Clark County Public Library
Winchester, KY
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Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

January 22, 2002

Dear Mr. Spears,

The Kentucky Pioneer Integrated Gasification Combined Cycle Demonstration Project, an electrical partnership between Eastern Kentucky Power and Global Energy of Cincinnati, OH is dangerous to the environment of Central Kentucky, detrimental to our quality of life, and finally contrary to the laws of the Commonwealth of Kentucky. For these reasons it should not be funded by the federal government. In order to operate this plant Global Energy will bring in up to 4000 tons of palletized municipal waste from New York and New Jersey into Clark County every day. 1/11 2/21

Over a year that amount of waste comes to one-half the total municipal waste of the entire state of Kentucky. It will be impossible, by any human standard, to regulate the content of that amount of refuse derived fuel. Carbon dioxide levels in the air will increase, as will levels of mercury, cadmium, arsenic and other toxic substances in air, land and water. No one can adequately predict the long- term detriments of those toxins, but we do know that high amounts of sulfur dioxide in the air can scar the lungs of young children; and, as you know, the Kentucky Pioneer plant site lays less than one mile from the Trapp elementary school where you met with the citizens of Clark County. 3/16 4/06 5/11

The immediate effects on the Kentucky River, the main drinking water source for all of Central Kentucky will be disastrous. Daily, millions of gallons of Kentucky River water will be annihilated by this plant to create hydrogen and oxygen for its fuel cells. That's millions of gallons of water completely lost. The water that is discharged from this plant will be contaminated, and the main intake of Clark County's water system lies only five miles downstream. All of this is going to happen to our community because legal definitions of the gasification process supposedly give Global Energy the right to circumvent local solid waste ordinances described in 1991 law SB2 and KRS statute 224. However, many people in the state think this circumvention of Kentucky statutes is illegal. Tom Fitzgerald of the Kentucky Natural Resources Council has already spelled out his legal objections in regard to KRS statute 224. Clark County Judge Executive Drew Graham has asked the Kentucky Attorney General to review the licensing of the Trapp plant in terms of those statutes. If necessary, these legal definitions will be challenged in court so that local autonomy over solid waste plans, something Kentuckians have fought very hard for, can be maintained. 6/07 2/21 (cont.)

Recently, many questions have been raised about the advisability of constructing power plants across the state of Kentucky. Governor Patton, who supported these plants, has called a moratorium on licensing new plants because of the questions raised. He also told the Public Service Commission a few weeks ago that he was going to make it more difficult for new plants to circumvent local solid waste statutes. So, even people who previously supported building new power plants in Kentucky are now reconsidering them because of their detrimental environmental, social, and economic impacts. 7/21

In light of all this, we are asking that you review the licensing Kentucky Pioneer, consider it's negative environmental and quality of life impacts, and act to help us stop this plant by withholding federal funding. 8/21 1/11 (cont.) 9/16

Comment No. 1 **Issue Code: 11**

Gasification is different from incineration. It is a better, more environmentally responsible approach to generating energy from the use of fossil fuels and refuse derived fuel (RDF). Incineration produces criteria pollutants, semi-volatile and volatile organic compounds and dioxin/furan compounds. Ash from hazardous waste incinerators is considered a hazardous waste under the *Resource Conservation and Recovery Act* (RCRA). In contrast, gasification, which occurs at high temperatures and pressures, produces no air emissions, only small amounts of wastewater containing salts. Synthesis gas (syngas) produced from the gasification process has very low concentrations of particulates, NO_x and SO_x. Non-volatile trace metals in the feed concentrate in the vitrified frit and are effectively immobilized, eliminating or reducing their leachability. The frit from BGL Gasifiers operating on a 100 percent coal feed has consistently been shown to be nonhazardous under RCRA. Since this project will be using a different feed stream, the first batch of frit should be tested to ensure that it meets all Toxicity Characteristic Leaching Procedure (TCLP) criteria and therefore nonhazardous under RCRA and applicable Kentucky laws and regulations.

Heavy metals and mercury would be emitted only from the power island component (combustion turbines) of the Kentucky Pioneer IGCC Demonstration Project. Total heavy metal deposition in areas downwind of the project would be much less than 1.1 kilogram per hectare (1 pound per acre) accumulated over a 20-year period and present little risk to human health and the environment.

Comment No. 2 **Issue Code: 21**

KPE is not attempting to circumvent Kentucky Revised Statutes (KRS) 224, or any other state or local laws. KPE has appealed to the state for an interpretation of the language of applicable solid waste laws regarding RDF. The Kentucky Natural Resources and Environmental Protection Cabinet, Department of Environmental Protection, Division

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We want to keep our environment, our farmlands and our waterways, clean; we do not want 800 ft. tall cracking towers fouling our scenery, and we do not want the traffic congestion and garbage stock piling this plant will cause.

The entire operational concept of this plant is an insult to all Kentuckians. It was not bad enough that industrial conglomerates got to pillage our lands and resources during the 20th century. Is the government now going to allow 21st century conglomerates to poison and bury us with their garbage?

I sincerely hope not.

John Maruskin
Adult Services Librarian
Clark County Public Library
859-737-2482 (h)
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Also on behalf of:

Lisa Collins
2344 Harrodsburg Rd.
Lexington, KY 40503

William S. Herrick
4859 Flat-Mary Rd
Campton, KY 41301

Ramesh Bhatt
Sierra Club Cumberland (Kentucky) Chapter
1000 Rain Court
Lexington, KY 40515

Tom Fitzgerald
Kentucky Resources Council
P.O. Box 1070
Frankfort, KY 40602

Elizabeth Crowe
Kentucky Environmental Foundation
P.O. Box 467
Berea, KY 40403

Naomi Schulz
Member, Kentuckians for the Commonwealth (KFTC)
109 Phillips Street
Berea, KY 40403

Phil Crewe
1817 Traveller Rd.
Lexington KY 40504

10/05, 6/07 (cont.) 11/04 12/10 13/12 13/12 (cont.)

Comment No. 2 (cont.) **Issue Code: 21**

of Waste has determined that the RDF is a recovered material and not waste. The Kentucky Pioneer IGCC Demonstration Project facility will be considered a recovered material processing facility and the gasification process will not require a waste permit as long as the RDF conforms to the statutory definition. A discussion of this issue has been added to Chapter 1 and Chapter 6 of the EIS.

Comment No. 3 **Issue Code: 16**

Chapter 3, Section 3.2.2.2, discusses the production and composition of the RDF pellets. KPE intends to supply all RDF pellets for this project from the same manufacturer. The gasification technology used produces a very consistent syngas product, regardless of the variability of the feed. Variation in RDF pellet composition due to different manufacturing processes should not be an issue for this project.

Comment No. 4 **Issue Code: 06**

Comment noted. Hazardous air pollutant emissions from the proposed project are identified in Table 5.7-2 of the EIS. The estimated maximum lifetime cancer risks associated with exposure to these emissions from the proposed project are presented in Table 5.7-4 of the EIS. As noted in the EIS, the proposed project would produce about 1.45 million metric tons (1.6 million tons) of greenhouse gas emissions per year (mostly carbon dioxide). This would be about 25 percent less than the amount produced by a comparable natural gas fueled power plant. Impacts to land and water are discussed in Sections 5.6, Geology, and 5.8, Water Resources and Water Quality, respectively, in the EIS.

Comment No. 5 **Issue Code: 11**

Comment noted. Modeling is the best tool available to determine the possible fate and transport of a substance in the environment to a receptor and the likely health consequences. This tool is very conservative in the estimate of health effects in order to protect the most sensitive members of the population. Dispersion modeling

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Comment No. 5 (cont.) **Issue Code: 11**
conducted for the Prevention of Significant Deterioration (PSD)/Title V permit application covered an area approximately 12 kilometers (7.5 miles) from the project site. The location of maximum impact was covered within this area.

Maximum air pollutant increments associated with emissions from the proposed project indicated that no significant air quality impacts would occur on either a short-term or long-term basis. Locations 24 to 40 kilometers (15 to 25 miles) away would be exposed to lower pollutant levels than the area covered by the dispersion modeling analysis. Total heavy metal deposition in areas downwind of the project would be much less than 1.1 kilogram per hectare (1 pound per acre) accumulated over 20 years.

More than 99 percent of the sulfur content of the raw fuel (coal and RDF) are removed and recovered by the sulfur removal and recovery process. The sulfur is converted to elemental sulfur, a marketable product. The sulfur compounds that would be emitted from the proposed project are listed in Tables 5.7-1 and 5.7-2 of the EIS. The emitted concentrations are well below reference concentrations and/or air quality standards that would cause acute or short-term adverse effects to the brain, eye, nervous system, nasal passages, and lungs.

Comment No. 6 **Issue Code: 07**
As stated in Section 5.8 of the EIS, Water Resources and Water Quality, treated wastewater is expected to contain conventional pollutants such as nitrogen, phosphorus, total dissolved solids, and biological and chemical oxygen demand. Pollutant discharge limitations would be set by the Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water's Water Resources Branch and would be identified in the Kentucky Pollutant Discharge Elimination System (KPDES) permit. These limitations would be established based on site-specific computer modeling of the

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Comment No. 6 (cont.) **Issue Code: 07**
expected effect on water quality of the Kentucky River at the proposed discharge point and in the mixing zone immediately downgradient. The limits specified in the permit would be protective of existing water quality. Fuel cells do not consume water to generate electricity. Furthermore, the fuel cell demonstration has been moved to the existing Wabash River IGCC Plant near West Terre Haute, Indiana.

The Water Resources Branch pays particular attention to the proximity of wastewater discharges to drinking water intakes. New sources of wastewater are prohibited within 8 kilometers (5 miles) of a water treatment plant intake. This 8-kilometer (5-mile) limit was established to provide an additional layer of protection for the water quality found at drinking water intakes over treatment alone and is referred to as Zone 1. Zone 2 extends from 8 to 16 kilometers (5 to 10 miles), while Zone 3 is the area from 16 to 40 kilometers (10 to 25 miles) from a water treatment plant intake. The proposed outfall is located in Zone 3 for the Winchester Water Treatment Plant. Water collected at the treatment plant is tested and treated to meet all federal and state requirements concerning drinking water quality. Therefore, no impacts to drinking water are expected.

Comment No. 7 **Issue Code: 21**
Comment noted.

Comment No. 8 **Issue Code: 21**
The EIS is part of the review to evaluate the project. DOE will issue the Record of Decision (ROD) based on the findings of the EIS and comments from the public.

Comment No. 9 **Issue Code: 16**
Comment noted. After the Final EIS is issued, DOE will consider all public comments on the project before issuing its ROD.

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Comment No. 11 **Issue Code: 04**
Comment noted. Impacts to the aesthetic and scenic environment of the project area are presented in Section 5.5 of the EIS, Aesthetic and Scenic Resources. The tallest structures that would be built for this project are the facility stacks for the gasifiers. These structures would stand 65 meters (213 feet) in height.

Comment No. 10 **Issue Code: 05**
All raw materials and wastes would be stored and handled in enclosed areas that would not be in direct contact with local soil. Therefore, no impacts to local farmland would be expected from operation of the plant.

Comment No. 12 **Issue Code: 10**
Comment noted. Specific traffic impacts are presented in Section 5.11, Traffic and Transportation.

Comment No. 13 **Issue Code: 12**
The proposed project would store approximately two 10-day supplies of RDF pellets. No garbage would be stockpiled on site. The proposed project would produce primarily vitrified frit, which is considered a commercial product and not a waste stream. Solid waste generated at the proposed facility would be landfilled in the State of Kentucky. Hazardous waste would be disposed of in accordance with applicable state and federal laws at a licensed hazardous waste disposal facility. As a generator of waste, KPE has to comply with state and federal regulations pertaining to waste storage, handling, transport, and disposal. The purpose of these regulations is to protect the public's health and environment by minimizing the impact of pollution.

Collins, Lisa P.
Lexington, KY
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December 17, 2001

Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Dear Mr. Spears:

I am writing concerning the public hearings held in Lexington and Trapp, Kentucky on December 10 and 11 in relation to the Kentucky Pioneer Integrated Gasification Combined Cycle Demonstration Project Draft Environmental Impact Statement. While this the first time that I have attended public hearings of this nature, the overwhelming impression left with me is that Kentuckians have not had the opportunity to review the Trapp EIS and were at a distinct disadvantage at the public hearings, the format of which did not allow for participants to learn about the proposed project. In addition, because the EIS has not been available in the public library in Clark County, the county on which the proposed project would have the most impact. Kentuckians have not been privy to the due process that these public hearings are designed to provide. 1/21

As you stated at the December 11 hearing in Trapp, advertising in the Louisville, Lexington and Winchester newspapers proved to be ineffective. I do not know where these public notices appeared, but if they appeared in the classified section of the newspapers, this is indeed an obsolete way to communicate. As you recommended, public notices of this importance should be disseminated via television and radio, and I add to your proposal that the notices should appear as display advertisements as opposed to classified advertisements. Additionally, it is only right that residents be given greater access to the EIS. Placing one copy in the public library is not a strong attempt at notification (and even that did not occur in the instance of Winchester in Clark County). Cannot is this document be available on the Web, and multiple copies available at all local schools, libraries, and courthouses? Additionally, the proposed project is extremely close to Estill and Madison counties, and Clark County is contiguous to Montgomery, Bourbon, Powell, and Fayette counties as well. Should not the public hearings have been advertised in these counties, and the EIS distributed there? 1/21 (cont.)

In light of the events to date, I am requesting the following:

1) that the EIS be made available on the Web and multiple copies sent to all schools, public libraries, and courthouses in Fayette, Clark, Madison, Estill, Powell, Bourbon and Montgomery counties;

2) that a second series of public hearings be held following a reasonable length of time beyond a thorough distribution of the EIS; 1/21 (cont.)

3) that the deadline for written comments be extended.

Comment No. 1 **Issue Code: 21**

NEPA requires that the public have the opportunity to comment on Draft EISs. The formal hearing was designed to obtain input from the public. Each of the public hearings was preceded by an informal open house during which members of the project staff were available to answer questions. One copy each of the Draft EIS was sent to Trapp Elementary School, Clark County Public Library (the designated project reading rooms), and Lexington Public Library during the general distribution on November 7, 2001. A public hearing in Lexington, Kentucky, was added in response to comments received during the scoping period. The public hearing dates, times, and locations were announced in the *Federal Register*, in local newspapers, *The Winchester Sun* and *The Lexington Herald-Leader*, and in public service announcements. All requirements in state and federal laws, rules, and regulations regarding announcements for public hearings were satisfied or surpassed. Due to security concerns resulting from the events of September 11th, DOE removed all NEPA documents from the agency's website. However, DOE distributed paper copies of the Draft EIS to all persons, organizations or agencies who commented during the scoping process or expressed interest in the Proposed Action. The comment period was extended through January 25, 2002. The Final EIS will be distributed to elected officials and any interested parties in neighboring counties. DOE will consider all public comments before issuing the ROD. The ROD will be issued no sooner than 30 days after the Final EIS is distributed and a notice of its availability is issued.

Collins, Lisa P.
Lexington, KY
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On today's date I heard from people who have not yet received the EIS, even though they requested it prior to the December 10 and 11 public hearings. The January 4, 2002 deadline to respond to the EIS is too short. As a property owner near Trapp in Clark County, I am requesting that residents and concerned citizens be given the opportunity to be informed about this proposed project.

1/21
(cont.)

Sincerely,

Lisa P. Collins

Lisa P. Collins
2344 Harrodsburg Rd.
Lexington, KY 40503

Collins, Lisa P.
Lexington, KY
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Kentucky Pioneer Integrated Gasification
Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

Written Comment Form

Must be received by January 4, 2002.

December 27, 2001

Dear Mr. Spears:

Please see the attached sheets for written comments.

Sincerely,

Lisa P. Collins

Lisa P. Collins
2344 Harrodsburg Rd.
Lexington, KY 40503

Please use other side if more space is needed.

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

Collins, Lisa P.
Lexington, KY
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Kentucky Pioneer Integrated Gasification
Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

Written Comment Form

The Kentucky Pioneer Integrated Gasification Combined Cycle Demonstration Project should not be constructed near Trapp in Clark County, Kentucky for the following reasons:

1. Kentucky Highway 89, the only artery to the proposed site, is not adequate to carry 500-830 vehicle trips *per shift change* and 40-60 heavy-duty truck trips per day. The road is old and narrow, and many stretches lack adequate shoulders. School children enter and exit school buses all along this route. This project puts school children and area residents at serious risk that cannot be ignored. Carpooling and a turn lane at the proposed site's entrance are not adequate solutions. 1/10

2. This is an experimental project. There is no firm evidence that the vitrified frit will not be hazardous. If it is hazardous, the frit can be held at the proposed site for 90 days, increasing risk to area residents in the form of air, soil, and water pollution. 2/12

3. The Commonwealth of Kentucky does not need the power that would be generated by the proposed project. The state will be adversely affected by price hikes and blackouts from an excess of electricity. Kentucky's electricity rates are currently low; merchant power could make rates increase. 3/14

4. Very little has been said about the Red River, which is 1.5 miles from the proposed project. This river, part of which has been designated a National Wild and Scenic River, adds to the unique cultural and historical significance of Clark, Madison, and Estill counties where the three counties meet near the confluence of the Red River and the Kentucky River. This area is extremely close to the proposed project. This plant will wholly compromise the aesthetic quality of the Red and Kentucky Rivers, in an area where real Kentucky pioneers explored and settled the country. 4/07 5/04 6/03

5. According to the EIS, the gasifier facility stacks and plumes would likely be visible from the City of Winchester, the community of Trapp, and the Pilot Knob State Nature Preservation. What possible sense does it make for a county as scenic as Clark County, as well as the adjacent areas of Madison and Estill Counties, to be marred by stacks and plumes in generating power the Bluegrass State does not need? 7/04

6. The Kentucky River has been compromised for many years, an example being the nearby Boonesborough Beach, which has been closed to swimmers for many years. 8/07

Comment No. 1 **Issue Code: 10**

Comment noted. Impacts to traffic levels along Kentucky Highway 89 are addressed in Section 5.11 of the EIS, Traffic and Transportation. As stated, during construction, 500 to 1,000 vehicle trips would occur along Kentucky Highway 89 at the beginning and end of the construction workday. The exact number would depend on the staffing levels required onsite. Construction schedules typically call for workers to be onsite relatively early in the morning, thus avoiding morning schoolbus traffic, until the early afternoon. The Transportation Division of the Clark County School Board indicates that schoolbuses utilize Kentucky Highway 89 when construction workers would be leaving the site. Section 5.11, Traffic and Transportation, has been modified to reflect the impacts of the extra vehicles on schoolbus routes.

The trucks would haul a maximum of 18 metric tons (20 tons) of cargo each, which would place the overall weight below the Kentucky-mandated maximum for Kentucky Highway 89 of 36,288 kilograms (80,000 pounds) for a five-axle vehicle. The Kentucky Transportation Cabinet indicated any vehicle below that weight traveling along that road would not be expected to cause damage to the roadway. Should damage occur from vehicles carrying more than the maximum weight allowance, the operator of the trucks, in this case KPE, would be responsible for any repairs to the road surface. Section 5.11, Traffic and Transportation, has been modified to address the concerns of damage to the local roads.

Comment No. 2 **Issue Code: 12**

Comment noted. Analysis of frit from gasification processes has shown that the frit is nonhazardous and rarely fails the TCLP for metals. Vitrified frit is expected to meet the more stringent Universal Treatment Standard criteria of the U.S. Environmental Protection Agency (EPA)-TCLP. There is no risk to residents from frit since all its constituents are immobilized in a glassy matrix which is resistant to corrosion in the environment and nonleachable by EPA standards. Vitrified frit is a commercial product and not a waste, therefore, it is expected to be marketable.

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Efforts to clean up the river are slow but constant. This proposed project is a step back in the environmental healing process of the river and will further compromise both the Kentucky and the Red rivers, since the Kentucky seasonally backs into the Red. Is it sensible to make a sick river sicker with a power plant that the state does not need? Kentuckians do want the Kentucky River to be environmentally sound and are working towards that goal. — 8/07 (cont.)

7. Transporting over 4,000 tons of municipal waste from New York and New Jersey to Kentucky *daily* to generate merchant power is an unwieldy plan. Why can't the power plant be built in New York or New Jersey? — 9/16

8. As a property owner near Trapp, I am extremely concerned about air, soil, and water pollution. The horrific results of the facilities in Paducah and Maxey Flats do not instill trust into this project, regardless of how much federal and state monitoring might take place. Don't put this risk in Trapp. — 10/06, 11/05, 12/07

9. The community has not been informed as to the route the power transmission lines will take to Montgomery County. This is another unknown that will adversely affect the aesthetic and historical nature of the area. It is another aspect of this project that will unfairly blindside area residents later on. — 13/21; 14/04, 13/21 (cont.)

10. The draft EIS does not come close to adequately addressing issues of culture, history, aesthetics. Trapp and much of Clark County, as well as most of neighboring Estill and Madison counties, are rural areas that heretofore have been largely saved from modern threats such as this one. Kentucky is a farming state, with a history of real pioneers in the area of the proposed plant. Putting the proposed plant at Trapp will change the lives of these people in too many negative ways. These people, with their history and culture were here before this plant; the plant should not be an interloper into this community and area. — 16/03; 17/04; 16/03 (cont.)

Finally, I protest the manner in which the December 2001 public hearings were advertised and conducted, and the length of time between the meetings and the deadline for the written comments.

First, advertisement was too little and too few. Radio and television stations are required to carry a minimum number of public service announcements free of charge; there is no justification for electronic media not being informed by the U.S. Department of Energy about the public hearings. Advertisement in the Lexington, Louisville, and Winchester newspapers was not enough. This project is extremely close to the historic College Hill area of Madison County and close to Estill County. Extensive display advertisement, *not classified advertisement*, should have occurred in all of these counties, as well as other counties contiguous to Clark County. Residents of Clark County were given little notice; residents of several contiguous counties were given zero notice, even though issues of pollution and aesthetic compromises affect residents there as well. Could it be that the attitude of the U.S. Department of Energy and Global Energy, Inc. is that Kentuckians are — 18/21; 19/03

Comment No. 3 **Issue Code: 14**

Chapter 2 of the EIS discusses EKPC's 1998 Power Requirements Study. The study indicates that the electrical load for the region is expected to increase by 3.0 percent per year through 2017. Net winter peak demand is expected to increase by 3.3 percent per year and net summer peak demand is expected to increase by 3.0 percent per year. Peak demand is projected to increase from 2,031 megawatts (MW) in 1998 to 2,394 MW in 2003 and 3,478 MW in 2015. Based on this load growth, EKPC will need additional power supply resources of 625 MW in 2003. The need is further shown by EKPC's plans to construct four new combustion turbine (CT) electric generating units to provide peaking service alongside the three existing peaker CTs at the J.K. Smith Site.

Comment No. 4 **Issue Code: 07**

The proposed plant is located 2.4 kilometers (1.5 miles) downstream of the confluence of the Kentucky River and the Red River. The distance between the confluence of the rivers and the discharge point and the fact that the confluence is upstream make the chance of any discharges backing up into the Red River remote. Therefore, no impacts to the Red River would be expected.

Comment No. 5 **Issue Code: 04**

Comment noted. Due to the hilly terrain of the area and the distance of the Red River from the project site, the facility stacks from the gasification island would not be visible from the Red River.

Comment No. 6 **Issue Code: 03**

Concurrent with the EIS process and prior to committing federal funds or granting a license or permit for this undertaking, DOE is responsible for considering the impacts of its actions on cultural resources. Consultation with the Kentucky Heritage Council and State Historic Preservation Officer (SHPO) has determined that there is no effect on historic properties from this project.

Collins, Lisa P.
Lexington, KY
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not bright enough to notice or care about the impact this project would have on their way of life?

Second, concerned citizens have been given from December 12 to January 4 to respond to the Draft EIS. This is an unreasonable length of time at any time of the year, but has been further compounded because this particular season is when students are finishing a school term and families are involved in significant holidays and the events that surround them. Who chose this unfair timeline at this time of the year? Again, was the thinking that Kentuckians would not notice or care? The manner in which the public hearings have taken place has done nothing to bolster confidence in this project. 20/21

Sincerely,

Lisa P. Collins

Lisa P. Collins
2344 Harrodsburg Rd.
Lexington, KY 40503

Comment No. 6 (cont.) **Issue Code: 03**
Chapters 4 and 5 have been revised to include the findings of the Section 106 Review process.

Comment No. 7 **Issue Code: 04**
Comment noted. Impacts to the aesthetic and scenic environment of the project area are presented in Section 5.5, Aesthetic and Scenic Resources, of the EIS. Because of DOE's limited role of providing cost-shared funding for the proposed Kentucky Pioneer IGCC Demonstration Project, alternative sites were not considered.

Comment No. 8 **Issue Code: 07**
Pollutant discharge limitations would be set by the Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water's Water Resources Branch and would be identified in the KPDES permit. These limitations would be established based on site-specific computer modeling of the expected effect on water quality of the Kentucky River at the proposed discharge point and in the mixing zone immediately downgradient. The limits specified in the permit would protect existing water quality.

Comment No. 9 **Issue Code: 16**
Because of DOE's limited role of providing cost-shared funding for the proposed Kentucky Pioneer IGCC Demonstration Project, alternative sites were not considered. KPE selected the existing J.K. Smith Site because the costs would be much higher and the environmental impacts would likely be greater if an undisturbed area were chosen.

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Comment No. 10 **Issue Code: 06**
Comment noted. Hazardous waste clean-up activities at both the nuclear waste disposal site at Maxey Flats and the DOE gas diffusion plant at Paducah have no association with the proposed Kentucky Pioneer IGCC Demonstration Project. The activities and technologies used at the Maxey Flats and Paducah sites have nothing in common with the proposed Kentucky Pioneer IGCC Demonstration Project facility.

Comment No. 11 **Issue Code: 05**
All raw materials and wastes would be stored and handled in enclosed areas that would not be in direct contact with local soil. Therefore, no impacts to local soil quality would be expected from operation of the plant.

Comment No. 12 **Issue Code: 07**
Pollutant discharge limitations would be set by the Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water's Water Resources Branch and would be identified in the KPDES permit. These limitations would be established based on site-specific computer modeling of the expected effect on water quality of the Kentucky River at the proposed discharge point and in the mixing zone immediately downgradient. The limits specified in the permit would protect existing water quality.

The primary issues with the facilities in Maxey Flats and Paducah involved historic releases of radioactive materials; there would be no radioactive materials associated with the proposed plant.

Comment No. 13 **Issue Code: 21**
Pursuant to Rural Utility Service (RUS) NEPA regulations, a NEPA document would be prepared that would address the impacts from the transmission line. Information in that NEPA document will be used to assure impacts are avoided and solutions integrated to avoid adverse public and environmental impacts.

Collins, Lisa P.
Lexington, KY
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Comment No. 14 **Issue Code: 04**
Comment noted. All visual and aesthetic impacts from the transmission line will be addressed in a NEPA document that would be prepared according to RUS NEPA regulations. Information in the document will be used to assure impacts are avoided and solutions integrated to refrain from adverse public and environmental impacts.

Comment No. 15 **Issue Code: 03**
The transmission line would be constructed as part of both No Action Alternative 2 and the Proposed Action and would be subject to Section 106 Review as an undertaking, as defined by the *National Historic Preservation Act*. The route of the transmission line has not yet been determined and a cultural resource identification effort has not been defined. The cultural resource identification would likely include a pedestrian survey for archaeological resources and an assessment of the potential for visual impacts to the setting of any nearby cultural resources. Impacts to cultural resources from the transmission line will be evaluated in a NEPA document that will be prepared under RUS NEPA regulations.

Comment No. 16 **Issue Code: 03**
The EIS provides a summary of the cultural resource work that has been conducted on the proposed demonstration project site. Chapters 4 and 5 have been updated to show the findings of the completed Section 106 Review process. The Kentucky SHPO has found that there is no effect on historic properties from this project.

Comment No. 17 **Issue Code: 04**
Comment noted. DOE believes that the EIS adequately addresses all impacts to visual and aesthetic resources in the project vicinity. Impacts to the environment of the project area are presented in Section 5.5, Aesthetic and Scenic Resources, of the EIS.

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Comment No. 18 **Issue Code: 21**
The public hearing dates, times, and locations were announced in the *Federal Register*, in local newspapers, *The Winchester Sun* and *The Lexington Herald - Leader*, and in public service announcements. The comment period was extended through January 25, 2002. The Final EIS will be distributed to elected officials and any interested parties in neighboring counties. All requirements in state and federal laws, rules, and regulations regarding announcements for public hearings were satisfied or surpassed.

Comment No. 19 **Issue Code: 03**
The Section 106 Review process has been completed. The Kentucky SHPO has issued a finding of no effect on historic resources from this project.

Comment No. 20 **Issue Code: 21**
The comment period was extended through January 25, 2002.

Collins, Thomas N.
Paris, KY
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(1)

Kentucky Pioneer Integrated Gasification Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

Written Comment Form
Must be received by January 4, 2002.

Dear Mr Spears,
I am writing you to express my concerns about the proposed gasification project.
The first thought that comes to mind is, if gasification of solid waste is such a good idea and will provide so many benefits to Kentucky, then why doesn't New Jersey keep and gasificy their own waste? Will not the pollution generated by ground transportation across multi states add to the green-house effect and

Please use other side if more space is needed. (over)

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

1/16

2/06

Comment No. 1 **Issue Code: 16**

Because of DOE's limited role in providing cost-shared funding for the proposed Kentucky Pioneer IGCC Demonstration Project, and because of advantages associated with the proposed location, DOE did not evaluate alternative sites for the proposed project. Site selection was governed primarily by benefits that Global Energy could realize. Global Energy preferred the proposed project site because the costs would be much higher and the environmental impacts likely much greater for an undisturbed area.

This project was first selected in 1993, with Duke Energy as the participant in partnership with an east coast utility. However, for various reasons, the siting for the project was changed to a site in Illinois. In 1999, Global Energy approached Duke and requested to take over the project. KPE, a subsidiary of Global Energy, entered into a power purchase agreement with East Kentucky Power Cooperative (EKPC) to buy the power from the Kentucky Pioneer facility. Because the current proposed site for the project would provide for demonstration of the BGL technology, and the power purchase agreement between KPE and EKPC would allow KPE to meet their repayment agreement with DOE, the partnership was found acceptable.

Comment No. 2 **Issue Code: 06**

Comment noted. Rail transport is the most economical and energy-efficient transportation method available for this project for fuel materials and marketable byproducts generated by the gasification process. Emissions per ton per mile for material transported by rail would be substantially less than comparable emissions associated with truck transport. Rail transport is clearly the preferred method for fuel materials and shipment of vitrified frit. Customers for sulfur produced by the sulfur recovery facility would determine whether shipment of that material is by rail or truck. All air impacts, including a discussion of greenhouse gas emissions and acid rain effects, are presented in Section 5.7, Air Resources, of the EIS.

Collins, Thomas N.
Paris, KY
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(2)

also acid rain that already plagues the Eastern United States?
What is the environmental impact in New Jersey that changes when the vast amounts of solid waste arrives in Kentucky?
As a Kentuckian, I have watched outside interests use this state for their own gain at our loss for years - I am thinking about strip mining. I have lived and worked in Kentucky all my life with the only time away from home a four year stent in the U.S. Navy. I have seen 3/4 of the rest of the world and I have not found any place better. Though I do not live in the immediate area of the prosposed project, (30 miles away) I have fished, boated and camped at the confluence

2/06 (cont.)

3/22

4/22

Comment No. 3 **Issue Code:22**
Comment noted. Reduced impacts as a result of removing the RDF from the manufacturer site is beyond the scope of this EIS.

Comment No. 4 **Issue Code:22**
Comment noted. The power generated by the Kentucky Pioneer IGCC Demonstration Project will be used within Kentucky.

Collins, Thomas N.
Paris, KY
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③

Kentucky Pioneer Integrated Gasification Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

Written Comment Form
Must be received by January 4, 2002.

of the Red River and the Kentucky River for twenty years. The fishing stories I could tell you, the wild life I have seen, the times of peace and tranquility I have spent there can have no monetary value placed on them. The solitude of this area is very remarkable given its close proximity to a large metropolitan population. Other questions that I have include, What will be the traffic impact on highway 89 during construction. This road is very busy during the work week and school buses run

Please use other side if more space is needed.

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

4/22 (cont.)

5/10

Comment No. 5 **Issue Code: 10**

Comment noted. Impacts to traffic levels along Kentucky Highway 89 are addressed in Section 5.11, Traffic and Transportation. As stated, during construction, 500 to 1,000 vehicle trips would occur along Kentucky Highway 89 at the beginning and end of the construction workday. The exact number would depend on the staffing levels required onsite. Construction schedules typically call for workers to be onsite relatively early in the morning to avoid morning schoolbus traffic, until early afternoon. The Transportation Division of the Clark County School Board indicates that schoolbuses utilize Kentucky Highway 89 when construction workers would be leaving the site. Section 5.11, Traffic and Transportation, has been modified to reflect the impacts of added vehicles on schoolbus usage.

The trucks would haul a maximum of 18 metric tons (20 tons) of cargo each, which would place the overall weight below the Kentucky-mandated maximum weight for Highway 89 of 36,288 kilograms (80,000 pounds) for a five-axle vehicle. The Kentucky Transportation Cabinet indicated any vehicle below that weight traveling along that road would not be expected to cause damage to the roadway. Should damage occur from vehicles carrying more than the maximum weight allowance, the operator of the truck, in this case KPE, would be responsible for any repairs to the road surface. Section 5.11, Traffic and Transportation, has been modified to address the concerns of damage to the local roads.

Collins, Thomas
Paris, KY
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(4)

up and down the road most of the year. Highway 89 is not a safe road at the best of times. What is the constitution of the waste pellets going to be? What is the quality control going to consist of? We are talking years and years of shipping with no assurance of stable regulation resources. If heavy metals, mercury PCB's - who knows what slips through, the damage is done.

On the surface, it seems this project is being pushed through under the radar of the public eye. The limited availability of the environmental impact statement, the short and limited notification of the public and lack of placement of documents in the Clark County ~~Count~~ library, weather through oversight or ~~on~~ intentionally, remains a fact.

Give this project a little breathing-

5/10 (cont.)

6/16

7/21

8/12

9/21

10/16

Comment No. 6 **Issue Code: 16**

Chapter 3, Section 3.2.2.2, discusses the production and composition of the RDF pellets.

Comment No. 7 **Issue Code: 21**

The Final PSD/Title V Air Permit, issued by the Kentucky Division for Air Quality on June 7, 2001, requires continuous emissions monitors for NO_x, SO_x, CO, O_2, and PM_{10}. Annual stack tests for all pollutants with emission limits established by the permit are also required. The KPDES permit, which will be obtained at least 180 days prior to the commencement of construction, will also have effluent limits and monitoring requirements established by state regulations. Along with the required monitoring under the permit, KPE would also monitor the levels of biological and chemical oxygen demand, pH, and temperature in any wastewater generated by the facility. Any monitoring and measurements would be based on usage limits and flows associated with natural gas-fired plants.

Comment No. 8 **Issue Code: 12**

The major criteria pollutant emissions and hazardous air pollutant emissions associated with the proposed project are identified in Tables 5.7-1 and 5.7-2 of the EIS. No polychlorinated biphenyls (PCBs) are generated from the proposed project.

Heavy metals emissions from the proposed facility are estimated to be 4.68 metric tons (5.16 tons) per year, or 93.6 metric tons (103.2 tons) over 20 years. Based on a very conservative screening analysis of heavy metals deposition, the resulting heavy metal deposition rate would be an average of 0.0375 kilograms per hectare (0.0335 pounds per acre) per year, or 37.5 grams per acre (0.54 ounces per acre) per year. Over a total of 20 years, the cumulative deposition of heavy metals would total an average of 0.75 kilograms per hectare (0.67

Collins, Thomas
Paris, KY
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(5)

Kentucky Pioneer Integrated Gasification
Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

Written Comment Form
Must be received by January 4, 2002.

room. Six months or a year postponement is nothing compained to the decades this plant will be in place and operating. This and future generations will thank you.

Yours,
Thom A. Collins
Thomas A. Collins
320 Springhill Drive
Paris, Kentucky 40361

Please use other side if more space is needed.

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

10/16 (cont.)

Comment No. 8 (cont.) **Issue Code: 12**
pounds per acre), or 756.6 grams per hectare (10.7 ounces per acre). That quantity does not indicate any significant impacts from heavy metal deposition downwind of the proposed project.

Comment No. 9 **Issue Code: 21**
The Draft EIS is available to anyone who requests a copy. Additionally, copies are available in the project reading rooms at Trapp Elementary School and Clark County Public Library, as well as the Lexington Public Library.

Comment No. 10 **Issue Code: 16**
Comment noted. The NEPA process is designed to allow for adequate time to review and comment on NEPA documents. DOE believes the schedule for the Kentucky Pioneer IGCC Demonstration Project is sufficient to account for public comments and review. The public comment period was extended to January 25, 2002. DOE will consider all public comments before issuing the ROD. The ROD will be issued no sooner than 30 days after the Final EIS is distributed and a notice of availability is issued.

Commonwealth of Kentucky House of Representatives
State Representative Mr. Don Pasley
Frankfort, KY
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Commonwealth of Kentucky

HOUSE OF REPRESENTATIVES

DON PASLEY
State Representative
5805 Ecton Road
Winchester, Kentucky 40391
(859) 842-3337

STATE CAPITOL ANNEX
Room 351E
Frankfort, Kentucky 40601
(502) 564-8100, Ext.630

73rd LEGISLATIVE DISTRICT

January 9, 2002

Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown WV 26507-0880

Dear Mr. Spears:

Thank you for extending the time for taking public comment on the Draft Environmental Impact Statement regarding the Kentucky Pioneer Demonstration Project in Clark County, Kentucky.

Many of my constituents have expressed their concern about the project. Some have said that they are inclined to support the demonstration plant. I, myself, continue to study the implications of the project.

For your consideration and for inclusion into the record on this project, I submit the enclosed documents which reflect the concerns of some of Clark County's citizens. Please give these comments careful consideration. Thank you.

Sincerely,

Don Pasley
State Representative

DP:cs
Enclosures

Commonwealth of Kentucky House of Representatives
State Representative Mr. Don Pasley
Frankfort, KY
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Please accept the following comments on the Draft Environmental Impact Statement regarding the Kentucky Pioneer Demonstration Project in Clark County, Kentucky:

1. Kentucky and Clark County will bear a disproportionate share of the burden created by a national energy policy which emphasizes coal use. If the technology fails, and there is no proof the technology will work as promised, the impacts will be borne by the citizens of Clark County. If the power created by this project is used outside of Kentucky, those burdens will be borne in Kentucky with no corresponding benefit.

2. Some citizens of Clark County fear a bait-and-switch by the operators. The DEIS states "*Global Energy, Inc., will not begin detailed design of the proposed project, including layout and flow sheet information, until the project financing is finalized.*" It thus appears that the DEIS may not accurately reflect the impacts that may be caused by the final design and operation of the project.

3. The Environmental Report for the projected 17 mile transmission line should be conducted simultaneously with this DEIS. The public should be given a picture of the impacts from the whole project. The project is valueless without a connection to the transmission grid. Therefore, the impacts of building the 17 mile power line should be considered simultaneously with the analysis of the project itself and not afterward.

4. Federal policy should not provide incentives for states to avoid their responsibility to provide within their own borders for the proper management of municipal solid waste. The federal funding for this demonstration project allows New Jersey and New York to continue to export their solid waste and in doing so to export the land, air, and water protection challenges that come with MSW disposal. The federal grant should include financial protections for Clark County from the consequences of failure of the technology or of the operator walking away from problems that might arise from bringing in large quantities of northeastern solid waste.

5. The DEIS fails to fully consider the environmental impacts on Clark County if the operator does not acquire the RDF pellets from a single supplier nor consider the impacts if the anticipated supplier significantly changes its source of MSW. The DEIS states only that such changes may result in a "slight change in the resulting waste stream". However, there is no analysis of how changes in the sources of RDF can affect wastes generated by the project.

6. On December 17, 2001, the Kentucky Natural Resources and Environmental Protection Cabinet issued a report on the cumulative environmental impacts of electric generating plants. The findings of this report must now be considered for purposes of this DEIS. For example, the state report notes that wastewater discharges from power plants may contain arsenic at levels above the

1/22
2/16
3/16
4/16
5/22
6/14
7/20
8/07

Comment No. 1 **Issue Code: 22**

The Kentucky Pioneer IGCC Demonstration Project is intended to demonstrate a power generation system with the potential to produce clean energy from high-sulfur coal while extending the life of domestic coal reserves. Since it is the first demonstration of this technology some risks will be associated with the project. Chapter 3 of the EIS has been revised to discuss financial risks in more detail. Potential environmental impacts are discussed in Chapter 5 of the EIS.

Comment No. 2 **Issue Code: 16**

The Kentucky Pioneer IGCC Demonstration Project was selected for further consideration under DOE's fifth solicitation(CCT-V) of the Clean Coal Technology (CCT) Program. DOE concludes that the project falls under CCT Program requirements due to the use of the first co-fed BGL technology. The purpose of the CCT Program is to demonstrate the efficiency and performance of new technologies. The power generated by the project will be used to support Kentucky's energy needs.

Comment No. 3 **Issue Code: 16**

Though final design has yet to be completed, conceptual design information is sufficient to enable adequate environmental impact analysis. DOE believes the full scope of environmental impacts from the construction and operation of the proposed project are sufficiently addressed in the EIS.

The EIS is intended to be used as a planning tool that analyzes the environmental impacts from a proposed project. DOE will consider the document and public comments in making the decision of whether or not to proceed with the project.

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maximum contaminant levels considered safe for drinking water. The proposed project will discharge wastewater into the Kentucky River at a point up river from a drinking water intake. This impact, as well as others in the Cabinet report, must be accounted for in the DEIS.

8/07 (cont) 7/20 (cont.)

Comment No. 4 **Issue Code: 16**
The EIS examined all potential impacts associated with the transmission line through a general analysis. Further studies of the impacts of the transmission line are addressed in an Environmental Report (ER) being prepared under RUS NEPA regulations. Information in the ER will be used to assure impacts are avoided and solutions integrated to avoid adverse public and environmental impacts.

Comment No. 5 **Issue Code: 22**
DOE does not believe that this project provides incentives for states to avoid their responsibility with regard to waste management issues. Rather, DOE believes that this project provides an opportunity to extend the life of domestic coal reserves. The RDF that would be imported to Kentucky is a feedstock for the facility and is not municipal solid waste (MSW) or solid waste. The federal grant cannot include financial protections for Clark County from the consequences of failure of the technology or of the operator walking away from the project. Any financial protection should be pursued through local legislatures during ordinance reviews. KPE is committed to providing power from the plant to EKPC for 20 years. Since the project would be the first demonstration of this technology, there are financial risks associated with it. Those risks are discussed in more detail in Chapter 3 of the EIS.

Comment No. 6 **Issue Code: 14**
As discussed in Chapter 3 of the EIS, KPE intends to supply all RDF pellets for this project from the same manufacturer. The gasification technology used produces a very consistent syngas product regardless of the variability of the feed. Variation in RDF pellet composition due to different manufacturing processes should not be an issue for this project.

Commonwealth of Kentucky House of Representatives
State Representative Mr. Don Pasley
Frankfort, KY
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To: Kentucky State Representative, Donald pasley
Fr: John Maruskin, Adult Services Librarian, Clark County Public Library
Re: Kentucky Pioneer Electricity Plant

December 28, 2001

Tommy Rector asked me to put together a list of concerns about the proposed Kentucky Pioneer Integrated Gasification plant to be built near Trapp, KY.

1. The environmental impacts are dangerous. All new power plants should be running on cleaner fuel. High sulfur coal and unregulated municipal waste are too hazardous.
2. The impact of this system on the Kentucky River could be disastrous. This plant will extract and consumes huge amounts of Kentucky River water. In a drought situation the effects on drinking water supplies would be bad for all of Central Kentucky.
3. There is no economic benefit from this plant to Clark County. Only Global Electric (the plant's parent company) will benefit. Of the 124 jobs that will be created from this plant only 24 will be in Clark County. The majority will be executive jobs created for Global in Cincinnati.
4. That this plant will be licensed in such a way that it is able to circumvent local solid waste plans is a political atrocity that completely undermines the intent of SB 2, the law that gives local governments the right to set their own environmental quality standards. This irks me the most. State government is undermining laws passed to protect citizens from these situations.
5. I am enclosing a "Technological Concept Evaluation" that shows that the process to be used at Trapp is also being considered as a way to dispose of nerve gas weapons. With this process available in Trapp, and with local control of fuel up to the discretion of the owning company, we could really be looking at a situation in which Clark County would not only be the nerve gas incinerator for the Madison County reserves, but for other, out of state nerve gas reserves. THIS WOULD BE VERY BAD.
6. Please refer to the article I've enclosed entitled "New power plants pose pollution challenge." On the bottom of the second page you will read that Governor Patton has told the PSC that he will present a package of legislation dealing with power plants in 2002. That legislation will make merchant power plants subject to local zoning and planning ordinances. BUT IT WILL BE TOO LATE FOR CLARK COUNTY IF WE DO NOT STOP THIS PLANT, NOW.

If you have any question about these concerns, please feel free to call be at the Library 859-744-5661. I cannot tell you how much it means to us to have your interest in this issue. Thank you for your help.

Comment No. 7 **Issue Code: 20**

The *Cumulative Assessment of the Environmental Impacts Caused by Kentucky Electric Generating Units* Report issued by the Kentucky Natural Resources and Environmental Protection Cabinet on December 17, 2001, has been reviewed. Relevant sections of the EIS, including Section 5.14, Cumulative Impacts, have been updated to reflect issues presented by the report.

Comment No. 8 **Issue Code: 07**

9/16
10/16
11/07
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13/21
14/22

As stated in Section 5.8, Water Resources and Water Quality, treated wastewater is expected to contain conventional pollutants such as nitrogen, phosphorus, total dissolved solids, and biological and chemical oxygen demand. Pollutant discharge limitations, including thermal limits, would be set by the Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water's Water Resources Branch and would be identified in the KPDES permit. These limitations would be established based on site-specific computer modeling of the expected effect on water quality of the Kentucky River at the proposed discharge point and in the mixing zone immediately downgradient. The limits specified in the permit would protect existing water quality.

15/21

The Water Resources Branch pays particular attention to the proximity of wastewater discharges to drinking water intakes. New sources of wastewater are prohibited within 8 kilometers (5 miles) of a water treatment plant intake. This 8-kilometer (5-mile) limit was established to provide an additional layer of protection for the water quality found at drinking water intakes over treatment alone and is referred to as Zone 1. Zone 2 extends from 8 to 16 kilometers (5 to 10 miles), while Zone 3 is the area from 16 to 40 kilometers (10 to 25 miles) from a water treatment plant intake. The proposed outfall is located in Zone 3 for the Winchester Water Treatment Plant. Water collected at the treatment plant is tested and treated to meet all federal and state requirements

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Frankfort, KY
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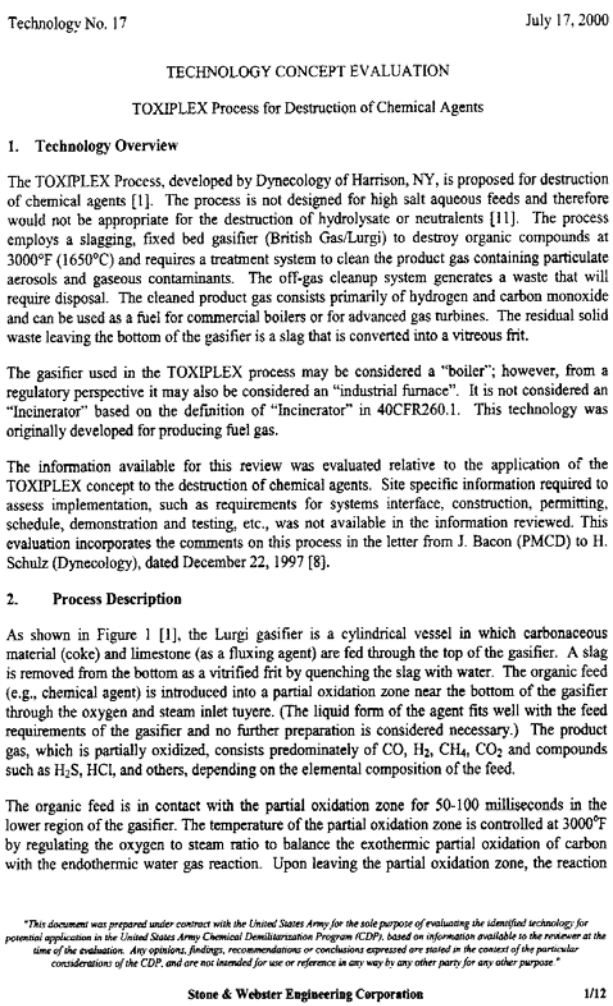

Technology No. 17 July 17, 2000

TECHNOLOGY CONCEPT EVALUATION

TOXIPLEX Process for Destruction of Chemical Agents

1. Technology Overview

The TOXIPLEX Process, developed by Dynecology of Harrison, NY, is proposed for destruction of chemical agents [1]. The process is not designed for high salt aqueous feeds and therefore would not be appropriate for the destruction of hydrolysate or neutralents [11]. The process employs a slagging, fixed bed gasifier (British Gas/Lurgi) to destroy organic compounds at 3000°F (1650°C) and requires a treatment system to clean the product gas containing particulate aerosols and gaseous contaminants. The off-gas cleanup system generates a waste that will require disposal. The cleaned product gas consists primarily of hydrogen and carbon monoxide and can be used as a fuel for commercial boilers or for advanced gas turbines. The residual solid waste leaving the bottom of the gasifier is a slag that is converted into a vitreous frit.

The gasifier used in the TOXIPLEX process may be considered a "boiler"; however, from a regulatory perspective it may also be considered an "industrial furnace". It is not considered an "Incinerator" based on the definition of "Incinerator" in 40CFR260.1. This technology was originally developed for producing fuel gas.

The information available for this review was evaluated relative to the application of the TOXIPLEX concept to the destruction of chemical agents. Site specific information required to assess implementation, such as requirements for systems interface, construction, permitting, schedule, demonstration and testing, etc., was not available in the information reviewed. This evaluation incorporates the comments on this process in the letter from J. Bacon (PMCD) to H. Schulz (Dynecology), dated December 22, 1997 [8].

2. Process Description

As shown in Figure 1 [1], the Lurgi gasifier is a cylindrical vessel in which carbonaceous material (coke) and limestone (as a fluxing agent) are fed through the top of the gasifier. A slag is removed from the bottom as a vitrified frit by quenching the slag with water. The organic feed (e.g., chemical agent) is introduced into a partial oxidation zone near the bottom of the gasifier through the oxygen and steam inlet tuyere. (The liquid form of the agent fits well with the feed requirements of the gasifier and no further preparation is considered necessary.) The product gas, which is partially oxidized, consists predominately of CO, H_2, CH_4, CO_2 and compounds such as H_2S, HCl, and others, depending on the elemental composition of the feed.

The organic feed is in contact with the partial oxidation zone for 50-100 milliseconds in the lower region of the gasifier. The temperature of the partial oxidation zone is controlled at 3000°F by regulating the oxygen to steam ratio to balance the exothermic partial oxidation of carbon with the endothermic water gas reaction. Upon leaving the partial oxidation zone, the reaction

"This document was prepared under contract with the United States Army for the sole purpose of evaluating the identified technology for potential application in the United States Army Chemical Demilitarization Program (CDP), based on information available to the reviewer at the time of the evaluation. Any opinions, findings, recommendations or conclusions expressed are stated in the context of the particular considerations of the CDP, and are not intended for use or reference in any way by any other party for any other purpose."

Stone & Webster Engineering Corporation 1/12

14/22 (cont.)

Comment No. 8 (cont.) **Issue Code: 07**
concerning drinking water quality. Therefore, no impacts to drinking water are expected.

Comment No. 9 **Issue Code: 16**
Comment noted. The purpose of this project is to demonstrate a technology with the potential to generate clean and safe energy from high-sulfur coal.

Comment No. 10 **Issue Code: 16**
DOE selected the Kentucky Pioneer IGCC Demonstration Project for further consideration under DOE's fifth solicitation (CCT-V) of the CCT Program and concludes that the project falls under the CCT Program requirements due to the use of the modified version of the BGL technology. The purpose of the CCT Program is to demonstrate technologies with the potential to provide cleaner and more efficient energy from coal resources. All coal and RDF pellets will be transported in covered containers. The concrete-floored storage building for the RDF pellets and coal will be located within the 4.8-hectare (12-acre) project site and would be capable of housing a 10-day supply of coal and RDF pellets. The 4.8-hectare (12-acre) project site is located within the larger 1,263-hectare (3,120-acre) J.K. Smith Site and is approximately 1.6 kilometers (1.0 mile) from the closest residence.

Comment No. 11 **Issue Code: 07**
As stated in Section 5.8, Water Resources and Water Quality, the Proposed Action would withdraw a total of 15.1 million liters per day (MLD) (4 million gallons per day [MGD]) of water from the Kentucky River. This is equivalent to 0.1 percent of average flow conditions and 4.0 percent of low-flow conditions. Should drought conditions warrant or the state mandate it, KPE would cease withdrawals from the river and shut down the plant temporarily.

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products then come in contact with an incandescent bed of coke (for one or more seconds) in the upper region of the gasifier (a highly reducing environment) where complete pyrolysis is achieved.

The product gas exiting the top of the gasifier is scrubbed free of contaminants such as H_2S, NH_3, and HCl. The product gas is a medium BTU fuel gas (300 BTU/ft^3), which can be substituted for natural gas in commercial boilers or as fuel for the advanced gas turbines of an integrated gasification, combined cycle power plant. All feed material that is not gasified is continuously withdrawn from the base of the gasifier as a molten slag. The slag is then fritted by quenching in water.

Figure 2 [1] provides a process flow schematic of the gasifier and gaseous effluent cleaning system. A mass balance is shown in Figure 3 [1] (based on a chemical agent feed of 11 tons per day). The mass balance of solid waste exiting from the gasifier is primarily dependent on the ash characteristics of the carbonaceous fuel used rather than the agent or toxic material destroyed. Dynecology has stated that in order to substantially reduce the solid waste exiting the gasifier and virtually eliminate any concerns related to heavy metals in the mass balance, refractory oxide packing may be used instead of coke to provide surface area for reaction. In this case, supplemental fuel will be required to ensure the desired reaction conditions are attained. The process produces a medium BTU product gas that provides a readily available source for this supplemental fuel [11].

3. Process Efficacy

3.1 Maturity of Technology

Gasification has been in commercial operation for many years. Lurgi has over 170 Gasification plants in operation including various downstream processes for gas clean-up, sulfur recovery and waste water treatment. These gasification reactors are of dry bottom design, meaning that the slag is removed in dry form in contrast to the slagging gasifier where melted slag is quenched with water to make a non-leachable frit for disposal purposes. British Gas and Lurgi developed a slagging gasifier design that was built and operated in Westfield, Scotland to produce synthesis gas [9]. British Gas discontinued its gasification efforts after natural gas was found in the North Sea.

The basic gasifier and auxiliary equipment are readily available, although they would have to be designed for site specific CWM application and integration with the plant site.

3.2 Process Monitoring and Control

The controlling parameter in operating the slagging gasifier to destroy chemical agents is the ratio of agent to oxygen/steam mixture. In general, adjusting the quantities of oxygen and steam flow entering the reaction zone can control the bed temperature and product gas composition.

Comment No. 11 (cont.) **Issue Code: 07**
In order to minimize potential conflicts over water availability during low-flow conditions, the State of Kentucky limits permitted users to no more than 10 percent of the lower average monthly flow.

Comment No. 12 **Issue Code: 02**
Comment noted. The Draft EIS is designed to present all of the possible environmental impacts of the various alternatives relating to the proposed federal action, both beneficial and detrimental. The economic benefits associated with the project are not intended as justification for the environmental costs of the project; however, they are presented as one of many resource areas impacted by the project.

14/22 (cont.) All 120 jobs associated with the operation of the Proposed Action would be created onsite in Clark County and all 270 of the jobs indirectly created would be within Clark, Fayette, and Madison Counties.

Comment No. 13 **Issue Code: 21**
The Kentucky Pioneer IGCC Demonstration Project is a federal action. The EIS is used as a tool to decide whether or not the DOE should provide funding to the project. If the project is approved, KPE would be required to abide by all local, state, and federal regulations.

Comment No. 14 **Issue Code: 22**
The facility would not be used as a nerve gas incinerator at any point during its operation.

Comment No. 15 **Issue Code: 21**
Comment noted. The proposed project would demonstrate power generation technology to produce clean energy from high-sulfur coal and RDF pellet co-feed.

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The oxygen/steam ratio balances the exothermic partial combustion reaction, $C + 1/2\ O_2 \rightarrow CO$, with the endothermic water gas reaction, $C + H_2O \rightarrow H_2 + CO$. Variations in the ratio of hydrogen/carbon monoxide and the carbon monoxide/carbon dioxide in the gas indicate departures from steady-state conditions.

Use of the gasification process for destruction of chemical agents would not appear to significantly alter the number of process controls required, as the mass of agent added compared to the mass of coke or coal utilized for oxidation is small.

If refractory oxide packing were used instead of carbon pellets, to provide surface area for reaction, supplemental fuel would be required to ensure the desired reaction reduction conditions would be present.

3.3 Process Robustness

Given the large thermal mass contained within the reactor system, periodic process feed perturbations will not significantly affect the high reaction temperature, and hence reaction kinetics.

Variation in agent feed flow rate would require small adjustment in oxygen, steam and supplemental fuel flow to maintain bed temperature. The thermal inertia of the gasifier (due to the large mass of bed material) should allow small variations in feed without compromising destruction efficiency. Upon shutdown of agent feed, Dynecology reports that the gasifier can be turned down to 10 percent of its feed rate for coke, oxygen, and steam to put the unit on standby and remain in stable operation [1].

Specific data on operational reliability was not available in the information reviewed but the TOXIPLEX process would most likely achieve high operability and reliability given the maturity of the technology and the long operating history of commercially sized plants.

3.4 Destruction Efficiency

Dynecology reports destruction efficiencies of 6 and 7 nines when treating hexachlorobenzene and PCB's [6]. Dioxins and furans measured in the PCB tests were below 0.03 ng/m^3, which is below the 1 ng/m^3 EPA limit. Destruction efficiencies for chemical agents were not available and, while required as a condition for further process development, would not be expected to be significantly different. Dynecology reports that the time required for the destructive processes to occur is less than 500 milliseconds and most likely in the range of 50 to 100 milliseconds [1].

4. Process Safety

Due to the rapid destructive rate (low contact time required), the inventory of toxic materials available for release from the gasifier during an abnormal or accidental release condition is low.

14/22
(cont.)

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The low inventory minimizes both the on-site and off-site consequences for reaction vessel failure or leakage.

The high temperatures involved, the use of pure oxygen in the process, and the presence of hydrogen and carbon monoxide gas would require the use of normal industrial process safety measures. Experience with commercial operating facilities indicates that there have been no known accidents due to the release of hydrogen or carbon monoxide [2].

Dynecology recommends operation of the gasifier under a relatively low pressure (compared to commercial gasifiers) of 100 psig. A jacketed design with an inert gas is used for leakage detection and control. An even lower operating pressure could be used with a corresponding increase in vessel and equipment size and cost, if justified by a HAZOP analysis for reducing risk of failure.

For organic feed streams containing oxidizing agents such as dissolved munitions or explosives, the usual industrial safety design and operating requirements for this type of feed would need to be implemented.

5. Environmental Impact

The overall mass balance provided in Figure 3 identifies the quantity of waste generated. Assuming 10,000 pounds per day of VX as the agent treated, 27,293 pounds per day of solid waste would be sent to disposal. This includes 16,363 pounds per day of slag from the gasifier bottoms and 10,900 pounds per day of calcium sulfate from the gas clean-up units. The mass of slag generated is directly related to the ash content of the carbon/coal used in the gasifier. The total solid waste would be expected to be higher for treatment of the chemical agent hydrolysates, due to higher salt and water content, than for the treatment of chemical agents.

The solid waste volume from slag can be substantially reduced by substituting a refractory metal oxide (such as zirconia) to serve as the incandescent contact surface or by using a coke product with a low ash content [10]. The use of refractory packings as a bed may not be appropriate for feeds containing phosphorus due to the production of phosgene gas. A moving bed reactor design may be required an/or an external off-gas treatment process may be needed for the phosgene formed in the highly reducing environment of the reactor.

The glassy frit produced by quenching the molten slag is non-leachable and may be sold as an aggregate for road building or landfill. The practicality of utilizing solid waste products from an agent destruction plant is unlikely. Waste disposal alternatives to using the molten slag as an aggregate must be planned.

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The gaseous effluent is characterized as a fuel gas with a heating value of 300 BTU/ft.^{3} This gas may be used as a suppiemental fuel in a turbine to generate electric power or in a boiler to generate steam. Both alternatives would require use of a flare during unit downtime. Compressed storage of the gas is possible but would be very expensive due to the cost of the storage vessels. Economic liquefaction of the gas is not feasible since the major gas components are hydrogen and carbon monoxide, which have boiling points substantially below that of natural gas.

If the gasifier were not operating, an alternative source of gaseous fuel would be required to support on-site processes. The relatively short duration of the overall program and potential non-continuous operation of supporting facilities with the TOXIPLEX process complicate the use of the product gas for off-site applications. The cost of a turbine/generator may not be economical given the short mission time. Because sulfur, phosphorus, and halogens are potentially present in an agent feed (agent dependent), off-gas treatment for the removal of these inorganic components would be required as part of the off-gas treatment process.

Since agent from ton containers will contain heavy metals, their ultimate fate when introduced into the gasifier must be determined. It had been expected that metals or ungasified components of neat agent fed to reactor, or processed agents, limestone or carbonaceous feed would be concentrated in the slag. However, tests performed at Columbia University [6] with toxic heavy metal compounds indicate the opposite: "A preponderant fraction of the metal and metal oxides introduced with the 1:2 coal/RDF pellets was carried over with the gaseous products; part was plated out on the upper, cooler portion of the refractory gasifier lining; part was trapped out with the condensed coal tars; and a negligible fraction was present in the fritted vitreous, silico-alumina slag." These results indicate the importance of determining the final dispensation solids contained within the organic feedstock, whether it be neat or treated agent such as hydrolysate.

For feedstocks containing primarily organic materials, the highly reducing environment of the gasifier precludes the formation of furans and dioxins as would be found in an incinerator during periods of operational upsets. This, coupled with the high destruction efficiency found for tested organics and the low potential inventory of the gasifier, makes the gasifier a suitable treatment for chemical warfare agent if the issues of product gas volume and mass of solid waste is acceptable. The gasifier, as a chemical warfare agent treatment option, appears to be potentially viable compared with existing process options used or contemplated today for new facilities.

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5.1 Permitting History

There is extensive permitting history of the process for use as a gasifier. However, use of the process for destruction of hazardous materials only includes permitting as research and demonstration facilities.

6. Schedule

Prior to full-scale implementation a pilot scale facility would need to be built and tested, first with surrogate feed and then with agent. Dynecology expects this to take at least 3 to 6 months. The schedule for implementation of a full-scale design would be heavily dependent on permitting requirements, which are expected to be less than those required for permitting an incinerator.

7. Cost

Capital cost estimates were not contained within the information reviewed from Dynecology. For a 22,000 pound per day agent destruction facility, Dynecology reports a cost for operation of $1500 to 2000 per ton or about $7,500 to $10,00 per 10,000 pounds of chemical agents destroyed [1]. Supporting information was not provided.

A detailed cost analysis comparing a facility using the TOXIPLEX technology versus existing technologies, such as incinerators was not provided within the material reviewed. Adjustment values for potential improved process control, lower inventory-at-risk, and higher destruction efficiency have not been determined and are required in order to assess the magnitude of potential benefits achieved by using this technology.

8. Implementation at Existing Chemical Demilitarization Incineration Facilities

Dynecology proposed [1] that TOXIPLEX replace the liquid agent incinerator at the existing Tooele, Utah site, but did not provide any site specific implementation information including interface requirements for existing systems, demonstration and test plans, construction schedules, waste handling, permitting requirements and schedules, etc.

The Tooele site includes four incinerator systems, each with a specific function of treating metal parts, explosives and propellants, liquid agent or dunnage. The TOXIPLEX system is applicable to only treating liquid agent and would only replace the existing liquid agent incinerator. The other incinerator systems would still remain in operation.

For an existing agent treatment facility utilizing incineration, cost factors such as providing new interfacing or support utilities such as material handing of coke pellets, off-gas treatment, and effluent flaring would additionally have to be addressed. Although no analysis has been

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performed, it would appear unlikely that a cost-benefit approach could be used to justify a process change utilizing this technology.

The hazards analysis [7] for the Tooele liquid incinerator system indicates that if failures were to occur, the agent feed piping system failures are most likely. Appropriate control design, however, could be employed to limit the release of agent from a feed line failure. Since the dominant failure modes and risks do not involve failure of the incinerator system, replacement of the incinerator with the TOXIPLEX system would not be expected to lead to an overall improvement in public safety.

9. Conclusions

- The TOXIPLEX technology offers the potential for high agent destruction efficiency. Destruction efficiencies of 6 and 7 nines were achieved when treating hexachlorabenzene and PCBs and destruction efficiencies for chemical agents would be expected to be as good.
- The solid waste (slag) quantity produced requires disposal, since use of the waste for other purposes is unlikely. However, since the solid waste produced is a function of the ash content of the fuel, it can be virtually eliminated by using a low ash petroleum coke or a refractory metal oxide such as zirconia instead of ordinary coke as the incandescent contact surface.
- Use of the product as a fuel needs to be identified, otherwise it would have to be flared. Alternatively, it could be used as a supplemental fuel in the event that (in order to substantially reduce the production of solid waste or slag) a refractory metal oxide is substituted for coke as the incandescent contact surface.
- The thermal inertia of the gasifier would allow variations in feeds without compromising destruction efficiency.
- The TOXIPLEX process would most likely achieve high operability and reliability given the maturity of the technology and the long operating history of commercial-size slagging gasifier plants.
- Due to the rapid destruction rate (50 to 100 milliseconds), the inventory of toxic materials available for release from the gasifier during an abnormal or accidental release condition is extremely low. The low inventory minimizes both the on-site and off-site consequences for reaction vessel failure or leakage. The safety of existing support systems at Tooele may limit the safety benefits of the TOXIPLEX process. Therefore, the overall benefit for replacement of the agent incinerator at Tooele, with the TOXIPLEX process, appears to be marginal.

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- For new facilities treating chemical warfare agents, this technology may be competitive with existing technologies and provide potential advantages in destruction capability and lower inventory-at-risk.

