

8.12 Hazardous Materials Handling

8.12.1 Introduction

This section evaluates the potential effects on human health and the environment from the storage and use of hazardous materials in conjunction with the South Bay Replacement Project (SBRP) Project. Subsection 8.12.2 presents the laws, ordinances, regulations, and standards (LORS) applicable to hazardous materials, Subsection 8.12.3 describes the existing environment that may be affected, and Subsection 8.12.4 identifies potential impacts on that environment and on human health from SBRP development. Subsection 8.12.5 discusses the offsite migration modeling protocol, Subsection 8.12.6 discusses fire and explosion risk. Subsection 8.12.7 investigates potential cumulative impacts, and Subsection 8.12.8 presents proposed mitigation measures. Subsection 8.12.9 describes the agencies involved and provides agency contacts. Subsection 8.12.10 describes permits required and the permit schedule. Subsection 8.12.11 provides the references used to develop this section.

The SBRP project consists of three phases:

- **The Construction Phase** – The first phase is the demolition of existing structures and foundations associated with the former Liquefied Natural Gas (LNG) Facility, preparation of construction lay down areas, and the construction of the SBRP. Initial operations of SBRP will include an interim interconnection to the San Diego Gas & Electric Company (SDG&E) transmission system through a new 230-kilovolt ampere (kVA) substation on approximately 0.6 acre (interconnecting to SDG&E's planned new 230-kilovolt [kV] transmission line) and an underground interconnection to the existing SDG&E South Bay 138/69 kV substation.¹
- **The Demolition Phase** – The second phase of Project construction activities will occur after the SBRP achieves commercial operation. The construction activity during this phase will be the demolition of the existing SBPP facilities, excluding SDG&E's existing South Bay Substation which will remain in service until the new substation is constructed.
- **The New Substation Phase** – The final phase of the Project will involve the construction of the SDG&E substation on approximately 6.5 acres south of and adjacent to the SBRP site. This construction will be performed after the start up of the SBRP and demolition of SBPP. After the new SDG&E substation construction is completed and operational, and the SBRP generator leads are attached to the new facilities, SDG&E could then initiate demolition activities on the South Bay Substation, located north of the SBRP Project site. These demolition activities, however, are not part of the scope of this Application for Certification (AFC). They are part of a separate project of unknown timing and scope.

The reason there are two interconnect steps is to ensure that interconnection can be secured by the proposed on-line date of SBRP (2010). Also, SDG&E holds certain obligations

¹ SDG&E was granted a Certificate of Public Convenience and Necessity (CPCN) for the Otay Mesa Power Purchase Agreement (OMPPA) Transmission Project. The CPCN is for the construction of two new 230 kilovolt (kV) electric transmission circuits to connect SDG&E's Miguel Substation with both the Sycamore Canyon Substation and the Old Town Substation in San Diego County. The circuit to the Old Town Substation is planned to pass within approximately 100 feet of the proposed SBRP. This project is under construction. The SBRP interconnection plan is based in part on interconnecting to this circuit.

associated with a new substation as part of its Memorandum of Understanding with the City of Chula Vista, but these obligations occur after the demolition of SBPP.

8.12.2 Laws, Ordinances, Regulations, and Standards

The storage and use of hazardous materials, including regulated substances, at SBRP are governed by federal, state, and local laws. Applicable laws and regulations address the use and storage of hazardous materials to protect the environment from contamination; they are also intended to protect facility workers and the surrounding community from exposure to hazardous materials.

Among the local LORS discussed in this section are certain ordinances, plans or policies of the City of Chula Vista. For informational purposes, this section reviews compliance of the Project with such requirements even though the Applicant understands that they are not applicable to the Project as a matter of law. (See Section 8.4 – Land Use for a discussion of this issue.) The analysis of City LORS in this section is informational and does not address the jurisdictional issues which are discussed in Section 8.4 – Land Use.

TABLE 8.12-1
Applicable Laws, Ordinances, Regulations, and Standards

LORS	Purpose	Applicability (AFC Section Explaining Conformance)
Federal		
29 CFR 1910 <i>et seq</i> and 1926 <i>et seq</i> .	Requirements for equipment used to store and handle hazardous materials.	Subsection 8.7, Worker Health and Safety
49 CFR Parts 172, 173, and 179	Provides standards for labeling and packaging of hazardous materials during transportation	Subsection 8.10, Traffic and Transportation
CERCLA/SARA		
Section 302	Requires certain planning activities when EHSs are present in excess of TPQ. SBRP will have ammonia and sulfuric acid in excess of the TPQ.	An HMBP will be prepared to describe planning activities (Subsection 8.12.8.4.2).
Section 304	Requires notification when there is a release of hazardous material in excess of its RQ.	An HMBP will be prepared to describe notification and reporting procedures (Subsection 8.12.8.4.1).
Section 311	Requires MSDS for every hazardous material to be kept onsite and submitted to SERC, LEPC, and the local fire department.	The HMBP to be prepared will include MSDSs and procedures for submission to agencies (Subsection 8.12.8.4.1).
Section 313	Requires annual reporting of releases of hazardous materials.	The HMBP to be prepared will describe reporting procedures (Subsection 8.12.8.4.1).

TABLE 8.12-1
Applicable Laws, Ordinances, Regulations, and Standards

LORS	Purpose	Applicability (AFC Section Explaining Conformance)
Clean Air Act (CAA)	Requires an RMP if listed hazardous materials (designated as “regulated substances”) are stored at or above a TQ.	An RMP will not be required under the CAA because SBRP will not store regulated substances above federal TQs. However the state’s CalARP program requirements will require an RMP for aqueous ammonia because the state’s TQ is lower than the federal one. (Subsection 8.12.8.4.2).
Clean Water Act (CWA)	Requires preparation of an SPCC plan if oil is stored above certain quantities.	An SPCC Plan will be prepared (Subsection 8.12.8.4.3).
State		
8 CCR Section 339; Section 3200 <i>et seq.</i> , Section 5139 <i>et seq.</i> and Section 5160 <i>et seq.</i>	8 CCR Section 339 lists hazardous chemicals relating to Hazardous Substance Information and Training Act; 8 CCR Section 3200 <i>et seq.</i> and 5139 <i>et seq.</i> address control of hazardous substances; 8 CCR Section 5160 <i>et seq.</i> Addresses hot, flammable, poisonous, corrosive, and irritant substances.	Subsection 8.7, Worker Health and Safety
Health and Safety Code, Section 25500, <i>et seq.</i>	Requires preparation of an HMBP if hazardous materials are handled or stored in excess of threshold quantities.	An HMBP will be prepared (Subsection 8.12.8.4.1).
CalARP Program. Health and Safety Code, Section 25531 through 25543.4	Requires registration with local CUPA or lead agency and preparation of an RMP if regulated substances are handled or stored in excess of TQs	After registration of regulated substances with the CUPA, i.e., the San Diego Department of Environmental Health, an RMP is likely to be required for ammonia (Subsection 8.12.8.4.2). SBRP will handle and store ammonia above the 500 pound TQ. Stored quantities of hydrogen will not exceed the TQ. Sulfuric acid is a regulated substance under the CalARP program only if it meets the definition of oleum or is concentrated and contains greater than 100 pounds of sulfur trioxide or is stored in a container with flammable hydrocarbons. SBRP will not use any forms of sulfuric acid regulated under CalARP.
Aboveground Petroleum Storage Act	Requires entities that store petroleum in ASTs in excess of certain quantities to prepare an SPCC Plan.	An SPCC Plan will be prepared (Subsection 8.12.8.4.3).
California Fire Code, Article 80 and others.	Includes provisions for storage and handling of hazardous materials.	Subsection 8.7, Worker Health and Safety

