KENTUCKY PIONEER ENERGY, LLC

SITE DEVELOPMENT PLAN

FOR

THE INTEGRATED GASIFICATION COMBINED CYCLE

PLANT LOCATED AT J.K. SMITH IN CLARK CO. KENTUCKY

I. INTRODUCTION

Kentucky Pioneer Energy LLC ("KPE"), a subsidiary of Global Energy USA ("Global"), is planning to construct a 540 MW (net export) Integrated Gasification Combined Cycle ("IGCC") electric generating plant locate on a 300 acre leased area ("Lease Site") within the 3,120 acre J.K. Smith Generation Site ("Smith Site") owned by East Kentucky Power Coop and located in Clark County, Kentucky. In accordance with KRS 278.704, KPE has applied to the Kentucky State Board on Electric Generation and Transmission Siting ("Board") for a construction certificate to construct the proposed IGCC facility. In support of its application for a construction certificate, KPE submitted an Environmental Impact Statement ("EIS") prepared by the Department of Energy as its Site Assessment Report pursuant to KRS 278.706(2)(l) and in accordance with KRS 278.708(3). KPE has developed this Site Development Plan as an indication of a planned plant layout and to provide a brief summation of the information contained in the EIS, incorporated herein, in accordance with KRS 278.708(3)(a).

II. DESCRIPTION OF THE PROPOSED FACILITY

a. Clean Coal Technology

IGCC is an advanced form of clean coal technology which converts coal and other organic material into a gas, cleans the gas and then burns the cleaned gas in a combustion turbine. The IGCC provides power generation from solid fuels with significantly lower emissions than conventional technology.

Under the contractual agreement presently in effect between KPE and East Kentucky Power Cooperative ("EKPC") one hundred percent of the power generated by KPE will be sold and delivered to EKPC pursuant to a long-term contract for EKPC's

transmission to its member distribution cooperatives for their use in serving their Kentucky retail customers. This is not a merchant plant that exports electricity on the wholesale market for resale to end use consumers. The plant will operate 24 hours a day, seven days a week, throughout the year and act as a capacity resource for EKPC to meet its base load supply requirements.

There are an increasing number of gasification facilities in operation in the United States. This project will be the first commercial application of the British Gas/Lurgi ("BGL") fixed bed gasification technology in the United States. This technology will convert high sulfur coal and refuse-derived fuel ("RDF") into clean synthetic gaseous fuel ("Syngas").

The gasification process operates at extremely high temperatures in a fully enclosed and pressurized reactor that converts its solid organic feedstock (coal and RDF) into a synthesis gas of primarily hydrogen and carbon monoxide. The raw synthesis gas stream from the gasification process then undergoes various cleanup steps including scrubbing to remove over 99% of its sulfur content, as well as other contaminants. The clean synthesis gas is suitable for chemical plant feedstock or for use as a clean fuel. In this project, the bulk of the synthesis gas will be fed to two gas turbines (General Electric 7 FA's) which, together with a single steam turbine, will deliver approximately 540 megawatts of electrical power to EKPC.

The proposed project is a chemical reaction process that generates a product -- synthesis gas or synfuel. The project does not burn municipal solid waste or even RDF -- the gasification process is not combustion. Rather, it is a chemical conversion process. The produced synthesis gas contains over 90% of the heating value in the

gasifier's feedstock. As such, the gasification process itself is a chemical conversion step for the RDF prior to any energy recovery or other step. The clean manufactured synthesis gas is chemically distinct from RDF and is analogous to natural gas when used as a fuel.

The feed to the IGCC will consist of coal and RDF. The RDF is a dense pelletized fuel product manufactured offsite from municipal solid waste ("MSW") through a process which typically includes sorting, shredding, addition of a binding agent and pelletizing. The resultant RDF is physically very different than MSW and is a useable fuel or organic feedstock. The RDF will be shipped to the proposed IGCC facility for use as one of the feedstocks to the gasifier. KPE plans to contract the supply of RDF pellets, and will not handle any raw municipal solid waste at the proposed site in Clark County. The proposed KPE facility will not be receiving any municipal solid waste nor will the facility be removing any component of a solid waste stream for any purpose, energy recovery or otherwise. Instead, the RDF will have been separated from MSW and manufactured into a sized, processed RDF fuel product at a separate facility. The proposed site will only be receiving, storing and reusing the already processed final fuel product, RDF. The extensive separation of solid waste and production of RDF pellets will occur at the source (i.e., where collected). This allows the processing to be handled by the waste contractor who would be more familiar with the waste supply business.

