clearing	0.512	0.633	5.848	0.095	0.041	893.849
Tons per const. Period - Grub/Land Clear	0.001	0.001	0.006	0.000	0.000	0.983
Pounds per day - Grading/Excavation	0.512	0.633	5.848	0.095	0.041	893.849
Tons per const. Period - Grading/Excavation	0.000	0.000	0.003	0.000	0.000	0.492
Pounds per day - Drainage/Utilities/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Drain/Util/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Paving	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Paving	0.000	0.000	0.000	0.000	0.000	0.000
tons per construction period	0.001	0.001	0.010	0.000	0.000	1.475

Water truck default values can be overriden in cells C91 through C93 and E91 through E93.

Water Truck Emissions	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Day	Default Values Miles Traveled/Day
Grubbing/Land Clearing - Exhaust	0.00	0	0.00	0
Grading/Excavation - Exhaust		0		0
Drainage/Utilities/Subgrade		0		0

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.40	11.32	1.78	0.35	0.26	1716.84
Emission rate - Grading/Excavation (grams/mile)	0.40	11.32	1.78	0.35	0.26	1716.84
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grub/Land Clear	0.00	0.00	0.00	0.00	0.00	0.00
Pound per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00
Pound per day - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00

Fugitive dust default values can be overridden in cells C110 through C112.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing		0	0.0	0.0	0.0	0.0
Fugitive Dust - Grading/Excavation		0	0.0	0.0	0.0	0.0
Fugitive Dust - Drainage/Utilities/Subgrade		0	0.0	0.0	0.0	0.0

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
	0	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Generator Sets	0.97	2.98	3.24	0.26	0.24	350.14
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Other Construction Equipment	1.91	14.37	25.41	0.96	0.88	2613.03
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing	pounds per day	2.9	17.3	28.6	1.2	1.1	2963.2
	Grubbing/Land Clearing	tons per phase	0.0	0.0	0.0	0.0	0.0	3.3

Grading/Excavation	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
	0	Cranes	0.00	0.00	0.00	0.00	0.00	0.00
	0	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	0	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Pumps	0.77	3.02	9.82	0.29	0.27	1389.46
	0	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	0	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	0.8	3.0	9.8	0.3	0.3	1389.5
	Grading	tons per phase	0.0	0.0	0.0	0.0	0.0	0.8

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
	0	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
	0	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	0	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	0	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Drainage	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0

Paving	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Pavers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Paving	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions all Phases (tons per construction period) =>			0.0	0.0	0.0	0.0	0.0	4.0

Equipment default values for horsepower and hours/day can be overridden in cells C289 through C322 and E289 through E322.

Equipment		Default Values Horsepower		Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		106		8
Bore/Drill Rigs		206		8
Cement and Mortar Mixers		10		8
Concrete/Industrial Saws		64		8
Cranes		226		8
Crawler Tractors		208		8
Crushing/Proc. Equipment		142		8
Excavators		163		8
Forklifts		89		8
Generator Sets	31.50	66	12.00	8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400		8
Other Construction Equipment	450.00	172	12.00	8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		167		8
Pavers		126		8
Paving Equipment		131		8
Plate Compactors		8		8
Pressure Washers		26		8
Pumps	300.00	53	5.00	8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		20		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		45		8

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END OF DATA ENTRY SHEET

Attachment 4

Copies of Emission Reports and Input Data for Completion
Based on the Road Construction Model

Road Construction Emissions Model, Version 7.1.3

Emission Estimates for -> Sojitz RG 1 Completion Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	CO2 (lbs/day)
Grubbing/Land Clearing	2.0	15.8	22.7	0.9	0.9	-	0.8	0.8	-	2,788.0
Grading/Excavation	-	-	-	-	-	-	-	-	-	-
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (pounds/day)	2.0	15.8	22.7	0.9	0.9	-	0.8	0.8	-	2,788.0
Total (tons/construction project)	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	-	4.1

Notes: Project Start Year -> 2013
Project Length (months) -> 0
Total Project Area (acres) -> 1
Maximum Area Disturbed/Day (acres) -> 0
Total Soil Imported/Exported (yd^3/day)-> 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Emission Estimates for -> Sojitz RG 1 Completion Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	Total PM10 (kgs/day)	Exhaust PM10 (kgs/day)	Fugitive Dust PM10 (kgs/day)	Total PM2.5 (kgs/day)	Exhaust PM2.5 (kgs/day)	Fugitive Dust PM2.5 (kgs/day)	CO2 (kgs/day)
Grubbing/Land Clearing	0.9	7.2	10.3	0.4	0.4	-	0.4	0.4	-	1,267.3
Grading/Excavation	-	-	-	-	-	-	-	-	-	-
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (kilograms/day)	0.9	7.2	10.3	0.4	0.4	-	0.4	0.4	-	1,267.3
Total (megagrams/construction project)	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	-	3.7

Notes: Project Start Year -> 2013
Project Length (months) -> 0
Total Project Area (hectares) -> 0
Maximum Area Disturbed/Day (hectares) -> 0
Total Soil Imported/Exported ($meters^3$/day)-> 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sume of exhaust and fugitive dust emissions shown in columns K and L.

Road Construction Emissions Model
Data Entry Worksheet

Version 7.1.3

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C25.

Input Type

Project Name	Sojitz RG 1 Completion	
Construction Start Year	2013	Enter a Year between 2009 and 2025 (inclusive)
Project Type	1	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	0.1	months
Predominant Soil/Site Type: Enter 1, 2, or 3	2	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length		miles
Total Project Area	0.6	acres
Maximum Area Disturbed/Day	0.0	acres
Water Trucks Used?	2	1. Yes 2. No
Soil Imported	0.0	yd^3/day
Soil Exported	0.0	yd^3/day
Average Truck Capacity	20.0	yd^3 (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of Construction Months	Program Calculated Months	2005	%	2006	%	2007	%
Grubbing/Land Clearing	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation		0.06	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade		0.04	0.00	0.00	0.00	0.00	0.00	0.00
Paving		0.02	0.00	0.00	0.00	0.00	0.00	0.00
Totals	0.13	0.13						

Hauling emission default values can be overridden in cells C45 through C46.

Soil Hauling Emissions

User Input	User Override of Soil Hauling Defaults	Default Values
Miles/round trip	25.00	30
Round trips/day	1.00	0
Vehicle miles traveled/day (calculated)		25

Hauling Emissions	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00
Emission rate (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
Tons per contruction period	0.00	0.00	0.00	0.00	0.00	0.00

Worker commute default values can be overridden in cells C60 through C65.

Worker Commute Emissions

	User Override of Worker Commute Default Values	Default Values
Miles/ one-way trip	12.50	20
One-way trips/day	6.00	2
No. of employees: Grubbing/Land Clearing	6.00	0
No. of employees: Grading/Excavation		0
No. of employees: Drainage/Utilities/Sub-Grade		0
No. of employees: Paving		0

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.204	0.283	2.490	0.047	0.020	443.262
Emission rate - Grading/Excavation (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Paving (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Grubbing/Land Clearing (grams/trip)	0.678	0.455	5.753	0.004	0.004	95.442
Emission rate - Grading/Excavation (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Draining/Utilities/Sub-Grade (gr/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Paving (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Grubbing/Land Clearing	0.310	0.352	3.380	0.048	0.021	454.493
Tons per const. Period - Grub/Land Clear	0.000	0.001	0.005	0.000	0.000	0.667
Pounds per day - Grading/Excavation	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Grading/Excavation	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Drainage/Utilities/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Drain/Util/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Paving	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Paving	0.000	0.000	0.000	0.000	0.000	0.000
tons per construction period	0.000	0.001	0.005	0.000	0.000	0.667

Water truck default values can be overriden in cells C91 through C93 and E91 through E93.

Water Truck Emissions	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Day	Default Values Miles Traveled/Day
Grubbing/Land Clearing - Exhaust	0.00	0	0.00	0
Grading/Excavation - Exhaust		0		0
Drainage/Utilities/Subgrade		0		0

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.40	11.32	1.78	0.35	0.26	1716.84
Emission rate - Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grub/Land Clear	0.00	0.00	0.00	0.00	0.00	0.00
Pound per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00
Pound per day - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00

Fugitive dust default values can be overridden in cells C110 through C112.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing		0	0.0	0.0	0.0	0.0
Fugitive Dust - Grading/Excavation		0	0.0	0.0	0.0	0.0
Fugitive Dust - Drainage/Utilities/Subgrade		0	0.0	0.0	0.0	0.0

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
	0	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Other Construction Equipment	1.27	9.58	16.94	0.64	0.59	1742.02
1.00		Other General Industrial Equipment	0.43	2.89	5.44	0.21	0.19	591.51
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing	pounds per day	1.7	12.5	22.4	0.8	0.8	2333.5
	Grubbing/Land Clearing	tons per phase	0.0	0.0	0.0	0.0	0.0	3.4

Grading/Excavation	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
	0	Cranes	0.00	0.00	0.00	0.00	0.00	0.00
	0	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	0	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	0	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Grading	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
	0	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
	0	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	0	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	0	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Drainage	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0

Paving	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Pavers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Paving	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions all Phases (tons per construction period) =>			0.0	0.0	0.0	0.0	0.0	3.4

Equipment default values for horsepower and hours/day can be overridden in cells C289 through C322 and E289 through E322.

Equipment		Default Values Horsepower		Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		106		8
Bore/Drill Rigs		206		8
Cement and Mortar Mixers		10		8
Concrete/Industrial Saws		64		8
Cranes		226		8
Crawler Tractors		208		8
Crushing/Proc. Equipment		142		8
Excavators		163		8
Forklifts		89		8
Generator Sets		66		8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400		8
Other Construction Equipment	450.00	172	8.00	8
Other General Industrial Equipment	300.00	88	5.00	8
Other Material Handling Equipment		167		8
Pavers		126		8
Paving Equipment		131		8
Plate Compactors		8		8
Pressure Washers		26		8
Pumps		53		8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		20		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		45		8

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END OF DATA ENTRY SHEET

Attachment 5

Copies of Emission Reports and Input Data for Equipment Installation
Based on the Road Construction Model

Road Construction Emissions Model, Version 7.1.3

Emission Estimates for -> Sojitz RG 1 Installation of Production Equipment Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	CO2 (lbs/day)
Grubbing/Land Clearing	3.6	15.4	27.9	1.6	1.6	-	1.5	1.5	-	2,678.6
Grading/Excavation	-	-	-	-	-	-	-	-	-	-
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (pounds/day)	3.6	15.4	27.9	1.6	1.6	-	1.5	1.5	-	2,678.6
Total (tons/construction project)	0.0	0.0	0.1	0.0	0.0	-	0.0	0.0	-	6.9

Notes: Project Start Year -> 2013
Project Length (months) -> 0
Total Project Area (acres) -> 1
Maximum Area Disturbed/Day (acres) -> 0
Total Soil Imported/Exported (yd^3/day)-> 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Emission Estimates for -> Sojitz RG 1 Installation of Production Equipment Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	Total PM10 (kgs/day)	Exhaust PM10 (kgs/day)	Fugitive Dust PM10 (kgs/day)	Total PM2.5 (kgs/day)	Exhaust PM2.5 (kgs/day)	Fugitive Dust PM2.5 (kgs/day)	CO2 (kgs/day)
Grubbing/Land Clearing	1.6	7.0	12.7	0.7	0.7	-	0.7	0.7	-	1,217.6
Grading/Excavation	-	-	-	-	-	-	-	-	-	-
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (kilograms/day)	1.6	7.0	12.7	0.7	0.7	-	0.7	0.7	-	1,217.6
Total (megagrams/construction project)	0.0	0.0	0.1	0.0	0.0	-	0.0	0.0	-	6.2

Notes: Project Start Year -> 2013
Project Length (months) -> 0
Total Project Area (hectares) -> 0
Maximum Area Disturbed/Day (hectares) -> 0
Total Soil Imported/Exported (meters^3/day)-> 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sume of exhaust and fugitive dust emissions shown in columns K and L.

Road Construction Emissions Model
Data Entry Worksheet

Version 7.1.3

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C25.

Input Type

Project Name	Sojitz RG 1 Installation of Production Equipment	
Construction Start Year	2013	Enter a Year between 2009 and 2025 (inclusive)
Project Type	1	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	0.2	months
Predominant Soil/Site Type: Enter 1, 2, or 3	2	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length		miles
Total Project Area	0.6	acres
Maximum Area Disturbed/Day	0.0	acres
Water Trucks Used?	2	1. Yes 2. No
Soil Imported	0.0	yd^3/day
Soil Exported	0.0	yd^3/day
Average Truck Capacity	20.0	yd^3 (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of Construction Months	Program Calculated Months	2005	%	2006	%	2007	%
Grubbing/Land Clearing	0.23	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation		0.11	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade		0.07	0.00	0.00	0.00	0.00	0.00	0.00
Paving		0.04	0.00	0.00	0.00	0.00	0.00	0.00
Totals	0.23	0.23						

Hauling emission default values can be overridden in cells C45 through C46.

Soil Hauling Emissions

User Input	User Override of Soil Hauling Defaults	Default Values
Miles/round trip	50.00	30
Round trips/day	2.00	0
Vehicle miles traveled/day (calculated)		100

Hauling Emissions	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00
Emission rate (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
Tons per contruction period	0.00	0.00	0.00	0.00	0.00	0.00

Worker commute default values can be overridden in cells C60 through C65.

Worker Commute Emissions

	User Override of Worker Commute Default Values	Default Values
Miles/ one-way trip	25.00	20
One-way trips/day	3.00	2
No. of employees: Grubbing/Land Clearing	3.00	0
No. of employees: Grading/Excavation		0
No. of employees: Drainage/Utilities/Sub-Grade		0
No. of employees: Paving		0

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.204	0.283	2.490	0.047	0.020	443.262
Emission rate - Grading/Excavation (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Paving (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Grubbing/Land Clearing (grams/trip)	0.678	0.455	5.753	0.004	0.004	95.442
Emission rate - Grading/Excavation (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Draining/Utilities/Sub-Grade (gr/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Paving (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Grubbing/Land Clearing	0.128	0.158	1.462	0.024	0.010	223.462
Tons per const. Period - Grub/Land Clear	0.000	0.000	0.004	0.000	0.000	0.574
Pounds per day - Grading/Excavation	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Grading/Excavation	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Drainage/Utilities/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Drain/Util/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Paving	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Paving	0.000	0.000	0.000	0.000	0.000	0.000
tons per construction period	0.000	0.000	0.004	0.000	0.000	0.574

Water truck default values can be overriden in cells C91 through C93 and E91 through E93.

Water Truck Emissions	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Day	Default Values Miles Traveled/Day
Grubbing/Land Clearing - Exhaust	0.00	0	0.00	0
Grading/Excavation - Exhaust		0		0
Drainage/Utilities/Subgrade		0		0

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.40	11.32	1.78	0.35	0.26	1716.84
Emission rate - Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grub/Land Clear	0.00	0.00	0.00	0.00	0.00	0.00
Pound per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00
Pound per day - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00

Fugitive dust default values can be overridden in cells C110 through C112.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing		0	0.0	0.0	0.0	0.0
Fugitive Dust - Grading/Excavation		0	0.0	0.0	0.0	0.0
Fugitive Dust - Drainage/Utilities/Subgrade		0	0.0	0.0	0.0	0.0

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Cranes	1.23	4.51	14.05	0.65	0.59	902.70
	0	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Excavators	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Forklifts	0.42	1.35	3.43	0.29	0.26	248.20
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Off-Highway Tractors	0.45	2.54	5.10	0.26	0.24	493.45
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Tractors/Loaders/Backhoes	0.23	2.36	2.18	0.10	0.09	503.70
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Welders	1.13	3.21	2.98	0.28	0.26	307.11
	Grubbing/Land Clearing	pounds per day	3.5	14.0	27.7	1.6	1.4	2455.2
	Grubbing/Land Clearing	tons per phase	0.0	0.0	0.1	0.0	0.0	6.3

Grading/Excavation	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
	0	Cranes	0.00	0.00	0.00	0.00	0.00	0.00
	0	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	0	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	0	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Grading	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
	0	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
	0	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	0	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	0	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Drainage	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0

Paving	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Pavers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Paving	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions all Phases (tons per construction period) =>			0.0	0.0	0.1	0.0	0.0	6.3

Equipment default values for horsepower and hours/day can be overridden in cells C289 through C322 and E289 through E322.