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Stone & Webster Engineering Corporation **8/12**

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LURGI

The British Gas / Lurgi Gasifier

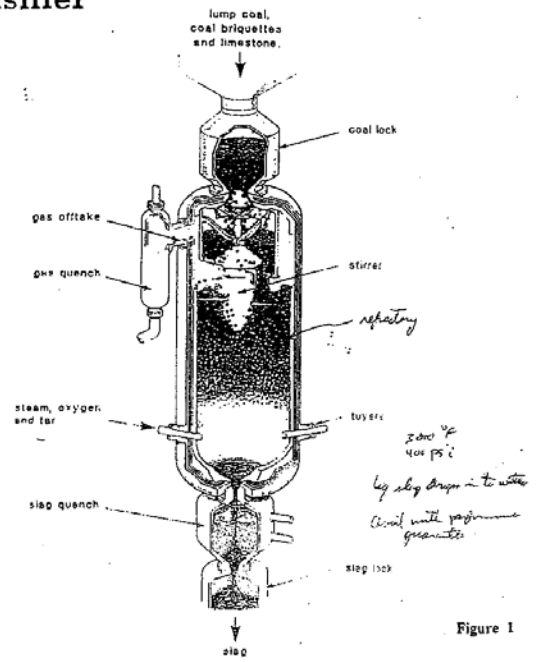

Figure 1

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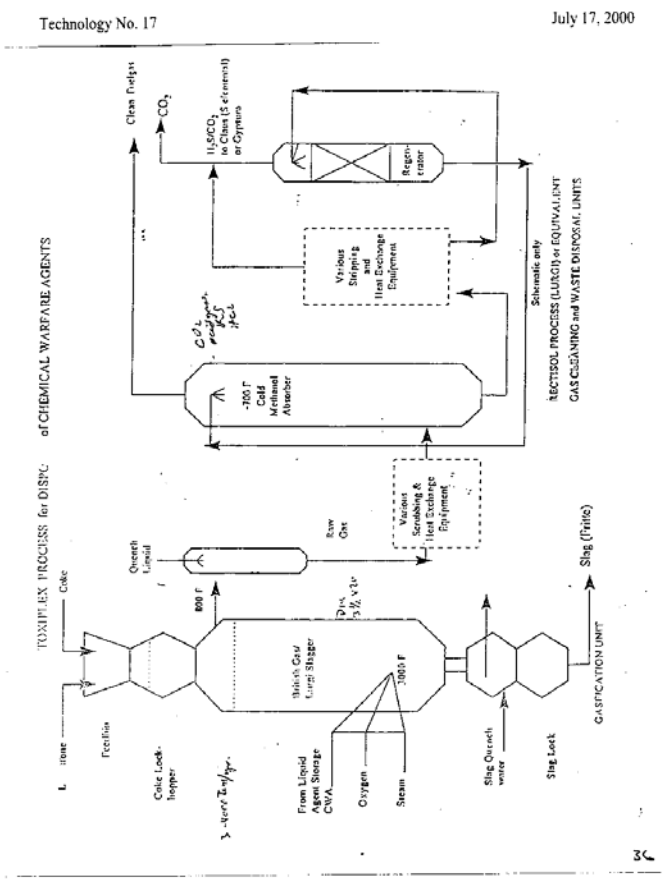

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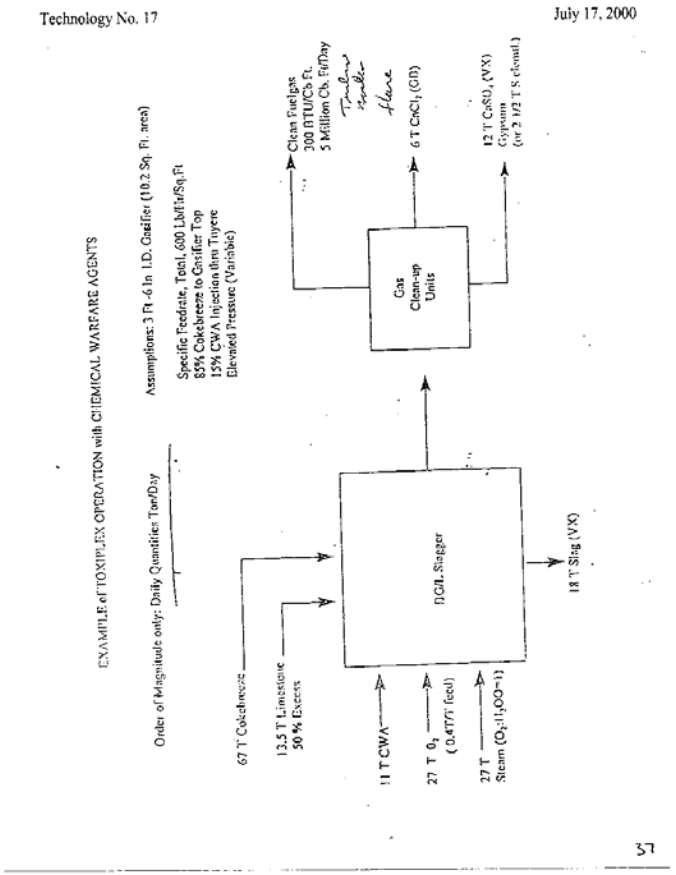

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season. But is it? See review of it and four ier films opening today.

ntucky

Smokers rebuffed: e Kentucky Supreme urt ruled that ailing okers cannot get a are of the state's portion the national tobacco set- ment. **B1**

usiness

Jacobson's future: cobson Stores Inc. says running out of cash may be forced to reor- nize or liquidate its 23- re chain, casting doubt the future of its Oxmoor ndel store. **B10**

orld

rgentina unrest: sident Fernando De la reportedly submitted esignation as his gov- nent crumbled amid dly rioting and looting ked by anger over Ar- ina's deepening eco- ic crisis. Above, pro- rs chanted in down- Buenos Aires. **A4**

OMORROW

cene: Don Rosa, the cartoonist who gave yville "Captain Ken- has published the in a book overseas. e he truly is a hero.

ONLINE

rier-journal.com

k Features to see mplete list of day TV shows

ORECAST

New power plants pose pollution challenge

Report: State must act to protect environment

By ALAN MAIMON
The Courier-Journal

FRANKFORT, Ky. — Kentuckians could breathe dirtier air if the state fails to prevent potential environmental hazards from 22 new power plants, according to an environmental report released yesterday.

A separate report on the impact of the proposed plants on Kentucky's power grid said the grid wouldn't be able to handle the volume of wholesale electricity transfers during high demand if all the plants are built, but is adequate to meet Kentucky's needs.

However, Martin Huelsmann, chairman of the Kentucky Public Service Commission, which conducted the grid study, said brownouts are unlikely. Kentucky's needs will take precedence in any case where the grid is threatened with being overburdened, he said.

Logan: The state thinks the plants can operate without unacceptable damage to human health or the environment.

Most of the proposed new plants, known as "merchant" plants, would sell electricity to out-of-state utilities during times of peak demand.

The environmental study, a six-month effort by the Kentucky Natural Resources and Environmental Protection Cabinet, said four counties — Henderson and Daviess on the Ohio River in Western Kentucky, and Boyd and Lawrence around Ashland — could have trouble meeting Environmental Protection Agency ozone standards if all of the power plants are built.

Ground-level ozone, a key component of smog, results from burning fossil fuels.

Bob Logan, commissioner of the Kentucky Department of Environmental Protection, said the cabinet was confident the plants could operate without unacceptable damage to human health or the environment.

The cabinet and the PSC assessed the environmental and power transmission impacts of the proposed plants in separate reports presented yesterday to the state Energy Policy Advisory Board.

Among the potential environmental

A group of British Royal Marines left a C-130 transport plane at B base, north of Kabul, Afghanistan, yesterday.

AFGHANISTAN

British peacekeepers land near

Associated Press

KABUL, Afghanistan — The first British peacekeepers flew into Afghanistan yesterday as the United Nations approved their mission to help the nation heal after decades of war. Even as they landed, the Afghan defense minister insisted they would have no authority to use force.

Fifty-three British Royal Marines landed at Bagram air base north of Kabul yesterday, part of an initial contingent of up to 200 peacekeepers that will move into the capital ahead of tomorrow's inauguration of an interim administration.

The U.N. Security Council unanimously backed the British-led force for the Kabul area. The force, which will eventually number 3,000-5,000 troops, was authorized to take military action as it helps keep security under the interim government, which is to rule for six months.

Hamid Karzai, has welc powerful role for the interi The interim foreign mini sent a letter to the Securi week agreeing to a clause tary action, backing off an

But interim Defense Mi med Fahim, reflecting an presence of foreign force volvement in factional f posed. He insisted the mul will have no authority to d ents, interfere in Afghan force.

"They are here because be. But their presence is as security is the responsibili Fahim said of the peacekee

The agreement signed b factions setting up the in ment authorized the securi

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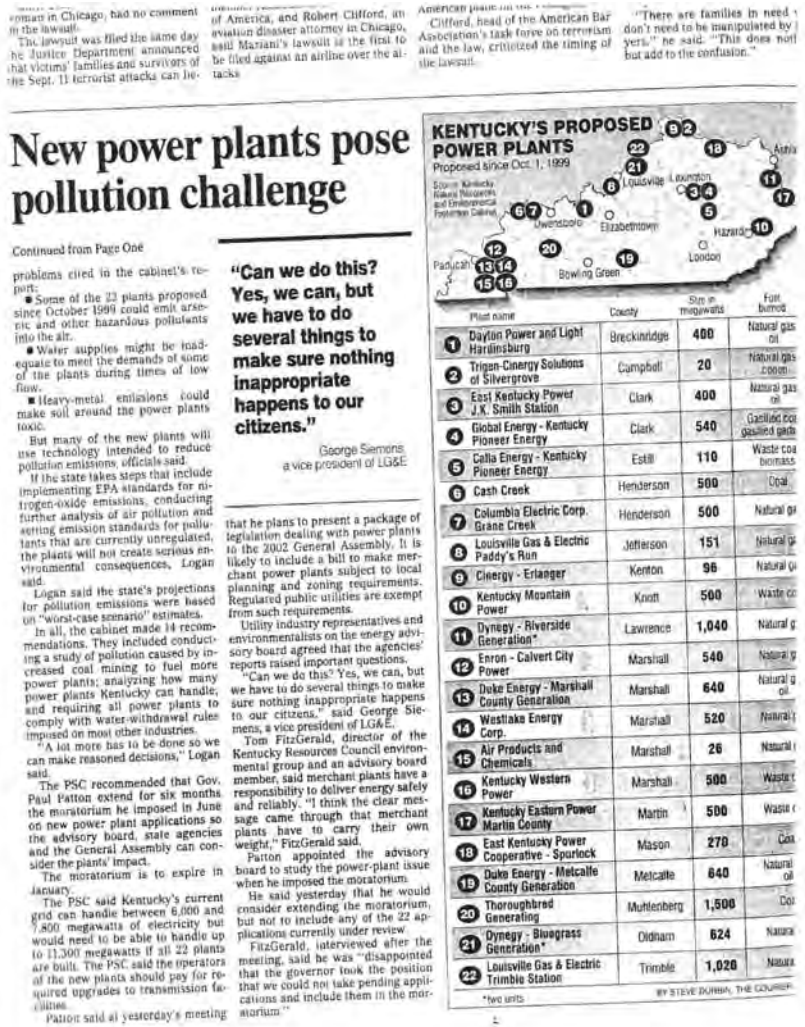

...woman in Chicago, had no comment on the lawsuit.

The lawsuit was filed the same day the Justice Department announced that victims' families and survivors of the Sept. 11 terrorist attacks can be...

...of America, and Robert Clifford, an aviation disaster attorney in Chicago, said Mariani's lawsuit is the first to be filed against an airline over the attacks.

...American plane in the ...

Clifford, head of the American Bar Association's task force on terrorism and the law, criticized the timing of the lawsuit.

"There are families in need ... don't need to be manipulated by ... yers," he said. "This does not ... but add to the confusion."

New power plants pose pollution challenge

Continued from Page One

problems cited in the cabinet's report:

- Some of the 22 plants proposed since October 1999 could emit arsenic and other hazardous pollutants into the air.
- Water supplies might be inadequate to meet the demands of some of the plants during times of low flow.
- Heavy-metal emissions could make soil around the power plants toxic.

But many of the new plants will use technology intended to reduce pollution emissions, officials said.

If the state takes steps that include implementing EPA standards for nitrogen-oxide emissions, conducting further analysis of air pollution and setting emission standards for pollutants that are currently unregulated, the plants will not create serious environmental consequences, Logan said.

Logan said the state's projections for pollution emissions were based on "worst-case scenario" estimates.

In all, the cabinet made 14 recommendations. They included conducting a study of pollution caused by increased coal mining to fuel more power plants; analyzing how many power plants Kentucky can handle; and requiring all power plants to comply with water-withdrawal rules imposed on most other industries.

"A lot more has to be done so we can make reasoned decisions," Logan said.

The PSC recommended that Gov. Paul Patton extend for six months the moratorium he imposed in June on new power plant applications so the advisory board, state agencies and the General Assembly can consider the plants' impact.

The moratorium is to expire in January.

The PSC said Kentucky's current grid can handle between 6,000 and 7,800 megawatts of electricity but would need to be able to handle up to 11,300 megawatts if all 22 plants are built. The PSC said the operators of the new plants should pay for required upgrades to transmission facilities.

Patton said at yesterday's meeting that he plans to present a package of legislation dealing with power plants to the 2002 General Assembly. It is likely to include a bill to make merchant power plants subject to local planning and zoning requirements. Regulated public utilities are exempt from such requirements.

"Can we do this? Yes, we can, but we have to do several things to make sure nothing inappropriate happens to our citizens."

George Siemens
a vice president of LG&E

Utility industry representatives and environmentalists on the energy advisory board agreed that the agencies' reports raised important questions.

"Can we do this? Yes, we can, but we have to do several things to make sure nothing inappropriate happens to our citizens," said George Siemens, a vice president of LG&E.

Tom FitzGerald, director of the Kentucky Resources Council environmental group and an advisory board member, said merchant plants have a responsibility to deliver energy safely and reliably. "I think the clear message came through that merchant plants have to carry their own weight," FitzGerald said.

Patton appointed the advisory board to study the power-plant issue when he imposed the moratorium.

He said yesterday that he would consider extending the moratorium, but not to include any of the 22 applications currently under review.

FitzGerald, interviewed after the meeting, said he was "disappointed that the governor took the position that we could not take pending applications and include them in the moratorium."

KENTUCKY'S PROPOSED POWER PLANTS

Proposed since Oct. 1, 1999

Source: Kentucky Natural Resources and Environmental Protection Cabinet

	Plant name	County	Size in megawatts	Fuel burned
1	Dayton Power and Light Hardinsburg	Breckinridge	400	Natural gas, oil
2	Trigen-Cinergy Solutions of Silvergrove	Campbell	20	Natural gas, coal
3	East Kentucky Power J.K. Smith Station	Clark	400	Natural gas, oil
4	Global Energy - Kentucky Pioneer Energy	Clark	540	Gasified coal, gasified gas
5	Calla Energy - Kentucky Pioneer Energy	Estill	110	Waste coal, biomass
6	Cash Creek	Henderson	500	Coal
7	Columbia Electric Corp. Grane Creek	Henderson	500	Natural gas
8	Louisville Gas & Electric Paddy's Run	Jefferson	151	Natural gas
9	Cinergy - Erlanger	Kenton	96	Natural gas
10	Kentucky Mountain Power	Knott	500	Waste coal
11	Dynegy - Riverside Generation*	Lawrence	1,040	Natural gas
12	Enron - Calvert City Power	Marshall	540	Natural gas
13	Duke Energy - Marshall County Generation	Marshall	640	Natural gas, oil
14	Westlake Energy Corp.	Marshall	520	Natural gas
15	Air Products and Chemicals	Marshall	26	Natural gas
16	Kentucky Western Power	Marshall	500	Waste coal
17	Kentucky Eastern Power Martin County	Martin	500	Waste coal
18	East Kentucky Power Cooperative - Spurlock	Mason	270	Coal
19	Duke Energy - Metcalfe County Generation	Metcalfe	640	Natural gas, oil
20	Thoroughbred Generating	Muhlenberg	1,500	Coal
21	Dynegy - Bluegrass Generation*	Oldham	624	Natural gas
22	Louisville Gas & Electric Trimble Station	Trimble	1,020	Natural gas

*two units

BY STEVE DUBBIN, THE COURIER-...

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Leslie Preston
1050 Ferry Rd.
Winchester, KY 40391
737-2445

Main Concerns pertaining to coal/garbage power plant

1. Pollution from smokestack emissions. Coal already has a bad track record. What substances in the solid waste fuel are left as byproducts (emissions) from incineration. 16/06
2. Water pollution. Kentucky River is close by. Water removed from runoff into? 17/07
3. Garbage fuel contamination and storage? Future fuel processing on site? 18/12, 19/16
4. Damage to roads (Highway 89). Safety due to more big truck traffic. 20/10

Comment No. 16 **Issue Code: 06**

The major criteria pollutant emissions and hazardous air pollutant emissions associated with the proposed project are identified in Tables 5.7-1 and 5.7-2 of the EIS. Table 5.7-4 identifies estimated maximum downwind concentrations of hazardous pollutants expected to be emitted by the proposed facility and the associated maximum lifetime cancer risks. The air quality permit for the project requires continuous emission monitoring for major criteria pollutants and annual emissions testing for cadmium, lead, mercury, hydrogen chloride, and dioxins/furans.

Comment No. 17 **Issue Code: 07**

As stated in Section 5.8, Water Resources and Water Quality, treated wastewater is expected to contain conventional pollutants such as nitrogen, phosphorus, total dissolved solids, and biological and chemical oxygen demand. Pollutant discharge limitations, including thermal limits, would be set by the Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water's Water Resources Branch and would be identified in the KPDES permit. These limitations would be established based on site-specific computer modeling of the expected effect on water quality of the Kentucky River at the proposed discharge point and in the mixing zone immediately downgradient. The limits specified in the permit would protect existing water quality.

Comment No. 18 **Issue Code: 12**

Chapter 3, Section 3.1.2.1 in the EIS, describes the handling and storage of raw materials, including RDF. The RDF pellets would be handled and stored to prevent release of particulate matter to the atmosphere or contact with water and possible contamination of soil and surface water from runoff.

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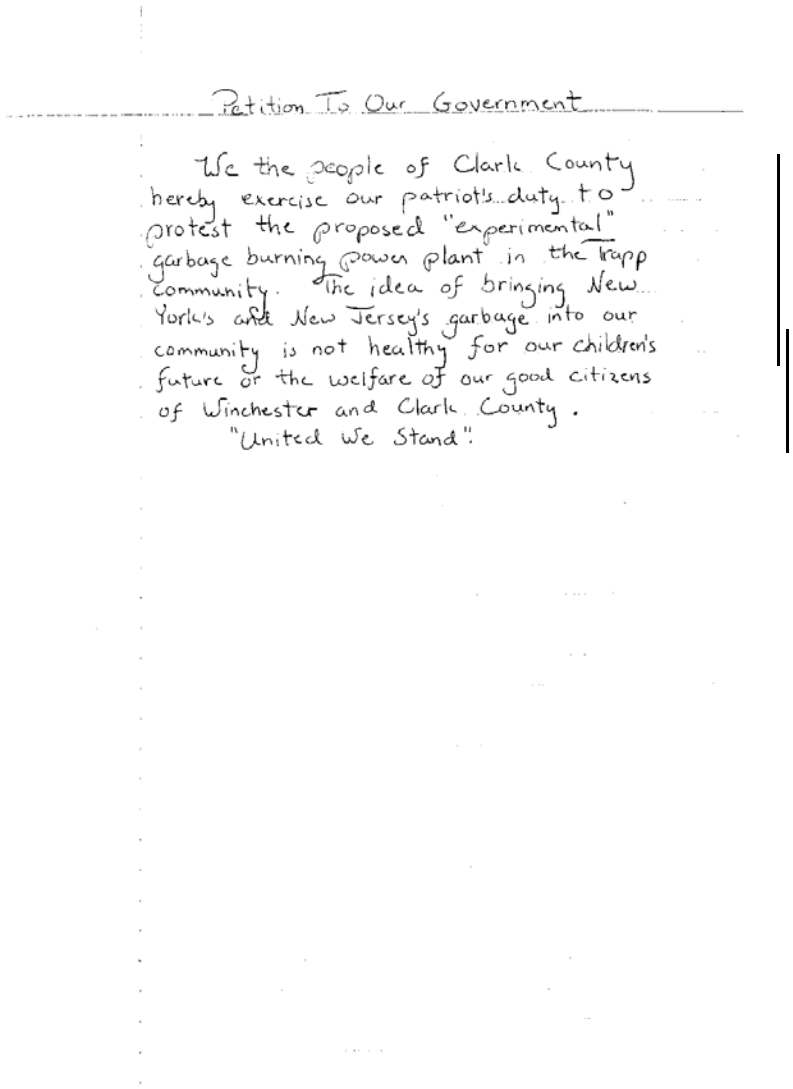

Petition To Our Government

We the people of Clark County hereby exercise our patriot's duty to protest the proposed "experimental" garbage burning power plant in the Trapp community. The idea of bringing New York's and New Jersey's garbage into our community is not healthy for our children's future or the welfare of our good citizens of Winchester and Clark County.

"United We Stand".

21/16

22/11

Comment No. 19 **Issue Code: 16**

Fuel processing will not be performed onsite. All RDF pellet processing will be done by the supplier on the east coast.

Comment No. 20 **Issue Code: 10**

Comment noted. Impacts to traffic levels along Kentucky Highway 89 are addressed in Section 5.11, Traffic and Transportation. As stated, during construction, 500 to 1,000 vehicle trips would occur along Kentucky Highway 89 at the beginning and end of the construction workday. The exact number would depend on the staffing levels required onsite. Construction schedules typically call for workers to be onsite relatively early in the morning to avoid morning schoolbus traffic, until early afternoon. The Transportation Division of the Clark County School Board indicates that schoolbuses utilize Kentucky Highway 89 when construction workers would be leaving the site. Section 5.11, Traffic and Transportation, has been modified to reflect the impacts of added vehicles on schoolbus usage.

The construction vehicles would haul a maximum of 18 metric tons (20 tons) of cargo each, which would place the overall weight below the Kentucky-mandated maximum weight for Kentucky Highway 89 of 36,288 kilograms (80,000 pounds) for a five-axle vehicle. The Kentucky Transportation Cabinet indicated any vehicle below that weight traveling along that road would not be expected to cause damage to the roadway. Should damage occur from vehicles carrying more than the maximum weight allowance, the operator of the trucks, in this case KPE, would be responsible for any repairs to the road surface. Section 5.11, Traffic and Transportation, has been modified to address the concerns of damage to the local roads.

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Comment No. 21 **Issue Code: 16**
Comment noted. The relatively small amounts and generally widely dispersed nature of MSW in Kentucky does not economically support exclusive utilization of Kentucky-generated MSW to produce RDF supplies. Importing RDF from a densely populated metropolitan area is more economically viable in order to supply the necessary amount of RDF required to operate the plant.

Comment No. 22 **Issue Code: 11**
No impacts to the general public's health and safety would be expected from the operation of the proposed facility, particularly from the combustion of RDF. Incremental increases in air emissions from operation of the combustion turbines and cooling tower would be a very small fraction of the relevant federal and state ambient air quality standards (less than 1 percent for gaseous pollutants such as nitrogen dioxide, sulfur dioxide, and carbon monoxide and less than 4 percent of the federal 24-hour PM_{10} standard). There would be no significant short- or long-term air quality impacts and the health risks are expected to be minor.

Crewe, Phil
Lexington, KY
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Phil Crewe
1817 Traveller Road
Lexington, Kentucky 40504
859/277-4512

January 24, 2002

Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Mr. Spears:

Here are my additional comments regarding the Kentucky Pioneer Integrated Gassification Combined Cycle Demonstration Project Draft Environmental Impact Statement, January 24, 2002. These comments are in addition to the ones I verbally submitted at the public hearing in Lexington.

The Draft Environmental Impact Statement gives a superficial treatment of several important issues raised by the facility's proposed siting at Trapp Kentucky. Perhaps the most important is that of the environmental fate of the heavy metals found in the enormous quantity of municipal waste that will be imported from the northeast U.S. Clearly, the draft leaves open the possibility that the "vitrified frit" will be hazardous waste: "The vitrified frit would be analyzed to determine if it is hazardous…If the hazardous constituents cannot be removed or the frit is not 100% marketable, it would be disposed of at an appropriate hazardous or solid waste disposal facility." While in the summary it is stated that hazardous wastes would be disposed at an "approved hazardous waste landfill outside of Kentucky", there is probably nothing legally binding to this statement and there can be no assurance that the operators wouldn't attempt to create such a facility in Kentucky. Our region should not be forced to assume permanent custodianship of toxics from northeastern garbage. 1/22 2/12

If the frit is not "toxic" in a legal sense, (that is, it passes the applicable leach test) but is not completely marketable, it presumably will end up in a Kentucky or regional landfill. Kentucky has made a great effort to deal with its own landfill issue. Our landfill capacity should not be consumed to enable the northeast to avoid dealing with its own solid waste problem. Market forces in that region should be allowed to encourage waste reduction, reuse, recycling, and composting. 3/12 4/22

Even if the frit "passes" the statutorily –mandated leach test on a regular basis and is sold as fill material or road aggregate, can we really be assured that leaching of heavy metals into the natural environment will not occur? I doubt it. MSW is an inconsistent and heterogeneous material. Its variability as a feedstock might very reasonably be expected to result in temporal or spatial spikes of leachability that could go undetected. In any case, there is nothing in the Draft EIS concerning the testing methods, (which tests, how large a sample, how representative of the total and how often it will be done) and who will do it. There is certainly not enough information to assume our soil and watersheds will be protected from the long-term leaching of Cadmium, Mercury, Nickel and other toxics. 2/12 (cont.) 5/16 6/21 7/05

There is no assurance that toxics won't be "cocktailed" into the RDF in a criminal way. 8/22

The claim is made in the summary (s-7) that this facility "does not actually combust any MSW " even though it is permitted by the U.S. EPA as a municipal waste combustor. under 40CFR60. To make this entirely misleading statement requires invoking one or two distortions: The first is that making fuel pellets out of the MSW means that it is no longer MSW. Removing "white goods" and aluminum does not 9/16

Comment No. 1 **Issue Code: 22**

Because of DOE's limited role in providing cost-shared funding for the proposed Kentucky Pioneer IGCC Demonstration Project, alternative sites were not considered. KPE selected the existing J.K. Smith Site because the costs would be much higher and the environmental impacts would likely be greater if an undisturbed area was chosen. DOE finds that the EIS presents the full scope of environmental impacts from the proposed project.

Comment No. 2 **Issue Code: 12**

Vitrified frit produced from the gasification process is a commercial product, not a waste. The constituents of the frit are immobilized in a glass matrix making them resistant to corrosion (nonleachable) in the environment. The vitrified frit consists primarily of ash (99.2 percent by weight) composed of oxides of the following elements: silicon (SiO_2), aluminum (Al_20_3), titanium (TiO_2), iron (Fe_20_3), calcium (CaO), magnesium (MgO), potassium (K_2O) and sodium (Na_2O). The frit also consists chloride, fluoride, antimony, arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, mercury, molybdenum, nickel, silver, thallium, vanadium and zinc. The frit from gasifiers operating on a 100 percent coal feed has consistently been shown to be nonhazardous under RCRA. Since this project will be using a different feed stream, the first batch of frit should be tested to ensure that it meets all TCLP criteria and is therefore nonhazardous. Vitrified frit is expected to pass the more stringent Universal Treatment Standard criteria of the EPA-TCLP analytical method. Chapter 3 of the EIS has been refined to include a more detailed description of the frit.

Since there are no hazardous waste treatment facilities in the State of Kentucky, any hazardous waste generated onsite would be managed in accordance with applicable state and RCRA's hazardous waste regulations (40 CFR Parts 260 to 270) and disposed of at an "out-of-state" licensed hazardous waste disposal facility.

Crewe, Phil
Lexington, KY
Page 2 of 5

Letter to Mr. Roy Spears
Page Two

transform garbage into something else. It is still garbage and will contain the vast amalgamation of pollutants found in garbage. 9/16 (cont.)

The other distortion is that combustion is not a part of the gassification process. This claim was also made by Mike Musulin, President of KPE, in a Lexington Herald-Leader op- ed piece dated 7/23/01. Combustion certainly is a part of the chemical process, even if the over all picture is one of pyrolysis in a (mostly) oxygen-starved environment. Combustion might be defined as the highly exothermic self-sustaining reaction of a flammable material in the presence of air or oxygen. In the vicinity of the oxygen ports, at 3200degrees F, the flammable material present is certainly undergoing combustion. 10/16

The process diagram on page s-1 shows an aqueous effluent exiting the "gas liquor separator". This appears not to be re-injected into the gassifier. What pollutants will it contain? Mercury? ;Tars, oils and aromatic hydrocarbons? What treatment will it receive before it enters the Kentucky River (above the water intakes of the cities of Central Kentucky)? The Draft EIS fails to discuss this effluent, its character, or its treatment. 11/07

The Draft EIS mentions the flare used to vent the gassifiers in the event of a malfunction or emergency. Since this is a direct venting into the atmosphere, any substances that were not destroyed by the flare would escape. What would be the nature of this release? Would it produce dioxins or furans? (The flare would not have the reducing conditions present in the gassifier.) How much Mercury would be released? 12/06

In general, the Draft EIS is very lacking. It is lacking in reference to previous experience with gassification of MSW under the conditions present in this plant, either at the pilot plant or full-scale level. If the proponents of this project credibly know what the character of the effluents and by-products of this plant will be, there is no experience-based justification offered for their confidence. 1/22 (cont.) 13/16

Sincerely,

Phil Crewe

Comment No. 2 (cont.) **Issue Code: 12**
Creation of hazardous waste landfills and the disposal of northeast municipal waste in the State of Kentucky are beyond the scope of this EIS.

Comment No. 3 **Issue Code: 12**
Comment noted. At this time, no decisions have been made about disposing of the frit because KPE anticipates that the frit would be marketable. Chapter 3 of the EIS has been revised to show the importance to KPE of ensuring the frit is nonhazardous.

Comment No. 4 **Issue Code: 22**
Comment noted. The issue is beyond the scope of the EIS.

Comment No. 5 **Issue Code: 16**
Variability in the RDF content is dependent on the MSW supply. However, RDF production methods inherently yield fairly uniform and homogeneous pellets. Due to the vitreous nature of the frit, there would be no particular variability when a leaching test is conducted, regardless of the composition of the feed.

Comment No. 6 **Issue Code: 21**
The Final PSD/Title V Air Permit, issued by the Kentucky Division for Air Quality on June 7, 2001, requires continuous emissions monitors for NO_x, SO_x, CO, O_2, and PM_{10}. Annual stack tests for all pollutants with emission limits established by the permit are also required. The KPDES permit, which will be obtained at least 180 days before commencing construction, will also have effluent limits and monitoring requirements established by state regulations. In addition to the required monitoring under the permit, KPE would monitor the levels of biological and chemical oxygen demand, pH, and temperature in any wastewater generated by the facility. Any monitoring and measurements

Crewe, Phil
Lexington, KY
Page 3 of 5

Comment No. 6 (cont.) **Issue Code: 21**
would be based on usage limits and flows associated with natural gas-fired plants.

Comment No. 7 **Issue Code: 05**
All raw materials and wastes would be stored and handled in enclosed areas that would not be in direct contact with local soil. Therefore, no impacts to local soil quality would be expected from operation of the plant.

Comment No. 8 **Issue Code: 22**
The Summary and Chapter 3, Section 3.2.2, of the EIS discuss RDF pellets. RDF is made from MSW, not hazardous waste, which has significantly higher levels of toxic materials. MSW is defined by EPA as durable and nondurable goods such as appliances, tires, batteries, newspapers, clothing, packaging, paper wood pellets, and food waste. While some of these goods contain toxic materials, EPA has found that household hazardous waste is comprised of less than 1 percent of MSW. The possibility of "cocktailed" toxins in RDF is unlikely based on the constituents used to generate it.

Comment No. 9 **Issue Code: 16**
Chapter 3, Section 3.2.2.2 of the EIS, discusses the production and composition of the RDF pellets. KPE intends to supply all RDF pellets for this project from the same manufacturer. Variation in RDF pellet composition due to different manufacturing processes should not be an issue for this project. The gasification technology used produces a very consistent syngas product, regardless of the variability of the feed. Chapter 3 of the EIS explains the BGL gasification process. The RDF pellet and coal cofeed is heated in a low oxygen environment, which causes a chemical conversion process that results in the formation of the syngas. The syngas product is combusted in the combined cycle turbines to produce electricity.

Crewe, Phil
Lexington, KY
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Comment No. 10 **Issue Code: 16**

Chapter 3, Section 3.2.2.2, of the EIS, discusses the production and composition of the RDF pellets. KPE intends to supply all RDF pellets for this project from the same manufacturer. Variation in RDF pellet composition due to different manufacturing processes should not be an issue for this project. The gasification technology used produces a very consistent syngas product, regardless of the variability of the feed. Chapter 3 of the EIS explains the BGL gasification process. The RDF pellet and coal cofeed is heated in a low oxygen environment, which causes a chemical conversion process that results in the formation of the syngas. The syngas product is combusted in the combined cycle turbines to produce electricity.

Comment No. 11 **Issue Code: 07**

The process diagram in the Summary, Figure S-1, of the EIS, was not intended to be a detailed construction drawing, but was included to represent a general depiction of the overall process. KPE states that the specific details of the nature and degree of aqueous effluent cannot be identified until the plant design is in more advanced stages. Prior to treatment, this waste stream may include pollutants such as metals, tars, and oils. However, as stated in Section 5.8, Water Resources and Water Quality, treated wastewater is expected to contain conventional pollutants such as nitrogen, phosphorus, total dissolved solids, and biological and chemical oxygen demand. Pollutant discharge limitations would be set by the Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water's Water Resources Branch and would be identified in the KPDES permit. These limitations would be established based on site-specific computer modeling of the expected effect on water quality of the Kentucky River at the proposed discharge point and in the mixing zone immediately downgradient. The limits specified in the permit would protect existing water quality.

Crewe, Phil
Lexington, KY
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Comment No. 12 **Issue Code: 06**

Emissions from the flare system, when combusting syngas during malfunction periods, would be similar to those from any gaseous fuel combustion system. Emission rates would vary somewhat from those of the gas turbines but would include essentially all the same pollutants. NO_x emissions would be lower than those from the gas turbines due to a lower combustion temperature. Sulfur dioxide emissions would be higher than those from the gas turbines since the syngas flow to the flare would not have been processed for sulfur recovery. Dioxin/furan formation would be lower than for the gas turbines due to lower combustion temperature and shorter residence time in the combustion zone. Mercury emissions would be similar to those for the gas turbines since neither system has emission controls designed to remove mercury. The air quality permit allows emission limits to be exceeded during process malfunctions for no more than 2 hours. The proposed facility is designed to allow full shutdown in well under 2 hours in the event that there is a malfunction that is not readily correctable.

Comment No. 13 **Issue Code: 16**

Plant design is not available or necessary at this point because the project is still in the planning stage. It will not be available until after the issuance of the ROD. This project would be the first commercial-scale application of the co-fed BGL technology in the United States. The technology has also been used at the Schwarze Pumpe facility in Germany and the Westfield facility in the United Kingdom.

Gen. Apps, Inc.
Winchester, KY
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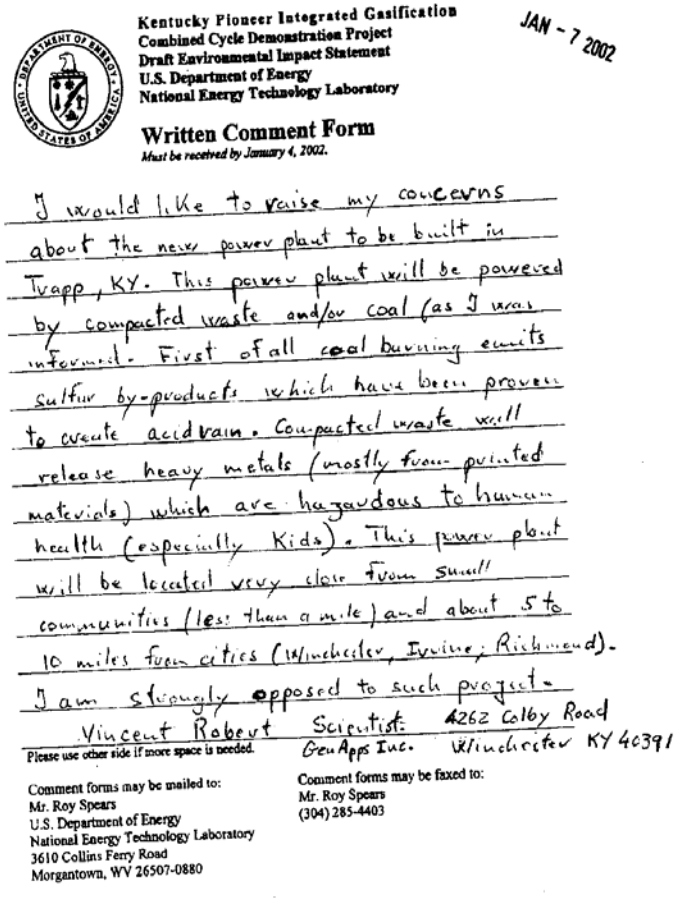

Kentucky Pioneer Integrated Gasification Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

JAN - 7 2002

Written Comment Form
Must be received by January 4, 2002.

I would like to raise my concerns about the new power plant to be built in Trapp, KY. This power plant will be powered by compacted waste and/or coal (as I was informed. First of all coal burning emits sulfur by-products which have been proven to create acid rain. Compacted waste will release heavy metals (mostly from printed materials) which are hazardous to human health (especially Kids). This power plant will be located very close from small communities (less than a mile) and about 5 to 10 miles from cities (Winchester, Irvine, Richmond). I am strongly opposed to such project.

Vincent Robert Scientist 4262 Colby Road
GenApps Inc. Winchester KY 40391

Please use other side if more space is needed.

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

Comment No. 1 **Issue Code: 06**

The proposed project is not a conventional power plant burning coal or RDF. Instead of burning such fuels in a boiler system, the proposed project would use gasification technologies to convert the solid fuels into syngas similar to natural gas. That syngas would be the fuel burned in the gas turbine generator system. More than 99 percent of the sulfur content of the raw fuel materials (coal and RDF pellets) would be removed and recovered as a marketable byproduct. The syngas would have a sulfur content similar to that of fuel oil, which is much lower than that of coal.

Chapter 5, Section 5.7 of the EIS, Air Resources, has been revised to discuss the sulfur content of syngas fuel and to clarify that acid deposition impacts would not be significant.

1/06

Comment No. 2 **Issue Code: 11**

2/11

The gasification process would produce a small amount of wastewater containing primarily dissolved salts. Heavy metals and mercury would be emitted only from the power island component (CTs) of the Kentucky Pioneer IGCC Demonstration Project. Total heavy metal deposition in areas downwind of the project would be much less than 1.1 kilogram per hectare (1 pound per acre) accumulated over 20 years and present little risk to human health and the environment. Furthermore, the air quality permit for the project requires continuous emission monitoring for major criteria pollutants and annual emission testing for cadmium, lead, mercury, hydrogen chloride, and dioxins/furans. Noncompliance with permitted emission levels would result in a plant shutdown.

3/16

Comment No. 3 **Issue Code: 16**

Commented noted.

Gulick, Brandon
Lexington, KY
Page 1 of 1

Kentucky Pioneer Integrated Gasification
Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

Written Comment Form
Must be received by January 4, 2002.

I am against polluting the air. I like nature and the beautiful skies and trees & animals. I want my children to be able to see this also.

Brandon Gulick

1/06

Please use other side if more space is needed.

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

Comment No. 1 **Issue Code: 06**

Comment noted. Incremental ambient air quality impacts from the project would be a very small fraction of the relevant federal and state ambient air quality standards (less than 1 percent of the standards for gaseous pollutants and less than 4 percent of the standards for PM_{10}). Table 5.7-4 of the EIS identifies estimated maximum downwind concentrations of hazardous pollutants expected to be emitted by the proposed facility and the associated maximum lifetime cancer risks.

Gulick, Michael
Lexington, KY
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Kentucky Pioneer Integrated Gasification
Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

Written Comment Form
Must be received by January 4, 2002.

I AM AGAINST BURNING WASTE AND POLLUTING THE AIR.

Please use other side if more space is needed.

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

1/16
2/06

Comment No. 1 **Issue Code: 16**
Comment noted.

Comment No. 2 **Issue Code: 06**
Comment noted. Incremental ambient air quality impacts from the project would be a very small fraction of the relevant federal and state ambient air quality standards (less than 1 percent of the standards for gaseous pollutants and less than 4 percent of the standards for PM_{10}). Table 5.7-4 of the EIS identifies estimated maximum downwind concentrations of hazardous pollutants expected to be emitted by the proposed facility and the associated maximum lifetime cancer risks.

Gulick, Pam
Lexington, KY
Page 1 of 1

Kentucky Pioneer Integrated Gasification Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

Written Comment Form
Must be received by January 4, 2002.

I oppose of the intergiated Gasification cycle demonstration project. Burning waste and pollutes the air. And also the big Semi-Trucks traveling on 89 is unsafe. and - ~~Pam Gulick~~ tears up the highway & makes it dangerous., Because there are huge pot holes. that you have to go around, because they will hurt your automobile.

Pam Gulick

Please use other side if more space is needed.

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

1/16
2/06
3/10

Comment No. 1 **Issue Code: 16**
Comment noted.

Comment No. 2 **Issue Code: 06**
Comment noted. The proposed project is not a conventional power plant burning coal or RDF. Instead of burning such fuels in a boiler system, the proposed project would use gasification technologies to convert the solid fuels into a syngas similar to natural gas. That syngas fuel would be burned in the gas turbine generator system. As illustrated in Table 5.7-3 of the EIS, maximum air quality impacts from the proposed project would be less than 1 percent of the relevant federal air quality standards for gaseous pollutants such as nitrogen dioxide, sulfur dioxide, and carbon monoxide. Maximum impacts from the proposed project on particulate matter concentrations would be less than 4 percent of the federal 24-hour PM_{10} standard and less than 1.5 percent of the federal annual average PM_{10} standard. Table 5.7-4 of the EIS identifies estimated maximum downwind concentrations of hazardous pollutants expected to be emitted by the proposed facility and the associated maximum lifetime cancer risks.

Comment No.3 **Issue Code: 10**
Comment noted. The trucks would haul a maximum of 18 metric tons (20 tons) of cargo each, which would place the overall weight below the Kentucky-mandated maximum weight for Kentucky Highway 89 of 36,288 kilograms (80,000 pounds) for a five-axle vehicle. The Kentucky Transportation Cabinet indicated any vehicle below that weight traveling along that road would not be expected to cause damage to the roadway. Should damage occur from vehicles carrying more than the maximum weight allowance, the operator of the trucks, in this case KPE, would be responsible for any repairs to the road surface. Section 5.11, Traffic and Transportation, has been revised to address the concerns of damage to the local roads.

Herrick, Will
Campton, KY
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Kentucky Pioneer Integrated Gasification
Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

Written Comment Form

Must be received by January 4, 2002.

SIR,

PLEASE find enclosed
My Written Comments.

Will Herrick
4859 FLAT MARY Rd
CAMPTON, KY
41301

Please use other side if more space is needed.

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

Herrick, Will
Campton, KY
Page 2 of 108

Comments on the Kentucky Pioneer IGCC Draft
Environmental Impact Statement

Will Herrick
4859 Flat Mary Rd
Campton, Ky 41301

January 22nd, 2002

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Campton, KY
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Campton, KY
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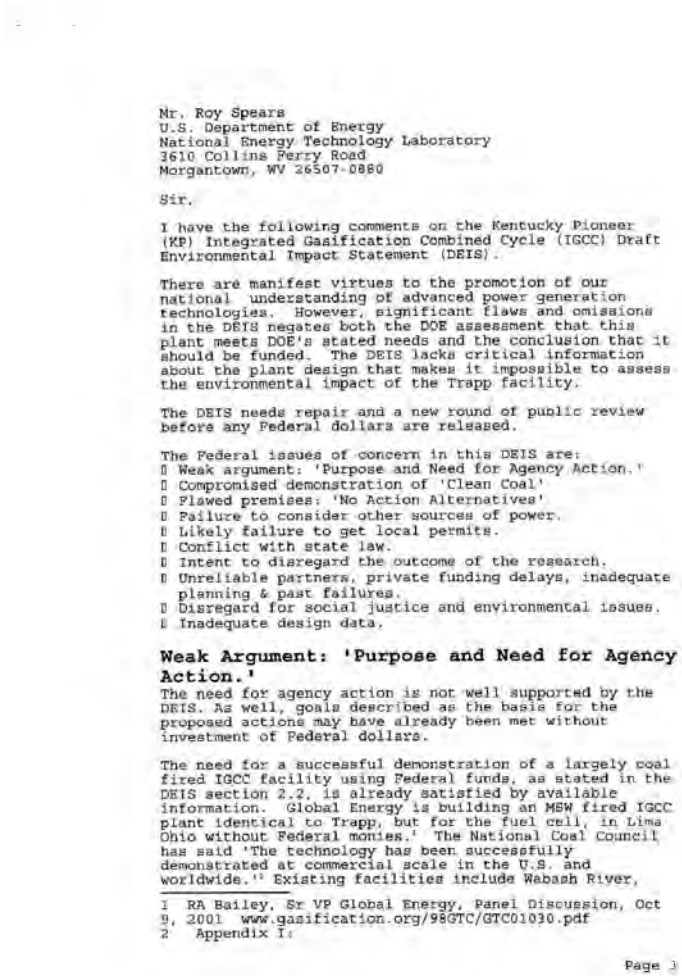

Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Sir,

I have the following comments on the Kentucky Pioneer (KP) Integrated Gasification Combined Cycle (IGCC) Draft Environmental Impact Statement (DEIS).

There are manifest virtues to the promotion of our national understanding of advanced power generation technologies. However, significant flaws and omissions in the DEIS negates both the DOE assessment that this plant meets DOE's stated needs and the conclusion that it should be funded. The DEIS lacks critical information about the plant design that makes it impossible to assess the environmental impact of the Trapp facility.

The DEIS needs repair and a new round of public review before any Federal dollars are released.

The Federal issues of concern in this DEIS are:
- Weak argument: 'Purpose and Need for Agency Action.'
- Compromised demonstration of 'Clean Coal'
- Flawed premises: 'No Action Alternatives'
- Failure to consider other sources of power.
- Likely failure to get local permits.
- Conflict with state law.
- Intent to disregard the outcome of the research.
- Unreliable partners, private funding delays, inadequate planning & past failures.
- Disregard for social justice and environmental issues.
- Inadequate design data.

Weak Argument: 'Purpose and Need for Agency Action.'

The need for agency action is not well supported by the DEIS. As well, goals described as the basis for the proposed actions may have already been met without investment of Federal dollars.

The need for a successful demonstration of a largely coal fired IGCC facility using Federal funds, as stated in the DEIS section 2.2, is already satisfied by available information. Global Energy is building an MSW fired IGCC plant identical to Trapp, but for the fuel cell, in Lima Ohio without Federal monies.[1] The National Coal Council has said 'The technology has been successfully demonstrated at commercial scale in the U.S. and worldwide.'[2] Existing facilities include Wabash River,

1 RA Bailey, Sr VP Global Energy, Panel Discussion, Oct 9, 2001 www.gasification.org/98GTC/GTC01030.pdf
2 Appendix I.

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3/14 (cont.)

Comment No. 1 **Issue Code: 14**

DOE believes that the Kentucky Pioneer IGCC Demonstration Project EIS adequately analyzes the full scope of environmental impacts from the proposed project. Chapter 3 of the EIS has been revised to provide more detail on the gasification process, including the production of the vitreous frit. Detailed plant design is not available or neccessary at this point because the project is still in the planning stage. It will not be available until after the issuance of the ROD.

Comment No. 2 **Issue Code: 21**

DOE believes that the EIS fully addresses all impacts of the Proposed Action and no action alternatives, as required by NEPA. The public comment period was extended through January 25, 2002. DOE will consider all public comments before issuing the ROD. The ROD will be issued no sooner than 30 days after the Final EIS is distributed and a notice of its availability is issued.

Comment No. 3 **Issue Code: 14**

The stated goal of the CCT Program is to advance DOE's mission to foster a secure and reliable energy system that is environmentally and economically sustainable. As such, the CCT Program was established to demonstrate the commercial feasibility of CCTs to respond to a growing demand for a new generation of advanced coal-based technologies characterized by enhanced operational, economic, and environmental performance. Since coal is an abundant, secure and economical fuel, and is used to produce over 51 percent of the electricity in this country, it must continue in its role as a key component in the United States and world energy markets.

The Kentucky Pioneer IGCC Demonstration Project utilizes the BGL oxygen-blown, fixed-bed slagging gasifier. The gasifier fuel will be a high-sulfur bituminous coal and blended with RDF, which uses only MSW as its basic component and does not use any hazardous or industrial waste. The syngas generated in the gasifier will

Herrick, Will
Campton, KY
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Tampa Electric's Polk Plant, the Netherland's Buggenum, plants in Germany, Scotland, Singapore & South Africa and Spain's Puertollano plant. Global Energy already has several commercial IGCC projects under development based on using BGL Gasification Technology to gasify solid hydrocarbons for power production (Appendix B, Introduction, paragraph 2). The National Coal Council reported in May 2001: 'Based on the success of the BGL process at the Schwarze Pumpe GmbH plant in Germany, Global Energy is building two plants in the U.S. The 400 MW Kentucky Pioneer Project and the 540-MW Lima Energy Project will both use BGL gasification of coal and municipal solid waste to produce electric power.'[2]

The fuel cell demonstration at Trapp is more about MSW than Clean Coal. When presenting their Trapp proposal at a national coal conference, the company providing the fuel cell technology to Kentucky Pioneer Energy(KPE) said: 'Fuel cell systems operating on coal have been studied extensively in past years.'[3](p.3) Later in the paper they go on to say of the Trapp facility: 'The project will feature Advanced Fuel Technology briquettes made of Kentucky coal and Municipal Solid Waste (MSW) as fuel in the gasification process...'(p.5). These facts indicate that the purpose of the demonstration is not the already well researched coal powered fuel cell but, in fact, the MSW powered fuel cell where coal is being removed from the feedstock to favor MSW. This fails to satisfy the expressed goal of DBIS section 2.2 for: '...technologies that will help alleviate pollution problems from coal utilization.' Alleviating coal pollution problems by not using coal is not what DOE & CCT are about.

3/14 (cont.)

The national interest in MSW as a non-competitive alternative to other fuels for energy production is at cross-purposes to the CCT effort at Trapp. The Office of Integrated Analysis and Forecasting of the Energy Information Administration reported in April of 1997: 'MSW-produced power is viewed [primarily] as a byproduct of a community's waste disposal activities and only secondarily as a competitive alternative to other fuels for energy production.'[5] The waste at Trapp is not a byproduct of that community's waste disposal activities, and the MSW is competing with local coal.

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2 www.nationalcoalcouncil.org/Documents/May2001report-revised.pdf P. 32
3 Appendix I: www.nationalcoalcouncil.org/Documents/May2001report-revised.pdf P. 28
4 Appendix C. Steinfeld Ghezel-Ayagh, Sanderson, & Abens: IGFC Demonstration Test. FuelCell Energy Inc, 25th International Technical Conference on Coal Utilization and Fuel Systems, March 6th, Clearwater FL.
5 DOE/EIA-M069(97) Model Documentation Renewable Fuels Model of the National Energy Modeling System. URL: tonto.eia.dos.gov/FTPROOT/modeldoc/m06997.pdf

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Comment No. 3 (cont.) **Issue Code: 14**

be used to fire a gas turbine. This project serves to further CCT Program objectives in the following ways:

1. RDF is an example of a fuel that has the potential to enhance the economics of coal utilization and lower the emissions output of a totally coal-based system. Coal-based systems that have sufficient flexibility to handle a range of fuels will have a competitive advantage over a nonfuel-flexible, coal-only system.

2. Gasification is a more environmentally efficient method to generate electricity from coal. While much was learned from the previous CCT gasification projects (Wabash River and Tampa Electric), the different technology techniques to produce syngas with flexible-fuel co-feeds have not been demonstrated and operating demonstrations are essential to accelerate the widespread use of gasification.

The fuel cell demonstration has been moved to the existing Wabash River IGCC Plant near West Terre Huate, Indiana.

Comment No. 4 **Issue Code: 14**

DOE selected the Kentucky Pioneer IGCC Demonstration Project for further consideration under DOE's fifth solicitation (CCT-V) of the CCT Program and concludes that the project meets CCT Program requirements due to the first demonstration of a co-fed BGL gasifier and the facility size would be approximately 40 to 50 percent larger than other 100 percent coal-fed BGL facilities.

Because of DOE's limited role in providing cost-shared funding for the proposed Kentucky Pioneer IGCC Demonstration Project, and because of advantages associated with the proposed location, DOE did not

Herrick, Will
Campton, KY
Page 6 of 108

At what point does the presence of coal become token? Please make a specific answer to that question as it is the sole basis for DOE CCT's investing in the Trapp facility. KPE has said that they intend to use only 20% coal in the feedstock in the long run, 50% or less initially. 'Operation will commence on 100% coal with slowly increasing levels of RDF throughout the demonstration. This method will allow the development of a database of plant performance at various levels of RDF feed.'[6] Using Clean Coal monies for research on MSW/RDF diverts those dollars from their intended purpose.

The Wabash IGCC facility in Terre Haute, operating since 1996, has demonstrated most of the retrofit, repowering, coal, sulfur and NOx related features of Trapp with a similar gasifier from KPE's parent, Global Energy. BG/L facilities are in place in Europe, Singapore and elsewhere. They already offer a wealth of technical, environmental and financial data. A 1998/2000 NETL report, entitled 'British Gas/Lurgi Gasifier IGCC Base Cases', reports the Cost of Energy for IGCC BG/L facilities on pages 25-40[7].

Kentucky already has the lowest energy prices in the nation. From a Federal point of view, siting this plant anywhere else makes more sense in terms of meeting needs. If, (as described in the DEIS page S-3, 'Purpose and Need for Agency Action' paragraph 2), the goal is to 'significantly reduce electric power costs...', it may be most effective to look at sites for this facility where electricity rates are higher.

While Kentucky has the lowest energy costs in the nation, there are many other providers seeking to offer base and peaking capacity in the EKPC market area, to wit: the EKPC Mason County Spurlock Plant proposal introduced above (and many others). Neglecting to consider these other energy sources and providers is a serious omission in the Section 2 of the DEIS, Purpose and Need for Agency Action.

EKPC has proven in the past to seriously miscalculate their power needs. That is how the Trapp site was originally prepared and then mothballed for 20 years. EKPC is adding base capacity outside of this initiative (the Spurlock facility in Mason County), as are others. EKPC's pursuit of the Mason County Spurlock facility (Appendix D) appears to, for the near run, address their '1998 Power Requirements Study', cited as the energy demand component of the 'Need for Agency Action.'

6 P.2 Advanced Electric Power Generation Program Update 2000. May 17th, 2001 URL: www.lanl.gov/projects/cctc/factsheets/updates/documents/sdvelecigcc_2000_all.pdf
7 www.netl.doe.gov/coalpower/gasification/system/bgl3x_20.pdf

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Comment No. 4 (cont.) **Issue Code: 14**
evaluate alternative sites for the proposed project. Site selection was governed primarily by benefits that Global Energy could realize. Global Energy preferred the proposed project site because the costs would be much higher and the environmental impacts likely much greater for an undisturbed area.

Comment No. 5 **Issue Code: 18**
After the issuance of the NOI and during the scoping process, a third alternative, in addition to No Action Alternative 1 and the Proposed Action, was identified. The alternative was determined to be a reasonably foreseeable future action. The construction of the proposed project cannot begin until DOE issues the ROD. Consideration of power generated by the Spurlock Power Station is outside the scope of the EIS.

Comment No. 6 **Issue Code: 14**
An analysis of the use of alternative sources of power is outside the scope of the EIS.

Comment No. 7 **Issue Code: 21**
The Kentucky Pioneer IGCC Demonstration Project is a federal action selected for the CCT Program. The EIS is used as a tool to decide whether or not DOE should provide funding to the project. If the project is approved, KPE would be required to abide by all local, state, and federal regulations.

The Kentucky Natural Resources and Environmental Protection Cabinet has advised KPE that the RDF is a recovered material, not a waste. The Kentucky Pioneer IGCC Demonstration Project facility will be considered a recovered material processing facility and the gasification process will not require a waste permit as long as the RDF conforms to the statutory definition.

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All the power plant interest in the Commonwealth bodes well for access to capacity in the long run. The base energy demand cited by DOE as justification for Trapp has not been well established, and would not compare well to most other sites where electricity rates were higher.

The case for spending Clean Coal dollars and the need for agency action has not been well made. The fact that the Lima facility is being built without Federal dollars undercuts the argument that the American power industry needs Federal funds to assess the potential of BG/L IGCC systems. There is an abundance of financial information already available. Little regarding coal powered IGCC systems will be learned at Trapp. Trapp is really about MSW, not CCT. Scarce tax dollars should not be spent, as the goals of the Clean Coal program described in the DEIS are already reasonably well met without Federal support, and are not well addressed by the Trapp proposal. Coal pollution abatement by not using coal defeats CCT goals.

Compromised Demonstration of 'Clean Coal'

Throughout the Introduction and Background section of the DEIS, the Federal goal is defined. The basis for funding, and the declared purpose stated there is demonstrating clean coal technology.

The summary page S-3's synopsis bundles the MSW derived fuel into the project goals. The inclusion of MSW & it's derivatives are not documented as a goal in the body of the DEIS, however. The entire background section details the chronology of the CCT program and DOE's interest in demonstration facilities. Nowhere is there mention of MSW or RDF fuels.

As presented in the DEIS, there is no Federal mandate for DOE's CCT program to demonstrate a waste-to-energy facility using clean coal monies. It seems disingenuous to label it a coal demonstration when so little coal is involved and in fact coal tonnage is being displaced by MSW. That is entirely contrary to the stated goals.

As designed, this facility is not going to demonstrate 'clean coal'; it is going to demonstrate a waste-to-energy technology. KPE has declared their long-term intention of using only 20% coal in the feedstock, with the rest being derived from distant sources of Municiple Solid Waste (MSW). DOE should justify how Clean Coal monies should be spent on MSW issues that remove coal from the feedstock.

I wrote the following to researchers at the University of Kentucky Center for Applied Energy Research: 'The questions that I have involve the phase states of the constituents as they transport through the gasifier, the gas cleaner, the sulfur recovery process and the turbine combustion. I am specifically trying to follow the transport and chemistry of metals and their oxides, the

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3/14 (cont.)

4/14 (cont.)

Comment No. 7 (cont.) **Issue Code: 21**

Chapter 3 of the EIS has been revised to include a more detailed and expansive description of the gasification process. The syngas is not a component of the RDF pellets, but rather a fuel generated from the coal and RDF pellets by a series of chemical reactions within the carefully controlled environment of the gasifiers.

Comment No. 8 **Issue Code: 21**

KPE is not attempting to circumvent KRS 224 or any other state or local laws. The Kentucky Natural Resources and Environmental Protection Cabinet has advised KPE that the RDF is a recovered material, not a waste. The Kentucky Pioneer IGCC Demonstration Project facility will be considered a recovered material processing facility and the gasification process will not require a waste permit as long as the RDF conforms to the statutory definition.

Comment No. 9 **Issue Code: 21**

KPE has a contract in place with EKPC to provide power continuously for a 20-year period. The facility would not shut down after the 1-year demonstration period, but would continue to operate to honor the commitment to EKPC. As discussed in Chapters 1 and 2 of this EIS, the performance, technical, and economic data would be used to determine the commercial viability of the co-fed BGL gasifier at other new and existing facilities. There would not be a new round of permitting following the end of the 1-year demonstration period. The PSD/Title V Air Permit issued by the Kentucky Division of Air Quality is final and does not require renewal following the demonstration. At the close of the demonstration period, the KPDES permit for water usage would also be final and not require renewal. Any required fuel feed component changes following the 1-year demonstration period would likely require modification of the air and water permits.

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fate of chlorinated compounds in the feedstock,and the technology applied to clean the synthesized hydrocarbons.' Dr Burt Davis <davis@noah.caer.uky.edu> replied on Tue Jan 8 17:02:18 2002: 'I assume that you are referring to the facility that has been proposed by Global. If that is the case I have a general understanding of what is proposed. Many of the issue[s] that you raise are very complex and would in many cases be apecific to the specific facility.' The results of the research cannot be directly applied other BG/L IGCC facilities that do not use MSW. The constituency of the feedstock, the combustion chemistry, the gas cleaning processes, and the resultant exhaust gases and slag will all vary significantly from facilities that just use coal. The value of Trapp as a research facility for Clean Coal is questionable.

DOE has acknowledged that it is normally responsible for a comprehensive review of alternative sites, and that by choosing to partner with Global Energy, the parent company of KPE, they feel relieved of that responsibility. There are several points to be addressed, however. In addition to the comments below, please consider the *Unreliable Partners* section.

Global Energy has other sites in various stages of construction using BGL based IGCC technology[8]. They are a CCT partner in a nearly identical IGCC plant burning coal since December 1995 in Indiana. They are putting an IGCC plant identical to Trapp in Lima Ohio.

To not consider these sites is improper-it is the same partner. The alternate sites appear to satisfy all stated goals of DOE & the CCT projects. Some may use 100% coal which makes them more valuable as CCT demonstrations sites than one that only uses 20% coal. There may well be other sites as well: DOE & the CCT program have IGCC partners as far away as Kazahkstan.

The fuel cell component of the Trapp demonstration is a fraction of 1% of the total energy production. It has already been demonstrated using sulfur-cleaned coal-based syngas. It is a modular technology that could be added to practically any current IGCC facility, and certainly to the Lima plant.

If MSW derived materials are to comprise 80% of the feedstock, sites closer to the source of the MSW need

8 Appendix E. APPLICATION OF BGL GASIFICATION OF SOLID HYDROCARBONS FOR IGCC POWER GENERATION
2000 Gasification Technologies Conference
San Francisco, California
October 8-11, 2000
Presented by:
GLOBAL ENERGY INC.
Richard A. Olliver

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4/14 (cont.)

Comment No. 10 **Issue Code: 22**
Before any federal funds are obligated, KPE will have to provide proof of finances for construction and operation of the project.

Comment No. 11 **Issue Code: 13**
The relatively small amounts and generally dispersed nature of MSW in Kentucky does not economically support exclusive utilization of Kentucky generated MSW to produce RDF supplies. Importing RDF from a densely populated metropolitan area is more economically viable in order to supply the necessary amount of RDF required to operate the plant.

Comment No. 12 **Issue Code: 16**
Detailed plant design is not available or necessary at this point because the project is still in the planning stage. It will not be available until after the issuance of the ROD. All assumptions made in conducting the analyses are detailed in the EIS.

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consideration. Energy prices are higher anywhere else in America, offering a better reward for siting elsewhere.

Without a thorough site review, it is impossible to establish whether the advantages offered by EKPC at Trapp are the best deal for the DOE & the public, or if Federal money is even needed to accomplish the goals presented by the DOE & EPA.

DOE and their current partners may better achieve their mandated goal of demonstrating CCTs at a different BG/L IGCC facility. They should be compelled to make that review. More importantly, DOE may be able to avoid spending taxpayers' dollars altogether while still managing to demonstrate coal based CCTs. It is a serious omission of this DEIS to neglect that opportunity.

Flawed Premises: 'No Action Alternatives'

There is good evidence provided by testimony before the PSC that the DEIS' Alternative 2 needs repair. EKPC's commitments, both present and future, are not accurately established. In the event that they are not as represented in the DEIS, the DEIS needs revision & subsequent public review.

Page S-8 describes the three alternatives analysed under this DEIS. The action described as Alternative 2 has been challenged by at least two documents. As well, personal communication with residents of the community of Trapp suggest that Alternative 2 may already be under construction, changing it's status from 'option' to fact.

On July 11, 2001, East Kentucky Power Co-Op (EKPC) amended its permit application before the Kentucky Public Service Commission (PSC) because KPE had not met its financial closing deadline of June 30, 2001. Due to the delay in KPE's financing, East Kentucky 'decided that it cannot reasonably rely on that project to satisfy its future power supply needs.' Therefore, EKPC has concluded that it should proceed to construct a 250 MW coal-fired generating unit at the Hugh L. Spurlock power station in Mason County, Kentucky[9]. This facility should be included as part of the DEIS Alternative 2.

The original NOI from DOE for Trapp includes the following: 'Under the no-action alternative, DOE would not provide partial funding for the design, construction, and operation of the project. In the absence of DOE funding, the Kentucky Pioneer IGCC Demonstration Project probably would not be constructed.'[10] Together, the two

9 Appendix D, Minutes of the Kentucky Public Service Commision, Case # 2001-053, September 26, 2001

10 DEPARTMENT OF ENERGY Notice of Intent To Prepare an Environmental Impact Statement for the Kentucky Pioneer Integrated Gasification Combined Cycle Demonstration Project, Trapp, KY and Notice of Floodplain Involvement. 10th day of April, 2000. David Michaels, Assistant

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(cont.)

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citations above suggest that all derived components of the DEIS that address Alternative 2 need to address the 250 Mw Mason County facility, and perhaps exclude the alternative as it is now written.

There may or may not be a natural gas fired power island at Trapp already under construction. This may be construction of some peaker units, however. If it is a fact that EKPC has already committed to building the power island, then it is not an 'alternative' but instead, an extant facility and should be dropped from the alternative section of the DEIS and added to the Cumulative Impacts. The residents of Trapp maintain that some construction is already underway.

The Proposed Action section may also need review. EKPC's commitment to the KPE IGCC facility is still contingent on future agreements, and that the DOE's Cooperative Agreement with KPE may be undone in the future by disagreements between KPE & EKPC & the PSC. In September, EKPC testified before the PSC that even 'In the event that KPE is able to secure project financing, East Kentucky stated that certain provisions in the existing purchase power agreement would have to be revised and any renegotiated contract will be resubmitted to the Commission for its prior approval.'

The alternatives offered to the public in the DEIS and scoping process do not represent the real alternatives before them. A revision of the DEIS & a new round of scoping and public comment after the DEIS is repaired is needed.

15/18 (cont.)

Likely Failure to get Local Permits

Over the last 15 years, Kentucky has bootstrapped itself into an enviable body of Solid Waste legislation. KRS 224 requires planning and management at both the state and county level for Municiple Solid Waste (MSW) production, reduction, and disposal. This statute provides the legal foundation for local permits. It also defines MSW and Refuse Derived Fuels (RDF).

The MSW being proposed as a feedstock does not quality under KRS 224 as an RDF, as most of the recyclables (paper & plastics) have not been recovered. See the section *Conflict with State Law* below for more discussion of MSW vs RDF in Kentucky. Further, under KRS 224 there is a 15% limit on RDF in the feedstock before the facility is a waste-to-energy plant requiring local permits.

The language voiced inside the state of Kentucky that has been used to describe the facility differs from that used in the Federal dialog by DOE's corporate partners EKPC and KPE. One wonders if the goal of this contradiction

7/21 (cont.)

Secretary, Environment, Safety and Health. [FR Doc. 00-9301 Filed 4-13-00; 8:45 am]

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is to avoid Kentucky law and the requisite permits from local Clark County government.

The DRIS supports the designation of Waste-to-Energy. On page 3-21, section 3.2.2.1, 'Pellet Manufacturers', it states 'Historically, the waste-to-energy industry has used RDF pellets as a means of assuring effective co-feeding at conventional power plants.' The implication is clear: using RDF is waste-to-energy.

KPE's staff are arguing that they are not burning or combusting the 2500-4000 tons/day MSW derived fuel[11] that comprises 50% to 80% of their plant's feedstock, and that the MSW they are using is no longer solid waste once they have removed only the glass and metals. They are leaving most recyclables in the waste stream for their BTU content, preferring to burn rather than recycle them[12].

It is clear to me that they are burning the fraction of MSW that vaporizes at 3200 degrees Fahrenheit, the syngas. DOE's documents frequently refer to the integrated combustion stage that drives the turbines in IGCC facilities: "...(3) **combustion** (emphasis mine)of the clean syngas in a turbine generator to produce electricity...". As well, it is clear that the facility is a waste-to-energy plant: "The briquettes would be made from high-sulfur coal (at least 50%) and refuse (municiple solid waste)" [13]

Outside of Kentucky, Global has no problem describing the process as combustion. For example, in a description of the industrial process they state: '...sulfur recovery units prior to combustion in the gas turbines, resulting in exceptionally low SO2 emissions. '[14] Please compare this with Mike Musulin's (President of KPE) published

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11 As proposed, KPE will transport as much as 4000 tons of municiple solid waste (MSW) per day from the East Coast to fuel the waste-to-energy facility in Trapp, Kentucky. This is an amount equal to approximately one half of Kentucky's own MSW production.
12 The sample provided by KPE for public inspection at the EPA EIS hearing on 12/11/01 in Trapp was a 10x50 mm compressed bolus made almost entirely of white paper. A rough guess is that particular sample was at least % recyclable content.
13 DOE's Notice of Intent to Prepare an Environmetal Impact Statement for the Kentucky Pioneer IGCC Demonstration Project, Trapp KY
14 Page 5, Appendix E, APPLICATION OF BGL GASIFICATION OF SOLID HYDROCARBONS FOR IGCC POWER GENERATION
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remarks where he says "It is not a combustion process."[15] KPE also plans to use an 80% MSW briquette after the 50% demonstration phase.[16]

The most obvious explanation for the strained language is that KPE needs to make these arguments in order to avoid the application of Kentucky law. If they are a Waste-to-Energy facility, then they are required to conform to the solid waste plan of Clark County Kentucky.