The RDF pellets will be delivered from the supplier. The pellet supplier will have expertise and access to large quantities of MSW as the feedstock to their RDF pellet manufacturing process. KPE will have no involvement in that operation.

On-site feed storage and handling equipment will unload the railcars, hold the material in covered storage and convey it to the process area for conversion into synthesis gas.

b. Location of IGCC Facility

The proposed IGCC facility will be located in Clark County, Kentucky, on approximately 300 acres within the 3,120 acre Smith Site. The Smith Site is located approximately 21 miles southeast of Lexington, 8 miles southeast of Winchester, and 1 mile west of Trapp, Kentucky. The 300 acre Lease Site has been previously disturbed by prior construction activities and has previously completed initial grading, primary foundations, fire protection piping and a rail spur access infrastructure. The freight rail line is owned by CSX and consists of a 3.1 mile railroad loop around the 300 acre Lease Site. The Smith Site is accessible via a 1 mile access road and through a gated perimeter fence off of Kentucky Highway 89 and currently operates five natural gas combustion turbines.[1]

III. SURROUNDING LAND USES

The proposed KPE IGCC process facility will occupy approximately 12 acres of the 300 acre Lease Site within EKPC's 3,120 acre Smith Site. The Smith Site is located within the Kentucky River Basin and is located on the edge of the Outer Bluegrass and Knobs Physiographic Regions.[2] The J.K. Smith site is a hilly highland bounded by the Upper Howard Creek on the north and west, the rail line on the east, and the Kentucky River on the South.[3] The predominate land uses within 5 miles of the

[1] *See* U.S. Department of Energy Kentucky Pioneer Integrated Gasification Combined Cycle Demonstration Project final Environmental Impact Statement, dated November 2002, at S-4.
[2] *Id.* at 4-9.
[3] *Id.* at 4-2.

proposed IGCC facility are cropland, pasture, forest, shrub/brush and rangeland.[4] Several small areas surrounding the perimeter of the Smith Site are zoned residential.[5] No impact on the surrounding land uses is expected to occur from the construction and operation of the IGCC facility.[6]

IV. LEGAL BOUNDARIES OF PROPOSED SITE

For a description of the Lease Site boundary, the Smith Site property boundary and a conceptual layout of the proposed facility please see the maps attached as "Exhibit A." By lease agreement with EKPC, there is no surveyed delineation of the KPE lease site. Rather, the lease generally identifies the rail loop, other areas, and certain buildings for joint and cooperative use.

V. PROPOSED ACCESS CONTROL TO THE SITE

The proposed IGCC facility will be entirely within EKPC's 3,120 acre Smith Site. EKPC's Smith Site is accessed by a 1 mile access road off of Kentucky Highway 89 that has a gated perimeter fence that follows the property boundary.[7] Continued gated access and use of the perimeter fence is anticipated during the construction phase and operation phase of the proposed IGCC facility.

VI. LOCATION OF FACILITY BUILDINGS, TRANSMISSION LINES, AND OTHER STRUCTURES

The 300 acre Lease Site is located approximately 2500 feet from the northern property boundary of the Smith Site, 1500 feet from its eastern property boundary, 7000 feet from its western property boundary, 5500 feet from its southern property boundary and within the existing rail loop. Within the Lease Site area, the main processing facility

[4] *Id.*
[5] *id.*
[6] *Id.* at 5-3.
[7] *Id.* at S-4.

will occupy approximately 12 acres tentatively located approximately 1,000 feet from the northern edge of the rail loop, 1,000 feet from its eastern edge, 1,900 feet from its western edge and 2,300 feet from its southern edge.[8] A conceptualized layout is described in the EIS and included in Exhibit A attached hereto. KPE will not undertake specific plant layouts until after the project has secured financing.

