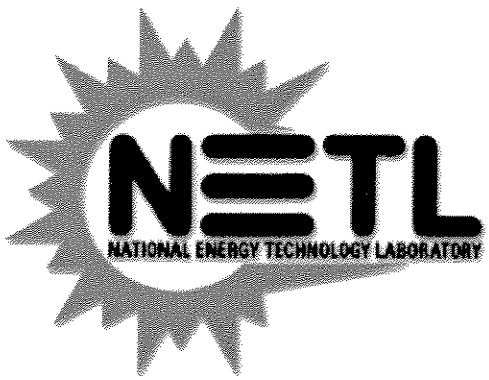

Advanced Coal Utilization Byproduct Beneficiation Processing Plant
Ghent Power Station, Carroll County, Kentucky

Final
Environmental Assessment

November 2004

National Environmental Policy Act (NEPA) Compliance
Cover Sheet

Proposed Action:

The proposed Federal action is to provide funding, through a cooperative agreement with the University of Kentucky Research Foundation (UKRF), Center for Applied Energy Research (CAER), for the design, construction, and operation of an advanced coal ash beneficiation processing plant at Kentucky Utilities (KU) Ghent Power Station in Carroll County, Kentucky. DOE would provide $4,492,008, and the industrial participant will provide the remaining 50% of the project costs.

The proposed coal ash beneficiation process is based on a hydraulic classification and froth floatation technology. The demonstration plant would use an existing waste stream of ash to manufacture concrete additives and construction materials. By utilizing the pozzolan material produced by the beneficiation process, reduction in Carbon Dioxide emissions would be realized as compared to that resulting from Portland cement manufacturing. Beneficial use of fly ash would also decrease the need for storage capacity, thereby reducing or eliminating the creation of additional fly ash storage impoundments.

Type of Statement: Draft Environmental Assessment

Lead Agency: U.S. Department of Energy; National Energy Technology Laboratory

DOE Contacts:

Project Information:
Janice Bell
NEPA Document Manager
U.S. Department of Energy
National Energy Technology Laboratory
Mail Stop 58-247A
626 Cochrans Mill Road
Pittsburgh, PA 15236
(412) 386-4512
Janice.Bell@NETL.DOE.GOV

NEPA Information:
Lloyd Lorenzi
NEPA Compliance Officer
U.S. Department of Energy
National Energy Technology Laboratory
P.O. Box 10940
Pittsburgh, PA 15236-0940
412-386-6159; 412-386-4604 (fax)
lorenzi@netl.doe.gov

Abstract:

The Clean Coal Power Initiative (CCPI) is a cost-shared partnership between the U.S. Department of Energy (DOE) and industry to demonstrate advanced coal-based power generation technologies. Through the CCPI, candidate technologies are demonstrated at commercial-scale facilities to foster widespread application. The goals of the program are to realize environmental and economic benefits through DOE and industry partnerships, as well as to move promising, yet commercially risky, advanced coal energy systems to market.

DOE proposes to provide funding, through a cooperative agreement with the University of Kentucky Research Foundation (UKRF), Center for Applied Energy Research (CAER), for the design, construction, and operation of an advanced coal ash beneficiation processing plant at

Kentucky Utilities (KU) Ghent Power Station in Carroll County, Kentucky. The proposed project would contribute to CCPI program goals by demonstrating a means to reduce the net costs of particulate control technologies through the conversion of ash into salable products. DOE would provide $4,492,008, approximately 50 percent of total project cost.

The proposed demonstration plant would process 200,000 tons per year of fly ash generated at the Ghent Power Station into:

- 156,000 tons per year of pozzolan for concrete
- 16,000 tons per year of high-quality block sand
- 16,000 tons per year of graded fill sand
- 1,500 tons per year of high-quality polymer filler
- 8,000 tons of carbon fuel

Because the proposed project would utilize an existing waste to produce concrete and masonry materials, which could replace Portland cement, overall CO_2 emissions resulting from concrete manufacturing could be reduced. Furthermore, the need for additional storage areas for fly ash would be reduced.

The findings of this Environmental are that no significant impacts to human health and safety or the environment from construction and operation of the proposed demonstration plant are anticipated. Because the project would be constructed within the confines of an inactive ash impoundment at the Ghent Power Station, no impacts to unspoiled areas would occur. Further significant degradation of soils and groundwater is unlikely. Cultural resource investigations have been conducted and conclude that no culturally or historically important features would be affected. Impacts to ecological resources, surface water resources, and land use would be insignificant. Construction and operation of the proposed project would not be expected to impact any federal- or state-listed threatened or endangered species. Increases in truck traffic over existing traffic conditions would be small. Only minor increases in noise and dust would be expected in the area near the project.

Public Participation:

DOE encourages public participation in the NEPA process. This Draft Environmental Assessment (EA) is being released for public review and comment. The public is invited to provide oral, written, or e-mail comments on this draft Environmental Assessment to DOE by the close of the comment period on October 25, 2004. Copies of the draft EA are also being distributed to Federal and State agencies. Comments received by the close of the comment period will be considered in preparing a final Environmental Assessment for the proposed DOE action.

Table of Contents

Summary 1

1.0 Background 2

2.0 Purpose and Need for Action 3

3.0 Description of Proposed Action and Alternatives 4

3.1 Proposed Action 4
3.2 No Action Alternative 9

4.0 Affected Environment 11

4.1 Geology and Soils 13
4.2 Cultural Resources 13
4.3 Ecological Resources 14
4.4 Threatened and Endangered Species 14
4.5 Water Resources 14
4.6 Air Quality 15
4.7 Noise 16
4.8 Land Use 16
4.9 Socioeconomic Conditions 16
4.10 Transportation 17

5.0 Environmental Impacts 17

5.1 Geology and Soils 17
5.2 Cultural Resources 17
5.3 Ecological Resources 18
5.4 Threatened and Endangered Species 18
5.6 Air Quality 19
5.7 Noise 21
5.8 Land Use 23
5.9 Socioeconomic Effects 23
5.10 Transportation 23

6.0 Conclusions 24

FIGURES

Figure 1. Process Flow Diagram 6
Figure 2. Current and Potential Ash Pond Locations 10
Figure 3. Ghent Location 11
Figure 4. Carroll County, KY 12
Figure 5. Project Location 12
Figure 6. Aerial View of Ghent Power Station. 13

TABLES

Table 1. Concentration of Criteria Pollutants for the Air Quality Monitoring Sites in Northern Kentucky ... 15
Table 2. Industrial Criteria Pollutants – Particulate Matter PM_{10} - Carroll County, Kentucky 15
Table 3. Summary of Emissions from Pozzolan Dryer using Natural Gas Fuel. 20
Table 4. Comparison of Emissions for Portland Cement and Pozzolan Manufacturing 21
Table 5. Operating Equipment Noise Levels. 21
Table 6. Permissible Noise Exposure Levels in Kentucky 22

Appendix A Agency Correspondence

Summary

The Clean Coal Power Initiative (CCPI) is a cost-shared partnership between the U.S. Department of Energy (DOE) and industry to demonstrate advanced coal-based power generation technologies. Through the CCPI, candidate technologies are demonstrated at commercial-scale facilities to foster widespread application. The goals of the program are to realize environmental and economic benefits through DOE and industry partnerships, as well as to move promising, yet commercially risky, advanced coal energy systems to market.

DOE proposes to provide funding, through a cooperative agreement with the University of Kentucky Research Foundation (UKRF), Center for Applied Energy Research (CAER), for the design, construction, and operation of an advanced coal ash beneficiation processing plant at Kentucky Utilities (KU) Ghent Power Station in Carroll County, Kentucky. The proposed project would contribute to CCPI program goals by demonstrating a means to reduce the net costs of particulate control technologies through the conversion of ash into salable products. DOE would provide $4,492,008, approximately 50 percent of total project cost.

The proposed demonstration plant would process 200,000 tons per year of fly ash generated at the Ghent Power Station into:

- 156,000 tons per year of pozzolan for concrete
- 16,000 tons per year of high-quality block sand
- 16,000 tons per year of graded fill sand
- 1,500 tons per year of high-quality polymer filler
- 8,000 tons of carbon fuel

Because the proposed project would utilize an existing waste to produce concrete and masonry materials, which could replace Portland cement, overall CO_2 emissions resulting from concrete manufacturing could be reduced. Furthermore, the need for additional storage areas for fly ash would be reduced.

The findings of this Environmental are that no significant impacts to human health and safety or the environment from construction and operation of the proposed demonstration plant are anticipated. Because the project would be constructed within the confines of an inactive ash impoundment at the Ghent Power Station, no impacts to unspoiled areas would occur. Further significant degradation of soils and groundwater is unlikely. Cultural resource investigations have been conducted and conclude that no culturally or historically important features would be affected. Impacts to ecological resources, surface water resources, and land use would be insignificant. Construction and operation of the proposed project would not be expected to impact any federal- or state-listed threatened or endangered species. Increases in truck traffic over existing traffic conditions would be small. Only minor increases in noise and dust would be expected in the area near the project.