TABLE 8.12-1
Applicable Laws, Ordinances, Regulations, and Standards

LORS	Purpose	Applicability (AFC Section Explaining Conformance)
Safe Drinking Water and Toxics Enforcement Act (Proposition 65)	Requires warning to persons exposed to a list of carcinogenic and reproductive toxins and protection of drinking water from same toxins.	The site will be appropriately labeled for chemicals on the Proposition 65 list (Subsection 8.12.8.4.4).
Local		
City of Chula Vista General Plan, Policies EE.17.1; 17.2; 19.1; 19.2; 20.1; 20.2; and 20.3	Provides guidance for remediation of contaminated sites and for siting and management of facilities that store, collect, treat, dispose or transfer hazardous waste.	SBRP will be consistent with the City's Hazardous Materials and Waste requirements (Chapter 9, Section 3.4 of the General Plan [Subsections 8.12.8.1, 8.12.8.2])
Title 6, Division 8, Chapters 9 and 11, San Diego County Code of Regulatory Ordinances. Certified Unified Program Agency, Hazardous Materials Inventory and Response Plans	Adopts and amends the state of California Health and Safety Code Division 20, Chapter 6.95 and designates the County of San Diego Department of Environmental Health as the CUPA. The Hazardous Materials Division (HMD) conducts inspections of businesses that handle hazardous materials, hazardous wastes, and/or have underground storage tanks.	SBRP will be consistent with local requirements concerning storage and handling of hazardous materials and wastes. (Subsection 8.12.8.2.3, 8.12.8.4, 8.12.9)
San Diego County Code of Regulatory Ordinances, Section 68.1113	Any business which handles materials subject to the state of California Health and Safety Code Division 20, Chapter 6.95, must provide a list of carcinogenic and reproductive toxins used onsite to the Director of the County of San Diego Department of Environmental Health	SBRP will be consistent and provide a list of carcinogenic and reproductive toxins to the appropriate local agency (Subsection 8.12.8.4.4)
City of Chula Vista Municipal Code, Title 15.36	Adopts the California Fire Code, 2001 Edition.	SBRP will be consistent. (Subsection 8.12.2.4)

AST	Aboveground Storage Tank
CalARP	California Accidental Release Program
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CUPA	Certified Unified Program Agency
EHS	Extremely hazardous substance
HMBP	Hazardous Materials Business Plan
LEPC	Local Emergency Planning Committee
MSDS	Material Safety Data Sheet
RMP	Risk Management Plan
RQ	Reportable Quantity
SARA	Superfund Amendments and Reauthorization
SERC	State Emergency Response Commission
SPCC	Spill Prevention Control and Countermeasures
TPQ	Threshold Planning Quantity
TQ	Threshold Quantity
USC	United States Code

8.12.2.1 Federal

Hazardous materials are governed under Title 29 of the US Code, Titles 29, 40, and 49 of the Code of Federal Regulations, CERCLA, the CAA, and the CWA.

8.12.2.1.1 29 CFR 1910 *et seq.* and 1926 *et seq.*

These sections contain requirements for equipment used to store and handle hazardous materials for the purpose of protecting worker health and safety. This regulation also addresses requirements for equipment necessary to protect workers in emergencies. It is designed primarily to protect worker health, but also contains requirements that affect general facility safety. The California regulations contained in Title 8 (California equivalent of 29 CFR) are generally more stringent than those contained in Title 29. The administering agency for the above authority is the U.S. Environmental Protection Agency (USEPA) and Cal/OSHA.

8.12.2.1.2 49 CFR Parts 172, 173, and 179

These regulations provide standards for labels, placards, and markings on hazardous materials shipments by truck (Part 172), standards for packaging hazardous materials (Part 173) and for transporting hazardous materials in tank cars (Part 179). The administering agency for the above authority is the California Highway Patrol and U.S. Department of Transportation.

8.12.2.1.3 CERCLA

The Superfund Amendments and Reauthorization Act of 1986 (SARA), an amendment to CERCLA, governs hazardous materials. The applicable part of SARA for SBRP is Title III, otherwise known as the Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA). Title III requires states to establish a process for developing local chemical emergency preparedness programs and to receive and disseminate information on hazardous materials present at facilities in local communities. The law provides primarily for planning, reporting, and notification concerning hazardous materials. Key sections of the law are:

- Section 302 – Requires that certain emergency planning activities be conducted when EHSs are present in excess of their TPQs. EHSs and their TPQs are found in Appendices A and B of 40 CFR Part 355.
- Section 304 – Requires immediate notification to the Local Emergency Planning Committee (LEPC) and the State Emergency Response Commission (SERC) when a hazardous material is released in excess of its RQ. If a CERCLA-listed hazardous substance RQ is released, notification must also be given to the National Response Center in Washington, D.C. (RQs are listed in 40 CFR Part 302, Table 302.4). These notifications are in addition to notifications given to the local emergency response team or fire personnel.
- Section 311 – Requires that either MSDSs for all hazardous materials or a list of all hazardous materials be submitted to the SERC, LEPC, and local fire department.
- Section 313 – Requires annual reporting of hazardous materials released into the environment either routinely or as a result of an accident.

The administering agencies for the above authority are the USEPA, Region IX, the National Response Center, and the San Diego Department of Environmental Health, Hazardous Materials Division (HMD). The HMD is a Certified Unified Program Agency (CUPA).

8.12.2.1.4 Clean Air Act

Regulations (40 CFR 68) under the CAA are designed to prevent accidental releases of hazardous materials. The regulations require facilities that store a TQ or greater of listed regulated substances to develop an RMP, including hazard assessments, prevention programs, and response programs to prevent accidental releases of listed chemicals. Section 112(r)(5) of the CAA discusses the regulated substances. These substances are listed in 40 CFR 68.130.

8.12.2.1.5 Clean Water Act

The Spill Prevention Control and Countermeasures (SPCC) program under the CWA is designed to prevent or contain the discharge or threat of discharge of oil into navigable waters or adjoining shorelines. Regulations under the CWA (40 CFR 112) require facilities to prepare a written SPCC Plan if they store oil and its release would pose a threat to navigable waters. The SPCC program is applicable if a facility has a single oil aboveground storage tank (AST) with a capacity greater than 660 gallons, total AST storage greater than 1,320 gallons, or underground storage capacity greater than 42,000 gallons.

8.12.2.1.6. Other

Other related federal laws that address hazardous materials but do not specifically address their handling are the Resource Conservation and Recovery Act (RCRA), which is discussed in Subsection 8.13, and the Occupational Safety and Health Act (OSHA), which is discussed in Subsection 8.7.

8.12.2.2 State

California laws and regulations relevant to hazardous materials handling at SBRP include Title 8 of the California Code of Regulations, Health and Safety Code Section 25500 (hazardous materials), Health and Safety Code Section 25531 (regulated substances), and the Aboveground Petroleum Storage Act (petroleum in aboveground tanks).

8.12.2.2.1 8 CCR Section 339; Section 3200 et seq., Section 5139 et seq. and Section 5160 et seq.

8 CCR Section 339 lists hazardous chemicals relating to Hazardous Substance Information and Training Act ; 8 CCR Section 3200 *et seq.* and 5139 *et seq.* address control of hazardous substances; 8 CCR Section 5160 *et seq.* addresses hot, flammable, poisonous, corrosive, and irritant substances. The administering agency for the above authorities is the CEC.

8.12.2.2.2 Health and Safety Code Section 25500

This law is found in the California Health and Safety Code, Section 25500, *et seq.*, and in the regulations contained in 19 CCR Section 2620, *et seq.* The law requires local governments to regulate business storage of hazardous materials in excess of certain quantities. The law also requires that entities storing hazardous materials be prepared to respond to releases. Those using and storing hazardous materials are required to submit an HMBP to their local administering agency (i.e., CUPA). They must also report releases to their CUPA and the Governor's Office of Emergency Services. The threshold quantities for hazardous materials are 55 gallons for liquids, 500 pounds for solids, and 200 cubic feet for compressed gases measured at standard temperature and pressure.

8.12.2.2.3 Health and Safety Code Section 25531

This law regulates the registration and handling of regulated substances, per California Health and Safety Code, Section 25531, *et seq.* Regulated substances are any chemicals

designated under 40 CFR 68.130 as part of the CAA's Accidental Release Prevention Program or designated by the state of California under its CalARP program. Facilities handling or storing regulated substances at or above TQs must register with their local CUPA and, if requested, must prepare an RMP.

8.12.2.2.4 Aboveground Petroleum Storage Act

This law is found in the Health and Safety Code at Sections 25270 to 25270.13 and is intended to ensure compliance with the federal CWA. The law applies if a facility has an AST with a capacity greater than 660 gallons or a combined AST capacity greater than 1,320 gallons and if there is a reasonable possibility that the tank(s) may discharge oil in "harmful quantities" into navigable waters or adjoining shore lands. If a facility falls under these criteria, it must prepare an SPCC Plan. The law does not cover AST design, engineering, construction, or other technical requirements, which are usually determined by local fire departments.

8.12.2.2.5 Safe Drinking Water and Toxics Enforcement Act (Proposition 65)

This law identifies chemicals that cause cancer and reproductive toxicity, informs the public, and prevents discharge of the chemicals into sources of drinking water. Lists of the chemicals of concern are published and updated periodically. The Act is administered by California's Office of Environmental Health Hazard Assessment. Some of the chemicals to be used at SBRP are on the cancer-causing lists of the Act.

