

4.17 Health and Safety

This section includes a discussion of both public health and safety and worker safety. The public health discussion focuses primarily on the human health risks from exposure to contaminants in air emissions produced by the existing and proposed activities at the Navajo Mine and FCPP including stack emissions, dust generation, and diesel particulate matter. The analysis considers the cumulative effects to human health from the 25 years of continued future operations. Other potential public health risks, including risks to public safety such as downed power lines, are also discussed. Public health and worker safety associated with hazardous materials and coal combustion, including the potential for public and worker exposure to hazardous wastes and hazardous materials is discussed in Section 4.15, Hazardous and Solid Wastes. A discussion of baseline levels of contaminants in air that could contribute to human health risks is included in Sections 4.1, Air Quality, of this EIS. A screening level risk assessment evaluating potential risk to sensitive receptors from diesel exhaust and a HHRA were conducted for the Project. The HHRA evaluated risk of inhalation of contaminations from stack emissions as well as from consumption of food and water within the deposition area.

The ROI for public health with respect to the FCPP is the 50-km radius air quality study area; for the Navajo Mine it is the existing Navajo Mine SMCRA Permit and Pinabete SMCRA Permit Areas plus a ½-mile buffer zone around the perimeter; and for the transmission lines it is the ROW plus a 1/2-mile buffer zone on either side. The ROI for worker safety and public safety is the FCPP's footprint, existing Navajo Mine SMCRA Permit and Pinabete SMCRA Permit Areas, and transmission line ROW plus a ½-mile buffer zone on either side.

4.17.1 Regulatory Compliance Framework

4.17.1.1 *Federal Regulations*

Surface Mining Control and Reclamation Act

SMCRA is the primary Federal law that regulates the environmental impacts of coal mining in the United States. SMCRA requires companies to obtain a permit to mine on Indian Reservations, Federal lands, or state lands in states that do not have a state run SMCRA program through OSMRE. Such permits include provisions to protect air and water quality. The protection of air and water quality in turn protects the public from exposure to contaminants which could impact public health.

Federal Mine Safety and Health Act of 1977

The Federal Mine Safety and Health Act requires that the U.S. Department of Labor's MSHA inspect all mines multiple times each year to ensure safe and healthy work environments for miners. In addition to setting safety and health standards for preventing hazardous and unhealthy conditions, MSHA's regulations establish requirements for:

- Immediate notification by the mine operator of accidents, injuries, and illnesses at the mine;
- Training programs that meet the requirements of the Mine Act;
- Obtaining approval for certain equipment used in gassy underground mines; and
- Requirements for the use of personal protective equipment (PPE).

MSHA is similar to the Occupational Safety and Health Act in intent and organizational purpose; however, MSHA is specific to mining operations.

Mine Improvement and New Emergency Response Act of 2006

This legislation amends the Mine Safety and Health Act of 1977 and contains a number of provisions to improve safety and health for miners working in America's mines. It requires mine-specific emergency response plans in underground coal mines, added new regulations regarding mine rescue teams and sealing of abandoned areas, requires prompt notification of mine accidents, and requires enhanced civil penalties.

In addition to this act, the Navajo Mine would also be required to comply with various parts of 30 CFR: Part 48, which outlines requirements for training and retraining of miners; Part 62, which addresses occupational noise exposure; and Part 77, which covers mandatory safety standards for surface coal mines.

Occupational Safety and Health Act (29 USC 651 et seq)

The Occupational Safety and Health Act allows the OSHA to issue workplace health and safety regulations. These regulations include limits on chemical exposure, employee access to information, requirements for the use of PPE, and requirements for safety procedures. The employees working at the FCPP and performing maintenance of transmission lines are covered under the Occupational Safety and Health Act, while mine workers are covered under MSHA.

Clean Air Act of 1970, 42 USC 7401 et seq, as amended 1990

The CAA passed by the Congress in 1970, and amended in 1990, authorized the EPA to establish NAAQS for pollutants known as criteria pollutants that threaten human health and the environment (40 CFR Part 50). Criteria pollutants include O₃, NO₂, CO, SO₂, PM₁₀, PM_{2.5}, and Pb. The CAA established two types of NAAQS:

- Primary standards to protect public health, including the health of “sensitive populations” such as individuals with respiratory conditions, children, and elderly.
- Secondary standards that set limits to protect the environment, including protection against “decreased visibility, damage to animals, crops, vegetation, and buildings.”

Additional detail regarding the NAAQS and the criteria pollutants including their impacts to health are included in Section 4.1, Air Quality. The ambient air quality standards are intended to protect the public health and welfare and specify the concentration of pollutants (with an adequate margin of safety) to which the public may be exposed without adverse health impacts. The standards are designed to protect those segments of the public most susceptible to respiratory distress (known as sensitive receptors). The Four Corners area, which includes the ROI, is designated attainment for all NAAQS.

Section 112 Hazardous Air Pollutants. Toxic air pollutants are those pollutants which are hazardous to human health or the environment but are not specifically covered under another portion of the CAA. These pollutants are typically carcinogens, mutagens, and reproductive toxins. The CAA of 1990 offers a comprehensive plan for achieving significant reductions in emissions of HAPs from major sources. The new law includes a list of 189 toxic air pollutants of which emissions must be reduced. HAPs is the Federal term for air toxics. HAPs can be emitted from coal combustion and operation of mobile equipment.

National Electrical Safety Code

The NESC is the industry-accepted safety standard for overhead and underground electric utility and communications utility installations. Adopted by most states and Public Service Commissions, the NESC covers electric supply and communication lines, equipment, and work practices employed by both public and private electric utility installations.

Subtitle D of the Resource Conservation and Recovery Act

The EPA published the Disposal of Coal Combustion Residuals from Electric Utilities final rule on December 19, 2014. The final rule regulates CCR as a RCRA Subtitle D solid waste. FCPP is required to comply with EPA's Final Rule, which provides specific deadlines for compliance. EPA issued minimum national criteria, including requirements for composite liners, groundwater monitoring, structural stability requirements, corrective action, and closure/post-closure care. The final rule includes air criteria to address the pollution caused by windblown dust from CCR units and requires owners and operators to minimize CCR from becoming airborne at the facility. The CCR rule (257.80) requires that operators adopt measures that will effectively minimize CCR from becoming airborne at the facility, including CCR fugitive dust originating from CCR units, roads, and other CCR management and material handling activities.

4.17.2 Affected Environment Pre-2014

4.17.2.1 *Navajo Mine*

Public health is affected when contaminants reach a receptor (human) in sufficient amounts to result in an adverse health outcome. Although the areas surrounding the Navajo Mine SMCRA Permit Area and the Pinabete SMCRA Permit Area are relatively remote, some residences lie within or immediately outside, but adjacent to the Navajo Mine Lease Area where humans could be exposed to contaminants from the mine. Currently, there are three houses within the Pinabete SMCRA Permit Area (DOI and BIA 2007). These residents would be relocated during the mining period.

Navajo Mine Site Access

All Navajo Mine operations are potentially accessible by members of the community and/or their domestic animals by various means. These means include authorized entry (e.g., mine tours, transit via public roads, regulatory inspections) or unauthorized entry (e.g., transit onto private roads, pedestrian encroachment, and vandalism). Public access roads allow access within the Navajo Mine SMCRA Permit Area and Pinabete SMCRA Permit Area. In addition to the North Plant Access Road (CR-6675), three public roads intersect the Navajo Mine Lease Area: Ramp 7 public access road, Table Mesa Road, and Burnham Road (BIA Road 3005 and Navajo Road N5082) (BNCC 2012h). For a more detailed description of land uses and public access roads in and around the Navajo Mine SMCRA Permit and Pinabete SMCRA Permit Areas, refer to Section 4.9, Land Use.

Various controls are in place both to prevent unauthorized entry or travel through the site and to direct authorized visitors away from hazardous mining activities. These controls include, but are not limited to, communication, site security, inspections, signage, audible alarms, fencing, barriers, site security, inspections, and training. Specific procedures up to and including road closures are implemented during blasting occurs close to the permit boundary or near public access roads.

NTEC regularly communicates with the community regarding operational changes that might affect the community (e.g., blasting notices in the local newspaper, consultations with Navajo Nation chapters and key stakeholders). NTEC manages a number of initiatives, or projects, including communication and consultation with the community to maintain awareness of changes and updates in mine activities (BNCC 2012a).

Most areas of the Navajo Mine have controlled access through fencing and security stations at the Navajo North and Area III Facilities. All authorized visitors must register at the respective mine security stations before entering mine premises and must receive MSHA 5000-23 hazard recognition training. NTEC has procedures in place for private vehicles, site tours, etc. For instance, vehicles are inspected and cannot enter without meeting proper safety criteria (e.g., working lights and brakes, onboard fire extinguisher, no flammable materials). Vehicles are tagged with color-coded numbered signs that correspond with the sign-in log and identify which designated areas they are allowed to enter. An experienced miner as defined by MSHA must escort all tours of mine property (BNCC 2012a).

If a vehicle deviates from designated areas, or other unauthorized access is observed, the observer is required to notify security and other appropriate mine personnel. To eliminate or minimize the risk from an unauthorized entry, protocols or procedures require shutdown of hazardous operations, such as aborting a blast, de-energizing rails, or shutting down rail or haulage operations, when unauthorized access has been observed.

The community uses a number of locations around the mine site as ingress and egress routes to other locations at uncontrolled public access roads. These roads are not subject to security check-in and verification of on-site access. To address this additional risk, various ground control measures (e.g., berms or barriers) minimize the potential for unauthorized entry into restricted areas. Security routinely patrols the mine site, intercepts unauthorized personnel, and escorts them back to the public access road. Also, as described above, all mine personnel are required to eliminate or minimize risks due to unauthorized entry as part of their safe work practices (BNCC 2012a).

Public Health Studies

The major public health risk associated with the Navajo Mine is exposure to mining-related emissions such as DPM from vehicles and fugitive coal dust.

