APPENDIX C
ENVIRONMENTAL IMPACT QUESTIONS

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, as detailed below, Entergy Louisiana, LLC (ELL) has carefully evaluated this portion of the IT inquiry and has concluded that the proposed Little Gypsy 3 Repowering Project avoids potential and real adverse environmental effects to the maximum extent possible. Potentially adverse environmental impacts due to the construction and operation of the new Circulating Fluidized Bed (CFB) units have been avoided/mitigated through the appropriate selection of technology, efficient use of fuel, use of an existing power station site, retirement of an existing gas fired boiler, and the use of existing infrastructure. To minimize off-site impacts, ELL will use state-of-the-art air emission control technology such as Selective Non-Catalytic Reduction (SNCR) for nitrogen oxides (NOx), sulfur dioxide (SO_2) scrubbers, dust collection systems (bag houses), and monitoring and automatic control systems in the design for the facility. Best Management Practices (BMPs) are also utilized to prevent any unauthorized discharge and minimize water-related impacts to the environment. Soil impacts will be minimized by proper waste management, recycling, and proper disposal. Impacts to crops, livestock, or agriculture are not anticipated.

The Little Gypsy Facility has been selected to minimize any environmental impacts. The Little Gypsy 3 Repowering Project will be confined to the existing facility footprint, which is a developed, ELL-owned property. Because the existing facility has an existing river intake and permit, wastewater discharge permit, and accessibility to barge-navigable waterways, roads and electrical transmission lines and tie-ins are easy to accomplish and minimize the need to disturb additional land, thus reducing the impact from construction activities.

ELL has evaluated a number of power generation options and selected the CFB boiler technology, a type of fluidized bed combustion (FBC) that is recognized for its environmental performance. The FBC technology is one of the major technologies developed under the Advanced Electric Power Generation of the U.S. Department of Energy's (DOE) Clean Coal Technology Program. The Clean Coal Technology Program, which is sponsored by the DOE and administered by the National Energy Technology Laboratory, is a partnership between the federal government and industry that supports the DOE's mission to foster a secure and reliable energy supply system in the U.S. that is both environmentally and economically sustainable. The Clean Coal Technology Program started in the mid-1980s with the objective of broadening the range of technological solutions available to eliminate environmental concerns associated with

the use of coal for electric power production and has resulted in clean coal technologies that are capable of complying with existing and emerging environmental regulations for the world energy marketplace. It has involved a series of demonstration projects that provide data for design, construction, operation, and technical/economic evaluation of full-scale applications. Most of the demonstrations have been conducted on a commercial scale, in actual user environments, and under circumstances typical of commercial operations. Two follow-on programs have been developed that build on the successes of the Clean Coal Technology Program: the Power Plant Improvement Initiative (authorized by Congress in 2001), and the Clean Coal Power Initiative (authorized by Congress in 2002). Five demonstration projects involving FBC technology have been conducted through the Clean Coal Technology Program. The Clean Coal Technology Program project at the JEA (formerly Jacksonville Electric Authority) petroleum coke and coal-fired Northside Generating Station demonstrated that the CFB boiler technology can be utilized to meet large-scale base load power demands while complying with the most stringent air-quality regulatory requirements.

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

The potential environmental impacts of the proposed Little Gypsy 3 Repowering Project are described below by media.

Air

The air emissions from the proposed Little Gypsy 3 Repowering Project will result primarily from the boiler unit and fugitive particulate sources. The boiler will generate substances associated with burning solid fuels, including carbon monoxide (CO), SO_2, NO_X, particulate matter with less than 10-micron diameters (shown as PM_{10}), and volatile organic compounds (VOCs). The Little Gypsy 3 Repowering Project will involve the permanent decommissioning of the existing Unit 3 boiler. This decommissioning will result in a decrease in emissions at the facility. A summary of the proposed project emissions and net emissions resulting from this project is included in Table 1-1.

Table 1-1
Little Gypsy 3 Repowering Project Net Annual Emissions

Pollutant	Potential Controlled Emissions (tpy)	Emissions Decrease from Unit 3 Decommissioning (tpy)	Net Emissions Change (tpy)
NO_X	1,404	3,433	-2,029
SO_2	3,539	5.5	3,534
PM/PM_{10}	294.6	25	269.6
CO	2,359	702	1,657
VOC	110.9	46	64.9
H_2SO_4	28.3	--	28.3
Lead	0.35	--	0.35
Fluorides (as HF)	19.7	--	19.7

Each of the two CFB boilers will be designed to fire various solid fuels with maximum heat input rates of 2,828 million BTU per hour (MMBtu/hr). CFB boiler technology is significantly different from conventional (i.e., pulverized coal, stoker, or cyclone) boiler technology and offers reduced emissions of SO_2 and NO_X associated with the injection and use of limestone as part of the bed matrix and the relatively low temperatures at which the fuels burn. As such, the CFB boiler technology is considered a Clean Coal Technology by the DOE.

In a CFB boiler, solid fuel and a sorbent (typically limestone) are jointly fed directly to the combustion chamber. Primary air is injected from the bottom of the combustion chamber to provide combustion air as well as to fluidize the burning bed. Fluidization of the bed allows for high heat transfer rates at relatively low combustion temperatures. Because of the turbulence and velocity in the circulating bed, the fuel mixes with the bed material quickly and uniformly. Secondary air is introduced at various levels to ensure solids circulation, provide staged combustion for NO_x reduction, and supply air for continuous fines combustion in the upper part of the combustion chamber. This staged combustion results in more complete burn of the fuel, resulting in lower emissions of CO, VOCs, and PM_{10}.

The emissions from the boiler and fugitive sources are subject to both National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) rules. This is important because, as discussed below, these rules are specifically designed to ensure that there are no significant adverse impacts to human health or welfare, and that there is no significant deterioration of existing air quality. The NAAQS establish both primary standards, designed to

protect human health, and secondary standards, designed to protect public welfare (i.e., aesthetics, etc.)[1]. The primary NAAQS establish concentrations of certain criteria pollutants that can exist in the ambient air (which is defined as air outside of industrial facility boundaries) without causing adverse health impacts. The standards are set to provide an ample margin of safety and to consider the cumulative impacts from all emissions in the area, including those from industrial facilities, as well as those from area sources such as motor vehicles.[2] The NAAQS are incorporated into state law under LAC 33:III.Chapter 7.

The PSD program extends even further protection to ambient air. The PSD rules are applicable for all criteria pollutants in areas that already have ambient air quality better than required by the NAAQS. These rules were designed to keep such "clean" air areas from backsliding into non-attainment with the NAAQS. They provide a ceiling on how much additional pollution can be tolerated through setting PSD "increments," which are small allowable additions to the baseline clean ambient air levels already in existence when the PSD rules for each criteria pollutant were established. Thus, the PSD rules do not necessarily allow ambient air quality levels in an area to rise up to the NAAQS levels, which, as discussed previously, have been determined to be protective of human health with an adequate margin of safety. LAC 33:III.509 contains the PSD rules.

St. Charles Parish is in compliance with all NAAQS, including the recently promulgated $PM_{2.5}$. This means that the PSD rules apply to all criteria pollutants in St. Charles Parish. The PSD rules apply to emissions of PM10, NOX, SO2, VOCs, CO, lead, and certain other sulfur compounds. These rules will not allow any new growth in industry if certain levels of these criteria pollutants are exceeded.

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[1] In a publication entitled "EPA's Updated Clean Air Standards A Common Sense Primer," September 1997, EPA stated: "Since the Clean Air Act's inception in 1970, Congress has directed EPA to set National Ambient Air Quality Standards (NAAQS) for the six most common air pollutants. The Clean Air Act requires these standards to be set **at levels that protect public health."** Emphasis added. In another publication, "The Plain English Guide to the Clean Air Act," EPA-400-K-93-001, USEPA further explained the NAAQS as follows: "A few common air pollutants are found all over the United States. These pollutants can injure health, harm the environment and cause property damage."

EPA calls these pollutants criteria air pollutants because the agency has regulated them by first developing **health-based criteria (science-based guidelines)** as the basis for setting permissible levels. One set of limits (primary standards) protects health; another set of limits (secondary standards) is intended to prevent environmental and property damage. A geographic area that meets or does better than the primary standard is called an attainment area; areas that don't meet the primary standard are called nonattainment areas. The Little Gypsy site is located in a parish that is attainment for all criteria pollutants.

[2] The Clean Air Act requires EPA to review the NAAQS every five years to assure that the standards provide adequate public health protections. The law also requires EPA to consult with the Clean Air Scientific Advisory Committee (CASAC), a Congressionally-mandated group of independent scientific and technical experts drawn from academia, industry, and the states.

In addition to providing for only incremental increases in ambient concentrations (which fall below NAAQS allowable health-based levels), the PSD rules also require application of Best Available Control Technology (BACT). In seeking a PSD permit, a facility must evaluate potentially available pollution control technologies among competing alternatives to select BACT. In conducting this review, the applicant must use a "top down" approach, whereby the available technology that results in the lowest emissions must be selected first and can be rejected as BACT only if other environmental, energy, or economic considerations indicate that it is not feasible. The BACT review for this permit is contained in Part 4 of the application for the Little Gypsy Facility.

As discussed in Part 4 of this application, BACT for the CFB Unit varies by pollutant and is based on proven technologies in use across the U.S. and accepted by the U.S. Environmental Protection Agency. For this project, BACT for solid fuel-fired units at various plants was evaluated, from the EPA's RACT/BACT/LAER Clearinghouse (RBLC) and from accepted industry standards and BMPs. The technologies to be used for this project are summarized in Table 1-2 and Table 1-3.

Table 1-2
Steam Generators BACT Summary

Pollutant	Control Method	Emission Limit lb/MMBtu
NO_X	CFB Technology and Selective Non-Catalytic Reduction (SNCR)	0.07 (base load) 0.15 (<60% load)
SO_2	CFB Technology and Limestone Injection with post-combustion Lime Spray Dryer (FGD)	0.15
PM_{10} Filterable	CFB Technology and Fabric filter	0.011
PM_{10} Condensable	No direct control	--
CO	Combustion Controls	0.10 (base load) 0.15 (<60% load)
VOC	Combustion Controls	0.0047
H_2SO_4	CFB Boiler Technology, FGD, and Fabric filter	0.0012
Fluorides (as HF)	CFB Boiler Technology, FGD, and Fabric filter	$8.34 \cdot 10^{-4}$

Table 1-3
Other Sources Control Technology Summary

Pollutant	Source	Control Method	Emission Limit
PM_{10}	Barge Unloading	Wind screen / Wet Suppression	--
	Outside Conveyors	Covered conveyors / Wet suppression	--
	Barge Unloading Transfer Tower	Enclosure / Wet suppression	--
	Storage Transfer Tower	Enclosure / Wet suppression	--
	Fuel and Limestone Storage	Wet suppression	--
	Petroleum Coke Reclaim Tower	Full Enclosure / Baghouse	Baghouse efficiency 99%
	Coal/Limestone Reclaim Tower	Full Enclosure / Baghouse	Baghouse efficiency 99%
	Diverter Tower	Full Enclosure / Baghouse	Baghouse efficiency 99%
	Crusher Tower	Full Enclosure / Baghouse	Baghouse efficiency 99%
	Fuel/Limestone Storage Silos	Full Enclosure / Baghouse	Baghouse efficiency 99%
	Lime Silo	Full Enclosure / Baghouse	Baghouse efficiency 99%
	PAC Silo	Full Enclosure / Baghouse	Baghouse efficiency 99%
	Sand Silo	Full Enclosure / Baghouse	Baghouse efficiency 99%
	Fly Ash / Bed Ash Silos	Full Enclosure / Baghouse	Baghouse efficiency 99%
	Ash Truck Loading	Vacuum system	--
	Haul Roads	Maintenance of paved surfaces, watering as necessary	--

For NO_X, the CFB boiler technology itself, coupled with SNCR 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 5 ppmv in the flue gas that exits the stack. The CFB boiler technology, with a polishing scrubber on the back-end, maintains a BACT limit of 0.10 lb/MMBtu for SO_2. The polishing scrubber operates by flue gas entering into a scrubbing chamber and then reacting with an atomized slurry of slaked lime and recycled reagent. The product of this reaction of the desulfurized flue gas and solid particulates consists mostly of nonhazardous calcium sulfite, calcium sulfate, and unreacted lime. Particulate matter generated in the polishing scrubber process is collected in a fabric filter (bag house) collector, as described below.

For PM_{10} control for the boiler flue stack, bag house filters will be installed for removal of fly ash. Downstream of the polishing scrubber, particulates from the scrubbing process will be collected in a series of bag house fabric filter modules. In the bag house, 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.

The Little Gypsy Facility's solid fuel, ash, scrubber by-product, limestone, and lime 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 bag houses. In general, BMPs per EPA's AP-42 will be implemented to reduce dust emissions. Where fabric filters are used, bag house vent emissions will be controlled to an exit grain loading of better than 0.02 grains/dscf, or a control efficiency of at least 99 percent, whichever is more stringent. Particulate matter collected in bag houses will routinely be recycled to the appropriate handling/storage system and will potentially be sold as recycled marketable material, or will be placed in silos or properly permitted solid waste facilities.

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

Hazardous air pollutants (HAPs) are below levels that would trigger a federal case-by-case Maximum Achievable Control Technology (MACT) analysis 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.

The projected maximum emissions of CO, NO_X, SO_2, VOCs, and PM_{10} have been modeled to determine potential worst-case ambient air concentrations at and beyond the facility's property line. The air dispersion modeling analysis is presented in Part 5 of this application and Appendix J contains an electronic copy of the modeling results. 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 proposed 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 reporting of any permit deviation, semiannual compliance reports, annual compliance certifications, an automated data acquisition and handling system, and a continuous emissions monitoring system on the stack.

Waste Generation and Control

The proposed Little Gypsy 3 Repowering Project is designed to meet or exceed all existing environmental regulations. Adverse environmental impacts will be avoided to the maximum extent possible. Waste that will be generated as a result of the operation of the CFB unit will consist of nonhazardous fly and bottom ash. A number of industrial applications have been found for fly and bottom ash, including soil stabilization, soil amendment, and concrete production. ELL intends to market the ash generated by the CFB units for these applications. Polishing scrubber wastes (a solid waste stream collected in the baghouse) will also be generated as a result of the proposed project from the polishing scrubber. All nonhazardous ash and scrubber waste that is not sold for reuse will be disposed of in a properly permitted solid waste facility.

No significant hazardous wastes are expected to be generated 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 on-site.

Water

The proposed Little Gypsy 3 Repowering Project will not require the incremental use of sub-surface groundwater for construction or operation of the facility. The plant will utilize the existing once-through cooling system, which utilizes an average 631.7 million gallons per day (mgd) of water supplied by the existing water intake structure along the Mississippi River and discharged back to the Mississippi River, in accordance with the facility's Louisiana Pollution Discharge Elimination System (LPDES) permit. Through the utilization of these existing structures, impacts due to water withdrawal and discharge are expected to be insignificant.

The proposed Little Gypsy 3 Repowering Project has been designed to utilize the existing once-through cooling systems. In addition, a small new cooling tower will be added to provide for the incremental equipment auxiliary cooling loads. The existing intake and outfall structures will also be maintained. Utilization of this existing infrastructure will further minimize impacts to the environment.

The section of the Mississippi River near the existing Little Gypsy Facility is designated for primary and secondary contact recreational uses, fish and wildlife propagation, and drinking water supply. This subsegment is not a designated outstanding natural resource water and is often used as both a source water and receiving stream for industrial users. Downriver from the proposed site, the Mississippi River supplies raw water to a number of public potable water suppliers, including parishes and municipalities, such as, Jefferson Parish and the City of New Orleans, which treat the water prior to distribution. The closest drinking water intake is at St. Charles Waterworks in New Sarpy, Louisiana near River Mile 125. The water discharged from the Little Gypsy Facility will combine with an average Mississippi River flow of 300,000 mgd. Therefore, due to mixing capacity, pretreatment, and distance (approximately 5 miles downstream) impacts to a drinking water intake or to Mississippi River water quality will be negligible. In addition, the regulations and policies established by the Louisiana Department of Environmental Quality (LDEQ) will ensure that the LPDES permit contains the provisions necessary to adequately protect the receiving streams.

