8.5 HAZARDOUS MATERIALS HANDLING

This section presents an evaluation of potential impacts to human health and the environment from the storage and use of hazardous materials in conjunction with the RCEC and the Advanced Wastewater Treatment (AWT) plant. A full description of the project is presented in Section 2. Closure of the RCEC is discussed in Section 4.

Section 8.5.1 describes the existing environment that the project may affect. Section 8.5.2 identifies potential impacts on the environment and human health from development of the project. Section 8.5.3 investigates potential cumulative impacts. Section 8.5.4 presents proposed mitigation measures, and Section 8.5.5 presents the laws, ordinances, regulations, and standards (LORS) applicable to hazardous materials. Section 8.5.6 describes the agencies involved and provides agency contacts, and Section 8.5.7 describes permits required. Section 8.5.8 provides the references used to develop this section.

8.5.1 Affected Environment

The project site is located within the City of Hayward. Land use in the vicinity of the all three sites is zoned for industrial use. Industrial buildings and warehouses are located to the north, west, and east. There are no sensitive receptors (such as schools, hospitals, daycare facilities, convalescent centers, or emergency response facilities) within a 1-mile radius of the RCEC (see Figure 8.9-2 in Section 8.9, Public Health). The nearest residences are located 0.82 miles from the site.

Hazardous and acutely hazardous materials will be stored at the RCEC during operation of these facilities. Hazardous materials will also be stored at the AWT plant during operations. Storage locations are described in Tables 8.5-1 ands 8.5-2, respectively.

Acutely hazardous materials as defined under California's La Follette Bill (California Health and Safety Code 25531 et seq.) will not be used during construction of the RCEC, AWT plant, or the associated facilities or linear routes. Therefore, no discussion of acutely hazardous materials storage or handling during construction is included in Section 8.5.1.1.

8.5.1.1 Construction Phase

Hazardous materials used during construction of the RCEC, associated linear facilities, and the AWT plant will include gasoline, diesel fuel, motor oil, hydraulic fluid, certain solvents, cleaners, sealants, welding flux, various lubricants, paint, and paint thinner. No acutely hazardous materials will be used or stored on-site during construction. There are no feasible alternatives to motor fuels and oils for operating construction equipment. The types of paint required are dictated by the types of equipment and structures that must be coated and the manufacturer's requirements for coating.

The most likely incidents involving these hazardous materials would be associated with minor spills or drips. Impacts from such incidents will be mitigated by thoroughly cleaning up minor spills as soon as they occur. In the case of a large spill of hazardous material, any contaminated soil will be excavated and stored in drums or roll-off bins for off-site disposal as a hazardous waste.

8.5.1.2 Operation Phase

A number of hazardous materials, including acutely hazardous aqueous ammonia and cyclohexylamine mixture, will be stored at the generating site during operation of the RCEC and AWT plant. Some of these materials will be stored at the generating site continuously, others will be brought on-site, used and not brought back on-site for a number of years, while still others will be on-site at for startup purposes only.

Table 8.5-1. RCEC hazardous materials storage locations.

Chemical	Use	Storage Location[1]
Aqueous Ammonia (28% NH_3 +72% H_2O)	Selective catalytic reduction	Outdoors, in the ammonia unloading/storage area (6)
Sodium Hydroxide (NaOH)	pH neutralization of cooling tower	Water treatment building/laboratory (18)
Sulfuric Acid (H_2SO_4) (93%)	Cooling tower pH control	Outdoors, near cooling towers (33)
Disodium Phosphate (Na_2HPO_4)	HRSG drum solids control	Water treatment building/laboratory (18)
Trisodium Phosphate (Na_3PO_4)	HRSG drum solids control	Water treatment building/laboratory (18)
Sodium Hypochlorite (NaOCL)	Cooling tower biological control	Cooling tower circulating water pump house (33)
Sodium Tolytriazole (NALCO 8306)	Scale control in cooling tower	Cooling tower circulating water pump house (20)
Stabrex ST70	Biocide in cooling tower	Near cooling tower (20)
NALCO 356 or NALCO TRI-ACT 1800	Corrosion control of condensate piping	Near each HRSG (21)
NALCO 7280	Antiscalant for use in reverse osmosis (RO) unit	Water treatment building (18)
ELIMIN-OX	Oxygen scavenger for use in process feedwater to DA	Near each HRSG (21)
NALCO 7408	Oxygen scavenger for use upstream of RO unit	Water treatment building (18)
NALCO 22106 or NALCO 7213	Chelate; injected in suction of boiler feed pumps	Near each HRSG (21)
Hydrogen gas	Steam turbine generator cooling	Adjacent to steam turbine (1)
Lubricating oil	Rotating equipment	Contained within equipment
Mineral Insulating Oil	Transformers	Contained within transformers (4,5)
No. 2 Diesel Fuel	Emergency fire pump engine	Near emergency fire pump (23)
Various cleaning chemicals	Chemical cleaning of HRSG	Water treatment building/laboratory (18)
Various laboratory reagents	Laboratory analysis	Water treatment building/laboratory (18)

[1]Storage locations are depicted with numerical references on Figure 2.2-1.

Table 8.5-2. AWT plant hazardous materials storage locations.

Chemical	Use	Storage Location[1]
Sodium Hypochlorite (NaOCL)	Biofoul control in MF/RO and disinfection in AWT	Chemical and dewatering area
Sulfuric Acid (H_2SO_4) (93%)	RO feedwater pH control, cleaning sludge press, pH adjustment	Chemical and dewatering area and RO area day tank
Hypersperse MDC220 (phosphonic acid)	RO antiscalant	Chemical and dewatering area and RO area day tank
Sodium Hydroxide (NaOH)	MF membrane cleaning	RO area
Memclean C	MF membrane cleaning	RO area
Citric Acid	MF membrane cleaning	RO area
Lime	RO concentrate/MF backwash pH adjustment	Chemical and dewatering area
Ferric Chloride	RO concentrate/MF backwash clarifying agent	Chemical and dewatering area
Sodium Sulfide	RO concentrate/MF backwash copper precipitation	Chemical and dewatering area
KleenMCT103	RO membrane cleaning	RO area
KleenMCT411	RO membrane cleaning	RO area

[1]Storage locations are depicted on Figure 2.3-1.

RCEC Plant Site

The following hazardous and acutely hazardous materials will be used and/or stored at the RCEC site during the operation phase:

Continuously On-Site

- Aqueous Ammonia (acutely hazardous)—to control nitrous oxide (NOx) emissions through selective catalytic reduction (12,000 gallons, liquid)
- NALCO 356 (or NALCO TRI-ACT 1800)—cyclohexylamine (acutely hazardous) and morpholine (hazardous) for corrosion control in condensate piping (2,000 gallons, liquid, 20 to 40 percent solution)
- Sulfuric Acid—for circulating water pH control (cooling tower treatment) (5,000 gallons, liquid, 93 percent solution)
- Sodium Hypochlorite—biocide for condenser cooling water system (5,000 gallons, liquid, 10 percent solution)
- Sodium Hydroxide (NALCO 7383)—for pH control of cooling tower (5,000 gallons, liquid, 50 percent solution)
- Disodium Phosphate—for boiler water pH and scale control (500 pounds, granular solid)
- Trisodium Phosphate—for boiler water pH and scale control (500 pounds, granular solid)
- NALCO 7280 Scale Inhibitor—Sodium hexameta phosphates, organophosphonates, and poly-acrylates; used as a scale inhibitor in RO process (250 gallons, liquid)
- Scale Inhibitors (various)—typical inhibitor would be NALCO 8306 Plus containing sodium tolyltriazole. Used to reduce scale formation in circulating water system (3000 gallons, liquid)

