SUMMARY

S.1 BACKGROUND

S.1.1 Previous NEPA Review and Litigation

Baja California Power, Inc. (hereafter referred to as Intergen), applied to the U.S. Department of Energy (DOE) on February 27, 2001, to construct a double-circuit, 230,000-volt (230-kV) transmission line across the U.S.-Mexico border. In a separate but similar proceeding, Sempra Energy Resources (hereafter referred to as Sempra) applied to DOE for a Presidential permit on March 7, 2001, also proposing to construct a double-circuit, 230-kV transmission line across the U.S.-Mexico border. Executive Order (E.O.) 10485 (September 9, 1953), as amended by E.O. 12038 (February 7, 1978), requires that a Presidential permit be issued by DOE before electric transmission facilities may be constructed, operated, maintained, or connected at the U.S. international border.

DOE and the U.S. Department of Interior (DOI), Bureau of Land Management (BLM), originally determined that the appropriate level of National Environmental Policy Act (NEPA; 42 *United States Code* §432 et seq.) review for the Intergen and Sempra Presidential permit applications was an environmental assessment (EA). DOE and BLM prepared a single EA that assessed the potential impacts that would accrue in the United States from the two transmission lines and from operation of the two related power plants in Mexico. DOE and BLM completed and issued the EA in December 2001. DOE relied on the EA to issue a Finding of No Significant Impact (FONSI) and Presidential permits for both projects on December 5, 2001. BLM issued two FONSIs on December 19, 2001, and two Records of Decision (RODs) to grant the rights-of-way (ROWs) on December 20, 2001, which allowed Intergen and Sempra to construct transmission facilities on Federal land. Following the authorizations by DOE and BLM, Intergen and Sempra constructed the transmission lines and began commercial operation to export electricity from Mexico in July 2003.

On March 19, 2002, the Border Power Plant Working Group (hereafter referred to as Border Power) sued DOE and BLM in the United States District Court for the Southern District of California (Case No. 02-CV-513-IEG (POR)), alleging violations of NEPA and the Administrative Procedure Act. Border Power sought to have the EA, FONSIs, Presidential permits, and ROW grants determined to be illegal and requested an injunction forbidding the use of the transmission lines. The District Court issued two orders in May and July of 2003, after briefings and arguments by the various parties. On May 2, 2003, the court held that the EA and the FONSIs did not comply with NEPA. On July 8, 2003, the court sent the matter back to DOE and BLM for additional review. The court declined to enjoin operation of the transmission lines immediately, but, instead, deferred the setting aside of the Presidential permits and the FONSIs until July 1, 2004, or until such time as superseding NEPA documents are issued, whichever is earlier. Thus, the transmission lines have operated while DOE and BLM conducted additional NEPA review. In light of the concerns raised by the court and to increase opportunities for public

and stakeholder participation in the environmental review process, DOE and BLM have decided to prepare this EIS.

In its July 8, 2003, order, the court expressly prohibited DOE and BLM from considering completion of construction and interim operation of the transmission lines or the court's analyses of environmental impacts of the proposed actions in conducting additional NEPA analyses. DOE and BLM have interpreted this language to require that they are to conduct their NEPA review from a fresh slate, as if the transmission lines had not been built. Accordingly, DOE and BLM will base their EIS analysis on the same purpose and need as the EA analysis: whether to grant or deny Presidential permits and ROWs to Intergen and Sempra. The discussion of the transmission lines (proposed) is presented as if the lines did not exist.

S.1.2 Project Overview

In each of these projects, the applicants would use the proposed international transmission lines to connect separate, new natural gas-fired power plants in Mexico to the existing San Diego Gas & Electric (SDG&E) Imperial Valley (IV) Substation located about 6 mi (10 km) north of the border in Imperial County, California. Within the United States, both transmission lines are proposed to be constructed on lands managed by the BLM, parallel and adjacent to the existing SDG&E 230-kV transmission line (IV-La Rosita line) that connects the IV Substation with Mexico's La Rosita Substation. Both Intergen and Sempra applied to BLM for ROW grants in order to be able to construct their respective projects across Federal land.

DOE and BLM have determined that the issuance of Presidential permits and ROW grants to Intergen and Sempra for the proposed projects would constitute a major Federal action that may have a significant impact on the environment within the meaning of NEPA. For this reason, DOE and BLM have prepared this Draft Environmental Impact Statement (EIS) to evaluate potential environmental impacts from the proposed Federal actions (granting Presidential permits and ROW grants for the proposed transmission facilities) and the range of reasonable alternatives, including the no action alternative. This Draft EIS was prepared in accordance with Section 102(2)(c) of NEPA, Council of Environmental Quality (CEQ) regulations (40 *Code of Federal Regulations* [CFR] Parts 1500–1508), and DOE NEPA Implementing Procedures (10 CFR Part 1021). DOE is the lead Federal agency, as defined by 40 CFR 1501.5. BLM is a cooperating agency.

NEPA requires Federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and the range of reasonable alternatives to those actions. To meet this requirement, Federal agencies prepare a detailed statement known as an EIS for actions that may have a significant impact on the environment. As part of the NEPA process, the preparation of an EIS includes two formal opportunities for public input: (1) the public scoping period and (2) the Draft EIS public comment period, both of which are described further in the Public Participation section of this summary. Following the Draft EIS public comment period, a lead agency, in coordination with any cooperating agencies, will prepare a Final EIS that will respond to oral and written comments received on the Draft EIS. Other environmental review requirements should be

implemented through the NEPA process to the fullest extent possible. In the case of the proposed projects, other environmental review requirements implemented through the NEPA process are floodplains and wetlands assessments, in accordance with E.O. 11988 and E.O. 11990, respectively (both signed on May 24, 1977) and 10 CFR Part 1022; Clean Air Act Conformity requirements; threatened and endangered species consultation required under the Endangered Species Act; and consultation under the National Historic Preservation Act.

S.1.3 Overview of Transmission Line Projects

S.1.3.1 Intergen Transmission Line Project

Intergen proposed to construct and operate a double-circuit, 230-kV transmission line that would extend from the La Rosita Power Complex (LRPC), located about 10 mi (16 km) west of Mexicali, Mexico (Figure S-1), northward for approximately 3 mi (4.8 km) to the U.S.-Mexico border at a point west of Calexico, California. From the border, the line would extend about 6 mi (10 km) north across Federal land managed by BLM and terminate at the IV Substation. The LRPC would consist of two natural gas-fired combined-cycle generating units. One unit (LR-1) would be owned by Energiá Azteca X, S. de R.L. de C.V. (EAX) and consist of three 160-MW gas turbines and one 270-MW steam turbine, for a total generating capacity of 750 MW. The second combined-cycle unit (LR-2) would be owned by Energiá de Baja California (EBC) and would consist of one 160-MW gas turbine and one 150-MW steam turbine, for a total generating capacity of 310 W. The capacity of the entire LRPC would be a nominal 1,060 MW (Figure S-2).

The electrical output of LR-2 is designated exclusively to the U.S. market and can be exported to the United States only over the proposed new international transmission line. The electrical output of one gas turbine at LR-1 and one-third (90 MW) of the electrical output of the LR-1 steam turbine are also designated for export to the U.S. market. However, the electrical output of the LR-1 export gas turbine could be transmitted to the United States over either the proposed new international transmission line or over the existing IV-La Rosita line owned by SDG&E.

230-kV Transmission Lines
Imperial-Mexicali Projects Time Line

2001	
February	Intergen applies to DOE for Presidential permit. Intergen and Sempra apply separately to BLM for ROWs.
March	Intergen initiates construction of power plant.
March	Sempra applies to DOE for Presidential permit.
December	DOE issues EA, FONSI, and Presidential permits to Intergen and Sempra allowing interconnection of transmission lines at the U.S.-Mexico border.
December	BLM issues FONSIs and Records of Decision to grant ROWs.
2002	
January	Sempra initiates construction of power plant.
September	Intergen places transmission line in service.
November	Sempra places transmission line in service.
2003	
May	The court issues an order that the EA and the FONSIs do not comply with NEPA.
July	Sempra begins commercial operation of power plant.
July	Intergen begins commercial operation of power plant.
July	The court orders additional environmental analyses.
October	DOE publishes Notice of Intent to Prepare an EIS.
November	Public scoping meetings held in El Centro and Calexico, California.
2004	
March	Intergen completes installation of SCR on LR-1 export gas turbine.

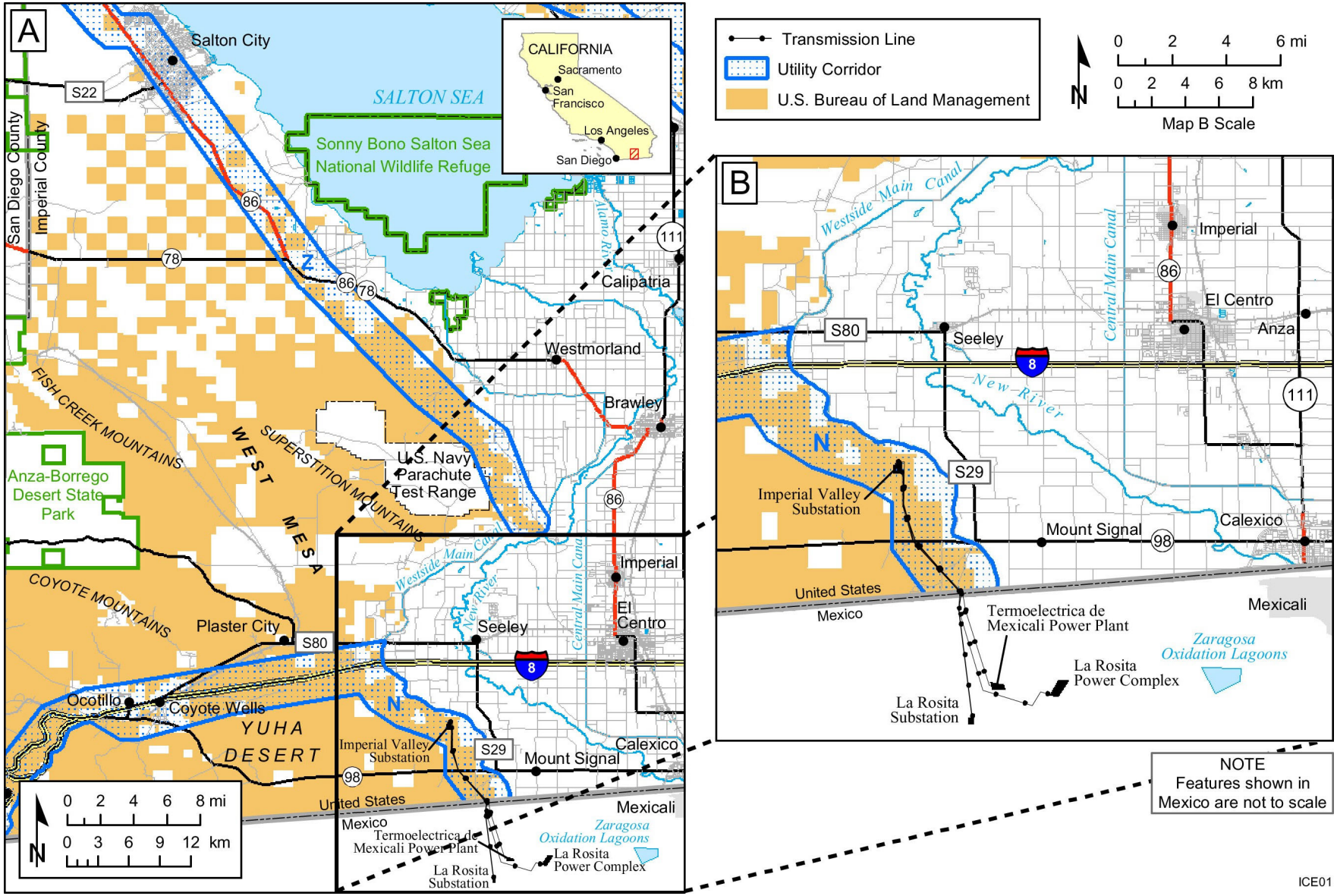
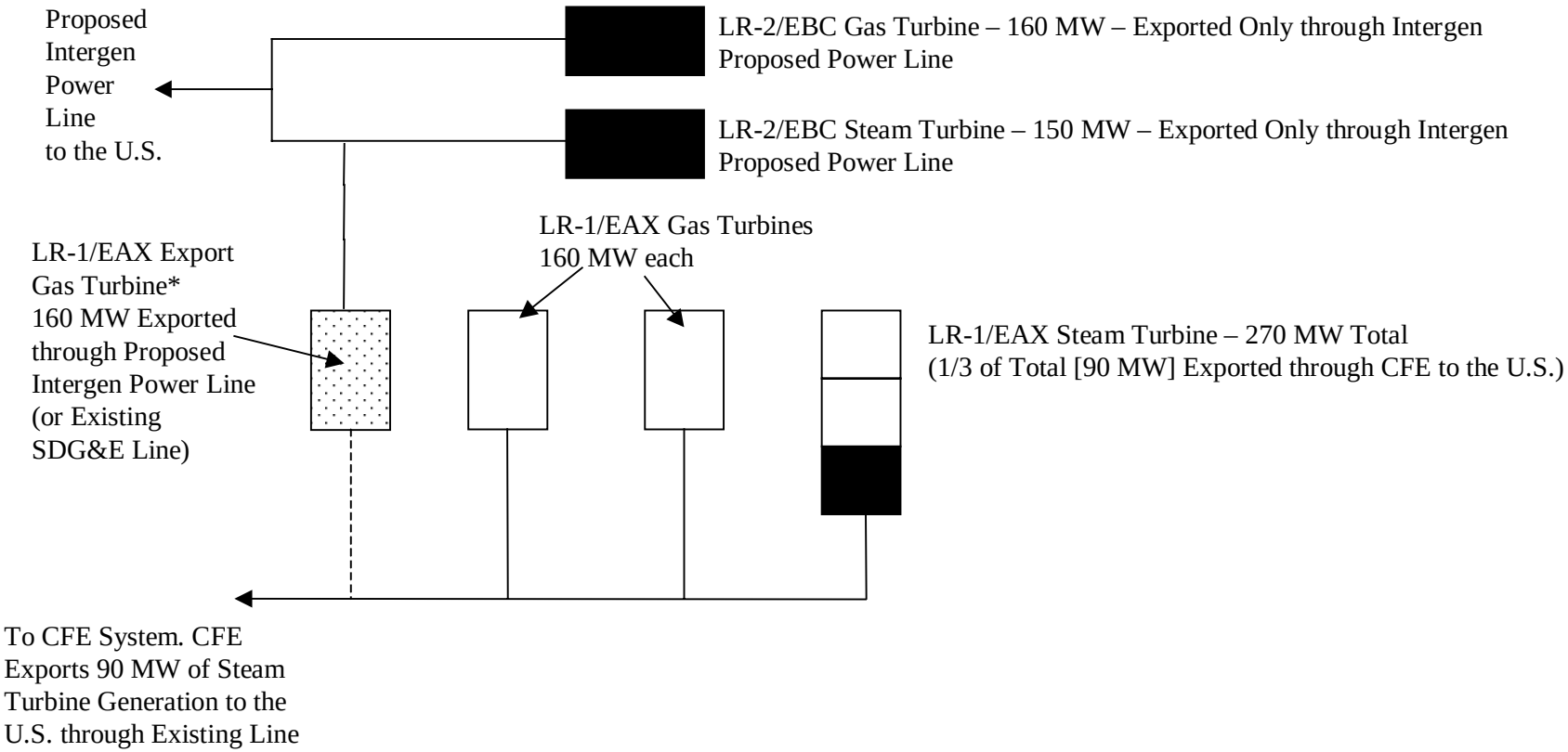


FIGURE S-1 Regional Setting for Imperial-Mexicali 230-kV Transmission Lines Projects



Turbine (or Portion), Designated for Export

Turbine (or Portion), Designated for CFE/Mexico

Turbine, Designated for Export or Backup for Mexico

*The electrical output of this gas turbine is designated primarily for export to the U.S., but may be a backup for either of the two CFE gas turbines. Normally, the electrical output of this turbine would be exported to the U.S. over the proposed new international transmission line. Under certain circumstances, the electrical output of this turbine could be directed onto the CFE system, which would then wheel the power to the U.S. over the existing SDG&E transmission line.

FIGURE S-2 La Rosita Power Complex: Electrical Distribution

The 90-MW electrical output of the LR-1 steam turbine designated for export to the United States may be transmitted to the United States only over the existing IV-La Rosita line. The remaining two EAX gas turbines and two-thirds of the electrical output of the EAX steam turbine are designated directly for the Mexico market and are connected to the Comisión-Federal de Electricidad (CFE), the national electric utility of Mexico.

To reduce nitrogen oxides (NO_X) emissions, all gas turbines at the LRPC would be equipped with dry low-NO_X burners, and ultimately with selective catalytic reduction (SCR) systems. The EBC export gas turbine (310 MW) would be built with SCR. The other three gas turbines would have SCR systems installed by March 2005. The combination of dry low-NO_X burners and SCR would reduce NO_X emissions to 4 parts per million (ppm). Carbon monoxide (CO) emissions are guaranteed by the gas turbine vendor to not exceed 30 ppm.

Cooling water for operation of the power plant would be obtained from the inlet of the Zaragoza Oxidation Lagoons and treated before use.

S.1.3.2 Sempra Transmission Line Project

Sempra proposed to construct a double-circuit, 230-kV transmission line that would extend from a natural gas-fired power plant to be located 13 mi (21 km) west of Mexicali, Mexico, developed by Termoeléctrica de Mexicali (TDM), northward approximately 3 mi (4.8 km) to the U.S.-Mexico border west of Calexico, California. The line would parallel the existing IV-La Rosita line in the United States northward from the border, across Federal land managed by BLM, a distance of about 6 mi (10 km) to the IV Substation.

The power plant would consist of one natural gas-fired combined-cycle generating unit, with a nominal capacity of 650 MW. The unit would consist of two 170-MW gas turbines and one 310-MW steam turbine. The power plant would produce electricity exclusively for export to the United States that could be transmitted only over the proposed new transmission line.

The gas turbines at the power plant would be equipped with dry low-NO_X burners and SCR systems, to reduce NO_X emissions to a maximum of 2.5 ppm, and an oxidizing catalyst system to reduce CO emissions to a maximum of 4 ppm.

Cooling water for operation of the power plant would be obtained from the outlet of the Zaragoza Oxidation Lagoons and treated before use.

