[6450-01-P]

DEPARTMENT OF ENERGY

Record of Decision, Texas Clean Energy Project

AGENCY: Department of Energy

ACTION: Record of Decision

SUMMARY: The U.S. Department of Energy (DOE) announces its decision to continue to provide financial support to the Texas Clean Energy Project (TCEP). DOE prepared an Environmental Impact Statement (EIS) (DOE/EIS-0444) to assess the environmental impacts associated with the TCEP, a project that Summit Texas Clean Energy, LLC (Summit) would design, construct, and operate. The project will demonstrate advanced power systems using integrated gasification combined-cycle (IGCC) technology to generate 400 megawatts (gross) of electric power from coal and will put 130 to 213 megawatts on the power grid while capturing approximately 90 percent of its carbon dioxide (CO_2) emissions. The project will sequester approximately 2.5 to 3.0 million tons (2.3 to 2.7 million metric tonnes) of CO_2 per year. The CO_2 will be delivered through a regional pipeline network to existing oil fields in the Permian Basin of West Texas for use in enhanced oil recovery (EOR) by third-parties. The plant will also produce urea, argon, and sulfuric acid for sale in commercial markets. Because of its multiple products,

the facility is referred to as a polygeneration (polygen) plant. The plant will be built on a 600-acre (243-hectare) oil field site in Ector County, Texas, north of the community of Penwell, and will continue in commercial operation for 30 to 50 years.

DOE's proposed action, as described in the EIS, is to provide cost-shared financial assistance under DOE's Clean Coal Power Initiative (CCPI) using a combination of American Recovery and Reinvestment Act of 2009 (ARRA) (Public Law 111-5) funds and other CCPI program funds. After careful consideration of the potential environmental impacts and other factors such as program goals and objectives, DOE has decided to provide, through a cooperative agreement with Summit, $450 million in cost-shared funding, which is approximately 26 percent of the project's total capital cost of $1.73 billion (2009 dollars). The balance of project funding is expected to come from private sector investors and lenders.

ADDRESSES: The Final EIS is available on the National Energy Technology Laboratory's website at: http://www.netl.doe.gov/publications/others/nepa/index.html and on the DOE NEPA website at: http://energy.gov/nepa. Copies of the EIS may be obtained from Mr. Mark L. McKoy, Environmental Manager, U.S. Department of Energy, National Energy Technology Laboratory, P.O. Box 880, Morgantown, WV 26507-0880; telephone: 304-285-4426; toll-free number: 1-800-432-8330 (ext 4426); fax: 304-285-4403; or e-mail: mmckoy@netl.doe.gov.

FOR FURTHER INFORMATION CONTACT: To obtain additional information about this project, the EIS, or this Record of Decision (ROD), contact Mr. McKoy by the means specified above under "ADDRESSES". For general information on the DOE NEPA process, contact Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance (GC-54), U.S. Department of Energy, 1000 Independence Avenue, S.W., Washington, DC 20585; telephone: 202-586-4600; fax: 202-586-7031; or leave a toll-free message at: 1-800-472-2756.

SUPPLEMENTARY INFORMATION: DOE prepared this ROD pursuant to the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 *et seq.*), Council on Environmental Quality's (CEQ's) regulations for implementing the procedural provisions of NEPA [40 Code of Federal Regulations (CFR) Parts 1500 – 1508], DOE's NEPA regulations (10 CFR Part 1021), and DOE's Compliance with Floodplain and Wetland Environmental Review Requirements (10 CFR Part 1022). This ROD is based on DOE's Final EIS for the Texas Clean Energy Project (DOE/EIS-0444), comments submitted on the EIS and proposed project, other information, and program considerations.

Background and Purpose and Need for Agency Action

The TCEP involves the planning, design, construction, and operation by Summit of a coal-fueled electric power and chemicals production plant integrated with CO_2 capture and geologic sequestration through EOR. Summit is owned jointly by the Summit Power Group, Inc., and CW NextGen, Inc., a Clayton Williams company. The project team

includes Summit; Summit Power Group, Inc.; Siemens Energy, Inc.; Linde, AG; Fluor Corporation; Blue Source, LLC; and others.

DOE selected this project for an award of financial assistance through a competitive process under the CCPI Round 3 program pursuant to the process set out in Funding Opportunity Announcement (FOA) DE-FOA-0000042. DOE's financial assistance will occur through cost sharing as specified under the terms of a financial assistance agreement between DOE and Summit. This project includes a demonstration period (including plant reliability and operations testing) following the construction and commissioning of the plant and continuing until the end of the cooperative agreement's period of performance (July 15, 2017).

As the nation's most abundant fossil fuel, coal is expected to have an important role in the United States' energy future. However, fossil fuel combustion is a major source of anthropogenic CO_2 emissions. Electric power generation contributes approximately 39 percent of all CO_2 emissions in the U.S. In 2009, 81 percent of all electricity production-related CO_2 emissions resulted from the burning of coal.

Public Law 107-63, enacted in November 2001, established the CCPI program, which is a cost-shared collaboration between the federal government and industry to increase investment in advanced, low-emissions coal technologies. Later, with Title IV of the Energy Policy Act of 2005 (EPACT 2005) (Public Law 109-58), the Congress established additional criteria for projects receiving financial assistance under the CCPI program. Under these criteria, CCPI projects must help the nation successfully

commercialize advanced power systems that "advance efficiency, environmental performance, and cost competitiveness well beyond the level of technologies that are in commercial service" (EPACT 2005, section 402(a)). In February 2009, the Congress appropriated $3.4 billion to DOE for fossil energy research and development, with $800 million allocated to the CCPI program. CCPI's Round 3 seeks to address the challenge of meeting the United States' dynamic demand for electricity while decreasing emissions of CO_2 from coal-based power generation. This is done through financial assistance awards to industrial participants for demonstrations, at commercial scale and in commercial settings, of low-CO_2 emissions coal-based technologies that have opportunities for timely deployment in the power industry.

DOE's purpose is to provide financial assistance to projects that have the best chance of achieving the CCPI program's objectives as established by the Congress. Specifically, DOE's purpose and need for action is to demonstrate the commercial-readiness of CO_2 capture and geologic sequestration fully integrated with a power plant. The technical, environmental, financial and performance data generated from the design, construction, and operation of the polygen plant will provide a commercial reference plant for these technologies.

EIS Process

DOE published a Notice of Intent in the *Federal Register* on June 2, 2010 (75 FR 30800) announcing its plan to prepare an EIS and hold a public scoping meeting. DOE held the scoping meeting in Odessa, Texas, on June 17, 2010. DOE considered all of the

comments it received on the scope of the EIS and addressed them in the Draft EIS. On March 18, 2011, the U.S. Environmental Protection Agency (EPA) published a Notice of Availability of the Draft EIS in the *Federal Register* (76 FR 14969). On March 22, 2011, DOE published in the *Federal Register* (76 FR 15968) a Notice of Availability and announced a public hearing in Odessa on April 5, 2011. Comments were solicited at the public hearing and throughout the 45-day public comment period, which ended May 2, 2011.