1.0 Background

The Clean Coal Power Initiative (CCPI) is a cost-shared partnership between government and industry to demonstrate advanced coal-based power generation technologies. Initiated in 2002 by the Bush Administration, the goal of the CPPI is to foster more efficient clean coal technologies for use in new and existing power plants. Proposals are selected by the Department of Energy (DOE), through a competitive bidding process, to demonstrate new technologies for commercial applications. The CCPI solicited proposals from the power industry, equipment manufacturing industry, service corporations, R&D firms, software developers, academia and other interested parties. Candidate technologies would be demonstrated at commercial-scale facilities to help promote widespread application. The goals of the program are to realize environmental and economic benefits through DOE and industry partnerships, as well as to move promising, yet commercially risky, advanced coal energy systems to market.

Under the CCPI, the installation of an advanced coal ash beneficiation processing plant was proposed by the University of Kentucky Research Foundation (UKRF) to be hosted at KU's Ghent Power Station in Ghent, Kentucky. The plant would demonstrate coal ash beneficiation in a process addressing the entire ash stream. The project would process coal ash, separating it by size or type for different applications. Coarse ash would be used to produce a lightweight aggregate for masonry and graded-fill sand for construction applications. Unburned carbon would be used as a supplemental fuel. And, clean, fine-size materials would be produced, which would be suitable for use as a polymer filler and specialized pozzolan.

The proposed project represents 10 years of research and development work at UKRF, to deal with observed changes in the quality of ash produced by several regional utilities. By fitting boilers with low-NO_x burners, the fly ash produced is generally coarser and contains higher levels of unburned carbon. These two factors make the fly ash less marketable as an admixture in concrete and masonry products.

The advanced coal ash beneficiation process proposed by UKRF is based upon a hydraulic classification and froth floatation technology. The technology would be capable of processing both ash stored in existing disposal ponds and new ash generated at the plant. The raw feed is classified by size into a fine stream and a coarse stream. The coarse material is then further classified and concentrated into block-sand and coarse-carbon products. The fine stream is then treated with a reagent system and the fine carbon removed by froth flotation. The remaining fine (non-carbon) fraction is concentrated, filtered, and dried for use as a pozzolan. Finally, a portion of the non-carbon fraction is further sorted hydraulically to produce a material with a finer particle size. This material would be suitable for use in a number of applications including a polymer additive.

2.0 Purpose and Need for Action

Through the CCPI program, candidate technologies are demonstrated at commercial-scale facilities to foster widespread application. The goals of the program are to realize environmental and economic benefits through DOE and industry partnerships, as well as to move promising, yet commercially risky, advanced coal energy systems to market. The program, by merging public and private sector interests, will benefit the environment, help to sustain or enhance electricity reliability, bolster energy security, or help to ensure an affordable supply of electricity. The technologies developed through the CCPI program will potentially lower fuel costs due to higher plant efficiency, lower capital costs for construction of new plants and re-powered facilities, lower capital and operating costs for existing plants, reduce costs of environmental compliance, avoid environmental costs, enhance industrial competitiveness leading to increased domestic sales and technology exports, and create additional jobs.

Power plants in the United States produce millions of tons of coal fly ash annually. The industry beneficially uses more than 35 percent of its annual production in a variety of applications, while the remainder is placed in landfills. Fly ash products are used to supplement or replace Portland cement, a primary ingredient in concrete in order to reduce raw material costs and to strengthen the concrete. Experts estimate that using 1 ton of fly ash in concrete will avoid approximately 1 ton of CO_2 being emitted from cement production. Furthermore, changes in the utility industry in the 1990s have adversely affected the quality of coal ash. For example, the Clean Air Act of 1990 (CAA) required power plants to reduce nitrogen oxide (NO_x) emissions, but these mandated reductions in NO_x have complicated the use of fly ash in ready-mix concrete, the largest market for fly ash. To achieve the CAA-specified NO_x reductions, power plants often use low NO_x burners, which restrict oxygen during combustion. Unfortunately, this allows unburned carbon to remain in the fly ash, as well as resulting in larger particles in the ash,. Both of these factors make the fly ash less suitable for use in concrete.

The proposed project represents the next step in ash beneficiation because it addresses the entire ash stream and a wide array of quality issues. Research into hydraulic classification has lead to new technology development to contend with changes in ash quality for various applications.

The process, referred to as the FastFloat technology, generates an ash-based cement substitute (i.e., pozzolan) that can be used for higher levels (30 percent versus the current 20 percent) of Portland cement substitution in concrete. Pozzolan from the FastFloat technology provides more strength and performs better than unprocessed ash. In addition, the FastFloat process produces a clean, very fine (~3 to 4 μm average particle size) material suitable for use as a polymer filler or specialized pozzolan. The plant would produce lightweight aggregate and graded fill sand from the bottom ash. Lightweight aggregate is a desirable component in the manufacture of concrete blocks since the blocks are lighter, but the strength is not compromised, and the graded-fill sand can be used as an alternative to washed-river sand in a variety of construction applications.

Unburned carbon would also be separated, concentrated, and returned to the boiler as a fuel.

DOE's programmatic purpose and need for this project is to demonstrate a means to reduce the net costs of particulate control technologies (and compliance with environmental regulations) through the conversion of ash into salable products. The proposed project would also contribute to the program goals of reducing greenhouse gas emissions by demonstrating an alternative to Portland cement manufacturing, which is a large source of CO_2 emissions. Furthermore, the project would recover an otherwise wasted fuel.

UKRF proposes installing an advanced coal ash beneficiation processing plant at the KU Ghent Power Station. Ash stored in an inactive ash pond at Ghent Station would be utilized as feed to the processing plant. At the present time, Ghent Station produces over 500,000 tons of ash each year, but none of the ash can be directly marketed, primarily due to quality considerations. It is estimated that by utilizing ash from the inactive pond at Ghent Station, nearly 200,000 tons per year of ash can be beneficially utilized. This would reduce ash storage needs, produce marketable cement and masonry materials, and create an additional fuel source.

3.0 Description of Proposed Action and Alternatives

3.1 Proposed Action

The proposed action is for the DOE to provide cost-shared financial support through a cooperative agreement with UKRF for the design, construction, and operation of an advanced coal ash beneficiation processing plant at KU's 2,200 MW Ghent Power Station in Carroll County, Kentucky. As a part of the CCPI, the DOE would provide $4,492,008, approximately 50 percent of total project cost. This money would be repaid to the DOE over a predetermined period, if the project is economically successful.

The proposed demonstration plant facility would process 200,000 tons per year of fly ash generated at the Ghent Power Station to produce:

- 156,000 tons per year of pozzolan for concrete;
- 16,000 tons per year of high-quality block sand;
- 16,000 tons per year of graded-fill sand;
- 1,500 tons per year of high-quality polymer filler; and
- 8,000 tons of carbon fuel.

