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5.6 Hazardous Material Handling

This section addresses potential impacts from the storage and use of hazardous materials during construction and operation of the Palen Solar Power Project (PSPP or Project). As needed, the section also presents mitigation measures that would avoid or minimize identified adverse impacts. Section 5.6 1 discusses applicable laws, ordinances, regulations, and standards (LORS).

The hazardous materials handling evaluation presented in the following pages is intended to support compliance both by the California Energy Commission (CEC) with the requirements of the California Environmental Quality Act (CEQA), and by the Bureau of Land Management (BLM) with the requirements of the National Environmental Policy Act (NEPA). The two agencies are conducting a joint review of the Project and a combined CEQA/NEPA document will be prepared.

Summary

The PSPP would have no significant hazardous materials handling-related impacts. The Project will be designed, constructed, operated, and maintained to ensure the safe use and storage of hazardous materials and in compliance with applicable LORS. A wide variety of accident prevention and mitigation programs, plans, and procedures will be implemented, including hazards assessments, process management systems, release prevention and emergency response programs, employee training, and adherence to sound professional design standards and operating procedures.

Hazardous materials that will be used during Project operations include the solar heat transfer fluid (Therminol VP-1™, a synthetic hydrocarbon), propane, diesel fuel, mineral insulating oil, and lube oil, among others. It is important to note that solar power plants use fewer hazardous materials than do combined-cycle or other fossil-fuel fired power plants,

5.6.1 LORS Compliance

Design, construction, and operation of the Project will be conducted in accordance with the LORS pertinent to hazardous materials handling. The applicable Federal, State, and local LORS are summarized in Table 5.6-1, and discussed in the text following the table.

Table 5.6–1 Summary of Applicable Hazardous Materials Handling LORS

LORS	Applicability	Where Discussed in AFC
Federal:		
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA): 42 United States Code (USC) Section 9601 et seq. Title 40 Code of Federal Regulations (CFR) Part 302	Requires notification to various agencies when there is a release of hazardous substances from a facility.	Sections 5.6.1 and 5.16, Waste Management

Table 5.6–1 Summary of Applicable Hazardous Materials Handling LORS

LORS	Applicability	Where Discussed in AFC
Emergency Planning and Community Right to Know Act of 1986 (EPCRA), commonly known as SARA Title III: 42 USC Section 11001 et seq.; Title 40 CFR Parts 350, 355 370, and 372	Requires inventory reporting, planning, and reporting for storage and release of hazardous and acutely hazardous materials.	Sections 5.6.3 and 5.6.4
Occupational Safety and Health Standards 29 USC Section 651 et seq., Title 29 CFR Part 1910 Safety and Health Regulations for Construction: Title 29 CFR Part 1926	Specifies standards for hazardous materials storage, handling, and worker protection in emergencies.	Sections 5.6.3 and 5.6.4, 2.0, Project Description, and 5.18, Worker Safety
Oil Pollution Prevention: Title 40 CFR Part 112	Requires the preparation of a Spill Prevention Control and Countermeasure (SPCC) Plan if storage capacity exceeds certain volumes, and should there be a reasonable possibility that the tank(s) may discharge oil into navigable waters of the U.S.	Sections 5.6.1 and 5.16, Waste Management
Chemical Facility Anti-Terrorism Standard (CFATS): Title 6 CFR Part 27	Requires facilities that use or store certain hazardous materials to submit information to the Department of Homeland Security so that a vulnerability assessment can be conducted to determine what security measures should be implemented.	Sections 5.6.3 and 5.6.4
State:		
Hazardous Material Business Plan (HMBP): California Health and Safety Code (HSC) Sections 25500 through 25543; Title 19 California Code of Regulations (CCR) Sections 2720 through 2732.	Requires the preparation and submittal of a chemical inventory, and planning and reporting for management of hazardous and acutely hazardous materials.	Section 5.6.3 and 5.16.4
Health and Safety Code, Section 25270 through 25270.13: Aboveground Petroleum Storage Act (APSA)	Requires preparation of an SPCC Plan if oil is stored in a single aboveground storage tank (AST) with a capacity greater than 660 gallons or if the total petroleum storage (including ASTs, oil-filled equipment, and drums) is greater than 1,320 gallons, and if there is a reasonable possibility that the tank(s) may discharge oil in “harmful quantities” into navigable waters or adjoining shore lands.	Sections 5.6.1 and 5.16, Waste Management

Table 5.6–1 Summary of Applicable Hazardous Materials Handling LORS

LORS	Applicability	Where Discussed in AFC
Hazardous Substance Information and Training Act (HSITA) Regulations: California Labor Code Section 6360 et seq., Title 8 CCR Sections 339, 3200 et seq., 5139 et seq. and 5160 et seq.	Requires listing and implementation of specified control measures for management of hazardous substances.	Section 5.6.3 and 5.16.4
California Building Code (CBC), Title 24 CCR	Requires local Building Official to inspect and verify compliance with hazardous material management requirements prior to issuance of an occupancy permit.	Section 5.6.1
Process Safety Management: Title 8 CCR Section 5189	Requires facility owners to develop and implement effective process safety management plans when toxic, reactive, flammable, or explosive chemicals are maintained on site in quantities that exceed regulatory thresholds.	Section 5.6.1
National Pollution Discharge Elimination System Industrial Activities Storm Water General Permit Order No. 97-03-DWQ, General Permit CAS000001 Construction Activities Storm Water General Permit Order No. 99-08-DWQ	Requires the preparation of a Storm Water Pollution Prevention Plan (SWPPP) for construction and industrial activities.	Sections 5.6.1 and 5.17, Water Resources
California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): HSC Sections 25249.5 et seq. Title 27 CCR Section 25102 et seq.	Requires warning to persons exposed to listed carcinogenic substances and reproductive toxins, and prohibits discharge of these chemicals into sources of drinking water.	Sections 5.6.1
Local:		
Riverside County Fire Code, Riverside County Code Chapter 8.32 (Ordinance No. 787)	Adopts the California Fire Code, 2007 Edition, with some of its appendices, into Riverside County regulations.	Sections 5.6.3 and 5.6.4
Disclosure of Hazardous Materials and the Formulation of Business Emergency Plans: Riverside County Ordinance 651	Requires disclosure where businesses handle hazardous materials and requires the development of response plans; designates Riverside County Department of Environmental Health as responsible for administration and enforcement of local codes.	Sections 5.6.3, 5.6.4, and 5.18, Worker Safety

Table 5.6–1 Summary of Applicable Hazardous Materials Handling LORS

LORS	Applicability	Where Discussed in AFC
Industry Codes and Standards:		
American Society of Mechanical Engineers (ASME), American National Standards Institute (ANSI) and American Society for Testing and Materials (ASTM)	Set forth standards for power plant design, including mechanical systems, electrical, and piping.	Sections 2.0, Project Description, 5.6.1, and 5.18, Worker Safety
7California Uniform Fire Code, Articles 79, 80, and others	Sets forth requirements for the storage and handling of hazardous materials.	Sections 2.0, Project Description, 5.6.3, 5.6.4, and 5.18, Worker Safety
National Fire Protection Association (NFPA)	Establishes fire prevention standards and guidelines.	Sections 2.0, Project Description, 5.6.3, 5.6.4, and 5.18, Worker Safety

5.6.1.1 Federal LORS

Federal LORS applicable to the handling and storage of hazardous materials are discussed below and listed in Table 5.6-1.

CERCLA, 42 USC Section 9601 et seq.; Title 40 CFR Part 302; EPCRA, 42 USC Section 11011 et seq.; Title 40 Parts 350, 355, 370, and 372

CERCLA (also known as Superfund) prescribes that the National Response Center be notified for any release of a reportable quantity of a hazardous substance (42 USC Section 9603); describes notification requirements for any potentially injured parties in connection with any such release (42 USC Section 9611(g)); and sets forth requirements for demonstration of financial responsibility in connection with the storage of hazardous substances (42 USC Section 9608(b)).

Superfund regulations define “hazardous substance” as any material appearing in lists referenced in Section 101, 42 USC Section 9601(14). The U.S. Environmental Protection Agency’s (EPA’s) regulation, at Title 40 CFR Section 302.4, sets forth the list of hazardous substances under CERCLA and the reportable quantities for each.