Comments on the Draft EIS included:

- proposed options to use municipal waste water and the proposed Fort Stockton Holdings water supply pipeline;
- possible changes in discharges to Monahans Draw and salt loading due to discharge to the draw;
- the need to reduce the project's demand for potable water in light of the limited regional supply;
- the choice of West Texas as the site for a coal-fueled electricity generating plant instead of a site near either the supply of coal or the demand for the electricity;
- the market for electricity and the economic viability of the project;
- DOE's proposed funding of clean coal projects instead of projects using renewable resources;
- the need for a comprehensive CO_2 emissions assessment that extends through the EOR process to the end uses of produced petroleum products;
- increased railroad traffic and associated coal dust; and

- the existence of additional foreseeable projects that should be included in the cumulative effects section of the EIS.

In the Final EIS, DOE considered and, as appropriate, responded to comments on the Draft EIS. The EPA published a Notice of Availability for the EIS in the *Federal Register* on August 5, 2011 (76 FR 47579). In addition to responding to comments on the Draft EIS, the Final EIS included new information related to, among other things, treatment of process water and the disposal of waste water by two additional options: evaporation ponds and deep well injection.

Decision

DOE has decided to proceed with $450 million in financial assistance (i.e., cost-shared funding) under the terms of the cooperative agreement with Summit for the design, construction and demonstration of the TCEP.

Basis of Decision

DOE's decision was reached after considering the potential environmental impacts presented in the EIS, the practicable options for mitigation of the impacts, the importance of achieving the objectives of programmatic and legislative mandates (CCPI, EPACT 2005, and ARRA) and other information. Specifically, the project meets or exceeds the three primary objectives of CCPI Round 3 and satisfies the programmatic and legislative objective of demonstrating the technical practicality of producing electricity and other

products from coal while capturing and beneficially using most of the CO_2 produced from coal gasification.

Furthermore, the project will create jobs and modernize the nation's infrastructure, meeting the objectives of the ARRA. During most of the construction period, the gross domestic product (GDP) in the region of influence (Ector, Midland, Crane and Ward Counties) is estimated to increase by more than 0.4 percent; during the final year of construction it will increase by an estimated 0.67 percent. During plant operations, regional GDP will increase by about 0.16 percent, representing a long-term benefit. Property taxes paid by the project are expected to total $14.5 million annually during the operations phase, after deducting anticipated abatements and tax reliefs. Income and sales taxes related to the project will further benefit local governments.

Summit estimates that an average of 650 construction workers will be needed to build the plant with a peak at perhaps 1,500 workers. TCEP's operational work force is expected to be approximately 150 workers. Accounting for indirect and induced jobs, the total number of jobs resulting from the project will average about 1,000 during construction and 300 during operations.

This decision incorporates all practicable means to avoid or minimize environmental, social, or economic harm. DOE plans to verify the implementation of appropriate avoidance and mitigation measures.

Mitigation

As a condition of its decision to provide funding for the design, construction and operation of the project, DOE is imposing requirements that will avoid or minimize the environmental impacts of the project. These conditions are described below. Under the terms of the cooperative agreement, DOE requires Summit to comply with applicable federal, state and local government laws, regulations, permit conditions, and orders. Mitigation measures beyond those specified in permit conditions enforceable by other federal, state and local agencies are addressed in this ROD and, as appropriate, will be set forth in a Mitigation Action Plan (MAP) as required by 10 CFR 1021.331. The MAP will further detail the mitigation measures, explaining how they will be planned, implemented, monitored and reported. These mitigation requirements are a condition for continued DOE funding.

DOE will ensure that commitments in this ROD (as further detailed in the MAP) are met through management of the cooperative agreement, which makes the conditions in the ROD contractually enforceable. DOE will make the MAP available for public inspection via postings on the DOE and NETL websites.

During project planning, Summit incorporated various mitigation measures and anticipated permit requirements. The analyses in the EIS assumed that these measures would be in effect. These measures are identified in Tables S2-7 and 2-8 of the EIS as commitments made by Summit and are incorporated into this ROD as conditions for DOE's financial assistance under the cooperative agreement.

Mitigations identified in this ROD shall be made a term and condition for future ownership or management of the TCEP by any other parties during the period of performance under the cooperative agreement.

After carefully reviewing the EIS, the comments received on the EIS and proposed project, and the current events in the region, DOE requires the following mitigation measures as a condition of its decision:

1) Summit shall design and construct the TCEP to capture at least 90 percent of the carbon in the fossil fuels when operating under normal conditions, and Summit shall use best efforts to achieve at least a 90 percent capture rate during the demonstration period.
2) Summit shall develop jointly with the Texas Bureau of Economic Geology and DOE a plan for monitoring, verification and accounting (MVA) of CO_2 sequestered through EOR. The MVA will be implemented by third-party buyers of the CO_2. Contracts established between Summit and these buyers (or the field operators who ultimately use the CO_2) shall make the implementation of the MVA plan a term and condition of the contract and shall, as appropriate, involve the Texas Bureau of Economic Geology and the Texas Railroad Commission in the certification of the sequestration of CO_2 via EOR. MVA reports submitted to the State of Texas shall also be submitted to Summit and to DOE (via Summit).
3) Summit shall not use the proposed Fort Stockton Holdings waterline as a primary water supply for the TCEP. If constructed, this waterline may be used as a backup

supply to temporarily provide water to the TCEP when the primary water supply is not in service.

4) Summit shall not enter into contracts whereby waste water discharge into Monahans Draw would increase by more than 0.75 million gallons per day, as an annual average, and 6 million gallons per day as a daily maximum, as a result of the TCEP.

5) The TCEP's power island shall be designed, constructed and operated with dry cooling towers. If this is found to be technically infeasible, then a hybrid cooling system (or a wet cooling assist) may be used. A wet cooling system is acceptable for the chemical plant component of the TCEP.

6) If the TCEP uses solar evaporation ponds, Summit shall plan, design, and construct any high salinity ponds to be ready for installation of bird deterrent netting. Before completing final design on solar evaporation ponds, Summit shall prepare, jointly with DOE and governmental agencies with regulatory jurisdiction, a plan for bird deterrence, monitoring and reporting; and this plan shall be implemented during the design, construction and operation of the solar evaporation ponds.

7) If Summit chooses to dispose of desalination reject water by deep well injection, in addition to complying with the terms and conditions of a permit under Texas's Underground Injection Control Program, Summit shall install a well near the bottom of the zone of potentially potable ground water (i.e., ground water with a total dissolved solids concentration of less than 10,000 milligrams per liter) and monitor this water for increases in total dissolved solids and hydrocarbons as

indicators of possible leakage of more deeply injected brine reject water or displaced native fluids. It may be feasible to use the same well for both monitoring and for supplying potable water to the polygen plant. Before completing final design on a system for deep well injection of brine reject water, Summit shall prepare, jointly with DOE and government agencies with regulatory jurisdiction, a plan for monitoring well design, construction, monitoring and reporting; and this plan shall be implemented during the design, construction and operations of the system for deep well injection.