8.12.2.2.6 California Fire Code, Article 80 and others

The code includes provisions for storage and handling of hazardous materials. There is considerable overlap between this code and Chapter 6.95 of the California Health & Safety Code. The fire code, however, contains independent provisions regarding fire protection and neutralization systems for emergency venting [see Section 80.303, D (compressed gases)]. Article 4 establishes hazardous materials storage thresholds above which a permit is required. Article 79 presents requirements for combustible and flammable liquids. The administering agency for the above authority is the San Diego County Department of Environmental Health, Hazardous Material Division (HMD), jointly with the City's Fire Department (Gipson, 2006).

8.12.2.3 Local

Among the local LORS discussed in this section are certain ordinances, plans or policies of the City of Chula Vista. For informational purposes, this section reviews compliance of the Project with such requirements even though the Applicant understands that they are not applicable to the Project as a matter of law. (See Section 8.4 – Land Use for a discussion of this issue.) The analysis of City LORS in this section is informational and does not address the jurisdictional issues which are discussed in Section 8.4 – Land Use.

The San Diego Department of Environmental Health, Hazardous Material Division (HMD) has jurisdiction over hazardous materials storage and handling practices. The local requirements that pertain to hazardous materials are discussed below.

8.12.2.4 Other Codes

The design, engineering, and construction of hazardous materials storage and dispensing systems will be in accordance with all applicable codes and standards, including the following:

- California Vehicle Code, 13 CCR 1160, et seq. – Provides the California Highway Patrol (CHP) with authority to adopt regulations for the transportation of hazardous materials in California
- State Building Standard Code, Health and Safety Code Sections 18901 to 18949 – Incorporates the Uniform Building Code (UBC), Uniform Fire Code, and the Uniform Plumbing Code
- American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section VIII
- American National Standards Institute (ANSI) K61.1
- City of Chula Vista Municipal Code

8.12.3 Affected Environment

The Project site is located in an industrial area of the City of Chula Vista in San Diego County, on Port property (Figure 2.1-1). Identification of sensitive receptor facilities (such as schools, day-care facilities, convalescent centers, or hospitals) within a 3-mile radius of the Project site is presented in Appendix 8.6A. The nearest sensitive receptors are the Harborside Elementary School located 0.50 mile from the Project site at 681 Naples Street, and the San Diego National Wildlife Refuge located approximately 0.25 mile south of the Project site. In addition, Chula Vista Christian Elementary School, Options Secondary School, and Southwestern Christian School and Daycare are each located approximately 1.0 mile from the site. A hospital, Scripps Memorial Hospital, is located approximately 1.75 miles from the site at 435 H Street.

Sensitive receptors within a 3-mile radius of the Project site are provided in Appendix 8.6A. It also contains a description of the receptors.

8.12.4 Potential Environmental and Human Health Effects

Hazardous materials to be used at SBRP during construction and operation, and during the demolition of the existing SBPP were evaluated for hazardous characteristics. Some of these materials will be stored at the generating site continuously. Others will be brought onsite for the initial startup and periodic maintenance. Some materials will be used only during startup. Hazardous materials will not be stored or used in the gas supply line, water supply line, or electric transmission line corridors during operations. Storage locations are described in Table 8.12-2. Table 8.12-3 presents information about these materials, including trade names; chemical names; Chemical Abstract Service (CAS) numbers; maximum quantities onsite; RQs; TPQs; TQs; and status as a Proposition 65 chemical (a chemical known to be carcinogenic or cause reproductive problems in humans). Toxicity characteristics and the exposure level criteria for regulated substances that will be handled at SBRP in quantities exceeding TQs are shown in Table 8.12-4. Health hazards and flammability data are summarized in Table 8.12-5. Table 8.12-5 also contains information on incompatible chemicals (e.g., potassium permanganate and diesel fuel). Measures to mitigate the potential effects from the hazardous materials are presented in Subsection 8.12.8. Due to the size of these tables, Tables 8.12-2 through 8.12-5 are presented at the end of this section.

8.12.4.1 Construction and Demolition Phases

During the construction and demolition phases of the Project and linear facilities, regulated substances, as defined in California's Health and Safety Code, Section 25531, will not be used. Therefore, no discussion of regulated substance storage or handling is included in this subsection.

Hazardous materials to be used during the construction and demolition phases of the Project and its associated linear facilities will include gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, various lubricants, paint, and paint thinner. There are no feasible alternatives to motor fuels and oils for operating construction/demolition equipment. The types of paint required are dictated by the types of equipment and structures to be coated and by the manufacturers' requirements for coating.

The quantities of hazardous materials that will be onsite during the construction and demolition phases are small. Construction and demolition personnel will be trained to handle the materials properly. The most likely possible incidents will involve the potential for fuels, oil, and grease dripping from construction/demolition equipment. The small quantities of fuel, oil, and grease that might drip from construction equipment will have relatively low toxicity and will be biodegradable. Therefore, the expected environmental impact is minimal.

Small oil spills may also occur during onsite refueling. Equipment refueling will be performed away from water bodies to prevent contamination of water in the event of a fuel spill. Therefore, the potential environmental effects from fueling operations are expected to be limited to small areas of contaminated soil. If a fuel spill occurs on soil, the contaminated soil will be placed into barrels or trucks for offsite disposal as a hazardous waste. The worst-case scenario for a chemical release from fueling operations would be a vehicle accident involving a service or refueling truck. Handling procedures for the hazardous materials to be used onsite during construction and demolition are presented in Subsection 8.12.8.1.

The quantities of hazardous materials that will be handled during the construction and demolition phases of the Project are relatively small and Best Management Practices (BMPs) will be implemented by contractor personnel. Therefore, the potential for environmental effects is expected to be small.

8.12.4.2 Operations Phase

Several hazardous materials, including three regulated substances (aqueous ammonia, hydrogen, and sulfuric acid), will be stored at the generating site during SBRP operation. However, only aqueous ammonia will be stored in amounts above the threshold quantity during the final stages of construction, initial startup, and operations phase. An RMP will be prepared consistent with the CalARP program requirements. Many of the hazardous materials that will be stored onsite are corrosive and are a threat to humans (particularly workers at the site) if inhaled, ingested, or contacted with the skin. The hazardous characteristics of materials being used at the site are summarized in Table 8.12-5. Table 8.12-5 also contains information on incompatible chemicals. Mixing incompatible chemicals can generate toxic gases. Measures to keep incompatible chemicals separated include separate storage and containment areas and/or berming (see Subsection 8.12.8).

Potential environmental and/or human health effects could be caused by accidental releases, accidental mixing of incompatible chemicals, fires, and injury to facility personnel from contact with a hazardous material. The accidental release of aqueous ammonia might present the most serious potential for effects on the environment and/or human health.

The SBRP facility will store the 19-percent aqueous ammonia solution in two stationary aboveground storage tanks. The capacity of the tanks will be approximately 12,000 gallons each. The tanks will be surrounded by secondary containment structures capable of holding the full contents of the tanks, plus rainwater. Each tank will be provided with its own separate secondary containment area of approximately 1,520 square feet (25.3 feet by 60 feet).

Aqueous ammonia will be delivered to the plant by truck transport. A possible supplier is La Roche located in City of La Mirada, California. The truck unloading area will be located on an unloading apron adjacent to the storage tank. The floor of the unloading apron will be sloped to a drain that empties into the secondary containment area. The use of 19 percent aqueous ammonia will require an average of approximately 1 to 2 deliveries of ammonia per week.

Pure ammonia (NH_3) is a volatile chemical that is stored under pressure as a liquid and is a toxic gas if released. The odor threshold of ammonia is about 5 parts per million (ppm), and minor irritation of the nose and throat will occur at 30 to 50 ppm. Concentrations greater than 140 ppm will cause detectable effects on lung function even for short-term exposures (0.5 to 2 hours).

At higher concentrations of 700 to 1,700 ppm, ammonia gas will cause severe effects; death occurs at concentrations of 2,500 to 7,000 ppm. The hazard to facility workers will be mitigated by facility safety equipment, hazardous materials training, and emergency response planning (see Subsection 8.7, Worker Health and Safety). The results of an Offsite Consequence Analysis presented in Subsection 8.12.5, Offsite Consequence Analysis, show that a release of a 19 percent solution of aqueous ammonia under a worst-case scenario will not cause significant offsite impacts to public health or safety.

Hydrogen gas is another regulated substance that will be used onsite in quantities less than its TQ of 10,000 pounds. Thus, its use will not require preparation of an RMP.

Sulfuric acid, an extremely hazardous substance, is a very corrosive chemical that can cause severe harm to humans if ingested, inhaled, or contacted. However, sulfuric acid has a very low vapor pressure and will not readily volatilize upon release. Therefore, the potential for harm to humans offsite is minimal. Sulfuric acid is identified as a regulated substance under the CalARP program, but only if it is concentrated with greater than 100 pounds of sulfur trioxide, if it meets the definition of oleum, or if it is stored in a container with flammable hydrocarbons. The sulfuric acid that will be used at the SBRP facility does not contain more than 100 pounds of sulfur trioxide or meet the definition of oleum. In addition, it will not be stored in a container with flammable hydrocarbons. Therefore, sulfuric acid is not subject to the RMP requirements under CalARP.