As of today in Clark County, the majority of the governing body, the County Attorney and the state Representative are publicly pursuing their county's right to require and enforce the permit. If KPE resorts to the courts to avoid the local permitting regulations, a significant delay is certain, and outright failure likely.

KPE has not applied for a permit from Clark County for their proposed facility. Their long standing denial of the need to get such a permit has turned public sentiment in the county against them.

Please see Appendix G, Kentucky Air Quality Permit. Further, under KRS 224, failure to get the required local permit disqualifies the state's right to permit the facility.

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Conflict With State Law

The following section is an excerpt from the Kentucky Resource Council's comments on the EPA's draft EIS for the Trapp site.

" The proposal to thermally treat and to combust the volatile fraction of one million tons or more per year of treated municipal solid waste falls squarely within the type of facility intended by the General Assembly to be scrutinized under the solid waste planning process.

KRS 224.40-315 mandates that:
No permit to construct or expand a municipal solid waste disposal facility shall be accepted for processing by the Cabinet unless the application contains a determination from the governing body for the solid waste management area in which the facility is or will be located concerning the consistency of the application with the area solid waste Management plan.

The scope of this statute and the requirement for a determination of consistency with the approved solid waste plan is defined by the term municipal solid waste disposal facility, which is defined in KRS 224.01-010(15)

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15 Op-Ed page, 7/23/2001, Lexington Herald-Leader, Lexington, KY
16Pers Comm: Dwight Lockwood, 12/10/01 c. 7 pm, manager of Regulatory Affairs, Global Energy Inc, Suite 2000, 312 Walnut St, Cincinatti OH 45202

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to include:

Any type of waste site or facility where the final deposition of any amount of municipal solid waste occurs, whether or not mixed with or including other waste allowed under subtitle D of the Federal Resource Conservation and Recovery Act of 1976, as amended, and includes, but is not limited to, incinerators and waste-to-energy facilities that burn municipal solid waste; .

Because the material is not a refuse derived fuel under KRS 224.01-010(23) in that it has not been subject to extensive separation of municipal solid waste including the extraction of recoverable materials for recycling the processing of the municipal solid waste stream to create the pelletized fuel does not make the material a recovered material under KRS 224.01-010(20). The proposed gasification step in the process and the cleaning of the volatile fraction of the waste for combustion does not make the facility a recovered material processing facility so as to exempt it from the definition of a municipal solid waste disposal facility or to avoid the obligation to be consistent with the local solid waste plan.

Even assuming that the partially processed waste fell within the ambit of refuse derived fuel and the 15%[17] limitation on RDF didn't limit the applicability of recovered material even as to RDF, the proposed facility is not a recovered material processing facility since it proposes to combust the gases created by the thermal and pressure treatment of the waste and is not storing and processing for resale or reuse.

Reuse, as that term is used by the General Assembly does not include use of wastes as a fuel with or without heat recovery. The latter concept is resource recovery and is a term distinct from reuse of solid waste. See: KRS 224.43-010 (3) which sets reuse of solid waste as a priority below reduction, and above recycling, composting, and resource recovery through mixed waste composting or incineration."

The resolution of the conflicting interpretations of KRS 224 will likely require adjudication. The Federal Government should immediately temper it's affinity for the Trapp facility and recognize that it is bankrolling a project that, at best, violates the spirit of Kentucky voters, and at worst will be killed by failing to get a local siting permit after an ugly court fight. Given the visible statutory issues, this project deserves a time out, not Federal dollars. By funding the Trapp facility, DOE & EPA help undermine the basis for much of the recent

17 Under Kentucky law, only 15% of the material processed by the facility creating the pellets could be credited as RDF.

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solid waste planning & management in the state of Kentucky.

Intent to Disregard the Research Results

The DEIS, on page 3-24, Section 3.4.2 'Proposed Actions' states at the end of the second paragraph, 'Data generated during the first-year demonstration would be used to determine if the coal and RDF pellet co-feed would continue after the first year of operation.'

KPE president Musulin has publicly rejected that premise and stated the KPE intends to operate the plant without a new round of permit reviews based on the outcome of the DOE funded research[18].

In regards to the review, who will make the determination to continue the RDF/coal co-feed? The DEIS is sorely inadequate in this area. Absent of any details of the review, no estimation can be made of the quality of environmental protection afforded by the review. The details of the review need to be developed and presented to the public immediately. The state of Kentucky has already issued an Air Quality permit for five years. If the proposed action described in the DEIS to review the data is to occur, then DOE and EPA will have to be the ones to require it.

Given KPE's clear intent, it is reasonable to require DOE to contractually obligate the review, publish it's full details, seek a bond to secure the agreement, and require Occurance class insurance to assure the intended levels of safety. In the face of evidence to the contrary, the cooperation of KPE cannot be presumed, and must be contractually required. Trusting KPE to volunteer for review and abide by the results can no longer be an option. This contract should also be part of the DEIS, and deserves public comment and review.

DOE's notice of intent to prepare the EIS states clearly that the project is "designed for at least 20 years of commercial operation...", and that "Upon completion of the demonstration, the facility **could** (my emphasis) continue commercial operation."[19] KPE has said "Kentucky Pioneer Energy will furnish Kentucky residents with low cost power, high-quality jobs, and a cleaner environment for years to come.""[20]

18 pers comm, Mike Musulin, President KPE, 12/11/01 9 pm, just after the close of the formal EPA EIS hearing "If we did that, nothing would ever get built." This comment was made to me, the Lee County Solid Waste Co-ordinator Ms. Neely Back, to Clark County resident, John Maruskin, and others.
19 DOE's Notice of Intent to Prepare an Environmetal Impact Statement for the Kentucky Pioneer IGCC Demonstration Project, Trapp KY
20 Op-Ed page, 7/23/2001, Lexington Herald-Leader, Lexington, KY

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One of two things can be drawn from these facts: either there should be a mandated public review and re-permit at the end of the demonstration because the outcome of the research and the safety of the waste product are uncertain, or that the outcome is certain and does not deserve Federal research monies.

In the event that DOE does fund the R&D facility, it should require, by contract and bond, a new round of public review and a new round of state permits predicated on the results of the test period. The absence of details about the how the data from the first year would be used to determine the continued use of coal/MSW/RDF is a significant omission in the DEIS.

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Unreliable Partners, Private Funding Delays, Inadequate Planning and Uncertainties

KPE & EKPC are having trouble already (see Appendix D, the PSC September 11[th] hearing). The public pronouncement by KPE that they intend to run the facility without regard to the outcome of the first year flies in the face of the text of the DEIS and challenges the notion that they are a good partner for DOE, EPA, and the public. As well, the determined effort to avoid the local permitting requirements calls into question their commitment to public partnership.

Many of the features of the KP IGCC DEIS are founded on the DOE's partnership with Global Energy, KPE & EKPC. The failure to consider other sites, the inclusion of MSW derived fuels instead of coal, and the reliance on old studies from EKPC's prior EIS's are among those features. The appropriateness of DOE's relaxed efforts is predicated on the quality of their choice of partners. There is evidence that these partners have failed to measure up and casts doubt on their ability or willingness to deliver.

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KPE missed it's financial closing deadline of June 30[th], 2001. In testimony before the Kentucky Public Service Commission, KPE's partner EKP stated "However, due to the delay in KPE's financing, East Kentucky (EKP) decided that it cannot reasonably rely on that project (Trapp) to satisfy its future power needs."[21]

The Trapp facility had originally been planned as a Duke Energy subsidiary (Ameren) project in southern Illinois, but that encountered siting difficulties and was canceled."[22]

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21 Appendix D. Commonwealth of Kentucky Public Service Commision case 2001-053, report on the hearing of 8/18/01, "Application of East Kentucky Power cooperative, Inc for a certificate of public convenience..."
22 Robert W. Gee,Assistant Secretary for Fossil Energy,

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EKPC failed to send representatives to either of the December 2001 DEIS public comment meetings in Kentucky. KPE has neglected to apply for a critical permit from Clark County. They failed to apply due diligence in the review of applicable law and instead maintain that they are not operating a waste-to energy facility, preferring a court battle over accommodating the local public.

The Federal Government should not risk public dollars on a project that, by DOE's own admission, may be poorly located, has a track record for last minute siting problems, and is anticipated to fail by it's own corporate partners. The quality of the partnership itself has become suspect in light of facts presented in these comments and appendices.

Disregard for Social Justice and Environmental Issues

Unlike New York, Kentucky has addressed our solid waste disposal problems. 4000 tons a day is a lot of trash. It is nearly half of what Kentucky produces each day. If folks in Trapp Kentucky can afford proper garbage disposal, New Yorkers can too. We have 23 other power plants awaiting permits. None of them want to incinerate 4000 tons of trash a day.

KPE has not offered any incentives to Kentucky. From Kentucky's view it's a clear loss. KPE is an Ohio company. Most jobs and all the profits leave the state. KPE will act to the advantage of it's parent, Global Energy, not EKPC or the Commonwealth. Since no local permit has been sought, there has been no discussion in Clark County of a 'Host Agreement', the contract of mutual benefits imposed on permit holders. Hence, there are no local benefits to offset any undesirable impacts from the facility. The Commonwealth's air quality is more excessively burdened by the metals and other contaminants in the imported MSW/RDF than if KPE burned Kentucky coal. From the Commonwealth's point of view KPE should be demonstrating 100% Kentucky coal. Kentucky already has the lowest energy costs in the nation: there is little demonstrated need for the power generated at Trapp.[23] A facility would be better located nearer it's feedstocks and high rate energy markets than at the proposed Trapp site.

If the Federal Government choses to fund the Trapp facility, many public bads (as opposed to public goods) will occur: Kentucky will see an escalation of landfill costs; elimination of new business opportunities due to increased scarcity of clean air and water; significant,

U.S. Department of Energy, before the Subcommittee on Interior and Related Agencies Committee on Appropriations, on March 14, 2000.
23 http://www.kentuckyconnect.com/heraldleader/news/121601/statedocs/16electricity-plants.htm

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Comment No. 13 **Issue Code: 02**

Economic benefits from the project are presented in Section 5.3, Socioeconomics, of the EIS. The majority of the revenue and income generated by the project would remain within the three-county Region of Influence (ROI) of Clark, Fayette, and Madison Counties. All 120 jobs would be created onsite, with none in Cincinnati. The region would also benefit from the indirect jobs created in other sectors and increases in tax revenue from the project.

Comment No. 14 **Issue Code: 21**

Comment noted. KPE will pursue all required state and local permits after financial closure on the project has been completed. KPE would be required to abide by all state and local regulations, including alerting the public during the public review process throughout the permit acquisition process.

Comment No. 15 **Issue Code: 06**

Comment noted. The metals content of RDF pellets may be higher than that of coal for some heavy metals, but not necessarily for all metals. Some heavy metals (such as beryllium, cobalt, and selenium) may not be present in detectable levels in RDF pellets. EPA's AP-42 emission rate documents do not provide a convenient comparison of uncontrolled heavy metal emission rates for coal versus RDF pellet combustion. Tables 1.1-18 and 2.1-8 in the AP-42 document provide a comparison of emission rates for facilities equipped with similar particulate matter emission controls. The data in those tables are presented as emission rates per ton of fuel. Bituminous coal has a typical heating value slightly more than twice as high as the heating value of RDF pellets (roughly 12,000 British Thermal Units [BTU] per pound for bituminous coal versus 5,500 BTU per pound for RDF pellets). When converted into emission rates on a fuel heat content basis (emission rates per million BTU), using RDF pellets as fuel would appear to produce higher emission rates than coal

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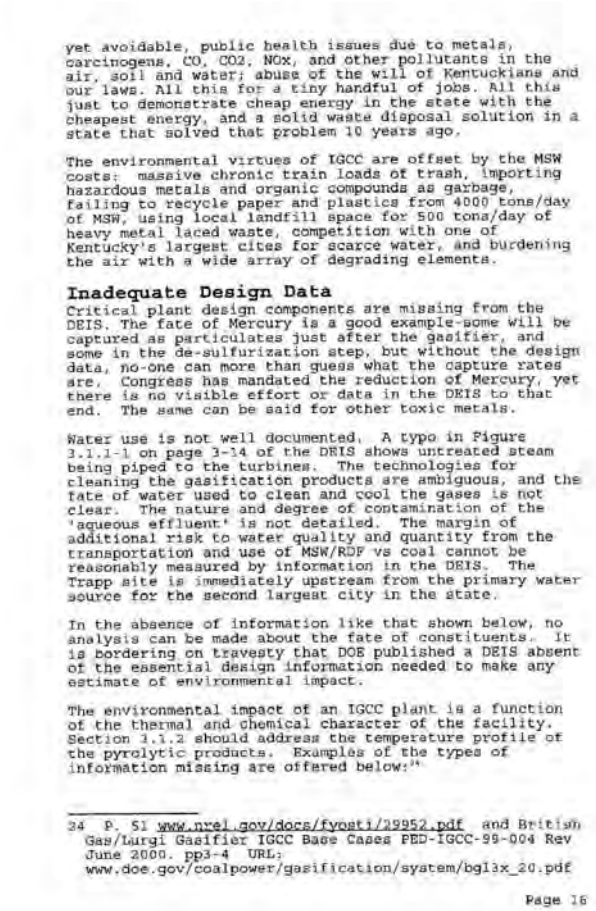

yet avoidable, public health issues due to metals, carcinogens, CO, CO2, NOx, and other pollutants in the air, soil and water; abuse of the will of Kentuckians and our laws. All this for a tiny handful of jobs. All this just to demonstrate cheap energy in the state with the cheapest energy, and a solid waste disposal solution in a state that solved that problem 10 years ago.

The environmental virtues of IGCC are offset by the MSW costs: massive chronic train loads of trash, importing hazardous metals and organic compounds as garbage, failing to recycle paper and plastics from 4000 tons/day of MSW, using local landfill space for 500 tons/day of heavy metal laced waste, competition with one of Kentucky's largest cites for scarce water, and burdening the air with a wide array of degrading elements.

Inadequate Design Data

Critical plant design components are missing from the DEIS. The fate of Mercury is a good example-some will be captured as particulates just after the gasifier, and some in the de-sulfurization step, but without the design data, no-one can more than guess what the capture rates are. Congress has mandated the reduction of Mercury, yet there is no visible effort or data in the DEIS to that end. The same can be said for other toxic metals.

Water use is not well documented. A typo in Figure 3.1.1-1 on page 3-14 of the DEIS shows untreated steam being piped to the turbines. The technologies for cleaning the gasification products are ambiguous, and the fate of water used to clean and cool the gases is not clear. The nature and degree of contamination of the 'aqueous effluent' is not detailed. The margin of additional risk to water quality and quantity from the transportation and use of MSW/RDF vs coal cannot be reasonably measured by information in the DEIS. The Trapp site is immediately upstream from the primary water source for the second largest city in the state.

In the absence of information like that shown below, no analysis can be made about the fate of constituents. It is bordering on travesty that DOE published a DEIS absent of the essential design information needed to make any estimate of environmental impact.

The environmental impact of an IGCC plant is a function of the thermal and chemical character of the facility. Section 3.1.2 should address the temperature profile of the pyrolytic products. Examples of the types of information missing are offered below:"

24 P. 51 www.nrel.gov/docs/fyosti/29952.pdf and British Gas/Lurgi Gasifier IGCC Base Cases PED-IGCC-99-004 Rev June 2000. pp3-4 URL: www.doe.gov/coalpower/gasification/system/bglsx_20.pdf

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22/22

23/22

12/16 (cont.)

24/06

25/07

12/16 (cont.)

Comment No. 15 (cont.) **Issue Code: 06**

for metals such as cadmium, chromium, mercury, nickel, and lead. Coal would appear to produce higher emission rates than RDF pellets for arsenic, beryllium, cobalt, and selenium.

The hazardous air pollutant emission estimates presented in Table 5.7-2 of the EIS are taken from the permit application for the proposed facility. Except for the hydrogen sulfide emission estimate, these underlying emission rates are based on test results for a comparable gas turbine unit fueled with syngas produced from a 100 percent coal feedstock. Those emission rates were used in setting the emission limits in the air quality permit for the proposed project. Those emission limits must be met regardless of whether the fuel feed to the gasification units is coal, RDF pellets, or a mix of coal and RDF pellets. It should be noted that the air quality permit for the project requires annual emissions testing for cadmium, lead, mercury, hydrogen chloride, and dioxins/furans.

Comment No. 16 **Issue Code: 22**

Comment noted. The process to be demonstrated by the Kentucky Pioneer IGCC Demonstration Project and approved for further study under the CCT Program is a new technology that uses a 50-50 ratio co-feed of coal and RDF pellets. All coal for the project will be supplied from within Kentucky. The purpose of the CCT Program is to provide a cleaner and more efficient source of energy from coal resources.

Comment No. 17 **Issue Code: 14**

Chapter 2 of the EIS discusses EKPC's 1998 Power Requirements Study which indicates that the electrical load for the region is expected to increase by 3.0 percent per year through 2017. Net winter peak demand is expected to increase by 3.3 percent per year and net summer peak demand is projected to increase by 3.0 percent per year. Peak demand is projected to increase from 2,031 MW in 1998

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Example process diagrams:

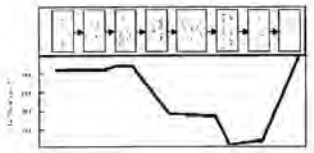

Figure 4.4 Temperature Profile of ARBRE Gasification System

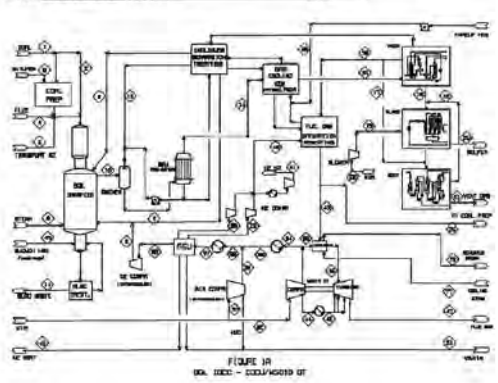

FIGURE 1A

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Comment No. 17 (cont.) **Issue Code: 14**
to 2,394 MW in 2003 and 3,478 MW in 2015. Based on this load growth, EKPC will need additional power supply resources of 625 MW in 2003. The need is further shown by EKPC's plans to construct four new CT electric generating units to provide peaking service alongside their three existing peaker CTs at the J.K. Smith Site.

Comment No. 18 **Issue Code: 22**
Comment noted. Because of DOE's limited role of providing cost-shared funding for the proposed Kentucky Pioneer IGCC Demonstration Project, alternative sites were not considered. KPE selected the existing J.K. Smith Site because the costs would be much higher and the environmental impacts would likely be greater if an undisturbed area was chosen.

Comment No. 19 **Issue Code: 12**
The project produces primarily vitrified frit which is considered a commercial product, not a waste stream. The frit from gasifiers operating on a 100 percent coal feed has consistently proven to be nonhazardous under RCRA. Since this project will be using a different feed stream, the first batch of frit should be tested to ensure that it meets all TCLP criteria and would therefore be nonhazardous. The waste generated at the proposed facility that would be landfilled in the State of Kentucky would be solid waste. It is difficult to determine whether waste from this project would drive up the cost of landfilling. Landfill cost increases are dependent on a number of factors, not just the waste generated from this proposed facility.

Comment No. 20 **Issue Code: 02**
All waste streams (air, water, and solid) generated by the project would be in compliance with federal, state, and local guidelines and ordinances. The presence of the facility should have no impact on future business opportunities in Clark County or Kentucky. No burdens to the economic health of the region as a result of this project

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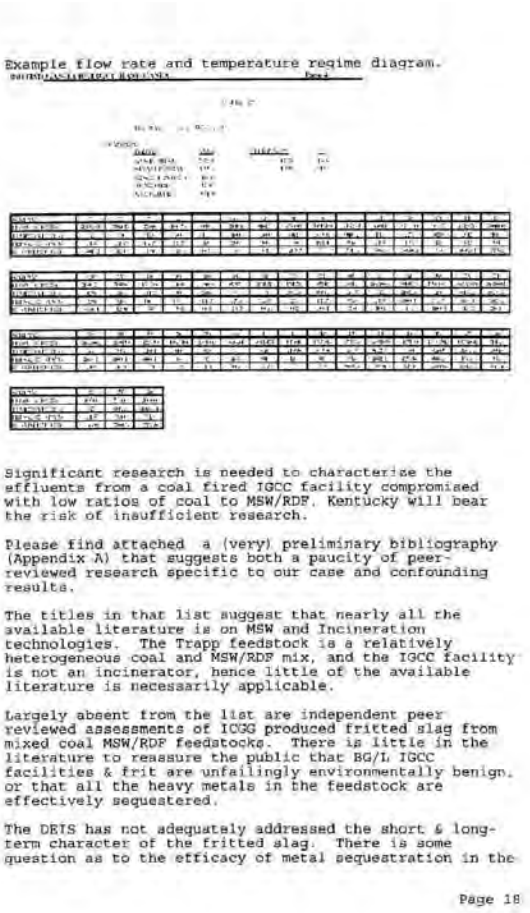

Example flow rate and temperature regime diagram.

Significant research is needed to characterize the effluents from a coal fired IGCC facility compromised with low ratios of coal to MSW/RDF. Kentucky will bear the risk of insufficient research.

Please find attached a (very) preliminary bibliography (Appendix A) that suggests both a paucity of peer-reviewed research specific to our case and confounding results.

The titles in that list suggest that nearly all the available literature is on MSW and Incineration technologies. The Trapp feedstock is a relatively heterogeneous coal and MSW/RDF mix, and the IGCC facility is not an incinerator, hence little of the available literature is necessarily applicable.

Largely absent from the list are independent peer reviewed assessments of ICGG produced fritted slag from mixed coal MSW/RDF feedstocks. There is little in the literature to reassure the public that BG/L IGCC facilities & frit are unfailingly environmentally benign, or that all the heavy metals in the feedstock are effectively sequestered.

The DEIS has not adequately addressed the short & long-term character of the fritted slag. There is some question as to the efficacy of metal sequestration in the

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12/16 (cont.)

26/12

Comment No. 20 (cont.) **Issue Code: 02**

have been identified. According to the *Cumulative Assessment of the Environmental Impacts Caused by Kentucky Electric Generating Units* prepared by the Kentucky Natural Resources and Environmental Protection Cabinet, further electric generation capacity often facilitates the development of the area economy.

Comment No. 21 **Issue Code: 11**

No impacts to the general public's health and safety would be expected from the RDF because the gasification process has no air emissions; only minor amounts of wastewater would be generated from this process. All facility wastewater would be treated and discharged to the Kentucky River in accordance with their KPDES permit. Incremental increases in air emissions from operation of the CTs and cooling tower would be a very small fraction of the relevant federal and state ambient air quality standards (less than 1 percent for gaseous pollutants such as NO_x, SO_2, and CO; and less than 4 percent of the federal 24-hour PM_{10} standard). There would be no significant short- or long-term air quality impacts and the health risks are expected to be minor.

Heavy metals in the RDF would be sequestered in the vitrified frit, a glassy matrix material created during the gasification process, making the potential of metals leaching from the frit into the soil and water extremely low. The frit from gasifiers operating on a 100 percent coal feed has consistently proven to not leach. Since this project will be using a different feed stream, the first batch of frit should be subjected to TCLP testing to ensure that it does not leach. Heavy metals emissions from the gas turbine operation would be less than 28.3 grams (1 ounce) per year. Total heavy metal deposition in areas downwind of the project would be much less than 1.1 kilogram per hectare (1 pound per acre) accumulated over 20 years. The maximum air pollutant increase associated with emissions from the proposed

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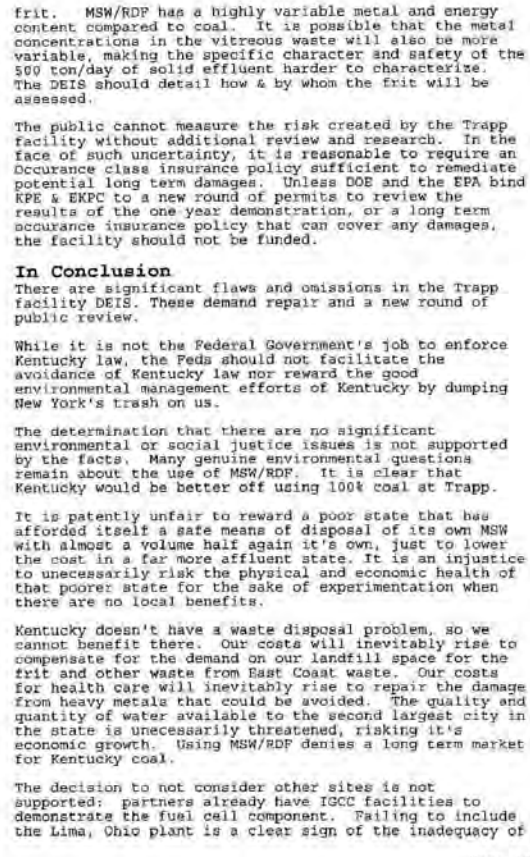

frit. MSW/RDF has a highly variable metal and energy content compared to coal. It is possible that the metal concentrations in the vitreous waste will also be more variable, making the specific character and safety of the 500 ton/day of solid effluent harder to characterize. The DEIS should detail how & by whom the frit will be assessed.

The public cannot measure the risk created by the Trapp facility without additional review and research. In the face of such uncertainty, it is reasonable to require an Occurance class insurance policy sufficient to remediate potential long term damages. Unless DOE and the EPA bind KPE & EKPC to a new round of permits to review the results of the one year demonstration, or a long term occurance insurance policy that can cover any damages, the facility should not be funded.

In Conclusion

There are significant flaws and omissions in the Trapp facility DEIS. These demand repair and a new round of public review.

While it is not the Federal Government's job to enforce Kentucky law, the Feds should not facilitate the avoidance of Kentucky law nor reward the good environmental management efforts of Kentucky by dumping New York's trash on us.

The determination that there are no significant environmental or social justice issues is not supported by the facts. Many genuine environmental questions remain about the use of MSW/RDF. It is clear that Kentucky would be better off using 100% coal at Trapp.

It is patently unfair to reward a poor state that has afforded itself a safe means of disposal of its own MSW with almost a volume half again it's own, just to lower the cost in a far more affluent state. It is an injustice to unecessarily risk the physical and economic health of that poorer state for the sake of experimentation when there are no local benefits.

Kentucky doesn't have a waste disposal problem, so we cannot benefit there. Our costs will inevitably rise to compensate for the demand on our landfill space for the frit and other waste from East Coast waste. Our costs for health care will inevitably rise to repair the damage from heavy metals that could be avoided. The quality and quantity of water available to the second largest city in the state is unecessarily threatened, risking it's economic growth. Using MSW/RDF denies a long term market for Kentucky coal.

The decision to not consider other sites is not supported: partners already have IGCC facilities to demonstrate the fuel cell component. Failing to include the Lima, Ohio plant is a clear sign of the inadequacy of

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26/12 (cont.)
9/21 (cont.)
2/21 (cont.)
8/21 (cont.)
11/13 (cont.)
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16/22 (cont.)
28/13
29/12
30/11
25/07 (cont.)
31/02
33/21

Comment No. 21 (cont.) **Issue Code: 11**

project would produce no significant short- or long-term air quality impacts. Air and water emissions from the proposed project would be regulated by the State of Kentucky. The air quality permit for the proposed project requires continuous emission monitoring for criteria pollutants and annual emissions testing for cadmium, lead, mercury, hydrogen chloride, and dioxins/furans. Noncompliance with permitted emission levels would result in a plant shutdown.

Comment No. 22 **Issue Code: 22**

Comment noted.

Comment No. 23 **Issue Code: 22**

The EIS is designed to present all of the potential environmental impacts of the various alternatives relating to the proposed federal action, both beneficial and detrimental. The benefits associated with the project are not intended to be used as justification for the environmental costs. The RDF will be used to generate the syngas fuel. The paper and plastics are retained in the RDF to add heat value to the feed material. The Kentucky Natural Resources and Environmental Protection Cabinet has advised KPE that the RDF is a recovered material, not a waste. The Kentucky Pioneer IGCC Demonstration Project facility will be considered a recovered material processing facility and the gasification process will not require a waste permit as long as the RDF conforms to the statutory definition. An Emergency Response Plan and Spill Prevention, Control, and Countermeasure (SPCC) Plan, which document procedures for providing emergency response and cleanup for any project related spills, including those during materials transport, have not yet been developed by KPE. The plans will be developed during the engineering and construction phase of the project and would adhere to local, state, and federal regulations.

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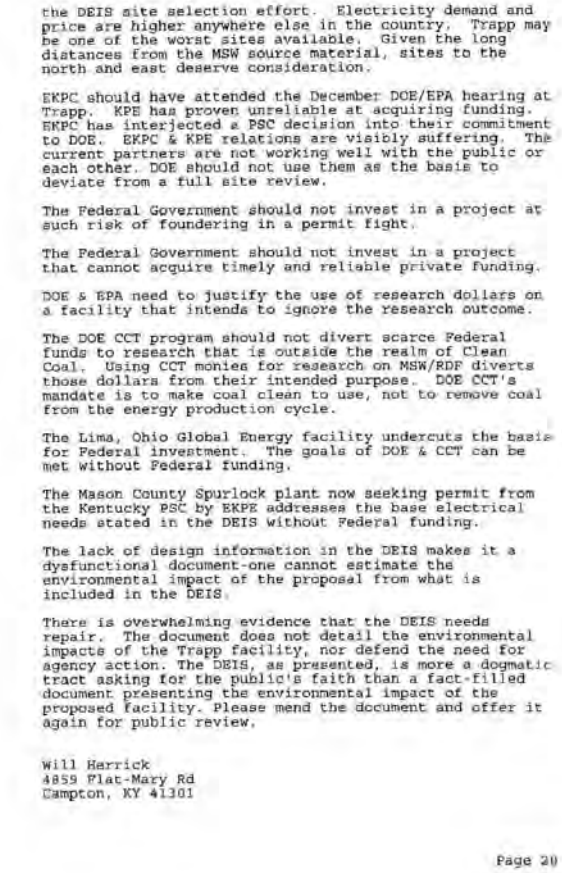

the DEIS site selection effort. Electricity demand and price are higher anywhere else in the country. Trapp may be one of the worst sites available. Given the long distances from the MSW source material, sites to the north and east deserve consideration.

EKPC should have attended the December DOE/EPA hearing at Trapp. KPE has proven unreliable at acquiring funding. EKPC has interjected a PSC decision into their commitment to DOE. EKPC & KPE relations are visibly suffering. The current partners are not working well with the public or each other. DOE should not use them as the basis to deviate from a full site review.

The Federal Government should not invest in a project at such risk of foundering in a permit fight.

The Federal Government should not invest in a project that cannot acquire timely and reliable private funding.

DOE & EPA need to justify the use of research dollars on a facility that intends to ignore the research outcome.

The DOE CCT program should not divert scarce Federal funds to research that is outside the realm of Clean Coal. Using CCT monies for research on MSW/RDF diverts those dollars from their intended purpose. DOE CCT's mandate is to make coal clean to use, not to remove coal from the energy production cycle.

The Lima, Ohio Global Energy facility undercuts the basis for Federal investment. The goals of DOE & CCT can be met without Federal funding.

The Mason County Spurlock plant now seeking permit from the Kentucky PSC by EKPE addresses the base electrical needs stated in the DEIS without Federal funding.

The lack of design information in the DEIS makes it a dysfunctional document-one cannot estimate the environmental impact of the proposal from what is included in the DEIS.

There is overwhelming evidence that the DEIS needs repair. The document does not detail the environmental impacts of the Trapp facility, nor defend the need for agency action. The DEIS, as presented, is more a dogmatic tract asking for the public's faith than a fact-filled document presenting the environmental impact of the proposed facility. Please mend the document and offer it again for public review.

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33/21 (cont.)

34/21

7/21 (cont.)

10/22 (cont.)

9/21 (cont.)

4/14 (cont.)

3/14 (cont.)

12/16 (cont.)

2/21 (cont.)

Comment No. 23 (cont.) **Issue Code: 22**

The 454 to 635 metric tons (500 to 700 tons) per day of frit generated by the facility would be sold as road aggregate and would not be deposited in a landfill. KPE has indicated that they would be willing to work with Kentucky Department for Environmental Protection (KDEP), Division of Water, during low-flow conditions in the Kentucky River and would cease plant operations and water withdrawals if required. All air emissions from the facility would comply with the limits established by the PSD/Title V Air Permit.

Comment No. 24 **Issue Code: 06**

Comment noted. Readily available information does not allow a mass balance analysis for the partitioning of toxic metals among vitrified frit, air emissions, and wastewater; however, it is expected that almost all of the mercury and other heavy metals contained in the feed stocks would partition out into the frit. Nevertheless, the emission estimates presented in the EIS for heavy metals are based on data from a similar IGCC facility using coal as the feedstock for the gasification facilities. Those emission rates were considered in setting the emission limits specified in the air quality permit for the proposed project. It should be noted that the air quality permit for the project requires annual emissions testing for cadmium, lead, mercury, hydrogen chloride, and dioxins/furans.

Comment No. 25 **Issue Code: 07**

The process diagram included as Figure 3.1.1-1 in the EIS was not intended to be a detailed construction drawing, but to represent a general depiction of the overall process. KPE states that the specific details of the nature and degree of aqueous effluent cannot be identified until the plant design is in more advanced stages. Prior to treatment, this waste stream may include pollutants such as metals, tars, and oils. However, as stated in Section 5.8, Water Resources and Water Quality, treated wastewater is expected to contain conventional pollutants such as nitrogen, phosphorus, total dissolved solids, and biological and chemical oxygen demand. Pollutant discharge

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Appendix A-IGCC Frit & MSW Title Search Results

The Dialog © search terms used here are : LURGI OR BG/L OR IGCC OR INTEGRATED()GASIFICATION OR FRIT OR SLAG)(S)(MSW OR GARBAGE OR RDF OR REFUSE)

As is evident from the titles below, nearly all the available literature is on MSW and Incineration technologies. The Trapp feedstock is a relatively heterogeneous coal & MSW/RDF mix.

As DOE's partner, KPE, has repeatedly informed us, the IGCC facility is not an incinerator, and RDF mixed with coal is not MSW, hence little of the available literature is necessarily applicable.

While a case by case review seems neccessary to determine whether the available publications are germane and their impact on the goals of the DEIS, what is largely absent is independent peer reviewed assessments of ICGG produced fritted slag from mixed coal MSW/RDF feedstocks. There is little in the literature to reassure the public that BG/L IGCC frit is unfailingly environmentally benign and that all the heavy metals in the feedstock are effectively sequestered there.

The first citation below is not part of the Dialog search.

Bibliography

5. "Destruction of Toxic Organic Substances in a Slagging Gasifier Including Determination of Heavy Metals in the Slag" Distefano, R. P., Eberle, D.J., et al., Columbia University Account Number 5-20270, Final Report for U.S. EPA Office of Research and Development July 15,1981.

2/6/1 (Item 1 from file: 10)
Application of refuse slag in concrete for agriculture (Cinders):
Onderzoek naar de toepassing van afvalverbrandingsslakken-beton
1980
AGRICOLA 70-2001/Dec (c) format only 2001 The Dialog Corporation

2/6/2 (Item 2 from file: 10)
472238 739226313
Einfluss ansteigender Gaben an Muellschlacke auf die Ertragsbildung und den Gehalt an Spurenelementen im Weizen; Influence of increasing amounts of refuse slag on yield of wheat and its content of trace elements
1973
AGRICOLA 70-2001/Dec (c) format only 2001 The Dialog Corporation

2/6/3 (Item 3 from file: 10)
429329 739188384
Die Verwertung von Muellschlacke fur landwirtschaftliche Zwecke/ Use of garbage slag for agricultural purposes [Fertilizing]
1972
AGRICOLA 70-2001/Dec (c) format only 2001 The Dialog Corporation

2/6/4 (Item 1 from file: 5)
05173740 BIOSIS NO.: 199497382119
PCDD/PCDF formation and destruction during co-firing of coal and RDF in a slag forming combustor.
1994
Biosis Previews (R) 1969-2001/DEC W4 (c) 2001 BIOSIS

2/6/5 (Item 2 from file: 5)
04124468 BIOSIS NO.: 050042105991
FIXATION OF RESIDUES FROM SPECIAL HAZARDOUS WASTE INCINERATORS FOR SHALLOW LAND DISPOSAL.
1992
Biosis Previews (R) 1969-2001/DEC W4 (c) 2001 BIOSIS

2/6/6 (Item 3 from file: 10)

Page 21

Comment No. 25 (cont.) **Issue Code: 07**

limitations would be set by the Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water's Water Resources Branch and would be identified in the KPDES permit. These limitations would be established based on site-specific computer modeling of the expected effect on water quality of the Kentucky River at the proposed discharge point and in the mixing zone immediately downgradient. The limits specified in the permit would protect existing water quality.

The Water Resources Branch pays particular attention to the proximity of wastewater discharges to drinking water intakes. New sources of wastewater are prohibited within 8 kilometers (5 miles) of a water treatment plant intake. This 8-kilometer (5-mile) limit was established to provide an additional layer of protection for the water quality found at drinking water intakes over treatment alone and is referred to as Zone 1. Zone 2 extends from 8 to 16 kilometers (5 to 10 miles), while Zone 3 is the area from 16 to 40 kilometers (10 to 25 miles) from a water treatment plant intake. The proposed outfall is located in Zone 3 for the Winchester Water Treatment Plant. Water collected at the treatment plant is tested and treated to meet all federal and state requirements concerning drinking water quality. Therefore, no impacts to drinking water are expected.

All materials transported on land would be enclosed in vehicles and would not be released to the environment under normal circumstances. In the event of an accident, some materials could be released to the environment. KPE would develop an Emergency Response Plan and an SPCC Plan during the project engineering and construction phase. These plans would detail KPE's planned response and clean-up methods for any spills or emergencies that occur on the J.K. Smith Site. In addition, the Kentucky Division of Water's Emergency Response Team should be called ([502] 564-2380 or 1-800-928-2380) in the event of an "environmental emergency." The spill or

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00969969 CAS Accession Number: 802407952
Study of the use of refuse slag concrete.
Original Title: Onderzoek naar de toepassing van afvalverbrandingsslakken-beton.
Publication Year: 1980
CAS Abstracts 1972-2001/Nov (c) 2001 CAS International
2/6/8 (Item 3 from file: 50)
00315886 CAS Accession Number: 751915089
Effect of increasing amounts of town refuse slag on yields and trace-element contents of wheat.
Publication Year: 1973
CAS Abstracts 1972-2001/Nov (c) 2001 CAS International
2/6/10 (Item 5 from file: 50)
00231560 CAS Accession Number: 750330246
Preliminary trials with refuse slag as a material for the drainagelayer in turf sports grounds.
Original Title: Vorversuche mit Mullschlacke als Dranschicht Baustoff fur Rasensportflachen.
Publication Year: 1974
CAS Abstracts 1972-2001/Nov (c) 2001 CAS International
2/6/12 (Item 1 from file: 203)
00921338
Plant uptake of heavy metals (pots and mini plots). D: Trace metals in solid waste materials, plant availabilities in soil mixtures at varying pH, pot experiments (sandy-loam, green house, Italian ryegrass, sludge, garbage , compost, sludge-pyrolysis slag , incineration slag , incineration fly ash, manganese, copper, zinc, nickel, lead, cadmium, pH) (Sporrmetalopptag i planter (kar- og rammeforsoeg). D: Sporrmetaller i affaldsmaterialer, plantetilgaengelighed ved jordindblanding ved varierende pH; karforsoeg)
1981
(Agricultural use of sewage, 3: Report sections) (Slammets jordbrugsanvendelse, 3: Delrapporter)
AGRIS 1974-2001/Oct Dist by NAL, Intl Copr All rights reserved
2/6/14 (Item 1 from file: 8)
05776764
Title: Fundamental tests on application of MSW direct melting slag as soil improvement material
Publication Year: 2000
EI Compendex(R) 1970-2001/Dec W4 (c) 2001 Engineering Info. Inc.
2/6/15 (Item 2 from file: 8)
04918884
Title: Muellschlackenbehandlung in der MVB Hamburg-Borsigstrasse
Title: Refuse incineration slag treatment in the Hamburg-Borsigstrasse refuse incineration plant
Publication Year: 1997
EI Compendex(R) 1970-2001/Dec W4 (c) 2001 Engineering Info. Inc.
2/6/16 (Item 3 from file: 8)
01863223
Title: Mechanische Aufbereitung von Schlacke aus Muellverbrennungsanlagen mit dem Schwerpunkt Schrott
Title: Mechanical processing of refuse incinerator slag with special emphasis on refuse incinerator scrap
Publication Year: 1993
EI Compendex(R) 1970-2001/Dec W4 (c) 2001 Engineering Info. Inc.
2/6/17 (Item 4 from file: 8)
02801727
Title: Beurteilung der Umweltvertraglichkeit von Muellverbrennungsschlacken im Strassenbau.
Title: Evaluation of the environmental compatibility of using slag from refuse incineration in road construction.
Publication Year: 1989
EI Compendex(R) 1970-2001/Dec W4 (c) 2001 Engineering Info. Inc.
2/6/18 (Item 5 from file: 8)
00678330
Title: Refuse Slag Melting: Experiences and Expectations.
Title: MUELLSCHLACKENSCHMELZE -- ERFAHRUNGEN, ERWARTUNGEN.
Publication Year: 1978
EI Compendex(R) 1970-2001/Dec W4 (c) 2001 Engineering Info. Inc.
2/6/20 (Item 7 from file: 8)
00242360
Title: Conclusions drawn from operating experience of a refuse slag sintering plant.
Title: Folgerungen aus den Betriebserfahrungen mit einer Muellschlackensinteranlage.
Publication Year: 1971
EI Compendex(R) 1970-2001/Dec W4 (c) 2001 Engineering Info. Inc.

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Comment No. 25 (cont.) **Issue Code: 07**

unexpected discharge of a hazardous material that threatens the life, health, or safety of citizens or the environment is considered an environmental emergency. More information on the Emergency Response Team can be found on the Internet at http://water.nr.state.ky.us/dow/dwert.htm.

Comment No. 26 **Issue Code: 12**

Vitrified frit produced from the quenching of molten slag from the gasification process is a commercial product, not a waste. The frit from gasifiers operating on a 100 percent coal feed has consistently proven to be nonhazardous under RCRA. Since this project will be using a different feed stream, the final batch of frit should be tested to ensure that it meets all TCLP criteria and is therefore nonhazardous. The vitrified frit consists primarily of ash (99.2 percent by weight) composed of oxides of the following elements silicon (SiO_2), aluminum (Al_20_3), titanium (TiO_2), iron (Fe_20_3), calcium (CaO), magnesium (MgO), potassium (K_2O) and sodium (Na_2O). The frit also consists chloride, fluoride, antimony, arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, mercury, molybdenum, nickel, silver, thallium, vanadium and zinc. All constituents of the frit are immobilized in a glassy matrix which is resistant to corrosion in the environment. The frit from gasifiers operating on other feed streams is considered nonleachable by EPA standards. Because the slag from the gasification process is in a fused, vitrified state, it rarely fails TCLP for metals. Slag is not a good substrate for binding organic compounds, so it is usually found to be nonhazardous, exhibiting none of the characteristics of hazardous waste. Vitrified frit produced by gasifiers operating on different feed streams passes the more stringent Universal Treatment Standards criteria of the EPA-TCLP analytical method and is nonhazardous. The frit from this facility is also expected to pass the Universal Treatment Standards criteria. Chapter 3 of the EIS has been revised to include a more detailed description of the frit.

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2/6/26      (Item 1 from file: 24)
09513461    Genuine Article#: 412VN   Number of References: 3
Title: Melting and stone production using MSW incinerated ash (ABSTRACT
AVAILABLE)Publication date: 20010000
SciSearch(R) Cited Ref Sci  1990-2001/Dec W5 (c) 2001 Inst for Sci Info
==========
2/6/28      (Item 3 from file: 40)
00398899    ENVIROLINE NUMBER: 92-09413
Slag and Fly Ash from MSW Incineration Plants Characterization and
Reuse
Sep 91
Enviroline(R)  1975-2001/Dec
==========
2/6/29      (Item 1 from file: 41)
254152    98-09586
Assessment of the long-term behavior of MSW incinerator slag
Pollution Abs  1970-2001/Nov (c) 2001 Cambridge Scientific Abstracts
==========
2/6/30      (Item 2 from file: 41)
035545    75-02666
Using slag from refuse incinerators as a building material.  Publ Yr:
1974
Pollution Abs  1970-2001/Nov (c) 2001 Cambridge Scientific Abstracts
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2/6/31      (Item 1 from file: 51)
00109885    76-02-m0224    SUBFILE: FSTA
Effect of increasing doses of incinerated household refuse slag on
yield and trace element content of wheat
Einfluss steigender Gaben an Muellschlacke auf die Ertragbildung und den
Gehalt an Spurenelementen in Weizen.
1975
Food Sci.&Tech.Abs  1969-2001/Feb W1 (c) 2001 FSTA IFIS Publishing
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2/6/32      (Item 1 from file: 63)
00797504      DA
TITLE: HOUSEHOLD REFUSE INCINERATION SLAG IN ROAD ENGINEERING - THE
FRENCH EXPERIENCE
PUBLICATION DATE: 20000000
DATA SOURCE: Transport Research Laboratory (TRL)
Transport Res(TRIS)  1970-2001/Nov (c) fmt only 2001 Dialog Corp.
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2/6/33      (Item 2 from file: 63)
00179992      DA
TITLE: REFUSE INCINERATION SLAG IN ROAD CONSTRUCTION;
ASVALVERBRANDINGSSLAK IN DE WEGENBOUW
PUBLICATION DATE: 19771000
DATA SOURCE: Transport and Road Research Laboratory Institute for Road
Safety Research State Road Laboratory, Netherlands
Transport Res(TRIS)  1970-2001/Nov (c) fmt only 2001 Dialog Corp.
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2/6/34      (Item 1 from file: 65)
03253636    INSIDE CONFERENCE ITEM ID: CN034391904
Household refuse incineration slag in road engineering -the French
experience'
CONFERENCE: European conference on mineral planning; Mineral planning in
Europe-2nd (199910)
Inside Conferences  1993-2001/Dec W4 (c) 2001 BLDSC all rts. reserv.
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2/6/35      (Item 2 from file: 65)
02311951    INSIDE CONFERENCE ITEM ID: CN024311210
Processing and utilisation of slag from refuse incinerators
CONFERENCE:  International mineral processing congress Vol 5; Wastetreatment; recycling
and soil remediation-20th (199705)
Inside Conferences  1993-2001/Dec W4 (c) 2001 BLDSC all rts. reserv.
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2/6/36      (Item 3 from file: 65)
02040225    INSIDE CONFERENCE ITEM ID: CN021901313
Actual Data Report of Residue and Fly Ash Melting, and Slag Recovery in
the MSW Incineration Plant
CONFERENCE: ISWA International Congress-7th (199610)
Inside Conferences  1993-2001/Dec W4 (c) 2001 BLDSC all rts. reserv.
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2/6/37      (Item 4 from file: 65)
00721397    INSIDE CONFERENCE ITEM ID: CN007031602
Chlorine, Sulfur, and Soluble Slag Extraction with Energy Density
Improvements of a MSW Slurry
CONFERENCE: Coal utilization and fuel systems-19th International
technical conference (199403)
Inside Conferences  1993-2001/Dec W4 (c) 2001 BLDSC all rts. reserv.
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2/6/38      (Item 1 from file: 68)
00452246  Environmental Bibliography Number: 21010??
Slag and fly ash from MSW incineration plants characterization and use
PUBLICATION YEAR: 1991
Env.Bib.  1974-2001/Nov (c) 2001 Internl Academy at Santa Barbara
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Comment No. 26 (cont.) **Issue Code: 12**
Variability in the RDF content is dependent on the MSW supply. However, RDF production methods inherently yield fairly uniform and homogenous RDF. Due to the vitreous nature of the frit, there would be no particular variability when a leaching test is conducted regardless of the composition of the feed.

Comment No. 27 **Issue Code: 16**
DOE believes that the Kentucky Pioneer IGCC Demonstration Project EIS adequately analyzes the full scope of environmental impacts from the proposed project. Chapter 3 of the EIS has been modified to provide more detail on the gasification process, including the production of the vitreous frit.

Comment No. 28 **Issue Code: 13**
The intent of the project is not to lower the costs of waste disposal in certain areas but rather to demonstrate this particular technology that has the potential to enhance the economics of coal utilization and lower the emissions output of a totally coal-based system. No risks to the economic health of Kentucky have been identified. All risks to the physical health of the area are identified in the EIS. Local benefits are discussed in Section 5.3, Socioeconomics. The relatively small amounts and generally dispersed nature of MSW in Kentucky does not economically support exclusive utilization of Kentucky-generated MSW to produce RDF supplies. Importing RDF from a densely populated metropolitan area is more economically viable in order to supply the necessary amount of RDF required to operate the plant.

Comment No. 29 **Issue Code: 12**
The project produces primarily vitrified frit which is considered a commercial product, not a waste stream. The frit from gasifiers operating on a 100 percent coal feed has consistently proven to be nonhazardous under RCRA. Since this project will be using a different

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2/6/39 (Item 1 from file: 73)
03992928 EMBASE No: 1989161924
Evaluation of the environmental compatibility of using slag from refuse incineration in road construction
BEURTEILUNG DER UMWELTVERTRAGLICHKEIT VON MÜLLVERBRENNUNGSSCHLACKEN IM STRASSENBAU
1989
EMBASE 1974-2001/Dec W4 (c) 2001 Elsevier Science B.V.

2/6/40 (Item 2 from file: 73)
01804900 EMBASE No: 1988254349
Effect of boiler ash on quality of slag from refuse combustion
EINFLUSS DER KESSELASCHE AUF DIE QUALITÄT VON MÜLLVERBRENNUNGSSCHLACKE
1988
EMBASE 1974-2001/Dec W4 (c) 2001 Elsevier Science B.V.

2/6/41 (Item 3 from file: 73)
02639723 EMBASE No: 1986128682
Slag and flyash of refuse incineration
1986
EMBASE 1974-2001/Dec W4 (c) 2001 Elsevier Science B.V.

2/6/42 (Item 4 from file: 73)
02633069 EMBASE No: 1986128027
Slag and flyash of refuse incineration plants
1986
EMBASE 1974-2001/Dec W4 (c) 2001 Elsevier Science B.V.

2/6/43 (Item 5 from file: 73)
02619837 EMBASE No: 1986128791
Slag and stack ash from refuse burning installations
1986
EMBASE 1974-2001/Dec W4 (c) 2001 Elsevier Science B.V.

2/6/44 (Item 6 from file: 73)
01618642 EMBASE No: 1980176312
Method for preparation of auxiliary building material from slag and ash from refuse burning installations
VERFAHREN ZUR HERSTELLUNG EINES ZUSCHLAGSTOFFES FÜR BAUMATERIALIEN AUS ABFALLSCHLACKE UND FLUTERASCHE AUS MÜLLVERBRENNUNGSANLAGEN
1980EMBASE 1974-2001/Dec W4 (c) 2001 Elsevier Science B.V.

2/6/46 (Item 8 from file: 73)
00997764 EMBASE No: 1978126093
Slag from refuse burning installations used in roadmaking
1977
EMBASE 1974-2001/Dec W4 (c) 2001 Elsevier Science B.V.

2/6/47 (Item 9 from file: 73)
00338014 EMBASE No: 1975110372
Preliminary trials of refuse slag as drainage layer construction material for turfed sport fields
VORVERSUCHE MIT MÜLLSCHLACKE ALS DRAINSCHICHT-BAUSTOFF FÜR RASENSPORTPLÄTZEN
1974
EMBASE 1974-2001/Dec W4 (c) 2001 Elsevier Science B.V.

2/6/48 (Item 10 from file: 73)
00118950 EMBASE No: 1974109052
Influence of increasing amounts of refuse slag on yield of wheat and its content of trace elements
EINFLUSS STEIGENDER GABEN AN MÜLLSCHLACKE AUF DIE ERTRAGSLEISTUNG UND DEN GEHALT AN SPURENELEMENTEN IM WEIZEN
1973
EMBASE 1974-2001/Dec W4 (c) 2001 Elsevier Science B.V.

2/6/49 (Item 1 from file: 77)
4613949
Supplier Accession Number: 01-07421 V27N06
Metal release from MSW melted slag in single batch leaching test
Conference Papers Index 1973-2001/Nov (c) 2001 Cambridge Sci Abs

2/6/51 (Item 1 from file: 94)
04670460 JICST ACCESSION NUMBER: 01A0500927 FILE SEGMENT: JICST-E
Utilization of Slag Produced by Pyrolysis Gasification and Melting Process of MSW . , 2001
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)

2/6/52 (Item 2 from file: 94)
04613997 JICST ACCESSION NUMBER: 00A0211677 FILE SEGMENT: JICST-E
Ground Improvement. The Fundamental Tests on Application of MSW Direct Melting Slag as Soil Improvement Material., 2000
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)

2/6/53 (Item 3 from file: 94)
04434305 JICST ACCESSION NUMBER: 00A0019170 FILE SEGMENT: JICST-E
Application of melt slag from garbage incinerated ash to fine aggregate

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Comment No. 29 (cont.) **Issue Code: 12**
feed stream, the final batch of frit should be tested to ensure that it meets all TCLP criteria and is therefore nonhazardous. Waste generated at the proposed facility that would be landfilled in the State of Kentucky would be solid waste. It is difficult to determine whether waste from this project would drive up the cost of landfilling. Landfill cost increases are dependent on a number of factors, not just the waste generated from this proposed facility. Analysis of east coast waste is beyond the scope of this EIS.

Comment No. 30 **Issue Code: 11**
Heavy metals emissions from the gas turbine operation would be less than 28.3 grams (1 ounce) per year. Total heavy metal deposition in areas downwind of the project would be much less than 1.1 kilograms per hectare (1 pound per acre) accumulated over 20 years. The maximum air pollutant increase associated with emissions from the proposed project would produce no significant short- or long-term air quality impacts and health risks are expected to be minor. Air emissions from the proposed project would be regulated by the State of Kentucky. The air quality permit for the proposed project requires continuous emission monitoring for criteria pollutants and annual emissions testing for cadmium, lead, mercury, hydrogen chloride, and dioxins/furans. Noncompliance with permitted emission levels would result in a plant shutdown.

Comment No. 31 **Issue Code: 02**
The water used for the plant and any aqueous waste stream generated by the project would be in compliance with federal, state, and local guidelines and ordinances. The presence of the facility should have no impact on future economic growth in Lexington, Clark County, or Kentucky. No burdens to the economic health of the region as a result of this project have been identified. According to the *Cumulative Assessment of the Environmental Impacts Caused by Kentucky Electric Generating Units* prepared by the Kentucky Natural Resources and

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for concrete and solidification material for cement., 1999
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)
2/6/54 (Item 4 from file: 94)
04434304 JICST ACCESSION NUMBER: 00A0013172 FILE SEGMENT: JICST-E
Utilization of melt slag (crystallization slag)from garbage incinerated ash to coarse aggregate for concrete., 1999
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)
2/6/55 (Item 5 from file: 94)
04434298 JICST ACCESSION NUMBER: 00A0013166 FILE SEGMENT: JICST-E
Effective utilization of slag made by thermal decomposition and melting process from the refuse., Part 1., 1999
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)
2/6/57 (Item 7 from file: 94)
04282933 JICST ACCESSION NUMBER: 99A0871943 FILE SEGMENT: JICST-E
The experimental examination on the utilization of the garbage incineration ash liquid slag., 1999
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)
2/6/58 (Item 8 from file: 94)
04258401 JICST ACCESSION NUMBER: 99A0852496 FILE SEGMENT: JICST-E
Utilization of Melted Slag of MSW for Asphalt Mixture., 1999
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)
2/6/59 (Item 9 from file: 94)
04236451 JICST ACCESSION NUMBER: 99A0814872 FILE SEGMENT: JICST-E
Study on effective utilization of liquid slag from fly ash in garbage incinerator., 1998
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)
2/6/60 (Item 10 from file: 94)
04193265 JICST ACCESSION NUMBER: 99A0730572 FILE SEGMENT: JICST-E
Development of Technology for Effective Utilization of Refuse Incineration Ash and Melting Slag., 1999
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)
2/6/62 (Item 12 from file: 94)
04168843 JICST ACCESSION NUMBER: 99A0588979 FILE SEGMENT: JICST-E
Trial manufacture of concrete secondary product using refuse liquid slag fine aggregate., 1998
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)
2/6/63 (Item 13 from file: 94)
04150419 JICST ACCESSION NUMBER: 99A0600616 FILE SEGMENT: JICST-E
Material property of sintered garbage slag fine aggregate of different production method., 1998
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)
2/6/64 (Item 14 from file: 94)
04150429 JICST ACCESSION NUMBER: 99A0600605 FILE SEGMENT: JICST-E
Possibility of utilization of sintered garbage slag fine powder as alternative cement material., 1998
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)
2/6/65 (Item 15 from file: 94)
04026140 JICST ACCESSION NUMBER: 99A0378178 FILE SEGMENT: JICST-ETechnology development in the Ministry of Construction Technology Office 114 On the basic research and test on the possibility of the reuse as a civil engineering material of the melting solidification (the non-industrial wastes refuse melting slag) The Tohoku Technology Office., 1999
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)
2/6/66 (Item 16 from file: 94)
03976483 JICST ACCESSION NUMBER: 99A0271560 FILE SEGMENT: JICST-E
Manufacturing of glaze and glaze ceramics from sludge slag and garbage incinerated ash 1995 . 1997 (Ministry of Education S)., 1998
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)
2/6/67 (Item 17 from file: 94)
03907441 JICST ACCESSION NUMBER: 99A0196152 FILE SEGMENT: JICST-E
The Variance in the Physical Properties of MSW Incineration Ash & Slag , 1998
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)
2/6/69 (Item 19 from file: 94)
03857283 JICST ACCESSION NUMBER: 99A0970883 FILE SEGMENT: PreJICST-E
Technology of strengthening garbage incineration fly ash molten slag . , 1998
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)
2/6/70 (Item 20 from file: 94)
03792718 JICST ACCESSION NUMBER: 98A0998764 FILE SEGMENT: JICST-E
Study on Refuse Incineration Ash Slag Aggregate Concrete., 1998
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)

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Comment No. 32 **Issue Code: 14**
Environmental Protection Cabinet, further electric generation capacity often facilitates the development of the area economy. Under the 50-50 co-feed ratio, the Kentucky Pioneer IGCC Demonstration Project would require the use of approximately 2,268 metric tons (2,500 tons) of high-sulfur coal per day. The project would fulfill this need solely through Kentucky coal.

Comment No. 33 **Issue Code: 21**
Because of DOE's limited role of providing cost-shared funding for the proposed Kentucky Pioneer IGCC Demonstration Project, alternative sites were not considered. KPE selected the existing J.K. Smith Site because the costs would be much higher and the environmental impacts would likely be greater if an undisturbed area was chosen.

Comment No. 34 **Issue Code: 22**
Before any federal funds are obligated, KPE will have to provide proof of finances for construction and operation of the project.