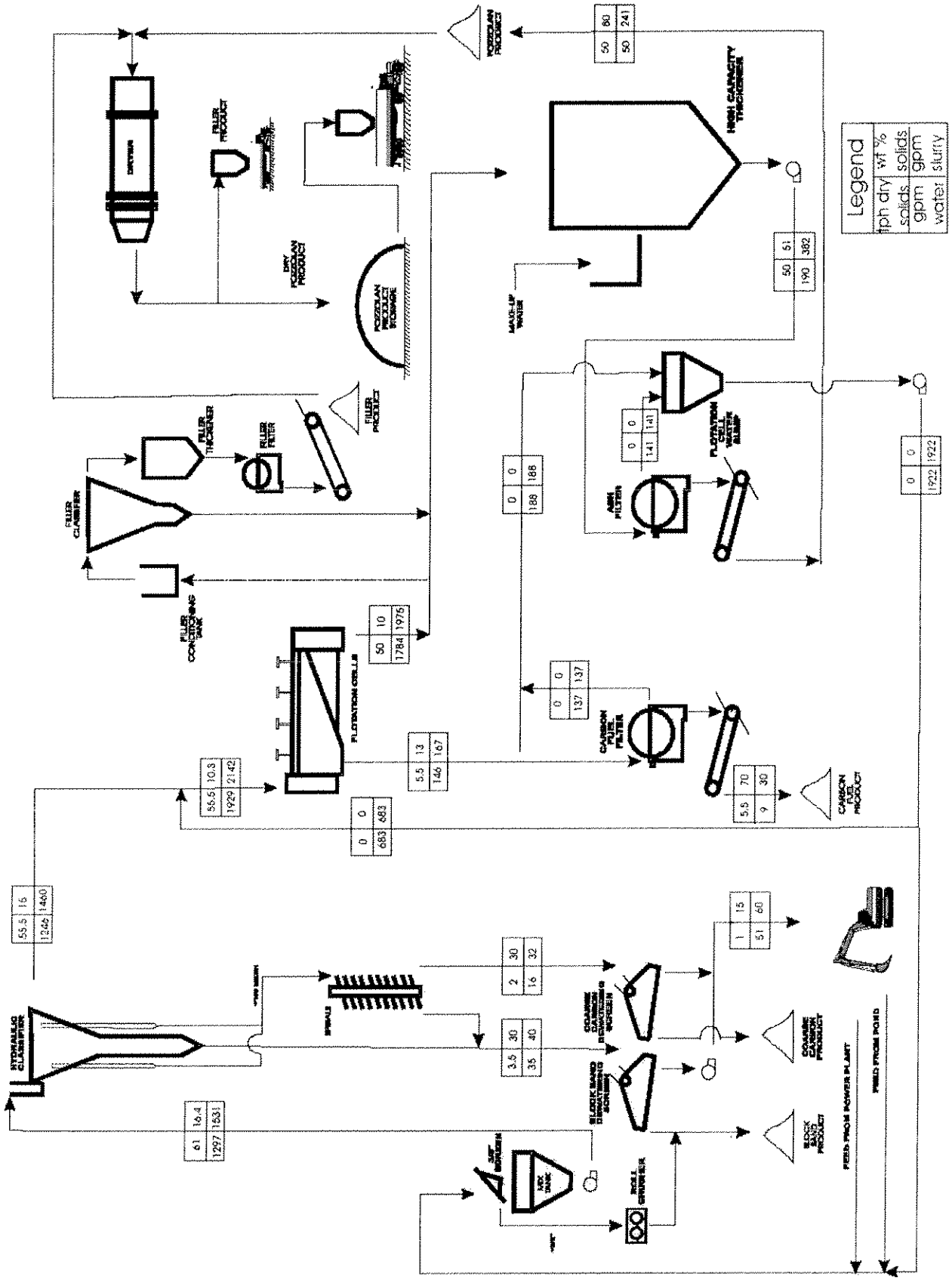

Figure 1. Process Flow Diagram

The process would involve dredging fly ash (from an inactive ash pond), to be processed through classification, flotation, dewatering and drying phases. The process is based upon a hydraulic classification and froth flotation technology developed at UKRF, whereby raw feed is classified by size into a pozzolan (fine) stream and a coarse stream. The pozzolan stream is treated using a reagent to separate the fine carbon by froth flotation. The pozzolan stream is then concentrated, filtered and dried. A small stream from the froth cell is further processed hydraulically to produce a material with a finer particle size, while the unburned carbon (tailings) would be concentrated and returned to the boiler as fuel. The coarse material is further classified and concentrated into block sand and coarse carbon products.

The process is designed to operate with essentially a closed-water balance, meaning that there are no direct water effluent streams leaving the process; the primary means for water to leave the process is as absorbed moisture in the various products. As a result, this process is considered a net consumer of water. A dredge located within the existing ash pond would feed ash to the process, although it is possible for a backhoe to feed the ash as well. In order to maintain a constant water balance, it would be necessary to dredge ash at a minimum of 30 percent solids by weight, which is well within the design specifications of the dredges under consideration. The feed slurry is diluted to 16 percent solids and fed into the hydraulic classifier. Coarse solids are removed and sent to concentrating spirals where coarse carbon and lightweight aggregate products are separated. These products are dewatered on high-frequency dewatering screens with 100 mesh openings. The <100 mesh solids and water can be either pumped into the classifier overflow, in order to recover any misplaced fines, or returned to the pond. If the solids in this stream are coarse (near-sized 100 mesh), it may be more desirable to return the solids to the pond so as not to diminish the quality of the pozzolan product. In any case, the amount of <100 mesh solids should be minimal.

The hydraulic classifier overflow reports to flotation where reagents are added to the circuit. The resulting froth product is dewatered by vacuum filtration and the filtrate is recycled back to the flotation feed. Depending on the type of frother used, the filtrate may have as much as 10 ppm frother in it, and recycling back to flotation would reduce the amount of frother that would need to be added to achieve effective flotation. The flotation tailings would be thickened, and filtered to 20 percent moisture. Clarified thickener overflow and filtrate water would be recycled back to the feed mix tank. The filler circuit operates similarly to the pozzolan circuit, where a portion of the flotation tailings is diverted into the filler circuit to produce an ultra-fine product that is thickened, filtered and dried. All effluent streams from the filler circuit report back to the pozzolan filter so that no ultra-fine particles are lost.

Based on this operating arrangement, the only means for water removal from the system would be as moisture as it adheres to the products. (A possible exception would be the lightweight aggregate and coarse carbon dewatering effluents). As a best management practice, all products would be stored on concrete pads or roll-off boxes so that any additional water drainage could be collected and pumped back into the processing plant.

A total of 35,000 gallons of reagent would be used per year in continuous, full-scale operation. This would include 20,000 gallons of collector and 15,000 gallons of frother. The function of the collector is to adsorb onto the carbon particles in order to induce hydrophobicity. Most of this collector remains adsorbed onto the carbon, which is collected for eventual combustion as supplemental fuel. Previous mass balance investigations using radioactive tracers at UKRF demonstrated that most of the collector (99.3 percent) remained adsorbed onto the solid products (i.e. carbon and ash). The majority (55.4 percent) was adsorbed onto the carbon while the remainder was adsorbed onto the ash. The testing was conducted at excessive dosages to simulate a worst-case scenario, as evidenced by collector adsorption onto the ash fraction. Nevertheless, even at excessive dosage, the collector adsorbs onto the solid phases. Any trace amounts present in the water would be adsorbed onto the solids since all of the water would be recycled in the processing plant. Collector present on the froth product would be combusted in the boiler when the froth is consumed as supplemental fuel while any collector adsorbed on the pozzolan would be volatilized during thermal drying.

Similar investigations with the frother have shown that approximately 70 percent is adsorbed into the pore structure of the froth product and would be burned during combustion of the carbon fraction. The remainder would be present in the recycled water. As a result, the amount of frother that needs to be added for effective flotation would decrease until the solution concentration is at equilibrium, (approximately 20 mg/l). Because of the frother present in the recycled water, it is likely that the total amount of frother used should be approximately 30 percent less than the originally estimated 15,000 gallons/year.

The anticipated excavating plan would be to initially focus mining on a small section (<5 acres) of the pond. While the exact location would be determined from coring, it would most likely be near the center of the existing pond. The site would be prepared using a backhoe to excavate only a small area of approximately 500 by 500 feet to a depth of 10 feet, sufficient to float and maneuver the dredge. A trench would be excavated to divert water from the overflow of the active pond into the area to be mined. With this arrangement, a small pond would be created within the existing ash pond. The site for the small pond would be isolated from the existing ash pond overflow to avoid any potential adverse impact on overflow turbidity. As mining commences, material would first be removed from the bottom of the mining area to increase the depth of the excavation and minimize the need to maneuver the dredge. As the volume of the excavation increases, water level would be maintained by channeling overflow water from the active ash pond.

Coarse lightweight aggregate would be stockpiled in a manner consistent with that used at other sites where this type of product is generated. Since fines (i.e.-100 mesh) are removed from the lightweight aggregate, dust generation has not been a problem at these sites. Coarse and fine carbon products would be stored in roll-off boxes to simplify handling and transport to the utility stockpile. Both carbon products would be stored damp. Roll-off boxes would be changed when they are filled and hauled to the utility fuel stockpile, so a minimum amount of carbon products would be stored on site. Once the

roll-off boxes are dumped on the utility stockpile, the carbon would be mixed with coal and compacted to minimize dusting, in the same manner that coal is routinely compacted. It may become necessary to pelletize the carbon before it can be used as fuel in order to meet utility handling requirements. In this case, dusting would be less of a problem.

The pozzolan would be stored as a damp product in a covered storage area. Since the pozzolan must eventually be dried, it would be desirable to minimize any additional moisture that can result from rainfall. When the pozzolan is to be transported for barge loading, it would be transported in dump trucks equipped with retractable tarps. The trucks would dump at the barge-loading site in a covered building where the barge would be loaded by conveyor. The barge would be equipped with sliding covers for each berth to keep rain from adding additional moisture.

While the products would be processed and stored wet, plants that would be utilizing the pozzolan are accustomed to storing and handling ash in a manner similar to Portland cement, that is, as a dry powder. Therefore, the ash pozzolan product would likely require drying. Fuel burning in the pozzolan dryer would result in CO_2, NO_X, SO_2, VOC, and CO emissions. The emission factors were selected from the EPA's Compilation of Air Pollutant Emission Factors, AP-42, Volume I: Stationary Point and Area Sources, Section 1.4: Natural Gas Combustion, which vary depending on the size (i.e. heat input) of the combustor. The dryer for the processing plant would have a maximum design feed rate of 50 tons of pozzolan per hour and utilize 701 ft^3 of natural gas/ton of pozzolan or 35,050 ft^3/hr. Using natural gas with an HHV of 1000 Btu/scf, the maximum heat input to the dryer would be 35 x 10^6 Btu/hr. This heat input is within the range specified for Small Industrial Boilers (10 to 100 x 10^6 Btu/hr).

