5.16 Worker Health and Safety

5.16.1 Introduction

The Hidden Hills Solar Electric Generating System (HHSEGS) will be located on privately owned land in Inyo County, California, adjacent to the Nevada border. It will comprise two solar fields and associated facilities: the northern solar plant (Solar Plant 1) and the southern solar plant (Solar Plant 2). Each solar plant will generate 270 megawatts (MW) gross (250 MW net), for a total net output of 500 MW. Solar Plant 1 will occupy approximately 1,483 acres (or 2.3 square miles), and Solar Plant 2 will occupy approximately 1,510 acres (or 2.4 square miles). A 103-acre common area will be established on the southeastern corner of the site to accommodate an administration, warehouse, and maintenance complex, and an onsite switchyard. A temporary construction laydown and parking area on the west side of the site will occupy approximately 180 acres.

Each solar plant will use heliostats—elevated mirrors guided by a tracking system mounted on a pylon—to focus the sun's rays on a solar receiver steam generator (SRSG) atop a tower near the center of each solar field. The solar power tower technology for the HHSEGS project design incorporates an important technology advancement, the 750-foot-tall solar power tower. One principle advantage of the HHSEGS solar power tower design is that it results in more efficient land use and greater power generation. The new, higher, 750-foot solar power tower allows the heliostat rows to be placed closer together, with the mirrors at a steeper angle. This substantially reduces mirror shading and allows more heliostats to be placed per acre. More megawatts can be generated per acre and the design is more efficient overall.

In each solar plant, one Rankine-cycle steam turbine will receive steam from the SRSG (or solar boiler) to generate electricity. The solar field and power generation equipment will start each morning after sunrise and, unless augmented, will shut down when insolation drops below the level required to keep the turbine online. Each solar plant will include a natural-gas-fired auxiliary boiler, used to augment the solar operation when solar energy diminishes or during transient cloudy conditions, as well as a startup boiler, used during the morning startup cycle, and a nighttime preservation boiler, used to maintain system temperatures overnight. On an annual basis heat input from natural gas will be limited by fuel use and other conditions to less than 10 percent of the heat input from the sun.

To save water in the site's desert environment, each solar plant will use a dry-cooling condenser. Cooling will be provided by air-cooled condensers, supplemented by a partial dry-cooling system for auxiliary equipment cooling. Raw water will be drawn daily from onsite wells located in each power block and at the administration complex. Groundwater will be treated in an onsite treatment system for use as boiler make-up water and to wash the heliostats.

Two distinct transmission options are being considered because of a unique situation concerning Valley Electric Association (VEA). Under the first option, the project would interconnect via a 230-kilovolt (kV) transmission line to a new VEA-owned substation

(Tap Substation) at the intersection of Tecopa Road[1] and Nevada State Route (SR) 160 (the Tecopa/SR 160 Option). The other option is a 500-kV transmission line that interconnects to the electric grid at the Eldorado Substation (the Eldorado Option), in Boulder City, Nevada.

A 12- to 16-inch-diameter natural gas pipeline will be required for the project. It will exit the HHSEGS site at the California-Nevada border and travel on the Nevada side southeast along the state line, then northeast along Tecopa Road until it crosses under SR 160. From this location a 36-inch line will turn southeast and continue approximately 26 miles, following the proposed Eldorado Option transmission line corridor, to intersect with the Kern River Gas Transmission (KRGT) pipeline. A tap station will be constructed at that point to connect it to the KRGT line. The total length of the natural gas pipeline will be approximately 35.3 miles.

The transmission and natural gas pipeline alignments will be located in Nevada, primarily on federal land managed by the U.S. Bureau of Land Management (BLM), except for small segments of the transmission line (both options) in the vicinity of the Eldorado Substation, which is located within the city limits of Boulder City, Nevada. A detailed environmental impact analysis of the transmission and natural gas pipeline alignments will be prepared by BLM.

This section is organized as follows: Section 5.16.2 describes the worker health and safety laws, ordinances, regulations, and standards (LORS) that may apply to the project. A discussion of the affected environment is included in Section 5.16.3. Safety training programs and general health and safety programs that will be prepared and implemented for this project, the methods to control the anticipated hazards from construction and operation of the project, and information on local resources such as fire protection are provided in Sections 5.16.4. Agencies and agency contacts are included in Section 5.16.5. Permits and schedules and the references cited in the preparation of this section are listed in Sections 5.16.6 and 5.16.7, respectively.

5.16.2 Laws, Ordinances, Regulations, and Standards

Construction and operation of HHSEGS will be conducted in accordance with all applicable LORS. Table 5.16-1 summarizes the federal, state, and local LORS relating to worker health and safety. Table 5.16-2 provides a summary of the applicable national consensus standards.

TABLE 5.16-1
Laws, Ordinances, Regulations, and Standards Applicable for Worker Health and Safety

LORS	Applicability
Federal	
Title 29 Code of Federal Regulations (CFR) Part 1910	Contains the minimum occupational safety and health standards for general industry in the United States
Title 29 CFR Part 1926	Contains the minimum occupational safety and health standards for the construction industry in the United States

[1] The road is also called Tecopa Highway and Old Spanish Trail Highway. The names are generally used interchangeably.

