5.6 Hazardous Material Handling

This section addresses potential impacts from the use of hazardous materials during construction and operation of the BSEP.

5.6.1 LORS Compliance

Design, construction and operation of the Project will be conducted in accordance with 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 LORS

LORS	Applicability	Where Discussed in AFC
Federal:		
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund), 42 USC §9601 *et seq.,* 40 Code of Federal Regulations (CFR) Part 302, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA)	Requires notification to various agencies when there is a release of hazardous substances from a facility.	Sections 5.6.4 and 5.16
Emergency Planning and Community Right to Know Act (EPCRA), 42 USC §11001 *et seq.* 40 CFR Parts 350, 355, and 370	Requires inventory reporting, planning and reporting for hazardous and acutely hazardous materials.	Section 5.6.4
Occupational Safety and Health Standards, 29 USC Section 65129; 29 CFR 1910 *et seq*. and Safety and Health Regulations for Construction, 29 CFR 1926 *et seq*.	Specifies standards for hazardous materials storage, handling, and worker protection in emergencies.	Sections 2.0, 5.6.4 and 5.18
Oil Pollution Prevention, 40 CFR 112	Requires the preparation of a Spill Prevention Control and Countermeasures (SPCC) Plan.	Sections 5.6.4 and 5.17
Chemical Facility Anti-Terrorism Standard, 6 CFR Part 27	Requires facilities that use or store certain hazardous materials to submit information to the Department of Homeland Security (DHS) so that a vulnerability assessment can be conducted to determine what security measures should be implemented.	Section 5.6.1

LORS	Applicability	Where Discussed in AFC
State:		
Hazardous Material Business Plan, California Health and Safety Code (HSC) § 25500 to 25541; 19 CCR §§ 2720-2734.	Requires the preparation and submittal of a chemical inventory, and planning and reporting for management of hazardous and acutely hazardous materials.	Section 5.6.4
Hazardous Substance Information and Training Act (HSITA), 8 CCR § 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 5.6.4
Safety Management Plans, Code of California Regulations (CCR) 8 CCR Section 5189	Requires facility owners to develop and implement effective safety management plans.	Section 5.6.4
California Building Standards Code, CCR, Title 24	Requires local Building Official to inspect and verify compliance with hazardous material management requirements prior to issuance of an occupancy permit.	Section 5.6.4
California Government Code Section 65850.2	Restricts the issuance of an occupancy permit to until the facility has submitted an RMP to the administering agency.	Section 5.6.4
Storm Water Pollution Prevention, Water Quality Order 97-03-DWQ, General Permit CAS000001 and Construction Activities Storm Water General Permit Order 99-08-DWQ	Requires the preparation of a Storm Water Pollution Prevention Plan for construction and industrial activities.	Sections 5.6.4. and 5.17
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65) HSC §25249.5 *et seq*.; CCR Title 22, Division 2, Part 2, Subdivision 1, Chapter 3 *et seq*.	California Safe Drinking Water and Toxic Enforcement Act (Proposition 65) requires persons who emits certain toxic chemicals to provide warning to exposed persons, and prevents certain toxic chemicals from being discharged into sources of drinking water.	Section 5.6.1
Local:		
Uniform Fire Code, Kern County Code Section 17.32.010	Adopts the Uniform Fire Code, 2000 Edition, into Kern County regulations.	Section 5.6.4
Industry Codes and Standards:		
American Society of Mechanical Engineers (ASME), American National Standards Institute (ANSI) and American Society of Testing Materials (ASTM)	Sets forth standards for power plant design, including mechanical systems, electrical, and piping.	Sections 2.0, 5.6.4, and 5.18
Uniform Fire Code, Articles 79, 80, and others	Sets forth requirements for the storage and handling of hazardous materials.	Sections 2.0, 5.6.4, and 5.18
National Fire Protection Agency (NFPA)	Establishes fire prevention standards and guidelines.	Sections 2.0, 5.6.4, and 5.18

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 (Superfund), as amended by SARA, and EPCRA

CERCLA prescribes that the National Response Center be notified for any release of a reportable quantity of a hazardous substance (42 USC Section 9603); 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 42 USC Section 9601(14)(Section 101). EPA's regulations codified at 40 CFR 302.4, Table 3.2-4, set forth the list of hazardous substances under CERCLA and the reportable quantities for each.

SARA Title III established a nationwide emergency planning and response program and imposed reporting requirements for businesses that store, handle, or produce significant quantities of extremely hazardous materials. The Act (codified in 40 C.F.R.,§68.110 *et seq*.) requires 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. The requirements of these Acts are reflected in the California HSC, Section 25531 *et seq*.