Currently, the EKPC J.K. Smith site has five natural gas fired combustion turbines in use. EKPC constructed several infrastructure facilities including roads and various buildings as part of its original J.K. Smith project that was cancelled. The lease agreement allows KPE to utilize these facilities including use of the administrative building located on the southwestern edge of the Lease Site area and use of the existing water supply and waste water discharge lines extending from the Lease Site south-westerly to the Kentucky River. In conjunction with the existing water system, KPE will construct a water intake structure to be jointly used by KPE and EKPC.[9]

EKPC will construct a new 138-kilovolt electric transmission line from the proposed IGCC's busbar. The proposed route for the line will extend northeasterly from the proposed IGCC facility to the Spencer Road Terminal located in Montgomery County.[10] However, the exact route of the transmission has not yet been determined.

VII. LOCATION AND USE OF ACCESS WAYS, INTERNAL ROADS, AND RAILWAYS

As previously noted, the Smith Site is reached by an access road off of Kentucky Highway 89 between mileposts 2.9 and 4.8. The access road is approximately 1 mile long, limited by gated access and enters on the eastern property boundary of the Smith

[8] *Id.* at 3-9.
[9] *See* Kentucky Pioneer Energy, LLC's Response to Board Staff's First Data Request Dated January 13, 2003, Question No. 8.
[10] *Id.* at 3-1.

Site. Once the access road enters the site, it splits into numerous paved and unpaved maintenance roads. The site lease agreement allows KPE to utilize the existing roads. Kentucky Highway 89, the access road and the existing roads will be utilized as the main access route to the proposed IGCC facility.

The freight rail line enters on the eastern boundary of the Smith Site and forms a rail loop around the Lease Site area. The existing rail system includes yard capacity and a Y-junction at the CSX mainline track. This system will be utilized to bring in major equipment and appropriate construction materials during the construction phase and the required feed stock to the process facility during the operation phase.

VIII. EXISTING OR PROPOSED UTILITIES TO SERVICE THE FACILITY

Currently, Clark Energy Cooperative, Inc. supplies electrical service to EKPC at the Smith Site. KPE expects to have a similar electrical connection with Clark Energy to supply electric service when the plant is not operating. However, KPE will self-generate its own requirements during operations. KPE has not yet determined the nature or specific characteristics of the connection with Clark Energy. For gas service, KPE intends to tie-in to one of the existing natural gas transmission lines within the Smith Site property boundary near EKPC's existing peaking station.

IX. COMPLIANCE WITH KRS 278.704 (2), (3), OR (5)

KRS 278.704 (2) requires the exhaust stack of a proposed facility to be at least 1000 feet from the property boundary of any adjoining property owner and 2000 feet from any residential neighborhood, school, hospital, or nursing home facility. As previously discussed, *supra*, the 300 acre Lease Site for the proposed IGCC facility is within EKPC's 3,120 acre Smith Site. Within the Lease Site area, the conceptualized

layout of the proposed IGCC facility anticipates the exhaust stack to be approximately 1000 feet from the boundary of the lease area. Additionally, the lease boundary is at least 1500 feet from the nearest property boundary of the Smith Site and adjacent property. Therefore, the anticipated distance from a proposed exhaust stack to any adjoining property is approximately 2500 feet and satisfies the requirements of KRS 278.704 (2).

KRS 278.704 (3) and (5), respectfully, allows a county or a municipality with a planning and zoning commission to establish the exhaust stack setback requirements and imposes specific setback conditions if the proposed facility will be located on a former coal processing plant. Since neither condition applies to the KPE's application for the proposed IGCC facility, section (3) and (5) of KRS 278.704 are not applicable.

X. EVALUATION OF NOISE

The EPA has identified outside noise levels of 55 dB and inside levels of 45 dB as desirable to protect public health and welfare.[11] Studies conducted in 1979 for the Smith Site, at locations not influenced by highway traffic, produced ambient noise levels of 39 to 55 dBA.[12] Noise monitoring performed by EKPC since 1992 confirms that the noise data collected in 1979 is still representative of ambient noise conditions for the area.[13] On July 30, 1999, the measured noise level at the perimeter of the EKPC turbine site was 39 dBA with three turbines in operation.[14]

[11] *Id.* at 4-34 general discussion of "Noise Terminology."
[12] *Id.* at 4-36.
[13] *Id.*
[14] *Id.*

