[6450-01-P]

DEPARTMENT OF ENERGY

Record of Decision and Floodplain Statement of Findings: Western Greenbrier Co-Production Demonstration Project, Rainelle, Greenbrier County, West Virginia

AGENCY: Office of Fossil Energy, U.S. Department of Energy (DOE).

ACTION: Record of Decision (ROD) and Floodplain Statement of Findings.

SUMMARY: DOE has decided to implement the Proposed Action alternative, identified as the preferred alternative, in the *Western Greenbrier Co-Production Demonstration Project, Final Environmental Impact Statement* (DOE/EIS-0361; November 2007) (FEIS). That alternative is to provide approximately $107.5 million (up to 50% of the development costs) to Western Greenbrier Co-Generation, LLC (WGC) through a cooperative agreement under the Clean Coal Power Initiative (CCPI) Program for a Co-Production Facility to be located at Rainelle in Greenbrier County, West Virginia. This funding will be used by WGC to design, construct and demonstrate a 98 megawatt (net) power plant and cement manufacturing facility based on an innovative atmospheric-pressure circulating fluidized bed (CFB) boiler with a compact inverted cyclone to generate electricity and steam by burning approximately 3,000 to 4,000 tons per day of coal refuse from several local sites.

DOE considered two overall alternatives: to provide cost-shared funding or not to provide cost-shared funding to WGC's proposed project. In addition, DOE examined a range of implementing options for the power plant site, fuel supply, water supply, limestone supply, means of transportation, and transmission corridors. DOE analyzed in detail the environmental

(including socioeconomic) impacts of each of these different options, as well as the economic and environmental benefits related to the reclamation and potential reuse of the coal refuse sites.

This ROD and Floodplain Statement of Findings have been prepared in accordance with the regulations of the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] Parts 1500-1508) for implementing the National Environmental Policy Act (NEPA), DOE's NEPA Implementing Procedures (10 CFR Part 1021), and DOE's Compliance with Floodplain and Wetland Environmental Review Requirements (10 CFR Part 1022).

ADDRESSES: The Final EIS is available on the DOE NEPA Web site at http://www.eh.doe.gov/nepa/documentspub.html and on the DOE National Energy Technology Laboratory (NETL) Web site at www.netl.doe.gov. This ROD and Floodplain Statement of Findings will be available on both Web sites in the near future. Copies of the Final EIS, this ROD and Floodplain Statement of Findings also may be requested by contacting Mr. Roy G. Spears, NEPA Document Manager, U.S. Department of Energy, National Energy Technology Laboratory, 3610 Collins Ferry Road, Morgantown, WV 26505; telephone: 304-285-5460; or e-mail: roy.spears@netl.doe.gov.

FOR FURTHER INFORMATION CONTACT: To obtain additional information about the project or the EIS, contact Mr. Roy G. Spears, NEPA Document Manager, U.S. Department of Energy, National Energy Technology Laboratory, 3610 Collins Ferry Road, Morgantown, WV 26505; telephone: 304-285-5460 or e-mail: roy.spears@netl.doe.gov. For general information on the DOE NEPA process, contact Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance (GC-20), U.S. Department of Energy, 1000 Independence Avenue, SW,

Washington, DC 20585-0103; telephone: 202-586-4600; or leave a toll-free message at 800-472-2756.

SUPPLEMENTARY INFORMATION: DOE has prepared this ROD pursuant to CEQ regulations for implementing the procedural provisions of NEPA [40 CFR Parts 1500-1508] and DOE NEPA regulations (10 CFR Part 1021). This ROD is based on DOE's Final EIS and other program considerations.

Background and Purpose and Need for Agency Action

The promotion of America's energy security through reliable, clean, and affordable energy is one of the core components of DOE's mission to discover solutions to power and secure America's future. Coal is the most plentiful energy source in America today. Accordingly, DOE has strived to accelerate deployment of innovative clean coal technologies that can meet near-term energy and environmental goals, reduce risk in the business community to an acceptable level, and provide incentives to the private sector for innovative research and development directed at solving various energy supply problems. Since the early 1970s, DOE and its predecessor agencies have supported research and development programs that include long-term, high business-risk activities for the development of a wide variety of innovative coal technologies through the proof-of-concept stage. On November 5, 2001, the President signed the "Department of the Interior and Related Agencies Appropriations Act, 2002," which established and appropriated initial funding for the CCPI Program (Public Law 107-63). Under this Initiative, DOE is required to promote the widespread commercial application of innovative technologies for more efficient and environmentally sustainable uses of coal by the power

industry in the United States. This Initiative achieves that goal by co-funding proposed projects that DOE has selected through solicitation and negotiation.

DOE issued the first-round CCPI solicitation in March 2002 and received 36 proposals. The Western Greenbrier Co-Production Demonstration Project was one of eight projects selected in January 2003 for further consideration following a preliminary environmental review. The evaluation criteria that DOE used in the selection process included technical merit of the proposed technology, potential for a successful demonstration of the technology, potential for the technology to be commercialized, and environmental factors. In addition to demonstrating the first commercial application in the United States of a compact, inverted cyclone CFB design, which reduces size, steel requirements, costs and construction time, this project offers a novel approach to converting waste ash into commercial building products while also integrating power generation with remediation of coal refuse piles. A successful demonstration would generate technical, environmental, and financial data to confirm that similar integrated technologies can be implemented at the commercial scale.