TABLE 5.16-1
Laws, Ordinances, Regulations, and Standards Applicable for Worker Health and Safety

LORS	Applicability
State	
California Occupational Safety and Health Act, 1970	Establishes minimum safety and health standards for construction and general industry operations in California
8 California Code of Regulations (CCR) 339	Requires list of hazardous chemicals relating to the Hazardous Substance Information and Training Act
8 CCR 450	Addresses hazards associated with pressurized vessels
8 CCR 750	Addresses hazards associated with high-pressure steam
8 CCR 1509	Addresses requirements for construction, accident, and prevention plans
8 CCR 1509, et seq., and 1684, et seq.	Addresses construction hazards, including head, hand, and foot injuries and noise and electrical shock
8 CCR 1528, et seq., and 3380, et seq.	Requirements for personal protective equipment (PPE)
8 CCR 1597, et seq., and 1590, et seq.	Requirements addressing the hazards associated with traffic accidents and earth-moving
8 CCR 1604, et seq.	Requirements for construction hoist equipment
8 CCR 1620, et seq., and 1723, et seq.	Addresses miscellaneous hazards
8 CCR 1709, et seq.	Requirements for steel reinforcing, concrete pouring, and structural steel erection operations
8 CCR 1920, et seq.	Requirements for fire protection systems
8 CCR 2300, et seq., and 2320, et seq.	Requirements for addressing low-voltage electrical hazards
8 CCR 2395, et seq.	Addresses electrical installation requirements
8 CCR 2700, et seq.	Addresses high-voltage electrical hazards
8 CCR 3200, et seq., and 5139, et seq.	Requirements for control of hazardous substances
8 CCR 3203, et seq.	Requirements for operational accident prevention programs
8 CCR 3270, et seq., and 3209, et seq.	Requirements for evacuation plans and procedures
8 CCR 3301, et seq.	Requirements for addressing miscellaneous hazards, including hot pipes, hot surfaces, compressed air systems, relief valves, enclosed areas containing flammable or hazardous materials, rotation equipment, pipelines, and vehicle-loading dock operations.
8 CCR 3360, et seq.	Addresses requirements for sanitary conditions
8 CCR 3511, et seq., and 3555, et seq.	Requirements for addressing hazards associated with stationary engines, compressors, and portable, pneumatic, and electrically powered tools
8 CCR 3649, et seq., and 3700, et seq.	Requirements for addressing hazards associated with field vehicles
8 CCR 3940, et seq.	Requirements for addressing hazards associated with power transmission, compressed air, and gas equipment

TABLE 5.16-1
Laws, Ordinances, Regulations, and Standards Applicable for Worker Health and Safety

LORS	Applicability
8 CCR 5109, et seq.	Requirements for addressing construction accident and prevention programs
8 CCR 5110, et. seq.	Requirements for the implementation of an ergonomics program
8 CCR 5139, et seq.	Requirements for addressing hazards associated with welding, sandblasting, grinding, and spray-coating
8 CCR 5150, et seq.	Requirements for confined space entry
8 CCR 5160, et seq.	Requirements for addressing hot, flammable, poisonous, corrosive, and irritant substances
8 CCR 5192, et seq.	Requirements for conducting emergency response operations
8 CCR 5194, et seq.	Requirements for employee exposure to dusts, fumes, mists, vapors, and gases
8 CCR 5405, et seq.; 5426, et seq.; 5465, et seq.; 5500, et seq.; 5521, et seq.; 5545, et seq.; 5554, et seq.; 5565, et seq.; 5583, et seq.; and 5606, et seq.	Requirements for flammable liquids, gases, and vapors
8 CCR 5583, et seq.	Requirements for design, construction, and installation of venting, diking, valving, and supports
8 CCR 6150, et seq.; 6151, et seq.; 6165, et seq.; 6170, et seq.; and 6175, et seq.	Provides fire protection requirements
24 CCR 3 et seq.	Incorporates current edition of Uniform Building Code
8 CCR, Part 6	Provides health and safety requirements for working with tanks and boilers
California Health and Safety Code Section 25500, et seq.	Requires that every new or modified facility that handles, treats, stores, or disposes of more than the threshold quantity of any of the listed acutely hazardous materials prepare and maintain a Risk Management Plan (RMP)
California Health and Safety Code Sections 25500 through 25541	Requires the preparation of a Hazardous Material Business Plan (HMBP) that details emergency response plans for a hazardous materials emergency at the facility

TABLE 5.16-2
Applicable National Consensus Standards for Worker Health and Safety

LORS	Applicability
Uniform Fire Code, Article 80	Addresses the prevention, control, and mitigation of dangerous conditions related to storage, dispensing, use, and handling of hazardous materials and information needed by emergency response personnel
National Fire Protection Association (NFPA) 10, Standard for Portable Fire Extinguishers	Requirements for selection, placement, inspection, maintenance, and employee training for portable fire extinguishers
NFPA 11, Standard for Low-Expansion Foam and Combined Agent Systems	Requirements for installation and use of low-expansion foam and combined-agent systems
NFPA 11A, Standard for Medium- and High-Expansion Foam Systems	Requirements for installation and use of medium- and high-expansion foam systems
NFPA 12, Standard on Carbon Dioxide Extinguishing Systems	Requirements for installation and use of carbon dioxide extinguishing systems
NFPA 13, Standard for Installation of Sprinkler Systems	Guidelines for selection and installation of fire sprinkler systems
NFPA 14, Standard for the Installation of Standpipe and Hose Systems	Guidelines for selection and installation of standpipe and hose systems
NFPA 15, Standard for Water Spray Fixed Systems	Guidelines for selection and installation of water spray fixed systems
NFPA 17, Standard for Dry Chemical Extinguishing Systems	Guidance for selection and use of dry chemical extinguishing systems
NFPA 20, Standard for the Installation of Centrifugal Fire Pumps	Guidance for selection and installation of centrifugal fire pumps
NFPA 22, Standard for Water Tanks for Private Fire Protection	Requirements for water tanks for private fire protection
NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances	Requirements for private fire service mains and their appurtenances
NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems	Requirements for the periodic inspection, testing, and maintenance of water-based fire protection systems, including land-based and marine applications.
NFPA 30, Flammable and Combustible Liquid Code	Requirements for storage and use of flammable and combustible liquids
NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines	Fire protection requirements for installation and use of combustion engines and gas turbines
NFPA 50A, Standard for Gaseous Hydrogen Systems at Consumer Sites	Fire protection requirements for hydrogen systems
NFPA 54, National Fuel Gas Code	Fire protection requirements for use of fuel gases
NFPA 59A, Standard for the Storage and Handling of Liquefied Petroleum Gases	Requirements for storage and handling of liquefied petroleum gases
NFPA 68, Guide for Explosion Venting	Guidance in design of facilities for explosion venting

