2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This section discusses the Proposed Action and a No Action Alternative. Section 2.1 describes the Proposed Action for the EA that would allow NNSA to meet its purpose and need for agency action. The No Action Alternative is presented in Section 2.2 as a baseline for comparison with the consequences of implementing the Proposed Action. Alternatives that were considered but dismissed from further analysis in this EA are discussed in Section 2.3, and related actions are discussed in Section 2.4.

2.1 Proposed Action

The Proposed Action is to install and operate two new gas-fired CTGs, each with an approximate output of 20 MW of electricity (rated at 7,400 feet [ft] or 2,220 meters [m] elevation) as stand-alone structures within the Building 3-22 Co-generation (the Power Plant generates both steam and power) Complex (Figure 2) at TA-3. Installation of the CTGs would occur consecutively over a period of years and would also include installation of two new compressors to provide the gas pressure required for operation of the CTGs. The Proposed Action has two options: (Option A) installation of two CTGs (CTG 1 and CTG 2) that would be used long-term (defined for this EA as extending over the next 25 years), as simple-cycle[3] gas-fired turbine generators without co-generation capabilities or (Option B) installation and subsequent conversion of one or both of the installed CTGs from simple-cycle operation to combined-cycle[4] co-generation at some future date. In addition to these two options for installing and operating the proposed CTGs, the existing steam turbines in the TA-3 Co-generation Complex would be maintained and refurbished and would continue to be operated over the long-term with the CTGs.

Option A: Installation and operation of two new simple-cycle CTGs.

Option A of the Proposed Action would be to install and operate two new simple-cycle CTGs and their accompanying compressors. The first simple-cycle CTG (CTG 1) and its compressor would be brought onsite and installed on concrete pads during the FY03–FY04 timeframe. A second similar CTG (CTG 2) is expected to be added to the TA-3 Co-generation Complex within the FY07–FY13 timeframe. CTG 2 would provide a reliable, onsite backup for CTG 1 and for the aging TA-3 steam turbines. The CTGs would be maintained and operated as simple-cycle units and would be used to provide supplemental power during periods of peak demand and to ensure a reliable electric service supply system to meet emergency and essential LANL power requirements. Under Option A, demolition of decommissioned cooling tower, Building 3-285, would be performed after the installation of CTG 1 to provide the space required for CTG 2, if necessary.

[3] Simple-cycle generator is a gas turbine generator running with all exhaust flue gas exiting to the atmosphere. In this method of operation approximately 63 percent of the fuel energy is passed to the atmosphere.

[4] Combined-cycle generator is a gas turbine generator with a heat recovery steam generator and steam turbine converting exhaust flue gas energy to steam energy to be used as heat or to make electrical energy. In this method of operation approximately 45 percent of the fuel energy is passed to the atmosphere.

