3.16 HEALTH AND SAFETY

This section describes the potential environmental health and safety impacts associated with the construction and operation of the proposed project. For purposes of this section, potential environmental health and safety impacts refer to potential levels of risk to workers and the general public during construction and operation of the proposed project. The level of risk presented herein is based on the current level of design of the proposed project, health and safety and spill prevention regulations, operating procedures, and mitigation plans to be prepared prior to the start of construction or operation of the project.

The existing BP Cherry Point Refinery is adjacent to the proposed cogeneration facility. The refinery has established health, safety, and emergency and security plans. The procedures described in these plans are practiced by refinery employees on a periodic basis, are updated regularly, and comply with applicable local, state, and federal regulations. In many instances, the potential hazards and risks present at the refinery would be the same or similar to the potential hazards and risks that may be present at the proposed cogeneration facility. The refinery's health, safety, and emergency and security plans would be modified for use at the cogeneration facility. Where additional sources of information have been used to evaluate the potential impacts associated with the proposal, those sources have been cited.

State, federal, and local health and safety regulations would govern work activities during construction and operation of the proposed project. Additionally, industrial codes and standards also apply to worker and public health and safety. Should any of the existing regulations, standards, or codes be updated during construction and operation of the proposed project, the Applicant would ensure its personnel and its contractors' personnel adhere to the revised or updated regulations. For a listing of the applicable state and federal health and safety regulations, standards, and applicable industrial standards and codes governing the construction and operation of the proposed project, see Table 3.16-1 below.

Table 3.16-1: Applicable Health and Safety Regulations

Applicable State Requirements	
Labor and Industries	• 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.

Table 3.16-1: Continued

Washington Utilities and Transportation Commission	• Chapter 480-93-020 WAC Gas companies – safety – proximity considerations. • Chapter 480-93-180 WAC Gas companies – safety – operations and maintenance procedures.
Applicable Federal Requirements	
	• 29 CFR 1952 170-1952.175, 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 implements the Occupational Safety and Health Act of 1970 to protect the health and safety of workers.
Applicable Industry Requirements	
	• U.S. Environmental Protection Agency Standards, including Standard of Performance for New Stationary Sources; • National Electrical Code, National Fire Protection Association (NFPA) 70, 1999; • National Electrical Safety Code, American National Standards Institute (ANSI) C2, 1997; • Standards administered through the ANSI; • Standards and guidelines administered through the Institute of Electrical and Electronics Engineers; • Standards and guidelines administered through the Insulated Cable Engineers Association; • Standards and guidelines administered through the National Electric Manufacturers Association; • Standards and guidelines administered through the NFPA; • Codes administered through the American Society of Mechanical Engineers; • Uniform Building Code; • Uniform Plumbing Code; • 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; • Standards administered through the American Welding Society; • 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.
Pertinent Local Ordinances and Permits	
	• Chapter 8.06 Smoking in the Workplace • Chapter 8.12 Solid Waste Disposal • Chapter 8.16 Flammable Liquids

Whatcom County Fire District No. 7 provides firefighting resources within a 73-square-mile area of the County including the project area, the City of Ferndale, and all major industrial facilities. The Whatcom County Sheriff’s Office provides police services to unincorporated Whatcom County including the project area. The Whatcom County Emergency Center and St. Joseph Hospital in Bellingham provide medical services to the general public and to refinery personnel as needed. For a description of these public safety services, see Section 3.13.

In addition to the public services noted above, the refinery has established communication protocols and a response plan in the event of a large refinery fire. The plan stipulates that Whatcom County Fire Department would be notified and the refinery's FERO plan would be implemented. The FERO plan provides detailed guidelines to facilitate effective response actions to emergencies. The plan is described further later in this section.

3.16.1 Existing Health and Safety Risks

Cogeneration Facility and Refinery Interface

Land surrounding the proposed cogeneration facility and the refinery interface area is zoned for industrial or rural use and is generally undeveloped. The cogeneration facility would be sited on the eastern edge of the refinery between Grandview and Brown roads. The existing refinery and cogeneration facility are approximately 6 miles northwest of Ferndale, Washington, 7 miles southeast of Blaine, Washington, and about 15 miles north of Bellingham. The nearest community is Birch Bay, Washington, located approximately 2 miles northwest of the refinery. The U.S.-Canada border is approximately 8 miles directly north of the proposed project.

The proposed cogeneration facility and the interconnecting piping, transmission lines, access roads, and laydown areas would be constructed on undeveloped land that has not been graded. Drainage ditches were constructed in the past to drain the proposed project site and surrounding area for use as farmland. According to the Applicant, there is no evidence that hazardous waste or contaminated materials were deposited within the area of the cogeneration facility or the eastern portion of the refinery (refinery interface). However, a Phase I Environmental Site Assessment of the area has not been performed; therefore, the level of potential health risk associated with contaminated soils is not known at this time. Natural and cultural resources within and surrounding the project area are described in Sections 3.1 through 3.7, and Section 3.14, respectively.

Transmission System

A new 230 kV double circuit transmission line would be installed between the cogeneration facility switchyard and existing Bonneville Custer/Intalco Transmission Line No. 2. The new transmission line would require four lattice-style towers and one monopole-style tower and would be approximately 0.8 mile long. The Applicant has not performed a Phase I Environmental Site Assessment of this transmission corridor; therefore, the health risk associated with contaminated soil is not known at this time.

Custer/Intalco Transmission Line No. 2

An option for interconnection with the existing Bonneville transmission system would involve reconstructing an existing transmission line between the Custer Substation and the cogeneration facility interconnection point (approximately 5 miles in length). The existing single-circuit line would be replaced with a double-circuit line using either lattice steel or steel monopole structures. The Applicant has not performed a Phase I Environmental Site Assessment of this transmission corridor; therefore, the health risk associated with contaminated soil is not known at this time.

Other Project Components

The Applicant has not performed a Phase I Environmental Site Assessment for the corridor of the industrial water supply piping from the Alcoa Intalco Works to Access Road 3, wetland mitigation areas, and Laydown Area 4. Therefore, the level of potential health risk associated with contaminated soil areas is not known at this time.

3.16.2 Impacts of the Proposed Action

This subsection describes potential health and safety risks associated with construction and operation of the proposed project. Features inherent in the design of proposed project facilities as well as compliance with mandatory regulations, plans, and policies to reduce these potential risks are summarized within each risk category. Additional mitigation measures proposed by the Applicant are summarized in Section 3.16.5. Risk levels present during construction and operation consider the degree or probability of exposure to hazardous and toxic substances and the exposure pathway (ingestion, inhalation, and dermal contact).

Construction

<u>Cogeneration Facility and Refinery Interface</u>

Potential health and safety risks present during construction of the cogeneration facility and ancillary structures connecting the refinery with the facility are generally typical of the risks present on major industrial/commercial construction sites. Health and safety concerns include the risk of fire or explosion from general construction activities; chemical storage and handling; spill response and release reporting; collection, storage, and disposal of non-hazardous and hazardous wastes; sanitary waste handling; risk of fire or explosion associated with a natural gas release; worker exposure to radiation; and medical emergencies. Anticipated construction wastes to be generated throughout the four-year construction period are shown in Table 3.16-2. Chemicals to be used during construction are shown in Table 3.16-3.

Risk of Fire or Explosion from General Construction Activities

Contractors experienced with the construction of gas-fired electrical generation plants would build the proposed cogeneration facility. Construction specifications would require that contractors prepare and implement a construction health and safety program that is intended to control worker activities as well as establish procedures to prevent, manage, and control possible fires or explosions, should they occur. The probability of a significant fire or explosion during construction of the proposed project is considered low. With implementation of mitigation measures and procedures described in the following paragraphs, health and safety risks to construction workers and the public are also considered low.

