3.16 Health and Safety

3.16.1 Existing Health and Safety Risks

3.16.1.1 Generation Plant

According to the applicant, there is no known contamination within the areas to be impacted by construction of the project (Wallula Generation 2001).

The proposed project would be constructed on approximately 78 acres of a 175.48-acre parcel located within the heavy industrial zone of the Attalia Industrial UGA, as identified in the Walla Walla County Comprehensive Plan. The project site is currently used for center-pivot irrigated agriculture. A wood-frame residential structure constructed in 1978 is present on the site. The project site is bordered on the west by U.S. Highway 12 and on the east by the Union Pacific Railroad. The closest resident to the site is approximately 4,000 feet northwest of the edge of the cooling tower. The nearest populated area is the community of Wallula, situated approximately 2 miles south of the project site.

3.16.1.2 Water Pipeline

The proposed 4.6-mile-long makeup water supply pipeline extends south from the project site. For approximately 1.5 miles, the water and gas pipelines would share a common corridor. The pipelines would cross agricultural lands composed of center-pivot irrigated farmland and fiber farms.

The applicant is proposing to build a temporary construction access road intersecting with U.S. Highway 12 south of the project site. A new road extension would be constructed between the project site and Dodd Road to serve as the primary project access during operation.

3.16.1.3 Transmission Line and Associated Facilities

The new 33-mile transmission line would begin at the Wallula Substation and extend about 5.1 miles (Wallula-Smiths Harbor segment) to the proposed Smiths Harbor Switchyard. There are no existing Bonneville or other high voltage transmission lines along this portion of the route, much of which would be on land with rights obtained by the applicant. A new, approximately 29-mile-long (Smiths Harbor-McNary segment) transmission line would also be constructed from the switchyard south into Umatilla County, Oregon, and then west to the existing McNary Substation.

The Smiths Harbor-McNary segment would be constructed parallel to or near the existing Lower Monumental–McNary 500 kV transmission line. The new transmission line would either be 200 feet north of the existing Lower Monumental–McNary 500 kV transmission line or 125 feet north of the existing PacifiCorp 230 kV transmission line, where the PacifiCorp line is north of the existing Lower Monumental–McNary line. The Smiths Harbor-McNary segment right-of-way would be 200 feet wide where it parallels the existing Bonneville transmission line and 140 feet wide where it parallels the existing PacifiCorp transmission line. The distance from centerline to centerline of the portion paralleling the Bonneville transmission line would be 200 feet and the portion paralleling the PacifiCorp transmission line would be 125 feet. The new transmission line route would require approximately 610 acres of new right-of-way. The new Smiths Harbor Switchyard would occupy 7 acres. Existing land use along the new transmission line rights-of-way is primarily agricultural. The new line would also cross approximately 0.4 mile of commercial lands, 0.5 mile of residential lands, and 0.7 mile of McNary National Wildlife Refuge lands.

3.16.1.4 Natural Gas Pipeline

A proposed 5.9-mile-long natural gas pipeline would extend to the south approximately 1.5 miles from the project site and then east-southeast to an intersection with the existing PG&E Gas Transmission-Northwest (GTN) pipeline.

3.16.2 Impacts of the Proposed Action

3.16.2.1 Construction

Generation Plant

Risk of Fire and Explosion

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

According to the applicant, potential hazards associated with the compressed gases and flammable liquids used for welding, painting, and other activities would be reduced by compliance with a construction health and safety program. The program would include the following elements:

- an injury and illness prevention plan,
- a written safety program,
- a personnel protective devices program,
- on-site fire suppression and prevention plans,

- off-site fire suppression support, and
- an emergency plan.

The general construction contractor would administer the program to ensure compliance with laws, ordinances, regulations, and standards pertaining to worker safety, including the State of Washington's construction safety standards (Chapter 296-155 WAC) and the requirements of the Occupational Safety and Health Administration (OSHA) (Title 29, Labor, Code of Federal Regulations Part 1926, Safety and Health Regulations for Construction).

The applicant proposes to use an existing 1,200 gpm on-site well, which would be outfitted with fire protection connections for use by Walla Walla County Fire District 5 during the construction period. Fire protection equipment, which includes the service water tank and the fire protection pumps, would be placed in service early.

The onsite fire suppression systems would be augmented by Fire District 5, which is located in Burbank, a distance of 7 miles from the project site. The estimated response time from the fire station to the project site is approximately 8–10 minutes during the day when it is operated by a full-time staff of fire fighters, and 10–20 minutes at night when it is staffed by volunteer fire fighters. A second unstaffed volunteer fire station is located in the community of Wallula about 2 miles from the project site. It has an estimated response time of 5 minutes. The local fire response units would be made aware of the potential fire hazards at the project site based on the applicant's emergency plan and on routine fire prevention inspections.

As committed in the Application for Site Certification, at least 90 days prior to the start of construction, meetings would be scheduled between the construction contractor, the applicant, and Fire District 5 to coordinate construction response requirements and communication details. Material Safety Data Sheets (MSDS) and an annual inventory of toxic and hazardous materials used on-site would be provided to all Fire District 5 and other interested emergency support agencies. The applicant's emergency plan would be submitted to EFSEC and Walla Walla County emergency response agencies at that time.

Releases or Potential Releases of Hazardous Materials to the Environment

Hazardous materials used during construction of the generation plant and ancillary 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. Large quantities of the chemicals for cleaning the HRSGs and process piping would also be used. Temporary gasoline and diesel oil storage tanks may be erected in the construction laydown area north of the cooling towers and/or construction vehicles may be serviced from portable fuel trucks. Approximately 520,000 gallons of diesel fuel oil and 130,000 gallons of gasoline would be used for mobile construction equipment.

