

3.16 Health and Safety

This section describes the environmental health and safety impacts associated with the built environment at the proposed Cogeneration Project. For each category of risk presented, the risk during construction, risk during operation, maintenance and standby, possible mitigation of risk, cumulative impacts, and significant unavoidable adverse impacts are discussed.

3.16.1 Existing Conditions

The proposed Cogeneration Project encompasses approximately 33-acres of land (not including construction staging and assembly areas) adjacent to the BP Cherry Point Refinery in Whatcom County, Washington. Land surrounding the Refinery is zoned for industrial or rural use and is generally undeveloped.

The proposed site is currently undeveloped and on land that was never graded, or developed, beyond use as farmland. There is no evidence, based on the past use and ownership, that hazardous waste or contaminated media were ever deposited on this land. No environmental site assessment has been performed for the property. No existing health and safety considerations are present relating to the project site location.

The section that follows identifies the municipal, state and federal health and safety regulations applicable to the proposed Cogeneration Project as it will be constructed and operated in the proposed location. Additionally, industrial codes and standards are listed. These regulations, standards and codes are frequently updated, and it is cautioned that this list must be reviewed and updated as necessary.

3.16.1.1 Applicable State Requirements

According to the Washington Department of Labor and Industries (L&I), the applicable statutes and regulations are as follows:

- Chapter 49.17 RCW, Washington Industrial Safety And Health Act;
- Chapter 296-24 WAC, L&I General Safety And Health Standards;
- Chapter 296-27 WAC, L&I Record keeping and Reporting, which provides for record keeping and reporting for employees covered under Chapter 49.17 RCW;
- Chapter 296-36 WAC, L&I Safety Standards - Compressed Air Work, which provides safety standards for compressed air work;
- Chapter 296-45 WAC, L&I Safety Standards For Electrical Workers;
- Chapter 296-46A WAC, L&I Safety Standards - Installing Electrical Wires and Equipment - Administration Rules;
- Chapter 296-62 WAC, L&I General Occupational Health Standards;
- Chapter 296-67 WAC, L&I Safety Standards For Process Safety Management Of Highly Hazardous Chemicals, which establishes requirements for preventing or minimizing consequences of releases of toxic, reactive, flammable or explosive chemicals;

- Chapter 296-155 WAC L&I Safety Standards For Construction Work;
- Chapter 173-60 WAC Maximum Environmental Noise Levels, and
- Chapter 173-303 WAC Dangerous Waste Regulations.

Pipeline safety is enforced by the Washington Utilities and Transportation Commission (WUTC). The following regulations pertain to the construction, maintenance, and operation of pipelines that transport natural gas in the state.

- Chapter 480-93-020 WAC Gas companies – safety – proximity considerations.
- Chapter 480-93-180 WAC Gas companies – safety – operations and maintenance procedures.

3.16.1.2 Applicable Federal Requirements

Federal statutes and regulations implemented by the above state statute(s) and regulations include:

- 29 CFR 1952.175, et seq., which gives full enforcement powers to the state of relevant occupational and health standards;
- 29 CFR 651, et seq., which implements the Occupational Safety and Health Act Of 1970 to protect the health and safety of workers;
- 29 CFR 1910, et seq., which contains the minimum occupational health and safety standards for general industry in the U.S.;
- 29 CFR 1926, et seq., which contains the minimum occupational health and safety standards for the construction industry in the U.S.; and
- 29 CFR 171-177, et seq., which generally implemented the Occupational Safety and Health Act of 1970 to protect the health and safety of workers.

3.16.1.3 Applicable Industry Requirements

The following industry codes and standards shall be used:

- U.S. Environmental Protection Agency (EPA) Standards, including Standard of Performance for New Stationary Sources;
- National Electrical Code (NEC), NFPA 70, 1999;
- National Electrical Safety Code (NESC), ANSI C2, 1997;
- Standards administered through the American National Standards Institute (ANSI);
- Standards and guidelines administered through the Institute of Electrical and Electronics Engineers (IEEE);
- Standards and guidelines administered through the Insulated Cable Engineers Association (ICEA);
- Standards and guidelines administered through the National Electric Manufacturers Association (NEMA);

- Standards and guidelines administered through the National Fire Protection Association (NFPA);
- Codes administered through the American Society of Mechanical Engineers (ASME);
- Uniform Building Code (UBC);
- Uniform Plumbing Code (UPC);
- 40 CFR 112 (Oil Spill Containment Structures);
- American Institute of Steel Construction Standards;
- Standards and guidelines administered through the American Society of Testing and Materials (ASTM);
- Standards administered through the American Welding Society (AWS);
- American National Standard for the Storage and Handling of Anhydrous Ammonia, K61.1.; and
- All applicable Washington State, Whatcom County, and local codes and regulations.