During construction, small quantities of flammable liquids and compressed gases would be used and stored onsite. Liquids would include construction equipment fuels, paints, and cleaning solvents. Compressed gases would include argon gas, acetylene, helium, nitrogen, and oxygen for welding (see Table 3.16-4). Potential risk hazards associated with the use of flammable liquids and compressed gases would be reduced by compliance with a construction health and safety program and proper storage of these materials when not in use, in accordance with all applicable local, state, and federal regulations. The construction health and safety program would include the following major elements:

- An injury and illness prevention program,
- A written safety program (including hazard communication),
- A personnel protection devices program, and
- Onsite fire suppression and prevention plans.

Table 3.16-2: Anticipated Construction Waste Streams

Waste Stream	Waste Stream Classification	Estimated Amount	Estimated Frequency of Generation	No. Truck Trips and Frequency	Quantity Shipped
Scrap wood, steel, glass, plastic, paper, calcium silicate insulation, mineral wool insulation	Non-hazardous solids	50 cubic yards	Weekly	1 per week	50 cubic yards
Empty hazardous material containers	Hazardous solids	1.5 cubic yard	Weekly	1 per week	1.5 cubic yard
Used and waste lube oil during CT and ST lube oil flushes	Hazardous or non-hazardous liquids	55 gallon drums	200 drums over life of construction	1 per 60 days	25 55-gallon drums
Oil rags, oil absorbent generated during normal construction activities, excluding lube oil flushes	Hazardous liquids	55 U.S. gallons	Monthly	1 per month	55 U.S. gallons
Solvents, used construction equipment lube oils, paint, adhesives	Hazardous liquids	200 U.S. gallons	Monthly	1 per month	200 U.S. gallons
Spent lead acid batteries	Hazardous solids	3 batteries	Yearly	1 per year	3 batteries
Spent alkaline batteries	Hazardous solids	80 batteries	Monthly	1 per month	80 batteries
ST and pre-boiler piping cleaning waste, chelant	Hazardous or non-hazardous liquids	400,000 U.S. gallons	Once before initial startup	34	400,000 U.S. gallons
Waste oil from oily waste holding tank	Hazardous or non-hazardous liquids	25 U.S. gallons	Monthly	1 per month	25 U.S. gallons
Sanitary waste from potable chemical toilets and construction office holding tanks	Non-hazardous liquids	500 U.S. gallons	Daily	1 per week	500 U.S. gallons
Storm water from construction area	Non-hazardous liquids	950,000 U.S. gallons	For a once in 2 year, 24-hour storm event	N/A	N/A
Fluorescent, mercury vapor lamps	Hazardous solids	40	Yearly	1 per year	40
Hydrotest water	Non-hazardous liquids	2 to 3 million U.S. gallons	Once before initial startup	N/A	2 to 3 million U.S. gallons

Source: BP 2002

Table 3.16-3: Chemicals to be Used and Stored 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 CGT and STG lube oil flushes	200 55-gallon drums over life of construction	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 on site	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
Argon gas	Welding and HRSG components	Not known at this time	Temporary warehouse
Acetylene	Cutting torches	Not known at this time	Temporary warehouse
Helium	Welding aluminum ducts	Not known at this time	Temporary warehouse
Nitrogen	Welding	Not known at this time	Temporary warehouse
Oxygen	Cutting torches	Not known at this time	Temporary warehouse

Source: BP 2002

Table 3.16-4: Anticipated Compressed Gases Use during Construction

Gas	Estimated Quantity	Storage	Use
Argon Gas	Not known at this time	Temporary warehouse	Welding and heat recovery steam generator 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

During construction mobilization, the general contractor would coordinate with the BP Cherry Point Refinery Fire Marshal and the Whatcom County Fire District regarding planned activities at the construction site. Also, a Joint Unified Command Structure or system would be established prior to the start of construction.

During construction, fire prevention and detection would be the responsibility of individuals working at the site. Heat and smoke detectors would be provided in buildings and temporary warehouses as required by federal, state, and local regulations. In addition, safe working practices would also be exercised. These would include, but would not be limited to, the following:

- Maintaining appropriate fire extinguishers within easy access of all work areas,

- Prohibiting the general public from entering working areas, in areas where heavy equipment is used, and where there would be potential exposure to toxic or hazardous materials,
- Prohibiting smoking in all areas, and
- Using a permit system for all hot work (welding, cutting, and grinding) outside of designated "free-burn" areas.

During construction, personnel properly trained in fire extinguisher deployment would address small fires controllable by handheld extinguishers. If a larger fire occurs, the Whatcom County Fire Department would be notified and the refinery's FERO plan would be implemented.

- The FERO plan provides detailed guidelines to facilitate effective response actions to emergencies. The FERO plan provides specific information to assist responders, and includes set up of command structure, duties and responsibilities, checklists for responders, equipment lists, instructional guides, and strategic actions for potential or critical incident scenarios that may occur in or around the refinery. The plan applies to all emergency response activities except oil spill and response, which are covered by regulatory-mandated response plans. General incident and response categories covered by the plan that would be modified to apply to the proposed cogeneration facility and refinery interface are summarized in Section 3.16.5. In the case of a large fire or explosion, a companion Emergency Preparedness Plan (EPP), which provides preparedness and planning information, would be implemented. This plan is intended to conform with, and incorporate, applicable regulatory guidelines of local, state, and federal agencies. General incident and response categories covered by the EPP that would be modified to apply to the proposed cogeneration facility and refinery interface are summarized in Section 3.16.5.

Where appropriate, the refinery would coordinate emergency response efforts with local emergency agencies (sheriff/fire services/emergency medical services), the Washington Department of Ecology, the local emergency planning commission, and other organizations to mitigate potential emergency situations.

As described in the FERO plan, Whatcom County Fire District No. 7 and the Refinery Fire Department would be summoned in the case of a large fire and/or explosions. Although the refinery has specialized equipment to fight fires unique to refineries and power plants and trained personnel to fight these fires, the Applicant may require additional resources to mitigate any incident beyond the firefighting resources of the refinery. In this event, the Applicant would develop response protocols with the Jurisdiction Having Authority, Whatcom County Fire Department District No. 7, to ensure that additional support and resources would be available from the district and other jurisdictions through the District Mutual Aid Agreements. Firefighting resources in Whatcom County are provided through 17 fire protection districts and two municipal city fire departments, and a total of approximately 175 paid firefighters and approximately 645 volunteer firefighters.

Chemical Storage and Handling

During construction, chemicals stored onsite may include paints, coatings, solvents, and adhesive materials, as listed in Table 3.16-3. These materials would be stored in a locked utility shed or secured in a fenced area. Storage of the various types of chemicals would conform to OSHA and applicable state guidelines. Construction personnel would be trained in handling chemicals, including hazardous materials, and would be alerted to the dangers associated with the storage of chemicals. An onsite Environmental Health and Safety Representative would be designated to implement the construction health and safety program and to contact emergency response personnel and the local hospital (St. Joseph Hospital), if necessary. Material Safety Data Sheets (MSDS) for each onsite chemical would be kept onsite, and construction employees would be made aware of their location and content.

The specific procedures for managing petroleum product storage tanks to be located onsite during and after construction and onsite petroleum use would be as follows:

- Lubrication oil used in construction equipment would be contained in labeled barrels. The barrels would be stored in a secondary containment area to contain any spillage, or in temporary warehouses.
- Vehicle refueling would occur at a designated area and would be closely supervised to avoid leaks or releases. Should a spill occur during refueling, the fuel would be properly cleaned up by the safety engineer and properly documented. If fuel tanks are used during construction, the fuel tank(s) would be located within a secondary containment with an oil-proof liner sized to contain the single largest tank volume plus an adequate space allowance for rainwater.
- When filling transformers with non-PCB mineral oil, the oil would be pumped from a truck located within a temporary secondary containment area to contain any spillage.
- All paint containers would be sealed and properly stored to prevent leaks or spills. Unused paints would be disposed of in accordance with applicable local and state regulations. Spray painting would not be performed on windy days, and drop cloths and vertical walls would be used to stop, collect, and dispose of drips and over-spray associated with painting activities.

