3.13 Health and Safety

A power plant could potentially increase risk to health and safety as a result of using hazardous materials and transmitting natural gas in an underground pipeline. However, the Energy Facility would be designed with attention to the reduction of potential hazards associated with its operation and meets or exceeds state and Federal safety standards in its components. Its design includes safety and emergency systems that would be included during construction to ensure safe and reliable operation of the proposed Energy Facility. Through continuous monitoring of process variables and a thorough maintenance program, safety and reliability would be further increased. Both electric and magnetic fields (EMFs) and noise would increase but would be within allowable limits.

This section discusses health and safety matters, including occupational health and safety; fuel management; use, handling, and storage of hazardous non-fuel substances; fire protection; electric shock hazard; EMFs; and noise. The affected environment is not described in this section because there are no activities currently ongoing at the site to which these issues apply. Rather, aspects of the proposed operations at the Facility are described, followed by a discussion of their potential impacts and mitigating measures.

The information presented in this section is based on the studies and analysis conducted for the SCA as amended by Amendments No. 1 and No. 2, filed with EFSC on July 25, 2003, and October 15, 2003, respectively.

3.13.1 Construction and Operation of Proposed Energy Facility

3.13.1.1 Occupational Health and Safety

A comprehensive occupational health and safety program would be implemented to protect workers during construction and operation of the proposed Facility. The health and safety program would meet Federal, state, and local health requirements.

If an accident occurred, Merle West Medical Center, located 35 miles from the Energy Facility site, and Bonanza Medical Clinic, located 3 miles from the site, could provide medical services. Life Flight of Oregon, located in Bend, provides helicopter and fixed-wing transport. By helicopter it is approximately 45 minutes from Bend to the Energy Facility site and Life Flight patients typically are taken to Merle West to be stabilized, then sent to Portland, Bend, or Medford for treatment. According to emergency medical service (EMS) personnel at Bonanza Medical Clinic, these facilities have adequate capacity to accommodate the proposed Facility during construction and operation (O’Keefe, 2002). The Bonanza Ambulance Service provides local response to calls for service. Klamath County Fire District #1 has the only state-certified HazMat response team and would respond to any hazardous material spill.

Health and Safety During Construction. During construction, a health and safety program would be implemented by the construction contractors, based on industry standards for accident prevention. At a minimum, the construction health and safety program would comply with Federal, state, and local health and safety regulations. Contractors involved with the proposed Facility would be required by contract to comply with the construction health and safety program. Key elements of the plan would include:

- Responsibilities of construction team and subcontractors
- Job site rules and regulations
- Emergency response procedures
- Safety inspections and audits
- Medical services and first aid
- Safety meetings, employee training, and communications, including the hazard communications program and a review of procedures when performing high risk tasks
- Personal protective equipment
- Standard construction procedures
- Accident investigation and reporting

Health and Safety During Operation. An employee health and safety program would be implemented for operations personnel. It would include regular employee education and training in safe working practices; communication of hazards in accordance with Federal, state, and local standards; accident incident evaluations; administrative health and safety procedures; emergency response; fire protection and fire response; and reporting and recordkeeping of safety performance data. Operations personnel would be provided with written safety guidance similar to that used at other project proponent facilities. A first aid station containing basic first aid equipment would be established at several locations around the Facility. First aid training would be required for operations personnel.

3.13.1.2 Fuel Management

Fuels used during construction would likely include diesel fuel and gasoline. These fuels would be stored in aboveground storage tanks located within secondary containment. The chemicals would be stored in drums and containers located inside construction storage trailers.

During operations, natural gas would be delivered from the existing PG&E GTN pipeline system through a 4.1-mile natural gas pipeline constructed from the Bonanza Compressor Station to the Energy Facility along the right-of-way of existing Klamath County roads. Natural gas would not be stored onsite.

Diesel fuel would be stored onsite for the diesel-fired fire water pump. The pump would be equipped with a diesel fuel tank of approximately 100 gallons that would be used for diesel fuel storage. The diesel-fired pump and fuel tank would be located inside a concrete spill containment berm sized to contain 110 percent of the fuel tank volume.