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2/6/71 (Item 21 from file: 94)
03256817 JICST ACCESSION NUMBER: 98A0104167 FILE SEGMENT: PreJICST-E
Utilization of liquid slag of incinerated ash from the municipal refuse to the road sub base. , 1997
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)

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2/6/72 (Item 22 from file: 94)
03252627 JICST ACCESSION NUMBER: 98A0081040 FILE SEGMENT: PreJICST-E
A few consideration on the application of the surface melting style garbage incineration ash slag to fine aggregate for concrete. , 1997
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)

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2/6/73 (Item 23 from file: 94)
03109521 JICST ACCESSION NUMBER: 97A0196193 FILE SEGMENT: JICST-E
Environment and waste processing, and electric heating. Melting of plasma type garbage incineration ash and resource recycling of slag . , 1997
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)

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2/6/74 (Item 24 from file: 94)
02853686 JICST ACCESSION NUMBER: 97A0164665 FILE SEGMENT: PreJICST-E
A study on stabilization of refuse incineration residue molten slag . , 1996
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)

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2/6/75 (Item 25 from file: 94)
02941434 JICST ACCESSION NUMBER: 97A0070899 FILE SEGMENT: PreJICST-E
Application of garbage incineration ash fused slag to asphalt concrete. , 1995JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)

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2/6/76 (Item 26 from file: 94)
02753809 JICST ACCESSION NUMBER: 96A0347617 FILE SEGMENT: JICST-E
Practice of environmental countertechnologies. Recycling technology of garbage incineration ash molten slag . , 1996
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)

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2/6/77 (Item 27 from file: 94)
02725779 JICST ACCESSION NUMBER: 96A0291249 FILE SEGMENT: JICST-E
Utilization of garbage incinerated ash liquid slag to asphalt mixture , 1996
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)

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2/6/78 (Item 28 from file: 94)
02663597 JICST ACCESSION NUMBER: 96A0060040 FILE SEGMENT: JICST-E
Resource recycling of slag by plasma-type garbage incineration ash fusion furnace. , 1995
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)

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2/6/79 (Item 29 from file: 94)
02620384 JICST ACCESSION NUMBER: 95A0851395 FILE SEGMENT: JICST-E
Study of Recycling Ash of Burnt Refuse (Part 3). Application of Slag Result from Melting Ash of Burnt Refuse for Ceramics Products., 1995
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)

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2/6/80 (Item 30 from file: 94)
02577671 JICST ACCESSION NUMBER: 95A0851394 FILE SEGMENT: JICST-E
Study of Recycling Ash of Burnt Refuse (Part 2). Application of Slag Result from Melting Ash of Burnt Refuse for Aggregates., 1995
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)

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2/6/82 (Item 32 from file: 94)
02550518 JICST ACCESSION NUMBER: 95A0578069 FILE SEGMENT: JICST-E
Study on the Chemical Components of Slag Prepared from Oota Refuse Incineration Plant., 1995
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)

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2/6/85 (Item 35 from file: 94)
01520428 JICST ACCESSION NUMBER: 92A0335287 FILE SEGMENT: JICST-E
Melting Treatment of MSW Incinerator Ash and Slag Utilization., 1992
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)

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2/6/86 (Item 36 from file: 94)
01342483 JICST ACCESSION NUMBER: 91A0525830 FILE SEGMENT: JICST-E
Effective utilization of melting slag from refuse incineration. (2nd Report)., 1991JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)

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2/6/87 (Item 37 from file: 94)
01342481 JICST ACCESSION NUMBER: 91A0525828 FILE SEGMENT: JICST-E
Investigation on scattering of melting slag from refuse incineration., 1991
JICST-EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)

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2/6/88 (Item 38 from file: 94)
01249669 JICST ACCESSION NUMBER: 90A0903543 FILE SEGMENT: JICST-E
Effective utilization of the slag . Paying attention to weight reductio of

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refuse incineration residue by high temperature melting, because of the diffeiculty in securing reclamation land., 1990
JICST EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)
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2/6/88 (Item 19 from file: 94)
01141255 JICST ACCESSION NUMBER: 90A0665583 FILE SEGMENT: JICST-E
Effective Utilization of melting slag from refuse incineration., 1990
JICST EPlus 1985-2001/Nov W3 (c)2001 Japan Science and Tech Corp(JST)
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2/6/90 (Item 1 from file: 98)
02517550 H.W. WILSON RECORD NUMBER: BGSI93017550
Garbage in, gravel out: plasma torches transmute waste into harmless slag
May '93 (19930500)
General Sci Abs/Full-Text 1984-2001/Nov (c) 2001 The HW Wilson Co.
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2/6/91 (Item 1 from file: 103)
04251714 DE-97-003061; EDB-98-009078
Title: Refuse incineration slag treatment in the Hamburg-Borsigstrasse refuse incineration plant
Original Title: Muellschlackenbehandlung in der MVB Hamburg-Borsigstrasse
Publication Date: Oct 1997
Energy SciTec 1974-2001/Sep B2 (c) 2001 Contains copyrighted material
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2/6/92 (Item 2 from file: 103)
04028442 EDB-96-113202
Title: Integrated gasification and brick-making process for treatment of MSW
Title: Twelfth annual international Pittsburgh coal conference: Proceedings. Coal -- Energy and the environment
Conference title: 12. annual international Pittsburgh coal conference
Publication Date: 1995
Energy SciTec 1974-2001/Sep B2 (c) 2001 Contains copyrighted material
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2/6/93 (Item 3 from file: 103)
03981630 NEDO-95-930346; EDB-96-065390
Title: Study of recycling ash of burnt refuse - Part 2. Application of slag result from melting ash of burnt refuse for ceramics products
Original Title: Tushi gomi shokyakubai no sairiyo ni kansuru kenkyu. 2. Shokyakubai yuyu slag no yogyo kenzai eno tekiyo
Publication Date: 1 Sep 1995
Energy SciTec 1974-2001/Sep B2 (c) 2001 Contains copyrighted material
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2/6/94 (Item 4 from file: 103)
03025074 SWD-95-007617; EDB-96-008834
Title: Corrosivity of flue gas slag in refuse fueled boilers - Background and slag synthesis
Original Title: Korrosivitet hos rookgasslagg i avfallspannor - Bakgrund och slaggsyntes
Publication Date: May 1995
Energy SciTec 1974-2001/Sep B2 (c) 2001 Contains copyrighted material
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2/6/95 (Item 5 from file: 103)
03719132 CLA-94-100788; EDB-94-135088
Title: RDF-pulverized coal co-firing in a slag combustor. Combustion tests at the Coal Tech facility
Title: Second international conference on combustion technologies for a clean environment
Conference title: 2. international conference on combustion technologies for a clean environment
Publication Date: 1993
Energy SciTec 1974-2001/Sep B2 (c) 2001 Contains copyrighted material
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2/6/96 (Item 6 from file: 103)
03620671 DE-94-001696; EDB-94-018637
Title: Mechanical processing of refuse incinerator slag with special emphasis on refuse incinerator arrays
Original Title: Mechanische Aufbereitung von Schlacke aus Muellverbrennungsanlagen mit dem Schwerpunkt Schrott
Publication Date: Dec 1993
Energy SciTec 1974-2001/Sep B2 (c) 2001 Contains copyrighted material
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2/6/97 (Item 7 from file: 103)
03423561 DE-92-013610; EDB-93-082437
Title: Possibilities of using refuse combustion slag
Original Title: Verwertungsmoeglichkeiten von Muellverbrennungsschlacke
Publication Date: Sep 1992
Energy SciTec 1974-2001/Sep B2 (c) 2001 Contains copyrighted material
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2/6/98 (Item 8 from file: 103)
01410897 EPA-09-011119; EDB-84-108697
Title: Characterization of slag and fouling residues from co-combustion of powdered refuse-derived fuel with residual oil and comparison with coal and RDF residues
Title: Resource recovery from solid wastes
Conference title: Conference on resource recovery from solid wastes
Publication Date: 1982

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Energy SciTec 1974-2001/Sep 02 (c) 2001 Contains copyrighted material
2/6/100 (Item 1 from file: 110)
00110767
Assessment of the long-term behavior of MSW incinerator slag
(1997)
WasteInfo 1974-2001/Jun (c) 2001 AEA Techn Env.
2/6/102 (Item 3 from file: 110)
00081363
Baustoffgemisch zur Herstellung von Form- und Fertigteilen sowie Verfahren zur Herstellung der Baustoffgemische. [Building material mix based on activated waste, preferably slag and ash from refuse incineration or power station and brick and concrete debris and waste] (In German)
(1992)
WasteInfo 1974-2001/Jun (c) 2001 AEA Techn Env.
2/6/103 (Item 4 from file: 110)
00077666
Process and device for cleaning slag from refuse incinerators(1991)
WasteInfo 1974-2001/Jun (c) 2001 AEA Techn Env.
2/6/104 (Item 5 from file: 110)
00072401
A method for incineration of refuse including recycling fly ash to convert it to slag and adding agent to reduce emissions of acid gases and/or dioxin(s)
(1989)
WasteInfo 1974-2001/Jun (c) 2001 AEA Techn Env.
2/6/105 (Item 6 from file: 110)
00024367
Characterization of slag and fouling residues from co-combustion of powdered refuse derived fuel with residual oil and comparison with coal and RDF residues
(1982)
WasteInfo 1974-2001/Jun (c) 2001 AEA Techn Env.
2/6/106 (Item 7 from file: 110)
00011829
LEACHING TESTS ON SLAG AND ASHES FROM HOUSEHOLD REFUSE COMBUSTION RESULTS AND CONCLUSIONS IN VIEW OF WATER PROTECTION. (IN GERMAN).
(1974)
WasteInfo 1974-2001/Jun (c) 2001 AEA Techn Env.
2/5/107 (Item 8 from file: 110)
00004456
THE OXYGEN REFUSE CONVERTER - A SYSTEM FOR PRODUCING FUEL GAS, OIL, MOLTEN METAL AND SLAG FROM REFUSE .
(NA)
WasteInfo 1974-2001/Jun (c) 2001 AEA Techn Env.
2/6/108 (Item 9 from file: 110)
00001856
USING SLAG FROM REFUSE INCINERATORS AS A BUILDING MATERIAL.
(NA)
WasteInfo 1974-2001/Jun (c) 2001 AEA Techn Env.
2/6/109 (Item 1 from file: 110)
04811140 ICONDA Accession Number: 1999(07):1001569 ICONDA
Betechnische Aspekte der Wasche von Muellverbrennungsschlacken
Engineering aspects of rinsed slag from garbage incineration plants
PUBLICATION DATE: 19990000
ICONDA-Intl Construction 1976-2001/Jan (c) 2001 Fraunhofer-IRB
2/5/110 (Item 2 from file: 110)
04779753 ICONDA Accession Number: 1999(07):1000131 ICONDA
Muellverbrennung und Muellverbrennungsrueckstaende in Wien
Refuse incineration processes and residual slag in Vienna
PUBLICATION DATE: 19900000
ICONDA-Intl Construction 1976-2001/Jan (c) 2001 Fraunhofer-IRB
2/6/111 (Item 3 from file: 110)
04081111 ICONDA Accession Number: 1996(05):1100010 ICONDA
Des machefers d'incineration d'ordures menageres pour le chantier de la deviation de Malzeville
MSIS (household refuse incineration slag) for the Malzeville diversion project
PUBLICATION DATE: 19950000
ICONDA-Intl Construction 1976-2001/Jan (c) 2001 Fraunhofer-IRB
2/6/112 (Item 4 from file: 110)
01163240 ICONDA Accession Number: 1993(10):1000376 ICONDA
MVA-Schlacken verglasen. Die Forderungen an die Auslaugbarkeit werden strenger neue Verfahren und Einsatzgebiete
Clinkered slag from refuse incineration plants. The demands on leachability are becoming stricter new methods and areas of application

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PUBLICATION DATE: 19930000
ICONDA-Intl Construction 1976-2001/Jan (c) 2001 Fraunhofer-IRB
2/6/113 (Item 5 from file: 118)
0252372 ICONDA Accession Number: 1997(02):1000753 ICONDA
Emissionspotential einer Muellverbrennungsschlacken-Monodeponie fuer Schwermetalle
Emission potential of a refuse incineration slag monodump for heavy metals
PUBLICATION DATE: 19950000
ICONDA-Intl Construction 1976-2001/Jan (c) 2001 Fraunhofer-IRB
2/6/114 (Item 6 from file: 118)
0199167 ICONDA Accession Number: 1988(02):1100030 ICONDA
Scories d'ordures incinerees comme granulat pour beton
Slag of household refuse incineration used in place of aggregatein concrete
ICONDA-Intl Construction 1976-2001/Jan (c) 2001 Fraunhofer-IRB
2/6/115 (Item 7 from file: 118)
0191256 ICONDA Accession Number: 1994(11):1000219 ICONDA
Schlacken und Staeube verglasen. Aus MVA-Rueckstaenden werden isolierende Glaswolle, Pasern, Schaumglas oder Gussglas hergestellt
Vitrification of slag and dust. Insulating glass wool, fibres, foamed glass or cast glass made from the residues of refuse incineration plants
PUBLICATION DATE: 19930000
ICONDA-Intl Construction 1976-2001/Jan (c) 2001 Fraunhofer-IRB
2/6/116 (Item 1 from file: 144)
12448286 PASCAL No.: 96-0105697
Des machefers d'incineration d'ordures menageres pour le chantier de la deviation de Malzeville
(EBRIS (household refuse incineration slag) for the Malzeville diversion project)
1995
Pascal 1973-2001/Dec W4 (c) 2001 INIST/CNRS
2/6/117 (Item 2 from file: 144)
12118447 PASCAL No.: 95-0348877
Valorisation en structure routiere du machefer d'incineration d'ordures menageres de l'usine de Lyon-Sud
(Upgrading of Lyon South incineration plant household refuse slag in road structures)
1995
Pascal 1973-2001/Dec W4 (c) 2001 INIST/CNRS
2/6/118 (Item 3 from file: 144)
07516738 PASCAL No.: 87-0018308
Scories d'ordures incinerees comme granulat pour beton
(Slag of household refuse incineration used in place of aggregate in concrete) 1986
Pascal 1973-2001/Dec W4 (c) 2001 INIST/CNRS
2/6/123 (Item 1 from file: 305)
217021
PCDD/PCDF (polychlorinated dibenzo-p-dioxins and dibenzofurans) formation and destruction during co firing of coal and RDF (refuse -derived fuel) in a slag forming combustor.
PD Jan 1994 ; 940100|
Analytical Abstracts 1980-2001/Dec W4 (c) 2001 Royal Soc Chemistry
2/6/124 (Item 2 from file: 305)
033555
Analysis of effluents of an urban solid refuse incinerator: study of methods of extraction and analysis for quantitative determination of polychlorodibenzo-p-dioxins.
PD 1981 ; 810000|
Analytical Abstracts 1980-2001/Dec W4 (c) 2001 Royal Soc Chemistry
2/6/125 (Item 1 from file: 583)
05871685
\genPigmennotizen: ML Entsorgungs- und Energiemarkt
NETHERLANDS: LURGI /SHELTERS GARBAGE INCINERATION
08 Jul 1991
Gale Group Globalbase(TM) 1986-2001/Dec 26 (c) 2001 The Gale Group
2/6/126 (Item 1 from file: 636)
02257514 Supplier Number: 44325726 (USE FORMAT 7 FOR FULLTEXT)
Converting Garbage to Glassy Slag
Jan, 1994
Word Count: 196
Gale Group Newsletter DB(TM) 1987-2001/Dec 27 (c) 2001 The Gale Group
2/6/127 (Item 2 from file: 636)
01098044 Supplier Number: 40764100 (USE FORMAT 7 FOR FULLTEXT)
Inrgi spotA promise in RDF cofiring
April 24, 1989

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Word Count: 558
Gale Group Newsletter DB(TM) 1987-2001/Dec 27 (c) 2001 The Gale Group
...
2/6/128 (Item 4 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Melting furnace with stable discharge of slag in waste treatment
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
...
2/6/129 (Item 5 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Study on development of application of municipal waste incineration
slags. Development of concrete products using crystallized slag as fine
aggregate=CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
...
2/6/130 (Item 6 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Method and equipment for treatment of waste garbage by gasification and
melting to produce slag byproduct
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
...
2/6/131 (Item 7 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Content and internal distribution of heavy metals in roots of plants
grown at alkaline pH on slag from municipal solid waste incineration
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
...
2/6/132 (Item 8 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Method for careful selection of raw material in producing melting slag
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
...
2/6/133 (Item 9 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Shaft furnaces for melting of trash with continuous discharging of molten
slag
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
...
2/6/134 (Item 10 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Hydraulic activity of eco-cement made by using slag from municipal solid
waste incinerator fly ash
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
...
2/6/135 (Item 11 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Manufacture of porous sintered body by using molten slag of municipal
waste and sewage sludge
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
...
2/6/138 (Item 14 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Chemical speciation of waste compounds in inorganic residues - A basis
for geochemical long term assessment
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
...
2/6/141 (Item 17 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.Manufacture of
chlorine-free slag
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
...
2/6/144 (Item 20 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Process and molten slag incinerator for treating urban domestic refuse
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
...
2/6/145 (Item 21 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Process integrated treatment of slag from municipal refuse incineration
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
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2/6/146 (Item 22 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Long-term behavior of slag from heat treatment of municipal wastes
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
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2/6/147 (Item 23 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Method for gasification treatment of organic waste with recycle of gas
and wastewater and particular slag
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
...
2/6/148 (Item 24 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Effect of post-combustion chamber conditions in refuse combustion
equipment on the quality of crude gas and slag
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
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2/6/150 (Item 26 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Operation of fluidized bed incinerator for industrial wastes or municipal refuse treatment
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2/6/154 (Item 30 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Method and device for suppressing generation of minute algae in water by using incinerator slag
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2/6/155 (Item 31 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Method for treatment of solid waste having large water content to be molten slag with purification of flue gas
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2/6/157 (Item 33 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Newest developments and long-term experiences in fluidized-bed combustion technology
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2/6/158 (Item 34 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
System for gasification of waste garbage and melting fly ashes with improved slag discharge
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY

2/6/159 (Item 35 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Elaboration of a MSWI fly ash solidification stabilization process: use of statistical design of experiments
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2/6/161 (Item 37 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Municipal refuse treatment for recovering valuable materials while detoxicating waste gasses
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY

2/6/162 (Item 38 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Treatment of slag from ashes from incineration of municipal refuse and wastewater treatment sludge
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY

2/6/165 (Item 41 from file: 399)DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Gasification and smelting system using oxygen blowing for municipal waste
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY

2/6/166 (Item 42 from file: 399)
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Plant for incineration of garbage and melting slag and its structure
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2/6/167 (Item 43 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Environmental properties of vitrified fly ash from hazardous and municipal waste incineration
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY

2/6/172 (Item 48 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Method for melting municipal refuse incineration residue without increasing viscosity of slag
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2/6/175 (Item 51 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Melting and burning apparatus for dry distillation and thermal decomposition of wastes and capable of recovering granulated slag with little heavy metal contamination
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2/6/179 (Item 55 from file: 399)
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Hydraulic compositions obtained from incinerator ash and their hardened products
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY

2/6/180 (Item 56 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Melting treatment of incinerator residue containing salts for slag recovery as aggregate

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2/6/182 (Item 58 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
System for gasification and melting treatment of waste garbage with improved slag
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2/6/183 (Item 59 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Apparatus treatment of melting slag from ash melting treatment in garbage treatment facility to reduce lead content
CA SEARCH(R) 1967-2001/UD=11601 (c) 2001 AMERICAN CHEMICAL SOCIETY
2/6/184 (Item 60 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Production of granulated slag with smooth surface
CA SEARCH(R) 1967-2001/UD=11601 (c) 2001 AMERICAN CHEMICAL SOCIETY
2/6/185 (Item 61 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Calcium silicate compositions containing incinerator ash molten slag for forming construction materials
CA SEARCH(R) 1967-2001/UD=11601 (c) 2001 AMERICAN CHEMICAL SOCIETY
2/6/186 (Item 62 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Characterization and assessment of refuse incinerator slag from 15 refuse incinerators with different technology
CA SEARCH(R) 1967-2001/UD=11601 (c) 2001 AMERICAN CHEMICAL SOCIETY
2/6/187 (Item 63 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Method for reducing heavy metals leaching from municipal refuse incineration ash and/or slag
CA SEARCH(R) 1967-2001/UD=11601 (c) 2001 AMERICAN CHEMICAL SOCIETY
2/6/188 (Item 64 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Valorization of LD slag with treated urban wasteCA SEARCH(R) 1967-2001/UD=11601 (c) 2001 AMERICAN CHEMICAL SOCIETY
2/6/189 (Item 65 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Combustion melting furnace for waste garbage with improved slag discharge
CA SEARCH(R) 1967-2001/UD=11601 (c) 2001 AMERICAN CHEMICAL SOCIETY
2/6/190 (Item 66 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Manufacture of high strength rock wool from molten slag of municipal refuse incineration ash
CA SEARCH(R) 1967-2001/UD=11601 (c) 2001 AMERICAN CHEMICAL SOCIETY
2/6/191 (Item 67 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Ground strengthening material from garbage incinerator ash-based slag
CA SEARCH(R) 1967-2001/UD=11601 (c) 2001 AMERICAN CHEMICAL SOCIETY
2/6/192 (Item 68 from file: 399)
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Metal recovery from slag generated by melting wastes
CA SEARCH(R) 1967-2001/UD=11601 (c) 2001 AMERICAN CHEMICAL SOCIETY
2/6/193 (Item 69 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Pavement test of asphalt admixture with molten slag of municipal solid waste incineration ash
CA SEARCH(R) 1967-2001/UD=11601 (c) 2001 AMERICAN CHEMICAL SOCIETY
2/6/194 (Item 70 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Method for operation of combustion melting furnace in waste treatment apparatus with control of slag temperature
CA SEARCH(R) 1967-2001/UD=11601 (c) 2001 AMERICAN CHEMICAL SOCIETY
2/6/198 (Item 74 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Method for separation of molten salt and molten slag in melting incinerator ashes
CA SEARCH(R) 1967-2001/UD=11601 (c) 2001 AMERICAN CHEMICAL SOCIETY
2/6/199 (Item 75 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Manufacture of tiles from garbage incineration ash slag
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DIALOG(6)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Refuse incineration slag treatment in the Hamburg-Borsigstrasse refuse
incineration plant, GermanyCA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL
SOCIETY
...
2/6/201 (Item 77 from file: 399)
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Method for preventing lowering of fluidity of molten slag in plasma
melting furnace for treatment of municipal refuse incineration ash.
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
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DIALOG(6)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Separation of pollutants from waste gases from municipal incinerators
using furnace ash and/or slag
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
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2/6/203 (Item 79 from file: 399)
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Process for separation of copper and heavy metals from incinerated
garbage residue and slag
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
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2/6/204 (Item 80 from file: 399)
DIALOG(6)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Actual data report of residue and fly-ash melting, and slag recovery in
the NSW incineration plant
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
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2/6/205 (Item 81 from file: 399)
DIALOG(6)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Behavior of slag derived from DIS (special industrial wastes) and used
for road building. Comparison with slag from incineration of domestic waste
ION)
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2/6/207 (Item 83 from file: 399)
DIALOG(6)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Modification of steelmaking slag by utilization of noncombustibles in
city garbage
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
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2/6/208 (Item 84 from file: 399)
DIALOG(6)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Serial batch tests performed on municipal solid waste incineration bottom
ash and electric arc furnace slag, in combination with computer modeling
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
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2/6/209 (Item 85 from file: 399)
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Melting of incinerator ash and fly ash in slag discharge type rotary kiln
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
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Coloring of molten slag from garbage incineration
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
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2/6/211 (Item 87 from file: 399)
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Heat-treating process for combustible material-containing waste solids
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
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2/6/212 (Item 88 from file: 399)DIALOG(6)File 399:(c) 2001 AMERICAN CHEMICAL
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Molten slag from municipal refuse for pavement
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
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2/6/213 (Item 89 from file: 399)
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Processing slag from incineration of municipal wastes
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
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2/6/214 (Item 90 from file: 399)
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Processing of municipal and other wastes in molten slag bath
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
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2/6/215 (Item 91 from file: 399)
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Treatment process for residues in refuse incinerator plants
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY
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2/6/216 (Item 92 from file: 399)
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Incinerator flue gas cleaning with salted slag sorbents
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2/6/217 (Item 93 from file: 399)
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The influence of combustion bed temperature during waste incineration on slag quality
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY

2/6/218 (Item 94 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Fusion of slags by the HBZ process
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY

2/6/219 (Item 95 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Logistics and management of mechanical slag beneficiation
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY

2/6/220 (Item 96 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Slag processing and utilization by an association for disposal and use of waste (GEA) in the Geiselbullach waste incinerator power plant (Germany)
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY

2/6/222 (Item 98 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Mechanical slag beneficiation technologies and mechanical equipment of the system KHD Humboldt Wedag AG
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY

2/6/223 (Item 99 from file: 399)
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Slag beneficiation through aging and leaching
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY

2/6/224 (Item 100 from file: 399)
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DBA-roller grate-direct current firing for optimization of slag qualityCA SEARCH(R)
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2/6/225 (Item 101 from file: 399)
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Criteria and acceptance questions for slag utilization in Switzerland
CA SEARCH(R) 1967-2001/UD=13601 (c) 2001 AMERICAN CHEMICAL SOCIETY

2/6/226 (Item 102 from file: 399)
DIALOG(R)File 399:(c) 2001 AMERICAN CHEMICAL SOCIETY. All rts. reserv.
Quantity, quality, and utilization possibilities of waste incinerator slags - general review
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The presence and distribution of heavy metals in municipal solid waste incinerators
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OFFICE OF FOSSIL ENERGY, U.S. DEPARTMENT OF ENERGY DOE/FE-0215P-39 ISSUE NO. 39, SPRING 2000

CLEAN COAL TODAY

A NEWSLETTER ABOUT INNOVATIVE TECHNOLOGIES FOR COAL UTILIZATION

PROJECT NEWS BYTES

In December 1999, George Rudins, DOE Office of Fossil Energy Deputy Assistant Secretary for Coal and Power Systems, was named 1999 winner of the **Washington Coal Club's Achievement Award**. The membership of the Washington Coal Club comprises private sector and government representatives working on coal issues and, for the past 20 years, has annually recognized members of Congress, industry, labor leaders, and government officials. Rudins was cited for his leadership in advancing clean coal technologies, as well as promotion of innovative concepts for pollution control, climate change mitigation, and carbon sequestration. He is also the author of FE's Vision 21 plan for a futuristic, virtually non-polluting fossil fuel energy plant.

See "News Bytes" on page 3..

IN THIS ISSUE

WABASH COMPLETES FOURTH YEAR OF COMMERCIAL OPERATION

One of the world's pioneering commercial-scale coal gasification-based power facilities, Wabash River's Integrated Gasification Combined-Cycle (IGCC) plant, has successfully completed its fourth year of commercial operation and processed over one-and-a-half million tons of coal. A winner of *Power* magazine's 1996 Powerplant Award, as well as other honors, Wabash River is one of the cleanest coal-fired facilities in the world, and has contributed greatly to the commercial potential of this advanced coal-based power generation technology. Gasification is already in wide use for syngas-to-chemical production, and under the DOE Office of Fossil Energy Vision 21 initiative, coal-based IGCC is expected to coproduce power and high-value chemicals and clean transportation fuels.

The 262-MWe Wabash River IGCC project repowered an existing facility.

DOE selected Wabash River in September 1991 as a Clean Coal Technology (CCT) Program Round IV demonstration project, and the Cooperative Agreement between the industrial participants and DOE was signed in July 1992. Commercial operation began in December 1995. The Cooperative Agreement ended in January 2000 after a four-year commercial demonstration, and the plant continues in commercial operation.

The original Participant was the Wabash River Coal Gasification Repowering Project Joint Venture, formed in 1990 by Destec Energy, Inc. of Houston, Texas and PSI Energy, Inc. of Plainfield, Indiana. Destec owned and operated the gasification facility, and PSI Energy owned and operated the power generation facility. In 1997, Houston-based Dynegy, Inc. purchased Destec. A final transfer took place last December when Global Energy, Inc. purchased Dynegy's gasification assets and technology. PSI Energy remains the owner and operator of the generating facility.

MAJOR REPAYMENT MADE TO DOE

Global Energy plans to market and license the Destec Gasification Process under the name: "E-GAS Technology™." Dynegy has repaid DOE $550,000 — $300,000 for the facility and $250,000 for the technology. Global Energy

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...Wabash continued

will promote commercialization of the technology, and make repayments on future equipment sales or licenses for a 20-year period.

The Project

The project is located at PSI's Wabash River Generating Station near West Terre Haute, Indiana. PSI repowered a 1950s vintage steam turbine and installed a new syngas-fired combustion turbine while continuing to utilize locally mined high-sulfur Indiana bituminous coal. The repowered steam turbine produces 104 MWe that combines with the combustion turbine generator's 192 MWe and the system's auxiliary load of 34 MWe to yield 262 MWe (net) to the PSI grid.

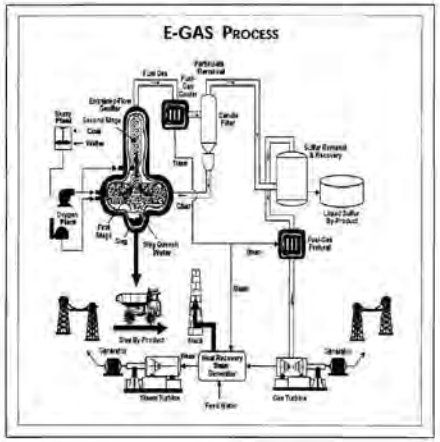
Gasification Process

The Wabash Project features the integration of the E-GAS process with an advanced General Electric MS 7001 FA high-temperature gas turbine. The E-GAS process features an oxygen-blown, two-stage entrained flow gasifier capable of operating on both coal and petroleum coke, with continuous slag removal.

As illustrated in the schematic, syngas is generated from gasification of a coal/water slurry with 95 percent oxygen in a reducing atmosphere at 2,600 °F and pressure of 400 psig. The syngas produced from coal comprises 45.3 percent carbon monoxide, 34.4 percent hydrogen, 15.8 percent carbon dioxide, 1.9 percent methane, and 1.9 percent nitrogen, and has a higher heating value of 277 Btu per standard cubic foot (dry basis). The ash melts and flows out of the bottom of the vessel as a vitrified slag (frit) by-product. Additional coal/water slurry added to the second gasification stage undergoes devolatilization, pyrolysis, and partial gasification to cool the raw gas and increase its heating value. The syngas flows to a heat recovery unit, producing high-pressure saturated steam that is superheated and used to drive a steam turbine. Subsequently, the particulates (char) in the raw gas are removed with a hot/dry candle filter and recycled to the gasifier where the remaining carbon is converted to syngas. After particulate removal, the syngas is water-scrubbed for chloride removal and passed through a catalyst that hydrolyzes carbonyl sulfide to hydrogen sulfide. The hydrogen sulfide is removed using methyldiethanolamine absorber/stripper columns. The syngas is then burned in a gas turbine that produces electricity. Gas turbine exhaust heat is recovered in a heat recovery steam generator to produce steam that drives the steam turbine to produce more electricity.

Over its four years of operation, the plant has demonstrated an impressive record of continually increasing reliability and syngas production, with 2.7 x 10^{12} Btu in 1996, 6.2 x 10^{12} Btu in 1997, and 8.8 x 10^{12} Btu in 1998. Overall, plant availability has increased from 56 percent in 1997 to 72 percent in 1998 and 79 percent in 1999. Thermal efficiency (HHV) is 39.7 percent on coal and 40.2 percent on petroleum coke compared to the 33–35 percent figure for conventional pulverized coal-fired plants. The greater the thermal efficiency, the less coal is needed to generate a given amount of electricity, thereby reducing both fuel costs and carbon dioxide emissions.

Emissions from Wabash River's IGCC facility are 0.1 pounds of SO_2 and 0.15 pounds of NO_x per million Btu of coal input. This SO_2 emission rate is less than one-tenth the emission limit set for the year 2000 by the acid rain provisions of the Clean Air Act Amendments of 1990. Particu-



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late emissions are less than the detectable limit set by EPA-approved emission measuring methods.

Another major environmental advantage at Wabash is the production of useful by-products. From startup through the end of 1999, Wabash has recovered and sold 33,888 tons of elemental sulfur (99.99 percent purity) for agricultural applications.

The IGCC technology demonstrated at Wabash River is an ideal candidate for repowering the more than 95,000 megawatts of existing U.S. coal-fired utility boilers that are more than 30 years of age, and for meeting the needs of a burgeoning foreign power generation market.

For more details on this and other CCT Program Demonstration Projects, please visit the Clean Coal Technology Compendium web site at http://www.lanl.gov/projects/cctc/.

Award-winning Wabash River IGCC plant continues in commercial operation after four years of successful demonstration.

...News Bytes continued

ENCOAL assets and responsibilities assumed by SGI International. SGI International (SGI) has purchased all ENCOAL plant assets from AEI Resources, which includes assuming full responsibility for marketing and repayment obligations to DOE. SGI has been actively securing customers for the plant's products in order to support the re-start of the mothballed demonstration plant. The company is adding new partners to share plant operating costs, and anticipates re-start by mid-2000. In a related action, SGI International has signed a long-term agreement with American Electric Power (AEP) to transport upgraded coal from the ENCOAL Demonstration Plant near Gillette, Wyoming to AEP's Cook Coal Terminal at Metropolis, Illinois for further barge delivery to various SGI customers, including AEP. This agreement provides a valuable incentive for SGI to restart the plant as well as move ahead with a larger commercial plant.

Fuel cell subcontract approved for Kentucky Pioneer IGCC Project. DOE has reviewed and approved the subcontract between Fuel Cell Energy (FCE) and Kentucky Pioneer L.L.C. FCE is planning to build and operate a 2-MWe molten carbonate fuel cell (MCFC) on a slipstream of clean syngas from the 400-MWe plant. FCE will scale up the design of their module from an existing 250-kW test facility. The FCE activity will cost about $34 million, of which DOE will fund 50 percent. The IGCC project is planned for an existing power plant site in eastern Kentucky and is currently in the design and permitting stage. When completed, this will be the largest commercial-scale IGCC and MCFC facility to operate on coal-derived syngas.

Rosebud SynCoal reorganizes to better align interests. Western SynCoal Co., Montana Power's research and development arm for enhanced coal technologies and products, has reorganized to reduce administrative costs and better align its interests with those of Western Energy Co., an affiliated coal mining company. Under the new structure, Western SynCoal and two other entities, SynCoal Inc. and the Rosebud SynCoal Partnership, will form Western SynCoal L.L.C., a limited liability company. Western SynCoal was the operating entity of the partnership formed in 1992 between subsidiaries of The Montana Power Company and Northern States Power Company (NSP) to enhance low-quality coals by improving their heating values while removing moisture, sulfur, and ash through an Advanced Coal Conversion Process (ACCP). Over the years, Western SynCoal bought out NSP's interest.

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INTEGRATED GASIFICATION FUEL CELL (IGFC) DEMONSTRATION TEST

George Steinfeld, Hossein Ghezel-Ayagh, Robert Sanderson, Sandors Abens

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3 Great Pasture Road
Danbury, CT 06813-1305

Introduction

Power generation in the United States relies heavily on coal with 56.3% of the power or 1807 billion kilowatt-hours generated using coal in 1998 as shown in Figure 1. As total U.S. coal consumption increases from 1043 to 1279 million tons a year between 1998 and 2020, the average annual increase is projected to be 0.9 percent. About 90 percent of the coal consumed in the U.S. is used for power generation. In the next 20 years, coal is expected to remain the primary fuel for power generation, although its share of total generation declines between 1998 and 2020 as natural gas increases its share[2].

As concern about the environment generates interest in ultra-clean energy plants, fuel cell power plants can respond to the challenge. Fuel cells convert hydrocarbon fuels to electricity at efficiencies exceeding conventional heat engine technologies while generating extremely low emissions. Emissions of SOx and NOx are expected to be well below current and anticipated future standards. Nitrogen oxides, a product of combustion, will be extremely low in this power plant because power is produced electrochemically rather than by combustion. Due to its higher efficiencies, a fuel cell power plant also produces less carbon dioxide. Fuel cells in combination with coal gasification, are an efficient and environmentally acceptable means to utilize the abundant coal reserves both in the United States and around the world.

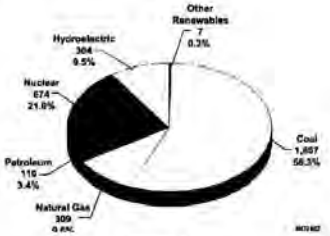

Figure 1

1998 U.S. Electric Generation by Fuel Type (Billion Kilowatt-hours)[1]

Source: U.S. DOE/EIA "Annual Energy Review 1998" (Data for U.S. Electric Utilities)

To demonstrate this technology, FuelCell Energy Inc. (FCE), is planning to build and test a 2-MW Fuel Cell Power Plant for operation on coal derived gas. This power plant is based on Direct Fuel Cell (DFC™) technology and will be part of a Clean Coal V IGCC project supported by the US DOE. A British Gas Lurgi (BGL) slagging fixed-bed gasification system with cold gas

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clean up is planned as part of a 400 MW IGCC power plant to provide a fuel gas slip stream to the fuel cell. The IGCC power plant will be built by Kentucky Pioneer Energy, a subsidiary of Global Energy, in Clark County, KY.

This demonstration will result in the world's largest fuel cell power plant operating on coal derived gas. The objective of this test is to demonstrate fuel cell operation on coal derived gas at a commercial scale and to verify the efficiency and environmental benefits.

Fuel Cell Power

The carbonate fuel cell derives its name from its electrolyte, which is made up of potassium and lithium carbonates. Figure 2 shows a simplified flow schematic of the carbonate fuel cell power plant. Syn-gas from the gasification plant clean-up system is cleaned up further and moisturized. The moisturized syn-gas is fed to the anode side of the fuel cell where methane is internally reformed and CO is shifted to CO_2 and H_2. Spent fuel exits the anode and is further oxidized in the anode exhaust oxidizer to supply oxygen and CO_2 to the cathode. The resulting reactions in the fuel cell anode and cathode produce DC output which is inverted to AC. The cathode exhaust supplies heat to the fuel clean-up, steam boiler and co-gen system as it is vented from the plant.

Figure 2.
Fuel Cell Power Plant Simplified Process Schematic

A 3-MW fuel cell power plant designed to operate on natural gas, shown conceptually in Figure 3, will be the basis for the power plant operating on coal derived gas. Two fuel cell modules, each housing four fuel cell stacks, produce the DC power. An inverter converts the DC power to AC. The balance of plant equipment includes thermal management, water treatment, switchgear and controls.

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Figure 3
3-MW Fuel Cell Power Plant for Natural Gas

System studies

Fuel cell systems operating on coal have been studied extensively in past years. A simplified block diagram of a fuel cell power plant system is shown in Figure 4. Gasification is used to convert the solid fuel to a gas which is processed to remove sulfur compounds, tars, particulates, and trace contaminants. The cleaned fuel gas is converted to electricity in the fuel cell. Waste heat from the carbonate fuel cell is used to generate steam required for the gasification process and to generate additional power in a bottoming cycle.

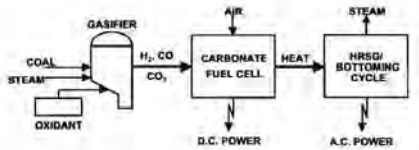

Figure 4
Integrated Gasification Fuel Cell System Simplified Block Diagram

At a 200 MW scale, past studies[4,5,6] indicated that using conventional gasification and clean-up technologies, a heat rate of 7379 (46.3 % HHV efficiency) can be achieved with IGFC utilizing BGL gasification and low temperature clean-up. This plant would require 1800 tons/day coal

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and generate a net output of 205 MW. Later studies[7,8,11] indicated that higher efficiencies, 51.7% -53.5%, can be achieved with higher methane producing gasifiers and by using hot gas clean-up. More recently[12], studies of hybrid fuel cell/turbine systems have shown that LHV efficiencies of 70% can be achieved on natural gas. This system utilizes a gas turbine as a bottoming cycle to the fuel cell, as shown in Figure 5. This concept can be applied to coal gas systems as well.

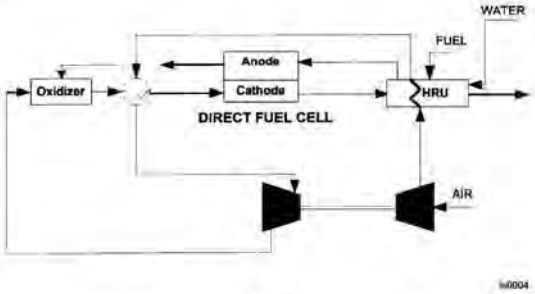

Figure 5
High Efficiency Hybrid Fuel Cell/Turbine Power Cycle

Emissions from this plant would be extremely low and below any current or anticipated future standards. Figure 6 compares the combined SOx, NOx, and solid waste emissions of existing commercial technologies, IGCC and IGFC. IGFC technology achieves the lowest levels of pollutant emissions in addition to lower CO_2 emissions and make-up water requirements. The CO_2 emission is 1.54 lb/kWh and the make-up water requirement is 6.8 GPM/MWh.

Figure 6
Environmental Impact Comparison of IGFC and Other Technologies

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Experimental testing

Experimental testing of a 20 kW sub-scale fuel cell stack was conducted[9] at Louisiana Gasification Technology Inc. (LGTI) in 1993-4 by Destec as shown in Figure 7. This was the world's first test of a carbonate fuel cell on coal derived gas. Gas from the entrained flow Destec gasifier was further cleaned-up after bulk gas clean-up by the fuel cell test facility and supplied to the fuel cell. The fuel cell operated on syn gas from the gasifier and inter-changeably with natural gas providing normal performance and stable operation.

Figure 7
20 kW Carbonate Fuel Cell Test at the LGTI Gasification Facility

After completion of the test, the fuel cell was disassembled for post-test inspection. Analysis of the components indicated no evidence of degradation and no detectable accumulation of coal gas borne contaminants in the fuel cell electrolyte or in the hardware. These results paved the way for a larger scale demonstration test.

Clean coal demonstration test

FuelCell Energy is planning to build and test a 2-MW carbonate fuel cell power plant as part of the Kentucky Pioneer Energy Project by Global Energy. The plant will be located in Trapp, KY and will be operational in 2003. This project, supported by DOE as part of the Clean Coal Technology Program will include a 400-MW Integrated Gasification Combined Cycle (IGCC) and a 2-MW fuel cell power plant (Integrated Gasification Fuel Cell, IGCF) as shown in Figure 8. The project will feature Advanced Fuel Technology briquettes made of Kentucky coal and Municipal Solid Waste (MSW) as fuel in the gasification process, adding a renewable fuel component to the project. The use of municipal solid waste as fuel reduces fuel cost to the power plant and provides low cost waste elimination. British Gas/Lurgi (BGL) gasification technology and General Electric advanced turbine power generation will be utilized for the IGCC.

As shown in Table 1 emissions from this plant will be significantly lower than conventional coal fired plants using PC boiler, atmospheric fluidized bed, and pressurized fluidized bed technologies.

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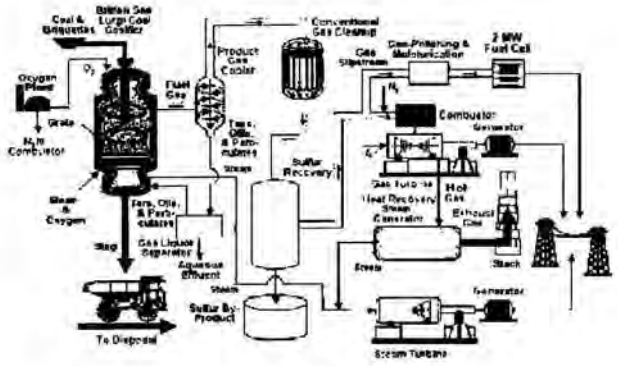

Figure 8
400-MW IGCC and 2-MW Fuel Cell Power Plant Process Flow Diagram[1]
Source: DOE Project Fact Sheet (Modified)

Table 1
Typical Emission Levels and Waste from Coal Based Power Plant Types

2.5% SULFUR EASTERN COAL *Source: EPRI With Adjustments By Duke Energy*				
PLANT TYPE	SO_2 EMISSIONS LB/MWH	NO_x EMISSIONS LB/MWH	SOLID WASTE (DRY) LB/MWH	CO_2 VENT GAS LB/MWH
Pulverized Coal (PC w/ESP Only)	35.7	11.2	136	1871
Pulverized Coal with FGD and LNB (90 percent S Removal, NO_x Control	3.6	5.8	232	1908
Atmospheric Fluidized Bed Combustion (AFBC)	3.6	4.9, 0.5 (SNCR)	249	1975
Pressurized Fluidized Bed Combustion (PFBC)	3.3	0.9	230	1826
Integrated Gasification combined cycle (IGCC) (99 Percent S Removal)	0.3	0.9	123	1695
BGL IGCC (99 Percent S Removal, 15 PPM NO_x)	**0.3**	**0.4**	**115**	**1585**
BGL IGFC	**0.25**	**0.18**	**90**	**1540**

[1] 25th International Technical Conference on Coal Utilization and Fuel Systems
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Sent on January 24, 2000

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Appendix D

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION
In the Matter of:
APPLICATION OF EAST KENTUCKY POWER COOPERATIVE, INC. FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY, AND A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY, FOR THE CONSTRUCTION OF A 250 MW COAL-FIRED GENERATING UNIT (WITH A CIRCULATING FLUID BED BOILER) AT THE HUGH L. SPURLOCK POWER STATION AND RELATED TRANSMISSION FACILITIES, LOCATED IN MASON COUNTY, KENTUCKY, TO BE CONSTRUCTED ONLY IN THE EVENT THAT THE KENTUCKY PIONEER ENERGY POWER PURCHASE AGREEMENT IS TERMINATED
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CASE NO.
2001-053
O R D E R
East Kentucky Power Cooperative, Inc. ("East Kentucky") filed its application on March 9, 2001 for a Certificate of Public Convenience and Necessity and a Certificate of Environmental Compatibility to construct a 250 MW coal-fired generating unit, referred to as "Gilbert," at the Hugh L. Spurlock power station ("Spurlock") and related transmission facilities in Mason County, Kentucky. The Gilbert unit was to be constructed only in the event that East Kentucky's prior agreement to purchase the output of a 540 MW generating unit proposed by the Kentucky Pioneer Energy, L.L.C. ("KPE") is terminated. The Attorney General's Office ("AG") and the Kentucky Natural Resources and Environmental Protection Cabinet, Department of Natural Resources, Division of Energy ("DOE") were granted intervention and a hearing was held on August 18, 2001..

On July 11, 2001, East Kentucky amended its application to eliminate the contingent nature of its request because KPE had not met its financial closing deadline of June 30, 2001. The amended application also revised Gilbert's output from 250 MW to 268 MW. East Kentucky has not terminated the power purchase agreement because the power will be sold at a very reasonable price and KPE has indicated that it believes it can obtain project financing by March 2002. However, due to the delay in KPE's financing, East Kentucky decided that it cannot reasonably rely on that project to satisfy its future power supply needs. Therefore, East Kentucky has concluded that it should proceed to build the Gilbert unit. In the event that KPE is able to secure project financing, East Kentucky stated that certain provisions in the existing purchase power agreement would have to be revised and any renegotiated contract will be resubmitted to the Commission for its prior approval.

East Kentucky submitted to the Natural Resources and Environmental Protection

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Cabinet ("Natural Resources Cabinet") a statement of environmental compatibility for the proposed Gilbert unit. By letter dated May 23, 2001, the Natural Resources Cabinet

Appendix D, Cont.

reported that East Kentucky's proposed Gilbert plant will be environmentally compatible. East Kentucky determined that additional power will be needed to meet its future load requirements and it issued a request for proposal to utilities and power marketers on January 11, 2001. Several responses were received, but East Kentucky's analysis shows that the proposed Gilbert unit will have the lowest cost. Additional analyses were performed in response to the request of the AG. One of those analyses shows that adding one 93 MW combined cycle unit in April 2004 and waiting for the KPE project to develop will cost $114 million less than adding the Gilbert unit now and then relying on the KPE development. East Kentucky rejected this scenario, claiming that it should not place all of its new base load requirements at market risk, contingent on the development of the KPE project as a commercially viable plant.

The AG recommends that East Kentucky's request to construct the Gilbert unit be granted. However, if KPE achieves financial closure by the summer of 2002, the AG suggests that the Commission and the parties explore cancellation of the Gilbert unit. DOE recommends that East Kentucky should complete a full and comprehensive study of the technical potential of demand-side resources and distributed generation in its service territory before proceeding to construct any new generation.

Based on East Kentucky's supply analyses, the uncertainty of the KPE project, and East Kentucky's need for additional power, the Commission finds that the construction of the Gilbert unit should be approved. Further, the Commission finds that when the KPE project achieves financial closure, East Kentucky should refile the power purchase agreement for review and approval by the Commission. The filing should include an analysis of the feasibility of the cancellation of the Gilbert unit and the substitution of a 93 MW combined cycle unit. In addition, the Commission finds that East Kentucky should continue to review the feasibility of demand side resources and provide a detailed analysis of its review in future filings related to generating capacity.

The Gilbert unit has the ability to burn not only coal but also wood waste and other biomass products due to the nature of a circulating fluid bed boiler. East Kentucky did not propose to include as part of the initial construction the handling facilities necessary to burn any of these other products. The AG recommended that the wood waste handling facilities be included in the unit design and that wood waste be -4- considered as one of the primary fuels. East Kentucky acknowledged that the wood waste handling facilities would cost $2.5 to $3 million and have a relatively short payback. Due to the potential cost savings over time from burning biomass, the Commission finds that East Kentucky should conduct a detailed analysis of fueling the Gilbert unit with wood waste and other biomass products.

East Kentucky indicated that additional transmission facilities would be needed to maintain stability of the unit at the Spurlock station. A transmission line will be needed to connect to transmission facilities owned by Cinergy Corp. East Kentucky indicated that certain agreements are necessary between the utilities, and additional time will be needed to finalize those agreements. Because of the potential delay in finalizing the transmission agreements, East Kentucky proposed to delete the transmission portion of its application and proceed only with the proposed generating facilities. The Commission finds East Kentucky's proposal to be reasonable.

IT IS THEREFORE ORDERED that:

1. East Kentucky is granted a Certificate of Public Convenience and Necessity and a Certificate of Environmental Compatibility to construct the Gilbert unit, a 268 MW coal-fired generating unit with a circulating fluid bed boiler, at the Spurlock station at an estimated cost of $367 million.
2. East Kentucky shall conduct a detailed analysis of the benefits of fueling with wood waste and other biomass products and file that analysis upon completion.
3. East Kentucky's request to delete from consideration at this time the construction of needed transmission facilities is granted. Within 30 days of completing all analyses, including the selection of a final route for the transmission facilities and the execution of all necessary agreements with other utilities, East Kentucky shall file a new

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application for approval of the proposed transmission facilities.
Done at Frankfort, Kentucky, this 25 th day of September, 2001.
By the Commission

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Appendix E

APPLICATION OF BGL GASIFICATION
OF SOLID HYDROCARBONS FOR
IGCC POWER GENERATION
2000 Gasification Technologies Conference
San Francisco, California
October 8-11, 2000
Presented by:
GLOBAL ENERGY INC.
Richard A. Oliver
With support from:
GENERAL ELECTRIC POWER SYSTEMS
John M. Wainwright
PRAXAIR
Raymond F. Drnevich.2

ABSTRACT

Since last year's GTC Conference, a considerable number of significant events have occurred in the gasification technology marketplace. New IGCC projects have come on stream with commercial operation, other new IGCC projects have been announced and started in development, environmental issues have gained emphasis, and energy prices, notably natural gas, have escalated dramatically. Directionally, all of these events appear to have created a more favorable atmosphere for IGCC projects.

Related to an ongoing IGCC project currently in development, a joint analysis has been performed by Global Energy, General Electric Power Systems, and Praxair to evaluate technical and economic elements for the performance of BGL Gasificsbon Technology based on solid hydrocarbon fuel feed to an IGCC for power generation.

Results of the analysis provide a picture of the relative economics in today's environment for electrical power generation by conventional natural gas fired combined cycle power systems compared to using BGL Gasification Technology in an IGCC configuration..3

INTRODUCTION

Over the last few years there have been a number of new Integrated Gasification Combined Cycle (IGCC) plants placed in operation, under construction, or otherwise in development, representing numerous technologies and fuel applications. Typically, the new IGCC plants have utilized either solid or liquid hydrocarbons as feed, gasification methods including entrained flow, fixed bed or fluid bed technologies, and power blocks utilizing various gas turbine systems

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and manufacturers.

Global Energy has several commercial IGCC projects under development based on using BGL Gasification Technology to gasify solid hydrocarbons for power production. Coincident with these development efforts, several feasibility studies have been performed related to diverse applications of the BGL Gasification Technology. This paper deals with the application of BGL Gasification Technology fueled with coal and incorporating an Oxygen plant provided by Praxair and a Power Island using 7FA Gas Turbines provided by General Electric Power Systems.

MACRO-ECONOMIC BACKGROUND

The original concept for performing this particular analysis evolved from ongoing technical analyses and business discussions related to several IGCC projects currently in development by Global Energy. The origins of these projects considered site issues and microeconomics of project specifics; additionally Global Energy kept an eye on the fundamental macroeconomic issues that were driving the IGCC industry and furthering its growth.

The interesting event that occurred at the inception of this analysis was the dramatic increase in energy prices this year, notably in prices for electrical power and natural gas. Accordingly, the analysis shifted its focus to consider the position of BGL Gasification Technology in the IGCC industry, the economic status of a commercial BGL based IGCC relative to power from natural gas, and a consideration of other factors of note in the rapidly changing world of energy prices.

BASIS FOR ANALYSIS

For purposes of this analysis, a single design case was developed and analyzed for the BGL Gasification Technology application, essentially considering use of Pittsburgh # 8 coal as the solid hydrocarbon feed to the Gasification Island.4

OVERALL IGCC CONFIGURATION

As shown in Attachment C, the overall project configuration includes the Gasification Island, comprised of the BGL gasification units, ASU, and syngas cooling and cleanup units, and the Power Island, which consists of two General Electric 7FA gas turbine generators and HRSGs and one steam turbine, all optimized for firing on syngas, but capable of operation on natural gas. At site design, ambient conditions of 59°F, 14.28 psia and 60% RH, Gross and Net Electrical Power Output are approximately 586MW and 538MW, respectively, and Net Heat Rate is 8072 BTU/KWh, HHV. Plant capital cost is assumed to be $1000/KW. The plant includes normal offsites, utilities and infrastructure required to support the main operating units.

GASIFICATION ISLAND

As shown in Attachment D, the BGL Gasification process is a fixed bed type gasifier that uses a lock hopper system to admit dry feed to the pressurized reaction vessel. The gasifier units are refractory lined and water jacket cooled. As the feedstock descends it is heated by rising high temperature gases. Moisture and volatile light hydrocarbons leave the coal soon after the feed

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enters the gasifier unit and exit the gasifier with the syngas stream. Oxygen and steam are injected near the bottom of the unit and react with devolatilized coal to provide thermal energy needed for the formation of syngas components. The high temperature also converts the inert ash content of the coal into vitreous frit or slag.

The vitreous frit is removed from the bottom of the gasifier via a lock hopper and is water quenched, thus capturing the inorganic content of the feedstock as a glassy silica matrix material resembling coarse sand. The vitreous frit is an environmentally benign synthetic aggregate material suitable for use as roadway base, roofing material and seawall construction.

The BGL Gasification IGCC system offers the following features:

- High gasification efficiency (carbon conversion), typically over 92%,
- Use of run-of-the-mine coal or other carbon-based feedstock,
- High thermal efficiency and simple heat exchanger for convenient heat recovery,
- High gasifier throughputs,
- Superior environmental performance, and
- A closed loop system with no primary stack and no ash residue.

The synthesis gas produced in this process is made up primarily of carbon monoxide and hydrogen (more than 85% by volume), and smaller quantities of carbon dioxide and methane..5 Hot syngas leaving the top of the gasifier is quenched and purified. Particulates and other impurities are removed in this initial gas processing stage. Heavier oils and tars will condense during cooling, and are returned to the gasifiers for reflux into the hearth zone.

Sulfur compounds in the feedstock are converted mainly to H2S and smaller quantities of COS in the raw syngas. Over 99% of these are removed through acid gas cleanup and sulfur recovery units prior to combustion in the gas turbines, resulting in exceptionally low SO2 emissions. The acid gas cleanup is accomplished using a selective solvent; the sulfur recovery is accomplished with the use of a process unit employing the Claus reaction to generate elemental sulfur. The elemental sulfur in these compounds is a commercially saleable product.

POWER ISLAND

The Power Island is based on a configuration of two trains of dual-fuel General Electric 7FA gas turbines with hydrogen-cooled generators. Each train is coupled to its own Heat Recovery Steam Generator (HRSG), which together will provide superheated steam for a single steam turbine generator. The system enables transfer to natural gas should syngas flow be interrupted. This provides for Power Island availability equal to that of conventional natural gas fired power plants.

Prior to entering the gas turbine combustor, the syngas is saturated with water and is then superheated. Additionally, nitrogen from the ASU is moisturized, superheated, and injected into

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the turbine combustor, effectively diluting the fuel to reduce NOx emissions. Saturating the syngas and the addition of saturated nitrogen also increases the mass flow to the gas turbine, resulting in increased electrical power generation.

Exhaust gas from each gas turbine is routed to a dedicated HRSG producing superheated steam. This steam is used to power a steam turbine generator and to meet the needs of the Gasification Island and the overall plant.

DESCRIPTION OF ANALYSIS

The analysis was aimed at an assessment of the economic considerations for power generation using solid hydrocarbon feed, specifically Pittsburgh # 8 coal, processed in an IGCC mode, which employed BGL Gasification Technology and General Electric 7FA gas turbines.

The analysis defined a specific IGCC plant configuration as noted, and accordingly, plant capital and operating costs were defined using estimated costs for fuel feed and other required support streams. The cost of electrical power was calculated based on those parameters, and further analyzed by calculating variations of power cost as a function of varied capital costs and gasifier feed costs.6

As a parallel evaluation, the analysis also looked at the cost of power generation from natural gas fired combined cycle plants of similar capacity, using varied prices for natural gas. A comparison was made between these two fuel scenarios to allow reflection on potential market opportunities.

RESULTS

The analysis results are presented in detail in the attachments and show that IGCC power generation systems with solid hydrocarbon feeds can be competitive with natural gas fired combined cycle (NGCC) systems. Results show equivalent Cost of Electricity (COE) for IGCC and NGCC Systems at certain natural gas and gasifier feedstock prices. For example, natural gas at about $3.75/MBTU and coal at $1.00/MBTU will both yield a COE of 4.90 cents/KWh.

While these electrical power prices are not likely to stimulate consideration of the large capital investment required to build a self-sufficient project financed power plant, rising prices for natural gas clearly make IGCC increasingly attractive as an option for power generation.

An important factor, which has the potential to directly improve today's IGCC economics, is the utilization of the BGL gasifier unit's ability to handle a wide variety of fuel (feedstocks), including Refuse Derived Fuel (RDF). For example, a mixture of coal at $1.00/MBTU and RDF at $0.00/MBTU at a ratio of 50/50 by heat content equated to a gasifier feedstock price of $0.50. This places electricity generated from a BGL based IGCC on par with electricity from a NGCC if the price of natural gas is $3.00, within the range of annual average fuel costs considered reasonable by developers motivated to build an electric power plant.

CONCLUSIONS

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Macroeconomic forces have created an atmosphere today where use of gasification to produce power is a real and competitive alternative to natural gas. There are a number of Gasification Technologies that are commercially proven and in a state of readiness to establish new commercial projects based on IGCC concepts using solid hydrocarbon feeds. BGL Gasification Technology is one of those technologies, with its own unique attributes, and potential for further technical and economic enhancements through application of evolving Power Island technology, as well the as use of co-production scenarios, which provide additional impetus to favorable and improved project economics.

The specific results of the analysis performed indicate that:

- If high natural gas prices are sustained, IGCC will be the economic preference over NGCC in more future power generation projects; and
- Even if natural gas prices level off or decline slightly, the application of BGL gasification using a composite feedstock of coal and RDF will improve IGCC economics and make it 7 the technology of choice in more future power generation projects.

Furthermore, the following prospects have the potential to further improve IGCC economics:

- GE Power Systems technology developments such as the 7H and 9H Systems TM , rated in IGCC at 460 MW and 550 MW respectively, will further improve IGCC economics. The real cost of oxygen has historically dropped about 3% per year. Praxair's process, equipment, and systems development activities expect to provide similar improvements in the future.
- The co-production of materials such as hydrogen, methanol, ammonia, steam, plus Fischer-Tropsch generated liquid transportation fuel products will improve economics.
- Ongoing developments by Global Energy are also expected to contribute to further economic enhancements for IGCC projects. The know-how derived from these activities is expected to provide significant benefits to current and future BGL projects. There are three IGCC projects publicly announced by Global Energy in various stages of project development, each based on using BGL Gasification Technology in an IGCC scenario. Global Energy is also in the process of acquiring Berlinwasser's gasification co-production facility Sekundärrohstoff Verwertungszentrum Schwarze Pumpe GmbH (SVZ) Recycling Project in Schwarze Pumpe, Germany, as well as the right, title and interest in SVZ's proprietary gasification technology, including its gasification-related patents. The facilities also include a new BGL gasifier, further enhancing Global's knowledge of the BGL Gasification Technology.

A collective view of all of these ongoing events suggest that further significant improvements for IGCC economics are likely to occur, and that use of BGL Gasification Technology for IGCC

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projects can provide notable economic benefits to this rapidly growing market.

SUPPORTING CONTRIBUTORS TO PAPER

The companies supporting the analysis efforts include Global Energy, General Electric Power Systems, and Praxair. Each organization has significant involvement and presence in the rapidly growing IGCC industry as follows:

Global Energy

Global Energy Inc. is an international independent energy company with expertise in Gasification Technology, Alternative Fuels and Environmental Technology. The company is a founding member of the Washington, D.C.-based Gasification Technologies Council, together with General Electric, Texaco and 11 world-class companies. Global Energy is focused on Gasification Technology projects designed to improve environmental and economic results for the power, refining, chemical, steel, fuel cell, and pulp and paper industries. The company has 8 more than 5,000 MW of project activity in development, construction and operation in the Americas and Europe, with business development interests worldwide. The company is well aligned with the U.S. DOE's Vision 21 plan for Multi-fuel, Gasification Technology, Co-production systems.

General Electric Power Systems

GE Power Systems is one of the world's leading suppliers of power generation technology, energy services and management systems, with year 2000 revenue estimated at $14.5 billion. The business has the largest installed base of power generation equipment in the global energy business. GE Power Systems provides turnkey equipment, service and management solutions across the power generation, oil and gas, distributed power and energy rental industries.

Praxair

Praxair is a technology pioneer and global leader in the industrial gases industry. The company is the largest industrial gases company in North and South America, and one of the largest worldwide. Praxair is also a recognized leader in the commercialization of new technologies that bring productivity and environmental benefits to a diverse group of industries..9

SUPPORTING BACKGROUND REFERENCES

U.S. Department of Energy, "Clean Coal Technology - The Investment Pays Off", November 1999.

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ATTACHMENTS

A. Energy Information Agency (EIA) – US Gas and Oil Prices

B. Energy Information Agency (EIA) – Fossil Fuel Prices to Electric Utilities

C. BGL IGCC Process Diagram

D. Schematic Diagram of BGL Gasifier

E. Basic Analysis Assumptions

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Appendix F

Kentucky Revised Statute 224.010
(20) "Recovered material" means those materials, including but not limited to compost, which have known current use, reuse, or recycling potential, which can be feasibly used, reused, or recycled, and which have been diverted or removed from the solid waste stream for sale, use, reuse, or recycling, whether or not requiring subsequent separation and processing, but does not include materials diverted or removed for purposes of energy recovery or combustion except refuse-derived fuel (RDF), which shall be credited as a recovered material in an amount equal to that percentage of the municipal solid waste received on a daily basis at the processing facility and processed into RDF; **but not to exceed fifteen percent (15%) of the total amount of the municipal solid waste received at the processing facility on a daily basis;**

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Appendix G

The below is the first section of the Air Quality Permit, please note the Section 1 language regarding local permits.

Commonwealth of Kentucky
Natural Resources and Environmental Protection Cabinet
Department for Environmental Protection
Division for Air Quality
803 Schneidt Lane
Frankfort, Kentucky 40601
(502) 573-3382

AIR QUALITY PERMIT

Permittee Name:
Kentucky Pioneer Energy LLC

Mailing Address:
312 Walnut Street, Suite 2000, Cincinnati, Ohio 45202

Source Name:
Kentucky Pioneer Energy LLC

Mailing Address:
312 Walnut Street, Suite 2000, Cincinnati, Ohio 45202

Source Location:
12145 Irvine Road, Trapp, Kentucky 40391

Permit Type:
Federally-Enforceable

Review Type:
PSD, Title V

Permit Number:
V-00-049

Log Number:
51132

Application
Complete Date:
January 21, 2000

KYEIS ID #
21-049-00053

SIC Code:
4911

OSR Code:
5266

Region:
Bluegrass

County:
Clark

Issuance Date:
June 7, 2001

Expiration Date:
June 7, 2006

John E. Hornback, Director

DEP7001 (1-97)

Division for Air Quality

Revised 06/2000

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SECTION A - PERMIT AUTHORIZATION

Pursuant to a duly submitted application which was determined to be complete on January 21, 2000, the Kentucky Division for Air Quality hereby authorizes the construction and operation of the equipment described herein in accordance with the terms and conditions of this permit. This draft permit has been issued under the provisions of Kentucky Revised Statutes Chapter 224 and regulations promulgated pursuant thereto.

The permittee shall not construct, reconstruct, or modify any emission units without first having submitted a complete application and receiving a permit for the planned activity from the permitting authority, except as provided in this permit or in the Regulation 401 KAR 50:035, Permits.

Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits, licenses, or approvals required by this Cabinet or any other federal, state, or local agency.

References in this permit to regulatory requirements of 401 KAR 50:035 are based on the governing regulation which was in effect at the time the permit application was deemed complete. For future reference to the regulatory basis for permit conditions and for the purposes of implementation and compliance, the corresponding portions of the provisions of new permitting regulations in 401 KAR Chapter 52 (effective January 15, 2001) shall apply.

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Appendix B

Kentucky Resources Council, Inc.

Post Office Box 1070
Frankfort, Kentucky 40602
(502) 875-2428 phone (502) 875-2845 fax
e-mail FitzKRC@aol.com

December 13, 2001

Rob Daniell

Division of Waste Management By fax & e-mail only

14 Reilly Road

Frankfort, Kentucky 40601

Re: Global Energy, Inc.

Request for Determination Regarding Applicability

Of KRS 224.40.

Dear Director:

After a review of the position paper submitted by Global Energy to the state Division for Waste Management, and after review of the applicable statute and case law, I believe that the facility is subject to the solid waste regulations and is required to obtain a determination of consistency from the solid waste management governing body of Clark County before importing and disposing of the solid waste fuel through thermal treatment.

By letter dated October 9, 2000, Global Energy Inc., Suite 2000, 312 Walnut Street, Cincinnati, OH 45202, through its manager of Regulatory Affairs Dwight Lockwood, requested a determination from the Kentucky Division of Waste Management as to the applicability of KRS 224.40 to the proposed "integrated gasification combined cycle (IGCC) power plant project in Clark County."

The request letter from Global Energy (Hereafter Global) asserted that the proposed project was "exempt from waste regulations." The 2-paged letter contained an attached "Analysis of the Non-Applicability of KRS 224.40 to the Kentucky Pioneer Energy IGCC Project."

The determination of applicability of the waste regulations rests in the first instance with the Natural Resources and Environmental Protection Cabinet, subject always to review by the courts. KRS Chapter 224 is a statute that is remedial in nature and its protections are to be liberally with a view towards promoting the public and environmental protection goals of the statute. *Roland v. Kentucky Retirement Systems*, Ky.App.52 S.W.3d 579 (2001). Exemptions from its reach are to be narrowly construed.

The question of whether the proposed coal and waste-fueled facility is subject to the requirements of KRS Chapter 224 as a waste management and waste

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Note:
This is a copy of the letter read by Mr. Herrick at the Public Comment Hearing held in Trapp, Kentucky, on December 11, 2001. Comments from this letter heve been identified in the meeting transcript and the appropriate responses are located alongside the text. The meeting transcript begins on page D-302 of this appendix and this letter begins on page D-329.

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disposal facility is of significance to the residents of Trapp and of Clark County, since if exempted from the ambit of the term "municipal solid waste facility," the planned importation of processed municipal solid waste from northeastern states representing the equivalent of "roughly half of the residential waste generated in the entire Commonwealth of Kentucky" will not be subject to scrutiny and a determination by the local governing body of Clark County of the consistency with that county's approved solid waste plan.

When enacted in 1991, Senate Bill 2 substantially revised state and local solid waste management, requiring of local communities that they plan for the proper management of solid waste generated within their borders and promising, in return, that the local "governing body" responsible for solid waste planning would have the ability to control the manner and extent to which waste generated outside of the boundary of that planning unit would be managed and disposed of within the planning area.

The proposal to thermally treat and to combust the volatile fraction of one million tons or more per year of treated municipal solid waste falls squarely within the type of facility intended by the General Assembly to be scrutinized under the solid waste planning process.

KRS 224.40-315 mandates that:

> No permit to construct or expand a municipal solid waste disposal facility shall be accepted for processing by the Cabinet unless the application contains a determination from the governing body for the solid waste management area in which the facility is or will be located concerning the consistency of the application with the area solid waste Management plan [.]

The scope of this statute and the requirement for a determination of consistency with the approved solid waste plan is defined by the term "municipal solid waste disposal facility", which is defined in KRS 224.01-010(15) to include:

> Any type of waste site or facility where the final deposition of any amount of municipal solid waste occurs, whether or not mixed with or including other waste allowed under subtitle D of the Federal Resource Conservation and Recovery Act of 1976, as amended, and includes, but is not limited to, incinerators and waste-to-energy facilities that burn municipal solid waste. . . .

The term is broadly inclusive of all types of waste sites or facilities where the final deposition of any amount of municipal solid waste occurs. There can be no serious argument that the feed material to be combined with the coal is a solid waste, which is to say, that the material is "garbage, refuse, sludge and

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other discarded material." The waste is to be processed, according to the applicant, at a facility in a state other than Kentucky, where it will be manufactured from municipal solid waste by removing "large objects and white goods" as well as "glass and metal [.]" The remaining material, including chlorinated plastics, will be milled and shredded.

These "pellets" are municipal solid waste processed as an intermediate step in the thermal treatment of the waste to produce a gas for combustion. The proposed facility is utilizing a fuel stream comprised of partially separated, shredded and shaped municipal solid waste used as a fuel source, disposing of the waste through thermal treatment at high temperature to drive off the volatile fraction for combustion. As such, it is engaged in disposal of a municipal solid waste stream and falls within the ambit of a "municipal solid waste disposal facility" the siting and operation of which should be reviewed for consistency with local solid waste plans.

The applicant claims exemption for the waste fuel from the waste program as a "recovered material," yet the clearly better reading of the statute, and the intent to carefully regulate the disposal of solid waste by thermal treatment as well as other means, militates against the exemption of the material from regulation as a solid waste. The material is not a "refuse-derived fuel" notwithstanding the claim by the applicant to the contrary, since the applicant has indicated that it intends to retain the recoverable plastics in the waste (likely for the Btu value), and thus is outside of the ambit of "recovered material," since that definition specifically excludes "materials diverted or removed for purposes of energy recovery or combustion []" from being considered recovered material.

Assuming, for the sake of argument, that the waste were further processed over what is proposed, in order to meet the state definition of "refuse derived fuel" by removing all recoverable plastics and other recoverable material, such as mixed paper, corrugated paper and newsprint, the definition of "recovered material" still would not apply to exempt the entire waste stream from regulation since only 15% of the material processed by the facility creating the pellets could be credited as "RDF."

While the acceptance by the applicant of regulation under EPA's Municipal Solid Waste Combustor standards makes it difficult to accept at face value the assertion of non-applicability of state "waste" designation, commenter concurs that the state law itself determines how this facility is to be characterized for purposes of state regulation.

Because the material is not a "refuse derived fuel" under KRS 224.01-010(23) in that it has not been subject to "extensive separation of municipal solid waste" including "the extraction of recoverable materials for recycling" the processing of the municipal solid waste stream to create the palletized "fuel" does not make the material a "recovered material" under KRS 224.01-010(20). The proposed gasification step in the process and the cleaning of the volatile fraction of the waste for combustion does not make the facility a "recovered material processing facility" so as to exempt it from the definition of a municipal solid waste disposal facility or to avoid the obligation to be consistent with the local solid waste plan.

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Beyond the specific failure of the application to meet the criteria for an exempt "recovered material processing facility" because the waste feed will retain recoverable materials, including all plastics and paper, the *context* in which municipal solid waste disposal facilities are regulated under KRS Chapter 224 makes clear that the attempt to shoehorn this substantial waste-fueled energy facility into the category of a "recovered materials processing facility" is an ill-fit from a public policy standpoint. KRS 224.01-010, which contains many of the definitions for the chapter, is prefaced with the caveat "[a] s used in this chapter unless the context clearly indicates otherwise [.]" The statutory provision requiring a determination of local consistency for disposal facilities was plainly intended to cover thermal treatment of municipal solid wastes with and without energy recovery, and to segment the facility into the component processes in order to exclude from the application of KRS 224.40-315 a facility which uses a sequential process of thermal treatment followed by combustion of volatile gases, and which presents many similar concerns in management of air, water and solid waste byproducts from a heterogeneous fuel source such as municipal solid waste (even if homogenous in shape), is contrary to the intent of the statute and the public policy behind it.

In sum, the Council believes that the pelletized mixed municipal solid waste does not fall within the ambit of the state statutory definition of "refuse derived fuel" and is thus not a "recovered material." By definition, the facility is a "municipal solid waste disposal facility" under KRS 224.40-315(1), KRS 224.40-310 and KRS 224.01-010(15).

Commenter appreciates the Division's consideration of these comments in making a final determination as to the applicability of the waste statutes to the proposed facility.

Cordially,

Tom FitzGerald
Director

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Kentucky Resources Council, Inc.
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BEFORE THE DEPARTMENT OF ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY
COMMENTS CONCERNING DEIS FOR PROPOSED
KENTUCKY PIONEER ENERGY INTEGRATED GASIFICATION
COMBINED CYCLE DEMONSTRATION PROJECT

Dear Mr. Spears:

These preliminary comments are submitted regarding the proposed Kentucky Pioneer Energy IGCC Project Draft Environmental Impact Statement, and will be supplemented with extensive written comments concerning the project prior to the close of the comment period. As a preliminary matter, however, the Council was asked to address the relationship of the proposed project and the utilization of a shredded, milled and pelletized municipal solid waste fuel, to Kentucky's solid waste disposal statute and the requirement of maintaining consistency with local solid waste plans.

After a review of the position paper submitted by Global Energy to the state Division for Waste Management, and after review of the applicable statute and case law, I believe that the facility is subject to the solid waste regulations and is required to obtain a determination of consistency from the solid waste management governing body of Clark County before importing and disposing of the solid waste fuel.

By letter dated October 9, 2000, Global Energy Inc., Suite 2000, 312 Walnut Street, Cincinnati, OH 45202, through its manager of Regulatory Affairs Dwight Lockwood, requested a determination from the Kentucky Division of Waste Management as to the applicability of KRS 224.40 to the proposed "integrated gasification combined cycle (IGCC) power plant project in Clark County."

The request letter from Global Energy (Hereafter Global) asserted that the proposed project was "exempt from waste regulations." The 2-paged letter contained an attached "Analysis of the Non-Applicability of KRS 224.40 to the Kentucky Pioneer Energy IGCC Project."

The determination of applicability of the waste regulations rests in the first instance with the Natural Resources and Environmental Protection Cabinet, subject to review by the courts. KRS Chapter 224 is a statute that is remedial in nature and its protections are to be broadly construed consistent with the

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public and environmental protection goals of the statute. Exemptions from its reach are to be narrowly construed.

The question of whether the proposed coal and waste-fueled facility is subject to the requirements of KRS Chapter 224 as a waste management and waste disposal facility is of significance to the residents of Trapp and of Clark County, since if exempted from the ambit of the term "municipal solid waste facility," the planned importation of processed municipal solid waste from northeastern states representing the equivalent of "roughly half of the residential waste generated in the entire Commonwealth of Kentucky" will not be subject to scrutiny and a determination by the local governing body of Clark County of the consistency with that county's approved solid waste plan.

When enacted in 1991, Senate Bill 2 substantially revised state and local solid waste management, requiring of local communities that they plan for the proper management of solid waste generated within their borders and promising, in return, that the local "governing body" responsible for solid waste planning would have the ability to control the manner and extent to which waste generated outside of the boundary of that planning unit would be managed and disposed of within the planning area.

The proposal to thermally treat and to combust the volatile fraction of one million tons or more per year of treated municipal solid waste falls squarely within the type of facility intended by the General Assembly to be scrutinized under the solid waste planning process.