During construction, the worst-case scenario would be a major leak during chemical cleaning of the HRSGs and steam and water piping before being placed into service. This method of cleaning consists of an alkaline degreasing step (in which a surfactant, caustic, or ammonia solution is used), a 3 to 4% 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 components of the process that would be most likely to leak are the temporary chemical cleaning piping, pump skids, and transport trailers. The HRSGs would be within curbed areas, and spills would be manually cleaned up and contaminated materials disposed of in accordance with the SPCC plan described in the following section.

Impacts to the public are unlikely. All these chemicals are liquid, and the likelihood of a spill reaching or affecting the area of Grandview Road, the nearest public thoroughfare located approximately 300 feet north of the proposed facility, is low.

Spill Response and Release Reporting

Machinery fluids, including diesel fuel, gasoline, motor oil, hydraulic fluid, brake fluid, and anti-freeze, could spill during construction. The general contractor's responsibility would include implementation of spill control measures and training of all construction personnel and subcontractors in spill avoidance. Training would also include appropriate response when spills occur, and containment, cleanup, and reporting procedures consistent with applicable regulations. The primary plan to be developed by the Applicant would describe spill response and clean up procedures.

Construction equipment would be monitored for leaks and undergo regular maintenance to ensure proper operation and reduce the chance of leaks. Maintenance of onsite vehicles would occur in a designated location. To further reduce the possibility of spills, no topping-off of fuel tanks would be allowed. Petroleum products would be stored in clearly labeled and sealed containers or tanks. If fuel or oil spills occur, the resultant contaminated soil would be removed and disposed of at an approved disposal site in accordance with the SPCC plan.

The State of Washington Utilities and Transportation Commission (WUTC), Washington Department of Labor and Industries (L&I), and the Local Emergency Planning Committee (Whatcom County Fire District No. 7 and Whatcom County Sheriff's Department) are the agencies primarily responsible for the administration of programs for managing a release of dangerous and hazardous chemicals and the notification of the appropriate agencies or parties. Additional mitigation measures regarding accidental spills and spill control and reporting procedures are described in Section 3.16.5.

Onsite supervisory personnel would coordinate with the Department of Ecology and other appropriate agencies to ensure spill control compliance and notification in case of an emergency release. The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) notification and reporting requirements would be made directly to the EPA.

Non-Hazardous and Hazardous Waste Collection, Storage, and Disposal

All non-hazardous waste materials such as empty containers, scrap wood, scrap metal, and trash would be collected, deposited, and stored in appropriate containers provided by a licensed solid waste management contractor. The general contractor would remove the containers and recycle or dispose of the material in accordance with applicable federal, state, and/or local regulations. No construction waste material would be burned or buried onsite. The onsite safety engineer would 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 materials potentially generated by construction activities include used oil, spent antifreeze, unused adhesives, discarded water treatment chemicals and residuals, and spent lead acid batteries, as listed in Table 3.16-2. The exact type and quantity of hazardous and toxic materials to be generated during construction have not been established at this time. However, Tables 3.16-2 and 3.16-3 list typical hazardous and toxic materials that may be used during construction.

A discussion of risks associated with the use and storage of hazardous materials and steps to mitigate those risks is presented in the previous section. A licensed waste management contractor would be responsible for treating or disposing of the various hazardous materials in compliance with all federal, state, and local regulations.

To minimize the potential release of hazardous materials during construction, BMPs would be employed. These would include good housekeeping measures, inspections, containment facilities, and spill prevention practices. Construction personnel would be instructed regarding the use of BMPs, and the onsite safety engineer would be responsible for the enforcement of the use and maintenance of the BMPs.

During pre-construction geotechnical investigations at the cogeneration facility site as well as during ground-disturbing construction activities, the Applicant would monitor and analyze soils to identify contaminated material. If contaminated soil were encountered, soils would be tested, handled, and disposed of in accordance with all applicable federal, state, and local requirements.

The Department of Ecology and the Whatcom County Fire District No. 7 would be notified if unknown water wells or underground storage tanks are discovered during construction. Subsequent abandonment, removal, and/or remediation of such facilities would be conducted in accordance with applicable federal, state, and local codes.

Sanitary Waste Management

Portable sanitation units would be used during construction. These units would be regularly maintained, and a licensed sanitary waste management contractor would collect waste from the units for disposal in accordance with applicable regulations. The production of 500 gallons of sanitary waste per day is anticipated during the construction phase of the project.

Risks of Fire or Explosion from a Natural Gas Release

Natural gas is currently supplied to the refinery via the Ferndale natural gas pipeline. Natural gas from this pipeline would be the primary source of fuel for the proposed project. The Ferndale natural gas pipeline system receives 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 Ferndale pipeline then transports and delivers natural gas to the refinery and to the Alcoa Intalco Works aluminum smelter near Ferndale.

The 16-inch Ferndale natural gas pipeline passes along the western and northern edges of the proposed project site adjacent to Grandview Road. The existing refinery metering station is the preferred tie-in location to connect the natural gas pipeline system with the proposed cogeneration facility. The metering station is immediately east of Blaine Road and immediately west of the proposed cogeneration facility. A short pipeline connection (150 feet) would be constructed from the metering station to a gas compressor, and then another short pipe connection (375 feet) would be constructed from the gas compressor to the cogeneration facility.

Generally, the risks of fire or explosion during pipeline construction are minimal, although natural disasters such as earthquakes or volcanic releases could trigger an accidental fire or explosion incident. Excavation/placement of soil and the welding of pipe sections are the primary construction tasks. “Lockout tagout” procedures would be used to verify that sections of the pipeline are isolated and free of gas prior to the start of work. The exact locations of existing natural gas pipelines near the metering station would be established and kept marked during construction. A 10-foot minimum clearance (buffer zone) between the existing and new pipe would be maintained to preclude stocking of soil on, or work over, the existing natural gas pipeline. Heavy construction equipment would not be allowed to run over the existing pipe in the new pipe construction zone. Construction methods and safety procedures would be established to avoid damaging the existing pipe. The contractor installing the new gas pipeline would be familiar with and experienced in performing this type of work. Implementation of normal pipeline construction BMPs and elements of the construction health and safety plan would reduce the risk of fire or explosion. A description of additional construction methods and safety procedures to be implemented during pipeline construction include the following:

- Existing utilities on Blaine Road would be located and staked before construction begins, and would be physically located every 1,000 feet and at intersections of other pipes and crossings. This would confirm the location and depth to ensure new construction does not impact the existing utilities.
- OSHA regulations for excavations would be followed. The trench for the new gas pipeline connections would be covered or cordoned off after work hours to prevent anything from falling into the trench. Heavy equipment would 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 would cross at right angles and the ground would be covered with mats or additional soil cover to protect the existing pipe.
- As the trench is excavated, the pipeline connections would be constructed in sections at the edge of the trench. After the welds are X-rayed, the pipe would be lowered into the trench using a series of side booms. Tie-in welds performed in the trench would be X-rayed after the pipe is in the trench. Once the pipe is completed in the trench and backfilled with soil, it would be pressure-tested with water. Onsite inspectors representing the Applicant would be present during construction to verify that the construction contractor is following engineering specifications and meeting regulatory requirements.

Radiation Risks

Some radioactive sources may be used for quality-control purposes during construction of the natural gas pipeline connections and high-pressure steam-lines. Examples of these uses may include soil density testers and X-ray sources for evaluating weld quality. No releases of radioactive materials would occur during these uses because these materials are strictly regulated. The radiation levels of these devices, and their use, storage, and application would be in accordance with all applicable state and federal regulations. Therefore, the risk of radiation exposure to workers is considered low.