The remaining materials in Table 8.12-3 are also considered to be hazardous, but they pose less threat to humans than aqueous ammonia, hydrogen, and sulfuric acid. Some materials will be used at the site only during initial commissioning and during periodic maintenance

(once every 3 to 5 years). Therefore, the potential for environmental or health effects will exist only during those rare occasions when the materials are onsite.

8.12.5 Offsite Consequence Analysis

Because there is human activity in the vicinity of the proposed site, a vulnerability analysis was performed to assess the risk to humans from release of aqueous ammonia. Dispersion modeling was conducted using the SLAB numerical dispersion model (LLNL, 1990).

The worst-case accidental release scenario assumed that one of the aqueous ammonia storage tanks was punctured and the entire contents of the tank were released into a secondary containment structure located beneath the tank. An initial ammonia emission rate for an evaporating pool of 19 percent aqueous ammonia solution was calculated pursuant to the guidance given in *RMP Offsite Consequence Analysis Guidance, EPA, April 1999*, and using the “evaporation calculator” provided by the National Oceanic and Atmospheric Administration (NOAA, 2004). An initial ammonia evaporation rate was calculated and assumed to occur for one hour. For concentrated solutions, the initial evaporation rate is substantially higher than the rate averaged over time periods of a few minutes or more since the concentration of the solution immediately begins to decrease as evaporation begins. However, using the initial evaporation rate results in a worst case ammonia emission rate for the evaporating pool of ammonia. Release rates for ammonia vapor from an evaporating 19-percent solution of aqueous ammonia were calculated assuming mass transfer of ammonia across the liquid surface occurs according to principles of heat transfer by natural convection. The ammonia release rate was calculated using the evaporation calculator, meteorological data listed below and the dimensions of the secondary containment area. The offsite consequence analysis is provided as Appendix 8.12A.

Parameters used to calculate the ammonia emission rates include an atmospheric stability classification of “F,” a wind speed of 1.5 meters/second and a temperature of 102 degrees Fahrenheit (°F), which represents the highest temperature recorded over the last 17 years.

Using these parameters, the ammonia plume was predicted – using a height of 1.6 meters – to extend approximately 20 meters (65 feet) from the ammonia storage tank at a concentration of 150 ppm. At a concentration of 75 ppm, the distance was 20.6 meters (67.6 feet) from the tank (see Table 8.12-6). The assumptions used in the ammonia analysis include the following:

- Ammonia emissions are assumed to occur over 1 hour, representing an evaporating pool of 10,200 gallons of a 19 percent ammonia solution
- An ammonia storage temperature of 102°F
- A diked secondary containment area of 1,520 square feet (25.3 feet wide by 60 feet long)

TABLE 8.12-6
Gaseous Ammonia Concentrations in the Event of a Release

Concentration (ppm)	Distance in meters from Ammonia Tank to Plume Edge (feet)	
	0-Meter Receptor Height	1.6-Meter Receptor Height
2000 ppm (risk of lethality)	14.7 (48.3)	17.11 (58.1)
300 ppm (OSHA's IDLH)	16.4 (53.9)	19.5 (64.0)
150 ppm (EPA/CalARP toxic endpoint)	16.8 (55.1)	19.78 (64.9)
75 ppm (CEC Significance Value)	17.3 (56.9)	20.59 (67.6)

Notes:

The complete Offsite Consequence Analysis may be found in Appendix 8.12A.

Distances calculated at ground level and based on the height of the average human (1.6 m).

Based on this conservative modeling analysis, the worst case accident is not expected to result in an offsite concentration greater than 75 ppm at the property boundary, located 102 feet from the center of the ammonia tank storage area, at the nearest point. Since the general public will not be exposed to ammonia concentrations above 75 ppm during a worst-case release scenario, the storage of aqueous ammonia onsite will not pose a significant risk to the public.

8.12.6 Fire and Explosion Risk

As shown in Table 8.12-5, many of the hazardous materials are non-flammable. Aqueous ammonia, which constitutes the largest quantity of hazardous materials onsite (except for the mineral oil in the transformers), is incombustible in its liquid state. Ammonia evaporating as a gas from a leak or spill of the aqueous solution is combustible within a narrow range of concentrations in air. However, the evaporation rate is sufficiently low that the lower explosive limit (LEL) will not be reached. In addition, 20,000 cubic feet (110 lbs) of hydrogen will be stored onsite. Hydrogen is highly flammable and will readily form explosive mixtures with air. Proper design, construction, and maintenance of the hydrogen storage facility will minimize leaks and the risk of fire or explosion. Also, the hydrogen will be stored in a separate area away from sources of ignition and heat and from oxidizing materials. The lubrication oil and diesel fuel are flammable and will be handled in accordance with a HMBP to be approved by HMD. Hydraulic oil, which is classified as combustible, will also be handled in compliance with the HMBP. With proper storage and handling of flammable materials in accordance with the HMBP, the risk of fire and explosion at the generating facility should be minimal.

The natural gas that will provide SBRP with fuel for the combustion turbines is flammable and could leak from the supply line that brings gas from the SDG&E gas line. The risk of leakage is the normal type of risk encountered with transmitting natural gas via pipeline. Proper design, construction, and maintenance of the line will minimize leaks and the risk of fire or explosion. The gas supply line will be buried along its entire length from the point of interconnect with the SDG&E gas distribution pipelines and the gas metering station on the SBRP site.

Oxidizers will be stored onsite that could contribute to a fire or explosion hazard. This includes oxygen in compressed gas cylinders. These materials will be segregated from flammables and combustibles during storage.

The closest fire station is located about 1.3 miles from the Project site at the corner of 4th Avenue and Oxford Street.

8.12.7 Cumulative Impacts

The primary potential cumulative impact from the use and storage of hazardous materials will be a simultaneous release from two or more sites of a chemical that will migrate offsite. Potentially, the two or more migrating releases could combine; thereby posing a greater threat to the offsite population than a single release by any single site. Hazardous materials that do not migrate, such as sulfuric acid will not present a potential cumulative impact. The hazardous material with the potential to migrate offsite from SBRP is ammonia.

Based on the offsite consequences analysis (OCA) results for the SBRP Project, ammonia vapor concentrations are not expected to occur offsite. In the unlikely event that an aqueous ammonia spill occurred at SBRP at the same time as a chemical spill at another nearby industrial facility, offsite ammonia levels from SBRP will not be sufficient to cause cumulative impacts.

8.12.8 Proposed Mitigation Measures

The following subsections present measures that the Applicant will implement during Project construction and operation phases to mitigate risks in handling hazardous materials, particularly the risk of inadvertent spills or leaks that might pose a hazard to human health or the environment.

8.12.8.1 Construction and Demolition Phases

During SBRP construction and the demolition of the existing SBPP, hazardous materials stored onsite will include small quantities of paints, thinners, solvents, cleaners, sealants, lubricants, and 5-gallon emergency fuel containers. This subsection describes measures that will be taken to mitigate potential risks from hazardous material usage. Paints, thinners, solvents, cleaners, sealants, and lubricants will be stored in a locked utility building. These materials will be handled per the manufacturers' directions and will be replenished as needed. The emergency fuel containers will be Department of Transportation (DOT)-approved, 5-gallon safety containers, secured to the construction equipment. The emergency fuel will be used only when regular vehicle fueling is unavailable.

Fuel, oil, and hydraulic fluids will be transferred directly from a service truck to construction/demolition equipment tanks and will not otherwise be stored onsite. Fueling will be performed by designated, trained service personnel either before or at the end of the workday. Service personnel will follow standard operating procedures (SOPs) for filling and servicing construction/demolition equipment and vehicles. The SOPs, which are designed to reduce the potential for incidents involving the hazardous materials, include the following:

- Refueling and maintenance of vehicles and equipment will occur in designated areas that are equipped with spill control features (e.g., berms, paved surfaces, spill response kits, etc.).
- Vehicle and equipment service and maintenance will be conducted by authorized personnel only.

- Refueling will be conducted only with approved pumps, hoses, and nozzles.
- Catch-pans will be placed under equipment to catch potential spills during servicing.
- All disconnected hoses will be placed in containers to collect residual fuel from the hose.
- Vehicle engines will be shut down during refueling.
- No smoking, open flames, or welding will be allowed in refueling or service areas.
- Refueling will be performed away from bodies of water to prevent contamination of water in the event of a leak or spill.
- When refueling is completed, the service truck will leave the Project site.
- Service trucks will be provided with fire extinguishers and spill containment equipment, such as absorbents.
- Should a spill contaminate soil, the soil will be put in containers for offsite disposal as a hazardous waste.
- All maintenance and refueling areas will be inspected monthly. Results of inspections will be recorded in a logbook that will be maintained onsite.