EIS Process

On June 3, 2003, DOE published in the *Federal Register* (68 FR 33111) a Notice of Intent to prepare the EIS and to hold a public scoping meeting. DOE held the meeting in Charmco, West Virginia, on June 19, 2003. The public scoping period ended on July 3, 2003. DOE considered all of the comments received in preparing the Draft EIS.

On December 1, 2006, the Environmental Protection Agency (EPA) issued a Notice of Availability of the Draft EIS in the *Federal Register* (71 FR 69562) and DOE's Notice of Availability of the Draft EIS was published in the *Federal Register* on December 4, 2006 (71 FR

70371). DOE's Notice of Availability announced a public hearing on the Draft EIS and invited agencies, organizations, and individuals to present oral and written comments.

DOE conducted a public hearing on the Draft EIS on January 4, 2007, in Crawley, West Virginia. An informational session was held prior to the hearing for the public to learn more about the proposed project. The public was encouraged to provide comments, either at the hearing or in writing, by January 18, 2007. Twenty people commented at the hearing and 179 people submitted written comments. DOE considered and responded to all public comments in the Final EIS.

In November 2007, DOE issued its Final EIS and the EPA published a Notice of Availability of the Final EIS in the *Federal Register* on November 9, 2007 (72 FR 63579).

Proposed Action

The Proposed Action is for DOE to provide WGC with approximately $107.5 million through a cooperative agreement under the CCPI Program for up to 50% of the cost for a Co-Production Facility, emphasizing a 98 megawatt (net) CFB that generates electricity and steam, to be located at Rainelle in Greenbrier County, West Virginia. The facility would be designed for long-term commercial operation (at least 20 years) following completion of the cooperative agreement. It is anticipated that DOE's share of project costs would be paid back over a 20-year period following the one-year demonstration period, based on a Repayment Agreement negotiated between DOE and WGC. The proposed power plant, which employs an inverted cyclone combustor, would require less steel than a plant configured with a conventional cyclone, reducing steel costs by approximately 40%. Because the boiler system is shorter and has a smaller footprint, it would take about 10% less time to construct than a conventional cyclone facility. WGC would obtain fuel for the power plant from the Anjean, Joe Knob, Donegan, and

Green Valley coal refuse sites in the area for an initial period of 20 years. Before these fuel sources are depleted, WGC would identify additional coal refuse sites in accordance with West Virginia Department of Environmental Protection (WVDEP) clean-up priorities. Refuse coal removed from these sites would be beneficiated (washed or otherwise cleaned to increase the energy content by reducing the ash content) in a semi-mobile, relocatable, coal preparation plant. Heavy-haul trucks would transport the fuel on local roads to the power plant site. By processing the fuel near the coal refuse sites, WGC would substantially reduce the volume of truck traffic that otherwise would be generated by the project and also reduce fuel processing and handling activities on the power plant site.

The power plant would generate electricity for distribution on the national grid via a new transmission line and corridor. The power plant would also produce an alkaline ash from fuel combustion. WGC would return a portion of the ash to coal refuse piles to facilitate remediation and reclamation efforts at each of the coal refuse sites in accordance with agreements between WGC and the WVDEP. WGC would produce cement from the balance of the ash by combining it with limestone in a coal-fired rotary kiln associated with the power plant. In addition to electricity and cement, the planned plant would co-produce steam and would serve as the anchor tenant for a proposed, environmentally balanced industrial park ("EcoPark") to be located on an adjacent property in Rainelle.

Alternatives

DOE pursues the goals of the CCPI Program by co-funding projects owned by non-Federal sponsors. As such, DOE has a more limited role than if the Federal government were the owner and operator of the projects. DOE evaluated CCPI Program applications to determine if they meet the CCPI Program's goals. It is appropriate for DOE to consider the applicant's needs

and goals in determining the scope of the EIS (i.e., identifying the range of reasonable alternatives).

Based on the foregoing principles, DOE has identified and analyzed two reasonable alternatives: (1) provision by DOE of cost-shared funding for the WGC Project as proposed, subject to conditions (e.g. mitigations), and (2) a no-action alternative in which DOE would not provide funding for the project. Without funding, DOE assumes that the project would be cancelled.

DOE considered and dismissed from further review other alternatives that did not meet the goals and objectives of the CCPI Program. Commenters proposed additional alternatives such as encouraging energy efficiency rather than demonstrating a coal-fired power plant and employing high quality fuel rather than refuse fuel. DOE considered but dismissed these and similar alternatives from further analysis because they would not satisfy the Department's purpose and need.

DOE examined numerous implementing options for the power plant site, fuel supply, water supply, limestone supply, materials handling, transportation, and transmission corridor sites. For example, DOE examined three locations for the proposed power plant facility, each of which would change the configuration and size of the power plant footprint. One of the advantages of the inverted cyclone technology is that it reduces the plant footprint, and the resulting reduction of material and construction cost is relevant to DOE's decision to fund or not fund. DOE also examined four different coal refuse sites for fuel supply. These sites vary widely in size and distance from the plant site. DOE examined secondary and tertiary water supply options that would involve varying degrees of surface (river) water and groundwater. The implementing options, in some instances, have distinct environmental impacts. For

example, one option for water supply would reduce streamflow in the Meadow River to a greater degree than the other option. The EIS analyzes in detail the environmental impacts of these different options.

After considering the range of reasonable implementing options, the potential environmental impacts, and all public comments, DOE concluded in the Final EIS that providing cost-shared funding for WGC's preferred configuration of options is DOE's Preferred Alternative.

