APPENDIX G
IT QUESTIONS

Introduction

Louisiana Generating, LLC (LaGen) owns and operates the Big Cajun II facility. This power station is located near New Roads, Pointe Coupee Parish, Louisiana. The initial start-up of the power station was between 1981 and 1983. Currently, Big Cajun II operates three 575 megawatt (MW) pulverized coal (PC) boilers. Each boiler is fired by low-sulfur, Powder River Basin (PRB) subbituminous coal. Combined, the three units generate 1,730 MW of baseload capacity.

LaGen is authorized to and plans to construct, own, and operate an additional electrical generation unit at the existing Big Cajun II facility. The unit, denoted as "Big Cajun II Unit 4" will be located within the boundaries of the existing LaGen plant site in Pointe Coupee Parish, Louisiana. Big Cajun II Unit 4, LLC, based in Baton Rouge, Louisiana, is a wholly owned subsidiary of NRG Energy, Inc. of Princeton, New Jersey.

Big Cajun II Unit 4 will produce approximately 675 (net) megawatts (MW) of electricity needed in the region. The unit will be located on property owned by LaGen. Unit 4 will be constructed adjacent to existing LaGen power generation Units 1, 2 and 3.

In accordance with LAC 33:III.507, the initial Big Cajun II Title V Permit Application was submitted by Cajun Electric Power Cooperative, Inc., in October 1996. While pending, a completely revised permit application was submitted to LDEQ by Big Cajun II Unit 4, LLC in September 2001 that included a Prevention of Significant Deterioration (PSD) air permit application for the addition of Unit 4, a new 675 MW pulverized coal-fired (PC) boiler, and associated changes and additions to the materials handling system and supporting infrastructure, as well the "IT" questions (incorporated herein by reference) in regards to the addition of Unit 4. This application superseded the October 1996 application. In March 2005 updated parts of the aforementioned application were submitted, which included the option for Big Cajun II Unit 4, LLC to use either a wet or dry scrubber, and updates based on revised calculations that were complete subsequent to the previous submittal in 2001. In August 2005, the Louisiana Department of Environmental Quality (LDEQ) issued a Part 70 Operating Permit (Permit No. 2260-00012-V0) and a PSD Permit (Permit No. PSD-LA-677) to Big Cajun II Unit 4, LLC for the construction of the new PC boiler and ancillary equipment and noted LaGen would install either a wet or a dry scrubber.

Since the issuance of the permit, Big Cajun II Unit 4, LLC has decided to reserve the right to fire low-sulfur PRB subbituminous coal, but to incorporate into the fuel possibilities the option to use high-sulfur bituminous coal, potentially from the Illinois Basin, to fire Unit 4. This modification of the potential fuel sources is being accompanied by changes that are required to accommodate its use.

Both the high-sulfur bituminous coal and the PRB subbituminous coal will be conveyed to the site via barge or rail, as discussed in the September 2001 application and subsequent updates. From the unloading area, coal will be transferred through a closed conveyance system to the appropriate coal pile, depending on the type of coal being transferred. Reclamation of coal from the storage pile will involve transfer of the coal via closed conveyance systems to the Crusher Tower, where it is fed into surge bins,

thence to one of the crushers in order to break the coal into smaller pieces. The coal is then transferred internally to pulverizers and silos, where it is stored prior to being fed to the Unit 4 boiler.

As previously mentioned, all coal conveyors will be covered to control the release of air emissions, specifically particulate matter (PM) emissions. PM emissions from all transfer towers, including the primary coal crusher, will be captured and controlled by baghouse dust collectors. Wetting agents will be used on the coal piles and other locations, as necessary, to prevent the release of fugitive coal dust emissions. No air emissions are generated from coal pulverization because the coal from this operation is pneumatically conveyed directly to the PC boiler where combustion takes place.

Energy produced during the combustion process heats water which circulates in the steam generator tubes and converts the water to steam. The steam is heated further and transported from the steam generator to the steam turbine, where, as it passes through a series of fixed and rotating vanes, the steam causes the turbine to rotate at a controlled speed. The rotating turbine provides the mechanical motive energy to the directly coupled generator, which converts the mechanical energy into electrical energy.

In the condenser, the turbine exhaust steam is condensed back into water as heat is indirectly transferred from the steam to cooling water that is circulated through the condenser tubes. The steam condensate exits the condenser and is returned back to the boiler and the steam cycle repeats. The heated cooling water leaving the condenser is transported to a cooling tower, which rejects the heat to the atmosphere through latent and sensible heat exchange caused by bringing the water into direct contact with air. The cooled cooling water is collected in a basin at the bottom of the tower, where the circulating water pumps provide motive force to transport the water through the condenser and back to the tower as the cooling water cycle repeats.

From an air pollution control perspective, the major source of air pollutants is the flue gas from the PC boiler. However, as discussed below, a number of air pollution control technologies have been incorporated into the design of Unit 4 to treat the flue gas and minimize air emissions.

Flue gas from the Unit 4 PC boiler will first be routed through a selective catalytic reduction (SCR) unit where, with the addition of ammonia and the presence of a catalyst, a large portion of nitrogen oxides (NO_X) from the combustion process will be converted to nitrogen and water. In addition to SCR, the steam generator will be equipped with low-NO_X burners (LNB) to reduce NO_X formation in the combustion process. Because SCR requires a fairly high temperature to operate effectively, the SCR unit will be installed in the back pass of the boiler upstream of the air heater. Ammonia slip, or excess unreacted ammonia, will be limited to 2 parts per million by volume (ppmv) in the flue gas that exits the stack.

The hot flue gases next pass through an air preheater, where the flue gas indirectly heats combustion air that is headed either directly to the PC boiler or to the coal pulverizers to pneumatically transport the pulverized coal to the PC boiler. Atmospheric air is supplied to the air preheater by the forced draft fans.

In order to control mercury from PRB coals, a sorbent injection system may be needed. A material that will absorb mercury, potentially activated carbon, will be injected into the flue gas stream. This material will absorb mercury in the gas stream before the flue gases are routed to the next control device: the baghouse. A second sorbent may be necessary in order to reduce sulfuric acid mist in the gas stream prior to the baghouse. This is not intended to actively control the outlet sulfuric acid mist emission rate as much to reduce bag corrosion and extend bag life. It is possible that a dry alkaline sorbent would need to be injected into the gas stream. This sorbent could potentially be a fine powdery substance and is a potential particulate matter emission source. Should Big Cajun II Unit 4, LLC choose to utilize a dry sorbent injection system to control sulfuric acid mist emissions, the material would be trucked on-site and transferred into a silo using a pneumatic system. Emissions from the silo would be controlled through the use of a high efficiency filtration system, which would reduce emissions by at least 99 percent.

The ash, sorbents, and other particulate matter suspended in the flue gas stream will be collected in baghouse fabric filter modules. In the baghouse, particulate matter collects on the filter bags as the gas passes through. The collected PM forms a cake in the bags, which enhances the filter efficiency. Periodically, the bags are cleaned by reverse air deflation, shaking, or air pulsing. The particulate matter cleaned from the bags falls into hoppers below the filter bags.

A Wet Flue Gas Desulfurization (Wet FGD) system will be installed after the baghouse to remove sulfur dioxide (SO_2) from the flue gases. In a Wet FGD, the flue gas enters a large vessel (spray tower or absorber), where it is sprayed with water slurry containing approximately 15 to 20 percent limestone. The calcium in the slurry reacts with the SO_2 to form calcium sulfite ($CaSO_3$) or calcium sulfate ($CaSO_4$). Compressed air is injected into the slurry to oxidize calcium sulfite to calcium sulfate or gypsum ($CaSO_4 \cdot 2H_2O$). A portion of the slurry from the reaction tank is pumped to a set of hydrocyclones to concentrate the slurry from 15 to 20 percent to approximately 50 percent solids. The hydrocyclone underflow with 50 percent solids is further dewatered in a belt filter to a gypsum product with 10 percent moisture. Hydrocyclone overflow with fine gypsum crystals and unreacted limestone is returned to the absorber for further reaction. Gypsum product from belt filter discharge is by belt conveyors to gypsum storage for sale or disposal.

By controlling the gypsum quality in the dewatering step, a wallboard-grade gypsum can be produced. Almost all Wet FGD systems in the United States in recent years use limestone with forced oxidation to produce commercial grade or disposal grade gypsum depending on local market for gypsum. LaGen will attempt to market all gypsum generated from the Wet FGD system. Gypsum which cannot be sold will be stored onsite in properly permitted solid waste units, in order to prevent adverse impacts to the environment.

Following the FGD system, the cleaned flue gas is discharged through the main stack. The stack will be equipped with Continuous Emissions Monitoring Systems (CEMS), as described in greater detail in Section 2.0 of the accompanying Title V modification.