- STABREX ST70—sodium hydroxide and sodium hypobromite-biocide in cooling tower water (2,000 gallons, liquid)
- ELIMIN-OX-carbohydrazide—oxygen scavenger in process feedwater to deaerator (2,000 gallons, liquid)
- NALCO 7408—sodium bisulfite-oxygen scavenger upstream of reverse osmosis unit (250 gallons, liquid)
- NALCO 22106—sodium polyacrylate and aryl sulfanate; chelate; injected in suction of boiler feed pumps (2,000 gallons, liquid) or NALCO 7213-tetrasodiumethylenediaminetetraacetate for boiler feedwater treatment (1,000 gallons, liquid)
- Hydrogen gas—used for cooling steam turbine generator (STG) (95,000 std. cubic feet [19,500 scf. in the generator caring and 75,000 scf. storage in tube trailer])
- Mineral Insulating Oil—contained in transformer systems (82,000 gallons, liquid)
- Lubrication Oil—for gas turbine and steam turbine bearings (19,500 gallons, liquid)
- No. 2 Diesel Fuel—for emergency fire pump engine (500 gallons, liquid)
- Various Detergents—combustion turbine compressor periodic cleaning (100 gallons, liquid)
- Various Laboratory Reagents—for water/wastewater analysis (10 gallons, liquid and 100 pounds, granular solid)

Periodically On-Site

- Hydrochloric Acid—for chemical cleaning of heat recovery steam generator (HRSG) (10,000 pounds initially, and once every 10 years, liquid, 30 percent solution)
- Ammonium Bifluoride—for chemical cleaning of HRSG (200 pounds initially, and once every 10 years, solid crystals)
- Citric Acid—for chemical cleaning of HRSG (100 pounds initially, and once every 10 years, solid powder)
- Sodium Carbonate—for chemical cleaning of HRSG and neutralization (500 pounds initially, and once every 10 years, solid powder)
- Sodium Nitrate—for chemical cleaning of HRSG (500 pounds initially, and once every 10 years, solid crystals)

On-Site During Commissioning Only

- Hydroxyacetic Acid—for chemical cleaning of HRSG feedwater system (1,000 pounds prior to start-up, solid crystals)
- Formic Acid—for chemical cleaning of HRSG feedwater system (600 pounds prior to start-up, liquid)

Information about these materials is presented in Table 8.5-3 including trade and chemical names, Chemical Abstract Service (CAS) numbers, maximum quantities on-site, hazardous characteristics, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Superfund Amendments and Reauthorization Act (SARA) Title III reportable quantities (RQ), La Follette Bill threshold planning quantities (TPQ) and Proposition 65 listing status. Proposition 65 chemicals are those known to be carcinogenic or cause reproductive problems in humans.

In addition to the chemicals noted in Table 8.5-3, small quantities (less than 5 gallons) of paints, oils, solvent, pesticides and cleaners, typical of those purchased at a retail hardware store, may also be used at the RCEC facility.

The hazardous materials to be stored include such incompatible chemicals as sodium hypochlorite and ammonia, or sodium hydroxide, sodium hypochlorite and sulfuric acid. Mixing of these chemicals could generate toxic gases. Measures to keep incompatible chemicals separated include separate storage and containment areas and/or berming.

One acutely hazardous material to be used on site is aqueous ammonia. Aqueous ammonia is a solution of ammonia and water, and is a common industrial chemical used in the Hayward Industrial Corridor. Pure ammonia (NH_3) is a volatile, acutely hazardous chemical that is stored under pressure as a liquid and becomes a toxic gas if released. Exposure to ammonia vapor at concentrations greater than 140 parts per million (ppm) will cause detectable effects on lung function even for short time exposures (0.5 to 2 hours). At higher concentrations of 700 to 1,700 ppm, the gas will cause severe effects. Concentrations of 2,500 to 7,000 ppm can be fatal.

Ammonia gas is very soluble in water. The aqueous ammonia concentration proposed for the RCEC is 28 percent ammonia (and 72 percent water). If the aqueous ammonia solution leaks or is spilled, the ammonia in solution will evaporate into the atmosphere. The rate of evaporation will depend on the temperature of the solution.

The second acutely hazardous material to be used on site is NALCO 356, which contains both cyclohexylamine (an acutely hazardous material) and morpholine (a hazardous material). Cyclohexylamine is corrosive to the eyes and skin and, depending on the length of exposure, can cause permanent eye damage and third degree burns to the skin. Morpholine is also a severe eye, skin, and mucous membrane irritant and can cause kidney damage. Neither of these chemicals is particularly volatile, however, and both are soluble in water, which constitutes 50 to 75 percent of NALCO 356. The maximum quantity of NALCO 356 stored on-site will be 2,000 gallons; the maximum quantity of pure cyclohexylamine in this solution will be 800 gallons, and the maximum quantity of pure morpholine in this solution will be 200 gallons. Because of the low volatility of these chemicals and the relatively small quantities stored, the off-site threat is considered small.

The hazard to facility workers for both of these acutely hazardous materials will be mitigated by facility safety equipment, hazardous materials training, and emergency response planning. A Risk Management Plan (RMP) as required under federal regulations (40 Code of Federal Regulations [CFR] 68) and the California Health and Safety Code (Sections 25531 to 25543.3) may be developed to describe these and other requirements (Section 8.5.6.4). An RMP is required for substances described in section 112(r)(5) of the Clean Air Act and listed in Appendix A of Part 355 of Subchapter J of Chapter I of Title 40 of the CFR and that are handled or stored in quantities in excess of certain levels.

The toxicity characteristics and exposure level criteria for these acutely hazardous material are shown in Table 8.5-4. The remaining materials in Table 8.5-3 are hazardous materials and pose a lesser threat to humans than the acutely hazardous material. The toxic effects and other characteristics of each hazardous material are summarized in Table 8.5-5.

Table 8.5-3. RCEC chemical inventory.

Trade Name	Chemical Name	CAS[a] Number	Maximum Quantity Onsite	Hazardous Characteristics	RQ[b]	TPQ[c]	Prop 65
Acutely Hazardous Materials:							
Aqueous Ammonia (28% solution)	Ammonium Hydroxide	7664-41-7 (for NH_3) 1336-21-6 (for $NH_3 - H_2O$)	12,000-gal. solution, 35,190 lb. NH_3	Corrosive Volatile	100 lb.	500 lb.	No
NALCO 356	Cyclohexyla-mine (20-40%) Morpholine (5-10%)	108-91-8 110-91-8	2,000 gal.	Corrosive	10,000 lb.	10,000lb	No
Or NALCO TRI-ACT 1800	Cyclohexyla-mine (10-20%) Ethanolamine (10-20%) Methoxypropyl amine (10-20%)	108-91-8 141-43-5 5332-73-0	2,000 gal.	Corrosive	10,000 lb.	10,000 lb	No
Hazardous Materials:							
Sulfuric Acid	Sulfuric Acid	7664-93-0	5,000 gal.	Corrosive	1,000 lb.	1,000 lb.	No
Bleach	Sodium Hypochlorite	7681-52-9	5,000 gal.	Corrosive	100 lb.		No
NALCO 7383	Sodium Hydroxide	1310-73-2	5,000 gal.	Corrosive	1,000 lb.		No
Disodium Phosphate	Sodium Phosphate	7558-79-4	500 lbs.	Toxic	[d]		No
Trisodium Phosphate	Tri-Sodium Phosphate	7601-54-9	500 lbs.	Toxic	[d]		No
NALCO 8306 Plus	Sodium Tolyltriazole	64665-57-2	3,000 gal.	Toxic	[d]		No
Hydrochloric Acid	Hydrochloric Acid	7647-01-0	10,000 lbs.	Corrosive	5,000 lb.		No
Citric Acid	Hydroxy-propionic-tricarboxylic Acid	77-92-9	100 lbs.	Corrosive	[d]		No
Hydroxyacetic Acid	Gyrolic Acid	None	1000 lbs.	Corrosive	[d]		No
Formic Acid	Methanoic Acid	64-18-6	600 lbs.	Corrosive	5,000 lb.		No

Table 8.5-3 (continued).