The Project will conform to these requirements by developing a Hazardous Materials Business Plan (HMBP). The administering agencies for the above authority are the EPA (Region IX), the National Response Center, and Kern County Environmental Health Services Department. Kern County Environmental Health Services Department is a Certified Unified Program Agency (CUPA).

Chemical Accident Prevention Provisions, 40 CFR Part 68

40 CFR Part 68 requires the preparation of a Risk 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 prevention 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 (CalARP) that generally mirrors the Federal RMP program (see below). For those aspects of the California program that differ from the Federal program, California's program is more stringent.

As discussed in more detail later in this section, the Project proposes to use three chemicals listed on the Federal regulated substance list: hydrogen, methane (a component of natural gas), and cyclohexylamine (found in a water treatment product). However, a Federal RMP is not required for the Project because none of the chemicals will be stored or used onsite during construction or operation in excess of the applicable threshold quantity. A maximum of approximately 330 pounds for hydrogen will be present onsite in storage and in the process equipment, well below the threshold of 10,000 pounds; a maximum of 140 pounds of methane will be present in natural gas in the process equipment, well below its threshold of 10,000 pounds; and a maximum of 665 pounds of cyclohexylamine will be stored on the Project site, well below its threshold of 15,000 pounds.

Occupational Safety and Health Standards, 29 USC Section 65129; 29 CFR 1910 *et seq*. and Safety and Health Regulations for Construction, 29 CFR 1926 *et seq*.

These standards requires employee training, personal protective equipment, safety equipment, and written procedures, programs and plans for insuring worker safety when working with hazardous materials or hazardous work environments. Although intended primarily to protect worker health and safety, these requirements affect general facility safety.

Oil Pollution Prevention, 40 CFR Part 112

The Oil Pollution Prevention regulations (40 CFR 112) require the preparation of a SPCC Plan if oil is stored at the facility in excess of 1,320 gallons in aboveground storage. The SPCC regulations place restrictions on the management of petroleum materials and, therefore, have some bearing on hazardous materials management (also see Section 6.17, Waste Management). The facility will be required to prepare SPCC Plan, as the quantity of oil stored aboveground is expected to exceed 1,320 gallons. The administering agency is the EPA; however, the Kern County Environmental Health Services Department conducts inspections related to the SPCC program.

Chemical Facility Anti-Terrorism Standard, 6 CFR Part 27

The Chemical Facility Anti-Terrorism Standard (CFATS) of the Cal/EPA Department of Health Services (DHS) regulations requires that facilities which use or store certain hazardous materials in substantial quantities to submit information to the DHS 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 DHS.

The Project proposes to use three chemicals listed as Chemicals of Interest in the regulation: hydrogen, methane (a component of natural gas), and cyclohexylamine (found in a water treatment product). However, none of the chemicals will be stored or used onsite during construction or operation of the Project in excess of the applicable threshold quantity. A maximum of approximately 330 pounds for hydrogen will be present onsite in storage and in the process equipment, well below the threshold of 10,000 pounds; a maximum of 140 pounds of methane will be present in natural gas in the process equipment, well below its threshold of 10,000 pounds; and a maximum of 665 pounds of cyclohexylamine will be stored onsite, well below its threshold of 15,000 pounds. Therefore, the CFATS will not apply to the BSEP.

5.6.1.2 State LORS

Applicable State of California LORS are summarized below.

HMBP, California HSC Sections 25500 - 25543.3; 19 CCR Section 2720 - 2734

These sections require the preparation of a HMBP by the facility operator. The HMBP identifies the hazards, storage locations and storage quantities for each hazardous chemical stored onsite. The HMBP is submitted to the CUPA for emergency planning purposes. A HMBP will be prepared by the Project to comply with these requirements. The administering agency is the CUPA, which in this case is the Kern County Environmental Health Services Department.

Hazardous Substance Information and Training, 8 CCR Section 339; Section 3200 *et seq*., Section 5139 *et seq*. and Section 5160 *et seq*.

Hazardous chemicals relating to Hazardous Substance Information and Training (HSITA) are listed in 8 CCR Section 339. 8 CCR Section 3200 *et seq*. and 5139 *et seq*. address control of hazardous substances; 8 CCR Section 5160 *et seq*. address hot, flammable, poisonous, corrosive, and irritant substances. The California regulations contained in Title 8 (Division of Occupational Safety and Health) are generally more stringent than those contained in Title 29 of the Federal regulations. The administering agency for these requirements is the California Occupational Safety and Health Agency (Cal-OSHA).