The remainder of this document provides detailed responses to the Environmental Impact Questions (IT Questions). These responses clearly demonstrate that LaGen has thoroughly considered and evaluated the

potential adverse environmental effects associated with the utilization of high-sulfur bituminous coal at their facility, and have incorporated the best available pollution control technology and practices, in order to prevent/minimize environmental impacts to the maximum extent possible.

1.0 Have the potential and real adverse environmental effects of the proposed Facility been avoided to the maximum extent possible? (This question requires the permittee to identify adverse environmental effects, both potential and real.)

Yes. The potential and real adverse impacts from the use of low-sulfur PRB subbituminous coal and high-sulfur bituminous coal as the fuel sources for Big Cajun II Unit 4 have been considered and will be avoided to the maximum extent possible.[1]

As in the use of any solid fuel, utilization of the high-sulfur bituminous coal to fire the Big Cajun II Unit 4 boiler will result in emissions to air, as well as generation of wastewater and solid waste material. However, a number of pollution control technologies have been incorporated into the design of Big Cajun II Unit 4 to minimize emissions. These technologies include use of an SCR, wet scrubber, baghouses, and closed material conveyance systems. These technologies are discussed in more depth in the following sections. In addition, Best Management Practices (BMP), written plans, and strict adherence to environmental regulations will further prevent/minimize environmental impacts.

A. What are the potential environmental impacts of the permittee's proposed Facility?

The potential environmental impacts of the use of high-sulfur bituminous coal to fire Big Cajun II Unit 4 are described below by media.

Air[2]

Use of high-sulfur bituminous coal at Big Cajun II Unit 4 will result in air emissions primarily from the boiler unit, the cooling tower, and fugitive particulate sources. The boiler will generate substances associated with combustion, including carbon monoxide (CO), SO_2, NO_X, particulate matter with less than 10-micron diameters (PM_{10}), volatile organic compounds (VOCs), and sulfuric acid mist (H_2SO_4). The calculated emissions are summarized in Table 1.

[1] Both low-sulfur PRB subbituminous and high-sulfur bituminous coals are planned for use in Big Cajun II Unit 4. An IT Analysis was completed, submitted, and approved by LDEQ for the use of PRB in Unit 4 and is incorporated herein by reference. As the effects of PRB have already been discussed in a previous IT document, this document addresses only the use of high-sulfur bituminous coal in the boiler.

[2] The Title V permit application that includes the Unit 4 addition at the Big Cajun II facility was filed in September 2001. A Part 70 Operating Permit and PSD Permit were issued by the LDEQ in August 2005, based on the 2001 application and supplemental information provided between 2001 and 2005. The current application filed for Big Cajun II Unit 4 is being submitted to provide the option to use high-sulfur bituminous coal as a fuel source, and to incorporate the design changes which are associated with its use.

Table 1
Project Emission Increases and PSD Threshold Comparison

Pollutant	Total Net Increase (tons/yr)	PSD Threshold Level (tons/yr)
NO_X	0	40
SO_2	0	40
CO	0	100
PM_{10}	0	15
VOC	-333.6	40
H_2SO_4	215.7	7

Pointe Coupee Parish, Louisiana is designated as an attainment area therefore the emissions from the boiler, the cooling tower, and fugitive sources are subject to both National Ambient Air Quality Standards (NAAQS) and PSD rules. The PSD rules also require application of Best Available Control Technology (BACT).

As discussed in Part 4.0, BACT for Big Cajun II Unit 4 varies by pollutant and is based on proven technologies in use across the United States and accepted by the USEPA. For this project, the use of low-NO_X coal burners (LNBs) in the boiler itself and an SCR for further reduction of NO_X emissions from the boiler flue gas will be employed for the new unit to maintain a NO_X limit of 0.07 lb/MMBtu. Ammonia slip (excess unreacted ammonia used in the SCR process) will be limited to 2 ppmv in the flue gas that exits the stack.

To comply with the new federal regulations requiring mercury removal, a powdered activated carbon (PAC) system is being proposed. In order to remove mercury from the flue gases, a sorbent material, possibly PAC, is injected into the gas stream. This sorbent absorbs mercury and allows it to be removed from the system. A second sorbent may be necessary in order to reduce sulfuric acid mist in the gas stream prior to the baghouse. This is not intended to actively control the outlet sulfuric acid mist emission rate as much to reduce bag corrosion and extend bag life. It is possible that a dry alkaline sorbent would need to be injected into the gas stream. This sorbent could potentially be a fine powdery substance and is a potential particulate matter emission source. Should Big Cajun II Unit 4, LLC choose to utilize a dry sorbent injection system to control sulfuric acid mist emissions, the material would be trucked on-site and transferred into a silo using a pneumatic system. Emissions from the silo would be controlled through the use of a high efficiency filtration system, which would reduce emissions by at least 99 percent.

After passing through the SCR and sorbent injection systems, particulate matter, consisting mostly of fly ash and sorbents that are entrained in the flue gas will be collected in a fabric filter (baghouse). In the fabric filter, the particulates collect on the filter bags as the gas passes through. The collected particulates form a cake on the bag, which increases the efficiency of the filter. The bags are periodically cleaned by

reverse air deflection or pulses of air that shake the bags, with the particulates collected into hoppers. From the hoppers, the material is transferred via an enclosed system to silos where it is either sold to off-site consumers or shipped to the existing on-site landfill.

Following the fabric filter, the flue gas is routed to a Wet FGD system to remove SO_2. Crushed limestone is routed to a slurry tank and mixed with water. The slurry is then injected into the Wet FGD system where it reacts with the flue gas and removes SO_2. The resulting material can be oxidized to form gypsum which can then be dried and used in a variety of processes, including wallboard manufacturing. LaGen intends to sell as much of the gypsum as possible as a beneficially reused product. Any excess gypsum that cannot be sold will be stored in the on-site landfill.

Big Cajun II Unit 4's supporting coal, ash, gypsum, and limestone handling and storage operations will also generate PM_{10} emissions. All affected equipment will utilize emission control measures that represent BACT for coal-fired power plants, including various combinations of dust suppression by wetting agents, enclosures, and/or ventilation to baghouses. In general, BMPs per the USEPA's AP-42 will be implemented to reduce dust emissions. Where baghouses are used, baghouse vent emissions will be controlled to an exit grain loading of better than 0.005 grains per dry standard cubic foot (gr/dscf), or a control efficiency of at least 99 percent. Particulate matter collected in baghouses will routinely be recycled to the appropriate handling/storage system, sold as recycled marketable material, or placed in the existing impoundments at the plant.

Limestone unloading and conveying systems will be covered and emissions suppressed by a combination of baghouses and water sprays. The limestone transfer tower will be enclosed and emissions controlled through the use of high efficiency wet suppression systems. The pulverizing of the limestone will occur inside of a totally enclosed building in a wet ball mill, and all emissions generated through this process are completely contained within the system. Coal conveyors will be enclosed to prevent the release of PM_{10} emissions and coal transfer points and the primary coal crusher will be completely enclosed and ventilated to a baghouse. Potential air emissions from the coal pulverization operation for Unit 4 will be completely eliminated by pneumatically routing all such emissions to the Unit 4 boiler, in which they will be combusted. Wetting agents will be used at various locations, as necessary, to prevent the release of fugitive coal dust emissions.

Boiler bottom ash will be handled wet in an enclosed system, eliminating the potential for PM_{10} emissions from the bottom ash processing operations. PM_{10} emissions from fly ash conveyance to the fly ash silo and from fly ash truck loading operations will be captured and routed to baghouse dust collection systems. Fly ash will be wetted (approximately 10 percent water) at the silo to minimize emissions during the unloading of the fly ash into the storage impoundments. Big Cajun II operates a road wetting truck to minimize dust emissions from truck traffic within the plant.

PM_{10} emissions will also occur from cooling tower operations when drift (small water droplets) escapes the cooling tower. PM_{10} emissions from the cooling tower will be minimized by using a mechanical drift eliminator that keeps drift to 0.002 percent of the circulating water rate and by limiting the total dissolved solids level in the circulating cooling water to approximately 1,200 ppmw.

For CO and VOC emission control, good combustion techniques and optimum burner design will be used.

Hazardous air pollutants (HAPs) are not required to be analyzed per recent federal actions, and are no longer covered by Federal case-by-case MACT requirements under 40 CFR Part 63, as referenced in LAC 33:III.5122. Nevertheless, the emissions controls planned for the project would in fact meet MACT standards for HAPs, if such a demonstration were required. It is expected that the redundant systems for particulate control will reduce metal emissions to the maximum levels practical with today's technologies. Emissions of organic HAPs are controlled to a high degree by the combustion controls used on the boiler, and acid gases are well controlled by the Wet FGD system.