Storm water management is part of a major national initiative to ensure that industrial facilities use proper design and engineering concepts to reduce storm water runoff pollution. Through a combination of structural controls, such as containment dikes, berms, and drainage systems, and by adhering to stringent safeguards to avoid unplanned releases of chemicals to the environment, the proposed Little Gypsy 3 Repowering Project is designed to minimize the quantity of storm water runoff that will come in contact with potential contaminants by enclosing all storage areas. Regular visual inspections throughout the facility will ensure that any potentially contaminated storm water will be routed, as appropriate, to the oil water separator or through the LPDES program. The existing storm drainage system of pipes and ditches will be expanded to include proposed Little Gypsy 3 Repowering Project and will be used to convey storm water associated with industrial activity to the rainfall surge pond for discharge through the existing outfall.

BMPs will be followed to prevent and control the discharge of pollutants from accidental release incidents. The comprehensive contingency plans, operating procedures, Spill Prevention Control & 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. The comprehensive contingency plan for the proposed Little Gypsy 3 Repowering Project will address risks associated with spills and/or discharges from same.

The aforementioned plans, as applicable to Little Gypsy Facility, must include a prediction of the direction, rate of flow, and total quantity of applicable substances that could be spilled at the site, where experience indicates there is 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, sumps, and collection systems.

ELL is fully committed to developing 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.

During construction, some temporary increase in suspended sediment loads and erosion may occur. The construction areas are of a size that an LPDES general permit for storm water discharges is required and will be obtained for the construction activities. Additionally, a Storm Water Pollution Prevention Plan (SWPPP) will be implemented to minimize any such impacts. Storm water runoff in all construction areas will be managed so as to prevent adverse effects on storm water ditches and surrounding areas.

Soil, Food, and Additional Impacts

The site of the Little Gypsy 3 Repowering Project is located on industrial land owned by, and within the fence line of ELL's existing Little Gypsy Facility. Construction of the power block is not expected to adversely impact the geology, topography, soils, vegetation, food, visibility/opacity in the area or to 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.

Source-Related Growth

The proposed Little Gypsy 3 Repowering Project will be located entirely within the existing Little Gypsy Facility in St. Charles Parish, Louisiana. Louisiana 2000 census data report the parish's population as 48,072, an increase of approximately 13.0 percent from 1990 to 2000. (US Census, 2001) Significant population growth associated with the proposed project is not expected.

At its peak, construction activity for the proposed Little Gypsy 3 Repowering Project is expected to create, directly or indirectly, about 690 new jobs in the region. Most of the construction positions are expected to be filled with members of the surrounding communities (primarily the Baton Rouge and New Orleans metropolitan areas). Once constructed, facility operation is expected to employ 57 workers directly, and indirectly employ 109 workers within the parish. Operational positions are also expected to be filled by members of the local and surrounding

communities. Thus, the employment of workers for this project is well within the normal fluctuations of the local economy and should not result in any significant population growth problems to the surrounding community.

In addition, the proposed Little Gypsy 3 Repowering Project should not result in any significant residential, commercial, or industrial growth problems surrounding the facility since its construction and operation will be supported by existing residents and commercial establishments.

Sensitive Soils and Vegetation

Potential impacts to soil and vegetation were evaluated in accordance with the Clean Air Act and a discussion is provided in Part 7 of the application. This analysis includes a comparison of the maximum predicted impacts to screening thresholds for specific plants. The comparison indicates the project will not adversely impact soils and vegetation in the area.

Visibility/Opacity

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 the Little Gypsy Facility were evaluated in accordance with the procedures outlined in the EPA's guidelines and described in Part 7 of the application. This evaluation utilizes calculated values relating source emissions to visibility impacts and compares them to a standardized screening value for potential plume effects. Please refer to Appendix N of this application for a copy of the Class I Area Analysis.

The results of the analysis indicate that the new CFB unit'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.

Noise

According to the St Charles Parish Council, the Little Gypsy Facility is located in an area that is zoned M-2, for heavy manufacturing and industry. Also according to the St. Charles Parish Council, facility operations located within an M-2 zoning district in the parish do not have to adhere to any parish noise restrictions. St. John the Baptist Parish, which is directly adjacent to St. Charles Parish (where the proposed facility will be located) has noise control provisions in its parish ordinance. This ordinance contains sound level limits, but the installation and maintenance of public and private utilities are exempt from the limits. Furthermore, industrial

areas are also exempt from said limits. Thus, the proposed Little Gypsy 3 Repowering Project will operate in compliance with all noise ordinances in effect for the area in which the facility will be located. Given the existing baseline conditions, the operation of the proposed Little Gypsy 3 Repowering Project is not expected to result in a significant shift in noise levels that would be considered unreasonable at any potential receptors. A noise survey was conducted June 26 through June 27 of 2006.

Class I Areas

The EPA requires an impact analysis be performed for sources located within 100 kilometers of a Class I area. The nearest Class I area to Little Gypsy Facility is the Breton Sound National Wildlife Area (BSNWA). The BSNWA is approximately 140 kilometers to the east-southeast of the Little Gypsy Facility. As a preliminary measure, ELL evaluated the impact of emissions on the BSNWA, in conjunction with the Bureau of Land Management (BLM), and determined that the impacts associated with this project are negligible. A Class I impact analysis was specifically requested by LDEQ for the proposed Little Gypsy 3 Repowering Project. ELL has completed this analysis and the results of it are provided in Appendix N of this application.

1. What wastes will be handled?

The proposed Little Gypsy 3 Repowering Project will not require the use of additional chemicals that contribute to waste products, beyond those which are already used at the Little Gypsy Facility in normal operations. The majority of waste which will be generated by the CFB unit will consist of fly ash and bed ash, which can potentially be sold for beneficial reuse. In terms of chemical usage, the only significant additional chemical used on-site will be 19 percent aqueous ammonia, which will be stored and handled in accordance with regulatory requirements and best management practices.

a. Classes of chemicals

The wastes to be handled at the Little Gypsy Facility fall into the following classes: solid wastes; recycled wastes; and hazardous wastes. The solid wastes are further separated into fly ash, bottom ash, polishing scrubber wastes, and routine maintenance solid wastes. Small amounts of hazardous wastes may be generated as a result of routine maintenance activities. These activities are discussed in more detail below.

b. Quantities (hazardous and non hazardous)

Total fly ash generation from the Little Gypsy Facility is estimated at approximately 2,076,000 tons per year. The ash generated will be sold or disposed in a properly permitted facility.

c. Physical and chemical characteristics

Fly ash, as it is collected from the stack gas, is a tan-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, the silicon oxide and aluminum oxide components react with its calcium fraction 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 from CFB operations a marketable resource that can be used as a road base or additive for a variety of purposes. Other companies in Louisiana, as well as the Louisiana Department of Transportation, utilize this type of ash from another facility in Louisiana.

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 are approximately the size of coarse sand.

The material from the polishing scrubber consists of solid particulates comprised of a mixture of calcium sulfite, calcium sulfate, unreacted lime (together these make up approximately 80 percent), and fly ash (the remainder, approximately 20 percent). A portion of the material will be recycled in order to make use of unreacted lime in the reaction process.

The Little Gypsy Facility will generate wastes from construction activities, normal operations, and maintenance activities. During Little Gypsy 3 Repowering Project construction, scrap metal, wood, plastic, and other building materials will need to be transported off-site for reuse, recycling or disposal, as appropriate. During normal plant operations, the Little Gypsy Facility is expected to generate small amounts of paper, plastic, and general office wastes. In addition, the Little Gypsy Facility will likely generate small quantities of non-hazardous wastes, such as used oil drums, paint cans, lube oil filters, cleaning agents, spent coolants, and other maintenance wastes. ELL will ensure proper containment, off-site transport and disposal of these materials and, if necessary, will contract for specialized waste management services.

d. Hazardous waste classification (listed, characteristic, etc.)

Only small quantities, if any, of hazardous wastes will be generated at the Little Gypsy Facility, predominantly related to routine maintenance activities, such as, cleaning, painting and repairs. It is not expected that the hazardous wastes generated from the Little Gypsy Facility will change the current small quantity hazardous waste generator classification of the site. Wastes generated at the Little Gypsy Facility will be properly collected, transported, and disposed of off-site at a

permitted Resource Conservation and Recovery Act (RCRA) facility in accordance with federal and state solid and hazardous waste regulations, or as otherwise appropriate.

2. How will they be handled?

See answer below.

a. Treatment

See answer below.

b. Storage

See answer below.

c. Disposal

See answer below.

Fly ash will be collected from the generating units at the following points in the process: economizer outlet hoppers, air heater outlet hoppers, and bag house hoppers. A 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 bag house for particulate matter control. Emissions from truck loading operations will be captured and routed to the bag house 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 off-site.

Bottom ash from the Little Gypsy Facility will be collected from the boiler's bottom ash hopper. The bottom ash will be removed from the base of the boiler and placed into ash trucks for off-site disposal.

The polishing scrubber wastes will be collected in three bag house fabric filter modules. In the fabric filters, the particulates collect in the filter bags as the gas passes through. The collected particulates form a cake on the bags which enhances filter efficiency. The bags will be cleaned periodically by reverse air deflation, shaking or air pulsing. The particulates cleaned from the bags will fall into hoppers below the filter bags and then be pneumatically emptied into a storage hopper equipped with a fabric filter. From the FGD hopper, the particulates will be transferred into dump trucks and hauled to the fly ash impoundment for disposal (no market currently exists for this material). A portion of the polishing scrubber byproduct will be recycled to the scrubber agent preparation system.

Hazardous waste will not be managed on the premises in a manner that would require the Little Gypsy Facility to be permitted as a hazardous waste treatment, storage or disposal facility. The small amounts of hazardous wastes generated will be handled by outside contractors, as needed, and shipped off-site 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

See answer below.

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

See answer below.

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

See answer below.

All wastes generated by the proposed Little Gypsy 3 Repowering Project will be a result of on-site construction, maintenance, or operations activities. Over the course of a typical year, it is anticipated that 2,076,000 tons of ash will be generated at facility. No wastes will be brought on-site from other sources. The types and percentages of these wastes will be in constant flux depending on the phase that the Little Gypsy Facility 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?

The majority of waste which will be generated by the CFB unit will consist of fly ash and bed ash. Both types of ash have the ability to be used in a number of industrial applications such as soil stabilization.

5. What wastes will remain on-site permanently?

If necessary, unsold ash may be disposed of on-site in properly permitted solid waste facilities. These facilities will be designed in accordance with LDEQ requirements.

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

See answer below.

1. Air

See answer below.

2. Water

See answer below.

3. Soil

See answer below.

4. Food

See answer below.

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 the Little Gypsy Facility and manufacturer specifications. Potential exposure due to water or soil pathways will be minimized through spill prevention and construction storm water 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 utilization 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 maintained on-site within approved containers, there does not appear to be any realistic potential for residents in the area adjacent to the Little Gypsy Facility to be exposed to hazardous materials.

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

The combination of properly designed facilities, lack of hazardous materials on-site, and thoroughly trained personnel accomplishes the goal of minimizing the potential for accidental releases to the fullest practical extent.

The Little Gypsy Facility is designed to collect storm water that falls within material handling and process areas. This storm water 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 bag houses on transfer points, enclosure of conveyors, wetting agents and pneumatic systems. In addition, particulate controls on the stack will include an electrostatic precipitator and a bag house after the semi-dry scrubber.

ELL will employ a highly trained and dedicated staff to operate the equipment at the Little Gypsy Facility. 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 the Little Gypsy Facility.

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 OSHA regulations. Furthermore, employees will be trained in the applicable pollution prevention, risk management planning, process safety, and SPCC measures and procedures.

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

1. Short term effects

See answer below.

a. Land area taken out of system

There are no significant short-term adverse effects anticipated due to the construction of the new CFB boiler and associated process equipment at the Little Gypsy Facility.

The proposed Little Gypsy 3 Repowering Project will be located at an existing power plant within property owned and developed for industrial use by Entergy Louisiana, LLC. Conveniences such as proximity to the Mississippi River, nearby highway transportation routes, accessibility for barge transportation, and a population skilled in industrial labor, make this an ideal site for the proposed Little Gypsy 3 Repowering Project. In addition, the proposed land is currently developed industrial land. The real adverse impacts of the Little Gypsy Facility have

been further minimized by its location within an existing power generation facility and sharing of various existing systems and structures. For example, the use of the existing once-through cooling system, water intake and discharge structures, transmission lines, and storage silos minimizes further land development on the owned property.

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 BMPs such as SPCC Plans and Construction SWPPPs. Additionally, the EPA's Integrated Data for Enforcement Analysis (IDEA) 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" ratio for fossil fuel electric power generation facilities is 0.06, which is one of the lowest rates for the industrial sectors reviewed (EPA, 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.

Little Gypsy Facility Compliance History

The demonstration of no adverse long-term effects is supported by the environmental compliance history of the existing Little Gypsy Facility. The facility has been in operation for over 45 years, employing hundreds of workers, and generating power via its existing natural gas/fuel oil units. The compliance history of the plant over this time period has been excellent. The facility has been subject to inspections from LDEQ and compliance orders have been successfully resolved to the satisfaction of the LDEQ.

SUMMARY

The potential and real adverse environmental effects of the proposed Little Gypsy 3 Repowering Project will be avoided through the employment of state-of-the-art air pollution controls, the use of existing infrastructure, collection and treatment of process and industrial storm water, the use of existing water intake and discharge structures as well as a once-through cooling system, and beneficial reuse of marketable ash 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. The proposed CFB unit'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 the Little Gypsy Facility will operate.

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? (This question requires the permittee to perform a cost-benefit analysis, or at least a quantitative indication of the economic benefits and a qualitative description of the negative impacts expected from the permittee's operation. The latter should come from the answer to Question 1.0.)

Yes. The social and economic benefits of the proposed Little Gypsy 3 Repowering Project greatly outweigh its minimal environmental impact. As indicated above, the Little Gypsy Facility will not have a significant adverse impact on the environment. The proposed Little Gypsy 3 Repowering Project will be located in St. Charles Parish, on the facility's existing power generation station. The proposed Little Gypsy 3 Repowering Project will be subject to strict requirements pertaining to wastewater and air emissions. The site location and design present strong environmental advantages such as the use of existing infrastructure, access to barge-navigable waters, an established water supply and water discharge structures, and existing rights-of-way, which minimize the potential environmental impacts.

The Little Gypsy 3 Repowering Project will utilize CFB technology, a state-of-the-art technology that offers multiple environmental benefits, while also offering economic benefits. Currently, the Little Gypsy Facility relies primarily on natural gas to supply its customers' demand for electricity generation. The extreme price fluctuations that have affected the natural gas market since the late 1990's have driven electricity producers to consider other fuel alternatives that will provide a reliable and inexpensive fuel supply for the coming years. Solid fuels, such as petroleum coke, coal, and biomass, provide this alternative. CFB technology will allow for the flexibility to use a variety of solid fuels and not be subject to the uncertainties and swings in fuel prices that have occurred for natural gas fueled plants. By diversifying its fuel source, the Little Gypsy Facility will be able to continue to provide reliable and affordable electric power to its consumers.

The Little Gypsy 3 Repowering Project has significant social and economic benefits. The paragraphs below provide a summary of the anticipated benefits.

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

1. Local or regional survey

See answer below.

2. On-site or off-site needs

See answer below.

3. Regional solid waste management benefit

See answer below.

4. Generic survey of solid waste needs (compatibility with master plan)

See answer below.

The Little Gypsy 3 Repowering Project has arisen from ELL's need to provide reliable and affordable electric power to its consumers. Having an adequate, reliable and affordable supply of electricity is essential to modern society, to the health and well-being of the public, and to the economic fortunes and prospects of the state and its residents. This puts a significant burden on anyone to conclude that a proposed modern power plant, which must be developed and operated to comply with the strict environmental regulations applicable to new facilities, nevertheless is accompanied by social and environmental costs that outweigh the benefits of the proposed plant.