SARA Title III (otherwise known as EPCRA), which amended CERCLA and governs hazardous materials, establishes a nationwide emergency planning and response program and imposes reporting requirements for businesses that store, handle, or produce significant quantities of extremely hazardous materials. The regulations implementing SARA Title III (Title 40 CFR Parts 302, 350, 355 and 370) require states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility. These requirements are reflected in California HSC Section 25531 et seq. and discussed in Section 5.6.1.2.

The Project will conform to these requirements by, among other things, developing a HMBP. The administering agencies are the EPA (Region 9), the National Response Center, and Riverside County Environmental Health Department. The Riverside County Environmental Health Department is the designated Certified Unified Program Agency (CUPA) for the Project site.

Chemical Accident Prevention Provisions, Title 40 CFR Part 68

Title 40 CFR Part 68 requires the preparation of a Resource Management Plan (RMP) if certain listed toxic or flammable substances are used in excess of the listed threshold quantity. The RMP addresses in detail the emergency plan implemented at the facility and the response actions planned by the facility in the event of a hazardous materials release. The RMP is based on studies identifying potential hazards associated with the handling of the listed materials used at the facility. California has developed its own program (California Accidental Release Prevention Program [CalARP]) that generally mirrors the Federal RMP program (see below), except that it is more stringent in some instances.

As discussed in more detail later in this section, the Project proposes to use two chemicals listed as Chemicals of Interest in the regulation: propane and acetylene. However, only propane will be stored or used on site during construction or operation of the Project in excess of the applicable threshold quantity. A maximum of approximately 76,000 pounds of propane will be stored at both Units #1 and #2, above the threshold of 10,000 pounds. The amount of acetylene that will be stored on site will be well below the applicable threshold of 10,000 pounds.

Pursuant to Title 40 CFR Section 68.126, a flammable substance listed in Tables 3 and 4 of Section 68.130 is excluded from all provisions of the federal Chemical Accident Prevention regulations when the substance is used as a fuel or held for sale as a fuel at a retail facility. Therefore, a RMP is not required at PSPP.

Occupational Safety and Health Standards, 29 USC Section 651 et seq.; Title 29 CFR Part 1910 and Safety and Health Regulations for Construction, Title 29 CFR Part 1926

These standards require employee training, Personal Protective Equipment (PPE), safety equipment, and written procedures, programs and plans for insuring worker safety when working with hazardous materials or in hazardous work environments. Although intended primarily to protect worker health and safety, these requirements affect general facility safety. To comply with these requirements, the Project will prepare and implement appropriate worker health and safety plans and policies.

Oil Pollution Prevention, Title 40 CFR Part 112

The Oil Pollution Prevention regulations require the preparation of an SPCC Plan if oil is stored at the facility in excess of 1,320 gallons in aboveground storage, and should there be a reasonable possibility that the tank(s) may discharge oil into navigable waters of the U.S. The SPCC regulations place restrictions on the management of petroleum materials and, therefore, have some bearing on hazardous materials management (also see Section 5.16, Waste Management). The facility may be required to prepare a SPCC Plan because the quantity of oil (lube oil, diesel, and insulating oil) stored aboveground is expected to exceed 1,320 gallons. However, preliminary determination has concluded that there are currently no waters of the U.S. on the Project site nor is there believed to be connectivity with waters of the U.S. If concurrence is received from the U.S. Army Corps of Engineers (USACE), then no SPCC Plan will be required (see also Section 5.3, Biological Resources regarding waters of the U.S.). The administering agency is the EPA; however, the Riverside County Environmental Health Department, as the CUPA, will conduct inspections related to the SPCC program for the Project.

CFATS, Title 6 CFR Part 27

The CFATS of the Department of Homeland Security regulations requires that facilities that use or store certain hazardous materials in substantial quantities submit information to the Department of Homeland Security so that a vulnerability assessment can be conducted to determine what security measures should be implemented to ensure facility security. The administering agency is the Department of Homeland Security.

The Project proposes to use two chemicals listed as Chemicals of Interest in the regulation: propane and acetylene. However, only propane will be stored or used on site during construction or operation of the Project in excess of the applicable threshold quantity. A maximum of approximately 76,000 pounds of liquefied petroleum gas (LPG) (principally propane) will be stored and present in each of the two power generation units on the Project site; this is above the threshold of 60,000 pounds. The amount of acetylene that will be stored on site will be well below the applicable threshold of 10,000 pounds. The CFATS will apply to the Project for propane and a Top Screen will need to be prepared.

5.6.1.2 State LORS

Applicable State of California LORS are summarized below.

HMBP, California HSC Sections 25500 through 25543; Title 19 CCR Sections 2720 through 2732

California implements the Federal accidental release prevention program pursuant to California HSC Sections 25500 through 25543, and Title 19 CCR Section 2720 through 2732. These sections require the preparation of an HMBP by the facility operator. The HMBP identifies the hazards, storage locations, and storage quantities for each hazardous chemical stored on site. The HMBP is submitted to the CUPA for emergency planning purposes. These sections identify minimum standards for area plans, procedures, and protocols for emergency rescue personnel, pre-emergency planning, notification and coordination, training, public safety and information, supplies and equipment, business plan general requirements, hazardous materials inventory reporting requirements, and hazardous materials inventory submittal requirements. An HMBP will be prepared by the PSPP to comply with these requirements. The administering agency is the Riverside County Environmental Health Department, which is the designated CUPA.

APSA, California HSC Sections 25270 through 25270.13

Pursuant to California HSC Sections 25270 through 25270.13, this law is intended to ensure compliance with the Federal Clean Water Act (CWA). The law applies if a facility is subject to the Spill Prevention Control and Countermeasure regulations under 40 CFR 112 or if the facility has 10,000 gallons or more of petroleum in any or combination of ASTs and connecting pipes. If a facility falls under these criteria, it must prepare an SPCC Plan.

The APSA requires the owner or operator of a tank facility to annually file a tank facility statement with the CUPA. The submission of a HMBP satisfies the requirement to submit the tank facility statement. The APSA also requires each owner or operator of a tank facility to immediately report, upon discovery, to the Governor's Office of Emergency Services and the CUPA, the occurrence of a spill or release of 42 gallons or more of petroleum. The law does not cover AST design, engineering, construction, or other technical requirements, which are usually determined by local fire departments.

The Project is expected to store petroleum products on site in excess of 10,000 gallons, and will be required to prepare an SPCC plan irrespective of whether or not an SPCC is required under 40 CFR 112. Additional requirements are imposed if the petroleum being stored has the potential to impact surface waters, ground waters, or sensitive ecosystems, as determined by the Colorado River Basin Regional Water Quality Control Board.

HSITA, California Labor Code Section 6360 et seq., Title 8 CCR Sections 339; 3200 et seq., 5139 et seq. and 5160 et seq.

Hazardous chemicals regulated pursuant to HSITA are listed in Title 8 CCR Section 339. Title 8 CCR Sections 3200 et seq. require employers to develop and implement an effective injury and illness prevention program (IIPP). Title 8 CCR Section 5139 et seq. establishes minimum standards for the prevention of harmful exposure of employees to dusts, fumes, mists, vapors, and gases. Title 8 CCR Section 5160 et seq. establishes minimum standards for the use, handling, and storage of explosive,

flammable, poisonous, corrosive, oxidizing, irritants, and otherwise harmful substances. The California occupational safety and health regulations contained in Title 8 are generally more stringent than those contained in Title 29 of the Federal regulations. The administering agency for these requirements is the California Division of Occupational Safety and Health (Cal/OSHA).

Process Safety Management Plans, Title 8 CCR Section 5189

These regulations require facility owners to develop and implement effective process safety management plans to prevent or minimize the consequences of catastrophic releases of toxic, reactive, flammable or explosive chemicals maintained on site in quantities that exceed the regulatory thresholds (regulatory threshold for flammable liquids or gases is 10,000 pounds; for other substances, the thresholds are listed in Appendix A of Title 8 CCR Section 5189). While such requirements primarily provide for the protection of workers, they also indirectly improve public safety. This requirement applies to the Project because of the onsite storage of propane gas to fuel boilers for rapid plant startup and for HTF freeze protection. .The administering agency for these requirements is Cal/OSHA.

RMP, HSC Section 25500 et seq.

The CalARP Program under HSC Section 25500 to 25543.3, Title 19 CCR Sections 2735.1 to 2785.1, requires facility owners storing or handling acutely hazardous materials in excess of threshold quantities to develop an RMP and submit it to appropriate local authorities, the EPA, and the designated local administering agency for review and approval. The RMP must include an evaluation of the potential impacts associated with an accidental release, the likelihood of an accidental release occurring, the magnitude of potential human exposure, any preexisting evaluations or studies of the material, and the accident history of the material.