Trade Name	Chemical Name	CAS[a] Number	Maximum Quantity Onsite	Hazardous Characteristics	RQ[b]	TPQ[c]	Prop 65
STABREX ST70	Sodium Hydroxide (1-5%) Sodium Hypobromite (10-20%)	1310-73-2 13824-96-9	2,000 gal.	Corrosive/Toxic	30,800 lb.		No
NALCO 7280	Polyacrylic Acid (20-40%)	Trade Secret	250 gal.	Toxic	[d]		No
ELIMIN-OX	Carbohydra-zide	497-18-7	2,000 gal.	Non-Hazardous			No
NALCO 7408	Sodium Bisulfite (40-70%)	7631-90-5	250 gal.	Corrosive	12,000 lb.		No
NALCO 22106	Sodium Polyacrylate Aryl Sulfonate	N/A	2,000 gal.	Toxic	[d]		No
Or NALCO 7213	Tetrasodium ethylenedia-minetetraace-tate (10-20%)	64-02-8	2,000 gal.	Corrosive	[d]		No
Hydrogen Gas	Hydrogen	1333-74-0	95,000 scf.	Flammable	[d]		No
Mineral Insulating Oil	Oil	None	82,000 gal.	Combustible	42 gal.[e]		Yes
Lubrication Oil	Oil	None	19,500 gal.	Flammable	42 gal.[e]		Yes
No. 2 Diesel	Oil	None	500 gal.	Flammable	42 gal.[e]		Yes
Detergents	Various	None	100 gal.	Toxic	[d]		--
Lab Reagents (liquid)	Various	None	10 gal.	Toxic	[d]		--
Lab Reagents (solid)	Various	None	100 lbs.	Toxic	[d]		--
Ammonium Bifluoride	Ammonium Bifluoride	1341-19-7	200 lbs.	Toxic, Corrosive	100		No
Sodium Carbonate	Sodium Carbonate	497-19-8	500 lbs.	Corrosive	[d]		No
Sodium Nitrate	Sodium Nitrate	7631-99-4	500 lbs.	Corrosive	[d]		No

[a] Chemical Abstract Service.
[b] Reportable Quantity per CERCLA. 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.
[c] Threshold Planning Quantity. If quantities of acutely hazardous materials equal to or greater than TPQ are handled or stored, they must be registered with the local Administering Agency. For hazardous materials, the TPQ is 10,000 lb.
[d] No reporting requirement.
[e] Must report if does or will reach California state waters, or if quantity released is a "harmful quantity."

Table 8.5-4. RCEC acutely hazardous materials.

Name	Toxic Effects	Exposure Levels
Aqueous Ammonia 28% solution	Contact with 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 = 300 ppm LD_{50} = 350 mg/kg - oral, rat ingestion of 3 to 4 mls may be fatal Sensitive Receptors ERPG-1 = 25 ppm ERPG-2 = 200 ppm ERPG-3 = 1,000 ppm
Cyclohexyla-mine	Caustic/corrosive to skin, eyes, and mucous membranes. Systemic effects include nausea, vomiting, anxiety, restlessness, and drowsiness.	Occupational Exposures PEL = 40 mg/m^3 OSHA TLV = 40 mg/m^3 ACGIH TWA = 40 mg/m^3 NIOSH STEL = None set Hazardous Concentrations LD_{50} = 779 mg/kg - oral, albino rats LD_{50} = 2,055 mg/kg – dermal, albino rabbits Sensitive Receptors ERPGs not available

PEL = OSHA Permissible Exposure Limit for 8-hr work-day

TLV = ACGIH Threshold Limit Value for 8-hr work-day

TWA = NIOSH time-weighted average for 8-hr work-day

STEL = Short term exposure limit, 15-min. exposure

IDLH = Immediately dangerous to life and health

LD_{50} = Dose lethal to 50 percent of those tested

LDLO = Lowest published lethal dose

OSHA = Occupational Safety and Health Administration

ERPG = Emergency Response Planning Guideline

TCLO = Lowest published toxic concentration

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

mg/m^3 = milligrams per cubic meter

mg/kg = milligrams per kilogram

ppm = parts per million

ACGIH = American Conference of Government Industrial Hygienists

NIOSH = National Institute of Occupational Safety and Health

Table 8.5-5. Characteristics of RCEC hazardous and acutely hazardous materials.

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability
Ammonia	Colorless gas with pungent odor.	Corrosive. Irritation to permanent damage from inhalation, ingestion, and skin contact.	Acids, halogens, strong oxidizers, salts of silver and zinc.	Combustible, but difficult to burn.
Sulfuric Acid	Colorless, dense, oily liquid.	Strongly corrosive. 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.	Not combustible.
Sodium Hypochlorite	Pale green; sweet, disagreeable odor. Usually in solution with H_2O or sodium hydroxide.	Corrosive. Toxic by ingestion. Strong irritant to tissue.	Ammonia and organic materials.	Fire risk when in contact with organic materials.
Sodium Hydroxide (NALCO 7383)	Clear yellow liquid.	Corrosive. Corrosive to tissue in presence of moisture. Strong irritant to tissue by ingestion.	Water, acids, organic halogens, some metals.	Noncombustible.
di-Sodium Phosphate	White powder.	Toxic. Toxic by ingestion.	None.	Non-flammable.
tri-Sodium Phosphate	Colorless crystals.	Toxic. Toxic by ingestion. Irritant to tissue.	None.	Non-flammable.
Scale Inhibitor (NALCO- 8306 Plus)	Yellow green liquid.	Slight to moderately toxic. Irritation to skin and eyes.	Strong acids.	Non-flammable.
Hydrochloric Acid	Colorless, pungent, fuming liquid.	Highly corrosive. Toxic by ingestion. Strong irritant to eyes and skin.	Metals, hydroxides, amines, alkalis.	Non-flammable.
Citric Acid	Translucent crystals.	None.	None.	Non-flammable.
Hydroxyacetic Acid	Colorless crystals.	Corrosive Toxic. Toxic by inhalation, ingestion, and dermal contact.	Strong bases, strong reducing and oxidizing agents.	Non-flammable.
Formic Acid	Colorless, fuming liquid.	Corrosive. Corrosive to skin and tissue.	Strong oxidizers, strong caustics, concentrated sulfuric acid.	Combustible.
STABREX ST70 Sodium Hydroxide (1-5%) Sodium Hypobromite (10-20%)	Clear, light yellow liquid.	Corrosive. Corrosive to eyes and skin. Harmful if ingested or inhaled.	Strong acids, organic materials, sodium hypochlorite.	Non-flammable.
NALCO 356 Cyclohexylamine (20-40%) Morpholine (5-10%) ***or***	Clear, light yellow/green liquid.	Corrosive. Corrosive to eyes and skin. Can cause kidney damage.	Strong oxidizers and acids. SO_2 or acidic bisulfite products.	Flammable.
NALCO-TRI-ACT 1800 Cyclohexylamine (10-20%) Ethanolamine (10-20%) Methoxypro-pylamine (10-20%)	Clear, colorless to light yellow.	Corrosive. Corrosive to eyes and skin. Can cause liver damage.	Strong acids, inorganic nitrites or nitrous oxide.	Flammable.