The facility has modeled its projected maximum emissions of CO, NO_X, SO_2, and PM_{10} to determine potential worst-case ambient air concentrations at and beyond the facility's property line. The modeling results are presented in Part 5.0 of the Air Permit Modification. The modeling results demonstrate that the projected emissions will not cause any PSD increments or NAAQS to be exceeded.

In addition to meeting the requirements of the PSD rules, the boiler unit will be subject to stringent New Source Performance Standards (NSPS) under 40 CFR Part 60, as referenced in LAC 33:III.3003, which pertain to coal-fired electric utility steam generating units. These rules impose NO_X, SO_2, PM, and mercury emission limits on new units. The maximum emission rates that represent BACT, as discussed above, will also comply with the NSPS limits. The NSPS rules also require initial stack tests after start up to verify that the emissions are within limits as well as continuous monitoring of several parameters to ensure that the units will be properly operated at all times. Also, Federal acid rain regulations, found at 40 CFR Parts 72 through 78, limit SO_2 and NO_X emissions, and impose stringent continuous emissions monitoring requirements. These requirements will be enforced through their inclusion in a Clean Air Act Title V operating permit, which will require prompt reports of any permit deviation, semiannual compliance reports, annual compliance certifications, and an automated data acquisition and handling system and continuous emissions monitoring system on the stack.

Finally, Big Cajun II Unit 4 will be subject to a maximum NO_X emission rate of 0.07 lb/MMBtu. It should be noted that Units 1 through 3 are subject to the newly promulgated LDEQ NO_X emission limit of 0.21 lb/MMBtu, as specified in LAC 33:III.2201, for coal-fired electric power generating boilers that have rated heat input capacities of greater than 80 MMBtu/hr and that are located in the Region of Influence. In addition to complying with this rule for Units 1 through 3, NRG agreed to and did commence installation of additional controls early. LaGen has already retrofitted all existing units (Units 1, 2, and 3) with low-NO_X combustion technology to comply with the new limit.

Waste Generation and Control

The burning of high-sulfur bituminous coal will result in the generation of solid waste material consisting of fly ash, bottom ash, and gypsum. The physical and chemical characteristics of Unit 4's fly ash and bottom ash are similar to the fly ash and bottom ash currently generated by the existing Units 1 through 3. Due to its pozzolanic characteristics, fly ash has been found to be a marketable resource that can be used as cement substitute or additive for a variety of purposes. Currently, LaGen sells the majority of fly ash

generated by Units 1 through 3, and plans to do the same for the fly ash generated by Unit 4. Bottom ash has also been found to have beneficial reuse applications. Although the existing market for bottom ash is not as large as for fly ash, LaGen will continue to investigate options to beneficially reuse the bottom ash. By actively pursuing and marketing the fly ash and bottom ash generated by Big Cajun II Unit 4, environmental impacts will be minimized as less material will need to be permanently disposed. Gypsum has many beneficial reuse properties, particularly in the wallboard manufacturing process, and LaGen is actively pursuing opportunities to reuse this material.

Big Cajun II Unit 4 has been designed to meet or exceed all existing environmental regulations. Adverse environmental impacts will be avoided to the maximum extent possible. During normal operations, any fly ash or bottom ash that is not sold for reuse will be placed into the existing permitted solid waste units at the facility which accepts the unsold fly and bottom ash from the existing Units 1 through 3. Gypsum, a solid waste stream related to the air pollution control equipment, will be generated from the Wet FGD and will also placed in an LDEQ permitted solid waste unit located onsite. The LDEQ solid waste regulations require that solid waste facilities be designed to include certain components, such as liners, dikes, and monitoring wells, to ensure that soil, groundwater, and surface water are not adversely impacted.

No significant hazardous wastes are expected to be generated as a result of burning high-sulfur bituminous coal at the new unit. Any minor quantities of hazardous wastes (e.g., cleaning products) that may be generated on-site will be properly disposed of off-site at appropriate facilities licensed and permitted by the State of Louisiana and shall be transported by licensed haulers. No hazardous wastes will be disposed of on-site.

Water

Big Cajun II Unit 4 will generate wastewaters such as cooling tower blowdown, utility wastewaters (low volume wastewater), sanitary wastewater discharges, and stormwater. To avoid potential adverse environmental impacts, these wastewaters will be collected in the existing systems at the Big Cajun II facility. After treatment and monitoring, wastewaters will ultimately be discharged to the Mississippi River near River Mile 264 via the existing Big Cajun II Louisiana Pollutant Discharge Elimination System (LPDES) permitted outfall structure. There will be no discharges to publicly owned treatment works (POTWs). All discharges for Unit 4 will occur pursuant to the effluent discharge limitations and monitoring requirements detailed in a modified LPDES permit issued by the LDEQ on September 10, 2003. The regulations and policies established by the LDEQ will ensure that the LPDES permit contains the necessary provisions to adequately protect the receiving streams.

Stormwater management is part of a major national initiative to ensure that industrial facilities use proper design and engineering concepts to reduce stormwater runoff pollution. Through a combination of structural controls, such as containment dikes, berms, and drainage systems, and by adherence to stringent safeguards to avoid unplanned releases of chemicals to the environment, LaGen will minimize the quantity of stormwater runoff that will come in contact with potential contaminants. Stormwater falling within the process area of the facility and stormwater which comes in contact with coal piles will be

routed to the existing rainfall surge basin, similar to existing Units 1 through 3. The existing coal storage piles will be utilized for the storage of the high-sulfur bituminous coal. These areas are equipped with drainage systems that also route contact stormwater to the existing rainfall surge basin for treatment and discharge through the existing outfall.

Containment dikes and/or berms with manual control valves will be installed around all storage areas for potentially toxic or hazardous materials used for water treatment and maintenance. Regular visual inspections will ensure that any potentially contaminated stormwater in these structures will be routed, as appropriate, to the oil water separator or through the LPDES system (the rainfall surge pond and treatment impoundments). In addition, BMP will be followed to prevent and control the discharge of pollutants from accidental release incidents. The comprehensive contingency plans, operating procedures, Spill Prevention Control and Countermeasures Plan (SPCC), Spill Prevention and Control (SPC) Plan, and BMPs will be updated to prevent and control the discharge of pollutants resulting from accidental release or spill events. An Integrated Contingency Plan combines these requirements into a single document and will be updated for the Big Cajun II facility to include any changes associated with the new solid fuel type.

These plans, as applicable to Big Cajun II Unit 4, must include a prediction of the direction, rate of flow, and total quantity of applicable substances that could be spilled at Big Cajun II Unit 4, where experience indicates a reasonable potential for equipment failure and/or human error. Appropriate containment and/or diversionary structures or equipment to prevent such substances from reaching waters of the State will be provided through use of the following:

- Dikes, berms, or retaining walls sufficiently impervious to contain spills;
- Curbing, drip pans;
- Culverts, gutters, and other drainable systems;
- Weirs, booms, and other barriers;
- Detention basin(s);
- Sorbent substances; and
- Sumps and collection systems.

Big Cajun II Unit 4, LLC is fully committed to a strong spill contingency plan and will, as required by applicable regulations, provide a written statement of its commitment to provide necessary manpower, equipment, and materials to ensure timely and effective action to minimize damage resulting from spill events. In addition to the minimum prevention standards listed under LAC 33:IX.907.D, the Facility's SPCC/SPC Plan will conform to the guidelines and spill prevention and containment procedures specified under LAC 33:IX.907.F-K.

Soil, Food, and Additional Impacts

Big Cajun II Unit 4 will be located on industrial land owned by, and within the fence line of, LaGen. Use of high-sulfur bituminous coal for the operation of Big Cajun II Unit 4 is not expected to adversely

impact the geology, topography, soils, vegetation, food, visibility/opacity in the area or adversely impact any Class I areas. The location has been sited on a topographically level area in order to minimize the amount of soil disturbance. Big Cajun II Unit 4, LLC will place solid wastes, such as unsold fly ash, bottom ash, and gypsum, into permitted impoundments constructed with a clay liner. The units are designed to prevent leaching into soils and shallow groundwater.

Sensitive Soils and Vegetation

Potential impacts to soil and vegetation were evaluated in accordance with the Clean Air Act described in Part 7.0 of the air permit modification. This analysis included a comparison of the maximum predicted impacts to screening thresholds for specific plants. The comparison indicates the use of the new solid fuel type will not adversely impact soils and vegetation in the area.