The harmful constituents in these emissions are PM and DPM and their respective constituents. PM emissions that are regulated under the Federal CAA through the NAAQS include PM₁₀ and PM_{2.5} standards. In general, most particles with a diameter of 10 micrometers or less (PM₁₀) are trapped in a person's mouth, nose, and throat and do not reach a person's lungs. Fine particles (smaller than 2.5 micrometers in diameter [PM_{2.5}]) tend to reach the deepest areas of a person's lungs, where illnesses can originate. Generally, particulate emissions from mining and material handling operations are coarse and larger than 10 microns. Emissions from fuel-burning equipment such as vehicles engines are generally smaller—less than 2.5 microns (BNCC 2011d).

Most epidemiological studies which evaluate health outcomes from exposure to coal dust inhalation are related to occupational exposures while few are related to environmental exposure. A few targeted health studies have been performed within or near the ROI and are discussed below. These studies don't specifically relate health outcomes from coal dust inhalation but provide an overall picture of community health issues.

San Juan County, New Mexico's most recent Community Health Profile includes a comprehensive overview of health indicators including respiratory health (San Juan County 2010). This study found that San Juan County has a higher incidence of chronic lower respiratory disease comprised of chronic bronchitis, asthma, and emphysema compared to all of New Mexico or the rest of the United States. Another study found that elevated levels of O₃ in San Juan County were linked to incidence of asthma-related medical visits. This study found that San Juan County residents are 34 percent more likely to have asthma-related medical visits after 20 ppb increases in local O₃ levels (New Mexico Department of Health 2007).

Another study, whose study area also included the ROI, was undertaken to better understand the relationship between the perceived risk to respiratory health from ambient air quality and the risk presented by coal combustion inside of dwellings for cooking and heating. The study considered special exposures for vulnerable populations, and examined the relationship between coal combustion in homes in the Shiprock area (Shiprock residents have easy access to the low or no-cost coal which is made available to Navajo tribal members near Navajo Mine) and impacts on respiratory health.

The conclusion of the report states that the presence of two large coal-fired power plants near Shiprock may contribute to that risk, but results from this study suggest that the risk could be reduced by making relatively simple and inexpensive changes to methods of home heating (Bunnell et al. 2010). Although this study highlights the role of the home use of coal, the EIS analysis focuses more on the Project-related impacts to human health.

In-home coal burning is ingrained in Navajo cultural and is not a direct consequence of operation of the Navajo Mine. Coal used for home heating and cooking come from many sources throughout the Nation. MCo now implements and plans to continue implementing a permit system that limits the use and transport of coal from the community coal stockpile at Navajo Mine. In addition, MCo trains representatives from local chapter houses on the safe use and transport of coal and these representatives are expected to inform their respective communities on the safe practices. The training informs the participants on the safe home use of coal through inclusion of a video produced by Four Directions, and is conducted with participation of Northern Navajo Medical Center, Indian Health Services, and the Office of Environmental Health.

Worker and Public Safety Programs

Typical risks encountered at an industrial facility such as the Navajo Mine include exposure to dust, noise, heat stress, frostbite, lightning strikes, animal and insect bites, and chemicals, as well as the increased chance for accidents due to working directly with or in proximity to large equipment. At the Navajo Mine, implementation and enforcement of safety policies and procedures reduce risks to mine workers and the public are implemented within the mine area (Cardno ENTRIX 2012, BNCC 2012a).

NTEC and its mine operator's health and safety program provides a systematic and integrated approach to the management of health and safety issues. The program consists of evaluating risks, developing programs to eliminate or mitigate the risk, auditing the programs for effectiveness, and implementing improvements or changes to the program based on feedback from the audit process. The health and safety program is used as a tool for NTEC to manage health and safety risks and minimize health and safety impacts both on site and off site. Visitors coming on site for tours or inspections must attend a safety briefing and must wear a hard hat, steel-toed safety boots with metatarsal protection, reflective vests (or reflective coveralls or reflective safety shirt), and wrap-around safety glasses or safety glasses with side shields.

Based on health and safety risk assessments, safety protocols, MSHA regulations, and Navajo Mine policies and practices, all employees receive safety training applicable to their work area and level of risk. This training includes MSHA Part 48 training, which requires that any employee or contractor working on site for more than 5 days within a 12-month period must receive no less than 24 hours of training before being assigned to work duties. This training includes:

- *Self-rescue and respiratory devices* - instruction and demonstration in the use, care, and maintenance of self-rescue and respiratory devices, where applicable.
- *Transportation controls and communication systems* - instruction on the procedures in effect for riding on and in mine conveyances where applicable; the controls for the transportation of miners and materials; and the use of mine communication systems, warning signals, and directional signs.
- *Introduction of work environment* – includes a visit and tour of the mine, or portions of the mine that is representative of the entire mine. The method of mining or operation utilized shall be observed and explained.
- *Escape and emergency evacuation plans; fire warning and fire-fighting* - a review of the mine escape system, and escape and emergency evacuation plans in effect at the mine; and instruction in the fire warning signals and fire-fighting procedures.
- *Ground control; working in areas of highwalls, water hazards, pits and spoil banks; illumination and night work* - introduction to and instruction on the highwall and ground control plans in effect at the mine; procedures for working safely in areas of highwalls, water hazards, pits and spoil banks; the illumination of work areas; and safe work procedures during the hours of darkness.

- *Health* - instruction on the purpose of taking dust measurements, where applicable, and noise and other health measurements, and any health control plan in effect at the mine shall be explained. The health provisions of the Act and warning labels shall also be explained.
- *Hazard recognition* - recognition and avoidance of hazards present in the mine.
- *Electrical hazards* - recognition and avoidance of electrical hazards.
- *First aid* - instruction in first aid methods acceptable to MSHA.
- *Explosives* - includes a review and instruction on the hazards related to explosives.
- *Health and Safety aspects of assigned tasks* - instructions in the health and safety aspects of the tasks to be assigned, including the safe work procedures of such tasks, the mandatory health and safety standards pertinent to such tasks, information about the physical and health hazards of chemicals in the miners work area, the protective measures a miner can take against these hazards, and the contents of the mine's Hazard Communications program.

Annual refresher training (8-hour) is required after 1 year. By regulation, MSHA-approved instructors conduct all courses (BNCC 2012a, h, k).

All training is documented, and records are maintained on NTEC's LMS. The LMS captures the training title, date, and name of the attendee. If training is MSHA-required, such as the Part 48 annual refresher or Part 77 Certified Supervisor, then in addition to being input into LMS, each participant receives a Federal Form 5000-23 (BNCC 2012h).

4.17.2.2 Four Corners Power Plant

The primary human health risks associated with the FCPP come from the contaminants in air from stack emissions, gasoline or diesel burning equipment, dust from coal handling operations or other dust generating activities. The human health risks from these emission sources may impact the public either from direct inhalation of the air or from other pathways such as ingestion of fish, plants, or water that have been exposed to the above-mentioned emissions. Past and present impacts to public health from emissions from FCPP are discussed in Section 4.18, Cumulative Impacts.

Hazardous materials that are flammable or toxic are handled and stored at the FCPP. A discussion of these chemicals and the risks they pose is included in Section 4.15, Hazardous Waste and Solid Wastes.

FCPP Site Access

The area surrounding the FCPP is relatively remote, with few small towns and no large populated areas in proximity. The total area of the FCPP site including ancillary facilities is 3,597 acres. A more detailed description of land uses in the area is included in Section 4.9, Land Use. The FCPP is a secure facility with a fence and controlled access on all sides. Entrance is via a gated entrance with a guardhouse. The FCPP has 24-hour security, and public access is prohibited except in the case of visitors who must have safety orientation training, wear proper PPE, and show proper identification (BNCC 2012h, Cardno ENTRIX 2012).

Worker and Public Safety Programs

Typical risks encountered at an industrial facility such as the FCPP include exposure to dust, noise, heat stress, falls, electrical shock, and chemicals. Safety policies and procedures in place at the FCPP are designed to reduce these risks.

The APS safety program is designed to follow a proactive plan to create a safety culture whereby employees are expected to work safely and are empowered to make the decisions and take the actions necessary to work safely. This goal is accomplished by delegating and communicating stop work authority to all personnel, including contractors. Documented safety procedures are coupled with a requirement to perform documented pre-job briefs on each job and a Job Hazard Analysis as needed.

Required safety training is completed in numerous areas to ensure employees have the knowledge necessary to work safely. Safety performance observation is used as a means of developing meaningful data to develop trends to assist with setting training requirements and to ensure written safety procedures are followed. The observation process also provides a venue for employee engagement to help build positive safety habits. APS also has an accident/incident investigation process to aid in determining causes of any incidents as well as to establish measures to prevent recurrence of an incident (BNCC 2012h).

The Dust Control Plan for Four Corners Steam Electric Station contains procedures and contact information for public complaints regarding fugitive dust. Attachment III, Detailed Plant Areas and Activities, Section 6, Safety and Communications, provides contact information for reporting incidences of fugitive dust emissions from FCPP off-property and potentially affecting the public. The CCR rule (257.80) requires that operators adopt measures that will effectively minimize CCR from becoming airborne at the facility, including CCR fugitive dust originating from CCR units, roads, and other CCR management and material handling activities.

4.17.2.3 Transmission Lines

Potential risk to humans from the transmission lines is from electromagnetic fields (EMF) exposure, electrocution from power lines, induced currents, and hazards to small aircraft from overhead power lines.

Transmission Line Site Access

For the Four Corners-Moenkopi and Four Corners-Cholla transmission lines, APS does not hold easements or access rights outside the transmission line ROWs. Access to the transmission line ROWs is achieved exclusively through the use of public roads. Access to the transmission line ROWs is generally open to the public unless access is restricted by the landowner; APS does not restrict access to the transmission line ROWs. In the ROWs, access to the lines and towers is generally achieved through the use of unpaved roads. APS does not perform regularly scheduled maintenance to roads within the ROWs. If access roads do not exist due to terrain constraints, maintenance crews use foot access or helicopters to access the transmission lines. The public is excluded from coming near the transmission lines due to the distance between the transmission lines and the ground. These distances are mandated by the NESC (APS 2012d).