Diesel fuel also would be used for the backup generators at the water supply well system and would be stored in skid-mounted, double-walled, diesel fuel tanks. An interior tank would be located inside a rupture containment basin. The tanks would be located inside a concrete spill containment berm sized to contain 110 percent of the fuel tank volume. Each tank would hold approximately 2,150 gallons of diesel fuel. The diesel fuel storage tanks at the water supply wells would provide sufficient diesel fuel to accommodate operation of the water supply wells for up to approximately 37 hours on diesel fuel if necessary.

3.13.1.3 Hazardous Nonfuel Substances

Several hazardous materials would be used at the Energy Facility. The following list summarizes typical chemicals currently planned for use at the proposed Energy Facility:

- Lubricants: medium and heavy weight oil, light lubrication oil, generator lube oil, and combustion turbine lube oil
- Aqueous ammonia
- Water treatment chemicals: sulfuric acid, sodium hydroxide, EDTA, hydrazine, ammonia hydroxide, sodium hypochlorite, sodium bisulfite, sodium metabisulfite, sodium nitrite, organic phosphate, sodium phosphate, lime, soda ash, magnesium chloride, polymers, filter acid, and iron chloride.
- Cleaning fluids and detergents: solvents, Pen-7 surfactant, sodium hypochlorite, and nitrogen
- Hydrogen
- Carbon dioxide

3.13.1.4 Fire Protection

During construction and operations, facility workers would receive basic fire suppression training to address small fires that could be controlled and/or extinguished with rack hoses and fire extinguishers. If a fire exceeds the resources available, assistance from the Bonanza Rural Fire Protection District (RFPD) would be requested.

3.13.1.5 Electrical Shock Hazard

Power lines can cause serious electric shocks if they are not constructed to minimize the shock hazard. Also, high-voltage transmission lines can cause nearby ungrounded metal objects to become charged, such as wire fencing mounted on wooden fence posts that prevent the energy from discharging into the ground. Providing grounding for the charged objects solves this problem.

3.13.1.6 Electric and Magnetic Fields

Transmission lines constructed to connect the Energy Facility to the regional power grid would emit electric and magnetic fields. Background on EMF fields is provided in this section.

Background. Oscillating EMFs are invisible lines of force surrounding devices that carry or use electricity. These fields are present wherever electricity is used or distributed, not just from overhead power lines but from indoor wiring, household appliances such as television sets, toasters, hair dryers, and computers. All electrical devices generate EMFs. The earth itself has a naturally occurring steady-state EMF.

The strength of EMFs falls off rapidly (exponentially) with distance. People are much more likely to be exposed to relatively high levels from appliances in their homes than from power lines, especially since most power lines are built on dedicated rights-of-way that are, by their nature, unoccupied.

Electric fields are related to voltage and are measured in units of volts per meter (V/m). When a conductor is energized, an electric field exists around the conductor that is proportional to the energized voltage. The closer to the conductor, the higher the electric field. Magnetic fields are generated by the electric current flowing through the wire. When alternating current flows through a conductor, an alternating magnetic field is created around the conductor. Magnetic fields are measured in milligauss (mG). In the United States, most AC has a frequency of 60 Hertz (Hz); the EMFs created by AC are referred to as 60-Hz fields.

Throughout the home, the electric field strength from wiring and appliances is typically less than 10 V/m; however, fields of 10 V/m and higher can be found very close to electrical appliances. Average magnetic field strength in most homes (away from electrical appliances and home wiring, etc.) is typically less than 2 mG. Very close to appliances carrying high current, fields of tens to hundreds of mG are present.

Studies of Health Risk Associated with Electric and Magnetic Fields. Both electric and magnetic AC fields induce currents in conducting objects, including people and animals. These currents, even from the largest power lines, are too weak to be felt. Despite this, some scientists believe that these currents might be potentially harmful and that long-term exposure should be minimized. Hundreds of studies on EMFs have been conducted in the United States and other countries. Studies of laboratory animals generally show that these fields have no obvious harmful effects (COB Energy Facility, LLC, 2002).