S.2 PURPOSE AND NEED

Intergen and Sempra each need approvals from BLM and DOE, respectively, to allow construction of the approximately 6 mi (10 km) of new 230-kV transmission lines in the United States and connection of the lines at the U.S.-Mexico border, with similar facilities in Mexico. DOE and BLM will use the Final EIS to ensure that they have the environmental

information needed for purposes of informed decision making. The decisions will be issued subsequently in the form of separate RODs by DOE and BLM.

S.2.1 DOE

DOE will use this EIS to determine whether it is in the public interest to grant Presidential permits to Sempra and Intergen for the construction, operation, maintenance, and connection of the proposed 230-kV transmission lines that would cross the U.S.-Mexico border. DOE's action responds to each applicant's request for a Presidential permit. DOE must comply with NEPA and, in this instance, is the lead Federal agency for NEPA compliance.

In determining whether a proposed action is in the public interest, DOE considers the impact of the proposed action on the environment and on the reliability of the U.S. electric power supply system. DOE also must obtain the concurrence of the Departments of State and Defense before it may grant a Presidential permit. If DOE determines that granting a Presidential permit is in the public interest, the information contained in the EIS will provide a basis upon which DOE will decide which alternative(s) and mitigation measures, if any, are appropriate for the applicants to implement. In a process that is separate from NEPA, DOE will determine whether a proposed action will adversely impact the reliability of the U.S. electric system. Issuance of a Presidential permit only indicates that DOE has no objection to the project; it does not mandate that the project be completed.

Both the Sempra and Intergen proposed transmission lines would be used to export small amounts of electricity from the United States for the purpose of initial startup and restarting their respective power plants in the event of a plant shutdown. This is known as "black start." In order to export power from the United States, both companies must obtain separate export authorizations from DOE under Section 202(e) of the Federal Power Act. Before authorizing exports to Mexico over the proposed transmission lines, DOE must ensure that the export would not impair the sufficiency of the electrical power supply within the United States and would not impede, or tend to impede, the coordinated use of the regional transmission system.

S.2.2 BLM

BLM will use this EIS to determine whether to approve electric transmission line ROW requests for the projects proposed by Sempra and Intergen. To obtain the ROW approval, Sempra submitted an "Application for Transportation and Utility Systems and Facilities on Federal Lands" to BLM on February 13, 2001. The proposed ROW would be within Utility Corridor N (Figure S-1) of BLM's California Desert Conservation Area (CDCA) Plan. Intergen filed its application for ROW approval with BLM on February 6, 2001, also for use of a ROW in Utility Corridor N. The Sempra and Intergen transmission line ROWs would each be 120 ft (36 m) wide, and both are proposed to be located along the east side of the existing IV-La Rosita line. In reviewing the applications for ROW grants, BLM must consider land status, consistency with land use plans, affected resources, resource values, environmental conditions, and concerns of various interested parties.

These projects must be consistent with BLM's regional and local plans. The proposed projects fall within the CDCA for which BLM administers a comprehensive land use management plan. The goal of the CDCA Plan is to provide for the educational, scientific, and recreational uses of public lands and resources within the CDCA in a manner that enhances and does not diminish the environmental, cultural, and aesthetic values of the desert and its productivity. The proposed projects are located within an area designated as Multiple Use Class L (limited) in the CDCA Plan. Class L protects sensitive, natural, scenic, ecological, and cultural resource values. Public lands designated as Class L are managed to provide for generally lower-intensity, carefully controlled multiple use of resources, while ensuring that sensitive values are not significantly diminished.

The CDCA Plan states that "applications for utility rights-of-way will be encouraged by BLM management to use designated corridors." The proposed projects are consistent with the CDCA Plan because they are located entirely within a designated utility corridor (N). Utility applications that do not conform to the corridor system would require a plan amendment.

The project area for the proposed transmission lines is located in the Yuha Basin Area of Critical Environmental Concern (ACEC), as designated by the CDCA Plan. The Yuha Basin ACEC Management Plan gives additional protection to unique cultural resource and wildlife values found in the region while also providing for multiple use management. It allows for the "traversing of the ACEC by proposed transmission lines and associated facilities if environmental analysis demonstrates that it is environmentally sound to do so."

The Flat-tailed Horned Lizard Rangewide Management Strategy was prepared to provide guidance for the conservation and management of sufficient habitat to maintain extant populations of flat-tailed horned lizards, a BLM sensitive species, in each of five Management Areas within the CDCA in perpetuity. The project area is within the Yuha Desert Management Area. The Strategy encourages surface-disturbing projects to be located outside of Management Areas. However, it does not preclude such projects from the Management Area. If a project must be located within a Management Area, effort should be made to locate the project in a previously disturbed area or in an area where habitat quality is poor and to time the project to minimize mortality. The applicants have agreed to accept all applicable mitigation measures identified in the Strategy.

S.2.3 Applicants' Purpose and Need

The Sempra and Intergen Presidential permit applications each described a need for the 230-kV transmission line to transport electrical power generated by the Mexico power plants to the United States. In its application, Sempra indicated that all power generated by its proposed Mexico power plant would be exported to the United States to "reduce the region's dependence upon conventional oil-burning generation plants, and improve the region's ability to meet future electrical capacity and energy requirements."

In its application, Intergen stated it would utilize its 230-kV transmission line to export 310 MW from its EBC unit and 250 MW from its EAX unit to the United States. Intergen stated

that this would reduce the need for power producers in southern California to build new oil- or gas-fired generation facilities, provide additional reserve capacity to California, and improve system reliability.

S.3 ALTERNATIVES ANALYZED

The following alternatives are analyzed in this EIS:

1. No Action: Deny both permit and corresponding ROW applications. This presents the environmental impacts in the United States as if the lines had never been constructed and provides a baseline against which the impacts in the United States of the action alternatives can be measured in the absence of Presidential permits and corresponding ROWs.

2. Proposed Action: Grant one or both permits and corresponding ROWs. This sets forth the impacts in the United States of constructing and operating the line(s) from the Mexico power plants, as those plants are presently designed.

3. Alternative Technologies: Grant one or both permits and corresponding ROWs to authorize transmission lines that connect to power plants that would employ more efficient emissions controls and alternative cooling technologies.

4. Mitigation Measures: Grant one or both permits and corresponding ROWs to authorize transmission lines whose developers would employ off-site mitigation measures to minimize environmental impacts in the United States.

DOE's and BLM's preferred alternative is to grant Presidential permits and ROWs to both Sempra and Intergen as their projects are presently designed.

DOE and BLM also consider alternative routes for the transmission lines within the United States under the action alternatives described above.

S.3.1 No Action

Under the no action alternative, neither of the proposed transmission lines would be constructed, and the environmental impacts associated with their construction and operation would not occur. In the case of Sempra, lack of the requested transmission line would preclude the TDM power plant from operating because there would be no delivery path for the electricity generated. Similarly, in the case of Intergen, the EBC export unit could not be operated because the proposed transmission line would have provided the only delivery path for the electricity generated from that unit.

However, the EAX gas turbines and the EAX steam turbine at the LRPC could still operate. The existing SDG&E transmission line has sufficient capacity to transmit the electrical output of the EAX export gas turbine and one-third (90 MW) of the EAX steam turbine output to the United States. Also, the other two EAX gas turbines and the remaining two-thirds (180 MW) of the electrical output of the EAX steam turbine are designated for the Mexico market and would operate under any and all circumstances.

Because DOE and BLM are proceeding with this EIS under the assumption that the proposed Intergen and Sempra transmission lines do not exist, this EIS does not address the removal of their lines and support structures from BLM lands. Should the Presidential permits and ROWs not be granted, the issue of whether to remove the existing lines from BLM lands would be a new Federal action subject to an appropriate separate NEPA review.

S.3.2 Proposed Action: Grant One or Both Presidential Permits and Corresponding ROWs

Under the proposed action alternative, for most resource areas, the analysis was bounded by calculating impacts as if both the Sempra and Intergen transmission lines would be constructed and operated and as if all generating units at the TDM and LRPC power plants would be able to operate. The only exceptions to this methodology are in the areas of air, water, and human health, as explained in Section S.5.

The impacts attributable to this alternative would be those associated with operation of the entire TDM power plant, the EBC and EAX export units, and the construction and operation of the proposed transmission lines. If the proposed Intergen transmission line were approved and constructed, the electrical output of the EAX export turbine at the LRPC would be exported to the United States over that line. Therefore, even though the EAX export turbine would be able to operate under the no action alternative, the impacts associated with this turbine are also included in the proposed action.

S.3.2.1 Descriptions of Proposed Transmission Lines

The proposed transmission lines would be located in the Yuha Basin in the Colorado Desert in the southwestern portion of Imperial County, California, about 10 to 12 mi (16 to 18 km) southwest of the town of El Centro (Figure S-1). Each proposed project would construct a double-circuit, 230-kV transmission line extending from the existing IV Substation south approximately 6 mi (10 km) to the U.S.-Mexico border, where each line would connect with a corresponding transmission line in Mexico. The transmission line support structures would consist of steel lattice towers from the border to just south of the IV Substation, where A-frame structures would be used for each transmission line to allow the crossing of the Southwest Power Link. The Southwest Power Link is a 500-kV transmission line that enters the IV Substation from the east at the substation's southeast corner. After crossing the Southwest Power Link, the proposed transmission lines would be supported by steel monopoles along the east side of the IV Substation and would enter it from the north.

From the U.S.-Mexico border to the last tower south of the Southwest Power Link at the IV Substation, both the Intergen and Sempra ROWs would parallel the existing line. The ROW for the Intergen transmission line would be adjacent to the existing 120-ft (37-m) ROW for the existing SDG&E transmission line and would also be 120 ft (37 m) wide, so that the centerline would be 120 ft (37 m) east of the centerline of the existing transmission line ROW. The centerline of the Sempra ROW would be east of and adjacent to the proposed Intergen transmission line ROW and would be 120 ft (37 m) wide. Thus, the centerline of the Sempra ROW would be 120 ft (37 m) east of the centerline of the proposed Intergen ROW and 240 ft (73 m) east of the centerline of the existing line. For both the Intergen and Sempra transmission lines, steel lattice towers would be erected on the centerlines of the ROWs. The towers would be spaced approximately 900 to 1,100 ft (274 to 335 m) apart and would be roughly in line with the existing line's towers in an east-west direction.

Construction would begin with site preparation, consisting of grading of access roads, where necessary, and drilling or excavation for support structures and footings. Support structures would be fabricated in segments by the same vendor in Mexico. Each lattice tower and A-frame structure would be carried to the construction site by helicopter, which would minimize the amount of lay-down area required in the United States. Monopoles would be brought to the site by truck in sections, assembled in lay-down areas, and lifted into place with a crane. Principal preparation at each support structure location would consist of preparing concrete foundation footings. Each lattice tower and A-frame support structure would require four footings, one on each corner; a single footing would be needed for each monopole.

Three types of steel lattice transmission towers and two types of steel monopoles would be used, depending on function. The three types of steel lattice towers are suspension, deflection, and dead-end; the two types of steel monopoles are suspension and deflection. Suspension towers (or monopoles) are used where cables are strung in a straight line from one tower to an adjacent one. Deflection towers (or monopoles) are used where transmission lines turn gradual angles, and dead-end lattice towers are used where transmission lines turn large angles or where a transmission line is brought into an electric substation. Suspension, deflection, and dead-end towers are about 140 ft (43 m) high, and both deflection and suspension monopoles are about 102 ft (31 m) high.

Conductors (wires) on the dead-end and deflection towers or poles would be supported by double insulators. Conductors on suspension towers or poles would be supported by single insulators. The minimum ground clearance of the conductors would be 36 ft (11 m).

A typical steel lattice tower and monopole structure are shown in Figure S-3.

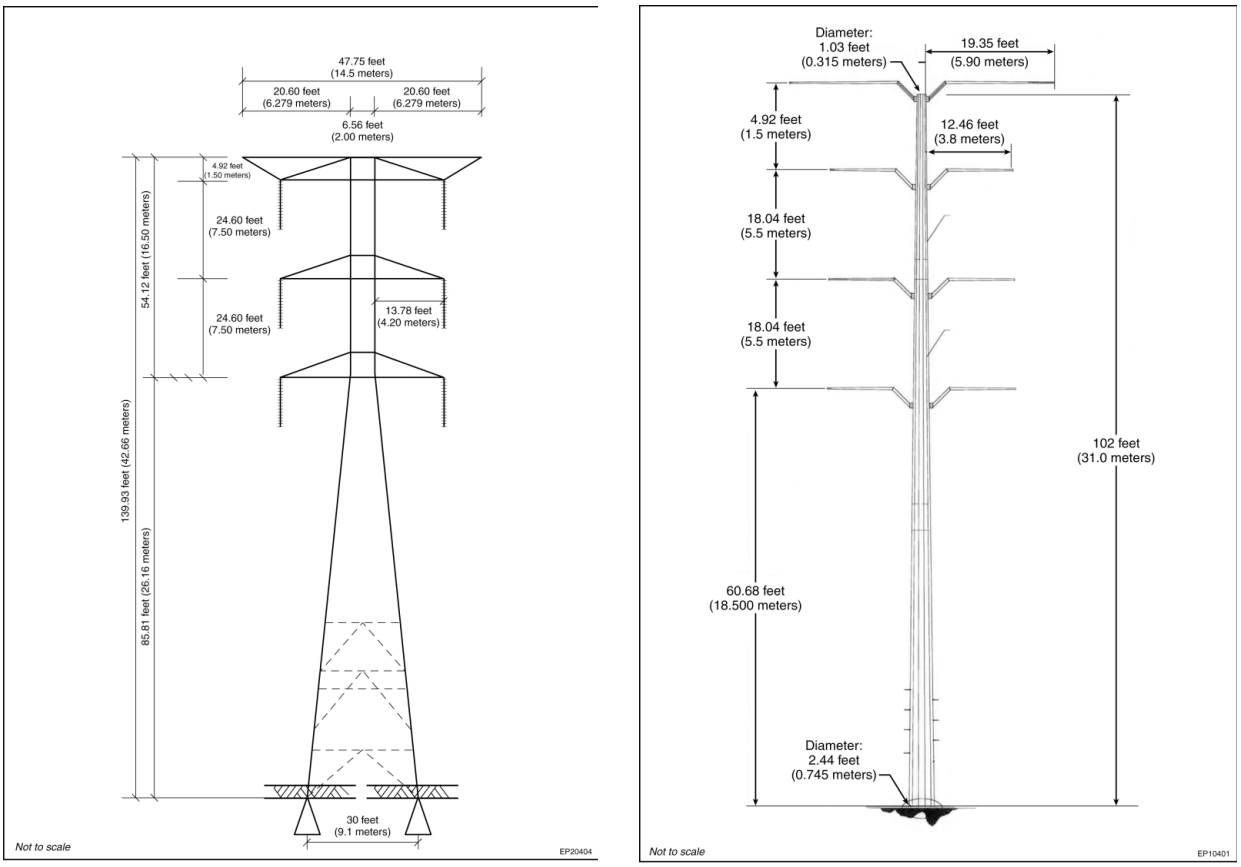


FIGURE S-3 Suspension Tower (left) and Suspension Monopole (right)

S.3.2.2 Alternative Transmission Line Routes

The identification of potential transmission line routes includes routes on Federal and private lands that would connect the IV Substation with lines from Mexico at the U.S.-Mexico border. BLM lands extend more than 20 mi (32 km) to the west of the existing 230-kV IV-La Rosita transmission line (hereafter, existing line) route, and private lands are within 1 or 2 mi (2 or 3 km) of the route to the east. Utility Corridor N, designated in the BLM Desert Plan, is identified as an appropriate location for utility lines. This corridor also allows a more direct route between the IV Substation in the United States and the La Rosita Substation in Mexico. Two alternative transmission routes to the applicants' proposed routes are evaluated in this EIS.

The end point and start point of each alternative route are at a fixed geographical location, namely the IV Substation to the north and the U.S.-Mexico border immediately east of where the existing line crosses the U.S.-Mexico border. The proposed routes represent a relatively direct path between these points.

The proposed and two alternative transmission line routes are shown in Figure S-4.

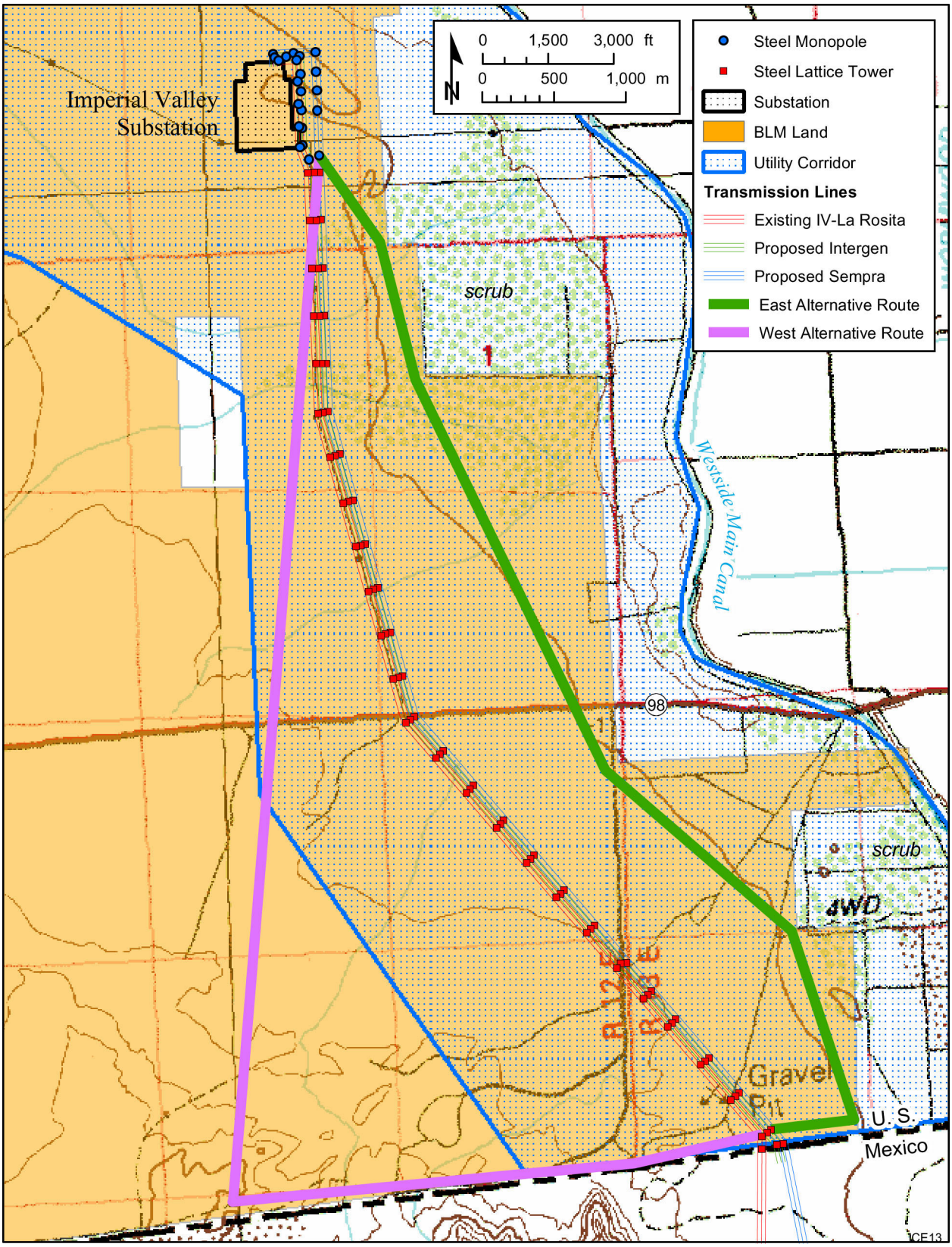


FIGURE S-4 Alternative Transmission Line Routes

West of the Existing 230-kV Transmission Line. An alternative route west of the existing 230-kV IV-La Rosita transmission line is evaluated. The location of the western route was selected to minimize the amount of land with sensitive cultural resources that would have to be crossed by the transmission lines. This route would require about 2 mi (3.2 km) more of ROW entirely on BLM land. The southern portion of this route would extend to the west, outside of the BLM-designated Utility Corridor N.