The collector is a mixture of 90 percent #2 fuel oil, and 10 percent oil-soluble petroleum sulfonate. The primary component of the fuel oil (>95 percent) is aliphatic and aromatic hydrocarbons (CAS# 68476-30-2) with the remainder being biphenyl (CAS# 92-52-4), naphthalene (CAS# 91-20-3) and xylene mixture (CAS# 1330-20-7). The primary component of the petroleum sulfonate is sodium sulfonate (CAS#68608-26-4). The vapor pressure of the fuel oil is <1mm Hg at 77°F,while that of the petroleum sulfonate is reported as negligible on the supplier MSDS. The frother is comprised primarily of polypropylene glycol (CAS#25322-69-4), which has a vapor pressure of <0.01 mm Hg at 20°C.

The emission rate to the air by volatilization of the collector and frother reagents is not known. However, based on technical data provided in the literature, the rate would likely be very slow. Propylene glycol, the main component of the frother, has an equilibrium vapor pressure (at 25°C) of 0.129 mm Hg and an evaporation rate of .01 relative to butyl acetate (rate = 1). For comparison, gasoline has a vapor pressure of 275 to 475 mm Hg (at 20°C) and a rate of 10-11, whereas diesel fuel has a vapor pressure of 0.465 mm Hg and a rate listed as "slow". The vapor pressure of water at similar temperatures is 19 - 22 mmHg.

The collector, which is composed of No. 2 fuel oil and petroleum sulfonate, is likewise a liquid of low volatility. The fuel oil component has a vapor pressure and evaporation rate similar to diesel fuel, whereas the petroleum sulfonate vapor pressure is negligible. A survey of the literature did not reveal any relevant kinetic data for the collector in aqueous solution, and the evaporation rate cannot be calculated from vapor pressure data. However, considering that the steady state concentration of collector in the process water would be on the order of 1 ppm, it is reasonable to assume that the project emission rate to the air by volatilization would be minimal.

Given the low vapor pressures of the flotation reagent components, it is not likely that escape into the air would be a significant issue. Precautions would be taken to minimize exposure of these chemicals to the air by proper storage in closed vessels and metering into enclosed pipes.

3.2 No Action Alternative

Under the No Action Alternative, the DOE would not provide funding for the coal ash beneficiation processing plant at the Ghent Power Station in Carroll County, Kentucky. The demonstration plant would not be constructed under the CCPI program. As a result, the Ghent Power Station would eventually require additional disposal areas for ash.

Figure 2 shows the location of the existing active and inactive ash storage ponds at Ghent Station, as well as the location of a future ash pond. The inactive ash pond was operational from 1973 until 1993 when it was filled to capacity. A second pond (Current Ash Pond) became operational in 1993, was expanded to increase capacity in 2004 and is expected to have an additional 10 years of storage capacity. At that time, it will be necessary to have adequate ash storage capacity available which will entail the construction of yet another pond. Presently, the most likely location under consideration is to the south east of the current ash pond.

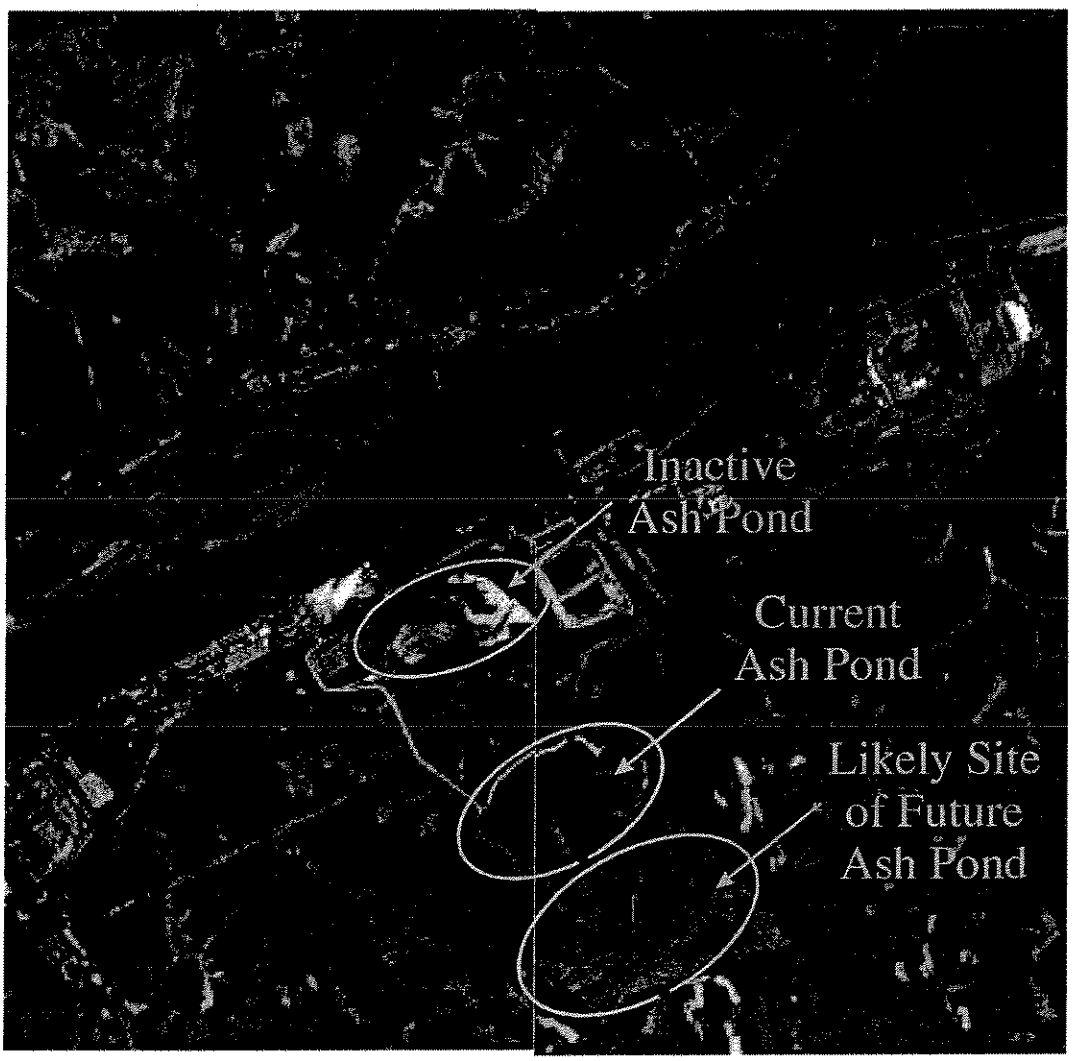

Figure 2. Current and Potential Ash Pond Locations

At the present time, Ghent Station produces 620,000 tons per year of ash (495,000 tons per year of fly ash and 125,000 tons per year of bottom ash). With a bulk density of 65 lb/ft^3, the volume of ash produced is 19 million ft^3/year or 438 acre ft/year. With a projected useful life of 10 years for the current ash pond, the volume of ash that will be emplaced is 4380 acre ft. At an average depth of 40 ft, the land area that will be used for storage in the current pond is 110 acres or 11 acres per year.

The future ash pond is projected to have a total useful life of 15 years and will have the capacity to store 438 acre ft of ash per year for a total volume of 6570 acre ft. With an average depth of 40 ft., the future ash pond will be required to be 164 acres, or 11 acres per year.

4.0 Affected Environment

The proposed project would be located at the Ghent Power Station in Carroll County, Kentucky. The facility would be approximately 44,800 ft^2 (280 ft x 160 ft) with a maximum height of 30 feet. The facility would be built on the existing inactive ash pond.

The power station is northeast of the community of Ghent, adjacent to the Ohio River between Cincinnati, OH, and Louisville, KY. U.S. Highway 42 runs parallel to the river, and separates the Ghent power station from the proposed project site at the ash pond.

Figure 3. Ghent Location

Carroll County is located in north-central Kentucky in the Outer Blue Grass region. The Ohio River, with normal pool elevation of 420 feet, is the northern boundary of the county. The Kentucky River enters Carroll County at Worthville, and joins the Ohio River between Carrollton and Prestonville. The normal pool level of the Kentucky River below Lock No. 1, 4 miles upstream from the Ohio River, is 420 feet; normal pool level above Lock No. 1 is 428 feet.