Visibility/Opacity

Particulate matter emissions will be minimized through the use of enclosed material conveyance/transfer systems, baghouses, and material wetting practices. Good combustion practices and BACT will be used to control NO_X and particulate matter emissions from the boiler. The potential visibility impacts due to the emissions from utilizing high-sulfur bituminous coal at Big Cajun II Unit 4 were evaluated in accordance with the procedures outlined in the USEPA's guidelines and described in Part 7.0 of the air permit modification. This evaluation utilizes calculated values relating source emissions to visibility impacts and compares them to a standardized screening value for potential plume effects. The results of the analysis indicate that Unit 4's emission sources will not cause visibility impairment in the vicinity. Proper precautions such as the application of water and the paving of the facility's roadways will be taken to minimize airborne dust emissions during construction activities.

Class I Areas

The USEPA requires an impact analysis be performed for sources located within 100 kilometers of a Class I area. The nearest Class I area to Big Cajun II Unit 4 is the Breton Sound National Wildlife Refuge. Breton Sound is approximately 250 kilometers to the east-southeast of the Big Cajun II facility. No Class I impact analysis is therefore necessary for the project. Because the air quality impact within the vicinity of the Facility is insignificant, any possible air quality impacts within the Breton Sound are too miniscule to quantify.

1. What wastes will be handled?

a. Classes of chemicals
b. Quantities (hazardous and non hazardous)
c. Physical and chemical characteristics
d. Hazardous waste classification (listed, characteristic, etc.)

Big Cajun II Unit 4 will not use any additional chemicals that contribute to waste products beyond those currently used at the Big Cajun II facility for normal operations, although usage of products will increase

somewhat to accommodate the new unit. Other than the gypsum produced by the Wet FGD system, no new waste streams are expected as compared to the waste streams from the existing units. In terms of chemical usage, the only significant additional chemical used onsite will be anhydrous ammonia; however, since this material is within a closed system and is a gas at ambient conditions, no wastes will be associated with the process that would require disposal.

Classes of Chemicals

The wastes to be handled at the Big Cajun II facility as a result of the use of high-sulfur bituminous coal, will include fly ash (most of which will be sold for beneficial reuse as a cement additive, similar to Units 1 through 3), bottom ash (some of which may also be sold), and gypsum, as well as routine maintenance solid wastes. Hazardous wastes, if generated, will be in minor quantities as a part of routine maintenance activities. These are discussed in more detail below.

Quantities of Chemicals

Total fly ash generation from Big Cajun II Unit 4 is estimated at approximately 346,020 tons per year, nearly all of which may be sold for beneficial use as a product. As such, it is not considered a waste. During normal operations of Big Cajun II Unit 4, unsold bottom ash will be generated and placed into the existing bottom ash impoundment at the facility. Total bottom ash generation from Big Cajun II Unit 4 is estimated at approximately 118,260 tons per year. Gypsum, a new waste stream related to the air pollution control equipment, will be generated by the Wet FGD and also placed in a LDEQ permitted solid waste unit to be located onsite. An estimated quantity of 2,365,200 tons per year of gypsum is expected to be generated from Big Cajun II Unit 4.

Physical and Chemical Characteristics

The physical and chemical characteristics of the fly ash and bottom ash generated from the combustion of high-sulfur bituminous coal is similar to that generated from the solid fuel currently used at the facility and have been described in previous solid waste permit applications to LDEQ. Fly ash, as it is collected from the stack gas, is a gray-colored, finely powdered substance. It has a consistency similar to that of talcum powder. Fly ash is composed primarily of oxides of silicon, aluminum, calcium, sulfur and iron. When fly ash mixes with water and free lime, the silicon oxide and aluminum oxide components react with the calcium in the lime to form a slow-hardening cement. The result of this reaction is a hard, structurally stable compound with very low permeability. It is this characteristic that makes fly ash a marketable resource that can be used as a mineral admixture in Portland cement concrete for a variety of purposes. The John Hancock Center, the Sears Tower and the Standard Oil Building are examples of high-rise buildings that were constructed with concrete utilizing fly ash.

Bottom ash is formed in the boiler when particles of ash fuse together such that they are too large to remain in the flue gas and fall to the bottom of the boiler. Bottom ash is a granular material that is medium brown in color, with similar chemical constituency as fly ash. Particles of bottom ash vary in diameter but approximate the size of coarse sand.

The material from the Wet FGD, gypsum, consists of solid particulates that will be routed to a dewatering building to remove excess water. Gypsum is a coarse granular material that will have the consistency of wet sand.

Big Cajun II Unit 4 will generate wastes from construction activities, normal operations, and maintenance activities. During construction of Big Cajun II Unit 4, scrap metal, wood, plastic, and other building materials will need to be transported offsite for reuse, recycling, or disposal as appropriate. During normal plant operations, Big Cajun II Unit 4 is expected to generate small amounts of paper, plastic, and general office wastes. In addition, Big Cajun II Unit 4 will likely generate small quantities of nonhazardous wastes, such as used oil drums, paint cans, lube oil filters, cleaning agents, spent coolants, and other maintenance wastes. Big Cajun II Unit 4, LLC will ensure proper containment, offsite transport and disposal of these materials and, if necessary, will contract for specialized waste management services.

Hazardous Waste Classification

Only small quantities, if any, of hazardous wastes will be generated at Big Cajun II Unit 4, predominantly related to routine maintenance activities such as, cleaning, painting and repairs. It is not expected that the hazardous wastes generated from Big Cajun II Unit 4 will change the current small quantity hazardous waste generator classification of Big Cajun II. Wastes generated at Big Cajun II Unit 4 will be properly collected, transported, and disposed of offsite at a permitted RCRA facility in accordance with federal and state solid and hazardous waste regulations or as otherwise appropriate. Based on similar history for existing Units 1 through 3, the hazardous waste classifications for these streams are expected to be flammables, corrosives, and metals-containing compounds.

2. How will they be handled?

a. Treatment
b. Storage
c. Disposal

Fly ash will be collected from Unit 4 at the economizer outlet hoppers, air heater outlet hoppers, and the fabric filter itself. An enclosed pneumatic conveying system will take the ash from these hoppers and convey it to a fly ash collection silo. The silo will be arranged so that the fly ash can be emptied into an ash truck to support transport and sale of the fly ash. The fly ash collection silo will be equipped with a baghouse for particulate matter control. Emissions from truck loading operations will be captured and routed to the baghouse dust collection system associated with the hopper that is being emptied. The ash will be transferred from the silos into dump trucks, covered and trucked offsite for resale. Ash that is not sold will be transferred from the silos into covered dump trucks and hauled to the fly ash impoundment for disposal.

Bottom ash from Big Cajun II Unit 4 will be collected from the boiler's bottom ash hopper. The bottom ash from the furnace that is not sold for reuse will be removed from the base of the boiler and placed into the existing bottom ash impoundment at the facility.

The gypsum will be collected at the gypsum dewatering building. In the building, gypsum from the Wet FGD will be processed to remove excess water and then transferred to outdoor storage piles. From the storage piles, the gypsum will be transferred into trucks and hauled off-site for beneficial reuse, or to a permitted solid waste unit located onsite for disposal.

Hazardous waste will not be managed on the premises in a manner that would require Unit 4 to be permitted as a hazardous waste treatment, storage, or disposal facility. The small amounts of hazardous wastes will be handled by outside contractors as needed and shipped offsite to permitted disposal facilities in approved containers or vessels. There will be no treatment, storage, or disposal of hazardous wastes at the site. Only licensed haulers will perform transportation of wastes. All hazardous wastes will be kept within approved containers until picked up by the transporter.

3. Sources of waste

a. On-site generation (type and percentage of total handled)
b. Off-site generation (type and percentage of total handled)

Over the course of a typical year of operation, total fly ash generation for Big Cajun II Unit 4 is expected to represent approximately 12 percent of Unit 4 generated wastes placed onsite. It is expected, however, that all of the fly ash will be sold for reuse. Total bottom ash generation for Big Cajun II Unit 4 is expected to represent approximately four percent of Unit 4 generated wastes placed onsite. Total gypsum generated at Big Cajun II Unit 4 is expected to represent approximately 84 percent of Unit 4 generated wastes placed onsite. The facility will not receive any wastes generated from off-site sources.

All wastes generated at Big Cajun II Unit 4 will be a result of on-site construction, maintenance, or operations activities. No wastes will be brought on-site from other sources. The types and percentages of these wastes, which are generally described above, will be in constant flux depending on the phase that Unit 4 is in, e.g., early construction, peak construction, normal operation, scheduled maintenance, etc.