Equipment		Default Values Horsepower		Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		106		8
Bore/Drill Rigs		206		8
Cement and Mortar Mixers		10		8
Concrete/Industrial Saws		64		8
Cranes		226	12.00	8
Crawler Tractors		208		8
Crushing/Proc. Equipment		142		8
Excavators		163		8
Forklifts		89	12.00	8
Generator Sets		66		8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400	12.00	8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		167		8
Pavers		126		8
Paving Equipment		131		8
Plate Compactors		8		8
Pressure Washers		26		8
Pumps		53		8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		20		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98	12.00	8
Trenchers		81		8
Welders		45	12.00	8

END OF DATA ENTRY SHEET

Attachment 6

Copies of Emission Reports and Input Data for Production
Based on the Road Construction Model

Road Construction Emissions Model, Version 7.1.3

Emission Estimates for -> Sojitz RG 1 Production Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	CO2 (lbs/day)
Grubbing/Land Clearing	3.3	10.0	10.3	0.9	0.9	-	0.8	0.8	-	1,127.5
Grading/Excavation	-	-	-	-	-	-	-	-	-	-
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (pounds/day)	3.3	10.0	10.3	0.9	0.9	-	0.8	0.8	-	1,127.5
Total (tons/construction project)	0.4	1.3	1.4	0.1	0.1	-	0.1	0.1	-	148.8

Notes: Project Start Year -> 2013
Project Length (months) -> 12
Total Project Area (acres) -> 1
Maximum Area Disturbed/Day (acres) -> 0
Total Soil Imported/Exported (yd^3/day)-> 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Emission Estimates for -> Sojitz RG 1 Production Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	Total PM10 (kgs/day)	Exhaust PM10 (kgs/day)	Fugitive Dust PM10 (kgs/day)	Total PM2.5 (kgs/day)	Exhaust PM2.5 (kgs/day)	Fugitive Dust PM2.5 (kgs/day)	CO2 (kgs/day)
Grubbing/Land Clearing	1.5	4.6	4.7	0.4	0.4	-	0.4	0.4	-	512.5
Grading/Excavation	-	-	-	-	-	-	-	-	-	-
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (kilograms/day)	1.5	4.6	4.7	0.4	0.4	-	0.4	0.4	-	512.5
Total (megagrams/construction project)	0.4	1.2	1.2	0.1	0.1	-	0.1	0.1	-	135.0

Notes: Project Start Year -> 2013
Project Length (months) -> 12
Total Project Area (hectares) -> 0
Maximum Area Disturbed/Day (hectares) -> 0
Total Soil Imported/Exported (meters^3/day)-> 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sume of exhaust and fugitive dust emissions shown in columns K and L.

Road Construction Emissions Model
Data Entry Worksheet

Version 7.1.3

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C25.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name	Sojitz RG 1 Production	
Construction Start Year	2013	Enter a Year between 2009 and 2025 (inclusive)
Project Type	1	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	12.0	months
Predominant Soil/Site Type: Enter 1, 2, or 3	2	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length		miles
Total Project Area	0.6	acres
Maximum Area Disturbed/Day	0.0	acres
Water Trucks Used?	2	1. Yes 2. No
Soil Imported	0.0	yd^3/day
Soil Exported	0.0	yd^3/day
Average Truck Capacity	20.0	yd^3 (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of Construction Months	Program Calculated Months	2005	%	2006	%	2007	%
Grubbing/Land Clearing	12.00	1.20	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation		5.40	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade		3.60	0.00	0.00	0.00	0.00	0.00	0.00
Paving		1.80	0.00	0.00	0.00	0.00	0.00	0.00
Totals	12.00	12.00						

Hauling emission default values can be overridden in cells C45 through C46.

Soil Hauling Emissions

User Input	User Override of Soil Hauling Defaults	Default Values
Miles/round trip	50.00	30
Round trips/day	0.23	0
Vehicle miles traveled/day (calculated)		11.5

Hauling Emissions	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00
Emission rate (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
Tons per contruction period	0.00	0.00	0.00	0.00	0.00	0.00

Worker commute default values can be overridden in cells C60 through C65.

Worker Commute Emissions

	User Override of Worker Commute Default Values	Default Values
Miles/ one-way trip	25.00	20
One-way trips/day	1.00	2
No. of employees: Grubbing/Land Clearing	1.00	0
No. of employees: Grading/Excavation		0
No. of employees: Drainage/Utilities/Sub-Grade		0
No. of employees: Paving		0

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.204	0.283	2.490	0.047	0.020	443.262
Emission rate - Grading/Excavation (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Paving (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Grubbing/Land Clearing (grams/trip)	0.678	0.455	5.753	0.004	0.004	95.442
Emission rate - Grading/Excavation (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Draining/Utilities/Sub-Grade (gr/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Paving (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Grubbing/Land Clearing	0.014	0.018	0.162	0.003	0.001	24.829
Tons per const. Period - Grub/Land Clear	0.002	0.002	0.021	0.000	0.000	3.277
Pounds per day - Grading/Excavation	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Grading/Excavation	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Drainage/Utilities/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Drain/Util/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Paving	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Paving	0.000	0.000	0.000	0.000	0.000	0.000
tons per construction period	0.002	0.002	0.021	0.000	0.000	3.277

Water truck default values can be overriden in cells C91 through C93 and E91 through E93.

Water Truck Emissions	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Day	Default Values Miles Traveled/Day
Grubbing/Land Clearing - Exhaust	0.00	0	0.00	0
Grading/Excavation - Exhaust		0		0
Drainage/Utilities/Subgrade		0		0

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.40	11.32	1.78	0.35	0.26	1716.84
Emission rate - Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grub/Land Clear	0.00	0.00	0.00	0.00	0.00	0.00
Pound per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00
Pound per day - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00

Fugitive dust default values can be overridden in cells C110 through C112.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing		0	0.0	0.0	0.0	0.0
Fugitive Dust - Grading/Excavation		0	0.0	0.0	0.0	0.0
Fugitive Dust - Drainage/Utilities/Subgrade		0	0.0	0.0	0.0	0.0

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
	0	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Pumps	3.28	9.88	10.31	0.87	0.80	1102.67
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing	pounds per day	3.3	9.9	10.3	0.9	0.8	1102.7
	Grubbing/Land Clearing	tons per phase	0.4	1.3	1.4	0.1	0.1	145.6

Grading/Excavation	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
	0	Cranes	0.00	0.00	0.00	0.00	0.00	0.00
	0	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	0	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	0	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Grading	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
	0	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
	0	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	0	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	0	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Drainage	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0

Paving	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Pavers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Paving	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions all Phases (tons per construction period) =>			0.4	1.3	1.4	0.1	0.1	145.6

Equipment default values for horsepower and hours/day can be overridden in cells C289 through C322 and E289 through E322.

Equipment		Default Values Horsepower		Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		106		8
Bore/Drill Rigs		206		8
Cement and Mortar Mixers		10		8
Concrete/Industrial Saws		64		8
Cranes		226		8
Crawler Tractors		208		8
Crushing/Proc. Equipment		142		8
Excavators		163		8
Forklifts		89		8
Generator Sets		66		8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		167		8
Pavers		126		8
Paving Equipment		131		8
Plate Compactors		8		8
Pressure Washers		26		8
Pumps	49.60	53	24.00	8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		20		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		45		8

END OF DATA ENTRY SHEET

Attachment 7

Copies of Emission Reports and Input Data for Plugging & Abandonment
Based on the Road Construction Model

Road Construction Emissions Model, Version 7.1.3

Emission Estimates for -> Sojitz RG 1 Plugging & Abandonment Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	CO2 (lbs/day)
Grubbing/Land Clearing	2.0	15.8	22.7	0.9	0.9	-	0.8	0.8	-	2,788.0
Grading/Excavation	-	-	-	-	-	-	-	-	-	-
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (pounds/day)	2.0	15.8	22.7	0.9	0.9	-	0.8	0.8	-	2,788.0
Total (tons/construction project)	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	-	4.1

Notes: Project Start Year -> 2013
Project Length (months) -> 0
Total Project Area (acres) -> 1
Maximum Area Disturbed/Day (acres) -> 0
Total Soil Imported/Exported (yd^3/day)-> 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Emission Estimates for -> Sojitz RG 1 Plugging & Abandonment Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	Total PM10 (kgs/day)	Exhaust PM10 (kgs/day)	Fugitive Dust PM10 (kgs/day)	Total PM2.5 (kgs/day)	Exhaust PM2.5 (kgs/day)	Fugitive Dust PM2.5 (kgs/day)	CO2 (kgs/day)
Grubbing/Land Clearing	0.9	7.2	10.3	0.4	0.4	-	0.4	0.4	-	1,267.3
Grading/Excavation	-	-	-	-	-	-	-	-	-	-
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-
Maximum (kilograms/day)	0.9	7.2	10.3	0.4	0.4	-	0.4	0.4	-	1,267.3
Total (megagrams/construction project)	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	-	3.7

Notes: Project Start Year -> 2013
Project Length (months) -> 0
Total Project Area (hectares) -> 0
Maximum Area Disturbed/Day (hectares) -> 0
Total Soil Imported/Exported (meters^3/day)-> 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sume of exhaust and fugitive dust emissions shown in columns K and L.

Road Construction Emissions Model
Data Entry Worksheet

Version 7.1.3

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C25.

Input Type

Project Name	Sojitz RG 1 Plugging & Abandonment	
Construction Start Year	2013	Enter a Year between 2009 and 2025 (inclusive)
Project Type	1	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	0.1	months
Predominant Soil/Site Type: Enter 1, 2, or 3	2	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length		miles
Total Project Area	0.6	acres
Maximum Area Disturbed/Day	0.0	acres
Water Trucks Used?	2	1. Yes 2. No
Soil Imported	0.0	yd^3/day
Soil Exported	0.0	yd^3/day
Average Truck Capacity	20.0	yd^3 (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of Construction Months	Program Calculated Months	2005	%	2006	%	2007	%
Grubbing/Land Clearing	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation		0.06	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade		0.04	0.00	0.00	0.00	0.00	0.00	0.00
Paving		0.02	0.00	0.00	0.00	0.00	0.00	0.00
Totals	0.13	0.13						

Hauling emission default values can be overridden in cells C45 through C46.

Soil Hauling Emissions

User Input	User Override of Soil Hauling Defaults	Default Values
Miles/round trip	25.00	30
Round trips/day	1.00	0
Vehicle miles traveled/day (calculated)		25

Hauling Emissions	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00
Emission rate (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
Tons per contruction period	0.00	0.00	0.00	0.00	0.00	0.00

Worker commute default values can be overridden in cells C60 through C65.

Worker Commute Emissions

	User Override of Worker Commute Default Values	Default Values
Miles/ one-way trip	12.50	20
One-way trips/day	6.00	2
No. of employees: Grubbing/Land Clearing	6.00	0
No. of employees: Grading/Excavation		0
No. of employees: Drainage/Utilities/Sub-Grade		0
No. of employees: Paving		0

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.204	0.283	2.490	0.047	0.020	443.262
Emission rate - Grading/Excavation (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Paving (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Grubbing/Land Clearing (grams/trip)	0.678	0.455	5.753	0.004	0.004	95.442
Emission rate - Grading/Excavation (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Draining/Utilities/Sub-Grade (gr/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Paving (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Grubbing/Land Clearing	0.310	0.352	3.380	0.048	0.021	454.493
Tons per const. Period - Grub/Land Clear	0.000	0.001	0.005	0.000	0.000	0.667
Pounds per day - Grading/Excavation	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Grading/Excavation	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Drainage/Utilities/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Drain/Util/Sub-Grade	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Paving	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Paving	0.000	0.000	0.000	0.000	0.000	0.000
tons per construction period	0.000	0.001	0.005	0.000	0.000	0.667

Water truck default values can be overriden in cells C91 through C93 and E91 through E93.

Water Truck Emissions	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Day	Default Values Miles Traveled/Day
Grubbing/Land Clearing - Exhaust	0.00	0	0.00	0
Grading/Excavation - Exhaust		0		0
Drainage/Utilities/Subgrade		0		0

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.40	11.32	1.78	0.35	0.26	1716.84
Emission rate - Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grub/Land Clear	0.00	0.00	0.00	0.00	0.00	0.00
Pound per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00
Pound per day - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	0.00	0.00

Fugitive dust default values can be overridden in cells C110 through C112.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing		0	0.0	0.0	0.0	0.0
Fugitive Dust - Grading/Excavation		0	0.0	0.0	0.0	0.0
Fugitive Dust - Drainage/Utilities/Subgrade		0	0.0	0.0	0.0	0.0

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
	0	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Other Construction Equipment	1.27	9.58	16.94	0.64	0.59	1742.02
1.00		Other General Industrial Equipment	0.43	2.89	5.44	0.21	0.19	591.51
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing	pounds per day	1.7	12.5	22.4	0.8	0.8	2333.5
	Grubbing/Land Clearing	tons per phase	0.0	0.0	0.0	0.0	0.0	3.4

Grading/Excavation	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
	0	Cranes	0.00	0.00	0.00	0.00	0.00	0.00
	0	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	0	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	0	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Grading	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
	0	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
	0	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	0	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	0	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Drainage	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0

Paving	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0	Pavers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	0	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Paving	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions all Phases (tons per construction period) =>			0.0	0.0	0.0	0.0	0.0	3.4

Equipment default values for horsepower and hours/day can be overridden in cells C289 through C322 and E289 through E322.

Equipment		Default Values Horsepower		Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		106		8
Bore/Drill Rigs		206		8
Cement and Mortar Mixers		10		8
Concrete/Industrial Saws		64		8
Cranes		226		8
Crawler Tractors		208		8
Crushing/Proc. Equipment		142		8
Excavators		163		8
Forklifts		89		8
Generator Sets		66		8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400		8
Other Construction Equipment	450.00	172	8.00	8
Other General Industrial Equipment	300.00	88	5.00	8
Other Material Handling Equipment		167		8
Pavers		126		8
Paving Equipment		131		8
Plate Compactors		8		8
Pressure Washers		26		8
Pumps		53		8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		20		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		45		8

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END OF DATA ENTRY SHEET

Attachment 8

Calculation of Facility Prioritization

Clculation of Fugitive Toxic Air Emissions

	How Many?	VOCs EF *lbs/hr*		VOCs *lbs/yr*
Pumps	1	0.00113		9.8988
Flanges/Connectors	4	0.00000086		0.007534
		TOTAL	VOCs	9.906

VOC Fugitive Emission Factor (EF) for heavy crude based on EPA Document # EPA-453/R-95-017, Nov. 1995, pages 2-15.

1 Well

	EF *(lbs/ln VOCs)*	Emissions *(lbs/yr)*
1,2,4 Trimethylbenzene	5.16E-03	5.11E-02
Benzene	1.32E-02	1.31E-01
Cyclohexane	4.82E-04	4.77E-03
Ethylbenzene	8.45E-03	8.37E-02
n-Hexane	1.49E-02	1.48E-01
Toluene	1.25E-02	1.24E-01
Xylenes	1.21E-02	1.20E-01

Wells => 8

	EF *(lbs/ln VOCs)*	Emissions *(lbs/yr)*
1,2,4 Trimethylbenzene	4.12E-02	4.09E-01
Benzene	1.05E-01	1.04E+00
Cyclohexane	3.86E-03	3.82E-02
Ethylbenzene	6.76E-02	6.69E-01
n-Hexane	1.19E-01	1.18E+00
Toluene	1.00E-01	9.93E-01
Xylenes	9.71E-02	9.62E-01

Name	Oilfield Equipment Heavy Crude Oil Fugitives					
Applicability	Use this spreadsheet for VOC fugitive emission from Oilfield Equipment using Heavy Crude Oil (Default if unknown). Entries required in yellow areas, output in grey areas.					
Author or updater	Matthew Cegielski		*Last Update*	June 18, 2013		
Facility:						
ID#:						
Project #:						
Inputs	lb /hr	lb /yr	**Formula**			
VOC Rate	1.00E+00	200.0	Emissions are calculated by the multiplication of each VOC Rate and Emission Factor. Hydrogen Sulfide emissions are variable, depending on source and control measures and should be provided by the project engineer or applicant in addition to these emissions.			
Substances	**CAS#**	**Emission Factor lbs/ lb VOC**	**LB/HR**	**LB/YR**		
1,2,4 Trimethylbenzene	**95636**	5.16E-03	5.16E-03	1.03E+00		
Benzene	**71432**	1.32E-02	1.32E-02	2.64E+00		
Cyclohexane	**110827**	4.82E-04	4.82E-04	9.64E-02		
Ethylbenzene	**100414**	8.45E-03	8.45E-03	1.69E+00		
n-Hexane	**110543**	1.49E-02	1.49E-02	2.98E+00		
Toluene	**108883**	1.25E-02	1.25E-02	2.51E+00		
Xylenes	**1330207**	1.21E-02	1.21E-02	2.43E+00		
References:						

The emission factor are based on table 18 pg. 59 of DEVELOPMENT OF SPECIES PROFILES FOR SELECTED ORGANIC EMISSION SOURCES. Principal Investigator: Albert C. Censullo, Ph.D. California Polytechnic State University, San Luis Obispo. 1991. A832-059.