East of the Existing 230-kV Transmission Line. An alternative route east of the existing line on the eastern boundary of BLM-managed land is also analyzed. The rationale for selecting the location of this route was to avoid concentrations of archaeological resources and also to attempt to reduce biological effects by constructing the lines on the border of the Yuha Basin ACEC. The eastern alternative route would require about 0.5 mi (0.8 km) more of ROW. This location, like the applicants' proposed routes, would remain entirely on BLM land within Utility Corridor N.

S.3.2.3 Applicants' Proposed Environmental Protection Measures

Several features of the projects' design and construction methods are intended to reduce the amount of surface disturbance and therefore the potential impacts on environmental resources. These include locating the support structures (steel lattice towers, crossing structures, and steel monopoles) so that new access roads can be kept as short as possible, using existing access roads to the maximum extent possible, and using a helicopter to place lattice tower assemblies onto footings to reduce the amount of ground disturbance that would otherwise be caused by the use of lay-down areas and operation of cranes. In addition, the applicants would hire the same construction contractor to build both lines, further minimizing impacts by combining and coordinating construction activity, eliminating potential repeated impacts to the same area, and minimizing traffic flows.

The applicants would commit to stringent BLM monitoring and mitigation requirements to protect biological, cultural, and paleontological resources.

S.3.2.4 Project-Related Power Plants

All generating units at both power plants would operate in a combined-cycle mode and would be fueled by natural gas supplied by a cross-border pipeline previously permitted by the Federal Energy Regulatory Commission. Figure S-5 is a schematic showing the general engineering features of the TDM and LRPC power plants. Electricity would be produced by both the gas turbines and the steam turbine generators. Exhaust gases from the gas turbine would be cleaned up and then sent to a heat recovery steam generator, which produces steam to drive a steam turbine generator. Heat from the gas turbine exhaust that would otherwise be released to the atmosphere would be recovered by the heat recovery steam generator to produce steam used by the steam turbine to generate additional electricity.

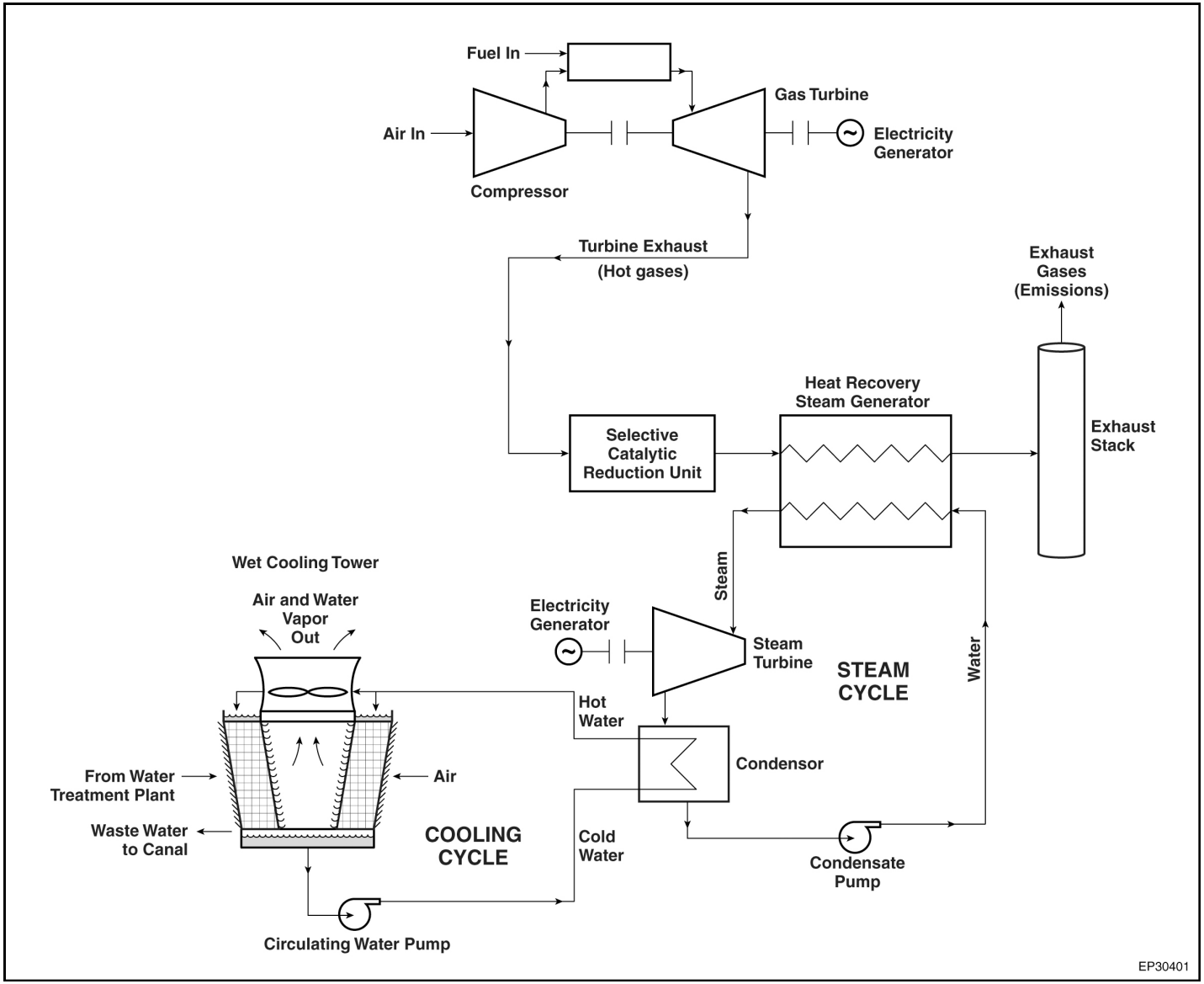


FIGURE S-5 General Engineering Features at the LRPC and TDM Power Plants

All units at both power plants would be equipped with dry low-NO_x burners that control emissions of NO_x during combustion. All turbines at both power plants would also eventually utilize an SCR system to further control NO_x emissions. SCR (Figure S-6) is a postcombustion cleaning technology that chemically reduces NO_x (NO and nitrogen dioxide [NO_2]) into molecular nitrogen and water vapor. A nitrogen-based reagent, such as ammonia (NH_3), is injected either as a gas or liquid into the ductwork, downstream of the combustion unit. The waste gas from the combustion turbine mixes with the reagent and enters a reactor module containing a catalyst. The hot flue gas and reagent diffuse through the catalyst, and the reagent reacts selectively with the NO_x. Unreacted NH_3 in the flue gas downstream of the SCR reactor is referred to as NH_3 slip. As the catalyst activity decreases, NO_x removal decreases and NH_3 slip increases. When NH_3 slip reaches the maximum design or permitted level, new catalyst must be installed. The NO_x removal efficiency of SCR is about 85%.

La Rosita Power Complex

EAX:

- 3 Siemens-Westinghouse Model W501F combustion turbines
- Alsthom steam turbine
- Doosan heat recovery steam generator

EBC:

- 1 Siemens-Westinghouse Model W501F combustion turbine
- Alsthom steam turbine
- Foster Wheeler heat recovery steam generator

Termoeléctrica de Mexicali Power Plant

- 2 General Electric Model 7FA combustion turbines
- Alsthom steam turbine
- Cerrey heat recovery steam generator

Both the LRPC and TDM power plants would use a mechanical-draft wet cooling system. The wet cooling system would consist of a surface condenser and a cooling tower.

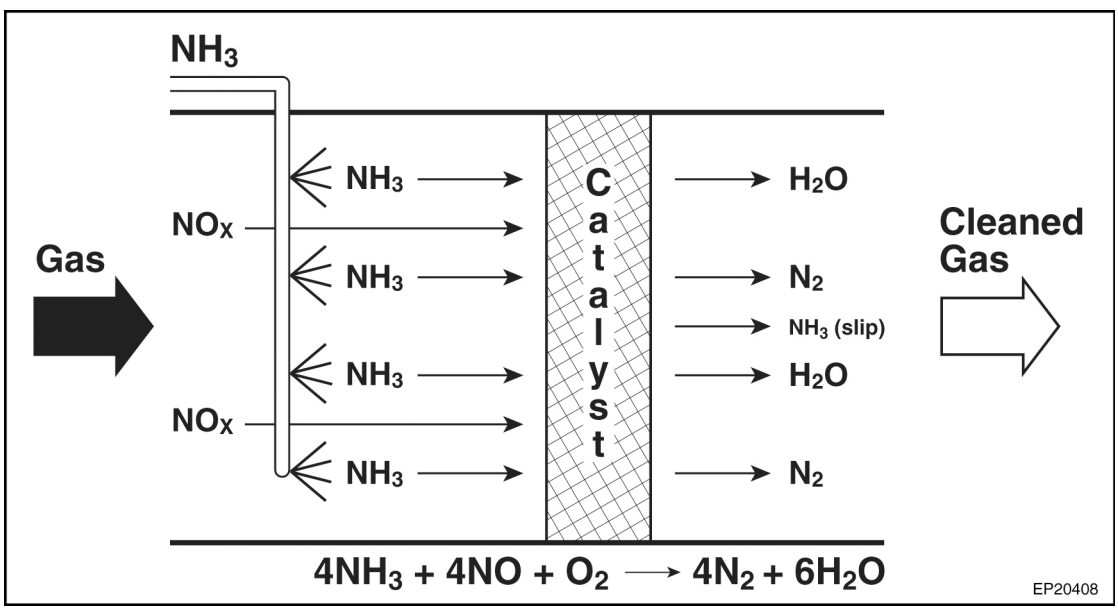


FIGURE S-6 Schematic of Typical SCR System

Because water used to produce steam in the steam turbine is distilled and free of scale-forming material, it is in a closed system and reused in the steam turbine. Exhaust steam from the steam turbine is condensed by water circulating in the surface condenser. The water in the surface condenser is then cooled by air flowing through the cooling tower(s) and the water is recirculated. Water is lost by evaporation in the cooling tower and must be replenished with "makeup water." Cooling towers are characterized by the means by which air is moved. Mechanical-draft cooling towers rely on power-driven fans to draw or force the air through the tower. Natural-draft cooling towers use the buoyancy of the exhaust air rising in a tall chimney to provide the draft. A fan-assisted natural-draft cooling tower employs mechanical draft to augment the buoyancy effect. To reduce the demand for cooling water, power plants could be equipped with either a dry cooling system or a wet-dry cooling system; these are described in Section S.3.3.

Water (both cooling and steam cycle) for both power plants would come from the Zaragoza Oxidation Lagoons located west of Mexicali (Figure S-7). The primary source of water entering the lagoons is municipal sewage. Minor sources include storm water runoff and industrial discharge water (both process and sewage). The Zaragoza facility receives and treats approximately 33,200 acre-ft/yr of sewage water (an acre-foot [ac-ft] of water is the volume of water that covers 1 acre [43,560 ft^2] to a depth of 1 ft [0.30 m]). The sewage water is processed at the Zaragoza facility through 13 lagoons or settling ponds. It is a primary treatment process in which solids are settled out before the water is discharged into the New River through drainage channels managed by the Comisión Nacional del Agua.

Water Treatment for LRPC. The LRPC would contract with the local Mexican municipal water authority, Comisión Estatal de Servicios Públicos de Mexicali, to provide untreated, municipal wastewater. Raw sewage water would be obtained at the inlet of the Zaragoza lagoons and piped to a sewage treatment plant adjacent to the lagoons that would treat the water for use at the LRPC. The sludge produced by the treatment plant would be dewatered and disposed of as nonhazardous waste, and the remaining water would be piped approximately 5.2 mi (8.3 km) to the LRPC.

Next to the LRPC, another sewage treatment plant would be constructed to further treat the water to reduce phosphates, dissolved organic matter, and heavy metals. The water would also be lime-softened and then stored in tanks for use at the plant.

All wastewater collected from power plant operations would be collected in sumps and would then be discharged, untreated, to the drainage channel. In the LRPC cooling towers, water would be used for up to five cooling cycles before it was discharged.

Water Treatment for TDM. The TDM power plant would obtain water from the Zaragoza lagoons after the water was treated in the primary settling ponds. The TDM sewage treatment plant would use a biological treatment process to first oxidize organic matter and NH_3 in an aerobic step (in the presence of air following aeration), and then remove nitrates formed by

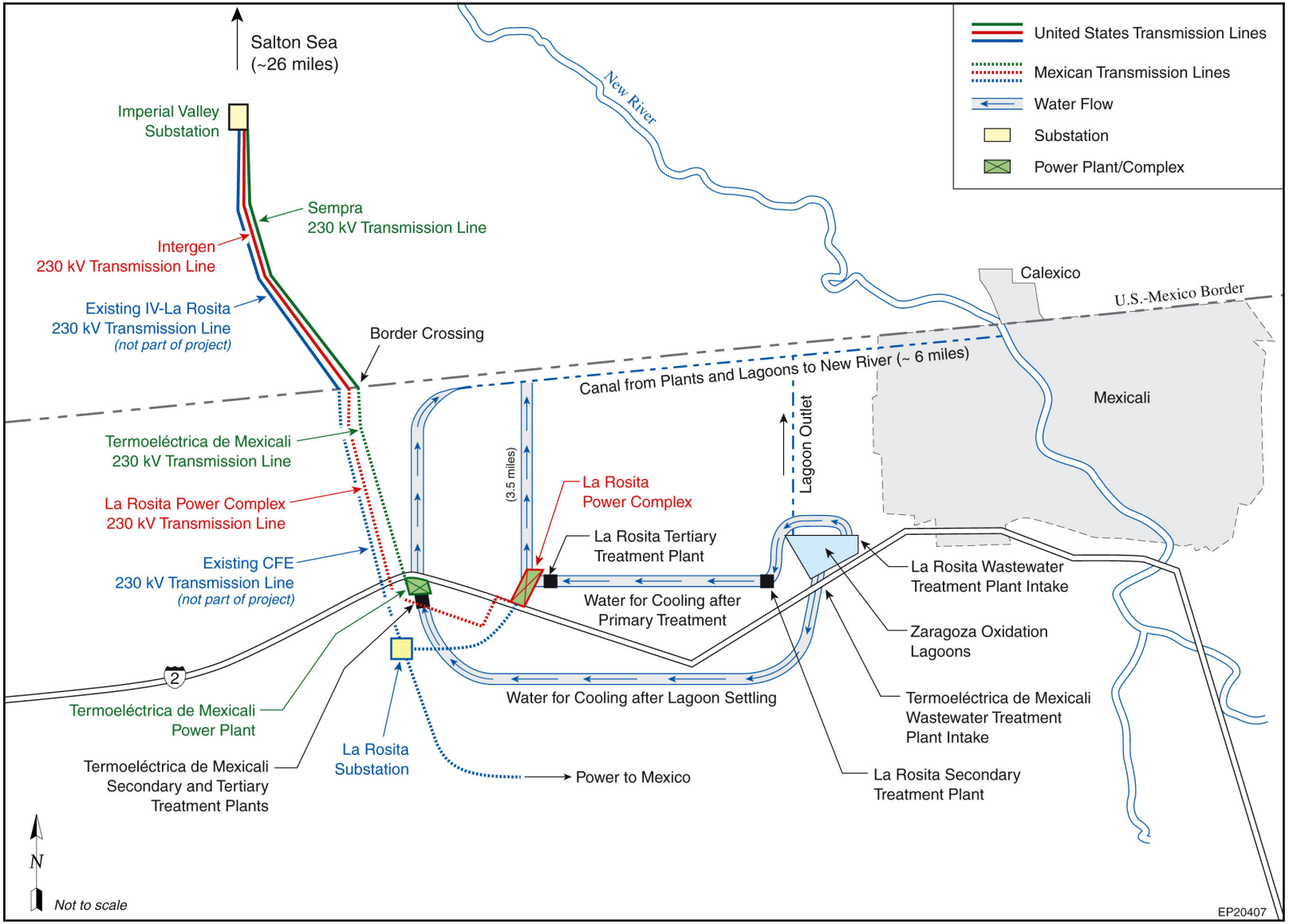


FIGURE S-7 Water Supply Cycle for LRPC and TDM Power Plants

NH_3 oxidation by bacterial action under anaerobic conditions (in the absence of air) in a second step. After biological treatment, water would be clarified by the addition of lime to raise the pH to cause the precipitation of dissolved minerals such as calcium and magnesium. The clarified water would then be adjusted to neutral pH with the addition of sulfuric acid and disinfected through the addition of chlorine. The precipitated sludge would settle out, thicken, and finally dehydrate on a belt press to produce a solid, nonhazardous waste, which would be hauled to a landfill in Mexico. The water so treated would be suitable for use as cooling water, the major use of water at the power plant. It would replace water lost to evaporation from the cooling towers.