The Project will use three chemicals listed on the State's regulated substance list: propane, acetylene, and sulfuric acid. The amount of acetylene that will be stored on site will be well below the threshold of 10,000 pounds. Sulfuric acid is only subject to CalARP RMP requirements if it is concentrated with 100 pounds of sulfur trioxide. The sulfuric acid proposed for facility use will not be concentrated with sulfur trioxide. One of the chemicals will be stored or used on site during construction or operation in excess of the applicable threshold quantity. A maximum of approximately 76,000 pounds of LPG (propane) will be stored and present in each of the two power generation units on the Project site, above the threshold of 10,000 pounds; however, pursuant to Section 2770.4.1 of the CalARP regulations, a flammable substance listed in Section 2770.5 Table 2, is excluded from all provisions of the CalARP requirements when the substance is used as a fuel or held for sale as a fuel at a retail facility. Therefore, a RMP is not required at the Project.

CBC, Title 24 CCR

The CBC is a compilation of three types of building standards from three different origins:

- Building standards that have been adopted by state agencies without change from building standards contained in national model codes;
- Building standards that have been adopted and adapted from the national model code standards to meet California conditions; and
- Building standards, authorized by the California legislature, that constitute extensive additions not covered by the model codes that have been adopted to address particular California concerns.

The CBC contains requirements regarding the storage and handling of hazardous materials. The Chief Building Official at the local government level (i.e., Riverside County Building and Safety) must inspect and verify compliance with these requirements prior to issuance of an occupancy permit.

Occupancy Permit, California Government Code Section 65850.2

Section 65850.2 restricts the issuance of an occupancy permit to any new facility involving the handling of acutely hazardous materials until the facility has submitted an RMP to the administering agency with jurisdiction over the facility. The only hazardous material at the Project that exceeded the threshold was propane and when used as a fuel, as will be the case, it is exempt. As this is the case, the Project will not be required to submit an RMP for review and approval to the EPA or to the designated local administering agency, which in this case is the Riverside County Department of Environmental Health.

CWA Industrial Activities Storm Water General Permit Order No. 97-03-DWQ and Construction Activities Storm Water General Permit Order No. 99-08-DWQ

The Project will be subject to statewide general permits governing storm water runoff from construction sites and from industrial facilities (during operation). The permits require implementation of a SWPPP, overseen by the State Water Resources Control Board through its Regional Boards. Each SWPPP must include a discussion of the management of hazardous materials with the potential to contaminate stormwater. The Project is developing a Drainage, Erosion, and Sediment Control Plan (DESCP) to meet California Energy Commission (CEC) requirements. A Preliminary DESCP, which is equivalent to a SWPPP (although the DESCP combines both construction and operation in one document, unlike the SWPPP), is provided as Appendix L. Development of and compliance with the SWPPP is discussed in more detail in Section 5.17, Water Resources.

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65), HSC Sections 25249.5 et seq.; Title 27 CCR Section 25102 et seq.

Proposition 65 requires that warnings be provided prior to exposing persons to chemicals recognized by the State to cause cancer or reproductive toxicity (listed chemicals) and prohibits the discharge of listed chemicals to drinking water. Certain exemptions apply for chemicals emitted in low quantities or low concentrations. The administering agency for Proposition 65 is the California Office of Environmental Health Hazard Assessment (OEHHA), although the program has no reporting requirements, and OEHHA has no inspection or direct oversight responsibilities for individual facilities. Lead, a listed chemical, will be present in lead-acid batteries; however, worker and public exposure to lead is unlikely under normal circumstances. Proposition 65-listed chemicals may be emitted as a result of combustion of LPG in the facility boilers or diesel use in the emergency engine. However, due to the estimated low levels of listed carcinogens and reproductive toxicants in the emissions, and the absence of sensitive receptors within close proximity, the Proposition 65 thresholds above which public notification would be required, are not expected to be exceeded. As part of the Hazard Communication Program, signage informing of the potential for Prop 65 emissions will be posted at the employee entrances to the Project. See Health Risk Assessment discussion in Section 5.10, Public Health, for more information.

5.6.1.3 Local LORS

Riverside County Fire Code, Riverside County Code Chapter 8.32 (Ordinance No. 787)

Ordinance 787 (as amended through 787.4) adopts in large part the California Fire Code, 2007 Edition (see Title 24 CCR Part 9, Appendices Chapter A, B, C, E, F, G, and H). The Riverside County Fire Code applies to unincorporated areas of Riverside County. The Riverside County Fire Department (along with the Department of Forestry and Fire Protection, CAL FIRE) is the administering agency. The Riverside County Fire Code is discussed in more detail in Section 5.6.1.4.

Disclosure of Hazardous Materials and the Formulation of Business Emergency Plans, Riverside County Ordinance 651

This ordinance requires disclosure of hazardous materials and the formulation of emergency response plans, with the purpose to implement the Hazardous Materials Release Response Plans and Inventory Law, Chapter 6.95 of the California HSC. It establishes a system for permitting businesses that handle hazardous materials, to enforce minimum standards respecting such materials, and to designate the Riverside County Department of Environmental Health as the agency responsible for administering and enforcing the HSC. Ordinance 651 may also require compliance with the most recently adopted California Fire Code dependent on which hazardous materials are identified.

5.6.1.4 Industry Codes and Standards

ASME, ANSI and ASTM Standards

ASME, ANSI, and ASTM publish extensive codes and standards covering most aspects of power plant design and construction, ranging from piping to storage tanks to combustion turbines. There is no administering agency specifically for ASME, ANSI, or ASTM code enforcement.

Uniform Fire Code, Articles 79, 80, and others

Article 79 identifies requirements for combustible and flammable liquids. Article 80 includes provisions for storage and handling of hazardous materials. There is some overlap between this code and Chapter 6.95 of the California HSC. The fire code contains independent provisions regarding fire protection and neutralization systems for emergency venting (e.g., Section 80.303, D, compressed gases). Article 4 establishes hazardous materials storage thresholds above which a permit is required. The administering agency for these requirements is the Riverside County Fire Department (along with CAL FIRE).

NFPA

NFPA publishes standards for fire prevention. Several NFPA standards potentially apply to the construction, operation and maintenance of the facility, including standards for installation of sprinkler protection, fire extinguishers, explosion prevention, flammable and combustible liquids use, fire prevention during welding and cutting, handling compressed gases, fire alarms, cooling towers, and construction standards for buildings and electrical facilities. The Riverside County Fire Department (along with CAL FIRE), is the administering agency for NFPA standards.

5.6.1.5 Involved Agencies and Agency Contacts

Agencies responsible for hazardous materials handling and agency contacts are provided in Table 5.6-2.

Table 5.6-2 Agencies and Agency Contacts

Agency Contact	Phone/E-mail	Permit/Issue
EPA Region 9 75 Hawthorne Street San Francisco, CA 94105	(866)-EPA-WEST (415) 947-8000 r9@info.epa.gov	SPCC Plan If concurrence is received from the U.S. Army Corps of Engineers, then no SPCC Plan will be required.

Table 5.6-2 Agencies and Agency Contacts		
National Response Center	(800) 424-8802	Hazardous substance release notification
Randy Schulley, Chief Office of Emergency Services 3650 Schriever Avenue Mather, CA 95655	(916) 845-8510 (non-emergency) (800) 852-7550 (emergency) randy.schulley@oes.ca.gov	Hazardous substance release notification
John Carmona Colorado River Regional Water Quality Control Board, Colorado River Office 73-720 Fred Waring Drive, Suite 100, Palm Desert, CA 92260	(760) 340-4521 jcarmona@waterboards.ca.gov	SWPPP
Riverside County Environmental Health Services Department (Main Office) 4065 County Circle Drive, Rm. 104, Riverside, CA 92503	Main: (951) 358-5316 Hazardous Materials: (951) 358-5055 eh@co.kern.ca.us	HMBP, AST inspections, hazardous substance release notification
Steve Diaz County Fire Marshall Riverside County Fire Department 2300 Market Street, Suite 150 Riverside, CA 92501	(951) 955-4777 Fax (951) 955-4777 Steve.diaz@fire.ca.gov	Uniform Fire Code, NFPA, including Fire Chief Approvals regarding hazardous materials storage and/or use
Mike Lara, Director Riverside County Building and Safety Department 4080 Lemon Street, 12th Floor (P.O. Box 1440) Riverside, CA 92502	(951) 955-4678 Fax (951) 955-2023 mlara@rctlma.org	Occupancy Permit
Cal/OSHA, San Bernardino 464 West 4th Street, Suite 332 San Bernardino, CA 92401	(909) 383-4321 Fax (909) 383-6789	HSITA, Worker safety

5.6.1.6 Permits Required and Permit Schedule

Environmental permits are not required for hazardous materials handling for the Project. However, the Project is required to file written plans related to hazardous material handling (e.g., HMBP) with the Riverside County Environmental Health Department prior to facility operation, and is required to have other plans (e.g., SWPPP) in place prior to facility construction.