L&I will administer and enforce all worker health and safety regulations. The proposed Cogeneration Project will be designed and operated in conformance with all relevant safety and health regulations.

3.16.1.4 Pertinent Local Ordinances and Permits

The Whatcom County Code (Title 8 Health and Safety) includes general safety requirements relating to a wide variety of topics. Those chapter sections relating to the proposed Cogeneration Project include the following:

- Chapter 8.06 Smoking in the Workplace
- Chapter 8.12 Solid Waste Disposal
- Chapter 8.16 Flammable Liquids

Chapter 8.06 Smoking in the Workplace is intended to provide a smoke-free environment for employees and the public who do not wish to be affected by the minority of employees and public who do smoke. [The Project Health, Safety and Environmental Plan will prohibit smoking in these areas. Because smoking will be prohibited at the proposed Cogeneration Project, this requirement will be met.](#)

Chapter 8.12 Solid Waste Disposal addresses fees, on-site disposal restrictions, and penalties. As no on-site disposal will occur at the proposed Cogeneration Project, this requirement will be met.

Chapter 8.18 Flammable Liquids regulates sales and deliveries of flammable liquids. The ordinance makes it unlawful for any garage, service station or other dispensary of flammable liquids, selling or disposing of the same to the public, to permit the delivery or dispensing of any inflammable liquid into any container, except by the owner or operator of such garage, service station or other dispensary, or by a regularly authorized

employee of such owner or operator. This ordinance will not apply to the proposed Cogeneration Project site.

3.16.2 Environmental Impacts of Project

This section will discuss the potential environmental impacts relating to health and safety at the proposed Cogeneration Project facility during construction, operation, maintenance, [and standby](#) ~~and dismantling~~. The preventative measures for each of the identified potential impacts are also presented.

3.16.2.1 Environmental Impacts During Construction

Health and safety concerns that will potentially be present during construction are generally typical of those concerns present on every industrial/commercial construction site. The concerns include the risk of fire and explosion, chemical storage and handling, spill response and release reporting, collection, storage and disposal of hazardous wastes, the installation of transmission lines, sanitary waste handling, the presence of natural gas, the hazards presented from working with compressed gasses, health and safety measures for radiation, and the requirements for appropriate response to medical emergencies.

The facility will be built by contractors experienced with the construction of gas-fired electrical generation plants. The construction specifications will require that contractors prepare and implement a safety program that addresses the management, prevention, and control of possible fires or explosions. The issues of fire and explosion during construction of the proposed Cogeneration Project are similar to those in most general construction projects, and are described below.

Fire and Explosion Risks During Construction

The risk of a significant fire or explosion during construction of the facility is considered low. During construction, small quantities of flammable liquids and compressed gases will be stored and used. Liquids will include construction equipment fuels, paints, and cleaning solvents. Compressed gases will include acetylene, oxygen, helium, hydrogen, and argon for welding. The potential hazards associated with these materials will be mitigated by following the construction safety requirements found in Washington Administrative Code 296-155 and 29 CFR 1926 (OSHA).

During construction, fire prevention and detection will be the responsibility of the various contractors and individuals working at the site. Heat and smoke detectors will be provided in buildings and temporary warehouse areas as required by federal, state, and local regulations.

Safe working practices will be exercised. These will include, but will not be limited to:

- Maintaining appropriate fire extinguishers within easy access of all work areas;
- Prohibiting smoking ~~in all areas~~ [per the Project Health, Safety and Environmental plan](#); and,
- Outside of designated “free-burn” areas, using a permit system for all hot work (welding, cutting, and grinding).

During construction, personnel properly trained in fire extinguisher deployment will address small fires controllable by handheld extinguishers. If a larger fire is encountered, the Whatcom County Fire Department and the Refinery Fire Emergency Response Operations (FERO) plan, as described in Appendix J, Emergency and Security Plans, will be activated, during which the Whatcom County Fire Department and the Refinery Fire Department will be summoned. During mobilization for the construction project, the Contractor will coordinate with the Refinery Fire Marshal and the Whatcom County Fire Department regarding activities that will be occurring at the construction site.