KRS 224.40-315 mandates that:

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The scope of this statute and the requirement for a determination of consistency with the approved solid waste plan is defined by the term "municipal solid waste disposal facility", which is defined in KRS 224.01-010(15) to include:

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The term is broadly inclusive of all types of waste sites or facilities where the final deposition of any amount of municipal solid waste occurs. There can be no serious argument that the feed material to be combined with the coal is a solid waste, which is to say, that the material is "garbage, refuse, sludge and other discarded material." The waste is to be processed, according to the applicant, at a facility in a state other than Kentucky, where it will be manufactured from municipal solid waste by removing "large objects and white goods" as well as "glass and metal [.]" The remaining material, including chlorinated plastics, will be milled and shredded.

These "pellets" are municipal solid waste processed as an intermediate step in the thermal treatment of the waste to produce a gas for combustion. The proposed facility is utilizing a fuel stream comprised of partially separated, shredded and shaped municipal solid waste used as a fuel source, disposing of the waste through thermal treatment at high temperature to drive off the volatile fraction for combustion. As such, it is engaged in disposal of a municipal solid waste stream and falls within the ambit of a "municipal solid waste disposal facility" the siting and operation of which should be reviewed for consistency with local solid waste plans.

The applicant claims exemption for the waste fuel from the waste program as a "recovered material," yet the clearly better reading of the statute, and the intent to carefully regulate the disposal of solid waste by thermal treatment as well as other means, militates against the exemption of the material from regulation as a solid waste. The material is not a "refuse-derived fuel" notwithstanding the claim by the applicant to the contrary, since the applicant has indicated that it intends to retain the recoverable plastics in the waste (likely for the Btu value), and thus is outside of the ambit of "recovered material," since that definition specifically excludes "materials diverted or removed for purposes of energy recovery or combustion []" from being considered recovered material.

Assuming, for the sake of argument, that the waste were further processed over what is proposed, in order to meet the state definition of "refuse derived fuel" by removing all recoverable plastics and other recoverable material, such as mixed paper, corrugated paper and newsprint, the definition of "recovered material" still would not apply to exempt the entire waste stream from regulation since only 15% of the material processed by the facility creating the pellets could be credited as "RDF."

While the acceptance by the applicant of regulation under EPA's Municipal Solid Waste Combustor standards makes it difficult to accept at face value the assertion of non-applicability of state "waste" designation, commenter concurs that the state law itself determines how this facility is to be characterized for purposes of state regulation.

Because the material is not a "refuse derived fuel" under KRS 224.01-010(23) in that it has not been subject to "extensive separation of municipal solid waste" including "the extraction of recoverable materials for recycling" the processing of the municipal solid waste stream to create the palletized "fuel" does not make the material a "recovered material" under KRS 224.01-010(20). The proposed gasification step in the process and the cleaning of the

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volatile fraction of the waste for combustion does not make the facility a "recovered material processing facility" so as to exempt it from the definition of a municipal solid waste disposal facility or to avoid the obligation to be consistent with the local solid waste plan.

Beyond the specific failure of the application to meet the criteria for an exempt "recovered material processing facility" because the waste feed will retain recoverable materials, including all plastics and paper, the *context* in which municipal solid waste disposal facilities are regulated under KRS Chapter 224 makes clear that the attempt to shoehorn this substantial waste-fueled energy facility into the category of a "recovered materials processing facility" is an ill-fit from a public policy standpoint. KRS 224.01-010, which contains many of the definitions for the chapter, is prefaced with the caveat "[a] s used in this chapter unless the context clearly indicates otherwise [.]" The statutory provision requiring a determination of local consistency for disposal facilities was plainly intended to cover thermal treatment of municipal solid wastes with and without energy recovery, and to segment the facility into the component processes in order to exclude from the application of KRS 224.40-315 a facility which uses a sequential process of thermal treatment followed by combustion of volatile gases, and which presents many similar concerns in management of air, water and solid waste byproducts from a heterogeneous fuel source such as municipal solid waste (even if homogenous in shape), is contrary to the intent of the statute and the public policy behind it.

In sum, the palletized mixed municipal solid waste does not fall within the ambit of the state statutory definition of "refuse derived fuel" and is thus not a "recovered material." By definition, the facility is a "municipal solid waste disposal facility" under KRS 224.40-315(1), KRS 224.40-310 and KRS 224.01-010(15).

Commenter suggests that DOE undertake these actions in order to assure full compliance with applicable state laws prior to engaging in funding support for this project:

1. request and await final determination by the Natural Resources and Environmental Protection Cabinet as to the applicability of the waste statutes to the proposed facility;
2. assuming the applicability of the statutes, defer the funding decision until the applicant demonstrates the viability of the project by obtaining a determination of consistency from the governing body of the solid waste management area covering Clark County of the proposed importation and utilization of the solid waste material for the facility; and
3. extending to the Governing Body of that solid waste management area the opportunity to participate in the EIS review process as a cooperating agency.

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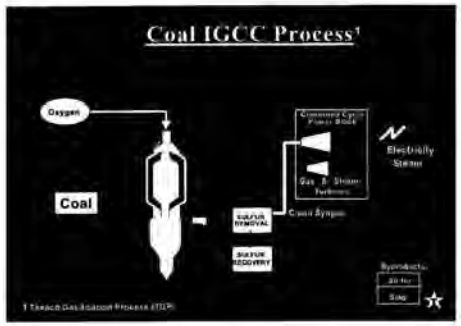
Increasing Electricity Availability From Coal-Fired Generation in the Near-Term
May 2001



THE NATIONAL COAL COUNCIL

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Increasing Electricity Availability From Coal-Fired Generation in the Near-Term

Chair: Mr. Steven F. Leer

Vice Chair: Mr. Wes M. Taylor

Study Work Group Chair: Ms. Georgia Nelson

The National Coal Council
May 2001

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THE NATIONAL COAL COUNCIL

Steven F. Leer, Chairman

Robert A. Beck, Executive Director

U.S. DEPARTMENT OF ENERGY

Spencer Abraham, Secretary of Energy

The National Coal Council is a Federal Advisory Committee to the Secretary of Energy. The sole purpose of the National Coal Council is to advise, inform, and make recommendations to the Secretary of Energy on any matter requested by the Secretary relating to coal or to the coal industry.

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Cover Letter to Secretary Abraham

NATIONAL COAL COUNCIL, INC.
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May 3, 2001

The Honorable Spencer Abraham
Secretary of Energy
United States Department of Energy
Room 7A-219
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Mr. Secretary:

On behalf of The National Coal Council I am pleased to submit the enclosed report entitled "Increasing Electricity Availability from Coal-Fired Generation in the Near-Term." This report was authorized by your predecessor then-Secretary Bill Richardson, on November 13, 2000 prepared, deliberated and recommended by the Coal Policy Committee at its meeting on April 3, 2001, and formally approved by The National Coal Council on May 3, 2001.

In his letter, Secretary Richardson requested that The National Coal Council conduct a study on measures, which the government or government in partnership with industry, could undertake to improve the availability of electricity from coal-fired power plants. His letter requested that the Council address improving coal-fired generation availability in two specific areas:

- Improving technologies at coal-fired electric generating plants to produce more electricity, and
- Reducing regulatory barriers to using these technologies.

The Council accepted Secretary Richardson's request and formed a study group of experts to conduct the work. The study group conducted its work at the direction of the Coal Policy Committee of the Council, which is chaired by Malcolm Thomas, Vice President of Kennecott Energy and a member of the Council. The study group itself was chaired by Georgia Nelson, President of Midwest Generation Company and a member of the Council.

The study was divided into two major sections: technologies and regulatory reform. The focus of the technologies section is on achieving more electricity from existing and new coal-fired power plants using technologies that improve efficiency, availability and environmental performance in the near term defined as the next 36 months.

However, unless there is a significant change in regulatory interpretation and enforcement regarding the installation of new technologies at existing power plants, it is not likely that any of this additional low-cost, low-cost emission electricity will be produced. The recent change in enforcement procedures by EPA, reinterpreting as violations of the Clean Air Act what had heretofore been considered routine maintenance at power plants, has had a direct and chilling effect on all maintenance and efficiency improvements, and clean coal technology installations at existing power plants. A return to the pre-1998

A Federal Advisory Committee to the U.S. Secretary of Energy

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interpretation of this one regulation would allow plant operators the opportunity to install technologies discussed in the report.

Several other existing regulations seem to be in conflict with the country's attempt to maximize the use of domestic energy sources, as well. Environmental regulation should be harmonized with the energy and national security goals of the country.

The National Coal Council strongly recommends that the country, with the Department of Energy in the lead, develop a clear comprehensive energy policy that supports the maximum use of domestic fuel sources, continues to protect the environment by implementing strong but balanced environmental regulations, and harmonizes conflicting regulations affecting energy development and use. Government and the private sector should work in partnership to achieve the desired goals and remove those regulatory barriers that create obstacles to achieving those goals, while preserving environmental performance. The specific recommendations of the Council can be found in the Executive Summary of the report.

The Council appreciates being asked to provide this report and we stand ready to answer any questions you may have about it.

Sincerely,

Steven F. Leer

Steven F. Leer
Chairman

Enclosure

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Abbreviations

AQRVs	Air quality related values
B&W	Babcock & Wilcox
BACT	Best available control technology
BGL	British Gas/Lurgi
Btu	British thermal units
Btu/kWh	British thermal units per kilowatt-hour
CAA	Clean Air Act
CFB	Circulating fluidized bed
CO_2	Carbon dioxide
COS	Carbonyl sulfide
DOE	Department of Energy
EIA	Energy Information Administration
EPA	Environmental Protection Agency
EPRI	Electric Power Research Institute
FGD	Flue gas desulfurization
FLMS	Federal land managers
GADS	Generation Availability Data System
GW	Gigawatts (10^9 watts)
HHV	Higher heating value
HRSG	Heat recovery steam generator
IGCC	Integrated gasification combined cycle
kW	Kilowatt
lb/MBtu	Pounds of emissions per million Btu of heat input
LAER	Lowest achievable emission rates
LHV	Lower heating value
LNB	Low NO_x burners
MACT	Maximum achievable control technology
Mbtu	Million Btu
MDGC	Maximum demonstrated generating capacity
MW	Megawatts (10^6 watts)
MWH	Megawatt-hour
NAAQS	National Ambient Air Quality Standards
NCC	National Coal Council
NERC	North American Electric Reliability Council
NGCC	Natural gas combined cycle
NOVs	Notices of violation
NO_x	Nitrogen oxides
NSPS	New Source Performance Standards
NSR	New Source Review
O&M	Operating and Maintenance
OEM	Original Equipment Manufacturer
PPM	Parts Per Million
PSD	Prevention of significant deterioration
SCR	Selective catalytic reduction
SO_2	Sulfur dioxide
SO_x	Sulfur oxides
tpy	tons per year
UDI	Utility Data Institute
WEPCo	Wisconsin Electric Power Company

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Preface

The National Coal Council is a private, nonprofit advisory body, chartered under the Federal Advisory Committee Act.

The mission of the Council is purely advisory: to provide guidance and recommendations as requested by the United States Secretary of Energy on general policy matters relating to coal. The Council is forbidden by law from engaging in lobbying or other such activities. The National Coal Council receives no funds or financial assistance from the Federal government. It relies solely on the voluntary contributions of members to support its activities.

Members of the National Coal Council are appointed by the Secretary of Energy for their knowledge, expertise, and stature in their respective fields of endeavor. They reflect a wide geographic area of the United States (representing more than 30 states) and a broad spectrum of diverse interests from business, industry, and other groups, such as:

- large and small coal producers;
- coal users such as electric utilities and industrial users;
- rail, waterways, and trucking industries as well as port authorities;
- academia;
- research organizations;
- industrial equipment manufacturers;
- state government, including governors, lieutenant governors, legislators, and public utility commissioners;
- consumer groups, including special women's organizations;
- consultants from scientific, technical, general business, and financial specialty areas;
- attorneys;
- state and regional special interest groups; and
- Native American tribes.

The National Coal Council provides advice to the Secretary of Energy in the form of reports on subjects requested by the Secretary and at no cost to the Federal Government.

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Executive Summary

Purpose

By letter dated November 13, 2000, then-Secretary of Energy Bill Richardson requested that the National Coal Council conduct a study on measures which the government or the government in partnership with industry could undertake to improve the availability of electricity from coal-fired power plants. His letter requested that the Council address improving coal-fired generation availability in two specific areas:

- improving technologies at coal-fired electric generating plants to produce more electricity; and
- reducing regulatory barriers to using these technologies.

The Council accepted the Secretary's request and formed a study group of experts to conduct the work and draft a report. The list of participants of this study group can be found in Appendix D of the report.

Findings

The study group found the following:

- Nationally, approximately 40,000 megawatts of increased electrical production capability is possible now from existing coal-fired power plants.
- Such increased electricity supply can be available through the installation of standard improvements and clean coal technologies. This will have the important effect of increasing efficiency and decreasing emissions per megawatt from such modified plants, thereby improving air quality.
- Such plant efficiency and increased electricity production capability may only be realized if a return to historic regulatory policy is made.
- Coal-based electricity will be important for many years into the future. Therefore, regulations and policies employed should encourage the clean use of this resource through accelerated installation of more efficient, cleaner technologies.

The study was divided into two major sections: technology and regulatory reform. The focus of the technology section is on achieving more electricity from existing and new coal-fired power plants using technologies that improve efficiency, availability, and environmental performance. The discussion is divided into three subsections:

a) achieving higher availability/reliability in the existing fleet of coal-fired plants;
b) Increasing generation output of existing coal-fired plants; and
c) Determining opportunities for repowering existing facilities with clean coal technologies as well as building new advanced clean coal technology generation facilities.

Analysis of the U.S. utility industry infrastructure of coal plants reveals a significant potential for increasing generation capacity by taking well-tested measures to improve the reliability/availability of older facilities. This effort, which will come mainly from improvements on the steam generators of these older plants, can create 10,000 MW of new capacity.

Techniques to recover lost capacity and increase capacity above nameplate have been collected from a combination of research studies by utility industry organizations such as EPRI and actual case studies which are detailed in the report. The nameplate capacity of coal units older than 20 years is approximately 220,000 MW; however, due to derating, the existing capacity is only about 200,000 MW.

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This group of plants has the potential for both capacity restoration (about 20,000 MW) and/or improvement (about 20,000 MW). It is estimated that this increased capacity of 40,000 MW could be recovered within 36 months. This can allow the economy to grow while new generation facilities are sited, constructed, and brought into service.

For new coal-fired power generating capacity, Pulverized Coal Combustion in supercritical steam plants (a mature technology) is available with minimal emissions, high efficiency, and at very favorable total production cost.

Repowering of an old existing coal fired power plant with a single modern steam generating unit, equipped with commercially proven emissions controls results in significant reductions in the total amounts of emissions even while substantially increasing the total MWh output of the facility.

Integrated Gasification Combined Cycle (IGCC) has become a commercially available technology for both greenfield and repowering applications. IGCC is a clean, new technology option insensitive to fuel quality variation.

While natural gas will fuel the majority of new capacity additions during this time period there are currently about 321,000 MW of coal-fired capacity in service. While not all of this capacity can be targeted for the new technologies discussed in this report, it is estimated that 75% of it can be retrofitted with one of these technologies. This additional increase in capacity is estimated to be 40,000 MW and much of it could be brought on line in the next three years. This minimizes economic impacts while new generation facilities are sited, constructed, and brought into service without increasing emissions at existing facilities and, in some cases, lowering emissions. Approximately 25% of existing facilities can be targeted for repowering with much cleaner and more efficient coal-based power generation.

However, unless there is a significant change in regulatory interpretation and enforcement regarding the installation of new technologies at existing power plants, it is not likely that any of this additional low-cost, low emission electricity will be produced. The recent change in enforcement procedures by EPA (reinterpreting as violations of the Clean Air Act what had heretofore been considered routine maintenance at power plants) has had a direct and chilling effect on all maintenance and efficiency improvements and clean coal technology installations at existing power plants. EPA has brought legal action against 11 companies and 49 generation facilities since 1998 under the New Source Review section of the 1990 Clean Air Act. The companies involved believe that they were conducting routine maintenance needed to keep these plants in good condition. The result has been that no new efficiency, availability, or environmental improvement has occurred since 1998 when EPA changed its enforcement policy. A return to the historic interpretation of this one regulation alone would allow plant operators the opportunity to install technologies discussed in the report. If just a three percent increase in capacity could be achieved through reducing outages and increasing plant efficiency, it could result in over 11,500 MW of coal-based capacity being added to the current fleet while continuing the downward trend in emissions.

Several other existing regulations seem to be in conflict with the country's attempt to maximize the use of domestic energy sources. Environmental regulation should be harmonized with the energy and national security goals of the country.

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Recommendations

The National Coal Council strongly recommends that the country, with the Department of Energy in the lead, develop a clear, comprehensive energy policy that supports the maximum use of domestic fuel sources, continues to protect the environment by implementing strong but balanced environmental regulations, and harmonizes conflicting regulations affecting energy development and use. Government and industry should work in partnership to achieve the desired goals and remove those regulatory barriers that create obstacles to achieving those goals while preserving environmental performance.

Specifically, the Council recommends that the Department of Energy take the following actions.

- Initiate and lead a dialogue with EPA, with the goal of returning to the traditional pre-1998 interpretation of the New Source Review section of the 1990 Clean Air Act.
- Promote accelerated installation of clean and efficient technologies at new and existing coal-fired power plants.
- Initiate and lead a dialogue with EPA to promote coordinated regulations for ozone attainment into a single compliance strategy.
- Initiate and lead a dialogue with EPA and electricity generators to establish credible and uniform emissions targets, which will provide regulatory certainty for a sufficient period in the future to assure electricity generators that they can achieve a return on investments for performance and environmental improvements.
- Lead the country's effort to develop a clear, comprehensive, and secure energy policy that maximizes the use of domestic fuels, including coal, while continuing the downward trend in emissions.

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Achieving Higher Availability/Reliability From Existing Coal-Fired Power Plants

This section will focus on recommendations that will improve existing coal-fired power plants' reliability and availability to eliminate or reduce forced outages and extend the time between planned maintenance outages. This suggested availability improvement program is meant to restore the plants' infrastructure to a level that restores the original reliability of the plants. Implementation of these recommendations will allow the plants to increase generation output above recent historical output without increasing gross generating capability.

We will show from the use of industry sources on reliability (GADS/NERC) and generation capacity (EIA) that there is a significant opportunity for the utility industry to increase the generation output from our existing fleet of coal-fired power plants by restoring portions of the plant infrastructure to their original condition.

Analysis of the U.S. utility industry's coal-fired plant infrastructure reveals a significant opportunity for increasing electricity output from these plants by taking measures to improve the reliability/availability of the older facilities. Maintaining or restoring plants that are over 20 years old to a condition similar to plants that are under 20 years old can result in more reliable facilities that will be available to play an important role in supporting the increasing strain on our electrical system's reserve margins and electrical demand growth.

Specifically, our analysis has shown that this reliability improvement effort can create 10,000 MWs of equivalent generation capacity within our existing coal-fired fleet of plants. Of particular note is that over 90% of these MWs of capacity will come from component replacement and material upgrades of the boiler/steam generator at our facilities that are more than 20 years old. The U.S. EPA has focused on boiler/steam generator component replacement projects in its recent enforcement actions, applying New Source Review ("NSR") standards to repairs formerly considered routine maintenance, repair, or replacement. The potential regulatory consequences of the EPA's enforcement actions may prevent the utility industry from taking full advantage of this relatively inexpensive way to increase the availability of our national electric generating capacity, which could be implemented in a two to three year time frame.

The U.S. electric generating system's reserve margins have declined dramatically over the last 20 years. This situation has put pressure on the operators of our existing coal-fired fleet to restore, maintain, or improve the reliability and availability of their facilities to keep pace with the growing demand for electricity in the face of limited new capacity coming on line. The mandate for higher availability, lower forced outage rates, and longer time spans between planned outages is more critical today than ever in our history.

The causes of plant unavailability are well defined, and sound, technology-based solutions are commercially available to improve plant availability and help restore our historic reserve margins.

Causes of plant unavailability and recommendations for solutions have been generally categorized according to the magnitude of their impact on plant availability in the following list:

Area 1: Boiler/Steam Generator
The primary cause of unavailability of our coal-fired plants is the reliability of the boiler/steam generator. Severe duty on both the fire side and the water/steam side of the various heat transfer surfaces in the boiler/steam generator cause frequent unplanned outages and lengthening of planned outages to repair

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failures to these critical components of the power plant. Replacement of these components will significantly reduce outages and increase the facility's availability and total generation output capability. Examples of our recommendations for improving the availability of the boiler/steam generator are:

a. furnace wall panel replacements;
b. reheater component replacements;
c. primary superheater component replacements;
d. secondary superheater component replacements;
e. economizer replacements;
f. various header replacements;
g. furnace floor replacements;
h. cyclone burner replacements; and
i. incorporation of improved materials of construction for items a-h.

This area represents between 50% and 70% (depending on age, design, and operating history of the unit) of all lost generation from our coal-fired fleet. The industry data sources referenced above indicate that if improvements to the boilers/steam generators on our plants that are older than 20 years can be made to restore these facilities to the condition of plants that are under 20 years, we will benefit from an attendant improvement in reliability/availability. To help quantify this finding, plants older than 20 years are, on average, currently experiencing nearly 10% loss of achievable generation due to problems in the boiler/steam generator. This compares to approximately 5% loss for plants that are less than 20 years old. If we can recover only this differential through restoration of the boiler/steam generator, we will be taking advantage of nearly 9,000 MWs of available generation capacity in our existing coal-fired generating fleet. This figure is expected to increase significantly as our older generating units are dispatched more often to meet the growing demand for electricity considering the less than adequate new capacity coming on line.

Although the implementation of any (or all) of these recommendations will significantly increase plant availability, recent regulatory treatment of previously routine repairs, maintenance, and replacement as modifications by the EPA discourages utilities from pursuing these kinds of projects in their future plans for availability improvement for fear of triggering NSR with accompanying permitting and modeling requirements. NSR can radically undermine the economic feasibility of these projects, preventing recapture of lost generating capacity or increased reliability.

Area 2: Steam Turbine/Generator

Problems with the steam turbine/generator represent the second largest source of reduced generation capability in coal-fired plants. This area represents a 3% loss of generation compared to up to 10% for the boiler/steam generator. An interesting finding from our analysis is that the data sources referenced above show very little difference in loss of generation capability due to turbine/generator problems between plants older than 20 years and plants younger than 20 years. This phenomenon may be due to the regimented safety and preventative maintenance program typically mandated by turbine manufacturers and followed by plant owners for the steam turbine/generator.

Section 2 describes turbine/generator improvements (e.g., uprating) that can change gross plant outputs without changing the turbine/generator's relatively good track record on availability. In addition to turbine uprating, some of the general improvements that have occurred in steam turbine design will also improve the availability/reliability of existing steam turbines. Recommendations include:

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a. turbine blading replacements with improved shapes (CFD modeling) and materials of construction to increase turbine efficiency and reliability;
b. implementation of measures to reduce or eliminate droplet formation and the resultant blade erosion preserving turbine reliability and performance; and
c. turbine/generator inclusion in plant diagnostic and data acquisition system for predictive maintenance (reference area 7c below) to reduce unnecessary maintenance and associated outage time.

Area 3: Plant Auxiliaries
This area focuses on plant auxiliaries including the air heater, feedwater system, cooling water systems, electrical systems, etc. Plant auxiliaries cause approximately 1-2% of lost megawatt-hour (MWh) generation from our coal-fired plants over 20 years old. This can be improved to under 1% with restoration of critical components in this area of the plant. Some examples of recommendations for improved reliability and increased operating efficiencies in these areas are:

a. air heater or air heater basket replacement with the attendant modern sealing systems;
b. improved air heater surface design and cleaning system installation to address fouling;
c. feedwater heater retubing or replacement with upgraded materials to reduce failure rates; and
d. cooling tower fill improvements.

Area 4: Environmental (Focus on Electrostatic Precipitators)
Precipitator performance has the fourth largest impact on loss of plant availability. This problem almost always manifests itself in the form of load curtailment caused by the potential for opacity excursions. To exacerbate the problem, these curtailments typically occur at very critical capacity supply situations such as periods with high load requirements. Recommendations for mitigation are:

a. collection plate and electrode upgrades and/or replacement;
b. collection surface additions (new fields);
c. various flue gas treatment system installations;
d. addition of modern control system installations; and
e. general correction of leakage and corrosion problems.

Area 5: Fuel Flexibility
Many utilities have expanded their coal purchase specifications to leverage the variability in the cost of coal as a means of providing low-cost electricity to their customers. This practice, however, can have an adverse affect on plant reliability due to stress on the plant. It should be noted that although this area is not statistically recognized as a cause of loss of plant availability, fuel related problems are a major part of loss of availability from Area 1 "boiler/steam generator" due to such phenomena as boiler slagging/fouling, limited pulverizer throughput, reduced coal grindability, inadequate primary air systems, etc. Recommendations to reduce or eliminate these limitations are:

a. coal handling system upgrades to accommodate lower Btu coal;
b. mill upgrades to accommodate reduced grindability of coal;
c. ash (bottom and/or fly) system upgrades to accommodate higher ash coal or different ash classes;
d. additional furnace-cleaning equipment to mitigate different slagging and fouling characteristics of the coals;
e. draft system upgrades including FD fans, ID fans, combustion air temperature, and related electrical systems to accommodate higher gas volume flow rates, and

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f precipitator upgrades to accommodate changes in fly ash resistivity and/or quantity.

Area 6: Boiler Water Treatment

This issue goes hand-in-hand with Area 1 described above. Performance of boiler heat transfer surface is highly dependent on the chemistry of the water/stream that keeps the surface cool. Upgrades of the boiler water treatment system should be coordinated with the upgrades described in Area 1. An added benefit of higher water purity standards is faster plant start-ups; and, therefore, a unit can come on-line more quickly and ramp up generation faster resulting in a higher overall generation output. In addition, water purity has a cascading effect increasing the reliability of feedwater heaters and turbine blades and improving condenser performance.

Area 7: Controls and Plant Diagnostic Systems

Modern digital control and diagnostic systems can improve heat rates (generation efficiency), lower emissions, reduce plant startup times, and provide valuable information for outage planning. Recommendations in this regard include:

a. replacement of outdated analog control with advanced digital control systems;
b. replacement and/or addition of instrumentation for better control of the unit over a wider range of loads and improved monitoring of critical system components for outage planning;
c. installation of plant diagnostic and data acquisition systems to perform predictive maintenance reducing unplanned outages and extending on-line time durations between planned outages; and
d. installation of turbine bypass system hardware and controls to facilitate lower load capabilities, faster unit start-ups and faster ramp rates increasing overall unit productivity.

Area 8: Plant Heat Rejection

For many plants, the highest capacity requirements of the year occur at the same time that they experience severe heat rejection limitations. Summertime cooling lake and river temperatures/water levels can cause load curtailments. Recommendations include:

a. water intake structure modifications to provide more flexibility during low water levels;
b. cooling tower additions to provide an alternate heat rejection mechanism; and
c. cooling lake design modifications (additional surface, redirected flow path, etc.) to increase heat rejection capability.

Summary

Restoration of our 20+-year-old coal-fired plants to a condition similar to those that are under 20 years through the recommendations described in these eight areas can create approximately 10,000 MWs of additional availability from existing assets. We would expect this number to grow significantly as we increase utilization of our older plants to meet growing demand. Without implementing these recommendations, the forecasted increases in utilization will accelerate failures in these older facilities increasing the need for the recommendations we have identified here.

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Of particular interest is that 90% of the increased availability identified will come from component replacement and other projects involving the boiler/steam generator. The boiler/steam generator has been the focus of the EPA's allegations in its recent reinterpretation of the New Source Review program as part of its power plant enforcement initiative.

Increasing Generation Output of Existing Units

The maximum demonstrated generating capacity (MDGC) of coal units older than 20 years, as identified above, is conservatively estimated to total approximately 220,000 MWs. The existing operating capacity is estimated to be 200,000 MWs (due to deratings). This group of plants has the potential for both capacity restoration (20,000 MWs) and/or capacity maximization (20,000 MWs). Thus, the total amount of potential increased MW output of this existing group of units is approximately 40,000 MWs. This increased capacity could be achieved within 36 months.

If all existing conditions resulting in a derating could be addressed, approximately 20,000 MWs of increased capacity could be obtained from regaining lost capacity due to unit deratings. This increase would be achieved using the approaches and techniques in Table 1 below.

Approximately an additional 20,000 MWs of capacity could be gained if it were possible to increase heat input and/or electrical output from generating equipment while still maintaining the acceptable design margins and allowable code ratings of the equipment. The approaches and techniques would be similar to those for regaining capacity, as indicated in Table 1.

These approaches and techniques could only be logically pursued by the facility owners if it was clearly understood that the increased availability and/or electrical output would not trigger New Source Review (NSR) and if repowering or construction of new clean coal technologies would be subject to the streamlined permitting authorized by the 1990 CAA Amendments.

The techniques to recover lost capacity and to increase capacity above MDGC have been collected from a combination of research studies by utility industry organizations (such as EPRI) and actual case studies (such as those outlined below) which had benefits for plant owners. They are summarized in Table 1 below.

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TABLE 1
Techniques and Approaches for Coal-Fired Power Plants Capacity Restoration and Increase

Capacity Increase Method	Capacity Restoration	Efficiency/ Capacity Increase	Fuel Conversion/ Repowering
Installation of improved air pollution control equipment	X	X	X
Steam turbine modernization improvements and upgrades	X	X	
Coal washing	X	X	
Coal switching	X	X	
Repowering with CFB technology			X
Consolidation of multiple, smaller inefficient units to larger, more efficient units		X	X
Operating above the nameplate but within the plant design	X	X	
Control system improvements	X	X	
Plant efficiency improvements	X	X	

The techniques and approaches listed in Table 1 have been implemented with proven results. The following highlights are from case studies.

- *SCR and FGD emissions control equipment was installed on a coal- fired generating station to reduce emissions of SOx and NOx. In order to offset the increased auxiliary load (16 MWs) of these new systems, an upgrade of the original 500-MW (nominal rating) steam turbine was performed. The upgrade consisted primarily of a new high-efficiency, high-pressure rotor with increased number of stages and an optimized steam path. The upgrade resulted in an output increase of approximately 15 MWs, almost offsetting the auxiliary load increase from the new emission controls.*
- *Turbine upgrades were completed on two 400-MW rated units to obtain an additional 25 MWs per unit. No additional steam was required from the boiler. No changes were made to the boiler. A more aerodynamic steam path through the turbine was designed and installed.*
- *Turbine upgrades were incorporated into another unit, nominally rated at 300 MWs achieving an additional 25 MWs. In this case, more steam had to be generated in the boiler and the steam turbine was upgraded.*
- *Coal cleaning is a process whereby a coal that is high in ash and sulfur is "washed." As a result, the coal is lower in both ash and sulfur content and higher in thermal value. The method consists of a multi-circuit wet process where water is used for screening and separation. Coal cleaning is a cost-effective means of separating ash and sulfur from coal, which in turn reduces opacity and SO_2 emissions. This enables one facility to continue to use local, lower cost, higher ash and sulfur coal and meet environmental limits. Without this coal cleaning process, the facility's load would be limited by approximately 10% due to opacity restrictions.*
- *Coal switching is an alternative to coal cleaning. In some cases where coal has been switched to reduce SOx emissions, the capacity may be impaired unless fuel handling systems are upgraded to allow efficient use of lower sulfur fuels.*
- *Repowering with CFB technology is an alternative to installing NOx and SOx emissions equipment. The use of this technique is highly site and fuel specific.*
- *Capacity increases can be accomplished by taking a brownfield site with several smaller old units, and repowering the site with a single large unit. This will require the full environmental permitting*

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process. It is a technique that is highly site specific and economically driven. To make the economics attractive, it is important that the units are running at low dispatch levels, so income losses are minimised, and the site can be readily cleared for construction of the larger unit.

- *Control system improvements can increase capacity in older plants. Modern control systems can improve efficiency and reduce emissions by optimizing the combustion process. General improvements to plant efficiency can be obtained by improved operating and maintenance practices along with targeted equipment improvements.*

Note: The additional 20,000 MW that can be achieved by capacity restoration described in this section includes the 10,000 MW of capacity that can be recovered due to deteriorated availability described earlier in the report.

Opportunities for Greenfield Sites and Repowering Existing Facilities with Pulverized Coal Power Generation

As a result of ongoing technology development, new and retrofitted pulverized coal power plants have achieved outstanding emissions performance for NOx, SOx, and particulates. Similarly, continued advances in the steam cycle continue to provide higher net plant efficiencies. As a result, new pulverized coal-fired power plants are now commercially available with minimal emissions and with very favorable total production cost. Repowering of an old existing coal-fired power plant with a single modern generating unit equipped with commercially proven emissions controls results in significant reductions in total tons of emissions, even while substantially increasing the total megawatt-hour output of the facility. A case study of repowering an actual old coal-fired plant with a unit utilizing current technology showed a 32% higher design capacity, achieving triple the total electrical output, an 87% reduction in tons of NOx and SOx up the stack, and a 42% reduction in total electricity production costs.

Pulverized Coal Technology Options

The configuration of today's state-of-the-art pulverized coal power plant is primarily dependent on the sulfur quantity of the coal to be utilized.

Low sulfur coals will most economically utilize a dry scrubber and baghouse for SO_2 and particulate control. Wet scrubbers can also be utilized with the benefit of producing a useful byproduct (gypsum).

Higher sulfur coals will utilize a wet scrubber and precipitator or baghouse for SO_2 and particulate control.

NOx emissions will be controlled by both Low NOx Burners (LNB)and Selective Catalytic Reduction (SCR).

The boiler/turbine steam cycle will vary from a standard subcritical cycle to an advanced supercritical cycle depending on project requirements and fuel costs.

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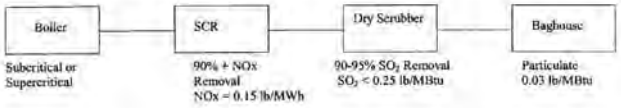
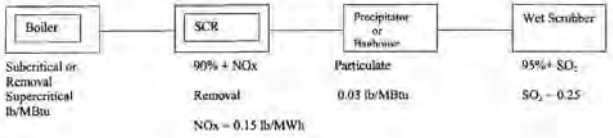
Example: Low Sulfur Coal Configuration with representative emissions performance.

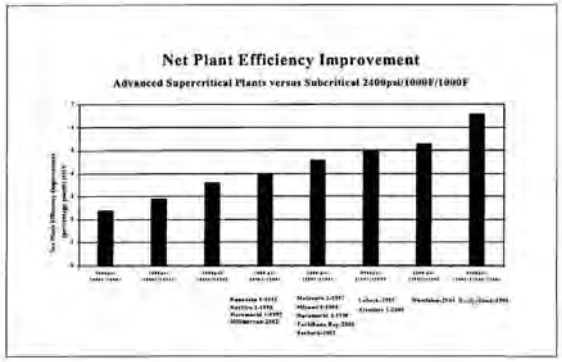


Example: High Sulfur Coal Configuration with representative emissions performance.



Heat Rate

Over the last 10 years, higher efficiency pulverized coal plants have been placed in commercial operation. The higher efficiencies are due not only to advanced pressure and steam cycles, but also to improvements in turbines and reductions in auxiliary power requirements. Pulverized coal power plant heat rate improvements versus steam parameters are shown below. (The actual operating plants have steam parameters close to the examples under which they are listed.)



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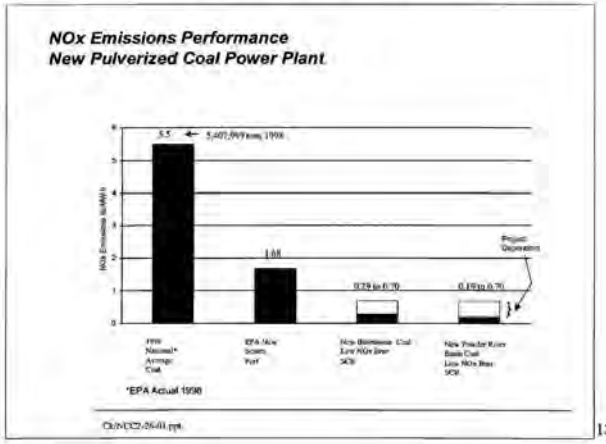
The summary point is that higher efficiency cycles are now being demonstrated with commercially required availability/reliability. Higher efficiency cycles will reduce the production cost by reduced fuel consumption and will result in a lower capital cost for all of the environmental equipment (on a $/kW cost basis). The ambient air emissions levels (NOx, SOx, particulate, and mercury) will primarily be a function of the emissions control devices installed (SCR, scrubber, baghouse, etc.). More efficient plants will provide an emissions reduction as well. For the U.S. market, the economically optimum cycle efficiency will be very project specific. However, today's advanced cycles have been demonstrated commercially and can be applied where project economics dictate.

Emissions Performance

NOx
Significant improvements in NOx emissions are being achieved in pulverized coal-fired power plants today. This is through both advances in Low NOx Burner Combustion technology and advances in Selective Catalytic Reduction systems, both of which are being widely applied. Low NOx Burner Combustion technology has resulted in combustion NOx levels being in the range of 0.15 to 0.30 lb/MBtu, depending on the coal. Selective catalytic reduction systems are in operation with NOx removal efficiencies up to 90-95%. An existing plant retrofit this year with an SCR will result in NOx emissions of approximately 0.30 lb/MWh, (approximately .03 lb/MBtu which is lower than the best natural gas combined cycle unit utilizing dry Low NOx Combustion, according to the most recent EPA actual operating data).

New pulverized coal power plants, through the application of commercially demonstrated Low NOx Burners and SCRs, can achieve NOx emissions as shown in the table below. In order to compare NOx emissions with natural gas-based power generation, the performance is reported in lb NOx per MWh.



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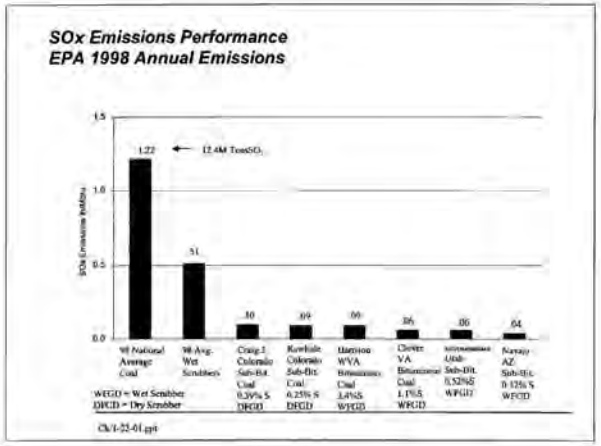
The NOx emissions performance represented in this section of the report and in the two case studies is derived from applying the state of the technology, Low NOx Burners, with the state of the technology Selective Catalytic Reduction Controls. These are applied to representative Eastern and Western coals and typical project parameters. The actual NOx emissions that can be obtained from a given new coal-fired project will depend on the analysis of the actual coal to be burned. It will also depend to some extent on the local ambient air conditions and condenser water availability and temperatures, which will impact the available heat rate of the cycle. The actual achievable NOx emissions rate for a given project can only be determined after the specific project and fuel parameters have been defined.

It should also be noted that this section of the report only addresses new, coal-fired generating plants. Whereas significant NOx reductions can be achieved from retrofits to an existing coal-fired generating unit, in many cases constraints from the original furnace design or other project constraints that cannot be modified will result in it not being possible to achieve the same NOx reductions on a retrofit as will be available for a greenfield generating unit that has maximum design flexibility for the boiler and environmental equipment.

SOx
Similarly, outstanding performance is being demonstrated on low SOx emissions technology, from a number of pulverized coal-fired power plants ranging from high sulfur Eastern bituminous coals to low sulfur Western coals. The graph shown below reflects actual SOx emissions from a number of coal-based power generating facilities as reported in the EPA 1998 Annual Emissions. In summary, the technology is available and is being commercially demonstrated to achieve extremely low SO_2 emissions.



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Particulate
High efficiency precipitators and baghouses are routinely achieving particulate emissions levels under .020 lb/MBtu.

Mercury
Significant mercury removal research from pulverized coal power plants has been underway over the last 10 years. In 2001, this will culminate in plant demonstrations for Advanced Mercury Removal Systems at Alabama Power's Gaston Station, Michigan South Central's Endicott Station, and Cinergy's Zimmer Station. These demonstrations are aimed at positioning coal-fired power plants for the announced future regulation of mercury emissions. Additionally, aggressive research and plant demonstrations are underway to substantially reduce mercury emissions.

Pulverized Coal Power Plant Applications

Following are two cases, which illustrate the impact of building new pulverized coal power generation plants.

1. Greenfield site or addition of a new generating unit to an existing power plant. This case shows typical plant efficiencies, emissions levels, electricity produced, and production costs for new pulverized coal power plants for both a low and high sulfur coal options.

2. Repowering of an old existing pulverized coal-fired power plant.

This case examines the performance emissions and production cost of repowering an entire old, coal-fired power plant consisting of multiple old, low-efficiency units that have high emissions rates with a single modern pulverized coal-fired generating unit.

Case 1

This case examines the efficiency, emissions performance, and production cost for adding a new coal-fired generating unit, either to a Greenfield site or to an existing power plant. Performance is shown for both an eastern bituminous coal and a Powder River Basin Coal Plant.

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TABLE 2
New Pulverized Coal Power Plant

		Low Sulfur PRB Coal		High Sulfur Bit. Coal	
Coal Heating Value	Btu/lb	8,000		12,500	
Coal % Sulfur	%	0.4		3.5	
Steam/Turbine Cycle		Supercritical	Subcritical	Supercritical	Subcritical
Net Plant Heat Rate	Btu/kWh	8900	9600	8500	9200
Net Plant Efficiency	HHV	38.3%	35.6%	40.1%	37.1%
Net Plant Efficiency	LHV	41.6%	39.8%	42.2%	39.0%
		Emissions - Ranges			
Combustion NOx	lb/Mbtu	0.20 to 0.40	same	0.40 to 0.50	same
SCR % NOx Removal	%	80 to 90	same	85 to 92	same
Outlet NOx	lb/Mbtu	0.020 to .080	same	0.032 to .075	same
Outlet NOx @ 3% O_2	ppm	14 to 58	same	23 to 54	same
Outlet NOx @ 15% O_2	ppm	5 to 20	same	8 to 18	same
Outlet NOx	lb/MWh	.18 to .70	.19 to .75	.28 to .66	.29 to .69
Uncontrolled SO_2	lb/Mbtu	1.0	same	5.6	same
Scrubber % SO_2 Removal	%	90	same	95	same
Outlet SO_2	lb/Mbtu	.10	same	.28	same
Outlet SO_2	lb/MWh	.89	.96	2.38	2.58
Coal Cost	$/MBtu	1.22	1.22	1.22	1.22
Fuel Production Cost	$/MWh	10.86	11.71	10.37	11.22
Non-Fuel O&M Cost	$/MWh	3.50	3.50	3.50	3.50
Total Production Cost	$/MWh	14.36	15.21	13.87	14.72

Total Production Cost
The curve below shows the variable production cost (Fuel + O&M, excluding capital investment costs) for all the coal-fired power plants in the U.S. in 1998 (UDI data).

The curve is a plot of the variable production cost of every coal-fired power plant, ranked from the lowest to the highest. It only shows the fuel and O&M cost, and not the sunk capital costs. This would also indicate the relative order of competitive dispatch.

Also shown on the curve is the variable production cost for the two plants discussed in the case studies. This shows that the total production costs for a new pulverized coal plant will be significantly lower than most of the existing coal fleet and will assure high capacity factors.

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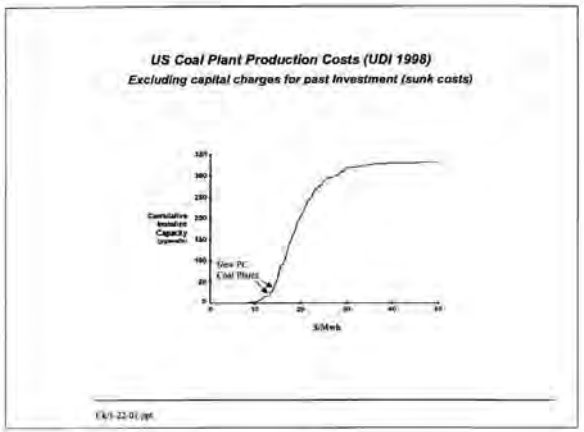
Case 1



Total Emissions Level
The total NOx and SOx emissions are significantly lower than what is being achieved in the existing coal-fired power plants today.

Total Emissions Performance
Table 3 (below) places a value on the total NOx and SOx emissions based on assumed allowance values for the examples in this case. To illustrate the low emissions level, the total outlet NOx and SOx emissions are given a monetary cost based on assumed allowance costs. When the emissions costs are stated as a production cost in $/MWh, it can be seen that these do not change the very favorable total production cost of electricity.

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TABLE 3

		Low Sulfur PRB Coal		Eastern Bituminous Coal	
		Supercritical	Subcritical	Supercritical	Subcritical
NOx Allowance Value (assumed)	$/ton	1000	1000	1000	1000
Outlet NOx	lb/MWh	.18	.19	.28	.29
NOx Allowance Cost	$/MWh	.09	.10	.14	.15
SOx Allowance Value (assumed)	$/ton	200	200	200	200
Outlet SO_2	lb/MWh	.89	.96	2.38	2.58
SOx Allowance Cost	$/MWh	.09	.10	.24	.26
Total Emission Allowance Cost	$/MWh	.18	.20	.38	.41

Case 2: Coal Power Plant Repowering

This case considers the repowering of an existing Eastern U.S. coal-fired power plant, burning low sulfur Eastern bituminous coal. The plant consists of six generating units that were built between 1949 and 1956, with a composite average net plant efficiency of 29.4%. The total gross generating capacity from all six units is 387 MW. The plant has no emission controls for NOx and SOx except for Low NOx Burners on one of the units.

The plant is repowered by replacing the boiler and turbine islands for all six units with a single 506-MW supercritical boiler/turbine, with an average net plant efficiency of 38.8%. The plant's coal receiving and handling, ash disposal, and electrical distribution infrastructure is retained where possible. The repowered unit is redesigned for the same heat input as the original six units; Low NOx Burners, an SCR, a dry SO_2 scrubber, and baghouse are added. The same coal is used in the repowered unit as is currently being burned.

Table 4 shows the actual operating performance from this plant for 1998 and the projected repowered performance in 2004.

In summary, with the plant repowered at the same heat input, it will now be rated at 31% higher megawatt output and operating efficiency. Both the NOx and SOx emissions will be reduced by 87% of the actual 1998 emissions in tons. The total production cost per megawatt-hour will be reduced 42%. Because of the low production cost, the unit will be base loaded with a high capacity factor, which will result in more than triple the actual megawatt hours produced during the year.

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TABLE 4
Case 2
Repowering Existing Coal Plant

	Existing Plant 1998 Actual Operating Data	Repowered 2004 Performance	Improvement %
Design Plant Total Heat Input MBtu/hr	4140	4140	
Nameplate MW	387	506	
Total # of Units	6	1	
Total Actual MWh	1,082,180	3,544,296	+327%
Total Actual Capacity Factor	31%	85%	
Heat Rate - Annual Average Btu/kWh	11,594	8,800	
Average Plant Efficiency HHV	29.4%	38.8%	+32%
Average Plant Efficiency LHV	30.9%	40.8%	
NOx Tons – annual	3536	468	-87%
NOx Emission Rate lb/MBtu	0.509	.03	
NOx Emissions Rate lb/MWh	5.9	0.26	
Coal % S	1.08	1.08	
SOx Tons Annual	12,881	1565	-88%
SOx Emissions Rate lb/MWh	23.8	0.88	
Fuel Cost $/MBtu	1.05	1.05	
Fuel Production Cost Annual Avg $/MWh	12.18	9.26	
Non-Fuel (OEM) Production Cost Annual Average $/MWh	9.87	3.57	
Total Production Cost $/MWh	$22.04	$12.83	-42%

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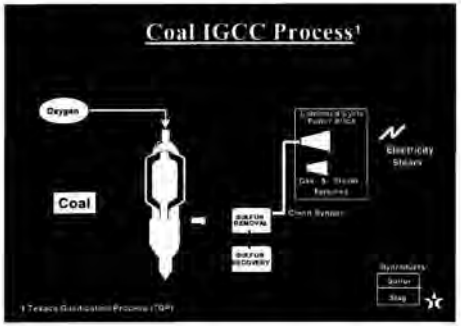
Opportunities for Greenfield Sites and Repowering Existing Facilities with Coal-Based Power Generation

When considering coal-based technologies for both greenfield applications and repowering of existing facilities, utilities have several primary options to consider. In addition to the modern pulverized coal technologies described earlier, integrated gasification combined cycle (IGCC) has become a viable, commercially available technology. With successes from the Clean Coal Technology Program in both new and repowered projects, much has been learned about IGCC performance, heat rate, cost, and emissions performance. This information, which has been widely published, has become an important tool for evaluation of this technology by electric utilities.

IGCC Technology Options

The diagram below shows a typical IGCC plant. The coal gasification process replaces the conventional coal-burning boiler with a gasifier, producing syngas (hydrogen and carbon monoxide) that is cleaned of its sulfur and particulate matter, and used as fuel in a gas turbine. The power generation cycle is completed through the use of the Heat Recovery Steam Generator (HRSG) and steam turbine, just as in a natural gas-fired combined cycle (NGCC) plant, offering the high efficiency and continual advances achieved with this equipment configuration.



The two primary technologies which have had the most success in the U.S. are Texaco's oxygen-blown, entrained-flow gasifier (Tampa Electric Company's Polk Power Station, a greenfield plant) and the Global Energy E-Gas (formerly Destec) oxygen-blown, entrained-flow gasifier (Cinergy/PSI Energy's Wabash River Station, a repowering project at an existing power plant).

In the Texaco gasification process, a down-flow slurry of coal, water, and oxygen, are reacted in the process burner at high temperature and pressure to produce a medium-temperature syngas. The syngas moves from the gasifier to a high-temperature heat recovery unit, which cools the syngas while generating

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high-pressure steam. The cooled gases flow to a water wash for particulate removal. Molten ash flows out of the bottom of the gasifier into a water-filled sump where it is forms an inert solid slag. Next, a COS hydrolysis reactor converts COS into hydrogen sulfide. The syngas is then further cooled in a series of heat exchangers before entering a conventional amine-based acid gas removal system where the hydrogen sulfide is removed. The sulfur may be recovered as sulfuric acid or molten sulfur. The cleaned gas is then reheated and sent to a combined-cycle system for power generation.

The Global Energy E-Gas process uses a slurry of coal and water in a two-stage, pressurized, upflow, entrained-flow slagging gasifier. About 75% of the total slurry is fed to the first (or bottom) stage of the gasifier. All the oxygen is used to gasify this portion of the slurry. This stage is best described as a horizontal cylinder with two horizontally opposed burners. The gasification/oxidation reactions take place at temperatures of 2,400 to 2,600°F. Molten ash falls through a tap hole at the bottom of the first stage into a water quench, forming an inert vitreous slag. The hot raw gas from the first stage enters the second (top) stage, which is a vertical cylinder perpendicular to the first stage. The remaining 25% of the coal slurry is injected into this hot raw gas. The endothermic gasification/devolatilization reaction in this stage reduces the final gas temperature to about 1,900°F. The 1,900°F hot gas leaving the gasifier is cooled in the fire-tube product gas cooler to 1,100°F, generating saturated steam for the steam power cycle in the process.

Particulates are removed in a hot/dry filter and recycled to the gasifier. The syngas is further cooled in a series of heat exchangers. The syngas is water scrubbed to remove chlorides and passed through a COS hydrolysis unit. Hydrogen sulfide is removed in the acid gas columns. A Claus unit is used to produce elemental sulfur as a salable by-product. The clean syngas is then moisturized, preheated, and sent to the power block.

In Europe, Global Energy has successfully used the British Gas/Lurgi (BGL) gasification process. In the BGL process, the gasifier is supplied with steam, oxygen, limestone flux, and coal. During the gasification process, the oxygen and steam react with the coal and limestone flux to produce a raw coal-derived fuel gas rich in hydrogen and carbon monoxide. Raw fuel gas exiting the gasifier is washed and cooled. Hydrogen sulfide and other sulfur compounds are removed. Elemental sulfur is reclaimed and sold as a by-product. Tars, oils, and dust are recycled to the gasifier. The resulting clean, medium-Btu fuel gas is sent to a gas turbine. Based on the success of the BGL process at the Schwarze Pumpe GmbH plant in Germany, Global Energy is building two plants in the U.S. The 400-MW Kentucky Pioneer Project and the 540-MW Lima Energy Project will both use BGL gasification of coal and municipal solid waste to produce electric power. The Kentucky project is being partially funded by DOE.

Heat Rate

DOE reports the Polk Power Station heat rate to be 9,350 Btu/kWh, with Wabash River at 8,910 Btu/kWh. These equate to about 38.4% and 40.2% (LHV) respectively. Overall IGCC plant efficiency of 45% LHV is likely to be demonstrated with the enhancements developed from the Clean Coal Technology Program projects and continued advances in gas turbine technology. As part of its Vision 21 Program, DOE has set a 2008 performance target of 52% on an HHV basis (about 55% LHV) for IGCC.

Emissions Performance

With gas becoming the fuel of choice for most new units, permitting agencies and environmental groups have become used to seeing very low emission limits for new units. Further, they have come to expect that repowering existing units should also meet those same low levels, regardless of economics or fuel choice. IGCC can approach the environmental performance of natural gas-fired power plants, opening the door for its application in new and repowered plants. As part of the Vision 21 Program, DOE has set a

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2008 performance target of 0.06 lb/mmBtu for SO_2, 0.06 lb/mmBtu for NOx, and 0.003 lb/mmBtu for particulate matter.

Conventional power plants that are candidates for repowering are typically 40-50 years old. Historically, the small upgrades and modifications that were made to maintain capacity or increase efficiency did not subject the utility to the New Source Review (NSR) process. With EPA's coal-fired power plants enforcement activities, many utilities are under enforcement pressure to meet very strict NSR limitations for SO_2, NOx, and particulates. Compliance with these limitations usually means retrofit with flue gas desulfurization (FGD) for SO_2 control, selective catalytic reduction (SCR) for NOx control, and possibly even upgrades to the electrostatic precipitator for increased particulate control. With such units being near the end of their economically useful lives, adding additional controls may not make economic sense for a unit that may be shut down in a few years.

Repowering with IGCC allows the utility to maintain or increase capacity, while significantly improving environmental performance and producing low-cost power. The coal gasification process takes place in a reducing atmosphere at high pressures. In the gasifier, the sulfur in the coal forms hydrogen sulfide, which is easily removed in a conventional amine-type acid gas removal system. The concentrated hydrogen sulfide stream can then be recovered as elemental sulfur or sulfuric acid, and sold as a commercial byproduct, eliminating the need to dispose of large amounts of combustion byproducts. The clean syngas is sent to the gas turbine to be burned. With the addition of nitrogen into the turbine for power augmentation, the combustion flame is cooled, minimizing NOx formation and eliminating the need for SCR.

Many existing coal-fired plants are also affected by the NOx SIP call, and utilities are facing the installation of SCR on these existing units in order to comply. With changes in utility regulation, and the age of the units, the economics of these retrofits presents a challenge to continued operation of the units. Further, the possibility of stricter limitations on SO_2 or other emissions in the next few years presents another layer of economic decisions. While the unit may still be economic to dispatch following the installation of SCR, the addition of FGD may not allow that to continue. In that case, the utility would face the stranding of its SCR assets after only a few years of operation. Repowering with IGCC would provide the utility with the ability to maintain or even increase capacity, meet NOx limitations, and prepare for stricter SO_2 emission limitations.

While the retrofit of emission controls reduces emissions, it leads to secondary environmental issues, such as the large amounts of land needed to dispose of the new FGD byproduct and groundwater protection. The SCR system raises issues regarding local exposure to risks of accidental release of ammonia and disposal of the SCR catalyst.

In the gasifier, the ash in the coal melts, and is recovered as a glassy, low permeability slag which can be sold for use in making roofing shingles, as an aggregate, for sandblasting grit, and as an asphalt filler. With the sulfur also recovered as a commercial byproduct, repowering with IGCC can eliminate the solid waste issues that utilities might face when retrofitting conventional coal-fired plants with FGD and SCR.

With EPA's recent determination to regulate mercury emissions from coal-fired units, utilities will face additional potential requirements for the retrofit of control equipment. With the reducing atmosphere, and by operating a closed system at high pressures, IGCC releases of mercury are minimized. Initial information from EPA's mercury-based Information Collection Request shows promising results for IGCC, with as much as 50% of the mercury in the coal feedstock reduced or removed, much of it bound in the slag and sulfur byproducts.

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Another issue that utilities will potentially face in the near future is the need to reduce CO_2 emissions. The existing coal-fired fleet in the U.S. is responsible for about one-third of all of the CO_2 emissions. While automobiles and other industries make up a large portion of U.S. CO_2 emissions, coal-fired power plants are an easier target to identify, measure, and control. Due to its high overall efficiency, repowering an existing coal-fired power plant with IGCC can reduce CO_2 emissions by as much as 20%.

Overall, repowering with IGCC provides a utility with significant increases in environmental performance. By reducing SO_2 and NOx emissions, minimizing solid waste disposal issues, and addressing potential near-term emission limitations for mercury and CO_2 repowering with IGCC allows the utility to move forward with the knowledge that it has addressed environmental issues effectively. For capacity additions and repowering over the next five years, IGCC is an option that utilities can seriously consider.

IGCC Power Plant Applications

Recent History and Applications

Coal gasification technology has been used for over a hundred years. The production of town gas worldwide is a simple form of gasification. Coupling this proven technology with efficient combined cycle technology was seen as a way to enjoy the advantages of using low-cost coal with the high efficiency of combined cycle technology. The 100-MW Cool Water IGCC project, which went in service in 1984, was the first commercial-scale demonstration of IGCC. That project was done in a consortium of EPRI, Southern California Edison, Texaco, GE, Bechtel, and others. The plant operated for more than four years, achieving good performance, low emissions, and developing a base of design for full-scale IGCC plants.

Since then, IGCC technology has improved greatly through DOE's Clean Coal Technology program. The Wabash River IGCC Project and Polk Power Station IGCC Project are in operation as a part of this program. Installations in other countries include the Buggenum plant in the Netherlands and the Puertollano plant in Spain. IGCC performance and reliability continues to see significant improvements. In the fourth year of operation of Tampa Electric's Polk Power Station, the gasifier had an on-stream factor of almost 80%, a considerable improvement over previous years. This project no longer suffers from the serious problems encountered over the first three years, including convective syngas cooler pluggage, piping erosion and corrosion, and sulfur removal problems. The on-going pluggage problems in the convective syngas coolers have been resolved by modifying start-up procedures to minimize sticky ash deposits, and by making configuration changes in the inlet to the coolers to reduce ash impingement at the tube inlets. In the fourth year, the coal gasification portion of the plant became so reliable that the leading cause of unplanned downtime was not there, but rather in the distillate oil system for the gas turbine (problem has been addressed).

Reliable performance has also been achieved at the Wabash River plant. During 2000, the gasification plant reached 92.5% availability, with the power block at 95%. In fact, the gasification technology caused no plant downtime at all. Other areas of the plant, such as coal handling and the air separation unit were available more than 98% of the time.

IGCC for New and Repowered Plants

These examples show that IGCC has met the challenges of the Clean Coal Technology program. Further, with almost 4,000 MW of IGCC in operation worldwide, and another 3,000 MW planned to go into

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operation over the next four years, this technology is commercially proven and ready for the repowering market.

The U.S. now has about 320,000 MW of coal-fired power plants, just over one-third of all installed capacity. These coal-fired power plants generate over half of all of the electricity in the U.S. Many of these plants are over 30 years old, with some over 50 years of age. With a growing need for additional capacity in many parts of the country, and rising operation and maintenance costs on existing units, many utilities are looking hard at repowering with technologies that can increase capacity, while decreasing operation and maintenance costs.

Repowering with IGCC can meet those challenges. Repowering older, less efficient generating units with IGCC, results in capacity increases, lower production costs, higher efficiency, and environmental compliance. Since the IGCC plant uses coal as its feedstock, much of the existing coal-fired plant's coal handling and steam turbine equipment and infrastructure can be utilized, lowering the overall cost of repowering. With greater than 95% of the sulfur emissions removed, and further improvements in combustion turbine low-NOx burner technology, emissions of SO_2 and NOx now approach the performance of NGCC plants. By using low-cost and/or low-quality coals, the cost of electricity generated from a plant repowered with IGCC technology can meet or beat that produced by NGCC plants.

One of the key efficiency advantages comes with oxygen-blown IGCC technology. In this type of gasification system, air is first separated into its main constituents: oxygen and nitrogen. The oxygen is used in the gasifier, and the nitrogen is injected into the gas turbine, where it increases the mass flow through the gas turbine, increasing power output, and minimizing NOx formation during combustion. Efficiency increases through further integration can be realized by using extraction air from the gas turbine in other areas of the plant. Since this extraction air leaves the gas turbine at high temperature and pressure, it can be used to preheat boiler feed water. After the heat is removed, the cooled air, still at high pressure, is used to feed the air separation unit, reducing the amount of energy expended there to compress air.

A typical method of repowering an existing unit is to remove the coal-fired boiler and replace it with a gas turbine, re-using the steam turbine in combined cycle mode. In a combined cycle plant, the steam turbine usually provides about one-third of the total output. In a recent study conducted for DOE, a large number of plants with twin 150 MW units were identified as good candidates for repowering. There, the utility could repower one of the units with two 170 MW natural gas-fired gas turbines. The steam produced by the HRSGs for these units would power the existing 150 MW steam turbine, for a total of almost 400 MW.

A typical F class gas turbine produces about 170 MW when firing natural gas. At high ambient temperatures, output may fall to only 150 MW. In an IGCC plant, the syngas is fired in the gas turbine along with the nitrogen, providing significantly higher overall mass flow over a wide range of ambient temperatures. When firing syngas, this same F class gas turbine produces about 20% more output, reaching 190 MW or more. This additional capacity from firing syngas is valuable when additional peaking power is needed during hot, summer days. The additional exhaust flow results in more steam production in the HRSG, making up for steam uses in the gasification area. By firing syngas, the overall capacity is increased to almost 550 MW, more than tripling the capacity of the unit. Repowering the twin 150-MW unit could increase the overall capacity from the original 300 MW to almost 1,100 MW.

While the typical repowering study targets coal-fired boilers, existing NGCC units also provide a technical and economic opportunity for repowering with IGCC. In the case of NGCC units presently firing natural gas, rising fuel costs have lead to increases in the cost of producing electricity. This

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typically results in a lower capacity factor, and the unit generates fewer MW-hours and revenues. Given the inherent high efficiency of the gas turbines, and the ability to utilize low-cost coal, repowering with IGCC can turn an NGCC unit with a high dispatch price into a unit that dispatches at a much lower cost. As described above, the additional 20% capacity gained from firing syngas instead of natural gas can have significant economic value in areas where there is insufficient peaking power capacity.

IGCC technology has become a more attractive option for new capacity because:

- the technology has been successfully demonstrated at commercial scale in the U.S. and worldwide;
- the enhancements made by the companies operating these IGCC plants, as well as by the technology suppliers, have decreased the cost and complexity of IGCC, while at the same time substantially improving the efficiency and reliability; and
- the price differential between natural gas and coal has risen sharply over the last year.

Economics

The ability to repower units and gain the capacity increases noted in the previous section is a major economic driver for repowering with IGCC. Another advantage of repowering with IGCC is the ability to reuse a significant amount of the existing infrastructure at the plant. Areas such as buildings, coal unloading, coal handling, plant water systems, condenser cooling water, transmission lines, and substation equipment can be incorporated into the repowered IGCC plant. This helps to minimize the time for repowering and can reduce the overall cost by about 20%.

With uncertainty in the pace and extent of utility industry restructuring, as well as with changes in environmental regulations, utilities have been reluctant to make large capital expenditures for new capacity. Almost all of the capacity installed over the last few years has been natural gas-fired gas turbines and NGCC. With ongoing decreases in the cost per kW for NGCC technology, along with forecasts of low natural gas prices, NGCC has been the choice for almost all of the new planned baseload capacity in the U.S. Most of this new generation has been built and is being planned in states that have completed their electric utility industry restructuring, making for easier entry into power markets. Unfortunately, the greatest needs for new generation have been in California and the Southeast where deregulation has either been incomplete, inconsistent, or delayed.

With recent increases in the price of natural gas, and stability or even decreases in coal costs, the electric utility industry has renewed its interest in coal-based technologies. Announcements by Tucson Electric Power and Wisconsin Electric Power to build the first coal-fired power plants in years puts coal back in the picture for new capacity. One important result of the improved performance of existing IGCC plants has been an overall decrease in second-generation IGCC plant capital costs. If the current differential price between coal and natural gas continues or grows larger, the economics for repowering with IGCC will become even more attractive.

In the paper "EPRI Analysis of Innovative Fossil Fuel Cycles Incorporating CO_2 Removal," various power generation technologies were analyzed with and without CO_2 removal systems, in a study performed by Parsons. The allowable capital costs were analyzed to determine a break-even cost of electricity based on a range of gas prices. For IGCC, the break-even point with $5/mmBtu gas was found to be about $1,200/kW, dropping to about $1,000/kW with $4/mmBtu gas prices. As IGCC plant costs continue to decrease, it will become an even more serious choice for repowering. If CO_2 removal is required in the future, the costs shown in the study for CO_2 removal and the cost of producing electricity from IGCC will be competitive with NGCC at gas prices of only $3.70-4.00/mmBtu.

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Reducing Regulatory Barriers

The Clean Air Act ("CAA") imposes a number of regulatory burdens on the expansion of electric generating capacity. EPA's recent interpretations of several existing laws have led to confusion and perhaps additional burdens. Formally proposed EPA revisions to existing CAA programs may impose further burdens if they are adopted. These burdens impact three activities that increase U.S. generating capacity: (1) the construction of new units; (2) efficiency and availability improvements at existing units; and (3) the repowering or reactivation of existing units.

New Construction

The CAA provides two main programs to control emissions from new coal-fired sources: New Source Performance Standards ("NSPS") and New Source Review ("NSR"). Both programs are intended to require the adoption of controls at the time it is most economical to do so – when a new unit is designed and built.

A utility wishing to construct a new coal-fired generating station must comply with NSPS. NSPS require new sources to meet numerical emissions limitations based on the best technology that EPA determines has been "adequately demonstrated." EPA revises these standards periodically to reflect advances in emissions control technology.

In areas that are in attainment with National Ambient Air Quality Standards ("NAAQS"), a new major source also must comply with prevention of significant deterioration ("PSD") requirements. PSD rules require new sources to adopt the "best available control technology" ("BACT") and to undergo extensive pre-construction permitting. This includes air quality modeling and up to one year of air quality monitoring to determine the impact of the new source on air quality. EPA or state permitting authorities determine what type of control constitutes BACT on a case-by-case basis. BACT may require control beyond NSPS for that source category, but may not be less stringent than applicable NSPS.

A company that constructs a new major source near a "Class I" attainment area must satisfy additional requirements. Class I areas include most national parks, and federal land managers ("FLMs") are charged with protecting air quality in these areas. PSD rules require that FLMs receive copies of PSD permit applications that may impact air quality in Class I areas. In cases where the new source will not contribute to emissions increases beyond allowable levels for the attainment area (*i.e.*, beyond the PSD "increment" for that area), the FLM may still object to issuance of the permit based on a finding that construction of the source will adversely impact "air quality related values" ("AQRVs") (including visibility) for that area. The FLM bears the burden of making that adverse impact demonstration. If the state concurs with the determination, then a permit will not be issued. In cases where the new source would contribute to emissions beyond the PSD increment, the company must satisfy both the FLM and the permitting authority that the unit will not adversely impact any AQRVs, before the permit may be issued.

A company that constructs a new major source in a nonattainment area must satisfy NSR requirements similar to, but more stringent than, PSD requirements. Instead of adopting BACT, the source must adopt control as needed to meet the Lowest Achievable Emission Rate ("LAER") for that source category. LAER is based on the most stringent emissions limitation found in the state implementation plan ("SIP") of any state, or the most stringent emission limitation achieved in practice in the source category, whichever is more stringent. A new major source in a

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nonattainment area also must demonstrate that any new emissions caused by the source will be offset by greater emissions reductions elsewhere.