Medical Emergencies during Construction

Selected construction personnel working on the cogeneration facility piping would receive first aid and CPR training. Onsite treatment would 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 would be referred to the refinery's medical clinic or to St. Joseph Hospital in Bellingham.

Transmission System

The transmission line connecting the cogeneration facility switchyard to Bonneville's Transmission Line No. 2 would be constructed in accordance with Bonneville standards. The transmission line would require four lattice-style structures and one monopole. An interconnection agreement between the Applicant and Bonneville would establish protocols and procedures to prevent fires within the electrical transmission corridor.

The Applicant has been issued a Corps of Engineers permit to construct the 0.8-mile transmission line. As part of the application for the permit, a SEPA Checklist described the potential impacts resulting from constructing and operating the line. Although the county made no SEPA determination, few impacts were identified and described in the checklist. The principal risks associated with construction of the transmission line were fire or explosion and releases or potential releases of hazardous materials to the environment, as described below.

Risk of Fire or Explosion

The risk of a fire or explosion during construction of the transmission line should be low. During construction, small quantities of flammable liquids and compressed gases would be used. Liquids would include construction equipment fuels, paints, and cleaning solvents. Compressed gases would include acetylene, oxygen, helium, hydrogen, and argon for welding.

The potential hazards associated with the compressed gases and flammable liquids used during construction welding, painting, and other activities as well as general worker risks associated with constructing elevated structures and installing electrical transmission lines would be reduced by compliance with a construction health and safety program (see description for the cogeneration facility). For example, while working to assemble and erect the towers, workers would be required to wear warning vests to increase their visibility to heavy equipment operators. In addition, workers would be trained to maintain safe distances from elevated loads, avoiding heavy working equipment, and preventing potentially dangerous situations.

The general construction contractor would administer the health and safety program to ensure compliance with construction safety laws, ordinances, regulations, and standards pertaining to worker safety, including the State of Washington construction safety standards and Bonneville regulations dealing with elevated structures and installation of electrical transmission lines. The program would also include requirements to meet OSHA regulations. In the event of a fire, the Applicant's fire-fighting personnel would assist Whatcom County Fire District No. 7 in suppressing a grass fire.

Releases or Potential Releases of Hazardous Materials to the Environment

Hazardous materials used during construction of the transmission line would be limited to gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux and gases, various lubricants, paint, and paint thinner.

Small quantities of fuel, oil, and grease may leak from construction equipment. Such leakage should not be a risk to health and safety or the environment because of low relative toxicity and low concentrations. Fuel oil and greases used would be biodegradable. If a large spill from a service or refueling truck were to occur, a licensed, qualified waste contractor would place contaminated soil in barrels or trucks for off-site disposal. Appropriate procedures would depend on the waste classification of the contaminated soil. For example, if soils were classified as dangerous waste, they would be transported to a permitted hazardous waste disposal facility.

If a spill were to involve hazardous materials equal to or greater than the specific reportable quantity, all federal, state, and local reporting requirements would be met. Other wastes likely to be generated include used oil, spent antifreeze, unused adhesives, and discarded chemicals and residuals. Non-hazardous solid waste associated with construction activities could include empty containers, scrap wood, scrap metal, and trash.

In general, the construction contractor would be considered the generator of waste oil and miscellaneous hazardous waste produced during construction and would be responsible for compliance with applicable federal, state, and local laws, ordinances, regulations, and standards. This would include licensing, personnel training, accumulation limits, reporting requirements, and record keeping.

During pre-construction geotechnical investigations as well as during ground-disturbing construction activities along the proposed transmission corridor, the Applicant has proposed and is committed to monitoring and analyzing soils to identify contaminated material. If contaminated soil is encountered, soils would be tested, handled, and disposed of in accordance with all applicable federal, state, and local requirements.

The Department of Ecology and the Whatcom County Fire District No. 7 would be notified if unknown water wells or underground storage tanks are discovered during construction. Subsequent abandonment, removal, and/or remediation of such facilities would be conducted in accordance with applicable federal, state, and local codes.

Custer/Intalco Transmission Line No. 2

Assuming the interconnection with the existing Bonneville transmission system involves the reconstruction of approximately 5 miles of an existing transmission line between the Custer Substation and the cogeneration facility interconnection point, then construction activities within the existing Bonneville transmission line right-of-way would occur. One of two types of transmission line towers would be used to replace the existing towers within the Bonneville transmission right-of-way. The new towers would either be a double circuit monopole or double circuit lattice design as shown in Figure 1-2. The towers that connect the cogeneration facility with the Bonneville transmission system would be the lattice design.

The potential environmental impacts resulting from the reconstruction of Custer/Intalco Transmission Line No. 2 would be similar to the impacts described for the construction of the 0.8 mile transmission line connecting the cogeneration facility to the Bonneville intertie point. Those mitigation measures described in the previous section for the proposed transmission line would be implemented during the reconstruction of Bonneville's transmission line. Minor electrical modification to the Custer Substation would be within the fence line of the substation and no significant impacts to the environment or to the public are anticipated.

<u>Other Project Components</u>

Construction of Access Road 3, the industrial water supply piping at Alcoa Intalco Works, Laydown Area 4, and the wetland mitigation areas would not result in significant environmental impacts. Potential impacts resulting from the construction of these project components would be similar to those impacts resulting from the construction and installation of pipelines, transmission connections, and support structures associated with the cogeneration facility and refinery interface.

As described above for the proposed transmission system, the Applicant would monitor soils for contamination during pre-construction geotechnical investigations as well as during ground-disturbing construction activities in these areas. If contaminated soil is encountered, soils would be tested, handled, and disposed of in accordance with all applicable federal, state, and local requirements. The Department of Ecology and the Whatcom County Fire District No. 7 would be notified if unknown water wells or underground storage tanks are discovered during construction. Subsequent abandonment, removal, and/or remediation of such facilities would be conducted in accordance with applicable federal, state, and local codes.

Operation and Maintenance

The potential risks present during operation of the proposed project are similar to those present during construction. Three categories of accidents could occur that would pose a health and safety risk to individuals at the cogeneration facility, the refinery, or in the project vicinity: risk of anhydrous ammonia release, risk of fire or explosion either from general facility operations or specifically from a natural gas release, and risk of a hazardous chemical release or spill. In addition, potential effects of electromagnetic fields (EMF) created with the use of electrical equipment, including the transmission lines, are described below.

All operational systems would be designed to provide the safest working environment possible for all site personnel. Design provisions and health and safety policies would comply with OSHA standards and 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;
- Isolation of all hazardous substances to a confined and restricted location;
- Separation of fuel storage from oxidizer storage; and
- Prohibition of smoking in the workplace.

For these reasons, the potential risks resulting from operation of the proposed cogeneration facility and associated infrastructure are considered low, as described in further detail below.

<u>Cogeneration Facility and Refinery Interface</u>

Risk of Anhydrous Ammonia Release

Each HRSG would be equipped with a SCR system used to inject anhydrous ammonia to minimize the production of NO_x emission. 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 (tank), ammonia transfer pumps, vaporizer, associated piping, and controls. An unloading station for trucks would be set up at the common ammonia storage tank located adjacent to the proposed cogeneration facility.

Approximately 60,000 pounds or 1,579 cubic feet (at 70°F) of anhydrous ammonia would be stored at the cogeneration facility. The ammonia would be stored in a 7-foot by 45-foot tank and would be sufficient for approximately four weeks of operation. A spill containment facility (curbed area to contain small spills) would be constructed around the truck unloading station, and a curbed containment area large enough to contain spilled ammonia and deluge water would be constructed around the liquid ammonia storage tank.

The refinery currently uses anhydrous ammonia in one of its process units. The original refinery ammonia tank was sized to contain a working volume of 59,200 pounds. A few years ago, a smaller tank containing a working volume of 40,000 pounds replaced the 59,200-pound tank. When the refinery Risk Management Plan (RMP) was first developed and submitted to the U.S. EPA, the refinery was using the larger ammonia tank and the modeling for the worst-case release of ammonia used the larger tank volume.