Chemical Storage and Handling During Construction

During construction, chemicals stored onsite may include paint, coatings, solvents, and adhesive materials. These materials will be stored in a locked utility shed or secured in a fenced area. Storage will conform to OSHA and applicable state guidelines. Construction personnel will be trained in handling chemicals including hazardous materials and will be alerted to the dangers associated with these materials. An onsite ~~safety engineer~~ [Environmental Health and Safety Representative](#) will be designated to implement health and safety guidelines and to contact emergency response personnel and the local hospital, if necessary. Material Safety Data Sheets (MSDS) for each onsite chemical will be kept onsite and construction employees will be made aware of their location and content.

The planned storage tanks and use of petroleum products located onsite during and after construction are as follows:

- Lubrication oil stored onsite will be contained in barrels. The barrels will be stored in a secondary containment area to contain any spillage, or in temporary warehouses.
- Construction refueling will be closely supervised to avoid leaks or releases. Should a spill occur during refueling, it will be properly cleaned up by the General Contractor and reported. If fuel tanks are used during construction, the fuel tank(s) will be located within a secondary containment with an oil proof liner sized to contain the single largest tank volume plus an adequate freeboard allowance for rainwater.
- When filling transformers with oil, the oil will be pumped from a truck within a temporary secondary containment area to contain any spillage.

All paint containers will be tightly sealed and properly stored to prevent leaks or spills. Paint will not enter the stormwater management system. Unused paints will be disposed of in accordance with applicable local and state regulations. Spray painting will not be done on windy days, and drop cloths will be used to collect and dispose of drips and over-spray associated with all painting activities.

Hazardous material use during construction will also include chemicals for the cleaning of the heat recovery steam generator (HRSG) and steam and water piping before being placed in service. Specialized contractors qualified to handle the materials perform this work. The contractor is responsible for providing, using, and properly disposing of the used chemicals. As a contractor has not been selected at this time, the specific chemicals

to be used are not known. The following list is typical of the types of chemicals that are used during the chemical cleaning of the HRSG and piping:

- Aqueous ammonia
- Surfactant
- Corrosion inhibitors
- Citric or other similar acid
- Sodium nitrate
- Ammonium bicarbonate
- Anti-foam agent

Spill Response and Release Reporting During Construction

Construction machinery fluids, including diesel fuel, gasoline, motor oil, hydraulic fluid, brake fluid, and anti-freeze, could potentially spill during construction. The Contractor's responsibility includes implementation of spill control measures and training of all construction personnel and subcontractors in spill avoidance. Training will also include appropriate response when spills occur, containment, cleanup, and reporting procedures consistent, as appropriate, with applicable regulations and the current Refinery practices.

Construction equipment will be monitored for leaks and receive regular preventive maintenance to ensure proper operation and reduce the chance of leaks. Maintenance of onsite vehicles will occur in a designated location. No topping-off of fuel tanks will be allowed, to further reduce the possibility of spills. Petroleum products will be stored in clearly labeled and tightly sealed containers or tanks. If fuel or oil spills do occur, the resultant soil contamination will be removed and disposed of at an approved disposal site in accordance with applicable regulations.

The State of Washington Utilities and Transportation (WUTC), L&I, and the Local Emergency Planning Committee (Whatcom County Fire Department and Whatcom County Sheriff's Department) are the agencies primarily responsible for the administration of the programs for managing a release of dangerous and hazardous chemicals and the notification of the appropriate agencies or parties. The applicable statutes and regulations are as follows:

- Chapter 49.70 RCW Worker And Community Right To Know; and
- Chapter 118-40 WAC Hazardous Chemical Emergency Response Planning And Community Right to Know.
- Chapter 173-340 WAC Model Toxics Control Act

The site representatives will coordinate with Ecology and other appropriate agencies to ensure compliance and notification related to the above statutes and regulations in case of an emergency release. The CERCLA notification and reporting requirements must be made directly to the EPA.