TABLE 5.16-2
Applicable National Consensus Standards for Worker Health and Safety

LORS	Applicability
NFPA 70, National Electric Code	Guidance on safe selection and design, installation, maintenance, and construction of electrical systems
NFPA 70B, Recommended Practice for Electrical Equipment Maintenance	Guidance on electrical equipment maintenance
NFPA 70E, Standard for Electrical Safety Requirements for Employee Workplaces	Employee safety requirements for working with electrical equipment
NFPA 72, Standard for the Installation, Maintenance and Use of Local Protective Signaling Systems for Guard's Tour, Fire Alarm and Supervisory Service	Requirements for installation, maintenance, and use of local protective signaling systems
NFPA 75, Standard for the Protection of Electronic Computer/Data Processing Equipment	Requirements for fire protection systems used to protect computer systems
NFPA 80, Standard for Fire Doors and Windows	Requirements for fire doors and windows
NFPA 85, Boiler and Combustion Systems Hazard Code	Requirements for boiler design, installation, operation, maintenance, and training
NFPA 90A, Standard for the Installation of Air Conditioning and Ventilating Systems	Requirements for installation of air conditioning and ventilating systems
NFPA 101, Code for Safety to Life from Fire in Buildings and Structures	Requirements for design of means of exiting the facility
NFPA 291, Recommended Practice for Fire Flow Testing and Marking of Hydrants	Guidelines for testing and marking of fire hydrants
NFPA 850, Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations	Requirements for fire protection in electric generating plants and alternative fuel electric generating plants
NFPA 1961, Standard for Fire Hose	Specifications for fire hoses
NFPA 1962, Standard for the Care, Maintenance, and Use of Fire Hose Including Connections and Nozzles	Requirements for care, maintenance, and use of fire hose
NFPA 1963, Standard for Screw Threads and Gaskets for Fire Hose Connections	Specifications for fire hose connections
American National Standards Institute/American Society for Mechanical Engineers (ANSI/ASME), Boiler and Pressure Vessel Code	Specifications and requirements for pressure vessels
ANSI, B31.2, Fuel Gas Piping	Specifications and requirements for fuel gas piping

5.16.3 Affected Environment

Construction of HHSEGS, from perimeter fencing to site preparation and grading to commercial operation, is expected to take place from the third quarter of 2012 to the second quarter of 2015 (29 months total). Construction of the common area facilities would occur concurrently with the construction of Solar Plant 1; Solar Plant 2 construction will be staggered 3 months behind Plant 1. The primary trades in demand include pipefitters, electricians, construction managers, ironworkers, laborers, millrights, carpenters, and unskilled labor.

5.16.4 Health and Safety Programs

5.16.4.1 Environmental Checklist

The California Environmental Quality Act checklist does not have specific questions for worker health and safety; however, questions related to worker health and safety are addressed in the Hazardous Materials Management and Noise checklists (Sections 5.5 and 5.7, respectively).

5.16.4.2 Hazard Analysis

During the project, workers will be exposed to construction safety and operation hazards. A hazard analysis has been prepared to evaluate the project hazards and control measures. The analysis identifies the hazards anticipated during construction and operation and indicates which safety programs should be developed and implemented to mitigate and appropriately manage those hazards. The hazard analysis prepared for construction activities is outlined in Table 5.16-3 and the hazard analysis prepared for plant operation is outlined in Table 5.16-4. Because the types of hazards anticipated during plant construction and operation are similar, there is considerable duplication between the tables.

TABLE 5.16-3
Construction Hazard Analysis

Activity	Hazard*	Control*
Motor vehicle and heavy equipment use	Employee injury and property damage from collisions between people and equipment	Motor Vehicle and Heavy Equipment Safety Program
Forklift operation	Same as heavy equipment	Forklift Operation Program
Trenching and excavation	Employee injury and property damage from the collapse of trenches and excavations	Excavation/Trenching Program
Working at elevated locations	Falls from the same level and elevated areas	Fall Prevention Program Scaffolding/Ladder Safety Program Articulating Boom Platforms Program
Use of cranes and derricks	Property damage from falling loads; employee injuries from falling loads; and injuries and property damage from contact with crane or derrick	Crane and Material Handling Program
Working with flammable and combustible liquids	Fire/spills	Fire Protection and Prevention Program; Housekeeping and Material Handling and Storage Program

TABLE 5.16-3
Construction Hazard Analysis

Activity	Hazard*	Control*
Hot work (including cutting and welding)	Employee injury and property damage from fire; exposure to fumes during cutting and welding; ocular exposure to ultraviolet and infrared radiation during cutting and welding	Hot Work Safety Program; Respiratory Protection Program; Employee Exposure Monitoring Program; Personal Protective Equipment Program
Inspection and maintenance of temporary systems used during construction activities	Employee injury and property damage from contact with hazardous energy sources (electrical, thermal, mechanical, etc.)	Electrical Safety Program
Working on electrical equipment and systems	Employee contact with live electricity and energized equipment	Electrical Safety Program; Personal Protective Equipment Program
Exposure to Hazardous Waste	Personnel who are working with or have the potential to be exposed to contaminated soil, groundwater, or debris during construction	Hazardous Waste Program
Confined space entry	Employee injury from physical and chemical hazards	Permit-Required Confined-Space Entry Program
General construction activity	Employee injury from hand and portable power tools	Hand and Portable Power Tool Safety Program; Personal Protective Equipment Program
General construction activity	Employee injury/property damage from inadequate walking and work surfaces	Housekeeping and Material Handling and Storage Program
General construction activity	Employee exposure to occupational noise	Hearing Conservation Program Personal Protective Equipment Program
General construction activity	Employee injury from improper lifting and carrying of materials and equipment	Back Injury Prevention Program
General construction activity	Employee injury to head, eye/face, hand, body, foot, and skin	Personal Protective Equipment Program
General construction activity	Employee exposure to hazardous gases, vapors, dusts, liquids, and fumes	Hazard Communication Program; Respiratory Protection Program; Personal Protective Equipment Program; Air Monitoring Program
General construction activity	Employee exposure to various hazards; reporting of hazardous conditions during construction	Injury and Illness Prevention Program
General construction activity	Heat and cold stress	Heat and Cold Stress Monitoring and Control Program
Construction and testing of high-pressure steam and air systems	Employee injury and property damage due to failure of pressurized system components or unexpected release of pressure	Pressure Vessel and Pipeline Safety Program; Electrical Safety Program