Because electricity is critical to nearly all economic activity, nearly every economic sector benefits from lower-cost power. More robust economic activity creates jobs for local workers, and lower-cost power aids in the job creation/job retention process, particularly in energy-intensive industrial sectors. This fact has been recognized by the Louisiana legislature, and indeed, established as a matter of public policy, particularly with respect to energy-intensive industries that have fallen on difficult economic times. See, Louisiana Revised Statute § 45:1163.2 , which states that "the Legislature finds and declares that it is essential to the continued growth and development of the state and to the continued employment, prosperity and welfare of the people of the state that such depressed energy-intensive industries now located in the state be encouraged to remain in operation in Louisiana. It is the purpose of this Section to encourage the retention of such industries, and the substantial number of jobs that they provide, by requiring the establishment of a rate structure for the provision of electric service that, together with other cost factors, may permit such industries in Louisiana to remain competitive with comparable industries located outside of the state." This statement of public policy largely iterates the established truism that businesses seeking to locate into a state place a very high

premium on the affordability and cost of power. Business surveys have consistently identified a reliable and competitively priced power supply as one of the most important factors in making relocation decisions.[1] The author of a study on the economic impacts of retail wheeling of electric power concluded that low energy costs, availability and reliability are all key to business attraction and development.[2] In short, states or regions with higher electric service rates place businesses at a competitive disadvantage, or at least offset other advantages, versus business having access to lower-priced power supplies. There are also consequent benefits generally identified to be associated with aggregate state reliance on the use of lower-cost, generally solid fuel power. The proposed project would contribute to such a power portfolio within the state.

In addition to generating more robust economic activity and attendant job creation/maintenance, lower-cost power also increases the disposable income of working families, where this additional income can be used to buy additional, primarily local, goods and services and thereby generate additional economic benefits. Furthermore, lower income earners are most affected by higher power rates. The Energy Information Administration of the U.S. Department of Energy produced an analysis based on 1997 data that showed that households at or near the federal poverty level spent 4 percent or more of their income on electricity, while moderate and upper income households spent less than 2 percent of their income on it.[3]

Apart from economic impacts, reduced incomes from higher-cost power supplies have the potential to produce adverse human health impacts because individuals with lower disposable incomes tend to spend less on nutrition, preventative health care, and household safety items.

Finally, adverse societal impacts associated with higher-priced power have been identified. A study issued by the National Association of Regulatory Utility Commissioners referenced the fact that forecasters are projecting that wholesale natural gas prices are likely to remain in the average range of $5 to $6 per MMBtu for the remainder of the decade. These prices are more than 30 percent above the average price of $3.87 per MMBtu that prevailed in 2000 and 2001. Such price increases substantially raise the cost of living for households throughout the nation and the cost of doing business in the industrial and economic sectors, thereby creating inflationary pressures and dampening long-term economic growth.

ELL has chosen CFB technology for the Little Gypsy 3 Repowering Project based on its fuel flexibility, as well as its environmental benefits. The CFB unit can use a variety of solid fuel sources, including petroleum coke, coal, and biomass. The current prices for petroleum coke and

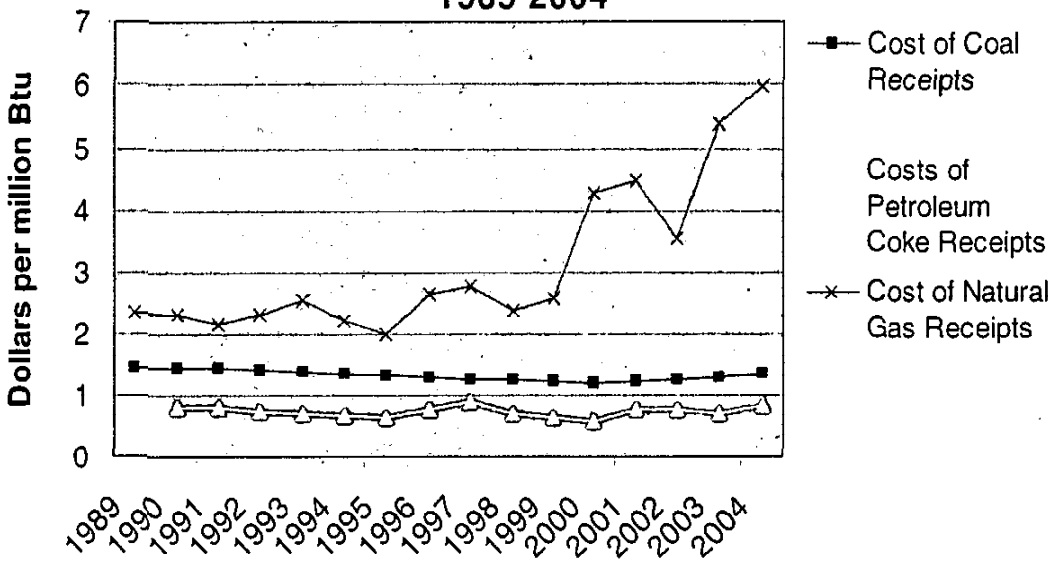
[1] See, e.g., Bohmeyer, L. (1996). Electric utilities and retail wheeling: The effect on economic development. *Economic Development Review*, 14 (2), 51.

[2] Ibid.

[3] 1997 Household Energy Consumption and Expenditure, U.S. Energy Information Administration.

coal are substantially less than the cost of natural gas on an equivalent MMBtu basis, and have not been subject to the extreme price fluctuations experienced by natural gas in the recent years, as shown in Table 2-1 below. Therefore, the stability and cost savings that will be gained as a result of this project can be passed on to consumers by providing them with energy that costs less.

TABLE 2-1
Costs of Fuels at U.S. Electricity Utility Plants, 1989-2004



Source: U.S. Energy Information Administration, March 2006 Monthly Energy Review.

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

See answer below.

1. How many permanent jobs will be created?

See answer below.

2. What is the expected annual payroll?

See answer below.

3. What is the expected economic multiplier from item B.2.?

See answer below.

4. What is the expected tax base and who will receive benefits?

See answer below.

The Little Gypsy Facility will provide significant economic and social benefits to St. Charles Parish, St. John the Baptist Parish, and the State of Louisiana. Construction of the proposed Little Gypsy 3 Repowering Project will create jobs, additional earnings for households, extra state and local taxes, and rising business activity throughout the Louisiana economy, St. Charles Parish, and surrounding areas.

To quantify these positive impacts, an economic study was recently performed for the proposed Little Gypsy 3 Repowering Project by Dr. Loren Scott, Ph.D., a Professor of Economics at Louisiana State University. A copy of this report, dated July 2006, is included in Appendix A. According to this analysis, the economic impact on St. Charles Parish and the state will be significant.

According to Dr. Scott:

During the five-year construction period, ELL intends to spend approximately $194.5 million in Louisiana constructing the new facility. (Total construction spending will be $682 million.) The following summarizes the impact on the regional economy.

- *A total of **$262.3 million in new business sales** will be generated in the region over this period, with $121.8 million of this amount occurring in the second year of construction.*
- *As a result of the infusion of money by ELL through its capital spending, an additional **$53.0 million in new household earnings** for the residents in the region will be created.*
- *At its peak, construction activity for the Little Gypsy plant will create about **690 new jobs** in the region.*

*The impacts on the **state's** economy of Little Gypsy's construction are:*

- *A total of **$412.7 million in new business sales** will be generated in the state over this period, with $191.6 million of this amount occurring in the second year of construction.*
- *As a result of the infusion of money by ELL through its capital spending, an additional **$133.3 million in new household earnings** for the residents in the state will be created.*

- *At its peak, construction activity for the Little Gypsy plant will create about **1,877 new jobs** in the state.*

Benefits from capital expenditures are one-time benefits, which do not extend beyond the period in which they are spent. This is not the case, however, with the on-going operational expenditures by ELL. These benefits will be recurring and they will continue to accrue to residents in the region and the state as long as the facility is in operation.

Annual operating expenditures for the Little Gypsy Facility will generate substantial benefits in new business sales, household earnings and jobs for the region. These benefits include:

- *As the operations expenditure impacts for Little Gypsy spread throughout the regional economy, they will generate **additional business sales totaling approximately $44.3 million annually**.*
- *Total direct earnings for Little Gypsy employees will total $4.6 million. In addition, the multiplier effects will create a total of $5.6 million in new household earnings. Thus, a total of **$10.2 million in new household earnings** for residents in the region will be created each year.*
- *Overall, operation of the Little Gypsy Facility will lead to an additional **166 permanent new jobs** in the region.*

*Annual operating expenditures for the Little Gypsy Facility will also generate substantial benefits in new business sales, household earnings and jobs for the **state**.*

- *As the operation expenditure impacts for Little Gypsy spread throughout the state's economy, they will generate **additional business sales totaling approximately $63.7 million annually**.*
- *Total direct earnings for Little Gypsy employees will total $4.6 million. In addition, the multiplier effects will create a total of $14.9 million in new household earnings. Thus, a total of **$19.5 million in new household earnings** for residents in the state will be created each year.*
- *Overall, operation of the Little Gypsy Facility will lead to an additional **416 permanent new jobs** in the state.*

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

No negative economic impacts are anticipated from the proposed Little Gypsy 3 Repowering Project. The unit is within an existing power generation plant that has been in operation for over 34 years. The Little Gypsy Facility's commitment to hire employees and to purchase supplies locally, and the impact of tax revenues from the operation of the site, will provide economic benefits to the local community.

1. What are the possible effects on property values?

The proposed CFB unit will be located within the existing Little Gypsy Facility; therefore, the project should not have an appreciable impact on local property values. Since the property is currently intended for industrial use and the CFB unit will be replacing an existing power generation unit, the addition of the CFB unit will not adversely affect neighboring property values.

2. Will public costs rise for:

a. Police protection

See answer below.

b. Fire protection

See answer below.

c. Medical facilities

See answer below.

d. Schools

See answer below.

e. Roads (also see below)

See answer below.

The Little Gypsy Facility will be located on property already being used for generation of electrical power. During the three year construction period, several hundred temporary workers will be located in the surrounding areas. As noted above, the construction workforce will be drawn from the local area to the greatest extent possible, thereby having little to no effect on the

provision of these services. Workers who do not reside in the immediate area will likely commute from surrounding areas with little to no effect on these services due to their transient presence. Rather, the positive economic impacts due to construction spending will be substantial (see Appendix A).

With respect to long-term impacts, the existing Little Gypsy plant currently employs 40 full-time employees as part of their normal operations. The Little Gypsy 3 Repowering Project is expected to add 25 more permanent employees. Additional operations personnel also will be drawn from the local area to the greatest extent possible. The number of permanent operations personnel will be less than the total construction workforce. In addition, the proposed Little Gypsy 3 Repowering Project will use the existing Little Gypsy Facility's security system and surveillance. Therefore, the level of services for police protection, fire protection, medical facilities, and schools will not be significantly affected by the Little Gypsy 3 Repowering Project. In actuality, the economic impact from additional taxes on the new unit will provide a long term source of funds to improve these services.

Primary fire protection for the site and associated equipment will be provided by the local fire department. The Little Gypsy Facility 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 the local agencies. However, the Little Gypsy Facility is part of an industry mutual association which can provide additional assistance if needed.

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 usual and expected need by the employees and their families from existing health care facilities. The proposed Little Gypsy 3 Repowering Project will not generate products or wastes, nor will it store materials on-site, that 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 proposed 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 the Little Gypsy Facility primarily by barge. Materials leaving the site are primarily expected to be transported by truck. This increased truck traffic will be necessary to recycle fly ash for road base and other soil stabilization products. As a result, while road traffic is expected to increase, it is not expected that existing roadways will be overburdened. In addition, the primary product generated by the facility could be utilized for road repairs in other areas of the state. Even during

the construction of the project, it is not expected that existing roadways will be overburdened. 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?

The Little Gypsy 3 Repowering Project will be located within an existing electrical power generation plant. The proposed property is already owned by industry and intended and currently used for industrial development. As a result, the construction and operation of the project 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?

See answer below.

a. Truck

See answer below.

b. Rail

See answer below.

c. Barge

See answer below.

d. Other

See answer below.

Convenience to existing transportation was a consideration in choosing the proposed site and was, in large part, a natural consequence of the more important considerations that are discussed later in this document. Generally speaking, location of a solid fuel-fired unit within an existing power plant facility adjacent to a major river ensures adequate transportation routes, as this is the preferred method for transporting petroleum coke and coal. When the Little Gypsy 3 Repowering Project is completed and operational, the primary mode of transportation for the

solid fuel and limestone will be barge, unless extenuating circumstances require trucking fuel and limestone into the facility on a temporary basis.

Transportation by truck will be used for construction commodities, for the transport of ash, and for routine maintenance materials that cannot be brought to or delivered from the proposed site by barge. Approximately one truck per day will be used for parts delivery. Approximately two to three trucks per week will be utilized for treatment chemical delivery. Ash generated by the proposed unit will be transported offsite for beneficial reuse via trucks. Approximately 200 truckloads of ash will be transported offsite daily.

During the construction phase of the Little Gypsy 3 Repowering Project, transportation of materials, equipment, and personnel will be made via barge and roads. It is expected that operations personnel will make use of the existing roadways for commuting to the job site. The increase in road traffic on state and local highways is considered minimal during the operations phase. A description of the estimated volume of traffic is given below, on page 2-11. Because the new CFB unit will be located within an existing power plant, existing local roads and the existing entrance road to the Little Gypsy Facility will be used for the Little Gypsy 3 Repowering Project.

2. What geographical area will it serve?

The Little Gypsy Facility is an ELL facility, and it provides firm network electric service to customers of both Entergy Louisiana and Entergy Gulf States. As such, the geographical area the Little Gypsy Facility will serve is focused in the State of Louisiana. Entergy Gulf States and Entergy Louisiana serve over 976,814 customers in 58 Louisiana parishes.

Given the volatility of natural gas prices, the addition of a reliable, economical alternative fuel source will help to stabilize energy prices for Louisiana consumers. 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?

See answer below.

a. Can local roads handle the traffic volume expected?

See answer below.

b. Can local roads handle the weight of trucks?

See answer below.

Traffic volume

During the construction period, there will be an increased level of traffic at the beginning and end of the work day as an estimated 600 people will be employed on-site during the peak period of the work effort. In line with industry norms, a conservative occupancy rate of 1.3 workers per vehicle at the peak of construction yields a traffic increase of approximately 460 vehicles. Traffic will also be increased during the work day as trucks will deliver materials and equipment. Typically, foundation materials (fill, concrete, etc.) are delivered by truck, approximately 30 per day at the peak of the work. Materials and equipment deliveries outside of foundation construction phase will number approximately 20 per day at most. Construction traffic will use state roads (i.e., Highway 981) to access the site. If necessary, additional mitigating measures will be used such, as the employment of a local police officer to control traffic entering and exiting the site during high traffic periods. Currently, the Little Gypsy Facility employs 40 full-time employees. Once operations commence, it is expected that an additional 25 full-time employees will be needed. ELL will attempt to market all ash generated from the proposed unit for beneficial reuse applications including cement production and soil stabilization. If successful, it is estimated that approximately 200 truckloads of ash will be removed from the facility on a daily basis. However, this amount is not expected to significantly impact traffic as access to the site is provided by a state highway that is more than adequate to handle this increase.

Truck weight

During construction, approximately 15 to 20 trucks per day on average will be traveling on state roads to and from the Little Gypsy Facility (with peaks of 30 trucks during the foundation construction phase). Traffic of this nature will be, in conformance with Louisiana Department of Transportation and Development (LDOTD) standards. There will be approximately 15 to 20 trips of heavy equipment throughout the three-year construction period. For these trips, the hauler will obtain LDOTD exemption permits as may be appropriate. The facility's General Construction Contractor (to be determined at a later date) will obtain all needed highway permits prior to hauling. After construction, truck traffic will consist of routine vehicles and trucks within highway standards. The existing public roads are adequate to handle this truck traffic.

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

See answers below.

a. Longevity of the facility?

The Little Gypsy Facility intends to operate the new CFB unit for up to 40 years or more, depending on market conditions and equipment life.

b. Who owns the facility?

Entergy Louisiana, LLC (ELL) owns the Little Gypsy Facility. The property on which the proposed Little Gypsy 3 Repowering Project will be located is owned by Entergy Louisiana, Inc., a subsidiary of Entergy Corporation.

c. Are the owners financially backed by others?

At this time, ELL does not plan to have another entity guaranty or otherwise back its obligations. ELL will seek to recover the cost of this investment through the traditional ratemaking process.

d. When is closure anticipated?

This question is more in line with a waste management facility and not a proposed power plant. However, as stated above, the Little Gypsy Facility has a planned lifespan of up to 40 years. Retrofitting the repowered unit at the Little Gypsy Facility, in the future, may extend the efficient and useful lifespan even further, if doing so is determined to be environmentally and economically feasible.

e. Who is responsible for the site after closure?