Table 8.5-5. (continued).

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability
NALCO 7280 Polyacrylic acid	Clear to slightly turbid yellow.	Toxic. Kidney damage. Effects on bones.	Reactive salts (nitrites and sulfites)	Non-flammable.
ELIMIN-OX Carbohydrazide	Colorless liquid.	Slightly toxic. Low human hazard.	Mineral acids, nitrites, and strong oxidizers.	Non-flammable.
NALCO 7408 Sodium Bisulfite	Yellow liquid.	Corrosive. Irritation to eyes, skin, and lungs. May be harmful if digested.	Strong acids and oxidizers.	Non-flammable.
NAL 22106 Sodium Polyacrylate Aryl Sulfonate	Clear to slightly yellow.	Toxic. Possibly harmful if swallowed.	None known.	Non-flammable.
Or				
NALCO 7213 Tetrasodium Ethylenediaminetetra-acetate (10-20%)	Clear, yellow to amber.	Toxic. Moderate health hazard. Moderate irritation to eyes and skin.	Strong acids.	Combustible. Flash point > 200°F.
Hydrogen Gas	Colorless, odorless gas	Simple asphyxiant, flammable.	None known.	Flammable gas.
Mineral Oil	Oily, clear liquid.	Minor.	Sodium hypochlorite.	May be combustible.
Lubrication Oil	Oily, dark liquid.	Ingestion hazardous.	Sodium hypochlorite.	Flammable.
Diesel Fuel	Oily, light liquid.	May be carcinogenic.	Sodium hypochlorite.	Flammable.
Ammonium Bifluoride	White crystals	May be fatal if swallowed or inhaled. Affects respiratory system, heart, skeleton, circulatory system, CNS, and kidneys.	Strong acids.	Non-flammable.
Sodium Carbonate	White powder or granules	Harmful if swallowed or inhaled. Irritation to skin and respiratory tract.	Acids.	Non-flammable.
Sodium Nitrate	White crystals	Toxic and corrosive. Irritation to eyes, skin, and lungs. Harmful if digested.	Strong acids.	Non-flammable.

Electric Transmission Line and Eastshore Substation Expansion—No hazardous or acutely hazardous materials will be stored at the electric transmission line or substation facilities during operations.

Natural Gas Pipeline—With the exception of the natural gas contained within the pipeline, no hazardous or acutely hazardous materials will be stored at the pipeline facilities during operations.

Wastewater Return Pipelines— There are no separate facilities associated with the wastewater return pipelines; therefore, no hazardous or acutely hazardous materials will be stored at this location during operations.

AWT plant

The following hazardous and acutely hazardous materials will be used and/or stored at the AWT plant site during the operation phase:

- Sodium Hypochlorite—for biofoul control in the MF/RO process and for disinfection in chlorine contact basin (7,000 gallons, 12.5% by weight solution)
- Sulfuric Acid—for RO feedwater pH control, cleaning sludge press, and pH adjustment (7,000 gallons, 93 percent solution)
- Hypersperse MDC220—phosphonic acid threshold inhibitor compound used to as a scale inhibitor in the RO feedwater (500 Gallons)
- Sodium Hydroxide—used for routine cleanings of the micro filtration membranes (500 gallons, 50percent solution)
- Memclean C—proprietary detergent used for routine cleanings of the MF membranes (500 Gallons)
- Citric Acid—used occasionally for routine cleanings of the MF membranes (250 gallons, 34percent solution)
- Lime—used for pH adjustment of RO concentrate and MF backwash streams, if necessary (6000 cubic feet)
- Ferric Chloride—used as clarifying agent for RO concentrate and MF backwash streams (10,000 gallons)
- Sodium Sulfide—used to aid in copper precipitation from RO concentrate and MF backwash streams, if necessary (2,000 pounds)
- KleenMCT103—nitrilotriacetic acid and phosphoric acid RO membrane cleaning solution (220gallons)
- KleenMCT411—sodium tripolyphosphate and sodium hydroxide RO membrane cleaner (2,000 pounds)

Information about these materials is presented in Table 8.5-6 including trade and chemical names, Chemical Abstract Service (CAS) numbers, maximum quantities on-site, hazardous characteristics, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Superfund Amendments and Reauthorization Act (SARA) Title III reportable quantities (RQ), La Follette Bill threshold planning quantities (TPQ) and Proposition 65 listing status. Proposition 65 chemicals are those known to be carcinogenic or cause reproductive problems in humans.

In addition to the chemicals noted in Table 8.5-6, small quantities (less than 5 gallons) of paints, oils, solvent, pesticides and cleaners, typical of those purchased at a retail hardware store, may also be used at the AWT plant.

The hazardous materials to be stored include such incompatible chemicals as sodium hydroxide, sodium hypochlorite and sulfuric acid. Mixing of these chemicals could generate toxic gases. Measures to keep incompatible chemicals separated include separate storage and containment areas and/or berming.

The toxic effects and other characteristics of each hazardous material are summarized in Table 8.5-7.

Table 8.5-6. AWT plant chemical inventory.

Trade Name	Chemical Name	CAS[a] Number	Maximum Quantity Onsite	Hazardous Characteristics	RQ[b]	TPQ[c]	Prop 65
Sulfuric Acid	Sulfuric Acid	7664-93-0	7,000 gal	Corrosive	1,000 lbs.	1,000 lb.	No
Bleach	Sodium Hypochlorite	7681-52-9	7,000 gal	Corrosive	100 lbs.		No
Sodium Hydroxide	Sodium Hydroxide	1310-73-2	500 gal	Corrosive	1,000 lbs.		No
Hypersperse MDC220	Phosphonic acid	2809-21-4	500 gal	Corrosive	[d]		No
Memclean C	Hydroxy-propionic-tricarboxylic Acid	77-92-9	500 gal	Corrosive	[d]		No
Citric Acid	Hydroxy-propionic-tricarboxylic Acid	77-92-9	250 gal	Corrosive	[d]		No
Lime	Calcium Hydroxide	1305-62-0	6,000 cu ft	Corrosive	[d]		No
Ferric Chloride	Ferric Chloride	7705-08-0	10,000 gal	Corrosive	1,000 lbs.		No
Sodium Sulfide	Sodium Sulfide	1313-82-2	2,000 lbs	Corrosive	[d]		No
KleenMCT103	Nitrilotriacetic Acid	5064-31-3	220 gal	Toxic	[d]		Yes
	Phosphoric Acid	7664-38-2			1,000 lbs.		No
KleenMCT411	Sodium Tripoly-phosphate	7758-29-4	2,000 lbs	Corrosive	5,000 lbs.		No
	Sodium Hydroxide	1310-73-2			1,000 lbs.		No

[a] Chemical Abstract Service.
[b] Reportable Quantity per CERCLA. 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.
[c] Threshold Planning Quantity. If quantities of acutely hazardous materials equal to or greater than TPQ are handled or stored, they must be registered with the local Administering Agency. For hazardous materials, the TPQ is 10,000 lb.
[d] No reporting requirement.