Name **Air Toxics "Hot Spots" Information and Assessment Act of 1987 Facility Prioritization Scores Prioritization 2.0 SJVAPCD**

Applicability	Use this spreadsheet to generate a Prioritization when emission rates of HAPs are known. Entries required in yellow areas, output in grey areas.
Author or updater	R Kapahi
Last Update	September 16, 2013
Facility:	Sojitz RG Short-Term Health Impacts
ID#:	DPM + Fugitive Emissions
Project #:	Sojitz RG
Data Entered by:	Ray Kapahi
Data Reviewed by:	
Location	

Inputs	Max Operating Hours hr/yr	Release Height (m)
	500	5

	Receptor Proximity & Proximity Factors (Meters)		Emissions Potency Method			Dispersion Adjustment Method				
			Carc Scores	**Non-Carc Scores**	**Facility Ranking**	**Carc Scores**	**Non-Carc Scores**	**Facility Ranking**		
	0< R<100	**1.000**	101.09	11.89	**High Priority**	99.89953	11.89285	**High Priority**		**Medium Priority**
	100≤R<250	0.250	25.27	2.97	**High Priority**	24.97488	2.97321	**High Priority**		**Medium Priority**
	250≤R<500	0.040	4.04	0.48	**Medium Priority**	3.99598	0.47571	**Medium Priority**		**Medium Priority**
	500≤R<1000	0.011	1.11	0.13	**Medium Priority**	1.09889	0.13082	**Medium Priority**		**Medium Priority**
	1000≤R<1500	0.003	0.30	0.04	**Low Priority**	0.29970	0.03568	**Low Priority**		**Low Priority**
	1500≤R<2000	0.002	0.20	0.02	**Low Priority**	0.19980	0.02379	**Low Priority**		**Low Priority**
	2000<R	0.001	0.10	0.01	**Low Priority**	0.09990	0.01189	**Low Priority**		**Low Priority**
Height Adjustment			<100m	<250m	<500m	<1000m	<1500m	<2000m	>=2000m	
<20m	60		1	0.25	0.04	0.011	0.003	0.002	0.001	
20m<= <45m	9		1	0.85	0.22	0.064	0.018	0.009	0.006	
=>45m	1		1	1	0.9	0.4	0.13	0.066	0.042	

CAS#	Substance	Annual Emissions	Maximum Hourly	Average Hourly	Disp Adj Method Carc	EP Method Carc	EP Method Chronic	EP Method Acute	EP Max of Chronic and Acute
79345	1,1,2,2-Tetrachloroethane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79005	1,1,2-Trichloroethane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75343	1,1-Dichloroethane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0	1,2,3,4,5,6,78-OctaD			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0	1,2,3,4,5,6,78-OctaF			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
39001020	1,2,3,4,6,7,8,9-Octachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3268879	1,2,3,4,6,7,8,9-Octachlorodibenzo-P-dioxin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67562394	1,2,3,4,6,7,8-Heptachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
35822469	1,2,3,4,6,7,8-Heptachlorodibenzo-P-dioxin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55673897	1,2,3,4,7,8,9-Heptachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
70648269	1,2,3,4,7,8-Hexachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
39227286	1,2,3,4,7,8-Hexachlorodibenzo-P-dioxin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57117449	1,2,3,6,7,8-Hexachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57653857	1,2,3,6,7,8-Hexachlorodibenzo-P-dioxin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
72918219	1,2,3,7,8,9-Hexachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
19408743	1,2,3,7,8,9-Hexachlorodibenzo-P-dioxin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57117416	1,2,3,7,8-Pentachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
40321764	1,2,3,7,8-Pentachlorodibenzo-P-dioxin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
96128	1,2-Dibromo-3-chloropropane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78875	1,2-Dichloropropane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
122667	1,2-Diphenylhydrazine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106887	1,2-Epoxybutane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106990	1,3-Butadiene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
542756	1,3-Dichloropropene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1120714	1,3-Propane sultone			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
123911	1,4-Dioxane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
42397648	1,6-Dinitropyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
42397659	1,8-Dinitropyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5522430	1-Nitropyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
39635319	2,3,3',4,4',5,5'-HEPTACHLORBIPHENYL (PCB 189)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
38380084	2,3,3',4,4',5-HEXACHLOROBIPHENYL (PCB 156)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

69782907	2,3,3',4,4',5'-HEXACHLOROBIPHENYL (PCB 157)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
32598144	2,3,3',4,4'-Pentachlorobiphenyl {PCB 105}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52663726	2,3',4,4',5,5'-HEXACHLOROBIPHENYL (PCB 167)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
74472370	2,3,4,4',5-PENTACHLOBIPHENYL (PCB114)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
31508006	2,3',4,4',5-PENTACHLOROBIPHENYL (PCB 118)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
65510443	2,3',4,4',5'-PENTACHOROBIPHENYL (PCB 123)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60851345	2,3,4,6,7,8-Hexachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57117314	2,3,4,7,8-Pentachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
51207319	2,3,7,8-Tetrachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1746016	2,3,7,8-Tetrachlorodibenzo-P-Dioxin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
88062	2,4,6-Trichlorophenol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
615054	2,4-Diaminoanisole			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95807	2,4-Diaminotoluene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
121142	2,4-Dinitrotoluene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53963	2-Acetylaminofluorene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
117793	2-Aminoanthraquinone			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
607578	2-Nitrofluorene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
32774166	3,3',4,4',5,5'-HEXACHLOROBIPHENYL (PCB 169)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57465288	3,3',4,4',5-PENTACHLOROBIPHENYL (PCB 126)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
32598133	3,3',4,4'-TETRACHLORBIPHENYL (PCB77)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
91941	3,3'-Dichlorobenzidine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
70362504	3,4,4',5-TETRACHLOROBIPHENYL (PCB 81)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
56495	3-Methylcholanthrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
101144	4,4'-Methylene bis(2 Chloroaniline) (MOCA)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
101779	4,4'-Methylenedianiline			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
92671	4-Aminobiphenyl			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

95830	4-Chloro-o-phenylenediamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60117	4-Dimethylaminoazobenzene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57835924	4-Nitropyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3697243	5-Methylchrysene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
602879	5-Nitroacenaphthene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7496028	6-Nitrochrysene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57976	7,12-Dimethylbenz[a]anthracene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
194592	7H-Dibenzo[c,g]carbazole			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75070	Acetaldehyde			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60355	Acetamide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107028	Acrolein			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79061	Acrylamide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79107	Acrylic acid			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107131	Acrylonitrile			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107051	Allyl chloride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
319846	alpha-Hexachlorocyclohexane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61825	Amitrole			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7664417	Ammonia			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62533	Aniline			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440382	Arsenic			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1016	Arsenic compounds (inorganic)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7784421	Arsine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1332214	Asbestos			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10294403	Barium chromate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
56553	Benz[a]anthracene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
71432	Benzene	1.31E-01		2.62E-04	1.06E-04	6.46E-03	6.55E-04	0.00E+00	6.55E-04
92875	Benzidine (and its salts)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1020	Benzidine-based dyes			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50328	Benzo[a]pyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
205992	Benzo[b]fluoranthene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
205823	Benzo[j]fluoranthene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
207089	Benzo[k]fluoranthene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100447	Benzyl chloride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440417	Beryllium			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
319857	beta-Hexachlorocyclohexane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57578	beta-Propiolactone			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111444	Bis(2-chloroethyl) ether {DCEE}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
542881	Bis(chloromethyl) ether			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440439	Cadmium			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
13765190	Calcium chromate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2425061	Captafol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
133062	Captan			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75150	Carbon disulfide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
630080	Carbon monoxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
56235	Carbon tetrachloride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57749	Chlordane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108171262	Chlorinated paraffin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7782505	Chlorine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10049044	Chlorine dioxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

108907	Chlorobenzene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
510156	Chlorobenzilate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0	Chlorodifluoromethane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67663	Chloroform			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107302	Chloromethyl methyl			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
76062	Chloropicrin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1333820	Chromium trioxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
18540299	Chromium, hexavalent			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
218019	Chrysene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1066	Coke oven emissions			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440508	Copper			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1319773	Cresols (mixtures of) {Cresylic acid}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
135206	Cupferron			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1073	Cyanide compounds			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57125	CYANIDE COMPOUNDS [Inorganic)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
117817	Di(2-ethylhexyl) phthalate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
226368	Dibenz[a,h]acridine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2263680	Dibenz[a,h]acridine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53703	Dibenz[a,h]anthracene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
224420	Dibenz[a,j]acridine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
192645	Dibenzo[a,e]pyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
189640	Dibenzo[a,h]pyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
189559	Dibenzo[a,i]pyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
191300	Dibenzo[a,l]pyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1080	Dibenzofurans (chlorinated) {PCDFs} [Treated as 2378TCDD for HRA]			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0	Dichlorodifluoromethene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
72559	Dichlorodiphenyldichloroethylene {DDE}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
73354	Dichloroethylene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62737	Dichlorovos {DDVP}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9901	Diesel engine exhaust, particulate matter (Diesel PM)	1.98E+02		3.96E-01	1.66E+00	1.01E+02	1.19E+01	0.00E+00	1.19E+01
111422	Diethanolamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79447	Dimethyl carbamoyl chloride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
68122	Dimethyl formamide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
124403	Dimethylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1086	Dioxins, total, w/o individ. isomers reported {PCDDs} [Treat as 2378TCDD for HRA			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1937377	Direct Black 38			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2602462	Direct Blue 6			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
16071866	Direct Brown 95 (technical grade)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106898	Epichlorohydrin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100414	Ethyl benzene	8.37E-02		1.67E-04	5.86E-06	3.56E-04	1.26E-05	0.00E+00	1.26E-05
75003	Ethyl chloride {Chlorethane}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

106934	Ethylene dibromide {EDB}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107062	Ethylene dichloride {EDC}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107211	Ethylene glycol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111762	Ethylene glycol monobutyl ethe			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110805	Ethylene glycol monoethyl ethe			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111159	Ethylene glycol monoethyl ether acetate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
109864	Ethylene glycol monomethyl ethe			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110496	Ethylene glycol monomethyl ether acetate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75218	Ethylene oxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
96457	Ethylene thiourea			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
151564	Ethyleneimine {Aziridine}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1101	Fluorides			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50000	Formaldehyde			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111308	Glutaraldehyde			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
76448	Heptachlor			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
118741	Hexachlorobenzene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1120	Hexachlorocyclohexane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
608731	Hexachlorocyclohexanes (mixed or technical grade)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67721	Hexachloroethane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110543	Hexane	1.48E-01		2.96E-04	0.00E+00	0.00E+00	6.34E-06	0.00E+00	6.34E-06
302012	Hydrazine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7647010	Hydrochloric acid			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
74908	Hydrocyanic acid			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7664393	Hydrogen fluoride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7783075	Hydrogen Selenide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7783075	HYDROGEN SELENIDE			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7783064	Hydrogen sulfide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
193395	Indeno[1,2,3-cd]pyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78591	Isophorone			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67630	Isopropyl alcohol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7439921	Lead			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
301042	Lead acetate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7758976	Lead chromate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1128	Lead compounds (inorganic)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7446277	Lead phosphate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1335326	Lead subacetate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
58899	Lindane {gamma-Hexachlorocyclohexane}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108316	Maleic anhydride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7439965	Manganese			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108394	m-Cresol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7487947	Mercuric chloride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7439976	Mercury			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67561	Methanol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
74839	Methyl bromide {Bromomethane}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

71556	Methyl chloroform {1,1,1-Trichloroethane}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78933	Methyl ethyl ketone			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
624839	Methyl isocyanate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1634044	Methyl tert-butyl ether			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75092	Methylene chloride {Dichloromethane}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
101688	Methylene diphenyl diisocyanate {MDI}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
90948	Michler's ketone			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108383	m-Xylene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
91203	Naphthalene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440020	Nickel			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
373024	Nickel acetate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3333673	Nickel carbonate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3333393	Nickel carbonate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
13463393	Nickel carbonyl			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
12054487	Nickel hydroxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1313991	Nickel oxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1146	Nickel refinery dust			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
12035722	Nickel subsulfide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1271289	Nickelocene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7697372	Nitric acid			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
139139	Nitrilotriacetic acid			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10102440	NITROGEN DIOXIDE			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1116547	N-Nitrosodiethanolamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55185	N-Nitrosodiethylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62759	N-Nitrosodimethylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
924163	N-Nitrosodi-n-butylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
621647	N-Nitrosodi-n-propylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
86306	N-Nitrosodiphenylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10595956	N-Nitrosomethylethylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
59892	N-Nitrosomorpholine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
684935	N-Nitroso-N-methylurea			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100754	N-Nitrosopiperidine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
930552	N-Nitrosopyrrolidine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
90040	o-Anisidine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95487	o-Cresol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8014957	OLEUM			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95534	o-Toluidine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95476	o-Xylene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10028156	OZONE			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1151	PAHs, total, w/o individ. components reported [Treated as B(a)P for HRA]			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1336363	PCBs {Polychlorinated biphenyls}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95692	p-Chloro-o-toluidine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120718	p-Cresidine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106445	p-Cresol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106467	p-Dichlorobenzene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

87865	Pentachlorophenol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
127184	Perchloroethylene {Tetrachloroethene}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108952	Phenol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75445	Phosgene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7803512	Phosphine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7664382	Phosphoric acid			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
85449	Phthalic anhydride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
156105	p-Nitrosodiphenylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7758012	Potassium bromate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
115071	Propylene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107982	Propylene glycol monomethyl ethe			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75569	Propylene oxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75569	Propylene oxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106423	p-Xylene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50555	Reserpine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7782492	Selenium			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7446346	Selenium sulfide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1175	Silica, crystalline			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7631869	Silica, crystalline			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10588019	Sodium dichromate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1310732	Sodium hydroxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7789062	Strontium chromate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100425	Styrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9960	Sulfates			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9960	SULFATES			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7446095	Sulfur Dioxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7446719	Sulfur Trioxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7664939	Sulfuric acid			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0	Tetrachlorophenols			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62555	Thioacetamide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62566	Thiourea			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108883	Toluene	1.24E-01		2.48E-04	0.00E+00	0.00E+00	1.24E-04	0.00E+00	1.24E-04
1204	Toluene diisocyanate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
26471625	TOLUENE DIISOCYANATE			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
584849	Toluene-2,4-diisocyanate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
91087	Toluene-2,6-diisocyanate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8001352	Toxaphene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79016	Trichloroethylene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0	Trichlororfluormethane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0	Trichlorotrifluormethane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
121448	Triethylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
51796	Urethane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440622	Vanadium (fume or dust)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1314621	VANADIUM PENTOXIDE			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108054	Vinyl acetate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75014	Vinyl chloride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75354	Vinylidene chloride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1330207	XYLENES (mixed xylenes)	1.20E-01		2.40E-04	0.00E+00	0.00E+00	5.14E-05	0.00E+00	5.14E-05

Long-Term Risk Prioritization

Includes DPM and Fugitive Emissions

Estimate of Long-Term Diesel Exhaust PM-10 and Fugitive Emissions

Revised Sept 14, 2013

DPM Emissions	1-Well	8-Wells
	(tons/yr)	*(tons/yr)*
Production	0.1	0.8
TOTALS	0.1	0.8

Note: Exhaust PM-10 emission rates are calculated using the ROADWAY Model Version 7.1.3.

Fugitive Emissions	1-Well	8-Wells
	(lbs/yr)	*(lbs/yr)*
Benzene	0.131	1.048
Ethylbenzene	0.0837	0.6696
n-Hexane	0.148	1.184
Toluene	0.124	0.992
Xylenes	0.12	0.96

No. of Wells 8

Name **Air Toxics "Hot Spots" Information and Assessment Act of 1987 Facility Prioritization Scores Prioritization 2.0 SJVAPCD**

Applicability	Use this spreadsheet to generate a Prioritization when emission rates of HAPs are known. Entries required in yellow areas, output in grey areas.
Author or updater	R Kapahi
Last Update	September 14, 2013
Facility:	Sojitz RG Long-Term Health Impacts
ID#:	8 Wells + Fugitive VOCs
Project #:	Sojitz RG Revisions
Data Entered by:	Ray Kapahi
Data Reviewed by:	
Location	

Inputs	Max Operating Hours hr/yr	Release Height (m)
	8760	5

Receptor Proximity & Proximity Factors (Meters)		Emissions Potency Method			Dispersion Adjustment Method				
		Carc Scores	**Non-Carc Scores**	**Facility Ranking**	**Carc Scores**	**Non-Carc Scores**	**Facility Ranking**		
0< R<100	**1.000**	816.05	5.48	**High Priority**	806.45387	5.47984	**High Priority**		**Medium Priority**
100≤R<250	0.250	204.01	1.37	**High Priority**	201.61347	1.36996	**High Priority**		**Medium Priority**
250≤R<500	0.040	32.64	0.22	**High Priority**	32.25815	0.21919	**High Priority**		**Medium Priority**
500≤R<1000	0.011	8.98	0.06	**Medium Priority**	8.87099	0.06028	**Medium Priority**		**Medium Priority**
1000≤R<1500	0.003	2.45	0.02	**Medium Priority**	2.41936	0.01644	**Medium Priority**		**Medium Priority**
1500≤R<2000	0.002	1.63	0.01	**Medium Priority**	1.61291	0.01096	**Medium Priority**		**Medium Priority**
2000<R	0.001	0.82	0.01	**Low Priority**	0.80645	0.00548	**Low Priority**		**Low Priority**

Height Adjustment		<100m	<250m	<500m	<1000m	<1500m	<2000m	>=2000m
<20m	60	1	0.25	0.04	0.011	0.003	0.002	0.001
20m<= <45m	9	1	0.85	0.22	0.064	0.018	0.009	0.006
=>45m	1	1	1	0.9	0.4	0.13	0.066	0.042