Three main waste streams would be piped into the waste sump during normal power plant operation. Waste streams would mix before being discharged untreated into a drainage channel that would eventually lead to the New River. The first stream would be the wastewater from the cooling tower. The cooling tower bank would consist of 12 units, and the water would be used for up to six cycles before it was discharged. The second stream would be wastewater from the demineralization process. The third stream would be water discharged from the steam cycle.

S.3.3 Alternative Technologies

Under this alternative, DOE and BLM would issue Presidential permits and ROW grants for transmission lines that connect to power plants that use more efficient control technologies and alternative cooling technologies. Alternative technologies evaluated in the EIS include dry cooling, wet-dry cooling, and air emissions controls to reduce CO emissions.

S.3.3.1 Dry Cooling

A dry cooling system operates by having fans blow over a radiator system (Figure S-8) to remove heat from the system via convective heat transfer. Steam from the steam turbine exhausts directly to a manifold radiator system that releases heat to the atmosphere, condensing the steam inside the radiator. A dry cooling system uses approximately 5% of the water used by a wet cooling system; however, a dry system reduces steam cycle efficiency and increases fuel consumption in the power plant.

S.3.3.2 Wet-Dry Cooling

Wet-dry cooling systems combine wet and dry cooling technologies (Figure S-9). A wide range of system designs is possible, covering the entire spectrum of wet versus dry depending on plant needs. A typical wet-dry cooling system would utilize both an air-cooled condenser and a wet evaporative cooling tower within the same cooling system. A typical wet-dry cooling system would achieve a ratio of wet-to-dry cooling on the order of 50%. Ratios can vary, however, on the basis of ambient air temperatures and humidity. A wet-dry system is sometimes called a “water conservation design,” or a “parallel condensing cooling system.” Wet cooling would be used during hot weather, while dry cooling would be used most other times.

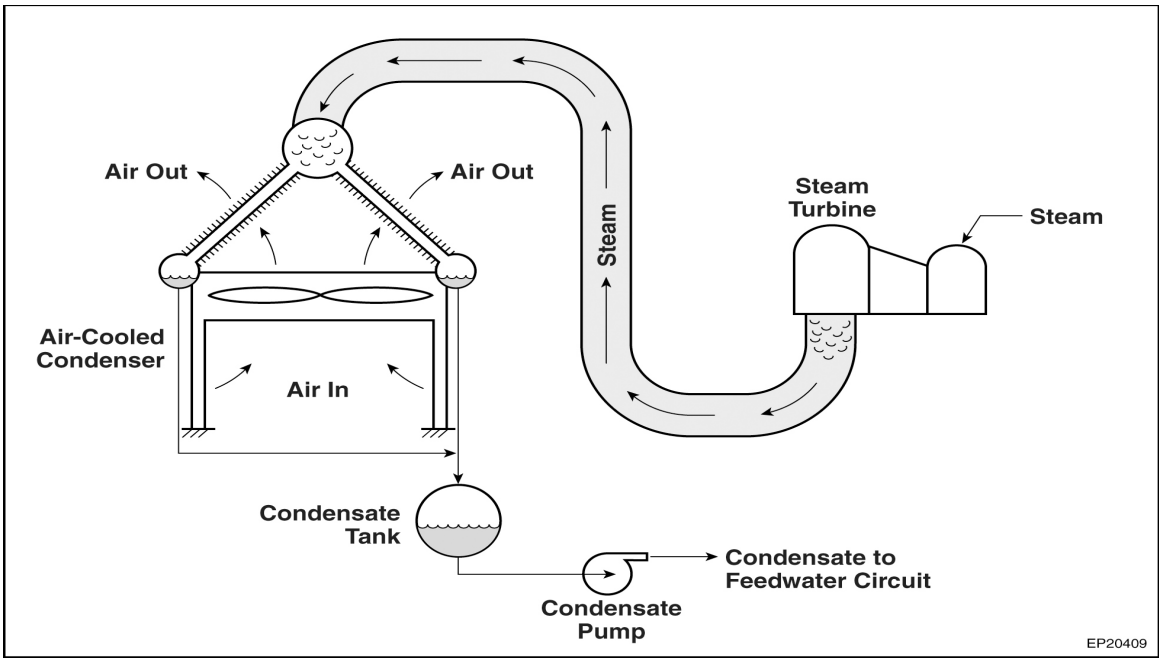


FIGURE S-8 Dry Cooling Technology

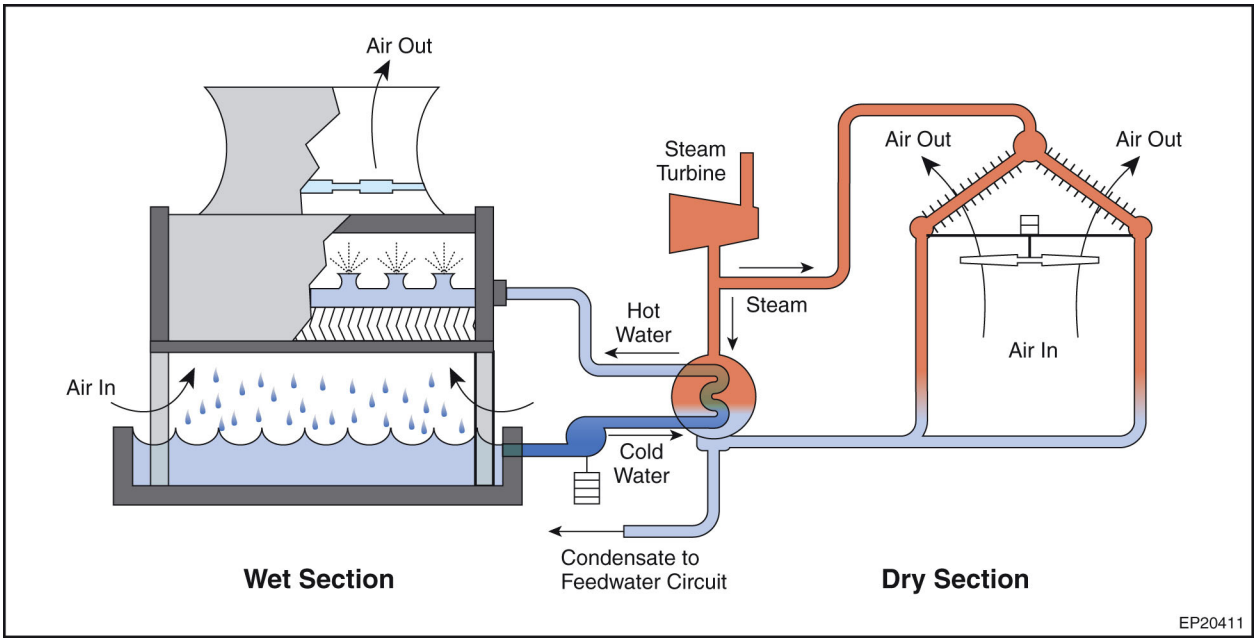


FIGURE S-9 Wet-Dry Cooling Technology

S.3.3.3 Carbon Monoxide Emissions Control

This alternative would include operation of power plants equipped with the use of oxidizing catalysts to reduce CO emissions. The analysis for this alternative assumes that the power plants that would connect to the proposed transmission lines would have emissions controls similar to those already described for the TDM plant.

The following is a description of a generic CO control system. CO is emitted when natural gas is not combusted completely. CO emissions in power plants are often controlled with an oxidation catalyst unit. A honeycomb-like structure containing the catalyst is placed in the flue gas ductwork. The catalyst is made of precious metals, such as platinum and palladium, which act to promote a chemical reaction to transform CO to carbon dioxide (CO_2). This system can also reduce other hydrocarbons caused by incomplete combustion. These hydrocarbons combine with oxygen to form water and CO_2. For effective reduction of CO and hydrocarbons, the flue gas must be lean (i.e., have excess oxygen) to promote the reactions.

S.3.4 Mitigation Measures

Under this alternative, DOE and BLM would grant one or both Presidential permits and corresponding ROWs to authorize transmission lines whose developers would employ off-site mitigation measures to minimize environmental impacts in the United States. The mitigation measures addressed under this alternative pertain only to offsets of air emissions from the power plants. DOE contacted the Imperial County Air Pollution Control Office and the Border Power Plant Working Group to obtain suggestions for off-site mitigation measures that could be evaluated under this alternative. Additional mitigation measures for water use were not analyzed because all available water in California is committed to other uses. Also, the Imperial Irrigation District (IID), the state agency that is presently addressing water use issues in the Salton Sea Watershed, currently has a monitoring and mitigation program to respond to such issues.

For air quality, the mitigation measures can be evaluated on a per-unit or individual project basis. The evaluation of impacts includes examples of reductions in particulate matter with a mean diameter of 10 micrometers or less (PM_{10}) and NO_x emissions that could occur as a result of updating engines in agricultural and transportation equipment and use of more efficient, newer automobiles. These examples could be assembled into a program that would mitigate impacts from the power plants. The EIS evaluates possible elements of such a program but does not specify combinations of elements.

The following mitigation measures identified by the Imperial County Air Pollution Control Office are also considered under this alternative. None of the measures, individually or collectively, would be able to offset the total quantities of PM_{10} or gaseous emissions produced by the power plants. However, implementation of one or more of these measures would serve to improve air quality in Imperial County.

- Paving Roads: The Imperial County Public Works Director provided the Imperial County Air Pollution Control Office with a list of about 50 road

segments totaling 22 mi (37 km) that could be paved to reduce fugitive dust emissions.

- Retrofitting Emission Controls on IID Power Plants: The Imperial County Air Pollution Control Office suggested that SCR installation on IID steam plant Unit 3 and the peaker plants would reduce NO_x emissions in the project area.

- Enhancing the Use of Compressed Natural Gas in Motorized Vehicles: Four projects were identified as follows: (1) provide funding to maintain the El Centro Compressed Natural Gas refueling facility located at Commercial and Fairfield Streets; (2) provide funding for a compressed natural gas fast-fill facility to be constructed at the Calexico Unified School District; (3) acquire land in Brawley, California, for construction of a compressed natural gas facility; and (4) replace or update engines for the current fleet of ten 40-ft-long (12-m-long) Imperial Valley transit buses and five smaller buses.

- Controlling Imperial Airport Dust: Fugitive dust from natural windstorms and from aircraft (particularly from helicopter landings) occurs frequently at the airport. Dust controls, such as chemical dust retardants and crushed rock on areas prone to wind erosion, could be implemented at the Imperial Airport.

- Retrofitting Diesel Engines for Off-Road Heavy-Duty Vehicles: Diesel engines of off-road vehicle equipment used in agriculture, earthmoving, or construction could be updated to reduce particulate and gaseous emissions.

Several other mitigation measures could be implemented in the Mexicali region that could serve to improve regional air quality. These include a program to replace older automobiles and buses in the Mexicali region with a newer, less polluting, fleet; reduction of fugitive dust through road paving; and reduction of emissions from brick kilns by converting the fuel used in firing the kilns to natural gas.

S.4 PUBLIC PARTICIPATION

The "Notice of Intent to Prepare an Environmental Impact Statement (EIS) and to Conduct Public Scoping Meetings and Notice of Floodplain and Wetlands Involvement" was published in the *Federal Register* (68 FR 61796) on October 30, 2003. Announcements were also placed in local newspapers. A project Web site maintained for DOE (http://web.ead.anl.gov/bajatermoeis) provides background information on the proposed projects, including previous NEPA review and DOE's NEPA process. Public scoping meetings were held by DOE and BLM at two California locations on November 20, 2003 — the City Hall of El Centro and the City of Calexico City Hall. A total of 20 individuals presented oral comments at the two public scoping meetings. Written comments were also solicited. Seventeen individuals submitted written comments during the scoping period, which closed on December 1, 2003.

Commentors focused mainly, but not exclusively, on the impacts of construction and operation of the two transmission lines and operation of the two power plants to environmental resources in Imperial County, California. To ensure that all issues with respect to the permit applications are considered, this Draft EIS addresses issues that were raised during the litigation before the United States District Court.

An additional opportunity for public participation will be provided during the public comment period on this draft EIS. At that time, interested or potentially affected agencies, tribes, organizations, and members of the public can comment on the Draft EIS (this document) and participate in public hearings.

S.4.1 Issues within the Scope of the EIS

The issues described below have been addressed in this EIS.

Several commentors suggested that operation of the natural gas-fired power plants in Mexico would have adverse impacts on water volume and water quality of the New River and the Salton Sea and water availability to the Imperial Valley in California. Specific issues included impacts to the New River caused by an increase in temperature, the increase in total dissolved solids (TDS), and the reduction of dissolved oxygen.

Many commentors were concerned that the two power plants would lead to further degradation of air quality in the region. Imperial County is classified as nonattainment for PM_{10} and ozone (O_3). Specifically, issues were raised about possible increases in NO_x, CO, O_3, and particulate matter that would be caused by power plant operations. Commentors questioned the assumptions presented in the court declarations for the NH_3 concentrations released at the plants used in calculations of secondary PM_{10} generation. One commentor suggested that the air samples taken at the border do not reflect maximum exposure concentrations and requested that stack heights and proximity to the border of the power plants be taken into consideration when estimating air emission concentrations.

Many commentors were concerned about human health impacts from the power plants. Individuals expressed concern over possible effects of emissions on incidences of asthma, particularly in children, in Imperial Valley. There were several requests that a comprehensive air-pollution-related health risk assessment for all residents of Imperial County be conducted as part of the EIS process.

Many commentors expressed the need for the EIS to discuss mitigation measures to offset impacts from power plant operations, mainly related to air emissions. Suggestions included establishing a mitigation fund, identifying offsets in the United States (ways to reduce air emission amounts from other sources to compensate for emissions from the power plants in Mexico), and completing projects to mitigate impacts from power plant operations.

Commentors raised issues related to alternative technologies that could be used at the power plants to reduce water use in plant cooling and air emissions from the facilities. Issues

included the use of dry cooling or a combination of wet-dry cooling to reduce water required for plant operation, installation of CO controls and SCR systems on all power plant units, and use of best available technology to reduce air emissions.

Ecological concerns raised by commentors related to transmission line construction and operation included potential impacts to endangered species and suggestions that birds protected by the Migratory Bird Treaty Act be addressed in the impact analysis. Issues raised related to aquatic habitats included salinity increases in the New River and Salton Sea, potential effects on fish and bird populations in the Salton Sea, and water quality degradation that would affect recreational fishing in the Salton Sea.

Commentors suggested that the EIS examine the visual impact of the two new transmission lines and that the EIS analysis address the potential effects of the projects on tourism and recreational fishing in the Salton Sea. Environmental justice was raised as an issue by a commentor. One commentor requested that the EIS address impacts of the project on cultural resources.

S.4.2 Issues outside the Scope of the EIS

Many commentors requested that the EIS evaluate impacts in Mexico. The requirements of E.O. 12114 (January 4, 1979) regarding consideration of impacts outside the United States do not apply because the proposed actions do not affect the global commons or a foreign nation not participating in the action.

Several commentors suggested that the Intergen and Sempra applications for Presidential permits, construction of the two power plants in Mexico, and approval of the North Baja Pipeline, LLC, by the Federal Energy Regulatory Commission are related actions and should be assessed as a single undertaking because the power plants would burn natural gas supplied by the pipeline. While the transmission lines and pipeline are related and complementary in that they would facilitate the operation of the electric generating facilities in Mexico, they are independent actions that serve distinct functions and that can proceed separately. Intergen and Sempra stated that if the Federal Energy Regulatory Commission had chosen not to grant a Presidential permit for the gas pipeline, the power plants would operate by using alternate fuel sources. North Baja Pipeline, LLC, submitted information to the Federal Energy Regulatory Commission indicating that the gas pipeline would be a viable project even without the Intergen and Sempra power plants.

A commentor suggested that a 50-year comprehensive cumulative impact assessment be conducted as part of the EIS. This EIS does contain a cumulative impact analysis that considers cumulative impacts from the projects for as long as they would occur (e.g., impacts from the transmission lines would continue for as long as the lines would be in place). CEQ guidance on conducting cumulative impact assessments states that projects be reasonably foreseeable. DOE and BLM believe that reasonably foreseeable new projects tend to have a planning period of 10 years or less. Projects that may be developed beyond a 10-year planning horizon are too speculative to be considered reasonably foreseeable.

A commentor requested that a national policy be developed to define the minimum distance that transmission lines can be constructed relative to gas pipelines. It is not the purpose of this EIS to consider such a national policy; therefore, this issue is outside the scope of the EIS.

Commentors requested that information pertaining to emergency outage plans and homeland security issues be examined as part of the EIS. The development of emergency outage response plans is the purview of local public safety officials and is outside the scope of the EIS. The proposed transmission lines and power plants present no greater target for terrorists than any other high-voltage transmission lines or power plants in the United States. Also, outside of the NEPA process, DOE will perform an electric reliability study to ensure that the existing U.S. power supply system would remain fully operational upon the sudden loss of power, regardless of the cause of the outage.

S.5 COMPARISON OF POTENTIAL ENVIRONMENTAL IMPACTS AMONG ALTERNATIVES

The following discussion identifies the environmental implications of choosing among alternatives, organized by resource area. Both temporary impacts during construction and long-term impacts during operation of the projects are considered. This discussion is followed by Table S-1, which provides a summary of impacts for the alternatives. For the proposed action, that is, the granting of one or both of the Presidential permits and ROWs, for most resource areas the analysis was bounded by calculating impacts as if both lines had been allowed. This serves two purposes. First, it demonstrates the maximum possible impacts; second, it clearly presents the combined impacts of the agencies' preferred alternative, that is, permitting both facilities. The only exceptions to this methodology are in the areas of air, water, and human health. For these areas, because of the particular concerns expressed by the commentors (and the court), the impacts are presented separately for each facility as well as in combination.

S.5.1 Geology, Soils, and Seismicity

Under the no action alternative, there would be no potential impacts to geologic resources. Current geologic conditions would continue, and no prime farmland would be disturbed. Erosional processes would continue naturally in undisturbed areas.

Under the proposed action, soils along the proposed and alternative transmission line routes would be affected at the support structure sites, access road and spur areas, construction areas, and staging areas. No cultivated land would be disturbed. It is likely, however, that the lower portion of the western alternative routes could cross prime farmland.