4. Where will the wastes be shipped if not handled at this site?

Big Cajun II currently contracts with a local vendor for marketing and trucking of the fly ash generated at the facility. Big Cajun II Unit 4, LLC will similarly contract a vendor for trucking and marketing of the fly ash product to various cement manufacturing facilities in the region. No fly ash, bottom ash, or gypsum is expected to require offsite disposal. Any miscellaneous solid wastes or hazardous wastes that are not sent to authorized recyclers will be transported to permitted solid or hazardous waste disposal facilities in the region by outside contractors approved by LDEQ. Transporters are required to adhere to strict regulatory requirements for waste management and transport.

5. What wastes will remain on-site permanently?

Fly ash that is not sold will be placed in the existing fly ash impoundment at the site. Bottom ash that is not sold for reuse will be placed within the existing permitted bottom ash impoundment. Gypsum that is not sold for reuse will be placed in a permitted impoundment onsite. While Big Cajun II Unit 4, LLC

may elect to selectively move or rearrange these materials between the impoundments, these solid wastes will remain on-site. Clarifier sludge will also be placed in the impoundments for permanent disposal.

B. By which of the following potential pathways could releases of hazardous materials from the proposed facility endanger local residents or other living organisms?

1. Air
2. Water
3. Soil
4. Food

Potential pathways of releases of hazardous materials include air, water, and soil, none of which would be expected to result in endangerment to local residents or other living organisms. Potential air and water releases will be controlled by redundant protective equipment designs and operating conditions as detailed in the respective air and water permit applications for Big Cajun II Unit 4 and manufacturer specifications. Potential exposure due to water or soil pathways will be minimized through spill prevention and construction stormwater pollution prevention plans, as well as detailed, written standard operating procedures related to safety, health, security and environmental permit compliance. Food is not considered to be a potential pathway of releases due to the use of state-of-the-art pollution control equipment. Because any hazardous wastes that may be generated would be non-routine, small in terms of quantity, and only briefly present onsite within approved containers, there does not appear to be any realistic potential for exposure of hazardous materials to residents in the area adjacent to Big Cajun II Unit 4.

C. What is the likelihood or risk potential of such releases?

The combination of properly designed facilities and thoroughly trained personnel accomplishes the goal of minimizing the potential for accidental releases to the fullest practical extent. Furthermore, the rural nature of the facility and distances to nearest residences are such that the potential health risks to the public as a result of a release are extremely remote.

For example, anhydrous ammonia storage and handling is subject to process safety management and risk management planning to avoid potential air releases. In accordance with Chemical Accident Prevention regulations, the potential for ammonia releases will be minimized through the implementation of a Risk Management Plan prior to storage onsite. The Big Cajun II facility is designed to collect stormwater that falls within material handling and process areas. This stormwater is routed to the rainfall surge pond prior to monitoring and discharge.

The particulate control systems are proven, reliable technologies that minimize the potential for releases. For fugitive particulates, these technologies include baghouses on transfer points, enclosure of conveyors, wetting agents and pneumatic systems. In addition, particulate controls on the stack will include a baghouse prior to the Wet FGD scrubber.

Big Cajun II Unit 4, LLC will employ a highly trained and dedicated staff to operate the equipment. Experienced personnel will form the nucleus of the operating staff. Operations, maintenance, and support personnel will be thoroughly trained and periodically tested in the proper use and operation of appropriate equipment and will be familiar with the potential hazards of operating Big Cajun II Unit 4.

All employees will be properly trained, including regular periodic "refresher" training, in all applicable safety and operational procedures and activities that are standard for the electric power industry. In addition, employees will be properly trained in all applicable safety, industrial hygiene, and public health procedures and standards in accordance with the OSHA regulations. Furthermore, employees will be trained in the applicable pollution prevention, risk management planning, process safety, and spill prevention and control measures and procedures.

D. What are the real adverse environmental impacts of the permittee's proposed Facility?

1. Short term effects

a. Land area taken out of system

There are no significant short term adverse effects anticipated due to land area taken out of the system.

Big Cajun II Unit 4 will be located within property owned and developed for industrial use by LaGen. The high-sulfur bituminous coal will be stored within the existing coal storage piles, precluding the need for developing an additional storage area. Wastes generated as a result of this project will be disposed of in existing permitted surface impoundments, as possible. An additional surface impoundment may need to be developed for disposal of the Wet FGD scrubber sludge; however, it will be located within the boundaries of the LaGen owned property and constructed per LDEQ requirements. Thereby, no additional land will need to be acquired and taken out of use.

2. Long term effects

Long-term adverse environmental impacts will be minimized by the use of BACT, adherence to air and water permit emission limits and the use of BMP such as Spill Prevention and Control Plans and Construction Storm Water Pollution Prevention Plans. Additionally, the USEPA's Integrated Data for Enforcement Analysis database indicates that fossil fuel electric power generation facilities are inspected more than three times as often as facilities in most other industrial sectors. This increased inspection rate, however, has not resulted in a corresponding higher rate of enforcement actions. In fact, the enforcement action to inspection rate for fossil fuel electric power generation facilities is 0.06, one of the lowest rates for the industrial sectors reviewed (USEPA, 1997). This indicates that while State and Federal environmental agencies closely monitor fossil fuel electric power generation facilities, the facilities generally operate in compliance with all environmental regulations and requirements. Therefore, long-term adverse environmental impacts are not expected to be significant.

In conclusion, the potential adverse environmental effects of utilizing high-sulfur bituminous coal as the fuel source for Big Cajun II Unit 4 will be avoided through the employment of state-of-the-art air

pollution controls, the use of existing coal storage piles and solid waste units, collection and treatment of process and industrial stormwater, the use of existing surface water intake and discharge structures as well as a closed-loop cooling tower, and beneficial reuse of marketable ash and gypsum product. In addition, experienced personnel, implementation of rigorous construction and operating procedures, and strict adherence to applicable laws and regulations will avoid or significantly minimize any adverse environmental effects. Big Cajun II Unit 4's location within an existing power generation plant, stringent air emission controls and design standards further minimize the potential for significant adverse impacts to the environment or the community within which Big Cajun II Unit 4 will operate. Various reviews and approvals by government agencies indicate the use of this solid fuel will not cause significant adverse environmental effects.

2.0 Does a cost benefit analysis of the environmental impact costs balanced against the social and economic benefits of the proposed Facility demonstrate that the latter outweighs the former?

Big Cajun II Unit 4, LLC is requesting the option to use high-sulfur bituminous coal as a fuel source for Big Cajun II Unit 4. This option will allow Big Cajun II Unit 4, LLC to diversify its solid fuel source for Unit 4 and, in turn, continue to provide affordable and reliable electrical power to its cooperative members and their customers. As discussed in the response to IT Question 1, the potential and real adverse environmental impacts will be minimal. The economical and social benefits that will be gained through diversification of the solid fuel source at Big Cajun II far outweigh the minimal environmental impact costs.

A. How was it determined that this Facility was needed?

1. **Local or regional survey**
2. **On-site or off-site needs**
3. **Regional solid waste management benefit**
4. **Generic survey of solid waste needs (compatibility with master plan)**

The cost of the PRB subbituminous coal currently utilized by Big Cajun II has risen in recent times. This rise in cost is due to a number of factors including higher demand and transportation costs. Due to its low sulfur content, a number of existing coal fired units around the country have switched to PRB coal rather than installing the pollution controls necessary for the continued combustion of bituminous coal. In addition, this increased demand has congested rail transportation from the PRB, causing an increase in transportation costs. It was determined that diversification of the coal type used at Unit 4, would allow Big Cajun II Unit 4, LLC to continue to provide reliable, cost-effective electricity to its customers, even during times of rising PRB coal costs.

B. What will be the positive economic effects on the local community?

1. **How many permanent jobs will be created?**
2. **What is the expected annual payroll?**
3. **What is the expected economic multiplier from item B2?**
4. **What is the expected tax base and who will receive benefits?**

Diversification of its solid fuel type will allow Big Cajun II Unit 4, LLC to cost-effectively operate Unit 4 as well as avoid an interruption in fuel deliveries, which will provide positive economic effects for the local community. As discussed in the "Response to IT Questions (revised February 2005)" included in the September 2001 Title V Permit application, construction of Big Cajun II Unit 4 will provide significant economic and social benefits to Pointe Coupee Parish and the State of Louisiana through the creation of jobs, additional earnings for households, extra state and local taxes, and rising business activity throughout the Louisiana economy and the local area. In addition, the benefits of a more stable,

lower cost fuel source will be passed along to Big Cajun II Unit 4, LLC's customers in the form of low-cost, reliable electricity.