CAS#	Substance	Annual Emissions	Maximum Hourly	Average Hourly	Disp Adj Method Carc	EP Method Carc	EP Method Chronic	EP Method Acute	EP Max of Chronic and Acute
79345	1,1,2,2-Tetrachloroethane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79005	1,1,2-Trichloroethane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75343	1,1-Dichloroethane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0	1,2,3,4,5,6,78-OctaD			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0	1,2,3,4,5,6,78-OctaF			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
39001020	1,2,3,4,6,7,8,9-Octachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3268879	1,2,3,4,6,7,8,9-Octachlorodibenzo-P-dioxin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67562394	1,2,3,4,6,7,8-Heptachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
35822469	1,2,3,4,6,7,8-Heptachlorodibenzo-P-dioxin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55673897	1,2,3,4,7,8,9-Heptachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
70648269	1,2,3,4,7,8-Hexachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
39227286	1,2,3,4,7,8-Hexachlorodibenzo-P-dioxin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57117449	1,2,3,6,7,8-Hexachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57653857	1,2,3,6,7,8-Hexachlorodibenzo-P-dioxin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
72918219	1,2,3,7,8,9-Hexachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
19408743	1,2,3,7,8,9-Hexachlorodibenzo-P-dioxin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57117416	1,2,3,7,8-Pentachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
40321764	1,2,3,7,8-Pentachlorodibenzo-P-dioxin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
96128	1,2-Dibromo-3-chloropropane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78875	1,2-Dichloropropane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
122667	1,2-Diphenylhydrazine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106887	1,2-Epoxybutane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106990	1,3-Butadiene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
542756	1,3-Dichloropropene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1120714	1,3-Propane sultone			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
123911	1,4-Dioxane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
42397648	1,6-Dinitropyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
42397659	1,8-Dinitropyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5522430	1-Nitropyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
39635319	2,3,3',4,4',5,5'-HEPTACHLORBIPHENYL (PCB 189)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
38380084	2,3,3',4,4',5-HEXACHLOROBIPHENYL (PCB 156)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

69782907	2,3,3',4,4',5'-HEXACHLOROBIPHENYL (PCB 157)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
32598144	2,3,3',4,4'-Pentachlorobiphenyl {PCB 105}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52663726	2,3',4,4',5,5'-HEXACHLOROBIPHENYL (PCB 167)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
74472370	2,3,4,4',5-PENTACHLOBIPHENYL (PCB114)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
31508006	2,3',4,4',5-PENTACHLOROBIPHENYL (PCB 118)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
65510443	2,3',4,4',5'-PENTACHOROBIPHENYL (PCB 123)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60851345	2,3,4,6,7,8-Hexachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57117314	2,3,4,7,8-Pentachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
51207319	2,3,7,8-Tetrachlorodibenzofuran			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1746016	2,3,7,8-Tetrachlorodibenzo-P-Dioxin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
88062	2,4,6-Trichlorophenol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
615054	2,4-Diaminoanisole			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95807	2,4-Diaminotoluene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
121142	2,4-Dinitrotoluene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53963	2-Acetylaminofluorene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
117793	2-Aminoanthraquinone			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
607578	2-Nitrofluorene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
32774166	3,3',4,4',5,5'-HEXACHLOROBIPHENYL (PCB 169)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57465288	3,3',4,4',5-PENTACHLOROBIPHENYL (PCB 126)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
32598133	3,3',4,4'-TETRACHLORBIPHENYL (PCB77)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
91941	3,3'-Dichlorobenzidine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
70362504	3,4,4',5-TETRACHLOROBIPHENYL (PCB 81)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
56495	3-Methylcholanthrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
101144	4,4'-Methylene bis(2 Chloroaniline) (MOCA)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
101779	4,4'-Methylenedianiline			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
92671	4-Aminobiphenyl			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

95830	4-Chloro-o-phenylenediamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60117	4-Dimethylaminoazobenzene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57835924	4-Nitropyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3697243	5-Methylchrysene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
602879	5-Nitroacenaphthene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7496028	6-Nitrochrysene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57976	7,12-Dimethylbenz[a]anthracene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
194592	7H-Dibenzo[c,g]carbazole			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75070	Acetaldehyde			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60355	Acetamide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107028	Acrolein			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79061	Acrylamide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79107	Acrylic acid			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107131	Acrylonitrile			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107051	Allyl chloride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
319846	alpha-Hexachlorocyclohexane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
61825	Amitrole			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7664417	Ammonia			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62533	Aniline			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440382	Arsenic			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1016	Arsenic compounds (inorganic)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7784421	Arsine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1332214	Asbestos			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10294403	Barium chromate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
56553	Benz[a]anthracene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
71432	Benzene	1.05E+00		1.20E-04	8.51E-04	5.17E-02	2.99E-04	0.00E+00	2.99E-04
92875	Benzidine (and its salts)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1020	Benzidine-based dyes			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50328	Benzo[a]pyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
205992	Benzo[b]fluoranthene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
205823	Benzo[j]fluoranthene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
207089	Benzo[k]fluoranthene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100447	Benzyl chloride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440417	Beryllium			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
319857	beta-Hexachlorocyclohexane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57578	beta-Propiolactone			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111444	Bis(2-chloroethyl) ether {DCEE}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
542881	Bis(chloromethyl) ether			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440439	Cadmium			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
13765190	Calcium chromate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2425061	Captafol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
133062	Captan			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75150	Carbon disulfide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
630080	Carbon monoxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
56235	Carbon tetrachloride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57749	Chlordane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108171262	Chlorinated paraffin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7782505	Chlorine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10049044	Chlorine dioxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

108907	Chlorobenzene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
510156	Chlorobenzilate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0	Chlorodifluoromethane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67663	Chloroform			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107302	Chloromethyl methyl			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
76062	Chloropicrin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1333820	Chromium trioxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
18540299	Chromium, hexavalent			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
218019	Chrysene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1066	Coke oven emissions			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440508	Copper			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1319773	Cresols (mixtures of) {Cresylic acid}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
135206	Cupferron			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1073	Cyanide compounds			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57125	CYANIDE COMPOUNDS [Inorganic)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
117817	Di(2-ethylhexyl) phthalate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
226368	Dibenz[a,h]acridine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2263680	Dibenz[a,h]acridine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
53703	Dibenz[a,h]anthracene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
224420	Dibenz[a,j]acridine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
192645	Dibenzo[a,e]pyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
189640	Dibenzo[a,h]pyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
189559	Dibenzo[a,i]pyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
191300	Dibenzo[a,l]pyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1080	Dibenzofurans (chlorinated) {PCDFs} [Treated as 2378TCDD for HRA]			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0	Dichlorodifluoromethene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
72559	Dichlorodiphenyldichloroethylene {DDE}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
73354	Dichloroethylene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62737	Dichlorovos {DDVP}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9901	Diesel engine exhaust, particulate matter (Diesel PM)	1.60E+03		1.83E-01	1.34E+01	8.16E+02	5.48E+00	0.00E+00	5.48E+00
111422	Diethanolamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79447	Dimethyl carbamoyl chloride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
68122	Dimethyl formamide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
124403	Dimethylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1086	Dioxins, total, w/o individ. isomers reported {PCDDs} [Treat as 2378TCDD for HRA			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1937377	Direct Black 38			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2602462	Direct Blue 6			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
16071866	Direct Brown 95 (technical grade)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106898	Epichlorohydrin			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100414	Ethyl benzene	6.70E-01		7.65E-05	4.69E-05	2.85E-03	5.74E-06	0.00E+00	5.74E-06
75003	Ethyl chloride {Chlorethane}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

106934	Ethylene dibromide {EDB}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107062	Ethylene dichloride {EDC}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107211	Ethylene glycol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111762	Ethylene glycol monobutyl ethe			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110805	Ethylene glycol monoethyl ethe			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111159	Ethylene glycol monoethyl ether acetate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
109864	Ethylene glycol monomethyl ethe			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110496	Ethylene glycol monomethyl ether acetate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75218	Ethylene oxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
96457	Ethylene thiourea			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
151564	Ethyleneimine {Aziridine}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1101	Fluorides			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50000	Formaldehyde			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
111308	Glutaraldehyde			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
76448	Heptachlor			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
118741	Hexachlorobenzene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1120	Hexachlorocyclohexane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
608731	Hexachlorocyclohexanes (mixed or technical grade)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67721	Hexachloroethane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
110543	Hexane	1.48E-01		1.69E-05	0.00E+00	0.00E+00	3.62E-07	0.00E+00	3.62E-07
302012	Hydrazine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7647010	Hydrochloric acid			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
74908	Hydrocyanic acid			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7664393	Hydrogen fluoride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7783075	Hydrogen Selenide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7783075	HYDROGEN SELENIDE			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7783064	Hydrogen sulfide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
193395	Indeno[1,2,3-cd]pyrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78591	Isophorone			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67630	Isopropyl alcohol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7439921	Lead			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
301042	Lead acetate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7758976	Lead chromate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1128	Lead compounds (inorganic)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7446277	Lead phosphate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1335326	Lead subacetate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
58899	Lindane {gamma-Hexachlorocyclohexane}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108316	Maleic anhydride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7439965	Manganese			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108394	m-Cresol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7487947	Mercuric chloride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7439976	Mercury			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
67561	Methanol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
74839	Methyl bromide {Bromomethane}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

71556	Methyl chloroform {1,1,1-Trichloroethane}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
78933	Methyl ethyl ketone			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
624839	Methyl isocyanate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1634044	Methyl tert-butyl ether			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75092	Methylene chloride {Dichloromethane}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
101688	Methylene diphenyl diisocyanate {MDI}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
90948	Michler's ketone			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108383	m-Xylene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
91203	Naphthalene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440020	Nickel			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
373024	Nickel acetate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3333673	Nickel carbonate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3333393	Nickel carbonate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
13463393	Nickel carbonyl			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
12054487	Nickel hydroxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1313991	Nickel oxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1146	Nickel refinery dust			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
12035722	Nickel subsulfide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1271289	Nickelocene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7697372	Nitric acid			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
139139	Nitrilotriacetic acid			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10102440	NITROGEN DIOXIDE			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1116547	N-Nitrosodiethanolamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55185	N-Nitrosodiethylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62759	N-Nitrosodimethylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
924163	N-Nitrosodi-n-butylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
621647	N-Nitrosodi-n-propylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
86306	N-Nitrosodiphenylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10595956	N-Nitrosomethylethylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
59892	N-Nitrosomorpholine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
684935	N-Nitroso-N-methylurea			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100754	N-Nitrosopiperidine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
930552	N-Nitrosopyrrolidine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
90040	o-Anisidine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95487	o-Cresol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8014957	OLEUM			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95534	o-Toluidine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95476	o-Xylene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10028156	OZONE			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1151	PAHs, total, w/o individ. components reported [Treated as B(a)P for HRA]			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1336363	PCBs {Polychlorinated biphenyls}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95692	p-Chloro-o-toluidine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120718	p-Cresidine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106445	p-Cresol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106467	p-Dichlorobenzene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

87865	Pentachlorophenol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
127184	Perchloroethylene {Tetrachloroethene}			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108952	Phenol			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75445	Phosgene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7803512	Phosphine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7664382	Phosphoric acid			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
85449	Phthalic anhydride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
156105	p-Nitrosodiphenylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7758012	Potassium bromate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
115071	Propylene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
107982	Propylene glycol monomethyl ethe			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75569	Propylene oxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75569	Propylene oxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
106423	p-Xylene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50555	Reserpine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7782492	Selenium			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7446346	Selenium sulfide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1175	Silica, crystalline			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7631869	Silica, crystalline			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10588019	Sodium dichromate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1310732	Sodium hydroxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7789062	Strontium chromate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100425	Styrene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9960	Sulfates			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9960	SULFATES			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7446095	Sulfur Dioxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7446719	Sulfur Trioxide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7664939	Sulfuric acid			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0	Tetrachlorophenols			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62555	Thioacetamide			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
62566	Thiourea			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108883	Toluene	9.92E-01		1.13E-04	0.00E+00	0.00E+00	5.66E-05	0.00E+00	5.66E-05
1204	Toluene diisocyanate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
26471625	TOLUENE DIISOCYANATE			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
584849	Toluene-2,4-diisocyanate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
91087	Toluene-2,6-diisocyanate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8001352	Toxaphene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
79016	Trichloroethylene			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0	Trichlororfluormethane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0	Trichlorotrifluormethane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
121448	Triethylamine			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
51796	Urethane			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440622	Vanadium (fume or dust)			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1314621	VANADIUM PENTOXIDE			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108054	Vinyl acetate			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75014	Vinyl chloride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75354	Vinylidene chloride			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1330207	XYLENES (mixed xylenes)	9.60E-01		1.10E-04	0.00E+00	0.00E+00	2.35E-05	0.00E+00	2.35E-05

Biological Assessment
Sojitz Energy Venture, Inc.
Rancho Grande Oil and Gas Exploration Project
Kern County, California

Prepared for:

Sojitz Energy Venture, Inc.
One Briar Lake Plaza
200 West Sam Houston Parkway, Suite 1450
Houston, TX 77401

Prepared by:

Robert A. Booher Consulting
Environmental Planning and Management
3221 Quail Hollow Drive
Fairfield, California 94534
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(707) 399-7835

April 2012

INTRODUCTION

Sojitz Energy Venture, Inc. (Sojitz) proposes to construct eight (8) well sites, and drill one (1) exploratory oil and gas well from each of the proposed well sites for a total of eight (8) exploratory wells within annual grassland habitat in southwestern Kern County, California. Sojitz retained the services of Irani Engineering (Irani) to secure required permits and clearances for the proposed project. Irani retained the services of Robert A. Booher Consulting (RAB Consulting) to conduct a biological survey and assessment of the proposed well sites, proposed access roads to the Rancho Grande 1-16 and 1-22 (the project sites), and buffer areas for submittal to the State of California, Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR).

On September 14 and 15, 2011, RAB Consulting conducted biological surveys of the proposed project area including the proposed well sites and access roads to Rancho Grande 1-16 and 1-22, as well as buffer areas to identify known or potential habitat for special-status wildlife and plant species. RAB Consulting conducted additional botanical surveys of the proposed project sites and buffer areas on April 10 and 11, 2012 during the appropriate blooming periods for special-status plant species. This report presents the results of our biological surveys and includes recommendations for avoidance and minimization measures to be implemented during the proposed project to avoid or minimize potential impacts to sensitive wildlife and plants and their habitats.

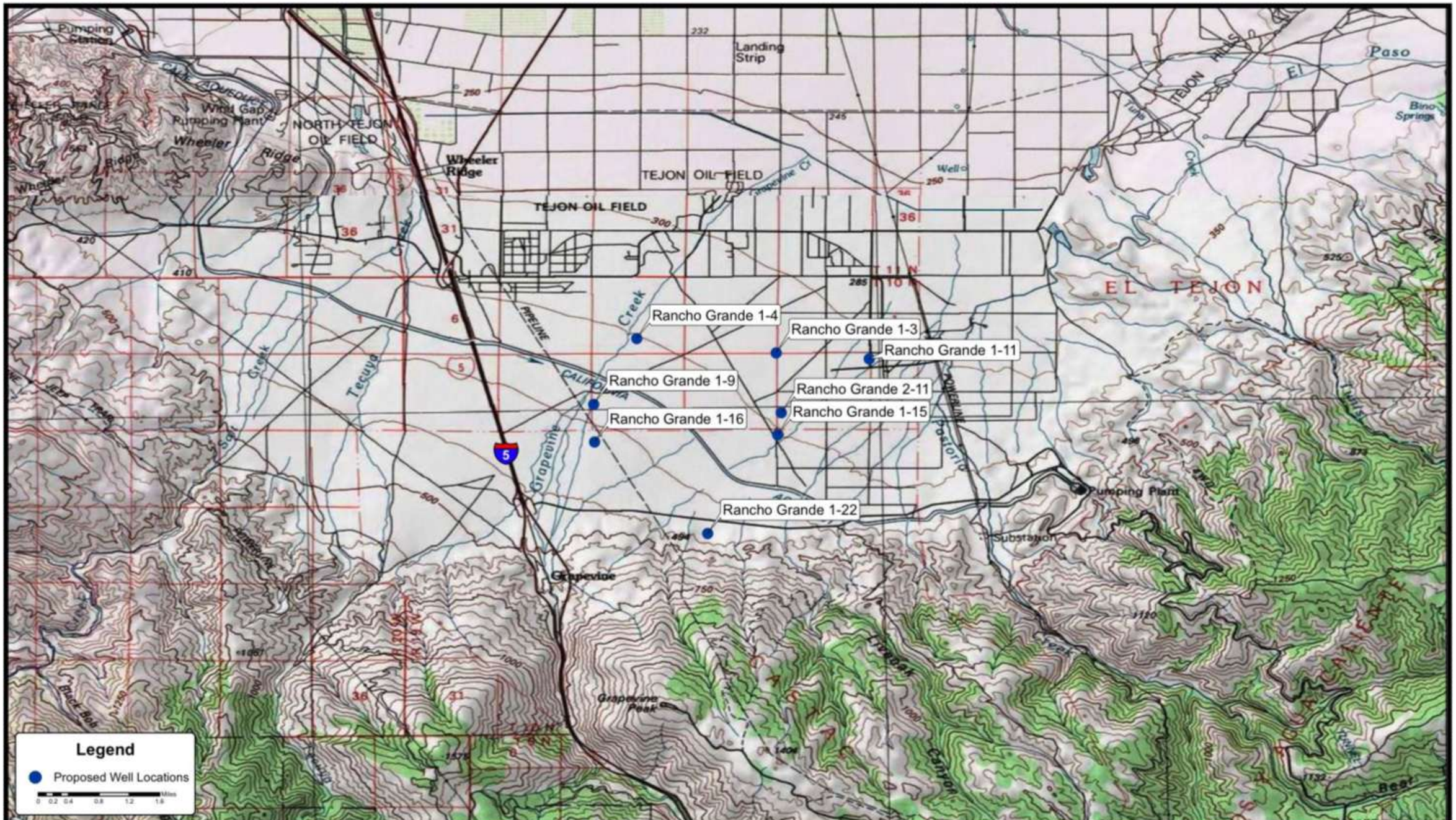
PROJECT LOCATION AND ENVIRONMENTAL SETTING

The proposed well sites are located between approximately 3.4 and 6.3 miles southwest of the community of Wheeler Ridge in southwestern Kern County, California (see Figures 1 and 2). The longitude and latitude using mapping datum WGS 84 for each of the proposed project sites are presented in Table 1.