Small spills will be contained and cleaned up immediately by trained, onsite personnel. Larger spills will be reported via emergency phone numbers to obtain help from offsite containment and cleanup crews. Personnel working on the Project during the construction phase will be trained in handling of and the dangers associated with hazardous materials. An onsite health and safety person will be designated to implement health and safety guidelines and contact emergency response personnel and the local hospital, if necessary.

If a spill involves hazardous materials equal to or greater than the specific reportable quantity, all federal, state, and local reporting requirements will be followed. In the event of a fire or injury, the local fire department will be called (City of Chula Vista Fire Station at 447 F Street in Chula Vista).

8.12.8.2 Operation Phase

During SBRP operation, hazardous materials will be stored onsite. Listed below are management and mitigation measures for minimizing the risks of hazardous material handling during facility operation.

8.12.8.2.1 Aqueous Ammonia

The aqueous ammonia storage and handling facilities will be equipped with a tank level monitor, temperature and pressure monitors and alarms, and excess flow and emergency block valves. Secondary containment will be provided. If there is an inadvertent release from the storage tank, the liquid will be contained within the secondary containment structure.

8.12.8.2.2 Hydrogen

Hydrogen gas will be stored outdoors in a portable compressed gas tanker truck. It will be used for cooling the steam turbine generator. Because it is highly flammable and potentially

explosive, it will be stored in a separate area away from sources of ignition and heat and from oxidizing materials.

8.12.8.2.3 Other Hazardous Materials

All hazardous materials will be handled and stored in accordance with applicable codes and regulations. All containers used to store hazardous materials will be inspected regularly for signs of leaking or failure. Incompatible materials will be stored in separate storage and containment areas. Areas susceptible to potential leaks and/or spills will be paved and bermed. Containment areas may drain to a collection area, such as an oil/water separator or a waste collection tank. Piping and tanks will be protected from potential traffic hazards by concrete or pipe-type traffic bollards and barriers.

If a spill involves hazardous materials equal to or greater than the specific reportable quantity all federal, state, and local reporting requirements will be followed. The California Water Code, Section 13272(f), establishes a reportable quantity of 42 gallons for spills of petroleum products in water bodies.

A worker safety plan, in compliance with applicable regulations, will be implemented. It will include training for contractors and operations personnel. Training programs will include safe operating procedures, the operation and maintenance of hazardous materials systems, proper use of personal protective equipment (PPE), fire safety, and emergency communication and response procedures. Plant personnel will be trained in emergency procedures, including plant evacuation and fire prevention. In addition, personnel are trained as First Responders at the operations level. For emergency spills, the San Diego County Department of Environmental Health Hazardous Incident Response Team (HMD-HIRT) response team will act as first responders. HMD-HIRT consists of ten California State Certified Hazardous Material Specialists who have completed formal training in Hazardous Materials Incident Response (<http://www.sdcounty.ca.gov/HMD/hmd/hirt/main.html>). HMD-HIRT will identify the type and source of the hazardous material, oversee evacuation of people, and confine the spilled material, if possible. Cleanup of the material is the responsibility of the facility causing the spill. The City of Chula Vista Fire Station No. 5, located at 391 Oxford Street in Chula Vista, is the nearest station to the proposed Project site; however it does not have the training or capabilities to respond to a hazardous material emergency (Geering, 2006).

8.12.8.3 Transportation/Delivery of Hazardous Materials

Hazardous materials will be delivered periodically to SBRP. Transportation will comply with the applicable regulations for transporting hazardous materials, including DOT, USEPA, California Department of Toxic Substances Control (DTSC), CHP, and California State Fire Marshal. Under the California Vehicle Code, the CHP has the authority to adopt regulations for transporting hazardous materials in California. The CHP can issue permits and specify the route for hazardous material delivery. The key hazardous material that will be delivered to SBRP is aqueous ammonia, and the Vehicle Code has special regulations for the transportation of hazardous materials that pose an inhalation hazard (Vehicle Code Section 32100.5). These and other regulations concerning any of the other hazardous materials delivered to SBRP will be fully satisfied.

8.12.8.4 Hazardous Materials Plans

Hazardous materials handling and storage, and training in the handling of hazardous materials will be set forth in more detail in hazardous materials plans that will be developed by the Applicant.

8.12.8.4.1 Hazardous Materials Business Plan

A HMBP is required by Title 19 CCR and the Health and Safety Code (Section 25504). The plan will include an inventory and location map of hazardous materials onsite and an emergency response plan for hazardous materials incidents. The topics to be covered in the plan are:

- Facility identification
- Emergency contacts
- Inventory information (for every hazardous material stored in quantities above the reporting threshold)
- MSDSs for every hazardous material
- Site map
- Emergency notification data
- Procedures to control actual or threatened releases
- Emergency response procedures
- Training procedures
- Certification

The HMBP will be filed with the County of San Diego Department of Environmental Health, the designated CUPA for the Project site.

8.12.8.4.2 Risk Management Plan

The requirements for an RMP are found in CalARP pursuant to Health and Safety Code Sections 25331 through 25543.3 and in the CCR Title 19, Section 2735.1 et seq. The California program is similar to the federal RMP program. An RMP is required for regulated substances listed in 19 CCR 2770.5 that exceed designated threshold levels (known as TQs). Under federal regulations, the TQ for aqueous ammonia is 20,000 pounds (for a concentration of 20 percent or greater) and 500 pounds under state regulations regardless of concentration.

The federal TQ for ammonia will not be triggered by the SBRP because a 19 percent concentration of aqueous ammonia will be used. However, because aqueous ammonia will be stored and used at SBRP in quantities exceeding the state threshold quantity, an RMP will be required, if requested by the local agency.

If requested, an RMP for aqueous ammonia will be filed with the County's Department of Environmental Health, the designated CUPA for the Project site. The RMP will include a hazard assessment to evaluate the potential effects of accidental releases; a program for

preventing accidental releases; and a program for responding to accidental releases to protect human health and the environment.

The basic elements of an RMP are:

- Management System
- Hazard Assessment
- Prevention Program
- Emergency Response

Another regulated substance, hydrogen, will be used at the SBRP. However, the hydrogen will not be stored in quantities that exceed the state or federal TQs, so an RMP will not be required for hydrogen.

8.12.8.4.3 Spill Prevention Control and Countermeasure Plan

Federal and California regulations require a Spill Prevention Control and Countermeasures (SPCC) Plan if petroleum products above certain quantities are stored in aboveground storage tanks. Both federal and state laws apply only to petroleum products that might be discharged to navigable waters. If stored quantities are equal to or greater than 660 gallons for a single tank, or equal to or greater than 1,320 gallons total, an SPCC Plan must be prepared. The key elements of an SPCC Plan are:

- Name, location, and telephone number of the facility
- Spill record of the facility and lessons learned
- Analysis of the facility, including:
 - Description of the facilities and engineering calculations
 - Map of the site
 - Storage tanks and containment areas
 - Fuel transfer and storage and facility drainage
 - Prediction and prevention of potential spills
- Spill response procedures
- Agency notification
- Personnel training and spill prevention

SBRP will store up to 20,000 gallons of turbine lubrication oil onsite. The nearest waterway is the San Diego Bay, which is approximately 0.5 mile from the Project site.

8.12.8.4.4 Proposition 65

The facility will use lubricating and turbine oils and diesel fuel. These materials are included in the State of California's Prop 65 list of chemicals known to the state to cause cancer. The site will be appropriately labeled for all chemicals on the Proposition 65 list. In addition an inventory list of carcinogenic and reproductive toxin stored at SBRP will be provided to the Director of the County of San Diego Department of Environmental Health, per the San Diego County Ordinance 68.113.

8.12.8.5 Monitoring

An extensive monitoring program will not be required because environmental effects during the construction and operation phases of the facility are expected to be insignificant.

However, sufficient monitoring will be performed during the construction and operation phases to ensure that the proposed mitigation measures are satisfied and that they are effective in mitigating any potential environmental effects.

8.12.9 Involved Agencies and Agency Contacts

Several agencies regulate hazardous materials, and they will be involved in regulating the hazardous materials stored and used at SBRP. At the federal level, the USEPA will be involved; at the state level, the California Environmental Protection Agency (CalEPA) will be involved. However, local agencies primarily enforce hazardous materials laws. For SBRP, the primary local agencies with jurisdiction will be the San Diego County Department of Environmental Health and the City of Chula Vista Fire Department. The persons to contact are listed in Table 8.12-8.