* The hazards and hazard controls provided are generic to construction activities. During various phases of construction, a hazard analysis will be performed to evaluate the hazards and develop appropriate controls.

TABLE 5.16-4
Operation Hazard Analysis

Activity	Hazard*	Control*
Motor vehicle and heavy equipment use	Employee injury and property damage from collisions between people and equipment	Motor Vehicle and Heavy Equipment Safety Program
Forklift operations	Same as heavy equipment	Forklift Operation Program
Trenching and excavation	Employee injury and property damage from the collapse of trenches and excavations	Excavation/Trenching Program
Working at elevated locations	Falls from the same level and elevated areas	Fall Protection Program; Scaffolding/Ladder Safety Program
Use of cranes or derricks	Property damage from falling loads, employee injuries from falling loads, injuries and property damage from contact with crane or derrick	Crane and Material Handling Program
Working with flammable and combustible liquids	Fire/spills	Fire Protection and Prevention Program
Working with hazardous materials	Employee injury due to ingestion, inhalation, dermal contact	Hazard Communication Program
Hot work (including cutting and welding)	Employee injury and property damage from fire; exposure to fumes during cutting and welding; ocular exposure to ultraviolet and infrared radiation during cutting and welding	Hot Work Safety Program; Respiratory Protection Program; Employee Exposure Monitoring Program; Personal Protective Equipment Program; Fire Protection and Prevention Program
Troubleshooting and maintenance of plant systems and general operational activities	Employee injury and property damage from contact with hazardous energy sources (electrical, thermal, mechanical, etc.)	Electrical Safety Program
Working on electrical equipment and systems	Employee contact with live electricity	Electrical Safety Program; Personal Protective Equipment Program
Confined space entry	Employee injury from physical and chemical hazards	Permit-Required Confined-Space Entry Program
General plant operation activities	Employee injuries from hand and portable power tools	Hand and Portable Power Tool Safety Program; Personal Protective Equipment Program
General plant operation activities	Employee injury and property damage from inadequate walking and work surfaces	Housekeeping and Material Handling and Storage Program
General plant operation activities	Employee overexposure to occupational noise	Hearing Conservation Program; Personal Protective Equipment Program
General plant operation activities	Employee injury from improper lifting and carrying of materials and equipment	Back Injury Prevention Program
General plant operation activities	Employee injury and property damage from unsafe driving	Safe Driving Program

TABLE 5.16-4
Operation Hazard Analysis

Activity	Hazard*	Control*
General plant operation activities	Employee overexposure to hazardous gases, vapors, dusts, liquids, and fumes	Hazard Communication Program; Respiratory Protection Program; Personal Protective Equipment Program; Employee Exposure Monitoring Program
General plant operation activities	Reporting and repair of hazardous conditions	Injury and Illness Prevention Program
General plant operation activities	Heat and cold stress	Heat and Cold Stress Monitoring and Control Program
General plant operation activities	Ergonomic injuries	Ergonomic Awareness Program
Maintenance and repair of high-pressure steam and air systems	Employee injury and property damage due to failure of pressurized system components or unexpected release of pressure	Pressure Vessel and Pipeline Safety Program; Electrical Safety Program

* The hazard and hazard controls provided are generic to operational activities. This hazard analysis may have to be updated if plant operations change or new equipment is added that was not considered during this evaluation.

5.16.4.3 Overview of Hazards and Related Programs and Training

The HHSEGS fire protection system is described in Section 2.2.9, Fire Protection. The fire protection system will be designed to protect personnel and limit property loss and plant downtime in the event of a fire. Onsite personnel will be trained in the use of fire protection equipment and will be the first responders to an incident.

Programs are overall plans that set forth the method or methods that will be followed to achieve particular health and safety objectives. For example, the Fire Protection and Prevention Program will describe what has to be done to protect against and prevent fires. This will include equipment required, such as alarm systems and firefighting equipment, and procedures to protect against fires. The Emergency Action Program/Plan will describe escape procedures, rescue and medical procedures, alarm and communication systems, and response procedures for very hazardous materials that can migrate. The programs or plans are contained in written documents that are usually kept at specific locations within the facility.

Each program or plan will contain training requirements that are translated into detailed training courses. These courses are taught to plant construction and operating personnel, as needed. For example, all plant operating personnel will receive training in escape procedures under the Emergency Action Program/Plan, but only those working with flammables will receive training under the Fire Protection and Prevention Program.

Tables 5.16-3 and 5.16-4, which list construction and operation activities and associated hazards, also show (under the "Control" column) the program designed to reduce the occurrence of each hazard.

5.16.4.4 Health and Safety Programs

To protect the safety and health of workers during the construction and operation of HHSEGS, health and safety programs designed to mitigate hazards and comply with applicable regulations will be implemented. Periodic audits will be performed by qualified individuals to determine whether proper work practices are being used to mitigate hazardous conditions and to evaluate regulatory compliance.