Table 1
Locations of Proposed Project Sites

Well Name (Project Site)	Latitude and Longitude (WGS 84)
Rancho Grande 1-3	34.97015, -118.88295
Rancho Grande 1-11	34.96897, -118.86488
Rancho Grande 2-11	34.95873, -118.88193
Rancho Grande 1-15	34.95447, -118.88267
Rancho Grande 1-4	34.97281, -118.90955
Rancho Grande 1-9	34.96036, -118.91774
Rancho Grande 1-16	34.95369, -118.91744
Rancho Grande 1-22	34.93671, -118.89573

The proposed well sites are located in annual grassland habitat adjacent to existing access roads with the exception of the Rancho Grande 1-16 and 1-22 well sites, which will require a new access road. No valley saltbush scrub, wetlands, streams, or other sensitive habitats are present within the



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SOJITZ RANCHO GRANDE OIL AND GAS EXPLORATION PROJECT

Figure 1 - Project Vicinity Map

Sojitz Energy Venture, Inc.
One Briar Lake Plaza
200 West Sam Houston Parkway, Suite 1450
Houston, TX 77401

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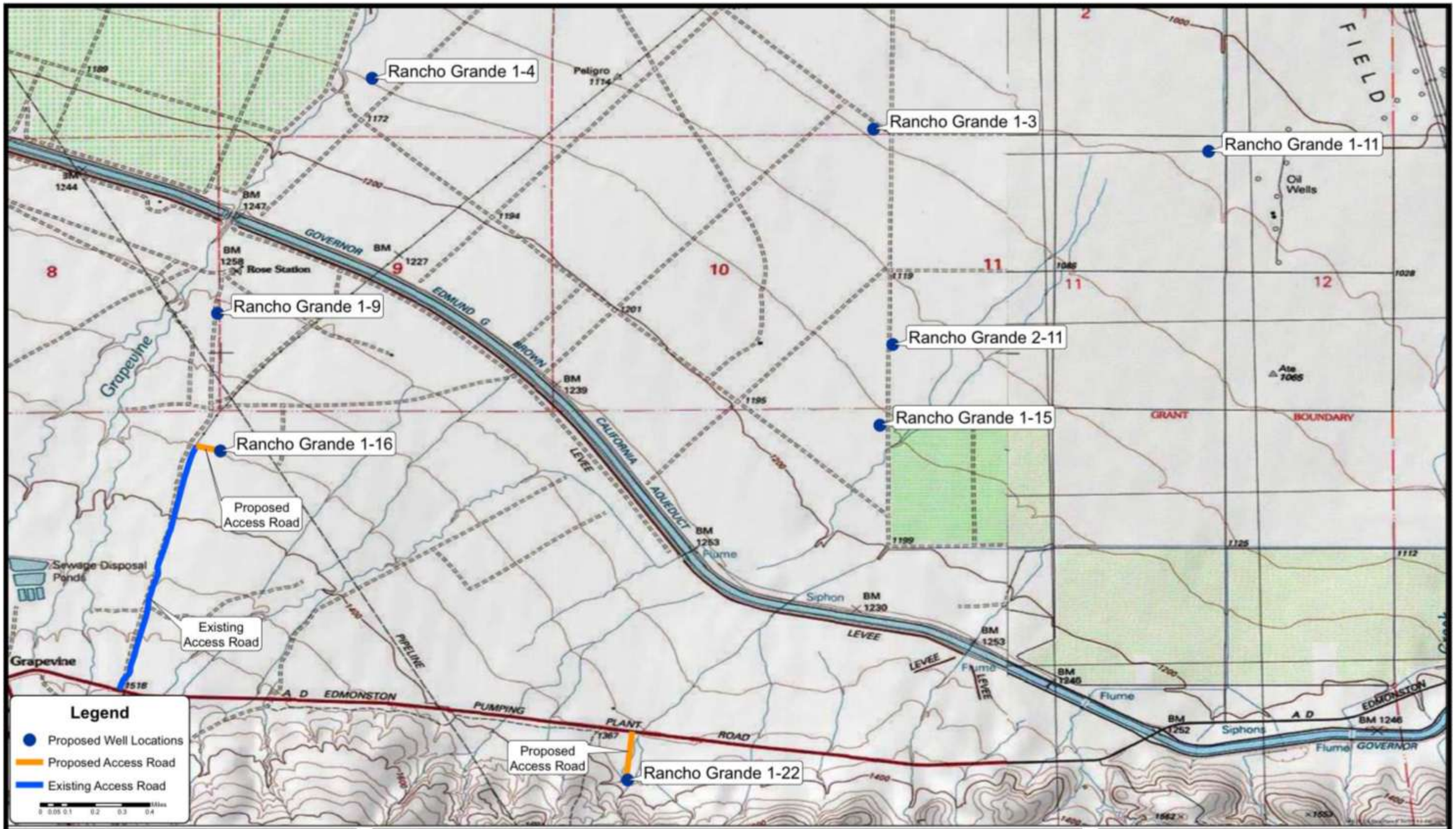

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SOJITZ RANCHO GRANDE OIL AND GAS EXPLORATION PROJECT

Figure 2 - Project Location Map

Sojitz Energy Venture, Inc.
One Briar Lake Plaza
200 West Sam Houston Parkway, Suite 1450
Houston, TX 77401

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boundaries of the proposed well sites or access road, or the buffers of these areas. The areas surrounding the proposed well sites consists of annual grasslands used for cattle and sheep grazing, and agricultural lands used for growing wine grapes (*Vitis vinifera*), alfalfa (*Medicago sativa*) hay, and almonds (*Prunus dulcis*).

No irrigation/drainage ditches are present within the proposed project sites or buffer areas. A number of dirt, gravel, and hard-topped access roads exist throughout the project area. Surrounding land uses include cattle grazing, agricultural activities, and oil/natural gas exploration and production activities.

Representative photographs of the proposed project sites are presented in Appendix A.

SURVEY METHODOLOGIES

Literature Review: We reviewed RAB Consulting data files, records from the California Natural Diversity Database (CNDDB) (California Department of Fish and Wildlife [CDFW[1]] 2011), the United States Fish and Wildlife Service (USFWS) online electronic database of threatened and endangered species (USFWS 2011), and the California Native Plant Society's (CNPS) *Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2011) for the USGS Frazier Mountain, Grapevine, Lebec, Mettler, Pastoria Creek, and Tejon Hills 7.5-minute quadrangle maps for special-status species that have potential to occur within the project area. Special-status species that potentially occur within and/or adjacent to the project sites and buffer areas are identified in Table 2. Figure 3 illustrates the location of documented special-status plant and animal occurrences within the project area.

Background information for listed wildlife and plant species (including biology, reasons for decline, limiting factors, etc.) that have potential to occur within and/or adjacent to the project sites and buffer areas is found in the recovery plan for upland species of the San Joaquin Valley, California (Williams et al. 1998). Species that do not have potential to occur are not discussed within this report.

Sources consulted for information on distribution of special-status wildlife species, as well as local and regional sensitive fauna include Remsen 1978 [birds], Williams 1986 [mammals], Jennings and Hayes 1994 [reptiles and amphibians], and Moyle et al. 1989 [fish] and Williams et al. (1998) for federal and state listed animal and plant species.

Special-Status Species - Special-status species are those taxa that are legally protected under the State or Federal Endangered Species Act (ESAs) or other regulations and considered sufficiently rare by the scientific community to qualify for such listing. Special-status plants and animals generally fall into one or more of the following categories:

[1] The California Department of Fish and Game (CDFW) changed its name to the California Department of Fish and Wildlife (CDFW) on January 1, 2013.

- Plants or animals listed or proposed for listing as threatened or endangered under the federal ESA (50 Code of Federal Regulations [CFR] 17.12 [listed plants], 1711 [listed animal] and various notices in the Federal Register [FR][proposed species]);

- Plants or animals that are candidates for possible future listing as threatened or endangered under the federal ESA (61 FR 40, February 28, 1996);

- Plants or animals listed or proposed for listing by the State of California as threatened or endangered under the California ESA (14 California Code of Regulations [CCR] 670.5);

- Animal species of special concern to the California Department of Fish and Game (CDFW) (Remsen 1978 [birds], Williams 1986 [mammals], Jennings and Hayes 1994 [reptiles and amphibians], Moyle et al. 1989 [fish]);

- Animals fully protected in California (California Fish and Game Code, Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]);

- Plants considered under the CNPS to be rare, threatened, or endangered in California (Lists 1B and 2) in CNPS (2001 and 2011) and Skinner and Pavlik (1994); and

Plants identified by CNPS for which more information is needed to determine their status (List 3) and plants of limited distribution (List 4) in CNPS (2001 and 2011) and Skinner and Pavlik (1994) – these taxa may be included as special-status species on the basis of local significance or recent biological information.

SENSITIVE WILDLIFE SPECIES SURVEYS

We surveyed the proposed well site locations, the proposed access roads to Rancho Grande 1-16 and 1-22, and a buffer area of 250 feet around the proposed well sites and access roads for sensitive wildlife and special-status plant species, their habitats, and other sensitive habitats on September 14 and 15, 2011. RAB Consulting conducted additional botanical surveys of the proposed project sites and buffer areas on April 10 and 11, 2012 during the appropriate blooming periods for special-status plant species. Wildlife species that we observed are discussed in text format and are presented in Table 3. A list of plant species observed during our surveys is presented in Table 4.

We used portions of standard agency approved methods to survey for special-status wildlife species. These methods are identified in the following references: CNPS (CNPS 1991, 2001b), CDFW (1984, 1990, 1995, 2000, 2003, and 2009), Orloff (1987), Nelson (1987), The California Burrowing Owl Consortium (1993), Tollestrup (1976), and USFWS (1989, 1995, 1996b, 1999, and 2000). In addition, guidelines given in Section 402.12 of the Federal Register Vol. 51, No. 106, pp. 19960-19963 for Biological Assessments were used to prepare this report. Surveys were conducted to identify the following:

- Suitability of habitat(s) to support special-status wildlife species
- Presence of known and potential San Joaquin kit fox dens

- Presence of blunt-nosed leopard lizard (BNLL) habitat and individuals
- Sightings, burrows, and "sign", of sensitive small mammal species

Table 2
Special-Status Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur in Project Area
Mammals					
San Joaquin antelope squirrel	*Ammospermophilus nelsoni*	-	CT	Found in western San Joaquin Valley from 200 to 1,200 feet elevation. Found on dry sparsely vegetated loam soils. Dig burrows or use kangaroo rat burrows. Require widely scattered shrubs, forbs, and grasses in broken terrain with gullies and washes.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffers areas. No potential burrows for this species were observed within the proposed well sites or proposed access roads to Rancho Grande 1-16 and 1-22. Potential burrows were observed within the buffer area of the proposed Ranch Grande 1-4, 1-16, and 1-22. However, potential habitat had an overall lack of bushes and shrubs, a component of the antelope squirrels habitat. No individual antelope squirrels or signs of their activity observed during surveys. This species has been documented approximately 0.9 miles west of the proposed Rancho Grande 1-16 well site (CDFW 2011) (see Figure 3).
Pallid bat	*Antrozous pallidus*	-	CSC	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Potentially present. Suitable foraging habitat for this species is present within the proposed project sites and buffer areas. However, no maternity or nesting sites observed during biological surveys. This species has not been documented within the proposed project area (CDFW 2011) (see Figure 3).
Giant kangaroo rat	*Dipodomys ingens*	FE	CE	Prefer annual grassland on gentle slopes of generally less than 10°, with friable, sandy-loam soils. However, most remaining populations are found on poorer, marginal habitats which include shrub communities on a variety of soil types and on slopes up to about 22°. Giant kangaroo rats develop burrow systems with one to five or more separate openings. Utilize two types of burrow: 1) a vertical shaft with a circular opening and no dirt apron, and 2) a larger, more horizontally-opening shaft, usually wider than high with a well-worn path leading from the mouth.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffers areas. No potential burrows for this species were observed within the proposed well sites or proposed access roads to Rancho Grande 1-16 and 1-22. Potential burrows were observed within the buffer area of the proposed Ranch Grande 1-4, 1-16, and 1-22. No individual giant kangaroo rats observed during surveys. This species has not been documented within the proposed project area (CDFW 2011) (see Figure 3).

Table 2
Special-Status Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur in Project Area
Tipton kangaroo rat	*Dipodomys nitratoides nitratoides*	FE	CE	Found in saltbush scrub and sink scrub communities in the Tulare Lake Basin of the southern San Joaquin Valley. Require soft friable soils which escape seasonal flooding. Dig burrows in elevated soil mounds at bases of shrubs.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffers areas. No potential burrows for this species were observed within the proposed well sites or proposed access roads to Rancho Grande 1-16 and 1-22. Potential burrows were observed within the buffer area of the proposed Ranch Grande 1-4, 1-16, and 1-22. No individual Tipton kangaroo rats observed during surveys. This species has been documented in the immediate vicinity of the proposed Rancho Grande 1-9 well site (CDFW 2011) (see Figure 3).
Tehachapi pocket mouse	*Perognathus alticolus inexpectatus*	-	CSC	Arid annual grassland and desert shrub communities. Also found in fallow grain fields and in Russian thistle. Burrows for cover and nesting. Aestivates and hibernates during extreme weather. Forages on open ground and under shrubs.	No potential. The proposed project sites are outside of the elevational range of this species.
American badger	*Taxidea taxus*	-	CSC	Found in drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Require uncultivated ground. Prey on burrowing rodents. The American badger digs their own burrows.	Potentially present. Suitable habitat for this species was observed within annual grassland habitat within the proposed project sites and buffer areas. No potential burrows for this species were observed within the biological survey area. No individual American badgers or signs of their activity observed during surveys. This species has been documented in the immediate vicinity of the proposed Rancho Grande 1-4, 1-9, and 1-16 well sites (CDFW 2011) (see Figure 3).
San Joaquin kit fox	*Vulpes macrotis mutica*	FE	CT	Inhabit annual grasslands or grassy open stages with scattered shrubby vegetation. Require loose-textured sandy soils for burrowing, and a suitable prey base.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffer areas. No potential burrows for this species were observed within the biological survey area. No individual San Joaquin kit foxes or signs of their activity observed during surveys. This species has been documented in the immediate vicinity of the

Table 2
Special-Status Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur in Project Area
					Rancho Grande 1-22 (CDFW 2011) (see Figure 3).
Birds					
Tricolored blackbird	*Agelaius tricolor*	-	CSC	Highly colonial species. Most numerous in Central Valley and Vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few kilometers of their colony.	No potential. No suitable habitat found within the project sites or buffer areas.
Grasshopper sparrow	*Ammodramus savannarum*	-	CSC	Found in dense grasslands on rolling hills, lowland plains, in valleys, and on hillsides on lower mountain slopes. Favors native grasslands with a mix of grasses, forbs, and scattered shrubs.	Potentially present. Suitable habitat for this species was observed within the proposed well project sites and buffer areas. No individual grasshopper sparrows or nest sites observed during surveys. This species has not been documented in the proposed project area (CDFW 2011) (see Figure 3).
Golden eagle	*Aquila chrysaetos*	-	CFP	Golden eagles are found in open and semi-open habitats from sea level to 3,600 meters elevation. Habitat types that they inhabit include tundra, shrublands, grasslands, woodland-brushlands, and coniferous forests. Most golden eagles are found in mountainous areas, but they also nest in wetland, riparian and estuarine habitats.	No potential. No suitable habitat found within the project sites or buffer areas. Additionally, the proposed project sites are outside of the elevational range of this species.
Long-eared owl	*Asio otus*	-	CSC	Riparian bottomlands grown to tall willows and cottonwoods. Also found in belts of live oaks paralleling stream courses. Require adjacent open land with the presence of mice and old nests of crows, hawks, or magpies for breeding.	No potential. No suitable habitat found within the project sites or buffer areas.
Burrowing owl	*Athene cunicularia*	-	CSC	Open grasslands, prairies, farmlands, and deserts.	Potentially present. Suitable habitat for this species was observed within the proposed well project sites and buffer areas. No potential burrows that were of appropriate size for use by this species were observed during biological surveys. This species has not been documented within the proposed project area (CDFW 2011) (see Figure 3).