5.6.2 Affected Environment

The overall BLM right-of-way to be leased from BLM is approximately 5,200 acres of primarily vacant and undisturbed desert land. There are no previously existing structures that will need to be demolished; however, Corn Springs Road may need to be extended to provide access to the facility. The area immediately adjacent to the north and east of the Project site is undeveloped desert land. U.S. Interstate 10 (I-10) is located to the south and two single-family residences and Cocopah Nurseries

(e.g., palm trees and citrus growers) are located to the north and west. A Southern California Edison 161-kilovolt transmission line runs across the southwest corner of the site.

5.6.2.1 Sensitive and Residential Receptors

The Project site will be closed to public access during both construction and operation. The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses. In addition, the location of the population in the area surrounding a project site may have a large bearing on health risk.

A consideration for hazardous materials analyses is the proximity of residential receptors and sensitive receptors, such as schools, hospitals, daycare centers, emergency response facilities, and long-term care facilities. The nearest sensitive receptors are the Escuela De La Raza Unida, Blythe Middle School, and Palo Verde Valley High School in Blythe, all of which are approximately 32 miles east of the site. The Blythe Nursing Care Center and Palo Verde Hospital in Blythe are located approximately 33 miles east of the site. The following two residences are located within one mile of the Project site and are shown in Figure 5.7-1 in Section 5.7, Land Use:

- Residence 1 - located approximately 25 feet north of the Project boundary; and
- Residence 2 - located approximately 3,500 feet north of the Project boundary.

The Project will also involve the construction of an electrical transmission line, although the route of this line has not been finalized because of uncertainties regarding the location of the SCE substation where the Project will interconnect with the regional grid. Construction and operation of the transmission line will involve negligible amounts of hazardous materials. It is possible that soil contaminated with hazardous substances may be encountered during construction. Management of contaminated soils that might be encountered is addressed in Section 5.16, Waste Management.

5.6.2.2 Topography and Meteorology

The Project site is located in California's Colorado Desert, which is a part of the larger Sonoran Desert that extends across southwest North America. The Colorado Desert region encompasses approximately seven million acres, reaching from the Mexican border in the south to the higher-elevation Mojave Desert in the north and from the Colorado River in the east to the Peninsular Mountain range in the west. The majority of the Colorado Desert is classified as a “low desert” and lies at a relatively low elevation, below 1,000 feet, with the lowest point of the desert floor at 275 feet below sea level in the Salton Trough. Although the highest peaks of the Peninsular Range reach elevations of nearly 10,000 feet, most of the region's mountains do not exceed 3,000 feet. These ranges block moist coastal air and rains, producing an arid climate.

The Colorado Desert's climate distinguishes it from other deserts. The region experiences greater summer daytime temperatures than higher-elevation deserts and almost never experiences frost. The mean maximum temperatures in July and August exceed 100 degrees Fahrenheit. In addition, the Colorado Desert, especially toward the southern portion of the region, experiences two rainy seasons per year, in the winter and late summer, while the more northerly Mojave Desert has only winter rains. During the summer, the Project site will be generally influenced by a Pacific subtropical high cell that sits off the coast, inhibiting cloud formation and encouraging daytime solar heating. The Colorado Desert is rarely influenced by cold air masses moving south from Canada and Alaska, as these frontal systems are weak and diffuse by the time the reach the desert. Most desert moisture arrives from infrequent warm, moist, and unstable air masses from the south. Additional topographical and meteorological information is provided in Section 5.2, Air Quality.

5.6.3 Environmental Impacts

The anticipated direct, indirect, and cumulative impacts from construction, operation, and maintenance of the proposed Project are addressed in the following subsections.

5.6.3.1 Significance Criteria

The hazards and potential adverse impacts on the public health, worker safety, or the environment associated with hazardous material storage and use as a result of the Project would be considered significant if any of the following conditions are met:

- Noncompliance with any applicable design code or regulation;
- Nonconformance to NFPA standards;
- Nonconformance to regulations or generally accepted industry practices related to operating policies and procedures concerning the design, construction, security, leak detection, spill containment, or fire protection;
- Significant increase in risk of fatality or serious injury;
- Substantial human exposure to a hazardous material;
- Significant exceedance of the OSHA exposure limits on the site; or
- Significant exceedance of the CEC or EPA risk management exposure endpoints off site.

The first three significance criteria listed above are related to design codes, fire codes, and generally accepted industry practices. As discussed in Section 2.0, Project Description, and Section 5.18, Worker Safety, the Project will be designed to meet all applicable standards to reduce the risk of an accidental release, operated in a manner that complies with safety standards and practices, and maintained so as to provide a safe workplace for Project personnel and to prevent significant adverse offsite impacts to the public at large. In addition, as presented in Appendix C, Engineering Design Criteria, construction and operation will incorporate up-to-date industrial technology and design standards, and adhere to regulatory health and safety codes and guidelines, as well as established good industrial practices. Training, operating, inspection, and maintenance procedures that will minimize the risk and severity of potential upset conditions will be implemented.

Since the Project will be constructed, operated, and maintained in accordance with applicable LORS, no further hazard analysis related to equipment design is required. The analysis of potential hazardous materials impacts presented in the following subsections focuses on potential upset scenarios (e.g., chemical spills, fire, or explosion) that may result in risk of serious injury or substantial chemical exposure.

5.6.3.2 Construction

Hazardous materials that are anticipated for use during Project construction include gasoline, diesel fuel, oil, lubricants, welding gases (e.g., acetylene, oxygen, and argon), and small quantities of solvents and paint. There are no feasible alternatives to these materials for running construction vehicles and equipment and conducting other construction activities such as welding. No acutely hazardous substances will be used or stored on the Project site during construction.

Diesel fuel is the hazardous material with the greatest potential for environmental consequences during the construction phase due to the volume of diesel fuel that will be used in construction equipment and the frequent refueling that will be required. To minimize the potential for a release, diesel fuel will not be stored on site, except in equipment/vehicle fuel tanks. When refueling is required, a mobile fuel truck will be brought on site to fuel each piece of equipment. The fueling will be supervised by both the fuel

truck and equipment operators. Any fuel spilled will be promptly cleaned up, and any contaminated soil disposed of in accordance with the applicable state and Federal requirements.

Small volumes of hazardous materials will be temporarily stored on site inside fuel and lubrication service trucks. Paints and solvents will be stored in flammable material storage cabinets. Welding gases will be stored in steel cylinders and chained upright to a solid support structure with the safety cover over the valve when not in use to prevent damage. Maintenance and service personnel will be trained in handling these materials. The most likely incidents involving these hazardous materials would be associated with minor spills or leaks. Impacts to site workers, the public or the environment of a minor spill or leak will be mitigated through the emergency response training program and procedures that will be implemented by Project construction contractors and employees, and by thoroughly cleaning up minor spills as soon as they occur. Soil contaminated by a spill or leak will be disposed in accordance with applicable state and Federal requirements. Minimal risk for fire and/or explosion exists with the use of these types of materials in the limited quantities expected. There is minimal potential for environmental impacts from incidents involving other hazardous materials during construction.

5.6.3.3 Operation and Maintenance

Hazardous materials will be used and stored on site during operations and maintenance. The hazardous material inventory, the general operational safety practices employed during hazardous material storage and use, the material-specific handling practices, and the toxicity of each hazardous material are discussed below. The quantities identified in the table below are “per power block” and Units #1 and #2 each will have its own power block.