The following subsections contain information on the anticipated content of the health and safety programs.

5.16.4.4.1 Construction Health and Safety Program

The following construction safety programs will be developed and implemented during construction of the project, as outlined in the following lists.

Injury and Illness Prevention Program

- Philosophy and safety commitment
- Safety leadership and responsibilities
- Accountability
- Specific core safety processes (see Construction Safety Programs later in this section)
- Employee communication
- Planning "job hazard analysis and pre-task"
- Compliance with work rules and safe work practices
- Measurement of compliance and effectiveness of prevention methods
- Communication of performance and implementation of necessary improvements
- Training and other communication requirements

Fire Protection and Prevention Program

- General requirements
- Housekeeping and proper material storage
- Employee alarm/communication system
- Portable fire extinguishers
- Fixed firefighting equipment
- Fire control and containment
- Flammable and combustible liquid storage
- Use of flammable and combustible liquids
- Dispensing and disposal of flammable liquids
- Service and refueling areas
- Training

Personal Protective Equipment Program

- Personal protective devices
- Head protection
- Eye/face protection
- Body protection
- Hand protection
- Foot protection
- Skin protection
- Fall protection

- High-voltage protection
- Respiratory protection
- Hearing protection
- Hazard analysis
- Training

Emergency Action Program/Plan

Emergency procedures for the protection of personnel, equipment, the environment, and materials:

- Fire and emergency reporting procedures
- Response actions for accidents involving personnel and or property
- Bomb threats
- Site assembly and emergency evacuation route procedures
- Natural disasters response

Reporting and notification procedures for emergencies; contacts, including offsite and local authorities:

- Alarm and communication systems
- Spill response, prevention, and control action plan
- Emergency response equipment
- Emergency personnel (response team) responsibilities and notification roster
- Training requirements

Construction Safety Programs

Motor Vehicle and Heavy Equipment Safety Program

- Operation and maintenance of vehicles
- Inspection
- Personal Protective Equipment
- Training

Forklift Operation Program

- Trained and certified operators
- Fueling operations
- Safe operating parameters
- Training

Excavation/Trenching Program

- Shoring, sloping, and benching requirements
- California Occupational Safety and Health Administration (Cal-OSHA) permit requirements
- Inspection
- Air monitoring
- Access and egress

Fall Protection Program

- Evaluation of fall hazards
- Protection devices
- Training

Scaffolding/Ladder Safety Program
- Construction and inspection of equipment
- Proper use
- Training

Articulating Boom Platforms Program
- Inspection of equipment
- Load ratings
- Safe operating parameters
- Operator training

Crane and Material Handling Program
- Certified and licensed operators
- Inspection of equipment
- Load ratings
- Safe operating parameters
- Training

Hazardous Waste Program
- Evaluation of hazard
- Training
- Air monitoring
- Medical surveillance
- Health and Safety Plan (HSP) preparation

Hot Work Safety Program
- Welding and cutting procedures
- Fire watch
- Hot work permit
- PPE
- Training

Employee Exposure Monitoring Program
- Exposure evaluation
- Monitoring requirements
- Reporting of results
- Medical surveillance
- Training

Electrical Safety Program
- Grounding procedure
- Lock-out/tag-out (LO/TO) procedures
- Overhead and underground utilities
- Utility clearance
- Training

Permit-Required Confined Space Entry Program
- Air monitoring and ventilation requirements
- Rescue procedures
- LO/TO and blocking, blinding, and blanking requirements
- Permit completion
- Training

Hand and Portable Power Tool Safety Program
- Guarding and proper operation
- Training

Housekeeping and Material Handling and Storage Program
- Storage requirements
- Walkways and work surfaces
- Equipment handling requirements
- Training

Hearing Conservation Program
- Identifying high-noise environments
- Exposure monitoring
- Medical surveillance requirements
- Hearing-protective devices
- Training

Back Injury Prevention Program
- Proper lifting and material handling procedures
- Training

Hazard Communication Program
- Labeling requirements
- Storage and handling
- Material Safety Data Sheets (MSDS)
- Chemical inventory
- Training

Respiratory Protection Program
- Selection and use
- Storage
- Fit testing
- Medical requirements
- Inspection and repair
- Training

Heat and Cold Stress Monitoring and Control Program
- Monitoring requirements
- Prevention and control

Pressure Vessel and Pipeline Safety Program

- Line-breaking program
- Equipment inspection and maintenance
- Blocking, bleeding, and blanking
- Training

5.16.4.4.2 Operations Health and Safety Program

Upon completion of construction and commencement of operations at HHSEGS, the construction safety and health program will transition into an operations-oriented program reflecting the hazards and controls necessary during operation. The following text outlines the topics that will be included in the Operations Health and Safety Program.

Injury and Illness Prevention Program

- Personnel with the responsibility and authority for implementing the plan
- Safety and health policy
- Work rules and safe work practices
- System for ensuring that employees comply with safe work practices
- Employee communications
- Identification and evaluation of workplace hazards

Methods and/or procedures for correcting unsafe or unhealthy conditions, work practices, and work procedures in a timely manner based on the severity of the hazards

- Specific safety procedures (see Plant Operation Safety Program)
- Training and instruction

Fire Protection and Prevention Program

- General requirements
- Fire hazard inventory, including ignition sources and mitigation
- Housekeeping and proper materials storage
- Employee alarm/communication system
- Portable fire extinguishers
- Fixed firefighting equipment
- Fire control
- Flammable and combustible liquid storage
- Use of flammable and combustible liquids
- Dispensing and disposal of liquids
- Training
- Personnel to contact for information on plan contents

Emergency Action Program/Plan (Part of the Risk Management Plan)

- Emergency escape procedures and emergency escape route assignments
- Procedures to be followed by employees who remain to operate critical plant operations before they evacuate
- Procedures to account for all employees after emergency evacuation has been completed
- Rescue and medical duties for those employees performing rescue and medical duties
- Fire and emergency reporting procedures
- Alarm and communication system