C. What will be the potential negative economic effects on the local community?

No negative economic impacts are anticipated from the proposed use of high-sulfur bituminous coal to fire Big Cajun II Unit 4. The unit is within an existing power generation plant that has been in operation for over 24 years. Big Cajun II Unit 4, LLC's commitment to hire employees, to purchase supplies locally, and the impact of tax revenues from the operation of Big Cajun II Unit 4, will provide economic benefits to the local community. In addition, the economic study that was performed for the original PSD application indicates a positive economic benefit for the region, and that study is incorporated herein by reference.

1. What are the possible effects on property values?

The area immediately in the vicinity of the Big Cajun II plant is sparsely populated. Big Cajun II Unit 4 will be located on property already occupied by an existing power generation plant that has been in operation for many years. Since the property is intended and already in industrial use and will be located adjacent to existing power generation units, the addition of Big Cajun II Unit 4 will not adversely affect neighboring property values.

2. Will public costs rise for:

a. Police protection
b. Fire protection
c. Medical facilities
d. Schools
e. Roads (also see below)

The use of high-sulfur bituminous coal to fire Unit 4 will not cause costs to rise for public services such as police protection, fire protection, medical services, schools, or roads. Big Cajun II Unit 4 and all associated coal handling/conveying areas will be located on property already being used for generation of electrical power. Big Cajun II Unit 4 will use the existing Big Cajun II plant's security system and surveillance.

Primary fire protection for the site and associated equipment will be provided by an expanded firewater system installed on-site. Big Cajun II has an existing fire brigade located on-site. Big Cajun II Unit 4 will not generate products or wastes, or store materials on-site, that might require firefighting capabilities greater than those that can be handled by on-site personnel or, in an extreme scenario, those currently available from local firefighting agencies.

There should be no need for additional medical facilities. Because permanent employees will be from the local community to the greatest extent possible, there will only be the normal need by the employees and their families for existing health care facilities. Big Cajun II Unit 4 will not generate products or wastes,

or store materials on-site, which might require medical capabilities greater than those currently available from local medical facilities.

There are no anticipated significant additional costs for schools as a result of this project. In fact, the economic impact from additional taxes on the new unit will provide a long term source of funds to improve local schools.

The impact on roads is also expected to be minimal. Raw materials and products will arrive at Big Cajun II Unit 4 primarily by rail or barge and will leave Big Cajun II Unit 4 by electric transmission lines, thus, resulting in minimal additional road traffic. Traffic resulting from trucks delivering parts and water treatment chemicals for Big Cajun II Unit 4's normal operations will be minimal, approximately two to three trucks per week for chemical deliveries and occasional delivers of parts on an as needed basis. As a result, there will be a slight, but not appreciable increase in road traffic during Big Cajun II Unit 4's operation. Even during Big Cajun II Unit 4's construction, it is not expected that existing roadways will be overburdened. In summary, there will be no new costs for public roadways, as the existing roads are sufficient for any anticipated traffic increase.

3. Does the prospective site have the potential for precluding economic development of the area by business or industries because of risk associated with establishing such operations adjacent to the proposed facility?

Big Cajun II Unit 4 will be located within an existing electrical power generation plant. The property is already owned by industry and intended and currently used for industrial development. As a result, the construction and operation of Big Cajun II Unit 4 does not preclude economic development in the area, but rather is expected to result in an increase in economic activity.

D. Was transportation a factor in choosing the proposed site?

1. What mode(s) of transportation will be used for the site?

a. Truck
b. Rail
c. Barge
d. Other

High-sulfur bituminous was chosen as an alternative solid fuel source for Unit 4 due to its ability to be transported via rail and barge. Big Cajun II currently has an existing barge unloading facility that is utilized in the delivery of PRB coal to the facility and will continue to be utilized for high-sulfur bituminous coal delivery as well. In addition, a possible loop will be added to the existing railspur and will also be used for both types of coal deliveries. The possible new rail spur will improve delivery reliability and will also avoid delivery interruption during critical river travel conditions (such as unusually high or low river water stages or ice-locked water upriver in the northern states in the winter).

Transportation by truck will be used for transport of ash and gypsum, and routine maintenance materials that cannot be brought to or delivered from the site by rail or barge. The increase in road traffic on state and local highways is considered minimal during the operations phase. Because the unit is located within an existing power plant, Big Cajun II Unit 4 will utilize existing local roads and the existing entrance road to the Big Cajun II facility.

2. What geographical area will it serve?

Big Cajun II Unit 4, LLC and LaGen, as subsidiaries of NRG Energy, Inc., hold exclusive power contracts with 11 Louisiana electric cooperatives and provide much of its generation to these entities. As such, the geographical area the Big Cajun II Unit 4 will serve is focused in the State of Louisiana. Given the rising price of PRB coal, the diversification of solid fuel sources will help to stabilize energy prices for Louisiana consumers.

The 11 electric cooperatives listed below serve over 1,000,000 Louisiana residents:

1. Southwest Louisiana Electric Membership Corporation
   Lafayette, Louisiana

2. Beauregard Electric Cooperative, Inc.
   DeRidder, Louisiana

3. Claiborne Electric Cooperative, Inc.
   Homer, Louisiana

4. Concordia Electric Cooperative, Inc.
   Jonesville, Louisiana

5. Dixie Electric Membership Corporation
   Baton Rouge, Louisiana

6. Jefferson Davis Electric Cooperative, Inc.
   Jennings, Louisiana

7. Northeast Louisiana Power Cooperative, Inc.
   Winnsboro, Louisiana

8. Pointe Coupee Electric Membership Corporation
   New Roads, Louisiana

9. South Louisiana Electric Cooperative Association
   Houma, Louisiana

10. Valley Electric Membership Corporation
Natchitoches, Louisiana

11. Washington-St. Tammany Electric Cooperative, Inc.
Franklinton, Louisiana

These cooperatives serve 55 of Louisiana's 69 parishes, covering nearly the entire state.

It is expected that the unit will also contribute to the wholesale market in Louisiana whenever the needs of the cooperatives are fulfilled. Because the cost of transmitting electricity generally increases with distance, economic factors favor local delivery.

3. By how much will local road traffic volume increase?

a. Can local roads handle the traffic volume expected?

b. Can local roads handle the weight of trucks?

Shipment of the high-sulfur bituminous coal will be transported to the facility via rail or barge and, therefore, will not affect road traffic volume. Gypsum, which will be produced in the Wet FGD system as a byproduct of SO_2 removal from the flue gas stream, has potential for beneficial reuse and will be marketed as such. Sold gypsum will be transported offsite in trucks in the same manner as sold fly ash is transported from the facility. However, the amount generated will be much less than the amount of fly ash generated, and the existing public roads will be more than adequate to handle the truck traffic and weight.

4. What are the long-term expectations of the proposed site?

a. Longevity of the facility?

Big Cajun II Unit 4, LLC intends to operate Unit 4 for up to 40 years or more depending on market conditions and equipment life.

b. Who owns the facility?

A project company known as Big Cajun II Unit 4, LLC, a wholly owned subsidiary of NRG Energy, Inc., will own Big Cajun II Unit 4. The property on which Big Cajun II Unit 4 will be located is owned by LaGen, a subsidiary of NRG Energy, Inc. NRG Energy, Inc. has multidisciplinary expertise and experience in developing, permitting, financing, constructing and operating complex power projects. The company focuses on the development and operation of clean, highly efficient electric power generation. To date, NRG has over 25,000 total megawatts of capacity in operation. NRG Energy, Inc. and its subsidiaries have extensive experience and an excellent record in safely operating units such as Big Cajun II Unit 4.

c. Are the owners financially backed by others?

It is expected that some portion of the capital investment (possibly as high as 40 percent) may be contributed by NRG Energy, Inc. The remainder of the investment may come from commercial bank loans. NRG Energy, Inc., the parent company of Big Cajun II Unit 4, LLC, is publicly traded on the New York Stock Exchange under the symbol NRG.

d. When is closure anticipated?

This question is more in line with a waste management facility and not a power plant. However, as stated above, Big Cajun II Unit 4 has a planned lifespan of up to 40 years. Retrofitting Unit 4 in the future may extend that efficient and useful lifespan even further if environmentally and economically feasible. Upon future closure of the facility, the regulated solid waste impoundments will be closed in accordance with the closure plan detailed in the existing solid waste permit.

e. Who is responsible for the site after closure?

LaGen and/or Big Cajun II Unit 4, LLC will be responsible for the Big Cajun II Unit 4 site and the permitted solid waste impoundments after closure.

f. What assurances will there be that the site will be closed in accordance with the plan?

LaGen has previously filed financial assurance documents with LDEQ for the solid waste impoundments, per regulatory requirements.

g. What financial assurances will be established to demonstrate the ability to handle problems after closure?

Financial assurances have been filed by LaGen for the closure and post closure care period of the regulated solid waste impoundments.

h. Who certifies that the site is properly closed?