Concern about health effects arose in 1979 when researchers looked at wired code classifications for residences and the incidence of leukemia (COB Energy Facility, LLC, 2002). The study resulted in a weak statistical link between proximity to power lines and childhood leukemia. Since the release of this study there has been a lot of effort to determine if this statistical link is reproducible and if there are any other human health effects from exposure to EMFs. The National Academy of Sciences reviewed more than 500 studies from a period of 17 years and issued a report in October 1996 which says that there is no conclusive evidence that EMFs play a role in the development of cancer, reproductive and developmental abnormalities, or learning and behavioral problems (NRC, 1996). An additional report issued May 4, 1999, by the National Institute of Environmental Health Science (NIEHS) came to the conclusion that the data showing the link between EMFs and cancer showed only marginal scientific support and concluded that aggressive regulation was not warranted. The report did recommend that attempts be made to minimize the exposure of the public to EMFs (NIEHS, 1999).

3.13.1.7 Noise

The Energy Facility site consists primarily of scrub brush with limited cattle grazing. There are no continuous noise sources in the project area. Intermittent noise includes traffic on local roads, agricultural activities, and distant overhead aircraft. Measurements reveal most noise occurs during the daytime; nighttime noise levels are low.

Noise Measurement and Terminology. To understand how the significance of noise impacts is determined, it is useful to understand how noise is defined and measured.

Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. There are several ways to measure noise, depending on the source of the noise, the receiver, and the reason for the noise measurement. Chapter 8, Glossary of Terms and Acronyms, defines the acoustical terms used in this discussion of noise.

In this discussion, some statistical noise levels are stated in terms of decibels on the A-weighted scale (dBA). Noise levels stated in terms of dBA reflect the response of the human ear by filtering out some of the noise in the low- and high-frequency ranges that the ear does not detect well. The A-weighted scale is used in most ordinances and standards, including the ODEQ standard. The equivalent sound pressure level (L_{eq}) is defined as the average noise level, on an energy basis, for a stated period of time (such as hourly).

In practice, the level of a sound source is conveniently measured using a sound-level meter that includes an electrical filter corresponding to the A-weighted curve. The sound-level meter also performs the calculations required to determine the L_{eq} for the measurement period. The following measurements relate to the noise-level distribution during the measurement period. The L_{90} is a measurement that represents the noise level exceeded during 90 percent of the measurement period. Similarly, the L_{10} represents the noise level exceeded for 10 percent of the measurement period.

Table 3.13-1 shows the relative A-weighted noise levels of common sounds measured in the environment and in industry for various sound levels.

Noise Regulations. OAR Chapter 340, Division 35, establishes statewide maximum permissible environmental noise levels for new commercial and industrial uses. The noise regulations apply at "appropriate measurement points" on "noise-sensitive property." The "appropriate measurement point" is defined as whichever of the following is farther from the noise source:

- Twenty-five feet toward the noise source from that point on the noise-sensitive building nearest the noise source; or
- That point on the noise-sensitive property line nearest the noise source.

"Noise-sensitive property" is defined as "real property normally used for sleeping, or normally used as schools, churches, hospitals or public libraries."

Residences are the only noise-sensitive property identified in the project area. Table 3.13-2 summarizes the applicable Oregon regulations.

The proposed Energy Facility may operate 24 hours per day and would generally represent a constant noise source.

Exemptions. Exemptions to the noise regulations (per OAR 340-035-0035(5)) are as follows:

- Sounds created by the tires or motor used to propel any road vehicle complying with the noise standards for road vehicles
- Sounds that originate on construction sites

- Sounds created in construction or maintenance of capital equipment
- Impulse noise regulated in OAR 340-035-0035(1)(d). However, gas turbines do not generate impulse noise.