TABLE 8.12-8
Agency Contacts for SBRP Hazardous Materials Handling

Issue	Agency	Address	Person Contacted	Title	Telephone
Certified Unified Program Agency (CUPA) for Hazardous Materials Inventory and Emergency Business Plan and Risk Management Plan	County of San Diego, Dept. of Environmental Health, Hazardous Materials Division	1255 Imperial Avenue, 3rd Floor San Diego, CA 92101	Michael Dorsey	Chief	(619) 338-2231
Fire Dept. Permits	City of Chula Vista Fire Department	447 F Street Chula Vista, CA 91910	Justin Gipson	Fire Marshall	(619) 409-5841
Hazardous Materials Response*	San Diego County, Dept. of Environmental Health, Hazardous Materials Division	1255 Imperial Avenue, 3rd Floor San Diego, CA 92101	Nick Vent	Supervisor	(619) 338-2372

* Hazardous Materials Response Team will respond to 911 calls for hazardous materials releases, but the site has to provide spill cleanup team or contractor

8.12.10 Permits, Permit Schedule, and Agency Contacts

For informational purposes, the list of applicable permits, including permits that would be required, but for the CEC's exclusive siting jurisdiction, are shown in Tale 8.12-9.

TABLE 8.12-9
Permits Required and Permit Schedule for SBRP Hazardous Material Handling

Permit	Schedule	Applicability	Agency Contact
Hazardous Materials Inventory and Emergency Business Plan	30 days prior to start of operations.	Applies to all hazardous materials exceeding reporting thresholds	San Diego Department of Environmental Health 1255 Imperial Avenue, 3rd Floor San Diego, CA 92101

TABLE 8.12-9

Permits Required and Permit Schedule for SBRP Hazardous Material Handling

Permit	Schedule	Applicability	Agency Contact
California Accidental Release Prevention Program (Risk Management Plan)	90 days prior to start of operations.	Applies to aqueous ammonia because it will exceed the TQ of 500 pounds	San Diego Department of Environmental Health 1255 Imperial Avenue, 3rd Floor San Diego, CA 92101
Compressed Gas Storage	Prior to storage of these materials at the site.	Applies to storage, handling and/or use of compressed gases.	Justin Gipson City of Chula Vista Fire Department 447 F Street Chula Vista, CA 91910
Cryogen Storage	Prior to storage of these materials at the site.	Applies to storage, handling and/or use of nitrogen	Justin Gipson City of Chula Vista Fire Department 447 F Street Chula Vista, CA 91910
Flammable and Combustible Liquids Storage	Prior to storage of these materials at the site.	Applies to storage, handling, and/or use of flammable and combustible liquids (diesel fuel)	Justin Gipson City of Chula Vista Fire Department 447 F Street Chula Vista, CA 91910
Hazardous Materials Use and Storage	Prior to storage of these materials at the site.	Applies to facilities that store, handle, and/or transport solids, liquids and/or gases	Justin Gipson City of Chula Vista Fire Department 447 F Street Chula Vista, CA 91910
Liquefied Petroleum Gasses Storage	Prior to storage of these materials at the site.	Applies to propane tanks over 125 gallons	Justin Gipson City of Chula Vista Fire Department 447 F Street Chula Vista, CA 91910
Lead Acid Battery Systems Storage	Prior to storage of these materials at the site.	Applies to lead acid batteries in power distribution center	Justin Gipson City of Chula Vista Fire Department 447 F Street Chula Vista, CA 91910

8.12.11 References

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<http://archive.orr.noaa.gov/cameo/evapcalc/evap.html>

U.S. Department of Health and Human Services, Public Health Service Centers for Disease Control. National Institute for Occupational Safety and Health. 1990. NIOSH Pocket Guide to Chemical Hazards.

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TABLE 8.12-2
Use and Location of Hazardous Materials

Chemical	Use	Storage Location	State	Type of Storage
Hydrogen	Generator Cooling	Outdoor Hydrogen Storage Area	Gas	Continuously Onsite
Aqueous Ammonia (19 percent NH ₃ by weight)	Control oxides of nitrogen (NO _x) emissions through selective catalytic reduction	Onsite storage tanks.	Liquid	Continuously Onsite
Aqueous Ammonia (19 percent NH ₃ by weight)	Cleaning of HRSG, initial startup and once every 3 to 5 years	Chemical storage tote or drums at a protected temporary storage location onsite.	Liquid	Initial Startup and Periodically Onsite
Antiscalant	Prevent scale in reverse osmosis membranes	Portable Storage Tote – Water Treatment Building	Liquid	Continuously Onsite
Carbon Dioxide	Generator Cooling	Outdoor Hydrogen Storage Area	Gas	Continuously Onsite
Citric Acid	Cleaning of HRSG, initial startup and once every 3 to 5 years	Pallet supported chemical storage bags in protected temporary storage location on site.	Solid Powder	Initial Startup and Periodically Onsite
Cleaning chemicals/detergents	Periodic cleaning of HRSG and combustion turbine	Chemical storage tote or drums at a protected temporary storage location onsite.	Liquid	Continuously Onsite
Diesel No. 2	Fuel for fire pump engine	Permanent onsite storage in above ground storage tank with secondary containment.	Liquid	Continuously Onsite
Hydraulic Oil	High-pressure combustion turbine starting system, turbine control valve actuators	Onsite 55 Gallon Drums	Liquid	Continuously Onsite
Laboratory reagents	Water/wastewater laboratory analysis	Laboratory chemical storage cabinets (stored in original chemical storage containers/bags)	Liquid and Granular Solid	Continuously Onsite
Lubrication Oil	Lubricate rotating equipment (e.g., gas turbine and steam turbine bearings)	Approximately 80 percent in equipment and 20 percent in onsite 55-gallon drums in the Maintenance/Warehouse Building	Liquid	Continuously Onsite
Mineral Insulating Oil	Transformers/switchyard	Switchyard	Liquid	Continuously Onsite
Neutralizing amines (e.g., NALCO 356) Or 19 percent aqueous ammonia	Boiler pH control	Portable Storage Tote – Water Treatment Building	Liquid	Continuously Onsite

TABLE 8.12-2
Use and Location of Hazardous Materials

Chemical	Use	Storage Location	State	Type of Storage
Oxygen Scavenger (e.g., NALCO ELIMIN-OX)	Oxygen scavenger for boiler water conditioning	Portable Storage Tote – Water Treatment Building	Liquid	Continuously Onsite
Potassium Permanganate	Oxidize Iron and Manganese in feedwater for removal by filtration.	Portable Storage Tote – Water Treatment Building	Liquid	Continuously Onsite
Sodium Bisulfite (NaHSO ₃)	Reduce oxidizers in reverse osmosis feed to protect the RO membranes	Portable Storage Tote – Water Treatment Building	Liquid	Continuously Onsite
Sodium Carbonate	Cleaning of HRSG, initial startup and once every 3 to 5 years	Pallet supported chemical storage bags in protected temporary storage location on site.	Solid Powder	Initial Startup and periodically Onsite
Sodium Hydroxide (NaOH)	Convert CO ₂ to alkalinity for removal by reverse osmosis	Portable Storage Tote – Water Treatment Building	Liquid	Continuously Onsite
Sodium Nitrite	Cleaning of HRSG, initial startup and once every 3 to 5 years	Pallet supported chemical storage bags in protected temporary storage location on site.	Solid	Initial startup and periodically onsite
Trisodium Phosphate (Na ₃ PO ₄) (e.g., NALCO 7208)	Boiler water alkalinity control	Portable Storage Tote – Water Treatment Building	Liquid	Continuously Onsite
Acetylene	Welding Gas	Maintenance / Warehouse Building	Gas	Continuously Onsite
Nitrogen	HRSG inerting/blanketing (gas)	Adjacent to HRSGs	Liquid	Continuously Onsite
Oxygen	Welding Gas	Maintenance / Warehouse Building	Gas	Continuously Onsite
Propane	Torch Gas	Maintenance / Warehouse Building	Gas	Continuously Onsite
Cleaning Chemicals	Cleaning	Admin / Control Building, Maintenance / Warehouse Building	Liquid or Solid	Continuously Onsite
Sulfuric Acid (in batteries)	Lead-Acid Batteries	CT PEECC, Power Distribution Center	Liquid	Continuously Onsite
Corrosion Inhibitor	Corrosion inhibitor for closed cycle cooling water	Maintenance Warehouse Building or Water Treatment Building	Liquid	Continuously Onsite
Paint	Touchup of painted surfaces	Maintenance / Warehouse Building	Liquid	Continuously Onsite