LaGen and/or Big Cajun II Unit 4, LLC will certify that the regulated solid waste impoundments are properly closed at the time of facility closure.

i. How are people protected from unwittingly buying land after closure?

1) Is the closed facility recorded in the deed?
2) What future uses are possible?

The closed solid waste units will be reflected by deed notices and restrictions in accordance with Louisiana Solid Waste Rules and Regulations. Future uses of the remainder property are subject to zoning

conditions and plans of the buyer and the property owner, LaGen, but could include any approved industrial, commercial, or agricultural use.

In conclusion, the option to use high-sulfur bituminous coal as an alternative solid fuel source allows Big Cajun II Unit 4, LLC to cost-effectively operate Unit 4 and will enable them to continue to provide reliable, low-cost electricity to its consumers. Improvements in pollution control technologies that will be incorporated into the design of Unit 4 will minimize and/or prevent adverse environmental impacts. As discussed in the above responses, the economic benefits provided by the diversification of solid fuel sources for Unit 4 significantly outweigh the minimal environmental impacts posed by the use of high-sulfur bituminous coal.

3.0 Are there alternative projects, which would offer more protection to the environment than the proposed Facility without unduly curtailing nonenvironmental benefits? (This question requires the permittee to demonstrate having considered alternate technologies.)

The Big Cajun II Unit 4 facility will provide electricity to meet the needs of both industrial and residential consumers. Since electricity needs to be reliable, dependable and economical for both types of consumers, the fuel sources chosen for the generation of the electricity need to be reliable and economical. As discussed in the alternative fuel evaluation summary included in the response to the "Expanded IT Decision Questions (February 2005)" associated with the September 2001 Big Cajun II Unit 4 Title V Application, utilization of coal as a fuel source provided the economic and reliability benefits sought as a result of the project. By having the option to use high-sulfur bituminous coal, as well as PRB subbituminous coal, Big Cajun II Unit 4, LLC may continue to meet the increasing demand for low-cost reliable electric power and avoid any potential supply interruptions.

Big Cajun II Unit 4, LLC will minimize/prevent, to the maximum extent possible, adverse effects to the environment by taking advantage of state-of-the-art technology and pollution controls when handling and utilizing either type of coal. These technologies include use of an SCR, wet scrubber, baghouses, and closed material conveyance systems. A BACT analysis was conducted as discussed in Section 4.0 of the air permit modification, in order to ensure that the pollution controls selected offered the most protection without unduly curtailing non-environmental benefits. A brief discussion of the results of the BACT analysis is included in the subsequent responses.

A. Why was this technology chosen (e.g., incineration over landfilling?)

1. Are other technologies available?

2. Describe the engineering design and operating techniques used to compensate for any site deficiencies.

Alternative pollution control technologies are available and were evaluated for this project. As previously discussed in Section 1.0, PSD rules require application of BACT. In seeking a PSD permit, a facility must evaluate potentially available pollution control technologies among competing alternatives to select BACT. BACT for the coal-fired Unit 4 varies by pollutant and is based on proven technologies in use across the United States and accepted by the U.S. Environmental Protection Agency. An in depth discussion of the technologies evaluated and chosen for this project is included in Section 4.0 of the Big Cajun II Unit 4 Project Title V Modification. A summary of the results of the BACT analysis for each pollutant is described below.

For this project, the use of low-NO_X coal burners (LNBs) in the boiler itself and an SCR for further reduction of NO_X emissions from the boiler flue gas will be employed for the new unit to maintain a NO_X

limit of 0.07 lb/MMBtu. Ammonia slip (excess unreacted ammonia used in the SCR process) will be limited to 2 ppmv in the flue gas that exits the stack.

In order to comply with the new federal regulations requiring mercury removal, a PAC system is being proposed. In order to remove mercury from the flue gases, a sorbent material, usually PAC, is injected into the gas stream. This sorbent absorbs mercury and allows it to be removed from the system. A second sorbent may be necessary in order to reduce sulfuric acid mist in the gas stream prior to the baghouse. This is not intended to actively control the outlet sulfuric acid mist emission rate as much to reduce bag corrosion and extend bag life. It is possible that a dry alkaline sorbent would need to be injected into the gas stream. This sorbent could potentially be a fine powdery substance and is a potential particulate matter emission source. Should Big Cajun II Unit 4, LLC choose to utilize a dry sorbent injection system to control sulfuric acid mist emissions, the material would be trucked on-site and transferred into a silo using a pneumatic system. Emissions from the silo would be controlled through the use of a high efficiency filtration system, which would reduce emissions by at least 99 percent.

After passing through the SCR and sorbent injection systems, particulate matter, consisting mostly of fly ash and sorbents that are entrained in the flue gas will be collected in a fabric filter (baghouse). In the fabric filter, the particulates collect on the filter bags as the gas passes through. The collected particulates form a cake on the bag, which increases efficiency of the filter. The bags are periodically cleaned by reverse air deflection or pulses of air that shake the bags, with the particulates collected into hoppers. From the hoppers, the material is transferred via an enclosed system to silos where it is either sold to off-site consumers or shipped to the existing on-site landfill.

Following the fabric filter, the flue gas is routed to a Wet FGD system to remove SO_2. Crushed limestone is routed to a slurry tank and mixed with water. The slurry is then injected into the Wet FGD system where it reacts with the flue gas and removes SO_2. The resulting material can be oxidized to form gypsum which can then be dried and used in a variety of processes, including wallboard manufacturing. Big Cajun II intends to sell as much of the gypsum as possible as a beneficially reused product. Any excess gypsum that cannot be sold will be stored in the on-site landfill.

Big Cajun II Unit 4's supporting coal, ash, gypsum, and limestone handling and storage operations will also generate PM_{10} emissions. All affected equipment will utilize emission control measures that represent BACT for coal-fired power plants, including various combinations of dust suppression by wetting agents, enclosures, and/or ventilation to baghouses. In general, BMPs per the USEPA's AP-42 will be implemented to reduce dust emissions. Where baghouses are used, baghouse vent emissions will be controlled to an exit grain loading of better than 0.005 grains per dry standard cubic foot (gr/dscf), or a control efficiency of at least 99 percent, whichever is more stringent. Particulate matter collected in baghouses will routinely be recycled to the appropriate handling/storage system, sold as recycled marketable material, or placed in the existing impoundments at the plant.

Limestone unloading and conveying systems will be covered and emissions suppressed by a combination of baghouses and water sprays. The limestone transfer tower will be enclosed and use high efficiency wet suppression to control emissions. The pulverizing of the limestone will occur inside of a totally enclosed

building in a wet ball mill, and all emissions generated through this process are completely contained within the system. Coal conveyors will be enclosed to prevent the release of PM_{10} emissions and coal transfer points and the primary coal crusher will be completely enclosed and ventilated to a baghouse. Potential air emissions from the coal pulverization operation for Unit 4 will be completely eliminated by pneumatically routing all such emissions to the Unit 4 boiler, in which they will be combusted. Wetting agents will be used at various locations, as necessary, to prevent the release of fugitive coal dust emissions.

Boiler bottom ash will be handled wet in an enclosed system, eliminating the potential for PM_{10} emissions from the bottom ash processing operations. PM_{10} emissions from fly ash conveyance to the fly ash silo and from fly ash truck loading operations will be captured and routed to baghouse dust collection systems. Fly ash will be wetted (approximately 10 percent water) at the silo to minimize emissions during the unloading of the fly ash into the storage impoundments. Big Cajun II operates a road wetting truck to minimize dust emissions from truck traffic within the plant.

PM_{10} emissions will also occur from cooling tower operations when drift (small water droplets) escapes the cooling tower. PM_{10} emissions from the cooling tower will be minimized by using a mechanical drift eliminator that keeps drift to 0.002 percent of the circulating water rate and by limiting the total dissolved solids level in the circulating cooling water to approximately 1,200 ppmw.

For CO and VOC emission control, good combustion techniques and optimum burner design will be used.

HAPs are not required to be analyzed per recent federal actions, and are no longer covered by Federal case-by-case MACT requirements under 40 CFR Part 63, as referenced in LAC 33:III.5122. Nevertheless, the emissions controls planned for the project would in fact meet MACT standards for HAPs, if such a demonstration were required. It is expected that the redundant systems for particulate control will reduce metal emissions to the maximum levels practical with today's technologies. Emissions of organic HAPs are controlled to a high degree by the combustion controls used on the boiler, and acid gases are well controlled by the Wet FGD system.