Safety Management Plans, 8 CCR Section 5189

8 CCR Section 5189 requires facility owners to develop and implement effective safety management plans to insure that large quantities of hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process (if/when applicable to the facility, which is not the case for the BSEP). The administering agency for these requirements is Cal-OSHA.

Risk Management Plan, HSC Section 25531 *et seq*.

The CalARP Program under HSC Section 25531 *et seq*. requires facility owners storing or handling acutely hazardous materials in excess of threshold quantities to develop a 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 four chemicals listed on the State's regulated substance list: hydrogen, methane (a component of natural gas), cyclohexylamine (found in a water treatment product) and sulfuric acid. However, a CalARP RMP is not required for the Project because none of the chemicals will be stored or used onsite during construction or operation in excess of the applicable threshold quantity. A maximum of approximately 330 pounds for hydrogen will be present onsite in storage and in the process equipment, well below the threshold of 10,000 pounds; a maximum of 140 pounds of methane will be present in natural gas in the process equipment, well below its threshold of 10,000 pounds; a maximum of 665 pounds of cyclohexylamine will be stored onsite, well below its 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.

California Building Code (CBC), CCR Title 24

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., Kern County) must inspect and verify compliance with these requirements prior to issuance of an 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. As the facility is not required to prepare a RMP, this requirement does not apply to the Project.

Storm Water Pollution Prevention, Water Quality Order 97-03-DWQ, General Permit CAS000001 (operations) and Construction Activities Storm Water General Permit Order 99-08-DWQ

The BSEP will be subject to the statewide permit governing storm water runoff from industrial facilities during both construction and operations. The permits require implementation of Storm Water Pollution Prevention Plans (SWPPP) overseen by the State Water Resources Control Board through its Regional Boards. The SWPPP describes the management of hazardous materials with the potential to contaminate storm water and, therefore, will have some bearing on hazardous materials management. 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 (Proposition 65), HSC Section 25249.5 *et seq*.; CCR Title 22, Division 2, Part 2, Subdivision 1, Chapter 3 *et seq*.

Proposition 65 requires persons who emit/release certain chemicals that cause cancer and reproductive toxicity to provide warning to exposed persons, and prevents certain chemicals that cause cancer and reproductive toxicity from being discharged into sources of 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. The proposed Project will not use any chemical substances that contain Proposition 65-listed chemicals. 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 combustion byproducts from the facility from combustion of natural gas in the facility boilers or from diesel fuel combustion in the emergency engine; however, the emission levels are not expected to exceed Proposition 65 thresholds for which public notification would be required.

5.6.1.3 Local LORS

Kern County Code Section 17.32.010

Section 17.32.010 adopts the Uniform Fire Code, 2000 Edition, published by the Western Fire Chiefs Association and the California Building Standards Commission with errata, together with those portions of

the Uniform Fire Code, 2000 Edition, including Appendix Chapters I-C, II-A, II-B, II-C, II-F, II-I, II-J, III-A, III-C, III-D, IV-A, and the "Uniform Fire Code Standards, 1997 Edition," as amended by the "Uniform Fire Code Standards, 2000 Edition". The Kern County Fire Department is the administering agency. The UFC is discussed in more detail in Section 5.6.1.4.

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 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. Article 79 identifies requirements for combustible and flammable liquids. The administering agency for these requirements is the Kern County Environmental Health Services Department.

National Fire Protection Association (NFPA)

NFPA publishes standards for fire prevention. Several NFPA standards potentially apply to the construction, operation and maintenance of the facility, including standards for hydrogen technologies, 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 Kern County Fire Department is the administering agency for NFPA standards.

The Project will be designed to meet all applicable industry 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 plant personnel and to prevent significant adverse offsite impacts to the public at large. In addition, Project construction and operation will incorporate up-to-date industrial technology and design standards, as well as established good industrial practices.