Temporary and permanent impacts would occur during the construction phase in the immediate area of construction-related activities. Impacts would include an increased potential for soil erosion because vegetation would be removed to prepare the site, soil disturbance associated with grading to construct access roads and spurs, and excavation for installing the tower support structures. Other areas of soil disturbance would include the work areas around

each tower, pull sites, lay-down areas, and the trench for optical cables. Soil compaction would occur as a result of vehicles on the access roads and spurs and heavy equipment within the lay-down areas used for monopoles. (The steel lattice towers and A-frame support structures would be delivered by helicopter.)

Although the Imperial Valley is seismically active, neither the proposed routes nor the alternative routes lie within a fault-rupture hazard zone. On the basis of the California Geological Survey's ongoing evaluation of fault zones to date, surface fault rupture is not likely to occur along any of the proposed transmission line routes.

The use of more efficient air emission control technologies and/or alternative cooling technologies would not change the transmission line configurations as described under the proposed action; thus, the impacts to geologic and soil resources under the alternative technologies alternative would be the same as those for the proposed action.

Under the mitigation measures alternative, any paving of roads would lead to some temporary, short-term impacts to soils along road ROWs (e.g., soil compaction or minor erosion from surface disturbance caused by equipment and vehicles parked along areas being paved). The overall impact of road paving would be beneficial because it would reduce fugitive dust emissions and soil erosion. Similar impacts could occur at the construction sites of the compressed natural gas fast-fill stations (i.e., in Brawley or adjacent to the Calexico Unified School District). Implementation of dust controls, such as chemical dust retardants and crushed rock on areas prone to wind erosion at the Imperial Airport, would be beneficial.

S.5.2 Water Resources

S.5.2.1 Water Use

Under the no action alternative, the LRPC EAX unit would operate and would consume 4,440 ac-ft/yr of water for cooling taken from the Zaragoza Oxidation Lagoons in Mexicali that would otherwise flow to the New River and on to the Salton Sea. The proposed action, mitigation measures, and alternative technologies alternatives would include EAX operation plus operation of the EBC export unit at the LRPC plant and the TDM plant. The proposed action and mitigation measures alternatives would consume 10,667 ac-ft/yr of water (the LRPC plant alone would consume 7,170 ac-ft/yr; the TDM plant alone would consume 3,497 ac-ft/yr). Under the alternative technologies alternative, the use of dry cooling would consume as little as 5% of the water used under the proposed action, and the use of wet-dry cooling would consume as much as a sizable fraction of the water used under the proposed action, depending on the amount of time wet cooling would be used. Water treatment and consumption by the power plants would affect the quality and quantity of water in the New River and in the Salton Sea.

S.5.2.2 New River

Power plant operations under the proposed action and mitigation measures alternatives would reduce the average annual flow of the New River at the Calexico gage (near the U.S.-Mexico border) by about 5.9%. Since the New River gains in flow from agricultural runoff as it flows northward, decreases in the average annual flow at the Westmorland gage near the Salton Sea would be much less, about 2.3%. The combined annual water consumption for the power plants would represent about 23.3% and 34.7% of the natural variability in annual flow at the Calexico and Westmorland gages, respectively. These decreases in flow would result in a decrease in average annual water depth of about 0.13 ft (3.9 cm) at the Calexico gage and 0.07 ft (2.1 cm) at the Westmorland gage. These changes would maintain floodplains within the extent of historical values; therefore, impacts to New River floodplains would be minimal. Impacts on flow from the alternative technologies alternative would range from essentially zero from the use of dry cooling to a sizable fraction of the impacts on flow under the proposed action, depending on water use associated with the wet-dry cooling technology (i.e., the extent to which dry versus wet cooling was used). Impacts on flow under the no action alternative would be less, about 46% of those under the proposed action alternative.

Power plant operations would also affect the water quality of the New River. Total dissolved solids (TDS) concentrations (i.e., salinity) would increase due to the evaporation of water for cooling and return of TDS to the New River. However, the annual total TDS load to the river would be reduced somewhat due to the permanent removal of some TDS by the water treatment plants associated with the power plants.

Under the proposed action and mitigation measures alternatives, TDS concentrations at the Calexico gage near the U.S. border would increase 5.6%, or about 46% of TDS variability in the New River, and would remain less than the 4,000-mg/L water quality objective for the Colorado River Basin. Under alternative cooling technologies, TDS concentration increases would be less, depending on the extent that dry cooling was used. The TDS concentration increase under the no action alternative would be less than 3.7% at the Calexico gage. The loads (total mass) of total suspended solids (TSS), biochemical oxygen demand (BOD), chemical oxygen demand (COD), selenium, and phosphorus as well as of TDS would also be reduced by plant operations. Changes in the temperature of the New River would be minimal as the power plant discharge water would flow approximately 6 mi (10 km) before entering the New River.

S.5.2.3 Salton Sea

Reductions in New River flow would result in a decrease in inflow to the Salton Sea, thus reducing its volume, lowering its elevation, and decreasing its surface area. Under the proposed action and mitigation measures alternatives, the decrease in water volume in the Sea would be about 10,667 ac-ft (1.32×10^7 m^3), less than 0.1% of the Sea's volume. The corresponding change in elevation would be about -0.05 ft (-0.6 cm), about 10% of the Sea's natural variability. Surface area would be decreased by about 97 acres (39 ha). This represents a decrease of about 0.04% of the Sea's initial surface area. Under the no action alternative, the reduction in the

surface area of the Salton Sea would be only about 40 acres (16 ha), and it would be almost zero with dry cooling under the alternative technologies alternative

Impacts to water quality in the Salton Sea would result from consumption of water from power plant operations. With no plants operating, the natural rate of the dissolved solids concentration (salinity) increase is about 443.6 mg/L/yr. With both plants operating, this rate would increase by 0.19 mg/L/yr to about 443.8 mg/L/yr due to the evaporation of cooling water and the return of TDS in cooling water to the New River. After 1 year of plant operations, the TDS concentration in the Sea would be about 44,510 mg/L, compared to 44,445 mg/L if no plants were operating within the same period. The Salton Sea would stabilize at a slightly lower elevation. Thereafter, there would be almost no difference between the no action and the three action alternatives in their effect on salinity. This result is due to the fact that reduced evaporation from the Salton Sea resulting from reduced surface area would offset evaporative losses from power plant cooling.

Operations of the water treatment plants associated with the power plants would reduce the load of phosphorus the New River discharges to the Sea by about 150,000 lb (68,030 kg), which is about a 5.3% reduction in the total phosphorus load to the Salton Sea (the New River delivers about 50% of the phosphorus load to the Sea). Selenium loads would be reduced by about 38 lb/yr (17 kg/yr), which represents only a very small fraction of the total selenium load to the Sea.

S.5.2.4 Brawley Wetland

The flow reductions in the New River would not interfere with the withdrawal of water for the Brawley wetland (a pilot wetland project that withdraws about 7 ac-ft/yr from the New River). However, increases in TDS and selenium concentrations could cause adverse impacts to the wetland system. Reductions in other water quality parameters (e.g., BOD, COD, and pathogens) could be beneficial. For all alternatives, the changes would be within the range of the parameters' normal variability.

S.5.2.5 Groundwater

Construction of footings for the support structures along the proposed transmission lines could be deep enough to enter the groundwater zone. Potential impacts to groundwater from transmission line construction would be limited to temporary and localized lowering of the water table if it was necessary to dewater an excavation to install a footing.

Indirect impacts to groundwater would occur as a result of decreasing flow in the New River, since the New River is a recharge source for groundwater in the Imperial Valley Groundwater Basin. However, since the New River is only one of many recharge sources, contributing about 7,000 ac-ft/yr (0.25 m^3/s), and the reduction of flow is expected to be low, the impacts to groundwater resources resulting from all alternatives are expected to be minimal.

DOE and BLM have not identified an action under the mitigation measures alternative for reducing impacts to water resources. However, mitigation measures for reducing air impacts, such as paving 22 mi (35 km) of dirt roads and construction of fast-fill compressed natural gas stations, could result in reduced soil erosion and thus potentially reduce sediment discharge to streams.

S.5.3 Air Quality

Air quality impacts resulting from transmission line construction include those from fugitive dust emissions, PM_{10} emissions, and fuel combustion emissions. Fugitive dust would be generated by construction vehicles used for excavation, by helicopter movement and landings for delivery of support structures, and by entrainment of soil on vehicle wheels. Impacts due to fugitive dust emissions are expected to be small and localized and would end once the construction activities are completed. Dust generation could be controlled by spraying water on access roads and work areas and tower sites.

Fugitive dust emissions would not affect ambient PM_{10} levels in the projects area. Fugitive PM_{10} emissions associated with tower pad construction are estimated to be about 26.4 lb (11.9 kg) of PM_{10} per acre per day over the construction period. Vehicular traffic to and from the construction areas and helicopter operations would generate a total of about 5.4 tons and 0.67 ton (4.9 t and 0.61 t) of PM_{10}, respectively, over the construction period. Construction-related PM_{10} emissions over the construction period would be about 11.4 tons (10.3 t) for the proposed routes, 14.4 tons (13.1 t) for the western alternative routes, and 12.3 tons (11.2 t) for the eastern alternative routes. Periodic maintenance activities would generate a maximum of 0.08 ton/yr (0.07 t/yr) (and slightly more for the longer alternative routes). Fuel combustion emissions associated with construction vehicle traffic are expected to be minimal and temporary in nature.

Air quality impacts from power plant operations would result from emissions of NO_x, CO, CO_2, and PM_{10} from the combustion of natural gas (stack emissions); PM_{10} from cooling towers; and NH_3 (known as NH_3 slip) from the SCR system used to reduce NO_x emissions.

Under the no action alternative, the three gas turbines of the LRPC EAX unit would operate, but the EBC unit at the LRPC and the TDM plant would not operate. Total emissions of CO and total PM_{10} emitted would be 2,181 tons/yr and 714 tons/yr (1,979 t/yr and 648 t/yr), respectively. Total NO_2 and NH_3 slip emitted through March 2005 would be 2,005 tons/yr and 74 tons/yr (1,819 t/yr and 67 t/yr), respectively. After the SCRs were installed on the two LRPC EAX Mexico turbines, NO_2 emissions would be reduced to 285 tons/yr (258 t/yr), while NH_3 slip would increase to 222 tons/yr (201 t/yr).

Under the proposed action, the EBC unit plus EAX export turbine at the LRPC and the TDM plant would operate. Emissions of CO and total PM_{10} caused only by these units would be 1,635 tons/yr and 732 tons/yr (1,483 t/yr and 664 t/yr), respectively. The NO_2 and NH_3 slip emitted by these units would be 418 tons/yr and 498 tons/yr (379 t/yr and 452 t/yr), respectively.

Projected increases in concentrations of NO_2, CO, and PM_{10} at U.S. reactor locations under both the no action and proposed action alternatives all fall below the U.S. Environmental Protection Agency (EPA) significance level (SL) for each pollutant (a benchmark used in this EIS of the threshold of significant impacts to air quality).

The potential for O_3 formation related to plant emissions is also evaluated. O_3 is a secondary air pollutant formed in the presence of sunlight from a variety of precursors that include NO_x, volatile organic compounds (VOC), and CO. Analysis in this EIS concludes that O_3 formation in Imperial County tends to be VOC-limited (i.e., adding VOC may increase O_3, whereas adding NO_x may or may not actually decrease it and vice versa). Operation of power plants under all alternatives could decrease O_3 levels marginally compared to background levels as a result of NO_x emissions. In any case, changes in O_3 levels are expected to be very small, less than 3 parts per billion (ppb).

Under the proposed action alternative (the EBC unit and the EAX export turbine at the LRPC and the TDM plant operating), emissions of carbon dioxide (CO_2, a greenhouse gas produced by human activity) would be about 5,100,000 tons/yr (4,600,000 t/yr), a value that is 0.088% of the total U.S. emissions from fossil fuel combustion. Under the no action alternative, CO_2 emissions would be about 3,900,000 tons/yr (3,500,000 t/yr) or about 0.066%, of total U.S. emissions. There are currently no Federal guidelines on CO_2 emissions in the United States.

Estimated exposures in the United States to NH_3 and hazardous air pollutants (HAPs) emitted from the plants and associated health risk estimates are discussed in Section S.5.11.2.

Indirect air quality impacts in the United States from operation of power plants in Mexico relate to consumption of cooling water and projected exposure of the Salton Sea lake bed, resulting in additional PM_{10} emissions from wind erosion. Under the proposed action, reductions in annual inflow to the Salton Sea from the New River would expose an estimated 97 acres (39 ha) of shoreline that is currently under water. A proportional comparison to the emissions from Owen's Lake, a dried lake bed in Inyo County, California, indicates that an estimated emission rate of 100 tons/yr (91 t/yr) of PM_{10} could result from a 97-acre (39-ha) reduction in Salton Sea area. This estimate is considered to be an upper bound, since a thin strip (about 3 ft 10 in. [1.3 m]) exposed around the Salton Sea shoreline would have less susceptibility to wind erosion than would the open, windswept, dried lake bed of Owen's Lake.

Under the alternative technologies alternative, the proposed transmission lines would connect to power plants that use an oxidation catalyst on all gas turbines. Use of oxidation catalyst technology would further reduce emissions of CO and HAPs when compared with those under the proposed action. CO levels would be well below EPA SLs. Levels of HAPs would be reduced below levels already estimated to be below risk thresholds for the proposed action (Section S.5.11.2).

Also, under the alternative technologies alternative, alternative cooling technologies (dry cooling or wet-dry cooling) would be used at power plants that connect to the transmission lines. Dry cooling tends to reduce plant efficiency on the order of 10 to 15%, especially when outdoor temperatures exceed 90°F (32°C). This would reduce electrical output for a given fuel

input and would necessitate additional fuel consumption, thus increasing plant emissions of all pollutants. Wet-dry cooling would have an intermediate effect on plant efficiency and associated air emissions (between those for plant operations described under the proposed action and plant operations employing dry cooling). Dry cooling would have a beneficial impact in that by removing the need for cooling towers, PM_{10} and NH_3 emissions would be reduced. Wet-dry cooling would require cooling towers; thus, it would reduce these emissions much less than would dry cooling.

Measures under the mitigation measures alternative generally focus on ways to compensate for air quality impacts in the United States due to power plant operations. Measures identified by the Imperial County Air Pollution Control Office include paving roads, retrofitting emissions controls on IID power plants, enhancing the use of compressed natural gas to fuel motorized vehicles, controlling Imperial Airport dust, and retrofitting diesel engines for off-road heavy-duty vehicles. PM_{10} and NO_x emissions could be reduced by paving roads, retrofitting emissions controls on IID power plants, and retrofitting diesel engines. Mitigation opportunities in Mexico could also prove to be beneficial and cost-effective; these might include road paving, replacing older automobiles and buses, and converting the fuel used in brick kilns to natural gas. This EIS, however, does not identify or recommend a particular mitigation program.

S.5.4 Biological Resources

S.5.4.1 Transmission Corridors

Impacts to biological resources as a result of transmission line construction under the action alternatives include temporary and permanent disturbance to desert habitat between the U.S.-Mexico border and the IV Substation. Under the proposed action, permanent impacts would involve about 3.1 acres (1.3 ha) of Sonoran creosote bush scrub and 0.3 acre (0.1 ha) of desert wash habitat adjacent to the existing transmission lines from ground disturbances at tower bases, placement of tower foundations, and construction of new spur roads. Temporary impacts to these resources would also occur. Construction along the alternative routes would result in more areas of desert habitat, with permanent and temporary impacts to desert habitat because both alternative routes would be longer than the proposed routes, and new access roads and spurs would have to be constructed (the proposed routes would use the existing access road but would require additional spurs). Ground disturbance and watering for dust control during construction of the proposed or alternative routes could create conditions favorable for the invasion of nonnative plant species.

Transmission line construction would not adversely impact any plants or animals Federally listed as threatened or endangered but could potentially destroy some plant species considered sensitive by the California Native Plant Society. Species protected by the Migratory Bird Protection Act would also not be adversely impacted. Impacts to raptors due to electrocution when landing on towers to perch would not occur since the spacing between the conductors and ground wire on the top of the towers would exceed the wing span of the bald eagle (the largest raptor that would likely occur in the projects area). Impacts to wildlife in the

projects area would be greatest for small mammals and reptiles with low mobility, which might be inadvertently killed by the movement of materials and heavy equipment during construction. Protective measures would be implemented to protect the flat-tailed horned lizard, a species of special interest to BLM, during the construction period (which would take place between November 15 and February 15 when the lizard is dormant). Protective measures would also be taken to protect the western burrowing owl, also a BLM sensitive species, during the construction period.

No wetlands would be affected by the proposed projects within the transmission line routes, but a total of 0.21 (0.08 ha) of desert wash areas considered to be navigable waters of the United States would be affected because of the placement of tower footings and access roads. Under the Clean Water Act, a permit would be typically required from the U.S. Army Corps of Engineers before the projects could be implemented; however, Nationwide Permit No. 12 covers projects, like the proposed projects, that do not exceed 0.50 acre (0.20 ha).

S.5.4.2 New River

Indirect impacts to biological resources along the New River could result from power plant operations, since the power plants would reduce the flow and depth of water in the New River and increase the concentrations of water quality parameters like salinity (measured as TDS). Decreases in water level, however, are not likely to result in impacts to riparian plant species since these changes would be on the scale of a few centimeters. Increases in New River TDS (from 2,620 mg/L under the no action alternative to 2,766 mg/L under the proposed action alternative) would remain below the 4,000-mg/L water quality objective for the Colorado River Basin and would have little or no effect on the growth of riparian vegetation (which generally has a high tolerance for salinity).

Decreases in New River water depth would not affect the operation and maintenance of the Brawley wetland since the water intake for the pump used to supply water to the wetland is located deep enough to work under the slightly reduced flows. The impacts due to water quality changes, especially in salinity, would depend on the salt tolerance of freshwater wetland plants. The California bulrush is reportedly capable of tolerating salinities up to about 6,000 mg/L. Salinity tolerances for other freshwater wetland plants have been estimated at about 4,800 mg/L. Under the proposed action, salinity at the Calexico gage at the U.S.-Mexico border would be about 2,766 mg/L, with less than a 0.01% chance that this concentration would exceed 4,000 mg/L.

Water quality changes in the New River are expected to have relatively minor impacts to fish and aquatic invertebrate populations between the Calexico gage and the Salton Sea. Slight increases in average salinity concentrations would fall within the range of levels that have occurred historically and would not likely adversely affect the survival or distribution of fish and aquatic invertebrate species.