Analysis of Environmental Impacts

Atmospheric conditions and air quality: In examining how the construction and operation of the WGC Co-Production Facility could impact air resources in the planning area, DOE reviewed the predictive air dispersion modeling, Class I and Class II Prevention of Significant Deterioration (PSD) analysis, and visibility modeling that were completed by WGC in support of the Permit to Construct, R14-0028, issued to WGC by WVDEP[1]. During construction of the Co-Production Facility and the associated coal preparation plant system, the potential sources of air emissions would be material handling and storage, soil excavation, diesel-fueled construction equipment, and construction worker vehicles. During operations, the potential sources of air emissions would be process equipment (including the CFB and kiln), material handling and storage, and vehicles. The majority of these emissions would be exhaust from the combustor and kiln via a common stack during operations. The Co-Production

[1] In accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§ 22-5-1 *et seq.*), 45 CSR. 13 - Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation, and 45 CSR. 14 - Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration.

Facility's emissions would be less than levels specified in the R14-0028 permit, which complies with New Source Performance Standards.

Each of the implementing options proposed by WGC would emit similar types and quantities of pollutants. Analyses in the EIS show that emissions of criteria pollutants, when combined with ambient background concentrations of pollutants, would comply with National Ambient Air Quality Standards (NAAQS). In addition, pursuant to the governing Permit R14-0028, the facility would be equipped with a Continuous Emission Monitoring System to ensure that NAAQS would not be exceeded.

To limit the rate at which increased emissions can occur in areas that attain air quality standards, PSD regulations include limits, or increments ("PSD increments"), that the proposed facilities classified as major sources must meet. PSD increments are the maximum allowable concentration increases above a baseline concentration. PSD increments applicable to the proposed project have been established for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and particulate matter (PM_{10}). The Co-Production Facility's emissions of these NAAQS pollutants, namely SO_2, NO_2 and PM_{10}, will contribute to PSD increments in the Class II areas (Class II areas are designated areas in which moderate deterioration, associated with well managed growth, is allowed) that surrounds the proposed WGC plant. These emissions, however, would contribute in a range between 25% and 75% of the allowable increment depending upon the pollutant and associated averaging time. The 24-hour PM_{10} emissions in the immediate vicinity of the site would be responsible for the greatest percentage of the PSD increment.

In response to public scoping comments and after consulting with WVDEP and Federal Land Managers, DOE analyzed potential impacts at the four nearest Class I areas (Class I areas are designated areas in which the degradation of air quality is to be severely restricted [e.g.,

National Park or Wilderness Areas]). These Class I areas (and their distances from Rainelle) are: James River Wilderness Area (74 miles), Otter Creek Wilderness Area (89 miles), Dolly Sods Wilderness Area (102 miles), and Shenandoah National Park (105 miles). A visibility analysis, using methodology requested by Federal Land Managers responsible for the Class I areas, indicated that in the closest Class I areas there would likely be no more than 6 days over a 3-year period when there would be a 5% change in light extinction, and no days with greater than 10% light extinction (thresholds that Federal Land Managers use to determine potential significance). However, meteorological records suggest that these occurrences may be attributable to natural obscuring conditions (such as fog, clouds, and rain). The analyses indicate that, even without accounting for naturally obscuring periods, concentrations of all the criteria pollutants emitted from the Co-Production Facility would have an insignificant impact at the nearest Class I Areas.

As a fossil fuel-fired steam electric power plant, the CFB would be among the 28 named source categories listed in section 169 of the Clean Air Act as a major source that has the potential to emit a regulated air pollutant (or precursor) or a hazardous air pollutant in quantities equal to or exceeding listed thresholds. For emissions that could be above a threshold, a Best Available Control Technology (BACT) analysis was conducted by WGC as part of the permitting process. This analysis resulted in the selection of the following emission control technologies:

- Nitrogen Oxides (NO_x) - Selective Non-Catalytic Reduction from the combined flow of the CFB and Kiln.
- Carbon Monoxide (CO) and Volatile Organic Compounds (VOCs) - A combination of temperature profile, residence time, turbulence, and excess air levels for controlling CO and VOC emission rates from the combined flow of the CFB/Kiln.

- SO_2 - Limestone injection into the CFB for controlling SO_2 emissions from the CFB, and use of a flash dryer absorber for the CFB/Kiln.
- Sulfuric Acid (H_2SO_4) - Limestone injection into the CFB for controlling SO_2 emissions from the CFB, and use of a flash dryer absorber for the CFB/Kiln.
- Particulate matter (PM) – Use of a baghouse for controlling PM emission rates from the combined flow of the CFB/ Kiln.

DOE independently reviewed the BACT analysis that WGC conducted to determine how WGC would control emissions of NO_x, CO, VOC, SO_2, H_2SO_4, and PM. In addition, in May 2006, the Sierra Club (West Virginia Chapter), West Virginia Highlands Conservancy, and Greenbrier River Watershed Association filed an appeal with the West Virginia Air Quality Board (AQB), challenging WVDEP's issuance of the air permit. The final order for this appeal was issued on February 28, 2007. In it, the AQB affirmed the WVDEP's issuance of the air permit to WGC. According to the final order, the AQB concluded that WGC appropriately conducted the BACT analysis, and WVDEP complied with procedural requirements in accordance with the applicable laws and regulations.

WGC's planned extraction and processing of coal refuse would emit fugitive dust and WGC would contain these emissions within site boundaries through the use of dust suppression activities in accordance with the West Virginia Code of State Rules (CSR) 38 CSR 2 and 45 CSR 5. WGC would construct and operate the preparation plant in accordance with a WVDEP Class II General Permit G10-C for coal preparation plants and coal handling operations. WVDEP would issue the permit in accordance with 45 CSR 13.