5.6.1.5 Permits Required and Permit Schedule

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

5.6.1.6 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
Peter Reich or Elizabeth Cox U.S. EPA Region IX 75 Hawthorne Street San Francisco, CA 94105	(415) 947-8000 reich.peter@epa.gov cox.elizabethm@epa.gov	SPCC
Larry McCune Occupational Safety and Health Administration (OSHA) Region IX 71 Stevenson Street, Room 420 San Francisco, CA 94105	(510) 286-7000 LMcCune@hq.dir.ca.gov	Hazardous material storage, worker safety
National Response Center	(800) 424-8802	Hazardous substance release notification
Randy Schulley, Chief Office of Emergency Services (OES) 3650 Schriever Ave. Mather, CA 95655	(916) 845-8510 (non-emergency) (800) 852-7550 (emergency) randy.schulley@oes.ca.gov	Hazardous substance release notification
Mike Plaziak Senior Water Resources Control Engineer Lahontan RWQCB, Victorville Office 14440 Civic Drive, Suite 200 Victorville, CA 92392	(760) 241-7325 mplaziak@waterboards.ca.gov	SWPPP
Matthew Constantine, Director Kern County Environmental Health Services Department 2700 M Street Bakersfield, CA 93301	(661) 862-8700 eh@co.kern.ca.us	HMBP, Aboveground Storage Tank (AST) inspections, hazardous substance release notification
Benny Wofford Deputy Fire Marshall Kern County Fire Department 5642 Victor Street Bakersfield, CA 93308	(661) 391-7000 (661)-822-1799 zwells@co.kern.ca.us	Uniform Fire Code, NFPA
Charles Lackey, Director Kern County Building Inspection Division, Engineering & Survey Services Department 2700 M Street Bakersfield, CA 93301	(661) 862-8650 ess@co.kern.ca.us	Occupancy Permit
Cal-OSHA, Central Valley 1901 North Gateway Boulevard, Suite 102 Fresno, CA 93727	(559) 454-1295	HSITA, Worker safety

5.6.2 Affected Environment

The BSEP plant site is approximately 2,012 acres, almost entirely vacant, and largely disturbed by past alfalfa farming, although no agricultural activities have occurred at the site since the 1980s. There are several unoccupied structures outside the plant site immediately south of the site access road from SR-14. The area immediately adjacent in all four directions of the BSEP plant site is undeveloped, with the nearest residence approximately 0.3 mile from the eastern plant site boundary.

5.6.2.1 Sensitive and Residential Receptors

The BSEP plant site will be closed to public access during both construction and operation. A consideration for hazardous materials analyses is the proximity of residential receptors and sensitive receptors, which are defined as schools, hospitals, day-care centers, emergency response facilities, and long-term care facilities. The nearest educational or medical facilities are the Red Rock Community Day School in Cantil (which has been determined to no longer be in use), approximately four miles northeast of the site, and the East Kern Health Care facility in California City, approximately 10 miles southeast of the site. Several residences have been identified within one mile of the plant site, the closest of which are listed below and shown on Figure 5.7-1 in the AFC Land Use section:

- East Residence 1 - located approximately 2,300 feet (0.4 mile) east of the point were the plant site's northern boundary turns south;
- East Residence 2 - located approximately 1,700 feet (0.3 mile) southeast of the point were the plant site's eastern boundary turns west;
- West Residence - located on the west side of SR-14 approximately 2,500 feet (0.5 mile) north of the point where the site access road intersects SR-14;
- Southeast Residence - located approximately 3,300 feet (0.6 mile) southeast of the plant site's extreme southeast corner; and
- Northeast Residence - located at the extreme southwest corner of Cantil, approximately 3,400 feet (0.6 mile) north of the plant site's extreme northeast corner.

The Project will also involve the construction of linear facilities, including a natural gas supply pipeline and electrical transmission lines. There are no known hazardous materials currently stored or used on the properties designated for these Project components. While no storage of hazardous materials is associated with operating these linear facilities, 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 Terrain and Meteorology

The Project site is located in the Mojave Desert which is classified as a "high desert". It is a transition between the "hot" Sonoran Desert to the south and the "cold" Great Basin Desert to the north. Characteristic of a desert climate, the Mojave Desert has extreme daily temperature changes, low annual precipitation, strong seasonal winds, and mostly clear skies. The terrain in the vicinity of the Project site is generally flat. The prevailing winds are from the south or south-southwest about 30 percent of the time. This is a result of large scale circulation patterns as well as nighttime drainage winds from the San

Bernardino Mountains to the south. The highest wind speeds in the vicinity of the site tend to be during summer afternoons. These high winds occur most frequently when the wind directions are from the south, south-southwest, and west. On a less frequent basis, usually during the fall and winter, the development of intense high pressure, centered over the Great Basin in Nevada, produce the high speed north to northeasterly Santa Ana winds. Additional terrain and meteorology 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 offsite.

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 plant personnel and to prevent significant adverse offsite impacts to the public at large. In addition, as presented in Appendix C, Engineering Design Criteria, Project 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. Thus, 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 plant site during construction.

Diesel fuel is the hazardous material with the greatest potential for environmental consequences during the construction phase due to the use of diesel fuel in construction equipment and the frequent refueling that will likely 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 onsite 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, 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 the 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 onsite during BSEP 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.