ELL will be responsible for the Little Gypsy Facility after closure.

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

This question is more in line with a waste management facility and not a proposed power generation unit. If a solid waste facility is constructed on-site, ELL will provide a closure plan and financial assurance as required by LDEQ, to ensure that the site will be closed in accordance with the applicable state regulations.

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

As previously discussed, this question is more in line with a waste management facility and not a proposed power generation unit. If a solid waste facility is constructed on-site, ELL will provide

a closure plan and financial assurance as required by LDEQ, to ensure that the site will be closed in accordance with the state regulations.

h. Who certifies that the site is properly closed?

ELL will certify that site is properly closed at the time of facility closure.

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

See answer below.

1) Is the closed facility recorded in the deed?

See answer below.

2) What future uses are possible?

See answer below.

This question is more in line with a waste management facility and not a proposed power generation unit. However, ELL will follow all applicable federal, state, and local requirements upon closure of the facility. Future uses of the property are subject to zoning conditions and plans of the buyer and the property owner, but could include any approved industrial, commercial, or agricultural use.

SUMMARY

In conclusion, the proposed Little Gypsy 3 Repowering Project will increase employment opportunities and personal income for Louisiana residents, especially those in St. Charles Parish, the greater New Orleans metropolitan area, and the cities of LaPlace and Norco, Louisiana. The Little Gypsy Facility will also increase tax revenues for St. Charles Parish surrounding parishes, and the state of Louisiana. The cost benefits have been quantified by an expert in economic impact studies and are based on sound and accepted economic models. The economic benefits are substantial and long lasting. The Little Gypsy Facility will provide reliable low-cost electric power to the eleven-member Louisiana cooperatives, as well as to the wholesale market. The use of petroleum coke or coal for fuel will provide an alternative in the state to natural gas supplies, which have recently experienced significant price volatility, and will help maintain and increase diversity of the fuel mix to retain reasonable pricing of power. A comparison of historical costs for coal versus natural gas, as previously shown in Table 2-1, demonstrates the stability of coal prices. The location of the CFB unit at the existing Little Gypsy Facility minimizes disturbance of undeveloped land and environmental impact, further keeping project

costs down. All of these factors benefit Louisiana consumers. These benefits are major, significant, and tangible. They significantly outweigh the minimal environmental impacts posed by the construction and operation of the proposed Little Gypsy 3 Repowering Project.

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

There are no alternative projects that would offer more protection to the environment than the proposed facility without unduly curtailing non-environmental benefits. The proposed Little Gypsy 3 Repowering Project 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 technology chosen for the generation of the electricity must also be reliable and economical. At the present time, Entergy Louisiana, LLC's (ELL's) portfolio of generating capacity indicates an over-reliance on natural gas, despite the fact that solid fuel (petroleum coke, coal, biomass, etc.) continues to be desirable from a cost and reliability standpoint. In order to continue to meet the increasing demand for stable low-cost and reliable electricity, ELL must improve the diversity of fuel source capacities by adding base load solid fuel-fired capacity.

The proposed Little Gypsy 3 Repowering Project will take advantage of state-of-the-art technology that offers multiple environmental benefits as described below, while also offering economic benefits. Therefore, there are no alternative projects that would offer more protection to the environment than the proposed Little Gypsy 3 Repowering Project without unduly curtailing non-environmental benefits. Possible alternative projects include nuclear, natural gas-fired power plants, and less efficient power boilers. Projects using wind, hydroelectric, solar, geothermal, and other renewable resources were not considered economically viable in the area of the proposed project or for the purpose for which it is intended.

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

Circulating Fluidized Bed (CFB) technology has been chosen for this project due to its superior environmental performance and its demonstrated fuel flexibility. The proposed Little Gypsy 3 Repowering Project will consist of two CFB boilers, each supplying steam to an existing steam turbine generator. The CFB boiler uses fluidized bed technology; which is a system in which air, distributed by a grid or distribution plate, is blown through bed solids developing a "fluidized" condition. (The term "fluidized" means to suspend the particles in a rapidly moving stream of gas or vapor to induce a flowing motion.) A circulating fluid bed boiler uses cyclone separators to separate the ash/unburned carbon/absorbent from the hot flue gas and returns the solids to the boiler for continued combustion and SO_2 removal. The technology is not new, but it has been

revived due to the high costs for standard fuel sources, coupled with the availability of lower cost opportunity fuels.

Fluidized Bed (FB) combustion is one of the major technologies developed under Advanced Electric Power Generation in the Department of Energy (DOE) Clean Coal Technology program. Fluidized bed boilers reduce emissions of SO_2 and NO_X, as compared to conventional boilers, by injecting sorbent, such as limestone, in the combustion chamber with the solid fuel and operating at temperatures lower than conventional boilers. At combustion temperatures of 1,400 to 1,600°F, the fluidized mixing of the fuel and sorbent enhances both complete combustion of the solid fuel and sulfur capture. In addition, the relatively low operating temperature minimizes NO_X formation, especially thermal NO_X. On average, NO_X generation from fluidized bed boilers is about 70 to 80 percent lower than those for standard boilers.

There are two types of FB boilers currently in commercial operation: bubbling fluidized bed (BFB) and CFB. ELL has selected the CFB technology because it provides an even greater economic and environmental benefit compared to BFB. The CFB technology allows for greater flexibility in fuel selection and greater combustion efficiency. In addition, the DOE has recognized CFB technology as a Clean Coal Technology, and previous findings through the BACT process have identified the technology as the best means to control key criteria pollutants generated through combustion of solid fuels.

1. Are other technologies available?

Alternative technologies for the production of electrical power are available; however, as discussed below, the majority of these technologies cannot provide a reliable and cost efficient source of power for ELL's consumers while still minimizing adverse impacts to the environment. The alternate technologies for generation of electricity at this site are discussed below, with consideration given to the reliability, economic, and environmental aspects mentioned above.

Hydroelectric. Generation of electricity by use of the hydrodynamic power of water requires that the water source be at an elevated level above the hydro-turbine generator. It is the potential energy associated with the elevation of the water that provides the ability to produce power. There is no source of elevated water at or anywhere near the site of the proposed Little Gypsy 3 Repowering Project or in the region. Thus, hydroelectric power is not a viable option.

Nuclear. Nuclear power is generated by utilizing the heat produced during nuclear reactions to heat water to make steam to drive a steam turbine. Nuclear power was not considered for the proposed Little Gypsy 3 Repowering Project for a variety of reasons including length and uncertainty of permitting and potential public opposition, as well as other factors. However,

ELL believes that nuclear power is an important source and continues to evaluate it for other sites in Louisiana and in the U.S.

Wind. The generation of power from wind is based on using a wind turbine to capture the energy associated with the velocity of the wind and driving a generator to produce electricity. However, this is a very low density energy source and is also very unreliable. The ability to produce the equivalent amount of energy that the proposed Little Gypsy 3 Repowering Project will generate would require an area many times larger, a capital cost many times greater, and the power would still be dependent on wind, thus making it unreliable. In addition, the South Louisiana area is not a sustained high wind area that would make it an effective candidate for wind energy. Based on these reasons, the generation of economic and reliable power using wind is not considered viable.

Natural Gas. The proposed Little Gypsy 3 Repowering Project involves the replacement of an existing natural gas fired units with two CFB units. The extreme price volatility that has affected the natural gas market since the late 1990s has driven electricity producers to consider other fuel alternatives that will provide a reliable, stable and inexpensive fuel supply for the coming years. Solid fuels, such as petroleum coke, coal, and biomass, provide this alternative and capture the identified non-environmental benefits of the proposed project; therefore, the project will utilize solid fuels to supply the "base-load" demand for electricity generation of the CFB unit. In addition, nearly all of the generation under construction or proposed in Louisiana is natural gas-based, thus, the state is moving more towards total dependence on a single fuel type (gas). Solid fuel-fired diversity is essential to stabilize electric power prices for Louisiana consumers.

Pulverized Coal. Pulverized coal (PC) technology is the conventional technology that has historically been used for coal-fired power plants. PC technology is not considered a Clean Coal Technology by the DOE. This type of power plant will generate power in the same manner as other fossil fuel-fired plants; however, an additional step must be taken before the coal enters the boiler. The coal must first go through a pulverizing system which grinds the coal into fine particles or dust. Coal is fed into a pulverizer where it is crushed and dried using hot air. The coal is then pneumatically transported to the burner front and blown directly into the furnace. PC units operate at higher combustion temperatures therefore producing more thermal NO_x. The design of the PC does not support in situ capture of sulfur dioxide. Relatively high operating and maintenance costs are incurred due to the need for extra coal handling equipment, pulverizers, and more advanced emission control equipment. There is also a lack of fuel flexibility, which is required to take advantage of low-priced feedstock markets. For these reasons, ELL has elected not to use this technology for its proposed Little Gypsy 3 Repowering Project.

Integrated gasification combined cycle (IGCC). IGCC is recognized by the DOE as a clean coal technology with the capability to remove SO_2 and NO_x, similar to that of supercritical PC boilers. The main component of the IGCC technology is coal gasification, a process for converting coal into combustible gases (largely carbon monoxide and hydrogen) by breaking the coal down into its chemical constituents. However, IGCC is not generally considered to be a commercially mature technology, in that there is insufficient data to reasonably estimate the cost of applying it, and the reliability of the processes is significantly lower than CFB technology. Many of the plants in service to date are demonstration units used to verify the operability of this type of plant. To date, the IGCC technology has not been proven as a consistently dependable or viable option for utility power plants. IGCC capital costs are reported to be higher than conventional coal power plants by about as much as 20 percent. An IGCC plant construction schedule is also longer in duration than the schedule for conventional coal-fueled plants, and such plants are more complex to operate.

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

Although there are no site-specific deficiencies that must be compensated for at the site of the proposed Little Gypsy 3 Repowering Project, the project was designed to minimize, to the maximum extent possible, adverse environmental effects. The design of the CFB technology provides for lower emissions of NO_X, SO_2, CO, VOCs, and PM_{10}, as compared to standard boiler technology. In addition, the use of a polishing scrubber and selective non-catalytic reduction (SNCR) will further reduce emissions of SO_2 and NO_x. Pollution controls, such as baghouses, dry fogging, wind screens, enclosures, and vacuum systems have also been incorporated into the design of the material handling areas to further reduce particulate matter emissions.

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

CFB boiler technology is significantly different from conventional boiler (pulverized coal, stoker, or cyclone boilers) technology and offers inherent emission reductions of SO_2 and NO_X associated with the injection and use of limestone as part of the bed matrix and the relatively low temperatures at which the fuels burn. As such, the CFB boiler technology is considered a Clean Coal Technology by the DOE. In a CFB boiler, solid fuel and a sorbent (typically limestone) are jointly fed directly to the combustion chamber. Primary air is injected from the bottom of the combustion chamber to provide combustion air as well as to fluidize the burning bed. Fluidization of the bed allows for high heat transfer rates at relatively low combustion temperatures. Because of the turbulence and velocity in the circulating bed, the fuel mixes with

the bed material quickly and uniformly. Secondary air is introduced at various levels to ensure solids circulation, provide staged combustion for NO_X reduction, and supply air for continuous fines combustion in the upper part of the combustion chamber. This staged combustion results in more complete burn of the fuel, resulting in lower emissions of carbon monoxide (CO), volatile organic compounds (VOCs), and particulate matter (PM_{10}).

C. Describe the reliability of technology chosen.

As previously discussed, CFB technology has proven to be a reliable technology for minimizing air emissions when compared to traditional solid fuel fired boilers and has been recognized by the DOE as a Clean Coal Technology.

1. Past experiences.

ELL evaluated a number of power generation options and selected the CFB boiler technology, a type of fluidized bed combustion recognized for its environmental performance. Entergy Gulf States has extensive experience with CFB units; it has operated such units in Louisiana since 1990. Furthermore, the fluidized bed combustion technology is one of the major technologies being developed under the Advanced Electric Power Generation of the DOE Clean Coal Technology Program. The Clean Coal Technology Program, which is sponsored by the DOE and administered by the National Energy Technology Laboratory, is a partnership between the federal government and industry that supports the DOE's mission to foster a secure and reliable energy supply system in the United States that is both environmentally and economically sustainable.

The Clean Coal Technology Program started in the mid-1980s with the objective of broadening the range of technological solutions available to eliminate environmental concerns associated with the use of coal for electric power production and has resulted in clean coal technologies that are capable of meeting existing and emerging environmental regulations for the world energy marketplace. It has involved a series of demonstration projects that provide data for design, construction, operation, and technical/economic evaluation of full-scale applications. Most of the demonstrations have been conducted at commercial scale, in actual user environments, and under circumstances typical of commercial operations. Two follow-up programs have been developed that build on the successes of the Clean Coal Technology Program: the Power Plant Improvement Initiative, authorized by Congress in 2001; and the Clean Coal Power Initiative, authorized by Congress in 2002. Five demonstration projects involving fluidized bed combustion technology have been conducted through the Clean Coal Technology Program. The Clean Coal Technology Program project at the JEA (formerly, Jacksonville Electric Authority) petroleum coke and coal-fired Northside Generating Station demonstrated that the CFB boiler

technology can be relied upon to meet large-scale base load power demands while complying with the most stringent air-quality regulatory requirements.

2. Environmental impacts.

ELL has evaluated and will utilize the BACT to further minimize air emissions from the operation of the proposed unit. This analysis was conducted in accordance with the requirements listed in LAC 33.III.509.J. The BACT requirements are intended to ensure that a proposed new facility or major modification will incorporate air pollution control systems and technologies that reflect the latest demonstrated practical control techniques for each particular emission unit. The reliability of the pollution control equipment identified for the proposed unit to reduce emissions is well established and offers the maximum protection to the environment without unduly curtailing non-environmental benefits.

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

This question is not applicable because no wastes will be received at the facility as a result of the proposed Little Gypsy 3 Repowering Project.

1. Analysis of waste

This question is not applicable because no wastes will be received at the facility as a result of the proposed Little Gypsy 3 Repowering Project.

2. Unloading

This question is not applicable because no wastes will be received at the facility as a result of the proposed Little Gypsy 3 Repowering Project.

3. Storage

This question is not applicable because no wastes will be received at the facility as a result of the proposed Little Gypsy 3 Repowering Project.

4. Treatment

This question is not applicable because no wastes will be received at the facility as a result of the proposed Little Gypsy 3 Repowering Project.

5. Monitoring

This question is not applicable because no wastes will be received at the facility as a result of the proposed Little Gypsy 3 Repowering Project.

6. Closure

This question is not applicable because no wastes will be received at the facility as a result of the proposed Little Gypsy 3 Repowering Project.

7. Post-closure

This question is not applicable because no wastes will be received at the facility as a result of the proposed Little Gypsy 3 Repowering Project.

8. Disposal

This question is not applicable because no wastes will be received at the facility as a result of the proposed Little Gypsy 3 Repowering Project.

9. Any residuals requiring further handling

This question is not applicable because no wastes will be received at the facility as a result of the proposed Little Gypsy 3 Repowering Project.

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

The proposed CFB boilers will be replacing an older, natural gas-fired supercritical boiler currently located at the Little Gypsy plant site. Due to the extreme price fluctuations that have affected the natural gas market since the late 1990's (from spot market lows of less than $2/MMBtu in July 1995, to a maximum of more than $11/MMBtu in February 2003), electricity producers have been driven to consider other fuel alternatives in order to continue to provide their customers with a reliable and inexpensive fuel supply for the coming years. The existing 30-year old supercritical boiler has a high NO_x emission rate, high minimum load requirements, and higher heat rate (i.e., lower efficiency in converting fuel to electricity). Solid fuels, such as petroleum coke, coal, and biomass, provide this alternative and capture the identified non-environmental benefits of the proposed project. CFB technology was chosen for the proposed project because it permits the combustion of a variety of solid fuels in a much more efficient and cleaner fashion than traditional solid fuel-fired units to replace the existing gas-fired boiler. By replacing the existing unit with CFB technology, the proposed project will allow ELL to provide reliable, lower cost electricity to customers in Louisiana with minimal environmental impacts.

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

The proposed unit is being built to supply electrical power to residents and businesses in Louisiana served by the Louisiana member cooperatives, as well as to the wholesale electrical market. The CFB technology will result in little or no hazardous waste generation.