The hazardous materials storage area would be located to the north of the cooling towers. Other than the chemicals used in the cleaning of the HRSGs, no acutely hazardous materials, related to construction, would be used or stored on site. Near the end of the construction period and just before generation plant startup, the normal supply of hazardous materials used to support operations would be received at the project site.

The types of paint required would be dictated by the types of equipment and structures that must be coated and by manufacturers' requirements for coating. These materials are considered to have low hazardous characteristics (toxicity, flammability, corrosiveness), given the small volumes and concentrations used for power plant construction.

The chemical cleaning of the HRSGs and process piping before being placed in service uses several chemicals that are hazardous and that require proper disposal. The following chemicals are typically used for cleaning the HRSGs and process piping (Wallula Generation 2001):

- aqueous ammonia,
- surfactant,
- corrosion inhibitors,
- citric or other similar acids,
- sodium nitrate,
- ammonium bicarbonate, and
- antifoam agent.

The applicant has not determined the quantity of the chemicals listed above that would be used. The selected chemical cleaning contractor would bring chemicals in by tanker truck, use the chemicals directly in the closed-loop cleaning process, and collect all waste chemical streams from the closed loop in suitable tanks for shipment off site. During the construction period, on-site storage of these chemicals or wastes would not exceed several weeks.

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 its low relative toxicity and low concentrations. Fuel oil and greases used would be biodegradable (Wallula Generation 2001). If a large spill from a service or refueling truck were to occur, contaminated soil would be placed in barrels or trucks by a licensed, qualified waste contractor for off-site disposal. Selection of the appropriate procedure would depend on the waste classification of the contaminated soil. For example, if the contaminated soils were classified as dangerous waste under state guidelines, 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, the applicant has committed to meeting all federal, state, and local reporting requirements. Other wastes likely to be generated include used oil, spent antifreeze, unused adhesives, discarded water treatment chemicals and residuals, and spent lead-acid batteries.

In general, the construction contractor would be considered the generator of waste oil and miscellaneous hazardous waste produced during facility 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.

Although it is not anticipated, in the event that contaminated soil is encountered during excavation activities for proposed project facilities, the soil would be segregated, sampled, and tested to determine appropriate disposal/treatment options. If required, the soil would be hauled to a Class I landfill or other appropriate soil treatment and recycling facility. Fire District 5 would be notified if unknown water wells or underground storage tanks were discovered during construction. Subsequent removal of such facilities, including potential remediation, would be conducted in accordance with applicable federal, state, and local regulations.

Radioactive Materials

Some radioactive sources may be used for quality control purposes during construction of the generation plant. Examples of these uses may include nuclear soil density testers and X-ray sources for evaluating weld quality. No releases of radioactive materials would occur during any of these uses. The radiation levels of these devices and their use, storage, and application would comply with all applicable regulations (e.g., Chapter 246-243 WAC, Radiation Protection—Industrial Radiography).

Water Pipeline

Risk of Fire and Explosion

The risk of fire and explosion during construction of the water supply pipeline should be low because of the lack of fire or explosion potential.

Releases or Potential Releases of Hazardous Materials to the Environment

Only small quantities of hazardous materials would be used along the makeup water supply pipeline during construction. Thus, the potential for environmental impact should be low.

Radioactive Materials

Some radioactive sources may be used for quality control purposes during construction of the water supply pipeline. Examples of these uses may include nuclear soil density testers and X-ray sources for evaluating weld quality. No releases of radioactive materials would occur during any of these uses. The radiation levels of these devices and their use, storage, and application would comply with all applicable regulations (e.g., Chapter 246-243 WAC).

Transmission Line and Associated Facilities

The transmission line and switchyard would be designed and constructed in accordance with Bonneville standards. The transmission line would use lattice steel structures similar in design to the existing towers for the Lower Monumental–McNary 500 kV transmission line. The structures would average 145 feet tall with an average distance between structures of 1,150 feet.

Risk of Fire and Explosion

The risk of a fire or explosion during construction of the transmission line and switchyard 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 would be reduced by compliance with a construction health and safety program. The program would include the following elements:

- an injury and illness prevention program,
- a written safety program,
- a personnel protective devices program, and
- on-site fire suppression and prevention plans.

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's construction safety standards and the State of Oregon's construction safety standards. The program would also meet OSHA requirements.

During construction of the Wallula–Smiths Harbor segment, the Walla Walla County Fire District 5 would support on-site fire suppression systems. During construction of the Smiths Harbor-McNary segment, local fire departments would be the first responders to a fire. The City of Umatilla has three fire stations with a combination of 33 paid and volunteer fire fighters available. Other communities along the route, such as Hermiston and Helix, have similar response capabilities. The City of Pendleton has three fire stations that would provide backup, but their response time to the transmission line construction sites would be at least 1 hour. The local fire response units would know about the potential fire hazards along the alignment and at the switchyard, based on Bonneville's emergency response plan and routine fire prevention inspections.

The City of Pendleton Station #1 has a staff of 52, including fire fighters, paramedics, a fire chief, and a fire marshal. It is equipped with several pumps, a ladder truck, a brush truck, and water tenders. The City of Pendleton Station #2 has several pumpers and ambulances, and the City of Pendleton Station #3 has an aircraft rescue/fire fighting truck and reserve pumper. It can also respond to hazardous materials incidents.

The National Forest Service in Umatilla County would provide the initial response to any fire outbreaks that occur in National Forest areas.

Bonneville would take all appropriate precautions to prevent fires and follow the fire control regulations established by the landowners, including carrying the requisite fire suppression equipment in motor vehicles.

Several common construction materials (e.g., concrete, paint, and wood preservatives) and petroleum products (e.g., fuels, lubricants, and hydraulic fluids) would be used during construction. Bonneville would follow strict procedures for disposal of these or other materials. Bonneville prohibits the storage of flammable materials on the right-of-way.