Hazardous Material Inventory

A list of the large-quantity hazardous materials stored and used at the BSEP 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	Relative Toxicity[1] and Hazard Class[2]	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Natural Gas (methane)	Low toxicity; Hazard class – Flammable gas	None Established	No on site storage, up to 140 pounds of natural gas in equipment and piping; pressurized carbon steel pipeline for delivery to site	No storage on site. Piping will be designed to U.S. Department of Transportation (DOT) specifications; onsite facilities (gas metering) will be designed and operated to industry standards.
Hydrogen	Low toxicity; Hazard class – Flammable gas	None Established	In generator cooling loop and "tube trailer"; total inventory of 63,000 SCF (335 pounds)	Pressure safety tank, crash posts, pressure relief valves
Sodium Hydroxide, 50% solution	High toxicity; Hazard class – Corrosive	PEL: 2 mg/m^3	Carbon steel tank; 8,500 gallons	Isolated from incompatible chemicals and secondary containment
Sodium Hypochlorite, 12.5% solution	High toxicity; Hazard class – Poison-B, Corrosive	Workplace Environmental Exposure Limit (WEEL) - STEL: 2 mg/m3 PEL: 0.5 ppm (TWA), STEL: 1 ppm as Chlorine TLV: 1 ppm (TWA), STEL: 3 ppm as Chlorine	Plastic tanks; 17,000 gallons total inventory (2 x 8,500 gallons)	Secondary containment
Sulfuric Acid, 29.5% solution	High toxicity; Hazard class – Corrosive, water reactive	PEL: 1 mg/m^3	Contained in batteries; 2,000 gallons total inventory	Isolated from incompatible chemicals and secondary containment
Sulfuric Acid, 93% solution	High toxicity; Hazard class – Corrosive, water reactive	PEL: 1 mg/m^3	Lined, carbon steel tanks; 16,000 gallons total inventory (2 x 8,000 gallons)	Isolated from incompatible chemicals, lined tank, and secondary containment

Hazardous Material	Relative Toxicity[1] and Hazard Class[2]	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Carbon Dioxide	Low toxicity; Hazard class – Non flammable gas	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 Diphenyl ether (73.5%) Biphenyl (26.5%)	Moderate toxicity, Hazard class – Irritant; Combustible Liquid (Class III-B)	Biphenyl = PEL: 0.2 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 MM 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.
Lube Oil	Low toxicity Hazard class – NA	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 for tank and for maintenance inventory
Mineral Insulating Oil	Low toxicity Hazard class – NA	None established	Carbon steel transformers; total onsite inventory of 32,000 gallons	Used only in transformers, secondary containment for each transformer
Diesel Fuel	Low toxicity; Hazard class – Combustible liquid	PEL: none established TLV: 100 mg/m^3	Carbon steel tank (300 gallons)	Stored only in fuel tank of emergency engine, secondary containment.
Nitrogen	Low toxicity; Hazard class – Non flammable gas	None established	Carbon steel tank; 7,500 pounds total inventory	Carbon steel tank with crash posts

Hazardous Material	Relative Toxicity[1] and Hazard Class[2]	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Hydraulic fluid	Low to moderate toxicity; Hazard class – Class IIIB combustible liquid	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.
Water treatment chemical NALCO Tri-Act 1800 Cyclohexlyamine (5 – 10%) Monoehtanolamine (10 – 30%) Methoxyproplyamine (10 – 30%)	High toxicity; Hazard class – Corrosive, Class II Combustible liquid	Cyclohexlyamine = TLV: 10 ppm (41 mg/m^3) Monoethanolamine = TLV: 3 ppm (7.5 mg/m^3) TWA: 3 ppm (7.5 mg/m^3) STEL: 6 ppm (15 mg/m^3) Methoxyproplyamine = TLV: 5 ppm TWA STEL: 15 ppm	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO Elimin-Ox Carbohydazide (5 -10%)	Moderate toxicity; Hazard class – Sensitizer	Carbohydazide = PEL: none established	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO 3D Trasar 3DT185 Phosphoric Acid (60 -100%)	High toxicity; Hazard class – Corrosive	Phosphoric acid = PEL: 1 mg/m^3 (TWA) TLV: 1 mg/m^3 (TWA), STEL: 3 mg/m^3	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO 3D Trasar 3DT177 Phosphoric acid (30%)	Moderate toxicity; Hazard class – Irritant	Phosphoric acid = PEL: 1 mg/m^3 (TWA) TLV: 1 mg/m^3 (TWA), STEL: 3 mg/m^3	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO 3D Trasar 3DT190	Low toxicity; Hazard class – Irritant	None established for mixture	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment

Hazardous Material	Relative Toxicity[1] and Hazard Class[2]	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Water treatment chemical NALCO Acti-Brom (R) 7342 Sodium bromide	Low toxicity; Hazard class – Irritant	Sodium bromide = PEL: none established	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO pHreedom® 5200M Sodium salt of phosphonomethylated diamine	Low to moderate toxicity; Hazard class – Irritant	Sodium salt of phosphonomethylated diamine = PEL: none established	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO PCL-1346	Low toxicity; Hazard class – Irritant	None established for mixture	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO Permacare (R) PC-7408 Sodium bisulfite	Low toxicity; Hazard class – Irritant	Sodium bisulfite = PEL: none established: TLV: 5 mg/m^3 TWA	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO BT-3000 Sodium hydroxide Sodium tripolyphosphate	High toxicity; Hazard class – Corrosive	Sodium hydroxide = PEL: 2 mg/m^3 Sodium tripolyphosphate = PEL: none established	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment
Water treatment chemical NALCO 8338 Sodium nitrite Sodium tolytriazole Sodium hydroxide	Moderate toxicity; Hazard class – Toxic	Sodium nitrite = PEL: none established Sodium tolytriazole = PEL: none established Sodium hydroxide = PEL: 2 mg/m^3	Plastic totes, 2 x 400 gallons	Inventory management, isolated from incompatible chemicals and secondary containment

Hazardous Material	Relative Toxicity[1] and Hazard Class[2]	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Welding gas Acetylene	Moderate toxicity; Hazard class – Toxic	PEL: none established	Steel cylinders; 200 cubic foot each, 800 cubic foot total on site	Inventory management, isolated from incompatible chemicals,
Welding gas Oxygen	Low toxicity; Hazard class – Oxidizer	PEL: none established	Steel cylinders; 200 cubic foot each, 800 cubic foot total on site	Inventory management, isolated from incompatible chemicals
Welding gas Argon	Low toxicity; Hazard class – Nonflammable gas	PEL: none established	Steel cylinders; 200 cubic foot each, 800 cubic foot total on site	Inventory management
Fertilizer Urea	Low toxicity; Hazard class - NA	WEEL: 10 mg/m^3, 8-hour TWA	Stored in bags (dry pellets), 5 x 50-pound, 250 pound total inventory	Inventory management, indoor storage
Fertilizer Monopotassium phosphate	Low toxicity; Hazard class - Irritant	TLV: 10 mg/m^3 (inhalable) 8-hr TWA, 3 mg/m^3 (respirable) 8-hr TWA PEL: 15 mg/m^3 (total dust) 8-hr TWA, 5 mg/m^3 (respirable) 8-hr TWA	Stored in bags (dry pellets), 5 x 50-pound, 250 pound total inventory	Inventory management, indoor storage
Activated Carbon	Non-toxic (when unsaturated), low to moderate toxicity when saturated, depending on the adsorbed material; Hazard class – combustible solid	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 x 2,000-lb canisters, 4,000 pounds total inventory, no additional storage	No excess inventory stored onsite, prompt disposal when spent
Herbicide Roundup® or equivalent	Low toxicity; Hazard class - Irritant	Isoproplyamine 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 onsite

Hazardous Material	Relative Toxicity[1] and Hazard Class[2]	Permissible Exposure Limit	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Soil stabilizer Active ingredient: acrylic or vinyl acetate polymer or equivalent	Non-toxic; Hazard class - NA	None established	No onsite storage, supplied in 55-gallon drums or 400-gallon totes, used immediately	No excess inventory stored onsite

[1] 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.

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

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 [CFC]), gasoline, hydraulic fluid, propane, and welding rods typical of those purchased from retail outlets may also be stored and used at the facility. 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 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 aboveground storage tanks (ASTs) manufactured of carbon steel or plastic, or in 400-gallon (nominal) capacity plastic totes. 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 containing sulfuric acid, sodium hydroxide, sodium hypochlorite, and the various water treatment chemicals each 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. Personal protection equipment (PPE) will be provided.

Appropriate safety programs will be developed addressing 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 Injury and Illness Prevention Program (see Section 5.18, Worker Safety), fire response program, plant safety program and facility standard operating procedures. As required under Federal and California regulations, a HMBP will be prepared and submitted to the Kern County Environmental Health Services Department.

The facility will be subject to the SWPPP requirements administered by the State Water Resources Control Board under the Storm Water General Permit. The SWPPP 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 Draft Erosion and Sediment Control Plan (DESCP) to meet CEC requirements is provided in Appendix L.2.

Chemical-Specific Operating Practices and Chemical Toxicity

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

Fuel Gas Delivery. A new 17.6-mile natural gas pipeline traveling north from its origin west of California City and buried in disturbed road shoulders will supply gas to the Project boilers. There will be no onsite storage of natural gas. A total of approximately 140 pounds of natural gas will be present on site in the pipelines and equipment. Natural gas consists mainly of methane (approximately 95 percent). Methane is a flammable gas with a National Fire Protection Association (NFPA) hazard rating of 4 (NFPA 1994) with low toxicity.