Hazardous Material Inventory

A list of the large-quantity hazardous materials stored and used at the Project site along with the toxicity and storage practices for each material is provided in Table 5.6-3. For the purpose of this discussion, “large quantity” is defined as those chemicals stored or used in excess of 55 gallons for liquids, 500 pounds for solids, and 200 cubic feet for compressed gases. These quantities coincide with the thresholds for reporting under California’s HMBP requirements.

Table 5.6-3 Summary of Special Handling Precautions for Large Quantity Hazardous Materials

Hazardous Material and CAS No.[1]	Relative Toxicity[2] and Hazard Class[3]	RQ[4] pounds (kg)	Permissible Exposure Limit (PEL)	Storage Description; Capacity	Storage Practices and Special Handling Precautions
LPG CAS No. 68476-85-7 Propane CAS No. 74-98-6	Low toxicity; Hazard class – Flammable Gas	10,000 pounds (lbs)	PEL: 1,000 parts per million (ppm)	Onsite storage, up to 36,000 gallons in storage tanks and piping; pressurized carbon steel tanks and pipelines for delivery to equipment	Tanks and piping will be designed to fire code and NFPA specifications and operated to industry standards
Sulfuric Acid, 29.5% solution CAS No. 7664-93-9	High toxicity; Hazard class – Corrosive, water reactive	1,000 lbs	PEL: 1 milligram per cubic meter (mg/m^3)	Contained in batteries; 2,000 gallons total inventory	Isolated from incompatible chemicals and secondary containment
Carbon Dioxide CAS No. 124-38-9	Low toxicity; Hazard class – Nonflammable gas	Not Applicable	TLV: 5,000 ppm (9,000 mg/m^3) TWA	Carbon steel tank; 15 tons maximum onsite inventory	Carbon steel tank with crash posts
Therminol VP-1™ Biphenyl (26.5%) CAS No. 92-52-4 Diphenyl ether (73.5%) CAS No. 101-84-8	Moderate toxicity, Hazard class – Irritant; Combustible Liquid (Class III-B)	Biphenyl = 100 lbs (45.4 kg) Diphenyl ether = Not applicable	Biphenyl = PEL: 0.2 milliliters per cubic meter (ml/m^3) (8-hr TWA) TLV: 0.2 ml/m^3 (1 mg/m^3) (8-hr TWA) Diphenyl ether = TLV: 1 ml/m^3 (8-hr TWA) TLV: 2 ml/m^3 (15-min TWA) PEL: 1 ml/m^3 (7 mg/m^3) (15-min TWA)	1.3 million gallons in system; no additional onsite storage	Continuous monitoring of pressure in piping network; routine inspections (sight, sound, smell) by operations staff; isolation valves throughout piping network to minimize fluid loss in the event of a leak; prompt clean up and repair

Table 5.6-3 Summary of Special Handling Precautions for Large Quantity Hazardous Materials

Hazardous Material and CAS No.[1]	Relative Toxicity[2] and Hazard Class[3]	RQ[4] pounds (kg)	Permissible Exposure Limit (PEL)	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Lube Oil CAS No. 64742-65-0	Low toxicity Hazard class – NA	Not applicable	None established	Carbon steel tanks; 10,000 gallons in equipment and piping; additional maintenance inventory of up to 550 gallons in 55-gallon steel drums	Secondary containment area for each tank and for maintenance inventory
Mineral Insulating Oil CAS No. 8042-47-5	Low toxicity Hazard class – NA	Not applicable	None established	Carbon steel transformers; total onsite inventory of 32,000 gallons	Used only in transformers; secondary containment for each transformer
Diesel Fuel CAS No. 68476-34-6	Low toxicity; Hazard class – Class IIIB Combustible Liquid	Not applicable	PEL: none established TLV: 100 mg/m^3 (ACGIH)	Carbon steel tank (300 gallon [generator & fire water pump engine])	Stored only in fuel tank of emergency engine; secondary containment
Nitrogen CAS No. 7727-37-9	Low toxicity; Hazard class – Non-Flammable Gas	Not applicable	None established	Carbon steel tank; 7,500 lbs total inventory	Carbon steel tank with crash posts
Hydraulic fluid CAS No. 64741-89-5	Low to moderate toxicity; Hazard class – Class IIIB Combustible Liquid	Not applicable	TWA (oil mist): 5 mg/m^3 STEL: 10 mg/m^3	Carbon steel tanks and sumps; 500 gallons in equipment; maintenance inventory of 110 gallons in 55-gallon steel drums	Found only in equipment with a small maintenance inventory. Maintenance inventory stored within secondary containment
Welding gas Acetylene CAS No. 74-86-2	Moderate toxicity; Hazard class – Toxic	10,000 lbs	PEL: none established	Steel cylinders, 200 cubic feet each; 800 cubic feet total on site	Inventory management; isolated from incompatible chemicals
Welding gas Oxygen CAS No. 7782-44-7	Low toxicity; Hazard class – Oxidizer	Not applicable	PEL: none established	Steel cylinders, 200 cubic feet each; 800 cubic feet total on site	Inventory management; isolated from incompatible chemicals
Welding gas Argon CAS No. 7440-37-1	Low toxicity; Hazard class – Non-flammable Gas	Not applicable	PEL: none established	Steel cylinders, 200 cubic feet each, 800 cubic feet total on site	Inventory management

Table 5.6-3 Summary of Special Handling Precautions for Large Quantity Hazardous Materials

Hazardous Material and CAS No.[1]	Relative Toxicity[2] and Hazard Class[3]	RQ[4] pounds (kg)	Permissible Exposure Limit (PEL)	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Activated Carbon CAS No. 7440-44-0	Non-toxic (when unsaturated), low to moderate toxicity (when saturated), depending on the adsorbed material; Hazard class – combustible solid	Not Applicable	TWA (total particulate): 15 mg/m^3 TWA (respirable fraction): 5 mg/m^3 TLV (graphite, all forms except graphite fibers): 2 mg/m^3 TWA	Used in two 2,000-lb canisters, 4,000 lbs total inventory; no additional storage	No excess inventory stored on site, prompt disposal when spent
Calcium Hypochlorite 100% CAS No. 7778-54-3	Moderate toxicity; Hazard Class – Corrosive, Irritant	10 lbs	PEL: none established Acute oral toxicity (LD50): 850 mg/kg [Rat].	Minimal onsite storage for water treatment; Not expected to exceed 50 lbs	Inventory management; isolated from incompatible chemicals
Oxygen Scavenger Reagent Acetic Acid 60% CAS No. 64-19-7 Iodine 20% CAS No. 7553-56-2 De-ionized water 20% CAS No. 7732-18-5	Moderate toxicity; Hazard Class – Corrosive, Irritant	5,000 lbs	PEL: 10 ppm TWA PEL: 0.1 ppm N/A	Minimal onsite storage for water treatment; Not expected to exceed 50 lbs	Inventory management; isolated from incompatible chemicals

Table 5.6-3 Summary of Special Handling Precautions for Large Quantity Hazardous Materials

Hazardous Material and CAS No.[1]	Relative Toxicity[2] and Hazard Class[3]	RQ[4] pounds (kg)	Permissible Exposure Limit (PEL)	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Herbicide Roundup® or equivalent CAS No. 38641-94-0	Low toxicity; Hazard class – Irritant	Not applicable	Isopropylamine salt of glyphosphate = no specific occupational exposure has been established	No onsite storage; brought on site by licensed contractor; used immediately	No excess inventory stored on site
Soil stabilizer Active ingredient: acrylic or vinyl acetate polymer or equivalent CAS No. Active ingredient is 'Not Hazardous'	Non-toxic; Hazard class – NA	Not applicable	None established	No onsite storage; supplied in 55-gallon drums or 400-gallon totes, used immediately	No excess inventory stored on site

[1] CAS No. – Chemical Abstracts Service registry number. This number is unique for each chemical.

[2] Low toxicity is used to describe materials with an NFPA Health rating of 0 or 1. Moderate toxicity is used describe materials with an NFPA rating of 2. High toxicity is used to describe materials with an NFPA rating of 3. Extreme toxicity is used to describe materials with an NFPA rating of 4.

[3] NA denotes materials that do not meet the criteria for any hazard class defined in the 1997 Uniform Fire Code.

[4] RQ - Reportable Quantity for hazardous substance as designated under section 102(a) defined under CERCLA. (To note: As previously discussed in the text, Table 5.6-3 includes those chemicals stored or used in excess of 55 gallons for liquids, 500 pounds for solids, and 200 cubic feet for compressed gases. These quantities coincide with the thresholds for reporting under California's HMBP requirements.)