Potential Impact from an Uncontrolled Ammonia Release

Although the liquid ammonia storage tank would be designed with appropriate controls to withstand the risk of potential upset, an accidental or uncontrolled release of ammonia could occur during a natural disaster, such as an earthquake or volcanic eruption, or possibly due to intentional acts such as vandalism or terrorism. Therefore, the Applicant modeled the potential effects of an ammonia release at the proposed cogeneration facility to human health and safety at the project site and in the project vicinity under different release scenarios, as described below.

Because the cogeneration facility proposes a nominal 60,000-pound ammonia storage tank, the Applicant used the same worst-case scenario for a release of ammonia as the refinery used for its RMP. Under this scenario, the tank containing 59,200 pounds of ammonia was assumed to fail, releasing a liquid and vapor of ammonia at a rate of 5,900 pounds per minute, with a release duration of 10 minutes. Wind speed was set at 5 feet per second with an atmospheric stability class “F.” Atmospheric stability class “F” refers to “stable atmospheric conditions, clear skies and light winds with very little horizontal or vertical turbulence.” Topography was set as “urban.” “Urban” topography refers to tree-covered terrain with buildings. The modeling results and a description of the potential human health effects from a release of ammonia from the refinery are described in the following paragraphs.

Under the worst-case scenario, the projected concentration of anhydrous ammonia above 200 ppm would be within approximately 2.8 miles north of the refinery; this general area includes portions of the residential community of Birch Bay as well as recreational sites such as Birch Bay State Park. Following the recommended Emergency Response Planning Guidelines (ERPG) of the American Industrial Hygiene Association (AIHA), the potential effects of vaporized ammonia at this concentration would be: “maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual’s ability to take protective action. There would likely be a strong odor and some eye irritation at this level, but serious health effects would be unlikely” (AIHA 1988). This would mean that workers and members of the general public would have approximately one hour to seek indoor shelter to avoid the transitory ammonia vapor before they would notice the odor and experience eye irritation. The exposure pathway would be through inhalation and dermal contact. There is a low probability of this worst-case scenario occurring due to storage tank equipment features designed to prevent releases and the highly regulated nature of ammonia, therefore the health and safety impacts to workers and the public is considered low.

Under the same worst-case scenario, projected concentration of anhydrous ammonia of 1,000 ppm would be within approximately 0.8 mile north of the refinery. Following ERPG, the potential effects of vaporized ammonia at this concentration would be: "maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing life-threatening health effects. This concentration may cause severe eye and nasal irritation; however, based on animal toxicology data, lethality would not be expected" (AIHA 1988). This would mean that workers and members of the general public would have approximately one hour to seek indoor shelter to avoid the transitory ammonia vapor before they would notice severe eye and nasal irritation. The exposure pathway would also be through inhalation and dermal contact. There is a low probability of this worst-case scenario occurring due to the storage tank equipment features designed to prevent releases and the highly regulated nature of ammonia, therefore the health and safety impacts to workers and the public is considered low. If, however, there is less than an hour’s warning of an ammonia release, it is anticipated that Whatcom County Emergency Service personnel would assist members of the public in seeking temporary indoor shelter until the vapor has dissipated and is no longer at a concentration that could cause health effects.

The Applicant also modeled a failure event that more closely represents a potential release. Under this scenario, 14,500 pounds of ammonia would be released through a ruptured transfer hose at a rate of 1,450-pounds per minute; the release duration would be 10 minutes. Wind speed was set at 10 feet per second with an atmospheric stability class “D.” Topography was set as "urban." Atmospheric stability class "D" refers to neutral atmospheric conditions, cloudy skies, and moderate-to-strong winds.

Under this scenario, the projected concentration of anhydrous ammonia over 200 ppm would be within approximately 1.10 miles north of the refinery. The potential health impacts within 1.10 miles would be the same as the impacts described above. An analysis to determine the location/direction of anhydrous ammonia at a concentration of 1,000 ppm was not performed by the Applicant.

Applicant-proposed mitigation measures to be implemented in the case of an accidental ammonia release are summarized in Section 3.16.5. In addition, EFSEC has asked the Applicant to perform additional modeling to identify the probable area of exposure to ammonia at a concentration of 1,000 ppm or higher under a realistic release scenario to allow assessment of health impacts from such an exposure.

Risk of Fire or Explosion from General Facility Operations

Operation of the proposed cogeneration facility and refinery interface would involve the use of flammable and combustible materials that pose an overall risk of fire or explosion at the project site. The potential for fire or explosion at the cogeneration facility and refinery interface would be minimized through implementation of appropriate fire protection measures. Prevention is the first consideration in any fire protection program. Specific elements of a facility-wide fire prevention program implemented during project operations are identified in Section 3.16.5 and summarized below.

Facility personnel would 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 are also important for fire prevention. MSDS would be consulted to aid in determining the correct storage for incompatible chemicals.

All state and local fire codes would be adhered to during operation of the proposed project. All areas of high risk would have engineered safeguards and automatic fire suppression systems in place.

The combustion turbine generator units would be equipped with specialized fire detection and protection systems. The details of this system would be determined at the time the manufacturer and model of the generator are decided.

Qualified personnel following written procedures would operate the proposed facility. Procedures would 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 would 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 would 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 would be given a facility plan, including a health and safety plan, and would receive training regarding the operating procedures and other requirements for safe operation of the proposed cogeneration facility. In addition, employees would receive annual refresher training, which would include the testing of their understanding of the procedures. The Applicant would maintain training and testing records.

Risk of Fire or Explosion from a Natural Gas Release

The proposed natural gas pipeline would be a specific source of potential fire or explosion during project operations. The first line of defense against a natural gas leak is the shutoff 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. Shutoff values would be installed along the new gas pipeline connecting the cogeneration facility to the Ferndale pipeline. A mercaptan (similar to odorant used for propane) is used in the existing natural gas line for leak detection because it has a very strong distinctive odor and makes a gas leak readily apparent. The gas would continue to be odorized and signage would be placed over the new pipeline to reduce the risk of pipeline rupture resulting from unauthorized excavation above or near the buried pipeline. Finally, operating and emergency plans would be prepared in accordance with state codes and regulations, and routine safety inspections would be conducted in accordance with state pipeline safety rules. Based on these design features and operating procedures, the risk of a fire or explosion resulting from the failure of or from a leak in the natural gas pipeline is considered low. Specific information regarding notification in the case of an emergency is described in Section 3.16.2.

Corrosion potential is a primary safety concern relating to the operation of gas pipelines in the vicinity of power generation. The Applicant proposes to 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 soil. When a cathodic protection system is installed, the protected structure (the new pipeline in this case) collects current from the surrounding electrolyte and the entire exposed surface becomes a single cathodic area.

In the unlikely event there is a fire and/or explosion resulting from the release of natural gas from the connecting pipeline to the cogeneration facility, the pipeline shutoff valves would close, and fire response services would be called. Specifically, the Applicant would call Whatcom County Fire District No. 7. Two stations within the district are located near the proposed project, at 4047 Brown Road (1.5 miles from the project) and 5419 Grandview Road (2.5 miles from the project). The district is a combination department consisting of 16 career and 70 volunteer firefighters. The district maintains and staffs seven engines out of the six stations, along with five licensed aid units (three rescues and two transport-capable ambulances). The district is currently purchasing a 100-foot aerial platform ladder truck designed to meet refinery and power plant needs.

Risk of Hazardous Chemical Release or Spill

The chemicals and hazardous substances to be used and stored at the proposed project during operation are listed in Table 3.16-5. The estimated waste streams that would be generated during operation are listed in Table 3.16-6. Petroleum products used onsite during operation would be stored following the same storage and handling guidelines described for construction. Additional measures planned by the Applicant during operation to minimize the risk of an accidental chemical release or spill are summarized in Section 3.16.5. During operation, 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% 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 components that would be most likely to leak would be the temporary chemical cleaning piping, pump skids, and transport trailers. The probability of a major leak of the cleaning solution is considered low and therefore the potential worker and pubic health and safety risk is considered low. The exposure pathway would be inhalation and dermal contact. All these chemicals are liquid, and the likelihood of a spill reaching or affecting Grandview Road, the nearest public thoroughfare, is low.