In July 1996, EPA proposed changes to these new source programs that would increase the burdens on the construction of new generating stations. EPA's proposal would give FLMs the authority to require companies to perform AQRV analyses even where their new units would not cause exceedence of the PSD increment. A company's PSD application would not be considered complete until it had completed these analyses. EPA's proposal also would transfer authority from EPA to FLMs to define AQRVs and determine what qualifies as an "adverse impact" on those values. These changes, as a whole, would increase the ability of FLMs to control the timing and eventual issuance of PSD permits. EPA also would require state and federal permitting authorities to adopt a "top down" method for determining BACT. Under this method, a PSD applicant must adopt as BACT the most stringent control available for a similar source or source category, unless it can demonstrate that such level of control is technically or economically infeasible. The effect of the policy is to make BACT more similar to LAER in the stringency of control required. The proposed rule is now under review by the Bush EPA.

Following another recent EPA determination, new sources may be required to meet technology-based emission limitations for mercury and other air toxics. On December 20, 2000, EPA indicated that it would regulate emissions of mercury and possibly other air toxics from coal- and oil-fired utilities under the CAA's maximum achievable control technology ("MACT") program. Depending on the basis for the determination, state and federal permitting authorities may be required to impose unit-specific MACT limits on new coal- and oil-fired units until a categorical federal standard is promulgated in 2004. As its name implies, MACT would require units to meet a numerical emissions limitation consistent with the use of the maximum control technology achievable for regulated pollutants.

New source permitting is a lengthy process. The permit must be issued within one year of the filing of a "complete" application. Developing a "complete" application, however, can take another year or longer, as a source negotiates with the permitting authority, FLM, and others regarding modeling, monitoring, control technology, AQRVs, and other issues. If the proposed revisions to the NSR rules are finalized and if case-by-case MACT determinations are required, this permitting process for new sources will take even longer. Even without these proposed revisions, it will be important to consider how this permitting process can be streamlined and expedited.

Efficiency/Availability Improvements at Existing Units

Utilities have many opportunities to increase electrical output at existing units without increasing fuel burn by improving efficiency or reducing forced outages through component replacement and proper maintenance. In some cases, utilities do so as a reaction to unexpected component failures (reactive replacement). In others, utilities replace worn or aging components that are expected to fail in the future or whose performance is deteriorating (predictive replacement). In some cases, utilities replace components because more advanced designs are available and would improve operating characteristics at the unit. Such component replacement can restore a unit's original design efficiency or, in some cases, improve efficiency beyond original design.

Babcock & Wilcox ("B&W"), industry experts on the construction, operation, and maintenance of coal-fired boilers, identify a number of components that electric generating stations typically replace or upgrade during their service lives to maintain or improve operations. These include

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economizers, reheaters, superheaters, furnace walls, burner headers and throats, and other assorted miscellaneous tubing. In their book Steam, the B&W authors identify predictable ages for the failure of these components and offer a variety of upgrade options to be incorporated as replacement parts. Other components that utilities frequently replace or upgrade include fans, turbine blades and rotors, feed pumps, and waterwalls.

NSR rules apply to "modifications" of existing facilities that result in new, unaccounted for pollution. For the first 20 years of these programs, EPA identified only a handful of "modifications." In 1999, however, EPA sued several major utility companies for past availability and efficiency improvement projects like those described above, characterizing them as modifications subject to NSPS and NSR. EPA has further indicated that it will treat innovative component upgrades that increase efficiency or reliability without increasing a unit's pollution-producing capacity as modifications as well. EPA's current approach to these projects strongly discourages utilities from undertaking them, due to the significant permitting delay and expense involved, along with the retrofit of expensive emission controls that are intended for new facilities This is the greatest current barrier to increased efficiency at existing units.

NSR rules define a modification as a physical change or change in the method of operation that results in a significant increase in annual emissions of a regulated pollutant. However, the rules exclude activities associated with normal source operation from the definition of a physical or operational change, including both "routine maintenance, repair, and replacement" and increases in the production rate or hours of operation.

For more than a decade following the establishment of these programs, EPA made very few determinations that projects triggered NSR as "modifications." These determinations involved sources that: (1) added new capacity beyond original construction, for example by adding an entirely new generating unit; or (2) reactivated a long-shutdown unit.

In 1988, EPA concluded that a collection of component replacements intended to extend the lives of five Wisconsin Electric Power ("WEPCo") generating units that had been formally derated and were at the end of their useful lives triggered NSR. Pointing to the project's "massive scope," unusually high cost ($80 million spent on five 80-MW units) and "unprecedented" nature, EPA concluded that the project was not "routine," and calculated an emissions increase for purposes of NSR.

Following the WEPCo decision, utility companies and the Department of Energy asked EPA to clarify the impact of its ruling for common component replacement projects in the industry. Through a series of communications with Congress and the General Accounting Office, EPA assured utilities that "WEPCo's life extension project is not typical of the majority of utility life extension projects, and concerns that the agency will broadly apply the ruling it applied to WEPCo's project are unfounded."

In 1992, EPA issued regulations that confirm the historical meaning of the modification rule and provide special guidance on the application of the rule to electric utilities. Under the 1980 rules, the method used to determine an emissions increase for NSR purposes depends on whether a unit is deemed to have "begun normal operations." The preamble to the 1992 rule states that units are deemed not to have begun normal operations only when they are "reconstructed" or replaced with an entirely new generating unit. Units deemed not to have begun normal operations must measure an emissions increase by comparing pre-change actual emissions to *potential* emissions after a change. Since few facilities operate at full capacity around the clock before a change, this test – if applied to existing sources -- nearly always shows an apparent emissions increase (even where

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emissions in fact decline after the change). Sources that have begun normal operations may compare actual emissions before the change to a projection of actual emissions after it. For utilities, the 1992 rule allows a comparison of past actual to "future representative actual emissions," a term defined to allow elimination of projected increases in utilization due to demand growth and other independent factors (provided that post-change utilization confirms the projections). Other units make a more generic comparison of pre- and post-project emissions holding production rates and hours of operation constant.

In the decade following the WEPCo decision, utilities continued to undertake the replacements described above without incident. In November 1999, however, EPA commenced a major PSD enforcement initiative against seven utility companies and the Tennessee Valley Authority alleging violations of PSD provisions. In complaints and notices of violation ("NOVs"), EPA alleged that replacements of deteriorated components undertaken at these units over the past 20 years were non-routine and triggered emissions increases under NSR rules. The complaints and NOVs target component replacements common in the industry, including economizers, superheaters, reheaters, air heaters, feedwater pumps, burners, turbine blades and rotors, furnace and water wall sections, and other components. EPA has since expanded the enforcement initiative to cover more than 20 companies, with plans to add more.

EPA's claim that these projects are now non-routine has left utilities highly uncertain about the coverage of the modification rule. In particular, EPA now suggests that it has discretion to classify projects as non-routine for several new reasons, including the fact that the replacement restores availability, improves efficiency, or involves a major component. At the same time, EPA has raised the stakes for a finding that a project is non-routine by assuming an emissions increase from all non-routine projects. Specifically, in contrast to the NSR rule, EPA now asserts that any non-routine change makes a unit into one that has not "begun normal operations" – necessitating use of an "actual to potential" emissions increase test that the unit is sure to fail. This is true even where such units have an extensive past operating history that would allow reliable predictions of future actual emissions.

A utility considering projects similar to those targeted in the complaints and NOVs must confront the fact that EPA has claimed broad discretion to classify availability and efficiency improvement projects as non-routine modifications subject to NSR. NSR requires the retrofit of BACT technology, which can cost hundreds of millions of dollars, and can delay projects by several years while permits are obtained and/or controls installed. Accordingly, EPA's actions strongly discourage utilities from undertaking projects that improve efficiency, and thereby increase generation without any increase in pollution.

B&W's Steam suggests the scope of projects blocked by EPA's current approach to modification. In order to reach a standard 55 to 65 year operating life, B&W estimates that a typical utility will replace its superheaters and burners at least twice, its reheaters at least once or twice, the economizer and lower furnace at least once, and all other tubing at least three times. Turbine blades are replaced more frequently still. Industry-wide, this means thousands of major component replacements may be prevented or delayed by EPA's approach, as well as other categories of projects EPA has not yet addressed but may find non-routine under its new discretion.

Moreover, EPA has extended its approach to innovative component upgrades that improve unit efficiency and other operating characteristics. In a letter dated May 23, 2000, EPA concluded that a plan by the Detroit Edison Company to replace worn turbine blades with new, improved blades was non-routine. Detroit Edison proposed to replace existing blading with a new, more durable

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blading configuration that would increase the efficiency of two turbines by 4.5% each. This would allow these units each to produce 70 additional megawatts of power with no increase in fuel consumption, or to continue producing at past energy levels while reducing fuel consumption by 112,635 tons of coal per year, SO_2 emissions by 1,826 tons per year ("tpy"), and NO_x emissions by 1,402 tpy. This would also allow an incidental 259,111 tpy reduction in CO_2 emissions – a compound that EPA currently lacks authority to control. The company estimated that widespread adoption of the upgrade at compatible units would allow CO_2 reductions of approximately 81 million tpy, with correspondingly large reductions in NO_x and SO_2. EPA based its finding of non-routineness in part on the fact that the project made use of new, upgraded component designs. EPA reached a similar conclusion in 1998, finding that a proposed blade replacement project at a Sunflower Corporation power plant could not be routine because it involved redesigned/ upgrad[ed]" components. Accordingly, utilities contemplating innovative upgrades of turbine and other components to improve efficiency face a known risk that EPA will classify them as non-routine modifications based on their use of advanced technology. Although the exact numbers of innovative projects blocked by EPA's approach is difficult to quantify, the example of Detroit Edison suggests that the losses in generation and pollution reduction from these efficiency gains is substantial.

In sum, EPA's new approach to its NSR rules presents a significant regulatory barrier to projects at existing sources that would otherwise be undertaken to improve availability and efficiency. This barrier can be expected not only to prevent significant gains in generating capacity at existing units, but also to actively reduce availability of these units by preventing needed maintenance. As a related matter, this barrier also can be expected to inhibit development of more efficient generating technologies, reducing the amount of energy that may be produced from existing units, and to encourage prolonged reliance on units operating at lower efficiencies.

Repowering and Reactivation

Replacing a coal-fired boiler with a more efficient generating technology, such as fluidized bed combustion, or an integrated gasification combined cycle, or state-of-the-art pulverized coal technology, can increase generation at an existing facility. This process is commonly known as "repowering." Title IV of the CAA grants special treatment to utilities that meet the acid rain requirements of that title through repowering. A project that qualifies as "repowering" for Title IV purposes also gains exemption from NSPS requirements if the project does not increase the unit's maximum achievable hourly emissions. Such projects almost certainly require PSD review, but are granted expedited review under the Act. EPA has yet to implement these expedited review procedures. Additional uncertainties for permitting these facilities are created by EPA's proposal to "reform" the new source permitting process discussed above.

Reactivation of shutdown existing units presents another means for utility companies to increase generation. A source that has been shutdown for an extended period may be subject to NSPS and/or NSR when it is reactivated. Early determinations on this topic are often unclear or inconsistent as to whether the reactivated unit is subject to NSPS or NSR because it is deemed to be a new unit, or because it is deemed to be an existing unit that has undergone a "modification." In its most recent determination on the subject, EPA has suggested that a unit could be subject to NSPS/NSR for either reason – making for a stricter, two-part standard. Clarification of EPA's reactivation policy, and streamlining of NSR requirements for reactivated facilities, would contribute capacity needed to respond to demand peaks.

30

Herrick, Will
Campton, KY
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Solutions

EPA's proposed rule on NSR would impose significant additional burdens for new sources if it is finalized in its current form. EPA's recent listing of coal- and oil-fired electric utility steam generating units as major sources of hazardous air pollutants could require additional, extended pre-construction review for new and reconstructed facilities. EPA's recent reinterpretation of the modification rule with respect to routine repair and replacement, calculating emissions increases, and source reactivation imposes additional burdens that discourage projects that increase unit availability and efficiency or reactivate shutdown units, including cases where shutdown was never intended to be permanent. EPA should return to its historic interpretation and application of these rules.

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Howe, J.
Clark County, KY
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FW: comment on KY Pioneer IGCC draft EIS Page 1 of

Itani, Maher -- Tt, Inc.

From: Preston, John S LRH
Sent: Wednesday, January 23, 2002 1:22 PM
To: Maher Itani (maher.itani@tetratech.com)
Cc: Roy Spears (rspear@netl.doe.gov)
Subject: FW: comment on KY Pioneer IGCC draft EIS

Maher: Below is a "phone-in" comment Lloyd forwarded to me. Thanks.

-----Original Message-----
From: Lloyd Lorenzi [mailto:Lloyd.Lorenzi@NETL.DOE.GOV]
Sent: Wednesday, January 23, 2002 11:48 AM
To: Preston, John S; Roy Spears
Subject: comment on KY Pioneer IGCC draft EIS

Commenter - J. Howe
Residence - Clark County, KY
Tele - 859-842-3914
Date - 23 January 2002
Time - ~10:00 am
Method - toll-free number

Comments:
1. "called to protest the waste-to-energy project at the Trapp site" 1/16
2. concerned about emissions of metals and carbon dioxide, and health effects of air emissions 2/06, 3/11
3. "opposed to burning trash from outside sources in New York and New Jersey - if they need to get rid of their trash, the plant should be built there." 4/16
4. "opposed to burning trash, even if the trash is from Kentucky" 5/22
5. the stacks would create a visibility issue 6/04
6. water usage from the Kentucky river is a concern
7. he would be interested in having DOE or the participants schedule another public meeting; his friends in Trapp are also concerned, and he believes that more than 50 people would attend a future meeting 8. he requested direct notification if another meeting is scheduled, and he communicated no other requests 7/07 8/21

Background:
Mr Howe's residence is located about 5 miles from the proposed project site, and he lived there for the past 7 years. He works as a nurse in Lexington, has 4 children, and moved to Clark County from out of state for, among other reasons, relocation away from areas of high pollution. He did not attend either of the public meetings sponsored by DOE or any other participant- or permit-related meetings on the project. He was not aware of the prior meetings, and he does not receive the local (Winchester) newspaper. He also was not aware of plans for the proposed project, only recently learned about the proposed project from a friend, and he indicated that news is substantially communicated by "word-of-mouth."

Comment No. 1 **Issue Code: 16**
Comment noted.

Comment No. 2 **Issue Code: 06**
Comment noted. Heavy metal emissions from the proposed project are identified in Chapter 5, Table 5.7-2, of the EIS. These emissions would average 4.68 metric tons (5.16 tons) per year. The estimated maximum lifetime cancer risks associated with exposure to these emissions from the proposed project are presented in Table 5.7-4. As noted in the EIS, the proposed project would produce about 1.45 million metric tons (1.6 million tons) of greenhouse gas emissions per year (mostly carbon dioxide). This would be about 25 percent less than the amount produced by a comparable natural gas fueled power plant. Additional discussion of metal deposition issues has been added to Chapter 5, Section 5.7.4, for the Final EIS.

Comment No. 3 **Issue Code: 11**
Incremental ambient air quality impacts from the proposed project would be a very small fraction of the relevant federal and state ambient air quality standards (less than 1 percent for gaseous pollutants such as nitrogen dioxide, sulfur dioxide, and carbon monoxide and less than 4 percent of the federal 24-hour PM_{10} standard). Total heavy metal deposition in areas downwind of the project would be much less than 1.1 kilogram per hectare (1 pound per acre) accumulated over 20 years. The maximum air pollutant increase associated with emissions from the proposed project would have no significant short- or long-term air quality impacts and the health risks are expected to be minor.

Howe, J.
Clark County, KY
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Comment No. 4 **Issue Code: 16**
Because of DOE's limited role of providing cost-shared funding for the proposed Kentucky Pioneer IGCC Demonstration Project, alternative sites were not considered. KPE selected the existing J.K. Smith Site because the costs would be much higher and the environmental impacts would likely be greater if an undisturbed area was chosen. Also, the relatively small amounts and generally widely dispersed nature of MSW in Kentucky does not economically support exclusive utilization of Kentucky-generated MSW to produce RDF supplies, which makes it necessary to import RDF. Importing RDF from a densely populated metropolitan area is more economically viable in order to supply the necessary amount of RDF required to operate the plant.

Comment No. 5 **Issue Code: 22**
Comment noted.

Comment No. 6 **Issue Code: 04**
Comment noted. Impacts to the aesthetic and scenic environment of the project area are presented in Section 5.5, Aesthetic and Scenic Resources, of the EIS.

Comment No. 7 **Issue Code: 07**
The cumulative effects of withdrawals from the Kentucky River by power plants have been discussed by the Kentucky Natural Resources and Environmental Protection Cabinet in their cumulative assessment report (KNREPC 2001) addressed in Section 5.14, Cumulative Impacts, of the EIS. The report acknowledges that because many of Kentucky's power plants are exempt from water withdrawal requirements, the Cabinet does not have an accurate inventory of the volume of water being removed each day by the existing power plants. However, the Cabinet is able to limit withdrawals from permitted sources during periods of abnormally low flow. Although the proposed plant would not be a permitted withdrawal source, KPE has stated that they would cease water withdrawals if requested to by the state.

Howe, J.
Clark County, KY
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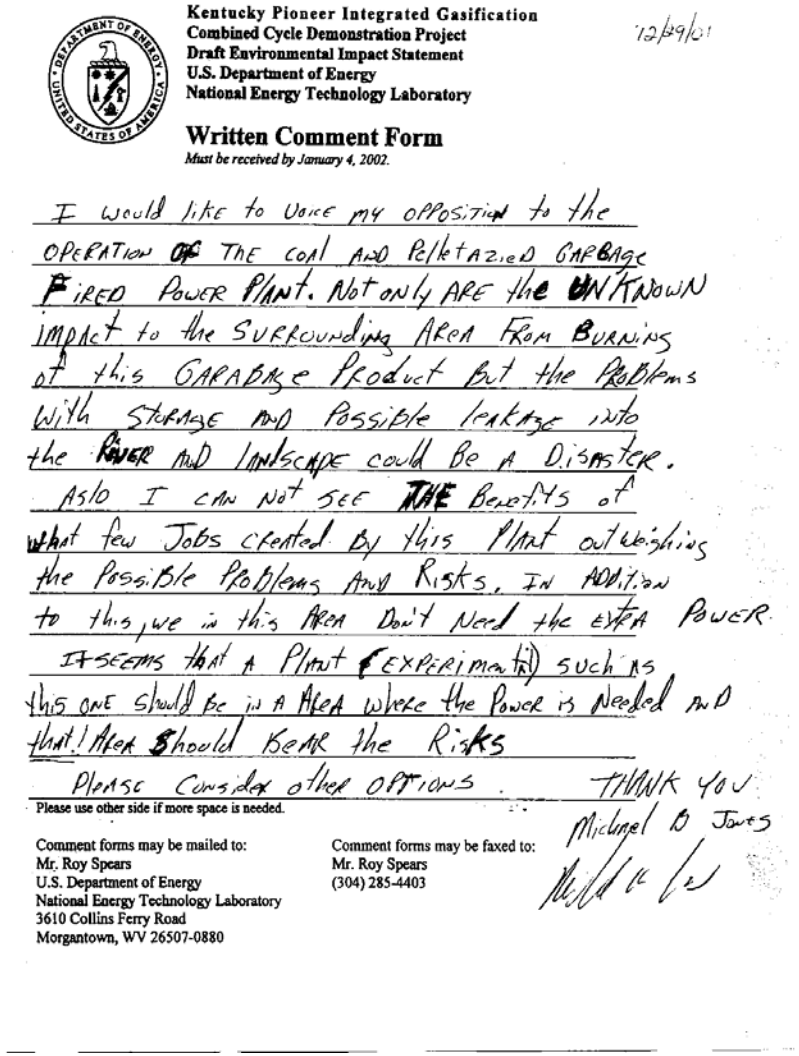
Comment No. 8 **Issue Code: 21**

NEPA requires that one public hearing be held during the public comment period. Based on public input during the scoping period, DOE decided to hold two public hearings during the public comment period, one in Lexington and another in Trapp, Kentucky. The meeting in Lexington was included as a result of the public input. All requirements in state and federal laws, rules, and regulations regarding public hearings were satisfied and surpassed. DOE will consider all public comments before issuing the ROD. The ROD will be issued no sooner than 30 days after the Final EIS is distributed and a notice of its availability is issued.

Jones, Michael B.
Lexington, KY
Page 1 of 2



Kentucky Pioneer Integrated Gasification
Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

12/29/01

Written Comment Form
Must be received by January 4, 2002.

I would like to voice my opposition to the operation of the coal and Petkatazied Garbage Fired Power Plant. Not only are the UNKNOWN impact to the surrounding Area From Burning of this Garabge Product but the Problems with Storage and Possible leakage into the River and landscape could be a Disaster. Also I can not see the Benefits of what few Jobs created by this Plant outweighing the possible Problems and Risks. In Addition to this, we in this Area Don't Need the extra Power. It seems that a Plant (Experimental) such as this one should be in a Area where the Power is Needed and that Area Should Bear the Risks. Please Consider other options. THANK YOU

Michael B Jones

Please use other side if more space is needed.

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

1/22

2/12

3/12

4/02

5/16

Comment No. 1 **Issue Code: 22**
Comment noted.

Comment No. 2 **Issue Code: 12**
There are distinct differences between gasification and incineration. Incineration occurs at atmospheric pressures and temperatures and mineral matter or ash in the waste is not completely fused. With incineration, there is increased production and emission of criteria pollutants. In contrast, gasification occurs at high temperatures and pressures which significantly reduces the formation of oxidative species such as SO_x and NO_x. Incineration produces semi-volatile and volatile organic compounds and dioxin/furan compounds not produced with gasification. Ash from hazardous waste incinerators is considered a hazardous waste under RCRA. Analysis of vitrified frit produced from gasification processes has consistently proven to be nonhazardous as defined by RCRA. In gasification, nonvolatile trace metals concentrate in the vitrified frit and are effectively immobilized eliminating or reducing their leachability.

The proposed project is not a conventional power plant burning coal or RDF. Instead of burning such fuels in a boiler system, the proposed project would use gasification technologies to convert the coal and RDF co-feed into a syngas fuel consisting primarily of CO and H_2. The gasifier operates as a completely enclosed pressurized system. Gasification occurs at high temperatures which ensures complete destruction of toxic organic compounds and incorporation of heavy metals in molten slag. The molten slag is recovered by quenching as a nonleachable glassy frit. Since gasification occurs in a carefully controlled environment, the process produces no air emissions. Furthermore, the high temperatures achieved during gasification from the use of oxygen instead of air prevent the formation of dioxins/furans. A description of the gasification process can be found in Chapter 3, Section 3.1.2.2, of the EIS.

Jones, Michael B.
Lexington, KY
Page 2 of 2

Comment No. 3 **Issue Code: 12**
RDF and vitrified frit are solid materials and would not leak into the Kentucky River. These materials would be held in covered storage and protected from the weather to avoid contact with precipitation and runoff.

Comment No. 4 **Issue Code: 02**
Comment noted. The EIS is designed to present all of the possible environmental impacts of the various alternatives relating to the proposed federal action, both beneficial and detrimental. The economic benefits associated with the project are not intended as justification for the environmental costs of the project; however, they are presented as one of many resource areas impacted by the project.

Comment No. 5 **Issue Code: 16**
The purpose of this EIS is to evaluate public and environmental impacts caused by the proposed project. DOE will consider the information provided in the EIS and public comments in this decision process. Chapter 2 of the EIS discusses EKPC's 1998 Power Requirements Study which indicates that the electrical load for the region is expected to increase by 3.0 percent per year through 2017. Net winter peak demand is expected to increase by 3.3 percent per year and net summer peak demand is projected to increase by 3.0 percent per year. Peak demand is projected to increase from 2,031 MW in 1998 to 2,394 MW in 2003 and 3,478 MW in 2015. Based on this load growth, EKPC will need additional power supply resources of 625 MW in 2003. The need is further shown by EKPC's plans to construct four new CT electric generating units to provide peaking service alongside the three existing peaker CTs at the J.K. Smith Site. Because of DOE's limited role of providing cost-shared funding for the proposed Kentucky Pioneer IGCC Demonstration Project, alternative sites were not considered.

Jones, Remona
Lexington, KY
Page 1 of 1

Kentucky Pioneer Integrated Gasification Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

122701

Written Comment Form
Must be received by January 4, 2002.

I am very much against having a trash burning power plant. This is a experiment that I think should take place in the forest. Some where away from families homes and live stock. The Clark County citizens do not need the trash hauled in from NY. and contaminate their land water & air. How would they (Clark Co.) benefit from it? Twenty or so jobs is NOT worth it. Other States NEED the power. Let them have this experimental project. Please Consider other States for the "Gasification Project"!

Thank you
Remona Jones
Remona Jones

Please use other side if more space is needed.

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

1/16
2/07
3/02
1/16 (cont.)

Comment No. 1 **Issue Code: 16**
Comment noted. Because of DOE's limited role of providing cost-shared funding for the proposed Kentucky Pioneer IGCC Demonstration Project, alternative sites were not considered. KPE selected the existing J.K. Smith Site because the costs would be much higher and the environmental impacts would likely be greater if an undisturbed area was chosen.

Comment No. 2 **Issue Code: 07**
All materials transported on land would be enclosed in vehicles and would not be released to the environment under normal circumstances. In the event of an accident, some materials could be released to the environment. KPE would develop an Emergency Response Plan and an SPCC Plan during the project engineering and construction phase. These plans would detail KPE's planned response and clean-up methods for any spills or emergencies that occur on the J.K. Smith Site. In addition, the Kentucky Division of Water's Emergency Response Team should be called ([502] 564-2380 or 1-800-928-2380) in the event of an "environmental emergency." The spill or unexpected discharge of a hazardous material that threatens the life, health, or safety of citizens or the environment is considered an environmental emergency. More information on the Emergency Response Team can be found on the Internet at http://water.nr.state.ky.us/dow/dwert.htm.

Comment No. 3 **Issue Code: 02**
The EIS is designed to present all of the possible environmental impacts of the various alternatives relating to the proposed federal action, both beneficial and detrimental. The economic benefits associated with the project are not intended as justification for the environmental costs of the project; however, they are presented as one of many resource areas impacted by the project. The project will create 120 jobs in Clark County and 270 indirect jobs throughout the ROI.

Kentucky Environmental Foundation
Berea, KY
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Kentucky Environmental Foundation
P.O. Box 467 Berea, Ky. 40403
Phone: 859-986-7565 Fax: 859-986-2695
e mail : kefwilll@acs.eku.edu web: www.cwwg.org

Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Rd.
Morgantown, WV 26507-0880

January 25, 2001

SUBMITTED BY MAIL AND ELECTRONIC MAIL

Dear Mr. Spears,

Following are comments on the draft Environmental Impact Statement for the Kentucky Pioneer Integrated Gasification Combined Cycle Demonstration Project. These comments are made on behalf of the Kentucky Environmental Foundation, a non-profit organization located in Berea, Madison County, Kentucky.

This EIS is indicative of a fundamentally flawed regulatory process: one that seeks to manage a set of unacceptable or unnecessary risks rather than find comprehensive solutions which may prevent risks altogether. In this case, citizens are asked to provide comments on a set of bad options in an EIS; this does not allow for review of the broad issues of energy needs and resources in Kentucky and elsewhere. 1/22

For this reason and those listed below, KEF advocates the "No Action Alternative 1," which states that no plant is constructed. 2/17

GENERAL COMMENTS

1. The EIS is not convincing in its argument that this power plant is necessary by any definition. In fact, the document states outright that "the need for greater electrical generation...is demonstrated by the stated intention of Global Energy, Inc., to proceed with the construction of two combined cycle combustion turbines regardless of whether DOE provides cost-shared funding for the proposed project." (p. 2-2). Decisions which affect public health and the environment should not be determined by corporate intent. 3/14

The fact that the proposed facility site has laid vacant for decades shows that neither DOE nor the companies involved in this project have a good perspective on the power supply needs of eastern Kentucky.

2. KEF supports a sustainable energy plan that would not include construction and operation of new power plants. Power plants are a leading contributor of greenhouse gases, heavy metals and other toxic contaminants into the environment. Considering the current background levels of all such contaminants in the environment, any new power plant – including "waste-to-energy" facilities like this one – is unacceptable. 4/22

Comment No. 1 **Issue Code: 22**
The CCT Programmatic EIS, released in 1989, addresses potential environmental consequences of the widespread commercialization of the successfully demonstrated CCTs. Energy use was reviewed under the purpose and need analysis. The analysis of other power sources is outside the scope of this EIS.

Comment No. 2 **Issue Code: 17**
Comment noted.

Comment No. 3 **Issue Code: 14**
Chapter 2 of the EIS discusses EKPC's 1998 Power Requirements Study which indicates that the electrical load for the region is expected to increase by 3.0 percent per year through 2017. Net winter peak demand is expected to increase by 3.3 percent per year and net summer peak demand is expected to increase by 3.0 percent per year. Peak demand is expected to increase from 2,031 MW in 1998 to 2,394 MW in 2003 and 3,478 MW in 2015. Based on this load growth, EKPC will need additional power supply resources of 625 MW in 2003. The need is further shown by EKPC's plans to construct four new CT electric generating units to provide peaking service alongside the three existing peaker CTs at the J.K. Smith Site.

Comment No. 4 **Issue Code: 22**
Comment noted. The issue of alternative power sources is outside the scope of the EIS.

Kentucky Environmental Foundation
Berea, KY
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Rather than manage the unacceptable risks of such a facility, which is only expected to function for twenty years, KEF instead urges an energy plan that is sustainable and non-polluting and which includes power from solar and wind, and other renewable resources.

3. The Precautionary Principle states that where there is doubt or scientific gaps, decisions should be based in precaution. This EIS greatly lacks in detail in a number of areas around known and suspected health effects from the IGCC plant. What we *do* know about emissive technologies, and the toxic chemical being emitted from these facilities, is enough to condemn the project (see specific comments below).

SPECIFIC COMMENTS

1. The EIS does not reflect any intent by DOE or Kentucky Pioneer to take public comment seriously; the document states in numerous places (e.g. the statement mentioned in General Comment #1 above) that some sort of plant will be constructed regardless of DOE funding.

2. What little IGCC process details exist in the EIS, seem to contradict the statement that this project "would best further the objectives identified in the [Clean Coal Technology] Program" (S-3). The EIS is not clear on the actual amounts of coal used in the process for the long-term.

3. The proposed facility could be more accurately described as a municipal waste combustion facility which happens to produce electricity. This poses several problems:

- burning municipal waste in any form -- including refuse derived fuel pellets -- will likely result in release of persistent organic pollutants, or POPs, including dioxins and heavy metals. This action alone poses a very serious health risk. The most recent draft of the USEPA's dioxin reassessment states that dioxins are a known carcinogen, and that the U.S. population on average already has a body burden of dioxin which exceeds any "safe" standard. Both the EPA, the World Health Organization and other independent health agencies consider dioxins alone to be the most toxic manmade chemicals. The seriousness of the existence of dioxins and other POPs in the world's environment, food chain and human bodies has resulted in the international POPs treaty which calls for the ultimate elimination of these chemicals. Specifically, the treaty recognizes the importance of preventing new sources of these chemicals.
- the details around the composition of the RDF is so lacking that it is impossible to make any more specific comments on that waste stream.
- there is no reference in Section 6 to Kentucky regulations regarding municipal waste combustion facilities. This facility should be required to, at the very least, meet these regulations.

4. The finding of no health or safety impact for the proposed IGCC facility is completely unfounded. Merely stating that the facility will meet all regulatory requirements has no bearing whatsoever on the plant's safety. There is no discussion whatsoever of the effects of facility emissions other than the "estimated lifetime cancer risk" table. The risks of acute and chronic exposures for both cancer and non-cancer effects need to be assessed for all segments of the population. Until more detail on these health effects is presented, it is impossible to provide meaningful comment.

4/22 (cont.)
5/11
6/21
7/14
8/22
9/06
10/16
11/21
12/11

Comment No. 5 **Issue Code: 11**

The emissions from the proposed project would have a less than significant impact because the incremental increase from air emissions is a small fraction of the relevant state and federal ambient air quality standards. Acute and short-term noncancer health effects would be very low because pollutant concentrations are below criteria pollutant and/or air quality standards. Conservative estimates of lifetime exposure risk (probability of developing cancer) for points of maximum downwind exposure are shown in Chapter 5, Table 5.7-4, of the EIS. An estimated lifetime exposure risk of 5E-05 (5.0×10^{-5}) applies to location of maximum exposure which is within the boundaries of the J.K. Smith Site. Cumulative estimate lifetime risk for offsite locations would be less than 5E-05 (5.0×10^{-5}) and decrease with distance from the site.

Comment No. 6 **Issue Code: 21**

All comments received during the public comment period will be considered during preparation of the Final EIS and addressed in the comment response document. A final decision will be made based on the findings of the EIS and public input, in addition to other factors. DOE will consider all public comments before issuing the ROD. The ROD will be issued no sooner than 30 days after the Final EIS is distributed and a notice of its availability is issued.

Comment No. 7 **Issue Code: 14**

DOE selected the Kentucky Pioneer IGCC Demonstration Project for further consideration under DOE's fifth solicitation (CCT-V) of the CCT and concludes that the project meets CCT Program requirements due to the use of the co-fed BGL technology. The proposed federal action is to provide funds for demonstration of the BGL gasification technologies. The EIS provides analysis and impacts based on the fuel feed used for the 1-year demonstration. The impacts presented in this EIS are based on the full 20-year timeframe that the plant is expected to be operating.

Kentucky Environmental Foundation
Berea, KY
Page 3 of 5

5. Similarly, there is no mention of health in the section discussing cumulative effects. This section should include the cumulative health effects as listed above, and also a discussion of the synergistic effects of plant emissions with background contaminants levels.

IN SUMMARY, KEF strongly opposes the IGCC project. The project is unnecessary, and the wide data gaps in the EIS make it impossible to comment with any greater detail.

Please feel free to contact me if you have any questions.

Sincerely,

Elizabeth Crowe

Elizabeth Crowe
Kentucky Environmental Foundation

also on behalf of:

Ramesh Bhatt
Sierra Club Cumberland (Kentucky) Chapter
1000 Rain Court
Lexington, KY 40515

William S. Herrick
4859 Flat-Mary Rd
Campton, KY 41301

Naomi Schulz
Member, Kentuckians for the Commonwealth
109 Phillips St.
Berea, KY 40403

Lisa Collins
2344 Harrodsburg Rd.
Lexington, KY 40503

John Maruskin
Adult Services Librarian
Clark County Public Library
1101 Ironworks Rd.
Winchester, KY 40391

Tom FitzGerald
Kentucky Resources Council
PO Box 1070
Frankfort, KY 40602

encl: Addendum page

Comment No. 8 **Issue Code: 22**
Comment noted.

13/20 **Comment No. 9** **Issue Code: 06**
Comment noted. Hazardous air pollutant emissions from the proposed
14/16 project are identified in Chapter 5, Table 5.7-2 of the EIS. The estimated maximum lifetime cancer risks associated with exposure to these emissions from the proposed project are presented in Table 5.7-4.

Comment No. 10 **Issue Code: 16**
Chapter 3, Section 3.2.2.2, discusses the production and composition of the RDF pellets using all available relevant data. KPE intends to supply all RDF pellets for this project from the same manufacturer. Variation in RDF pellet composition due to different manufacturing processes should not be an issue for this project. The gasification technology used produces a very consistent syngas product, regardless of the variability of the feed. Chapter 3 has been modified to provide more detail on the gasification process, including the production of the vitreous frit.

Comment No. 11 **Issue Code: 21**
KPE is not attempting to circumvent KRS 224, or any other state or local laws. KPE has appealed to the state for an interpretation of the language of applicable solid waste laws regarding RDF. The Kentucky Natural Resources and Environmental Protection Cabinet has determined that the RDF is a recovered material, not waste. The Kentucky Pioneer IGCC Demonstration Project facility will be considered a recovered materials processing facility and the gasification process will not require a waste permit as long as the RDF conforms to the regulatory definition. A discussion of this issue has been added to Chapters 1 and 6 of the EIS.

Kentucky Environmental Foundation
Berea, KY
Page 4 of 5

Following is a list of commentors for the DOE/EIS-0318 Kentucky Pioneer Integrated Gasification Cycle Demonstration Project Draft Environmental Impact Statement. Also following is a list of citizens and names of organizations. On behalf of, and with permission of, the original commentors, we request that the names and organizations on the second list be added to the submitted comments in the first list.

List of comments submitted:

William S. Herrick, comments submitted 01/23/02
4859 Flat-Mary Rd
Campton, KY 41301

Ramesh Bhatt, comments submitted 01/20/02
Sierra Club Cumberland (Kentucky) Chapter
1000 Rain Court,
Lexington, KY 40515

Tom Fitzgerald
Kentucky Resources Council
P.O. Box 1070
Frankfort, KY 40602

Phil Crewe, comments submitted 01/24/02
1817 Traveller Rd.
Lexington KY 40504

Elizabeth Crowe, comments submitted 01/25/02
Kentucky Environmental Foundation
P.O. Box 467
Berea, KY 40403

List of names to be appended to the above listed comments:

John Maruskin
Adult Services Librarian
Clark County Public Library
1101 Ironworks Rd.
Winchester, KY 40391

Lisa Collins
2344 Harrodsburg Rd.
Lexington, KY 40503

William S. Herrick
4859 Flat-Mary Rd
Campton, KY 41301

Ramesh Bhatt
Sierra Club Cumberland (Kentucky) Chapter
1000 Rain Court
Lexington, KY 40515

Comment No. 12 (cont.) **Issue Code: 11**
Acute and short-term noncancer health effects would be very low because pollutant concentrations are below criteria pollutant and/or air quality standards. Conservative estimates of long-term health effects of cancer for points of maximum downwind exposure are shown in Chapter 5, Table 5.7-4, of the EIS. The proposed project would be permitted at levels to minimize the acute, short-term and long-term health impacts to the public. The air quality permit for the proposed project requires continuous emission monitoring for criteria pollutants and annual emissions testing for cadmium, lead, mercury, hydrogen chloride, and dioxins/furans. Noncompliance with permitted emission levels would result in a plant shutdown.

Comment No. 13 **Issue Code: 20**
Comment noted. Section 5.14, Cumulative Effects, has been revised to include an analysis of the cumulative health effects.

Comment No. 14 **Issue Code: 16**
Comment noted.

Kentucky Environmental Foundation
Berea, KY
Page 5 of 5

Tom Fitzgerald
Kentucky Resources Council
P.O. Box 1070
Frankfort, KY 40602

Elizabeth Crowe
Kentucky Environmental Foundation
P.O. Box 467
Berea, KY 40403

Naomi Schulz
Member, Kentuckians for the Commonwealth (KFTC)
109 Phillips Street
Berea, KY 40403

Phil Crewe
1817 Traveller Rd.
Lexington KY 40504

Kentucky Resources Council, Inc.
Frankfort, KY
Page 1 of 74

Kentucky Resources Council, Inc.
Post Office Box 1070
Frankfort, Kentucky 40602
(502) 875-2428 phone (502) 875-2845 fax
e-mail FitzKRC@aol.com

February 1, 2002

BEFORE THE DEPARTMENT OF ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY

COMMENTS CONCERNING DEIS FOR PROPOSED
KENTUCKY PIONEER ENERGY INTEGRATED GASIFICATION
COMBINED CYCLE DEMONSTRATION PROJECT

Roy Spears
NEPA Document Manager
U.S. Department of Energy
National Energy Technology Laboratory
P.O. Box 880
Morgantown, WV 26507-0880

By fax & email
304-285-4403
rspear@netl.doe.gov

Dear Mr. Spears:

These comments supplement those earlier submitted into the record during the public hearing on the proposed Kentucky Pioneer Energy Integrated Gasification Combined Cycle Demonstration Project (IGCC Protect). I appreciate your commitment to accept comments through today, and offer these comments as supplemental to those submitted previously by the Kentucky Resources Council, Inc. (Council). In addition, the Council endorses comments submitted by the Kentucky Environmental Foundation, Sierra Club Cumberland Chapter and Will Herrick, which are contained in the record.

1/22

The Council is a non-profit environmental advocacy organization providing legal and technical assistance without charge to individuals and organizations in the Commonwealth on air, waste, water and resource extraction issues.

INTRODUCTION

By letter dated November 8, 2001, the Council received the *Draft Environmental Impact Statement for the proposed Kentucky Pioneer Energy Integrated Gasification Combined Cycle (IGCC) Demonstration project in Clark County, Kentucky*. According to that letter, the document was prepared "to evaluate the environmental impacts of a Clean Coal technology Program

Comment No. 1 **Issue Code: 22**
Comment noted.

Issue Code: 21

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demonstration project that is proposed to be partially funded by the Department of Energy."

The project purpose, according to that letter, is "to establish the commercial viability of the fixed bed British Gas Lurgi process in the United States and the operation of a high temperature molten carbonate fuel cell using synthesis gas."

The comment period, which was to close on January 4, 2002, was extended by notice published in the *Federal Register* on January 18, to January 25, 2002. By telephonic communication, Mr. Spears indicated to the undersigned that comments would be accepted through today, February 1, 2002.

The proposal to construct a 540 mW IGCC plant at the J.K. Smith site in Trapp, Kentucky for generation of electricity from a gases generated from a mixed waste-coal fuels, raises several threshold questions concerning the suitability of the project for expenditure of Clean Coal Technology monies, and whether the project has met applicable solid waste requirements under state law.

1. THE PROJECT VIABILITY APPEARS CONTINGENT ON LOCAL APPROVAL BY CLARK COUNTY SOLID WASTE PLANNING UNIT; FURTHER REVIEW SHOULD AWAIT CLARIFICATION OF APPLICABILITY OF WASTE REQUIREMENTS

The applicant has acknowledged that the use of solid waste is a component of the economics of the project, without which one would assume that the project may not be viable. Given the central role that the blending of a 50% - 80% mixture of processed waste plays in the project, the uncertainty concerning the proper characterization of the waste for state and local regulatory purposes advises that the project review be suspended until this threshold matter is resolved.

The Council was asked to address the relationship of the proposed project and the intended utilization of a shredded, milled and pelletized municipal solid waste fuel, to Kentucky's solid waste disposal statutes and the requirement of maintaining consistency with local solid waste plans.

After a review of the position paper submitted by Global Energy to the state Division for Waste Management, and after review of the applicable statute and case law, the Council believes that the facility is subject to the solid waste regulations and is required to obtain a determination of consistency from the solid waste management governing body of Clark County before importing and disposing of the solid waste fuel.

By letter dated October 9, 2000, Global Energy Inc., Suite 2000, 312 Walnut Street, Cincinnati, OH 45202, through its manager of Regulatory Affairs Dwight Lockwood, requested a determination from the Kentucky Division of Waste

2/14

3/21

Comment No. 2 **Issue Code: 14**

The stated goal of the CCT Program is to advance DOE's mission to foster a secure and reliable energy system that is environmentally and economically sustainable. As such, the CCT Program was established to demonstrate the commercial feasibility of CCTs to respond to a growing demand for a new generation of advanced coal-based technologies characterized by enhanced operational, economic, and environmental performance. Since coal is an abundant, secure and economical fuel, and is used to produce over 51 percent of the electricity in this country, it must continue in its role as a key component in the United States and world energy markets.

The Kentucky Pioneer IGCC Demonstration Project utilizes the BGL oxygen-blown, fixed-bed slagging gasifier. The gasifier fuel will be a high-sulfur bituminous coal and blended with RDF, which uses only MSW as its basic component and does not use any hazardous or industrial waste. The syngas generated in the gasifier will be used to fire a gas turbine. This project serves to further CCT Program objectives in the following ways:

1. RDF is an example of a fuel that has the potential to enhance the economics of coal utilization and lower the emissions output of a totally coal-based system. Coal-based systems that have sufficient flexibility to handle a range of fuels will have a competitive advantage over a nonfuel-flexible, coal-only system.

2. Gasification is a more environmentally efficient method to generate electricity from coal. While much was learned from the previous CCT gasification projects (Wabash River and Tampa Electric), the different technology techniques to produce syngas with flexible-fuel co-feeds have not been demonstrated and operating demonstrations are essential to accelerate the widespread use of gasification.

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Management as to the applicability of KRS 224.40 to the proposed "integrated gasification combined cycle (IGCC) power plant project in Clark County."

The request letter from Global Energy (Hereafter Global) asserted that the proposed project was "exempt from waste regulations." The 2-paged letter contained an attached "Analysis of the Non-Applicability of KRS 224.40 to the Kentucky Pioneer Energy IGCC Project."

The determination of applicability of the waste regulations rests in the first instance with the Natural Resources and Environmental Protection Cabinet, subject to review by the courts. KRS Chapter 224 is a statute that is remedial in nature and its protections are to be broadly construed consistent with the public and environmental protection goals of the statute. Exemptions from its reach are to be narrowly construed.

The question of whether the proposed coal and waste-fueled facility is subject to the requirements of KRS Chapter 224 as a waste management and waste disposal facility is of significance to the residents of Trapp and of Clark County, since if exempted from the ambit of the term "municipal solid waste facility," the planned importation of processed municipal solid waste from northeastern states representing the equivalent of "roughly half of the residential waste generated in the entire Commonwealth of Kentucky" will not be subject to scrutiny and a determination by the local governing body of Clark County of the consistency with that county's approved solid waste plan.

When enacted in 1991, Senate Bill 2 substantially revised state and local solid waste management, requiring of local communities that they plan for the proper management of solid waste generated within their borders and promising, in return, that the local "governing body" responsible for solid waste planning would have the ability to control the manner and extent to which waste generated outside of the boundary of that planning unit would be managed and disposed of within the planning area.

The proposal to thermally treat and to combust the volatile fraction of one million tons or more per year[1] of treated municipal solid waste falls squarely within the type of facility intended by the General Assembly to be scrutinized under the solid waste planning process.

KRS 224.40-315 mandates that:

> No permit to construct or expand a municipal solid waste disposal facility shall be accepted for processing by the Cabinet unless the application contains a determination from

[1] The Public Service Commission filing by East Kentucky Power Cooperative in response to requests for information indicated a 50-50% fuel to waste feed mix at 1 million tons of each per year, while noting that the actual feed ratio may vary.

3/21 (cont)

Comment No. 2 (cont.) **Issue Code: 14**

The fuel cell demonstration has been moved to the existing Wabash River IGCC Plant near West Terre Haute, Indiana.

Comment No. 3 **Issue Code: 21**

KPE is not attempting to circumvent KRS 224, or any other state or local laws. KPE has appealed to the state for an interpretation of the language of applicable solid waste laws regarding RDF. The Kentucky Natural Resources and Environmental Protection Cabinet has determined that the RDF is a recovered material, not waste. The Kentucky Pioneer IGCC Demonstration Project facility will be considered a recovered material processing facility and the gasification process will not require a waste permit as long as the RDF conforms to the statutory definition. A discussion of this issue has been added to Chapter 6 of the EIS.

KPE received the Final PSD/Title V Air Permit issued by the Kentucky Division for Air Quality on June 7, 2001, and will submit an application for the KPDES permit at least 180 days before commencing construction. All other permit applications required will be completed after financial closure and during the development phase of the project.

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> the governing body for the solid waste management area in which the facility is or will be located concerning the consistency of the application with the area solid waste Management plan [.]

The scope of this statute and the requirement for a determination of consistency with the approved solid waste plan is defined by the term "municipal solid waste disposal facility", which is defined in KRS 224.01-010(15) to include:

> Any type of waste site or facility where the final deposition of any amount of municipal solid waste occurs, whether or not mixed with or including other waste allowed under subtitle D of the Federal Resource Conservation and Recovery Act of 1976, as amended, and includes, but is not limited to, incinerators and waste-to-energy facilities that burn municipal solid waste. . .

The term is broadly inclusive of all types of waste sites or facilities where the final deposition of any amount of municipal solid waste occurs. There can be no serious argument that the feed material to be combined with the coal is a solid waste, which is to say, that the material is "garbage, refuse, sludge and other discarded material." The waste is to be processed, according to the applicant, at a facility in a state other than Kentucky, where it will be manufactured from municipal solid waste by removing "large objects and white goods" as well as "glass and metal [.]" The remaining material, including chlorinated plastics, will be milled and shredded.[2]

These "pellets" are municipal solid waste processed as an intermediate step in the thermal treatment of the waste to produce a gas for combustion. The proposed facility is utilizing a fuel stream comprised of partially separated, shredded and shaped municipal solid waste used as a fuel source, disposing of the waste through thermal treatment at high temperature to drive off the volatile fraction for combustion. As such, it is engaged in disposal of a municipal solid waste stream and falls within the ambit of a "municipal solid waste disposal facility" the siting and operation of which should be reviewed for consistency with local solid waste plans.

The applicant claimed exemption for the waste fuel from the waste program as a "recovered material," yet the clearly better reading of the statute, and the intent to carefully regulate the disposal of solid waste by thermal treatment as well as other means, militates against the exemption of the material from regulation as a solid waste. The material is not a "refuse-derived fuel" notwithstanding the claim by the applicant to the contrary, since the applicant has

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(cont.)

[2] Subpart Eb Siting Analysis Public Meeting and Comments, pp. 7-8.

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indicated that it intends to retain the recoverable plastics in the waste[3] (likely for the Btu value), and thus is outside of the ambit of "recovered material," since that definition specifically excludes "materials diverted or removed for purposes of energy recovery or combustion []" from being considered recovered material.

Assuming, for the sake of argument, that the waste were further processed over what is proposed, in order to meet the state definition of "refuse derived fuel" by removing all recoverable plastics and other recoverable material, such as mixed paper, corrugated paper and newsprint, the definition of "recovered material" still would not apply to exempt the entire waste stream from regulation since only 15% of the material processed by the facility creating the pellets could be credited as "RDF."

While the acceptance by the applicant of regulation under EPA's Municipal Solid Waste Combustor standards makes it difficult to accept at face value the assertion of non-applicability of state "waste" designation, commenter concurs that the state law itself determines how this facility is to be characterized for purposes of state regulation.

Because the material is not a "refuse derived fuel" under KRS 224.01-010(23) in that it has not been subject to "extensive separation of municipal solid waste" including "the extraction of recoverable materials for recycling" the processing of the municipal solid waste stream to create the palletized "fuel" does not make the material a "recovered material" under KRS 224.01-010(20). The proposed gasification step in the process and the cleaning of the volatile fraction of the waste for combustion does not make the facility a "recovered material processing facility" so as to exempt it from the definition of a municipal solid waste disposal facility or to avoid the obligation to be consistent with the local solid waste plan.[4]

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(cont.)

Beyond the specific failure of the application to meet the criteria for an exempt "recovered material processing facility" because the waste feed will retain recoverable materials, including all plastics and paper, the *context* in which municipal solid waste disposal facilities are regulated under KRS Chapter 224 makes clear that the attempt to shoehorn this substantial waste-fueled energy facility into the category of a "recovered materials processing facility" is an ill-fit from a public policy standpoint. KRS 224.01-010, which contains many of the definitions for the chapter, is prefaced with the caveat "[a] s used in this chapter unless the context clearly indicates otherwise [.]" The statutory provision

[3] Id.

[4] Even assuming that the partially processed waste fell within the ambit of "refuse derived fuel" and the 15% limitation on RDF didn't limit the applicability of "recovered material" even as to RDF, the proposed facility is not a "recovered material processing facility" since it proposes to combust the gases created by the thermal and pressure treatment of the waste and is not storing and processing for resale or reuse. "Reuse," as that term is used by the General Assembly does not include use of wastes as a fuel with or without heat recovery. The latter concept is "resource recovery" and is a term distinct from "reuse of solid waste." See. KRS 224.43-010 (3) (which sets reuse of solid waste as a priority below reduction, and above recycling, composting, and resource recovery through mixed waste composting or incineration.

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requiring a determination of local consistency for disposal facilities was plainly intended to cover thermal treatment of municipal solid wastes with and without energy recovery, and to segment the facility into the component processes in order to exclude from the application of KRS 224.40-315 a facility which uses a sequential process of thermal treatment followed by combustion of volatile gases, and which presents many similar concerns in management of air, water and solid waste byproducts from a heterogeneous fuel source such as municipal solid waste (even if homogenous in shape), is contrary to the intent of the statute and the public policy behind it.

In sum, the palletized mixed municipal solid waste does not fall within the ambit of the state statutory definition of "refuse derived fuel" and is thus not a "recovered material." By definition, the facility is a "municipal solid waste disposal facility" under KRS 224.40-315(1), KRS 224.40-310 and KRS 224.01-010(15).

The letter by which the Council requested a formal determination from the Division of Waste Management concerning the applicability of KRS Chapter 224 is annexed to these comments.

Subsequent to the Council's preliminary comments, the County Attorney for Clark County, the host community in which the project is proposed, has written on behalf of the Clark County Fiscal Court, seeking an opinion from the Kentucky Attorney General as to the applicability of KRS Chapter 224. A copy of that letter is reprinted below:

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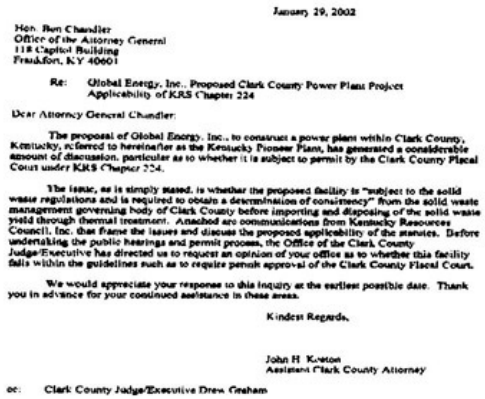

January 29, 2002

Hon. Ben Chandler
Office of the Attorney General
118 Capitol Building
Frankfort, KY 40601

Re: Global Energy, Inc., Proposed Clark County Power Plant Project
Applicability of KRS Chapter 224

Dear Attorney General Chandler:

The proposal of Global Energy, Inc., to construct a power plant within Clark County, Kentucky, referred to hereinafter as the Kentucky Pioneer Plant, has generated a considerable amount of discussion, particular as to whether it is subject to permit by the Clark County Fiscal Court under KRS Chapter 224.

The issue, as is simply stated, is whether the proposed facility is "subject to the solid waste regulations and is required to obtain a determination of consistency" from the solid waste management governing body of Clark County before importing and disposing of the solid waste yield through thermal treatment. Attached are communications from Kentucky Resources Council, Inc. that frame the issues and discuss the proposed applicability of the statutes. Before undertaking the public hearings and permit process, the Office of the Clark County Judge/Executive has directed us to request an opinion of your office as to whether this facility falls within the guidelines such as to require permit approval of the Clark County Fiscal Court.

We would appreciate your response to this inquiry at the earliest possible date. Thank you in advance for your continued assistance in these areas.

Kindest Regards,

John H. Kveton
Assistant Clark County Attorney

cc: Clark County Judge/Executive Drew Graham

The Council believes that further review of the proposed project should be deferred, pending a final determination by the Natural Resources and Environmental Protection Cabinet as to the applicability of the waste statutes to the proposed facility, and a determination by the Attorney General as to whether a formal Opinion will be provided and if so, the outcome of that opinion.

Assuming that the state statutes concerning solid waste planning are applicable to the importation of the waste into the solid waste planning area for disposal, DOE should return the application to the applicant as incomplete and defer any further consideration of the requested funding until and unless the applicant provides documentation of consistency from the governing body of the solid waste management area covering Clark County of the proposed importation and utilization of the solid waste material for the facility.

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(cont.)

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Further, DOE should in that case extend to the Governing Body of that solid waste management area the opportunity to participate in any further EIS review as a cooperating agency.

2. PROJECT NECESSITY AND SCOPE; ALTERNATIVES MUST BE BROADENED

The necessity of funding the project and suitability of a project that proposes to displace up to 80% coal feed with pelletized garbage is another legitimate threshold inquiry, for one aspect of the environmental review and determination of reasonable alternatives is the question of whether the project as proposed is necessary, and whether the expenditure of federal funds intended to enhance rather than displace coal utilization, is appropriate.

Initially, appears that, with respect to the co-firing of municipal solid waste and coal, sufficient information exists or could be derived from comparable facilities firing comparable waste feeds without the substantial capital investment proposed in this case.

Available information suggests that this project is duplicative of another project reported to be under development by the parent company, Global Energy, in Lima Ohio, in which, according to information obtained from the EPA website, a 540 megawatt electric generation unit utilizing coal gasification and fed with a combination of coal and municipal solid waste, will be utilized.[5] To the extent that the Lima project is similar in technology and waste feed, an alternative that must be considered is whether the technology has been sufficiently "demonstrated" and/or whether that unit, or another unit, could be modified to demonstrate any aspects of this proposal at far lesser cost.

There are additional alternatives beyond those evaluated, that are well within the "rule of reason" established by the courts for bounding the scope of agency consideration of alternatives. The first is utilization of the Lima facility or the European counterpart facility in Germany, to demonstrate the technology, rather than providing new monies for capital construction of a facility which will be in "demonstration" mode for a brief period and which has the potential to revert with little modification to a traditional natural gas-fired plant. Either plant could be retrofitted to include the fuel cell unit.

The proposed construction of the Lima Energy Project raises a second question, which is whether DOE subsidy is necessary, since that project is proceeding without federal support. The federal Clean Coal effort has been criticized as spending taxpayer funds on projects that would have been viable without the subsidy, for technologies that were not in need of such support. In this case, it would appear that funding a 400 mW project utilizing a technology

[5] www.epa.gov/swercpsc/bf/pdf/ss_lima.pdf

3/21 (cont.)

4/14

Comment No. 4 **Issue Code: 14**

The stated goal of the CCT Program is to advance DOE's mission to foster a secure and reliable energy system that is environmentally and economically sustainable. As such, the CCT Program was established to demonstrate the commercial feasibility of CCTs to respond to a growing demand for a new generation of advanced coal-based technologies characterized by enhanced operational, economic, and environmental performance. Since coal is an abundant, secure and economical fuel, and is used to produce over 51 percent of the electricity in this country, it must continue in its role as a key component in the United States and world energy markets.

The Kentucky Pioneer IGCC Demonstration Project utilizes the BGL oxygen-blown, fixed-bed slagging gasifier. The gasifier fuel will be a high-sulfur bituminous coal and blended with RDF, which uses only MSW as its basic component and does not use any hazardous or industrial waste. The syngas generated in the gasifier will be used to fire a gas turbine. This project serves to further CCT Program objectives in the following ways:

1. RDF is an example of a fuel that has the potential to enhance the economics of coal utilization and lower the emissions output of a totally coal-based system. Coal-based systems that have sufficient flexibility to handle a range of fuels will have a competitive advantage over a nonfuel-flexible, coal-only system.

2. Gasification is a more environmentally efficient method to generate electricity from coal. While much was learned from the previous CCT gasification projects (Wabash River and Tampa Electric), the different technology techniques to produce syngas with flexible-fuel co-feeds have not been demonstrated and operating demonstrations are essential to accelerate the widespread use of gasification.

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and feedstock very similar to a project under construction by the parent company in a sister state without such subsidy, to be a questionable use of R&D monies.

An additional question is the extent to which the technology is in need of further demonstration. Funding of the development of a commercial coal-fired base load plant would not be an appropriate use of research and demonstration dollars, yet there is evidence in the record that the proposed technology is adequately demonstrated and that the proposal to provide federal funding is more a start-up subsidy for a commercial project than a demonstration project:

* according to the National Coal Council, the British Gas/Lurgi (BGL) gasification process has already been demonstrated by Global Energy in Europe at the Schwarze Pumpe GmbH plant in Germany, raising the question of why the construction of this plant is being subsidized if the technology is "proven."[6] The project description makes much of the assertion that this will be the first commercial application of the technology in the United States, but there is no meaningful distinction to be drawn from the geographic location of the plant in or out of this country for purposes of analyzing the reliability, environmental impacts and costs of operating such a plant using the proposed waste feed. In a response to comments provided by the applicant as part of the air permitting process, the applicant indicated "This plant will be the first application in this country of the BGL technology and will be the first in this country to process RDF as well. An identically sized BGL is currently operating in Germany as part of the primary waste recycling facility in that country."

The applicant also noted that:

> The main point is that the technology is well understood and has and aqueous stream cleanup technologies are well understood.

* In response to the Public Service Commission request to provide feasibility studies for the project from East Kentucky Power Cooperative, Inc. in the Public Service Commission case of 2000-079, Dwight Lockwood of Kentucky Pioneer Energy, responding for East Kentucky Power Cooperative, stated that:

> Global Energy has concluded that **the extensive operational history of both gasification and the BGL in particular, serves as an adequate demonstration of the feasibility of the technology. Commercial viability of the project is demonstrated by the Kentucky Pioneer Energy contractual commitments for the development and long-term operation of the facility.**
>
> **The enclosed brochure "Gasification of Solid and Liquid**

[6] www.nationalcoalcouncil.org/documents/May2001report-revised.pdf

4/14
(cont.)

Comment No. 4 (cont.) **Issue Code: 14**

The fuel cell demonstration has been moved to the existing Wabash River IGCC Plant near West Terre Haute, Indiana.

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> **Fuels for Power Generation"**, by Department of Trade and Industry in the UK, presents a comprehensive analysis of gasification in general and a discussion of the various versions of gasification technology. **Information presented clearly demonstrates the technology is in place and operational.**

(Emphasis added).[7]

If the technology is sufficiently demonstrated that no feasibility study is deemed necessary to respond to the Public Service Commission request, how then can the DOE justify the expenditure of $78 million of taxpayer funds to fund a "demonstration project" for a technology with "extensive operational history" that the applicant admits has had "adequate demonstration[.]"

* The synopsis of the project on the DOE NETL website describes the technology in this way:

> The technology is expected to be adaptable to a wide variety of potential market applications because of several factors. First, the BGL gasification technology has successfully used a wide variety of U.S. coals. Also, the highly modular approach to system design makes the BGL-based IGCC and molten carbonate fuel cell competitive in a wide range of plant sizes. In addition, the high efficiency and excellent environmental performance of the system are competitive with or superior to other fossil-fuel-fired power generation technologies.

Since the system design is "highly modular," one alternative that must be evaluated in addition to those proposed is to test the molten carbonate fuel cell (which accounts for a very minor relative amount of the power expected to be generated) on an existing unit, whether one of Global's or otherwise.

The consideration of alternatives must also consider alternative sites within and outside of the Commonwealth of Kentucky. The DEIS indicates that the DOE's role is limited to cost-sharing, and that this justifies the failure to consider alternative sites. In truth, the DOE support is important to the project economics, and the fact that DOE's role is a financial one rather than a permitting action does not excuse the agency from the obligation to consider a range of alternatives, including alternative sites. There is nothing unique or inherently advantageous to the proposed site; it will be importing both the coal and garbage pellets from elsewhere, and is certainly not the only site previously disturbed by industrial activity that is available. The record reflects that East Kentucky Power Cooperative, which had a contract to purchase the generated power, has received approval to construct a new unit to supply its anticipated power needs because the Public Service Commission found it reasonable for that utility not to rely on the power proposed to be generated and sold by this project.

[7] A copy of this response is attached to the hard copy of these comments.

4/14 (cont.)

5/14

Comment No. 5 **Issue Code: 14**

Comment noted. Because of DOE's limited role of providing cost-shared funding for the proposed Kentucky Pioneer IGCC Demonstration Project, alternative sites were not considered. KPE selected the existing J.K. Smith Site because the costs would be much higher and the environmental impacts would likely be greater if an undisturbed area was chosen.

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Another area in which the DEIS is lacking in analysis is in consideration of the environmental effects of the processing of the waste fuel. The proposed project would, according to a response to comments developed by the company, use "the equivalent of roughly half of the residential waste generated in the entire commonwealth of Kentucky", with that the waste coming from out of state. The direct and indirect effects of the management and processing of that material, including air, land and water effects, must be assessed in order to determine the full range of environmental impacts associated with diversion of that waste to "fuel."

There are a number of concerns that must be assessed by DOE relative to the fuel source(s) and processing:

* What controls will be in place to assure that industrial and commercial wastes, including exempt hazardous wastes, will not be in the MSW?

* Where will the waste be processed, by whom, what QA QC controls will be in place and how will this be monitored?

* What emissions and discharges will be associated with the transportation, storage, transfer and processing of the MSW?

3. WASTES GENERATED BY PROJECT NEED FURTHER CHARACTERIZATION AND ANALYSIS

The project proposes to co-mingle and thermally treat two waste streams that contain many constituents of ecological and human health concern. With a heterogeneous waste stream being utilized as a fuel source, the possibility for variability in the chemical composition of the waste streams that could in turn affect combustion performance and the creation of products of combustion and of incomplete combustion that are of air toxics and waste management concern, is increased. Moisture, chlorine, and metals content may vary widely among and within these waste streams. The coal itself contains numerous metals of potential public health concern, and the fate and transport of these metals in the gasification process (including mercury) must be evaluated and addressed. The DEIS lacks appropriate assessment of the composition and fate of these constituents of concern during the thermal treatment process, including the fate of metals and chlorinated compounds released during thermal treatment.

While the processed garbage will be sized to homogenous dimensions, the chemical composition of the waste stream will vary. Yet the DEIS contains little information on the fuel composition, moisture, metals or chlorine content, variability, testing, and on the fate and transport of the products of complete or incomplete thermal treatment of this RDF/coal mixture under various blending scenarios.

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7/16 (cont.)

Comment No. 6 **Issue Code: 14**

All processing of MSW into RDF would occur at the RDF supplier's facilities. The actual conversion of waste to RDF is an established process currently ongoing and is not specific to the proposed project. The process is described so that the content of the RDF can be explained. The effects of processing MSW into RDF are outside of the scope of this EIS.

Comment No. 7 **Issue Code: 16**

Chapter 3, Section 3.2.2.2, of the EIS, discusses the production and composition of the RDF pellets using all available and relevant data. KPE intends to supply all RDF pellets for this project from the same manufacturer. Variation in RDF pellet composition due to different manufacturing processes should not be an issue for this project. The gasification technology used produces a very consistent syngas product, regardless of the variability of the feed. Chapter 3 explains the BGL gasification process. The RDF pellet and coal co-feed is heated in a low oxygen environment, which causes a chemical conversion process that results in the formation of the syngas. The syngas product is combusted in the combined cycle turbines to produce electricity.

Comment No. 8 **Issue Code: 12**

Gasification occurs at high temperatures and pressures using oxygen instead of air (nitrogen and oxygen) inputs. The high temperatures ensure complete destruction of toxic organic compounds. Inorganic toxic heavy metals are immobilized in molten slag and recovered by quenching as a nonleachable glassy frit. Gasification significantly reduces the formation of oxidative species such as SO_x and NO_x, and prevents the formation of dioxins/furans. Chloride, fluoride, mercury, arsenic, cadmium, lead, chromium, nickel and selenium have the potential to be present in the clean syngas or gas turbine exhaust. These elements usually represent less than 10 percent of input into the gasifier with coal. Nonvolatile elements such as barium, beryllium,

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The DEIS must include full characterization of the fuel and the degree of variability of the fuel, and of the fate and transport of the waste under thermal treatment conditions.

The process of thermal treatment of these potentially chemically complex and variable waste streams, and of pretreatment of the resulting gas, could result in release of certain VOCs and creation of products of the treatment. The possibility of malfunctions exists, and the nature and composition of the products of partial or incomplete combustion of the RDF/coal mixture must be understood, and the fate characterized and assessed by the EIS.

Solid waste incineration releases metals, acid gases, and products of incomplete combustion. At least 217 different organic compounds have been identified in MSW incinerator emissions. Emissions during upset conditions can release compounds of concern at levels orders of magnitude higher than steady state products of thermal treatment of the wastes. The possibility of emissions of compounds of particular concern that are present in the coal and may be present also in the waste, such as mercury, and which may be created through thermal treatment of chlorinated compounds, such as dioxins and furans, must be thoroughly assessed. Monitoring and emissions data from comparable facilities burning such waste, and/or trial burn results, should be developed to determine the possibility for such emissions from this thermal treatment process during steady-state or upset conditions.