SUMMARY

In conclusion, Entergy Louisiana, LLC selected the CFB technology for the proposed Little Gypsy 3 Repowering Project because of the flexibility it provides to utilize various grades of economical fuels, such as petroleum coke, a by-product of the petroleum refining process. No other technology provides such a reliable and cost-efficient source of power while minimizing adverse impacts to the environment. The DOE has recognized the CFB technology as a Clean Coal Technology, and previous findings through the BACT process have identified the best pollution control technologies to reduce criteria pollutants generated through combustion of solid fuels.

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

As detailed below, there are no alternative sites that would offer more protection to the environment than the proposed facility without significantly decreasing the non-environmental benefits. The alternative sites evaluation indicated that the use of an existing power generation facility offered significant environmental and economical benefits. In addition, the location of the Little Gypsy Facility offers a number of benefits which will allow construction and operation of the proposed Little Gypsy 3 Repowering Project with only minimal impacts to the environment.

In selecting a site for utilization of solid fuel for electric power generation, Entergy Louisiana, LLC (ELL) developed a screening criteria process to select the most optimum site.

The Little Gypsy 3 Repowering Project will be located within the existing Little Gypsy Facility. Locating the proposed CFB unit and ancillary equipment within an existing power generation facility has inherent environmental and economic benefits over siting a new unit on an undeveloped non-industrial (Greenfield) site. Greenfield sites are usually the least preferred siting alternative because they tend to have the greatest potential to impact human populations and the environment. These sites also tend to have the greatest financial burden, as they generally require a greater amount of infrastructure to be constructed. For a Greenfield site to be chosen, it would have to offer more protection to the environment than an existing site would, without unduly curtailing non-environmental benefits. ELL evaluated this option and determined that using a Greenfield site was neither economically nor environmentally beneficial.

ELL also evaluated existing facilities within the service area that could be expanded or repowered in a cost-effective manner. Unlike waste disposal facilities or most manufacturing facilities, electrical generation plants must rely on transmission lines and other infrastructure that only exists at a limited number of sites. Sites lacking the necessary infrastructure would increase the potential adverse environmental impacts because construction of transmission lines and other infrastructure would be required. Sites were also evaluated based on their accessibility to transportation routes, such as barge-navigable waterways and highways. Based on this evaluation, it was apparent that the Little Gypsy Facility was the preferred location for the proposed Little Gypsy 3 Repowering Project. The specific environmental and economic advantages of locating the Little Gypsy 3 Repowering Project at the existing Little Gypsy

Facility are detailed below in Section A.1. The results of the alternative sites evaluation verify that locating the proposed project at the existing Little Gypsy Facility will offer more protection to the environment, and at a lower cost, than any alternative sites.

A. *Why was this site chosen?*

1. Specific advantages of the site;

The placement of a new power generating facility at the Little Gypsy Facility has a number of specific advantages that far outweigh the alternative sites that were under consideration. These advantages include:

1. There is substantial existing land at the Little Gypsy Facility to locate equipment and facilities to support the project;
2. The Little Gypsy Facility is located on the Mississippi River; in proximity to the Intracoastal Waterway and Gulf of Mexico; therefore, there is access to river transportation and to sources of fuel and limestone from the mid-west United States, Gulf Coast, and international suppliers. This is important as the CFB boiler's primary fuel source (petroleum coke) can be easily transported by barge from any number of refineries in the areas to the north and south along the Mississippi river, and/or east and west along the Intracoastal Waterway. Additionally, coal can be easily brought in via barge from a number of different locations around the country or from worldwide sources;
3. An existing 230 kV and 115 kV transmission line and an electrical switchyard are already on-site, negating any new need for rights-of-way through sensitive areas;
4. An once-through cooling system using the Mississippi River as the heat sink has been installed for the steam turbine and existing auxiliaries and will be utilized for the proposed CFB units;
5. The proposed location of the CFB unit is at an existing site; therefore, disturbance of currently undeveloped acreage at another site will be avoided;
6. No known threatened or endangered species are present on the site;
7. No known archaeological sites will be impacted;
8. The addition of the CFB unit will have no negative economic impacts in the area;
9. Proximity to the residential and industrial consumers served, especially in the fast-growing industrial corridor between Baton Rouge and New Orleans, will reduce costs to consumers and improve the competitiveness of Louisiana industries; and
10. The location of the power generating facility at the Little Gypsy Facility will allow the new power generating facility to share much of the existing infrastructure. In addition

to minimizing environmental impacts, sharing existing infrastructure will result in less overall capital expenditures and operating costs resulting in lower energy prices to Louisiana consumers. In turn, ELL can pass these cost savings on to consumers.

The existing infrastructure that can be shared includes the following:

- Existing make-up water supply facilities, avoiding the need for a new intake;
- Existing surface water discharge structure, avoiding the need for an additional discharge structure;
- Cross-tie service systems such as compressed air, service water, emergency power, etc., to the existing units. This will increase the reliability of the new unit and the existing units;
- Administration facilities of the existing units. (This includes office areas, site security services, and employee parking);
- Existing roads and other access routes that are now used for the existing units;
- Existing firewater system;
- Use of the existing turbine generation, condenser, pumps, heater and piping with associated electrical distribution systems within the existing unit to be repowered; and
- The use of the existing site reduces the amount of grading and drainage work. Such work was previously conducted for the siting of the existing Little Gypsy Facility.

Overall, based on the selection and evaluation procedure (described in more detail below), the Little Gypsy Facility offers the greatest level of environmental protection of all sites considered.

2. Were other sites considered and rejected?

Yes, several sites were considered and rejected. A general list of criteria considered crucial to the siting of the CFB unit was considered when evaluating possible sites. These criteria included the following high priority items:

- Compliance to generation needs resulting from integrated resource plans;
- Entergy Services, Inc. performs system planning functions for all Entergy operating companies. In executing this function, an integrated resource plan is developed that defines the regional load projections and determines the type and quantity of generation needs to meet system reliability criteria. In Louisiana, the integrated resource plan identified that the Amite South area consisting of customers west of Baton Rouge, through New Orleans, to Bogalusa, Louisiana, required additional base load capacity of approximately 500 megawatts;

- Sufficient available space to allow for supporting components of the project (i.e., solid fuel storage, solid waste facilities, etc.);
- In addition to available property space, the proximity of the site to existing residential communities was considered to minimize the adverse impact to local communities;
- Proximity to power transmission lines and substations or existing power plants, to ensure sufficient transmission capacity;
- Accessibility to firm, reliable transmission capacity is considered a substantial economic and environmental consideration;
- Proximity to available water supply;
- Proximity to a surface water supply for plant cooling and process water requirements is considered preferable to sites requiring the use of ground water;
- Proximity to a surface water body of significant size and quality for transportation of solid fuel and for discharge of treated effluent;
- Access to navigable waterways capable of accommodating river barge or ocean-going vessels is considered a distinct economic advantage both during construction (for delivery of large equipment) and during operation (for the cost effective delivery of fuel and absorbents from worldwide producers);
- Proximity to highways;
- Shipment of fuel and delivery of marketable ash products;
- Unit size; and
- The experience with CFB technology indicates that the proven size limit of the CFB is nominal 300 MW. The unit selected would be 300 MW or less or sized to accept two boilers of 300 MW or less. The optimum design for economies of scale would be two boilers of approximately 300 MW and one steam turbine.

The areas reviewed included "Greenfield" and existing "Brownfield" sites. As previously noted, Greenfield sites (such as ELL's Wilton site in Convent, Louisiana) are those sites which are not currently developed for industrial use and have no existing environmental impact assessments or permits. These sites are usually the least preferred siting alternative, because they tend to have the greatest potential to impact human populations and the environment. In addition, these sites tend to pose the greatest financial burden, because they generally require a greater amount of infrastructure prior to construction. For these reasons, ELL has eliminated the Greenfield sites. ELL also evaluated existing power generation (i.e., Brownfield) facilities that could be repowered or upgraded to produce additional electricity in a more cost-effective manner. Of the

existing power generation facilities considered, only the Little Gypsy Facility was able to meet all the above criteria necessary for the siting of the project.

Sites within the state of Louisiana were evaluated using maps and available literature to determine areas meeting the above criteria. During this process, certain exclusionary criteria were also applied. These exclusions included proximity to environmentally sensitive areas such as known inventoried wetlands, scenic rivers, wildlife refuges, state parks, national forests and Indian reservations. This initial exercise yielded certain areas warranting further evaluation and comparison.

Based on the initial evaluation, a total of five sites were selected for further consideration as suitable locations for the siting of a CFB unit in Louisiana. These five sites included Ninemile in Westwego, Michoud in New Orleans East, Nelson in Westlake, Willow Glen in Geismar, and Little Gypsy in Montz. All of these sites are Brownfield sites with repower potential, but they do not possess all of the necessary benefits in comparison with the Little Gypsy Facility. The few benefits these locations did possess were offset by the adverse environmental impacts, higher costs, or negatives regarding their location, in comparison to generation needs. The following is a summary of potential issues associated with the four rejected sites.

I. Ninemile Site – Westwego, Louisiana

- Located in ELL's Amite South Region.
- Utilized the footprint of two CFBs to replace each boiler on Unit 4 and Unit 5 at 750 MW each.
- The site is located in a bend of the river prone to silt deposition - barge delivery only is assumed.
- Property line impacts and noise can not be abated with engineering and a design change of the layout. Doubling the distance between noise source and the property line reduces perceived sound by only 3 dbA.
- The adjacent property must be purchased.
- Material handling equipment could be located south of the existing power block where the oil tank yard is located - may impact oil burning capability and there are transmission lines and support towers there.
- Ash storage would have to be off-site - not specified.
- Many interferences at this site necessitate further study.

II. Michoud Site – New Orleans East, Louisiana

- Located in ELL's Amite South Region.
- The only practical site to locate a CFB is to the east of Unit 3 switchyard between the fuel oil tanks and the discharge structure.
- The new administration building and an HV power line are obstructions at this location.
- Material handling could fit north of the construction site at and above the tank farm. Includes two geodesic dome storage enclosures each holding two weeks of fuel capacity (60,000 tons) and a limestone shed at 36,000 tons capacity.
- Additional space will be needed off-site for ash handling - possible areas are located to the east or across Gentilly Road, to the north.
- Site prone to severe flooding, as indicated by post-Hurricane Katrina flooding.
- The plant is located on the Mississippi Gulf Outlet Canal, which has an uncertain future due to storm surge flooding perceived to have resulted from this source.

III. Nelson Site - Westlake, Louisiana

- Located in ELL's West of the Atchafalaya Basin (WOTAB) region.
- Nelson has trained personnel with experience in pet coke boiler operation.
- Nelson 3 is a candidate similar to NISCO - 154 MW.
- The Nelson site has a market and facilities for ash.
- Nelson 4 site, 2x250 MW CFB, has construction impacts underground and HV lines to switchyard.
- Single CFB supercritical may be better choice over two 250 MW in-tandem boilers for this site.
- No deep water facility adjacent to Nelson site.
- Key issue is sharing of material handling assets with previous projects - Nelson 5 site, railroad access, and over-build on solid fuel handling equipment for Nelson 6 may be an advantage to be utilized in repowering.

IV. Willow Glen Site - Geismar, Louisiana

- Located in ELL's Central Region.
- Willow Glen Unit 3 is not a good candidate due to poor operating flexibility, nitrogen oxide (NOx) emissions, and heat rate.
- Present assessment of the Willow Glen Unit 3 existing turbine is good - recently overhauled.
- Willow Glen Units 4 & 5 may have value into the future due to their oil burning capability.
- The Willow Glen site does have some layout impacts and conflicts if multiple units are repowered (i.e. HV power lines to switchyards).
- Willow Glen has access to deep water fuel delivery.

Results of Evaluation

Based on this evaluation, the existing Little Gypsy Facility was selected as the preferred site. The Little Gypsy Facility meets all of the necessary criteria required for the siting of the CFB unit, such as location within ELL's Amite South Region load area, sufficient available space for the proposed project, proximity to existing transmission lines and barge navigable waters, and availability of existing water intake and discharge structures. The proposed Little Gypsy 3 Repowering Project is a nominal 560 MW, which is in the most economical size range of existing technology.

In sum, our evaluation indicated that the Little Gypsy Facility is the most favorable for the project due to the environmental and economic advantages discussed previously. The alternative sites were rejected based on a comparative evaluation of key factors which indicate that the construction of the CFB unit at these sites would have a greater adverse impact on the environment and at significantly greater costs.

3. Is the location of the site irrevocable; i.e., would denial of a permit based on the site preclude the development of the project?

The denial of a permit would likely preclude the development of the project, due to the distinct advantages of the unit being constructed at the existing Little Gypsy Facility, which has the required existing infrastructure. Denial of this permit for the St. Charles Parish location would cause a significant delay in the development of this project due to the need to find a new site, a significant increase in costs, and delays triggered by additional permitting. These factors could result in the cancellation of the project entirely.

The Little Gypsy Facility has an established surface water intake and discharge structure, offers accessibility to barge-navigable waterways for delivery of solid fuel and equipment during construction, and has existing transmission lines. ELL believes the selected site, as discussed previously, will not cause significant impacts to the environment. Alternative sites would require disturbance of relatively large portions of currently undeveloped land. Therefore, none of the alternative sites would offer more protection to the environment than the proposed site without unduly curtailing non-environmental benefits.

B. Is the chosen site in or near environmentally sensitive areas?

1. Wetlands

A very small area of low value wetlands is present within the boundaries of the Little Gypsy Facility. These wetlands were identified through delineation and will be mitigated through the U.S. Army Corps of Engineers (USACE) Section 404 process.

2. Estuaries

The facility is located between the main levee of the Mississippi River and the Lake Pontchartrain estuary, and current site drainage and discharges exit to both waterways. A St. Charles Parish drainage ditch runs through the property and discharges to Lake Ponchatrain. ELL's intent is to re-work site drainage such that all discharges are routed to the Mississippi River instead of the St. Charles Parish drainage ditch.

3. Critical habitat

The CFB unit will be located within the Little Gypsy Facility in an area currently developed with natural gas units. No critical habitats are known to exist within the Little Gypsy Facility.

4. Historic or culturally significant areas

Please see answer below.

a. Indian mounds

Please see answer below.

b. Antebellum houses

Please see answer below.

c. Tourist attractions or facilities (e.g., bed and breakfast inns)

Please see answer below.

d. Campgrounds or parks

Please see answer below.

No known historic or culturally significant areas are known to exist within the Little Gypsy Facility.

C. What is the zoning and existing land use of the prospective site and nearby area?

According to the St. Charles Parish Council, the Little Gypsy Facility is located in an area that is zoned M-2 (Heavy Manufacturing and Industry). The prospective site is located within the boundaries of the Little Gypsy Facility (which is an existing industrial property) and will be surrounded by structures belonging to the Little Gypsy plant. Land use in the surrounding area outside the Little Gypsy Facility boundary is mixed and consists of residential homes, large industrial facilities, and commercial property. To the south and to the west of the site is the Mississippi River levee.

1. Is the site located near existing heavy industrial, chemical process or refinery operations?

The site is located within the existing Little Gypsy power generation facility, owned by ELL, which is located in a semi-rural setting. There are considerable refinery/chemical facilities in Norco, Louisiana, located approximately three miles to the west of the facility. Across the Mississippi River from the plant there are two existing ELL plants, Waterford 1&2 Fossil and Waterford 3 Nuclear. Also across the Mississippi River is Occidental Chemical Company. Upriver or northwest of the site is the Bayou Steel facility.

2. Is there a precedent for chemical contamination near the site or are the soil and water pristine?

The facility completed closure of five impoundments (North and South Metal Cleaning Waste Ponds, Low Volume Waste Pond, Boiler Blowdown Pond, and West Ditch Enlargement) in 1996 in accordance with the applicable LDEQ solid waste regulations. The post-closure groundwater monitoring is also complete and the five piezometers were plugged and abandoned in April 2006. Additionally, there is an abandoned substation on-site that ELL will commence investigation of in the near future.

With the potential exception of the two aforementioned facilities, there is no known soil or groundwater contamination near the site.

3. Is the area particularly noted for its aesthetic beauty?

While "aesthetics" is a subjective term, the planned CFB unit will be located within an existing industrial power plant in an area surrounded by developments associated with an electrical power plant. More specifically, the CFBs will be located to the north of existing Units 1 and 2. Therefore, ELL believes the proposed construction will not significantly impact aesthetics in the area.