Hazardous Waste Collection, Storage and Disposal During Construction

All construction waste materials will be collected, deposited, and stored in appropriate containers provided by a licensed solid waste management contractor. The contractor will remove the containers and recycle or dispose of the material in accordance with applicable regulations. No construction waste material will be burned or buried onsite. The onsite Project Engineer will instruct all site personnel regarding proper waste disposal procedures.

Hazardous solid waste materials may be generated during the cleanup of a spill particularly if contaminated soils must be removed from the site. Other hazardous wastes potentially generated by construction activities include used oil, spent antifreeze, unused adhesives, discarded water treatment chemicals and residuals, and spent lead acid batteries. Non-hazardous solid waste associated with construction activities may include empty containers, scrap wood, scrap metals, and trash.

The exact hazardous wastes that may be produced during construction of the generation plant are uncertain at this time. However, Table 3.16-1 lists typical wastes that may be generated at a construction project of this type. Estimated quantities and the planned method of disposal are provided.

TABLE 3.16-1

Hazardous or Toxic Materials to Be Used During Construction

Chemical	Purpose	Estimated Quantity	Storage Location
STG and pre-boiler piping cleaners	STG and pre-boiler piping cleaning waste, chelant chemical cleaner or demineralized water treated with oxygen scavenger and amine	400,000 gallons	Brought to site by equipment vendor/contractor
Solvents, used equipment lube oils, paints, adhesives	Used in construction	200 gallons monthly	Not known at this time
Used and waste oils	For CTG and STG lube oil flushes	200 55-gallon drums over construction period	Not known at this time
Spent lead batteries	Various	3 batteries annually	Not known at this time
Spent alkaline batteries	Various	80 batteries monthly	Not known at this time
Waste oil from oily waste holding tank	Collected onsite	25 gallons monthly	Not known at this time
Oil rags, oil absorbent	Generated during normal construction activities, excluding lube oil flushes	55 gallons monthly	Not known at this time

Source: Duke/Fluor Daniel, 2001

A discussion of risks and steps to mitigate those risks is presented in Appendix J, Emergency and Security Plans. A licensed waste contractor will be responsible for treating or disposing of the waste in compliance with all federal, state, and local regulations.

To minimize the potential release of hazardous materials during construction, Best Management Practices will be employed. These will include good housekeeping measures, inspections, containment facilities, and spill prevention practices. Construction personnel will be instructed regarding the management requirements, and the onsite Project Manager will be responsible for their implementation.

Sanitary Waste Management During Construction

Portable sanitation units will be used during construction of the proposed Cogeneration Project. These units will be maintained on a regular basis, and a licensed sanitary waste management contractor will collect waste from the units for disposal in accordance with applicable regulations. The production of five hundred gallons of sanitary waste per day is anticipated during the construction phase.

Risks Presented by Natural Gas During Construction

Natural gas is currently supplied to the Cherry Point Refinery via the Ferndale natural gas pipeline. Natural gas from this pipeline would be the primary source of fuel for the proposed Cogeneration Project. The Ferndale natural gas pipeline system takes natural gas from the Westcoast Pipeline near Sumas, at the Washington State/Canadian border. The gas is then metered and odorized by ARCO Western gas Pipeline near the border. The pipeline then transports and delivers the natural gas to the BP Cherry Point Refinery and to the Alcoa Intalco Works aluminum smelter near Ferndale.

The 16-inch Ferndale natural gas pipeline is located next to the western and northern edges of the proposed Cogeneration Project site. The existing metering station, which is currently the preferred tie-in location, is west of the project site along the Contractor's entrance road. A short connection (150 ft) would need to be constructed from the metering station to the gas compressor and then another short connection (375 ft) would be constructed from the gas compressor to the Cogeneration Project plant site. Additional natural gas may be needed to fuel the proposed Cogeneration Project and would be obtained through a second pipeline operated by a third party.

Generally, the risks of fire or explosion during pipeline construction are minimal; moving of soil and the welding of pipe are the primary tasks required. Lock-out tag-out procedures will be used to verify that sections of the pipeline are isolated for work. The exact location of the existing pipeline will be established and kept marked during construction. A 10-foot minimum clearance (buffer zone) between the existing and new pipe will be maintained to allow for construction without having to pile soil or work over the existing natural gas pipeline. Heavy construction equipment will not run over the existing pipe in the new pipe construction zone. Construction methods and safety procedures will be established to avoid damaging the existing pipe. The contractor installing the new gas pipeline will be familiar with and experienced in performing this type of work. Active use of all the mitigating factors should drastically reduce the risk of fire or explosion.