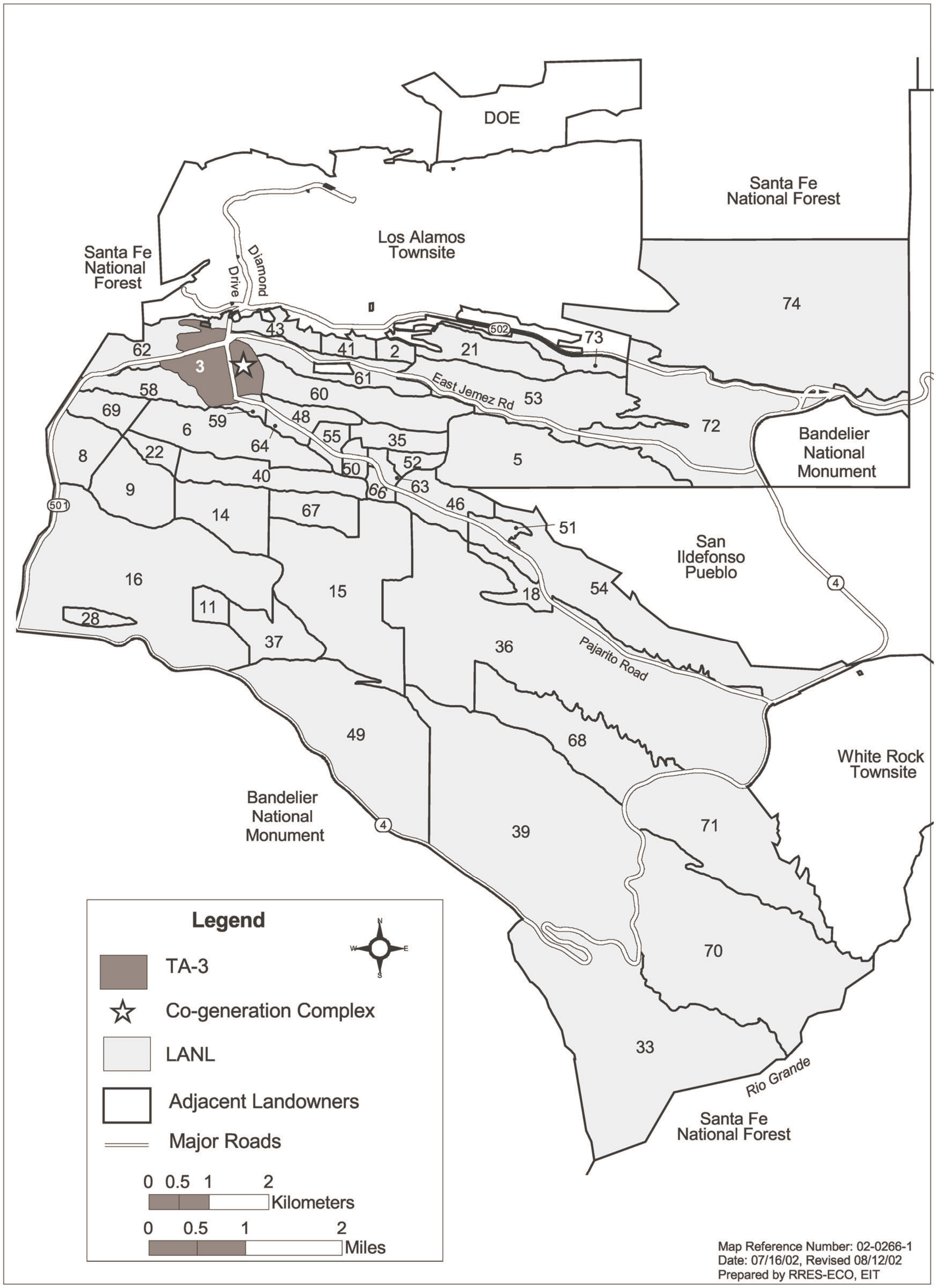

Figure 2. Site of TA-3 Co-generation Complex.

Option B: Conversion of the new simple-cycle CTGs to combined-cycle co-generation CTGs.

Option B of the Proposed Action would be to convert one or both of the installed simple-cycle CTGs (as described in Option A) to a combined-cycle CTG capable of co-generation at some time in the future. Conversion to combined-cycle co-generation CTGs would be accomplished by the addition of heat recovery steam generators (HRSGs) to the installed simple-cycle CTGs. This conversion is discussed in more detail in Section 2.1.3. The combined-cycle co-generation CTG would operate under base-loaded[5] conditions, as opposed to peak demand conditions as described in Option A. The installation of bypass valves in the CTG system would provide the option of utilizing either CTG, or both CTGs, as simple-cycle units. Under Option B, the demolition of decommissioned cooling tower, Building 3-58, would be performed to make space available for the addition of the HSRG.

2.1.1 Project Elements Common to Both Options of the Proposed Action

The Proposed Action would be located in TA-3 (Figure 2), which is a highly developed area. The TA-3 Co-generation Complex is located on the east side of Diamond Drive between East Jemez Road and Eniwetok Drive. The aging TA-3 steam turbines would be maintained and refurbished, as required, and would continue to be operated as part of the Proposed Action. The TA-3 Co-generation Complex currently provides the additional electric power needed to meet peak load demands when demand exceeds the allowable supply at LANL. The Co-generation Complex has a design capacity of 20 MW, but the deficiencies within the existing cooling system (composed of low-pressure steam condensers, pumps, valves, cooling towers, and piping) limit the generating capacity to 17 MW in the summer. Various upgrades of the aging steam turbine generators, cooling tower piping, battery banks, circuit breakers, metering, and power generation controls are needed. It takes approximately two years to rebuild a steam turbine. During the time required to rebuild one of the existing turbines, the power provided by the new CTGs under either Option A or Option B of the Proposed Action would supplement the power provided by the remaining two existing TA-3 steam turbines. When refurbishment of the existing steam turbines is complete, total electric output including the two CTGs, would be approximately 60 MW. Each CTG would have the potential to generate approximately 20 MW of electricity and the existing steam turbines would generate an additional 20 MW at peak winter heating steam demand. Annual LANL hourly electric demand varies between 40 MW and 83 MW. All electric power generated by LANL could be consumed onsite. However, the Power Pool would have the option and possibly the requirement to sell available power from offsite resources to the grid if the need arises. If the CTGs are no longer required to meet LANL's electric power needs, they could be taken out of service until such time as their output is needed to sustain future LANL projects and growth. The Proposed Action would include removal of certain structures (cooling towers) that are no longer needed. The resulting available space would be used for the Proposed Action option of choice.

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[5] Base-loaded means that the unit would be operated at full-power 24 hours per day, seven days per week, and approximately 335 days per year. The only time the unit would be down would be about two weeks per year for preventive and corrective maintenance.

The proposed CTG installation site is immediately adjacent to existing structures and vehicle parking areas. No undeveloped (so called "green field") areas would be involved. No installation activities would be conducted within a floodplain or wetland. The CTGs would not be installed over a known fault or within 50 ft (15 m) of a known fault line. New lighting sources installed would be as minimal as practicable. When installation of the CTGs and compressors is complete, existing fencing would be modified within the TA-3 Co-generation Complex and the site would be landscaped, as appropriate.

The Proposed Action would be conducted in accordance with general design criteria (LANL 1999) and DOE Order 413.3 (EO 413.3). Consistent with DOE Order 413.3, the sustainable design would be space efficient, incorporate recycled and reclaimed materials into the construction whenever practicable, and integrate the building and site to maximize environmental benefits without compromising productivity.

Best management practices (BMPs) for soil erosion control purposes would be implemented for demolition and excavation activities and for the installation of the CTGs. These BMPs may include the use of hay bales, plywood, or synthetic sedimentation fences with appropriate supports. A National Pollutant Discharge Elimination System (NPDES) General Permit Notice of Intent would be filed. A Storm Water Pollution Prevention Plan (SWPPP) would be required for the construction activity and the SWPPP for the Co-generation Complex would have to be updated before construction is completed.