Based on test burn analysis conducted for WGC's PSD Permit Application, WGC and DOE concluded that the Co-Production Facility would emit a maximum of 0.014 tons ofmercury

per year, which is significantly less than the 200 pound (0.1 ton) per year threshold listed in 45 CSR 13. The plant is not anticipated to discharge objectionable odors as regulated by 45 CSR 4.

Analysis based on the Seasonal/Annual Cooling Tower Impact model, developed by the Electric Power Research Institute, demonstrated that the cooling tower proposed for the WGC project would not lead to excess fogging, rime ice deposition, plume shadowing, loss of solar energy, or salt and water deposition. The analysis shows that the cooling tower would have minimal adverse air impacts on neighboring properties.

Under the Acid Rain Program established by Title IV of the Clean Air Act, utility generating units greater than 25 MW are required to obtain a Phase II Acid Rain Permit from EPA, under which they cannot emit more tons of SO_2 than held in marketable allowances. The proposed Co-Production Facility would have to obtain and comply with such a permit and would be operated in a manner that is consistent with EPA's overall efforts to reduce SO_2 emissions.

CO_2 Emissions: The Intergovernmental Panel on Climate Change, in its Fourth Assessment Report[2], stated that warming of the earth's climate system is unequivocal, and that warming is very likely due to anthropogenic greenhouse gas (GHG) concentrations. Emissions of the GHG, CO_2, from the proposed project (including activities at the coal refuse and preparation plant sites and related trucking activities) would be approximately 0.87 million tons per year (0.79 million metric tons). Emissions of CO_2 resulting from global fossil fuel combustion are estimated to have averaged 28 billion tons (26 billion metric tons) per year during the period 2000 to 2005.[3] Over the 50-year duration of expected commercial operation, the proposed project could release approximately 44 million tons (40 metric tons) of CO_2.

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[2] Intergovernmental Panel on Climate Change, Fourth Assessment Report, Climate Change 2007: Synthesis Report, Summary for Policy Makers, released in Valencia, Spain, November 17, 2007.
[3] Energy Information Agency, http://www.eia.doe.gov/pub/international/iealf//tableh1co2.xls

DOE is not aware of any methodology to correlate the CO_2 emissions exclusively from the proposed project to any specific impact on global warming; however, studies such as the IPCC report support the premise that CO2 emissions from the proposed project, together with global GHG emissions, will very likely have a cumulative impact on global warming.

Although not proposed by the applicant, DOE has considered potential measures to mitigate impacts on global climate change by using geologic sequestration to reduce emissions of CO_2. DOE determined that geologic sequestration is not reasonable for this project. Unlike plants that use integrated gasification combined cycle technology and produce a capturable stream of high-pressure CO_2 in the pre-combustion gasification stage, the proposed project will use a circulating fluidized bed system, and only emit a post-combustion, low pressure, diluted CO_2 stream in the flue gas. Currently, there is no economically viable technology that can capture diluted CO_2 in this low pressure stream. In order to raise its CO_2 to a pressure high enough for capture, the plant would need to use pressurization equipment that would consume so much energy and be so prohibitively expensive to operate that the plant would be economically infeasible.[4]

In the future, cost-effective energy efficient technology may be available to capture the type of low-pressured CO_2 stream that a CFB plant emits. DOE has established a 2020 goal for the commercial scale operation of large scale plants that can select from a suite of technologies (currently in a conceptual phase) to capture up to 90% of CO_2 emissions and store it with 99% storage permanence (meaning that at most 1% of the stored CO_2 might leak out) at less than a

[4] For information on the status of various capture technologies, see http://www.netl.doe.gov/technologies/carbon_seq/FAQs/tech-status.html.

10% increase in the cost of energy services. At present, however, because CO_2 capture and subsequent sequestration is not a feasible option for the proposed project, DOE is not requiring specific mitigation measures to reduce CO_2 emissions.

Surface Water: As required by a National Pollutant Discharge Elimination System General Construction Permit, WGC would minimize impacts from discharge of pollutants and storm water on surface waters during construction by implementing an erosion and sedimentation control plan. WGC would implement a storm water management pollution prevention plan and a groundwater protection plan based on West Virginia Department of Transportation and WVDEP requirements, thereby minimizing impacts on surface water during operation of the plant.

WGC intends to use effluent from the Rainelle Sewage Treatment Plant as the primary source of process water for the facilities. WGC proposed two implementing options to provide supplemental sources of process water. Under the first option, WGC would withdraw groundwater as a secondary source of water supply and withdraw surface water from the Meadow River as a tertiary supply. The plant would withdraw water from the Meadow River intermittently, only during low aquifer conditions. WGC estimates that the Meadow River's streamflow would be reduced by a maximum of approximately 1.6 to 2.0 cubic feet per second (cfs) at the end of a 25-year period. Under the second implementing option, WGC would withdraw from the Meadow River as a secondary source of water supply. This might reduce base river flows, but the plant would stop withdrawing river water when flows could fall below 60% of the annually or seasonally adjusted average flow. The West Virginia Division of Natural Resources has provided base flow thresholds to be maintained in the Meadow River: 178 cfs April through September and 118 cfs October through March. A flow monitoring system would

be implemented to alert operators or inspectors when the flows are at or approaching the thresholds. WGC personnel are responsible for the monitoring. WGC will install an electronic monitoring device with a "low flow" alarm, which will provide constant river flow information.