D. Is the site flood prone?

1. Is the site in a floodplain?

Please see answer below.

a. How current are the maps used to make floodplain determinations?

Please see answer below.

b. What is the elevation of the site?

Please see answer below.

c. Is diking required or desired to provide flood protection?

Please see answer below.

1. What is the design height of the dike?

Please see answer below.

2. How is the dike protected from erosion?

Please see answer below.

3. What frequency and design storm was used?

Please see answer below.

4. Is the access to the site over or through dikes?

Please see answer below.

The CFB units will not be located within the 100-year floodplain, according to the 1999 data available.

The elevation at the Little Gypsy Facility is approximately 15 feet above mean sea level.

2. Is the site hurricane vulnerable?

Please see answer below.

a. Is the site in an area subject to storm surge?

Please see answer below.

b. What are the design storm specifications?

Please see answer below.

c. Should damage from wave action be considered?

Please see answer below.

d. For what levels of wind speed is the facility designed?

Please see answer below.

The site is vulnerable to hurricanes to the extent that the State of Louisiana's Office of Emergency Preparedness considers the entire state vulnerable. The site has the potential for storm surge from Lake Pontchartrain, which is approximately seven miles north of the plant. Wave action is not considered applicable because of the site elevation and distances from shorelines. Design storm specifications and wind speed specifications for plant structures and equipment will be in accordance with the latest version of the building code accepted by the local governing body.

E. Is groundwater protected?

Groundwater below the Little Gypsy Facility is protected from contamination because of the engineered design of the facilities and the hydrogeological setting of the site.

At the Little Gypsy Facility, in accordance with LDEQ regulations at LAC 33:IX.907, all storage containers containing oils and other substances listed in LAC 33:I.3931 will be constructed with appropriate containment and/or diversionary structures or equipment to prevent any spilled substance from reaching waters of the state. Engineering controls and secondary containment

structures such as dikes, berms, retaining walls, curbing, culverts, and drip pans will be used to prevent the release of such substances. Additionally, storm water pollution prevention measures and dry clean-up measures, such as booms and absorbents, will be used at the plant in the event of a spill. A spill prevention, control and countermeasures plan will be developed and implemented to avoid spills and protect groundwater.

Storage containers for applicable substances will be constructed with secondary containment adequate to hold the entire contents of the largest single tank in the containment structure with additional capacity for rainfall, if stored outside. These outside containment structures will be fitted with valves or other positive means to prevent a spill event and will be visually inspected before any rainwater is released. Many of the substances to be stored on-site will be stored indoors, and therefore will not be exposed to storm water. The measures outlined above will protect both surface waters and groundwater. Therefore, the proposed project is not expected to impact underlying aquifers.

1. Are aquifers or recharge areas underlying the site used for drinking water?

According to the *Recharge Potential of Louisiana Aquifers* (1988), by the Louisiana Geological Survey, the project area lies within an area that does not recharge major Louisiana freshwater aquifers. There are no impacts to the recharge zone anticipated as a result of the proposed project.

According to the Louisiana Geological Survey, *Ground-Water Resources of The Norco Area, Louisiana*, Water Resources Bulletin No. 18, there are four freshwater–bearing aquifer systems underlying the area. They are, from shallow to deep, the shallow aquifers, the Gramercy Aquifer, the Norco Aquifer, and the Gonzales-New Orleans Aquifer. The shallow aquifers, the Gramercy aquifer, and the Norco aquifer are interconnected and, along with the Mississippi River, work together as a large hydrologic system.

The shallow aquifers are typically abandoned channel deposits of the Mississippi River and its distributaries and associated point bar deposits. They are limited and irregular in aerial extent. The distributary channel deposits are typically composed of fine, silty sand and are less than 50 feet in thickness. Point bars are deposits of fine sand that accumulate on the inside of the river's bends. Point bars have been identified in the subsurface along the Mississippi River in the LaPlace/Norco/Luling area. They are often overlain by up to 30 feet of natural levee deposits and have a maximum thickness of approximately 130 feet. While the distributary channel deposits and the point bars are not important aquifers, they are significant hydrologically, in that they can provide hydraulic connection between the river and deeper aquifers.

The Gramercy Aquifer is a shallow component of the southward dipping regional aquifer system. It is the least continuous of the major aquifers in the area, yet is a very important connection between overlying and underlying aquifers. Depth to the top of the Gramercy Aquifer ranges from approximately 125 feet in the Norco area, to approximately 225 feet at Luling. Thickness averages approximately 100 feet, while approaching 175 feet to the southwest. The Gramercy Aquifer is composed of fine to coarse sand (Louisiana Geological Survey, *Ground-Water Resources of the Norco Area, Louisiana*, Water Resources Bulletin No. 18).

The Norco Aquifer is a very important aquifer in the area. It is nearly flat in the study area but has a regional dip to the south at about ten feet per mile. It is continuous across the area where it is generally 100 to 150 feet thick. In the vicinity of the Little Gypsy Facility, depth to the top of the Norco Aquifer ranges from approximately 300 to 350 feet. The Norco Aquifer is comprised of well-sorted, yellowish quartz grains that range from fine to coarse in texture. The Norco Aquifer is underlain by 200 to 300 feet of clay across much of the area, separating it from the underlying Gonzales-New Orleans Aquifer (Louisiana Geological Survey, *Ground-Water Resources of the Norco Area, Louisiana*, Water Resources Bulletin No. 18).

The Gonzales-New Orleans Aquifer is a continuous unit present in the subsurface from eastern Iberville Parish to the eastern part of Orleans Parish (Water Resources Technical Report No. 24). The aquifer has a general regional dip of 25 to 50 feet per mile to the south. The thickness ranges from approximately 200 to 250 feet, with localized variations. In the vicinity of the Little Gypsy Facility, depth to the top of the Gonzales-New Orleans aquifer is approximately 600 feet. The Gonzales-New Orleans Aquifer is described as very fine to fine sand that is more uniform in grain size and texture than the sand in the overlying Norco and Gramercy Aquifers (Louisiana Geological Survey, 1972, *Ground-Water Resources of the Norco Area, Louisiana*, Water Resources Bulletin No. 18).

A Louisiana Department of Transportation and Development (LDOTD) water well search conducted on June 13, 2006 showed that no public supply wells are located near the Little Gypsy power plant. Two active industrial wells at depths of 387 and 440 feet below ground surface (bgs) are located approximately three-fourths of a mile south of the facility. Four piezometers (belonging to the Little Gypsy Facility), with depths of 16 to 22 feet, are located within the facility boundaries; however, these piezometers were used solely for shallow groundwater monitoring purposes. These four piezometers have recently been plugged and abandoned (March 2006).

Best Management Practices and pollution prevention practices, such as secondary containment around storage tanks, will be used to protect groundwater in the area.

2. What is the relationship of the site to the water table?

According to the USDA Soil Conservation Services *Soil Survey of St. Charles Parish, Louisiana* (1987), the soils at the site are a mixture of Commerce Silt Loam and Commerce Silty Clay Loam. These are generally poorly drained soils that are described as having a water table from 1.5 to 4 feet bgs.

3. What wells exist in the area?

According to the LDOTD, Water Resources Section, and ELL records, four domestic wells, two industrial wells, and one irrigation well are located within a one-mile radius of the subject property. The remaining active wells within a one-mile radius consist of monitoring, piezometer, or recovery wells. The remaining wells are located approximately one-half mile south of Little Gypsy, on the opposite side of the Mississippi River. This survey was conducted on June 13, 2006 and reflects the known current status of water wells in the area.

4. What is the flow rate and direction of the groundwater flow?

Groundwater data available for the shallow aquifers within the Little Gypsy Facility area is limited to the western side of the plant. The shallow stratigraphy has been described to a depth of 20 feet bgs. Two distinct soil strata have been described (Stratum I and Stratum II). Stratum I is described as having a one to three and a half foot thick surface layer of fill consisting of shell, clay, and sand. The fill is underlain by a soft to very stiff medium brown and gray clay that ranges from two to eight feet thick and a medium stiff to stiff, medium brown and gray silty clay that is approximately two to four feet thick. Stratum I is eight feet thick and is present from approximately one to nine feet bgs (Entergy Services, Inc., Fossil Operations, July 2002, *Second Quarter Ground Water Monitoring Report, April 25, 2002*).

Stratum II is the uppermost permeable unit at the facility and is described as a two foot thick medium brown and gray silty clay and clayey silt. It is underlain by medium brown and dark gray clayey silt that is approximately 10 feet thick. Stratum II is present from approximately eight to 20 feet bgs (Entergy Services, Inc., Fossil Operations, July 2002, *Second Quarter Ground Water Monitoring Report, April 25, 2002*).

Potentiometric data indicates groundwater flow in Stratum II to be in two directions, to the northeast in the area of the West Ditch Enlargement and to the southwest in the Low Volume impoundment area. The groundwater gradient is approximately 8.85×10^{-3} (Entergy Services,

Inc., Fossil Operations, July 2002, *Second Quarter Ground Water Monitoring Report, April 25, 2002*).

The direction of flow of groundwater in the Gramercy and Norco Aquifers in the general area of the site was determined from literature stated below.

According to the *Ground-Water Resources of the Norco Area, Louisiana* (Louisiana Geological Survey, 1972, Water Resources Bulletin No. 18), the Gramercy Aquifer is thin, absent, or connected to the underlying Norco Aquifer in the vicinity of the site. Available data on the Gramercy Aquifer in the Little Gypsy area is sparse. The natural direction of groundwater flow in the Norco aquifer has been influenced by pumping of the Norco Aquifer. According to the literature, a cone of depression is present in the Norco Aquifer east of the Little Gypsy Facility, near the town of Norco. Groundwater flow would appear to be to the east northeast, toward the pumping center. Based on available hydraulic gradients, it is estimated that water in the Norco is moving toward the pumping center at a rate of 400 feet per year (*Ground-Water Resources of the Norco Area, Louisiana, Id.).*

5. What is the groundwater quality in the underlying aquifers?

Since the Gramercy Aquifer is thin, absent, or connected to the underlying Norco Aquifer in the vicinity of the Little Gypsy Facility, groundwater quality is unknown. According to the *Ground-Water Resources of the Norco Area, Louisiana, Id.*, "water in the Gramercy aquifer is in a very dynamic state in the central part of the [study] area and varies more widely as the chemical type than does water in the other two major aquifers in the Norco area." According to the *Ground-Water Resources of the Norco Area, Louisiana, Id.* overall groundwater quality for the Norco is complex and ever-changing. Due to recharge, interconnection with the overlying aquifer, and the presence of salt water within the aquifer, water quality across the aquifer varies. Water quality ranges from a sodium bicarbonate to a sodium chloride type. Where the water is fresh, the hardness ranges from 40 to 60 milligrams per liter (mg/l); hardness increases with salinity to over 500 mg/l. Iron is usually less than 0.5 mg/l, while pH averages in the 7.5 to 8.0 range. Temperature of the water ranges from 70° to 73° Fahrenheit. Dissolved solids content ranges from approximately 750 to 1,000 mg/l where the water is fresh to more than 2,500 mg/l where the water is salty (*Ground-Water Resources of the Norco Area, Louisiana*, Louisiana Geological Survey, 1972, Water Resources Bulletin No. 18).

6. Is there a hydraulic connection between the aquifers?

In the area of the Little Gypsy Facility, shallow aquifers of limited extent connect the Mississippi River and all aquifers (i.e., Gramercy and Norco) above the Gonzales-New Orleans Aquifer.

The Gonzales-New Orleans Aquifer is separated from the overlying Norco Aquifer by a 200-300 foot thick layer of clay.

F. Does prospective site pose potential health risks as defined by proximity to:

1. Prime agricultural area (crop or pastureland)

See answer below.

2. Residential area

See answer below.

3. Schools or day care centers

See answer below.

4. Hospitals or prisons

See answer below.

5. Public buildings or entertainment facilities

See answer below.

6. Food storage area

See answer below.

7. Existing community health problems that may be aggravated by operation of additional hazardous waste disposal capacity

See answer below.

Minimal potential health risks are expected due to the proximity of the plant to the above potential receptors. The general area is mixed use of residential, commercial and industrial facilities. Some residential areas do exist within three miles of the site, with the nearest being located approximately at the eastern most property line of the site. The closest incorporated area, LaPlace, is located approximately four miles from the site. The nearest school or day care center is located approximately 500 feet from eastern property line of the site. The St. Charles Parish Detention Center is located approximately five miles west of the site. The closest hospital is River Parishes Hospital, located in LaPlace, Louisiana, approximately seven miles west of the

Little Gypsy Facility. The nearest public building or entertainment facilities are located in LaPlace, Louisiana, approximately five miles from the site. The closest commercial food preparation storage site is in Norco, Louisiana, approximately four miles east of the proposed CFB unit.

The proposed CFB unit will meet all applicable water and air discharge regulations and will not generate large volumes of hazardous wastes to be stored or disposed on-site, as discussed in previous sections. Therefore, it is not anticipated that the Little Gypsy 3 Repowering Project will pose potential health risks to residential areas, schools, hospitals, or other public places in the vicinity of the site. The CFB unit will be built on property already owned by industry and suitable for industrial development.

Environmental Justice

Former President Clinton signed Executive Order No. 12898, on February 11, 1994, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," which directs federal agencies to achieve environmental justice as a part of their mission.

The EPA Office of Environmental Justice is committed to ensuring that all communities are empowered through information dissemination and education to have a better understanding of the environment. Environmental justice is the goal for all communities, so that people of all races, colors, cultures, income and educational levels are treated fairly and with respect with regard to the development and enforcement of protective environmental laws, regulations, and policies.

The current Louisiana permitting process, which includes public comment periods, the availability of public hearings, and detailed information, such as that described herein, provides for a means of information and education. The LDEQ has developed stringent policies and regulations that are intended to protect human health concerns. ELL is committed to adherence to these strict requirements specified in Louisiana's environmental laws, regulations and policies as well as to the permit conditions for the proposed project.

The site search process as described in this section was based solely on environmental factors, project economics, and also several other factors presented in Expanded IT Question 4.0.A. Demographic information is provided below, for reference.

According to the 2000 U.S. Census Bureau, St. Charles Parish has a total population of 48,072. The 2000 Census data for St. Charles Parish is summarized below. For information that is not available for year 2000, information from the 1990 Census was used.

Demographic Characteristics of St. Charles Parish Site Population

Demographic Characteristics	St Charles Parish	
	Total	Percent of Population
Population	48,072	100
Number of Households*	17,430	---
White	34,083	70.9
Black	12,130	25.2
Other	119	2.3
Persons Living Below Poverty	5,598	11.6
Per Capita Income*	$19,054	---

Based on U. S. Census Bureau's year 2000 Census.

* Based on 1999 information.

G. Is air quality protected?

The Little Gypsy 3 Repowering Project will meet or exceed all applicable state and federal emission standards, including ambient standards designed to protect human health and welfare. (Refer to the response to Question 1.0.A. for a detailed description of the air quality controls and procedures to be implemented by the facility.) In fact, the project will employ state-of-the-art air pollution control technologies to protect air quality in accordance with Best Achievable Control Technology (BACT) (see Table 2).

1. Is the site within an ozone or criteria pollutant non-attainment area?

No, St. Charles Parish is an attainment parish for all applicable criteria pollutants.

2. What protection is afforded from each contaminant generated by the site?

Federal Prevention of Significant Deterioration (PSD) regulations and Louisiana state regulations require that BACT be used to minimize the emissions of pollutants from a new major source or a major modification of an existing major source. BACT is applied to each new or modified emissions unit emitting pollutants subject to PSD review, and for this project, said pollutants include carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter (PM_{10}), volatile organic compounds (VOC), sulfuric acid (H_2SO_4) mist, and fluorides (as Hydrogen Fluoride). Although nitrogen oxide (NOx) emissions will actually decrease due to the proposed project, and therefore are not be subject to PSD requirements or BACT analysis, ELL is committed to utilizing state-

of-the-art NOx controls on each CFB unit. For this reason, NOx was included in the BACT analysis.