All phases of the Proposed Action, including demolition, installation, and operation, would be conducted in accordance with LANL's requirements for waste management (LANL 1998). These requirements specify that waste shall be reduced as much as technically and economically feasible. Waste minimization practices (such as material substitution, source reduction, hazard segregation, recycling, and reuse) would be incorporated into all waste-generating activities. Every effort would be made to encourage recycling and re-use of the demolition materials. LANL has existing recycling contracts for the following materials: metals, paper, cardboard, scrap wood (such as pallets), concrete, asphalt, wire, and plastics. To the maximum extent possible, the demolition contractor would be required to segregate these materials for recycling. Disposal of waste would be employed only when other options are not safe or are not technically or economically feasible. A Waste Minimization Plan would be prepared for the project.

Site preparation and installation activities would produce a type of waste called "construction and demolition" waste, which is a nonhazardous subcategory of solid waste as defined in New Mexico State regulations. Solid waste[6] refers to the regulatory definition of waste in 40 CFR 261.1 and not to its physical state; solid wastes may be solid, liquid, or gaseous. Soil, reclaimed asphalt material and crushed concrete rubble are classified as construction and demolition waste. Reclaimed concrete rubble, reclaimed asphalt material, and clean soil would be staged at the building-debris storage yards on Sigma Mesa (TA-60) or at another approved material management area for recycling or for future use at LANL. Non-reclaimable debris would be disposed of at the Los Alamos County Landfill or its replacement facility. Reclaimed wire,

[6] Solid waste, as defined in the Code of Federal Regulations (40 CFR 261.1) and in the New Mexico Administrative Code (20 NMAC 9.1), is any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities.

copper, and scrap metal would be sent offsite to a recycle facility. Re-usable items, such as pumps, light fixtures, panel boxes, and fan motors, would be recycled through a salvage facility. Approximately 250 cubic yards (yd^3) [190 cubic meters (m^3)] of solid waste is expected to be generated during installation of CTG 1. A similar amount is likely to be generated during the installation of CTG 2. Waste that cannot be recycled would be disposed of at the Los Alamos County Landfill or another approved facility. It is estimated that approximately 13 truckloads (each containing 20 yd^3 [15 m^3]) would be sufficient to remove material from the site after each installation activity. The installation contractor would be prohibited from using chemicals that generate Resource Conservation and Recovery Act (RCRA)-regulated wastes onsite.

Installation, demolition, and excavation activities would be performed using common construction industry methods. Operation of the CTGs would not involve potential hazards that would entail unique structural requirements or uncommon installation methods. Standard industry practices would be employed during the installation phase. Work at the site would require the use of heavy equipment such as cranes, cement trucks, forklifts, dump trucks, trackhoes, front-end loaders, backhoes, soil compactors, and related equipment such as a trencher and welders, as well as other similar construction and installation equipment. It would also require the use of a variety of hand tools and equipment. Installation, demolition, and excavation vehicles would specifically be expected to include two cranes, one dump truck, one trackhoe, one front-end loader, one backhoe, two soil compactors, five pickups, and related equipment such as a trencher and welders. These vehicles would operate primarily during the daylight hours and would be left onsite over night. No permanent additional exterior artificial lighting is expected to be required for the installation activities. If necessary, temporary task lighting would be directed toward the work area.

Site work would be planned and managed to ensure that standard worker safety goals are met and that work would be performed in accordance with good management practices, regulations promulgated by the Occupational Safety and Health Administration, and various DOE orders involving worker and site safety practices. For example, noise at the site would be audible primarily to involved workers and to workers housed in the adjacent LANL core area. Maximum noise levels emitted from heavy equipment would be less than 85 decibels (dBA) at 10 ft (3 m). Involved site workers would be required to wear appropriate personal protective equipment (PPE), including hearing protection, if required. To prevent serious injuries all site construction contractors would be required to submit and adhere to a Contractor Safety Plan (Plan). This Plan would be reviewed and approved by UC staff at LANL before construction activities could begin. Following approval of this Plan, UC staff at LANL and NNSA site inspectors would routinely verify that construction contractors are adhering to the Plan, including applicable Federal and State health and safety standards. Construction and installation workers would be drawn primarily from local communities and communities across northern New Mexico. The project would be expected to start in FY03 and take approximately one year to complete.

CTG installations including utility corridor trenching activities could potentially disturb some potential release site (PRS)[7] areas of contaminated soil. Should an unsuspected contaminated

[7] PRSs are potentially contaminated sites at LANL that are identified either as solid waste management units (SWMUs) or areas of concern (AOCs).

site be disclosed during subsurface construction work, LANL's Environmental Restoration (ER) Project staff would review the site and would identify procedures for working within that area. At least one known PRS is present within the identified footprint structure at the construction site. Confirmatory sampling and characterization would be required and remediation of the PRS may be required before the proposed demolition or construction would proceed through this PRS area. If remediation is necessary, the contaminated soil would be disposed of through the LANL Waste Management Program.

Demolition, excavation, and installation activities during site preparation would have the potential to generate dust and to encounter previously buried materials. Standard dust suppression methods (such as water spraying) would be used onsite to minimize the generation of dust during site activities. If buried material or cultural remains were to be encountered during site preparation, activities would cease until an assessment could be performed and appropriate subsequent actions taken. LANL personnel would ensure that the New Mexico and National Air Quality Standards for particulate emissions are met throughout any demolition, excavation, and installation activities.

During the installation phase, space in the immediate vicinity would be available for parking, equipment storage, and material staging. Vehicular traffic could be affected for short periods during delivery of construction materials and the CTGs and by the addition of construction workers in the area. Approximately 20 construction workers would be onsite during the peak construction period, adding approximately 10 vehicles to local roadways during the construction period. These workers would park their personal vehicles either in existing parking lots or in other designated parking areas.