Construction activities on the proposed IGCC facility are estimated to last approximately 30 months.[15] A conservative estimate of construction site noise has been developed by assuming an average of 20 heavy equipment operating in the same area over a 10-hour workday, and nighttime construction is not anticipated.[16] Estimated noise levels under this model is estimated to be 90 to 92 dBA at 100 feet, 71 dBA at 1,000 feet, 61 dBA at 2,500 feet, 50 dBA at 1 mile, and approximately 44 dBA at 1.5 miles.[17] Actual levels are anticipated to be less due to terrain and vegetation effects and anticipated to be similar to or less than background noise levels at locations beyond the EKPC property.[18] Additional truck traffic generated by construction activity would produce some additional noise level increases along affected highways.[19]

During the operation phase, noise levels inside the turbine buildings and gasification are expected to be very high (155 dBA and 95 dBA respectfully). However, the buildings enclosing these facilities will provide significant noise reduction.[20] Studies conducted by KPE indicate that operational noise levels are anticipated to be approximately 62 dBA at the perimeter of the lease site, 56.5 dBA at the EKPC property boundary, 53.4 dBA at the closest structure outside the EKPC property, and 44.7 dBA in the community of Trapp.[21] The noise levels outside EKPC's property boundary are considered compatible with rural residential land uses.[22]

Increase rail and vehicle traffic during the operation phase is anticipated to have minor effects on noise levels. The additional rail traffic has been has been evaluated

[15] *Id.* at 5-31.
[16] *Id.* at 5-31.
[17] *Id.*
[18] *Id.*
[19] *Id.*
[20] *Id.*
[21] *Id.*
[22] *Id.*

and determined not to have a significant effect on existing noise levels along the mainline tracks.[23] Vehicle traffic during the operation phase is also not anticipated to have an impact on noise along Highway 89. The additional amount of traffic based on the anticipated workforce will be less than 80 vehicles at any shift change period.[24] It is anticipated that this small increment of additional traffic will have little or no impact on highway traffic noise conditions in the area.[25]

XI. IMPACT TO THE SCENIC SURROUNDINGS

The proposed IGCC units are anticipated not to have any significant impact on the aesthetic and scenic resources and would not be visible from outside the Smith Site.[26] Additionally, the units would most likely not be visible from the observation position at the top of Pilot Knob State Nature Preserve located 8 miles east of the Smith Site.[27] Outside lighting necessary for illuminating stairways and entrance will consist of downward illumination and is anticipated to have a minimal impact.[28] Additionally, the proposed IGCC units will not have any significant impacts on the aesthetic and scenic resources of the Daniel Boone National Forest or the Red River.[29]

However, the upper portion of the stacks associated with the proposed IGCC units would likely be visible from the City of Winchester, the observation position on top of Pilot Knob State Nature Preserve, and the community of Trapp.[30] The upper portions of the exhaust stacks will also utilize a strobe light in accordance with Federal Aviation

[23] *Id.* at 5-31 and the accompany table of data on 5-32.
[24] *Id.* at 5-32.
[25] *Id.*
[26] *Id.* at 5-11.
[27] *Id.*
[28] *Id.*
[29] *Id.*
[30] *Id.* at 5-12.

Administration regulations.[31] In addition, there would be visible plumes associated with the cooling towers.[32] Although visibility is dependant upon the weather and wind patterns and the location of the viewer, the plumes would most likely be visible from Trapp, the Pilot Knob State Nature Preserve, and up to 8 miles from the Smith Site.

Additionally, in the event of abnormal operations within the facility, flaring may be necessary.[33] The flare vent will be approximately the same height as the turbine stacks, although much smaller in profile. Additional illumination from a flare event would be of relative short duration. A flare effect would be an infrequent occurrence and would not have a lasting effect on the aesthetics and scenic resources of the area.[34]

XII. POTENTIAL EFFECTS ON PROPERTY VALUE

The proposed IGCC facility will be located with in EKPC's 3,120 acre Smith Site with limited visibility from outside the property boundary. However, the stacks and taller structures may be visible from some locations. The proposed IGCC facility will be located 1 mile from the nearest tract available to a potential buyer (the closes residence). This distance should mitigate the effect on property values.[35] The proposed IGCC facility may negatively affect property values, however, due to the numerous factors that impact property value, there is no quantitative method for measuring the impact from the construction of the proposed IGCC facility.[36]