For the Four Corners-San Juan and the Four Corners-West Mesa transmission line ROWs, PNM has obtained easements from landowners for the construction, operation, and maintenance of the transmission lines, but PNM does not own the land underlying the ROWs. Public access to land underlying the transmission line ROWs is determined by the landowner, which in this case includes private individuals, private businesses, tribes, and government agencies. Some sections of the ROWs are publically accessible, while others are restricted by choice of the landowner. At the point where transmission lines enter the boundary of a power plant or switchyard, access is restricted in accordance with facility security requirements (PNM 2012).

Electric and Magnetic Fields

Magnetic and electric fields are separate phenomena that occur naturally and as a result of human activity. Human-induced fields occur over a broad electrical and electromagnetic spectrum and are generated by communications equipment, appliances, and the generation, transmission, and local distribution of electricity. Both electric and magnetic fields are produced when transmission lines are energized. The strength of the electrical field is directly correlated to voltage, and the strength of the magnetic field is dependent on current. Both electric and magnetic fields attenuate rapidly with distance from the source. In addition, electric fields associated with transmission lines are dampened by most objects, such as trees or houses, which shield receptors; however, magnetic fields are not easily shielded by objects or materials. As a result, the primary concern regarding potential health effects associated with EMF from transmission lines is related to magnetic fields. Extremely low frequency (ELF) fields include

AC fields and other electromagnetic, non-ionizing radiation from 1 to 300 Hz. ELF fields at 60 Hz is produced by power lines, electrical wiring, and electrical equipment.

In 1992, Congress authorized the development of the Electric & Magnetic Fields Research and Public Information Dissemination Program, or EMF-RAPID. Congress instructed the National Institute of Environmental Health Sciences (NIEHS) to review the information presented by EMF-RAPID and prepare a response. NIEHS created the EMF-RAPID website and prepared a report titled *Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields* (NIEHS 1999). This report summarizes the evidence on health risks from ELF-EMF and makes recommendations to protect the public health.

The report discusses the discrepancy between the findings from epidemiological studies and laboratory studies and the significance of the discrepancy. Epidemiology is the study of the patterns, causes, and effects of health and disease conditions in defined populations. Epidemiological studies have serious limitations in their ability to demonstrate a cause and effect relationship whereas laboratory studies, by design, can clearly show that cause and effect are possible.

As discussed in the report, the strongest evidence for health effects from ELF-EMF comes from associations observed in human populations or epidemiological studies with two forms of cancer: childhood leukemia and chronic lymphocytic leukemia in occupationally exposed adults. While the support from individual studies is weak, the epidemiological studies demonstrate, for some methods of measuring exposure, a fairly consistent pattern of a small, increased risk with increasing exposure that is somewhat weaker for chronic lymphocytic leukemia than for childhood leukemia.

In contrast, the studies conducted in a laboratory or controlled setting and the animal toxicology literature fail to demonstrate any consistent pattern across studies although sporadic findings of biological effects have been reported. No indication of increased leukemia in experimental animals has been observed. Virtually all of the laboratory evidence in animals and humans and most of the mechanistic work done in cells fail to support a causal relationship between exposure to ELF-EMF at environmental levels and changes in biological function or disease status.

The lack of consistent, positive findings in animal or mechanistic studies weakens the belief that this association is actually due to ELF-EMF, but it cannot completely discount the epidemiological findings. The lack of connection between the human data and the experimental data (animal and mechanistic) severely complicates the interpretation of these results.

In the recommended action section of the report, the NIEHS states:

“The NIEHS suggests that the level and strength of evidence supporting ELF-EMF exposure as a human health hazard are insufficient to warrant aggressive regulatory actions; thus, we do not recommend actions such as stringent standards on electric appliances and a national program to bury all transmission and distribution lines. Instead, the evidence suggests passive measures such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures. NIEHS suggests that the power industry continue its current practice of siting power lines to reduce exposures and continue to explore ways to reduce the creation of magnetic fields around transmission and distribution lines without creating new hazards.”

Research over several decades by national and international panels is inconclusive regarding potential public health risks from exposure to power line EMF. The existing data do not provide sufficient evidence to conclude that EMF causes cancer. No EPA or New Mexico State guidelines or regulations relate to EMF levels from electrical transmission lines, and no defined or adopted NEPA standards define health risk from EMF.

Non-EMF

The following non-EMF power field issues are associated with electrical transmission lines: interference with radio, television, and electronic equipment; interference with cardiac pacemakers; and induced currents and shock hazards.

Interference with Radio, Television, and Electronic Equipment

Electric fields associated with transmission lines do not generally interfere with electronic equipment in homes or businesses because the equipment is shielded by building walls. However, magnetic fields are able to penetrate building walls and, therefore, have the potential to interfere with electronic equipment. The degree of interference by magnetic fields is dependent on the sensitivity of the equipment. PNM and APS have no record or knowledge of complaints involving interference with radio, television, or electronic equipment associated with the transmission lines (APS 2012d). If a complaint were received, it is routed to the appropriate department for assessment and investigations are conducted on a case-by-case basis (APS 2012d, PNM 2012).

On June 12, 2009, over-the-air analog television broadcasts ceased, and all over-the-air broadcasts converted to digital broadcasts. These digital broadcasts are assigned to the UHF band, which is the frequency range not affected by transmission line noise due to the noise attenuation at these higher frequencies. Thus, digital television will not experience the interference problems that analog television had the potential of experiencing.

No specific limits on high-frequency emissions from electric power facilities have been developed. However, the Federal Communications Commission has promulgated regulations specifying that transmission lines be operated such that no harmful interference is produced (Federal Communications Commission Regulations, Section 15.25).

Interference with Cardiac Pacemakers

The electrical fields associated with transmission lines have the potential to interfere with cardiac pacemakers. Two general types of pacemakers exist: asynchronous pacemakers, which pulse at a predetermined rate; and synchronous pacemakers, which pulse only when the sensing circuitry of the device determines that pacing is necessary. Asynchronous pacemakers are generally immune to interference because they do not have sensing circuitry and are relatively uncomplicated. Synchronous pacemakers can be affected by electrical fields between 2 and 9 kV per meter, which may cause an erroneous signal in the pacemaker's sensing circuitry, but prolonged asynchronous pacing is not considered a significant concern.

Induced Currents and Shock Hazards

The magnetic fields generated by transmission lines can induce currents and voltages in conductive objects such as metal fences, automobiles, and metal roofs or buildings that are close to and run parallel to the transmission line. The induced currents in these objects can result in a small electrical shock or a perceptible current when contacted by humans or animals. These small shocks are a nuisance, but do not cause physiological harm. The magnetic field level is a function of the current level in the transmission line, which in turn is a function of the line loading.

Induced currents can also adversely affect pipelines located in the vicinity of and parallel to electrical transmission lines. Stray electrical currents, primarily AC, from overhead electrical lines can affect the integrity of pipeline coatings. No record of issues involving induced current or shock hazard complaints is associated with the PNM or APS transmission lines (APS 2012d, PNM 2012).

Risk to Small Aircraft

Power lines can be a risk to aerial agricultural applicators, aerial firefighters, and other small aircraft. Pilots familiar with the area and who know the location of the transmission lines have a decreased risk. Training for pilots, particularly those who work near power lines such as transmission line and pipeline patrol pilots, includes increasing their situational awareness for such hazards as power lines (Helicopter Association International 2009). Maps that include locations of power lines are also helpful in reducing risk. A review of the "Arizona Aeronautical Chart 2008," Arizona Department of Transportation, Aeronautics Division indicates the charts generally show the transmission line locations for the transmission lines associated with the Project. As discussed in Section 4.9, Land Use, Shiprock Airstrip and Farmington Regional Airport are the nearest airports to the ROI. In addition, APS and PNM transmission lines are constructed and maintained to comply with FAA rules and regulations for the protection of low-flying aircraft. Marker balls are in place as required by the FAA and increase the visibility of transmission lines for aircraft. The transmission line support structures are lower than the FAA height requirement for lighting or marking.

Worker and Public Safety Programs

Typical risks encountered when working on or near transmission lines include exposure to electrical shock, heat stress, and chemicals, as well as the increased chance for accidents due to falls and working directly with or in proximity to large equipment. For the transmission lines, implementation and enforcement of safety policies and procedures reduce risks to electrical workers and the public within the ROW. APS has a training program that includes employees who provide production and maintenance work on the transmission lines (2012d). Required safety training is completed in numerous areas to ensure employees have the knowledge necessary to work safely. Examples of some of the safety training topics include Fall Arrest Equipment Inspection and Storage, Fall Protection, Switchyard Entry, Fire and Emergency Evacuation, Hearing Conservation, Hazard Communication, and Ladder and Stairway Safety.

APS has a public safety program to reduce risks to the public and to property from activities on or near APS facilities (APS 2012d). The objectives of the APS Public Safety program are:

- Ensure public knowledge of and compliance with the applicable electrical safety laws, regulations, codes, and standards.
- Ensure that the public and first responders are made aware of the electrical hazards relating to activities on or near APS's electrical facilities.
- Ensure that all public safety-related incidents and activities are evaluated with respect to applicable laws, codes, regulations and standards and that timely consultation and recommendations are provided.
- Provide continuous input to administering bodies on the adequacy and applicability of codes related to APS's facilities.

To accomplish these goals, APS has a Public Safety Electrical Safety Outreach Program¹ that reaches out to the public to:

- Describe first response initial actions where electrical facilities are present.
- Identify the main components of transmission and distribution electrical systems.
- Describe the precautions for substation emergencies.

¹ APS Public Safety Electrical Safety Brochures in English can be accessed online at http://www.aps.com/_files/mktg/PublicSafety.pdf and in Spanish at http://www.aps.com/_files/mktg/PublicSafetySPAN.PDF

- Describe precautions for responding to electrical emergencies related to overhead and underground power lines and equipment.
- Describe the basics of electrical current and associated dangers.
- Describe the electrical precautions for first response in emergency situations.
- Identify the dangers of electrical equipment around trees and aerial equipment.
- Describe photovoltaic systems and safe operating procedures.