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. Construction vehicles would be serviced from portable fuel trucks.

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, contaminated soil would be placed in barrels or trucks by a licensed, qualified waste contractor for off-site disposal. Appropriate procedures would depend on the waste classification of the contaminated soil. For example, if soils were to classify 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. Nonhazardous 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.

Although it is not anticipated, in the event that contaminated soil is encountered during excavations, the soil would be segregated, sampled, and tested to determine appropriate disposal/treatment options. In Walla Walla County, Washington, if the soil were to be classified as dangerous, the Washington Department of Ecology would be notified immediately and, if required, the soil would be hauled to a Class I landfill or appropriate soil treatment and recycling facility. If soil containing petroleum hydrocarbons were to be encountered, but could be classified as nonhazardous, it might remain on site or be disposed of/recycled as nonhazardous waste. Contaminated soil encountered in Umatilla County, Oregon, would be reported to the Oregon Department of Environmental Quality (ODEQ), Waste Prevention and Management Division.

In the State of Washington, Ecology and the Walla Walla County Fire District 5 would be notified if unknown water wells or underground storage tanks were discovered during construction. The ODEQ Waste Prevention and Management Division would be contacted regarding wells or underground storage tanks discovered during construction of the transmission lines through Umatilla County. Subsequent abandonment, removal, and/or remediation of such facilities would be conducted in accordance with applicable federal, state, and local codes.

Natural Gas Pipeline

Risk of Fire and Explosion

GTN would build the natural gas pipeline from the existing GTN pipeline to the project site. Generally, the risks of fire and explosion during natural gas pipeline construction are minimal because the primary tasks are earth moving and pipe welding. The natural gas pipeline lateral for the project would cross the existing Chevron Products pipeline approximately 3.6 miles southeast of the project site. This crossing would present a risk of fire and explosion because of the potential for unintended damage to the Chevron Products pipeline during construction.

Depending on the product in the Chevron pipeline at the time of damage, a spark or other energy source could cause a fire or explosion. Without ignition energy, the result would be a release of the petroleum product to the ground and/or atmosphere requiring cleanup to prevent environmental damage. This risk would be lessened through appropriate design and construction of the new natural gas pipeline. Measures to lessen natural gas pipeline construction risks would include the following (Wallula Generation 2001).

- A qualified and experienced pipeline construction contractor would perform construction.
- Prior to construction, the existing natural gas pipeline would be located and staked.
- Construction method and safety procedures would be established to avoid striking or damaging the Chevron Products pipeline.
- Heavy equipment would not normally be operating over the Chevron Products pipeline during construction of the new natural gas pipeline.

- Heavy equipment or trucks would cross the existing natural gas pipeline at existing road crossings or at right angles to the natural gas pipeline with the ground bridged with mats or additional soil cover.
- The trench for the new natural gas pipeline would be covered or cordoned off after work hours to prevent livestock or anything else from falling into the trench.

Releases or Potential Releases of Hazardous Materials to the Environment

Only small quantities of hazardous materials would be used along the natural gas pipeline during construction. Thus, the potential for environmental impact should be low.

Radioactive Materials

Some radioactive sources may be used for quality control purposes during construction of the natural gas pipeline. Examples of these uses may include nuclear soil density testers and X-ray sources for evaluating weld quality. No releases of radioactive materials would occur during any of these uses. The radiation levels of these devices, and their use, storage, and application, would comply with all applicable regulations (e.g., Chapter 246-243 WAC).

3.16.2.2 Operation and Maintenance

Generation Plant

Risk of Fire and Explosion

The proposed project would use natural gas and distillate fuel oil for equipment combustion firing, lubricating oil for equipment operation, and mineral oil for transformer operation. The natural gas fuel would be used for powering the four combustion gas turbines, duct firing in the four HRSGs, building space heating, and fueling the auxiliary boiler.

Natural gas would pose a fire and/or explosion risk because of its flammability. Although natural gas would be used in significant quantities, it would not be stored on-site. Risk of fire and/or explosion would be reduced through adherence to applicable laws, ordinances, regulations and standards, and the implementation of effective safety management practices in all areas of the generation plant. Fire prevention and suppression measures that would be included within key areas are listed in the paragraphs that follow.

The generation plant fire protection system would include

- a dedicated firewater storage supply of a minimum of 240,000 gallons in the service water storage tank, sized in accordance with National Fire Protection Association

(NFPA) 850 to provide 2 hours of protection from the on-site, worst-case single fire (NFPA 850, Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations);

- an electric jockey pump and electric motor-driven main fire pump to increase the water pressure in the power plant fire mains to the level required to serve all water fire fighting systems;
- a diesel engine-driven fire pump to pressurize the fire loop, if the power supply to the main fire pump fails;
- a dedicated underground firewater loop piping system with fire hydrants and the fixed suppression systems supplied from the firewater loop;
- fixed fire suppression systems installed at determined fire risk areas such as transformers, turbine lubrication oil equipment, and the cooling towers;
- sprinkler systems installed in the fire pump building as required by NFPA; and
- hand held fire extinguishers of the appropriate size and rating located in accordance with NFPA 850 throughout the facility.

The combustion gas turbine-generator units would be equipped with

- gas detectors that alarm when combustible gas in the combustion gas turbine unit enclosures reaches approximately 25% of the lower explosive limit;
- automatic shutdown controllers for the natural gas supply trip valves if the combustion gas turbine concentration reaches 60% of the lower explosive limit;
- vent fans in the combustion gas turbine enclosures to ventilate any collected gas; and
- thermal fire detectors and smoke detectors located throughout the combustion gas turbine generator enclosures; actuating one sensor would provide a high temperature alarm on the combustion gas turbine control panel; actuating a second sensor would trip the combustion gas turbine, turn off ventilation, close the ventilation openings, and automatically release gaseous carbon dioxide to quench the fire.