Construction methods and safety procedures include the following:

- The existing utilities on Blaine Road will be located and staked before construction of the new line begins, and will be physically located every 1,000 feet and at intersections of other pipes and crossings. This will confirm the location and depth to ensure new construction does not impact the existing utilities.
- OSHA regulations for excavations will be followed. The trench for the new pipeline connections will be covered or cordoned off after work hours to prevent anything from falling into the trench. Heavy equipment will not normally be operating over the existing utilities during construction of the new line. If heavy equipment or trucks must cross the existing utilities, they will cross at right angles and the ground will be bridged with mats or additional soil cover to protect the existing pipe.
- As the trench is excavated, the pipeline connections will be constructed in sections at the edge of the trench. After the welds are X-rayed, the pipe will be lowered into the trench using a series of side booms. There are tie-in welds performed in the trench that are X-rayed after the pipe is in the trench. Once the

pipe is completed in the trench and backfilled with soil, it will be pressure-tested with water. Onsite inspectors representing the owner will be present during construction to verify that the Contractor is following all engineering specifications and meeting all regulatory requirements.

- The existing Ferndale natural gas supply line is currently odorized near Sumas before it is transported to the Refinery and Alcoa. A mercaptan (similar to odorant used for propane) is used for leak detection because it has a very strong distinctive odor. This odor would make a gas leak readily apparent.

Compressed Gases During Construction

The compressed gases listed in Table 3.16-2 are typically present during the construction of any industrial project. These gases will be properly stored when not in use, in accordance with all applicable local, state, and federal regulations.

TABLE 3.16-2

Compressed Gases Present during Construction

Gas	Estimated Quantity	Storage	Use
Argon Gas	Not known at this time	Temporary warehouse	Welding & HRSG components
Acetylene	Not known at this time	Temporary warehouse	Cutting torches
Helium	Not known at this time	Temporary warehouse	Welding aluminum ducts
Nitrogen	Not known at this time	Temporary warehouse	Welding
Oxygen	Not known at this time	Temporary warehouse	Cutting torches

Radiation Risks During Construction

In the construction phase of the proposed Cogeneration Project, there will be minor use of radiation in the form of X-rays. X-rays are used for quality control and quality assurance for welds and pipe construction of the natural gas line and high-pressure steam lines. Experienced technicians in a controlled setting, consistent with common industry practice, will perform X-rays.

Medical Emergencies During Construction

All permanent employees will receive training in first aid and cardiopulmonary resuscitation (CPR). Construction staff will address minor injuries and provide initial first aid on more serious situations. Onsite treatment will be provided in medical situations that require first aid treatment only or stabilization of the victim(s) until professional medical attention is obtained. Any injury or illness that requires treatment beyond first aid will be deferred to a local medical facility, as identified in Appendix J, Emergency and Security Plans.

[During construction, the worst-case scenario would be a major leak during chemical](#)

cleaning of the HRSGs and associated piping. This method of cleaning consists of an alkaline degreasing step (in which surfactant, caustic, or ammonia solution is used), a 3 to 4 percent citric acid cleaning step, and a passivation step. Most of the solution would be contained in permanent facility piping and equipment (specifically the HRSGs). The point that would be most likely to leak would be the temporary chemical cleaning piping, pump skids, and transport trailers.

Impacts to the public are very unlikely. All these chemicals are liquid, and the likelihood of a spill reaching or affecting Grandview Road, the nearest public thoroughfare, is low.

3.16.2.2 Risks During Operation, Maintenance and Standby

The risks present at the proposed Cogeneration Project during operation, maintenance and standby are very similar to those present during construction. Three major categories of accidents could occur that would pose a health and safety risk to individuals at the plant or in nearby areas. The first is the rupture of the ammonia storage tank, the second would be a natural gas explosion and fire, and the third would be the release of a hazardous chemical.

The Refinery operates with strict adherence to the Safety and Health Manual, Emergency Preparedness Response Plan, and Fire Emergency Response Operations (FERO) Plan. These directives provide planning information and guidance related to preparation for potential emergency conditions and facilitation of effective response actions to emergency situations. The plans are intended to conform with and incorporate applicable regulatory guidelines of local, state, and federal agencies.