S.5.4.3 Salton Sea

Indirect impacts to biological resources in the Salton Sea would occur as a result of changes in flow volume, salinity, and nutrient levels of the New River. Reduction in New River flow volumes would reduce the inflow to the Sea, thus increasing concentrations of Salton Sea salinity and nutrients. Under the proposed action and mitigation measures alternative, it is estimated that the salinity in the Salton Sea would reach a critical level (60,000 mg/L) in about 36.06 years, which is 4 days sooner than if no plants were operating. Salinity above a concentration of 60,000 mg/L would be toxic (i.e., above levels for survival of most aquatic species in the Sea). Biological resources would be impacted by increasing salinity before this toxic level would be reached.

In the near term (about 1 year), the proposed action would result in a decrease of about 5.3% in the annual phosphorus load to the Salton Sea (about 3.7% more than if no plants were operating). This decrease would likely reduce eutrophication[1] in the area of inflow and could reduce the frequency (relative to the situation if no plants were operating) at which low dissolved oxygen events occur. (These events are the cause of mortality events for fish and aquatic invertebrates in that part of the Sea.) Depending on the salinity levels (i.e., if they remain below the toxic level of 60,000 mg/L), the reduction in phosphorus could increase the availability of food resources for birds and other wildlife that use the Salton Sea.

Impacts to habitat for waterfowl and wading birds summering or migrating through the area are not expected to occur, since the maximum reduction in water elevation of the Salton Sea (as a result of decreases in inflow volume) under the proposed action would be small (about 0.05 ft or 0.6 cm).

The alternative technologies alternative using dry cooling or wet-dry cooling systems could impact biological resources in the New River and Salton Sea. Potential indirect impacts to the New River would be reduced if alternative cooling technologies were employed. Dry cooling technologies would reduce water consumption by about 95% compared with consumption under the proposed action alternative. The use of wet-dry cooling technology would result in water consumption that falls between that identified for dry cooling alone and that identified for the proposed action alternative. While both dry cooling and wet-dry cooling would result in less potential for adverse impacts compared with the proposed action, it should be noted that impacts to biological resources associated with the New River resulting from implementation of either the proposed action or the alternative technologies would be small.

Implementation of actions under the mitigation measures alternative would be the same as impacts under the proposed action since all plants would be assumed to be operating. Actions such as paving of roads in Imperial County or construction of compressed natural gas service

[1] Eutrophication is the process by which freshwater bodies are enriched by nutrients, such as phosphorus and nitrogen, which leads to excessive plant growth. This plant growth usually occurs as an extensive growth of algae, which eventually die and cause reduced oxygen levels because of their bacterial breakdown. The lower water oxygen levels eventually lead to fish kills.

stations in El Centro or Calexico would not affect water quality in the New River and thus not impact biological resources.

S.5.4.4 Special Status Species

Special status species include Federal- and State-listed threatened and endangered species and those species considered sensitive by BLM. Impacts to special status species occurring in the riparian or aquatic habitats of the New River or the Salton Sea under the no action and action alternatives would not be expected. Small changes in New River flow volumes and water quality are not expected to result in adverse impacts to the southwestern willow flycatcher, Gila woodpecker, or bank swallow that occur in the desert scrub riparian areas. Small changes in Salton Sea water elevation are expected to be too small to create adverse impacts for special status bird species (e.g., bald eagle, brown pelican, and Yuma clapper rail). Decreases in nutrient levels, however, may produce small beneficial impacts by reducing episodic fish kills from reduced oxygen levels, thus resulting in an improved food base for fish-eating birds. Because the desert pupfish is highly tolerant of elevated salinity, it is not likely to be affected by increases in salinity under either the no action or action alternatives. There is a high potential for adverse impacts to the flat-tailed horned lizard and the western burrowing owl and their habitats as a result of transmission line construction activities. These impacts would be reduced by implementing protection measures as directed by BLM.

Under the alternative technologies alternative, implementation of the dry cooling or wet-dry cooling technologies on power plants would reduce the use of cooling water compared with the proposed wet cooling system. The impacts to the New River and Salton Sea from either a dry cooling or wet-dry cooling system would change water levels and water quality only slightly in comparison with the no action and proposed action alternative. Therefore, no impacts are expected to the desert pupfish, bald eagle, brown pelican, Yuma clapper rail, southwestern willow flycatcher, Gila woodpecker, or bank swallow from implementation of the alternative technologies alternative.

The impacts of implementing the mitigation measures alternative on protected species would depend on the nature and location of the actual measures employed. Site-specific information on the protected species at the location planned for the mitigation action would need to be obtained prior to implementing the measure in order to determine the appropriate way of minimizing or avoiding impacts.

S.5.5 Cultural Resources

Under the no action alternative, the Presidential permits and corresponding ROWs would be denied, and the transmission lines would not be built. Therefore, no impacts to cultural resources would be expected.

Under the proposed action, three alternative transmission line routes were evaluated. A cultural resources survey was conducted for the proposed routes to ascertain if any cultural

resources are present. The survey discovered 9 previously recorded sites and recorded 18 new sites and 34 isolated artifacts. All but one of the sites appear to be from the prehistoric period and are likely related to Lake Cahuilla, an ancient lake located along the applicants' proposed routes. The historic period site dates to the 1930s. Twenty-three of these sites have been recommended as eligible for *National Register of Historic Places* (NRHP) listing. Of the sites identified, four would be directly impacted under the proposed action using the applicants' proposed routes. There is also the potential for additional impacts from the creation of access roads, spurs, and lay-down areas. A treatment plan for the four potentially eligible sites that would be impacted, would be developed and approved by the California State Historic Preservation Office (SHPO) before construction of the transmission lines to mitigate any adverse effects.

BLM has partially surveyed the western alternative routes for the presence of cultural resources. The western routes were chosen to avoid cultural resources. This would be partially achieved by being west of the Lake Cahuilla shoreline. As a result, the impacts to archeological resources would be expected to be less along the western alternative routes than along the proposed routes. However, the transmission lines in the western routes would run along the U.S.-Mexico border for a greater distance, and the border itself is considered a cultural resource. These routes would have the potential to degrade the appearance of the border by introducing a visual intrusion. If these routes were selected, additional cultural resource surveys would be necessary as well as additional consultation with the SHPO and the appropriate Native American tribes.

BLM has not surveyed the eastern alternative transmission line routes for the presence of cultural resources. If these routes were selected, a cultural resources survey would be necessary as well as additional consultation with the SHPO and the appropriate Native American tribes. Use of more efficient control technologies (use of oxidation catalysts to reduce CO emissions) and/or alternative cooling technologies would not change the transmission line configurations; thus the impacts to cultural resources under the alternative technologies alternative would be the same as those for the three alternative routes under the proposed action.

In addition to activities described for the proposed action, activities under the mitigation measures alternative would require consultation with the SHPO before construction (e.g., paving of roads) commences. If cultural resources were to be impacted, the NRHP eligibility status of the sites would have to be evaluated. If found to be NRHP-eligible, protection measures for these sites would be developed in consultation with the SHPO and the appropriate Native American tribes.

S.5.6 Land Use

Under the no action alternative, the Presidential permits and corresponding ROWs would be denied, and the transmission lines would not be built. Land use in the Yuha Basin ACEC would remain limited.

The environmental impacts to land use associated with granting the Presidential permits and corresponding ROWs would be similar for all of the proposed routes. Land use would be

restricted along the access roads for the new transmission lines regardless of which routes were chosen. Additional impacts would be incurred for the proposed western and eastern alternative routes because each would require a new restricted access road to be built across the desert. The total amount of permanent disturbance for the western and eastern alternative routes (13.1 and 10.4 acres, respectively [5.3 and 4.2 ha]) would be higher than for the proposed routes (<3.55 acres [<1.4 ha]). The western alternative routes would run partially outside of designated Utility Corridor N and would require alteration of the land use designation (Class L, Multiple Use) for this part of the routes. Under the proposed and eastern alternative routes, no alteration of current land use plans would be necessary. However, since the entire area encompassing the proposed, eastern, and western alternative routes is listed as a limited use area and given the small amount of land needed for the transmission lines, this additional limiting of land use would not represent a major impact.

Two locations in the southern portion of the proposed routes were previously used for the mining of sand and gravel. Mining activities have been discontinued in these areas. The nearest mining activities are 2.5 mi (4 km) west of the proposed routes and would be unaffected by locating the transmission lines for the proposed or alternative routes.

Recreation activities in the Yuha Basin ACEC are limited to camping. BLM does not allow the use of off-road vehicles in this area except on county roads. Camping is also allowed only with a permit and only in designated areas. There are no designated camping areas within 10 mi (16 km) east or west of the proposed transmission line routes.

No agricultural activities take place on BLM-managed land. Therefore, using the proposed routes on BLM land would interfere with any agricultural practices. If the eastern alternative routes were chosen, however, there is some potential for interference with crop-dusting activities. The lower portion of the western alternative routes could cross prime farmland.

The use of the western or eastern alternative routes would require that portions of the transmission lines run parallel to the border. The U.S. Customs and Border Patrol Agency discourages practices of this sort because it would require additional patrolling to ensure the integrity of the lines.

Use of more efficient control technologies and/or alternative cooling technologies would not change the transmission line configurations as described under the proposed action; thus land use impacts under the alternative technologies alternative would be the same as those for the proposed action.

The expected impacts to land use under the mitigation measures alternative would depend on the nature of the mitigation measures. For example, if the paving of roads were selected as a mitigation measure, increased access to certain remote areas that are currently difficult to access could result in adverse impacts to current land use.

S.5.7 Transportation

Under the no action alternative, the Presidential permits and corresponding ROWs would be denied, and the lines would not be built. With no construction traffic, there would be no increases in local traffic, and local traffic conditions would continue.

Small increases in local traffic would be expected throughout the duration of transmission line construction for the proposed and alternative routes. Workers residing locally, including those residing in the area temporarily, would travel to the construction sites by private vehicles. In addition, for the proposed routes, 10 workers would be brought to the construction sites from Mexico by bus on a daily basis. Most workers would travel between the El Centro and Calexico areas and the construction site on State Route 98. For the proposed routes, construction traffic would vary across the 5 months of construction, from 18 round-trips per day in the first 2 months, falling to 8 in the third month and 5 in the last two months. Given the current traffic volume on State Route 98 and the relatively low volumes of vehicular traffic associated with the proposed action, no impacts on traffic flow over local segments of State Route 98 are expected for any of the routes.

Use of more efficient control technologies and/or alternative cooling technologies would not change the traffic volumes associated with transmission line construction as described under the proposed action; thus transportation impacts under the alternative technologies alternative would be the same as those for the proposed action.

Under the mitigation measures alternative, impacts to local transportation networks would depend on the nature of the mitigation measure. In the short term, any mitigation-related construction project would increase local traffic.

S.5.8 Visual Resources

Construction and operation of the transmission lines would meet the visual contrast criteria established under the objectives for Visual Resource Management (VRM) Class III, whereby the existing character of the landscape would be partially retained, with any level of change being moderate. The project would attract attention to viewers in the area, but it would not dominate views. The area in the vicinity of the proposed transmission line routes is classified as a Class III Visual Resource Inventory Area. VRM Class III objectives stipulate that the existing character of the landscape should be partially retained and that any level of change should be moderate. While landscape changes may attract attention, they should not dominate the view of casual observers. Under the no action alternative, the Presidential permits and corresponding ROWs would be denied, and the lines would not be built. No changes in landscape contrast would occur, and the area in the vicinity of the proposed lines would maintain a Class III VRM rating.

While additional lines along the proposed routes would be a visible feature of the landscape, the lines would be constructed by using steel lattice towers similar to those of the existing line, where the natural light and background landscape elements that show through the

structures would diminish the impact of the additional lines on the landscape. Given the type of construction used for the towers, the visual impression of the towers would also lessen considerably with distance from the lines. Similarly, the view from the nearest residence, located 1.3 mi (2.1 km) east of the existing line, would not be impacted substantially, given the location of the existing line and the landforms and vegetation between this location and the proposed routes.

Transmission lines built along the eastern and western alternative routes would have impacts similar to those along the applicants' proposed routes. Because of the alternative routes' proximity to the existing line (at distances of about 9,840 ft [3,000 m] east or west of the applicants' proposed routes along State Route 98), views to road users from key observation points on either side of the transmission routes would not differ substantially between the alternative routes. However, the location of the eastern alternative routes would be closer to the nearest residence and would therefore be a larger aspect of the landscape than lines constructed along either of the other routes.

Use of more efficient control technologies and/or alternative cooling technologies would not change the transmission line configurations as described under the proposed action; thus impacts to visual resources under the alternative technologies alternative would be the same as those under the proposed action.

The impacts to visual resources under the mitigation measures alternative would depend on the nature of the mitigation measures. For example, the Imperial County Air Pollution Control District indicated that a compressed natural gas fast-fill station would be similar in appearance and size to a gasoline service station. Thus, the heights of structures would not cause a visual contrast that would attract the attention of viewers if they were located in industrial or commercial areas.

S.5.9 Noise

Under the no action alternative, the Presidential permits and the corresponding ROWs would be denied, and the transmission lines would not be built. Noise levels would continue at background levels of approximately 35 A-weighted decibels [dB(A)].

During construction of the proposed transmission lines, daytime noise would increase in areas located near the ROWs. Typical noise levels for construction would be about 90 dB(A) at a distance of 50 ft (15 m) from the operating equipment, assuming two pieces of equipment are operating simultaneously.

Noise levels decrease about 6 dB as the distance from the source doubles because of the way sound spreads geometrically over an increasing distance. The nearest residence to the proposed routes is located 6,900 ft (2,100 m) directly to the east along State Route 98. At this location, noise from construction activities would be 48.6 dB(A). This level would be about 43.8 dB(A) as day-night average sound level (DNL), if construction activities are assumed to be limited to an 8-hour daytime shift. This value is below the EPA guideline level of 55 dB(A) for

residential zones, which was established to prevent interference with activity, annoyance, or hearing impairment. The western alternative routes would be even farther from any residence, and again, the noise impacts during construction would be below the EPA guidance level.

If the eastern alternative routes were used, the distance to the nearest existing residence would be decreased to about 360 ft (109 m) from the center of the ROW along State Route 98. At this distance, where construction activity would occur at any one time, the estimated noise level would be 74.3 dB(A) and 69.5 dB(A) as DNL for an 8-hour daytime shift. This value is much higher than the EPA guideline of 55 dB(A). However, this construction activity near the residence would be limited to a short duration (less than 1 week) and then move to the next tower. These estimates are probably an upper bound because they do not account for other types of attenuation, such as air absorption and ground effects due to terrain. Since this impact is associated with the construction phase only, it would be temporary and short term.

Operation of transmission lines can result in noise impacts from corona, which is the electrical breakdown of air into charged particles, caused by the electrical field at the surface of conductors. Corona-generated audible noise from transmission lines is generally characterized as a crackling or hissing noise. Modern transmission lines are designed, constructed, and maintained so that during dry conditions they will generate a minimum of corona-related noise. During dry weather conditions, noise from the proposed transmission lines would generally be indistinguishable from background noise (35 dB(A) DNL or less) at locations beyond the edge of the ROW. During very infrequent rainfall events, the noise level at the edge of the ROW would be less than 39 dB(A). This is a low level (typical of the noise level in a library). Because of the arid climate in the region and the distance of receptors from the ROW, the impact of corona-generated audible noise during operation of the proposed and alternative transmission line routes is expected to be negligible.

Occasional maintenance activities on the transmission lines and substation would be required. Noise impacts from these activities would be intermittent.

Use of more efficient air emission control technologies and/or alternative cooling technologies would not change the noise levels in the vicinity of the transmission line routes as described under the proposed action; thus noise impacts under the alternative technologies alternative would be the same as those under the proposed action.

The noise impacts under the mitigation measures alternative would depend on the nature of the mitigation measure. For example, one mitigation measure could be paving roads. This would cause short-term noise impacts from operation of the road paving equipment, especially if the road paving occurred near residential areas. Another mitigation measure, retiring older automobiles, could have beneficial noise impacts (reduction of noise).

S.5.10 Socioeconomics

Under the no action alternative, the Presidential permits and corresponding ROWs would be denied, and the transmission lines would not be built. Local economic activity would continue at current levels.

Although a small number of workers are expected to temporarily relocate to Imperial County during construction of the proposed transmission lines, these workers would reside in the county for a maximum of only 5 months, and it is unlikely that the relocated workers would be accompanied by their families. Impacts of the project on the population would therefore be minimal. No impacts to local housing markets are expected, as it is assumed that in-migrating workers would occupy temporary accommodations, with no impact on the local rental housing market. With only a small number of temporary in-migrants, impacts on local public services, including police and fire protection, educational and other local government services, and health and medical resources, would also be minimal.

No new jobs would be created in Imperial County to operate the transmission lines; consequently, no permanent in-migration or population impacts are expected.

Construction of the transmission lines along the proposed or alternative routes would create a small amount of direct and indirect economic activity in the county. Construction along the proposed routes would create 69 direct jobs. Direct employment for the alternative routes would be the same. However, since the alternative routes are longer than the proposed routes, slightly more time would be required for construction, with additional labor and material expenditures required to complete lines along these routes. Wage and salary expenditures and material procurement associated with direct expenditures for each alternative route would produce indirect employment impacts ranging from 23 for the proposed routes, to 25 for the eastern alternative routes, and 32 for the western alternative routes. The total employment impact would be 92 for the proposed routes, 94 for the eastern alternative routes, and 101 for the western alternative routes. None of the routes would impact the county employment growth rate for 2002 by more than 1/100th of a percentage point.

Longer construction durations for the alternative routes are reflected in both the direct and indirect labor income impacts. Construction along the proposed routes would produce $1.4 million in direct income and an additional $0.5 million in indirect income, with $1.9 million in income produced in total. Slightly more total labor income would be produced by the eastern and western alternative routes ($2 million and $2.6 million, respectively) than with the proposed routes.

No new jobs would be created in Imperial County to operate the transmission lines; consequently, no additional employment or income would be generated from line operations.

Impacts of the projects on local government revenues would be slight, with small differences between the proposed routes and the two alternative routes. Sales taxes generated directly by project expenditures and indirectly through the overall increase in economic activity resulting from wage and salary expenditures and material procurement would amount to roughly

$25,900 for the proposed routes, $27,300 for the eastern alternative routes, and $34,900 for the western alternative routes.

A small number of employees would stay in temporary accommodations for the duration of the project, producing tax revenues through the motel occupancy tax. These revenues would range from $6,900 for the proposed routes, $7,300 for the eastern alternative routes, and $9,300 for the western alternative routes.