8) Before land disturbance at the plant site and along the utility corridors, Summit shall survey areas to be disturbed and undertake measures to protect wetlands, waterways (including non-jurisdictional waters), playa lakes, rare species (e.g., the sand dune lizard, *Sceloporus arenicolus*, federal candidate for listing) and critical habitats (e.g., the Shinnery Oak Sand Dune habitat), and state-listed rare species (particularly the Texas horned lizard), as specified in the MAP. As appropriate, Summit shall consult with the U.S. Fish and Wildlife Service and the Texas Parks and Wildlife Department regarding special natural communities and features, as well as rare species and their habitats.

9) To reduce impacts to species protected under the Migratory Bird Treaty Act, ground disturbing activities in areas of potential breeding habitat shall be avoided during the breeding and nesting season (March 1 through July 31). If this seasonal avoidance is not practicable, a qualified biologist shall survey the potentially affected area prior to any ground disturbing activities to determine if nesting is underway; and buffer areas shall be established as needed to protect eggs and

young birds until they fledge. Owls and hawks may nest in this area at other times of year. Surveys shall be conducted for owl and hawk nests, and buffer areas shall be established around active nests. If a power transmission line route crosses or is located near a water body or playa lake bed, the adjacent section of the line shall have line markers to reduce the potential for bird collisions. To prevent electrocution of perching raptors and to reduce power outages and maintenance, Summit shall consider the use of various protection measures such as adequate line spacing, perch guards, and insulated jumper wires.

10) For linear facility routes chosen by Summit, phase I cultural resource surveys (including archaeological and paleontological surveys), along with consultations with the Texas State Historic Preservation Officer and DOE, shall be completed for segments not previously surveyed but for which surveys are warranted. Further consultation with the State Historic Preservation Officer for any unforeseen areas of construction or ground disturbance not included within the EIS shall be completed before construction starts to determine the need for further cultural resource investigations and any appropriate mitigation measures.

11) For any pipeline crossings of Monahans Draw, Summit shall first consider the practicability of pipeline installation beneath the streambed by directional drilling. If trenching is chosen as the method of installation of pipeline, Summit shall seek to use crossing locations and construction techniques whereby impacts to aquatic life, vegetation and land surface features along the draw would be minimized; and Summit shall use land surface reconstruction, erosion controls, and revegetation

(with native species) to stabilize and restore the affected floodplains, stream banks, stream beds, and vegetation.

12) Where vegetative ground cover remains disturbed or soil remains exposed after project-related construction activities, Summit shall strive to achieve beneficial results in terms of erosion control, land stabilization, long-term vegetative cover and habitat improvement through revegetation, landscaping and other techniques as appropriate. Plantings of vegetation shall use species that are native, adaptable to the planting location, beneficial to wildlife, drought tolerant, and helpful with water conservation. Where practicable, grass re-seedings or plantings shall use only native species, usually in a mixture of grasses and forbs appropriate to address potential erosion problems and provide long-term cover.

13) Summit shall prepare annual reports during the term of the cooperative agreement that document the operations and corresponding air emissions from the TCEP. Annual reports shall include summary information on the TCEP's emissions of criteria pollutants, mercury and other toxic pollutants of concern, and CO_2. These reports shall indicate the performance and emissions of the TCEP during normal operations. If air emissions data are collected during periods of operation outside normal steady-state conditions, this information also shall be summarized in the report.

14) To reduce visual impacts associated with polygen plant structures and facilities, including exposed portions of linear facilities, DOE recommends that Summit choose, where appropriate, finish coat colors for exterior surfaces that reduce the form, color and line contrasts between the surrounding landscape and the exteriors

of buildings and structures. Chosen colors should be slightly darker than the surrounding landscape to achieve optimal benefit. This choice of color would not apply where regulation, safety, service, material type, or other reasons dictate the choice of other colors or no paint.

Summit will conduct further resource assessments as the project planning and design continues. If there are substantial changes in the TCEP proposal or significant new information relevant to environmental concerns, as described in 40 CFR 1502.9(c)(1), DOE will prepare a supplemental EIS. If it is unclear whether an EIS supplement is required, DOE will prepare a Supplement Analysis, in accordance with 10 CFR 1021.314(c), to support the determination. DOE will make Supplement Analyses available to the public and to regulatory agencies with jurisdiction for 30 days of review and comment prior to DOE determining whether a supplemental EIS is required.

Project Description and Location

The project will be located approximately 15 miles (mi) (24 kilometers) southwest of the city of Odessa in Ector County, Texas. Summit will build the polygen plant on a 600-acre (243-hectare) site adjacent to the community of Penwell and north of Interstate Highway 20 (I-20) along a Union Pacific Railroad line. Summit chose this site primarily because of its proximity to an existing CO_2 market, a connection point to a CO_2 pipeline network, and multiple oil fields currently performing or suitable for CO_2 floods.

The project's linear facilities include one or two electric transmission lines to connect the plant with one or both of the nearby power grids; process water supply pipelines; a natural gas pipeline; a pipeline for captured and compressed CO_2; one or two access roads; and a rail spur.

The TCEP will employ integrated gasification combined-cycle (IGCC) technology. Gasification is the process of converting coal into a fuel called synthesis gas (syngas). A combined-cycle electric power plant is one that uses both a gas turbine-generator (similar to a jet aircraft engine) and a steam turbine-generator (which uses steam produced by exhaust heat from the gas turbine-generator) to produce more electricity than would be produced by a boiler and conventional steam turbine-generator alone. Combining (integrating) the gasification process with a combined-cycle power plant is known as IGCC.

This polygen plant will include CO_2 capture and compression with transport of the CO_2 off-site for geologic sequestration through EOR. Specifically, the plant will have an air separation unit, a coal gasification system (with two operating gasifiers), a syngas cleanup system, a mercury (Hg) removal filter, an acid gas scrubber (for sulfur species and CO_2), a CO_2 compressor system, a sulfuric acid (H_2SO_4) production plant, a gas turbine-generator, a heat recovery steam generator (HRSG), a steam turbine-generator, and a urea production plant. The linear facilities will convey the outputs and inputs of the polygen plant to and from existing infrastructure.

Summit's TCEP will generate up to 400 megawatts (MW), of which 130 to 213 MW (approximately 1.0 to 1.7 billion net kilowatt-hours of electricity per year) will be available to the electricity grid. In addition, the plant will be designed to capture, as CO_2, 90 percent or more of the total carbon in the fossil fuels used by the plant under typical operating conditions. Summit will capture up to 3 million tons (2.7 million metric tonnes) of CO_2 annually. Approximately 2.5 to 3.0 million tons (2.3 to 2.7 million metric tonnes) of the captured CO_2 will be sold under commercial contracts and subsequently injected into partially depleted oil reservoirs where it will be used to extract more oil. In addition, the plant will produce urea for sale as fertilizer. Products from the gasification process (argon, H_2SO_4, and inert slag) will also be sold on the commercial market.