Similarly, at PNM, linemen for the transmission lines attend safety training sponsored by the PNM Safety Department biannually. Training subjects include the information in PNM Health and Safety Programs, which are included in Table 4.17-1.

PNM conducts various public safety activities and communications to inform and educate the public about the risks associated with transmission lines. They include annual press releases on topics such as holiday safety, spring safety, and Balloon Fiesta safety. A large power line safety press conference is held each year during the Balloon Fiesta kickoff. PNM also uses social media sites such as Facebook to distribute their safety information and uses EnergyWorks for outreach to the public regarding safety. Monthly bill inserts are also used to communicate safety messages. In addition, PNM's Engineering Department regularly communicates applicable NESC or National Electrical Code standards to customers/interconnectors. A link on the PNM.com website called "My Safety" addresses the following topics (PNM 2012)

- If power goes out
- Tree trimming and planting
- Household appliances
- Power lines
- Cords, outlets, and switches
- Kites
- Breakers and fuse boxes
- Thunderstorms and lightning
- Call before you dig

Table 4.17-1 Summary of Health and Safety Programs for the Four Corners Power Plant and Navajo Mine Energy Project

Program Title	Program Summary
<i>Navajo Mine Health and Safety Programs</i>	
Emergency Response Plan (NTEC Document HSEC-001)	The Emergency Response Plan is designed to provide a systematic method to effectively respond to an event that involves potential or actual injuries or impacts to the environment or community. These systematic methods are designed to further eliminate or minimize the risk of potential fatalities or serious environmental or community incidents.
Surface Fire Plan (NTEC Document)	During surface mining operations, fires are a risk when coal dust comes in contact with oxygen and an ignition source. The document's purpose is to outline the processes and procedures in place to eliminate or minimize the risk of incidents associated with a surface operations fire including coal fires in stockpiles and in the unmined coal seam. Procedures include fire prevention and risk awareness training requirements for workers and the location of onsite equipment for fire response or suppression, Response procedures in the event of a fire are also included in the Navajo Mine Emergency Response Plan,
Environmental, Health, Safety and Community Event Reporting (NTEC Document WIN-NMC-HSEC-006)	This work instruction provides a systematic method for defining, reporting, and investigating Health, Safety, Environmental, and Community events so that feedback into risk management and corrective and preventive actions can be accomplished at the Navajo Mine. All employees and contractors use this procedure to report events occurring at the Navajo Mine, following initial emergency response actions.

Program Title	Program Summary
Overburden Blasting Management (NTEC Document WIN-NCC-PRO-002)	Blasting agents and explosives are used at the Navajo Mine to expose the coal for mining. Overburden blasting includes the process of managing explosives from the purchasing stage through storage and use in the field and ultimately verification of successful blasts. Only trained, competent, and authorized employees and contractors must perform the transport, storage, and usage of explosives and initiating components in strictly managed and controlled environments for the security of explosive materials and protection of personnel. A more in-depth discussion of the handling and storage of these explosive materials is included in Section 4.15, Hazardous and Solid Wastes.
Pre-blast and Shot-firing Management (NTEC Document WIN-NCC-PRO-003 and WIN-NCC-PRO-004)	Pre-blast procedures detail the steps taken before setting off explosives. Shot-firing is the process of setting off explosives. Signs, blasting notice, sirens, berms, or physical barriers are used to prevent access to loaded blast areas. Additional precautions are taken when blasting occurs within 1,000 feet of mine lease boundary. Includes public access road closure requirements and procedures.
Contractor Management Program (NTEC Document PLN-NMC-COS-001)	The intent of this document is to provide an outline of the Contractor Management process and its core elements. These processes are intended to specifically decrease the commercial, health, safety, environmental, community, and legal risks that are present between two entities engaged in a business relationship.
Hazardous Materials and Hazardous Waste Management System (NTEC Document WIN-NMC-ENV-017)	The intent of this work instruction is to eliminate or minimize the risk of hazardous materials and hazardous waste incidents that could result in injuries and significant environmental events including spills or releases that could migrate off site. It also includes procedures to protect workers from exposure to hazardous materials and wastes. This document includes the policies and procedures for the proper storage, handling, and transportation of hazardous materials and hazardous waste at the Navajo Mine. The program includes Hazard Communication and Hazardous Waste Operations and Emergency Response training requirements, risk management procedures, a hazardous materials procurement system, spill prevention and response for offsite transportation of hazardous materials and wastes.
Personnel Protection Equipment (PPE)	PPE use is important because it is the last line of defense between an employee or visitor and a potential serious injury. The minimum PPE required on the work site is hard hat, steel-toed safety boots with metatarsal protection, reflective vests (or reflective coveralls or reflective safety shirt), and wrap-around safety glasses or safety glasses with side shields. Visitors coming on site for tours, inspection, etc., are also required to follow the minimum PPE standard. In addition to the minimum required PPE, specific tasks require additional PPE. Work which would expose workers to coal dust and inhalation hazards requires proper respiratory protection.
Navajo Mine Ground Control Plan (Document PLN-NCC-ENG-001)	This plan details the controls in place that protect personnel from the potential dangers of falls onto the ground at stockpiles, dam walls, waste rock dumps, trenches and similar locations.
Mine Site Traffic Management and Collision Avoidance (NTEC Document WIN-NMC-PRO-009)	Driving has the potential to cause accidents and injury. The intent of this document is to eliminate or minimize the risk of incidents associated with driving on site including driving on public roads within the mine site.
Surface Mobile Equipment Management with ATVs (NTEC Document PLN-NMC-PRO-001)	The intent of this program is the safe operation of ATVs to minimize the risk incidents associated with the use of surface mobile equipment.
Light Vehicle and Road Going Vehicle Management (NTEC Document PLN-NMC-PRO-002)	The intent of this program is to ensure that all Light Vehicle and Road Going Vehicles are maintained and operated safely.

Program Title	Program Summary
On-site Light Vehicle Safety (NTEC Document WIN-NMC-PRO-011)	The movement of large equipment during mining operations poses a risk to workers driving smaller vehicles. This document specifies the required safety features for light vehicles used at surface mine sites. The scope includes company- and contractor-owned light vehicles that access the site. Privately owned vehicles used for low-risk, off-site business travel are not covered.
Drivers Certification (NTEC Document POL-NMC-HSEC-001)	This policy's intent is to provide clarity on the requirements for driver certification criteria for all employees, contractors, and visitors.
Isolation Management (NTEC Document PLN-NMC-MTC-001)	Isolation management is designed to eliminate or minimize the risk of incidents arising from the uncontrolled release of energy or hazardous materials. Phases of work, tasks, locations, machinery, vehicles, and mobile equipment requiring a permit to work, or isolation of energy sources to safely perform work (including de-energizing stored energy), must be planned and managed to protect personnel from harm.
Lifting Management Program (NTEC Document PLN-NMC-MTC-002)	This program is designed to eliminate or minimize the risk of incidents arising from any operation concerned with the lifting, suspending, or lowering of a load with a crane. Competent employees and contractors must plan and manage lifting operations using fit-for-purpose equipment in a manner that minimizes the risk of injury to personnel or damage to facilities.
Working at Heights Management (NTEC Document PLN-NMC-MTC-003)	This program is designed to eliminate or minimize the risk of incidents arising from working at heights. Work at height must be minimized and managed where a potential exists to fall 2 meters or more, where a fall could result in a significant incident, or with a danger of dropped objects from the work being performed.
Isolation Locking and Tagging Procedures (NTEC Document WIN-NMC-MTC-011)	Failure to properly isolate energy sources and hazardous materials has the potential to be fatal or to result in serious long-term health effects. This document sets forth the process detail and technical requirements necessary for performing proper personal and group isolations, and applies to all activities on site, including contractor activities.
Pathogens and Viruses (NTEC Document WIN-NMC-IHH-002)	NTEC monitors for occupational health and hygiene exposures at the Navajo Mine. This process provides the data necessary for identifying and controlling industrial health and hygiene-related risks. A need for industrial health and hygiene monitoring is identified through risk assessment or regulatory requirements. This program is one of the programs developed to monitor health and safety exposures.
<p>APS Health and Safety Programs (Includes Four Corners Power Plant and APS owned and Operated Transmission Lines)</p>	
Fire Protection Plan	The purpose of the Fire Protection Plan is to ensure that FCPP has in place the appropriate procedures to minimize the occurrence of fires, quickly control fires that do develop, conserve property and minimize losses due to fires, investigate fire causes so as to prevent recurrence, and ensure the safety of plant employees.
General Safety	This section contains specific requirements, instructions, and guidelines for employees that establish safety expectations that help reduce accidents or close call events that may result in injury. Many of the requirements, instructions, and guidelines are derived from regulatory agencies such as OSHA or EPA.