Table 2
Special-Status Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur in Project Area
Southwestern willow flycatcher	*Empidonax traillii extimus*	FE	CE	Riparian woodlands in southern California.	No potential. No suitable habitat found within the project sites or buffer areas.
Bald eagle	*Haliaeetus leucocephalus*	Delisted	CE/CFP	Nests and winters near ocean shores, lake margins and rivers. Nests in large, old-growth, or dominant live trees with open branches, especially Ponderosa pine. Roosts communally in winter.	No potential. No suitable habitat found within the project sites or buffer areas.
California condor	*Gymnogyps californianus*	FE	CE, Fully protected	Found as a recently reintroduced species primarily in the mountains of Ventura, Santa Barbara, and Los Angeles counties. However, individuals are known to be wide ranging and have even been seen soaring over the Tehachapi Mountains and southern Sierra Nevada. The species is strictly a scavenger and may travel up to 35 miles or more from roost sites in search of carrion. Most foraging occurs in open habitats that facilitate landings and takeoffs. Traditional roost sites are on cliffs or ledges, but snags and trees in old growth coniferous forest may also be used.	Potentially present. Suitable foraging habitat for this species was observed within the proposed project sites and buffer areas. No potential nesting habitat for this species is present within the project sites or buffer areas. No individual California condors observed during surveys. This species has not been documented in the proposed project area (CDFW 2011) (see Figure 3).
Invertebrates					
Vernal pool fairy shrimp	*Branchinecta lynchii*	FT	-	Found in short-lived seasonal cool-water vernal pools with low to moderate dissolved solids.	No potential. No suitable habitat found within the project sites or buffer areas.
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FT	-	Occurs only in the Central Valley of California, in association with blue elderberry (*Sambucus mexicana*). Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for stressed elderberry shrubs.	No potential. No suitable habitat (elderberry bushes) found within the project sites or buffer areas.
Amphibians and Reptiles					
Tehachapi slender salamander	*Batrachoseps stebbinsi*	-	CT	Valley foothill hardwood-conifer and valley-foothill riparian habitats in the Piute and Tehachapi Mountains of Kern County. Prefers wet talus slopes or log-strewn hillsides with a steep, north facing exposure.	No potential. No suitable habitat found within the project sites or buffer areas.

Table 2
Special-Status Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur in Project Area
Western pond turtle	*Emys marmorata*	-	CSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Require basking sites and suitable upland habitat (sandy banks or grassy open fields) for egg-laying.	No potential. No suitable habitat found within the project sites or buffer areas.
Yellow-blotched salamander	*Ensatina eschscholtzii croceator*	-	CSC	Forests and well shaded canyons, as well as oak woodlands and old chaparral. Require surface objects such as logs, boards, and rocks. Also require old rodent burros or other underground retreats.	No potential. No suitable habitat found within the project sites or buffer areas.
Blunt-nosed leopard lizard	*Gambelia sila*	FE	CE, Fully Protected	Resident of sparsely vegetated alkali and desert scrub habitats, in areas of low topographic relief. Seeks cover in mammal burrows, under shrubs or structures such as fence posts. They do not excavate their own burrows.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffers areas. No potential burrows for this species were observed within the proposed well sites or proposed access roads to Rancho Grande 1-16 and 1-22. Potential burrows were observed within the buffer area of the proposed Ranch Grande 1-4, 1-16, and 1-22. No individual blunt-nosed leopard lizards observed during surveys. This species has been documented in the immediate vicinity of the Rancho Grande 1-22, Rancho Grande 2-11, and Rancho Grande 1-15 well site (CDFW 2011) (see Figure 3).
Coast horned lizard	*Phrynosoma blainvillii*	-	CSC	Inhabits coastal sage scrub and chaparral in arid and semiarid climate conditions. Prefers friable, rocky, or shallow sandy soils.	No potential. No suitable habitat found within the project sites or buffer areas.

Table 2
Special-Status Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur in Project Area
California red-legged frog	*Rana draytonii*	FT	CSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11 to 20 weeks of permanent water for larval development. Must have access to aestivation habitat, consisting of small mammal burrows and moist leaf litter.	No potential. No suitable habitat found within the project sites or buffer areas.
Plants					
Horn's milk vetch	*Astragalus hornii var. hornii*	-	List 1B	Meadows, seeps, playas, and lake margins. Elevational range: 60 to 850 meters. Blooming period: May through October.	No potential. No suitable habitat found within the project sites or buffer areas.
Round-leaved filaree	*California macrophylla*	-	List 1B	Cismontane woodland, valley and Foothill Grassland on clay soils. Elevational range: 15 to 1,200 meters. Blooming period: March through May.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffer areas. This species was not observed during biological surveys. This species has not been documented in the project area (CDFW 2011) (see Figure 3).
Palmer's mariposa lily	*Calochortus palmeri var. palmeri*	-	List 1B	Chaparral, lower montane coniferous forest, meadows, and seeps. Elevational range: 1,000 to 2,390 meters. Blooming period: April through July.	No potential. No suitable habitat found within the project sites or buffer areas. Additionally, the proposed project sites are outside of the elevational range of this species.
Lemmon's jewelflower	*Caulanthus coulteri var. lemmonii*	-	List 1B	Pinyon and juniper woodland, valley and foothill grassland. Elevational range: 80 to 1,220 meters. Blooming period: March through May.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffer areas. This species was not observed during biological surveys. This species has not been documented in the project area (CDFW 2011) (see Figure 3).
Tehachapi buckwheat	*Eriogonum callistum*	-	List 1B	Chaparral. Elevational range: 1,400 to 1,500 meters. Blooming period: May through July.	No potential. No suitable habitat found within the project sites or buffer areas. Additionally, the proposed project sites are outside of the elevational range of this species.
Fort Tejon woolly sunflower	*Eriophyllum lanatum var. hallii*	-	List 1B	Chaparral and cismontane woodland. Elevational range: 1,065 to 1,500 meters. Blooming period: May through July.	No potential. No suitable habitat found within the project sites or buffer areas. Additionally, the proposed project sites are outside of the elevational range of this species.
Tejon poppy	*Eschscholzia lemmonii*	-	List 1B	Chenopod scrub and valley and foothill	Potentially present. Suitable habitat for this

Table 2
Special-Status Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur in Project Area
	ssp. kernensis			grasslands. Elevational range: 160 to 1,000 meters. Blooming period: March through May.	species was observed in annual grassland habitat within the proposed project sites and buffer areas. This species was not observed during biological surveys. This species has not been documented in the project area (CDFW 2011) (see Figure 3).
Comanche Point layia	*Layia leucopappa*	-	List 1B	Chenopod scrub and valley and foothill grassland. Elevational range: 100 to 350 meters. Blooming period: March through April.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffer areas. This species was not observed during biological surveys. This species has not been documented in the project area (CDFW 2011) (see Figure 3).
Calico monkeyflower	*Mimulus pictus*	-	List 1B	Broadleaved upland forest and Cismontane woodland. Elevational range: 100 to 1,300 meters. Blooming period: March through May.	No potential. No suitable habitat found within the project sites or buffer areas.
Tehachapi monardella	*Monardella linoides ssp. oblonga*	-	List 1B	Lower montane coniferous forest, pinyon and juniper woodland, and upper montane coniferous forest. Elevational range: 900 to 2,470 meters. Blooming period: June through August.	No potential. No suitable habitat found within the project sites or buffer areas. Additionally, the proposed project sites are outside of the elevational range of this species.
Baja navarretia	*Navarretia peninsularis*	-	List 1B	Chaparral, lower montane coniferous forest, meadows, seeps, and pinyon and juniper woodland. Elevational range: 1,500 to 2,300 meters. Blooming period: June through August.	No potential. No suitable habitat found within the project sites or buffer areas. Additionally, the proposed project sites are outside of the elevational range of this species.
Piute Mountains navarretia	*Navarretia setiloba*	-	List 1B	Cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland. Elevational range: 305 to 2,100 meters. Blooming period: April through July.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffer areas. This species was not observed during biological surveys. This species has been documented approximately 2.0 miles southeast of the proposed Rancho Grande 1-15 well site (CDFW 2011) (see Figure 3).
Robbin's nemacladus	*Nemacladus secundiflorus var. robbinsii*	-	List 1B	Chaparral and valley and foothill grassland. Elevational range: 350 to 1,700 meters. Blooming period: April through June.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffer areas. This species was not observed during biological surveys. This species has not been documented in the project area (CDFW 2011) (see Figure 3).

Table 2
Special-Status Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur in Project Area
Bakersfield cactus	*Opuntia treleasei*	FE	CE, List 1B	Chenopod scrub, cismontane woodland, and valley and foothill grassland. Elevational range: 120 to 1,140 meters. Blooming period: April through May.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffer areas. This species was not observed during biological surveys. This species has not been documented in the project area (CDFW 2011) (see Figure 3).
San Bernardino aster	*Symphyotrichum defoliatum*	-	List 1B	Cismontane woodland, coastal scrub, lower montane coniferous forest, meadows, seeps, marshes, swamps, and valley and foothill grassland. Elevational range: 2 to 2,040 meters. Blooming period: July through November.	Potentially present. Suitable habitat for this species was observed in annual grassland habitat within the proposed project sites and buffer areas. This species was not observed during biological surveys. This species has not been documented in the project area (CDFW 2011) (see Figure 3).
Sensitive Habitats					
Southern Cottonwood Willow Riparian Forest (not present)					
Valley Needlegrass Grassland (not present)					
Valley Oak Woodland (not present)					

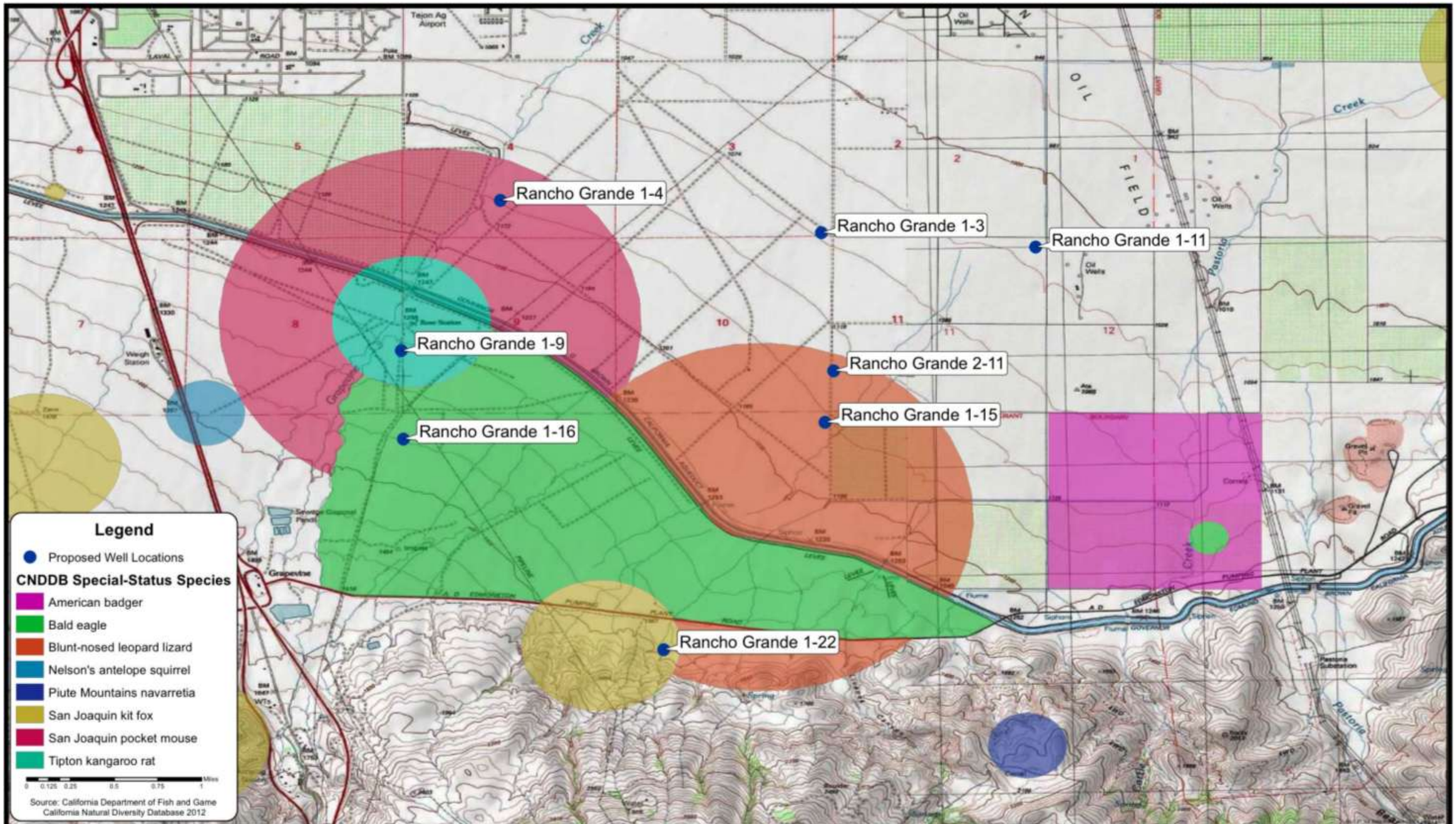
Status Codes:

Federal
FE = Federally listed as Endangered
FT = Federally listed as Threatened
FC = Federal Candidate species

State
CE = California listed as Endangered
CT = California listed as Threatened
CR = California listed as Rare
CFP = California Fully Protected

California Native Plant Society
CNPS 1B = Plants rare or endangered in California and elsewhere
CNPS 2 = Plants rare or endangered in California, but more common elsewhere
CNPS 3 = Plants about which we need more information
CNPS 4 = Plants of limited distribution; a watch list.

Status and habitat information from California Natural Diversity Database (CDFW 2011), California Native Plant Society Electronic Inventory (CNPS 2011), and USFWS Online Endangered Species Database (USFWS 2011).



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SOJITZ RANCHO GRANDE OIL AND GAS EXPLORATION PROJECT

Figure 3- CNDDB Species Occurrences in the Vicinity of Project Area

Sojitz Energy Venture, Inc.
One Briar Lake Plaza
200 West Sam Houston Parkway, Suite 1450
Houston, TX 77401

- Sightings, burrows, and "sign", of western burrowing owls and other sensitive avian species
- Vegetation association, habitat types, and special-status plant species
- Dominant plant canopy and ground cover species
- Habitat condition and quality
- On-site, adjacent, and surrounding land uses

We conducted surveys by walking parallel meandering transects spaced 30 to 50 feet apart to identify special-status wildlife species. Presence of these species was confirmed by direct observation or by identification of "sign" (e.g., tracks, scats, dens and/or burrows, etc.) unique to a particular species.

San Joaquin Kit Fox - We conducted diurnal surveys for San Joaquin kit fox dens and their "sign." Scats measuring 15 to 20 millimeter in diameter of appropriate canid shape was attributed to kit fox. No other vulpid is known to inhabit the project area, and scats larger than 20 millimeter in diameter probably belong to coyote (*Canis latrans*) or domestic dog (*Canis familiaris*). Canid tracks up to 45 by 38 millimeter in size were attributed to kit fox. Tracks larger than this are probably attributable to coyote or domestic dog (Murie 1974).

We conducted surveys along transects spaced 30 to 50 feet apart following CDFW Approved Survey Methodologies for Sensitive Species (CDFW 1990) and by USFWS guidelines (USFWS 1989, 1995, 1999). If San Joaquin kit fox "sign" and dens were identified, they were recorded and mapped on USGS topographic maps. In addition, we used knowledge gained from past experiences working with numerous kit fox dens and their "sign" (tracks, scats, etc.) during radio telemetry studies, and kit fox den identifications during other preactivity surveys. We classified underground dens according to the following USFWS kit fox den definitions (USFWS 1989 and 1995):

> ***Known Den*:** Any existing natural den or man-made structure for which conclusive evidence or strong circumstantial evidence can be shown that the den is used or has been used at any time in the past by San Joaquin kit fox.
>
> ***Potential Den*:** Any natural den or burrow within the species' range that has entrances of appropriate dimensions (5 to 8 inches in diameter) to accommodate San Joaquin kit foxes for which, however, there is little to no evidence of kit fox use.
>
> ***Pupping Den*:** Any known San Joaquin kit fox den (as defined - see above) used by kit foxes to whelp and/or rear their pups.
>
> ***Atypical Den*:** Any known San Joaquin kit fox den that has been established in, or in association with, a man-made structure.

San Joaquin Antelope Squirrel - We surveyed for San Joaquin antelope squirrels, their scats and potential burrows while conducting surveys for other species (i.e., San Joaquin kit foxes and blunt-nosed leopard lizard [BNLL]) (CDFW 1990).

Giant Kangaroo Rat – We surveyed for evidence of giant kangaroo rats within the project area by searching for their burrow systems (precincts that may have 1 to 4 entrances, each 50 to 55 millimeter in diameter) and for small holes where seeds are stored (pit caches) that may be excavated around burrow entrances and at the edges of the precincts. In addition, we searched for clipped areas ("mowed" areas) and "hay stacks" of clipped grasses around suitable burrows for this species. Haystacks are a diagnostic characteristic for determining presence of this species (Williams and Killburn 1991).

BNLL - We surveyed for potential presence of BNLL and to evaluate suitability of habitat to support this species by walking parallel transects spaced 30 to 50 feet apart (Tollestrup 1976, as modified by CDFW 1990 and 2004). We identified all lizards observed with the aid of binoculars.