Compressed Gas Storage. Hydrogen will be used as a generator coolant for the Project. A maximum of 63,000 standard cubic feet (335 pounds) of hydrogen may be present on site at any one time in the equipment cooling loop and "tube trailer". The hydrogen tanks on the tube trailers are DOT-specification tanks capable of withstanding the normal abuse of highway travel and all but the very worst vehicular collisions without release. In addition, the tube trailers will be located outside, remote from the steam turbine generator, and away from electrical lines and other potential ignition sources, as required by applicable building and fire codes. The hydrogen tanks also will be protected from vehicular impact by installation of crash posts and other protective measures. While parked at the facility, the tanks have a very low risk of failure. Hydrogen is a flammable gas with a NFPA hazard rating of 4 (NFPA, 1994), and low toxicity.

Other 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. Storage of large quantities of sulfuric acid (16,000 gallons), sodium hydroxide (8,500 gallons), and sodium hypochlorite (17,000 gallons) will require special precautions, due to their corrosive natures. Each of the chemicals will be stored in tanks constructed of a chemically compatible material to minimize the potential for catastrophic failure of the tank. A spill containment structure

surrounding each storage tank will also be provided in order to contain spills and leaks. Concrete spill containment structures will be coated with a corrosion-resistant material such as epoxy. Sulfuric acid is corrosive and water reactive. Although sulfuric acid is highly toxic, due to the low vapor pressure, it is typically hazardous only by direct physical contact. Sodium hydroxide is corrosive. Although sodium hydroxide is corrosive, due to the low vapor pressure, it is typically hazardous only by direct physical contact. Sodium hypochlorite is toxic, corrosive and a Poison-B.

Boiler feedwater and cooling water treatment chemicals include the corrosion inhibitors, oxygen scavengers, pH buffers, and anti-scaling agents. A total of 11 proprietary (NALCO) water treatment products are anticipated for use in the boiler feedwater and cooling tower applications, as shown in Table 5.6-3. These products are stored in 400-gallon (nominal) plastic totes, and are shipped to the site in those containers. Shipping and storing the products in the same container minimizes chemical transfers, and thus minimizes the chances of a spill. The totes will be provided with secondary containment sufficient to hold the full stored contents with an allowance for precipitation. The toxicity of each mixture is low; however, the toxicity of individual specific ingredients in the mixture may be higher.

Heat Transfer Fluid. Therminol VP-1™ is the HTF that will be used in the solar array and steam cycle of the Project. Approximately 1,300,000 gallons of Therminol are present in the solar system; no additional Therminol will be stored onsite. 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 the HTF fluid 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. As mentioned in AFC Section 2.5.5, the Project is considering remote sensing equipment to allow for the detection of large sudden leaks. Leaks will be repaired promptly, and fluid spills will be cleaned up as described in Section 5.16, Waste. Therminol VP-1™ is a synthetic oil consisting of diphenyl ether and biphenyl. Biphenyl has a CERCLA Reportable Quantity of 100 pounds; approximately 377 pounds (42 gallons) of Therminol contains the Reportable Quantity of biphenyl. Therminol VP-1™ is moderately toxic, a skin irritant, and a Class III-B combustible liquid. The Material Safety Data Sheet (MSDS) for Therminol is provided in Appendix D of the AFC.

Petroleum Products. Lube oil is stored in a 10,000-gallon carbon steel tank associated with the 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 UFC.

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.

Due to the storage of petroleum products in quantities exceeding 1,320 gallons in above ground storage in the transformers, lube oil tank and fuel tank, the Project will prepare a SPCC Plan. The SPCC Plan will

describe the storage of oil, the spill prevention measures employed by the facility, the potential consequences of a spill, and spill response measures developed by the facility to respond to an oil spill. The SPCC Plan will also describe the inspection and monitoring performed by the facility associated with oil storage.

Fertilizer. Fertilizer will be used to enhance biological activity in the bioremediation land farm planned for remediation of HTF-contaminated soil. Up to 250 pounds of urea and 250 pounds of monopotassium phosphate is used for every 500 cubic yards of contaminated soil in the landfarm. The fertilizer will be purchased and stored in 50 pounds bags of pellets. The bags will be stored in the maintenance warehouse. The pellets are dry; a spill will simply be swept up.