Noise Emissions. Construction of the proposed Energy Facility is expected to be typical of other energy facilities in terms of schedule, equipment used, and other types of activities. The noise level would vary, depending on the construction phase. Construction of energy facilities generally can be divided into five phases in which different types of construction equipment are used: site preparation and excavation, concrete pouring, steel erection, mechanical, and cleanup. The specific equipment that would be used at the site is not known at this time. Based on similar construction projects, noise would be produced by a range of construction equipment, including light and heavy trucks, backhoes, bulldozers, graders, cranes, air compressors, welding machines, and power hand tools.

The primary operational noise sources anticipated with this Energy Facility are the CTG packages, the HRSG packages, the STG packages, and the air-cooled condensers. Secondary noise sources are anticipated to include the generator step-up transformers (GSUT), the HVAC systems, the boiler feed pumps (BFP), and the circulating water pumps (CWP).

Sensitive Receptors. The only noise-sensitive receptors in the vicinity are residences. The closest residences are on land controlled by the project proponent and would be kept vacant or razed if necessary to comply with ODEQ noise standards. Accordingly, the noise analysis focuses on the two closest residential receptors not controlled by the Facility. One receptor (R1), located about 6,700 feet to the southeast, has a direct line of sight to the Energy Facility. The other receptor (R3), with no line of sight, is located over the bluff about 5,700 feet away to the northwest. Noise-level measurements were conducted at these receptors—R1 and R3. These receptors are also referred to as monitoring locations M1 and M2, respectively. The receptors and the two monitoring locations are shown in Figure 3.13-1.

Ambient Noise Measurements. Representative nighttime L_{50} levels of 20.5 dBA were calculated for M1 by averaging L_{50} levels between 10:00 p.m. and 4:00 a.m. the nights of May 10, 11, and 12, 2002. Similarly, a representative nighttime L_{50} of 20 dBA was calculated for M2 by averaging L_{50} levels between 10:00 p.m. and 4:00 a.m. the night of May 16, 2002. The average L_{10} levels at M1 and M2 during those same periods were calculated to be 29 and 26, respectively. At M1, the L_{10} was between 3 and 20 dBA higher than the L_{50} during those same periods. The wide variation between the L_{10} and L_{50} is likely the result of residents dogs barking, and it was thought to be inappropriate to include such activity in the average L_{10} calculation[14].

To limit the effect of "outliers" on the L_{10}, the median difference between the L_{10} and L_{50} was used rather than the average. The median difference between the L_{10} and L_{50} during the averaging period is 7 dBA at M1, resulting in an L_{10} of 27 dBA. At M2, the median difference between the L_{10} and L_{50} is 4 dBA during the averaging period resulting in an L_{10} of 24 dBA. It should be noted that the L_{50} is the more restrictive noise criterion. The hours between 10:00 p.m. and 4:00 a.m. were the quietest hours of the night on an L_{50} basis. Averaging the L_{50} during the quietest hours results in data that do not emphasize either the noise peaks or

[14] Based on conversation between Mark Bastasch/CH2M HILL and Kerrie Standlee/Daly Standlee Associates.

unusual quiet, as required by Section 4.5.6 of the ODEQ publication titled NPCS-1: Sound Measurement Procedures Manual (1983).

3.13.2 Environmental Consequences and Mitigation Measures

Construction and operation of the proposed Energy Facility would not have a substantial adverse effect on health and safety. Various features would be built into the proposed Energy Facility, and operational practices adopted, to ensure that the Energy Facility would meet or exceed state and Federal safety standards in its components.

Impact 3.13.1. A natural gas leak could occur, posing a risk of fire.

Assessment of Impact. Natural gas could leak, posing a risk of fire. The proposed Energy Facility would include design features to reduce the chance of a natural gas leak, as well as prescribe measures to be taken in the event of a gas leak. The natural gas pipeline would be constructed in accordance with the requirements of the U.S. Department of Transportation as set forth in 49 CFR and OAR 345-24-060.