Summit received a financial assistance award in Round 3 of DOE's CCPI program and qualified for investment tax credits under Internal Revenue Code (IRC) section 48A, Qualifying Advanced Coal Project. Summit intends to seek tax credits under IRC section 45Q, Credit for Carbon Dioxide Sequestration. However, most of TCEP's funding will consist of owner-invested equity and debt obtained in private capital markets.

DOE's Proposed Action

DOE's Proposed Action, as described in the EIS, is to provide a total of approximately $450 million in financial assistance for Summit's TCEP through a cooperative agreement. The financial assistance would be provided on a cost-share basis for the planning, design, construction, and demonstration-phase testing and operation of the project. Under the terms of the agreement, DOE has already made available

approximately $48 million on a cost-share basis for the project's definition phase, which includes completion of the NEPA process.

Alternatives

The Congress directed DOE to pursue the goals of the CCPI by providing financial assistance to projects owned by non-federal sponsors and using coal for at least 75 percent of the project's fuel requirement. This approach places DOE in a much more limited role than if it were the owner and operator of the project. Here, the purpose and need for DOE action is defined by the CCPI program and the ARRA. Given that CCPI's programmatic purposes and needs are defined by legislation, the reasonable alternatives available to DOE, prior to selection of this project, were the other projects submitted for DOE's consideration in response to the FOA and that were determined to be responsive to the FOA's requirements. All projects that were deemed responsive to the FOA were analyzed in an environmental critique pursuant to 10 CFR 1021.216, which establishes a specific NEPA process for competitive awards of financial assistance and contracts. A synopsis of the environmental critique is included in Appendix B of the EIS.

After DOE selects a project, the reasonable alternatives become: (1) the project as proposed by the applicant, (2) alternatives or options still under consideration by the applicant or that are within reasonable confines of the project as proposed (e.g., the particular location of the plant on the parcel of land proposed for the project), and (3) the "no action" alternative.

DOE issued the FOA for CCPI Round 3 in August 2008, and reopened it in June 2009 in response to the addition of ARRA funding to the CCPI program. Private sector participants submitted 38 proposals in response to the reopened solicitation. After an initial screening removed from further consideration those proposals that failed to meet the eligibility requirements, the remaining 25 responsive proposals were subjected to environmental review and consideration (during the selection process) in accordance with 10 CFR 1021.216. From these 25 proposals DOE selected three proposals representing diverse technologies and using a variety of coals to further the goals of the CCPI program. DOE selected the TCEP under the reopening of Round 3 because it would demonstrate IGCC power generation integrated with chemical production and CO_2 capture technologies in a commercial project.

Summit chose the site for its TCEP based on a selection process that it had completed prior to applying for DOE's financial assistance. Because of its desire to integrate IGCC technology with CO_2 capture, Summit focused its site selection efforts in Texas, which has both a regional market for CO_2 for use in EOR and existing infrastructure for transporting CO_2 to oil fields. Summit considered several sites in Texas, including Corpus Christi, Oak Grove, Big Brown, and two sites -- Jewett and Odessa -- that had been considered for DOE's FutureGen project. Summit ultimately selected the Odessa site primarily because of its proximity to an existing CO_2 pipeline and multiple oil fields where EOR is or may be used. The Odessa site also has close access to rail, natural gas, transmission lines, and sources of water, which the other sites lacked in varying degrees. The Odessa site enjoys significant community support for the TCEP.

Under the proposed action alternative, DOE assessed the potential environmental impacts associated with alternative water supplies, alternative routes for linear facilities, and options for certain plant sub-systems (e.g., evaporation ponds versus deep well injection of reject water from the desalination of supply water) as described in the EIS. In identifying alternative routes for linear facilities, Summit considered selection factors such as using or paralleling existing rights of ways and avoiding developed areas and sensitive areas. In the EIS, DOE reviewed the potential environmental impacts of these various project alternatives still under consideration by Summit with the goal of deciding for each of Summit's alternatives whether any adverse consequences might be sufficiently objectionable that DOE would disallow the usage of that alternative in the TCEP as a condition for DOE's financial assistance.

No-Action Alternative

Under the No-Action Alternative, DOE would not share in the cost for detailed design, construction and a three-year demonstration phase of the TCEP. For purposes of analysis in the EIS, DOE considered the "no-action" alternative to be the same as the "no-build" alternative.

In the absence of financial assistance from DOE, Summit might choose to construct and operate the TCEP if it could obtain sufficient private financing. However, DOE believes this option is unlikely, because of the financial risks and costs of deploying a new power plant, especially one with IGCC technology integrated with CO_2 capture and sequestration. Without DOE participation, it is likely that the proposed project would not

be built, environmental resources would remain in their current condition, and none of the impacts associated with the project would occur, whether adverse or beneficial (i.e., no new construction, jobs, marketable products, resource use, land-use alterations, emissions, discharges, or wastes).

If the project were canceled, the proposed technologies of the TCEP (e.g., commercial-scale IGCC integrated with CO_2 capture and geologic storage of CO_2 using EOR; the manufacture of urea from gasified coal) may not be implemented in the near term. Consequently, commercialization of these technologies may be delayed or may not occur because utilities and industries tend to use known and demonstrated technologies rather than new technologies. The no action alternative would not contribute to CCPI's goals of accelerating the commercial readiness of advanced multi-pollutant emissions control; improving combustion, gasification, and efficiency technologies; and demonstrating advanced coal-based technologies that capture and sequester CO_2 emissions.

Potential Environmental Impacts

In making its decision to provide continued financial assistance to the TCEP, DOE considered the environmental impacts of the proposed project and no-action alternative on affected resources. These include air quality and greenhouse gas emissions; climate; soils, geology, and mineral resources; ground water; surface water, floodplains and wetlands; biological resources; aesthetics; cultural resources; land use; socioeconomics and community services; environmental justice; utility services; transportation; materials and waste management; human health, safety, and accidents; and noise and vibration.

The EIS also examined potential incremental impacts of the TCEP in combination with other past, present, and reasonably foreseeable actions (i.e., cumulative impacts). The following sections summarize the environmental impacts and mitigation measures described and analyzed in the Final EIS.

Air Quality

The TCEP will be categorized as a major source of air pollutants under Clean Air Act regulations because emissions of some criteria pollutants (NO_2, SO_2, CO, PM_{10}, and $PM_{2.5}$) will exceed 100 tons per year. Construction-related and operational emissions would not cause air quality to exceed either the Prevention of Significant Deterioration (PSD) increments or the National Ambient Air Quality Standards (NAAQS). However, ambient air concentrations of criteria pollutants could increase between 9 percent and 200 percent at the point of maximum ground level impact under certain weather conditions during plant operations. While the TCEP will capture for beneficial use at least 90 percent of the carbon as CO_2 in its fuels, annual emissions of CO_2 from the TCEP will reach 300,000 tons per year, and these emissions will contribute to global atmospheric concentrations of CO_2.