[5] RQ - Reportable Quantity for extremely hazardous substance as designated under section 302(a)(2) defined under CERCLA.

In addition to the chemicals listed in Table 5.6-3, small quantities (less than 55 gallons, 500 pounds or 200 cubic feet) of janitorial supplies, office supplies, laboratory supplies, paint, degreasers, herbicides, pesticides, air conditioning fluids (chlorofluorocarbons), gasoline, hydraulic fluid, propane, and welding rods typical of those purchased from retail outlets may also be stored and used at the PSPP. These materials will be stored in the maintenance warehouse or office building. Flammable materials (e.g., paints, solvents) will be stored in flammable material storage cabinet(s) with built-in containment sumps. The remainder of the materials will be stored on shelves as appropriate. Due to the small quantities involved, the controlled environment, and the concrete floor of the warehouse, a spill can be cleaned up without significant environmental consequences.

General Operating Practices

Chemicals will be stored or processed in vessels or tanks specifically designed for their individual characteristics. All hazardous materials storage or process vessels will be designed in conformance with applicable ASME codes. Large quantity (bulk) liquid chemicals will be stored outdoors in ASTs manufactured of carbon steel or plastic, or in 400-gallon (nominal) capacity plastic totes, if applicable. Spill containment structures (e.g., curbing, double-walled tanks or equivalent) to contain the chemicals in the event of a leak or spill will be constructed around each of the large-quantity hazardous chemical storage tanks or totes. Bulk storage tanks or totes will have secondary containment structures capable of holding the tank or tote volume plus an allowance for precipitation (25-year, 24-hour rain event). Concrete containment structures will be coated with a chemical resistant coating (e.g., epoxy) to ensure long-term integrity of the containment structure.

Small quantity chemicals will be stored in their original delivery containers in order to minimize risk of upset. Personnel working with chemicals will be trained in proper handling technique and in emergency response procedures for chemical spills or accidental releases. PPE will be provided.

Appropriate safety programs will be developed to address hazardous materials storage and use, emergency response procedures, employee training requirements, hazard recognition, fire safety, first-aid/emergency medical procedures, hazardous materials release containment/control procedures, hazard communications training, PPE training and release reporting requirements. These programs include IIPP (see Section 5.18, Worker Safety), a fire response program, a plant safety program and facility standard operating procedures. As required under Federal and California regulations, a HMBP will be prepared and submitted to the Riverside County Department of Environmental Health.

The facility will be subject to the SWPPP requirements administered by the State Water Resources Control Board under the Storm Water General Permits for construction and industrial activities. The SWPPPs will describe the management practices in place at the facility (e.g., regular inspections and maintenance of drainage facilities, employee training in proper hazardous material storage and handling procedures, and chemical spill response procedures) to prevent the release or discharge of hazardous materials to the waters of the State (see also discussion in Section 5.17, Water Resources).
A preliminary DESCP to meet CEC requirements /construction SWPPP is provided in Appendix L.

Chemical-Specific Operating Practices and Chemical Toxicity

Substance-specific operating practices and toxicity issues are described in the following paragraphs.

Fuel Gas Delivery

LPG will supply gas to boilers used for rapid daily plant startup and for HTF freeze protection. There will be two truck deliveries each week for both power plant units. A total of approximately 18,000 gallons of LPG will be stored at each power plant unit. LPG consists mainly of propane and butane. LPG is a flammable gas with a NFPA hazard rating of 4 with low toxicity. The fuel gas supplier will comply with all Department of Transportation (DOT) regulations that apply to the transport of hazardous substances.

Compressed Gas Storage

Compressed gases stored and used at the facility may include gases typically used for maintenance activities, such as shop welding. These gases include acetylene, argon, and oxygen.

Acetylene is a flammable gas and a narcotic. It is highly reactive and is not toxic. Oxygen is an oxidizer with low toxicity. Argon has low toxicity but may cause asphyxiation if released in a confined area. The potential impacts presented by the use of these gases at the Project are less than significant based on the following site-specific conditions:

- Compressed gases will be stored in standard compressed gas cylinders at the facility (typically 200 cubic feet per cylinder), and the total quantity will be kept to the minimum required for operation and maintenance.
- The compressed gases will be delivered and stored in DOT-approved safety cylinders, and secured to a solid support (such as a building or rack) to prevent tipping and physical damage.
- The compressed gases will be stored in an isolated storage area surrounded by crash posts to minimize potential for accidents or upset.
- Incompatible gases (e.g., flammable gases and oxidizers) will be stored in separate, isolated areas.
- Operators will be trained in the proper use of equipment and materials.

Water Treatment Chemicals

Water treatment chemicals will be present in minimum quantities. Calcium hypochlorite and oxygen scavenger reagent are water treatment products that will be used in the boiler makeup water and auxiliary cooling tower application, as shown in Table 5.6-3. Approximately 50 pounds of these products will be stored onsite and shipped to the site as required. Shipping and storing the products in the same container minimizes chemical transfers, and thus minimizes the chances of a spill. The toxicity of each mixture is moderate and they are classified as irritants and corrosives.

HTF

Therminol VP-1™ is the HTF that will be used in the solar array and steam cycle of the Project. Approximately 8,300 tons of Therminol VP-1™ will be present in the solar system including the piping and necessary expansion tanks; no additional HTF will be stored on site. The heat transfer system is a closed loop and the system pressure will be monitored continuously. The solar field will be regularly monitored by the operations staff using sight, sound, and smell to detect system leaks. Isolation valves will be installed throughout the solar field to minimize HTF loss in the event of a system leak. The isolation valves will be designed for automated operation triggered by a pressure drop in the system, or manual operation if a leak is detected by other means. The Project is considering remote sensing equipment to allow for the detection of sudden large leaks. Leaks will be repaired promptly, and fluid spills will be cleaned up as described in Section 5.16, Waste Management. Therminol VP-1™ is a synthetic oil consisting of diphenyl ether and biphenyl. Biphenyl has a CERCLA Reportable Quantity of 100 lbs—the amount present in approximately 377 lbs (42 gallons) of Therminol. Therminol VP-1™ is moderately toxic, a skin irritant, and a Class III-B combustible liquid. The Material Safety Data Sheet for Therminol VP-1™ is provided in Appendix D.

Petroleum Products

Lube oil is stored in a 10,000-gallon carbon steel tank and in equipment and piping associated with each steam turbine. The turbine enclosure provides secondary containment sufficient to hold the full contents of the tank. The tank will be inspected daily to ensure that it is not leaking. Lube oil has low toxicity and does not meet the criteria for any hazard class defined by the Uniform Fire Code.

Diesel fuel will be used to fuel the emergency fire water pump engine. The fire water pump engine has a 300-gallon fuel supply in a carbon steel tank. The equipment skid provides secondary containment that can hold the full amount of the fuel. Diesel is a combustible liquid with low toxicity.

Insulating oil is used in the electrical transformers at the facility. The total quantity of insulating oil present at the facility will be 32,000 gallons. Each transformer is installed in a secondary containment structure that will contain 100 percent of the transformer capacity plus an allowance for precipitation.

The Project will store petroleum products in aboveground storage in the lube oil tank and fuel tank, so the owner or operator will annually file a tank facility statement with the CUPA; the submission of a HMBP will satisfy the requirement to submit the tank facility statement. Each owner or operator will immediately report, upon discovery, to the Governor's Office of Emergency Services and the CUPA, the occurrence of a spill or release of 42 gallons or more of petroleum product.

Activated Carbon

The HTF expansion tank will be vented through a two-stage activated carbon system for the control of air emissions from the tank. Each stage of the system is comprised of a 2,000-lbs capacity carbon canister. The facility will not maintain an inventory of additional carbon. New activated carbon has low toxicity, however, once in use, the activated carbon will adsorb volatile organic compounds (VOC) and toxic air contaminants (TAC) including benzene, diphenyl ether, and biphenyl, and the toxicity will increase. Activated carbon is difficult to ignite, but will smolder once ignited.

The emissions control system will be monitored periodically (with a frequency specified in the air operating permit) to determine the saturation level of the carbon. When saturated with VOC and TAC, activated carbon is disposed of as a hazardous waste; waste disposal is discussed in Section 5.16, Waste Management.