Table 8.5-7. Characteristics of AWT plant hazardous materials.

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability
Sulfuric Acid	Colorless, dense, oily liquid.	Strongly corrosive. 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.	Not combustible.
Sodium Hypochlorite	Pale green; sweet, disagreeable odor. Usually in solution with H_2O or sodium hydroxide.	Corrosive. Toxic by ingestion. Strong irritant to tissue.	Ammonia and organic materials.	Fire risk when in contact with organic materials.
Sodium Hydroxide	Clear yellow liquid.	Corrosive. Corrosive to tissue in presence of moisture. Strong irritant to tissue by ingestion.	Water, acids, organic halogens, some metals.	Noncombustible.
Hypersperse MDC220 (Scale Inhibitor)	Light yellow to amber liquid.	Corrosive. Mild irritant.	Strong oxiders.	Combustible.
Memclean C (detergent)	Brown liquid, mild detergent odor.	Mild irritant.	None.	Non-flammable.
Citric Acid	Translucent crystals.	None.	None.	Non-flammable.
Lime	White crystals or powder.	Corrosive. Sever irritant to respiratory tract. Causes burns to tissue.	Acids	Non-combustible.
Ferric Chloride	Yellow brown deliquescent crystals.	Corrosive. Harmful if swallowed or inhaled. Causes burns on contact.	Metals, water.	Non-combustible.
Sodium Sulfide	White crystals.	Corrosive. May be fatal if swallowed or inhaled.	Acids, oxiders, aluminum.	Combustible.
Kleen MCT103	Clear yellow liquid.	Severe irritant.	Strong oxiders.	Combustible.
Kleen MCT411	White powder.	Severe irritant.	Strong oxiders.	Combustible.

8.5.2 Environmental Consequences

8.5.2.1 Offsite Consequences Analysis

An Off-Site Consequence Analysis (OCA) was performed, per CEC requirements, to assess the risk from a potential spill or rupture of the aqueous ammonia storage tank at the RCEC. The ammonia, which is used in the selective catalytic reduction (SCR) system to control nitrogen oxides (NO_X) emissions, will be delivered and stored on-site in the form of an aqueous solution (28 percent NH_3). If a release of aqueous ammonia were to occur, the quantity of ammonia gas released would be significantly less than that released by an anhydrous ammonia system failure; therefore, the potential off-site impact is greatly reduced by selecting this option.

The RCEC site will have one 15,000-gallon aqueous ammonia storage tank. As discussed in Section 8.5.4.2, the tank will be enclosed within a secondary containment structure. The analysis presented below is based on a scenario in which the inner tank fails and aqueous ammonia is released within the secondary containment structure. Ammonia vapor then escapes to the atmosphere through a one-foot diameter vent at the top of the secondary containment structure. This analysis includes modeling of

ammonia vapor release and dispersion to assess the impact to off-site receptors at various distances from the site.

Methods

The mass release rate of ammonia vapor was calculated assuming failure of a full, 15,000-gallon tank of aqueous ammonia. Specific parameters used in the calculation are listed in Table 8.5-8. The aqueous solution flows into the surrounding containment enclosure until liquid levels within the tank and enclosure are equal. This release is assumed to occur over a ten-minute period, in accordance with the RMP Offsite Consequence Analysis Guidance (EPA 1996). Clean air is displaced and pushed out the vent in the enclosure ceiling as aqueous solution fills the bottom of the enclosure.

Table 8.5-8. Ammonia mass release rate calculation parameters.

Parameter	Value
Temp. within secondary containment enclosure	80 °F
NH_3 Partial pressure above 28% solution (80 °F)	11.6 psia
Diffusivity of ammonia in air	2.4 E-4 ft^2/sec
Ammonia vapor concentration at liquid surface	580 grams/m^3

To calculate the quantity of ammonia vapor released from the spill, it was assumed that the temperature of the stored ammonia and the air within the concrete secondary containment enclosure are 80 degrees Fahrenheit (°F), and remain constant throughout the event. The ammonia concentration in air directly above the liquid surface is calculated based on the vapor pressure of ammonia at 80°F above a 28% aqueous solution. Ammonia vapor diffuses through the air above the spill and is released through the 1-foot diameter vent. The rate of diffusion is controlled by the concentration gradient in the enclosure. A mass emission rate through the vent of 0.50 grams ammonia per second was calculated based on the rate of diffusion and the area of the opening.

As the ammonia diffuses through the headspace in the secondary containment enclosure, vapor is released through the one-foot diameter opening in the top of the enclosure. Worst-case downwind ammonia concentrations were determined using the EPA dispersion model TSCREEN. Model input parameters are listed in Table 8.5-9. The model assumes a wind speed of 1.0 meter per second and worst-case stability class to calculate downwind ammonia concentrations.

Table 8.5-9. TSCREEN dispersion modeling input parameters.

Parameter	Value
NH_3 emission rate	0.50 grams/sec.
Release height	12 feet
Vent diameter	1 foot
Exit velocity	.001 meters/sec.
Exhaust and ambient temperature	80 °F
Receptor height	1.5 meters
Terrain	Urban

Results

Based on the results of this analysis, ammonia concentrations generated from this type of release would be well below safe levels prior to reaching the property line. The distance from the ammonia storage area to the closest property boundary is 43 meters. The modeled ammonia concentration 43 meters from the release is 10.1 ppm. The EPA's toxic endpoint and Emergency Response Planning Guide Level 2 (ERPG-2) concentration for ammonia is 200 parts-per-million (ppm). This is the maximum airborne concentration below which nearly all individuals could be exposed for up to one hour without experiencing life-threatening health effects. The CEC significance threshold is 75 ppm for ammonia. Therefore, potential offsite consequences from a failure in the ammonia storage tank would not be significant.

8.5.2.2 Fire and Explosion Risk

As shown in tables 8.5-5 and 8.5-7, many of the hazardous materials to be stored and used at the RCEC and the AWT plant are non-combustible. Aqueous ammonia, which constitutes the largest quantity of hazardous materials on-site (except for the mineral oil in the transformers and lubrication oil for the gas turbine and steam turbine bearings), can release ammonia vapor that is combustible within a very narrow range of concentration and is therefore not easy to burn. Both hydroxyacetic acid and formic acid are combustible, but will be used at the site only during commissioning, and will be handled by the HRSG chemical cleaning contractor. The lubrication oil and diesel fuel are both flammable and will be handled in accordance with a Hazardous Materials Business Plan to be approved by the City of Hayward Fire Department. With proper storage and handling of flammable materials in accordance with the plan, the risk of fire and explosion at the generating facility should be minimal.

The topics to be covered in the plan are:

- Facility Identification
- Emergency Contacts
- Inventory Information (for every hazardous material)
- Material Safety Data Sheets (MSDS) for every hazardous material
- Site Map
- Emergency Notification Data
- Procedures to Control Actual or Threatened Releases
- Emergency Response Procedures
- Training Procedures
- Certification

The natural gas fuel for the RCEC combustion turbines and duct burners is flammable, and could leak from the in-plant supply piping or from PG&E's pipeline. The risk of leakage will be minimized by proper design, construction, and maintenance of the in plant piping and supply pipeline in accordance with applicable LORS.

8.5.3 Cumulative Impacts

The primary potential cumulative impact from the use and storage of hazardous materials would be from a simultaneous release from two or more sites of a chemical or chemicals that would migrate offsite.