The steam turbine-generator units would be supplied with

- bearing preaction water spray systems that would provide fire spray water to the steam turbine-generator bearings in case of a fire; and
- fire detectors and an automatic water-deluge water spray system for the steam turbine-generator lube oil areas.

Each major transformer would be supplied with

- a deluge spray system in case of a fire;
- concrete foundations with crushed rock and curbs to contain a fire; and
- block walls as fire breaks between transformers.

The auxiliary boiler building would house the diesel fire pump, the emergency diesel generator, and the gas-fired auxiliary boiler. This equipment would also be supplied with fire detectors and automatically operated deluge water spray systems. The cooling towers would be supplied with a dry-pipe water spray system in case of a fire. To control overpressure of the natural gas piping systems downstream of the valve station, relief valves would be installed with discharge to a safe location. The released natural gas should rapidly dissipate into the air. A system alarm would sound in the control room. No natural gas would be released to the atmosphere from upstream of the control valve station.

A comprehensive communication plan would be developed to coordinate responses to fire and explosion emergencies at the project site. This comprehensive plan would be part of the fire prevention plan during operation. At least 90 days before the start of operation, a meeting would be held that would include the plant operations and maintenance contractor, the applicant, and Fire District 5 to coordinate all operational response requirements and communication details.

Releases or Potential Releases of Hazardous Materials to the Environment

Hazardous materials that would be used during the operation of the proposed project are listed in Table 3.16-1. Hazardous waste materials such as paints and lubricants would be stored in the fenced area to be located near the raw water storage tank. The hazardous waste materials would be periodically removed by and transferred to a licensed hazardous waste disposal area by a waste disposal contractor.

Table 3.16-1. Anticipated Hazardous Chemical Use and Onsite Storage Capacity

Chemical	Onsite Storage Capacity
Aqueous ammonia (24.5%) for NOx control	Two 15,000-gallon storage tanks to be located on the northeast portion of the project site
Sulfuric acid (93%) for reverse osmosis, pH, and alkalinity control	One 1,000-gallon storage tank to be located in the water treatment building
Sulfuric acid (93%) for circulating/water/ softener/brine concentrator pH and alkalinity control	Two 6,000-gallon storage tanks to be located near the cooling tower side-stream softener equipment
Sodium hydroxide for softener treatment and to remove silica	One 5,000-gallon storage tank to be located near the cooling tower side-stream softener equipment
Magnesium hydroxide for softener treatment and to remove silica	One 2,500-gallon storage tank to be located near the cooling tower side-stream softener equipment
Polymer to aid in dewatering sludge	One 250-gallon storage tank to be located near the brine concentrator equipment
Soda ash for softener treatment and silica removal	One 1,000-gallon storage tank to be located near the cooling tower side-stream softener equipment
Sodium hypochlorite to prevent biological growth in the raw water	One 100-gallon storage tank to be located in the water treatment building
Biocides for circulating water biocide control	Storage tank to be located near the cooling tower side-stream softener equipment (storage tank size not yet determined)
Sodium hypochlorite for circulating water biological growth control	One 4,500-gallon storage tank to be located near the cooling tower side-stream softener equipment
Corrosion inhibitor for circulating water scale control	One 250-gallon storage “Tote” to be located near the cooling tower side-stream softener equipment
Anti-scalant for reverse osmosis scale control	One 50-gallon storage tank to be located in the water treatment building

Chemical	Onsite Storage Capacity
Anti-scalant for brine concentrator scale control	One 250-gallon storage tank to be located near the brine concentrator equipment
Sodium hypochlorite for potable water biological growth control	One 100-gallon storage tank to be located in the water treatment building
Sodium bisulfite for reverse osmosis system to remove chlorine	One 50-gallon storage tank to be located in the water treatment building
Phosphate for boiler water control	One 75-gallon storage tank to be located in the turbine building
Amine for condensate water control	One 50-gallon storage tank to be located in the turbine building
Oxygen scavenger for boiler water control	One 50-gallon storage tank to be located in the turbine building
Anti-foam for brine concentrator foam control	One 250-gallon storage tank to be located near the brine concentrator equipment
Gasoline for motor vehicles	One 500-gallon storage tank to be located near the demineralized water storage tanks
Diesel oil for motor vehicles	One 500-gallon storage tank to be located near the demineralized water storage tanks
Distillate fuel oil for emergency diesel generator and diesel-driven fire pump	One 5,600-gallon storage tank to be located next to the auxiliary boiler building
Steam turbine hydraulic oil reservoir/piping	Two reservoirs of 4,600 gallons each to be located in the turbine building
Steam turbine-generator seal oil reservoir/piping	Two reservoirs of 14,000 gallons each to be located in the turbine building
Combustion gas turbine hydraulic oil reservoir/piping	Four reservoirs of 200 gallons each to be located on the combustion gas turbine equipment
Main transformer mineral oil	Six reservoirs of 13,000 gallons each
Auxiliary transformer mineral oil	Two reservoirs of 2,400 gallons each
Battery sulfuric acid for emergency batteries	Not known at the time of the application but would be located in the turbine building
Hydrogen gas for generator cooling	70,000 cubic feet of bulk storage located in the turbine building.
Various compressed gases	Not known at the time of application submittal.
Source: Wallula Generation (2001)	

Protective equipment would be provided for personnel use during chemical unloading. In addition, personnel working with chemicals would be trained in proper handling techniques and in emergency response procedures for chemical spills or accidental releases.