"Top Down" BACT Analysis

BACT is defined in the Clean Air Act as "an emissions limit based on the maximum degree of emissions reduction for each pollutant . . . which the permitting authority determines, on a case by case basis, taking into account energy, environmental, and economic impacts and other costs, is achievable for such facility through the application of production processes and available methods, systems, and techniques . . ." The primary guidance utilized in preparation of the BACT analysis is the EPA's 1990 Draft New Source Review Workshop Manual, which defines the "Top-Down" BACT procedure.

BACT determination begins with identification of all technologies that may be applied to control a particular pollutant, followed by a determination of which of those are technically feasible for the emission unit being analyzed. The top-down BACT process provides that all technically feasible control technologies be ranked in descending order of control effectiveness. If there is only a single feasible option, or if the applicant is proposing the "top," or lowest achievable emission rate (LAER) alternative (the most stringent limit achieved in practice by another unit in the same class or category of source), then no further analysis is required. That alternative is established as BACT unless the applicant demonstrates that the most stringent technology is not feasible due to economic or environmental considerations. If the most stringent control alternative is eliminated, based upon these criteria, then the next most stringent alternative is evaluated until a feasible control alternative is established.

The discussion below includes a summary of BACT for each criteria pollutant. A more detailed discussion is included in Part 4 of this application.

NO_X BACT

The formation of NOx is determined by the interaction of chemical and physical processes occurring within the flame zone of the furnace of the proposed boiler. There are two principal forms of NOx designated as "thermal NOx" and "fuel NOx." Thermal NOx formation is the result of oxidation of atmospheric nitrogen contained in the inlet gas in the high-temperature, post-flame region of the combustion zone. The major factors influencing thermal NOx formation are temperature, concentrations of combustion gases (primarily nitrogen and oxygen) in the inlet air, and residence time within the combustion zone. Fuel NOx is formed by the oxidation of fuel-bound nitrogen. NOx formation can be controlled by fuel type, adjusting the combustion process and/or installing post-combustion controls.

Although NOx was not subject to PSD requirements, a technology evaluation was nonetheless performed. A number of potentially applicable NOx control technologies were reviewed as part of this evaluation. For CFB steam generators firing high-sulfur petroleum coke, coal, or biomass, the most effective technology for NOx control is a combination of the CFB boiler technology and selective non-catalytic reduction (SNCR). A NOx emission limit of 0.07 lb/MMBtu (12-month rolling average) was determined to be BACT for the CFB boiler when operating at or near base load. When operating significantly under base load (60 percent load or less), ELL will achieve an emission limit of 0.15 lb/MMBtu on a 12-month rolling average.

SO_2 BACT

The operation of a CFB boiler is recognized by DOE as a Clean Coal Technology. The design of a CFB boiler provides for removal of SO_2, typically greater than 90 percent, in the combustion process without the use of adding post-combustion controls. Through use of sorbent material, typically limestone, sulfur present in the fuel is retained in the circulating solids in the form of calcium sulfate, allowing a higher sulfur retention rate. In a CFB boiler, a mixture of fuel and limestone is injected near the base of the boiler and "fluidized" (kept in turbulent motion) by upward air flow from the bottom of the furnace. The limestone ($CaCO_3$) is calcined to form calcium oxide (CaO). The calcium oxide then quickly reacts with the sulfur that has been oxidized (SO_2) to form calcium sulfate ($CaSO_4$).

Several techniques are used to reduce SO_2 emissions from coal combustion. Strategies for the control of SO_2 emissions can be divided into pre- and post-combustion categories. Given the inherent SO_2 control of a CFB boiler, pre-combustion controls are not necessary. As previously discussed, the CFB boiler acts as a post-combustion control device, with the limestone in the boiler bed reacting with the SO_2 and removing it from the gas stream. CFB technology with limestone injection and post-combustion polishing scrubber with an SO_2 emission limit of 0.15 lb/MMBtu (12-month rolling average) was determined to be BACT for the CFB boiler.

CO and VOC BACT

In order to minimize emissions of CO and VOC, good combustion must be ensured. An ideal burner scenario designed for complete combustion would allow for maximum temperatures, maximum residence time and enough excess air and turbulence to assure good mixing and availability of oxygen (O_2) to allow for the complete conversion of VOC to CO_2 and water. Combustion control is the only feasible method available to control CO and VOC emissions for a CFB boiler. Combustion control was selected as BACT for CO and VOC with limits of 0.10 lb/MMBtu and 0.0047 lb/MMBtu, respectively, when operating at base load. When operating significantly under base load (60 percent or lower), the emission limits will be 0.15 lb/MMBtu

and 0.0047 lb/MMBtu for CO and VOC, respectively. Compliance with these limits is to be determined based on stack tests.

PM_{10} BACT for CFB Boiler

PM_{10} composition and emission levels are a complex function of boiler firing configuration, boiler operation, pollution control equipment, and coal properties. Uncontrolled PM_{10} emissions from coal-fired boilers include the ash from combustion of the fuel, noncombustible metals present in trace quantities and unburned carbon resulting from incomplete combustion. In pulverized coal systems, combustion is almost complete. Thus, the emitted PM_{10} is primarily composed of inorganic ash residues. Other sources of PM_{10} include condensable organics and minerals present in the combustion air. PM_{10}[1] includes both filterable and condensable particulate matter. The greatest degree of control for filterable particulate matter is achieved through the use of a fabric filter. Therefore, a fabric filter capable of controlling emissions of filterable PM_{10} to 0.011 lb/MMBtu was selected as BACT for PM_{10}. There is no control technology available for condensable particulate matter (CPM). The polishing scrubber system combined with the fabric filter works to prevent the formation of CPM by reducing the precursors. This control system may help to reduce the amount of reactants that can eventually form CPM, but the system itself does not remove CPM from the gas stream.

PM_{10} BACT for Material Handling Operations

PM_{10} emissions will be generated from the solid fuel, ash, and lime handling operations. All affected equipment will utilize the "top" technologies in use today at solid fuel-fired power plants. The material handling sources for the Little Gypsy 3 Repowering Project include the following:

- Conveyors;
- Crusher house;
- Drop points (barge unloading, fuel and limestone domes, fuel and limestone reclaim hoppers);
- Ash silos;
- Lime silo;

[1] PM (greater in aerodynamic diameter than 10 microns) is treated for this purpose as PM_{10}, since it can be assumed that control of particulates greater than 10 microns is essentially complete.

- Transfer houses;
- Truck loading (ash); and
- Materials moving on paved roads.

PM_{10} emissions from these sources are generated from the physical disturbance of granular material exposed to air. These emissions typically result from either:

- Physical disturbance through pulverization or abrasion of surface materials by mechanical means (i.e. wheels, blades, dropping, etc.); or
- Wind eroding exposed granular material by the effect of entrainment.

The particulates typically have limited spatial impact, tending to settle rapidly in the downwind area near the emission point.

ELL will employ a variety of controls to minimize PM emissions from materials handling processes. Additionally, ELL will follow "Best Operating Practices" to minimize and control the emissions of particulate matter to the greatest degree practicable. The material handling operations and the BACT to be utilized for each are identified in the table below.

Material Handling PM_{10} BACT Control Summary

ACTIVITY	CONTROL TECHNOLOGY
Conveyors	Enclosures, Wet Suppression
Crusher House	Enclosed Structures, Wet Suppression
Storage Piles	Wet Suppression, Best Operating Practices
Storage Silos	Enclosed Structures, Baghouses
Transfer Points/Houses	Enclosed Buildings, Wet Suppression/ Water Sprays, Best Operating Procedures
Truck Loading	Closed – Vent System
Paved Roads	Best Operating Practices (Cleaning and Sweeping)

H_2SO_4 Mist BACT

The CFB boiler is the only source with the potential to emit H_2SO_4 mist. Sulfuric acid mist begins as small concentrations of sulfur trioxide (SO_3) within the boiler. Sulfur oxides are produced by the oxidation of the available sulfur in the fuel. Generally speaking, sulfur reacts with oxygen to form SO_2 and heat. Trace amounts of SO_3 are formed by the reaction of SO_2 with

oxygen. Once formed, the SO_3 combines with water (H_2O) vapor to form H_2SO_4 in the cold end of the boiler air preheater. H_2SO_4 is emitted from the boiler as either vapor adsorbed or condensed onto fly ash or as (H_2SO_4) mist. Factors that affect the formation of SO_3 include the fuel sulfur content, ash content and composition, temperature and excess level of air (oxygen). The operation of a CFB boiler is recognized by DOE as a Clean Coal Technology. The design of a CFB boiler provides for removal of SO_2, typically greater than 90 percent removal, in the combustion process without the use of adding post-combustion controls. Limiting the formation of SO_2 reduces the amount of SO_3 formed, thereby providing a control of sulfuric acid mist.

CFB technology with limestone injection and post-combustion polishing scrubber and fabric filter has been demonstrated to maintain 90 percent removal of H_2SO_4 mist on similar power plants. The polishing scrubber and fabric filter were selected as BACT for H_2SO_4, with an emission limit of 0.0012 lb/MMBtu.

Fluorides BACT

Combustion of fuel results in emissions of fluoride compounds, primarily in the form of hydrogen fluoride (HF). A portion of the fluorine in the fuel may be absorbed onto fly ash or bottom ash. Hydrogen fluoride is generally water soluble and readily controlled by acid gas scrubbing systems, such as Dry FGD/baghouse systems and Wet FGD systems.

After careful evaluation of the available control options, ELL has selected the polishing scrubber system (Dry FGD) as the appropriate control technology for control of hydrogen fluoride emissions from the new CFB boilers. The polishing scrubber system was chosen as it is the technology that can achieve a high degree of control of hydrogen fluoride emissions, has limited environmental, economic, and energy impacts, and is also selected as BACT for SO_2 control.

3. What is the potential for unregulated emissions?

ELL will operate the CFB unit within strict regulatory guidelines and will operate equipment within manufacturer's guidelines to prevent unauthorized discharges.

The potential for unregulated emissions is minimized by compliance with the federal and state regulations that call for emissions monitoring. The acid rain regulations (40 CFR 75) require a continuous emissions monitoring system (CEMS) for stack flow, opacity, NO_x, and SO_2. Quarterly reporting of emissions is required by the acid rain regulations.

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 and spill prevention and control countermeasures procedures, including SWPPP requirements.

ELL will monitor and/or report any unauthorized discharges to the atmosphere and record those emissions in the Little Gypsy Facility's annual report to LDEQ. It is expected that the LDEQ will perform routine inspections of the CFB units to confirm compliance with the terms of the air permit.

4. What plans are implemented to provide for odor control?

No significant odors are associated with or expected from the repowered unit. The petroleum coke, coal, and biomass are relatively low odor fuels. There is some potential for ammonia-related odors associated with the fly ash; however, this potential has been minimized to the fullest extent by the use of various control technologies proposed for the project described below.

The ammonia unloading and storage systems as well as the transport piping, vaporization and injection systems are designed to fully contain ammonia so as to prevent its release.

Some unreacted ammonia will remain in the flue gas as it leaves the SNCR. This is termed "ammonia slip." In order to minimize plugging of the boiler air heater and to minimize operating cost, this ammonia slip is controlled to less than 2 parts per million dry volume (ppmdv) corrected to three percent O_2. The SNCR system will be able to achieve its required NOx reduction at this level of ammonia slip. At this level, there will be no discernable ammonia odor resulting from the stack emissions. The odor threshold level for ammonia is approximately 5 ppmdv.

The ammonia slip may be further reduced by two additional mechanisms. In many cases, a fraction of the ammonia will condense on the fly ash removed by the electrostatic precipitator. However, recent operating experience with units utilizing selective catalytic reduction (SCR) systems and firing Powder River Basin coal indicates that very little ammonia will condense on the alkaline fly ash produced by this class of coal. Therefore, at the above ammonia slip level, the extremely low level of ammonia absorbed onto the ash will not have an ammonia odor and will not affect the marketability of the fly ash for off-site use in cement manufacturing. Some ammonia may also be removed in the polishing scrubber system. This ammonia would be present in the polishing scrubber byproduct as ammonium sulfate. While ammonium sulfate is water soluble, it would be encapsulated in the polishing scrubber byproducts sent to the permitted solid waste impoundments. These solids form monolithic fill with a very low permeability. The polishing scrubber byproduct will not have an ammonia odor.

5. Who will be affected by emissions?

The significance of the Little Gypsy 3 Repowering Project air emissions and evaluation of any such impacts were evaluated using predictive modeling tools. The protocols and modeling results are discussed in Part 5 of this application. The modeling methodology satisfies the federal requirements contained in 40 CFR 52.21(k) and (m), 40 CFR, Appendix W to Part 51, Guidelines on Air Quality Models, and follows the latest regulatory modeling guidance,

including the EPA's *Guideline on Air Quality Models (Revised).* In addition, the modeling was conducted in accordance with an LDEQ approved modeling protocol for PSD impact analysis (see Appendix I of the application). The most recent version of the Industrial Source Complex Short-Term (ISCST3, Version 02035) model was used in the PSD modeling analysis. For all criteria pollutants, the air quality dispersion modeling discussed in Part 5 of the application and attached in Appendix J indicates the proposed emission increases will not contribute to a violation of any PSD increments or NAAQS. These demonstrations are designed to show that any effects from air emissions are within acceptable regulatory criteria for protection of human health.

6. Describe the control of vapors at various stage of process.

Emissions from each point source are identified in Part 2 and Part 3 of this application. Emissions are primarily products of combustion from the CFB boilers. Emissions from the stack and materials handling sources will be controlled through the use of BACT as required by the PSD rules. For a thorough discussion of selection of BACT, see Part 4 of this application.

H. Have physical site characteristics been studied; what has been done in terms of a geotechnical investigation?

A geotechnical study is underway to determine foundation and support design. A Groundwater Certification investigation is also being performed to provide information for a Groundwater Certification; which will be submitted to the LDEQ.

1. Site geology

According to the Geologic Map of Louisiana (1984) by the Louisiana Geologic Survey, the site is underlain by gray to brownish gray silty clay and silt of the Quaternary alluvium deposits. According to the *Ground-Water Resources of The Norco Area*, 1972, St. Charles Parish and surrounding parishes are underlain by a complex series of southerly dipping, clay, silt, sand, and gravel deposits. Fresh-water and salt-water-bearing sediments range in age from Pleistocene to Recent with a regional dip to the south at the rate of about 20 feet per mile.

2. Hydrology

Surface water north of the Mississippi River, within the plant boundaries, drains to outfalls that discharge to a county-maintained ditch, flow north and eventually drains to Lake Pontchatrain. Outfall 001, which is the once-through cooling water discharge, is directed to the Mississippi River.

3. Topography

According to USGS Quadrangle 7.5 Minute Maps, LaPlace and Hahnville, Louisiana, 1998, topography of the land in the area of the proposed site is primarily flat.

The dominating feature of the entire region is the Mississippi River. The project area sits to the east of the Mississippi River, east of the man-made levee, and just to the west of the Bonne Carre Spillway. Elevations in the area are approximately 10 feet above mean sea level (msl).

4. Soil properties

According to the USDA Soil Conservation Services *Soil Survey of St. Charles Parish, Louisiana* (1987), the soils at the site are a mixture of Commerce Silt Loam and Commerce Silty Clay Loam. They are generally poorly drained soil with intermediate to high positions on the natural levees of the Mississippi River and its distributaries.

The typical surface layer of the Commerce Silt Loam is grayish brown silt loam about four inches thick. The subsoil is dark grayish brown loam or silt loam. The underlying material, to a depth of about 60 inches, is silty clay loam. This material is grayish brown, mottled, mildly alkaline silt loam. Water and air move through this soil at a moderately slow rate and water runs off the surface at a slow rate. A high water table fluctuates between 1½ to 4 feet from December to April. The shrink-swell potential is moderate in the subsoil and underlying material.

The typical surface layer of the Commerce Silty Clay Loam is a dark grayish brown silty clay loam about 10 inches thick. The subsoil is mottled, dark grayish brown silty clay loam. The underlying material to a depth of about 60 inches is gray, mottled, silty clay loam. Water and air move through this soil at a moderately slow rate and water runs off the surface at a slow rate. A high water table fluctuates between 1½ to 4 feet from December to April. The shrink-swell potential is moderate.

5. Aquifer location

As discussed previously, according to the Louisiana Geological Survey, *Ground-Water Resources of the Norco Area, Louisiana*, Water Resources Bulletin No. 18, there are four freshwater–bearing aquifer systems underlying the area. These are (from shallow to deep): the Gramercy Aquifer; the Norco Aquifer; and the Gonzales-New Orleans Aquifer. The shallow aquifers (Gramercy and the Norco) are interconnected and, along with the Mississippi River, work together as a large hydrologic system.