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-pound 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. Beacon Solar plans to contract the weed control program to an outside contractor, thus herbicide will not be stored on site, but rather will be brought on site on an as-needed basis. Beacon Solar will ensure that the contractor has the appropriate licenses and a robust safety programs 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. A specific product has not yet been selected, however, most soil stabilizers consists 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. With the exception of natural gas that will be delivered to the Project site via pipeline, hazardous materials will be delivered to the Project site via truck along SR-14 and then into the gated and fenced site via the plant access road. SR-14 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 BSEP 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. Therefore, an offsite consequence analysis has not been prepared for the AFC.

Fire and Explosion Risks

The proposed Project will utilize two materials that pose potential risks of fire and explosion because of their flammability. These are natural gas and hydrogen, each of which is discussed below.

Natural Gas. Natural gas, which will be used as a fuel for the two boilers at the facility, poses a fire and/or explosion risk as a result of its flammability. Natural gas will be delivered to the site via pipeline owned and operated by Southern California Gas Company and will not be stored onsite. The potential risk of a natural gas pipeline rupture will be reduced to insignificant levels through adherence to applicable codes and the development and implementation of appropriate operational procedures that are standard in the industry. The risk of a fire and/or explosion is not considered to be a significant risk by the CEC staff. (CEC, 1999).

Hydrogen. As noted earlier, hydrogen will be used as a generator coolant for the Project. Hydrogen is a flammable gas with a NFPA hazard rating of 4 (NFPA, 1991). A maximum of 63,000 standard cubic feet (335 pounds) of hydrogen may be present on site at any one time in the equipment cooling loop and "tube trailer". The hydrogen tanks on the tube trailer are DOT-specification tanks, capable of withstanding the normal abuse of highway travel, and all but the very worst vehicular collisions. In addition, the tube trailer will be located outside, remote from the steam turbine generator, and away from electrical lines and other potential ignition sources, as required by applicable building and fire codes. The hydrogen tanks also will be protected from vehicular impact by installation of crash posts and other protective measures. Location of the hydrogen tube trailers as described above, coupled with operations consistent with electric power industry design and safety standards, present a negligible risk of explosion or fire.

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 vapor cloud of hazardous materials that could move off 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. (CEC, 2007)

BSEP 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 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 BSEP operational life. 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 BSEP will reduce the Project's potential impacts to below significance levels. The other identified cumulative projects (the Pine Tree Wind Development Project and the Barren Ridge-Castaic Transmission Project) 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). Thus, Project construction and operation activities will not cause or contribute substantially to significant cumulative impacts with respect to hazardous materials handling.

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, Beacon Solar 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, personal protective equipment, and spill containment equipment, such as absorbents.
- Service trucks will not remain on the job site after fueling and service are complete.

HAZ-3 Spills that occur during vehicle maintenance will be cleaned up immediately, and contaminated soil will be containerized and sent for subsequent evaluation and offsite disposal. A log of all spills and cleanup actions will be maintained.

HAZ-4 Emergency telephone numbers will be available on site for the fire department, police, local hospitals, ambulance service(s), and environmental regulatory agencies.

HAZ-5 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, Beacon Solar proposes the following mitigation measures to minimize the potential for incidents involving hazardous materials during operations.

HAZ-6 Hazardous materials storage will typically consist of storage of oil within equipment, aboveground storage tanks, 400-gallon totes, 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 UFC.
- 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 (29 CFR 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-7 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 onsite one or more spill response kits. These kits will contain absorbents appropriate for the hazardous materials kept onsite and each kit will be clearly designated for the type of spilled material for which it should be used.

HAZ-8 The project owner will develop and implement several programs to address hazardous materials storage, emergency response procedures, employee training requirements, hazard recognition fire safety, first-aid/emergency medical procedures, hazardous materials release containment/control procedures, hazard communication training, personnel protective equipment 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

American Institute of Governmental Industrial Hygienists, 1997. Chemical Hazard Handbook.

California Office of Emergency Services, 1998. Risk Management Plans. (www.oes.ca.gov.)

California Energy Commission (CEC), 1999. Letter to Mr. Andrew Welch from Richard K. Buell. High Desert Power Plant – Final Hazardous Materials Management and Air Quality Testimony. July 15.

CEC, 2007. Preliminary Staff Assessment for the Victorville 2 Hybrid Power Project, November.

NFPA, 1991. Fire Protection Guide on Hazardous Materials. Tenth Edition. Quincy, MA.

NIOSH Pocket Guide to Chemical Hazards, 2005. NIOSH Publication No. 2005-151, September.

Perry, R. H., and Chilton, C. H., 1984. Chemical Engineers' Handbook, Fifth Edition, McGraw-Hill Book Company, New York.

Uniform Fire Code, 1997. Prepared by the International Fire Code Institute. March.