Several programs would be developed to address hazardous materials storage, emergency response procedures, employee training, hazard recognition, fire safety, first aid/emergency medical procedures, hazardous materials release containment/control procedures, hazard communications, personnel protective equipment, and release reporting requirements. The applicant has also committed to developing and implementing emergency plans addressing the following topics:

- project evacuation,
- fire or explosion,
- natural gas release on-site,

- natural gas release off-site,
- ammonia release on-site,
- other chemical releases on-site,
- diesel oil/gasoline release on-site,
- floods,
- weather abnormalities,
- emergency freeze protection,
- earthquake,
- volcanic eruption,
- personnel injury,
- facility blackout, and
- external facility threats (e.g., bomb threats).

Details regarding the various plans are provided in the Application for Site Certification (Wallula Generation 2001).

Operation of the generation plant would not produce any spent fuel wastes such as ash. A small amount of sludge would result from the treatment of the generation plant makeup water and from operation of the mechanical-draft cooling towers. The sludge would be disposed of in an approved landfill.

Use and Storage of Ammonia. The facility would use aqueous ammonia (24.5% aqueous solution) for the selective catalytic reduction (SCR) system to control emissions on NOx from the combustion turbines. The ammonia would be stored in two 15,000-gallon tanks, each of which would be placed inside a secondary containment dike. Aqueous ammonia would be delivered to the plant via truck. The truck unloading facility would be bermed to contain any ammonia spills during transfer to the storage tanks.

Accidental Release Prevention for Ammonia. The facility would be subject to EPA's Accidental Release Prevention Program (ARPP) regulations for ammonia (40 CFR Part 68). The ARPP would require the facility to implement the following procedures to minimize the potential for accidental releases.

- Develop a quality control program to ensure that all equipment used in the ammonia system is designed according to industry standards.
- Develop standard operating procedures for operation, inspection, and maintenance of the ammonia system.
- Conduct annual worker training for the ammonia system.
- Conduct a Process Hazard Analysis for the ammonia system to identify equipment or operations with a potential for accidental release, then mitigate those identified problems.

- Develop an Emergency Response Plan for the ammonia system, describing alarms and procedures to repair leaking equipment.
- Submit a Risk Management Plan to EPA, predicting the downwind impacts caused by hypothetical accidental releases of ammonia.
- Conduct periodic audits of the accidental release prevention program.

Hypothetical Ammonia Releases. The release of ammonia is the most likely chemical release accident to occur at the facility with the potential for off-site impacts. The applicant modeled three hypothetical ammonia release scenarios:

- ammonia storage tank rupture,
- ammonia tanker truck unloading spill, and
- ammonia feed piping system failure.

NOx emissions from the combustion turbines can be controlled by using either anhydrous ammonia (an undiluted, almost pure form of ammonia) or aqueous ammonia (a water solution of lower concentration). Anhydrous ammonia boils at –28.3°F at atmospheric pressure, whereas aqueous ammonia must be treated in a vaporizer to release the ammonia from the water. To make the same amount of ammonia available for use in NOx control, aqueous ammonia, because of its lower ammonia concentration, requires greater storage capacity and more tanker truck shipments than anhydrous ammonia. However, to reduce the severity of any potential ammonia accident at the Wallula Power Project, the applicant plans to use aqueous ammonia.

Ammonia Storage Tank Rupture. The preliminary design (described in Wallula Generation 2001) indicates that ammonia would be stored at the project site in two horizontal tanks (each 12 feet in diameter and 17.75 feet long, for a total capacity of 30,000 gallons). The tanks would be placed in a diked, concrete containment area. The height of the dikes would be such that 110% of the capacity of an entire tank plus the rainfall of the 100-year rainstorm in a 24-hour period could be contained.

The applicant used the U.S. Environmental Protection Agency's (EPA's) Risk Management Plan (RMP) Comp Program to estimate the emissions per unit area per unit time. A worst-case spill scenario was modeled (F stability, 1.5 meters/second wind speed, and an ambient temperature of 100° Fahrenheit). Release of the ammonia was assumed at a height of 1 meter. The worst-case emissions flux was calculated at 3.37 grams/second/meter squared (gm/sec/m^2). The Screen3 Model (EPA's RMP Offsite Consequence Analysis Guidance, May 24, 1996) was used with that emission flux, along with the worst-case wind and stability conditions to estimate the ammonia impact at various distances.

The analysis considered four benchmark exposure levels specified as (1) lethal, (2) immediately dangerous to life and health, (3) the RMP endpoint required by EPA, and (4) a level considered to pose no serious adverse effects to the public. The ammonia levels corresponding to the four benchmark criteria were assumed to be 2,000 parts per million (ppm), 500 ppm, 200 ppm, and 75 ppm, respectively. The distances to these levels were calculated, as well as the concentration level at the nearest fence line.

The calculated worst-case distance to reach the 2,000 ppm level was approximately 554 feet; 500 ppm - 1,280 feet; 200 ppm - 2,205 feet; and 75 ppm level - 4,100 feet. The closest distance between the ammonia tanks and the east property boundary of the Wallula Power Project is 400 feet and occurs next to an unoccupied area of the J.R. Simplot Company feedlot. The concentration at this distance was estimated to be 3,330 ppm. The nearest J.R. Simplot Company building where workers might be exposed is over 2,640 feet (0.5 mile) from the ammonia storage tanks.

The Screen3 Model was used to estimate the dispersion (rather than the EPA's RMP Comp Program dispersion estimates) because Screen3 allows various shapes and heights of the containment dike to be modeled and calculates the distances to various concentrations rather than just the RMP endpoint.

Ammonia Tanker Truck Unloading Spill. The potential impact of the release of aqueous ammonia from a tanker truck accident was also modeled by the applicant using EPA's Screen3 Model. The following assumptions were made.