Plant-wide emissions of hazardous air pollutants will not exceed either the individual pollutant threshold (10 tons per year) or the combined pollutant threshold (25 tons per year). Maximum predicted concentrations for all identified compounds that could have a negative impact to human health were found to be below their respective effects

screening limits for general public exposure, except for short-term exposures to coal dust on the plant site (which will not exceed industrial exposure criteria).

Although air quality impacts will be small, the TCEP will reduce emissions and impacts to the fullest extent practicable. As a condition of its decision, DOE requires reports on air emissions from the TCEP (see **Mitigation**).

Climate

Construction and operation of the TCEP will not cause measurable impacts on local, regional or global climate and meteorology. However, operations of the TCEP will contribute greenhouse gas emissions to the atmosphere. Annual emissions of CO_2 from the TCEP operations will range up to 300,000 tons per year, and these emissions will contribute to global atmospheric concentrations of CO_2. Small amounts of methane and other organic compounds (the TCEQ-issued air emissions permit limit equals 39.6 tons per year) will be emitted and will contribute to greenhouse gas effects.

The TCEP is designed to reduce its emissions of greenhouse gases (and precursors) to levels that are much lower than conventional power plants of equivalent gross generating capacity and lower than other advanced clean coal power plants that have been constructed and operated. DOE requires as a condition of its decisions that the TCEP be designed and constructed to capture at least 90 percent of the carbon in its fossil fuels (see **Mitigation**).

Soils, Geology and Mineral Resources

Soils will be disturbed as areas are prepared for construction. Disturbed soils will be protected from erosion and will be re-planted where practicable. Disturbance at the plant site will result in permanent removal or displacement of soils on up to 600 acres. Soil disturbance in utility corridors is expected to be temporary and will vary greatly depending on the options and routes selected, ranging from 132 to 1,032 acres (53.4 and 417.7 hectares) (assuming that the permanent rights-of-ways but not the temporary rights-of-ways will be fully disturbed). New transportation corridors connecting to the power plant site could require between 25.3 and 39.0 acres (10.2 and 15.8 hectares) of soil disturbance.

The CO_2 from the TCEP will be sold to ongoing EOR operations in the Permian Basin. This use of CO_2 in the basin is a well-established process that will serve as final sequestration for the CO_2 captured at the TCEP. Capture and sale of CO_2 from the polygen plant will promote the recovery of oil and gas in the Permian Basin, where average additional oil production is approximately 1.86 barrels of oil per ton of CO_2 injected. As a tertiary method of EOR, CO_2 floods help oil field operators recover another 8 to 16 percent of the original quantity of oil in the reservoir.

Because oil and gas are withdrawn from oil reservoirs as CO_2 is injected, fluid pressures within the reservoir would not be expected to build up to levels that would represent a substantial risk of seismic activity, displacement of native fluids into overlying strata, or migration of injected CO_2 into other strata. Abandoned oil wells typically present the

most likely leakage routes in old oil fields, and these leaks can usually be identified and plugged. Over the long term, injected CO_2 would be trapped in the reservoirs that had previously trapped oil and natural gas through many millions of years. DOE requires as a condition of its decision that Summit monitor and verify the sequestration of TCEP's injected CO_2 (see **Mitigation**).

Ground Water

Supplies of non-potable (brackish or saline) ground water appear more than adequate in the region to meet TCEP's consumption rates for process (industrial) water. Although no adverse impacts are expected to occur if non-potable ground water is used, water conservation and use of a dry cooling system have been included as an integral part of the plant to minimize the potential for water supply impacts to the fullest extent practicable.

Aside from meeting the TCEP's needs for process water, Summit is considering installation of an on-site well into the Dockum Aquifer to serve the plant's potable water needs. Operational demand will be approximately 4,500 gal (17,034 L) per day based on approximately 150 workers on-site. In Ector County, the quality of the Dockum Aquifer ranges from fresh to brackish. Although irrigation and public supply use is limited in Ector County, at least one resident in the adjacent community of Penwell currently relies on water from the same aquifer for residential and small-scale commercial use. Potential water quality effects on this adjacent well user will be estimated through testing of a newly drilled well on-site, if this option is further investigated for its potential to supply potable water to the TCEP.

The TCEP could affect ground water in several ways: (1) project consumption from underground sources of drinking water, (2) displacement of fluids into underground sources of drinking water, (3) contamination due to spills, leaks, releases or leaching during construction and operations, and (4) diminished recharge due to alterations of the ground surface.

The consumption of potable water from ground water aquifers would constitute a significant impact if the TCEP were to use such sources for primary supply of process water. From the beginning, project planners were aware of the potential harms in using potable water for the plant's process water needs, so this type of water supply was disfavored.

The Edwards-Trinity (Plateau) Aquifer was considered as one of the options for water supply, using an existing well field located near the town of Fort Stockton, Texas. This well field yields water of marginal quality for human consumption and the water would benefit from desalination to improve its acceptance for drinking water. Currently water from this field is being used for agricultural irrigation. The proposed Fort Stockton Holdings waterline would divert water currently used for irrigation to the cities of Midland and Odessa where it could be used for potable water supply.

If the Fort Stockton Holdings waterline were built, the TCEP could use approximately 10 percent of its capacity. Because no additional ground water would be withdrawn from the aquifer (beyond the current rate of pumping for agricultural irrigation) and because very

little of the water currently used for irrigation recharges the Edwards-Trinity Aquifer, Fort Stockton Holdings' proposed waterline project, and TCEP's use of 10 percent of the waterline's capacity, would have no additional impact on the aquifer. The proposed Fort Stockton Holdings waterline is highly controversial and has been unable to obtain needed permits and approvals. Therefore, it is unlikely that this waterline would be built in time for the TCEP to use it as a primary water supply. DOE requires as a condition of its decision that the Fort Stockton Holdings water line not be used as a primary source of water (see **Mitigation**).

The Capitan Reef Complex Aquifer is a minor aquifer in West Texas that is approximately 25 miles to the west of the plant site. Summit proposed this aquifer as an option for the process water source. The aquifer generally contains poor quality water. Most of the ground water pumped from this aquifer in Texas is used for secondary oil recovery. A small amount is used for irrigation of salt-tolerant crops. Over the last 70 years, water levels in the aquifer have declined in some areas. The Oxy Permian pipeline system distributes brackish ground water from the Capitan Reef formation to water flood projects in the Permian Basin. The closest source of Oxy Permian water to the polygen plant site is a group of ground water wells near the town of Kermit, Texas.

The Oxy Permian system is not used at its full capacity, and demand for water for use in secondary oil recovery has been slowly declining. Because the amount of water pumped for the Oxy Permian pipeline has steadily decreased, the impacts of additional pumping for use as TCEP process water would be small. Usage of this water supply option would

require the installation and use of a substantial desalination system at the TCEP plant site, with disposal of a substantial volume of desalination reject water (brine).