- Personnel to contact for information on plan contents
- Training requirements

Personal Protective Equipment Program

- Hazard analysis and prescription of PPE
- Personal protective devices
- Head protection
- Eye and face protection
- Body protection
- Hand protection
- Foot protection
- Skin protection
- Sanitation
- Safety belts and life lines for fall protection
- Protection for electric shock
- Medical services and first aid/bloodborne pathogens
- Respiratory protective equipment
- Hearing protection
- Training

Plant Operation Safety Program

Motor Vehicle and Heavy Equipment Safety Program

- Operation and maintenance of vehicles
- Inspection
- Personal Protective Equipment
- Training

Forklift Operation Program

- Trained and certified operators
- Fueling operations
- Safe operating parameters
- Training

Excavation/Trenching Program

- Shoring, sloping, and benching requirements
- Cal-OSHA permit requirements
- Inspection
- Air monitoring
- Access and egress

Fall Protection Program

- Evaluation of fall hazards
- Protection devices
- Training

Scaffolding/Ladder Safety Program
- Construction and inspection of equipment
- Proper use
- Training

Articulating Boom Platforms Program
- Inspection of equipment
- Load ratings
- Safe operating parameters
- Operator training

Crane and Material Handling Program
- Certified and licensed operators
- Inspection of equipment
- Load ratings
- Safe operating parameters
- Training

Hot Work Safety Program
- Welding and cutting procedures
- Fire watch
- Hot work permit
- Personal Protective Equipment
- Training

Workplace Ergonomics Program
- Identification of personnel at risk
- Evaluation of personnel
- Workplace and job activity modifications
- Training

Employee Exposure Monitoring Program
- Exposure evaluation
- Monitoring requirements
- Reporting of results
- Medical surveillance
- Training

Electrical Safety Program
- Grounding procedure
- LO/TO procedures
- Overhead and underground utilities
- Utility clearance
- Training

Permit-Required Confined Space Entry Program
- Air monitoring and ventilation requirements
- Rescue procedures
- LO/TO and blocking, blinding, and blanking requirements

- Permit completion
- Training

Hand and Portable Power Tool Safety Program
- Guarding and proper operation
- Training

Housekeeping and Material Handling and Storage Program
- Storage requirements
- Walkways and work surfaces
- Equipment handling requirements
- Training

Hearing Conservation Program
- Identifying high-noise environments
- Exposure monitoring
- Medical surveillance requirements
- Hearing protective devices
- Training

Back Injury Prevention Program
- Proper lifting and material handling procedures
- Training

Hazard Communication Program
- Labeling requirements
- Storage and handling
- MSDS
- Chemical inventory
- Training

Respiratory Protection Program
- Selection and use
- Storage
- Fit testing
- Medical requirements
- Inspection and repair
- Training

Heat and Cold Stress Monitoring and Control Program
- Monitoring requirements
- Prevention and control

Pressure Vessel and Pipeline Safety Program
- Line-breaking policy
- Equipment inspection and maintenance
- Blocking, bleeding, and blanking
- Communication
- Training

Safe Driving Program
- Inspection and maintenance
- Training

5.16.4.5 Safety Training Programs

To ensure that employees recognize and understand how to protect themselves from potential project hazards, comprehensive training programs for construction and operation will be implemented as indicated in Tables 5.16-5 and 5.16-6. Each of the safety procedures developed to control and mitigate potential site hazards will require some form of training. Training will be delivered in various ways, depending on the requirements of Cal-OSHA standards, the complexity of the topic, the characteristics of the workforce, and the degree of risk associated with each of the identified hazards.

Tables 5.16-5 and 5.16-6 summarize the safety training programs that will be provided to construction and operations personnel, respectively.

TABLE 5.16-5
Construction Training Program

Training Course	Target Employees
Injury and Illness Prevention Training	All
Emergency Action Program/Plan	All
Personal Protective Equipment Training	All
Motor Vehicle and Heavy Equipment Safety Training	Employees working on, near, or with heavy equipment or vehicles
Forklift Operation Training	Employees operating forklifts
Excavation/Trenching Safety Training	Employees involved with trenching or excavation
Fall Protection Training	Employees working at heights greater than 6 feet or required to use fall protection
Scaffolding/Ladder Safety Training	Employees required to erect or use scaffolding
Crane Safety Training	Employees supervising or performing crane operations
Fire Protection and Prevention Training	Employees responsible for the handling and storage of flammable or combustible liquids or gases
Hazard Communication Training	Employees handling or working with hazardous materials
Hazardous Waste	Employees handling or excavating hazardous waste
Hot Work Safety Training Fire Prevention and Protection Training	Employees performing hot work
Electrical Safety Training	Employees performing LO/TO or working on systems that require LO/TO activities
Electrical Safety Training	Employees required to work on electrical systems and equipment, or use electrical equipment and cords
Permit-Required Confined-Space Entry Training	Employees required to supervise or perform confined-space entry activities
Hand and Portable Power Tool Safety Training	Employees that will be operating hand and portable power tools
Heat Stress and Cold Stress Safety Training	Employees that are exposed to temperature extremes

TABLE 5.16-5
Construction Training Program

Training Course	Target Employees
Hearing Conservation Training	All
Back Injury Prevention Training	All
Safe Driving Training	Employees supervising or driving motor vehicles
Pressure Vessel and Pipeline Safety Training	Employees supervising or working on pressurized systems or equipment
Respiratory Protection Training	All employees required to wear respiratory protection
Fire Protection and Prevention Training	All