2.1.2 Demolition and Site Preparation

Two existing structures, cooling towers Building 3-58 and Building 3-285 (Figure 3), may be demolished at various times during the site preparation stage. CTG 2 would be installed where Building 3-285 is presently sited. Building 3-58 would be demolished to install the HRSG system for combined-cycle co-generation operation as described in Option B. Demolition of these structures would provide adequate available space for the location of the CTGs, HRSGs, and compressors and would provide more room for maneuverability of construction workers and equipment in addition to more parking spaces for project workers.

Site preparation would include placement of concrete foundations to support the CTGs and compressors and installation of electrical and natural gas tie-ins. When the site is ready for installation, the CTGs and compressors would be brought onsite and placed on the concrete slabs. Connections would then be made to the necessary utilities.

Small-scale demolition work would be accomplished using hand-held or small-scale mechanically-operated equipment (as in the case of the removal of fan boxes, panel boxes, light fixtures, and copper wiring). Large-scale demolition would use heavy machinery to remove the concrete foundations, piping, and walls of the cooling towers.

A small amount of hazardous waste, lead-based paint, has been identified associated with the cooling towers and the building. There may be small amounts of incorporated asbestos-

Figure 3. Structures to be demolished and existing Co-generation Complex at TA-3.

containing building material that would require an asbestos removal program as well. The lead-based paint would be chemically stabilized by spraying or painting with a bonding material to render the material non-hazardous. The residual substance would then be removed and disposed of in the Los Alamos County Landfill or its replacement facility. Asbestos-containing material would be removed, packaged appropriately, and shipped offsite for disposal at a specifically permitted disposal facility.

After the structures are demolished, their concrete slabs and other building debris would either be crushed onsite for fill material or would be moved to the Los Alamos County Landfill for inclusion in the LANL concrete recycling program or for disposal, as appropriate. The excavated area would be backfilled with soil. Heavy equipment would be used to grade the site. Site preparation would include soil compaction and soil density testing. Engineered fill material may be brought to the site if necessary to provide appropriate site compaction and grade.

2.1.3 Option A. Installation and Operation of Two New Simple-Cycle CTGs

2.1.3.1 Combustion Turbine Generator Number One (CTG 1)

A concrete pad, about 4,500 square feet (ft^2) (405 square meters [m^2]) in size, would be poured to support CTG 1. The dimensions of the concrete pad for the CTG would be approximately 100 ft (30 m) by 45 ft (15 m). A second small concrete pad, about 196 ft^2 (18 m^2) in size, would be poured to support the compressor. The dimensions of this concrete pad would be approximately 14 ft by 14 ft (4.2 m by 4.2 m). The first simple-cycle CTG (Figure 4), CTG 1, and its compressor would be brought onsite and installed on the concrete pads during the FY03–FY04 timeframe. CTG units are basically self-contained with packaged control and monitoring equipment and a sound-baffling enclosure. Each unit consists of a steel superstructure designed to meet current manufacturer's loading, wind, and seismic standards. Requirements for these conditions can be found in the LANL Engineering Manual (LANL 1999) that is part of the specifications for the CTG. The new CTG 1 would have approximate dimensions of 71 ft (21.3 m) long by 13.5 ft (4.1 m) wide by 13.5 ft (4.1 m) high. The entire CTG 1, including the gas emissions stack, would not be any taller than adjacent structures within the Co-generation

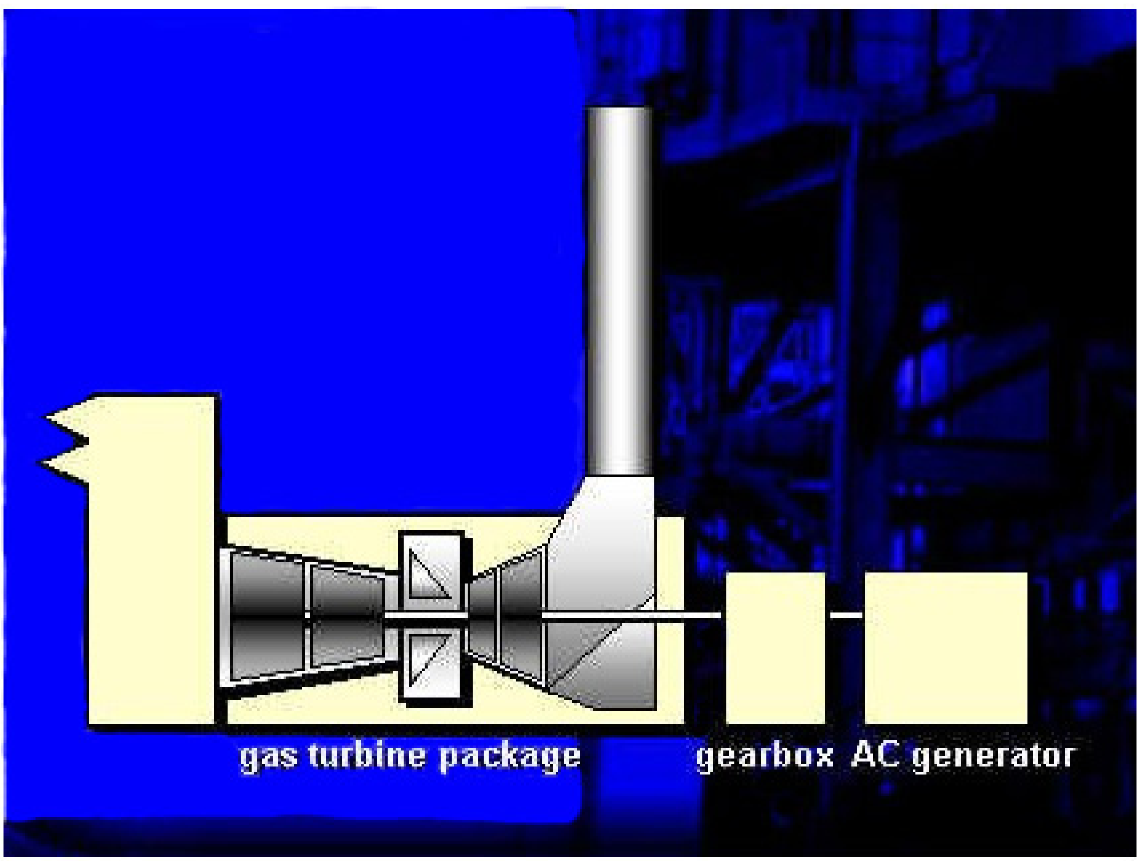

Figure 4. Simple-cycle co-generation combustion turbine generator.