In addition to tax revenues generated by the projects for local and state governments, the projects would also generate lease rental revenue for the Federal government through payments made to BLM. These would range from $2,180 for the proposed routes, $2,300 for the eastern alternative routes, and $1,934 for the western alternative routes.

Use of more efficient air emission control technologies and/or alternative cooling technologies would not produce changes in employment, housing, or government revenues associated with transmission line construction as described under the proposed action; thus socioeconomic impacts under the alternative technologies alternative would be the same as those under the proposed action.

Measures under the mitigation measures alternative are likely to create local employment as a result of hiring and material procurement. Mitigation-related wage and salary spending and material expenditures would have a beneficial effect on the overall level of economic activity in the county.

S.5.11 Human Health

S.5.11.1 Electric and Magnetic Fields along Transmission Lines

Electrical transmission lines produce electric and magnetic fields (EMF). The strength of each field weakens with distance from the conductors. Electric fields associated with 230-kV transmission lines are below levels of concern. The following discussion concerns magnetic fields.

Information from the literature on magnetic field strengths for split-phase, 230-kV transmission lines similar to the proposed action lines was used to evaluate expected field strengths. Data suggest that magnetic field strengths range from 34 to 48 milligauss (mG) at the centerline, 5 to 8 mG at 60 ft (18 m) from the centerline (corresponding to the edge of the ROW), 1.3 to 2.3 mG at 100 ft (30 m) from the centerline, and 0.19 to 0.35 mG at 200 ft (61 m) from the centerline. As a point of reference, most people in the United States are exposed to 24-hour average magnetic fields of less than 2 mG. Electrical workers may be exposed up to 40 mG.

Because the three 230-kV lines (one existing and two proposed) would run parallel to each other, with each line's ROW adjacent to the neighboring line's ROW, the estimated

magnetic fields of adjacent lines were added together to assess exposure at various locations in the vicinity of the lines.

Assuming additivity of the magnetic fields, the highest field strength would be found directly beneath the center transmission lines (proposed Intergen lines) at a level of approximately 53 mG (48 mG from that transmission line, plus about 2.3 mG from each of the transmission lines located 120 ft [37 m] to either side of the center transmission line). At the edge of the ROW for either the existing line or the proposed Sempra transmission line, the approximate magnetic field strength would be 11 mG (8 mG from the nearest transmission line 60 ft [18 m] away, plus about 2.3 mG from the transmission line 120 ft [37 m] away, and less than 0.4 mG from the transmission line 300 ft [91 m] away). At 140 ft (43 m) from the edge of the ROW on either side of the transmission lines, the field strength would be less than 0.35 mG, in the range of the background magnetic field strength of less than 1 mG.

Field strengths would be slightly lower if the alternative transmission routes were selected; however, the width of the area with a field strength greater than 10 mG would be decreased from 360 ft (110 m) (the width of the ROWs of the three lines combined) to 240 ft (73 m) (the width of the lines combined).

Magnetic fields would be at background levels at locations more than 140 ft (43 m) from the edge of the ROWs; therefore, no exposures above background would occur at residential locations for the proposed routes or the alternative routes. No adverse health impacts would be associated with residential magnetic field exposures from the transmission lines. Transmission line workers would have higher-than-background exposures while working within the transmission line ROWs. However, work activities would generally be limited to monthly inspections of towers and poles and other intermittent repair work. Recreational visitors passing within the transmission line ROWs would also have higher-than-background EMF for limited amounts of time. Exposure data suggest that these temporary elevated exposures would not result in adverse health impacts.

S.5.11.2 Air Pollutants from Power Plants

Under the no action and the three action alternatives, power plant emissions would result in increases in ambient concentrations of NO_x, PM_{10}, CO, and NH_3 in Imperial County. However, all such increases would be below SLs established by the EPA and used as a benchmark of air quality impacts. Accordingly, health impacts from plant emissions would not exceed a threshold level of concern. Health impacts from potential secondary O_3 formation from plant emissions would also be minimal, on the basis of the calculation that O_3 levels would not increase but might actually decrease slightly as a result of plant NO_x emissions in a VOC-limited area.

The proportion of areawide PM_{10} attributable to direct emissions from the power plants is low in comparison with the total ambient concentrations as measured at the area air quality monitoring stations. Secondary PM formed in the atmosphere from power plant emissions, estimated to be, at most, 1 $\mu g/m^3$, would be only a very small fraction of the secondary PM from

other emission sources in the region and would not exceed SLs even in combination with direct PM emissions from the plants.

The asthma problem in Imperial County is a real and important concern, especially with regard to the high incidence of asthma in children in the region. O_3 and PM in the region are likely to be contributing factors to this problem. However, operation of the TDM power plant and the EBC and EAX export units at the LRPC would contribute only very minor increases to the O_3 and PM levels in the region and thus would add only minimally to the asthma problem or other air-quality-related health problems in Imperial County.

A health risk assessment was prepared to determine the potential health risks in the United States from the emissions of HAPs and NH_3 emitted from the power plants. The estimated incremental increase from the proposed action (all plants operating) in cancer risk due to emissions of HAPs ranges from 0.20 to 0.72 per million. This result is below the significance threshold of 1 per million. Noncancer risks were evaluated in terms of a hazard index, which is a comparison of estimated exposures to a threshold level considered to be without adverse impacts. The incremental increase from the proposed action in the chronic (exposure) hazard index for HAPs plus NH_3 would be 0.001, and the incremental increase in the acute (exposure) hazard index would be 0.01, both of which are below the significance threshold of 1.0 for hazard indices. That is, exposure to HAPs plus NH_3 would be, at most, at levels that are 0.1% and 1% of levels considered to be safe for chronic and acute exposures, respectively.

Under the alternative technologies alternative, use of dry cooling or wet-dry cooling systems on power plants in Mexico would have no effect on the EMF produced by the proposed transmission lines. PM emissions from power plants would be below SLs and less than those from plants using only wet cooling. Health benefits would be minimal when compared with those under the proposed action. Likewise, use of oxidizing catalysts on power plants to reduce CO and HAPs would yield minimal health benefits.

Activities under the mitigation measures alternative would benefit regional air quality in Imperial County and the Mexicali area. The impacts to human health cannot be predicted because design information for the individual mitigation projects has not been developed. However, possible actions — such as replacing older automobiles with a newer, less polluting fleet; paving roads; providing natural gas to fuel brick kilns in Mexicali; converting the engines of off-road diesel-powered equipment used in agriculture; increasing the use of compressed natural gas in Imperial Valley transit buses; and installing SCR technology on the IID's Unit 3 at the steam plant — all would result in reductions of pollutant emissions in the project region in the long term.

Mitigation measures that would reduce the level of PM in the study area (e.g., retiring older automobiles, paving roads) could result in a small reduction in the number of asthma cases and other respiratory problems in the region, assuming there is a direct relationship between PM concentrations and health effects. The effect of mitigating other sources of O_3 precursors (NO_x and VOC) in the study area and associated health effects would depend on the specific measured selected. Any such programs would have to carefully consider the complex behavior of O_3 as it relates to the relative effects of various precursors.

S.5.12 Environmental Justice

Under the no action alternative, the Presidential permits and corresponding ROWs would be denied, and the transmission lines would not be built.

Temporary impacts from noise and dust emissions during transmission line construction and more long-term impacts from noise and EMF strengths near the transmission lines during their operation were analyzed at the block group level within a 2-mi (3-km) corridor along the proposed and alternative routes. Census block groups consist of individual census blocks (defined by the U.S. Census Bureau as the smallest geographic unit for which data are tabulated) that are lumped together so that they contain between 250 and 550 housing units. A comparison with the spatial distribution of minority and low-income populations in Imperial County shows that the temporary impacts from noise and dust emissions and the more long-term impacts from noise and EMF in the vicinity of the transmission lines would not contribute to high and adverse impacts to the general population or to disproportionately high and adverse impacts to minority and low-income populations in any block group.

The analysis of impacts to minority and low-income populations due to power plant emissions were also assessed at the block group level. The central points of the block groups were matched with the closest air monitoring receptor station to provide data on the local nature of emissions due to power plant operations. For each of the receptor stations, increases in air pollution due to emissions of $PM_{2.5}$ and PM_{10} were found to be below new source significance levels used as a benchmark for negligible impacts by the EPA. Therefore, these emissions would not contribute to high and adverse impacts to the general population or to disproportionately high and adverse impacts to minority and low-income populations in any block group.

The reduction in New River inflow to the Salton Sea would increase the Sea's salinity and nutrient concentration. Adverse impacts to biological resources from power plant operations under the proposed action would not result in high and adverse impacts to the general population who fish recreationally at the Sea; these impacts would not be disproportionately high and adverse for any populations who might rely on the Sea for subsistence fishing. The time frame during which impacts would occur to fish species would be about 36 years, essentially the same with or without the power plants operating.

The mitigation measures to compensate for power plant air emissions would likely have a beneficial impact on regional air quality. An assessment of impacts at the census-block level cannot be conducted in this EIS because of uncertainty as to where the mitigation measures would be implemented.

S.5.13 Cumulative Impacts

Cumulative impacts that could occur as a result of the potential impacts of the proposed action when added to impacts from other past, present, and reasonably foreseeable future actions are evaluated both for the period of project construction and for the postconstruction (operation)

period for as long as the impacts would last. The region of influence varies for each resource area and depends primarily on the distance a potential impact can reach.

The following actions are ongoing or have been evaluated as reasonably foreseeable and included in the analysis of cumulative impacts: IID water conservation and transfer project, Mexicali II wastewater treatment project, Salton Sea restoration project, total maximum daily load (TMDL) program, wetlands construction on the New River, and power plant development in the Imperial Valley-Mexicali region.

The most important cumulative impacts would be to water resources, air quality, and biological resources. Impacts to soils, noise, transportation, and socioeconomics due to the proposed action during the short term (for the construction period) would be localized and not likely to contribute to cumulative impacts.

The potential cumulative impacts to water resources relate mainly to the reduction in the volume of flow in the New River from the proposed action, which would, in turn, reduce inflow in the Salton Sea. Combined with ongoing and foreseeable projects, most notably the IID water conservation and transfer project, these reductions in New River flow would decrease the elevation of water in the Salton Sea and increase its salinity. The volume of water available to recharge groundwater in the Imperial Valley Groundwater Basin would also be reduced. Although other foreseeable projects like the TMDL program and construction of wetlands on the New River would have beneficial effects on water quality in the Salton Sea watershed, it is not clear whether the cumulative effects of all actions in the watershed on biological resources would be beneficial or adverse. Salinity concentrations in the Salton Sea are increasing and could reach a point that adverse impacts to fish and aquatic species, and the birds that feed on them, would be unavoidable. Likewise, salinity increases in New River water could increase to a point that would adversely affect riparian and wetland plant species and fish and aquatic invertebrates in the river after a period of about 36 years. The proposed action would contribute to these changes, but it would have a relatively small contribution.

The cumulative effects of past, present, and future actions, including industrial and agricultural trends (increased acreage and use of irrigated lands) in the Imperial Valley-Mexicali region, would be to increase emissions of pollutants like NO_x, CO, PM_{10}, and NH_3 to the Salton Sea Air Basin. The proposed action would contribute to these ongoing changes, but it would have a relatively small contribution. In addition, actions taken under the mitigation measures alternatives would reduce these emissions, especially PM. For example, paving of 22 mi (37 km) of dirt roads in Imperial County would reduce PM_{10} emissions by about 650 tons (589 t) per year.

TABLE S-1 Summary of Impacts for Proposed Action and Other Alternatives by Resource Area[a]

For the proposed action, that is, the granting of one or both of the Presidential permits and ROWs, for most resource areas, the analysis was bounded by calculating impacts as if both lines had been allowed. This serves two purposes. First, it demonstrates the maximum possible impacts; second, it clearly presents the combined impacts of the agencies' preferred alternative, that is, permitting both facilities. The only exceptions to this methodology are in the areas of air, water, and human health. Impacts to air, water, and human health attributable to permitting each transmission line separately are contained in Sections 4.2, 4.3, and 4.11, respectively.

Resource	No Action	Proposed Action	Alternative Technologies	Mitigation Measures
Geology, Soils, and Seismicity (4.1)	No additional impacts are anticipated to geological resources or soils. Normal erosional forces would continue. Because the transmission lines would not be built, seismicity hazards would not be relevant.	*Geology* Minor disturbance of surface material resulting from construction but with minimal potential for slope failure. *Seismicity* On the basis of the California Geological Survey's on-going evaluation of fault zones to date, surface fault rupture is not likely to occur along the proposed or alternative transmission line routes. *Soils* Potential for impacts would increase as a result of vegetation removal, and grading and excavation during construction that could lead to increased erosion. Temporary increase in soil compaction resulting from vehicle usage of access roads.	Impacts would be the same as those under the proposed action.	Impacts would be the same as those under the proposed action. In addition, with regard to soils, any paving of roads or construction activities could have short-term adverse impacts to soils due to soil disturbance. Overall, impact would be beneficial because dust emissions and soil erosion would be reduced over the long term.
Applicants' Proposed Routes:		Temporary impacts due to soil disturbance total about 15.8 acres (6.4 ha); permanent impacts would be less than 3.6 acres (1.5 ha) since no new access road would be built.		
Western Alternative Routes:		Temporary impacts would be about 18.0 acres (7.3 ha); permanent impacts about 13.1 acres (5.3 ha). The lower portion of the routes could cross prime farmland.		
Eastern Alternative Routes:		Temporary impacts would be about 16.3 acres (6.6 ha); permanent impacts about 10.5 acres (4.2 ha).		

TABLE S-1 (Cont.)

For the proposed action, that is, the granting of one or both of the Presidential permits and ROWs, for most resource areas, the analysis was bounded by calculating impacts as if both lines had been allowed. This serves two purposes. First, it demonstrates the maximum possible impacts; second, it clearly presents the combined impacts of the agencies' preferred alternative, that is, permitting both facilities. The only exceptions to this methodology are in the areas of air, water, and human health. Impacts to air, water, and human health attributable to permitting each transmission line separately are contained in Sections 4.2, 4.3, and 4.11, respectively.

Resource	No Action	Proposed Action	Alternative Technologies	Mitigation Measures
Water Resources (4.2)	*Transmission Lines* Under the no action alternative no transmission lines would be built and thus there would be no impacts. *Water Consumption* The LRPC unit would consume up to 4,940 ac-ft/yr of water taken from the Zaragoza Oxidation Lagoons in Mexicali. *Flow Reduction* The flow of the New River would be reduced by less than 4% (15.7% of the standard deviation for the flow at the Calexico gage). *New River* The TDS concentration would be increased by less than 3.7% (31% of the standard deviation). TSS, BOD, COD, and phosphorus loads in the New River would be reduced.	*Transmission Lines* Construction of two transmission lines along the proposed routes or alternative routes would have minimal impacts on surface waters. A maximum of two lattice towers for each line would be placed on the 100-yr floodplain for the Pinto Wash. This placement would have minimal impacts on floodplain function or values. Impacts to groundwater would be prevented during construction. *Water Consumption* The LRPC and TDM power plants would consume 10,667 ac-ft/yr of water for cooling purposes. The water would be taken from the Zaragoza Oxidation Lagoons in Mexicali. (The LRPC power plant alone would consume 7,170 ac-fr/yr. The TDM power plant alone would consume 3,497 ac-ft/yr.) *New River* Power plant operations would directly impact the New River by reducing the flow of water received from the Zaragoza Oxidation Lagoons and by modifying its quality. As a result, the average annual flow of the New River would be decreased by about 5.9% at the U.S.-Mexico border (Calexico gage). Decreases in flow would result in a decrease in average annual water depth of about 0.13 ft (3.9 cm) at the Calexico gage and 0.7 ft (2.1 cm) at the Westmorland gage near the Salton Sea. TDS concentrations would increase by 5.6%, or about 46% of its variability in the river at the Calexico gage, TDS, TSS, BOD, COD, phosphorus, and selenium loads would be reduced as a result of water treatment at the plants.	*Dry Cooling* The plants would use about 5% of the water needed for wet cooling under the proposed action. BOD, TSS, and phosphorus and selenium concentrations in the New River would be essentially unchanged. COD would slightly decrease. Indirect impacts to the Salton Sea would be minimal. *Wet-Dry Cooling* Impacts would be greater than those for dry cooling but less than those for wet cooling only, as described for the proposed action. Impacts to the New River, Salton Sea, Brawley Wetlands, and groundwater would be less than those for the no action and proposed action alternatives and would be proportional to the amount of wet-cooling used.	Impacts would be the same as for the proposed action. Measures to reduce air quality impacts could result in beneficial impacts to water resources over the long term, since surface runoff from unpaved surfaces would be reduced.

TABLE S-1 (Cont.)

For the proposed action, that is, the granting of one or both of the Presidential permits and ROWs, for most resource areas, the analysis was bounded by calculating impacts as if both lines had been allowed. This serves two purposes. First, it demonstrates the maximum possible impacts; second, it clearly presents the combined impacts of the agencies' preferred alternative, that is, permitting both facilities. The only exceptions to this methodology are in the areas of air, water, and human health. Impacts to air, water, and human health attributable to permitting each transmission line separately are contained in Sections 4.2, 4.3, and 4.11, respectively.

Resource	No Action	Proposed Action	Alternative Technologies	Mitigation Measures
Water Resources (4.2) (Cont.)	*Salton Sea* The Salton Sea inflow would be reduced by 0.4%, or 6.3% of the standard deviation of total inflow. Salinity would increase by less than 0.17 mg/L/yr. *Brawley Wetland* New River flow reductions would not interfere with withdrawal of water for wetland. Increases in TDS would not cause adverse impacts to the system. *Groundwater* The flow reduction of 4% at the Calexico gage would have minimal effect on groundwater recharge to the Imperial Valley Groundwater Basin, from the New River.	*Salton Sea* New River inflow to the Salton Sea would decrease, thus reducing its volume, lowering its elevation, and decreasing its surface area. The decrease in inflow of 10,667 ac-ft/yr would result in a elevation decrease of about 0.05 ft (0.6 cm), about 10% of the Sea's natural variability. Surface area would decrease by about 97 acres (39 ha), which is about 0.04% of its initial surface area and about 9% of its natural variability. Decreased water inflow would increase the TDS concentration (salinity) by 0.19 mg/L/yr. This rate of increase would cause the Salton Sea to reach a threshold of 60,000 mg/L only about 4 days earlier out of 36 years than it would with no plants operating. Phosphorus loads would be reduced by about 5.3%. Selenium loads would be reduced by about 38 lb/yr, or about 0.2% of the dissolved mass in the sea. *Brawley Wetland* New River flow reductions would not interfere with withdrawal of water for wetland. Increases in TDS would not cause adverse impacts to the system. Changes in other parameters (i.e., BOD, COD, and pathogens) could have beneficial impacts. All changes would fall within the range of the parameter's variability. *Groundwater* Indirect impacts to groundwater would occur as a result of decreasing flow in the New River since it is a recharge source for groundwater in the Imperial Valley Groundwater Basin. Impacts to the basin would be minimal because the New River is only one of many recharge sources, and the reduction in its flow is expected to be low.		