Potentially, the two or more migrating releases could combine and thereby pose a greater threat to the offsite population than would a single release by any one site.

Hazardous materials that do not migrate, such as sulfuric acid, would not present a potential cumulative impact. The only hazardous material that has the potential to migrate offsite from the RCEC is ammonia vapor released from spilled aqueous ammonia. Based on the results of the OCA, offsite ammonia vapor concentrations would only occur at very low levels (10.1 ppm or less). In the unlikely event that an aqueous ammonia spill occurred at the RCEC simultaneously to a chemical spill at another nearby industrial facility, offsite ammonia levels from the RCEC would not be sufficient to cause cumulative impacts.

Hazardous materials that will be stored at the AWT plant do not have the potential to migrate offsite; therefore, there are no potential hazardous materials cumulative impacts from the AWT plant.

8.5.4 Proposed Mitigation Measures

The following subsections describe measures that Calpine/Bechtel plan to take during both the construction and operating phases of the project to mitigate the risk in handling hazardous materials, particularly the risk of inadvertent spills or leaks that might pose a hazard to human health or the environment.

8.5.4.1 Construction Phase

During construction, hazardous materials stored on-site will be limited to small quantities of paint and thinner, solvents, cleaners, sealants, lubricants, and 5-gallon emergency fuel containers. Paint, thinner, solvents, cleaners, sealants, and lubricants will be stored in a locked utility building, handled per the manufacturer's directions, and replenished as needed. Non-hazardous paint will be used if possible. 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 when regular vehicle fueling is unavailable.

Fuel, oil, and hydraulic fluids will be transferred directly from a service truck to construction equipment tanks and will not otherwise be stored on-site. Fueling will be performed by designated, trained service personnel either prior to the start of the work day or at completion of the work day. Service personnel and construction contractors will follow standard operating procedures (SOPs) for filling and servicing construction equipment and vehicles. The SOPs are designed to reduce the potential for incidents involving the hazardous materials and include:

- Refueling and maintenance of vehicles and equipment will occur only in designated areas that are either bermed or covered with concrete or asphalt to control potential spills.
- Vehicle and equipment service and maintenance will be conducted only by authorized personnel.
- Refueling will only be conducted 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 liquids in the hose.
- Vehicle engines will be shut down during refueling.
- No smoking, open flames, or welding will be allowed in refueling or service areas.
- 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 adsorbents.
- In the event a spill contaminates soil, the soil will be containerized and disposed of as a hazardous waste.
- All containers used to store hazardous materials will be inspected at a minimum of once per week for signs of leaking or failure. All maintenance and refueling areas will be inspected monthly. Results of inspections will be recorded in a log book which will be maintained on-site.

Small spills will be contained and cleaned up immediately by trained, on-site personnel. Larger spills will be reported via emergency phone numbers to obtain help from off-site containment and clean up crews. All personnel working on the project during the construction phase will be trained in handling hazardous materials and the danger associated with hazardous materials.

An on-site health and safety person will be designated to implement health and safety guidelines and contact emergency response personnel and the local hospital, if necessary. Material Safety Data Sheets (MSDSs) for each on-site chemical will be maintained. Employees will be made aware of the chemicals and the location of MSDS sheets.

8.5.4.2 Operation Phase

Hazardous materials will be stored and handled at the RCEC and AWT plant in accordance with all local, state and federal regulations and codes. A safety program will be implemented including safety training programs for contractors and operations personnel, respectively. A Hazardous Materials Business Plan will be prepared for approval by the CEC CPM and the City of Hayward Fire Department, which is the local CUPA.

A fire protection system will be included to detect, alarm, and suppress a fire, in accordance with the applicable laws, ordinances, regulations, and standards.

During the operation phase of the RCEC, acutely hazardous materials will be stored on-site. A Risk Management Plan (RMP) for handling the acutely hazardous materials at the facility will be prepared before start of operations. The RMP process will identify and propose adequate mitigation measures to reduce the risk to the lowest possible level.

Tables 8.5-5 and 8.5-7 describe the toxicity of acutely hazardous and hazardous materials that will be stored at the RCEC and AWT plant, respectively. The two acutely hazardous materials that will be used at the RCEC are aqueous ammonia and cyclohexylamine. The following sections describe the mitigation measures to be implemented for these acutely hazardous materials.

Aqueous Ammonia

The aqueous ammonia storage and handling facilities will be equipped with continuous tank level monitors, temperature and pressure monitors and alarms, and excess flow and emergency block valves. Pressure-relief valves and excess flow control valves on the tank fill connections will also be provided. Secondary containment will be provided by a vented enclosure around the tank. Therefore any potential inadvertent release from the storage tank would be contained within the secondary containment structure. Additionally, the ammonia area will be bermed and sloped to an underground sump to contain any potential releases during aqueous ammonia unloading up to the contents of a full delivery tanker truck. Ammonia vapor detectors will be installed around the aqueous ammonia storage tanks and truck

unloading area to generate alarm signals in the plant control room that will alert the operators to potential leaks.

Approximately every 2-3 days, an 8,000-gallon tanker truck will deliver aqueous ammonia to the RCEC. The 15,000-gallon tank which will have a maximum working capacity of 12,000 gallons, will not be drawn below 4,000 to 5,000 gallons remaining volume before it is refilled by the tanker truck.

Cyclohexylamine

Cyclohexylamine in the form of NALCO 356 will be fed into the condensate piping to control corrosion. The feed equipment will consist of a storage tank, pumps, leak detection system, alarm system, and a fire detection and protection system. The chemical will be stored in 500- to 700-gallon tanks that will be located near each of the HRSGs. The tanks will be located above concrete, epoxy-lined containment areas with sufficient capacity to contain the full quantity of a tank in the event of a spill or tank rupture. If exposed to rainfall, the containment areas will be sized additionally to contain the accumulated rainfall for 24 hours from a 25-year storm.

Other Hazardous Materials

Of the hazardous materials that are continuously on-site, two merit individual mention because of the quantity of material stored. Sodium hypochlorite (NaOCl) is used as a biocide for both the RCEC condenser cooling water (circulating water) system and at the AWT plant. The system at each facility will consist of a storage tank, two full capacity chemical feed pumps, a leak detection system, an alarm system, and a fire detection and protection system.

Sodium hydroxide (NaOH) will be used in the RCEC to control circulating water pH. The system consists of a 5,000-gallon storage tank, chemical feed pumps and a leak detection and alarm system. The 5,000-gallon tank will be contained within a concrete containment and collection bay that will have the capacity to contain the sodium hydroxide in the event of a spill. Sodium hydroxide may also be used to control the pH of the boiler feedwater. A maximum of 7 pounds per day of sodium hydroxide will be fed into the feedwater at the HRSGs from 300 to 400 gallon totes or portable tanks. Sodium hydroxide will also be used at the AWT plant for routine cleanings of the MF membranes.

All hazardous materials will be handled and stored in accordance with applicable codes and regulations. 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.

A worker safety plan, in compliance with applicable regulations, will be implemented and will include training for both 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, fire safety, and emergency communication and response procedures. All plant personnel will be trained in emergency procedures including plant evacuation and fire prevention. In addition, designated personnel will be trained as a plant hazardous material response team and receive first responder and hazardous material technical training as the Hazardous Materials Business Plan will describe (Section 8.5.6.4). However, in the event of an emergency, plant personnel will defer to the Alameda County Hazardous Materials Emergency Response Team.