The natural gas pipeline would have a shutoff system to quickly shut down natural gas flow in the event of fire. In addition, PG&E GTN would have remote shutdown capability from its 24-hour operated gas control center in the event of excess flow conditions or other incidents.

Recommended Mitigation Measures. No measures beyond those included in the proposed Energy Facility are recommended.

Impact 3.13.2. Diesel fuel could leak from a storage container, posing a fire risk or possible contamination of soil.

Assessment of Impact. Diesel fuel storage of approximately 100 gallons for the diesel-fired fire water pump and approximately 4,300 gallons for the backup generators at the water supply well system would be provided. Diesel fuel could leak from the storage container, posing a fire risk and possible contamination of soil.

The proposed Energy Facility would include measures to reduce the risk of fire and to contain any spill to prevent contamination. Systems for fire prevention, detection, and control would be installed throughout the Facility's buildings and yard areas as required by the National Fire Protection Association (NFPA) and insurance requirements. Diesel fuel would be stored in areas designed to contain spills through berms, curbs, and other secondary containment features during construction and operation of the Facility. A spill prevention control plan would be in effect from the beginning of construction and continue throughout the life of the Facility.

Recommended Mitigation Measures. No measures beyond those included in the proposed project are recommended.

Impact 3.13.3. Aqueous ammonia spill could spill and/or ammonia vapor could be released to the atmosphere, posing a health risk.

Assessment of Impact. Aqueous ammonia solution would be stored in a 30,000-gallon aboveground storage tank. The design of the aqueous ammonia storage and handling subsystem would be done with careful attention to the goal of eliminating hazards associated with the use of ammonia. Nonetheless, ammonia could spill or ammonia vapor could be released to the atmosphere, posing a health risk.

The tank would be contained within a bermed area, and would be designed in accordance with applicable industry specifications. The tank would be equipped with a level gauge and would be monitored from the control room. The area for delivery of aqueous ammonia to the storage tank also would be bermed.

The spill prevention control plan, mentioned previously, would address the potential for an aqueous ammonia spill.

A material safety data sheet (MSDS) for aqueous ammonia would be available at the Facility. The MSDS would identify the appropriate procedures for handling the aqueous ammonia, which would be maintained and enforced by the Energy Facility manager or the manager's delegated safety coordinator.

Recommended Mitigation Measures. Hazardous materials would be stored in structures that meet the requirements of the Uniform Fire Code, Article 80. In addition, a Hazardous Materials Inventory Statement and a Hazardous Materials Management Plan would be written and filed with the Bonanza RFPD and Klamath County Fire District #1, which has a mutual aid agreement with the Bonanza RFD and has the only state-certified HazMat response team within the area.

Impact 3.13.4. Spills of other hazardous, nonfuel substances could occur, with the potential to harm people at the Energy Facility and in the surrounding area.

Assessment of Impact. Hazardous nonfuel substances could spill, with the potential to harm people in the Energy Facility and in the surrounding area.

The following measures would be taken to prevent and minimize the impacts of a spill of any hazardous, nonfuel substance:

- Management of hazardous substances would be conducted in accordance with applicable Federal, state, and local regulatory standards for public and occupational safety and health protection.
- Training would be provided to appropriate workers in materials handling and disposal.
- The storage and conveyance systems for liquid hazardous chemicals would be designed to prevent and contain spills through pumping and storage controls and secondary containment tanks.

Recommended Mitigation Measures. The recommended mitigation measures are the same as those proposed for aqueous ammonia.

Impact 3.13.5. A fire could occur at the Energy Facility, posing a threat to workers and nearby people and structures.

Assessment of Impact. A fire could occur at the Energy Facility, posing a threat to workers and nearby people and structures. To reduce the risk and consequences of fire, systems for fire prevention, detection, and control would be installed at the Energy Facility. These systems would meet local, state, and NFPA standards.

The main fire protection system would include a dedicated water storage system, hose stations, and fire water pumps. A portion of the raw water aboveground storage tank would be dedicated to the fire protection system. NFPA requires providing a 2-hour supply for the largest fire system demand plus a minimum 500-gpm rate.