Under DOE's preferred alternative, DOE would fund the plant only if it employs surface water as a secondary source and groundwater as a tertiary source (i.e., operates under the second implementing option). During periods when the plant does not use groundwater for water supply, the local aquifer would recharge and replenish itself. According to the widely used Tenant Method and the West Virginia Division of Natural Resources' recently determined base flow thresholds, the WGC plant's withdrawal of river water will leave the water flow high enough to sustain survival of stream habitat. Based on the West Virginia Division of Natural Resources' guidelines, the maximum that WGC would be allowed to withdraw from the river is 2.7 cfs, which represents less than 1% of Meadow River's average annual flow. Withdrawal from the river would be limited to high flow conditions. The WGC plant would reduce streamflow by a maximum of approximately 0.8 cfs at the end of a 25-year period.

Floodplains: All of the power plant siting options would unavoidably impact the floodplain of Sewell Creek. The preferred option would have the least impact on the floodplain, requiring 16 acres to be filled, resulting in a maximum increase in water elevation for a 100-year flood of 0.48 ft. The other two (non-preferred) options would require up to 20 acres to be filled, resulting in a maximum increase in water elevation for a 100-year flood of up to 0.67 ft. These potential increases in the 100-year flood elevations for Sewell Creek would be less than the Federal Emergency Management Agency (FEMA) designated maximum height of 1 ft in the local upstream area. No component of the Proposed Action would impact floodplains at coal

refuse sites, limestone supply quarries, or power transmission facilities associated with the proposed project.

Biological Resources (Including Wetlands): The power plant site has lost most of its original ecological resource value as a result of prior land-disturbing activity. Extensive adjacent acreage of undisturbed upland areas offer higher quality habitat. DOE determined that the project is not expected to impact any protected species. The U.S. Fish and Wildlife Service reviewed DOE's habitat assessment report and surveys and confirmed that no federally-listed threatened and endangered species were found in the vicinity of the proposed project, and determined that no further consultation is required under Section 7 of the Endangered Species Act for DOE's preferred alternative.

The preferred power plant siting option would impact approximately 0.26 acres of wetlands. The non-preferred power plant options would encroach into significant areas of wetlands and require filling of a meander bend of Sewell Creek. In addition, construction and operation of the proposed transmission line corridor could impact approximately three acres of wetlands. With respect to the proposed transmission line corridor, most of the wetlands impacts would be temporary and the areas would be restored to their pre-existing conditions when construction activities end. Over time, restored wetlands would develop a similar or greater functional capacity compared to pre-disturbance conditions. However, impacts to approximately 0.38 acres of forested wetlands would result in a permanent habitat conversion and a change in wetlands function because post-construction corridor maintenance would result in a scrub-shrub cover type and prevent transitioning into a forested cover type. WGC has submitted a revised wetlands permit application to WVDEP and the U.S. Army Corps of Engineers (USACE). The 0.26 acres of wetlands impacted by the preferred option, or larger acreage impacted by the non-

preferred options, in addition to the approximately three acres of wetlands impacted within the transmission line corridor would result in a cumulative wetland impact that exceeds 0.5 acres, and thus necessitated WGC's submission of an Individual Permit application. Both state Section 401 and Federal Section 404 wetlands permit applications discuss temporary and permanent wetlands impacts and best management practices (BMPs), and include a compensatory conceptual wetlands mitigation plan for impacted wetlands. The conceptual wetlands replacement design would be finalized once WVDEP approves the plan. The USACE has decided to evaluate the WVDEP's response regarding compensatory wetlands replacement design before it would issue a jurisdictional determination on wetlands delineated by WGC. The Floodplain Statement of Findings in this ROD (below) contains further information about potential floodplain and wetlands impacts.

Geology and Groundwater: DOE's groundwater modeling demonstrated that both of the implementing options considered for pumping water from the local aquifer were feasible and would not cause unacceptable levels of drawdown. These implementing options are described in greater detail under *Surface Water*. The Rainelle Water Department separately indicated that the two city wells would be able to safely meet the city water demand under both implementing options.

In response to concerns expressed by members of the public during the EIS process about potential impacts on groundwater resulting from leaching of metals in the CFB ash proposed to be used for coal refuse remediation, DOE has conducted a further examination, including a review of case studies. Based on its review, DOE has concluded that CFB ash can be used to remediate coal refuse sites in a manner that does not degrade groundwater resources by leaching of arsenic or other metals. Remedial plans would govern the potential leaching of metals in the

context of local conditions at the coal refuse site (e.g., geology and hydrology). The potential for mobilizing arsenic and other metals would be carefully evaluated as part of the remediation planning efforts overseen by WVDEP, who would direct and supervise the development and implementation of the site-specific reclamation plans. DOE will require that WGC develop plans in a manner that not only is protective of groundwater and surface water resources, but would potentially have a long-term beneficial impact to water resources.

Cultural Resources: None of the project components associated with the Proposed Action would occur on, or otherwise affect, federally-recognized Native American tribal lands. The West Virginia State Historic Preservation Office (WV SHPO) concurred with the conclusion of a Phase I survey that none of the WGC implementing options for the proposed project would have an effect on any archaeological resources that might exist at the plant site. To date, no other cultural, historic or archaeological resource impacts have been identified at the sites associated with this project. In general, these sites have been extensively disturbed by previous mining-related operations and, as such, DOE does not expect that archaeological resources will be present in the vicinity of the proposed project. DOE conducted and submitted an additional Phase I survey to the WV SHPO in November, 2007, following further refinements to the proposed transmission corridor and water supply facilities. No prehistoric or historic archeological materials were reported in the survey; however, DOE anticipates WV SHPO's comments on the report in the near future and will continue consultation with the WV SHPO in accordance with the National Historic Preservation Act Section 106 review process.