8.5.4.3 Transportation/Delivery of Hazardous Materials

Hazardous and acutely hazardous materials will be delivered periodically to the RCEC and AWT plant. Transportation will comply with all DOT, U.S. Environmental Protection Agency (USEPA), California Department of Toxic Substances Control (DTSC), California Highway Patrol (CHP), and the California State Fire Marshal regulations for the transportation of hazardous materials. Under the California Vehicle Code, the CHP has authority to adopt regulations for the transportation of hazardous materials in California. The CHP can issue permits and specify the route for hazardous material delivery. The only acutely hazardous material posing an inhalation hazard that will be delivered to the RCEC is aqueous ammonia. The Vehicle Code has special regulations for the transportation of hazardous materials that pose an inhalation hazard (Vehicle Code Section 32100.5). The RCEC will comply with these regulations.

8.5.4.4 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 the applicant will develop.

Hazardous Materials Business Plan

An HMBP is required by the California Code of Regulations (Title 19) and the Health and Safety Code (Section 25504). The RCEC and AWT plant will have separate HMBPs. These plans will include an inventory and location map of hazardous materials on-site and an emergency response plan for hazardous materials incidents. The topics to be covered in the plans are:

- Facility Identification
- Emergency Contacts
- Inventory Information (for every hazardous material)
- Material Safety Data Sheets (MSDS) for every hazardous material
- Site Map
- Emergency Notification Data
- Procedures to Control Actual or Threatened Releases
- Emergency Response Procedures
- Training Procedures
- Certification

Risk Management Plan

Since acutely hazardous materials will be stored and used at the RCEC, a Risk Management Plan (RMP) will be required pursuant to the Clean Air Act (CAA) and its regulations (40 CFR 68 Subpart G) and under California's Accidental Release Prevention Program (CalARP) pursuant to the Health and Safety Code Sections 25331 through 25543.3. The California program is similar to the federal program but may be more stringent in some areas. There are three programs under 40 CFR, and the RMP requirements increase in stringency from Program 1 to Program 3. Program 1 applies to facilities where, under a worst-case release assessment, the distance to any public receptor cannot fall within the toxic endpoint release concentration for ammonia of 0.14 milligrams per liter, or 200 ppm. Whether the RCEC will qualify for Program 1 will not be known until the modeling is completed as described in Section 8.5.3. Program 3 applies where a chemical is stored at or above its threshold quantity (TQ). The TQ for

ammonia concentrations of 20 percent or greater is 20,000 pounds of solution. Program 2 is for facilities that do not fit into Programs 1 or 3.

The RMP will be filed with and administered by the area's Certified Unified Program Agency (CUPA) which is the City of Hayward Fire Department. The RMP is in addition to the HMBP and covers acutely hazardous materials that can produce toxic clouds when inadvertently released. Included in the RMP is 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 in order to protect human health and the environment. The basic elements of a RMP are:

Description of the Facility

- Accident History of the Facility
- History of Equipment Used at the Facility
- Design and Operation of the Facility
- Site Map(s) of the Facility
- Piping and Instrument Diagrams of the Facility
- Seismic Analysis
- Hazard and Operability Study
- Prevention Program
- Consequence Analysis
- Off-site Consequence Analysis
- Emergency Response
- Auditing and Inspection
- Record Keeping
- Training
- Certification

Spill Prevention Control and Countermeasure Plan

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

- Name, location, and telephone number of the facility
- Spill record of the facility and lessons learned
- Analysis of the facility, including:
  - A description of the facilities and engineering calculations
  - A 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

The RCEC will have up to 19,500 gallons of turbine lubrication oil on-site and will, therefore, have to prepare a SPCC plan.

8.5.4.5 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 minimal. However, sufficient monitoring will be performed during both phases to ensure that the proposed mitigation measures are complied with and that they are effective in mitigating any potential environmental effects.

Visual monitoring during construction and operation will be performed to determine compliance with and the effectiveness of the proposed mitigation measures. Written records of all monitoring events will be kept, including observations, actions taken, persons involved, and any recommendations.

Applicable Laws, Ordinances, Regulations, and Standards

The storage and use of hazardous materials and acutely hazardous materials at the RCEC and AWT plant is governed by federal, sate, and local laws. Applicable laws and regulations address the use and storage of hazardous materials to protect the environment from contamination, and protection of facility workers and the surrounding community from exposure to hazardous and acutely hazardous materials. The applicable laws, ordinances, regulations, and standards (LORS) are summarized in Table 8.5-10.

8.5.5.1 Federal

Hazardous materials are governed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the CAA, and the Clean Water Act (CWA).

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

An amendment to CERCLA, the Superfund Amendments and Reauthorization Act of 1986 (SARA) governs hazardous materials. The applicable part of SARA for the NEC 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 primarily provides 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 Extremely Hazardous Substances (EHS) are present in excess of their TPQs. EHSs and their TPQs are found in Appendices A and B to 40 CFR Part 355.
- Section 304—When there is a release of a hazardous material in excess of its RQ, Section 304 requires immediate notification to the local emergency planning committee (LEPC) and the state emergency response committee (SERC). If the release is of a RQ of a CERCLA-listed hazardous substance, notification must also be provided 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 notification provided 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 the local fire department.
- Section 313—Requires annual reporting of hazardous materials released into the environment either routinely or as a result of an accident.

Clean Air Act (CAA)

Regulations (40 CFR 68) under the CAA are designed to prevent accidental releases of hazardous materials. These regulations require facilities that store a TQ or greater of listed hazardous materials to develop a RMP, including hazard assessments and response programs to prevent accidental releases of certain chemicals. Section 112(r)(5) of the CAA discusses the chemicals regulated. These chemicals are listed in 40 CFR 68.130 of the regulations. Aqueous ammonia is a listed substance and its TQ for solutions of 20 percent or greater is 20,000 pounds.

Clean Water Act (CWA)

The 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 (40 CFR 112) under the CWA requires facilities to prepare a written SPCC if they have a single aboveground oil storage tank with a capacity greater than 660 gallons, total aboveground tank storage greater than 1,320 gallons, or underground storage capacity greater than 42,000 gallons, and that poses a threat to navigable waters.

Other related federal laws that address hazardous materials, but are either not relevant to the RCEC or do not specifically address the handling of hazardous materials, are the Resource Conservation and Recovery Act (RCRA), which is discussed in Section 8.13, and the Occupational and Safety Health Act (OSHA) which is discussed in Section 8.7.

8.5.5.2 State of California

California laws and regulations relevant to hazardous materials handling at the RCEC include the Waters Bill (hazardous materials), the La Follette Bill (acutely hazardous materials), and the Aboveground Petroleum Storage Act (petroleum in aboveground tanks).

Waters Bill

This law is found in the California Health and Safety Code, Section 25500 et seq. and the regulations to the law in 19 California Code of Regulations (CCR) Section 2620 et seq. The law requires local governments to regulate local businesses' storage of hazardous materials if in excess of certain threshold 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 a HMBP to their local administering agency (AA) and to report releases to their AA 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.

Table 8.5-10. LORS Applicable to hazardous materials management.