Program Title	Program Summary
Tailboard Conferences	This section includes the guidelines and requirements associated with pre-job tailboard conferences. The tailboard conference is used to identify and communicate a job's critical elements to the workers involved so that safety is provided for employees as well as the public. Human error related accidents typically occur when one or more individuals involved in the performance of a work assignment fail to fully understand or recognize certain elements of that work.
Personal Protective Equipment (PPE)	APS has conducted hazard assessments of all job categories to evaluate the potential for injury to various body parts and to determine the necessary PPE and clothing to protect against those injuries. This section contains the requirements for employees for use of PPE, devices, and clothing.
Hazardous Materials	This program contains specific requirements, instructions, and guidelines for employees purchasing and using hazardous chemicals. This information is made available to workers through training, access to Material Safety Data Sheets, and container labeling.
Waste Management	<p>APS has various written programs for the proper handling of various types of waste that is generated:</p> <ul style="list-style-type: none"> • Universal Waste Compliance Plan (ENV-FC03-CMP-D3-14) • Solid Waste Compliance Plan (ENV-FC03-CMP-D3-3) • Conditionally Exempt Hazardous Waste Management (EFO S1FEC) • Recycling Scrap Metal & Electronic Waste (ENV-FC03-CMP-D3-21) • Biohazardous and Medical Waste (ENV-FC03-CMP-D3-16) • Dust Control Plan for Four Corners Steam Electric Station
Tools and Rigging	This program contains specific requirements, instructions, and guidelines for employees purchasing and using hand and power tools.
Confined Space	A confined space is a space that is large enough for a person to enter the space and perform work and has a limited or restricted means for entry or exit. This program contains specific requirements, instructions, and guidelines for employees conducting activities within confined spaces.
Digging Operations	This program contains specific safety requirements, instructions, and guidelines for employees conducting digging operations.
Mobile Equipment Fleet and Shop Safety	This program contains specific safety requirements, instructions, and guidelines for employees operating APS's motor vehicle fleet and mobile equipment.
Work Zone Safety	This program contains specific safety requirements, instructions, and guidelines for employees who work outdoors. Outdoor works includes, but is not limited to performing survey work to establish ROWs, digging holes to set poles, or walking through alleyways and easements to set or read meters.
Transmission and Distribution Clearance Procedure and Switching Orders	This program contains specific requirements, instructions, and guidelines for employees for Transmission & Distribution Clearance Procedure & Switching Orders.
Grounding	A ground is a conducting connection between an electric conductor or equipment and earth or to some conducting medium that serves in the place of earth. Grounding is important to protect from accidental energizing of the system, induced voltage, and accidental contact with an energized line, lighting, and static electricity. This program contains specific safety requirements, instructions, and guidelines for employees for grounding.

Program Title	Program Summary
Transmission/Distribution/Substation Work Practices	This program contains specific safety requirements, instructions, and guidelines for all electrical distribution and transmission personnel. These requirements, instructions, and guidelines are also applicable to personnel from other departments or divisions engaged in distribution or transmission work. These requirements, instructions, and guidelines have been compiled to help prevent electrical contact or accidents during the construction or maintenance of overhead or underground circuits and substations.
Welding Safety	This program contains specific safety requirements, instructions, and guidelines for employees involved in welding.
Work Involving Helicopters	This program contains specific safety requirements, instructions, and guidelines for employees involved in helicopter work.
Vegetation Management	This program contains specific safety requirements, instructions, and guidelines for employees in vegetation management or doing any other work required maintaining a clear ROW for our electric lines. This section's intent is to provide safe working rules in an effort toward accident prevention. It is not possible to list all hazards that might be encountered, but the use of these specific requirements, instructions, and guidelines, together with good judgment and common sense, will ensure a safe operation.
Emergency Action Plan (EAP) for the Lined Ash Impoundment (LAI) and the Lined Decant Water Pond (LDWP) at the Four Corners Power Plant	This EAP is a formal document that identifies potential emergency conditions that could develop at the LAI and LDWP, provides a plan for communication of the conditions, and specifies preplanned actions to be followed to minimize property damage and loss of life. This EAP also provides procedures and information to assist the owner in issuing early warning information of the emergency situation to responsible emergency management authorities.
<i>PNM Transmission Line Health and Safety Programs</i>	
Fire Protection Program	PNM obtains wildfire information by monitoring media reports and websites for active fire monitoring maintained by multiple Federal and state agencies. PNM monitors government agency websites for fire restrictions and closures and coordinates critical maintenance with agencies during forest and public land closures. PNM also receives email notices from agencies such as the USFS and New Mexico Department of Homeland Security and Emergency Preparedness regarding prescribed burns. In the event of fire danger to a transmission line, the company would dispatch field crews to work with fire incident managers, and could prepare for loss of a line by de-energizing the transmission line and redispatching generation on its system to manage the flow of power on its system. PNM would also be in contact with the Western Electric Coordinating Council Reliability Coordinator if fire conditions impact reliability of PNM's transmission system.
Emergency/Rescue Procedures	This program includes the emergency response and rescue procedures for PNM's transmission lines.
Safety Communication – radio and pre-job safety tailboards	PNM's policy requires employees to perform safety tailboards at every job each day. Records of these safety meetings are maintained on site.
Proper Use of Line Trucks and Mechanical Equipment	This program contains specific safety requirements, instruction, and guidelines for employees using line trucks and mechanical equipment.
Trenching and Excavation	This program contains specific safety requirements, instructions, and guidelines for employees involved in trenching and excavation.
Overhead Power Pole Framing, Setting, or Removal	This program contains specific safety requirements, instructions, and guidelines for employees involved in overhead power pole, framing, setting or removal.

Program Title	Program Summary
Working in Energized Areas	This program contains specific safety requirements, instructions, and guidelines for employees working in energized areas.
Common Electrical Practices Including Lockout/Tagout	This program includes the procedures for locking out and tagging equipment before maintenance procedures and other safety related practices for working around electrically charged equipment.
Switching, Grounding, Tagging, and De-energizing	This program contains specific requirements, instructions, and guidelines for employees for grounding.
Fire Prevention Equipment and Protection	The program lists the fire protection equipment available in the event of a fire. It also includes procedures for fire prevention.
Material handling including toxic materials	This program includes handling, storage, labeling, and disposal requirements for various materials including toxic or hazardous materials used by PNM. A discussion of the use of and location of Material Safety Data Sheets is also included.
Vegetation management	This program includes procedures and safety measures needed when cutting trees and other types of vegetation management.
Protective clothing and equipment	This program address the risk associated with certain work processes and identifies the PPE necessary to protect workers.
Proper use of tools	This program details the proper safety precautions required for working with various tools.
Confined space	This program details the proper safety precautions required for working in confined spaces.
Proper use of barricades to protect crews and or the public	This program details the proper use of barricades to protect crews and the public.

Sources: APS 2012d, BNCC 2012k, PNM 2012.

Transmission Line Safety Features

APS's 345-kV transmission lines were constructed in 1961 and the 500-kV line in 1966, in accordance with the NESC in force at the time. The NESC was prepared to protect public safety by requiring designing facilities with adequate strength to prevent or minimize failures, and to provide safety through separation, either vertical or horizontal, between the energized transmission lines and the public. NESC specifies that power lines be kept specific distances from nearby objects—including trees. NESC requires greater clearances for higher-voltage lines. For the same safety reasons, transmission line ROWs are wider than for local distribution lines. The transmission lines are constructed and maintained to comply with FAA rules and regulations. Marker balls are present on the 500-kV line at Towers 1/3, 72/1, and 179/1; marker balls are present on the 345-kV lines at Towers 1/2, 3/1, 1/4, 4/1, and 139/1.

APS maintains all transmission lines to ensure safety and reliability. Two types of inspections, aerial and climbing, are performed on the 500-kV and 345-kV transmission lines at different intervals. Aerial inspections are performed annually by helicopter to identify any immediate public safety issues. Climbing inspections are carried out every 7 years and involve a close visual inspection of each tower, tightening of hardware and repairs as needed. The lines are also inspected any time a power line trip occurs or if emergency repairs are required due to fire or lightning. The transmission lines are monitored and protected by a system of protective relays in the substations. The relays monitor the current and voltage and are programmed to rapidly de-energize the line if a line failure or other abnormal condition occurs. For example, if a conductor breaks, the protective relay system would de-energize the conductors and protect the public or emergency first responders from coming in contact with energized electrical lines. This protective relay system would also de-energize the transmission line in the event of an electrical overload to prevent damage to the conductors.

The height of the conductors above the ground is based on NESC and Western Electricity Coordinating Council standards and is a minimum of 29 feet. The minimum conductor vertical clearance dictates the exact height of each tower structure, based on topography and requirements for safety (APS 2012d).

PNM transmission lines were constructed over 40 years ago in accordance with the NESC in force at the time. PNM has no documents that specifically refer to other national standards used at the time of construction. However, typical practice would have been to reference various American National Standards Institute standards for the purchase of materials (e.g., treated wood poles, porcelain insulators, aluminum conductor steel reinforced conductors), which would take into account material strengths for planned uses.

The existing transmission line relays are a combination of microprocessor-based, electronic, and electromechanical design. The typical clearing time to interrupt a fault, which is the sum of the relay operating time and breaker operation time, is between 3 to 4 cycles (0.05 to 0.067 second) (PNM 2012).

Incidents Due to Wind and Earthquakes

Transmission line structures can be damaged or fail due to natural forces such as wind and earthquakes. Failure of transmission line support structures is relatively rare and is typically due to anomalous loading conditions such as tornadoes or ice storms. Structural failure can present a physical hazard to public safety and can disrupt electrical service.

The transmission lines have been designed and built based on design codes that specify loading requirements related to wind conditions. Transmission line towers are not designed for seismic loadings because wind and ice loads produce greater forces on the structures than seismic events. Engineering calculations account for high wind conditions but do not typically consider earthquakes as transmission line structures are discrete highly flexible structures that are relatively light and would tend to move with the earth's surface. No failures related to extreme weather conditions have occurred on the APS or the PNM transmission lines (APS 2012d, PNM 2012).

Incidents Due to Fire

During Project operation, the most significant fire hazard is electrical arcing from overhead transmission lines. Electrical arcing occurs primarily in lower-voltage distribution lines that are generally strung closer to the ground and closer to trees or other types of vegetation. The fire hazard potential associated with arcing from high-voltage transmission lines is low due to greater clearances between the trees and other vegetation and the overhead transmission lines. Greater clearances are also accomplished by requiring a wider ROW for higher-voltage transmission lines. Following are descriptions of APS's and PNM's Vegetation Management Plans (APS 2012d, PNM 2012).

APS removes and prunes vegetation to provide access to the lines and structures and minimize the potential for fire damage. Routine vegetation maintenance involves the cyclical treatment of vegetation approximately every 5 to 10 years utilizing mechanical, manual, and herbicidal treatments. Vegetation may be cleared within the entire permitted ROW width, including clearing around poles, guy wires, anchors, and towers. On rare occasions vegetation maintenance outside the routine cycle is required to address emergencies or imminent threats to the transmission line's performance. Vegetation maintenance activities are sensitive to resource (cultural) and plant and animal species concerns. APS conducts aerial helicopter patrols of the transmission lines 1 to 3 times per year to identify potential problem areas, to plan maintenance schedules and to monitor effectiveness of treatment. Ground patrols may be required to follow up on any identified problem areas (APS 2012d).