TABLE 5.16-6
Operations Training Program

Training Course	Target Employees
Injury and Illness Prevention Training	All
Emergency Action Plan	All
Personal Protective Equipment Training	All
Excavation/Trenching Safety Training	Employees involved with trenching or excavation
Scaffolding/Ladder Safety Training	Employees required to erect or use scaffolding
Fall Protection Training	Employees required to use fall protection
Forklift Operator Training	Employees operating forklifts
Crane Safety Training	Employees supervising or performing crane operations
Workplace Ergonomics	Employees performing repetitive activities
Fire Protection and Prevention Training	Employees responsible for the handling and storage of flammable or combustible liquids or gasses
Hot Work Safety Training	Employees performing hot work
Electrical Safety Training	Employees performing LO/TO
Electrical Safety	Employees required to work on electrical systems and equipment
Permit-required Confined-space Entry	Employees required to supervise or perform confined-space entry
Hand and Portable Power Tool Safety Training	Employees that will be operating hand and portable power tools
Heat Stress and Cold Stress Safety Training	Employees exposed to temperature extremes
Hearing Conservation Training	All
Back Injury Prevention Training	All
Safe Driving Training	Employees supervising or driving motor vehicles
Hazard Communication Training	Employees handling or working around hazardous materials
Pressure Vessel and Pipeline Safety Training	Employees supervising or working on pressurized systems or equipment
Respiratory Protection Program	All employees required to wear respiratory protection
Fire Protection and Prevention Training	All

5.16.4.6 Fire Protection

HHSEGS is within the jurisdiction of the Southern Inyo County Fire Protection District. The District has one permanent fire station (in Tecopa) and is working on establishing a second permanent station. The first response will come from a fire response crew (volunteer) in the Charleston View area (approximate response time of 5 to 10 minutes), but it is not a permanent station and is staffed only 75 percent of the time. It has eight volunteers: one first response truck is staffed with three personnel and one fire truck with five personnel. While Charleston View will be the first to respond, it will not have adequate capability for a major incident. The Tecopa Station located in Tecopa, California, at 410 Tecopa Hot Springs Road, 27 miles from the project site (approximate response time of 30 to 50 minutes) will be a backup responder, as will fire response agencies from Nevada. The Tecopa Station has one Type I fire engine with 500 gallon water tank, 1 inch hose (for wild land fires), 1.5- and 2.5-inch hoses (for small and medium residential fires), ladders, breathing apparatus, and foam for wild fires. One of its five staff has EMT1 medical certification (usually the engine operator). The others have basic medical training. In addition, the Tecopa Station has two water tenders with 2,000-gallon capacity, and two ambulances. It has one full-time fire chief and eight volunteer firefighters (Postle, 2011). Because of the remote nature of the area, the construction phases of the project may have minor impacts on fire or hazardous material handling resources. The Applicant is working with the Inyo County Fire Department to understand their requirements and reduce any impacts on service.

Additional assistance will be brought in from Pahrump, Nevada. Inyo County has mutual aid agreements with the Pahrump Valley Fire-Rescue Service (Pahrump, Nevada) and with the Nye County Fire Department (Pahrump, Nevada), as part of Nye County Emergency Services [NCES], as well as one with Clark County (Las Vegas, Nevada) for responses requiring more assistance. The Nye County Fire Department has an approximate response time of 40 minutes from Station 51 at 1510 East Siri Lane in Pahrump (Postle, 2011). The Pahrump Valley Fire-Rescue Service's main station at 300 North Highway 160, Pahrump, Nevada, is located not far from the Nye County Fire Department's Station 51. Pahrump Valley Fire-Rescue's main station is approximately 26 miles from the HHSEGS site and response time is approximately 40 minutes. Pahrump Valley Fire-Rescue's main station has one Class A Engine (2,000 gallons), two 3,500-gallon water tenders, one Type 6 Brush truck, and one Type III Brush Truck, and ALS Ambulances; it also has three additional stations located in the Pahrump area with additional equipment that can be brought in (Pahrump Valley, 2001). It has full-time staff, including more than 10 firefighters (Postle, 2011). Additional assistance can also be obtained from Round Mountain/Smoky Valley Fire Services in Nye County, according to the NCES (Jones, 2011). Support can be obtained from Las Vegas as well, but it is at least a 1-hour response time, and can take up to 2 hours (Jones, 2011).

Based on a March 2011 conversation with James Aragon, Fire Management Officer for the BLM Barstow Field Office, the Barstow office of the BLM has jurisdiction for the project area and BLM land in California that is adjacent to the project site (to the north and west). According to Mr. Aragon, the BLM fire station at Apple Valley will be the next responding station after Southern Inyo County Fire Protection District's two stations and Pahrump Valley Fire. The station is 1.5 hours from the project site and has two engines and one water

tender, as of March 2011. It also has a fire fighting helicopter during fire season; response time for the helicopter is approximately 45 minutes to the project site (Aragon, 2011).

5.16.4.7 Emergency Response

All full-time and volunteer fire fighters in the Southern Inyo Fire Protection District have basic medical training (Postle, 2011). In addition, as of March 2011, there were three Southern Inyo Fire Protection District personnel with EMT certification and five more in training to become EMT certified. The Tecopa Fire Station has two ambulances with two staff each, and a response time of 30 minutes. NCES (in Pahrump) has medical personnel that can be accessed by means of the mutual aid agreement between Inyo County and NCES. Pahrump Valley Fire-Rescue Services has two EMTs and one paramedic at its main station in Pahrump, as well as two ambulances (Pahrump Valley, 2011).

5.16.4.8 Hazardous Materials Response

The Southern Inyo Fire Protection District indicated in March 2011 that local firefighters are equipped to handle simple HazMat incidents, but that HazMat teams from Nye County, Nevada (Nye County Fire Department and Pahrump Valley Fire-Rescue Services) will need to be called in for assistance with more complex situations. Pahrump Valley and Nye County have HazMat teams and can be called in for assistance as part of the mutual aid agreements with Inyo County (Postle, 2011).