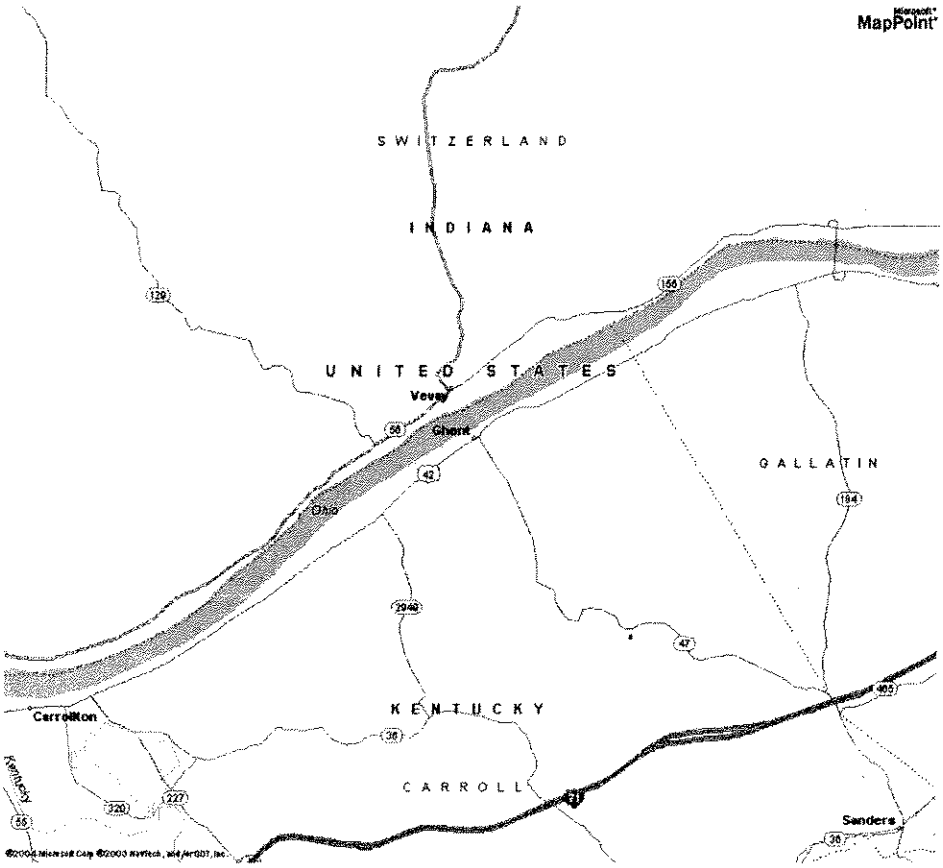

Figure 4. Carroll County, KY

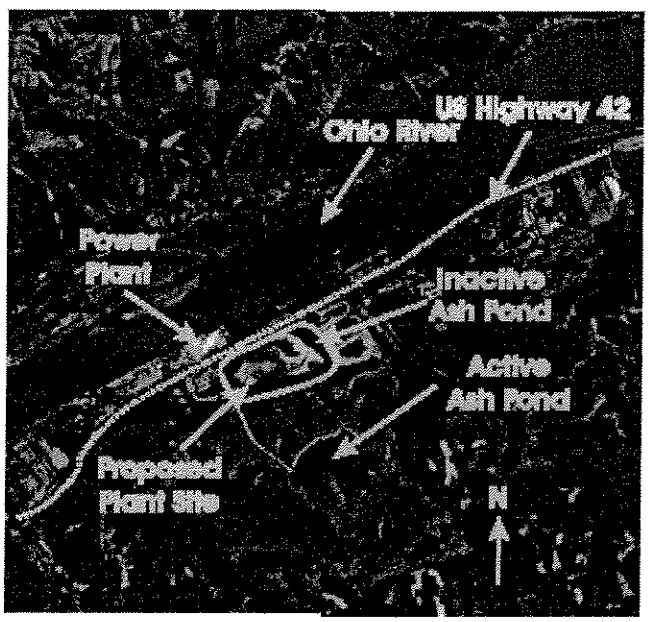

Figure 5. Project Location

The area is well dissected and is characterized by narrow valleys (except along major streams), steep slopes, and narrow ridges. Ridge tops with elevations between 800 and 900 feet are common. The highest elevation is 940 feet on a ridge located about 1½ miles north of Worthville. The elevation of the alluviated valley of the Ohio River ranges between 450 and 490 feet. The elevation of Ghent is 495 feet.

4.1 Geology and Soils

In Carroll County, water is obtained from consolidated sedimentary rocks of Ordovician age and unconsolidated sediments of Quaternary age. Over the last one million years, unconsolidated Quaternary sediments have been deposited along the larger streams and rivers. The bedrock beneath the project site is comprised mainly of limestone and shale.

The majority of the soils in Carroll County are well-drained to moderately well-drained clays and loams, derived from siltstone, shale, and limestone, on gentle to very steep slopes. Data from boreholes drilled in the vicinity of the project site, as well as the Ghent plant, indicate that the alluvium beneath the ash impoundment is mainly composed of silty clay, sand, and gravel.

4.2 Cultural Resources

Review of the Environmental Impact Statement (EIS) prepared by the U.S. EPA for Ghent Units 3 and 4 in 1978, reveals only one potential historically significant feature, a cemetery located in the coal stockpile area of the power station (*See Figure 1, below).* The project would be constructed and operated within a filled ash pond located where there are no historical, cultural, or archeological resources. No scenic vistas or protected settings have been identified within the area of potential effect for this project.

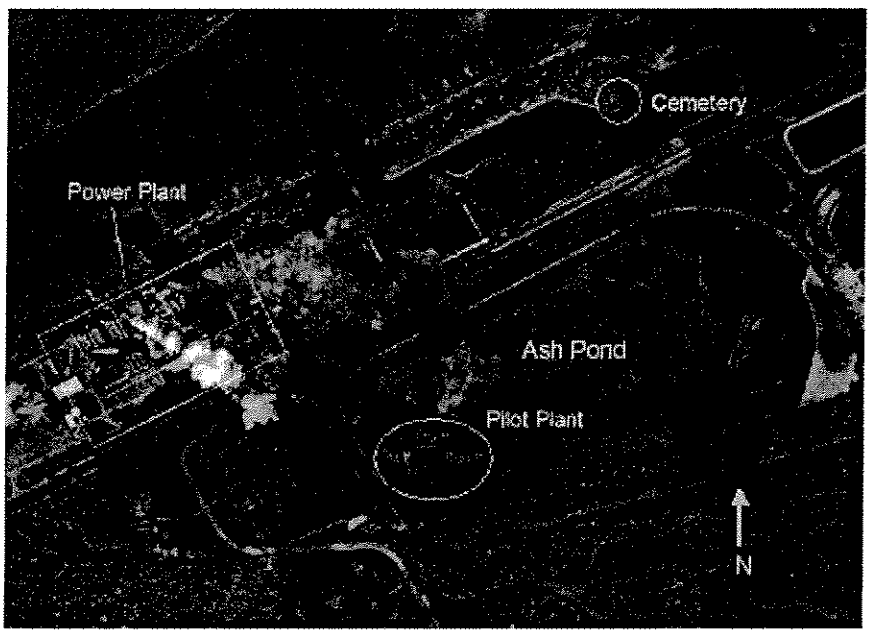

Figure 6.. Aerial View of Ghent Power Station.

4.3 Ecological Resources

The proposed project area is located in a transition region called the Western Mesophytic Forest Region. Land use and the resultant vegetation cover at the site are greatly influenced by topography. Woodlands between normal water level and normal high-water level bordering the Ohio River are dominated by American sycamore (*Platanus occidentalis*), cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), and American elm (*Ulmus americana*). Above the normal high-water mark, but below the floodplain, dominance is assumed by hackberry (*Celtis occidentalis*), sugar maple (*Acer saccharum*), American elm, and black locust (*Robinia pseudoacacia*). The floodplain proper is mostly in farmland and pastureland, with black locust, American sycamore, and American elm along edges and small drainage ways. Adjacent to and above the floodplain, on the more gentle slopes, are pasturelands which have been invaded by black locust, eastern red cedar (*Juniperus virginianus*), and honey locust (*Gleditsia triacanthos*). Blackberry (*Rubus sp.*), prairie rose (*Rosa setigera*), and snowberry (*Symphoricarpos orbiculatus*) grow along fencerows and edges. Upper slopes above the floodplain are either cut-over (in most areas) or mature (locally in very steep areas) forests. Dominants here are hardwoods such as sugar maple, bitternut hickory (*Carya cordiformis*), black walnut (*Juglans nigra*), yellow-poplar (*Liriodendron tulipifera*), black locust, box elder (*Acer negundo*), and hackberry.

The Ohio River is a migratory pathway, feeding area, and resting area for waterfowl and shorebirds. Streamside animals, such as raccoons and mink, are abundant along its edge. Riverside forests harbor a variety of resident and migratory birds. The river floodplain provides open pastureland and farmland areas, extensive brushy edges, and woodlots as habitat for animals such as cotton-tailed rabbits, bobwhite, and opossums. Woody and brushy hillsides rising to the uplands from the floodplains provide habitat for gray squirrels and fox squirrels, ruffed grouse, white-tailed deer, and a variety of songbirds. Approximately 32 amphibian, 30 reptile, 255 bird, and 40 mammal species are listed as having ranges encompassing the area.