Other Sensitive Wildlife - We surveyed for evidence of pallid bat, Tipton kangaroo rat, Tehachapi pocket mouse, American badger, grasshopper sparrow, burrowing owl, California condor, and other targeted species of concern (see Table 2) while conducting transect surveys. This consisted of recording sightings of the species and/or their "sign" (tracks, scats, dens and/or burrows, etc.).

SPECIAL-STATUS PLANT SURVEYS

Literature Review: Prior to conducting field surveys, we reviewed information from published and unpublished sources to determine special-status plant species known, or that have potential to occur in the vicinity of the proposed project sites. Special-status plant species include species listed as Endangered, Threatened, or Rare by USFWS (1990, 2000, and 2011), or by CDFW (1989, 2009, and 2011), and species listed by Smith and Berg (1988) and CNPS (2001 and 2011). Sources consulted for information on the distribution of special-status plant species include regional and local floras (Abrams 1923, 1944, 1951, Abrams and Ferris 1960, Hickman 1996, Twisselmann 1956, 1967, Moe 1995, Munz and Keck 1968), occurrence records and maps from CNDDB (CDFW 2011), county and USGS quadrangle records in Smith and Berg (1988), CNPS (2001 and 2011), and occurrence records from previous surveys in the region. In addition, we consulted Taylor (1987) and Taylor and Davilla (1986) for locations of endemic San Joaquin Valley listed plant species that have potential to occur within the area surrounding the proposed project.

Plant Species Surveys and Identification - We surveyed 30 to 50 feet wide transects within the proposed well sites, proposed access roads to Rancho Grande 1-16 and 1-22, and a buffer area of 250 feet around these areas on September 14 and 15, 2011. RAB Consulting conducted additional botanical surveys of the proposed project sites and buffer areas on April 10 and 11, 2012 during the appropriate blooming periods for special-status plant species. We identified vascular plant species encountered in the surveys, which were in identifiable condition using standard manuals (Abrams 1923, 1944, 1951, Abrams and Ferris 1960, Hickman 1996, Moe 1995, Munz and Keck 1968 and Twisselmann 1956, 1967). Scientific nomenclature used for plant species in this report follows Hickman (1996), Munz and Keck (1968), and Kartesz and Kartesz (1980). We used modifications of Cheatham and Haller (1975) and Holland (1986) to describe habitat types found on the project sites. Our plant surveys were conducted during the appropriate blooming period of all of the 8 targeted special-status plant species identified in Table 2 as potentially occurring within the project sites and areas.

RESULTS AND DISCUSSION

Results of our biological surveys for the proposed project are presented below. The following discussion focuses on special-status wildlife species that could potentially occur within the proposed project sites and buffer areas. Special-status wildlife species that have no potential to occur within the project sites or buffer areas are not discussed further. Wildlife species observed during our surveys are presented in Table 3.

San Joaquin Kit Fox - We observed no burrows that were of adequate size for potential use by San Joaquin kit foxes during our survey. There were no "active signs" (i.e., adult and puppy scat, prey remains, tracks, fur, etc.) of use by San Joaquin kit fox observed during surveys. San Joaquin kit foxes have been documented in the immediate vicinity of the Rancho Grande 1-22 (CDFW 2011) (see Figure 3).

American Badger - We observed no burrows that were of adequate size for potential use by American badgers during our survey. There were no "active signs" (i.e., scat, prey remains, tracks, fur, etc.) of use by American badgers observed during surveys. This species has been documented in the immediate vicinity of the proposed Rancho Grande 1-4, 1-9, and 1-16 well sites (CDFW 2011) (see Figure 3).

Sensitive Small Mammal Species - We did not observe San Joaquin antelope squirrels during our surveys within the project area. We searched for burrows and scat of this species and were vigilant for sightings (and listened for vocalizations), but found no evidence of *A. nelsoni* during our surveys. We did not observe burrows appropriate for use by this species within the proposed project sites during biological surveys. Potential burrows that could be utilized by this species were observed within the buffer area of the proposed Rancho Grande 1-4, 1-16, and 1-22 well sites. These potential burrows were greater than 50 feet in distance from these project sites. No individual squirrels were observed during surveys. Ground cover within the proposed project sites and buffer areas was deemed lower in quality due to a lack of shrub cover. This species has been documented approximately 0.9 miles west of the proposed Rancho Grande 1-16 well site (CDFW 2011) (see Figure 3).

We found no evidence (i.e., precinct mounds, vertical and pit cache holes, scats, tracks, tail drags, etc.) of giant kangaroo rats (recent and/or past use) within the proposed project sites or buffer areas during biological surveys. We observed potential burrows that could be utilized by this species within the buffer areas of the proposed Rancho Grande 1-4, 1-16, and 1-22 well sites. These burrows were greater than 50 feet in distance from these proposed project sites. We found appropriate vegetative communities for this species (i.e., annual grassland habitat) within the proposed project sites and buffer areas. This species has not been documented within the project or area (CDFW 2011) (see Figure 3).

We found no evidence (i.e., pit cache holes, scats, tracks, tail drags, etc.) of Tipton kangaroo rats within the proposed project sites or buffer areas during biological surveys. We observed potential burrows that could be utilized by this species within the buffer areas of the proposed Rancho Grande 1-4, 1-16, and 1-22 well sites. These burrows were greater than 50 feet in distance from these proposed project sites. However, we found no evidence (i.e., vertical and pit cache holes,

scats, tracks, tail drags, etc.) of this species adjacent to these potential burrows. We found appropriate vegetative communities for this species (i.e., annual grassland habitat) within the proposed project sites and buffer areas. This species has been documented in the immediate vicinity of the proposed Rancho Grande 1-9 well site (CDFW 2011) (see Figure 3).

We observed potential foraging habitat for the Pallid Bat within all areas surveyed during biological surveys. However, we did not observe any known or potential maternity or nesting sites during biological surveys. No individual pallid bats were observed during biological surveys. This species has not been documented within the project area (CDFW 2011) (see Figure 3). This species may forage intermittently throughout the project area, but is not expected to nest.

Blunt-Nosed Leopard Lizard - We observed potential habitat for this species within annual grassland habitat in the proposed project sites and buffer areas during biological surveys. We did not observe burrows appropriate for use by this species within any of the proposed project sites. Potential burrows that could be utilized by this species were observed within the buffer areas of the proposed Rancho Grande 1-4, 1-16, and 1-22. These burrows were greater than 50 feet in distance from these proposed project sites. We evaluated the proposed project sites as being unsuitable in their current state for BNLLs because of a lack of suitable small mammal burrows. As such, additional protocol level surveys were not conducted and are not required. This species has been documented in the immediate vicinity of the Rancho Grande 1-22, Rancho Grande 2-11, and Rancho Grande 1-15 well sites (CDFW 2011) (see Figure 3).

Sensitive Avian Species - Suitable habitat for burrowing owls was observed in annual grassland habitat within the proposed project sites and buffer areas during biological surveys. However, no known or potential burrows that could be used by this species for nesting activities were observed during biological surveys. No burrowing owls were observed during biological surveys, and this species has not been documented within previously within the project area (CDFW 2011) (see Figure 3).

Potential nesting and foraging habitat for grasshopper sparrows was observed within the proposed project sites and buffer areas during biological surveys. However, no nesting sites (active or inactive) were observed for this species during field surveys. No individual grasshopper sparrows were observed during biological surveys. Grasshopper sparrows have not been documented within the project area (CDFW 2011) (see Figure 3).

The California condor typically nests in chaparral, conifer forest, or oak woodland communities. Historically, condors nested on bare ground in caves and crevices, behind rock slabs, or on large ledges or potholes on high sandstone cliffs in isolated, extremely steep, rugged areas. Cavities in giant sequoia (*Sequoiadendron giganteum*) and redwood (*Sequoia sempervirens*) have also been documented. Nest sites are often surrounded by dense brush. Nest sites also have the following requirements:

- Entrances large enough for the adults to fit through;
- Ceiling height of at least 14.8 inches at the egg position;
- Floors fairly level with some loose surface substrate;
- Nest space unconstricted for incubating adults; and

- A nearby landing point.

Most foraging occurs in open terrain of foothills, grasslands, potreros with chaparral areas, or oak savannah habitats. Historically, foraging also occurred on beaches and large rivers along the Pacific coast. Water is required for drinking and bathing.

California condors are opportunistic scavengers, feeding exclusively on the carcasses of dead animals. Typical foraging behavior includes long-distance reconnaissance flights, lengthy circling flights over a carcass, and hours of waiting at a roost or on the ground near a carcass. California condors travel up to 150 miles in a single day in search of food. They typically fly at a height of approximately 600 feet while in search of carrion. However, they have been recorded at heights of 15,000 feet while in flight.

Suitable foraging habitat for California condors was observed within the proposed project sites and buffer areas during surveys. However, no potential nesting habitat (cliffs at higher elevations or old growth forest) was observed during field surveys. This raptor species may, however, forage intermittently within the project area. No condor sightings have been documented in the immediate area of the proposed project sites, and no individual condors were observed during field surveys.

A number of avian species protected under the Federal Migratory Bird Treaty Act were observed foraging during field surveys (see Table 3 below for a list of these species). No active or inactive nesting sites were observed during biological surveys. The potential exists that avian species (including those listed in Table 3 below) may nest in nut trees and grape vines within the buffer areas of the proposed Rancho Grande 1-3 and 1-15 well sites. However, it is unlikely that nesting takes place in these orchards due to the agricultural nature of these areas (active maintenance of trees and vines for production). Therefore, these avian species are expected to not nest in the buffer areas of these project sites, and no avoidance measures are required as part of the proposed project.

Incidental Wildlife – Wildlife species that we recorded during our focused surveys for special-status species are listed in Table 3 below.

Special-Status Plants – No special-status plant species were identified during the course of botanical surveys within the project sites and buffer areas. Surveys were conducted during the appropriate blooming period of all of the 8 targeted special-status plant species identified in Table 2 as potentially occurring within the project sites and areas. The annual grassland habitat found within the project sites and buffer areas is disturbed due to ongoing cattle grazing activities, and the likelihood of special-status plant species occurring within the proposed project sites is unlikely. Additionally, non-native weedy grassland species within the project sites and buffer areas likely out compete special-status species that could occur within the project sites and buffer areas.

Habitat Types – Habitat types observed during field surveys are described further below:

Ruderal/Disturbed

This habitat type was observed within and along the edges of existing access roads adjacent to the proposed project sites proposed for use during project activities. This vegetative community was also observed adjacent to wine/almond orchards and alfalfa fields with the buffer areas of the proposed Rancho Grande 1-3, 1-4, and 1-15 well sites during biological surveys. Common plant species found in this community were composed primarily of weedy non-native and native species. Vegetative species observed included slender wild oats (*Avena barbata*), wild oat (*Avena fatua* L.), black mustard (*Brassica nigra* [L.] Koch), soft chess brome (*Bromus hordeaceus*), rip-gut brome (*Bromus rigidus* Roth), common mallow (*Malva neglecta* Wallr.), pineapple-weed (*Matricaria matricariodes*), alfalfa (*Medicago sativa*), perennial sowthistle (*Sonchus arvensis* L.), spiny sowthistle (*Sonchus asper* [L.] Hill), and annual sowthistle (*Sonchus oleraceus* L.).

Wildlife use of this community is limited due to the monocultural and weedy nature of plant species present. Although the diversity of wildlife is limited, species that do occur in the habitat type are often abundant and well adapted to the presence of humans.

Table 3
Wildlife Species Observed within Proposed Project Area

Birds

Turkey vulture (*Cathartes aura*)
Common raven (*Corvus corax*)
Western meadowlark (*Sturnella neglecta*)
American crow (*Corvus brachyrhynchos*)
House sparrow (*Passer domesticus*)
Mourning dove (*Zenaida macroura*)

Mammals

Domesticated cattle (*Bos tauras*)
Black-tailed jackrabbit (*Lepus californicus*)
Coyote (*Canis latrans*)
Domesticated sheep (*Ovis aries*)

Reptiles

Common side-blotched lizard (*Uta stansburiana*)

Non-Native Annual Grassland

Non-native annual grassland was observed within all of the proposed well sites, the proposed access roads to Rancho Grande 1-16 and 1-22 and within the buffer areas of the proposed well sites and access road. Common species found in this vegetative community were composed of introduced grasses and broadleaf weedy species. Plant species observed during field surveys included blow wives (*Achyrachaena mollis*), fiddleneck (*Amsinckia intermedia*), ranchers fireweed (*Amsinckia menziesii*), Mt. Diablo locoweed (*Astragalus oxyphysus*), slender wild oats (*Avena barbata*), wild oat (*Avena fatua* L.), black mustard (*Brassica nigra* [L.] Koch), soft chess brome (*Bromus hordeaceus*), red brome (*Bromus madritensis ssp. rubens*), rip-gut brome (*Bromus rigidus* Roth), red maids (*Calandrinia ciliata*), shepherd's-purse (*Capsella bursa-pastoris*), turkey mullein (*Croton setigerus*), redstem filaree (*Erodium cicutarium*), broadleaf filaree (*Erodium botrys*), California poppy (*Eschscholzia californica*), hare barley (*Hordeum leporinum*), hill lotus (*Lotus humistratus*), horehound (*Marrubium vulgare*), lacepod

(*Thysanocarpus curvipes*), vinegar weed (*Trichostema lanceolatum*), and red clover (*Trifolium pratense*).

Wildlife species observed in this community during field surveys included domesticated cattle (*Bos tauras*), coyote (*Canis latrans*), turkey vulture (*Cathartes aura*), American crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), Black-tailed jackrabbit (*Lepus californicus*), Domesticated sheep (*Ovis aries*), house sparrow (*Passer domesticus*), western meadowlark (*Sturnella neglecta*), common side-blotched lizard (*Uta stansburiana*), and mourning dove (*Zenaida macroura*).

Agricultural Lands

An alfalfa field was observed east of the proposed Rancho Grande 1-4 well site within the buffer area. Wildlife use of this vegetative community is limited due to the monocultural nature of alfalfa crops and plant species. Although the diversity of wildlife is limited, species that do occur in the area are often abundant and well adapted to the presence of humans.

Nut orchards (almond) were observed within the northern buffer area of the Rancho Grande 1-3 well site, and wine grapes were observed planted east of the proposed Rancho Grande 1-15 well site in the buffer area. Nut and grape orchards are monocultural in nature. Trees/vines in this habitat type contain open understories to facilitate harvest. Orchards are planted in uniform patterns and are intensively managed. They are usually established as sapling trees and vines. As trees/vines become old, damaged, or diseased, they are usually replaced. The understory of orchards are managed to prevent understory growth, and as such, herbaceous vegetation was minimal or lacking in this habitat type. Plant species observed in this habitat type included Common wild oats (*Avena fatua*), black mustard (*Brassica nigra*), soft brome (*Bromus hordeaceus*), common mallow (*Malva neglecta* Wallr.), almond (*Prunus dulcis*), and grapes.

Table 4
Plants Observed within the Project Area

Blow wives - *Achyrachaena mollis*	Fiddleneck - *Amsinckia intermedia*
Ranchers fireweed - *Amsinckia menziesii*	Mt. Diablo locoweed - *Astragalus oxyphysus*
Slender wild oats - *Avena barbata*	Wild oat - *Avena fatua* L.
Black mustard - *Brassica nigra* (L.) Koch	Soft chess brome - *Bromus hordeaceus*
Red brome - *Bromus madritensis ssp. rubens*	Rip-gut brome - *Bromus rigidus* Roth
Red maids - *Calandrinia ciliata*	Shepherd's-purse - *Capsella bursa-pastoris*
Turkey mullein - *Croton setigerus*	Redstem filaree - *Erodium cicutarium*
Broadleaf filaree - *Erodium botrys*	California poppy - *Eschscholzia californica*
Hare barley - *Hordeum leporinum*	Hill lotus - *Lotus humistratus*
Common mallow - *Malva neglecta* Wallr.	Horehound - *Marrubium vulgare*
Pineapple-weed - *Matricaria matricariodes*	Alfalfa - *Medicago sativa*
Almonds - *Prunus dulcis*	Perennial sowthistle - *Sonchus arvensis* L.
Spiny sowthistle - *Sonchus asper* (L.) Hill	Annual sowthistle - *Sonchus oleraceus* L.
Lacepod - *Thysanocarpus curvipes*	Vinegar weed - *Trichostema lanceolatum*
Red clover - *Trifolium pratense*	Wine grape - *Vitis vinifera*

Orchards have historically been planted on deep fertile soils, which once supported productive and diverse natural habitats. Larger and more diverse populations of wildlife were also supported by these native habitats. Some species of birds and mammals have adapted to the orchard

habitats and many have become "agricultural pests," which have resulted in various efforts to reduce crop losses. Wildlife, such as black tailed deer (*Odocoileus hemionus*) and black-tailed jackrabbit (*Lepus californicus*), forage on the trees and vines, while others, such as squirrel (*Sciurus* spp.) and numerous birds, feed on nuts and grapes. Some wildlife (e.g., mourning dove [*Zenaida macroura*], California quail [*Callipepla californica*]) are more passive in their use of orchards for cover and nesting sites. Orchards can be especially beneficial to wildlife during inclement weather or hot summer periods. Many wildlife species act as biological control agents by feeding on weed seeds and insect pests.