The mutual aid agreements are activated through the Southern Inyo County Sheriff's Department. The response comes from either the Pahrump Valley Fire-Rescue Services' main station at 300 North Highway 160, Pahrump or from the Nye County Fire Department's Station 51 (1510 East Siri Lane, Pahrump, Nevada). Station 51 is staffed with 15 to 20 volunteers who are trained as HazMat technicians. The responding team has the following equipment: one hazmat truck with a 25-foot trailer, one biohazard unit, one fire engine, and one ambulance. The response time to the project site, with full resources capabilities, is 45 minutes to 1 hour. Clark County (Las Vegas, Nevada) also has a HazMat response team, but response time is approximately 1 to 2 hours, so the first response will come from the teams in Pahrump (Jones, 2011).

HHSEGS will be required to provide an emergency response plan to identify hazardous materials used at the project to the Inyo County Department of Environmental Health Services (Long, 2011).

5.16.4.9 Law Enforcement

Law enforcement is provided by the Inyo County Sheriff. There is one sheriff station in Shoshone (Highway 127, # 15, Shoshone, California) that has two deputies and two cars. The response time from Shoshone is approximately 30 minutes to 1 hour. In addition, the California Highway Patrol (CHP) has a resident unit between the area east of Death Valley and the Nevada border. Either the Sheriff or CHP would dispatch fire response services, and can activate mutual aid with other counties (Hardcastle, 2011).

Because of the remote nature of the area, the construction phases of the project may have minor impacts on law enforcement. The Applicant is working with the Inyo County Sheriff's Office to understand their requirements and reduce any impacts.

5.16.4.10 Hospitals

Any injured workers will be transported to Desert View Regional Medical Center at 360 South Lola Lane, Pahrump, Nevada (Postle, 2011). The Medical Center is located approximately 30 miles from the project site (45 to 50 minutes drive time). Trauma patients will be air lifted by Mercy Air or Medical Evac to University Medical Center in Las Vegas (1800 West Charleston Blvd., Las Vegas, Nevada). University Medical Center is approximately 57 miles distant. This is a fully staffed teaching hospital, serving the medical needs of southern Nevada and parts of California and Arizona.

5.16.5 Involved Agencies and Agency Contacts

Several agencies are involved to ensure protection of worker health and safety. Agency contacts relative to worker health and safety and fire are shown in Table 5.16-7.

TABLE 5.16-7
Agency Contacts for Worker Safety

Issue	Agency	Contact
Fire Suppression	Southern Inyo County Fire Protection District	Paul Postle, Chief Southern Inyo County Fire Protection District 410 Tecopa Hot Springs Rd Tecopa, California 92389-0051 (760) 852-4130 paul2701@wildblue.net
Hazardous Materials Incidents	Nye County Emergency Services	Brent Jones Director of Nye County Emergency Services 1510 E Siri Lane Pahrump, Nevada 89060 (775) 764-9063 BaJones@co.nye.nv.us
Law Enforcement	Inyo County Sheriff's Department	Keith Hardcastle, Undersheriff Inyo County Sheriff's Department 550 South Clay Street PO Box "S" Independence, California 93526 (760) 878-0326 Khardcastle@Inyocounty
Hazardous Materials Permitting	Inyo County Department of Environmental Health Services	Mark Long Inyo County Department of Environmental Health Services 207 W. South St. Bishop, CA 93514 (760) 878-0264
Safety Compliance	Cal-OSHA – District Office	Jerry Walker District Manager Cal-OSHA (District Office) 2550 Mariposa Street, Room 4000 Fresno, CA 93721 (559) 445-5302 Fax: (559) 445-5786

TABLE 5.16-7
Agency Contacts for Worker Safety

Issue	Agency	Contact
Pressure Vessel Compliance	Cal-OSHA Pressure Vessel Unit	Donald Cook Principal Engineer Oakland PV (Pressure Vessel) Headquarters Office Suite 1302 1515 Clay Street Oakland, CA 94612 (510) 622-3066 Fax (510) 622-3063 Email: dcook@dir.ca.gov

5.16.6 Permits Required and Permit Schedule

Table 5.16-8 lists applicable permits related to the protection of worker health and safety for HHSEGS certification. The activities covered and application requirements to obtain each permit are provided.

All permits noted in Table 5.16-8 may be obtained from any Cal-OSHA district or field office as needed. There are no specific schedule requirements for obtaining these permits, other than making notification at least 24 hours prior to commencing the activity.

TABLE 5.16-8
Permits Required and Permit Schedule for Worker Health and Safety

Permit	Agency Contact	Schedule
Trenching and excavation permit	Any Cal-OSHA district or field office	Submit completed permit application to any Cal-OSHA district or field office prior to commencing construction.
Permit to erect a fixed tower crane	Any Cal-OSHA district or field office	Submit completed permit application to any Cal-OSHA district or field office at least 24 hours prior to initiation of activity.

5.16.7 References

Aragon, James. 2011. Fire Management Officer, Barstow Field Office, Bureau of Land Management. Personal communication with Ashraf Shaqadan/CH2M HILL. March 30 and July 14.

Hardcastle, Keith. 2011. Inyo County Sheriff's Department. Personal communication with Ashraf Shaqadan/CH2M HILL. March 28.

Jones, Brent. 2011. Nye County Emergency Services. Personal communication with Ashraf Shaqadan/CH2M HILL. April 6.

Long, Mark. 2011. Inyo County Department of Environmental Health Services. Personal communication with Ashraf Shaqadan/CH2M HILL. April 11.

Pahrump Valley. 2011. Pahrump Valley Fire-Rescue Services. http://pahrumpfire.biz. Accessed by Karen Parker/CH2M HILL. June 26.

Postle, Paul. 2011. Southern Inyo County Fire Protection District. Personal communication with Ashraf Shaqadan/CH2M HILL. March 29 and July 11.