The other notable area in which the DEIS failed to adequately assess impacts was in the waste streams generated by the facility. While the applicant hopes to market the "frit," the DEIS must assume that the material will be land-disposed, and the short- and long-term impacts of the management, storage, transportation and disposal of between 500 and 1000 tons per day of the material must be assessed. Additionally, the costs of disposal of the material and the impact of these costs on project viability should be evaluated.

Partitioning, fate and transport of the metals in the waste are of concern. A Columbia University research report for the US WEPA Office of Research and development, July 15, 1983 entitled "Destruction of Toxic Organic Substances un a Slagging Gasifier Including Determination of Heavy Metals in the Slag, authored by Distefano, et al., indicated that, rather than the expected concentration of metals and ungasified components in the slag,

> A preponderant fraction of the metal and metal oxides introduced with the 1:2 coal/RDF pellets was carried over with the gaseous products; part was plated out on the upper, cooler portion of the refractory gasifier lining; part was trapped out with the condensed coal tars; and a negligible fraction was present in the fritted vitreous, silico-alumina slag."

7/16 (cont.)

Comment No. 8 (cont.) **Issue Code: 12**
chromium, cobalt, manganese, nickel, and vanadium are immobilized almost entirely in the vitrified frit.

Comment No. 9 **Issue Code: 06**
Comment noted. All solid or liquid fossil fuels generate a vast array of organic compound emissions when combusted or subject to thermal decomposition processes. The total quantity of such compounds would be relatively low from the proposed project, as indicated by the emission estimates presented in Chapter 5, Table 5.7-1, of the EIS.

9/06

These emissions are far less than those that would be produced by direct combustion of coal or RDF pellets. Table 5.7-2 summarizes emission estimates for hazardous air pollutants. The emission rate estimates presented in Tables 5.7-1 and 5.7-2 are based in part on data from similar facilities. The air quality permit allows emission limits to be exceeded during process malfunctions for no more than 2 hours.

Additional discussion of acid and metal deposition issues has been added to Section 5.7.4 for the Final EIS.

Comment No. 10 **Issue Code: 12**

10/12

Frit from other gasifiers operating on different feed stocks pass the more stringent Universal Treatment Systems criteria of the EPA-TCLP analytical method and are nonhazardous. The frit from this facility is also expected to pass the Universal Treatment Systems criteria. If it is not marketable, KPE would dispose of the frit at an industrial solid waste landfill in the State of Kentucky and bear all associated costs. KPE cannot assess waste treatment costs until the plant is designed. KPE would not know what "specific" waste disposal requirements, if any, may exist until the plant is designed, or waste disposal requirements are identified or specified by regulatory determinations. General waste disposal requirements would not be known until day-to-day plant operations begin.

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The partitioning, fate and transport of the metals, and the characterization, management and disposal of lining materials and the effect of land disposal of those materials must be included as direct effects of the gasification process.[8] The DEIS makes no mention of this waste stream, and should evaluate from a systemic standpoint the concentration of constituents of concern in the waste feed and the fate of those constituents in the process, rather than limiting consideration to the "frit."

One metal of particular public health concern is mercury, yet it is given scant consideration. High mercury capture is available at relatively low cost from coal gasification facilities using activated carbon before syngas is burned, and should be required.

The characterization of the "frit" must include assessment of the available literature regarding short and long-term potential for mobilization of constituents of concern from the material. Among the questions to be addressed are the extent to which leaching would occur under a range of beneficial reuse or disposal conditions; including monofill or mixed-waste disposal. The applicant has indicated that the waste passes the TCLP test, but that test measures short-term leaching potential under conditions of mixed waste disposal (low pH). If the waste is land-disposed, it will likely be disposed in a monofill, and possibly under higher pH conditions. Additionally, short-term leaching tests may not fully reflect leaching potential, and longer term leaching tests under a range of pH values, should be reviewed. The variability of combustion conditions and of waste feed metals and chlorine content and the effect, if any, that these variables have on the leaching potential of the resulting frit must also be assessed.

CONCLUSION

The Council respectfully requests that these considerations, and the comments submitted by Will Herrick, the Kentucky Environmental Foundation, Sierra Club Cumberland Chapter and others be carefully evaluated, and that additional assessment of the full range of alternatives and effects, be undertaken in advance of a final decision on federal cost-sharing for the proposed project

Cordially,

Tom FitzGerald
Director

[8] With four planned refractory lined reactors each with an internal diameter of 12 feet, the change out and disposal of linings must be addressed but from a waste management standpoint and from a financial standpoint, since the cost of land disposal if the problems identified in the Columbia study have applicability here, may affect the project economics and project viability.

10/12 (cont.)

11/11

10/12 (cont.)

Comment No. 11 **Issue Code: 11**

Most of the mercury in the gasification process would be immobilized in the frit. Chapter 3 of the EIS has been revised to discuss metal partitioning in the gasifiers.

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December 13, 2001

Rob Daniell
Division of Waste Management
14 Reilly Road
Frankfort, Kentucky 40601

By fax & e-mail only

Re: Global Energy, Inc
Request for Determination Regarding Applicability
Of KRS 224.40.

Dear Director:

After a review of the position paper submitted by Global Energy to the state Division for Waste Management, and after review of the applicable statute and case law, I believe that the facility is subject to the solid waste regulations and is required to obtain a determination of consistency from the solid waste management governing body of Clark County before importing and disposing of the solid waste fuel through thermal treatment.

By letter dated October 9, 2000, Global Energy Inc., Suite 2000, 312 Walnut Street, Cincinnati, OH 45202, through its manager of Regulatory Affairs Dwight Lockwood, requested a determination from the Kentucky Division of Waste Management as to the applicability of KRS 224.40 to the proposed "integrated gasification combined cycle (IGCC) power plant project in Clark County."

The request letter from Global Energy (Hereafter Global) asserted that the proposed project was "exempt from waste regulations." The 2-paged letter contained an attached "Analysis of the Non-Applicability of KRS 224.40 to the Kentucky Pioneer Energy IGCC Project."

The determination of applicability of the waste regulations rests in the first instance with the Natural Resources and Environmental Protection Cabinet, subject always to review by the courts. KRS Chapter 224 is a statute that is remedial in nature and its protections are to be liberally with a view towards promoting the public and environmental protection goals of the statute. *Roland v.*

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Kentucky Retirement Systems, Ky.App.52 S.W.3d 579 (2001). Exemptions from its reach are to be narrowly construed.

The question of whether the proposed coal and waste-fueled facility is subject to the requirements of KRS Chapter 224 as a waste management and waste disposal facility is of significance to the residents of Trapp and of Clark County, since if exempted from the ambit of the term "municipal solid waste facility," the planned importation of processed municipal solid waste from northeastern states representing the equivalent of "roughly half of the residential waste generated in the entire Commonwealth of Kentucky" will not be subject to scrutiny and a determination by the local governing body of Clark County of the consistency with that county's approved solid waste plan.

When enacted in 1991, Senate Bill 2 substantially revised state and local solid waste management, requiring of local communities that they plan for the proper management of solid waste generated within their borders and promising, in return, that the local "governing body" responsible for solid waste planning would have the ability to control the manner and extent to which waste generated outside of the boundary of that planning unit would be managed and disposed of within the planning area.

The proposal to thermally treat and to combust the volatile fraction of one million tons or more per year[9] of treated municipal solid waste falls squarely within the type of facility intended by the General Assembly to be scrutinized under the solid waste planning process.

KRS 224.40-315 mandates that:

> No permit to construct or expand a municipal solid waste disposal facility shall be accepted for processing by the Cabinet unless the application contains a determination from the governing body for the solid waste management area in which the facility is or will be located concerning the consistency of the application with the area solid waste Management plan [.]

The scope of this statute and the requirement for a determination of consistency with the approved solid waste plan is defined by the term "municipal solid waste disposal facility", which is defined in KRS 224.01-010(15) to include:

> Any type of waste site or facility where the final deposition of any amount of municipal solid waste occurs, whether or not mixed with or including other waste allowed under

[9] The Public Service Commission filing by East Kentucky Power Cooperative in response to requests for information indicated a 50-50% fuel to waste feed mix at 1 million tons of each per year, while noting that the actual feed ratio may vary.

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> subtitle D of the Federal Resource Conservation and Recovery Act of 1976, as amended, and includes, but is not limited to, incinerators and waste-to-energy facilities that burn municipal solid waste. . . .

The term is broadly inclusive of all types of waste sites or facilities where the final deposition of any amount of municipal solid waste occurs. There can be no serious argument that the feed material to be combined with the coal is a solid waste, which is to say, that the material is "garbage, refuse, sludge and other discarded material." The waste is to be processed, according to the applicant, at a facility in a state other than Kentucky, where it will be manufactured from municipal solid waste by removing "large objects and white goods" as well as "glass and metal [.]" The remaining material, including chlorinated plastics, will be milled and shredded.[10]

These "pellets" are municipal solid waste processed as an intermediate step in the thermal treatment of the waste to produce a gas for combustion. The proposed facility is utilizing a fuel stream comprised of partially separated, shredded and shaped municipal solid waste used as a fuel source, disposing of the waste through thermal treatment at high temperature to drive off the volatile fraction for combustion. As such, it is engaged in disposal of a municipal solid waste stream and falls within the ambit of a "municipal solid waste disposal facility" the siting and operation of which should be reviewed for consistency with local solid waste plans.

The applicant claims exemption for the waste fuel from the waste program as a "recovered material," yet the clearly better reading of the statute, and the intent to carefully regulate the disposal of solid waste by thermal treatment as well as other means, militates against the exemption of the material from regulation as a solid waste. The material is not a "refuse-derived fuel" notwithstanding the claim by the applicant to the contrary, since the applicant has indicated that it intends to retain the recoverable plastics in the waste[11] (likely for the Btu value), and thus is outside of the ambit of "recovered material," since that definition specifically excludes "materials diverted or removed for purposes of energy recovery or combustion []" from being considered recovered material.

Assuming, for the sake of argument, that the waste were further processed over what is proposed, in order to meet the state definition of "refuse derived fuel" by removing all recoverable plastics and other recoverable material, such as mixed paper, corrugated paper and newsprint, the definition of "recovered material" still would not apply to exempt the entire waste stream from regulation since only 15% of the material processed by the facility creating the pellets could be credited as "RDF."

---

[10] Subpart Eb Siting Analysis Public Meeting and Comments, pp. 7-8.

[11] Id.

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While the acceptance by the applicant of regulation under EPA's Municipal Solid Waste Combustor standards makes it difficult to accept at face value the assertion of non-applicability of state "waste" designation, commenter concurs that the state law itself determines how this facility is to be characterized for purposes of state regulation.

Because the material is not a "refuse derived fuel" under KRS 224.01-010(23) in that it has not been subject to "extensive separation of municipal solid waste" including "the extraction of recoverable materials for recycling" the processing of the municipal solid waste stream to create the palletized "fuel" does not make the material a "recovered material" under KRS 224.01-010(20). The proposed gasification step in the process and the cleaning of the volatile fraction of the waste for combustion does not make the facility a "recovered material processing facility" so as to exempt it from the definition of a municipal solid waste disposal facility or to avoid the obligation to be consistent with the local solid waste plan.[12]

Beyond the specific failure of the application to meet the criteria for an exempt "recovered material processing facility" because the waste feed will retain recoverable materials, including all plastics and paper, the *context* in which municipal solid waste disposal facilities are regulated under KRS Chapter 224 makes clear that the attempt to shoehorn this substantial waste-fueled energy facility into the category of a "recovered materials processing facility" is an ill-fit from a public policy standpoint. KRS 224.01-010, which contains many of the definitions for the chapter, is prefaced with the caveat "[a] s used in this chapter unless the context clearly indicates otherwise [.]" The statutory provision requiring a determination of local consistency for disposal facilities was plainly intended to cover thermal treatment of municipal solid wastes with and without energy recovery, and to segment the facility into the component processes in order to exclude from the application of KRS 224.40-315 a facility which uses a sequential process of thermal treatment followed by combustion of volatile gases, and which presents many similar concerns in management of air, water and solid waste byproducts from a heterogeneous fuel source such as municipal solid waste (even if homogenous in shape), is contrary to the intent of the statute and the public policy behind it.

In sum, the Council believes that the pelletized mixed municipal solid waste does not fall within the ambit of the state statutory definition of "refuse derived fuel" and is thus not a "recovered material." By definition, the facility is a

[12] Even assuming that the partially processed waste fell within the ambit of "refuse derived fuel" and the 15% limitation on RDF didn't limit the applicability of "recovered material" even as to RDF, the proposed facility is not a "recovered material processing facility" since it proposes to combust the gases created by the thermal and pressure treatment of the waste and is not storing and processing for resale or reuse. "Reuse," as that term is used by the General Assembly does not include use of wastes as a fuel with or without heat recovery. The latter concept is "resource recovery" and is a term distinct from "reuse of solid waste." See: KRS 224.43-010 (3) (which sets reuse of solid waste as a priority below reduction, and above recycling, composting, and resource recovery through mixed waste composting or incineration.

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"municipal solid waste disposal facility" under KRS 224.40-315(1), KRS 224.40-310 and KRS 224.01-010(15).

Commenter appreciates the Division's consideration of these comments in making a final determination as to the applicability of the waste statutes to the proposed facility.

Cordially,

Tom FitzGerald
Director

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EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2000-079
INFORMATION REQUEST RESPONSE
PUBLIC SERVICE COMMISSION REQUEST
DATED JUNE 1, 2000

FILED JUNE 9, 2000

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Frankfort, KY
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EAST KENTUCKY POWER COOPERATIVE

RECEIVED
JUN 9 2000
OFFICE OF RATE INTERVENTION
PUBLIC SERVICE LITIGATION BRANCH

HAND DELIVERED

June 9, 2000

Mr. Martin J. Huelsman, Jr.
Executive Director
Public Service Commission
P. O. Box 615
Frankfort, KY 40602

Re: PSC Case No. 2000-079

Dear Mr. Huelsman:

Please find enclosed for filing with the Commission in the above-referenced case, an original and eight copies of East Kentucky Power Cooperative, Inc.'s ("EKPC") responses to the Commission's Information Request No. 3 dated June 1, 2000. These responses are based on information provided by Kentucky Pioneer Energy, L.L.C.

Very truly yours,

Charles A. Lile
Senior Corporate Counsel

cal/lhs
enclosures
c: Service List
David Brown – Kinlock

4775 Lexington Road 40391
P.O. Box 707, Winchester,
Kentucky 40392-0707

Tel. (606) 744-4812
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EAST KENTUCKY POWER COOPERATIVE, INC.

PSC CASE NO. 2000-079

INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED JUNE 1, 2000

In response to the following Public Service Commission's third request for information, East Kentucky Power Cooperative, Inc. (EKPC) submits responses to the questions contained therein. Each response with its associated supportive reference materials is individually tabbed.

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COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF EAST KENTUCKY POWER COOPERATIVE, INC. FOR APPROVAL OF A POWER PURCHASE AGREEMENT WITH KENTUCKY PIONEER ENERGY, L.L.C.	)))))	CASE NO. 2000-079

ORDER

IT IS ORDERED that East Kentucky Power Cooperative, Inc. ("East Kentucky"), and Pioneer Energy, L.L.C. ("Pioneer") shall file the original and 8 copies of the following information with the Commission with a copy to all parties of record no later than June 9, 2000. Each copy of the data requested should be placed in a bound volume with each item tabbed. When a number of sheets are required for an item, each sheet should be appropriately indexed, for example, Item 1(a), Sheet 2 of 6. Include with each response the name of the witness who will be responsible for responding to questions relating to the information provided. Careful attention should be given to copied material to ensure that it is legible. Where information requested herein has been provided along with the original application, in the format requested herein, reference may be made to the specific location of said information in responding to this information request.

1. Provide the feasibility studies for the project.

2. Provide a copy of the Tender Specification Documents ("TSD") of the construction contractor. Provide the design and engineering of the process if it is not

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included in the TSD. Were the characteristics of Kentucky-produced coal considered in the selection of the type of process and equipment?

3. Provide the estimated budget for the project.

4. Provide the preliminary schedule for the project and estimated date of construction.

5. Provide the ratio of the coal to solid waste.

6. Will the solid waste be combined with coal to produce a briquette or will the solid waste be converted into gas and then processed with the coal? Explain the process to be used.

7. Will Kentucky coal be used exclusively for the briquettes? If yes, describe the term of contracts that are expected to be signed.

8. How much coal and how much solid waste are anticipated to be utilized on an annual basis?

9. Where will the solid waste and coal be stored and where will the briquettes be made?

10. Will all the solid waste originate in Kentucky or will out-of-state solid waste be imported?

11. What is the range of specifications for the coal that can be used in this gasification process? What are the specifications of the coal that will be used in this process?

12. Describe the type of purification system for the produced gas.

13. What is the estimated gas yield in Btu's gas per unit weight of coal and unit weight of solid waste?

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14. What is the estimated annual operating cost of the plant?
15. Explain the type of process that will be used for coal gasification.
16. Provide the operating manual, if available.
17. What is the gasification media (e.g., air, oxygen, steam)?
18. What is the estimated cost of the synthetic gas per million Btu?
19. If the proposed combustion turbine is operated exclusively on natural gas, what is the maximum gas consumption per hour and what is the maximum quantity of gas per hour available at the site for this combustion turbine?

Done at Frankfort, Kentucky, this 1st day of June, 2000.

By the Commission

ATTEST:

Executive Director

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TAB 1

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PSC Request 1
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EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2000-079
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 1
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 1. Provide the feasibility studies for the project.

Response 1. Global Energy has concluded that the extensive operational history of both gasification in general and the BGL in particular, serves as an adequate demonstration of the feasibility of the technology. Commercial viability of the project is demonstrated by the Kentucky Pioneer Energy contractual commitments for the development and long-term operation of the facility.

The enclosed brochure "Gasification of Solid and Liquid Fuels for Power Generation", by Department of Trade and Industry in the UK, presents a comprehensive analysis of gasification in general and a discussion of the various versions of gasification technology. Information presented clearly demonstrates the technology is in place and operational.

Kentucky Pioneer Energy economic modeling and engineering work are subject to international contractual secrecy agreements and are therefore business confidential and not available.

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TECHNOLOGY
STATUS REPORT

GASIFICATION OF SOLID AND LIQUID FUELS FOR POWER GENERATION

CLEANER COAL TECHNOLOGY PROGRAMME

TSR
008

DECEMBER 1998

dti
Department of Trade and Industry

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GASIFICATION OF SOLID AND LIQUID FUELS FOR POWER GENERATION

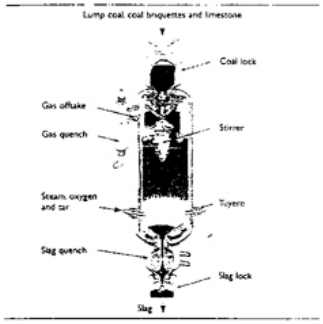

Figure 1 The BGL gasifier (courtesy of BG plc)

SUMMARY

Gasification is the conversion of solid and liquid materials (eg coal or oil) into a gas whose major components are hydrogen (H_2) and carbon monoxide (CO). Gasification has been employed for over a hundred years with the gas produced being used for various applications such as domestic heating and lighting ('Town Gas'), chemicals manufacture, eg ammonia (NH_3) or methanol, and the production of petrol- and diesel-substitutes.

In recent years, there has been interest in using gasification to generate electricity. The initial reason for this was the development of large, efficient gas turbines. It was soon realised that the gasification of coal, coupled with a gas turbine, could potentially generate power as efficiently as the most modern conventional coal-fired power plant, but with much lower emissions. The first experimental integrated gasification combined cycle (IGCC) power plant was built in the early 1970s in Germany, and today there are several coal-fired demonstration plant worldwide.

IGCC power plant can also be fired with oil-derived feedstocks such as heavy oils and tars. These products are formed during oil-refining processes. Traditionally, these products have been used to manufacture heavy fuel oils for use in power station boilers and as marine fuel. However, the market for heavy fuel oil has declined rapidly in recent years, and some refineries now have a surplus of such products. Gasifying these heavy oils can provide both power for the refinery, and for export, and H_2 which can be used within the refinery to upgrade and clean other products, such as diesel and petrol. There are at least four major oil IGCC projects active in Europe.

Both biomass and wastes can be gasified; however, IGCC technology tends to favour large, centralised power plant whilst biomass and wastes are best exploited using smaller plant close to their source. An alternative, therefore, is to gasify the biomass or waste in a small gasifier adjacent to an existing power plant and use the gas produced to partially replace the coal or oil being fired. This allows an existing power station to utilise biomass and wastes as and when they are available. Some gasifier technologies allow biomass and wastes to be co-gasified with coal. Several biomass and waste gasification projects are currently going ahead, mostly in Europe, with several of the most important in the UK.

IGCC plant are still at the demonstration stage and nearly all of the projects so far have required some form of Government support. The technology has three major deficiencies that need to be remedied before it becomes widely used:

i IGCC plant are expensive to build, costing significantly more than conventional coal-fired plant with environmental protection equipment.

ii IGCC plant have so far suffered from relatively poor reliability.

iii The operational flexibility of IGCC plant at least those with oxygen (O_2) plant - has yet to be fully proven, in particular, the start-up times for IGCC plant are measured in days rather than hours.

Further development work is required to overcome these obstacles to the uptake of the technology. When they have been overcome, IGCC plant should take a significant market-share of new coal-fired power plant worldwide.

BENEFITS OF THE TECHNOLOGY

Gasification technologies offer the following benefits:

- highly-efficient and clean generation of power from coal
- clean generation of power from oil residues with substantial scope for integration with refinery activities
- environmentally-benign disposal of solid and liquid wastes with scope for further energy recovery
- utilisation of biomass for power production.

DEPARTMENT OF TRADE AND INDUSTRY SUPPORT

Since 1990, the Department of Trade and Industry (DTI) has supported 49 projects associated with gasification for power generation, contributing £10.9M to a total projects cost of £36.6M.

INTRODUCTION

Gasification

Gasification is the conversion of a carbon-containing solid or liquid substance into a gas in which the major components are H_2 and CO. This gas can then be used as a fuel or as a chemical feedstock from which products such as NH_3 or methanol can be made.

The defining chemical characteristic of gasification is that it entails the partial oxidation of the feed material; in combustion, the feed is fully oxidised, whilst in pyrolysis, the feed undergoes thermal degradation in the absence of O_2.

The oxidants for gasification are O_2 or air and, usually, steam. Steam helps to act as a temperature moderator, as the reaction of steam with the carbon in the feed is endothermic (ie it absorbs heat). The choice of air or pure O_2 depends on a number of factors such as the reactivity of the feed material, the purpose for which the gas is to be used and the type of gasifier.

The first major application of gasification was to convert coal into a fuel-gas for domestic lighting and heating. This application has gradually died out in most places due to the availability of natural gas, although gasification is still used for this purpose in China (and until recently in Eastern Europe). For the last few decades, the main application of gasification has been in the petrochemical industry to convert various hydrocarbon streams into 'synthesis gas', eg for the manufacture of methanol, the supply of H_2 for NH_3 production or the hydrodesulphurisation or hydrocracking of oil streams. Other, more specialised uses of gasification have included the conversion of coal into synthetic motor fuels (as practised in South Africa) and the manufacture of substitute natural gas (SNG) (not practised commercially at present but given serious consideration in the late 1970s and early 1980s).

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GASIFICATION PROCESSES

Types of Gasification Process

There are many different gasification processes on offer. These differ considerably in terms of, for example, technical design, scale, reference experience and fuels handled. The most useful way of classifying them is by flow regime, ie the way in which the fuel and oxidant flow through the gasifier.

Just as conventional solid-fuel boilers may be divided into three basic types (namely pf-fired, fluidised bed and grate-fired), gasifiers fall into three groups: entrained flow, fluidised bed and moving bed (sometimes called, somewhat erroneously, fixed bed). Fluidised bed gasifiers are exactly analogous to fluidised bed combustors; entrained flow gasifiers are similar in concept to pf-firing, and moving bed gasifiers bear some resemblance to grate firing. Characteristics of each are compared in Table 2.

	Entrained flow	Fluidised bed	Moving bed
Fuel types	Solid and liquid	Solid	Solid
Fuel size (solid)	<500μm	0.5-5mm	5-50mm
Fuel residence time	1-10s	5-50s	15-30min
Gas outlet temperature	900-1400°C *	700-900°C	400-500°C

* [illegible]

Table 2 Comparison of gasifier types

Entrained Flow Gasifiers

In an entrained flow gasifier, pf or atomised oil flows co-currently with the oxidising medium (typically O_2). The key characteristics of entrained flow gasifiers are their very high and uniform temperatures (usually more than 1000°C) and the very short residence time of the fuel within the gasifier. For this reason, solids fed into the gasifier must be very finely divided and homogeneous, which in turn means that entrained flow gasifiers are not suitable for feedstocks such as biomass or wastes, which cannot be readily pulverised. The high temperatures in entrained flow gasifiers mean that the ash in the coal melts and is removed as a molten slag. Entrained flow gasifiers are well suited to gasifying liquids, and the primary application of such gasifiers today is in refineries, gasifying oil-feedstocks.

Entrained flow gasifiers have been selected for nearly all the coal- and all the oil-based GPPs currently in operation or under construction. Entrained flow gasifiers include the Texaco gasifier, the two variants of the Shell gasifier (one for coal, the other for oil), the Prenflo® gasifier and the Destec gasifier. Of these, both the Texaco gasifier and the Shell oil gasifier have over 100 units in operation worldwide.

Fluidised Bed Gasifiers

In a fluidised bed, solids (eg coal, ash) are suspended in an upwardly flowing gas stream. In a fluidised bed gasifier, this gas stream comprises the oxidant (normally air rather than O_2). The key feature of the fluidised bed gasifier (like the fluidised bed combustor) is that the fuel ash must not be allowed to become so hot that it melts and sticks together; if the fuel particles stick together, the bed will defluidise. The use of air as the oxidant keeps the temperature below ~1000°C. This in turn means that fluidised bed gasifiers are best suited to relatively reactive fuels, such as biomass.

Advantages of the fluidised bed gasifier include the ability to accept a wide range of solid feeds, including household waste (suitably pre-treated) and biomass such as wood. It is also to be preferred for very high ash coals, particularly those in which the ash has a high melting point, because other gasifier types (entrained flow and moving bed) lose significant amounts of energy in melting the ash to form slag.

Fluidised bed gasifiers include the High Temperature Winkler (HTW) and that developed by British Coal Corporation and now marketed by Mitsui Babcock Energy Ltd (MBEL) as part of the Air Blown Gasification Cycle (ABGC). There are relatively few large fluidised bed gasifiers in operation. Fluidised bed gasifiers are not suitable for liquid feeds.

Moving Bed Gasifiers

In a moving bed gasifier, the oxidant (steam and O_2) is blown into the bottom of the gasifier. The raw fuel-gas produced moves upward through a bed of solid feedstock, which gradually moves downwards as the feed at the bottom of the bed is consumed. The defining characteristic of moving bed gasifiers is therefore counter-current flow. As the raw fuel-gas flows through the bed, it is cooled by the incoming feed, which in turn is dried and devolatilises. There is therefore a very pronounced temperature profile in the gasifier, from 1000°C or more at the bottom to perhaps 500°C at the top. The devolatilisation of the fuel during the gasification process means that the outgoing fuel-gas contains significant amounts of tarry compounds and methane. This raw fuel-gas is therefore washed at the outlet with water to remove the tars. As a consequence of this, the fuel-gas does not require high-temperature cooling in a syngas cooler, as it would if from an entrained flow reactor. Moving bed gasifiers were designed for coal, but can accept other solid fuels, such as wastes.

There are two main moving bed gasifier technologies. The Lurgi dry-ash gasifier was originally developed in the 1930s and has been used extensively for Town Gas production and in South Africa for chemicals from coal. In this gasifier, the temperature at the bottom of the bed is kept below the ash fusion point so the coal ash is removed as a solid. In the 1970s, Lurgi and the then British Gas Corporation (now BG plc) developed a slagging version in which the temperature at the bottom is sufficient for the ash to melt. This gasifier is referred to as the BGL (BG-Lurgi) gasifier. Several BGL gasifiers are currently being installed into plant for gasifying solid wastes and co-gasifying coal and waste.

SPECIFIC GASIFIERS

Some of the most important and well-known gasification processes are described below in alphabetical order.

BGL Gasifier (Moving Bed)

The BGL gasifier was originally developed in the 1970s to provide a syngas with a high methane content in order to provide an efficient means of manufacturing SNG from coal. It was developed over about 15 years at British Gas' Westfield Development Centre in Fife, initially to test the process for applicability to SNG manufacture and later for IGCC.

Lump coal and a flux such as limestone are fed into a lockhopper which periodically discharges into the top of the gasifier (Figure 1). A slowly rotating distributor plate distributes the coal evenly over the top of the bed. For caking coals, the distributor is connected to a stirrer which also keeps the bed even and prevents the coal from agglomerating. As the bed descends the gasifier, it undergoes a number of reactions. These reactions can be grouped into three zones at different heights in the fuel bed: in the upper zone coal is dried and devolatilises; in the middle zone it is gasified, and in the lower zone it is combusted, the CO_2 produced acting as a gasification agent in the middle section. O_2 and steam are added at the bottom of the bed through nozzles (tuyères). The molten slag produced forms a pool in the bottom of the gasifier and is periodically removed.

The gasifier vessel is refractory-lined to prevent excessive heat loss from the bed. The refractory does not experience high temperatures as it is insulated from the hottest part of the bed (at the tips of the tuyères) by the coal bed itself.

The gas exiting the gasifier is at a temperature of 450-500°C and contains tars and oils produced by the devolatilisation of the coal, together with coal dust elutriated from the bed. This is removed by a quench vessel located at the gas exit. The gas is simultaneously cooled and cleaned by a water quench. The gas then passes to a further chain of exchangers that cool the gas to ambient temperature prior to being desulphurised. The tars and water removed from the gas pass to a separator, from which the tars and coal dust are recycled to the tuyères of the gasifier (a portion may be added to the top of the gasifier to suppress the elutriation of coal dust).

The BGL gasifier has a very high cold gas efficiency; ie, compared with other gasifiers, a larger portion of the original calorific value (CV) of the coal appears as chemical energy in the gas as opposed to thermal energy. Thus, the BGL gasifier does not feature high-temperature heat exchangers as required by Shell and Texaco systems amongst others. The gasification island and CCGT unit is therefore less closely coupled as the gas-cooling train is not intimately integrated into the steam turbine cycle. In a BGL system more of the power is generated by the gas turbine and less by the steam turbine than in an entrained flow system.

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Fuel is pressurised in a lockhopper and then stored in a day- or charge-bin before being fed by screw into the gasifier. The bottom part of the gasifier itself comprises a fluidised bed, the fluidising medium being air or O_2 and steam. Gas plus entrained solids flow up the reactor, with further air/O_2 and steam being added in this region to complete the gasification reactions. The crude syngas is then declustered in a cyclone and cooled. The solids removed in the cyclone are returned to the gasifier base. Ash is removed from the base of the gasifier by means of an ash screw.

The temperature in the base of the gasifier is kept at about 800-900°C; this is controlled to ensure that the temperature does not exceed the ash softening point; the temperature in the freeboard above the bed itself can be significantly higher. The operating pressure can vary between 10bar (for syngas manufacture) and 25-30bar (for IGCC).

Lurgi Dry Ash (Moving Bed)

The Lurgi dry-ash gasification process was developed by Lurgi GmbH in the early 1930s as a means of producing Town Gas. The first commercial plant was built in 1936. Until 1950, the process was mostly restricted to lignites, but in the 1950s Lurgi and Ruhrgas collaborated to develop a process suitable for bituminous coals as well. Since then the Lurgi gasification process has been widely used worldwide for producing Town Gas and syngas for a variety of purposes (eg NH$_3$, methanol, liquid fuel productions). In addition to plant supplied by Lurgi itself, Lurgi-type gasifiers have been built in Eastern Europe and the former Soviet Union.

The first ever IGFC at Lünen in Germany used the Lurgi system (unluckily, the gasifiers were shutdown). Other significant installations using the Lurgi system are the Great Plains SNG plant in North Dakota, USA, and the SASOL synfuels plant in South Africa.

The process itself is shown schematically in Figure 5.

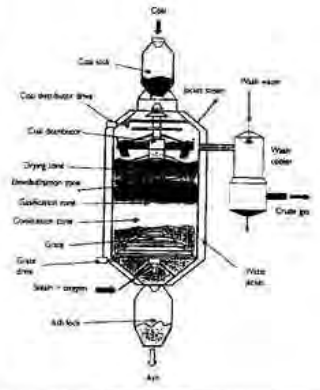
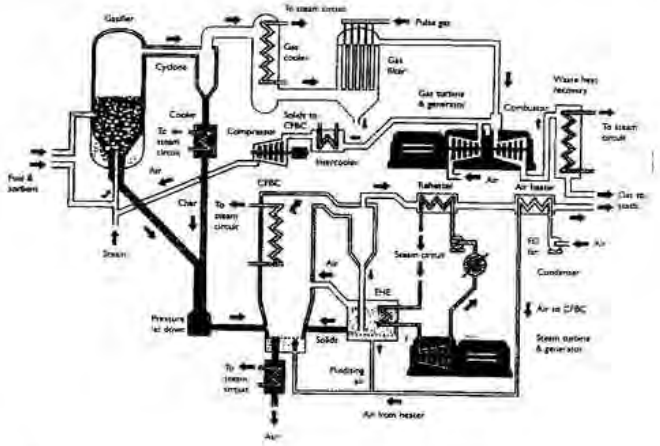


Figure 5 Lurgi dry-ash gasifier



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Shell Coal Gasification Process (Entrained Flow)

Shell's experience with gasification dates back to the 1550s, when the first SCGP units were commissioned. In 1972, Shell started development work on a gasification process for coal. Following experience with a 6tpd pilot plant in Amsterdam, in 1978 Shell started operation of a 150tpd demonstration plant operated by Deutsche Shell at Harburg near Hamburg, Germany. Shell used the experience gained to construct a plant at its existing petrochemicals complex at Deer Park in Houston, USA. This plant was sized to gasify 220tpd (250 US tons per day) of bituminous coal or 365tpd (400 US tons per day) of high-moisture, high-ash lignite. The Deer Park gasifier went into operation in 1987, and proved the ability of the SCGP to gasify a wide range of coals.

In 1989 it was announced that the SCGP had been chosen for an IGCC plant at Buggenum, the Netherlands. This remains the only commercial plant using the SCGP.

The Shell gasifier is shown in Figure 8.

Figure 8 The Shell coal gasifier (courtesy of Shell)

The gasifier vessel consists of a carbon steel pressure shell, within which is a gasification chamber enclosed by a refractory-lined membrane wall. Water circulated through the membrane wall is used to control the temperature of the gasifier wall and raises saturated steam. Dried pf, O_2 and steam are fed through opposed burners at the bottom of the gasifier, which operates at ~25-30bar. Gasification occurs at temperatures of 1500°C and above, which ensures that the ash in the coal melts and forms a molten slag. The slag runs down the inner surface of the gasifier wall and is quenched in a water bath at the bottom of the gasifier. A portion of the slag achieves to the wall of the gasifier and cools, forming a protective layer.

Gasification of the coal forms a raw fuel-gas that is predominantly H_2 and CO with a little CO_2 and some entrained slag particles. At the gasifier outlet, the raw gas is quenched with recycled, cooled fuel-gas to lower the temperature to ~900°C. This cooling freezes the slag particles, rendering them less sticky and less prone to fouling surfaces.

The fuel-gas is then cooled to ~300°C in the syngas cooler, raising high- and medium-pressure steam. In contrast to the syngas cooler for Shell's oil gasification process, the SCGP syngas cooler has the gas on the shell side. The syngas cooler thus has a complex tube bundle comprising various economisers, medium- and high-pressure evaporators and some superheaters.

The cooled syngas is filtered using ceramic filters. About 50% of the cooled syngas is then recycled to the top of the gasifier to act as the quenching medium for the gas. The remainder is washed to remove halides and NH_3 and then passed to the desulphurisation unit.

Texaco Gasification Process (Entrained Flow)

The key feature of Texaco's process is the very wide range of feedstocks that have been successfully gasified using the same basic technology. This range encompasses gases, oils, Orimulsion™, petroleum coke and a range of coals. Texaco is additionally working on pre-treatment processes that will allow waste plastics and scrap tyres to be gasified.

The Texaco Gasification Process was originally developed in the late 1940s. The initial focus of the work was to develop a process for reforming natural gas so as to make synthesis gas for conversion into liquid hydrocarbons. Soon, the emphasis shifted to producing syngas for NH_3 production. During the 1950s, work was carried out to extend the process to gasify oil and, to a lesser extent, coal. When the oil crisis occurred in 1973, work on coal gasification was re-commenced, and the first commercial plant gasifying coal began operation in 1983 at Eastman Chemicals' plant at Kingsport, Tennessee, USA. In 1984 the Cool Water IGCC plant went into operation. Currently operational GPFs using the Texaco process are El Dorado (petroleum coke) and Polk (coal). The Texaco process has also been selected for the majority of oil-residue IGCCs being built or planned.

There are two basic variants of the process, which differ in the method used to cool the raw syngas. In the quench variant, the raw syngas from the bottom of the gasifier is shock-cooled with water. In the full heat recovery variant, the raw syngas is cooled using a syngas cooler. The Texaco quench gasifier is shown schematically at Figure 9 and the full heat recovery version in Figure 10.

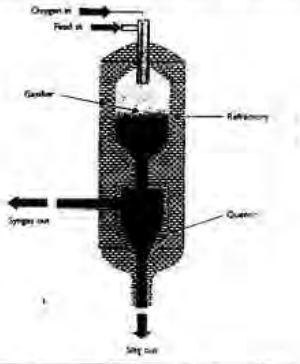

Figure 9 Texaco downflow gasifier

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CURRENT GASIFICATION POWER PLANT PROJECTS

There are currently at least 35 GPP projects in operation, commissioning, construction, design or planning. These vary in size from 500MW$_e$ to less than 10MW$_e$ and use a variety of fuels such as coal, heavy oil residues, waste woods, sewage sludge and sugar cane bagasse. A selection of these projects are reviewed below whilst a full list of operational and near-operational plant is given in Table 3.

Coal GPPs

Buggenum (Netherlands)

The Buggenum plant is the world's first commercial-sized (253MW$_e$), coal-fired IGCC (Figure 11). The IGCC is based around a Shell SCGP gasifier and a CCGT supplied by Siemens. The plant was started up in 1993. As well as being the first of the current generation of IGCC plant, the project is important in that it contains a number of advanced design features. The most significant of these is that the ASU and the gas turbine are very closely coupled together, with the gas turbine compressor supplying all the air to the ASU. This increases efficiency at the cost of making the plant more complex and less easy to start

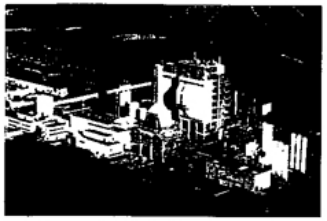

Figure 11 Buggenum IGCC (courtesy of Demkolec)

Name	Location	Output(MW)	Fuel	Gasifier	Power Island	1998 Status	Year
Buggenum	Netherlands	253MW$_e$	Bituminous coal	Shell	CCGT - V94.2	Operational	1995
Piñon Pine	USA	100MW$_e$	Bituminous coal	KRW	CCGT - GE 6FA	Commissioning	1998
Polk	USA	250MW$_e$	Bituminous coal	Texaco	CCGT - GE 7F	Operational	1996
Puertollano	Spain	298MW$_e$	Coal and petroleum coke	Prenflo®	CCGT - V94.3	Commissioning	1998
Vresová	Czech Republic	400MW$_e$	Lignite	Lurgi	CCGT - 2xGE 9E	Operational	1995
Wabash River	USA	262MW$_e$	Bituminous coal	Destec	CCGT - GE 7FA	Operational	1995
El Dorado	USA	40MW$_e$ (gross)	Petroleum coke	Texaco	GT - GE 6B	Operational	1996
Falconara	Italy	234MW$_e$	Visbreaker residues	Texaco	CCGT - ABB 13E2	Construction	1999
GSK	Japan	550MW$_e$	Vacuum residue	Texaco	CCGT - 2xGE 9EC	Construction	2000
Pernis	Netherlands	125MW$_e$	Refinery residues	Shell SGP	CCGT - 2xGE 6B	Operational	1997
Priolo Gargallo	Italy	521MW$_e$	Refinery asphalt	Texaco	2xCCGT V94.2	Construction	1999
Saras	Italy	550MW$_e$	Visbreaker residue	Texaco	CCGT - 3xGE 9E	Construction	2000
Star	USA	240MW$_e$	Petroleum coke	Texaco	2xGE 6FA	Construction	1999
Amercentrale	Netherlands	85MW$_{th}$	Wood wastes	Lurgi CFB	Existing boiler	Construction	2000
ARBRE	UK	8MW$_e$	SRC willow	TPS CFB	CCGT - AGT typhoon	Construction	1999
Energy Farm	Italy	12MW$_e$	Short rotation forestry	Lurgi CFB	CCGT - Nuovo Pignone PGT10B/1	Construction	2000
Lahti	Finland	70MW$_{th}$	Wood wastes	Foster Wheeler CFB	Existing boiler	Operational	1998
McNeil	USA	~15MW$_{th}$	Wood chips	Battelle CFB	Existing boiler	Operational	1997
Värnamo	Sweden	6MW$_e$	Wood wastes	Foster Wheeler CFB	CCGT - AGT Typhoon	Operational	1993
Fondotoce	Italy	1MW$_e$	MSW	Thermo-select (moving bed)	Gas-motor generator	Operational	1994
Greve in Chianti	Italy	6.7MW$_e$ (gross)	Refuse - derived fuel	TPS CFB	Boiler and steam turbine	Operational	1992
New Bern	USA	<60MW$_{th}$	Black liquor	Chemrec (entrained flow)	Boiler and steam turbine	Operational	1997
Schwarze Pumpe	Germany	60MW$_e$	Assorted solid and liquid wastes	Noell, Lurgi BGL	CCGT - GE Frame 6	Operational. BGL to start-up in 1999	1997
Westfield	UK	120MW	Sewage sludge plus coal	BGL	CCGT - GE 6B	GT Operational on natural gas	1998
Zeltweg	Austria	10MW$_{th}$	Biomass/wastes	AE&E CFB	Existing boiler	Operational	1997

Table 3 Operational and near-operational GPPs

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Westfield (UK)

The site of British Gas Westfield Development Centre in Fife is being developed by the US-based Nth Power. The existing BGL gasifiers on the site are being refurbished to gasify a mixture of coal and sewage sludge. When the plant is fully commissioned, it will generate ~120MW$_e$.

In a second project at the same site, Fife Power plans to build a 400MW$_e$ unit, also using BGL gasifiers, to gasify coal and household refuse.

FUTURE PROSPECTS

Market Opportunities

Coal

The most important markets for new coal-fired plant over the next 10-15 years will be China and South and East Asia. However, overwhelmingly in these markets, the technology chosen will be conventional pf-fired boilers, as the primary pre-requisites for these markets are low capital cost and high reliability, as well as the need to locally source equipment wherever possible. The most important markets for IGCC will be North America (8-16GW$_e$) and China (8-8GW$_e$), the former driven by stringent emissions limits, the latter by the sheer amount of new capacity required. The uptake of IGCC in Europe will be constrained by the widespread availability of cheap natural gas. Overall, coal-fired IGCC will represent no more than 10% of new coal-fired plant worldwide until its costs are significantly lowered and its reliability increased.

Oil and Petroleum Coke

There is considerable scope in the short-to-medium term for oil- and petroleum coke-fired IGCCs plant integrated with refinery processes. The key drivers are the refiners' need to find routes for the disposal of heavy oil residues and petroleum coke and their need for H_2 to upgrade other refinery products. There is scope for up to 14GW$_e$ of oil-fired IGCC in the European Union (EU) by 2010 (based on the amount of heavy residue likely to be available). However, the actual oil-IGCC capacity in the EU will be constrained by the availability of natural gas, which is an alternative source of H_2. Another significant market may be India, where the deployment of oil-IGCC will depend on being able to get reliable and secure power purchase agreements (PPAs). In the short-to-medium term, oil-IGCC plant may well out-number coal IGCC plant.

Biomass

Biomass is becoming increasingly important as a fuel in both the EU and the USA because of concerns over CO_2 emissions. For biomass GPPs to make headway, they will have to become more cost-competitive relative to biomass combustion plant. Typical projects will be combined heat and power schemes utilising agricultural and forestry residues, eg in remote areas of Scandinavia, China, Canada, India and Brazil.

Waste

Gasification is an excellent, if expensive, way to dispose of wastes such as MSW and sewage sludge, both 'neat' and co-gasified with coal. It has several significant advantages over waste incineration, such as producing only an inert solid residue and eliminating the potential for the production of dioxins. Waste gasification will first 'take off' in those parts of Europe with particularly strong environmental concerns over waste incineration, such as Germany and Switzerland. By 2010, perhaps 15% of new waste disposal plant in Europe will be based on gasification.

A further application of the gasification of biomass and wastes is the production of fuel-gas for the partial repowering of existing oil- and coal-fired boilers. Several schemes are already in operation. Biomass and wastes cannot be used directly in conventional boilers. Their low or negative cost can make them attractive fuels in principle but they cannot be fired, as they cannot be ground finely enough. Air-blown gasification converts them into a fuel-gas that can be fired in the boiler, providing a means of waste disposal.

Research and Development Needed

The current weaknesses of GPP technologies are high capital costs, poor reliability (at least for coal-fired IGCCs) and poor operational flexibility. The current strengths are high efficiency and environmental performance. It is therefore clear that, in the short-to-medium term, R&D effort needs to be focused on reducing costs and increasing reliability and operability. This R&D effort can be broken down into three major areas:

i. research into the fundamentals of gasification
ii. R&D to improve individual plant components
iii. R&D into better overall process layout and design

Research into the fundamentals of gasification is required to establish the fuel flexibility of IGCC technologies. This would be directed at understanding gasification reaction rates and carbon conversion and at predicting the gasifiability of individual coals and other fuels, ashslag behaviour and the potential for sulphur capture in fluidised bed gasifiers.

R&D is required to improve the following component(s) of IGCC, to make them more reliable and/or cheaper:

- gasifiers/syngas coolers
- pressurised coal feeding systems
- gas clean-up
- gas turbines
- ASUs

The required R&D for gasifiers and syngas coolers is centred on the development of improved alloys and manufacturing processes to improve the corrosion resistance and lower the cost of these components.

Pressurised coal feeding systems (both dry pf systems and briquetting systems) need to be improved to increase reliability and lower costs.

The development of improved hot gas clean-up systems could lower the cost of IGCC by providing a cheaper alternative to the conventional low-temperature processes currently employed. R&D is required to improve the reliability of both hot gas filters and hot gas desulphurisation systems.

The highest priority gas turbine R&D for IGCC is the development of better combustion systems for low-CV syngas. Also required is the development of more rugged gas turbines, capable of reliably running on uncleaned or partly-cleaned syngas.

Further work is required to allow the successful integration of ASUs into an IGCC. The two areas requiring attention are improved control systems for, and better dynamic simulation of, highly integrated ASUs. There is also the need, in the longer term, for alternatives to conventional cryogenic ASUs in order to lower costs.

A key area of R&D for IGCC is optimisation of the overall plant configuration and layout. Specific issues that require study are:

- dynamic simulation
- start-up and shut-down strategies
- operability
- simplified designs which reduce cost
- optimum integration strategies
- combining operability assessments within existing thermo-economic optimisation techniques.

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TAB 2

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EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2000-079
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 2
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 2. Provide a copy of the Tender Specification Documents ("TSD") of the construction contractor. Provide the design and engineering of the process if it is not included in the TSD. Were the characteristics of Kentucky-produced coal considered in the selection of the type of process and equipment?

Response 2. Kentucky Coal has qualities well suited for use by the Kentucky Pioneer Project. Kentucky Coal and other fuel components are included in all design work.

The PSD Permit Application to the Commonwealth of Kentucky, Department of Environmental Protection (DEP), and anticipated permit conditions, contain substantial design information for the project. Department of Air Quality (DAQ) within DEP is preparing a Draft Permit for public comment. Since the air permit is a prerequisite to project financing, there is ample opportunity to effectively reflect environmental requirements in the plant design.

Kentucky Pioneer Energy project design information is subject to international contractual secrecy agreements and is therefore business confidential and not available.

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TAB 3

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EAST KENTUCKY POWER COOPERATIVE, INC.
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INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 3
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 3. Provide the estimated budget for the project.

Response 3. The direct costs associated with engineering, major equipment and construction of the project are estimated at $470 million.

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TAB 4

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PSC CASE NO. 2000-079
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 4
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 4. Provide the preliminary schedule for the project and estimated date of construction.

Response 4. Kentucky Pioneer Energy expects commercial operation after a 36-month engineering, procurement and construction period following financial closure in late 2000.

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TAB 5

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EAST KENTUCKY POWER COOPERATIVE, INC.
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INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 5
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 5. Provide the ratio of the coal to solid waste.

Response 5. The AFT briquette Coal to RDF ratio can vary and will depend upon economic considerations, component qualities, and desired performance. Kentucky Pioneer Energy anticipates a ratio ranging from 2:1 to 1:1 RDF to Coal.

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TAB 6

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EAST KENTUCKY POWER COOPERATIVE, INC.
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PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 6
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 6. Will the solid waste be combined with coal to produce a briquette or will the solid waste be converted into gas and then processed with the coal? Explain the process to be used.

Response 6.
Typically the fuel briquette mixture of Kentucky Coal and RDF will be gasified, though a feed of coal is also feasible. Solid feed material will be gasified and the syngas will then be purified before use as combustion turbine fuel.

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TAB 7

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EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2000-079
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 7
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 7. Will Kentucky coal be used exclusively for the briquettes? If yes, describe the term of contracts that are expected to be signed.

Response 7. Kentucky Pioneer Energy intends to exclusively use Kentucky Coal. Long-term (i.e. 20 year) supply contracts are planned.

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TAB 8

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PSC CASE NO. 2000-079
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 8
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 8. How much coal and how much solid waste are anticipated to be utilized on an annual basis?

Response 8. Assuming a 50/50 blend of Kentucky Coal and RDF, annual consumption would approach:

Coal: 1 million tons per year
RDF (MSW): 1 million tons per year

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TAB 9

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EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2000-079
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 9
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 9. Where will the solid waste and coal be stored and where will the briquettes be made?

Response 9. The briquette production facility location has not yet been selected. Storage of solid waste components will be avoided by just-in-time delivery. Receipt of solid waste is planned to be indoors in a negative pressure building -- followed by immediate processing. Coal supplies will be staged sufficient to support briquette production upon receipt of MSW.

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TAB 10

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EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2000-079
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 10
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 10. Will all the solid waste originate in Kentucky or will out-of-state solid waste be imported?

Response 10. The relatively small amounts and generally widely dispersed nature of MSW in the Commonwealth (i.e. small quantities in each county) does not economically support exclusive utilization of Kentucky generated MSW supplies.

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TAB 11

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EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2000-079
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 11
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 11. What is the range of specifications for the coal that can be used in this gasification process? What are the specifications of the coal that will be used in this process?

Response 11. A major benefit of BGL gasification technology is that it is capable of processing a wide range of feed materials, with wide-ranging specification. Also, syngas clean up (e.g. sulfur removal) enables use of high sulfur (non-compliance) coal. Acceptable coal content can be in excess of 7% sulfur and approximately 25% ash.

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TAB 12

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EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2000-079
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 12
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 12. Describe the type of purification system for the produced gas.

Response 12. Detailed design and final selection of the syngas purification system will occur in the early stages of engineering and construction after project financing. Major components of this system would typically include sulfur removal and recovery in excess of 99% as well as other conventional processing steps to prepare the syngas for use as a fuel.

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TAB 13

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EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2000-079
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 13
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 13. What is the estimated gas yield in Btu's gas per unit weight of coal and unit weight of solid waste?

Response 13. Syngas production is not normally measured relative to components, but rather of briquette feed. However, if one assumes a 50/50 blend of Coal/RDF the briquette will have a heating value (HHV) of approximately 10,000 Btu/lb of briquette feed. The BGL gasifier has a conversion efficiency of approximately 92%. Therefore, syngas yield will be approximately 9200 Btu/lb of briquette feed.

Kentucky Resources Council, Inc.
Frankfort, KY
Page 59 of 74

TAB 14

Kentucky Resources Council, Inc.
Frankfort, KY
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PSC Request 14
Page 1 of 1

EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2000-079
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 14
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 14. What is the estimated annual operating cost of the plant?

Response 14. Annual Operating Expenses for fuel and other consumables will be governed by final contracts for those materials. Specific Operating Expenses for the Integrated Gasification Combined Cycle (IGCC) facility are business confidential and therefore not available.

Kentucky Resources Council, Inc.
Frankfort, KY
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TAB 15

Kentucky Resources Council, Inc.
Frankfort, KY
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PSC Request 15
Page 1 of 1

EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2000-079
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 15
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 15. Explain the type of process that will be used for coal gasification.

Response 15. BGL gasification is oxygen blown, fixed bed slagging technology operating at approximately 350 psig. Each of the four planned refractory lined reactors have an internal diameter of 12 feet, are water jacket cooled and have reaction zone temperatures at a nominal 3200°F. Briquettes are fed through a lock-hopper at the top and descend by gravity in countercurrent flow to the rising syngas. The syngas, therefore, causes the vaporization of moisture and volatilization of light hydrocarbons from the briquettes. Instead of ash going to landfill disposal from a conventional coal power plant, the ash content of fuel briquettes is produced as solid inert vitrified frit from the bottom of the gasifier through a quench and lock-hopper. Vitrified frit, also known as synthetic aggregate, is inert, non-leaching and viable for sale as road paving material.

Kentucky Resources Council, Inc.
Frankfort, KY
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TAB 16

Kentucky Resources Council, Inc.
Frankfort, KY
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PSC Request 16
Page 1 of 1

EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2000-079
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 16
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 16. Provide the operating manual, if available.

Response 16. An operating manual for the plant, consisting of a library of volumes, will be developed after detailed design and during construction.

Kentucky Resources Council, Inc.
Frankfort, KY
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TAB 17

Kentucky Resources Council, Inc.
Frankfort, KY
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PSC Request 17
Page 1 of 1

EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2000-079
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 17
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 17. What is the gasification media (e.g., air, oxygen, steam)?

Response 17. Gasification media consists of oxygen and steam.

Kentucky Resources Council, Inc.
Frankfort, KY
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TAB 18

Kentucky Resources Council, Inc.
Frankfort, KY
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PSC Request 18
Page 1 of 1

EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2000-079
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 18
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 18. What is the estimated cost of the synthetic gas per million Btu?

Response 18. Kentucky Pioneer Energy intends to deliver synthesis gas to the combustion turbines at a unit cost lower than natural gas.

Kentucky Resources Council, Inc.
Frankfort, KY
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TAB 19

Kentucky Resources Council, Inc.
Frankfort, KY
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PSC Request 19
Page 1 of 1

EAST KENTUCKY POWER COOPERATIVE, INC.
PSC CASE NO. 2000-079
INFORMATION REQUEST RESPONSE

PUBLIC SERVICE COMMISSION REQUEST DATED 6/1/00
REQUEST 19
RESPONSIBLE PERSON: **Dwight Lockwood**
COMPANY: **Kentucky Pioneer Energy**
(responding for East Kentucky Power Cooperative)

Request 19. If the proposed combustion turbine is operated exclusively on natural gas, what is the maximum gas consumption per hour and what is the maximum quantity of gas per hour available at the site for this combustion turbine?

Response 19. The combustion turbines will normally be operated at base load. Heat input of each combustion turbine is approximately 1700 million Btu/hour. Five interstate pipelines are in the general vicinity of the project site, with at least one crossing the property. Adequate supplies are seen to be available.

Kentucky Resources Council, Inc.
Frankfort, KY
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COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF EAST KENTUCKY POWER COOPERATIVE, INC. FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY, AND A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY, FOR THE CONSTRUCTION OF A 250 MW COAL-FIRED GENERATING UNIT (WITH A CIRCULATING FLUID BED BOILER) AT THE HUGH L. SPURLOCK POWER STATION AND RELATED TRANSMISSION FACILITIES, LOCATED IN MASON COUNTY, KENTUCKY, TO BE CONSTRUCTED ONLY IN THE EVENT THAT THE KENTUCKY PIONEER ENERGY POWER PURCHASE AGREEMENT IS TERMINATED	CASE NO. 2001-053

ORDER

East Kentucky Power Cooperative, Inc. ("East Kentucky") filed its application on March 9, 2001 for a Certificate of Public Convenience and Necessity and a Certificate of Environmental Compatibility to construct a 250 MW coal-fired generating unit, referred to as "Gilbert," at the Hugh L. Spurlock power station ("Spurlock") and related transmission facilities in Mason County, Kentucky. The Gilbert unit was to be constructed only in the event that East Kentucky's prior agreement to purchase the output of a 540 MW generating unit proposed by the Kentucky Pioneer Energy, L.L.C. ("KPE") is terminated. The Attorney General's Office ("AG") and the Kentucky Natural Resources and Environmental Protection Cabinet, Department of Natural Resources, Division of Energy ("DOE") were granted intervention and a hearing was held on August 18, 2001.

Kentucky Resources Council, Inc.
Frankfort, KY
Page 72 of 74

On July 11, 2001, East Kentucky amended its application to eliminate the contingent nature of its request because KPE had not met its financial closing deadline of June 30, 2001. The amended application also revised Gilbert's output from 250 MW to 268 MW. East Kentucky has not terminated the power purchase agreement because the power will be sold at a very reasonable price and KPE has indicated that it believes it can obtain project financing by March 2002. However, due to the delay in KPE's financing, East Kentucky decided that it cannot reasonably rely on that project to satisfy its future power supply needs. Therefore, East Kentucky has concluded that it should proceed to build the Gilbert unit. In the event that KPE is able to secure project financing, East Kentucky stated that certain provisions in the existing purchase power agreement would have to be revised and any renegotiated contract will be resubmitted to the Commission for its prior approval.

East Kentucky submitted to the Natural Resources and Environmental Protection Cabinet ("Natural Resources Cabinet") a statement of environmental compatibility for the proposed Gilbert unit. By letter dated May 23, 2001, the Natural Resources Cabinet reported that East Kentucky's proposed Gilbert plant will be environmentally compatible.

East Kentucky determined that additional power will be needed to meet its future load requirements and it issued a request for proposal to utilities and power marketers on January 11, 2001. Several responses were received, but East Kentucky's analysis shows that the proposed Gilbert unit will have the lowest cost. Additional analyses were performed in response to the request of the AG. One of those analyses shows that adding one 93 MW combined cycle unit in April 2004 and waiting for the KPE project to develop will cost $114 million less than adding the Gilbert unit now and then relying on

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Kentucky Resources Council, Inc.
Frankfort, KY
Page 73 of 74

the KPE development. East Kentucky rejected this scenario, claiming that it should not place all of its new base load requirements at market risk, contingent on the development of the KPE project as a commercially viable plant.

The AG recommends that East Kentucky's request to construct the Gilbert unit be granted. However, if KPE achieves financial closure by the summer of 2002, the AG suggests that the Commission and the parties explore cancellation of the Gilbert unit. DOE recommends that East Kentucky should complete a full and comprehensive study of the technical potential of demand-side resources and distributed generation in its service territory before proceeding to construct any new generation.

Based on East Kentucky's supply analyses, the uncertainty of the KPE project, and East Kentucky's need for additional power, the Commission finds that the construction of the Gilbert unit should be approved. Further, the Commission finds that when the KPE project achieves financial closure, East Kentucky should refile the power purchase agreement for review and approval by the Commission. The filing should include an analysis of the feasibility of the cancellation of the Gilbert unit and the substitution of a 93 MW combined cycle unit. In addition, the Commission finds that East Kentucky should continue to review the feasibility of demand side resources and provide a detailed analysis of its review in future filings related to generating capacity.

The Gilbert unit has the ability to burn not only coal but also wood waste and other biomass products due to the nature of a circulating fluid bed boiler. East Kentucky did not propose to include as part of the initial construction the handling facilities necessary to burn any of these other products. The AG recommended that the wood waste handling facilities be included in the unit design and that wood waste be

-3-

Kentucky Resources Council, Inc.
Frankfort, KY
Page 74 of 74

considered as one of the primary fuels. East Kentucky acknowledged that the wood waste handling facilities would cost $2.5 to $3 million and have a relatively short payback. Due to the potential cost savings over time from burning biomass, the Commission finds that East Kentucky should conduct a detailed analysis of fueling the Gilbert unit with wood waste and other biomass products.

East Kentucky indicated that additional transmission facilities would be needed to maintain stability of the unit at the Spurlock station. A transmission line will be needed to connect to transmission facilities owned by Cinergy Corp. East Kentucky indicated that certain agreements are necessary between the utilities, and additional time will be needed to finalize those agreements. Because of the potential delay in finalizing the transmission agreements, East Kentucky proposed to delete the transmission portion of its application and proceed only with the proposed generating facilities. The Commission finds East Kentucky's proposal to be reasonable.

IT IS THEREFORE ORDERED that:

1. East Kentucky is granted a Certificate of Public Convenience and Necessity and a Certificate of Environmental Compatibility to construct the Gilbert unit, a 268 MW coal-fired generating unit with a circulating fluid bed boiler, at the Spurlock station at an estimated cost of $367 million.

2. East Kentucky shall conduct a detailed analysis of the benefits of fueling with wood waste and other biomass products and file that analysis upon completion.

3. East Kentucky's request to delete from consideration at this time the construction of needed transmission facilities is granted. Within 30 days of completing all analyses, including the selection of a final route for the transmission facilities and the

-4-

Kentucky Department of Fish and Wildlife Resources
Frankfort, KY
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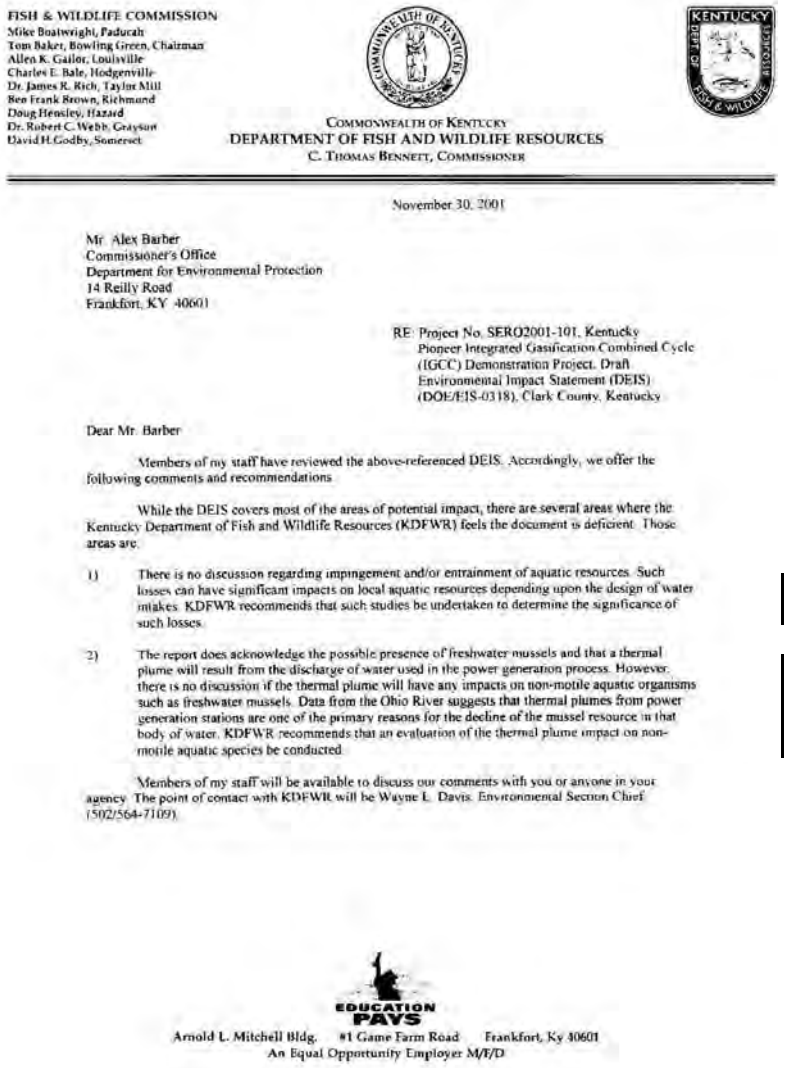

FISH & WILDLIFE COMMISSION
Mike Boatwright, Paducah
Tom Baker, Bowling Green, Chairman
Allen K. Gailor, Louisville
Charles E. Bale, Hodgenville
Dr. James R. Rich, Taylor Mill
Ben Frank Brown, Richmond
Doug Hensley, Hazard
Dr. Robert C. Webb, Graysun
David H. Godby, Somerset

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF FISH AND WILDLIFE RESOURCES
C. THOMAS BENNETT, COMMISSIONER

November 30, 2001

Mr. Alex Barber
Commissioner's Office
Department for Environmental Protection
14 Reilly Road
Frankfort, KY 40601

RE: Project No. SERO2001-101, Kentucky Pioneer Integrated Gasification Combined Cycle (IGCC) Demonstration Project, Draft Environmental Impact Statement (DEIS) (DOE/EIS-0318), Clark County, Kentucky

Dear Mr. Barber

Members of my staff have reviewed the above-referenced DEIS. Accordingly, we offer the following comments and recommendations

While the DEIS covers most of the areas of potential impact, there are several areas where the Kentucky Department of Fish and Wildlife Resources (KDFWR) feels the document is deficient. Those areas are:

1) There is no discussion regarding impingement and/or entrainment of aquatic resources. Such losses can have significant impacts on local aquatic resources depending upon the design of water intakes. KDFWR recommends that such studies be undertaken to determine the significance of such losses. 1/08

2) The report does acknowledge the possible presence of freshwater mussels and that a thermal plume will result from the discharge of water used in the power generation process. However, there is no discussion if the thermal plume will have any impacts on non-motile aquatic organisms such as freshwater mussels. Data from the Ohio River suggests that thermal plumes from power generation stations are one of the primary reasons for the decline of the mussel resource in that body of water. KDFWR recommends that an evaluation of the thermal plume impact on non-motile aquatic species be conducted. 2/08

Members of my staff will be available to discuss our comments with you or anyone in your agency. The point of contact with KDFWR will be Wayne L. Davis, Environmental Section Chief (502/564-7109).

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Arnold L. Mitchell Bldg. #1 Game Farm Road Frankfort, Ky 40601
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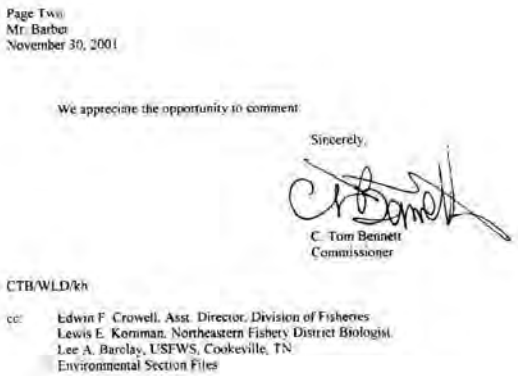
Comment No. 1 **Issue Code: 08**

National Pollution Discharge Elimination System (NPDES) regulations found in Title 40 Part 125 of the *Code of Federal Regulations* (CFR) address cooling water intake structures for new facilities. The final rule was published on December 18, 2001, and implemented in Section 316(b) of the *Clean Water Act* for new facilities that use water withdrawn from rivers and streams and other waters of the United States for cooling purposes (EPA 2001). The regulations establish national technology-based performance requirements applicable to the location, design, construction, and capacity of cooling water intake structures at new facilities. The purpose of the regulations are to reduce impingement and entrainment of aquatic organisms and preserve the ecosystems they inhabit. The regulations apply to new and stand-alone facilities that use cooling water intake structures with designed intake flows of greater than 7.6 MLD (2 MGD) and that use at least 25 percent of water withdrawn for cooling purposes. If a new facility has or requires an NPDES permit but does not meet the 7.6 MLD (2 MGD) intake flow threshold or uses less than 25 percent of its water for cooling water purposes, the permit authority will implement Section 316(b) on a case-by-case basis, using the best professional judgment. An example of a new facility is a facility constructed on the same property as an existing facility, but is a separate and independent industrial operation. The Kentucky Pioneer IGCC Demonstration Project meets the definition of a new facility. Currently, it is projected that the facility would withdraw a total of 15.2 MLD (4 MGD) of surface water for turbine condenser cooling and process and cooling water makeup. Thus, 40 CFR 125 regulations would apply. Compliance with the regulations in the design, construction, and capacity of cooling water intake structures will minimize adverse environmental impacts to aquatic organisms and their ecosystems.