Summit also considered the Pecos Alluvium Aquifer in response to a suggestion submitted during the public comment period on the Draft EIS. This aquifer is of major regional importance and has been widely used for irrigation. In central Ward County, it is also used for municipal and industrial purposes. Production rates greatly exceed recharge rates and aquifer drawdown has approached 200 feet (61 meters) in some areas. The aquifer is also highly variable in production quality and quantity. If TCEP were to use this option, impacts to the aquifer's water quality and quantity would likely be significant within the region of the drawdown.

If deep injection wells are used for the disposal of waste water (whether brine water or industrial waste water), its injection could displace native fluids upward into underground sources of drinking water. The area of risk would be around the injection wells where fluid pressures could increase significantly in response to the injection. The extent of this area would be estimated after a test well is drilled by Summit to gather hydrologic information on each of the likely injection targets. If Summit chooses this option, DOE requires monitoring of changes in water quality in the deepest underground source of drinking water above the injection site (see **Mitigation**).

If additional municipal waste water, after treatment, would be disposed of into Monahans Draw as a result of the TCEP, there would be only a small risk of increased

contamination of ground water beneath the draw. Permit limits on total dissolved solids (salinity) in water discharged into the draw will not be increased, but the volume of waste water discharged and salt loading could increase. DOE requires a limit on TCEP-related waste water discharges and salt loading to Monahan's Draw (see **Mitigation**).

Surface Water, Floodplains and Wetlands

At the TCEP site and along access roads, no surface water resources, floodplains, or wetlands are present and, therefore, no direct impacts to them are expected. Floodplains and wetland areas have been identified within pipeline corridors, with the following amounts of wetlands being subject to disturbance: WL1, up to 2.53 acres (1.0 hectares); WL3, up to 0.86 acres (0.35 hectares); and WL5, up to 1.29 acres (0.52 hectares). The options for installation of pipelines beneath wetlands and water bodies are trenching and directional drilling. The choice of installation technique would be made by Summit on a case-by-case basis after more information is gathered at each location. After construction is complete, pipelines will not further impact floodplains. For transmission lines, structures could be sited to avoid wetlands along these routes. Construction activities in corridors that have water bodies (WL1, WL3 and WL5) are likely to result in short-term, construction-related impacts such as increased turbidity, sedimentation, streambed disturbance, and stream-bank vegetation removal.

Under one option for primary supply of process water, municipal waste water from Midland would be processed through primary and secondary treatment by the Gulf Coast Authority's (GCA's) plant and then processed through micro-filtration or ultra-filtration

devices before being piped to the TCEP for use. If this option is chosen by Summit, there would be an increase in effluent discharge to Monahans Draw from the GCA outfall as a result of accepting more waste water, on most days, than is required for the TCEP and as a result of disposal of the reject water. The draw would be dry most of the time if not for the discharges of treated municipal and industrial waste water that maintain ponds and wetlands on portions of the draw. The wetlands, although small, are among the largest and best in the area and are used by a variety of birds and other wildlife. The potential increase in GCA's discharge to Monahans Draw (1) would not contribute significantly to flooding events in downstream low-lying areas, (2) would make a small contribution to the existing salt loading in the draw, and (3) would further support and may slightly expand wetlands within the draw.

If Summit chooses the option to use Midland's municipal waste water, the forecasted average increase of 0.75-million gallons per day (2.8-million Liters/day) in GCA's discharge to Monahans Draw would represent a 27 percent increase over the current average discharge from the GCA outfall and may cause a small increase in the downstream extent of stream flow along the draw during dry periods and in the downstream extent of wetlands. Neither the average per day increase in GCA's effluent discharge, nor the infrequent full release of waste water received from Midland (6 million gallons per day) would represent a significant impact to flood flow volume, flood elevations, or flooding frequency in the downstream areas along Monahans Draw.

The increase in concentration of total dissolved solids in GCA's discharges would be negligible (dissolved salts would pass through the micro filtration or ultra filtration devices). However, if Summit chooses to use Midland's municipal waste water, there would be a small contribution to the existing salt loading in the draw because of the increase in the quantity of effluent.

Biological Resources

Land disturbance and usage at the TCEP site will result in the permanent loss of up to 600 acres (243 hectares) of the mesquite shrub and grassland vegetation community and associated habitat functions. Construction activities could result in the death of slow-moving terrestrial species not able to escape the path of construction equipment. Noise associated with construction could result in wildlife displacement and behavioral changes that could have minimal impacts on reproductive success. Noise associated with plant operations will have negligible long-term effects on wildlife, because the wildlife will become accustomed to it. Land at the plant site is suitable for the Texas horned lizard (*Phrynosoma cornutum*) (state listed, threatened) as well as 11 other state-listed rare species. DOE requires, as a condition of its decision, measures to protect listed species (see **Mitigation**).

Construction of the linear facilities will result in the permanent removal of 132 to 1,032 acres (53 to 418 hectares) of mesquite shrub and grassland community and associated habitat functions, based on the smallest and largest combinations of the linear facility options. An additional 246 to 949 acres (100 to 384 hectares) of habitat could be

temporarily removed or disturbed during construction. Impacts to terrestrial species will be similar to those described above. DOE requires, as a condition of its decision, measures to protect listed species (see **Mitigation**).

At the polygen plant site up to 600 acres (243 hectares) of suitable habitat for scrubland-nesting migratory birds and their nests will be permanently removed. Introduced species (European starlings and house sparrows) commonly associated with development activities (e.g., maintained landscaping, open trash receptacles) could encroach on the plant site and displace or out-compete native songbird species. Migratory birds could experience noise-related impacts. Additional habitat loss for migratory birds will occur from the construction and operation of the linear facilities. Furthermore, disturbance from access road construction and use could displace migratory birds from areas adjacent to these. Bird and bat mortalities due to collisions with transmission lines will also occur. DOE requires, as a condition of its decision, minimization of impacts to migratory birds (see **Mitigation**).

If Summit chooses to use solar evaporation ponds for the disposal of waste water, the ponds could attract waterfowl to them thereby exposing the birds to concentrated brine water, which could cause salt toxicosis and salt encrustation of feathers leading to bird deaths. Covering ponds with netting would be one option for deterring birds from contacting the brines. Others options exist for deterring birds, and these would be considered when Summit prepares a bird deterrence plan (see **Mitigation**).

Aesthetics

Visual impacts caused by the polygen plant were evaluated from a number of key observation points in the area. The plant, as viewed from most locations (including the Monahans Sandhills State Park) will have only minor impacts on the view shed. The view of the plant will be more dramatic from the crest of the escarpment to the east, especially as seen by motorists traveling west from Odessa on I-20.

During operations, the height and size of the plant structures and coal storage pile will create moderate, adverse, direct impacts as viewed from the crest of the escarpment to the east because of the strong form, color, and line contrasts with the surrounding landscape. Water vapor emitted from the cooling tower will increase the extent of visual intrusion.