TABLE 8.12-3
SBRP Chemical Inventory

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ ^a	RQ of Material as Used Onsite ^b	EHS TPQ ^c	Regulated Substance TQ ^f	Prop 65
Acetylene	Acetylene	74-86-2	800 cubic feet (4 cylinders)	d	d	d	d	No
Antiscalant	Antiscalant	None	1,000 gal.	d	d	d	d	No
Aqueous Ammonia (Operations)	Aqueous Ammonia (19 percent)	7664-41-7 (NH ₃)	24,000 gal.	100 lb	100 lb	500 lb	500 lb (state)	No
Aqueous Ammonia (Start up and HRSG cleaning)	Aqueous Ammonia (19 percent)	7664-41-7 (NH ₃)	500 gal.	100 lb	100 lb	500 lb	500 lb (state)	No
Carbon Dioxide	Carbon Dioxide	124-38-9	15,000 cubic feet, 2,000 lb	d	d	d	d	No
Citric Acid	Citric Acid	77-92-9	30,000 lb	d	d	d	d	No
Cleaning Chemicals/Detergents	Various	None	500 gal.	d	d	d	d	No
Corrosion Inhibitor (NALCO 8305 Plus)		None	600 gal.	d	d	d	d	No
Diesel No. 2	Oil	None	250 gal.	42 gal. ^e	42 gal. ^e	d	d	Yes
Hydraulic Oil	Oil	None	2,000 gal.	42 gal. ^e	42 gal. ^e	d	d	No
Hydrogen	Hydrogen gas	1333-74-0	20,000. cubic feet, 110 lb	d	d	d	10,000 lb (federal)	No
Laboratory Reagents (liquid)	Various	None	25 gal.	d	d	d	d	No
Laboratory Reagents (solid)	Various	None	100 lb	d	d	d	d	No
Lubrication Oil	Oil	None	20,000 gal.	42 gal. ^e	42 gal. ^e	d	d	Yes
Mineral Insulating Oil	Oil	8012-95-1	53,000 gal.	42 gal. ^e	42 gal. ^e	d	d	Yes
Neutralizing Amines (e.g. NALCO 356)	Cyclohexylamine (20 to 40 percent)	108-91-8	1,000 gal.	d	d	d	d	No
Nitrogen	Nitrogen	7727-37-9	500 gal.	d	d	d	d	No

TABLE 8.12-3
SBRP Chemical Inventory

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ ^a	RQ of Material as Used Onsite ^b	EHS TPQ ^c	Regulated Substance TQ ^f	Prop 65
Oxygen	Oxygen	7782-44-7	800 cubic feet (4 cylinders)	d	d	d	d	No
Oxygen Scavenger (e.g. NALCO ELIMIN-OX)	Carbohydrazide	497-18-7	1,000 gal.	d	d	d	d	No
Paint	Various	Various	25 gal.	d	d	d	d	No
Potassium Permanganate	Potassium Permanganate	7722-64-7	1,000 gal.	100 lb	100 lb	d	d	No
Propane	Propane	74-98-6	800 cubic feet (4 cylinders)	d	d	d	d	No
Sodium Bisulfite	Sodium Bisulfite	7631-90-5	1,000 gal.	1,000 lb	1,000 lb	d	d	No
Sodium Carbonate	Sodium Carbonate	497-19-8	35,000 lb	d	d	d	d	No
Sodium Hydroxide	Sodium Hydroxide	1310-73-2	1,000 gal.	1,000 lb	2,000 lb	d	d	No
Sodium Nitrite	Sodium Nitrite	7632-00-0	5,000 lb	100 lb	100 lb	d	d	No
Sulfuric Acid (in batteries)	Sulfuric Acid	7664-93-9	600 gal.	1,000 lb	1,075 lb	1,000 lb	d,g	No
Trisodium Phosphate	Sodium Phosphate, Tribasic	7601-54-9	1,000 gal.	5,000 lb	5,000 lb	d	d	No

^a Reportable quantity for a pure chemical, per the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) [Ref. 40 CFR 302, Table 302.4]. Release equal to or greater than RQ must be reported. Under California law, any amount that has a realistic potential to adversely affect the environment or human health or safety must be reported.

^b Reportable quantity for materials as used onsite. Since some of the hazardous materials are mixtures that contain only a percentage of a reportable chemical, the reportable quantity of the mixture can be different than for a pure chemical. For example, if a material only contains 10 percent of a reportable chemical and the RQ is 100 lb, the reportable quantity for that material would be (100 lb)/(10 percent) = 1,000 lb

^c Threshold Planning Quantity [Ref. 40 CFR Part 355, Appendix A]. If quantities of extremely hazardous materials equal to or greater than TPQ are handled or stored, they must be registered with the local Administering Agency.

^d No reporting requirement. Chemical has no listed threshold under this requirement.

^e State reportable quantity for oil spills that will reach California state waters [Ref. CA Water Code Section 13272(f)]

^f TQ is Threshold Quantity from 19 CCR 2770.5 (state) or 40 CFR 68.130 (federal)

^g There is a state TQ of 1,000 lb for sulfuric acid that does not apply to this form of sulfuric acid

TABLE 8.12-4

Toxic Effects and Exposure Levels of Regulated Substances Exceeding TQs

Name	Toxic Effects	Exposure Levels
Aqueous Ammonia (19 percent solution)	Toxic effects for contact with pure liquid or vapor causes eye, nose, and throat irritation, skin burns, and vesiculation. Ingestion or inhalation causes burning pain in mouth, throat, stomach, and thorax, constriction of thorax, and coughing followed by vomiting blood, breathing difficulties, convulsions, and shock. Other symptoms include dyspnea, bronchospasms, pulmonary edema, and pink frothy sputum. Contact or inhalation overexposure can cause burns of the skin and mucous membranes, and headache, salivation, nausea, and vomiting. Other symptoms include labored breathing, bloody mucous discharge, bronchitis, laryngitis, hemmoptysis, and pneumonitis. Damage to eyes may be permanent, including ulceration of conjunctiva and cornea and corneal and lenticular opacities.	Occupational Exposures PEL = 35 mg/m ³ OSHA TLV = 18 mg/m ³ ACGIH TWA = 25 mg/m ³ NIOSH STEL = 35 mg/m ³ Hazardous Concentrations IDLH = 500 ppm LD ₅₀ = 350 mg/kg - oral, rat ingestion of 3 to 4 ml may be fatal Sensitive Receptors ERPG-1 = 25 ppm ERPG-2 = 200 ppm ERPG-3 = 1,000 ppm
ACGIH	American Conference of Government Industrial Hygienists	
ERPG	Emergency Response Planning Guideline	
ERPG-1	Maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing other than mild transient adverse health effects	
ERPG-2	Maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without developing irreversible or serious health effects	
ERPG-3	Maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing life-threatening health effects	
IDLH	Immediately dangerous to life and health	
LD ₅₀	Dose lethal to 50 percent of those tested	
LDLO	Lowest published lethal dose	
mg/kg	Milligrams per kilogram	
mg/m ³	Milligrams per cubic meter	
NIOSH	National Institute of Occupational Safety and Health	
PEL	OSHA permissible exposure limit for 8-hr workday	
REL	Reference Exposure Level	
ppm	parts per million	
STEL	Short-term exposure limit, 15-min. exposure	
TCLO	Lowest published toxic concentration	
TLV	ACGIH threshold limit value for 8-hr workday	
TWA	NIOSH time-weighted average for 8-hr workday	

TABLE 8.12-5
Toxicity of Hazardous Materials

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability*
Acetylene	Colorless gas	Asphyxiant gas	Oxygen and other oxidizers including all halogens and halogen compounds. Forms explosive acetylide compounds with copper, mercury, silver, brasses containing >66 percent copper and brazing materials containing silver or copper.	Flammable
Aqueous Ammonia	Colorless liquid with pungent odor	<i>Corrosive</i> : Irritation to permanent damage from inhalation, ingestion, and skin contact.	Acids, halogens (e.g., chlorine), strong oxidizers, salts of silver and zinc.	Liquid is incombustible; Vapor is combustible, but difficult to burn
Antiscalant	Amber liquid	May cause slight irritation to the skin and moderate irritation to the eyes	None	Non-flammable
Citric Acid	Translucent crystals	None.	None.	Non-flammable
Cleaning Chemicals/Detergents	Liquid	Refer to individual chemical labels.	Refer to individual chemical labels.	Refer to individual chemical labels
Corrosion Inhibitor	Light yellow liquid, sweet organic odor	Irritant to eyes, skin, and respiratory tract	Strong oxidizers, strong acids, and reactive metals	Nonflammable
Diesel No. 2	Oily, light liquid	May be carcinogenic.	Sodium hypochlorite. Oxidizers.	Flammable
Hydraulic Oil	Oily, dark liquid	Hazardous if ingested.	Sodium hypochlorite. Oxidizers	Combustible
Hydrogen	Hydrogen Gas	Asphyxiant gas	Dangerous when exposed to heat or flame	Highly flammable and explosive
Laboratory Reagents	Liquid and solid	Refer to individual chemical labels.	Refer to individual chemical labels.	Refer to individual chemical labels
Lubrication Oil	Oily, dark liquid	Hazardous if ingested.	Sodium hypochlorite. Oxidizers	Flammable
Mineral Insulating Oil	Oily, clear liquid	Minor health hazard.	Sodium hypochlorite. Oxidizers	Can be combustible, depending on manufacturer
Neutralizing amines (e.g. NALCO 356)	Clear, light yellow/green liquid	<i>Corrosive</i> : Irritation to eyes and skin. Can cause kidney damage	Strong oxidizers and acids. SO ₂ or acidic bisulfite products	Flammable