Complex; the total height of the structure would be approximately 45 ft (14 m) above ground level.

The new simple-cycle CTG 1 would use approximately 38 percent less natural gas for an equivalent amount of power produced from the three existing steam turbines at the TA-3 Co-generation Complex. A breakdown of current usage and projected savings for natural gas consumption is as follows:

- Heat Rate of the Power Plant Steam Turbines = 16,000,000 British Thermal Units (BTU) per megawatt-hour (MWh)
- Projected Heat Rate of the Simple-cycle CTG = 9,856,000 BTU per MWh
- Natural Gas Savings = 6,144,000 BTU per MWh = (16,000,000 BTU per MWh, the heat rate of the power plant steam turbines) – (9,856,000, the projected heat rate of the simple-cycle CTG) (approximately 38 percent savings)
- Combined-cycle Co-generation CTG - Approximately 0.8 standard cubic feet of natural gas would be saved per pound (lb) of steam generated in the HRSG as compared to the existing steam boilers. The HRSG can generate approximately 75,000 lb of steam from the exhaust heat of the CTG.

The use of the proposed simple-cycle CTG 1 would save approximately 36,800 gallons (gal.) of water for each hour of operation for an equivalent amount of power as compared to the amount of water consumed by the existing Power Plant steam turbines. A breakdown of current usage and projected savings for water consumption is as follows:

- Water Usage of the Power Plant Steam Turbines = 1,840 gal. per MWh
- Water Usage of the Simple-cycle CTG = 0 gal. per MWh
- Water Savings = (1,840 gal per MWh) × (20 MW) = 36,800 gal. per hour
- Water Usage of the Combined-cycle co-generation HRSG should be about the same as the existing steam boilers

The natural gas fuel supply for each CTG would be provided by the existing LANL natural gas distribution system. Natural gas utility services within LANL are sufficient at the proposed installation site to serve each CTG. The Proposed Action would require the installation of a short (400 ft [20 m]) natural gas line that would be tied into an existing service line located adjacent to the proposed installation site. Minimal shallow trenching would be required. Currently, natural gas is supplied to the TA-3 plant through a pressure reducing station located just east of Building 3-22. The supply pressure at this point is 88 pounds per square inch (psi). In order to use gas from this supply point, additional fuel compression would be required. CTG 1 would use a new natural gas compressor that would be about 6 ft by 7 ft by 14 ft (1.8 m by 2.1 m by 4.2 m) in size. It would be located approximately 200 to 400 ft (60 to 120 m) from CTG 1 and would increase the normal operating gas pressure of about 88 psi to approximately 450 psi, which is the expected operating pressure that would be required by the CTG. A closed (dry) cooling system, similar to a car radiator, would be used as a cooling source for the CTG.

There are several overhead utility lines that would need to be relocated before CTG 1 could be brought onsite. The existing power lines cut across the site and would need to be relocated around the perimeter. There would be one new permanent power line pole. All other perimeter power line poles are currently in place. The service connection for various utilities and grounding for CTG 1 would require approximately 4,200 ft (1,260 m) of shallow trenching within previously disturbed areas. The trenching would include the individual utility tie-ins such as electrical service tie-ins, communications tie-ins, and grounding to existing grounding grids. After CTG 1 is installed, mounds of loose soil would be removed from the area. The surrounding area would be landscaped in accordance with the LANL Facility Engineering Manual (LANL 1999) and DOE Order N450.4 (DOE 2001), Assignment of Responsibilities for Executive Order 13148, Greening the Government through Leadership in Environmental Management.

2.1.3.2 Combustion Turbine Generator Number Two (CTG 2)

It is projected that the second CTG, CTG 2, and its compressor would be brought onsite and installed on concrete pads during the FY07–FY13 timeframe. Additional site preparation would be needed for the installation of CTG 2. CTG 2 and its compressor would be installed at the same site as, and adjacent to, CTG 1 in the area vacated by the demolition of cooling tower, Building 3-285. Installation of CTG 2 and its compressor would require two additional concrete pads that would be the same approximate size as the concrete pads put in place for CTG 1 (see previous Section 2.1.2.1). Approximately 1,000 ft (300 m) of new trenching would be required to accommodate utility service tie-ins and grounding grid installation.

Operation of the Simple-cycle Combustion Turbine Generators

The CTGs would be operated in accordance with manufacturer's requirements. The estimated operational life for each CTG is approximately 100,000 hours of operation. The actual hours of operation would be determined by air quality permit restrictions that limit nitrogen oxides (NOx) emissions to 40 tons per year (tpy) and carbon monoxide (CO) emissions to less than 80 tpy. The use of dry, low NOx combustors would control and lower NOx emissions to less than 40 tpy, below the Prevention of Significant Deterioration (PSD) permitting thresholds, and ensure that the NOx emission limit in the New Source Performance Standards (NSPS) (40 CFR Part 60, Subpart GG) of the Clean Air Act (CAA) for gas turbines would be achieved.