Table 3.16-5: Chemical and Hazardous Substances Anticipated to be Used during Operation

Chemical	Estimated Quantity	Storage	Purpose
Lubricating oil	25,800 gallons	In STG and GTG equipment	STG/GTG equipment
Control oil	400 gallons	In STG equipment	STG equipment
Hydrogen	605,000 scf	GTG/STG gas bottles	Power generation
Carbon dioxide	32,500 scf	GTG/STG gas bottles	Power generation, estimate based on purge and fire protection requirements
Transformer oil	49,500 gallons	Combustion turbine transformers	Coolant
Transformer oil	17,000 gallons	Steam turbine transformers	Coolant
Transformer oil	10,000 gallons	Auxiliary transformers	Coolant
Anhydrous ammonia	168,500 gallons annually	Above grade horizontal cylindrical tank	No_x reduction
SCR Catalyst [1]	4,800 ft^3	In HRSG	No_x reduction
CO Catalyst [1]	990 ft^3	In HRSG	CO reduction
Propylene glycol	22,800 gallons	Above-grade tank	Closed-loop cooling water system
Nitrate/borate corrosion inhibitor	50 gallons	Drum	Closed-loop cooling water system
Diethyl hydroxylamine oxygen scavenger	500 gallons	Tank	Boiler feedwater treatment
Morpholine corrosion inhibitor	500 gallons	Tank	Boiler feedwater treatment
Di- and trisodium phosphate pH/scale control agent	200 pounds	Bags/tank	Boiler feedwater treatment

Source: BP 2002

1 Total amount of catalyst for all three HRSGs

Table 3.16-5: Continued

Chemical	Estimated Quantity	Storage	Purpose
Cation resin	950 ft^3	Warehouse/tank	Water treatment system
Anion resin	900 ft^3	Warehouse/tank	Water treatment system
Caustic (50 wt%)	8,000 gallons	Tank	Water treatment system
Sulfuric acid (93 wt%)	16,000 gallons	Two tanks	Water treatment system
Polyquaternary amine polymer	350 gallons	Tank	Water treatment system
Powered cellulose and activated carbon	2,000 lb	Bags or drums	Water treatment system
Sodium hypochlorite 15% solution	16,000 gallons	Two tanks	Cooling tower circulating water treatment
Polyacrylamide polymer	800 gallons	Two tanks	Cooling tower circulating water treatment
Zinc and phosphonate solution	800 gallons	Two tanks	Cooling tower circulating water treatment
Natural gas	N/A	Pipeline	Plant fuel system

Source: BP 2002

1 Total amount of catalyst for all three HRSGs

Table 3.16-6: Estimated Waste Streams during Operation

Waste Stream	Classification	Amount	Disposition
Boiler feedwater demin regeneration waste, boiler B/D, treated washdown, misc. oily drains	Non-hazardous liquids	70 gpm	Discharged to refinery for treatment per NPDES
Spent SCR catalyst (heavy metals)	Hazardous solids	Approx. 4,800 cubic feet (once every 3 - 5 years)	Recycle
Spent oxidation catalyst (noble metals, heavy metals)	Hazardous /non-hazardous solids	Approx. 990 cubic feet (once every 3 - 5 years)	Recycle/reclaim
CGT used air filters	Non-hazardous	Approx. 1,500 filters (once every 3 years)	Landfill disposal
CGT offline wash water	Non-hazardous liquid based on soap type	< 4,000 gallons/month	Refinery water treatment system
Scrap wood, steel, glass, plastic, paper	Non-hazardous solids	3 cubic yards/week	Landfill disposal
Used oil filters, grease, oil rags, oil absorbent	Hazardous solids	_ cubic yard/month	Hazardous waste disposal facility
Spent batteries	Hazardous solids	100 batteries/year	Recycle
Solvents, paint, adhesives	Hazardous solids	<55 gallons/month	Hazardous waste disposal facility
Used lube oils and hydraulic fluids	Hazardous liquid	25,000 gallons (once every 10 years)	Recycle at refinery
Oily water separator oil	Hazardous liquid	20 gallons/month	Recycle at refinery

Source: BP 2002

A chemical cleaning contractor would be responsible for supplying neutralization chemicals and the technical expertise to address any spill or release. To mitigate the risks, the contractor would be expected to provide temporary berms around the chemical cleaning equipment and chemicals.

A number of safeguards would be incorporated to further reduce potential 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. Additional mitigation measures are described in Section 3.16.5.

Medical Emergencies

All permanent employees at the cogeneration facility would receive first aid and CPR training. Onsite treatment would be provided in medical situations that require only first aid treatment or stabilization of the victim(s) until professional medical attention is obtained. Any injury or illness that requires treatment beyond first aid would be referred to the refinery's medical clinic or to a local medical facility.

Spill Prevention and Control

The emergency response plan and a SPCC plan for the BP Cherry Point Refinery would be modified for applicability to possible spills at the site during project operations. The Applicant would coordinate with the Washington State Department of Ecology during the preparation of both plans.

<u>Transmission System</u>

Risk of Fire or Explosion

The transmission line conductors would be located high above ground. Only qualified personnel would perform maintenance on the transmission lines. Sufficient clearance would be provided for all types of vehicles traveling under the transmission lines. Bonneville, the operator of the line, would establish and maintain safe clearance between the tops of trees and the proposed transmission lines to prevent fires.

Ground wires and counterpoise wires would be installed on the new transmission system, providing lightning strike protection and therefore reducing the risk of explosion. However, a brush fire could occur in the rare event that a conductor parted and one end of the energized wire fell to the ground, or perhaps in the event of lightning strikes. Under these circumstances, the normal fire fighting capabilities of both Whatcom County and the refinery would be called upon.

Bonneville would operate and maintain the transmission facilities consistently with Bonneville safety and health programs (similar to the construction health and safety program).

Releases or Potential Releases of Hazardous Materials to the Environment

Hazardous materials used during maintenance of the transmission facilities would be limited to gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux and gases, various lubricants, paint, and paint thinner. Small quantities of fuel, oil, and grease may leak from maintenance equipment. Such leakage should not be a risk to health and safety or the environment because of low relative toxicity and low concentrations.

Electric and Magnetic Fields

Magnetic fields are the result of movement of electrons in a wire (current), and electric fields are created by voltage, the force that drives the electrical current. All electrical wiring, devices, and equipment, including transformers, switchyards, and transmission lines, produce EMF. The strength and distance of EMF depends on the voltage and the design of the electrical component, and the distance from the electrical component. The strength of EMF diminishes rapidly with distance from the EMF source. Building material, insulation, trees, and other obstructions can reduce electric fields, but do not significantly reduce magnetic fields.

The electrical field strength can be measured and expressed as kilovolts per meter, or kV/m. The magnetic field strength is expressed as a unit of magnetic induction (gauss) and is normally measured as a milligauss (mG), which is one thousandth of a gauss. The average home electric appliance typically has an electrical field of less than 0.01 kV/m. In most homes, when in a room away from electrical appliances, the magnetic field is typically less than 2 mG. However, when very close to an appliance carrying high voltage, the magnetic field can be tens of hundreds of mG. Table 3.16-7 lists the typical electric and magnetic field strengths from common household appliances.