Socioeconomics: DOE determined that socioeconomic impacts would be predominately beneficial. Construction and operation of the power plant would increase local employment opportunities and provide economic stimulus to area businesses without displacing existing

residents or businesses or adversely affecting current trends in population growth and the demand for housing. During construction, the project would likely employ an average of 185 individuals per month over a 29-month period. During the demonstration phase and subsequent commercial operation, the proposed project would employ approximately 126 full-time personnel and would result in approximately 114 new jobs from economic activity triggered by the proposed project. However, due to their close proximity to the proposed power plant, residential properties to the east of and within 1,500 feet of the plant site could decline in value because of temporary impacts to aesthetics, noise, dust emissions, and traffic during construction, and long-term impacts to aesthetics and noise during operations.

Environmental Justice: DOE determined that the proposed power plant would not have a disproportionately high and adverse impact on minority or low-income populations. DOE did not identify any minority populations in the potentially affected area. The proportion of minorities in the region affected by the power plant site is substantially below 50%, and is not meaningfully greater than the proportion of minorities in the larger local jurisdictions, county, and state. DOE did, however, identify low-income populations. The general population of western Greenbrier County represents a "low-income population." In comparison to the state and county, local communities in the proposed project area have relatively large low-income populations. However, the EIS analyses show that there will be no significant impacts on any populations, and DOE has concluded that impacts on low-income populations would not be disproportionately high and adverse.

Land Use: WGC would develop the proposed project on disturbed land near areas that have historically been used for industrial activities. Potential business opportunities arising from the proposed project could cause land uses surrounding the power plant to change. The three

communities sponsoring the project envision the development of the EcoPark industrial park on adjoining vacant land that was previously designated for such use but has not been developed. Once WGC has completed its reclamation work at the degraded coal refuse sites, these sites might be suitable for other uses beneficial to the local communities, county, and state. The development of a transmission line corridor right-of-way would require the clearing of a 206-acre corridor. The route would not traverse populated land areas, and would not cross any parks, trails, or byways. Many of the properties that would be traversed by the new corridor are owned by timber companies that would likely clear-cut the properties prior to WGC's construction of the power line. WGC would compensate landowners for granting an easement.

Community Services and Utilities: Because the local population has been declining since the 2000 census, currently available public services are adequate for Rainelle. Based on community response to the proposed project, DOE expects that most of the construction workers would be hired locally. The operation of the proposed facility may attract up to 100 employees from larger communities just outside of Rainelle (e.g., Lewisburg). Thus, DOE anticipates that the proposed power plant would not impose excessive demands on community services and utility systems during construction and operation, and the project would not induce unsupportable development. Construction activities and anticipated injuries may increase the short-term demand on medical services.

Traffic and Transportation: DOE determined that existing roadways could accommodate the additional traffic volumes during construction and operation of the proposed power plant. The trucking of fuels, limestone, and other materials would not cause delays beyond level of service "C" at any of the intersections studied because it would occur on designated heavy haul routes ("C" represents stable traffic flow; levels beyond "C" (i.e., levels of service "D" through

"F"), signify higher density of traffic flow and increasing degradation of roadway capacity). However, heavy-haul trucks would likely increase travel times on some local roads between the preparation plant sites and the power plant site.

Public Health and Safety: DOE anticipates that worker safety impacts would track normal Bureau of Labor Statistics for the construction and operation of the power plant, activities at the coal refuse and preparation plant sites, and trucking of fuel and limestone. Worker safety at the proposed facilities would be subject to Occupational Safety and Health Administration standards.

EIS analyses show that carcinogenic and non-carcinogenic risks to members of the public from routine plant releases would be insignificant.

Aqueous ammonia would be stored at the power plant to reduce NO_x emissions. A sudden release of aqueous ammonia (whether accidental or caused by an act of sabotage or terrorism) could present a health hazard to people within a 600-ft radius of the power plant; however, there are only two residential properties within the 600-ft radius and WGC plans to purchase these properties. Thereafter, there would be no residents living within the 600-ft radius. On-site workers are present within a 300-ft radius, such that they could be affected in the event of a release.

Noise: DOE anticipates that the majority of adverse impacts during plant construction, including blasting noise and vibration, would only impact those residential properties located within 1,500 ft east of the plant site and would be temporary and intermittent. Some short-term, intermittent daytime noise impacts would occur during construction activities at other areas associated with the proposed project. In accordance with noise requirements as regulated by the West Virginia Public Service Commission, WGC would incorporate noise attenuation and

mitigation measures into the final design that would ensure operational noise levels would remain below a threshold level at each identified receptor site above which noise monitoring would otherwise be required by the Public Service Commission. Nonetheless, to ensure compliance, WGC would monitor noise levels during plant operations. Noise from steam blow-off sources would be temporary and infrequent, occurring only during start-up and maintenance operations. Coal refuse sites and candidate preparation plant sites are located in remote, sparsely populated areas where there has been or still are coal mining activities. Commercial operations at limestone quarries would not change appreciably from baseline conditions. DOE estimates that traffic-related noise during construction and operation will fall below Federal and state impact criteria.