CTG start up and operation are automated; CTGs can also be started remotely. Approximately two full-time employees would be required to maintain the CTGs. These personnel would maintain electrical equipment, mechanical equipment, and electronic equipment. Maintenance contract personnel would be onsite as needed for preventive maintenance or for repair activities and other additional related services. Routine maintenance of the CTGs would be performed as required throughout their operational lifespan.

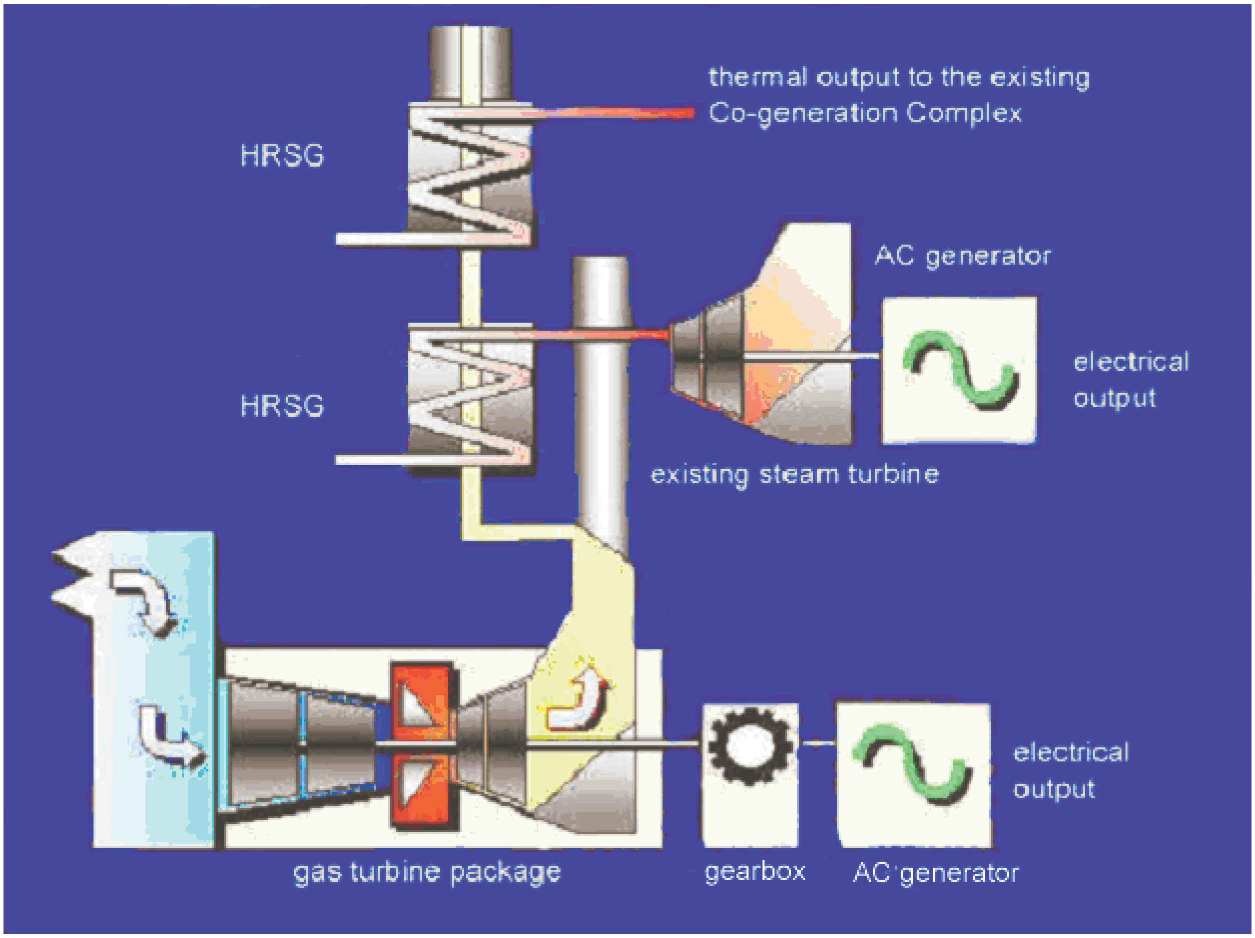

Figure 5. Combined-cycle co-generation combustion turbine generator.

2.1.4 Option B. Conversion of the New Simple-cycle CTGs to Combined-cycle Co-generation CTGs

Under Option B, either one or both of the existing simple-cycle CTG plants installed and operated as described in the Option A discussion, would be converted to a combined-cycle co-generation CTG plant (Figure 5) by the addition of a HRSG.

The HRSGs would be fabricated offsite and shipped in sections to the gas turbine site. The sections would be joined together and attached to a concrete and steel support system. The HRSG footprint would be approximately 20 to 30 ft (6 to 9 m) wide, 30 to 40 ft (9 to 12 m) long, and less then 45 ft (14 m) high. The main components of a HRSG would be the following: steam drum, mud drum, economizer, floor and water wall tubes, supplementary natural gas burners, forced and induced draft fans, and a superheater with a Selective Catalytic Reduction[8] (SCR)

[8] A SCR system for combined-cycle plants normally operates between 660 and 800 degrees Fahrenheit. At this temperature range, the SCR is normally installed inside the HRSG. The SCR will typically reduce NOx by 60 percent to 70 percent. NOx is reduced by reaction between it and ammonia as the mixed gases pass through the catalyst.

system to scrub NOx. External piping that would need to be installed includes feed water supply from the Co-generation Complex, blowdown piping to the Co-generation Complex, steam piping to the steam distribution system, the Co-generation Complex turbines and natural gas supply. Bypass valves are expected to be installed to allow operation of the CTGs without the boiler, if needed. Ammonia tanks and piping would be constructed for NOx removal. Electric power to the fans and communication lines would also be required. The HRSG would be connected with ducting to the outlet stack of the CTGs and would have its own separate stack.