Table 3.16-7: Typical Electric and Magnetic Field Strengths at 1 foot from Common Appliances

Appliance	Electric Fields (kV/m)	Magnetic Fields [1] (mG)
Coffee maker	0.03	1 – 1.5
Electric range	0.004	4 – 40
Hair dryer	0.04	0.1 – 70
Television	0.3	0.4 – 20
Vacuum cleaner	0.016	20 – 200
Electric blanket [2]	0.01 – 1.0	15 - 100

Source: Miller 1975; Gauger 1985
kV/m = kilovolt per meter; mG = milligauss
1 By 3-5 feet the magnetic field from appliances is usually decreased to less than 1 mG.
2 Values are for distances from a blanket in normal use, less than 1 foot away.

Electric fields from power lines are relatively stable because line voltage does not vary much. However, magnetic fields on most lines fluctuate greatly as current changes in response to changing loads (consumption or demand). Magnetic fields are described statistically in terms of averages, maximums, etc. Figure 3.16-1 shows typical mean magnetic fields calculated for 321 power lines for 1990 annual mean loads. During peak loads (about 1% of the time), magnetic fields are about twice as strong as the mean levels shown in Table 3.16-7.

Figure 3.16-1: Typical Electromagnetic Levels for Transmission Lines

Electric transmission lines contribute a relatively small portion of the electric and magnetic fields to which people are exposed. Nonetheless, members of the public often express concerns about EMF from transmission lines. Scientific research about EMF from transmission lines has focused on magnetic fields, because electric fields are shielded from the interior of homes and buildings where people spend the vast majority of their time. To evaluate potential impacts from magnetic fields, hundreds of epidemiological and laboratory studies have been conducted in the United States and other countries. The results of these studies do not demonstrate any link between exposure to magnetic fields from transmission lines and adverse health effects (Frey 1993).

For nearby homes, businesses, and other facilities, transmission lines can be a source of exposure to magnetic fields. There are no national standards for electrical or magnetic fields, but some states have established electric or magnetic field standards. In the Northwest, Bonneville has not established a standard or magnetic field strength, but has established an electrical field standard of 9 kV/m maximum on the right-of-way and 5 kV/m at the edge of the right-of-way. Washington State does not have a regulatory standard for electrical or magnetic field exposure.

With the startup of the cogeneration facility, the three existing substations within the confines of the refinery would be disconnected. Any potential health risks present within and adjacent to the substations would be eliminated. The 230 kV switchyard to be located within the cogeneration facility would contain transformers to step down the power from 230 kV to an internal rate voltage (either 69 kV or 115 kV) to supply the refinery. Given that the results of studies have indicted that there are no known health effects from exposure to magnetic fields, operation of the cogeneration facility substation would not present health risks to workers or the general public.

<u>Custer/Intalco Transmission Line No. 2</u>

Following the reconstruction of Bonneville's Transmission Line No. 2 no significant human health and safety risks are anticipated from operation of the transmission line. The transmission line, including tower construction, wires, and clearances, would meet the requirements of Bonneville, including meeting the electrical field strength standards described above.

A locked fence encloses the existing Custer Substation and access is limited to authorized personnel. The substation's ground surface is covered with crushed rock, and no combustible vegetation is located within the fenced area. The risk of a major fire is low because the substation switchyard does not contain large oil-filled equipment. The substation contains coupling capacitor voltage transformers, each containing non-PCB oil.

<u>Other Project Components</u>

Following installation of the industrial water supply pipeline below grade, no health and safety impacts are anticipated from operation of the pipeline. Use of Access Roads 1 and 3 and conversion of the open space north of Grandview Road to the wetland mitigation areas would not result in health and safety effects either to the public, to workers at the refinery, or at the cogeneration facility.

3.16.3 Impacts of No Action

The Ferndale and Cascade natural gas pipelines and the BP Cherry Point Refinery have been adjacent to the project site for decades. If the proposed project were not constructed, the worker and public health and safety risks related to the use, storage, collection, and treatment of non-hazardous and hazardous chemicals at the refinery would still exist. Under the No Action Alternative, there would be no additional health and safety risks related to construction and operation of any of the components of the proposed project.

3.16.4 Secondary and Cumulative Impacts

No significant cumulative impacts on workers or public health and safety were identified resulting from fire and explosion, spill or releases of hazardous or toxic materials, and toxic air emissions during the construction of the cogeneration facility and ancillary infrastructure. The mitigation measures described above would reduce potential worker and public health and safety impacts under normal construction and operational conditions. During the two-year construction period, additional chemicals and hazardous and toxic materials would be transported to the project area. The additional chemicals and hazardous and toxic materials transported through this industrial region with several operating industrial facilities also transporting, storing, and using chemicals and hazardous and toxic materials, is not expected to result in cumulative impacts. The transport of these chemicals and materials is regulated by local, state, and federal regulations; should an accidental release of these chemicals and/or materials occur, the resulting impact would be less than significant and local in extent.

Potential operational risks to worker and public health and safety relate to the unexpected or accidental release of toxic and flammable gases. With the transport and use of toxic and flammable gases by the cogeneration facility and surrounding industrial facilities, there is the potential for a release due to an operational accident and/or through a natural catastrophe such as an earthquake. The probability of this type of worker and public risk is considered low given the design of the industrial facilities, proposed safety protocols in maintenance plans and programs, and mitigation measures described previously. Although workers, both within the proposed project and in surrounding industries, and the general pubic could be exposed to the toxic and flammable gases, the significance of the potential cumulative impact has not been determined. A regional determination of cumulative impacts would require a risk analysis based on procedures and operating conditions of regional industrial facilities.

Another project is planned for construction in the project vicinity. The GSX natural gas pipeline would be constructed along Grandview Road immediately north of the proposed project. Potential increased health risks resulting from construction of the pipeline include accidental rupture and failure of the Ferndale and Cascade natural gas pipelines and the occupational hazards associated with the operation of heavy equipment and use of hazardous materials. The new buried pipeline would have the same risks as other existing pipelines that transport natural gas—that is the risk of leaks, fires, and explosions resulting from an accidental rupture of the pipeline. Operation of the GSX natural gas pipeline would increase the potential risk for fire and explosion of the existing natural gas pipelines, the proposed cogeneration facility, and the refinery.

3.16.5 Mitigation Measures

Worker and public health and safety risks would be minimized through an integrated combination of health and safety plans, procedures, and training proposed by the Applicant. The Applicant ensures that these plans and procedures would be adhered to and enforced. In addition to the mitigation measures and design features described previously in this section, the following mitigation measures are proposed by the Applicant to reduce potential health and safety impacts resulting from construction and operation of the proposed project.

Construction

Before construction starts, the Applicant would require its Engineering, Procurement, and Construction (EPC) contractor to prepare an Environmental, Health, and Safety Program (EHSP) to address the management, prevention, and control of possible fire or explosion during construction. During construction mobilization, the contractor would coordinate with the refinery's Fire Marshal, Whatcom County Fire District No. 7, and regulating authorities regarding activities that would be occurring at the various construction sites.

The following is an overview of the mitigation plans to be prepared by the Applicant's EPC contractor. For the most part, these plans represent a modification of plans currently implemented at the refinery. The plans, when approved by regulatory agencies, would be part of the EHSP, implemented by the EPC contractor, and overseen by the Applicant.

<u>Fire Prevention and Response Plan</u>

This plan would address fire prevention and detection, and describe the responsibility of subcontractors and individuals working at the various sites. Safe working practices such as maintaining appropriate fire extinguishers within easy access of any work area, restricting smoking to designated locations, and using a permit system for all hot work (welding, cutting, and grinding) outside of designated "free burn" areas.

A FERO plan would be prepared for the cogeneration facility. This plan, a modification of the refinery's FERO plan, would describe procedures and protocols to address the following conditions:

- Fire and explosion
- Rescue
- Emergency medical services
- Insulation removal during emergencies
- Terrorist and bomb threats
- Civil disorder
- Earthquakes
- Pipeline leak/rupture
- Offsite ammonia release

To address potentially larger fires, a companion plan known as the EPP would be prepared. This plan would describe preparedness and planning information and would conform with and incorporate applicable regulatory guidelines of local, state, and federal agencies.