PNM conducts yearly inspections of each structure on each transmission line and conducts maintenance as needed. Visual and physical inspections include vehicle (passenger and all-terrain vehicle), pedestrian, and aerial surveys. Vegetation management is conducted in accordance with the PNM Transmission Vegetation Management Plan and includes hand-cutting, mechanical clearing, and use of herbicides.

Vegetation maintenance usually occurs every 4 to 5 years in pinon-juniper and forested areas and every 2 to 3 years in riparian areas (PNM 2012).

4.17.3 Changes to Public Health and Safety Affected Environment Post-2014

Two completed Federal Actions have been incorporated into the baseline for this analysis: (1) the EPA has made its ruling with respect to BART to control air emissions; and (2) OSMRE has approved the SMCRA permit transfer from BNCC to NTEC (Section 2.4). These completed Federal Actions are considered part of the environmental baseline to which the impacts of continuing operations and the Proposed Actions are compared in the following section. The EPA BART determination reduces the emissions of all air contaminants from FCPP, including any hazardous air pollutants. These reductions are quantified in Section 4.1, Air Quality. Public Health impacts from the on-site storage, handling, and transportation of ammonia reagent are discussed in Section 4.15, Hazardous and Solid Wastes.

4.17.4 Environmental Consequences

This section provides an analysis of potential environmental impacts on worker safety and public health that could occur under the Proposed Action and alternatives. The impact assessment includes both short-term and long-term impacts. At the Navajo Mine SMCRA Permit and Pinabete SMCRA Permit Areas, short-term impacts could occur during construction activities and mining operations and may persist through the reclamation phase. Long-term impacts are those that would persist beyond or occur after reclamation. For the FCPP and transmission lines, short-term impacts are those that could occur immediately following approval of the lease renewals, plus the period of time associated with an increase level of work activity (i.e., a total of about 5 years). Long-term impacts are impacts that would persist beyond or occur after the 5-year period including post-closure of the FCPP.

The analysis for worker safety focuses on occupational hazards within the workplace. In typical industrial occupational settings, compliance with various policies, programs, and procedures mandated by MSHA and OSHA are used to protect employees. The impact assessment methodology for worker safety includes identification of the risks associated typical work activities encountered by employees working at the Project and a review of the adequacy of occupational safety programs to protect those employees. Risks encountered at an industrial facility such as the Navajo Mine, FCPP, and the transmission lines include exposure to dust, noise, heat stress, electrical hazards, chemical hazards, hazards associated when working above ground, below ground and in confined spaces, as well as the increased chance for accidents due to working directly with or in proximity to large equipment or automobiles and energized systems.

The analysis for public health focuses primarily on the human health risks from exposure to contaminants in air emissions produced by the proposed activities at the Navajo Mine and FCPP. These activities include burning coal (stack emissions), operating gasoline and diesel fired equipment (diesel particulate matter), and coal excavation and handling (fugitive dust). Other public health risks including risks to public safety are considered, but are expected to be small in comparison. Public health risks associated with hazardous materials, including the potential for public exposure to hazardous wastes, hazardous materials, or CCR is discussed in Section 4.15, Hazardous and Solid Wastes.

When assessing health impacts from air emissions, two different sets of criteria are used. One criterion is used for criteria pollutants and another is used for toxic air contaminants. The term, "criteria air pollutants," refers to those pollutants that are pervasive around urban or industrial environments including coal mining and power plants and for which health-based or national ambient air quality standards have been established. The term, "hazardous air pollutants," refers to those pollutants that occur at relatively low concentrations and are associated with carcinogenic and other adverse health effects, but for which no ambient air quality standards have been established. Below is a discussion of the two criteria:

- **Criteria Pollutants.** The impact assessment for public health is based on whether the levels of criteria pollutants would cause an exceedance of NAAQS in the Project Area. The EPA regulates the criteria pollutants by developing human health-based criteria (science-based guidelines) for

setting permissible levels. Criteria air pollutants include O₃, CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and Pb. Most of the criteria pollutants are directly emitted. O₃, however, is a secondary pollutant that is formed in the atmosphere by chemical reactions between NO_x and ROGs (reactive organic compounds). The significance criteria for identifying a public health concern associated with the criteria pollutants are the NAAQS (See Table 4.1-1 in Section 4.1.1.2, Air Quality for further discussion on NAAQS). The four-state region (New Mexico, Colorado, Arizona, and Utah), which includes the ROI, is in attainment area for all criteria pollutants. For particulate matter (PM₁₀ and PM_{2.5}), the EPA (2009a) has noted that toxicity associated with exposure to airborne particulate matter can vary by particulate matter composition with the implication that the NAAQS for particulate matter may not be health protective in all cases. This concern is addressed in the public health analysis of this section as it pertains to fugitive coal dust emissions.

- **HAPs.** Section 112 of the CAA Amendments of 1990 identifies 188 pollutants as HAPs, the Federal term for air toxics. HAPs can be emitted from coal combustion and operation of mobile equipment. Mobile sources associated with operations in Navajo Mine SMCRA Permit and Pinabete SMCRA Permit Areas include diesel-powered draglines, loaders, coal haul trucks, support vehicles, and explosives detonation. Mobile sources associated with the FCPP include materials handling equipment, maintenance equipment, and support vehicles. The dominant fuel used for mobile sources at the Navajo Mine SMCRA Permit and Pinabete SMCRA Permit Areas and FCPP is diesel fuel, also referred to as distillate fuel oil no. 2, along with some gasoline. DPM, which is emitted from diesel-powered equipment, is considered a carcinogenic air toxic (DOI and BIA 2007) and is addressed in this section.
- **Analytical Approach.** Three types of predictive modeling studies were conducted to evaluate impacts to public health: 1) a screening health risk assessment was performed to evaluate the risk to sensitive receptors from diesel exhaust (diesel particulate matter); 2) a model of fugitive dust emissions for comparison to particulate matter NAAQS; and 3) a model of human health risk from FCPP stack emissions. Fugitive dust emission results for Navajo Mine SMCRA Permit and Pinabete SMCRA Permit Areas activities were also evaluated using a risk assessment process focused on coal dust constituents. The results of the risk assessment processes are numerical estimates of health risk that are compared to target health risk goals established by government and public health agencies.

4.17.4.1 Alternative A – Proposed Action

Navajo Mine

Worker Safety

Under the Proposed Action, no new work processes that might introduce new or increase existing safety risks to on-site workers are proposed. The existing safety programs for the Navajo Mine SMCRA Permit Area would be expanded to incorporate the Pinabete SMCRA Permit Area. Existing health and safety programs comply with MSHA health and safety regulations associated with the work activities at the mine and therefore adequately address the associated risks of the Permit Areas; therefore, impacts on worker safety from the Proposed Actions at the Navajo Mine SMCRA Permit Area and Pinabete SMCRA Permit Area would be negligible.

Public Health

Public receptors within the Pinabete SMCRA Permit Area include three houses which would be permanently relocated as a result of Project implementation. The location of public receptors beyond the Pinabete SMCRA Permit Area and within the ROI are shown in Section 4.1 (Air Quality) as Figure 4.1-1.

The air pollutant of primary public health concern associated with the Proposed Action at the Navajo Mine SMCRA Permit Area and Pinabete SMCRA Permit Area is fugitive dust containing PM₁₀. PM₁₀ and PM_{2.5}

emission sources include blasting, overburden removal, coal extraction, transport, and handling, and general operation of mine vehicles and equipment. Operation of mine vehicles and equipment also produces emissions of other criteria pollutants, mainly CO, SO₂, NO_x, and VOCs.

Criteria Pollutants

Ambient air modeling found that fugitive dust emissions would not cause a measurable change in ambient PM₁₀ or PM_{2.5} concentrations in San Juan County, New Mexico. San Juan County is currently in “attainment” status, and ambient air quality does not regularly exceed the NAAQS. In part, to assess whether compliance with these NAAQS is protective of health for sensitive populations, an alternative risk analysis was also applied to particulate matter whereby coal dust metal concentrations in PM_{2.5} were estimated using metal concentrations for Navajo Mine coal reported by Bunnell et al. (2010) and assuming PM_{2.5} concentrations were equal to the primary NAAQS for PM_{2.5} of 12 µg/m³. Excess cancer risks and hazard quotients were calculated using EPA (2013) residential air regional screening levels (RSLs) as toxicity benchmarks.

The risk analysis for PM_{2.5} shows that the metals present in Navajo Mine coal and likely to be present in fugitive dusts at the primary NAAQS for PM_{2.5} of 12 µg/m³ would not pose an unacceptable risk to public health. As shown in Table 4.17-2, all excess cancer risks are less than the target risk level of 1 x 10⁻⁶ and all hazard quotients are less than the target hazard quotient of 1 for residential exposures. The Proposed Action would result in the same levels of O₃ precursor emissions as the existing operations. Therefore, no substantial adverse public health consequences from criteria air pollutants would occur for the Proposed Action and the NAAQS are an appropriate significance criterion.

Table 4.17-2 Risk Analysis for PM_{2.5} Assuming Navajo Mine Coal Metals Composition for Fugitive Dust Emissions

Element	Coal Composition (mg/kg)	Air Concentration (µg/m ³)	RSLc (µg/m ³)	RSLnc (µg/m ³)	Risk	Hazard Quotient
Antimony	0.512	6.1E-06	NA	2.1E-01	NA	2.9E-05
Arsenic	0.272	3.3E-06	5.7E-04	1.6E-02	5.7E-09	2.0E-04
Beryllium	0.807	9.7E-06	1.0E-03	2.1E-02	9.7E-09	4.6E-04
Cadmium	0.021	2.5E-07	1.4E-03	1.0E-02	1.8E-10	2.5E-05
Cobalt	2.57	3.1E-05	2.7E-04	6.3E-03	1.1E-07	4.9E-03
Lead	9.76	1.2E-04	NA	1.5E-01	NA	7.8E-04
Manganese	10.0	1.2E-04	NA	5.2E-02	NA	2.3E-03
Mercury	0.016	1.9E-07	NA	3.1E-01	NA	6.2E-07
Nickel	2.21	2.7E-05	9.4E-03	9.4E-02	2.8E-09	2.8E-04
Selenium	1.70	2.0E-05	NA	2.1E+01	NA	9.7E-07

Notes:

Chromium was not evaluated because EPA has not derived an RSL for trivalent chromium, the form of chromium expected to be present in naturally occurring bituminous coal.