4.4 Threatened and Endangered Species

According to the Kentucky Fish and Wildlife Service, there are no federally listed or proposed endangered or threatened species within the impact area of the project. The Kentucky State Nature Preserves Commission (KSNPC) states that there are three federally listed endangered species of mussels located in the Ohio River in the vicinity of the Ghent Plant. The KSNPC also recognizes six mussel species, one fish species (*Ictiobus niger,* "Black Buffalo"), and one amphibian (*Cryptobranchus alleganiensis alleganiensis,* "Eastern Hellbender") as endangered or of special concern in the area.

4.5 Water Resources

The project area is located adjacent to the Ohio River, which is 2550 feet from the potential location of the plant. Water drainage in the area is generally northwest into the Ohio River. Surface water from the site's ash pond area accumulates in a natural basin

Average 8 hr. Concentration of Criteria Pollutants for Northern Kentucky Air Quality Monitoring Sites.						
Criteria Pollutant	Units	NAAQS	1976-1985	1985-1995	1996-2002	Statewide Average
Carbon Monoxide	ppm	9.0	6.2	4.54	3.1	2.3
Sulfur Dioxide	ppm	0.14	0.058	0.035	0.03	0.02
Nitrogen Dioxide	ppm	0.05	0.025	0.019	0.016	0.012
Ozone	ppm	0.125	0.124	0.115	0.113	0.104
PM_{10}	$\mu g/m^3$	50	37	26	22	21

Table 1. Concentration of Criteria Pollutants for the Air Quality Monitoring Sites in Northern Kentucky

area between the two ash ponds, and then flows to a stream which goes northwest into Black Rock Creek, and eventually the Ohio River. The Kentucky Fish and Wildlife Service reports that there are no indications of wetlands present at the site. At the eastern section of the ash pond there is some open water, the fringe of which has developed aquatic habitat common to pond margins.

4.6 Air Quality

The Kentucky Division for Air Quality operates the Air Quality Surveillance Network to generate monitoring data. The network includes 117 monitors in 33 counties, and has been operational since 1967. Monitoring stations, which are selected based on U.S. EPA guidance, have been established near high population areas, as well as air pollution sources. The monitoring data is used to demonstrate compliance with ambient air quality standards, to show progress towards meeting standards, and to identify pollution trends. Data are also used to evaluate public health impacts and emergency control procedures. Based on data from 2002, there were nine criteria pollution source facilities within Carroll County, KY, but there were no monitoring stations placed in the county. Air quality data for Northern Kentucky is presented in Table 1. According to the table, no standards were exceeded for any criteria pollutant in the northern Kentucky region in 2002.

Table 2, below, shows two industrial criteria pollutant sites located relatively close to the proposed project site. For example, North American Stainless is located approximately 2 miles west of the Ghent Power Station on U.S. Highway 42.

County	Site	Facility-ID	# Obs	Annual Mean	Obs >150	1st max	2nd max	3rd max	4th max
Carroll	US Highway 42 Ghent	North American Stainless	57	26	0	80	69	64	50
Mason	KY 576 Maysville	East Kentucky Power	42	19	0	69	42	39	31

Table 2. Industrial Criteria Pollutant – Particulate Matter PM_{10} – Carroll County, Kentucky

In addition, of the 156 Mandatory Class I Federal Areas monitored for visibility, only one is located in Kentucky,. This area, Mammoth Cave National Park, is located approximately 120 miles southwest of Ghent. Other Class I areas in close proximity to the Ghent Station are Great Smokey Mountains National Park, in Tennessee and North Carolina (230 miles southeast), Dolly Sods Wilderness Area in West Virginia (340 miles east), and Shenandoah National Park, Virginia (360 miles east).

4.7 Noise

The existing noise sources in the general area of the proposed project site are the Ghent Power Station, traffic along U.S. Highway 42, and sporadic rail traffic on the tracks parallel and adjacent to U.S. Highway 42. However, because the general area is already highly industrialized, no noise sensitive land uses, such as residences, schools, or churches exist in the immediate area. The nearest point of public access to the proposed site is across U.S. Highway 42 from the main entrance to Ghent Power Station, approximately 1600 ft from the proposed site.

4.8 Land Use

Carroll County, Kentucky is a rural area with an average population density of about 78 people per square mile, and no metropolitan area.[1] Regionally, the Ohio Valley is primarily of agricultural land interspersed with industrial facilities and small communities.

4.9 Socioeconomic Conditions

Carroll County, Kentucky is located in the north-central area of the state. In 2000, the county had a population of 10,155, with a median age of 35. There were 3,940 households, and 2,722 families residing in the county. The racial makeup of the county is 95.16 percent White, 1.94 percent Black or African American, 0.23 percent Native American, 0.17 percent Asian, 0.05 percent Pacific Islander, 1.42 percent from other races, and 1.04 percent from two or more races. Of the population, 3.25 percent are Hispanic or Latino.[2]

The median income for a household in the county is $35,925, and the median income for a family is $44,037. The per capita income for the county is $17,057, with 14.90 percent of the population being below the poverty line. Of the total people living in poverty, 19.80 percent are under the age of 18, while 21.60 percent are 65 or older.

Carroll County's economy is based on both agriculture and industry. Farms produce crops, such as tobacco, corn, soybeans, garden vegetables, and fruit, as well as livestock. Combined agricultural receipts in 1986 totaled $10.29 million, including $8.27 million in crops, and $2.02 million in livestock. According to the 2000 Census, the manufacturing

[1] U.S. Census 2000

[2] Carroll County Kentucky Demographics http://www.encyclopedia4u.com/c/carroll-county-kentucky.html

industry employs the highest percentage of Carroll County workers, with almost 30 percent of the workforce. Industrial manufacturers include: Atochem, Dow Corning, Kentucky Ladder, North American Stainless, Teledyne, and Woodmaster Foundations.

4.10 Transportation

The project site is located near U.S. 42, a two-lane road, extending from Warsaw to Carrollton, KY. Access to Interstate 71 is available at both towns. U.S. 42 accommodates a large amount of commercial traffic from the industries located along the route, with approximately 6,000 vehicle movements per day.

5.0 Environmental Impacts

5.1 Geology and Soils

Proposed Alternative

No direct impacts to geological resources are expected from the construction and operation of the proposed project due to the facility location. The site would be constructed entirely within the confines of the inactive ash pond and would use the existing access roads, and would not impact any undisturbed area.

No Action Alternative

The No Action Alternative would eventually require the creation of additional storage impoundments to accommodate coal ash at the Ghent Power Station. This could include construction and excavation of additional land in order to create additional impoundments, which would disturb soil and geological resources or isolate these resources from other productive uses.

5.2 Cultural Resources

Proposed Alternative

No cultural resources would be impacted by the proposed project. Review of the EIS prepared by the U.S. EPA for Ghent Units 3 and 4 in 1978, identified only one historically significant feature in the area, a cemetery located in the current coal stockpile area of the Ghent plant. Consequently, because excavation and construction activities associated wit the proposed project are not expected to impact the coal stockpile are, no impacts to this historical feature are anticipated. Additionally, the Kentucky State Historic Preservation Office does not list any historic or cultural resources in the area. The proposed project would be located within the inactive ash pond and would not impact any cultural resources.

No Action Alternative

The No Action Alternative would eventually require the creation of additional storage to accommodate coal ash produced at the Ghent Power Station. While the existing impoundments do not impact cultural resources, a cultural resource survey would need to be conducted to assess the potential impacts of future ash pond sites or to determine the optimum place to construct a new impoundment, if it were necessary to avoid cultural

resources. Construction of additional ash storage facilities would increase the potential to encounter cultural resources.

5.3 Ecological Resources

Proposed Alternative
Impacts to ecological resources would be minimal. The proposed project site was previously disturbed to establish the two existing ash ponds. While areas of the existing pond do contain vegetation suitable for wildlife habitat (in the shallow-water portion of the impoundment), these areas would not be impacted by the project because the ash in these areas is contaminated with clay and silt and is not suitable for processing.

Success of the proposed project could result in the construction of additional facilities that utilize the ash byproducts. As a result, this growth in industry could indirectly impact ecological resources by causing a loss of habitat due to construction.

No Action Alternative
Without alternatives to utilize ash generated by the Ghent Power Station, eventually the creation of additional storage impoundments would be necessary. Consequently, the additional impoundments would displace the terrestrial ecosystem at the site of the ash ponds, resulting in loss of habitat. Associated surface water impacts and ground water impacts would probably degrade aquatic and terrestrial habitats located downstream of these ponds.

5.4 Threatened and Endangered Species

Proposed Alternative
Potential impacts to threatened or endangered species located in the Ohio River would be limited to the effects of sedimentation during construction activities. However, such sediment transport is unlikely because runoff must flow through open-water clarifying zones in the eastern end of the impoundment. These zones were designed to prevent ash from flowing into the Ohio River.