TABLE 8.12-5
Toxicity of Hazardous Materials

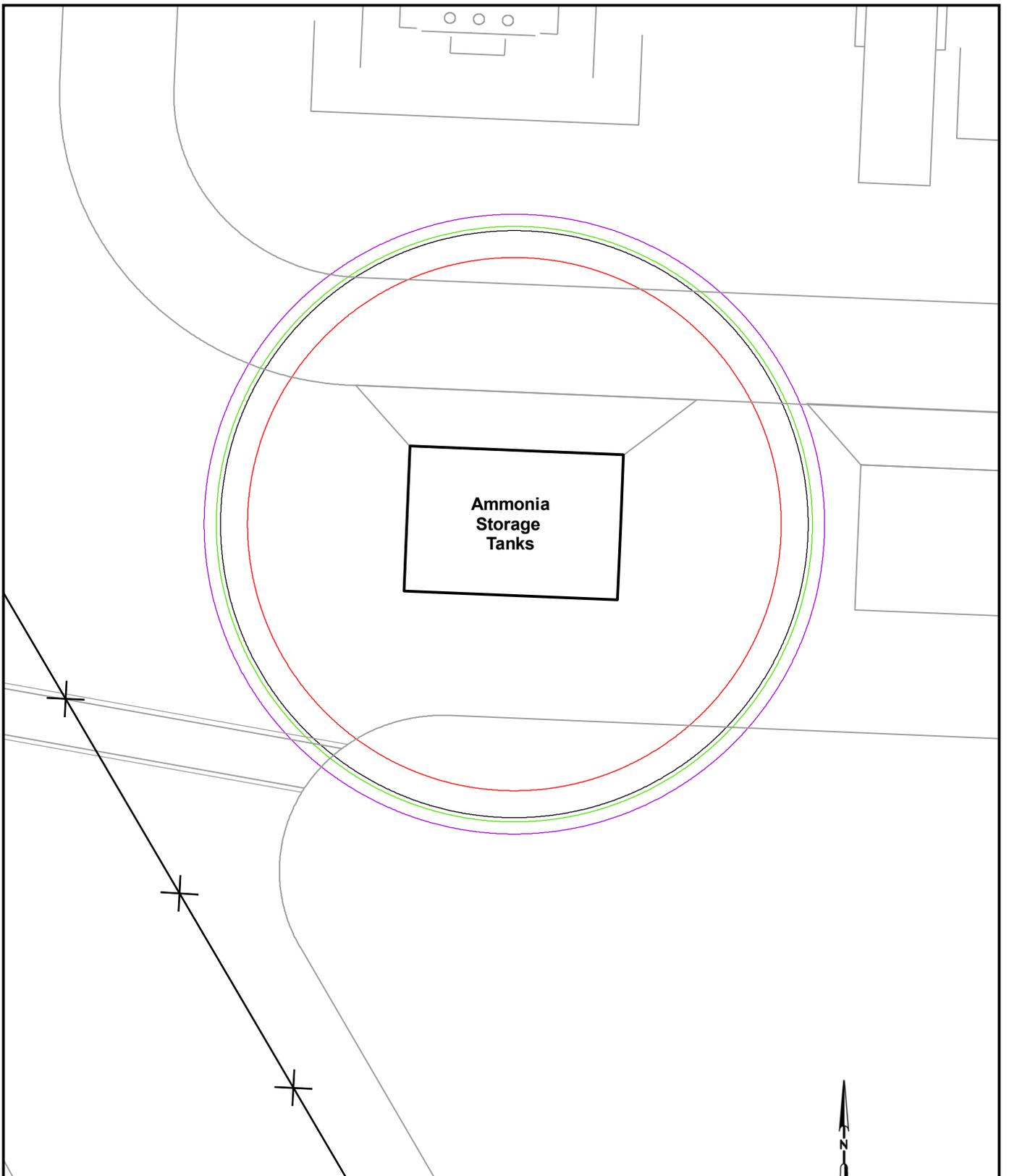
Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability*
Nitrogen	Colorless, odorless, tasteless gas	Simple asphyxiant	None.	Nonflammable
Oxygen	Colorless, odorless, tasteless gas	Therapeutic overdoses can cause convulsions. Liquid oxygen is an irritant to skin.	Hydrocarbons, organic materials	Oxidizing agent; actively supports combustion
Oxygen Scavenger (e.g. NALCO ELIMIN-OX)	Colorless liquid	<i>Toxic:</i> Slightly toxic, low human hazard.	Mineral acids, nitrites, and strong oxidizers.	Non-flammable
Paint	Various colored liquid	Refer to individual container labels.	Refer to individual container labels.	Refer to individual container labels
Potassium Permanganate	Purple bronze crystals	<i>Corrosive and Toxic:</i> Causes burns to any area of contact, harmful if swallowed or inhaled	Powdered metals, alcohol, arsenites, bromides, iodides, phosphorous, sulfuric acid, organic compounds, sulfur, activated carbon, hydrides, strong hydrogen peroxide, ferrous or mercurous salts, hypophosphites, hyposulfites, sulfites, peroxides, and oxalates	Oxidizing agent
Propane	Propane gas (odorant added to provide odor)	Asphyxiant gas. Causes frostbite to area of contact.	Strong oxidizing agents and high heat	Flammable
Sodium Bisulfite	Coarse white granules	Hazardous if ingested. Causes irritation of skin, eyes, and respiratory tract.	Water, acids, alkalis, sodium nitrite, oxidizers, aluminum powder.	Non-flammable
Sodium Carbonate	White crystals or power	<i>Corrosive and Toxic:</i> Mildly toxic by ingestion. Irritation to skin and eyes	Aluminum, Phosphorus (V) Oxide, Sulfuric Acid, Fluorine, Lithium, 2,4,6-trinitrotoluene	Non-flammable
Sodium Hydroxide (50 percent)	Clear yellow liquid	<i>Corrosive:</i> Irritant to tissue in presence of moisture; strong irritant to tissue by ingestion	Water, acids, organic halogens, some metals	Non-flammable
Sodium Nitrite	White or slightly yellow, hygroscopic; odorless	Causes irritation of skin, eyes, and respiratory tract.	Acids, ammonium compounds, reducing agents, high heat, and sources of ignition	Non-combustible

TABLE 8.12-5
Toxicity of Hazardous Materials

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability*
Sulfuric Acid	Colorless, dense, oily liquid.	<i>Strongly Corrosive:</i> Strong irritant to all tissue. Minor burns to permanent damage to tissue.	Organic materials, chlorates, carbides, fulminates, metals in powdered form. Reacts violently with water.	Non-flammable
Trisodium Phosphate	Colorless crystals.	<i>Corrosive and Toxic:</i> Toxic by ingestion. Irritant to tissue.	None.	Non-flammable

Data were obtained from MSDSs and Lewis (1991).

* Per Department of Transportation regulations, under 49 CFR 173: "Flammable" liquids have a flash point less than or equal to 141°F; "Combustible" liquids have a flash point greater than 141° F.



LEGEND

— Ammonia Storage Area

✕ Fence

Gaseous Ammonia Concentrations in the Event of Release

PPM

2000 ppm (risk of lethality)

300 ppm (OSHA's IDLH)

150 ppm (EPA / CalARP toxic endpoint)

75 ppm (CEC Significance Value)

Source: Results from SBEF Primary OCA (1.6m AGL)

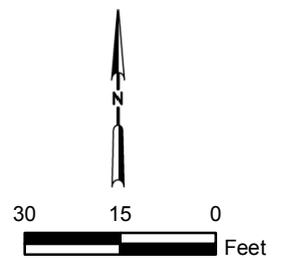


FIGURE 8.12A
OFFSITE CONSEQUENCE
ANALYSIS
 SOUTH BAY REPLACEMENT PROJECT
 CHULA VISTA, CA