- The truck capacity was 6,000 gallons (maximum truck size used by ammonia suppliers for the project).
- A wind speed of 1.5 meters per second and F stability were used to model the worst-case scenario.
- The ammonia was released at ground level through the 1-square-meter opening to the containment area.
- The tanker bulk temperature was assumed to be 100° F.
- The entire contents of the truck would be spilled in the truck unloading area.
- The unloading area was 27 feet by 67 feet, sloped and diked to confine any spills in that area.
- The drainage system is designed to collect the spilled ammonia into an underground sump tank below the truck offloading area.
- The spilled ammonia would directly enter a drain to the sump.
- Only the drain opening would be exposed to the atmosphere.
- The sump is designed to contain 110% of the 6,000-gallon spill plus the rainfall of a 100-year, 24-hour rainstorm.

Ammonia emissions from a spill contained within the enclosed sump area were computed using EPA methods (RMP Guidance for Consequence Analysis, April 1999). The results indicated that the concentration of ammonia would be approximately 525 ppm at the closest (east) property line. The 75 ppm level would be reached at about 1,224 feet from the sump, and the 200 ppm RMP endpoint would be reached within about 690 feet.

Ammonia Feed Piping System Failure. This scenario involved the release of aqueous ammonia from the piping system for the ammonia feed system between the ammonia tanks and the combustion turbines/HRSGs. The following assumptions were made.

- The piping system for the ammonia feed system would be broken or severed, emptying the contents in the piping system. Additional aqueous ammonia would be pumped out of the piping until the ammonia feed pump would be shut down.
- The spilled ammonia would form a pool with a depth of 1 centimeter.
- The ammonia would evaporate from the pool.
- The entire contents of the piping system (0.5-inch diameter piping with a length of about 1,000 feet) would be released in addition to the volume released over a 5-minute period before the ammonia pump (at a pumping rate of 1.5 gallons per minute) was shut off.
- The amount of ammonia released for this case would be approximately 18 gallons – 10 gallons from the piping system plus 8 gallons resulting from pump operation.
- The resulting pool size would be 73.4 square feet with a diameter of 9.7 feet.
- The EPA's RMP Comp was used to estimate the ammonia release rate.
- A worst-case scenario (F stability, 1.5 meters per second wind speed, and an ambient temperature of 100° F) was modeled.
- Aqueous ammonia was released at a height of 1 meter with an emission flux of 3.36 gm/sec/m^2.

The Screen3 Model was used to estimate ammonia concentrations at various distances. For the worst-case situation, the distance to reach the 2,000 ppm level was approximately 690 feet; 500 ppm – 1,604 feet; 200 ppm – 2,800 feet; and 75 ppm – 5,265 feet.

Gasoline/Diesel. The gasoline and diesel oil storage tanks for fueling facility vehicles would be located above ground in a concrete-floored area with concrete curbing or dike whose enclosed volume would exceed the volume of the tanks within the diked area plus a freeboard of 10%. Any overflow rainwater would be drained through oil/water separators to a detention pond. The diesel fuel and gasoline storage tanks would comply with relevant regulations and codes. All tanks would be steel and would be tested for leak tightness before any oil/gasoline is introduced into them.

Oil/gasoline unloading lines from the delivery trucks and oil piping to the oil-containing equipment would be tested for leaks before being placed in service. Pressure relief valves would be installed as required by code to protect the systems from being over pressurized. Oil/gasoline tank level indicators, visible from the delivery truck or filling position, would reduce the likelihood of overfilling the tanks. Delivery hose connections would be clearly identified with a valve and pipe cap to secure the pipe when not in use. Curbed drip areas or other oil/gasoline collection devices would be located under the fill connections to contain any spills of oil/gasoline left in the hoses as they are disconnected from the fill pipe. All drains from oil/gasoline areas would pass through an oil/water separator.

Chemicals. Table 3.16-1 lists the chemicals that would be used at the plant. Chemicals that are either corrosive or toxic would be stored inside containment berms in accordance with building standards. Piping used to convey chemicals from their respective storage sites to points of use in the generation plant would be in areas protected by dikes, in protected piping byways above ground, or in concrete encased piping below ground.

SPCC Plan. Spillage prevention and control measures for diesel fuel oil, gasoline, lubricating oil, boiler and water treatment chemicals, and resins would be documented in a spill prevention, control, and countermeasures plan developed prior to commencement of operations. This will show storage, detention, and response procedures for all chemicals on site.

Radioactive Materials

Some radioactive sources could be used for quality control purposes during maintenance of the generation plant. Examples of these uses may include X-ray sources for evaluating weld quality. No releases of radioactive materials would occur during any of these uses. The radiation levels of these devices and their use, storage, and application would comply with all applicable regulations (e.g., Chapter 246-243 WAC).

Water Pipeline

Risk of Fire and Explosion

The makeup water supply pipeline would be buried from the generation plant to the source of the water supply. No risk of explosion or fire would exist along this pipeline.

Releases or Potential Releases of Hazardous Materials to the Environment

Small quantities of hazardous materials such as lubricants would be used along the makeup water supply pipeline during maintenance, as required. None should be used during normal operations. The potential for environmental impact should be low.

Some radioactive sources may be used for quality control purposes during construction of the water supply pipeline. Examples of these uses may include X-ray sources for evaluating weld quality. No releases of radioactive materials would occur during any of these uses. The radiation levels of these devices and their use, storage, and application would comply with all applicable regulations (e.g., Chapter 246-243 WAC).

Transmission Line and Associated Facilities

Risk of Fire and 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 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. There should be no 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 Walla Walla and Umatilla Counties could be called upon.

The Smiths Harbor Switchyard would be completely enclosed by a locked fence. Access would be limited to authorized personnel. The switchyard would be covered with crushed rock, and no combustible vegetation would be located within the fenced area. The risk of a major fire should be low because the switchyard would not contain large oil-filled equipment.