The fire detection system would continuously monitor the Energy Facility, provide an indication of the location of fires, warn Energy Facility personnel, and activate the fire protection system. The combustion turbine enclosures would include carbon dioxide fire-extinguishing systems. Smoke detectors, heat detectors, manual alarm stations, and indicating devices would be installed throughout the Energy Facility. Portable fire extinguishers would be placed at key locations. Flammable materials would be stored in appropriate containers and cabinets.

Recommended Mitigation Measures. No measures beyond those included in the proposed project are recommended.

Impact 3.13.6. The high-voltage electric transmission line could cause electrical shocks directly and from induced charges.

Assessment of Impact. The high-voltage electric transmission line could cause electrical shocks directly and from induced charges. The electric transmission line would be designed so that induced currents resulting from the transmission line and related facilities would be as low as reasonably achievable. The project proponent would agree to a program that would provide reasonable assurances that fences, gates, cattle guards, trailers, or other permanent objects or structures that could become inadvertently charged with electricity would be grounded through the life of the line.

Recommended Mitigation Measures. No measures beyond those included in the proposed project are recommended.

Impact 3.13.7. Electric and magnetic fields would increase but would be well within allowable limits.

Assessment of Impact. EMF estimates were calculated for the proposed Energy Facility's 7.2-mile electric transmission line to obtain the maximum possible EMF strengths that would be produced. The maximum operating voltage is expected to be 550 kV. The nominal operating voltage would be 500 kV, and the normal operating voltage would be 540 kV. These estimates are computed at a height of 1 meter (3.3 feet) aboveground at midspan. The estimates also consider the maximum current per phase of 1,260 amps. There would be one three-phase circuit on the easement. The circuit configuration would be delta, which minimizes EMFs.

Figures 3.13-2 and 3.13-3 present the EMF estimates. Because the proposed electric transmission lines would be symmetrical (Figure 2-3), the EMF profiles on both sides of the line would be identical. The maximum magnetic field would be at the center of the easement and the maximum electric field would occur at 24 feet from centerline for the 138M tower and 20 feet from centerline for the 238M tower.

The allowable limit for electric field intensities for the state of Oregon is 9 kV/m at the peak. The maximum electric field for a line using the 138M tower is slightly above the peak, whereas the maximum electric field for a line using the 238M tower is below the peak.

Figure 3.13-4 shows that, based on the calculations, the electric fields would be 1.92 and 1.48 kV/m at the edge of the 154-foot easement for the 138M and 238M towers, respectively, for a minimum clearance at midspan of 33 feet.

Figure 3.13-5 shows that the maximum magnetic field for 1,260 amps flowing in each phase would be approximately 214 mG and 188 mG for the lines using the 138M and 238M structures, respectively. The maximum values would occur directly under the center phase. At 77 feet from the center of the line (or the edge of the planned easement), the magnetic fields would decrease to 45.9 mG and 36.7 mG for the lines using the 138M and 238M structures, respectively.

Based on the estimates, the EMFs would be well within allowable limits.

Recommended Mitigation Measures. No measures beyond those included in the proposed project are recommended.

Impact 3.13.8. Operation of the proposed Energy Facility could affect noise levels but would be within limits allowed by state statute.

Assessment of Impact. The modeling used to predict the Energy Facility's noise emissions during operation assumed a "worst case" scenario, with the Energy Facility operating under steady-state conditions at full capacity and with the combustion and steam turbines at base load and the air-cooled fans operating. After Energy Facility noise emissions were determined, modeling was performed to predict sound levels at the closest noise sensitive receptors—monitoring locations M1 and M2. This modeling also conservatively assumed environmental conditions that facilitate sound transmission.

Energy Facility

The Energy Facility sound level, with mitigation incorporated, would be 30.5 dBA or less at residences, as shown in Figure 3.13-1. This level would be the maximum sound level audible at the nearest residences during ideal sound propagation weather conditions. During most weather conditions and at the most times, the Facility sound level would be well less than 30 dBA and would not be audible at the residences.