According tot the KSNPC, the Northern Leopard Frog (*Rana pipiens*) is listed as a species of concern and may use portions of the impoundment as a breeding area in the spring. However, leopard frogs have not been heard or observed at the pond during spring and summer visits. In addition, while other frogs are generally observed and breeding calls are heard on the eastern end of the pond, this is not an area likely to be disturbed during the project since it is a shallow, the water-covered area containing clay-rich soils not suitable for processing.

No Action Alternative
The No Action Alternative would require the creation of additional storage impoundments to accommodate coal ash produced at the Ghent Power Station. While no area has been identified for additional storage impoundments, the area selected could

impact threatened or endangered species or their habitats. Site locations would need to be selected with due care and in coordination with state and federal resource agencies.

5.5 Water Resources

Proposed Alternative
Because the proposed processing plant would be constructed within the confines of the existing ash impoundment, it is expected that minimal impacts to surface water or ground water would occur. The proposed plant would involve limited construction of impermeable surfaces, such as roofing and concrete pads. Impacts to storm water runoff within the ash impoundment am expected to be negligible and entirely contained within the impoundment. Spill control structures would be built around the containers that storing the collecting and frothing agents to minimize risks associated with accidental releases.

There are no public or domestic water wells in the vicinity of the Ghent Power Station, although there are wells in the nearby town of Ghent, approximately 2 miles west of the project site. Any leakage of collector from the impoundment would be detected by existing impoundment monitoring wells.

No Action Alternative
The No Action Alternative would eventually require the construction of additional ash storage for the Ghent Power Station. Impacts to water resources would probably result from the construction, with the degree and nature of the impact depending on the location of the impoundments.

5.6 Air Quality

Proposed Alternative
Based on the proposed project, three sources of air emissions were considered: fugitive dust resulting from excavation and construction activities; emissions from combustion of the collector and frothing agents; and emissions from thermal drying of the pozzolan prior to distribution.

Escape of fugitive dust from the site during the construction phase would be controlled based on best management practices already in place for excavation and hauling at the Ghent Station. For example, excavated ash would be heaped into short piles, and then moistened with water sprays to minimize surface dust generation. Leveled construction areas would be disked to create furrows, thereby minimizing runoff during rains, which would aid in keeping the surface moistened. Construction roads would also be sprayed as necessary, to minimize dust. IImpacts from fugitive dust are expected to be minimal.

As part of the byproduct recovery, carbon in the ash pond is collected using collecting and frothing agents and then burned as a supplemental fuel. Over 50% of the collector and over 70% of the frother remain adsorbed to the carbon after processing. While this

supplemental carbon would be combusted, minimal hazardous air emissions are expected. The adsorbed collecting/frothing agents comprise mainly carbon, hydrogen, oxygen, and small amounts of sulfur.

Summary of Emissions from Pozzolan Dryer using Natural Gas Fuel					
Compound	Combustor Type	Emission Factor	Emissions		
		lb/10^6 ft^3	lb/ton pozzolan	lb/year	Tons/year
SO_2	Uncontrolled	0.6	0.0042	65.6	0.033
	Controlled-Low NO_x burners	0.6	0.0042	65.6	0.033
NO_x	Uncontrolled	140	0.0981	15,310	7.66
	Controlled-Low NO_x burners	83	0.058	8,736	4.37
CO	Uncontrolled	35	0.025	3,900	1.95
	Controlled-Low NO_x burners	61	0.043	6,708	3.39
N_2O	Uncontrolled	2.2	0.0015	234	0.12
	Controlled-Low NO_x burners	0.64	0.00043	67.1	0.03
CO_2		$1.25x10^5$	84.1	$1.3x10^7$	6560
TOC		5.8	0.0041	640	0.32
Filterable PM		6.2	0.0043	0.47	0.0002
Condensable PM		7.8	0.0055	0.60	0.0003

Table 3. Summary of Emissions from Pozzolan Dryer using Natural Gas Fuel.

Emissions from the pozzolan dryer for the proposed project (See Table 3) were calculated using U.S. EPA Emission Factors for Small Industrial Boilers, (assuming the use of natural gas with a HHV of 1000 Btu/scf and average sulfur content of 2000 gr/10^6 scf). For comparative purposes, the emissions were calculated for both combustion with no additional controls and combustion with low NO_x burners. Uncontrolled combustion or combustion with low NO_x burners has no influence on SO_2 emissions which were calculated to be 0.033 tons/year. Use of low NO_x burners would reduce annual NO_x emissions from 7.66 tons/year to 4.37 tons/year. However, the reduction of NO_x emissions resulting from the use of low NO_x burners would result in an increase in CO emissions to 3.39 tons/year compared to 1.95 tons/year with uncontrolled combustion. Using low NO_x burners would reduce annual N_2O emissions from 0.12 tons/year to 0.03 tons/year. As with SO_2, combustor type has no influence on emissions of CO_2, Total Organic Compounds (TOC) nor either filterable or condensable Particulate Matter (PM). Emissions of EPA-designated HAPs would be negligible.

No Action Alternative

On average, 2,000 lbs of CO_2 is emitted for every ton of Portland cement produced. By using the pozzolan product in concrete, a net reduction of 1,910 lbs of CO_2 per every ton of Portland cement would be achieved (90 lbs of CO_2/ton Portland cement). However, no offset in CO_2 emissions would be realized with the No Action Alternative.

	PM	SO_2	NO_x	CO	CO_2	TOC
Cement	0.078	0.540	2.10	1.80	900.0	0.059
Pozzolan						
Uncontrolled	0.005	0.003	0.056	0.014	42.3	0.003
Low-NO_x Burners	0.005	0.003	0.036	0.023	42.3	0.003

* Emissions are in kg/metric ton of cement clinker or pozzolan produced
*Source: US EPA Clearinghouse for Inventories & Emissions Factors
www.epa.gov/ttn/chief/ap42/index.html
* PM data includes all particulate matter, because EPA data set is incomplete for PM_{10}.

Table 4. Comparison of Emissions for Portland Cement and Pozzolan Manufacturing

5.7 Noise

Proposed Alternative
The proposed processing plant would be comprised of a variety of equipment configured in an elevated open structure. Surface operations, such as loading and hauling would occur outside throughout the working shift. Noise levels generated by this type of equipment and activity were compiled from a variety of manufacturers and users and are tabulated below.

Operating Equipment Noise Levels		
Equipment	**Operating Frequency**	**Noise Level @ 50 ft. (dB)**
Loader	Intermittent	79
Truck (empty)	Intermittent	81-85
Truck (loaded)	Intermittent	87-91
Pumps (Centrifugal)	Continuous	81-85
Compressor	Continuous	91-98
Vibrating Screens	Continuous	74

Table 5. Operating Equipment Noise Levels.

Operating equipment activities relevant to loading and moving processed product would occur intermittently throughout the working shift. Each of loading cycles would occur approximately 5 times per hour. Loader and truck operators would be enclosed in cabs to reduce sound exposure. These activities would occur at a distance of not less than 200 ft from the processing plant in order to minimize the noise exposure of plant operators not associated with these activities to less than 80 dB in accordance with OSHA Permissible Noise Exposure Levels.

The primary noise sources within the processing plant itself would be from centrifugal pumps, vibrating screens and air compressors. Since these specific pieces of equipment

would be operating continually during the production shift, personal hearing protection would be required for the plant operators. The most significant source of noise would be from the compressor, which would be enclosed in a room constructed with sound abatement material to reduce noise levels. Normal plant operation would be from an enclosed control room, which would also be constructed with sound abatement material. Worker exposure to noise levels in excess of 80 dB would be limited to less than 1 hr/8 hr. shift during routine maintenance and cleanup while noise levels from the plant during normal operation would be less than 70 dB at a distance of 100 ft.

Permissible occupational noise exposure levels allowed in Kentucky are described under Kentucky Occupational Safety and Health (KY OSH) Regulation 29 CFR 1910.95 and are summarized in Table 5, below.

Permissible Noise Exposure Levels**	
Sound Level	Duration per 8 hr day
90 dB	8 hrs
92 dB	6 hrs
95 dB	4 hrs
97 dB	3 hrs
100 dB	2 hrs
102 dB	1.5 hrs
105 dB	1 hr
110 dB	0.5 hr
115 dB	<0.25 hr

**Source: Kentucky Labor Cabinet, Department of Workplace Standards, Division of Occupational Health and Safety Compliance, 803 KAR 2:306, Rev. 6/15/1999.

Table 6. Permissible Noise Exposure Levels in Kentucky

Employee exposure levels are determined by a time-weighted exposure method, which considers the amount of time during the day that an employee is exposed to a given sound level. If the daily exposure is greater than the permissible levels, regulations stipulate that feasible administrative or engineering controls shall be utilized. Otherwise, personal protection equipment must be provided to reduce noise exposure.