Risk of Ammonia Release During Operation, Maintenance and Standby

Each HRSG will be equipped with a selective catalytic reduction system that would use ammonia injection to minimize the production of nitrous oxides. The anhydrous ammonia storage and transfer system would consist of equipment intended to vaporize the anhydrous ammonia. This equipment would be located next to each SCR system, and there would be a common ammonia storage vessel, ammonia transfer pumps, vaporizer, associated piping and controls. An unloading station for trucks would be located at the common ammonia storage tank. The system would be designed to return displaced ammonia vapor to the unloading vehicle. The ammonia storage tank would be sized to store a multi-day supply of anhydrous ammonia. A spill containment facility would be provided around both the truck unloading station and the ammonia liquid storage tank.

The Refinery currently uses anhydrous ammonia in one of its process units. A Risk Management Plan has been created and implemented according to EPA guidelines for the existing storage of anhydrous ammonia, as well as such pollutants as hydrogen sulfide, sulfur dioxide, nitrogen oxides, and other hazardous air pollutants (HAPs). The current anhydrous ammonia dispersion modeling is a radius of 2.3 miles, based on a maximum inventory of 60,000 pounds. The ammonia storage facility will be equipped with ammonia leakage detectors and an automatically initiated water deluge system to cool the ammonia storage tank. The ammonia storage area will contain sufficient containment to allow for full storage capacity plus deluge.

The entire ammonia system will be designed and built per NACE recommended practices and WISHA standards, EPA standards for risk management plans and American National Standard for the Storage and Handling of Anhydrous Ammonia, K61.1.

The potential for rupture of the common ammonia tank and the associated operational equipment containing ammonia is low. A spill response plan including information relating to community notification will be prepared for the proposed Cogeneration Project.

Risk of Natural Gas or Compressed Gas Release, Fire or Explosion During Operation, Maintenance and Standby

The WUTC is responsible for enforcement of pipeline safety rules pertaining to operation and maintenance of pipelines that transport natural gas in the State of Washington. Operating and emergency plans are required for gas pipelines in accordance with WAC 480-93-180.

The first line of defense against a natural gas leak is comprised of the shut-off valves that can isolate a section of the gas line. Actuating these valves limits the amount of gas that can leak from any breach of the line.

A primary safety concern relating to the operation of gas pipelines in the vicinity of power generating facilities relates to corrosion potential. BP will use special pipeline coatings and cathodic protection to reduce the likelihood of corrosion. Cathodic protection is the use of direct current electricity from an external source to oppose the discharge of corrosion current from anodic areas that would be present naturally in the ground. When a cathodic protection system is installed, the protected structure (the pipeline in this case) collects current from the surrounding electrolyte and the entire exposed surface becomes a single cathodic area.

Risk of Hazardous Chemical Spills During Operation, Maintenance and Standby

Petroleum products used onsite during operation will follow the same storage and handling guidelines as indicated in Section 3.16.2.1. Additional measures planned during operation include:

- The aboveground containers for steam-cycle chemicals including oxygen scavenger, neutralizing amine, and phosphate storage tanks, will be located indoors and will be contained in a curbed area sized sufficiently to contain the single largest storage tank volume.
- The aboveground acid tank will be located within a secondary containment area lined with an acid-proof coating and sized with sufficient freeboard to accommodate rainwater.
- The aboveground caustic tank will be located within a secondary containment area and sized with sufficient freeboard to accommodate rainwater.
- The aboveground step-up transformer mineral oil storage tanks will be located within secondary containment areas that will hold the transformer volume plus an adequate freeboard to accommodate rainwater.

- An oily water sewer (OWS) system will collect selected equipment drains and potentially oily rainfall and washdown runoff from within the curbed areas. Collected drainage and runoff will be pumped to the existing Refinery treatment system.

The chemicals and hazardous substances that will be used and stored at the proposed Cogeneration Project during operation are listed in Table 3.16-3.