Actual mitigation measures would be determined by the equipment manufacturers and suppliers. A barrier wall would be reserved as a contingency mitigation measure that would be installed in the event a noise exceedance is detected during Facility performance testing.

A sound level of 30 dBA is quite low; for comparison, a typical cooling fan on a desktop computer is 40 to 45 dBA at the operator's ears, and rustling leaves in a light breeze are generally louder than 30 dBA. Power plant noise is typically very steady in nature, with no extraordinary tones or impact type noises. The noise is similar to an idling car or a neighbor's air conditioning unit. The Energy Facility noise would tend to be a steady faint background noise source in the everyday noise environment to which people are exposed.

Electric Transmission Line

The corona discharge from high-voltage electric transmission lines is known to generate audible noise (often described as crackling or sizzling) under certain conditions. Noise from AC electric transmission lines would be at a maximum during periods of precipitation. Formulas have been developed by BPA and others to estimate maximum electric transmission line noise based on operational parameters and distance from the line. The general equation for AC electric transmission lines developed by BPA was used to estimate L_{50} noise levels under maximum conditions.

The estimated L_{50} electric transmission line noise under worst case conditions is presented for several distances in Table 3.13-3. The maximum L_{50} estimated at the closest residence would be 27 dBA. This would be much less than the L_{50} nighttime absolute limit of 50 dBA. The increase in noise over the existing nighttime average L_{50} of 20 dBA (as estimated at M2) would be less than 10 dBA. The electric transmission line noise level would be lower most of the time.

Water Supply Well System

Pumphouses would be designed to mitigate noise levels to less than 27 dBA at the nearest residence, which would be R8 (located approximately 3,500 feet away). The major noise generating equipment would be located in a fully enclosed and acoustically designed structure. In addition, submersible pumps would be used. Currently, acoustically designed enclosures capable of achieving 20 dBA at 3,000 feet are available.

An emergency generator would be located at the pumphouse site. It is likely that this generator would only run continuously if power was lost for a minimum of 7 days. The generator would probably also be run once monthly for 15 minutes during the day for maintenance and reliability. The emergency operation of the generator would be exempted from ODEQ's noise regulations because it is "emergency equipment not operated on a regular or scheduled basis." Scheduled operation of the emergency generator would be 15 minutes per month for maintenance and reliability. Operation would be limited to between the hours of 8:00 a.m. and 6:00 p.m. During these hours, the ambient noise levels are elevated from agricultural, transportation, or other activities and the generator noise level should not be a concern at the nearest residence 3,500 feet away. Scheduled operation would likely qualify for an exemption from ODEQ's noise restrictions as an "infrequent event" or exempted as "sounds created in construction or maintenance of capital equipment."

Recommended Mitigation Measures. Noise emissions from major equipment at the Energy Facility would be specified at an appropriate level to ensure the overall Energy Facility sound levels satisfy the noise criteria. Final selection of mitigation measures would be determined by the project proponent's engineer, equipment manufacturers, and suppliers prior to procurement. Noise mitigation is not recommended for the electric transmission line or the natural gas pipeline because noise from these facilities would not exceed any applicable ODEQ noise standard. A barrier wall would be reserved as a contingency mitigation measure that would be installed in the event a noise exceedance is detected during Facility performance testing.

Impact 3.13.9. Construction of the proposed Energy Facility could affect noise levels.

Assessment of Impact.

Energy Facility

Table 3.13-4 shows the loudest equipment types generally operating at a power plant site during each phase of construction.[15] The composite average or equivalent site noise level, representing noise from equipment, is also presented in Table 3.13-4 for each phase.