Off-site impacts from noise would be limited due to the lack of receptors. The nearest potential receptor would be located 1600 feet from the proposed site at the main entrance to the Ghent Power Station. Considering that noise from a localized source decreases 6 dB with each doubling of distance from source to receptor, the noise level at the nearest off-site receptor would be approximately 60 dB when construction site noise levels are 90 dB. The acceptable residential limit of 60 dB is not likely to be exceeded during construction or operation at the point of public access.

Due to the distance to off-site receptors and safety practices for on-site receptors, impacts from noise would be minimal.

No Action Alternative
The creation of additional storage impoundments as a result of the No Action Alternative would have only temporary impacts to noise receptors during the construction of the impoundment.

5.8 Land Use

Proposed Alternative
There are no impacts to land use expected as a result of the construction or operation of the proposed project. The proposed project is located on property for the Ghent Power Station that is already used for industrial purposes, and the proposed project would not alter or affect land use at the site or in the area.

Indirectly, success of the proposed project could result in the construction of additional facilities that utilize the products. This growth in industry could impact land use in the area by increasing industrial land use and limiting agriculture.

No Action Alternative
The No Action Alternative would eventually require the creation of additional storage impoundments to accommodate coal ash at the Ghent Power Station. The creation of new impoundments would displace the existing land uses in the areas of the new ponds. Most likely, the new ponds would be located within or adjacent to the industrial setting of the Ghent power plant.

5.9 Socioeconomic Effects

Proposed Alternative
There would be a limited number of temporary jobs created through construction of the proposed project and several permanent positions for its continued operation. These positions would not have significant socioeconomic impacts to the area.

The operation of the plant would continue after the DOE-sponsored efforts are completed and would employ 3 plant operators, 3 assistant plant operators, 1 dispatcher/clerk, 1 manager/sales representative, and 1 loader/operator (or dredge operator), for a total of 9 employees. The annual payroll for the plant is estimated at approximately $400,000.

No Action Alternative
Minimal socioeconomic impacts to the area are expected from the No Action Alternative. As more land is committed to ash disposal in the future, this land is removed from other, potentially higher value uses.

5.10 Transportation

Proposed Alternative
Impacts to transportation resulting from the proposed action would be minimal. During the commercial phase of operations, trucks would use U.S. Highway 42 to transport

products within the local market. Limited truck traffic is anticipated to transport lightweight aggregate and fill sand. With targeted production of 16,000 tons per year (tpy) of lightweight aggregate and 16,000 tpy graded fill sand, the amount of products trucked directly to consumers is estimated to be 32,000 tpy. Using 240 days as a base for product shipment with 20 ton trucks, the anticipated traffic would be 6 to 8 truck movements per day. Current plans do not include barge transportation for construction or operation of the proposed project.

Indirectly, success of the proposed project could result in the construction of additional facilities that utilize the products produced. This growth in industry could impact transportation by increasing truck traffic and/or through the construction of a barge loading facility with additional river traffic.

No Action Alternative
No impacts to transportation are expected as a result of the No Action Alternative.

6.0 Conclusions

The proposed project would use an existing waste stream of ash to manufacture concrete additives and construction materials. By utilizing the pozzolan material produced by the beneficiation process, reduction in CO_2 emissions would be realized as compared to that resulting from Portland cement manufacturing. Beneficial use of fly ash also reduces the need for storage capacity, thereby reducing or eliminating the creation of additional fly ash storage impoundments.

No significant impacts to human health and safety or the environment are anticipated from the construction and operation of the proposed ash beneficiation plant. The proposed project would be constructed on a previously disturbed site, so significant impacts to geology or soils are unlikely. Cultural resource investigations have been conducted and additional investigation was not warranted; therefore no further action pursuant to Section 106 of the National Historic Preservation Act is required. No significant impacts are expected to ecological resources, surface water resources, ground water resources, or land use. Construction and operation of the proposed project would not be expected to impact any federal- or state-listed threatened or endangered species. Increases in truck traffic would be minor given the existing traffic conditions; therefore impacts to transportation would be small. Minor increases in noise and dust may occur, in comparison to the No Action Alternative.

Under the No Action alternative, greater impacts to health and safety or the environment are anticipated. Given current ash production rates, it is estimated that additional storage impoundments would need to be constructed in approximately 10 years when the current pond reaches its maximum capacity. The additional impoundment would most likely be located near the southeastern end of the current pond. Due to the disturbed nature of the site, impacts to geology and soils, cultural resources, ecological resources, surface or groundwater, land use, or threatened or endangered species would be small.

Appendix A

Agency Correspondence

Carroll Co. DP

U.S. Department of Energy

National Energy Technology Laboratory

NETL

#8492

May 13, 2003

RECEIVED
MAY 16 2003
KY HERITAGE COUNCIL

Mr. David L. Morgan
State Historic Preservation Officer
Executive Director, Kentucky Heritage Council
300 Washington Street
Frankfort, KY 40601

Dear Mr. Morgan:

The United States Department of Energy (DOE) is considering participation, through cooperative agreements with Louisville Gas & Electric Energy Corporation and the University of Kentucky Research Foundation, in projects for "Demonstration of Advanced Environmental Control Technologies at the Ghent Generating Station" near Carrollton, Kentucky. Under the cooperative agreements, new facilities would be installed at the Ghent Generating Station to demonstrate innovative technologies. The technologies will focus on achieving additional control of air emissions, including emissions of sulfur dioxide, oxides of nitrogen and mercury, as well as converting coal-combustion wastes to marketable products. Descriptions of the proposed technologies and graphics depicting the project location are provided as enclosures.

As part of our coordination and consultation responsibilities, and to comply with provisions implementing Section 106 of the National Historic Preservation Act of 1966, we are requesting information on historic or cultural properties in the project area. Your thoughts on the potential impacts associated with the proposed project would also be appreciated.

Based on the scope of the proposed project, DOE plans to initiate preparation of an Environmental Assessment (EA), in accordance with requirements of the National Environmental Policy Act, to analyze, document, and disseminate information on the potential environmental consequences of the proposed project. Information that you provide will be incorporated and appropriately addressed in the EA. If your initial review concludes that no historic or cultural properties are present in the project area, a written acknowledgement of that conclusion would be appreciated. In any case, the information you provide will be considered in preparing the draft EA, which will be provided for review upon availability.

Should you require additional information, please contact me by telephone at 412-386-4512 or by e-mail at 'Janice.Bell@netl.doe.gov.'

Sincerely,

Janice Bell

Janice Bell
NEPA Document Manager

Enclosures

Concur
No Effect on Historic Properties
By Dai Pol Date 9/30/03
for David L. Morgan
Kentucky State Historic Preservation Officer

3610 Collins Ferry Road, P.O. Box 880, Morgantown, WV 26507-0880 ☐ 626 Cochrans Mill Road, P.O. Box 10940, Pittsburgh, PA 15236-0940
REPLY TO: Pittsburgh Office • jbell@netl.doe.gov • Voice (412) 386-4512 • Fax (412) 386-4806 • www.netl.doe.gov

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3761 GEORGETOWN ROAD
FRANKFORT, KY 40601

June 23, 2003

Mrs. Janice Bell
U.S. Department of Energy
Natural Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, West Virginia 26507

Subject: FWS #03-2202, New facilities at the Ghent Generating Station, Carroll County, Kentucky

Dear Ms. Bell:

Thank you for your correspondence of June 23, 2003, regarding the proposed construction of new facilities at the Ghent Generating Station in Carroll County, Kentucky, as shown on the attachments to your correspondence. Fish and Wildlife Service (Service) personnel have reviewed the information submitted, and we offer the following comments.

Information available to the Service does not indicate that wetlands exist in the vicinity of the proposed project. However, our wetland determination has been made in the absence of a field inspection and does not constitute a wetland delineation for the purposed of Section 404 of the Clean Water Act. The Corps of Engineers should be contacted if other evidence, particularly that obtained during an on-site inspection, indicates the potential presence of wetlands.

Endangered species collection records available to the Service do not indicate that federally listed or proposed endangered or threatened species occur within the impact area of the project. We note, however, that collection records available to the Service may not be all-inclusive. Our database is a compilation of collection records made available by various individuals and resource agencies. This information is seldom based on comprehensive surveys of all potential habitat and thus does not necessarily provide conclusive evidence that protected species are present or absent at a specific locality. However, based on the best information available at this time, we believe that the Department of Energy's requirements of Section 7 of the Endangered Species Act of 1973, as amended, are fulfilled. DOE's obligations under Section 7 of the Act must be reconsidered if (1) new information reveals impacts of the proposed action that may affect listed species or critical habitat in a manner not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered during this consultation, or (3) new species are listed or critical habitat designated that might be affected by the proposed action.

Thank you for the opportunity to comment on this proposed action. If you have any questions regarding the information which we have provided, please contact Mindi Brady at (502)/695-0468 (ext.229).

Sincerely,

Virgil Lee Andrews, Jr.

Virgil Lee Andrews, Jr.
Field Supervisor