Medical Emergency Plan

This plan would describe how construction staff would address minor injuries and provide initial first aid on more serious situations. Onsite treatment guidelines for first aid and/or injury stabilization would be described. A procedural plan to handle any injury or illness that requires treatment beyond first aid would also be described.

Spill Prevention Plan

This plan would describe who would have the responsibility for implementing spill control measures and training in spill avoidance. Training procedures to be described include appropriate spill response, containment, cleanup, and reporting protocols consistent with applicable regulations and refinery policy.

With respect to petroleum products located onsite during and after construction, specific instructions for the handling and storage of petroleum products would be described. Examples include:

- Lubrication oil stored onsite would be contained in barrels. The barrels would be stored in a secondary containment area to contain any spillage or in temporary warehouses.
- Construction refueling would be closely supervised to avoid leaks or releases. If fuel tanks are used during construction, they would be located within a secondary containment with an oil-proof liner sized to contain the single largest tank volume plus an adequate space allowance for rainwater.
- When filling transformers with oil, the oil would be pumped from a truck within a temporary secondary containment area to contain any spillage.

Hazardous Materials Management Plan

This plan would describe a specific area within a construction site designated for servicing and fueling the construction equipment. Also included in the plan would be instructions for training of all construction personnel and subcontractors in spill avoidance, containment, cleanup, and reporting procedures consistent with the Applicant's policy and regulatory requirements. The plan would identify an onsite Safety Engineer who would be designated to implement health and safety guidelines and to contact emergency response personnel and the local hospital, if necessary.

Hazardous Waste Management Plan

This plan would describe the responsibilities of a licensed Solid Waste Management contractor who would be responsible for collection, treatment, or disposal of wastes generated during construction in compliance with all federal, state, and local regulations. In addition, the plan would identify BMPs to be used, including good housekeeping measures, inspections, containment facilities, and spill prevention practices. Finally, the responsibilities of the Applicant's onsite project manager would be described in the plan.

Explosion Risk Management Plan

The risks of fire or explosion during construction of the pipeline connections are considered minimal. Nevertheless, a management plan to reduce the risks of explosion would be prepared. The plan would include work and pipeline isolation procedures to safeguard against accidents while working around pipelines. Examples of such procedures include locating and marking the existing gas pipeline to avoid construction damage, and limiting construction equipment or heavy haul crossings to suitably designated locations.

Operation and Maintenance

During operation and maintenance of the proposed project, specific plans, procedures, and protocols for managing worker and public health and safety would be developed. These may include:

- Safety and Health Manual;
- Emergency Preparedness Response Plan; and
- Fire Emergency Response Operations Plan.

Operational plans would be prepared before startup of the cogeneration facility. Mitigation features have been incorporated into the design of the cogeneration facility. The following plans to be prepared and design features are described below.

Fire Prevention and Response Plan

The following elements of the fire prevention and response plan would be described:

- Protective materials to be used for equipment and pipelines;
- Means to gauge the contents of materials contained in storage vessels;
- Spill kits;
- Signs;
- Preventive maintenance program;
- Procedures for visual inspections;
- Good housekeeping procedures;
- Procedures for handling flammable liquids;
- Mandatory hazardous communication written procedures and training program;
- Procedures for establishing designated flammable storage areas;
- Employee training; and
- Safety and environmental audits.

In addition, a response protocol would be developed with Whatcom County Fire District No. 7 to ensure that additional support and resources are available from the district and other fire jurisdictions through the District Mutual Aid Agreements.

Spill Prevention Plan

To minimize the potential for hazardous material and chemical spills during operation of the proposed project, an operational spill prevention plan would be prepared. Design features have been incorporated into the layout of the project. The design and location of storage tanks and secondary containment areas are intended to prevent spills from tanks and transfer locations.

The following tanks would hold diesel fuel oil for the emergency generator and fire suppression water pump or lube oil for major rotating equipment. These tanks would have secondary containment for spill control with adequate space for rainwater.

- The fire pump diesel fuel storage tank would be a horizontal tank with a capacity of approximately 460 gallons.
- The diesel generator diesel fuel storage tank would be a vertical tank with a capacity of approximately 1,500 gallons.
- The steam turbine lube oil storage tank would be a rectangular tank with a capacity of approximately 7,200 gallons. Depending on the supplier of the steam turbine, the electro-hydraulic control oil system may be integrated with the lube oil system or it may be a stand-alone system.
- One combustion turbine lube oil storage tank would be provided for each of the three CGTs. Each tank would have a capacity of approximately 6,200 gallons. These lube oil tanks would be located inside the accessory module.
- Transformers would be installed into secondary containment areas that would hold the transformer’s volume plus an adequate space to accommodate rainwater. Transformer oil would be pumped from a truck within a temporary secondary containment area. Spills that occur during filling of the transformer would be properly cleaned up and reported.
- A secondary containment area would be constructed around the ammonia tank that would contain 150% of the working volume. The additional containment would be provided to accommodate water from a deluge spray system and rainwater.
- The caustic tanks would be surrounded by a secondary containment area and sized with sufficient space for rainwater.
- The acid tanks would be located within a secondary containment area lined with an acid-proof coating and sized with sufficient space for rainwater.
- Oxygen scavenger, neutralizing amine, corrosion inhibitors, phosphate, and cooling tower chemical storage tanks would be contained in a curbed area sufficiently sized to contain the volume of the single largest storage tank.

The design of the cogeneration facility includes an oil-water separator system that collects selected drainage and runoff from within curbed areas that could carry trace oil. Collected drainage and runoff would be pumped to the refinery’s treatment system.

Hazardous Waste Management

Little waste would be produced during the operation and maintenance of the proposed project. Used lubrication and transformer oils, small quantities of used paints, thinners, and solvents used during operation would be disposed of in accordance with federal, state, and local regulations. Safeguards would include bermed secondary containment, tank overfill protection, routine maintenance, safe handling practices, supervision of all loading/unloading by plant personnel and truck drivers, and appropriate training of operation and maintenance staff.

Prevention of Natural Gas Release During Operation

The Applicant would comply with all federal and state regulatory requirements regarding pipeline safety. In addition, all underground gas piping and pipeline connections to the cogeneration facility would be have cathodic protection systems and corrosion-resistant coatings.

Explosion Risk Management

Several proposed mitigation measures would ensure prompt detection of a natural gas release at the project site. First, the natural gas would be odorized with mercaptan to give the gas a strong, distinctive odor that should make any gas leak immediately apparent. Second, a breach in the natural gas system would result in a drop in the pressure of the gas line, which would be detected in the control room so that the system would be shut down until the situation is resolved. Automatic shutoff valves in the existing pipeline would close to limit the amount of gas that could leak from the system.

If a local, small gas leak were suspected, a combustible gas indicator would be used to measure the percentage of oxygen and concentrations of natural gas in the ambient air.

In the event of a leak, the pipeline system would be isolated by closing a shutoff valve. The leaking section would be repaired or replaced by a licensed contractor. Upon completion of the repair work, the pipeline system would be pressure tested to ensure that the leak has been appropriately addressed.

The Applicant has taken additional steps to reduce the opportunities for pipeline failure. These steps include: (1) pipeline appurtenances would be limited to fenced (controlled) areas within the project site, (2) the pipeline would be buried in all other uncontrolled locations, (3) the pipeline appurtenances would be protected within the cogeneration facility site by being contained within buildings or within fenced areas, (4) steel posts would be erected to ensure that onsite vehicles are not able to reach critical areas, and (5) access to critical areas would be limited to authorized personnel.

3.16.6 Significant Unavoidable Adverse Impacts

With implementation of the Applicant's proposed project design and mitigation measures, no significant unavoidable adverse impacts to workers or to the general public's health and safety resulting from construction, operation, and maintenance of the proposed project and ancillary infrastructure have been identified.