- NA = not applicable
- RSLc = residential air regional screening level for carcinogenic effects.
- RSLnc = residential air regional screening level for noncancer effects.

Hazardous Air Pollutants

The population living in the vicinity of the mine is widely dispersed, and the impacts of mining are relatively short-term at any particular location, which suggests that public health impacts from operation of diesel-powered equipment have been, and would continue to be minimal. To confirm this, a screening health risk assessment was performed as part of the air quality analysis. Below is a summary of the results of the screening HRA for the Navajo Mine SMCRA Permit Area and Pinabete SMCRA Permit Area.

Diesel Particulate Matter or DPM, which is part of a complex mixture that makes up diesel exhaust, is considered a HAP by the EPA. At the mine, larger and more persistent sources of DPM could potentially present a health risk to nearby sensitive receptors. An example of this situation would be mining operations where large diesel-powered equipment and vehicles are used in active areas for extended lengths of time such as months or a year.

In order to evaluate this potential risk, a screening-level HRA for DPM was performed using conservative methodology (EPA 1992b) for maximum mining activity levels and timeframes against the target risk levels. The actual impacts would be lower than these model results; because the conservative model found that the DPM emissions were within the target risk levels, no attempt was made to refine the analysis with lower, more realistic, exposure values. Results of the screening HRA are presented in Table 4.17-3 for two scenarios:

1. *Alternative Case 1.* Two years coal extraction and loading operations in Area IV; activity in same general location (zone) impacting a receptor 0.5 mile (1,600 meters) away; DPM emission rate of 28 pounds per day; wind blowing from source toward receptor 30 percent of the time (diurnal pattern).
2. *Alternate Case 2.* Same as above, but 1 year duration.

Table 4.17-3 Diesel Particulate Matter Health Risk Assessment

DPM Screen Parameter	Units	Alternate Case 1	Alternate Case 2
Onsite Emission Rate	lb/day g/sec	28 1.47E-01	28 1.47E-01
Receptor Distance	meters	800	800
Modeled Hourly Concentration	µg/m ³	8.1	8.1
Corrected Annual Concentration	µg/m ³	0.81	0.81
Unit Risk Value (70-year MEI)	(µg/m ³) ⁻¹	3.00E-04	3.00E-04
Chronic Reference Exposure Level	(µg/m ³)	5	5
Activity Duration	days	730	365
Wind Direction	frequency	0.30	0.30
Exposure Correction ¹	fraction	8.6E-03	4.3E-03
Cancer Risk	probability per million	2E-06 2	1E-06 1
Significance Threshold	probability per million	1E-06 – 1E-04 1 - 100	1E-06 – 1E-04 1 - 100
Noncancer Hazard Quotient	unitless	0.16	0.16
Noncancer Hazard Threshold	unitless	1	1

Note:

¹ Exposure Correction is 2 years/70 years times 0.3.

AERSCREEN, the screening version of the AERMOD dispersion model developed by the EPA (2011c), was used to determine worst-case ambient concentrations of emissions. For DPM, an organic air toxic with published emission factors and unit risk values (OEHHA 2009), cumulative cancer risk was determined for the nearest receptors for working periods of 2 years and 1 year. The nearest receptor which would not be relocated, is approximately 0.5 mile from the Pinabete SMCRA Permit Area boundary and would be 0.9 mile (approximately 1,448 meters) from the proposed mining operations. Thus, the 70-year unit risk value for DPM was corrected to reflect these actual lengths of time. AERSCREEN predicts “worst case” 1-hour, 3-hour, 8-hour, 24-hour, and annual concentrations – without the need for site-specific hourly meteorological data – that are equal to or greater than generated by AERMOD; however, the degree of conservatism varies depending on the application.

The results of the screening HRA show that the risk due to inhalation of DPM at the receptor is estimated to be about 2 in a million for the first alternative case, and about 1 in a million for the second alternative case. These risk estimates fall well within the EPA’s National Contingency Plan risk range for making risk management decisions (40 CFR Part 300). The noncancer hazard quotient of 0.16 is less than the noncancer hazard threshold of 1. Therefore, the results of the analysis indicate that impacts of particulate emissions during mining would not pose a health risk to sensitive receptors (e.g., residents) located downwind of the mine.

Four Corners Power Plant

Worker Safety

Under the Proposed Action, the SCR installed on Units 4 and 5 would require the transportation and storage of ammonia and lime at the FCPP. Depending on the type of ammonia used, regulatory requirements exist for the storage, use, and transportation. These requirements and potential impacts of exposure to ammonia are evaluated in Section 4.15 and determined to be minor under the recommended and selected urea form of ammonia. No other new work processes that might increase safety risks to on-site workers are proposed. Existing health and safety programs comply with MSHA and OSHA regulations and are adequately implemented to address the associated risks of the FCPP; therefore, impacts on worker safety from the Proposed Action and the continued operation of the FCPP would be negligible.

Public Health

Criteria Pollutants

In addition to stack emissions, modeling of fugitive dust emissions from road traffic, materials handling, and mining operations determined that the Proposed Action would not cause local exceedances of NAAQS for PM₁₀ (respirable particulate) and PM_{2.5} (fine particulate). Attainment of primary NAAQS is protective of public health, including sensitive receptors, as described above under *Criteria Pollutants*; therefore, impacts in the short- or long-term operation of the FCPP are estimated to be negligible. (AECOM 2013d).

Hazardous Air Pollutants

Three types of predictive modeling studies were conducted to evaluate impacts to public health: 1) a screening HRA was performed to evaluate the risk to sensitive receptors from diesel exhaust; 2) a model of fugitive dust emissions for comparison to particulate matter NAAQS; and 3) a model of human health risk from FCPP emissions. The section summarizes the results of the analysis of potential health risks from FCPP emissions.

Potential Risk from FCPP Emissions

An HHRA was performed to evaluate the health effects of HAP emissions from FCPP Units 4 and 5 (AECOM 2013d). The emissions characterization, dispersion, deposition, and fate and transport modeling conducted for the HHRA also supports the Deposition Modeling Study for the ERA.

The HHRA was conducted according to the HHRA Protocol (protocol) established by the EPA (2005b) for hazardous waste combustion facilities, which is also considered appropriate for coal-fired power plants. As such, the HHRA includes the five standard steps of risk assessment:

1. *Hazard Identification.* Selects the compounds of potential concern (COPC), also referred to as "target compounds," both organic and inorganic.
2. *Dose Response Assessment.* Reviews the published risk factors developed by regulatory agencies to account for carcinogenic and noncarcinogenic (acute and chronic) health effects of chemical exposure.
3. *Exposure Assessment.* Involves modeling the dispersion, deposition, and fate and transport of COPCs in the environment and various pathways (i.e., inhalation, ingestion, absorption) by which individuals may be exposed.
4. *Risk Characterization.* Involves combining results of the dose response and exposure assessments to determine potential health risk.
5. *Uncertainty Assessment.* Provides a qualitative discussion of the factors that affect the risk estimates and how uncertainty in those factors could affect the veracity of risk estimates.

The protocol recommends three exposure scenarios for persons living in the vicinity of a source: 1) typical residential exposure; 2) farm products consumption exposure (beef, pork, chickens, eggs, milk; although sheep are not included, their uptake factors would be encompassed by these animals recommended by EPA for these analyses); and 3) fish consumption exposure. These scenarios consider the potential exposure of adults and children through direct and indirect exposure pathways. The exposure pathways include inhalation of compounds emitted from stacks and dispersed into ambient air (a direct pathway) and ingestion of trace compounds that enter the food chain through plant uptake and animal ingestion (an indirect pathway).

Compounds enter the food chain through deposition from air to soil, deposition on crops and forage, and deposition into watersheds and their associated waterbodies. The HHRA used conservative default exposure assumptions recommended by EPA unless appropriate site-specific exposure parameters were available. For example, the HHRA applied ingestion rates of locally-caught fish based on local advisories for fish consumption instead of default values. Also, a supplemental analysis was conducted to evaluate the maximum incremental contribution of FCPP emissions to blood-borne lead levels in children using the EPA's Integrated Exposure Uptake Biokinetic Model.

Selection of COPCs was based on the following two previous studies, "Updated Hazardous Air Pollutants (HAPs) Emissions Estimates and Inhalation Human Health Risk Assessment for U.S. Coal-Fired Electric Generating Units" (EPRI 2009) and "Multi-Pathway Human Health and Ecological Risk Assessment for a Model Coal-Fired Power Plant" (EPRI 2011).

For atmospheric dispersion modeling using EPA's AERMOD program, the HHRA evaluated the following COPC emissions from Units 4 and 5:

- 2,3,7,8-TCDD, equivalents
- Acrolein (C₃H₄O)
- Antimony (Sb)
- Arsenic (As)
- Barium (Ba) compounds
- Benzene (C₆H₆)
- Benzo(a)pyrene, equivalents
- Beryllium (Be)
- Cadmium (Cd)
- Chlorine (as Cl₂)

- Chromium (Cr)
- Cobalt (Co)
- Hydrogen chloride (HCl)
- Hydrogen cyanide (HCN)
- Hydrogen fluoride (HF)
- Lead (Pb)
- Manganese (Mn)
- Mercury, total (Hg)
- Naphthalene (C₁₀H₈)
- Nickel (Ni)
- Selenium (Se)
- Silver (Ag)
- Sulfuric acid (H₂SO₄)
- Zinc (Zn)

Selection of these 24 COPCs was based on two studies in 2009 and 2011. In the 2009 study, the relative inhalation risk associated with all HAPs known to be present in coal combustion emissions were evaluated for each coal-fired electric generating unit in the United States, including FCPP Units 4 and 5. The 2011 study added several HAPs for evaluating multipathway risks from a hypothetical coal-fired power plant. The HHRA includes these as COPCs along with sulfuric acid mist, a byproduct of SCR operation (AECOM 2013d).