Adverse impacts to night sky conditions could occur during both construction and operations due to the installation of high-intensity lighting within and around the site. Light reflected upward will create regionally visible light pollution and sky glow. Strobe lighting (if required by the Federal Aviation Administration) on the top of the taller plant structures will adversely affect night sky conditions by imposing high-intensity flashing lights that will be regionally visible.

Transmission line structures will adversely impact the view-shed because of their height and intrusive vertical form contrasts with the landscape and because they will be visible from major travel routes. Because of existing power lines, however, they will not become a focus of viewer attention.

Minor adverse impacts will occur during construction of pipelines because equipment and trenches will be visible and because vegetation will be cleared along rights-of-ways. Although pipelines will be buried, long-term impacts to aesthetics will occur because rights-of-ways will be maintained clear of larger vegetation.

Cultural Resources

Construction and operation of the TCEP are not anticipated to impact significant cultural resources; however, utility corridors have not been thoroughly investigated and could have resources that deserve protection. Near the plant site one historical complex or set of buildings, the Rhodes Welding Complex, is considered eligible for the National Register of Historic Places (NRHP). Changes to the setting will not affect its NRHP eligibility. DOE requires, as a condition of its decision, cultural resource surveys to be completed for options and linear facility routes tentatively chosen by Summit (see **Mitigation**).

Land Use

The plant site is currently used for ranching and oil and gas production, and these will be displaced on the 600-acre plant site by the TCEP. Existing subsurface rights will continue to be available for exploration and production of oil and gas. Operation of the polygen plant will not be incompatible with most of the surrounding land uses. However, the project will directly affect at least one and perhaps other nearby residential units in the mostly abandoned community of Penwell.

For the linear facilities, existing land uses will be briefly and temporarily affected by construction. During operations, impacts to land use will be limited to the rights-of-way. The rights-of-way land requirements vary by facility type, and the associated impacts will last for at least the life of the utilities. The linear facilities will be consistent with the intent of the zoning districts through which they pass. Generally, existing land uses will be expected to continue after the linear facilities are constructed.

Socioeconomics and Community Services

Impacts to local and regional population during construction will be minor because most workers will commute from nearby communities. Impacts to population during operations will be negligible because most of the 150 permanent workers will come from the local population, although some may come from outside the area. Existing housing and hotel supply will be adequate to meet demands during operations and most of the construction phase. Because TCEP workers will come primarily from the existing nearby populations, no changes are anticipated in the demand for law enforcement, emergency response, health services, schools, and recreational opportunities in the region.

During most of the construction, GDP in the region of influence (Ector, Midland, Crane and Ward Counties) is estimated to increase by more than 0.4 percent. During the final year of construction, it will increase an estimated 0.67 percent. During operations, it will increase by about 0.16 percent, representing a long-term and beneficial impact for the region. Tax revenue from the TCEP will have a beneficial and long-term impact to the

region as revenue will be redistributed to counties, which in turn will allocate and redistribute to local communities.

Environmental Justice

Construction and operation of the proposed project are not anticipated to have disproportionately high and adverse impacts on minority or low-income populations in the area around the TCEP. Ector County has a higher concentration of minority populations than the state as a whole, and many areas of the county have higher concentrations of low-income individuals and families. Minority and low-income populations were not identified in the immediate vicinity of the TCEP (e.g., region of influence for operational noise). Project emissions are not expected to cause significant air quality impacts or exceed regulatory thresholds. Impacts to surface and ground water resources are not expected to be high. Construction-related traffic congestion and traffic noise would temporarily increase significantly in some road segments very near the plant site, but these impacts are not expected to be disproportionate. Noise generated by operations and construction of the project would be significant locally; however, these impacts would not be disproportionate on environmental justice populations.

In general, the project could disproportionally harm minority and low-income communities in regard to housing availability (primarily short-term housing, such as motels), utility rates, and safety issues associated with increased traffic, but these impacts are not expected to be high. Short-term beneficial impacts could include an increase in employment opportunities and higher wages during construction.

Utility Service

To accommodate the electricity generated by the TCEP, there may be a need for system upgrades associated with the electrical interconnection to either the Electric Reliability Council of Texas (ERCOT) grid or the Southwestern Power Pool (SPP) grid. The nature of the upgrades will be further defined as interconnection studies are completed. These upgrades could involve local installation of larger conductors, new power transmission line segments, and upgrades of other local system components.

Transportation

Several routes were considered as potential new access roads to the polygen plant site. One route is directly from the community of Penwell, linking FM 1601 to the plant site via an underpass beneath the railroad at the southern border of the plant. The other routes are from the east and northeast of the plant site, connecting either to FM 866 or an I-20 frontage road.

During the period of plant construction, local traffic will increase as a function of the employment levels at the plant site. Delays associated with merging traffic and increased percent of time spent following slow vehicles will affect the level of service (LOS) of each road to which a plant site access road may be connected. Construction activities will result in temporary localized traffic delays, and most impacts will occur during shift changes.

During TCEP operations, there will be an average of four additional 150-car unit-trains per week along the railroad (Union Pacific), amounting to a 3 percent increase over the existing rail traffic on this line. Under the peak urea production option, there would be an average of approximately six additional 150-car unit-trains per week along the railroad, amounting to a five percent increase in rail traffic. Neither option represents an increase that would exceed system capacity nor cause delay to existing railway operations. Because the loading and unloading of TCEP-related materials will occur on the railroad spur, no impacts to the railroad will occur.

Materials and Waste Management

No impacts will occur from the management of construction materials. Furthermore, no impacts will occur to the supply of construction materials as a result of the demand from the project. Operations materials will include coal, natural gas, process water, process chemicals, and commercially marketable products. No impacts from the management of these materials are expected. Plans for delivery, handling, and storage of operations materials will be in place before operations begin.

Human Health, Safety, and Accidents

During construction, Summit will follow established procedures to provide a safe and healthy environment for workers, contractors, visitors, and the community. Based on industry workplace hazard statistics, the TCEP construction workforce could experience 91.65 nonfatal, recordable incidents and 48.75 lost workdays. Statistics suggest that fatalities are unlikely (0.19 fatality) during the three-year construction period.

Design features and safety programs will be established by Summit to minimize hazards during operations of the TCEP and linear facilities. Based on industry workplace hazard statistics, over the life of the project the TCEP operations workforce could experience 158 recordable incidents, 122 lost workdays, and less than one fatality.

Adverse impacts to human health and safety, although unlikely, could result from various types of accidents or acts of sabotage and terrorism, ranging from small pipeline leaks to, in an extremely unlikely case, an explosion at the polygen plant. The greatest risks to human health and safety are associated with sudden, unconstrained releases of toxic gases, such as ammonia (NH_3) and hydrogen sulfide (H_2S). Exposure modeling of unmitigated releases using worst-case atmospheric conditions was used to evaluate the risks of various levels of harm. These analyses were made assuming no mitigations are used; therefore, these risks can be reduced with the appropriate measures, such as planning, design and engineering controls. While the probability of intentional acts like sabotage and terrorism cannot be easily predicted, the consequences could be similar to the accidents analyzed in the risk assessment.