Herbicide

Herbicide will be used in the solar field to kill weeds in order to minimize the fire potential. The Applicants plan to contract the weed control program to an outside contractor. Accordingly, herbicide will not be stored on site but will instead be brought on site on an as-needed basis. The Project will ensure that the contractor has the appropriate licenses and a robust safety program for its employees.

Soil Stabilizer

The facility will apply a polymer dust suppressant/soil stabilizer periodically, as required, to reduce fugitive dust emissions in the solar field. While a specific product has not yet been selected, most soil stabilizers consist of water emulsions of acrylic or vinyl acetate polymers. These products are non-toxic and do not meet the definition of any hazard classification.

Hazardous Material Transportation

Hazardous materials will be delivered to the Project site via truck along I-10 and then into the gated and fenced site via the Project access road. I-10 is currently used for the transport of hazardous materials; the Project will cause a small increase in hazardous material traffic along this route. Traffic and transportation issues are discussed in more detail in Section 5.13, Traffic and Transportation.

Offsite Consequence Analysis

The Project has been designed so that large quantities of volatile, hazardous chemicals are not required for construction or operation. Consequently, there are no reasonably foreseeable chemical release scenarios that would have the potential for offsite consequences. The presence of large quantities of LPG (propane) at the Project site would typically require that an offsite consequence analysis be prepared. The fact that the propane will be used as a fuel exempts the Project from the preparation of a

RMP and therefore eliminates the necessity of preparing an offsite consequence analysis. However, out of an abundance of caution and in consideration of the large volume of propane that will be stored on site, an offsite consequence analysis was conducted.

The propane storage tanks and handling facilities will be equipped with continuous tank level monitors, temperature and pressure monitors and alarms, and excess flow and emergency island valves. Only trained technicians will conduct system maintenance and repairs.

Delivery

Propane is typically delivered in 5,000-gallon tank trucks. The tank trucks will be unloaded in an unloading area immediately adjacent to the propane tanks. The unloading area will be paved with concrete and curbed. During unloading operations, the driver performing the unloading operation will wear appropriate protective equipment, and will have a cut-off switch to stop the propane transfer in case of an emergency. The offloading operation will also be monitored by a control room operator via camera to provide backup support if there is a leak, hose break, or other accident during unloading.

With respect to the transport of propane to the Project site, DOT regulations require all truck tank trailers to meet strict requirements for collision and accident protection. Hazardous materials shipments will comply with applicable regulations in terms of route selection, operator training and qualifications, etc. The tank trucks are designed to withstand violent accidents without breach of containment.

Storage

Storage of propane in an 18,000-gallon tank at each unit creates the potential for leak, spill or rupture of the tank, releasing propane to the atmosphere. Propane is a flammable gas. Pressurized metallic storage tanks have a mean time to catastrophic failure of 0.0109 per million hours of service, or on average one failure every 10,500 years. Thus, failure of a pressurized propane tank during the lifetime of the facility is unlikely. Additionally, the storage tank will be protected by concrete curbing and steel columns to reduce the likelihood of accidental vehicle impacts.

Accident Scenarios Modeled

Table 5.6-4 shows the worst-case accident scenarios considered in the propane analysis. The accident scenarios consist of a catastrophic failure of the 18,000-gallon propane tank resulting in either a vapor cloud explosion with resultant overpressure or a boiling liquid expanding vapor explosion (BLEVE) with resultant thermal exposure. A truck unloading accident was considered as an alternative worst case analysis, but the unloading accident would involve only 5,000 gallons of propane, and would produce less severe impacts than the larger stationary propane storage tank.

There is one 18,000-gallon propane tank proposed at both Units #1 and #2. However, there are no credible accident scenarios that will produce the simultaneous rupture of both propane tanks at the Project site, as they will be located about 1.4 miles apart. Transportation accidents, seismic events, aircraft crashes, and terrorist attacks have not been considered applicable and/or credible accident scenarios for the purposes of hazardous material analyses during past CEC power plant licensing cases. Thus, the worst-case accident scenarios chosen assumed the failure of a single tank on the Project site, consistent with EPA RMP program guidance. Table 5.6-4 presents the two scenarios.

Table 5.6–4 Definition of Hazard Scenarios Modeled

Scenario	Hazard	Chemical	Discussion
1	Vapor Cloud Explosion	Propane	Assumes 18,000 gallons of propane released instantaneously due to catastrophic tank failure. 10 percent of released propane vaporizes/aerosolizes and ignites to form vapor cloud explosion. Risk threshold is overpressure of 1.0 pound/in^2 (psi) at ground level.
2	BLEVE	Propane	Assumes 18,000-gallon propane tank subject to external heating without pressure relief, resulting in a catastrophic tank failure producing BLEVE involving 100 percent of. full propane tank. Risk threshold is an equivalent thermal exposure ("dose") of 5.0 kilowatts/square meter (kW/m^2) for 40 seconds.

Hazard Assessment Modeling Methods

Consequence modeling was performed for the scenarios identified below. The purpose of the modeling was to estimate the offsite consequences of accidental release scenarios for an 18,000 gallon propane tank at the Project site. The modeling was based on equations from the EPA's RMP Off-Site Consequence Analysis Guidance document for estimating impact distances for vapor cloud explosions and BLEVE. The EPA equations for these events were programmed into an EXCEL spreadsheet and used to determine the distance to the impact threshold.

Vapor Cloud Explosions

For vapor cloud explosion, a catastrophic failure of the storage tank releases the liquid propane to the atmosphere where it is vaporized/aerosolized. An ignition source initiates a vapor explosion involving ten percent of the released mass of propane. The impact threshold is defined to be the distance to an overpressure at ground level of one pound psi. The distance to threshold level is determined using Equation 1.

BLEVE

The equations used by the EPA to estimate impact distances for BLEVEs were employed in this analysis. The parameters input to the Hazard Analysis and the computed distance to impact thresholds are given in Table 5.6-5.

Table 5.6–5 Parameters Used in Hazard Analysis

Palen Solar Power Project Hazards Analysis					
Chemical Physical Parameters					
Input	**Chemical**	**Hc (joules/kg)**	**Density (lb/gallon)**	**Flash Fraction Factor[6]**	**Reference**
1	Propane	4.63E+07	4.24	0.38	6

References
1 Petroleum Refining, J. Gary and G Handwerk, Marcel Dekker, Inc, 1975
2 Perry's Chemical Engineering Handbook
3 Conversation with Dennis Feist, Equilon/Shell
4 ARCO Table 1C1.3
5 Standard Handbook for ME, Marks
6 EPA 550-B-99-009. Risk Management Program Guidance for Offsite Consequence Analysis

Table 5.6–5 Parameters Used in Hazard Analysis

Scenario Definitions						
Scenario	**Container**	**Event Type**	**Chemical**	**Gallons**	**lbs**	**kg**
1	Propane Tank	Vapor Cloud Explosion	Propane	18,000	76,320	34,619
2	Propane Tank	BLEVE	Propane	18,000	76,320	34,619

Hazard Assessment Results

The results of the model runs are summarized in Table 5.6-6. The impacts for the two worst-case scenarios, catastrophic failures of the facility storage tanks, do not extend past the property fenceline. The two accident scenarios modeled are not likely to occur and were estimated using the very conservative EPA RMP worst-case assumptions. These worst-case assumptions assume the accident will occur at night during low wind speed and very stable nighttime conditions.

The vapor explosion impact metric is overpressure that can damage structures and injure persons exposed to the blast wave. The BLEVE impact metric is thermal exposure that can cause skin damage or other thermal-related injuries. As shown in Table 5.6-6, the worst-case BLEVE would only exceed risk thresholds for 500 meters, whereas the distance to the facility fence line is over 1,000 meters. Thus, the potential for significant impacts to persons or property immediately outside the property line due to the worst-case BLEVE is negligible.

Table 5.6–6 Distance (meters) to Endpoint from Center to Upset*

Scenario	Event	Distance to Threshold (meters)	Distance to Property Fence Line (meters)	Off-Property Impact?
1	Vapor Cloud Explosion	500	1,070	No
2	BLEVE	580	1,070	No

Endpoint: EPA 550-B-99-009, Risk Management Program Guidance for Offsite Consequence Analysis
Vapor Explosion Endpoint – 1.0 psi
Fireball/BLEVE Endpoint – 5.0 kW/m^2 for 40 seconds, or equivalent exposure
All distances are rounded to the nearest 10 meters.

Fire and Explosion Risks

The PSPP will utilize two materials that pose potential risks of fire and explosion because of their flammability. These are propane and HTF, each of which is discussed below.