[31] *Id.*
[32] *Id.*
[33] *Id.*
[34] *Id.*
[35] *Id.*
[36] *Id.*

XIII. TRAFFIC AND TRANSPORTATION

Construction of the proposed IGCC facility is anticipated to take 30 months and employ an average of 600 people with a peak employment of 1,000.[37] During periods of average construction worker staffing, an additional 500 to 600 vehicle trips would occur at the beginning and end of shifts.[38] During periods of operation, an anticipated additional 50 to 60 vehicle trips will occur. Additionally, it is anticipated that approximately 30 heavy-duty trucks would operate in the area during the construction phase, adding approximately 8 vehicle trips per hour worked to the local roads.[39]

The location of the proposed IGCC facility is conducive with local traffic patterns. Based upon the traffic patterns analyzed in the area, the increase of traffic associated with either the construction phase or operation phase of the proposed IGCC project would flow in opposite directions of existing heavy flows of traffic and would not compound any existing traffic congestion during commuting periods.[40] Additionally, due to the fact that typical construction shifts begins and ends comparatively early in the day, the majority of traffic from construction workers will occur outside of commuting periods.[41]

However, significant traffic impacts would occur to the roads in Trapp and at the intersection of Highway 89 and the access road as construction traffic enters and leaves Highway 89.[42] The lack of traffic control at this intersection will likely result in minor congestion.[43] Additionally, the presence of school buses along Highway 89 operating

[37] *Id.* at 5-34.
[38] *Id.*
[39] *Id.*
[40] *Id.*
[41] *Id.*
[42] *Id.*
[43] *Id.*

during the end of the work shift will increase the amount of traffic congestion.[44] However, the safety of the children should not be at risk since the buses stop at each child's individual home thereby minimizing the amount of walking along the road.[45]

The majority of heavy truck traffic delivering construction supplies and removing construction waste would occur at the anticipated average of 8 per hour during the work day.[46] All trucks used for the construction and operation of the facility would haul a maximum of 20 tons which is half of Kentucky Highway 89 allowable legal gross weight of 40 tons and according to the Kentucky Transportation Cabinet should not cause any damage to the roadway.[47] Construction traffic along routes to and from landfills should have little to no impact on existing traffic patterns since the routes to the anticipated landfills are lightly traveled.[48] Trucks traffic carrying supplies to the proposed IGCC site are also expected to have little to no impact on existing traffic along the routes in the area.[49]

Major equipment and appropriate construction materials can be delivered by rail and would typically occur during construction shift hours.[50] Feedstock material for the operation phase of the proposed IGCC facility will also be delivered by rail and is anticipated to average of 56.4 rail cars per day or 8 train movements per week.[51] The supply trains will travel onto the existing rail loop while at the site for unloading and it is anticipated that no delays to mainline rail traffic will occur.[52] It is anticipated that rail

[44] *Id.*
[45] *Id.*
[46] *Id.*
[47] *Id.* at 5-35.
[48] *Id.*
[49] *Id.* and See "*Traffic and Transportation"* analysis at 4-37
[50] *Id.* at 5-35.
[51] *Id.* at 5-36.
[52] *Id.*

traffic due to construction will be insignificant since the materials will be delivered intermittently and the deliveries will be coordinated with CSX.[53] During the operational phase, the addition of approximately one train per day along c-237 would have little or no effect since deliveries to the site will be coordinated by CSX.[54]

XIV. MITIGATING MEASURES

Construction of the proposed IGCC facility will produce dust in the vicinity of the construction site and may temporarily affect visibility within the Smith Site. Although it is anticipated that the dust produced during construction will not leave the J.K. Smith site, dust control measures typically utilized in the construction industry will be implemented to minimize its impact.

Traffic and transportation impacts from the proposed facility will be addressed with the Kentucky Department of Transportation during construction planning. Their guidance and recommendations will be addressed. Additionally, if seen to be an appropriate mitigation, KPE will consider transportation options such as car pooling or bus transport and directional controls at the access road.

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[53] *Id.* at 5-35.
[54] *Id.* at 5-36.

EXHIBIT A