The HHRA used conservative methodology to analyze risks posed by the COPCs as prescribed in the protocol supplemented with site-specific information about receptors, land use, water bodies, and recommended maximum rates of fish ingestion. Calculated results were evaluated against EPA not-to-exceed risk thresholds ranging from 10⁻⁴ (1 in 10,000) to 10⁻⁶ (1 in 1,000,000) for lifetime (70-year) cancer risk and 1 (unity) for noncancer Hazard Index (EPA 2005b). Because the HHRA lacked site-specific fugitive dust analysis, an additional analysis was conducted that specifically focused on assessing health effects associated with PM₁₀, PM_{2.5}, diesel particulate matter, and exposure to coal constituents in coal dusts at PM_{2.5} levels. The fugitive dust emission risk assessment focused on coal dust constituents based on data from the mine. The Navajo Mine has an on-going fugitive dust monitoring program, which includes triggers for taking further action.

The results of the multipathway HHRA predicted that for 25 years of future operation of FCPP, none of the estimated cancer risks exceed the strictest risk threshold of 1 in a million. For noncancer effects, the HHRA reported all Hazard Indices were below the threshold Hazard Index of 1 and the estimated blood lead concentrations were well below the CDC target blood lead concentration of 5 µg/dl. Therefore, the HHRA concludes that operation of FCPP over the next 25 years would not have a major impact on human health in the vicinity of FCPP. The HHRA also states that given the degree of conservatism purposefully built into the risk assessment methods and thresholds, this conclusion is highly protective of public health (AECOM 2013d). Specifically, the results are as follows:

- Average case long-term cancer risk would not exceed 6 x 10⁻⁹ for adults and 2 x 10⁻⁹ for children and chronic Hazard Index would not exceed 0.01 for adults and children.
- Intermediate case long-term cancer risk would not exceed 1 x 10⁻⁷ for adults and 5 x 10⁻⁸ for children and chronic Hazard Index would not exceed 0.04 for adults and 0.05 for children.
- Worst case long-term cancer risk would not exceed 2 x 10⁻⁷ for adults and 8 x 10⁻⁸ for children and chronic Hazard Index would not exceed 0.7 for adults and 1 for children.
- Short-term average acute Hazard Index would not exceed 0.05 for adults and children.
- Short-term maximum acute Hazard Index would not exceed 0.1 for adults and children.
- Infant exposure to dioxins and furans through breastfeeding would not exceed 0.052 percent of the target average daily dose (permissible maximum).
- Child blood lead content would not exceed 0.0013 percent of the CDC recommendation (permissible maximum).

These impacts are minor.

Public Health impacts from the on-site storage, handling, and transportation of ammonia reagent, as well as potential for accidental release from the ash impoundments at FCPP are discussed in Section 4.15, Hazardous and Solid Wastes.

Transmission Lines

No new transmission line construction is proposed as part of the Project nor are any changes anticipated in the frequency or type of maintenance activities to be conducted along the transmission corridor.

Worker Safety

No new or increased work activities are proposed for the transmission lines under the Proposed Action Alternative; therefore, there are no impacts to worker safety.

Public Health

The transmission lines meet NESC design requirements which protect public safety by requiring designing transmission lines with adequate strength to prevent or minimize failures, and to provide safety through separation between the energized transmission lines and the public and so the transmission lines are unlikely to be damaged or fail in the event of high wind or an earthquake. Also, the Project would not result in any change in operating procedures which could lead to a change in EMF or Non-EMF impacts. Therefore, there would be no impacts to public safety from continued operation of the transmission lines.

4.17.4.2 Alternative B – Navajo Mine Extension Project

Navajo Mine

Similar to the Proposed Action, under Alternative B, no new work processes that might increase safety risks to on-site workers are proposed. NTEC's existing safety programs would be expanded to incorporate the mining of Area IV South. Existing health and safety programs adequately address the associated risks of the Navajo Mine Extension Project area; therefore, impacts to worker safety from Alternative B and the continued operation of the Navajo Mine SMCRA Permit Area would be the same as described for the Proposed Action.

Four Corners Power Plant

Under Alternative B, the BIA would approve the lease amendment for the FCPP, and the FCPP would operate as described under the Proposed Action. Therefore, impacts would be the same as described for the Proposed Action.

Transmission Lines

Under Alternative B, the transmission line ROWs would be approved and would continue to be operated and maintained as described under the Proposed Action. No changes are proposed. Therefore, as described for the Proposed Action, no impacts would occur.

4.17.4.3 Alternative C – Alternative Pinabete Mine Plan

Navajo Mine

Similar to the Proposed Action, under Alternative C no new work processes that would increase safety risks to on-site workers are proposed. The existing safety programs would be expanded to incorporate the mining of Area IV North and Area IV South. Existing health and safety programs adequately address the associated risks of the Alternative Pinabete Mine Plan area; therefore, impacts to worker safety from Alternative C and the continued operation of the Navajo Mine SMCRA Permit Area would be the same as described for the Proposed Action.

Four Corners Power Plant

Under Alternative C, the BIA would approve the lease amendment for the FCPP and the FCPP would operate as described under the Proposed Action. No changes are proposed. Impacts would be as described for the Proposed Action.

Transmission Lines

Under Alternative C, the transmission line ROWs would be approved and would continue to be operated and maintained as described under the Proposed Action. No changes are proposed. As described for the Proposed Action, no impacts with regard to health and safety would occur.

4.17.4.4 Alternative D – Alternative Ash Disposal Area Configuration

Navajo Mine

Under this alternative, OSMRE would approve the Pinabete SMCRA Permit application and renew the Navajo Mine SMCRA permit. The Navajo Mine would operate as described under the Proposed Action. Impacts would be the same as described for the Proposed Action.

Four Corners Power Plant

Under this alternative, the area of disturbance required for the DFADAs would be 350 acres instead of 385 acres. The 10 percent reduction in surface area of the DFADAs would result in the same potential impacts as described for the Proposed Action. All other FCPP components of this alternative are the same as for the Proposed Action. Therefore, impacts would be the same as described for the Proposed Action.

Transmission Lines

Under Alternative D, the transmission line ROWs would be approved and they would continue to be operated and maintained as described for the Proposed Action. As such, impacts would be the same as described for the Proposed Action.

4.17.4.5 Alternative E – No Action Alternative

Navajo Mine

Under the No Action Alternative, mining would stop when the ROD is issued in 2015. Mining activities which require health and safety programs would no longer be performed after closing the mine under the No Action Alternative thereby contributing a negligible improvement of long-term (beyond dismantling and reclamation activities) public health and safety. No impacts to public health would result from the anticipated mine closure; mining activity would continue to comply with all relevant laws and regulations and safety plans.

Four Corners Power Plant

Under the No Action Alternative, APS would shut down Units 4 and 5 in 2016 when the current lease expires. The FCPP would be decommissioned and held for future use. In addition to the five units, all three switchyards would also be decommissioned. Several potential future uses of the site are possible. It could continue as an energy generation site with several potential technology scenarios. The infrastructure could also be demolished and the site redeveloped for industrial, commercial, or residential uses. It is entirely speculative at this time to predict the likely alternative future uses for the site. APS has not yet prepared a decommissioning plan. Any decisions regarding the future uses must be with the concurrence of the Navajo Nation. Currently, the site is held undivided by all of the owners; future uses may therefore require subdivision of the property. Any such uses would be subject to environmental review at either the tribal or Federal level, including potentially under NEPA, at the time they are developed and proposed.

Short-term impacts on worker safety and public health during decommissioning would be the same as the Proposed Action. Long-term impacts would be beneficial because no mining activities that could contribute to worker safety or public health issues would occur.

Transmission Lines

Under the No Action Alternative, the ROWs for the four subject transmission lines would not be approved. Since the subject lines primarily transmit power from the FCPP, under the No Action Alternative, the power source for the transmission lines would be removed. The lines would either be decommissioned and dismantled, or left in place. As with the FCPP, decommissioning and dismantling activities would need to be coordinated with the Navajo Nation and/or the BLM (depending on the land crossed by each subject line, e.g., the FCPP to Cholla Substation line only crosses Navajo Nation jurisdiction and would not require coordination with the BLM) such that the area meets the specific needs of the planned reuse. Compliance with all environmental laws and regulations would occur throughout the demolition process.

Worker safety impacts would be slightly higher than the Proposed Action during decommissioning activities if the transmission lines are removed due to increased worker activity such as tower and power line removal. Because these activities would occur in compliance with all environmental laws and regulations, these impacts would be expected to be negligible to minimal and short-term. Beyond decommissioning and dismantling activities, there would be no impact under the No Action Alternative to Worker Safety. There would be no impacts to Public Health under the No Action Alternative.

4.17.5 Health and Safety Mitigation

The Project Applicants have proposed measures that would be implemented to reduce or eliminate some of the environmental impacts of the Proposed Action. These measures include specific mitigating measures for certain environmental impacts, standard operating procedures that reduce or avoid environmental impacts, and BMPs for specific activities. These are described in Section 3.2.6.17. These measures are part of their application materials and are enforceable through permit or lease conditions. In addition, the Project Applicants must comply with additional protective regulatory requirements including laws, ordinances, regulations, and standards that are enforceable by the responsible agency over that activity. These are described in the Regulatory Compliance Framework Section for each resource category. Where the environmental analysis in this EIS recommends additional protective measures, over and above the applicant proposed measures and regulatory compliance, they are listed below as specific mitigation measures.

The Proposed Action, including the continuing operations of Navajo Mine, FCPP, and the transmission lines, would not result in major adverse impacts to public health and safety. Therefore, no additional mitigation is recommended.

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