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.

The Smiths Harbor Switchyard would contain six coupling capacitor voltage transformers, each containing about 47 gallons of non-PCB oil.

Electric and Magnetic Fields

Background. Electric and magnetic fields (EMF) are produced by any device that consumes or conducts electricity, such as electrical transmission and distribution lines, lights, televisions and radios, shavers and hair dryers, electric blankets, computers, cellular phones, microwave ovens, and other appliances. All of the electrical wiring in homes and office buildings, for example, emits EMF when the power is on. The voltage on transmission lines conductors (wires) produces an electric field in the space between the conductors and the point of measurement.

Electric field strength for transmission lines is expressed in units of volts per meter (V/m) or kilovolts per meter (kV/m) at a height of 1 meter above the ground. The magnetic field is a function of the current flowing in the conductors. The magnetic field is expressed in milligauss (mG) and is also reported at a height of 1 meter above the ground. The strengths of the electric and magnetic fields associated with transmission lines generally decrease as the distance from the conductors increases.

Computed electric field values at the edge of the right-of-way, for a given line height, are fairly representative of what can be expected along the transmission line corridor. However, the presence of vegetation on or at the edge of the right-of-way can reduce the actual electric field strengths below the calculated values. The arrangement of the conductors on the transmission line towers can also affect the field strengths. The triangular arrangement proposed for the transmission line would reduce the EMF levels below corresponding levels for a horizontal arrangement. The presence of other transmission lines can also affect the field strengths, producing higher or lower values.

Regulatory considerations. There are currently no national standards in the U.S. for 60 Hz EMF. Oregon's formal rule in its transmission line siting procedures specifically addresses field limits. The Oregon limit of 9 kV/m for electric fields is applied to areas accessible to the public (Oregon 1980). The Oregon rule also addresses grounding practices, audible noise, and radio interference. Oregon does not have a limit for magnetic fields from transmission lines. The State of Washington does not have guidelines for EMF from transmission lines.

Bonneville has established an electric field strength standard of 9 kV/m maximum on the right-of-way and 5 kV/m at the edge of the right-of-way. Bonneville has also set maximum allowable electric field strengths of 3.5 kV/m and 2.5 kV/m for shopping center parking lots and commercial/ industrial lots, respectively. All Bonneville lines are designed and constructed in accordance with the National Electrical Safety Code (NESC). The NESC specifies the minimum allowable distances between transmission lines and the ground or other objects. These requirements help determine the width of the right-of-way.

Electrical Shock. Transmission lines, as the electrical wiring in a home, can cause serious electric shocks if precautions are not taken in their design, construction, and operation. Transmission lines can induce voltages onto objects near the lines. This transference can lead to nuisance shocks when a voltage is induced onto something like a wire fence installed near the transmission line. However, should a shock hazard develop, simple grounding techniques can eliminate the problem.

Health Effects. Everyone is exposed to varying levels of EMF. Concern regarding the possible health effects of such exposure has led to extensive research. Research in EMF and human health has historically focused primarily on the existence of a cause-andeffect association between EMF and cancer, and on the possibility that a biological mechanism may exist by which EMF exposure can cause cancer. None of the proposed biological mechanisms has held up under additional testing, and laboratory studies in living animals do not show that EMF can cause cancer.

Following their evaluation of scientific literature available through 1998, the National Institute of Environmental Health Sciences (NIEHS) concluded that the majority of animal studies provide evidence that EMF does not cause cancer or promote cancer in exposed animals. They further concluded that the literature does not provide a basis to conclude that EMF affects cancer (NIEHS 1998).

The question of power lines and cancer arose because epidemiological studies (i.e., studies of disease occurrence in people) had reported a link between EMF and some kinds of cancer. This link is a statistical association that derived from study results indicating that a higher incidence of cancer occurred among children who had lived closer to certain types of power lines or who were exposed to higher estimated magnetic fields (Savitz et al. 1988, Wertheimer et al. 1979, Feychting and Ahlbom 1993).

Because the meaning of these results was unclear, additional studies were undertaken. The subsequent studies did not produce convincing evidence of links between EMF and childhood cancer (e.g., Linet et al. 1997, Preston-Martin and Navidi et al. 1996, Preston-Martin and Gurney et al. 1996, Gurney et al. 1996, McBride et al. 1999, Kleinerman et al. 2000, UK Childhood Study Investigators 1999, Green et al. 1999a, 1999b). Studies of even higher exposures occurring in workplaces have not linked cancer with EMF overall, and have not shown strong, convincing links with any specific type of cancer (NIEHS 1998).

The U.S. Government has recently focused its efforts on the EMF Research and Public Information Dissemination (RAPID) program, which has included a number of whole-animal research studies, and the 1998-1999 NIEHS evaluation of scientific research cited above. The NIEHS reviewed epidemiological and laboratory research related to cancer, as well as noncancer endpoints.

Both epidemiology and laboratory studies are relevant for assessing possible effects of exposure on human health. Laboratory studies of animals conducted as part of the NIEHS program and results published after the NIEHS report provide no basis to conclude that EMF affects cancer; animals exposed for protracted periods did not develop more cancer than unexposed animals.

The NIEHS concluded that while EMF exposure "cannot be recognized as entirely safe," evidence for risk of cancer and other diseases was weak, and the probability that EMF exposure is a health hazard is small and "…insufficient to warrant aggressive regulatory concerns." NIEHS found a lack of consistently positive findings in animal or mechanistic studies. However, epidemiological studies raised concerns over childhood leukemia and adult chronic lymphocytic leukemia from occupational exposure to EMF. Because everyone is exposed to EMF and because the epidemiological studies showed areas of concern, the NIEHS recommended continued research and passive regulatory action to reduce EMF exposure.