Cumulative Impacts: Other than commercial activities by private sponsors, there are no known major projects planned by Federal, state, county, or municipal authorities in the WGC area. The principal commercial activities in the planning area include the following: ongoing timber harvesting activities (clear cutting) in the vicinity of the proposed project; ongoing and future surface coal mining and preparation operations at and near the Green Valley and Anjean sites; a proposed wind power generating facility to be located north of the proposed project area by Invenergy Wind, LLC; and the planned EcoPark industrial development to be located adjacent to the WGC plant site. Greenbrier Valley Economic Development Corporation plans to develop the EcoPark on approximately 26 acres of land on the former site of the Meadow River Lumber Company located directly northwest of the WGC plant site across Sewell Creek. The proposed plant would support the EcoPark by providing electricity, steam, and hot water and by producing cement in a kiln for use in the manufacture of construction materials by potential tenants. The EcoPark may include a facility for the production of building products using

cement from the kiln, a facility to produce farm-raised tilapia fish, and a commercial greenhouse operation. DOE did not identify significant adverse cumulative impacts resulting from the proposed project.

Environmentally Preferred Alternative

DOE has identified the no-action alternative as environmentally preferred. Under the no-action alternative, DOE would not provide cost-shared funding for the proposed project and the project would not be completed. Without the project as a stimulus and anchor, it is doubtful that the planned EcoPark would attract potential tenants. If the project is not constructed, baseline conditions would remain unchanged. No site preparation (grading, clearing of trees and other vegetation) would occur, no employment or transportation of construction workers and operators would occur, coal refuse would not be removed, and no discharges, emissions, or solid wastes would be produced. Hence, DOE would anticipate that no adverse impacts would occur other than adverse impacts from existing conditions. Biological conditions at the coal refuse sites would remain unchanged but any offsetting benefits associated with land reclamation and acid mine water remediation would not be realized. Socioeconomic conditions would remain unchanged, however given the current reduced state of the local economy, employment, and income, the area would lose the potential for stimulus to prevent further decline. Long term environmental benefits (e.g. reclamation of old coal refuse piles, reduction in acid mine drainage) that would be expected from project actions would not be provided under the no-action alternative.

Comments Received on the Final EIS

DOE received comments on the Final EIS from EPA, Region III, Environmental Programs Branch, Philadelphia, Pennsylvania, and from the Appalachian Center for the Economy and the Environment (ACEE), Mathias, West Virginia (on behalf of ACEE and the West Virginia Highlands Conservancy).

EPA stated that on January 17, 2007, they had provided comments on the Draft EIS, that DOE responded to those comments in the Final EIS, and that EPA has no further concerns. EPA further recognized "the growing concerns with CO_2 emissions from coal-fired power plants and Climate Change. Through a number of initiatives, the Federal government, partnerships and programs continue to investigate opportunities to conserve fossil fuels, improve energy efficiency"... and it was their expectation that: "the DOE Clean Coal Power Initiative will further promote these national goals."

Comments provided by the ACEE were substantially identical to comments on the Draft EIS previously submitted by ACEE on January 17, 2007, and were addressed in Volume 3 of the Final EIS, "Comments and Responses on the Draft Environmental Impact Statement." Nevertheless, DOE reviewed the comments to ensure that the Final EIS adequately addressed the areas of expressed concern. In the Final EIS, DOE provides further information about the areas of expressed concern. For example, as discussed in the Final EIS, to address concerns expressed about potential impacts on surface and groundwater, DOE conducted new aquifer tests that confirm results of earlier studies. DOE also modified its preferred alternative regarding water use as requested by WVDEP to ensure protection of the Meadow River. In addition, the Final EIS contains additional information about the fuel supply sites and potential associated impacts, and responds to other issues raised by ACEE.

Decision

DOE has decided to provide approximately $107.5 million (representing up to 50% of the development costs) to WGC through a cooperative agreement under the CCPI Program for a Co-Production Facility to be located at Rainelle in Greenbrier County, West Virginia. This funding will be used by WGC to support the design, construction and demonstration of a 98-megawatt (net) power plant and cement manufacturing facility based on an innovative atmospheric-pressure CFB boiler with a compact inverted-cyclone to generate electricity and steam by burning approximately 3,000 to 4,000 tons per day of coal refuse from several local sites. This action is identified as the preferred alternative in the "Western Greenbrier Co-Production Demonstration Project, Final Environmental Impact Statement" (DOE/EIS-0361) issued in November 2007.

Basis for Decision

This decision is based on the information contained in the Final EIS and other program considerations. In arriving at its decision, DOE noted the potential for substantial economic benefits to the local community and environmental benefits related to the reclamation and potential reuse of coal refuse sites. Based on the analysis in the Final EIS and the mitigation commitments enforced through the cooperative agreement with WGC, DOE expects that the project will be implemented in an environmentally responsible manner. DOE has concluded that the project will meet DOE's objectives under the CCPI Program by generating technical, environmental, and financial data needed to confirm that similar integrated technologies could be implemented at the commercial scale.

Mitigation

DOE's decision was made after careful review of the potential environmental impacts, presented in the EIS, and incorporates as mitigation measures and BMPs all practicable means to avoid or minimize environmental harm. WGC will implement all of the mitigation measures and BMPs listed in Table 4.19-1 in Section 4.19 (Volume 1) of the EIS, and in the Floodplain and Wetlands Assessment, Appendix M (Volume 2) of the EIS. DOE will verify the environmental impacts predicted in the EIS and the implementation of appropriate avoidance and mitigation measures through an Environmental Monitoring Plan, which will be developed as a requirement of DOE's cooperative agreement with WGC. After consideration of engineering and site evaluation and planning measures, compliance with environmental requirements, and application of BMPs, WGC also may implement further mitigation measures. In addition, WGC will comply with state and Federal wetlands permits, which may require additional mitigation, such as compensatory wetlands replacement.