The shallow aquifers are typically abandoned channel deposits of the Mississippi River and its distributaries and associated point bar deposits. They are limited and irregular in aerial extent. The distributary channel deposits are typically composed of fine, silty sand and are less than 50 feet in thickness. Point bars are deposits of fine sand that accumulate on the inside of the river's bends. Point bars have been identified in the subsurface along the Mississippi River in the LaPlace/Norco/Luling area. They are often overlain by up to 30 feet of natural levee deposits and have a maximum thickness of approximately 130 feet. While the distributary channel deposits and the point bars are not important aquifers, they are significant hydrologically, in that they can provide hydraulic connection between the river and deeper aquifers.

The Gramercy Aquifer is a shallow component of the southward dipping regional aquifer system. It is the least continuous of the major aquifers in the area, yet is a very important connection between overlying and underlying aquifers. Depth to the top of the Gramercy ranges from approximately 125 feet in the Norco area to approximately 225 feet at Luling. Thickness averages approximately 100 feet, while approaching 175 to the southwest. The Gramercy Aquifer is composed of fine to coarse sand (Louisiana Geological Survey, *Ground-Water Resources of the Norco Area, Louisiana*, Water Resources Bulletin No. 18).

The Norco Aquifer is a very important aquifer in the area. It is nearly flat in the study area but has a regional dip to the south at about 10 feet per mile. It is continuous across the area where it is generally 100 to 150 feet thick. In the vicinity of the Little Gypsy Facility, depth to the top of the Norco ranges from approximately 300 to 350 feet. The Norco aquifer is comprised of well sorted, yellowish quartz grains that range from fine to coarse in texture. The Norco is underlain by 200 to 300 feet of clay across much of the area, separating it from the underlying Gonzales-New Orleans Aquifer (Louisiana Geological Survey, *Ground-Water Resources of the Norco Area, Louisiana*, Water Resources Bulletin No. 18).

The Gonzales-New Orleans Aquifer is a continuous unit present in the subsurface from eastern Iberville Parish to the eastern part of Orleans Parish (Water Resources Technical Report No. 24). The aquifer has a general regional dip of 25 to 50 feet per mile to the south. The thickness ranges from approximately 200 to 250 feet, with localized variations. In the vicinity of the Little Gypsy Facility, depth to the top of the Gonzales-New Orleans Aquifer is approximately 600 feet. The Gonzales-New Orleans Aquifer is described as very fine to fine sand that is more uniform in grain size and texture than the sand in the overlying Norco and Gramercy Aquifers (Louisiana Geological Survey, 1972, *Ground-Water Resources of the Norco Area, Louisiana*, Water Resources Bulletin No. 18).

6. Subsidence problems

No subsidence problems are expected for the area of the proposed plant site.

7. Climatic conditions

Based on research performed at the Louisiana State University's Southern Regional Climate Center, climatological data from the New Orleans Station was used because it is the closest station to the Little Gypsy Facility. Based on the National Oceanic and Atmospheric Administration (NOAA)/Southern Regional Climate Center's data, the average annual temperature is 68.8°F for the New Orleans area (New Orleans International Airport Station). From 1971 to 2000, October was the driest month on average at 3.05 inches of rain; the wettest month was June, with an average of 6.83 inches (www.srcc.lsu.edu).

SUMMARY

For the reasons discussed, ELL believes that no alternative sites would offer more protection to the environment than the proposed site without unduly curtailing non-environmental benefits.

- The Little Gypsy 3 Repowering Project was chosen to meet the electricity market's demand for low-cost power and is ideally located adjacent to existing infrastructure such as transmission lines, cooling towers, and associated structures. In addition, the Little Gypsy Facility has the necessary access to the Mississippi River for barge transportation, has available water intake and discharge structures, and is located near the customers it serves.
- An evaluation of alternative sites performed for this project indicated that the existing Little Gypsy Facility is the preferred site and is distinguished from the alternative sites by a number of distinct environmental and non-environmental benefits. It provides the highest level of environmental protection of any of the sites without unduly curtailing non-environmental benefits.
- The Little Gypsy 3 Repowering Project will be located on property owned by ELL and zoned, used, and developed for industrial purposes.
- The area of the proposed unit is not expected to have an adverse impact on property values or on existing infrastructure, but is expected to contribute significantly to the local and state economy.

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. The economic, social, and environmental benefits discussed in Questions 2.0, 3.0, and 4.0, and the emission measures discussed in Question 1.0, combine to support the conclusion that additional mitigation measures are not available which would be more protective of the environment than the proposed facility without unduly curtailing non-environmental benefits. The best mitigation possible is the elimination of a potential environmental impact. The proposed project site is located within the existing Little Gypsy Facility, which has an excellent environmental and safety record. Written plans, best management practices, and employee training are in place at the facility in order to prevent and minimize adverse impacts to the environment to the maximum extent possible. The proposed Little Gypsy 3 Repowering Project will utilize effective pollution prevention initiatives and pollution control technologies to minimize environmental impacts from waste generation, air emissions, and water discharges.

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

Not Applicable. This question pertains specifically to municipal waste management and is not applicable to the Little Gypsy 3 Repowering Project.

1. How does it fit into the plan?

Not Applicable. This question pertains specifically to municipal waste management and is not applicable to the Little Gypsy 3 Repowering Project.

2. What geographical area is served by the plan?

Not Applicable. This question pertains specifically to municipal waste management and is not applicable to the Little Gypsy 3 Repowering Project.

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

Not Applicable. This question pertains specifically to municipal waste management and is not applicable to the Little Gypsy 3 Repowering Project.

1. On-site

Not Applicable. This question pertains specifically to municipal waste management and is not applicable to the Little Gypsy 3 Repowering Project.

2. Regional

Not Applicable. This question pertains specifically to municipal waste management and is not applicable to the Little Gypsy 3 Repowering Project.

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

The solid waste generated from the proposed CFB unit will consist of fly ash and bottom ash, which are produced in the boiler as a result of the combustion of solid fuel. The fly ash and bottom ash will be managed in the most effective manner practiced for plants of this nature. A number of industrial applications have been found for fly and bottom ash, including soil stabilization, soil amendment, and concrete production. Entergy Gulf States, Inc. currently sells the ash generated at its Nelson site for these applications, and Entergy Louisiana, LLC (ELL) plans to do the same for any ash generated at the Little Gypsy Facility. Alternative methods of handling this material, such as off-site disposal, do not offer any advantages and would most likely cause additional impacts to the environment.

Any amounts of hazardous waste generated by the proposed Little Gypsy 3 Repowering Project will be hauled off-site by licensed contractors and disposed of in licensed disposal sites.

1. Technology limitations

The proposed Little Gypsy 3 Repowering Project will utilize effective pollution prevention initiatives and pollution control technologies to minimize environmental impacts form waste generation, air emissions, and water discharges. As previously mentioned, nonhazardous ash is generated as a result of the combustion of solid fuel which occurs within the CFB boiler. However, the ash material has been found to be useable in a number of commercial and industrial applications, such as soil stabilization and cement production. ELL will make every attempt to market the ash material because beneficial reuse is highly preferred over permanent disposal. If ELL is unable to market all the ash generated at its Little Gypsy Facility, then it will dispose of the unsold ash in a properly permitted solid waste facility.

As is the current practice, any hazardous waste generated on-site is disposed of at a property permitted off-site facility. This is the most viable option because ELL does not have the technology or regulatory approval to treat hazardous waste.

2. Cost factors

As previously discussed, ELL will attempt to beneficially reuse the ash generated by the CFB unit. This is not only the environmentally preferred alternative; it is also the most cost effective. Only unsold ash will be permanently disposed of at a properly permitted solid waste facility.

3. Other reasons

ELL's rationale for its chosen waste handling procedures is provided in the answers to the previous questions in this section.

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

The Little Gypsy Facility will produce approximately 1,109,600 tons of ash per year as a result of the proposed Little Gypsy 3 Repowering Project. As the material is generated, it will be temporarily stored on-site and eventually sold for beneficial reuse. If necessary, the Little Gypsy Facility will only dispose of unsold ash and Flue Gas Desulfurization (FGD) wastes in a properly permitted solid waste facility.

The Little Gypsy Facility will also generate waste from construction activities, normal operations, and maintenance activities. During construction of the Little Gypsy Facility, scrap metal, wood, plastic, and other building materials will require off-site recycling or disposal, as appropriate. During normal plant operations, the Little Gypsy Facility is expected to generate small amounts of paper, plastic, and general office wastes. In addition, the plant will likely generate small quantities of non-hazardous wastes such as used oil drums, paint cans, lube oil filters, cleaning solvents, spent coolants, and other maintenance wastes. ELL will ensure that solvents, coolants, and other special wastes generated at the Little Gypsy Facility are disposed of properly, and, if necessary, will contract for specialized waste management services.

The Little Gypsy Facility will provide training to its employees regarding multiple environmental programs. This training will address the importance of waste minimization and proper disposal of wastes generated on-site. This effort will also help ensure that non-compatible wastes are not mixed and that all wastes are stored, packaged, labeled, and disposed of properly in compliance with applicable environmental regulations.

1. Plans for lab work

As previously stated, ELL will ensure proper disposal of solvents, coolants, and other special wastes, and, if necessary, will contract for specialized waste management services.

2. How are out-of-spec wastes handled?

As previously stated, no off-site wastes will be accepted at the Little Gypsy Facility. Regarding on-site generated wastes, ELL will provide training to its employees regarding multiple environmental programs. This training will address the importance of waste minimization and the proper disposal of wastes generated on-site. The training will also help to ensure that non-compatible wastes are not mixed and that all wastes, including out-of-spec wastes, are stored, packaged, labeled, and disposed of properly in compliance with applicable environmental regulations.

3. What happens to rejected wastes?

Not applicable. The questions deals specifically with wastes that are accepted from off-site sources and is not applicable to the proposed Little Gypsy 3 Repowering Project.

4. Treatment stabilization

Not applicable. No treatment stabilization will be required for any wastes generated by the proposed Little Gypsy 3 Repowering Project.

5. Segregation of noncompatible wastes

As previously stated, ELL will provide training to its employees regarding multiple environmental programs. This training will address the importance of waste minimization and the proper disposal of wastes generated on-site. The training will also help to ensure that non-compatible wastes are not mixed and that all wastes, including out-of-spec wastes, are stored, packaged, labeled, and disposed of properly in compliance with applicable environmental regulations.

6. Handling of containerized wastes

As previously stated, ELL will provide training to its employees regarding multiple environmental programs. This training will address the importance of waste minimization and the proper disposal of wastes generated on-site. The training will also help to ensure that non-compatible wastes are not mixed and that all wastes, including out-of-spec wastes and any containerized wastes, are stored, packaged, labeled, and disposed of properly in compliance with applicable environmental regulations.

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

ELL will implement feasible methods to control the release of wastes or waste constituents into the environment. Air emissions are regulated under the Prevention of Significant Deterioration (PSD) program, which requires selection and use of Best Available Control Technology (BACT). The BACT process is similar to the mitigating measures demonstration required by this question in that it involves the use of those technologies that offer the greatest protection, without excessive cost or operational difficulties. Part 4 of this application discusses in detail the selection of BACT for the proposed Little Gypsy 3 Repowering Project from among available alternative technologies. Methods utilized by the Little Gypsy Facility to control air emissions associated with CFB boilers include:

- The CFB boiler, which has a relatively low combustion temperature, reduces nitrogen oxides (NO_X) emissions when compared to other, higher temperature processes.
- Limestone injected into the CFB process reacts with sulfur dioxide (SO_2) generated during the combustion process to form calcium sulfate, thus reducing total SO_2 emissions. This process is what creates the previously discussed ash material, which is then sold to third parties as a product for a variety of industrial processes.
- A polishing scrubber with a control efficiency of over 98 percent will be utilized to control SO_2 from the CFB process.
- A Selective Non-Catalytic Reduction Unit (SNCR) with a control efficiency of up to 70 percent will be used to control post-combustion NO_X emissions from the CFB process.
- Good combustion practices and the staged combustion associated with the CFB will minimize emissions of carbon monoxide (CO) and volatile organic compounds (VOCs); including organic hazardous air pollutants (HAPs).
- The limestone injection, polishing scrubber, and bag house, in concert, will effectively control emissions of acid gases and trace metals (including lead and mercury).

Additional environmental control measures will include the use of secondary containment around tanks and other containers of oils and other substances listed in LAC 33:I.3931, which will be able to contain the contents of the largest vessel in the containment structure plus adequate freeboard for rainfall. Best Management Practices to prevent storm water contamination from parking areas, loading and unloading sumps, and other areas will be used in accordance with required Storm Water Pollution Prevention Plans and Spill Prevention, Control and Countermeasures Plans. In addition, the existing Risk Management Plan will be updated to

include a hazard assessment for anhydrous ammonia storage and will include prevention and emergency response measures, as well as specific employee training.

Other mitigating measures include:

- The proposed Little Gypsy 3 Repowering Project will be located within an existing power plant with established security and trained operations staff.
- The site is located in a non-urban area, is owned by industry, and is used for industrial purposes.
- Transfer of raw materials and products will occur primarily by barges and transmission lines; thereby, minimizing potential adverse impacts to the public.
- There is no treatment or disposal of hazardous wastes on-site.
- Ash and FGD wastes will be placed in a properly permitted disposal facility.
- There are no significant adverse impacts on wetland, estuarine, wildlife habitat, or prime agricultural areas as a result of the proposed Little Gypsy 3 Repowering Project.
- Storm water associated with industrial activities, wastewater, and cooling tower blowdown generated at the facility will be discharged in accordance with the facility's LPDES permit. Furthermore, effluent limitations, monitoring requirements, and all other conditions contained in the LPDES permit will be followed. The discharges will only minimally impact the Mississippi River receiving water as the discharges will be low in volume.

1. Surface impoundment

As stated previously, ELL intends to market 100 percent of the ash generated by the CFB facility. However, in the event that an onsite solid waste landfill is required for the storage/disposal of ash, a surface impoundment may be required for the management of leachate collected in the landfill.

2. Land application treatment

Not applicable. The proposed Little Gypsy 3 Repowering Project will not include land application of any wastes.

3. Landfill (burial)

See previous discussion. The solid waste generated at the facility (i.e., unsold ash) will only be disposed of in a properly permitted solid waste unit should it be determined that there is no market for it.

4. Incinerator

Not applicable. The proposed Little Gypsy 3 Repowering Project will not include the incineration of any wastes.

5. Container storage

ELL will provide training to its employees regarding multiple environmental programs, including the importance of waste minimization and proper disposal of wastes generated on-site. This effort will help to ensure that any containerized wastes are stored, packaged, labeled, and disposed of properly and in compliance with applicable regulations.

6. Tanks

As previously stated, environmental control measures implemented at the facility will include the use of secondary containment around tanks and other containers of oils and other substances listed in LAC 33:I.3931, which will have the capacity to contain the contents of the largest vessel in the containment structure plus adequate freeboard for rainfall.

SUMMARY

ELL has determined that the CFB technology and pollution controls chosen for the proposed Little Gypsy 3 Repowering Project offer the most protection to the environment without unduly curtailing non-environmental benefits. The proposed project will be sited within an existing industrial facility, which will minimize adverse effects from construction as much of the existing infrastructure can be utilized. Measures, such as written plans, Best Management Practices, and employee training programs are currently in existence at the facility and will either minimize or prevent adverse impacts to the environment. In addition, air emissions and water discharges will be controlled, and the proposed Little Gypsy 3 Repowering Project will aggressively utilize effective pollution prevention initiatives and pollution control technologies to further minimize potential environmental impacts. The non-hazardous solid waste generated at the facility will either be marketed for beneficial reuse or will be disposed of in properly-permitted waste facilities. Other than the small quantities of hazardous waste related to maintenance activities currently generated at the facility, no additional hazardous waste will be generated as a result of the proposed project. The Little Gypsy Facility is a small quantity generator, and any hazardous waste generated will continue to be disposed of in properly permitted facilities. In sum, there are no mitigating measures that would offer more protection to the environment that proposed Little Gypsy 3 Repowering Project without unduly curtailing non-environmental benefits.