~~During construction, the worst case scenario would be a major leak during chemical cleaning of the HRSGs and associated piping. This method of cleaning consists of an alkaline degreasing step (in which surfactant, caustic, or ammonia solution is used), a 3 to 4 percent citric acid cleaning step, and a passivation step. Most of the solution would be contained in permanent facility piping and equipment (specifically the HRSGs). The point that would be most likely to leak would be the temporary chemical cleaning piping, pump skids, and transport trailers.~~

~~Impacts to the public are very unlikely. All these chemicals are liquid, and the likelihood of a spill reaching or affecting Grandview Road, the nearest public thoroughfare, is low.~~

TABLE 3.16-3

Hazardous or Toxic Materials to Be Used During Operations and Maintenance

Chemical	Estimated Quantity	Storage	Purpose
Lubricating oil	25,800 gallons 22,900 gallons	In STG and GTG equipment	STG/GTG equipment
Control oil	400 gallons 230 gallons	In STG equipment	STG equipment
Hydrogen	605,000 scf 60,400 scf	GTG/STG gas bottles	Power generation
Carbon dioxide	32,500 scf 41,000 scf	GTG/STG gas bottles	Power generation, estimate based on purge and fire protection requirements
Transformer oil	49,500 gallons 48,000 gallons 30,000 gallons 6,000 gallons	Combustion turbine transformers Steam turbine transformers Auxiliary transformers	Coolant 15,700 gallons 17,200 gallons 600—9,100 gallons
<u>Transformer oil</u>	<u>17,000 gallons</u>	<u>Steam turbine transformers</u>	<u>Coolant</u>
<u>Transformer oil</u>	<u>10,000 gallons</u>	<u>Auxiliary transformers</u>	<u>Coolant</u>
Anhydrous Ammonia	168,500 gallons annually 60,000 pounds stored; 940,000 used annually	Above grade vertical <u>horizontal</u> cylindrical tank	No _x reduction
SCR Catalyst <u>(Note 1)</u>	4,800 ft ³	In HRSG	No _x reduction
CO Catalyst <u>(Note 1)</u>	990 ft ³	In HRSG	CO reduction
Propylene glycol	22,800 gallons 17,500 gallons	Above-grade tank	Closed-loop cooling water system
BPC 68170 (nitrate) Nitrate/borate) corrosion inhibitor	50 gallons	Drum	Closed loop <u>loop</u> cooling water system
BPB 59396 (diethyl Diethyl hydroxylamine) oxygen scavenger	500 gallons	Tank	Water treatment system <u>Boiler Feedwater Treatment</u>
BPB 59465 (mMorpholine) corrosion inhibitor	500 gallons	Tank	Boiler Feedwater Treatment <u>Water treatment system</u>
Di- and trisodium phosphate pH/scale control agent	200 pounds	Bags/tank	<u>Boiler Feedwater Treatment</u> <u>Water treatment system</u>
Cation resin	950 ft ³	Warehouse/tank	Water treatment system
Anion resin	900 ft ³	Warehouse/tank	Water treatment system
Caustic (50 wt%)	8000 gallons 4,000 gallons	Tank	Water treatment system
Sulfuric acid (93 wt%)	16,000 gallons 4,000 gallons	(2) Tanks <u>Tank</u>	Water treatment system
BPW 76321 (polyquatarnary	350 gallons	Tank	Water treatment system

Chemical	Estimated Quantity	Storage	Purpose
Polyquaternary amine) polymer			
Powdered cellulose and activated carbon	2000lb	Bags or drums	Water treatment system
Sodium Hypochlorite 15% solution	16,000 gallons	(2) Tanks	Cooling tower circulating water treatment
Polyacrylamide polymer	800 gallons	(2) Tanks	Cooling tower circulating water treatment
Zinc and phosphonate solution	800 gallons	(2) Tanks	Cooling tower circulating water treatment
Natural Gas	N/A	Pipeline	Plant fuel system

Source: Duke/Fluor Daniel, 2001.

The chemical cleaning contractor will be responsible for supplying neutralization chemicals and the technical expertise to address any spill or release. To mitigate the risks, the site's primary contractor will provide temporary berms around the chemical cleaning equipment and chemicals.

A number of safeguards will be incorporated to mitigate the risks. These include, but are not limited to, bermed secondary containment, tank overfill protection, routine maintenance, safe handling practices, supervision of all loading/unloading by site personnel and the truck driver, and appropriate training of operation and maintenance staff.

3.16.3 Environmental Impacts of No Action Alternative

The pipeline and Refinery have been present at the project site for decades. If the proposed Cogeneration Project were not constructed, health and safety issues related to the Refinery would still exist. With the no action alternative, there would be no health and safety risks due to construction and operation of the proposed Cogeneration Project.