TABLE S-1 (Cont.)

For the proposed action, that is, the granting of one or both of the Presidential permits and ROWs, for most resource areas, the analysis was bounded by calculating impacts as if both lines had been allowed. This serves two purposes. First, it demonstrates the maximum possible impacts; second, it clearly presents the combined impacts of the agencies' preferred alternative, that is, permitting both facilities. The only exceptions to this methodology are in the areas of air, water, and human health. Impacts to air, water, and human health attributable to permitting each transmission line separately are contained in Sections 4.2, 4.3, and 4.11, respectively.

Resource	No Action	Proposed Action	Alternative Technologies	Mitigation Measures
Air Quality (4.3)	*Primary Emissions* Plant emissions would be somewhat greater for no action than for the proposed action for CO and NO_x because of the inclusion of the Mexico units at LRPC. However, emissions would still result in impacts in the United States below EPA SLs for all pollutants. Carbon dioxide (CO_2) emissions would be about 3.9 million tons/yr, or about 0.066% of total U.S. CO_2 emissions. *Secondary Air Pollutants* Increases or decreases of ambient ozone concentrations resulting from plant emissions of NO_x and volatile organic compounds (VOC) would be minor. Secondary PM_{10} (particulate matter with a mean aerodynamic diameter of 10 µm or less) production from plant emissions would also be minor and be similar to that under the proposed action. *Fugitive Dust* There would be no fugitive dust emissions from construction as transmission lines would not be built.	*Primary Emissions* The impacts from operation of export turbines at the TDM and LRPC power plants are considered as effects of the transmission line projects. Plant emissions of PM_{10}, nitrogen oxides (NO_x), carbon monoxide (CO), and ammonia (NH_3) all would result in increases in air concentrations that are below EPA SLs used here as thresholds of significant deterioration of air quality. CO_2 emissions would be about 5.1 million tons/yr, or about 0.088% of total U.S. CO_2 emissions. *Secondary Air Pollutants* Characterization of the air chemistry in the region suggests that plant emissions of NO_X and VOC could result in slight (less than 3 ppb) increases or decreases in the concentration of ambient ozone levels. Secondary production of PM_{10} in the atmosphere resulting from plant emissions of NH_3 and NO_x is expected to be no more than 1 µg/m^3. The SL for PM_{10} is not expected to be exceeded with the addition of secondary PM_{10}. *Fugitive Dust Emissions* Temporary emissions from transmission line construction would include those from fugitive dust, PM_{10} (construction, vehicular traffic, and helicopter operations), and fuel combustion. Construction-related PM_{10} emissions over the construction period would be about 11.4 tons (10.3 t) for the proposed routes, 14.4 tons (13.1 t) for the western alternative routes, and 12.3 tons (11.2 t) for the eastern alternative routes. The emission rate of fugitive dust (PM_{10}) from exposed shoreline resulting from the reduction in the surface area of the Salton Sea would be at most 100 tons/yr (91 t/yr).	*Emission Controls* CO emissions would be up to 80% less than those under the proposed action. HAPs emissions are assumed to be reduced by 50%. Emissions of other pollutants would as for the proposed action. Secondary O_3 and PM_{10} impacts would be the same as those for the proposed action. *Dry cooling or wet-dry cooling* Plant emissions of PM_{10} would be reduced without wet-cooling tower use. Other emissions would increase 10–15% as a result of reductions in plant efficiency. *Fugitive Dust Emissions* Emissions from transmission line construction would be the same as for the proposed action.	*Primary Emissions* Plant emissions would be the same as for the proposed action. Impacts of plant emissions on air quality would be offset by reductions in emissions of the same pollutants from other sources in the air basin. *Secondary Air Pollutants* Secondary O_3 and PM_{10} impacts from plant emissions could be reduced as compared to those for the proposed action with the use of emission offsets. *Fugitive Dust Emissions* In addition to emissions from transmission line construction, mitigation activities such as road paving could produce temporary fugitive dust emissions but long term improvement.

TABLE S-1 (Cont.)

For the proposed action, that is, the granting of one or both of the Presidential permits and ROWs, for most resource areas, the analysis was bounded by calculating impacts as if both lines had been allowed. This serves two purposes. First, it demonstrates the maximum possible impacts; second, it clearly presents the combined impacts of the agencies' preferred alternative, that is, permitting both facilities. The only exceptions to this methodology are in the areas of air, water, and human health. Impacts to air, water, and human health attributable to permitting each transmission line separately are contained in Sections 4.2, 4.3, and 4.11, respectively.

Resource	No Action	Proposed Action	Alternative Technologies	Mitigation Measures
Biological Resources (4.4)	*Transmission Lines* No additional impacts to desert habitat or wildlife are expected since no transmission lines would be built. *New River* Impacts to biological resources would occur from changes in water quality and volume in the New River, due to power plant operation. Impacts to aquatic organisms would be in proportion to the water resource impacts under the proposed alternative in accordance with relative water consumption. *Wetlands* No impacts would occur to wetlands because the transmission lines would not be built. The Brawley Wetland would not be adversely impacted by a decrease in New River water depth or an increase in salinity.	*Transmission Lines* Permanent impacts to Sonoran creosote bush scrub and desert wash habitat would occur during construction of the transmission lines. Construction may adversely impact small mammals and reptiles with low mobility during construction. No Federal-listed threatened or endangered species would be impacted by the proposed action; however, some sensitive plant species could be disturbed. Protective measures would be taken to minimize impacts to the flat-tailed horned lizard, the western burrowing owl, and other sensitive species. *New River* Water quality changes would have a minor adverse impact on fish and aquatic invertebrates. Riparian vegetation would not be impacted by a decrease in water depth or an increase in salinity. *Wetlands* No wetlands would be impacted by transmission line construction and operation. Desert wash areas [about 0.2 ac (0.08 ha)] could be adversely impacted. Brawley Wetland would not be adversely impacted by a decrease in New River water depth or an increase in salinity.	*Transmission Lines* The effects on desert habitat would be the same as those for the proposed action. *New River* The use of alternative cooling technologies at the power plants would reduce the adverse impacts associated with slight water depth and water quality changes to the New River and Salton Sea (though all these impacts would be small). *Wetlands* Impacts would be less to the Brawley wetland than under the proposed action for dry cooling or wet-dry cooling systems.	*Transmission Lines* Impacts would be the same as under proposed action. *New River* Impacts would be the same as for proposed action. *Wetlands* Impacts would be the same as for proposed action. *Salton Sea* Impacts would be the same as for proposed action. *Mitigation Measures Impacts* Prior to implementation an evaluation of potential impacts to special status species would be conducted.

TABLE S-1 (Cont.)

For the proposed action, that is, the granting of one or both of the Presidential permits and ROWs, for most resource areas, the analysis was bounded by calculating impacts as if both lines had been allowed. This serves two purposes. First, it demonstrates the maximum possible impacts; second, it clearly presents the combined impacts of the agencies' preferred alternative, that is, permitting both facilities. The only exceptions to this methodology are in the areas of air, water, and human health. Impacts to air, water, and human health attributable to permitting each transmission line separately are contained in Sections 4.2, 4.3, and 4.11, respectively.

Resource	No Action	Proposed Action	Alternative Technologies	Mitigation Measures
Biological Resources (4.4) (Cont.)	*Salton Sea* No additional impacts to aquatic invertebrates and fish.	*Salton Sea* Reduction in New River inflow would increase salinity (e.g., increase of 0.19 mg/L/yr) and could cause small adverse impacts to biological resources. A decrease in phosphorus load could reduce eutrophication, resulting in fewer episodic fish kills and improving the food base for some bird species. Impacts to habitat for waterfowl and wading birds would be small.	*Salton Sea* The use of alternative cooling technologies at the power plants would reduce the adverse impacts associated with slight water depth and water quality changes to the New River and Salton Sea (though all these impacts would be small).	
Applicants' Proposed Routes:		Permanent impact to 3.1 acre (1.3 ha) of Sonoran creosote bush scrub and 0.3 acre (0.1 ha) of desert wash habitat.		
Western Alternative Routes:		Permanent impacts would be about 30% greater due to greater length relative to the proposed routes.		
Eastern Alternative Routes:		Permanent impacts would be about 8% greater due to greater length relative to the proposed routes.		
Cultural Resources (4.5)	No additional impacts expected.	Cultural resources would be impacted by the construction and operation of the transmissions lines. Impacts to cultural resources would be mitigated.	Impacts would be the same as those identified for the proposed action.	Any measures involving road paving or construction may require evaluation for NRHP eligibility status and protection in consultation with California SHPO to mitigate impacts.
Applicants' Proposed Routes:		Construction of the transmission lines in the proposed routes would impact four archaeological sites. Adverse impacts from transmission line construction to these archaeological sites would be mitigated in consultation with the California SHPO.		

TABLE S-1 (Cont.)

For the proposed action, that is, the granting of one or both of the Presidential permits and ROWs, for most resource areas, the analysis was bounded by calculating impacts as if both lines had been allowed. This serves two purposes. First, it demonstrates the maximum possible impacts; second, it clearly presents the combined impacts of the agencies' preferred alternative, that is, permitting both facilities. The only exceptions to this methodology are in the areas of air, water, and human health. Impacts to air, water, and human health attributable to permitting each transmission line separately are contained in Sections 4.2, 4.3, and 4.11, respectively.

Resource	No Action	Proposed Action	Alternative Technologies	Mitigation Measures
Cultural Resources (4.5) (Cont.) *Western Alternative Routes:*		Portions of the western alternative routes have not been surveyed for cultural resources. While these routes would avoid the larger concentrations of archaeological sites found along the proposed routes, the routes would likely impact cultural resources. Any adverse effects would be mitigated prior to construction.		
Eastern Alternative Routes:		Portions of the eastern alternative routes have not been surveyed for cultural resources. While these routes would avoid the larger concentrations of archaeological sites found along the proposed routes, the routes would likely impact cultural resources. Any adverse effects would be mitigated prior to construction.		
Land Use (4.6)	No additional impacts expected.	Land use in the projects area is limited due to its status as an Area of Critical Environmental Concern. Vehicle use is confined to roads, and camping is limited to designated areas only. No farming or mining is currently allowed in the area.	Impacts would be the same as those under the proposed action.	Impacts would depend on mitigation measure (e.g., paving roads could result in adverse impacts if access to remote areas is increased).
Applicants' Proposed Routes:		Permanent impacts would be less than 3.6 acres (1.5 ha) since no new access roads would be built. No alteration of current land use plans is required.		
Western Alternative Routes:		Permanent impacts would be greater than those of the proposed and eastern routes: about 13.1 acres (5.3 ha). Routes would partially run outside of the utility corridor and would require alteration of land use designation.		
Eastern Alternative Routes:		Permanent impacts would be greater than those of the proposed routes: about 10.5 acres (4.2 ha). No alteration of current land use plans would be required.		

TABLE S-1 (Cont.)

For the proposed action, that is, the granting of one or both of the Presidential permits and ROWs, for most resource areas, the analysis was bounded by calculating impacts as if both lines had been allowed. This serves two purposes. First, it demonstrates the maximum possible impacts; second, it clearly presents the combined impacts of the agencies' preferred alternative, that is, permitting both facilities. The only exceptions to this methodology are in the areas of air, water, and human health. Impacts to air, water, and human health attributable to permitting each transmission line separately are contained in Sections 4.2, 4.3, and 4.11, respectively.

Resource	No Action	Proposed Action	Alternative Technologies	Mitigation Measures
Transportation (4.7)	No additional impacts expected.	Traffic in the projects area would increase during the transmission line construction period. Given the current levels of service on State Route 98 and low traffic volumes associated with projects, no impacts on existing levels of service are expected for the proposed or alternative routes.	Impacts would be same as those under the proposed action.	Impacts would depend on mitigation measures. In the short-term, adverse impacts could result from increased local traffic.
Visual Resources (4.8)	No additional impacts expected.	Construction and operation of the transmission lines would not alter the Class III Visual Resource Management rating for the project area. Transmission lines would not be a prominent addition to the existing landscape. Location of the lines in the Eastern routes would be closer to the nearest residence and a larger aspect of the landscape than in the other routes.	Impacts would be the same as those under the proposed action.	Impacts would depend on mitigation measure used (e.g., a compressed natural gas station would not cause a visual contrast, since its height would be similar to that of a gasoline service station).
Noise Impacts (4.9)	No additional impacts expected.	No adverse impacts are expected during transmission line construction or operation. Noise levels would be below EPA guideline values for the proposed and western alternative routes. For the eastern alternative routes, construction noise would be above EPA guidelines, but only for a short period of time (8-hr daytime shift, less than 1 week).	Impacts would be the same as those under the proposed action.	Impacts would depend on mitigation measures (e.g., paving roads would cause short-term adverse noise impacts due to equipment use near residential areas, but retiring old automobiles would have a beneficial impact).
Socioeconomics (4.10)	No additional impacts expected.	Temporary, small beneficial impacts on the local economy would occur during construction of the transmission lines as a result of wage expenditures and material procurement. Local tax revenues and lease payments to the Federal government from the proposed action are expected be minimal.	Impacts would be the same as those under the proposed action.	Impacts would depend on the mitigation measure (e.g., wage and salary spending and material procurement to implement a measure would have a beneficial impact to the local economy).

TABLE S-1 (Cont.)

For the proposed action, that is, the granting of one or both of the Presidential permits and ROWs, for most resource areas, the analysis was bounded by calculating impacts as if both lines had been allowed. This serves two purposes. First, it demonstrates the maximum possible impacts; second, it clearly presents the combined impacts of the agencies' preferred alternative, that is, permitting both facilities. The only exceptions to this methodology are in the areas of air, water, and human health. Impacts to air, water, and human health attributable to permitting each transmission line separately are contained in Sections 4.2, 4.3, and 4.11, respectively.

Resource	No Action	Proposed Action	Alternative Technologies	Mitigation Measures
Human Health Impacts (4.11)	No additional impacts from EMF would occur since the transmission lines would not be constructed. Impacts due to plant emissions would be minimal since they would be below EPA SLs. Secondary production of ozone and PM_{10} from plant emissions of precursors (NO_x, NH_3, and VOCs) would pose minimal health impacts.	No health impacts to residents, workers, or recreationalists due to EMF exposure would be expected from the proposed action. Emissions of NO_x, CO, and PM_{10} would result in air concentration increases to levels that would be below EPA SLs and therefore unlikely to adversely impact the health of residents in the air basin. Secondary production of ozone and PM_{10} from plant emissions of precursors (NO_x, NH_3, and VOCs) would pose minimal health impacts. Estimated incremental (above no action) cancer risks from exposure to HAPs are below the one per million significance threshold. Noncancer risks for HAPs and NH_3 are below the significance threshold for both acute and chronic exposure.	EMF impacts would be as for the proposed action. Emission controls (oxidizing catalysts) would reduce CO and HAPs emissions relative to the proposed action. Only minimal benefits to residents of the air basin would be expected. The use of alternative cooling technologies at the power plants would increase air emissions up to 15%, but health impacts would be minimal.	EMF impacts would be as for the proposed action. Mitigation measures would result in beneficial impacts by improving the air quality in the region. Road paving would produce long-term reductions in PM_{10} emissions. Fuel conversions would produce short- and long-term reductions in NO_x, CO, and VOC emissions.

TABLE S-1 (Cont.)

For the proposed action, that is, the granting of one or both of the Presidential permits and ROWs, for most resource areas, the analysis was bounded by calculating impacts as if both lines had been allowed. This serves two purposes. First, it demonstrates the maximum possible impacts; second, it clearly presents the combined impacts of the agencies' preferred alternative, that is, permitting both facilities. The only exceptions to this methodology are in the areas of air, water, and human health. Impacts to air, water, and human health attributable to permitting each transmission line separately are contained in Sections 4.2, 4.3, and 4.11, respectively.

Resource	No Action	Proposed Action	Alternative Technologies	Mitigation Measures
Environmental Justice	No additional impacts expected.	Temporary impacts from noise and dust emissions and the more long-term impacts from noise and EMF in the vicinity of the transmission lines would not contribute to high and adverse impacts on the general population or to disproportionately high and adverse impacts on minority and low-income populations in any block group. Increases in air pollution due to emissions of $PM_{2.5}$ and PM_{10} were found to be below new source significance levels used as a benchmark for negligible impacts; therefore, these emissions would not contribute to high and adverse impacts on the general population or to disproportionately high and adverse impacts on minority and low-income populations in any block group. Adverse impacts to biological resources as a result of increases in Salton Sea salinity could result in minor impacts on the general population that fishes recreationally at the Sea. These impacts attributable to the proposed action would not be disproportionately high and adverse for any populations that might rely on the Sea for subsistence fishing, because the same minor effects on biological resources are estimated as under no action.	Installation of dry cooling or wet-dry cooling systems at the power plants would not contribute to impacts.	Mitigation measures to compensate for power plant emissions would have a beneficial impact on low-income and minority populations by improving air quality in the region. (Because of uncertainties related to the location of mitigation measures, an impact assessment at the census-block level was not conducted.)

a Abbreviations: BOD = biochemical oxygen demand; CO = carbon monoxide; COD = chemical oxygen demand; EMF = electric and magnetic fields; EPA = U.S. Environmental Protection Agency; HAPs = hazardous air pollutants; LRPC = La Rosita Power Complex; metric ton = 2,206 lb; NH_3 = ammonia; NO_x = nitrogen oxides; NRHP = National Register of Historic Places; O_3 = ozone; $PM_{2.5}$ = particulate matter less than 2.5 micrometers in diameter; PM_{10} = particulate matter less than 10 micrometers in diameter; ROW = right-of-way; SHPO = State Historic Preservation Office; SL = significance level; TDS = total dissolved solids; TSS = total suspended solids; VOC = volatile organic compound(s).