Each combined-cycle co-generation CTG would operate as a base-loaded unit (defined in Section 2.1). The only time the unit would be down would be approximately two weeks per year for preventative and corrective maintenance. Although LANL does not require an additional base-loaded plant at this time, the additional capacity may be needed in the future to support LANL operations, particularly if there is an overall failure of the regional electric transmission lines or of the existing TA-3 steam turbines.

Operation of the combined-cycle co-generation CTGs.

Operation of each unit would be similar to that of the simple-cycle CTG discussed in Section 2.1.2.3. The combined-cycle co-generation CTG would be operated in accordance with the manufacturer's requirements, as discussed under Option A. A breakdown of current usage and projected savings for natural gas and water consumption is described in Section 2.1.2.1. Routine maintenance would be performed as required throughout its operational lifespan. Approximately three full-time employees would be required to maintain it. These personnel would maintain electrical equipment, mechanical equipment, and electronic equipment. Maintenance contract personnel would probably be onsite as needed for preventive maintenance or when required for repair activities.

Similar to the simple-cycle CTGs discussed in Option A, it is expected that emissions from the combined-cycle co-generation CTGs would not exceed 40 tpy of NOx or 80 tpy CO because of the inclusion of a dry, low NOx system within the CTGs and the addition of a SCR system to the boiler. The SCR system would reduce NOx emissions by an additional 60 percent to 70 percent.

Emissions Information Common to Both Options

Under both Option A and Option B of the Proposed Action, NOx emissions from all equipment at the TA-3 Co-generation Complex, including the three existing boilers and any new CTGs, would all have to remain under 99.6 tpy, as specified in air quality permit No. 2195B for the existing TA-3 Co-generation Complex. CO emissions would be required to remain below 81.3 tpy as specified in the permit. Both the proposed simple-cycle CTGs and the combined-cycle co-generation CTGs would be subject to the requirements of the NSPS Subpart GG which specifies emission standards for NOx and sulfur dioxide (SO_2) from gas turbines and fuel monitoring for nitrogen and sulfur content. Although NOx is the primary concern and focus for CTGs, the next pollutant of concern for gas-fired CTGs is CO because of potential permit issues, such as PSD permitting. CO, itself, is not harmful until it reaches higher concentrations than other pollutants. For this reason, PSD review for a modification is triggered at 100 tpy for CO emissions, as opposed to 40 tpy for NOx emissions. NOx and CO emissions under both Option A and Option

B would be controlled and reduced to below PSD permitting thresholds. LANL would permit the proposed CTGs as a “minor stationary source.”

2.2 No Action Alternative

The No Action Alternative provides a description of current conditions to compare to the potential effects of the Proposed Action. This alternative must be considered even if NNSA is under a court order or legislative command to act [10 CFR 1021.32 (c)]. Under the No Action Alternative DOE, NNSA would not install the CTGs in the TA-3 Co-generation Complex. The existing aged steam turbines would continue to serve LANL as a supplemental supply of electric power and steam until they failed and were rebuilt. The existing turbines would not provide the reliability of an additional source of electricity and may not provide the power required for peak loads and emergency operations that LANL operations require. LANL would not be assured of adequate power for existing and approved operations pursuant to the SWEIS ROD and Mitigation Action Plan (MAP) (DOE 2000b).

Under the No Action Alternative, NNSA would not have the capability to supply LANL with power in the event of a loss of import capability or in times of emergency. FY02 peak electrical demand was 86 MW. When peak electrical loads exceed import and onsite resources, the only alternative would be to curtail LANL operations. Current minimum electric demand for LANL and Los Alamos County is approximately 40 MW. LANL would not have the additional 20-MW to 40-MW capability added to the existing 20-MW steam generating capability at the TA-3 Co-generation Complex (at least until the older units fail permanently). LANL would not have the ability to meet future minimum electric loads for LANL and Los Alamos County in the event of a total blackout of the northern New Mexico grid.

Under the No Action Alternative, there would be no installation or demolition debris that would require disposal. There would be no air emissions from new CTGs.

2.3 Alternatives Considered but Dismissed

2.3.1 Additional Regional Transmission Capacity

The preferred method of supplying additional reliable power to meet LANL capability requirements would be to bring in power by another transmission line from external power sources. Two future regional transmission developments, when completed, would add capability to supply power to the northern New Mexico regional transmission systems and LANL.

Tri-State (Colorado based electric utility) is proceeding with final approvals for the construction of a 113-mi (182-km), 230-kV line known as the Colorado–New Mexico Intertie Project (CNMIP) from Gladstone, New Mexico, to Walsenburg, CO. This project is scheduled to be completed by 2004. However, right-of-way (ROW) problems may delay the project. The CNMIP in concert with the proposed correction of the Norton-Hernandez (NH) thermal overload problem described in subsequent paragraphs, could create up to a 209-MW increase in the import rating of the northern New Mexico regional transmission systems.