3.16.4 Potential Mitigation Measures

Health and safety risks will be minimized through an integrated combination of plans, procedures and training, as are currently employed at the Refinery. Health and safety and the use and management of hazardous materials during the construction and operation of electrical power generating plants are highly regulated. BP will ensure that these regulations are closely adhered to and enforced. No mitigation, beyond the strict enforcement of the existing laws and regulations is proposed.

3.16.4.1 Safety Standards Compliance/Protection of Employees

All systems will be designed to provide the safest working environment possible for all site operating personnel. Such provisions shall consist of, but not be limited to, the following:

- Safe egress from all confined areas;
- Adequate ventilation of all enclosed work areas;
- Fire protection;
- Pressure relief of all pressurized equipment to a safe location; and
- Isolation of all hazardous substances to a confined and restricted location.

These provisions will also comply with OSHA (29 CFR 1910 Occupational Safety and Health Standards).

The proposed Cogeneration Project is not expected to use, generate, or release any radioactive materials during operation.

3.16.4.2 Fire Protection

Prevention is the first consideration in any fire protection program. The following elements of fire prevention will be implemented during site operations:

- Protective materials used for equipment and pipelines;
- Ability to gauge the contents of materials contained in storage vessels;
- Spill kits;
- Signs;
- Preventive maintenance program;
- Visual inspections;
- Good housekeeping;
- Procedures for handling flammable liquids;
- Mandatory HAZCOM written procedures and training program;
- Designated flammable storage areas;
- Employee training; and
- Regular safety and environmental audits.

Employees will use general good housekeeping practices to control the accumulation of flammable and combustible waste materials and residues so that they do not contribute to a fire emergency. Proper storage and use of chemicals is also important for fire prevention. MSDSs will be consulted to aid in determining the correct storage for incompatible chemicals.

All state and local fire codes will be adhered to during operation and maintenance. All areas of high risk will have engineered safeguards and automatic fire suppression systems in place. For a more thorough discussion of the prevention, detection, and protection system, see Appendix J, Emergency and Security Plans.

The combustion turbine generator units will be equipped with specialized fire detection and protection systems. The details of this system will be determined at the time that the exact manufacturer and model of generator is determined.

The proposed Cogeneration Project will be operated by qualified personnel following written procedures. Procedures will provide clear instructions for safely conducting activities involved in the initial startup, normal operations, temporary operations, normal shutdowns, emergency shutdowns, and subsequent startups. The procedures for emergency shutdowns will include the conditions under which emergency shutdowns are required and the assignment of shutdown responsibilities to qualified operators to ensure that shutdowns are done in a safe and timely manner. Also covered in the procedures will be the consequences of operational deviations and the steps required to correct or avoid the deviations.

Before they are allowed to operate the facility, employees will be given a facility plan, including a Health and Safety Plan, and will receive training regarding the operating procedures and other requirements for safe operation of the proposed Cogeneration Project. In addition, employees will receive annual refresher training, which will include the testing of their understanding of the procedures. Training and testing records will be maintained.

3.16.4.3 Medical Emergencies

All permanent Cogeneration Project employees will receive first aid and CPR training. Onsite treatment will be provided in medical situations that require only first aid treatment or stabilization of the victim(s) until professional medical attention is attained. Any injury or illness that requires treatment beyond first aid will be deferred to a local medical facility.

3.16.4.4 Spill Prevention and Control

The Emergency Response Plan and a Spill Prevention and Control plan for the Refinery will be modified for applicability to possible spills at the proposed Cogeneration Project. The site representatives will coordinate with Ecology and comply with these regulations if it is found that they are applicable.

3.16.4.5 Risks During Dismantling

The fire and explosion risks in dismantling a power plant are the same as those encountered when dismantling any industrial facility. All gases must be removed in accordance with the operating procedures. All liquids must be drained and disposed of in accordance with regulatory directives. Once the systems have been drained and purged they can be dismantled by conventional means.

3.16.5 Cumulative Impacts

No cumulative impacts were identified relating to the risk of fire and explosion, spill prevention and control, hazardous or toxic materials, pipeline safety, or employee protection.

3.16.6 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts were identified relating to the risk of fire and explosion, spill prevention and control, hazardous or toxic materials, pipeline safety, or employee protection.