Habitat Conservation and Natural Community Conservation Plans – There are no adopted Habitat Conservation Plans, Natural Community Conservation Plans or other approved local, regional, or state habitat conservation plans in the project area.

ANALYSIS OF POTENTIAL IMPACTS

The biological assessment conducted for the proposed project found that no special-status animal or plant species were present within the proposed project sites or buffer areas. However, suitable habitat for sensitive plant and animal species was observed within the proposed project sites and buffer areas. No riparian, wetland, stream, vernal pool, or other sensitive community types were observed during the biological assessment.

Direct mortality or injury to common wildlife and plant populations could occur during ground disturbance activities associated with implementation of the proposed project. Small vertebrate, invertebrate, and plant species are particularly prone to impact during project implementation because they are much less to non-mobile, and cannot easily move out of the path of project activities. Other more mobile wildlife species, such as most birds and larger mammals, can avoid project-related activities by moving to other adjacent areas temporarily. Increased human activity and vehicle traffic in the vicinity may disturb some wildlife species. However, common wildlife species have likely become acclimated to on-going agricultural activities. Because common wildlife species found in the project area are locally and regionally common, potential impacts to these resources are considered less than significant. Therefore, no avoidance or minimization measures are proposed at this time.

Implementation of the proposed project has the potential to impact nesting special-status avian species by causing abandonment of nests, nesting colony sites, and the destruction of active nest sites. Grasshopper sparrows have the potential to nest within the annual grassland habitat within the proposed project sites and buffer areas during implementation of the proposed project. In addition, other nesting migratory bird species protected by the Federal Migratory Bird Treaty Act and state and federal protection acts may be present within the project buffer areas during project activities. Impacts could include direct disturbance of active nesting sites during project implementation, or indirect disturbance due to noise impacts from human presence and use of construction and drilling equipment. No nesting avian species were identified during field surveys of the project sites and buffer areas. However, bird species could establish nests prior to project implementation. Disturbance of bird nests would be considered a significant impact. Avoidance and minimization measures to protect special-status avian species from potential impacts are described further in the ***Recommended Avoidance and Minimization Measures***

section.

Implementation of the proposed project could potentially impact individual and nesting burrowing owls should they become established within the proposed project sites and buffer areas prior to project implementation. Impacts to these species could occur through crushing by construction equipment during the construction of the proposed well sites and the proposed access roads to the Rancho Grande 1-16 and 1-22 well sites. Actively nesting burrowing owls could also be affected due to noise and vibration from project activities if nests are located closer than 250 feet to the proposed well sites and proposed access roads; project related noise and vibration could cause the abandonment of active nest sites. Impacts to this species would be considered significant. Avoidance and minimization measures to protect these species from potential impacts are described further in the ***Proposed Avoidance and Minimization Measures*** section.

Traffic, consisting predominantly of ranching vehicles and equipment within the project area varies from sporadic to moderate. A short-term increase in vehicle traffic is anticipated during project implementation and less so after project completion. This will result in a short-term increase in associated noise, which may cause temporary disturbance to wildlife species. More tolerant species may adapt to and even take advantage of close human contact. Increased vehicular traffic could cause direct mortality to these species or impede normal activities such as dispersal (Luckenbach 1975, Weinstein 1978). Species intolerant of human activities may use the project sites less when humans are regularly present in the area (Bushnel 1978, Lee and Griffith 1977). Those species observed at or near the project sites appear to have acclimated to ongoing activities.

Direct mortality or injury to sensitive animal populations could occur if earth-moving activities are not confined to approved construction, access roads, and staging areas (assuming that sensitive animal populations are established in the construction zone during project implementation).

The project would not interfere with movements of wildlife species or with established native resident or migratory wildlife corridors. Native resident and/or migratory fish and known native wildlife nursery sites are not present within the project sites or areas.

PROPOSED AVOIDANCE AND MINIMIZATION MEASURES

Implementation of proposed avoidance and minimization measures included in this report are recommended to reduce potential impacts to wildlife and plants. Avoidance and minimization measures presented below are what can be expected for the proposed project. These measures have been adapted here from the programmatic biological opinion issued by the USFWS (USFWS 2001). It should be noted that the proposed project is not covered by the programmatic biological opinion, as the proposed project is located on land with privately owned surface and minerals. As such, these measures are only recommended:

1. As close to beginning of construction as possible, but not more than 14 days prior to construction, a qualified biologist shall conduct a final pre-construction survey of the

construction zone to insure that no special-status wildlife species have recently occupied the sites. A qualified biologist shall be present immediately prior to construction activities that have potential to impact sensitive species (i.e., well site preparation, access road grading, etc.) to identify and protect potentially sensitive resources.

2. Project site boundaries shall be clearly delineated by stakes, flagging and /or rope or cord to minimize inadvertent degradation or loss of adjacent habitat during construction and drilling operations. Staff and/or its contractors shall post signs and/or place fence around the site to restrict access of vehicles and equipment unrelated to drilling operations.

3. A biological monitor will be present during initial ground disturbance and site construction activities.

4. If San Joaquin kit foxes become established within the proposed project site or buffer area prior to project implementation, Sojitz will implement the measures contained in the United States Fish and Wildlife Service's (USFWS) "Standardized recommendations for protection of the San Joaquin kit fox prior to or during ground disturbance" (USFWS 2011). Sojitz will implement the following measures:

    a. If kit fox dens have become established within 200 feet of the construction area prior to project implementation that may be indirectly impacted by construction activities exclusion zones shall be established prior to construction by a qualified biologist and dens shall not be disturbed in any way. Exclusion zone fencing should include untreated wood particle-board, silt fencing, orange construction fencing or other fencing as approved by the USFWS and CDFW[2]. Exclusion zones shall be roughly circular with a radius of the following distances measured outward from entrance; potential den 50 feet, and known den 100 feet. Fencing must contain openings for kit fox ingress/egress and keeps humans and equipment out. If a natal/pupping den is discovered within a project site or within 200 feet of the project site, the USFWS and CDFW shall be immediately notified and under no circumstances should the den be disturbed or destroyed without prior authorization. If the preconstruction survey reveals an active natal pupping or new information, the project applicant should contact the USFWS and CDFW immediately to obtain the necessary take authorization/permit. If the take authorization/permit has already been issued, then the biologist may proceed with den destruction within the project boundary, except natal/pupping den which may not be destroyed while occupied. A take authorization/permit is required to destroy these dens even after they are vacated. Protective exclusion zones can be placed around all known and potential dens which occur outside the project footprint.

    b. San Joaquin Kit fox exclusion zone barriers shall be maintained until all construction and drilling activities have been completed, and then removed. If specified exclusion zones cannot be observed for any reason, USFWS and CDFW

[2] The California Department of Fish and Game (CDFW) changed its name to the California Department of Fish and Wildlife (CDFW) on January 1, 2013.

shall be contacted for guidance prior to ground disturbing activities at or near the subject den. In the event that USFWS and CDFW concur that an occupied San Joaquin kit fox den would be unavoidably destroyed by a planned project action, procedures detailed in the USFWS Standardized Recommendations for protection of the San Joaquin Kit Fox (USFWS 2011) shall be implemented. Den excavation shall be undertaken only by a qualified biologist pursuant to USFWS and CDFW authorization and direction for excavation of kit fox dens.

c. In the event that a San Joaquin kit fox is injured or killed, the incident shall immediately be reported to the project biologist. The project biologist shall contact CDFW immediately in the case of a dead, injured or entrapped kit fox. The CDFW contact for immediate assistance is State Dispatch at (916)445-0045. They will contact the local warden or Mr. Paul Hoffman, wildlife biologist, at (530)934-9309. The USFWS should be contacted at Endangered Species Division, (916) 414-6620 or (916) 414-6600. The USFWS and CDFW shall be notified in writing within three (3) working days of the accidental death or injury to a San Joaquin kit fox during project related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The USFWS contact is the Chief of the Division of Endangered Species, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-1846. The CDFW contact is Mr. Paul Hoffman at 1701 Nimbus Road, Suite A, Rancho Cordova, California 95670. New sightings of kit fox shall be reported to the CNDDB. A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed will also be provided to the USFWS as well.

d. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4 inches or greater that are stored at a construction site for one or more overnight periods shall be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe shall not be moved until the USFWS and CDFW has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.

e. Limited destruction of kit fox dens may be allowed, if avoidance is not a reasonable alternative, provided the following procedures are observed. Destruction of any known or natal/pupping kit fox den requires take authorization/permit from the USFWS and CDFW. Destruction of the den shall be accomplished by careful excavation until it is certain that no kit foxes are inside. The den shall be fully excavated, filled with dirt and compacted to ensure that kit foxes cannot reenter or use the den during the construction period. If at any point during excavation, a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described above shall be resumed. Destruction of the den may be completed when in the judgment of the

biologist, the animal has escaped, without further disturbance, from the partially destroyed den. Natal or pupping dens which are occupied cannot be destroyed until the pups and adults have vacated and then only after consultation with the USFWS and CDFW. Known dens occurring within the footprint of the activity must be monitored for three (3) days with tracking medium or an infra-red beam camera to determine the current use. If no kit fox activity is observed during this period, the den should be destroyed immediately to preclude subsequent use. If kit fox activity is observed at the den during this period, the den should be monitored for at least five (5) consecutive days from the time of the observation to allow any resident animal to move to another den during its normal activity. Use of the den can be discouraged during this period by partially plugging its entrances(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied may the den be excavated under the direction of the biologist. If the animal is still present after five (5) or more consecutive days of plugging and monitoring, the den may have to be excavated when, in the judgment of a biologist, it is temporarily vacant, for example during the animal's normal foraging activities. The USFWS and CDFW encourage hand excavation, but realize that soil conditions may necessitate the use of excavating equipment. However, extreme caution must be exercised. For potential dens, if a take authorization/permit has been obtained, den destruction may proceed without monitoring, unless other restrictions were issued with the take authorization/permit. If no take authorization/permit has been issued, then potential dens shall be monitored as if they were known dens. If any den was considered to be a potential den, but is later determined during monitoring or destruction to be currently, or previously used by kit fox (e.g., if kit fox sign is found inside), then all construction activities shall cease and the USFWS and CDFW shall be notified immediately.

5. Suitable sensitive species small mammal burrows will be avoided by 50 feet.

6. The burrowing owl nesting season begins as early as February 1 and continues through August 31. If burrowing owls are located or become established within the project site or exclusion areas at the time of the final pre-activity biological survey and are using burrows within the project site or exclusion area, a qualified biologist will consult with CDFW; the following measures shall be implemented:

    a. Sojitz will follow recommendations included in CDFW's Staff Report on Burrowing Owl Mitigation (CDFW 2012) including avoidance of occupied burrows by implementation of a no-construction zone of a minimum distance of 500 meters, unless a qualified biologist approved by CDFW verifies through non-invasive methods that either : 1) the birds have not begun egg laying and incubation; or 2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

    b. On-site passive relocation of burrowing owls shall be implemented if owls are using the burrows after August 31. Passive relocation is defined as encouraging

owls to move from occupied burrows to alternate natural or artificial burrows that are beyond 150 feet from the impact zone and that are within or contiguous to a minimum of 6.5 acres of foraging habitat for each pair of relocated owls. Relocation of owls shall only be implemented during the non-breeding season.

c. Owls shall be excluded from burrows in the immediate impact zone and within a 150 feet exclusion zone by installing one-way doors in burrow entrances. One-way doors shall be left in place 48 hours to insure owls have left the burrow before excavation. One alternate natural or artificial burrow shall be provided for each burrow that will be excavated in the project impact zone.

d. The project area shall be monitored daily for one week to confirm owl use of alternate burrows before excavating burrows in the immediate impact zone. Whenever possible, burrows shall be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe or burlap bags shall be inserted into burrow tunnels to prevent tunnel collapse while soil is excavated around that portion of a tunnel.

7. In order to avoid or reduce potential impacts to grasshopper sparrows and migratory avian species, Sojitz will conduct pre-construction nesting surveys for special-status avian species within a given project site and buffer area during the appropriate survey periods for each species. Surveys will follow required CDFW and USFWS protocols where required. Where special-status bird nest sites are identified or suspected to occur during pre-construction surveys, a qualified biologist will establish the following buffer zones around nest sites, and no disturbance activities will occur within these buffer zones until young birds have fledged:

   Grasshopper Sparrow
   Grasshopper sparrows typically nests and rears young from April through August. In order to avoid and minimize impacts on grasshopper sparrow, a 250-foot buffer will be established around active nests. No project related activities would be allowed to occur within this buffer until young have fledged or the species are no longer attempting to nest. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

   Other Migratory Bird Species
   Migratory bird species typically nest and rear young from February through August. In order to avoid and minimize impacts on migratory bird species, a 250-foot buffer will be established around active nesting sites when project activities will occur during their active nesting period. No project-related activities will occur within this zone. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

8. A project representative shall establish restrictions on construction-related traffic to approved construction areas, storage areas, staging and parking areas via signage. Off-road traffic outside of designated project areas shall be prohibited. Project-related traffic shall

observe a 15 mph speed limit in all project areas except on County roads and State and federal highways to avoid impacts to special-status wildlife species.

9. Project activities during the drilling phase of the proposed project shall be scheduled to avoid evening hours, as feasible, to avoid special-status wildlife species that are active in the nighttime.

10. All vehicle operators shall check under vehicles and equipment before moving them if they have remained parked and shut off for 30 minutes or longer.

11. Hazardous materials, fuels, lubricants, and solvents that spill accidentally during project-related activities shall be cleaned up and removed from the project as soon as possible according to applicable federal, state and local regulations.

12. All equipment storage and parking during site development and operation shall be confined to the project sites or to previously disturbed off site areas that are not suitable habitat for listed species.

13. An Environmental Awareness Program shall be conducted to orient all employees involved in construction and drilling operations. The program shall consist of a brief presentation in which biologists knowledgeable of endangered species biology and legislative protection shall explain endangered species concerns. The program shall include a discussion of special-status plants and sensitive wildlife species. Species biology, habitat needs, status under the Endangered Species Act, and measures being taken for the protection of these species and their habitats as a part of the project shall be discussed.

14. If wildlife proof barricade fencing is not used at the proposed well sites, all excavated steep-walled holes or trenches in excess of three feet in depth shall be provided with one or more escape ramps constructed of earth fill to prevent entrapment of endangered species or other animals during the construction phase. Ramps shall be located at no greater than 1,000-foot intervals (for pipelines etc.) and at not less than 45-degree angles. Trenches shall be inspected for entrapped wildlife each morning prior to onset of construction activities and immediately prior to the end of each working day. Before such holes or trenches are filled they shall be inspected thoroughly for entrapped animals. Any animals discovered shall be allowed to escape voluntarily without harassment before construction activities resume, or removed from the trench or hole by a qualified biologist and allowed to escape unimpeded.

15. All construction pipes, culverts, or similar structures stored at a construction site overnight having a diameter of four inches or greater shall be inspected thoroughly for wildlife species before being buried, capped, or otherwise used or moved in any way. Pipes laid in trenches overnight shall be capped. If during construction a wildlife species is discovered inside a pipe, that section of pipe shall not be moved or, if necessary, moved only once to remove it from the path of construction activity, until the wildlife species has escaped.

16. All food-related trash items such as wrappers, cans, bottles or food scraps generated during construction or during subsequent operation shall be disposed of only in closed containers

and regularly removed from the project sites. Food items may attract wildlife species onto a project site, consequently exposing such animals to increased risk of injury or mortality. No deliberate feeding of wildlife shall be allowed.

17. To prevent harassment or mortality of wildlife species via predation, or destruction of their dens or nests, no domestic pets shall be permitted on-site.

18. Use of rodenticides and herbicides on the project sites shall be permitted only as part of a USFWS and CDFW approved management plan unless such use is otherwise approved on a case-by-case basis. This is necessary to prevent primary or secondary poisoning of endangered species using adjacent habitats or depletion of prey upon which sensitive wildlife may depend.

CONCLUSION

Special-status species and their habitat have been documented in the general vicinity of the proposed well sites. No sensitive plant or wildlife species were observed during the biological survey and assessment. If the proposed avoidance and minimization measures recommended in this report are implemented during the proposed project, impacts to sensitive wildlife and special-status plant species and/or their habitats will be less than significant.

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APPENDIX A
REPRESENTATIVE PHOTOGRAPHS

Photograph 1
Proposed Rancho Grande 1-3 well site. View looking west from east side of proposed well location.

Photograph 2
Proposed Rancho Grande 1-4 well site. View looking west from east side of proposed well location.

Photograph 3
Proposed Rancho Grande 1-9 well site. View looking south from north side of proposed well location.

Photograph 4
Proposed Rancho Grande 1-11 well site. View looking west from east side of proposed well location.

Photograph 5
Proposed Rancho Grande 2-11 well site. View looking east from west side of proposed well location.

Photograph 6
Proposed Rancho Grande 1-15 well site. View looking west from east side of proposed well location.

Photograph 7
Proposed Rancho Grande 1-16 well site. View looking south from north side of proposed well location.

Photograph 8
Proposed Rancho Grande 1-22 well site. View looking south of proposed well location.