As detailed above, Big Cajun II Unit 4, LLC has evaluated the environmental impacts of utilizing high-sulfur bituminous coal and has determined that no alternative, other than that described above, would be more protective of the environment without unduly curtailing non-environmental benefits. The state-of-the-art coal combustion and pollution control technology to be used at Big Cajun II Unit 4 has been successfully utilized in other plants to safely produce steam and electricity in an environmentally sound manner.

B. Is the proposed technology an improvement over that presently available?

A number of technology improvements have been made by industry that make combustion of higher sulfur bituminous coal as safe and clean as the lower sulfur subbituminous coal. Wet flue gas desulfurization technology was identified as BACT to effectively reduce SO_2 emissions generated by the use of bituminous coal. This technology is a well-established process for removing SO_2. First applied in

the early 1970s, FGD systems have been the subject of continuous research and innovation over the past 30 years. The first generation of FGD systems were limited to relatively low removal efficiency (70 percent) and subject to numerous and frequent material and equipment failures. In contrast, the current generation of systems is capable of achieving low outlet emissions (0.10 lb SO_2 per million Btu) and attaining reliability ratings comparable to the steam generator.

Wet FGD systems use either lime (CaO) or limestone ($CaCO_3$) as a reagent and are capable of producing calcium sulfate (gypsum) as a byproduct that can be used in the manufacture of cement or wallboard. Gypsum not sent to offsite uses can be safely disposed of in permitted solid waste units.

C. Describe the reliability of technology chosen.

1. Past experiences.
2. Environmental Impacts.

The reliability of the pollution control equipment for use of PRB and proposed for high-sulfur bituminous coal at the Big Cajun II Unit 4 is well established and has been proven as reliable methods for reduction of emissions. SCR and low-NO_X burners for NO_X control are accepted as current BACT, with vendor guarantees of emissions reductions. SO_2 removal via the Wet FGD scrubber system is proven to be effective with up to 98 percent removal efficiencies, and is offered by a number of vendors. The use of baghouses for particulate control is also highly effective, with removal efficiencies of 99.9 percent. The use of LDEQ approved solid waste units for disposal of bottom ash, unused fly ash, and unused FGD waste over the past 24 years has proven to be effective, with no releases to groundwater. Since coal is a naturally occurring, abundant material, impacts to the environment due to coal spills would be benign by nature.

D. Describe the sequence of technology used from arrival of wastes to the end process at the facility (flow chart).

1. Analysis of waste
2. Unloading
3. Storage
4. Treatment
5. Monitoring
6. Closure
7. Post-closure
8. Disposal
9. Any residuals requiring further handling

This question is not applicable because no wastes will be received at Unit 4.

E. Will this Facility replace an outmoded/worse polluting one?

This question is not applicable as the Unit 4 project involves the utilization of an additional coal type and not replacement of a facility.

F. What consumer products are generating the waste to be disposed? Are there alternative products that would entail less hazardous waste generation?

The project will supply economic and reliable electrical power needed by residents and businesses in Louisiana served by the Louisiana member cooperatives, as well as to the wholesale electrical market. The technology to be used by Big Cajun II Unit 4 will result in little or no hazardous waste generation.

In conclusion, Big Cajun II Unit 4, LLC has chosen an environmentally compatible technology with highly efficient, commercially proven technology to supply low-cost electricity to its member cooperatives in Louisiana and to the wholesale grid. Given NRG Energy, Inc.'s (and Louisiana's) need for diversification and reliability of fuels, coal has been selected as the fuel of choice, specifically PRB subbituminous and high-sulfur bituminous coal. Based on a review of coal combustion technologies, various particulate and post combustion controls have been designed into Big Cajun II Unit 4 that represents current BACT for these coal types. No other alternative projects would offer more protection to the environment. Big Cajun II Unit 4 is designed to comply with all applicable environmental regulations to minimize any adverse impacts the facility may have on the environment. As discussed previously, the technology to be used will result in little or no hazardous waste generation and incorporates a number of pollution prevention methods recognized by USEPA and the "top" technologies in use at pulverized coal-fired plants around the country.

4.0 Are there alternative sites, which would offer more protection to the environment than the proposed facility site without unduly curtailing non-environmental benefits? (This is the question that deals directly with siting criteria.)

This question is not applicable as the proposed project involves the utilization of an additional coal type and not construction of a new facility. A siting evaluation for placement of Big Cajun II Unit 4 was conducted and discussed in the September 2001 Big Cajun II Unit 4 Title V Application and IT Analysis (revised February 2005) and is incorporated herein by reference.

5.0 Are there mitigating measures which would offer more protection to the environment than the Facility as proposed without unduly curtailing non-environmental benefits? (This question requires the permittee to demonstrate having considered the most stringent techniques for reducing or more efficiently handling waste.)

No. There are no mitigating measures that would offer more protection for the environment than the current design of Big Cajun II Unit 4. Unit 4, subject to the PSD Regulations, will meet BACT for all criteria pollutants. Therefore, there are no additional air emissions controls that would significantly reduce emissions without significantly curtailing non-environmental benefits. These controls and the justification of each along with emissions limits are discussed in detail elsewhere herein.

A. Is this Facility part of a master plan to provide waste management? Whose plan?

1. How does it fit into the plan?

2. What geographical area is served by the plan?

The question deals specifically with municipal waste management and is not applicable to the use of an additional coal type.

B. Does this facility fit into an integrated waste management system? (reduction, recovery, recycling, sales tax, exchange, storage, treatment, disposal).

1. On-site

2. Regional

The question deals specifically with municipal waste management and is not applicable to the proposed project.

C. Can waste be disposed in another fashion (way)?

1. Technology limitations

2. Cost factors

3. Other reasons

The fly ash and bottom ash will be managed in the most effective manner practiced for plants of this nature. Via the use of baghouses, maximum amounts of fly ash will be collected for potential resale. The flue gas desulfurization system will use limestone with forced oxidation to produce commercial grade gypsum which also has the potential to be beneficially reused in the manufacturing of cement and wallboard. Bottom ash, unsold fly ash, and unsold gypsum will be disposed on site in properly permitted solid waste units. The only alternative to the onsite disposal option is offsite disposal at a commercial facility; however, given the fact that the permitted impoundments are already in operation and provide adequate protection to the environment, the costs for offsite disposal are prohibitive.

Any minor amounts of hazardous waste generated by Big Cajun II Unit 4 will be hauled of-site by licensed contractors and disposed of in licensed disposal sites permitted by the State of Louisiana.

D. What quality assurance control will be utilized to protect the environment?

1. **Plans for lab work**
2. **How are out-of-spec wastes handled**
3. **What happens to rejected wastes**
4. **Treatment stabilization**
5. **Segregation of noncompatible wastes**
6. **Handling of containerized wastes**

Big Cajun II Unit 4, LLC will only dispose of bottom ash, unsold fly ash, and unsold gypsum onsite in the permitted solid waste units in accordance with their Solid Waste Permit.

Big Cajun II Unit 4 will also generate waste from construction activities, normal operations, and maintenance activities. During construction of Big Cajun II Unit 4, scrap metal, wood, plastic, and other building materials will need to be transported off-site for recycling or disposal as appropriate. During normal plant operations, Big Cajun II Unit 4 is expected to generate small amounts of paper, plastic, and general office wastes. In addition, the plant will likely generate small quantities of nonhazardous wastes such as used oil drums, paint cans, lube oil filters, cleaning solvents, spent coolants, and other maintenance wastes. Big Cajun II Unit 4, LLC will ensure proper disposal of solvents, coolants, and other special wastes, and if necessary, will contract for specialized waste management services.

Big Cajun II Unit 4, LLC will provide training to its employees regarding multiple environmental programs. This training will include the importance of waste minimization and proper disposal of wastes generated onsite. This effort will help ensure non-compatible wastes are not mixed and that all wastes are stored, packaged, labeled, and disposed of properly in compliance with the applicable environmental regulations.

E. Innovative techniques used to control release of waste or waste constituents into the environment.

1. **Surface impoundment**
2. **Land application treatment**
3. **Landfill (burial)**
4. **Incinerator**
5. **Container storage**
6. **Tanks**

Big Cajun II Unit 4, LLC will implement feasible methods to control the release of wastes or waste constituents into the environment. As previously discussed, Big Cajun II Unit 4, subject to the PSD regulations, will meet BACT for all criteria pollutants, thereby controlling air emissions to the maximum extent feasible. Wastes generated as a result of the combustion of coal at Big Cajun II Unit 4 will be

marketed for beneficial reuse or disposed in properly permitted solid waste units. Stormwater associated with industrial activities, including the coal storage area, will be collected and routed to an existing impoundment for treatment prior to discharge through an LPDES permitted outfall. The effluent limitations, monitoring requirements, and any other conditions stated in the LPDES permit will be followed.

APPENDIX H
ACID RAIN PERMIT