Additionally, DOE-Albuquerque has offered to work with PNM to develop a joint project to correct the NH thermal overload problem. Efforts need to proceed to negotiate extension of the ROW easements, which traverse approximately 6.6 mi (10.6 km) of federally-administered lands, 5.4 mi (8.7 km) of San Ildefonso Pueblo lands, 5.2 mi (8.4 km) of Santa Clara Pueblo lands, 0.6 mi (1 km) of privately owned lands, and 2.6 mi (4.2 km) of San Juan Pueblo lands. However, the PNM ROW through San Ildefonso Pueblo lands expires on December 31, 2002. If this ROW renewal effort were successful, the NH line may be rebuilt as a high-capacity 115-kV circuit. There is no timeline established for this project.

Neither of these transmission developments is yet underway and their futures are uncertain. Although these regional transmission developments would add capability to the northern New Mexico transmission system, including LANL, the increased import capability still would not provide LANL with the reliability of a redundant power generating system. An independent electrical power supply is essential for continued LANL operations in the event of interruption or destruction of the import transmission lines or a blackout of the northern New Mexico power supply due to human-made or natural disaster. Therefore, this method of addressing the NNSA's need for action is not analyzed further in this EA.

2.3.2 Development of Alternative Power Generating Technology

The development of alternate power generation at LANL was considered. This scenario would involve the development of local or onsite alternative power technologies such as solar, wind, fuel cells, nuclear, micro turbines, geothermal, or coal to deliver the needed electricity. An alternative power generating technology would be costly and time-intensive due to the technical and environmental challenges involved. These challenges are an inherent part of the make-up of the technologies. Solar- and wind-generated power have such low capacity factors (percent of time during the day when power is available) that they may not be available for continuous use or may not be available when needed. In addition, the land area required for such facilities to supply 20 MW to 40 MW of power would be prohibitive. LANL does not have an abundance of available real estate that would be required for large wind or solar farms. LANL is not located in a favorably windy area such as the flat lands of eastern New Mexico. Fuel cells and micro turbines are proven technologies, but individual units are not very large. To meet the capacity requirements, numerous units and utility tie-ins would be required. The installation of small, natural gas fired power generation units at individual buildings could not be achieved at a reasonable cost and within a reasonable timeframe as this would include the need for installation of an additional gas services. These units are expensive and difficult to put in service all at once if power were required in a short timeframe. The nearest geothermal resource is miles away and LANL does not own the subsurface geothermal rights, nor are they readily available. Clean coal technology is very expensive, and would require delivery of the coal by rail. Los Alamos County does not have rail service, so this technology would not be feasible. The development of alternate power generation has been dismissed from further consideration in this EA.

2.4 Related Actions

2.4.1 Final Site-Wide Environmental Impact Statement for the Continued Operation of the Los Alamos National Laboratory

The Final LANL SWEIS (DOE 1999a), dated January 1999, was issued in February of that year. A ROD was issued in September 1999, and a MAP was issued in October 1999 (DOE 1999b). The SWEIS (p. 4–179) included the information that the existing electric transmission line has been evaluated and found to be deficient and that loss of power from the regional electric distribution system results in system isolation where the TA-3 Co-generation Complex is the only source of sufficient capacity to prevent a total blackout. In addition, the SWEIS (p. 4–181) includes the information that the TA-3 Co-generation Complex is over 50 years old and needs various upgrades. An analysis of the effects of supplementing the existing electrical services was not included in the SWEIS (DOE 1999a).

The SWEIS included an analysis of impacts for operations of the existing TA-3 Co-generation Complex operations at levels that were greater than are currently being forecast as needed in the foreseeable future. The analysis of impacts is therefore bounding of the operations as they would be conducted if the Proposed Action's installation of the CTG were to occur. This EA tiers from the SWEIS and a re-analysis of the operations per say will not be provided in this EA. Any points of difference from the effects attributable to installation of the CTG will, however, be included in the Section 3 analysis of effects within this EA.

2.4.2 Demolition of Vacated Buildings

The demolition of vacated buildings and structures is ongoing at LANL. Demolition activities are evaluated for NEPA compliance purposes. Some of the TA-3 buildings and structures, other than those involved in the Proposed Action, have been categorically excluded from the need to prepare either an EA or an EIS. Some of these structures were included in other EAs—DOE/EA-1238, *Environmental Assessment for the Proposed Construction and Operation of the Nonproliferation and International Security Center*; DOE/EA-1375, *SM-43 Administration Building Replacement Environmental Assessment*; DOE/EA-1407, *Proposed TA-16 Engineering Complex Refurbishment and Consolidation*; DOE/EA-1410, *Environmental Assessment for the Proposed Disposition of the Omega West Facility at Los Alamos National Laboratory, Los Alamos, New Mexico*.

2.4.3 DOE/EA-1247 Environmental Assessment for Electrical Power Systems Upgrades at Los Alamos National Laboratory

This EA, issued in March 2000, analyzed the effects of upgrading the electrical power supply system for LANL to increase the reliability of the system to meet current and future needs. The EA provided sufficient evidence and analysis to determine that a FONSI was appropriate for the Proposed Action and Alternatives 1 and 2. The Proposed Action included construction of a 115-kV power transmission line across Bureau of Land Management (BLM)-, United States Forest Service-, and DOE-administered lands; and the uncrossing of two other 115-kV lines within LANL. The Proposed Action included the operation of a 115-kV power line that would originate at the existing Norton Substation and proceed westerly to its intersection with the existing

Reeves Line and then primarily north across the Rio Grande to LANL. The line would then continue northwesterly mostly through the central portion of LANL to the proposed West Technical Area Substation. The first three ROW segments would be constructed using 345-kV-type structures; the remaining ROW segment would be constructed using 115-kV-type structures. Two short 115-kV line segments are needed to extend an interior transmission "loop" from TA-3. The No Action Alternative was also considered.