The Wright residence, the receptor closest to the site with a direct line of sight, would be more than 1 mile (6,700 feet) away (receptor position R1 in Figure 3.13-1). Table 3.13-5 shows the average or equivalent construction noise levels projected to the nearest residences from the Energy Facility site. These results are conservative because topography and other potentially attenuating factors are not included.[16] Average noise levels during construction activities would be between 35 and 46 dBA at R1 and between 37 and 48 dBA at R2.

Table 3.13-6 shows the maximum noise levels from construction equipment projected to the residences nearest to the Energy Facility site.

Noise generated during the testing and commissioning phase of the proposed Facility would not be substantially different from noise produced during normal, full-load operations. Starts and abrupt stops would be more frequent during this period, but on the whole they would usually be short-lived. The steam releases associated with these starts and stops should not be problematic because they would be vented through permanent vent silencers.

Electric Transmission Line

Noise from electric transmission line construction is represented by the site clearing and excavation, concrete pouring, and steel erection phases shown in Table 3.13-5. The closest receptor would be 3,000 feet from the electric transmission line. As with the Energy Facility construction noise, these estimates are conservative because divergence is the only attenuating mechanism taken into account. Depending on the construction activity, the noise level would range between 42 and 53 dBA. Table 3.13-6 shows the maximum noise levels from construction equipment projected to the nearest residences from the electric transmission line, which would range between 37 and 52 dBA.

Water Supply Well System and Water Supply Pipeline

Noise levels from construction equipment associated with the water wells, pumphouses, and water pipeline are anticipated to be similar to the levels presented in Table 3.13-6. The closest receptor would be located 0.7 mile away (Receptor R8).

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[15] Because specific data regarding the types, quantities, and operating schedules of construction equipment that would be used for the proposed Facility are not currently available, the DEIS analysis relies on research conducted by the EPA Office of Noise Abatement and Control and the Empire State Electric Energy Research Company, which have extensively studied noise from individual pieces of construction equipment as well as from construction sites of power plants and other types of facilities similar to the proposed Energy Facility. The use of these data, which are 21 to 26 years old, is conservative because the evolution of construction equipment has been toward quieter designs as the nation becomes more urbanized and the population becomes more aware of the adverse effects of noise.

[16] Topographic attenuation is expected to be significant at R2, which is over a bluff from the Energy Facility site. Because this factor is not accounted for in the analysis of construction noise in this exhibit, predicted construction sound levels at R2 and other receptors where the line of sight is blocked by terrain are likely overstated. Similarly, given the large distance to R1 (over 1 mile), atmospheric attenuation is expected to be significant. As with R2, because this factor is not accounted for in the analysis of construction noise in this exhibit, predicted construction sound levels at R1 and other distant receptors are likely overstated.

Natural Gas Pipeline

Noise levels from construction of the natural gas pipeline are anticipated to be similar to levels presented in Table 3.13-6.

Recommended Mitigation Measures. No mitigation measures are recommended because construction noise is exempt from state of Oregon noise regulations.

3.13.3 Cumulative Impacts

There are no other existing or proposed facilities in the vicinity of the proposed project that would produce typical industrial or urban sounds. The proposed Energy Facility would not lead to cumulative impacts to the health and safety of workers or the community.

3.13.3.1 Hazardous Materials

Some elements of the proposed Energy Facility could potentially increase risk to public health and safety. This includes the transmission of natural gas in an underground pipeline and use and storage of hazardous chemicals. Although safety features would be built into the proposed Energy Facility to reduce hazards to public health and safety, the risk of accidents could not be completely eliminated. However, the proposed Energy Facility is unlikely to contribute to a cumulative increase to risks to public health and safety because uses in the vicinity of the Energy Facility are limited to farming and forest use.

3.13.3.2 Electric and Magnetic Fields

The proposed Energy Facility would not create EMFs over the allowable state limit, so the project would not lead to a cumulative impact.

3.13.3.3 Noise

The proposed Energy Facility would be a new source of noise, but it would comply with Oregon's noise regulations. Land uses around the Energy Facility are devoted to farming and forest use, so it is unlikely that future development would occur that would cumulatively add to noise generation within the vicinity of the Energy Facility.