These conclusions regarding possible effects of EMF on humans are consistent with the information contained in the Assessment of Research Regarding EMF and Health and Environmental Effects prepared by Exponent and T. Dan Bracken (included as Appendix F of this EIS). That report also states that literature published to date has shown little evidence of adverse effects of EMF from high voltage transmission lines on wildlife and plants.

Project-Specific Field Strengths. The proposed 500 kV transmission line would be a three-phase, single-circuit line with the phases arranged in a delta (triangular) configuration. The maximum phase-to-phase voltage would be 550 kV, and the average voltage would be 540 kV. The maximum electrical current on the line would be 1,445 amperes per phase. This projection is based on Bonneville's projected normal system annual peak load with 2004 as the base year.

Each phase of the proposed 500 kV line would have three 3.30 centimeter (cm) diameter conductors (aluminum conductor steel-reinforced) arranged in an inverted triangle bundle configuration with 43.3 cm spacing between conductors. Voltage and current waves are displaced by 120° in time (one-third of a cycle) on each electrical phase. The horizontal phase spacing between the lower conductor positions would be 14.6 meters (m). The vertical spacing between the conductor positions would be 10.5 m. The spacing between conductor locations could vary slightly where special towers are used, such as angle points along the line.

Minimum conductor-to-ground clearance would be 10.7 m at a conductor temperature of 122°F (50°C), which represents maximum operating conditions and high ambient air temperatures; clearances above ground would be greater under normal operating temperatures. The average clearance above ground along a span would be approximately 13.7 m. At road crossings, the ground clearance would be at least 16.5 m. The 10.7 m minimum clearance provided by Bonneville is greater than the minimum required to meet the NESC (IEEE 2002). The final design of the proposed line could entail larger clearances.

Electric and magnetic field strengths were calculated by Bonneville. The calculated peak electric field expected on the right-of-way of the proposed line would be 8.8 kV/m or less, depending on the configuration. For average clearance, the peak field would be 6 kV/m or less. The largest values expected at the edge of the right-of-way of the proposed line would be 2.5 kV/m. The peak values would be present only at locations directly under the line, near mid-span where the conductors are at the minimum clearance.

For the proposed 500 kV line, the maximum calculated 60 Hz magnetic field expected at 1 m above the ground would be 249 mG. This field was calculated for the maximum current of 1,445 amperes with the conductors at a height of 10.7 m. The maximum field would decrease for increased conductor clearance. For an average conductor height of 13.7 m, the maximum field would be 173 mG.

Maximum fields under the proposed line in the configuration with no parallel lines would be less than these values. At the edge of the right-of-way of the proposed line, the calculated magnetic field for maximum current conditions is 73 mG for minimum conductor height and 63 mG for average conductor height. Fields at the edge of the right-of-way of the proposed line with no parallel lines would be less than these values. The field at the edge of the right-of-way adjacent to a parallel line would depend on that line. The magnetic field falls off rapidly as distance from the line increases. At a distance of 61 m from the centerline of the proposed line with no parallel lines, the field would be 10 mG for maximum current conditions.

Additional information on Bonneville's measures to address EMF concerns is provided in Section 3.17, Cumulative Impacts.

Natural Gas Pipeline

The natural gas pipeline would be designed, constructed, and operated by GTN. The pipeline would be operated under the guidelines and stipulations of the Federal Energy Regulatory Commission. The natural gas pipeline would be periodically inspected by GTN. The pipeline would not cross any active faults and would traverse relatively flat to rolling terrain with little possibility of landslide or other land movement.

The top of the pipeline would be buried 5 feet below grade to reduce the potential for farm equipment impact on the pipeline. Any repair or maintenance work would be performed to meet all applicable American National Standards Institute, American Society of Mechanical Engineers, and American Petroleum Institute standards. Maintenance or repair work on either the existing Chevron Products pipeline or the proposed natural gas pipeline would be coordinated and jointly inspected by both Chevron Products and GTN to ensure no damage to either pipeline would occur.

The natural gas pipeline would be constructed of high-strength ductile steel with minimum wall thickness of 0.350 to 0.375 inches. Hazardous materials would not be stored or used in the natural gas pipeline corridor during operations. Pipeline appurtenances at the compressor station would be contained within buildings or fenced areas. Bollards would be installed to prevent vehicular access to exposed natural gas pipeline valves or other facilities in critical areas. Access to critical areas would be controlled and limited to authorized personnel.

Releases or Potential Releases of Hazardous Materials to the Environment

Small quantities of hazardous materials such as lubricants would be used along the natural gas pipeline during maintenance, as required. None should be used during normal operations. The potential for environmental impact should be low.

Radioactive Materials

Some radioactive sources could be used for quality control purposes during maintenance of the natural gas pipeline. Examples of these uses may include X-ray sources for evaluating weld quality. No releases of radioactive materials would occur during any of these uses. The radiation levels of these devices and their use, storage, and application would comply with all applicable regulations (e.g., Chapter 246-243 WAC).

3.16.3 Impacts of Alternatives

3.16.3.1 Alternative Tower Height and Longer Span Design

It is possible that taller towers could reduce EMF field strengths at ground level.

3.16.3.2 Alternative Alignment near McNary Substation

The magnetic and electric fields from both of the alternatives would be comparable to or less than those from existing 500 kV lines in Oregon and Washington. The magnetic field at the edge of the right-of-way from the proposed line would be below the regulatory levels allowed in Oregon.

3.16.3.3 No Action Alternative

There are no risks to environmental health and safety associated with the No Action Alternative.

3.16.4 Mitigation Measures

No additional mitigation measures beyond those included as part of the project are recommended at this time.

3.16.5 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts to health and safety resulting from the construction, operation, and maintenance of the proposed project and the associated transmission facilities have been identified.