During operations of the polygen plant, the risk of someone being killed by exposure to a toxic gas in the event of a release would vary depending on his location relative to the release. The risk per year ranges from one in 1,000 to one in 100,000,000 of being killed in the project area. Toxic substance hazards are dominated by the potential releases of ammonia gas from the pipeline leading from the ammonia synthesis unit to the urea

synthesis plant, or through ammonia production or storage processes. Risks are greatest to those workers closest to the ammonia synthesis unit.

Noise and Vibration

During construction, equipment noise will be perceptible outdoors at the Penwell receptor locations north of I-20; however, people south of I-20 will likely not hear a substantial increase in noise owing to existing noise from vehicles on I-20. Intermittent increases in noise will result from steam venting prior to and during plant startup and commissioning. Although this venting will briefly exceed acceptable Federal Transit Administration (FTA) levels for residential areas (there will be a series of short loud blasts over a two-week period), the FTA's commercial-area construction threshold levels will not be exceeded.

Construction of some linear facilities (WL3, TL5, TL6, NG1–NG3, and AR1) will likely create temporary, adverse noise impacts to residents where the proposed lines are located close to residential areas.

During polygen plant operations, several plant components (e.g., generators, pumps, fans, vents, relief valves, coal delivery/handling system) will generate noise. This operational noise will exceed the EPA's 55 dBA Ldn outdoor noise threshold at the two closest noise-sensitive receptors in Penwell (exceeding the threshold by 6 and 4 dBA). Long-term indoor noise levels are expected to be in compliance with EPA health and safety guidelines.

Environmentally Preferred Alternative

From a local perspective, the no-action alternative is environmentally preferable because it would result in no changes to the existing environmental conditions. However, from a national perspective, DOE's Proposed Action is the environmentally preferred alternative because it could hasten the deployment of carbon capture and sequestration practices at power plants and other industrial facilities around the world in an effort to reduce greenhouse gas emissions that otherwise will occur with the continued combustion of fossil fuels, especially coal, in stationary facilities. In addition to demonstrating carbon capture from a power plant and sequestration of captured CO_2 through EOR, the TCEP will encourage faster deployment of several other technologies that, if widely deployed by industry, could help reduce environmental impacts: (1) integrated gasification combined-cycle technology, which allows for the production of more electricity from a given quantity of coal compared to convention power plants; (2) polygeneration, which may allow for lower cost and more efficient production of electricity and various other products (including products made using captured CO_2, such as urea); (3) dry cooling, which greatly reduces water consumption or usage by various industrial processes; (4) zero liquid discharge or water reuse concepts, which help reduce water consumption and minimize the quantity of waste water.

Comments Received on the Final EIS

DOE received comments, both oral and written, from U.S. EPA's Region 6 on the Final EIS concerning the lack of identification of preferred alternatives and the need to further investigate potential impacts to resources in association with some of the options.

EPA's Region 6 found that DOE's revisions to the Draft EIS were generally improvements, but it remains concerned that a preferred alternative for each of the linear facilities was not identified in the Final EIS. Region 6 understood that Summit could not identify a preferred alternative for each of the linear facilities until additional investigations occur.

For the TCEP, DOE identified its preferred alternative in the Final EIS, which is to fund the project. Subject to the mitigations required by this ROD and given the information presented in the Final EIS, DOE has no preference among the options not dismissed from further consideration by this ROD. DOE finds all the remaining options to be equally acceptable, provided that Summit undertakes the mitigations required by this ROD.

EPA's Region 6 also requested that DOE make a commitment in the ROD that, if field investigations reveal that an option chosen by Summit has impacts greater than those identified in the EIS, DOE would prepare a supplemental analysis. EPA further requested that the supplement analysis be provided to all regulatory agencies, including the EPA, for review. DOE will gather additional information and, if that information reveals potential impacts that are not adequately addressed in the EIS, it will prepare a Supplement Analysis to assist DOE in determining whether a supplemental EIS is needed.

DOE also received comments in writing from the Texas Parks and Wildlife Department (TPWD) on the Final EIS concerning protection of wildlife and habitat.

TPWD recommended that DOE review TPWD's comments and recommendations submitted during the public scoping and comment periods as many of these remain applicable to the project described in the Final EIS. As requested, DOE has again reviewed these two submittals and has factored TPWD's previous comments and recommendations into this ROD, particularly in the section on **Mitigation**.

TPWD notes that because few water sources exist on or near the project site, resident and migratory birds may be attracted to the proposed evaporation ponds spanning 160 acres in this arid area. TPWD therefore recommends a bird deterrent system be developed for the evaporation ponds. In anticipation of this request, this ROD includes a requirement for a bird deterrent plan and the implementation of the plan, if Summit chooses to use solar evaporation ponds (see **Mitigation**). More specifically, this ROD requires that high salinity ponds be designed and constructed to be ready for the installation of netting. TPWD further asks that it be contacted to discuss specific details of a bird deterrent system. DOE and Summit will consult with TPWD during the development of the bird deterrent plan.

TPWD supports Summit's preferred option of using Midland's municipal waste water as a supply for the polygen plant. However, TPWD believes that waterline option WL1 appears to better minimize adverse impacts to surface waters than WL5 because it has fewer crossings of Monahans Draw. To minimize impacts to the draw, TPWD recommends that the TCEP use directional drilling rather than trenching for pipeline crossings regardless of the waterline route chosen. The EIS notes that trenching, if this

method of pipeline installation is chosen, would include restoration procedures, such as stream bank stabilization and revegetation. Further site investigations into the technical feasibility, costs, and potential for adverse impacts would be completed before determining the exact stream crossing locations, method of pipeline installation at streambeds, and mitigation methods.

One individual submitted comments on the Final EIS. These comments encourage the use of desalinated brackish or brine ground water (particularly water co-produced with oil and gas) and provided an Internet address for an article on emerging desalination technologies that may cost less for waters produced from oil fields. The comments also suggest that Summit should consider a larger desalination system that could serve both the TCEP and some portion of the municipal water supply needs of Odessa. In response, Summit indicates that it is investigating various desalination systems and currently plans to size its system to meet the TCEP's needs assuming that brackish water from the Capitan Reef Complex Aquifer would be the source. Summit further indicates that it has engaged in preliminary discussions with representatives of the city of Odessa regarding the possibilities for cooperation in the desalination of water.

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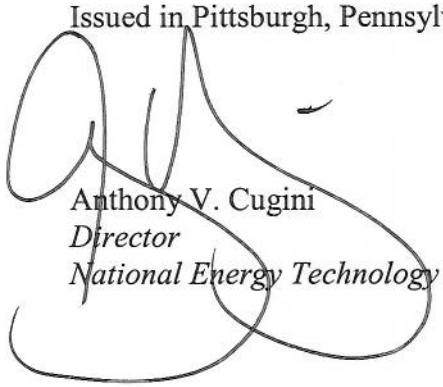

Anthony V. Cugini
Director
National Energy Technology Laboratory