As stated above, CO_2 capture and subsequent sequestration is not a viable option for the project; therefore, DOE is not requiring such measures to reduce CO_2 emissions. Although not viewed as a mitigation action, WGC plans to use waste heat from the Co-Production Facility in the planned EcoPark, which would off-set CO_2 emissions that might otherwise be associated with producing energy from the facility.

DOE has prepared a Mitigation Action Plan, in accordance with Section 1021.331(a) of the DOE NEPA regulations, to describe how mitigation measures will be planned and implemented.

Floodplain Statement of Findings

DOE included a Floodplain and Wetland Assessment as Appendix M in Volume 2 of the Final EIS. The assessment and these findings have been prepared in accordance with DOE's regulations "Compliance with Floodplain and Wetland Environmental Review Requirements," 10 CFR Part 1022. Portions of the proposed site for the Co-Production Facility unavoidably fall within a 100-year floodplain. A map of the floodplain is shown in Figure 2.2 of Appendix M in Volume 2 of the Final EIS. DOE concluded that the activities associated with the construction and operation of the proposed Co-Production Facility do not involve critical actions (e.g., storage of highly volatile, toxic, or water-reactive materials), which would present unacceptable risks even if there is a slight chance of flooding and would require a 500-year floodplain evaluation. DOE has concluded that there are no practicable alternatives to some construction in floodplains, and consistent with 10 CFR Part 1022, WGC will design or modify actions to minimize potential harm to floodplains and wetlands.

DOE determined that all practicable power plant site layout options would cross into floodplain and wetland areas. DOE evaluated three implementing options including the preferred site layout by WGC. Under each option the power plant site would be graded to rise about 20 feet so that the base elevation would be above the 100-year floodplain elevation. Up to 20 acres of floodplains could be permanently lost (for the preferred site layout, approximately 16 acres of floodplains would be filled). This means that the proposed project will affect a very small area of floodplain, and none of the siting options would result in changes in surface water elevations that would exceed the FEMA designated height of one foot for the 100-year flood event as demonstrated by predictive modeling conducted by DOE. Based on the changes from the layout options proposed by WGC in the water surface elevations, only minor changes are

expected for the predicted 100-year flood boundary, with little potential impact to upstream or downstream structures over baseline conditions. Potentially disturbed areas will be restored by WGC to their original grade, where feasible, and planted with native vegetation. WGC will implement BMPs to minimize adverse environmental impacts during construction of road crossings. WGC has prepared and submitted a Federal Section 404 Authorization permit for water resources impacts, including wetlands impacts, and a State Section 401 permit under the Clean Water Act issued by USACE and WVDEP, respectively. DOE estimated that 0.26 acre of wetlands will be potentially impacted at the proposed power plant site by service roads, stockpile areas, and water supply lines.

Under one option a cooling water intake structure, pump house, and pipeline would be used to withdraw water from Meadow River. WGC is currently looking at the best locations for these facilities to minimize disturbance of wetlands and floodplains. Prior to construction of a permanent intake structure WGC must obtain a Section 404 Authorization permit from the USACE and Section 401 permit from the WVDEP. The Section 404 Authorization permit is required as a result of water resources impacts, including wetlands impacts. The Water Quality 401 Certification is required to ensure that the project will not violate the state's water quality standards or stream designated uses. Depending upon the final plant design and location of the water supply line from the sewage treatment plant, up to one additional acre of wetlands and 120 linear feet "waters of the U.S." could be impacted. WGC is in the process of consulting with the USACE concerning the wetland permitting process to identify wetland impacts and methods for avoiding and minimizing impacts and developing suitable forms of wetland mitigation.

Under all options for the transmission line corridor from the proposed WGC power plant to the Grassy Falls substation, construction activities would be temporary and localized and

would not result in permanent impacts to existing 100-year floodplains. Where the transmission line corridor would cross a stream, new power line poles would be situated at maximum distances so as to not obstruct flood flows. Construction and operation of the transmission line could impact approximately three acres of wetlands, of which 0.38 acres could be permanently impacted as discussed above in *Biological Resources.*

No floodplain or wetland impacts are expected as a result of the fuel recovery efforts that would occur at the Anjean, Donegan, Green Valley, and Joe Knob coal refuse sites to be used for fuel supply to the project.

Any structures located within the floodplain would be designed in accordance with the National Flood Insurance Program (NFIP) requirements for nonresidential buildings and structures located in special flood hazard areas. The NFIP regulations require vulnerable structures to be constructed above the 100-year flood elevation or to be watertight. In accordance with 10 CFR Part 1022, DOE will ensure through the cooperative agreement that WGC implements measures to mitigate the adverse impacts of actions in a floodplain or wetlands, including but not limited to, minimum grading requirements, runoff controls, design and construction constraints. Whenever possible, WGC will avoid disturbing floodplains and wetlands and will minimize impacts to the extent practicable, if avoidance is not possible. Impacts to floodplains and wetlands will be minimized through the implementation of engineering design standards and BMPs (as described above under Mitigation, these measures are contained in Appendix M (Volume 2) of the EIS). In addition, WGC will comply with state and Federal wetlands permits, which may require additional mitigation as well as compensatory wetland replacement.

Issued in Washington, DC on this 23 day of April, 2008.

James A. Slutz

Acting Principal Deputy Assistant Secretary

Office of Fossil Energy