LORS	Applicability	Conformance (Section No.)
Federal:		
CERCLA/SARA		
Section 302	Requires certain planning activities when EHS are present in excess of TPQs. The RCEC will have ammonia in excess of its TPQ.	A Risk Management Plan (RMP) will be prepared which will describe planning activities. (Section 8.5.6.4).
Section 304	Requires notification when there is a release of hazardous material in excess of its RQ.	A HMBP will be prepared which will describe notification and reporting procedures. (Section 8.5.6.4).
Section 311	Requires MSDS for every hazardous material to be kept on-site and submitted to SERC, LEPC, and the local fire department.	The HMBP that will be prepared will include MSDSs and procedures for submission to agencies. (Section 8.5.6.4).
Section 313	Requires annual reporting of releases of hazardous materials.	The HMBP that will be prepared will describe reporting procedures. (Section 8.5.6.4).
CAA	Requires a RMP if listed hazardous materials at or above a TQ are stored.	A RMP will be prepared. (Section 8.5.6.4).
CWA	Requires preparation of SPCC plan if oil is stored above certain quantities.	A SPCC will be prepared. (Section 8.5.6.4).
California:		
Waters Bill	Requires preparation of a HMBP if hazardous materials are handled or stored in excess of threshold quantities.	A HMBP will be prepared. (Section 8.5.6.4).
La Follette Bill	Requires registration with local CUPA or lead agency and preparation of a RMP if acutely hazardous materials handled or stored in excess of TPQs.	A RMP will be prepared which will describe procedures for registration with local authorities. (Section 8.5.6.4).
Aboveground Petroleum Storage Act	Requires entities that store petroleum in ASTs in excess of certain quantities to prepare a SPCC.	A SPCC will be prepared. (Section 8.5.6.4).
Safe Drinking Water and Toxics Enforcement Act (Proposition 65)	Requires warning to persons exposed to 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.

La Follette Bill

Found in the California Health and Safety Code, Section 25531 et seq., this law regulates the registration and handling of acutely hazardous materials. Acutely hazardous materials are any chemicals designated as an extremely hazardous substance by the USEPA as part of its implementation of SARA Title III.

Health and Safety Code Section 25531 expands the programs mandated by the Waters Bill and overlaps or may duplicate some of the requirements of SARA and the CAA. Facilities handling or storage of acutely hazardous materials at or above TPQs requires registration with local AA and preparation of a RMP, formerly known as a Risk Management and Prevention Program (RMPP). The TPQ for ammonia is 500 pounds.

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 aboveground storage tank with capacity greater than 660 gallons or combined AST capacity greater than 1,320 gallons and 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 a SPCC. The law does not cover AST design, engineering, construction and other technical requirements, which are usually determined by local fire departments.

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 the state Office of Environmental Health Hazard Assessment. Some of the chemicals planned to be used at the RCEC are on the cancer causing and reproductive toxicity lists of the Act.

8.5.5.3 Local

Local AAs usually have the responsibility for administering hazardous materials requirements and insuring compliance with federal and state laws. The City of Hayward Fire Department is the AA for the RCEC and the AWT plant.

8.5.5.4 Codes

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

- California Vehicle Code, 13 CCR Section 1160 et seq.—provides the California Highway Patrol with authority to adopt regulations for the transportation of hazardous materials in California.
- The Uniform Fire Code, Article 80—Article 80 is the hazardous materials section of the Fire Code. Local fire agencies or departments enforce this code and can require that a Hazardous Materials Management Plan and a Hazardous Materials Inventory Statement be prepared. This requirement and the Waters Bill requirement for a Hazardous Materials Business Plan can usually be satisfied in a single combined document.
- State Building Standard Code, Health and Safety Code Sections 18901 to 18949—This code incorporates the Uniform Building Code, Uniform Fire Code, and Uniform Plumbing Code.
- The American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section VIII.
- The American National Standards Institute (ANSI) K61.1

8.5.6 Involved Agencies and Agency Contacts

There are a number of agencies that regulate hazardous waste that would be involved in regulation of the waste generated by the RCEC project and the AWT plant. At the federal level is the USEPA, and at the state level is the California Environmental Protection Agency (CalEPA). The administration and enforcement of the hazardous materials laws, however, is primarily through a local agency. For the RCEC and the AWT plant, the local agency is the City of Hayward Fire Department. The person to contact is shown in Table 8.5-11.

Table 8.5-11. Agency contacts.

Type Material	Agency	Contact	Title	Telephone
All hazardous materials	City of Hayward Fire Department, Hazardous Materials Office	Hugh Murphy	Hazardous Materials Program Coordinator	(510) 583-4924
All hazardous materials RMP, HMBP	City of Hayward Fire Department, Hazardous Materials Office	Danny Galang	Environmental Specialist	(510) 583-4925
Hazardous Materials Emergency Response Team	Alameda County Hazardous Materials Emergency Response Team	Deputy Chief Mark Blanchard	Hazmat Response Team Supervisor	(510) 618-3490

8.5.7 Permits Required and Schedule

Applicable hazardous material permits and plans required for the project are listed below and in Table 8.5-12. Information required to obtain each permit is also included.

Welding and Cutting Operations Permit—to conduct welding and cutting operations in any occupancy or temporary job site involving construction permitted and regulated by the City. These permits will be obtained prior to initiation of welding or cutting operations. These permits are not submitted to an agency; however, they must be prepared an approved on-site prior to initiation of welding or cutting operations.

Consolidated Permit—will cover hazardous materials storage. A Hazardous Materials Business Plan must be submitted as part of the application for the permit. The permit will be obtained prior to storage of hazardous materials at the site.

Administrative Use Permit—The City of Hayward Zoning Ordinance specifies permitting requirements for the use of hazardous materials in areas zoned Industrial (I). Group B materials require an Administrative Use Permit for quantities used or stored above the threshold quantities of 5,000 pound (solid), 550 gallons (liquid), or 2,000 cubic feet (gas). Group B materials that will be stored in quantities above the threshold quantity at the RCEC and/or the AWT plant include non-fuming sulfuric acid, aqueous ammonia, cyclohexylamine, sodium hypochlorite, sodium hydroxide, and hydrogen gas.

In addition, several plans must be prepared, including a HMBP, a RMP, and a SPCC. It is possible that these plans could be combined into a single plan that would meet all requirements. The plan or plans will be developed after filing of the AFC and prior to start-up.

Table 8.5-12. Permits required and permit schedule.

Permit/Approval Required	Schedule
Welding and Cutting Operations Permit • Description of work to be performed • Name of company and person(s) performing the job • Availability of fire extinguishers or other fire suppression equipment • Checklist to ensure conditions are safe for the planned activity	Prior to initiation of construction welding or cutting operations
Consolidated Permit/HMBP • Business Owner/Operator Identification Unified Program Consolidated Form (UPCF). This form identifies owner and operator contact information. • Business Activities UPCF—Provides a summary of hazardous material usage and hazardous waste generation. • Hazardous Materials Inventory—Chemical Description UPCF. Provides detailed information for each hazardous material and hazardous waste on-site above threshold quantities. • Material Safety Data Sheets • Hazardous materials storage location map • Emergency contact information • Emergency response procedures • Training procedures	Prior to storage of hazardous materials at the site
Administrative Use Permit • Maximum hazardous material quantities (Group B Materials) • Hazardous material storage locations • Material Safety Data Sheets	Prior to storage of hazardous materials at the site
RMP • RMP Certification • Off-Site Consequences Analysis • Prevention Program information • Emergency Response Program information • Hazard assessment	Prior to start-up
SPCC • Facility location and site description • Petroleum storage quantities and areas • Spill scenarios • Spill containment measures • Spill response/contingency plan notification procedures • Emergency response actions • Training plan	Prior to start-up

References

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Russell City Energy Center AFC

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