Propane will be used as a fuel for the two boilers at the facility and poses a fire and/or explosion risk as a result of its flammability. Propane will be delivered to the site weekly by trucks owned and operated by a licensed vendor and will be stored on site in an 18,000-gallon AST at each power block. The HTF at high temperatures can also present a fire hazard.

Seismic Risk

The possibility exists that an earthquake could cause the failure of a hazardous materials storage tank or HTF piping somewhere in the solar field. An earthquake could also cause the failure of the secondary containment system (berms and dikes), as well as electrically controlled valves and pumps.

The failure of all these preventive control measures might then result in a leak or discharge of hazardous materials. Due to the limited types and quantities of hazardous materials to be stored on site and the sparsely inhabited surroundings, it is unlikely that hazardous materials could move off the site and impact residents and workers in the surrounding area.

The effects of the Loma Prieta earthquake of 1989, the Northridge earthquake of 1994, and the earthquake in Kobe, Japan, in January 1995 heighten concerns about earthquake safety. Information obtained after the January 1994 Northridge earthquake showed that some damage was caused to several large and small storage tanks at the water treatment system of a cogeneration facility. The tanks with the greatest damage, including seam leakage, were older tanks, while newer tanks sustained lesser damage with displacements and attached line failures. The CEC conducted an analysis of the codes and standards which should be followed to adequately design and build storage tanks and containment areas that could withstand a large earthquake. CEC staff also reviewed the impacts of the February 2001 Nisqually earthquake near Olympia, Washington, a state with similar seismic design codes to California. No hazardous materials storage tanks were impacted by this quake.

Project facilities will be designed and constructed to the applicable standards of the 2007 CBC for Seismic Zone 4 (see Section 5.5, Geologic Resources and Hazards, and Section 2.0, Project Description). Based on the experience from the Northridge and other earthquakes, when tanks are constructed to current codes and standards, tank failures during seismic events are not likely and do not represent a significant risk to the public.

The piping in the solar array contains the vast majority of the HTF and the solar field will not be constructed with secondary containment. However, it is very unlikely that an earthquake could cause the failure of the piping in the solar array resulting in a loss of HTF that would have an offsite impact. The piping in the solar array will be specifically constructed to allow movement due to thermal expansion – the steel piping in the mirrored trough sections of the array is connected to the HTF distribution headers with ball joints and the piping is not rigidly mounted to foundations or other structures. Further, the solar array will be constructed with isolation valves to limit the HTF losses in the event of a piping failure. Due to these inherent design features, piping failures during seismic events are not likely and do not represent a significant risk to the public.

5.6.3.4 Facility Closure

Premature closure or unexpected cessation of facility operations will be outlined in the facility's Closure Plan. The Plan will outline steps to secure hazardous and non-hazardous materials and wastes. Such steps will be consistent with Best Management Practices and the HMBP, and will be outlined according to applicable LORS. The Plan will include monitoring of vessels and receptacles of hazardous material and wastes, safe cessation of processes using hazardous materials or hazardous wastes, and inspection of secondary containment structures.

Planned permanent closure impacts will be incorporated into the facility Closure Plan and evaluated carefully near the end of the Project's operational life (see Section 3.0, Closure. The facility Closure Plan will document nonhazardous and hazardous waste management practices including the inventory, management, and disposal of hazardous materials and wastes, and permanent closure of permitted hazardous materials and waste storage units.

5.6.3.5 Cumulative Impacts

Facility design and hazardous materials handling programs developed and implemented for the Project would reduce the Project's potential impacts to below significant levels. The other identified cumulative projects would be required to comply independently with hazardous materials regulations depending on their specific circumstances (e.g., nature and quantities of hazardous materials stored and used). Many

of the cumulative projects (including the PSPP), are separated by miles from any of the other projects so there is minimal risk of an accident at one project affecting another project. Solar projects also use less hazardous materials than do fossil fuel-fired power plants. In short, Project construction and operation activities would not cause or contribute substantially to significant cumulative impacts with respect to hazardous materials handling from either a local or regional perspective.

5.6.4 Mitigation Measures

This section describes the mitigation measures that are proposed in order to ensure that Project impacts resulting from hazardous materials handling and use are less than significant.

5.6.4.1 Construction Phase

Although the Project is not expected to cause significant adverse environmental impacts from hazardous material handling during construction activities, the Project proposes the following mitigation measures to minimize the potential for incidents involving hazardous materials during construction.

HAZ-1 An onsite construction safety officer will be designated to implement health and safety guidelines and, if necessary, contact emergency response personnel and local hospitals.

HAZ-2 Project construction contractors will be required to develop standard operating procedures for servicing and fueling construction equipment. These procedures will, at a minimum, include the following:

- No smoking, open flames or welding will be allowed in fueling/service areas.
- Servicing and fueling of vehicles and equipment will occur only in designated areas. These areas will be bermed, covered with concrete, or fashioned in some other manner to control potential spills.
- Fueling, service and maintenance will be conducted only by authorized, trained personnel.
- Refueling will be conducted only with approved pumps, hoses, and nozzles.
- All disconnected hoses will be handled in a manner to prevent residual fuel and liquids from being released into the environment.
- Drip pans will be placed under equipment to collect small drips and minimize potential spills during servicing.
- Service trucks will be equipped with fire extinguishers, PPE, and spill containment equipment, such as absorbents.
- Service trucks will not remain on the job site after fueling and service are complete.

HAZ-3 Emergency telephone numbers will be available on site for the fire department, police, local hospitals, ambulance service(s), and environmental regulatory agencies.

HAZ-4 Containers used to store hazardous materials will be properly labeled and kept in good condition.

5.6.4.2 Operations Phase

Although the Project is not expected to cause significant adverse environmental impacts from hazardous material storage or handling during the operations, the Project proposes the following

mitigation measures to minimize the potential for incidents involving hazardous materials during operations.

HAZ-5 Hazardous materials storage will typically consist of storage of oil within equipment, ASTs, 55-gallon drums, or 5-gallon pails of lubricants and oils, and smaller containers of paints and solvents. These materials will be managed as described below to mitigate potential releases.

- Hazardous materials will be stored in accordance with applicable regulations and codes, e.g., the Uniform Fire Code.
- Trucks delivering hazardous materials will be parked adjacent to the usage area or storage area where the chemicals are to be stored to minimize potential unloading and transportation accidents.
- Incompatible materials will be stored separately.
- Containerized hazardous materials will be stored in original containers appropriately designed for the individual characteristics of the contained material. Containers will be labeled with contents in accordance with the OSHA Hazard Communication Standard (Title 29 CFR Part 1910.1200).
- Containers of flammable materials will be stored in inflammable storage cabinet(s) when not in use.
- Hazardous materials will be stored within secondary containment structures, typically constructed of sealed concrete. These structures will have capacity for the largest container plus an allowance for rainwater equivalent to a 24-hour, 25-year storm, if the area is outdoors. Alternatively, containerized hazardous materials may also be stored in commercially available hazardous materials storage sheds with built-in secondary containment.
- Empty containers, especially portable totes and drums, will be emptied, drained, and returned to the supplier for reuse to the maximum extent possible or recycled off site.
- Pollution prevention efforts such as replacement of hazardous materials with less hazardous materials, reduction of hazardous waste generation volumes, and recycling will be employed at the facility, as practical.

HAZ-6 The project owner will develop and implement spill response procedures. Personnel working with hazardous materials will be trained in proper handling and emergency response to chemical spills or accidental releases. Additionally, designated personnel will be trained as a facility hazardous materials response team. Safety equipment will be provided for use as required during chemical containment and cleanup activities, and will include safety showers and eyewash stations. The facility will maintain on site one or more spill response kits. These kits will contain absorbents appropriate for the hazardous materials kept on site and each kit will be clearly designated for the type of spilled material for which it should be used.

HAZ-7 The project owner will develop and implement several programs to address hazardous materials storage and security, emergency response procedures, employee training requirements, hazard recognition fire safety, first-aid/emergency medical procedures, hazardous materials release containment/control procedures, hazard communication training, PPE training, and release reporting requirements. These programs will include the HMBP, worker safety program, fire response program, plant health and safety program, and facility standard operating procedures. The HMBP will include procedures on hazardous

materials handling, use, and storage; emergency response; spill prevention and control; training; record keeping; and reporting.

5.6.5 References

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