Kentucky Department of Fish and Wildlife Resources
Frankfort, KY
Page 2 of 2



Page Two
Mr. Barber
November 30, 2001

We appreciate the opportunity to comment.

Sincerely,

C. Tom Bennett
Commissioner

CTB/WLD/kh

cc: Edwin F. Crowell, Asst. Director, Division of Fisheries
Lewis E. Kornman, Northeastern Fishery District Biologist
Lee A. Barclay, USFWS, Cookeville, TN
Environmental Section Files

Comment No. 2 **Issue Code: 08**

The Kentucky Natural Resources and Environmental Protection Cabinet has established regulatory limits relative to the Kentucky River, which explicitly provide a mechanism to establish thermal impact parameters. Kentucky regulations (401 Kentucky Administration Regulations [KAR] 5:031) contain specific, seasonal (generally month to month) temperature limits which permitted effluent limits are based. Project-specific information will not be available until an application for a KPDES permit is submitted approximately 1 year (minimum time is 180 days) before plant operation begins. However, effluent temperature will be limited and established to avoid impacting the monthly Kentucky River receiving stream limits. Use of the bounding analysis in Section 5.9, Ecological Resources, of the EIS, indicates that benthic organisms most likely to be affected would be in close proximity to the discharge port. Mortality of benthic organisms may occur along with a potential shift in species' populations or lack of recolonization of the affected area. A statement to this effect has been added to Section 5.9, Ecological Resources. Conditions set by the KPDES permit will be followed, including any recommendations for further evaluation.

Kentucky Natural Resources and Environmental Protection Cabinet
Frankfort, KY
Page 1 of 2

JAMES E. BICKFORD
Secretary

PAUL E. PATTON
Governor

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
14 REILLY RD
FRANKFORT KY 40601

February 11, 2002

Roy Spears
National Energy Technology Laboratory
U.S Department of Energy
P O Box 880
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Re: Kentucky Pioneer Integrated Gasification Combined Cycle (IGCC) Demonstration Project Draft Environmental Impact Statement (DEIS) (DOE/EIS-0318) in Clark County (SERO 2001-101)

Dear Mr. Spears:

The Natural Resources and Environmental Protection Cabinet (NREPC) serves as the state clearinghouse for review of environmental documents generated pursuant to the National Environmental Policy Act (NEPA). Within the Cabinet, the Commissioner's Office in the Department for Environmental Protection **coordinates** the review for Kentucky State Agencies.

The Kentucky agencies listed on the attached sheet have been provided an opportunity to review the above referenced report. Responses were received from 9 (also marked on attached sheet) of the agencies that were forwarded a copy of the document. Attached are comments from the Kentucky Divisions of Water and Waste Management, and the Kentucky Department of Fish and Wildlife Resources. 1/21

If you should have any questions, please contact me at (502) 564-2150, ext. 112.

Sincerely,

Alex Barber
State Environmental Review officer

Enclosure

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Comment No. 1 **Issue Code:21**
Comment noted.

Kentucky Natural Resources and Environmental Protection Cabinet
Frankfort, KY
Page 2 of 2

NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
ENVIRONMENTAL REVIEW

Kentucky Pioneer Integrated Gasification Combined Cycle (IGCC) Demonstration Project Draft Environmental Impact Statement (DEIS) (DOE/EIS-0318) in Clark County

The following agencies were asked to review the above referenced project. Each agency that returned a response will appear below with their comments and the date the project response was returned.

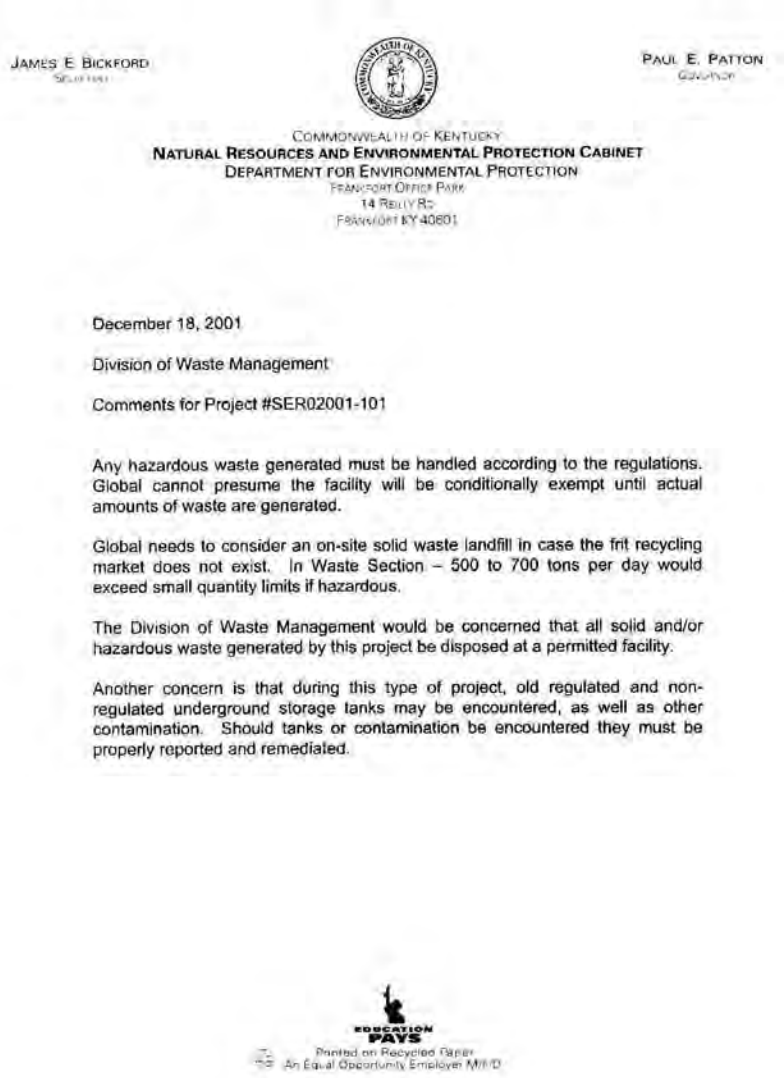
C denotes Comments
NC denotes No Comment
IR denotes Information Request
NR denotes No Response

REVIEWING AGENCIES:

Division of Water	comments
Division of Waste Management	comments
Division for Air Quality	nc
Department of Health Services	
Economic Development Cabinet	
Division of Forestry	
Department of Surface Mining Reclamation & Enforcement	nc
Department of Parks	nc
Department of Agriculture	
Nature Preserves Commission	nc
Kentucky Heritage Council	nc
Division of Conservation	
Department for Natural Resources	ns
Department of Fish & Wildlife Resources	comments
Transportation Cabinet	ns
Department for Military Affairs	nc

1/21
(cont.)

Kentucky Natural Resources and Environmental Protection Cabinet, Division of Waste Management
Frankfort, KY
Page 1 of 1



JAMES E. BICKFORD
SECRETARY

PAUL E. PATTON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
14 REILLY RD
FRANKFORT KY 40601

December 18, 2001

Division of Waste Management

Comments for Project #SER02001-101

Any hazardous waste generated must be handled according to the regulations. Global cannot presume the facility will be conditionally exempt until actual amounts of waste are generated. 1/12

Global needs to consider an on-site solid waste landfill in case the frit recycling market does not exist. In Waste Section – 500 to 700 tons per day would exceed small quantity limits if hazardous. 2/12

The Division of Waste Management would be concerned that all solid and/or hazardous waste generated by this project be disposed at a permitted facility. 3/12

Another concern is that during this type of project, old regulated and non-regulated underground storage tanks may be encountered, as well as other contamination. Should tanks or contamination be encountered they must be properly reported and remediated. 4/12

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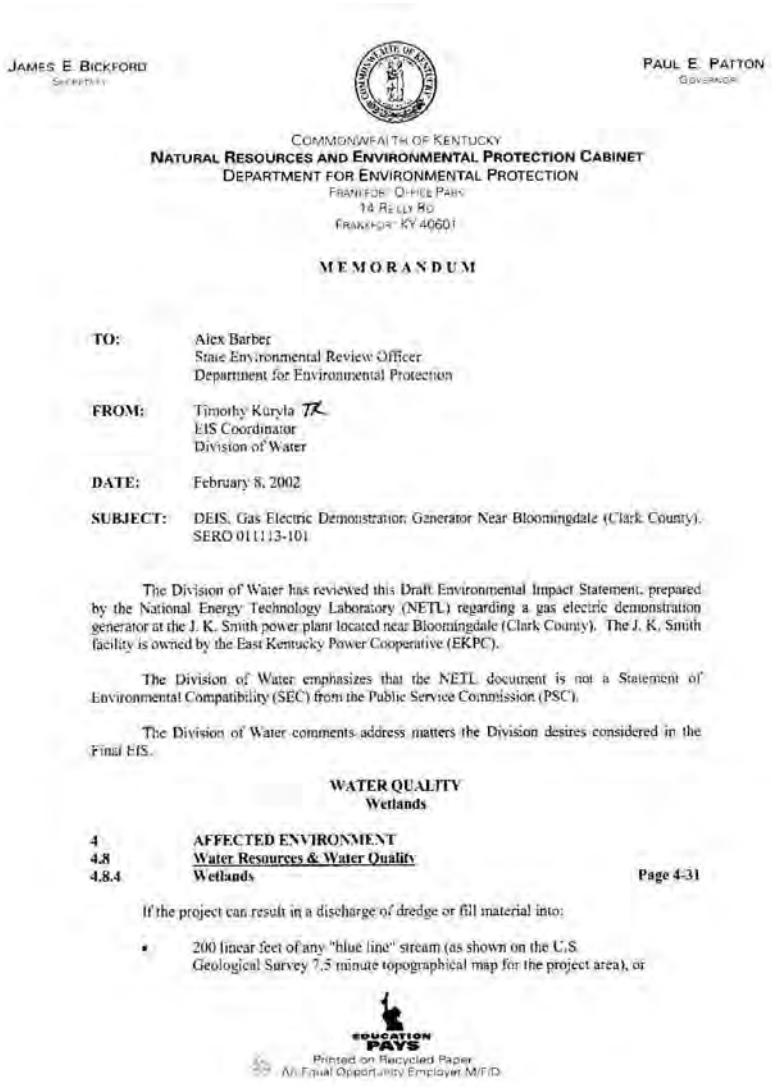
Comment No. 1 **Issue Code: 12**
Comment noted. KPE waste management activities will be in accordance with RCRA and applicable state regulations.

Comment No. 2 **Issue Code: 12**
Comment noted. Analysis of the frit from other gasification processes has found that it is nonhazardous and rarely fails the TCLP for metals. The frit generated by the proposed project is expected to pass the more stringent Universal Treatment Systems criteria of EPA-TCLP analytical method. If any of the frit could not be sold, it would be stored temporarily in covered rail cars and be disposed of at a licensed industrial solid waste landfill in the State of Kentucky, as discussed in Section 5.13, Waste Management.

Comment No. 3 **Issue Code: 12**
KPE waste management activities will be in accordance with RCRA and applicable state regulations. All waste generated onsite would be disposed of at licensed waste disposal facilities, as discussed in Section 5.13, Waste Management.

Comment No. 4 **Issue Code: 12**
As noted in Section 4.2, Land Use, the project area will consist of a 121-hectare (300-acre) tract of land previously distributed during site preparation for the abandoned construction of the J.K. Smith plant by EKPC. Therefore, because of this grading, KPE does not anticipate encountering any underground storage tanks or other contamination. In the event of encountering an unregulated storage tank or the occurrence of a reportable quantity spill, KPE would notify the KDEP and local emergency response units as well as the general public.

Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water
Frankfort, KY
Page 1 of 2



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COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
14 REILLY RD
FRANKFORT, KY 40601

MEMORANDUM

TO: Alex Barber
State Environmental Review Officer
Department for Environmental Protection

FROM: Timothy Kuryla TK
EIS Coordinator
Division of Water

DATE: February 8, 2002

SUBJECT: DEIS, Gas Electric Demonstration Generator Near Bloomingdale (Clark County). SERO 011113-101

The Division of Water has reviewed this Draft Environmental Impact Statement, prepared by the National Energy Technology Laboratory (NETL) regarding a gas electric demonstration generator at the J. K. Smith power plant located near Bloomingdale (Clark County). The J. K. Smith facility is owned by the East Kentucky Power Cooperative (EKPC).

The Division of Water emphasizes that the NETL document is not a Statement of Environmental Compatibility (SEC) from the Public Service Commission (PSC). 1/21

The Division of Water comments address matters the Division desires considered in the Final EIS.

WATER QUALITY
Wetlands

4 AFFECTED ENVIRONMENT
4.8 Water Resources & Water Quality
4.8.4 Wetlands **Page 4-31** 2/07

If the project can result in a discharge of dredge or fill material into:

- 200 linear feet of any "blue line" stream (as shown on the U.S. Geological Survey 7.5 minute topographical map for the project area), or

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Comment No. 1 **Issue Code: 21**
Comment noted. Once design is complete, KPE will seek a Statement of Environmental Compatability from the Public Service Commission.

Comment No. 2 **Issue Code: 07**
It is not currently anticipated that the project would result in a discharge of dredge or fill material into "navigable waters of the United States." However, if KPE determines in the more advanced stages of plant design that such a discharge could occur, a Section 401 water quality certification and Section 404 permit would be obtained from the U.S. Army Corps of Engineers (USACE).

We concur with the recommendation that native flora should be used for erosion control revegetation.

Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water
Frankfort, KY
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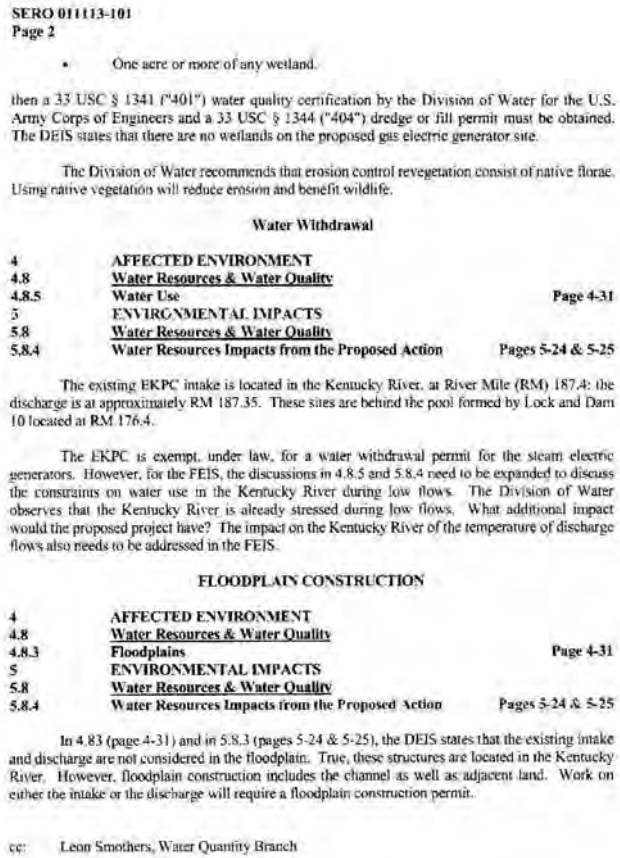


SERO 011113-101
Page 2

- One acre or more of any wetland.

then a 33 USC § 1341 ("401") water quality certification by the Division of Water for the U.S. Army Corps of Engineers and a 33 USC § 1344 ("404") dredge or fill permit must be obtained. The DEIS states that there are no wetlands on the proposed gas electric generator site.

The Division of Water recommends that erosion control revegetation consist of native florae. Using native vegetation will reduce erosion and benefit wildlife.

Water Withdrawal

4	AFFECTED ENVIRONMENT	
4.8	Water Resources & Water Quality	
4.8.5	Water Use	Page 4-31
5	ENVIRONMENTAL IMPACTS	
5.8	Water Resources & Water Quality	
5.8.4	Water Resources Impacts from the Proposed Action	Pages 5-24 & 5-25

The existing EKPC intake is located in the Kentucky River, at River Mile (RM) 187.4; the discharge is at approximately RM 187.35. These sites are behind the pool formed by Lock and Dam 10 located at RM 176.4.

The EKPC is exempt, under law, for a water withdrawal permit for the steam electric generators. However, for the FEIS, the discussions in 4.8.5 and 5.8.4 need to be expanded to discuss the constraints on water use in the Kentucky River during low flows. The Division of Water observes that the Kentucky River is already stressed during low flows. What additional impact would the proposed project have? The impact on the Kentucky River of the temperature of discharge flows also needs to be addressed in the FEIS.

FLOODPLAIN CONSTRUCTION

4	AFFECTED ENVIRONMENT	
4.8	Water Resources & Water Quality	
4.8.3	Floodplains	Page 4-31
5	ENVIRONMENTAL IMPACTS	
5.8	Water Resources & Water Quality	
5.8.4	Water Resources Impacts from the Proposed Action	Pages 5-24 & 5-25

In 4.83 (page 4-31) and in 5.8.3 (pages 5-24 & 5-25), the DEIS states that the existing intake and discharge are not considered in the floodplain. True, these structures are located in the Kentucky River. However, floodplain construction includes the channel as well as adjacent land. Work on either the intake or the discharge will require a floodplain construction permit.

cc: Leon Smothers, Water Quantity Branch

2/07 (cont.)

3/07

4/08

5/07

Comment No. 3 **Issue Code: 07**
Sections 4.8 and 5.8, Water Resources and Water Quality, have been expanded to include information on constraints on water use in the Kentucky River during low flows. Although EKPC is exempt from obtaining a water withdrawal permit from the state, KPE has indicated that they would work with state authorities during low-flow conditions and would cease plant operations if required.

Comment No. 4 **Issue Code: 08**
The Kentucky Natural Resources and Environmental Protection Cabinet has established regulatory limits relative to the Kentucky River, which explicitly provide them with a mechanism to establish thermal impact parameters. Kentucky regulations (401 KAR 5:031) contain specific, seasonal (generally month to month) temperature limits on which permitted effluent limits are based. The impacts analysis contained in Section 5.9, Ecological Resources, of the EIS addresses the potential impacts from a thermal plume. Project-specific information will not be available until an application for a KPDES permit is submitted approximately 1 year (minimum time is 180 days) before construction begins. This will occur after the project if financed and the plant designed. However, effluent temperature will be limited, and will be established to avoid impacting the monthly Kentucky River receiving stream limits. Should low flow or drought conditions require the cessation of water withdrawal from the Kentucky River, an event that has not yet occurred, the plant would be shut down for that period of time. A statement to this effect has been added to Section 5.9, Ecological Resources, of the Final EIS.

Comment No. 5 **Issue Code: 07**
Comment noted. The text of the EIS has been revised accordingly.

Littrell, Maxine
Lexington, KY
Page 1 of 1

—

Kentucky Pioneer Integrated Gasification
Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

Written Comment Form
Must be received by January 4, 2002.

I am very unhappy with the Federal government's idea of spending $78,000,000 of our tax dollars for an experimental plant at Trapp, Kentucky that will use high-sulphur coal and refined garbage as a fuel source. 1/16

We should be exploring ways to take care of our Mother Earth and the environment. The people of Kentucky do not need to be guinea pigs for a useless experiment. 2/22

Please use your influence to stop this project.

Please use other side if more space is needed.

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

Maxine Littrell
4800 Dresden Way
Lexington, Ky. 40514

Comment No. 1 **Issue Code: 16**
Comment noted.

Comment No. 2 **Issue Code: 22**
Comment noted.

Neighbors Opposing Pipeline Extravagance
Lexington, KY
Page 1 of 2

NEIGHBORS OPPOSING PIPELINE EXTRAVAGANCE
Post Office Box 8125
Lexington, Kentucky 40533

Dec 18, 2001

Mr. Roy Spears
US Department of Energy
3610 Collins Ferry Rd.
PO Box 880
Morgantown, WV 26507-0880

Dear Mr. Spears,

I am writing in regard to the draft EIS for the proposed Global Energy Power Plant located at Trapp, Kentucky to be operated by Kentucky Pioneer Energy.

Neighbors Opposing Pipeline Extravagance (NOPE) is a grassroots citizens group formed in 1999 to oppose the construction of a water supply pipeline from the Ohio River at Louisville to Lexington, which as you know is located approximately 20 miles downstream of Trapp on the Kentucky River. Lexington draws its water supply from this small river. The proposed pipeline, a $100 million ratepayer-financed project which is sought by the privately-owned Kentucky American Water Company, is intended to be a backup water supply source during a drought. The Kentucky Attorney General's office, the Lexington-Fayette Urban County Government and many Bluegrass citizens have opposed this pipeline project as too costly and unnecessary.

During the severe drought of 1999, the Kentucky River water supply was extremely limited. In September of that year, water stopped flowing over the dams on the Kentucky River, and mandatory water conservation was imposed on Lexington residents. Experts have predicted that in the event of a more severe 100-year drought, with the projected population expansion of the region, the Kentucky River will be unable to meet the water supply needs of Kentucky-American's customers by the year 2020. NOPE takes the position that water conservation and improvements to the Kentucky River's system of locks and dams would be sufficient to get us through a drought, but we are alarmed at the projected 3.6 million gallons per day of water that would be drawn from the Kentucky River by the proposed Trapp power plant.

1/07

Comment No. 1 **Issue Code: 07**
The cumulative effects of withdrawals from the Kentucky River by power plants have been discussed by the Kentucky Natural Resources and Environmental Protection Cabinet in their cumulative assessment report (KNREPC 2001), addressed in Section 5.14, Cumulative Impacts. The Cabinet acknowledges that because many of Kentucky's power plants are exempt from water withdrawal requirements, the Cabinet does not have an accurate inventory of the volume of water being removed each day by the existing power plants. However, the KDEP has the authority to limit withdrawals from permitted sources during periods of abnormally low flow. Although the proposed plant would not be a permitted withdrawal source, KPE has stated that they would cease water withdrawals if requested by the state. Section 5.8, Water Resources and Water Quality, has been revised to address this issue.

Because of the lock and dam system on the Kentucky River in the project area, the withdrawals from the power plant located on the North Fork of the Kentucky River would be isolated from the area of the river in the proposed project area.

Comment No. 2 **Issue Code: 22**
Comment noted.

Comment No. 3 **Issue Code: 20**
The recently permitted Enviropower Power Plant is located on the North Fork of the Kentucky River upstream from the confluence with the South Fork that creates the Kentucky River. As discussed in Section 4.8, Water Resources and Water Quality, the Kentucky River is a series of pools created by 14 locks and dams composing the navigation system maintained and operated by the USACE. The proposed Kentucky Pioneer IGCC Demonstration Project would be

Neighbors Opposing Pipeline Extravagance
Lexington, KY
Page 2 of 2

In a severe drought, we simply do not have this water available. I would refer you to the Kentucky Division of Water for more information on this issue.

The end result of building a power plant at Trapp may be an additional $100 million dollars burden on the people of Central Kentucky, a burden which is not recognized in your draft EIS.

I submit to you that the citizens of Central Kentucky are being asked to bear all of the costs of this proposal, yet receive few if any benefits.

I request that the Department of Energy consider the water withdrawal impacts of this proposal on the Kentucky River. I would also point out that the recently permitted Enviropower power plant located on the North Fork of the Kentucky River in Knott County, will also draw enormous quantities of water from the North Fork of the Kentucky River. It is possible that these two power plants will remove so much water from the Kentucky River that Lexington would be unable to survive even a 1999-type drought.

Sincerely,

David S. Cooper
President, NOPE

USA
David Cooper
201 Westwood Ct.
Lexington, KY 40503

2/22

1/07 (cont.)

3/20

Comment No. 3 (cont.) **Issue Code: 20**

located upstream of Lock 10. There are four additional locks upstream from the project site to the confluence of the North and South Forks of the Kentucky River.

The flow of the river is regulated by each lock and dam structure. Since there are four lock and dam structures between the two proposed plants, any withdrawals from the North Fork of the Kentucky River and resulting impacts to the flow rates would be mitigated by the time the river flow reached the area above Lock 10. As discussed in Section 5.14, Cumulative Impacts, the proposed Kentucky Pioneer IGCC Demonstration Project would withdraw 15.2 MLD (4 MGD) from the Kentucky River on a continual basis. The cumulative withdrawal from the Kentucky Pioneer facilities and all seven existing and reasonably foreseeable CTs at the J.K. Smith Site operating at full capacity would be 19.2 MLD (5 MGD) of operation. The cumulative withdrawal of all facilities operating full time at the J.K. Smith Site would be less than 0.15 percent of the average flow of the Kentucky River and would have little impact on water levels within the river itself.

Parker, Charles Ray
Winchester, KY
Page 1 of 1

Kentucky Pioneer Integrated Gasification
Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

Written Comment Form
Must be received by January 4, 2002.

MR. Roy SPEARS
I HAVE LIVED NEAR TRAPP Ky. NEAR EAST KENTUCKY PLANT PROPERTY. I ATTENDED The Public MEETING AT TRAPP school ON dec. 11, 2001 1/21
WE did NOT HEAR ANY ANSWERS TO ANY THING.
EAST KENTUCKY POWER PURCHASED 3,000 ACRES To build A COAL FIRED PLANT
I AND others REJECT To ANY KIND OF garbage To be ON This PROPERTY To be stored 2/16
OR To be buried IN A LAND Fill
Charles Ray Parker
P.S. I Lived here all my life of 71 years
CHARLES RAY PARKER
1450 old Log Lick Rd.
WINCHESTER Ky. 40391

Please use other side if more space is needed.

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

Comment No. 1 **Issue Code: 21**
Each of the public hearings was preceded by an informal open house during which members of the project staff were available to answer questions.

Comment No. 2 **Issue Code: 16**
As discussed in Chapter 3 of the EIS, Section 3.2.2.2, Refuse Derived Fuel Pellet Production, RDF is made from MSW. However, the process is such that a sterile "mulch type material" is produced. The sterile mulch is then formed into dense pellets by being forced through a mold at high pressures.

RDF pellets are stable and durable because they are made with relatively low moisture content. The process in which RDF pellets are produced results in pellets with a relatively uniform size and shape. They also have a relatively low ash content and good handling and storage life before use. The concrete-floored storage building for the RDF pellets, located within the 4.8-hectare (12-acre) project site, would be capable of housing a 10-day supply of coal and RDF pellets. The 4.8-hectare (12-acre) project site is located within the larger 1,263-hectare (3,120-acre) J.K. Smith Site and is approximately 1.6 kilometers (1.0 mile) from the closest residence.

Pratt, Don
Lexington, KY
Page 1 of 1

From: <DBP91044@aol.com>
To: <rspear@netl.doe.gov>, <james.watts@netl.doe.gov>
Date: 12/29/01 12:00PM
Subject: Re: DOE Extends Public Comment Period - KY Pioneer Energy IGCC Demo. Proj.

John Preston,
Thanks for the extension. I hope it is beneficial.
I, personally, am opposed to this construction, but am not scientifically versed well enough to comment on my greatest fear, the residue coming from the facility. 1/12
The human animal and such proponents of the IGCC have so little concern for the long term,and know their short term goal is profit or momentary pleasure, and not public service. Such would actually be best found in conservation measures, not their priority. 2/22
I am also concerned about the visual effect of the stacks from the top of Pilot Knob, a place I visit and hold dearly in my respect for the environment. 3/04
Not so humorously, I commented if you approve and they do build two stacks, that they be allowed to hang banners of and for advertising, even ennvironment promos for themselves.
The hypocrisy would be more obvious.
- don pratt, 210 Walton Ave., Lexington, Ky. 40502.

,NOTICE OF EXTENSION
OF PUBLIC COMMENT PERIOD

The U.S. Department of Energy is extending the public comment period on the Draft Environmental Impact Statement (DEIS) for the proposed Kentucky Pioneer Energy Integrated Gasification Combined Cycle (IGCC) Demonstration Project at Trapp, Clark County, Kentucky from January 4, 2002 to January 25, 2002. Comments may be submitted by mail, fax, or electronically to: Mr. Roy Spears, NEPA Document Manager, U.S. Department of Energy, National Energy Technology Laboratory, P.O. Box 880, Morgantown, WV 26507-0880; FAX: 304-285-4403; e-mail: rspear@netl.doe.gov. For further information, please call Mr. Spears at 304-285-5460 or leave a message at 1-800-276-9851.

Comment No. 1 **Issue Code: 12**
Air and wastewater emissions from the proposed facility would be in compliance with air quality and NPDES permits. If emissions were to exceed allowable limits set by the air permit and the problem could not be remedied within 2 hours, the plant would be shut down to avoid being found in violation of the requirements of the air quality permit. The air and wastewater pollutants limits have been established to protect the public health and the environment.

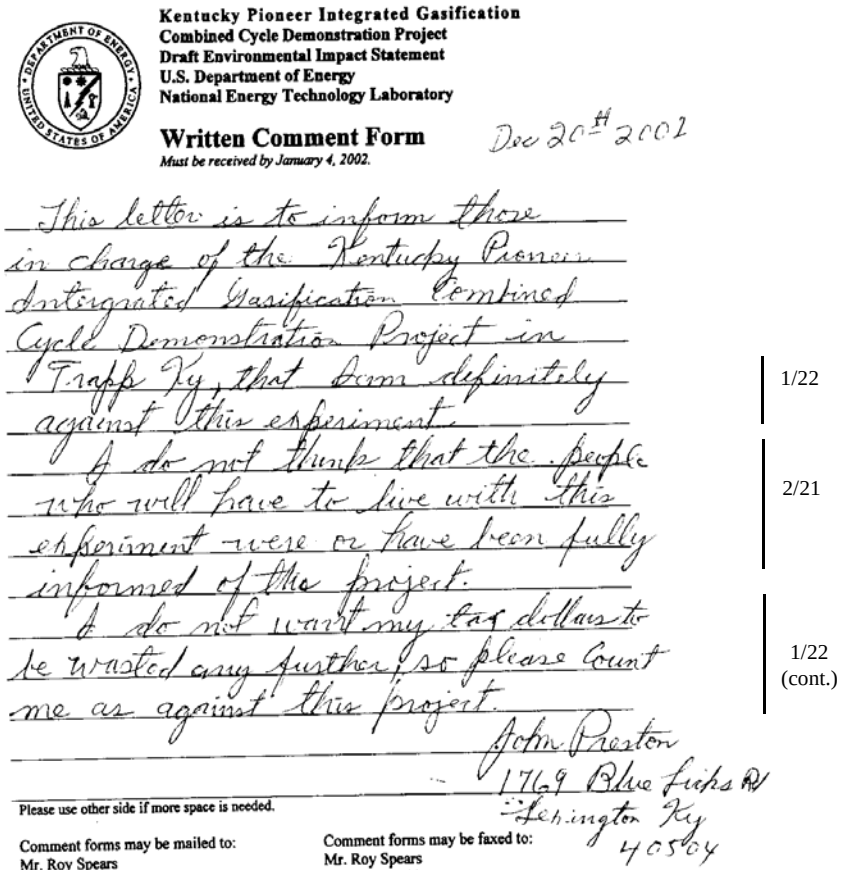
Incremental ambient air quality impacts from the proposed project would be a very small fraction of the relevant federal and state ambient air quality standards (less than 1 percent for gaseous pollutants such as nitrogen dioxide, sulfur dioxide, and carbon monoxide and less than 4 percent of the federal 24-hour PM_{10} standard). Therefore, the overall increase in air emissions due to operation of the plant would be very low and present little risk to human health and the environment. KPE is uncertain about the residue referred to by the commentor as coming from the facility.

The management of other waste streams associated with the proposed project is discussed in Section 5.13 of the EIS, Waste Management.

Comment No. 2 **Issue Code: 22**
Comment noted. The Kentucky Pioneer IGCC Demonstration Project was selected for further consideration under DOE's fifth solicitation (CCT-V) of the CCT Program. The purpose of the CCT Program is to provide a cleaner and more efficient source of energy from coal resources.

Comment No. 3 **Issue Code: 04**
Comment noted. Impacts to the aesthetic and scenic environment of the project area are presented in Section 5.5, Aesthetic and Scenic Resources, of the EIS.

Preston, John
Lexington, KY
Page1 of 1



Kentucky Pioneer Integrated Gasification
Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

Written Comment Form Dec 20th 2001
Must be received by January 4, 2002.

This letter is to inform those in charge of the Kentucky Pioneer Intergrated Gasification Combined Cycle Demonstration Project in Trapp Ky, that I am definitely against this esperiment. 1/22

I do not think that the people who will have to live with this esperiment were or have been fully informed of the project. 2/21

I do not want my tax dollars to be wasted any further, so please count me as against this project. 1/22 (cont.)

John Preston
1769 Blue Licks Rd
Lexington Ky
40504

Please use other side if more space is needed.

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

Comment No. 1 **Issue Code: 22**
Comment noted. The issue of the Nation's funds are outside the scope of the EIS.

Comment No. 2 **Issue Code: 21**
The public hearing dates, times, and locations were announced in the *Federal Register*, in local newspapers *The Winchester Sun* and *The Lexington Herald-Leader* and in public service announcement information made available to local media outlets. All requirements in state and federal laws, rules, and regulations regarding announcements for public hearings were satisfied or surpassed.

Preston, Virginia
Lexington, KY
Page1 of 1

Kentucky Pioneer Integrated Gasification
Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

Written Comment Form
Must be received by January 4, 2002.

Dec. 20, 2001

I am writing to strongly oppose the Ky. Pioneer Integrated Gasification Combined Cycle Demonstration Project of Trapp Ky. Since this is experimental, let the powers that be try this "experiment" in New York or New Jersey, or where ever ppw will be bringing this trash from. There is no way for any-one will be able to determine whether this trash will be toxic or what it will be. As a taxpayer of Ky please count me as against this project.

Virginia Preston
1769 Blue Licks Rd
Lex. Ky. 40504

Please use other side if more space is needed.

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

1/22

2/16

3/12

Comment No. 1 **Issue Code: 22**
Comment noted.

Comment No. 2 **Issue Code: 16**
Because of DOE's limited role of providing cost-shared funding for the proposed Kentucky Pioneer IGCC Demonstration Project, alternative sites were not considered. KPE selected the existing J.K. Smith Site because the costs would be much higher and the environmental impacts would likely be greater if an undisturbed area was chosen.

Comment No. 3 **Issue Code: 12**
The waste that would be generated at the proposed facility would be similar to waste generated at industrial facilities. Section 5.13, Waste Management, discusses waste that would be generated during construction and operation of the proposed facility. Solid waste generated during operation includes: office garbage (e.g., paper, boxes); liquid maintenance wastes; wastewater treatment sludge, process filters, treated salts from the wastewater treatment system and waste oil. Hazardous waste would include cleaning solvents. Vitrified frit and elemental sulfur produced in the gasification process are not waste streams, but rather marketable products. Solid and hazardous wastes generated at the facility would be managed and disposed of in accordance with applicable state and RCRA regulations.

U.S. DEPARTMENT OF ENERGY
Kentucky Pioneer
Integrated Gasification Combined Cycle
Demonstration Project
Draft Environmental Impact Statement
Public Scoping Meeting
Lexington, Kentucky
December 10, 2001

APPEARANCES:

FOR THE U.S. DEPARTMENT OF ENERGY:

Roy Spears, U.S. Department of Energy

John Preston, Corps of Engineers, Project Manager

Jim Watts, Project Manager

Gordon Lorenzi, Compliance Officer

The U.S. Department of Energy public meeting was held at 7:00 p.m., December 10, 2001 at the Lexington Public Library, downtown Lexington, Kentucky, before Michele G. Hankins, Court Reporter.

INDEX

P R O C E E D I N G S

MR. SPEARS: May I have your attention, please?

Everyone should take a seat, or find a comfortable spot to lean up against, we will begin this meeting.

Is the volume okay back there, Tim?

Good evening ladies and gentlemen.

Just a few housekeeping chores that we want to cover before we get too far into this public meeting.

If you find it necessary to go to the restroom, you can take the elevator, which is just outside and to your right. Go to the second floor and it is on either side of the elevator.

In the event of an emergency evacuation, fire, or some other emergency, we have this exit from this room and there are two exits both street sides here.

And if there is something back there that prevents us from getting out that way, there is an exit behind me here off the stage.

So I just want you to know that those are there, and hopefully we won't need them, at least

5

we know where they are.

There are a few people that I would like to introduce tonight who have been very, very, helpful in putting together this draft environmental impact statement for the Kentucky Pioneer Energy, IGCC project.

One is from the Department of Energy, and project manager for this project, Jim Watts, who sits on the back row back there.

John Preston who is going to be doing some presenting tonight. John works for the U.S. Army Corps of Engineers out of the Huntington District. John is the project manager for the NEPA document here.

We have three gentlemen that are here from the Kentucky Pioneer Energy Project. We have Mike Muslin, Dwight Lockwood, who is the environmental regulatory affairs person.

We have Rich Bailey, who is vice president of Global Energy, but he is also with Kentucky Pioneer.

I would like to express my appreciation to these gentlemen for all the efforts that have been put forward. It has been a long rigorous process

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getting to this point, and we think we have made significant progress and we look forward to continuing, going through this public hearing, public comments that we will receive from you. Putting that together in a final EIS and getting a Record of Decision, which is our ultimate goal, of course.

I think without further adieu I would like to turn the program over to John Preston, who will take us through the NEPA process and give us some insight on some of the things that we have done, and some of the things that we still need to do.

John?

MR. PRESTON: Thank you, Roy. I thought it important to talk a little bit about why we are here. It is National Environmental Policy Act is a planning tool. And any federal action requires that we go through the NEPA process.

It is important tonight because we are at that point where it provides another opportunity for the public to give us comments so that we can do a better job of planning.

We started back in April with what is called a Notice of Intent, just basically an announcement that the Department of Energy determined

that the appropriate document for this project, or proposed project, was the Environmental Impact Statement.

In May, we had a scoping meeting in Trapp, Kentucky, and I recognize some of the faces, some of you were there. That is where we got your comments on what we should look at in the process.

Since then, we have been preparing this Draft Environmental Impact Statement. And it is draft because we are now at the public hearing stage, or public comment period where we want to get your comments on how well we did in addressing those issues that you told us were important to you, as well as the ones we may have already decided were important.

After this hearing tonight, we have another in Trapp tomorrow at the same time, and then on January 4, we close the public comment period.

So we are requesting your comments be either submitted orally tonight, or you can submit them in writing to Mr. Spears, and the address is in your handout, by January 4.

We will take those comments and each comment will be considered, and we will have a

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comment document that will accompany the final EIS and you can see in there how we addressed your comments.

After that, within the agency, the Department of Energy will make a decision, and the decision will be whether to fund this demonstration project. That is indeed the federal action here is to decide whether or not to provide funding.

The EIS, we have the draft, considers three alternatives. Number one, is something required in all NEPA documents, this is the No Action. If the federal government does nothing, what will the environmental conditions be like, it pretty much remains the same, but there can be some adverse impacts, as well as beneficial impacts, to no federal action.

No Action, Number 2, is important in this document because should the DOE not fund the gasification demonstration and fuel cell demonstration of this project, Global Energy and Kentucky Pioneer, have indicated that they would go ahead and build what we term the power island portion of the project, which has determined to produce electricity, they would fuel that with natural gas.

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So, therefore, there are impacts from that no federal action alternative, as well, and we decided to call them both No Actions, because, again, the federal action is demonstrating the technology by providing that which would allow the demonstration to take place.

So the proposed action is DOE provides funding to assist in the demonstration of the British Gas Lurgi, IGCC, power plant at a commercial scale, along with a two megawatt fuel cell -- and I am sure these gentlemen, if you got a chance to talk to them earlier, can describe that better than I, as far as technically, anyway.

The EIS, we consider a lot of environmental factors, this is where some of your comments came in at scoping, what we should look at.

This is essentially the outline of the main topic we considered.

There is too much detail to go in, but I do just want to say, that our analysis indicates that there is no significant impact from this project. Every one of them has an impact, but we don't feel any are significant on this scale of a project.

So, again, this is an important part of

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the NEPA process where we get the public's comments on how well we did addressing the impacts from this proposed action. Because it is important to the agency to make the decision on whether or not to go forward with the proposed alternatives, or not.

So I appreciate you all coming, and again the close of comment period is January 4.

You can speak orally here, we have a list of people registered to speak, we will open it to the floor, after those who have registered to speak.

Again, you can submit comments in writing, but also over the Internet. And I believe those addresses are in your pamphlet, there but again, you can submit comments in writing and also over the Internet. I believe those addresses are in your pamphlet. There are a couple of things in there that describe the project in more detail, as well as describe the NEPA process.

Thank you.

MR. SPEARS: John mentioned the handout that is available at the table at the back of the room. And this is what it looks like, I hope everyone got one, if you did not, this is what it

looks like and it has some material in the back.
It also has the comment sheet inside.
Be sure to pick one up if you don't have one yet.
One other gentleman that I waited to introduce, he sort of overlooks everything that we do on the NEPA side, at the National Energy and Technology Laboratory. He is our NEPA compliance officer, Lloyd Lorenzi, he is in the back.
We are very pleased that a number of you came out tonight. This is indicative of at least a concern of what is going on in your community, and a that is, in essence, why we have the public meeting.
We want to find out what you think about things, what comments you have, what concerns you have. So the purpose of this meeting tonight, as we have indicated a couple of times, is to receive your comments on this draft environmental impact statement for the Kentucky project.
I would like to now ask the first on our sign-up sheet to come forward. Actually, you will have a microphone delivered to you.
We would like for you to state your complete name slowly so that the court reporter can make sure that we get your name correct. And it

12

probably wouldn't hurt if you spelled your name as well.

We would like to request somewhere in the neighborhood of a five-minute comment period. We do not have a whole lot of commenters tonight, so that is not real, real important, but we do not want to go into a 20- or 30-minute dissertation.

So, if you will hold them to about five minutes, and then later on, after all of your speaker, or speakers, have had an opportunity to comment, then perhaps you could come back up and make another comment if you wish.

Let's talk about the handout. One very important issue is the closing of the comment period, which is January 4, 2002. So if you keep that in mind as you comment, we surely would appreciate that.

We are now ready for Mr. Crewe, to begin his comment.

MR. CREWE: My name is Phil Crewe.

My name is spelled C-R-E-W-E, and I live here in Lexington. I am a member of the Sierra Club.

My concerns are several, one of them is firstly, why is this plant specifically the

1/14

Comment No. 1 **Issue Code: 14**

Because of DOE's limited role in providing cost-shared funding for the proposed Kentucky Pioneer IGCC Demonstration Project, alternative sites were not considered. Chapter 2 of the EIS discusses EKPC's 1998 Power Requirements Study which indicates that the electrical load for the region is expected to increase by 3.0 percent per year through 2017. Net winter peak demand is expected to increase by 3.3 percent per year and net summer peak demand is expected to increase by 3.0 percent per year. Peak demand is expected to increase from 2,031 MW in 1998 to 2,394 MW in 2003 and 3,478 MW in 2015. Based on this load growth, EKPC will need additional power supply resources of 625 MW in 2003. The need is further shown by EKPC's plans to construct four new CT electric generating units to provide peaking service alongside the three existing peaker CTs at the J.K. Smith Site. The power generated by the project will be used to support Kentucky's energy needs. The relatively small amounts and generally widely dispersed nature of MSW in Kentucky does not economically support exclusive utilization of Kentucky-generated MSW to produce RDF supplies. Importing RDF from a densely populated metropolitan area is more economically viable in order to supply the necessary amount of RDF required to operate the plant.

13

gasification of municipal waste being built in Kentucky?

We understand that the municipal waste will come from New York and New Jersey. There is an abundance of municipal waste in New York and New Jersey and there is a shortage of power in the northeast.

We, on the other hand, don't have that degree of shortage of power. It would seem logical that the plant be built where there is the abundance of the waste to be processed, and where there is a market, where the price for power is much higher.

As a matter of environmental justice, I believe the plant should be built near where the most of the feed stock for the plant is generated.

And I am concerned, and have so far not gotten completely satisfactory answers about the environmental state of toxic heavy metals in the municipal waste.

We understand that most of them will end up in the vitrified frit component, and that is just the bottom of the gas fired.

What insurance do we have that this material will not leach toxic heavy metals, plus

Comment No. 2 **Issue Code: 13**

DOE does not believe that the proposed project poses environmental justice concerns. The environmental justice analysis is presented in Section 5.19 of the EIS, Environmental Justice.

1/14 (cont.) For this project, KPE selected the J.K. Smith Site due to the initial grading and development that occurred during the construction on the previously discontinued J.K. Smith plant. KPE determined that the project costs would be much higher and the environmental impacts greater if an undisturbed area was chosen.

Comment No. 3 **Issue Code: 12**

With the exception of white goods (e.g., refrigerators), glass, and cans, the remaining components of MSW (e.g., paper, plastic, and food waste) are processed to make RDF. The process of manufacturing the RDF creates a relatively homogeneous end product; however, since MSW is variable, the exact components of RDF are not known. The vitrified frit consists primarily of ash (99.2 percent by weight) composed of oxides of the following elements: silicon (SiO_2), aluminum (Al_2O_3), titanium (TiO_2), iron (Fe_2O_3), calcium (CaO), magnesium (MgO), potassium (K_2O) and sodium (Na_2O). The frit also consists of chloride, fluoride, antimony, arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, mercury, molybdenum, nickel, silver, thallium, vanadium and zinc. Since all constituents are immobilized in the frit, which is resistant to corrosion in the environment and has been proven nonleachable by EPA standards, they will not contaminate the environment.

2/13

3/12

14

lead, dioxin, cadmium and others over the long haul.

Even if it does pass, how does the claim that is made by Global Energy that the frit passes the so-called -- I believe it is the TTLT, leach test, if that is correct. How does that translate into the real world? If it just barely passes that test, it can be sold as road aggregate or construction material or fill material. How much leaching of toxic a day will occur? We don't have the answer to that question.

What is the basis of the claim that this will not leach toxins in the Kentucky environment that have come from another part of the country?

Another concern would be the amount of water usage. This plant will consume water from the Kentucky Rivers in the pool above Lexington. There is a continuing demand on the Kentucky River.

Last year, if you remember, we had a severe drought where the flow of the river almost stopped and the consumption by the community, was actually greater than the flow of the river.

So the component of gasifying coal and/or municipal waste, greatly increases the water consumption. So, we would be assured that this plant

3/12 (cont.)

4/07

Comment No. 3 (cont.) **Issue Code: 12**

Vitrified frit from this facility is expected to pass the more stringent Universal Treatment Systems criteria of the EPA-TCLP analytical method. Frit is considered a commercial product, not a waste; therefore, the vitrified frit from the gasification process can be used in areas such as road and building construction. Chapter 3 of the EIS has been modified to include a more detailed description of the frit.

Comment No. 4 **Issue Code: 07**

The cumulative effects of withdrawals from the Kentucky River by power plants have been discussed by the Kentucky Natural Resources and Environmental Protection Cabinet in their cumulative assessment report (KNREPC 2001), addressed in Section 5.14, Cumulative Impacts. The Cabinet acknowledges that because many of Kentucky's power plants are exempt from water withdrawal requirements, the Cabinet does not have an accurate inventory of the volume of water being removed each day by the existing power plants. However, the KDEP is able to limit withdrawals from permitted sources during periods of abnormally low flow. Although the proposed plant would not be a permitted withdrawal source, KPE has stated that they would cease water withdrawals if requested to by the state.

would not consume a large amount of water, when there were extremely low flows in the Kentucky River.

Another concern is the visual pollution. The stacks from the gasification aspect of this plant, would be visible from the top of Pilot Knob, that is supposedly where Daniel Boone first viewed the Bluegrass in 1769 on the first long hunt in Kentucky into the bluegrass.

And I have been up there many times and it is a beautiful site and it is largely a rural view. You are looking at what looks like a great sea stretching out into infinity. And this will be visual pollution, if you will, about eight miles away it will be visible.

I will probably have other comments later, or before the January 4th cut off period, but particularly my concern is, I will reiterate, the ultimate environmental phase of the heavy metals coming into Kentucky in municipal waste. Keeping toxic waste out of that, which I don't think there will be a way to do. And the question of environmental justice, why the plant is not being built near the source of the feed stock and the municipal waste?

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4/07 (cont.)

5/04

3/12 (cont.)

2/13 (cont.)

Comment No. 5 **Issue Code: 04**

Comment noted. Impacts to the aesthetic and scenic environment of the project area are presented in Section 5.5, Aesthetic and Scenic Resources, of the EIS. The tallest structures that would be built for this project are the facility stacks for the gasifiers. These structures would stand 65 meters (213 feet) in height and would likely be visible from the 222.5-meter (730-foot) high observation position on top of the Pilot Knob State Nature Preserve, 12.8 kilometers (80 miles) east of the project site. However, due to the distance from the facility, the aesthetic and scenic impact to the viewshed from Pilot Knob would be minor.

That is all I have to say right now. I appreciate the opportunity.

MR. SPEARS: Thank you very much, Mr. Crewe. I appreciate your comments.

Commenter number two, Ramesh Bhatt.

MR. BHATT: My name is Ramesh Bhatt. R-A-M-E-S-H, B-H-A-T-T.

I am a resident of Lexington, Kentucky, also.

I have many of the same concerns that Crewe voiced just recently. I want to reinforce some of them.

First, I was struck by the vagueness of the analysis of the draft EIS. 6/14

My judgment is that an EIS is useful and highly special, and I was surprised that there was no data on whether this frit, this left over product that comes from this process, whether it is hazardous or not. 7/12

The people don't even know at this point. I think the EIS document is unclear whether it is hazardous or not.

I don't know what kind of EIS can be done if you don't even know that. There are all 6/14 (cont.)

16

Comment No. 6 **Issue Code: 14**

DOE believes that the Kentucky Pioneer IGCC Demonstration Project EIS adequately analyzes the full scope of environmental impacts from the proposed project. Chapter 3 has been modified to provide more details on the gasification process, including the production of the vitreous frit.

Comment No. 7 **Issue Code: 12**

RCRA, Subtitle C, has established special on-site accumulation requirements for generators of hazardous waste depending on the RCRA generator status of the facility. Assuming that the proposed plant would be a large quantity generator (generating more than 1,000 kilograms [2,200 pounds] or more of hazardous waste per month), under RCRA it is allowed to accumulate hazardous waste conversion onsite for no more than 90 days (§262.34a).

Vitrified frit is considered a commercial product, not a waste. The frit produced by the proposed project is expected to be marketable. The frit from gasifiers operating on a 100 percent coal feed has consistently proven to be nonhazardous and rarely fails the TCLP test. Since this project will be using a different feed stream, the first batch of frit should be tested to ensure that is meets all TCLP criteria and is therefore nonhazardous.

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kinds of environmental issues with the handling of the hazardous material, if it turns out to be hazardous.

So I was a little surprised by that. I think for the final EIS, we need to know more information, because this is obviously going to be a critical aspect of this project here.

That is one point.

The second point that I am concerned about that was clear to me from the EIS document, the draft anyway, was the nature of the monitoring.

This is an experimental facility. This is the first time that something like this is going to be tried in the U.S.

It is designated as an official municipal waste combustion. It is about a mile from a local school. Given all this, shouldn't there be some more information about who is going to be monitoring it, what is going to be monitored? This is supposed to be a one-year project, we want to know what happens at the end of it. Is there going to be a public meeting at the end of one year where we know what will come of this? Is it going to be a complete new permitting process at the end of the first year?

6/14 (cont.)

8/11

9/21

Comment No. 8 **Issue Code: 11**

The air quality permit issued by the Air Quality Division of the KDEP requires continuous emissions monitoring. Compliance with emission limits set by the Final PSD/Title V Permit would be verified by a detailed set of monitoring and reporting requirements as outlined in the permit. Continuous emissions monitoring equipment is required on the generator system stacks for NO_X, CO, O_2, SO_2, and opacity. Initial stack tests are required for NO_X, CO, SO_2, PM_{10}, volatile organic compounds, beryllium, cadmium, lead, mercury, hydrogen chloride, and dioxins/furans. Initial monitoring of hydrogen sulfide (H_2S) is required at the sulfur recovery facility, and periodic opacity observations are required at various material handling facilities. In addition, annual stack tests are required for PM_{10}, cadmium, lead, mercury, hydrogen chloride, and dioxins/furans.

Appropriate and required personnel monitoring would also be conducted. Health and safety procedures and health monitoring requirements would be addressed during the design and construction phase of the proposed project.

Comment No. 9 **Issue Code: 21**

KPE has a contract in place with EKPC to provide power continuously for a 20-year period. The facility would not shut down after the 1-year demonstration period, but would continue to operate to honor the commitment to EKPC. As discussed in Chapters 1 and 2 of the EIS, the performance, technical, and economic data would be used to determine the commercial viability of the BGL gasifier at other new and existing facilities. There would not be a new round of permitting following the end of the 1-year demonstration period. The PSD/Title V Air Permit issued by the Kentucky Division of Air Quality is final and does not require renewal following the demonstration. At the close

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I think all of this information needs to be in the EIS.

The third point that is of concern to me is that from what I could make up, the analysis was based on 50 percent of this refuse pellet and 50 percent coal waste. But my understanding is that in the future, more refuse may be used. All of this chemical analysis, what is going to be the outcome, et cetera, et cetera, based on 50 percent/50 percent, or is it going to be 80 percent, 90 percent?

That brings me to another critical aspect of the EIS that needs to be addressed. A fourth aspect is the nature of this refuse pellet, or the refuse derived fuel. It is unclear, it is a little vague, as to what the components of this would be, not a lot of hand waiving about things may be removed, some things ought to be removed, but if they get removed, we don't know.

It says that the intent is to buy this fuel from one particular supplier. If that is the intent, will we have more information about this? We should probably have a lot more information about the composition of these pellets, what happens, what are the pellets made for, are they being burned into the

10/14

11/16

11/16 (cont.)

Comment No. 9 (cont.) **Issue Code: 21**
of the demonstration period, the KPDES permit for water usage would also be final and not require renewal. Any required fuel feed component changes following the 1-year demonstration period would likely require modification of the air and water permits.

Comment No. 10 **Issue Code: 14**
The EIS provides analysis and impacts based on the fuel feed used for the 1-year demonstration. The impacts presented in the EIS are based on the full 20-year timeframe that the plant is expected to be operating. Varying the percentage composition of the feed stream after the demonstration period will not significantly alter the expected environmental impacts from the proposed project.

Comment No. 11 **Issue Code: 16**
Chapter 3, Section 3.2.2.2 of the EIS, discusses the production and composition of the RDF pellets using all available and relevant data.

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atmosphere, are they being used elsewhere for whatever purpose?

So I would like to know about all of these things. My suggestion is that we have the information of this nature. It should be an integral part of the EIS.

The draft EIS also says that on these of tons of tons of sulfur dioxins, carbon monoxide, that it kind of dismisses this as not being significant. From what perspective? It may not be significant in terms of a traditional coal-fired plant, but we don't want to have chemicals anymore than we need.

So I don't understand how EIS can be so dismissive of a thing like this. You have a cumulative impact of all of these things on the environment of Kentucky. I think this is an important issue and it needs more discussion.

Another point I have was the visual pollution that someone made about the stacks being visible from this Pilot Knob and the City of Winchester. This is a critical issue and an important issue from this region, but at the same time they are talking about beautifying this region and bringing more people in for tourism and things of

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Comment No. 12 **Issue Code: 06**

11/16 (cont.) The EIS characterizes the emissions from the proposed project as having a less than significant impact based on the fact that incremental ambient air quality impacts from these emissions would be a very small fraction of the relevant federal and state ambient air quality standards (less than 1 percent of the standards for gaseous pollutants and less than 4 percent of the PM_{10} standards). In addition, the project would comply with all applicable federal and state air quality regulations, including federal PSD regulations.

12/06 Section 5.7, Air Resources, of the EIS has been revised to further evaluate impacts related to acid deposition and heavy metal deposition downwind of the project site.

Comment No. 13 **Issue Code: 20**

Comment noted. Section 5.14, Cumulative Effects, has been revised to include an analysis of the cumulative health effects.

13/20 **Comment No. 14** **Issue Code: 04**

Comment noted. Impacts to the visual setting of the project area are presented in Section 5.5, Aesthetic and Scenic Resources, of the EIS. The large size of the surrounding J.K. Smith Site and the hilly nature of the area would reduce the visual and aesthetic impacts to a large degree. The facility would be visible from high elevations including the 222.5-meter (730-foot) high observation position on top of Pilot Knob State Nature Preserve, 12.8 kilometers (8 miles) east of the project site. However, due to the distance from the facility, the aesthetic and scenic impact to the viewshed from Pilot Knob would be minor. No impacts to regional tourism have been identified as a result of this project.

14/04

that nature.

Another point, a final point, from the draft EIS, I could make out that up to 60 percent of the water is taken from the Kentucky River, it is used for thermal electric power production, that is a lot.

In other words, of all of the water that is taken from the river, most of it, the majority of it, 60 percent of it, goes for the production of energy. Now, what does it do to the river eventually?

The draft EIS statement dismisses the water taken out as not being a significant amount and a maximum of up to four percent of the flow when the water levels are low. But if you look at the cumulative aspects of all of this, ultimately I think we are going to be in trouble if we don't take better care of our water.

So, those are the comments that I have. I suspect that other speakers will have issues about water, too.

The bottom line for me has been that the EIS, I don't feel like it gives enough information, and relies a lot on data provided by the interested

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15/07

6/14
(cont.)

Comment No. 15 **Issue Code: 07**

The cumulative effects of withdrawals from the Kentucky River by power plants have been discussed by the Kentucky Natural Resources and Environmental Protection Cabinet in their cumulative assessment report (KNREPC 2001), addressed in Section 5.14, Cumulative Impacts of the EIS. The Cabinet acknowledges that because many of Kentucky's power plants are exempt from water withdrawal requirements, the Cabinet does not have an accurate inventory of the volume of water being removed each day by the existing power plants. However, the KDEP is able to limit withdrawals from permitted sources during periods of abnormally low flow. Although the proposed plant would not be a permitted withdrawal source, KPE has stated that they would cease water withdrawals if requested to by the state.

company, rather than presumably from objective observers on the outside.

The process of it, we don't know what the frit is going to be about, we don't know whether it is hazardous or not. If it is hazardous, how can we get rid of it in a nonhazard way? What is the concentration of the hazardous waste, they get up to 60 days or 90 days to move this hazardous waste in the same location.

There a lot of environmental issues involved with all of those things. It seems to me that a complete EIS would have to bring out these issues.

Thank you.

MR. SPEARS: Thank you, Mr. Bhatt.

Our next commenter is Patty Draus.

MS. DRAUS: Thank you. My name is Patty Draus and I am from Lexington.

My comments are very similar in nature to the previously mentioned ones.

I do have some concerns about the water usage and the fact that large quantities -- the quantity that will returned to the water, presumably to the river, would be at a higher temperature than

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6/14 (cont.)

7/12 (cont.)

16/07

Comment No. 16 **Issue Code: 07**

Section 5.9 of the EIS, Ecological Resources, discusses potential impacts from the water returned to the river at high temperatures. As stated in Section 5.8, Water Resources and Water Quality, treated wastewater is expected to contain conventional pollutants such as nitrogen, phosphorus, total dissolved solids, and biological and chemical oxygen demand. Pollutant discharge limitations, including thermal limits, would be set by the Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water's Water Resources Branch and would be identified in the KPDES permit. These limitations would be established based on site-specific computer modeling of the expected effect on water quality of the Kentucky River at the proposed discharge point and in the mixing zone immediately downgradient. The limits specified in the permit would protect existing water quality.

The Water Resources Branch pays particular attention to the proximity of wastewater discharges to drinking water intakes. New sources of wastewater are prohibited within 8 kilometers (5 miles) of a water treatment plant intake. This 8-kilometer (5-mile) limit was established to provide an additional layer of protection for the water quality found at drinking water intakes over treatment alone and is referred to as Zone 1. Zone 2 extends from 8 to 16 kilometers (5 to 10 miles), while Zone 3 is the area from 16 to 40 kilometers (10 to 25 miles) from a water treatment plant intake. The proposed outfall is located in Zone 3 for the Winchester Water Treatment Plant. Water collected at the treatment plant is tested and treated to meet all federal and state requirements concerning drinking water quality. Therefore, no impacts to drinking water are expected.

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what was taken out, what will be the environmental impacts of that? As well as what chemicals will be returned to the river?

As previously mentioned, during low flow times -- we have had some concerns here in Lexington, where will we get our drinking water and now we will have drinking water with additional chemicals in it that I am particularly not interested in drinking.

My second concern has to do with the trash that is being brought from out of state. I hate to see the State of Kentucky become the trash reciprocal for other states, now we can start getting this from all over the nation. How do you control the content of the trash and when you burn this and when you produce this frit, how do you control what comes out and what effect it will have on our environment?

So, I just really would rather see that we not be using trash as the fuel source for this power plant.

And my third concern, which probably, or is definitely not within the scope of your environmental impact, but I do have concern about whether we need this power. Where is the demand for

Comment No. 17 **Issue Code: 12**

The RDF pellet and coal cofeed that is processed during gasification results in the formation of molten slag, which becomes vitrified frit when quenched with water. The vitrified frit from gasifiers utilizing other feed stocks is resistant to corrosion in the environment and considered nonleachable by EPA standards. The frit produced by this facility is expected to meet all TCLP criteria. It will be a marketable product, not a waste.

16/07 (cont.)

Comment No. 18 **Issue Code: 16**

DOE selected the Kentucky Pioneer IGCC Demonstration Project for further consideration under DOE's fifth solicitation (CCT-V) of the CCT Program and concludes that the project falls under CCT Program requirements due to the use of the co-fed BGL technology.

17/12

Comment No. 19 **Issue Code: 14**

Chapter 2 of the EIS discusses EKPC's 1998 Power Requirements Study which indicates that the electrical load for the region is expected to increase by 3.0 percent per year through 2017. Net winter peak demand is expected to increase by 3.3 percent per year and net summer peak demand is expected to increase by 3.0 percent per year. Peak demand is expected to increase from 2,031 MW in 1998 to 2,394 MW in 2003 and 3,478 MW in 2015. Based on this load growth, EKPC will need additional power supply resources of 625 MW in 2003. The need is further shown by the EKPC's plans to construct four new CT electric generating units to provide peaking service alongside the three existing peaker CTs at the J.K. Smith Site. The Kentucky Pioneer IGCC Demonstration Project will not be used to phase out existing coal-burning plants. The power generated by the IGCC will be used to support Kentucky's energy needs.

18/16

19/14

23

this plant or will it be phasing out another old coal-burning plant that is not as efficient and not as clean?

And those are the three things that I am concerned with.

Thank you.

MR. SPEARS: Thank you very much, Ms. Draus.

Our next commenter, Naomi Shultz.

MS. SHULTZ: My name is Naomi Shultz. And I am speaking tonight on behalf of my colleagues at the Kentucky Environment Foundation, which is located in Greenup, Kentucky.

For the past six weeks, Kentucky Environment Foundation has focused almost exclusively on the issue of chemical weapons disposal and have fought hard to protect all central Kentucky citizens from the effects of a proposed chemical weapons incineration.

At Kentucky Environment Foundation, we steadily support non-incineration technology which do not release toxic chemicals in Kentucky's air, water and food.

We continue to maintain focus on the

19/14 (cont.)

20/22

Comment No. 20 **Issue Code: 22**

Comment noted.

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chemical weapons incinerator, yet are compelled to comment tonight, and later in the form of written comment, on the ludicrous idea of a waste burning power plant in Clark County.

Here briefly are our primary concerns. The first concern is using municipal waste to fuel a power plant -- I am having trouble with using this word -- municipal waste to fuel a power plant. We think it is extremely dangerous to public health.

Municipal waste have heavy metal, corrosive plastics and other materials, which when burned, come out the other end in the form of toxic compounds (inaudible).

One such family of chemicals known as dioxins, are considered by the U.S. EPA, various health organizations, and the United Nations Environmental Program are among the most dangerous chemicals ever made.

In 1994, the U.S. EPA stated that the average U.S. citizen there has already found unsafe levels of dioxins. That is, we have already been exposed to a level of dioxins as which health effects can occur.

What are the health effects, cancer,

Comment No. 21 **Issue Code: 11**

20/22 (cont.)

No significant impacts to the general public's health and safety would be expected from gasification of RDF. The proposed project is not an incinerator or conventional power plant burning coal or RDF. The gasifier operates as a completely enclosed pressurized system. Gasification occurs at high temperatures which ensures complete destruction of toxic organic compounds and incorporation of heavy metals in molten slag, recovered by quenching as a nonleachable glassy frit. Since gasification occurs at high pressures, the process produces no air emissions. Furthermore, the high temperatures achieved during gasification from the use of oxygen instead of air prevent the formation of dioxins/furans. The resulting product of the gasification process is syngas, consisting mainly of CO and H_2. Only minor amounts of wastewater are produced from the gasification process. The wastewater would be treated and discharged to the Kentucky River in accordance with the KPDES permit. Sludge from the wastewater treatment process is expected to be nonhazardous.

21/11

No emissions or waste products are produced from the gasification process. Refer to Chapter 3 of the EIS, Section 3.1.2.2, for an additional description of the gasification process. Use of RDF reduces the burden associated with disposal of large quantities of MSW and the need for additional landfill space.

Dioxin discharges are presented in Chapter 5, Table 5.7-4 of the EIS. The value given in this table overstates the actual emissions that will occur because it is the maximum limit established by the PSD/Title V Air Permit. No data is available for plant design to allow for modeling of actual dioxin emission rates, so the permit limit was used for the analysis.

birth defects, immune system defects, diabetes and much more.

We know the effects are linked to low levels of mercury, lead and a host of other heavy metals.

Our second concern, is a release of toxic chemicals into the environment, a new international treaty aimed at protecting health and the environment.

Last summer, the United States agreed to ratify the international treaty of the preexisting organic pollutants, or POPS.

POPS are a category of chemicals, including dioxins, PTBs, pesticides and some other metals, which are already found around the world and include a body of people all over the globe and which can cause the health effects explained above.

The POPS treaty calls for the ultimate elimination of the chemicals. Central and eastern Kentuckians are being asked to deny satisfying public health and safety and accept this facility, which will pollute our families for generations to come.

Our third concern that even use of the state-of-the-art plant, contributes significantly to

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21/11 (cont.)

22/22

22/22 (cont.)

23/06

Comment No. 22 **Issue Code: 22**

Comment noted. The EIS is intended to analyze environmental impacts from the proposed project. DOE does not believe international treaties are being violated.

Comment No. 23 **Issue Code: 06**

The project area does not experience poor air quality. Both the state and EPA consider the project region to be in compliance with all applicable ambient air quality standards. Incremental ambient air quality impacts from the proposed project would be a very small fraction of the relevant federal and state ambient air quality standards (less than 1 percent of the standards for gaseous pollutants and less than 4 percent of the PM_{10} standards). Table 5.7-4 of the EIS identifies estimated maximum downwind concentrations of hazardous pollutants expected to be emitted by the proposed facility and the associated maximum lifetime cancer risks. The air quality permit for the project requires continuous emission monitoring for major criteria pollutants and annual emissions testing for cadmium, lead, mercury, hydrogen chloride, and dioxins/furans.

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bad air quality.

It may be true that central Kentucky has suffered poor air quality that has affected so many urban and rural communities.

Let's set our goals to provide the highest possible standards for clean air, not the highest number of children requiring asthma treatment.

The fourth concern is that waste should be reduced and recycled, not shipped across state lines to be burned, period.

And the fifth and final concern for tonight, solution to demands for power in Kentucky and elsewhere, will not be found in shortsighted, waste to energy facility but in more sustainable methods.

The Kentucky Environmental Foundation will provide more detailed comments in writing by the January deadline.

For now, we emphatically state our opposition to this facility in Clark County, central Kentucky, or anywhere.

Thank you very much.

MR. SPEARS: Thank you very much,

23/06 (cont.)

24/22

25/22

26/16

Comment No. 24 **Issue Code: 22**
Comment noted.

Comment No. 25 **Issue Code: 22**
Comment noted.

Comment No. 26 **Issue Code: 16**
Comment noted.

Ms. Shultz.

Our next commenter, Bernard McCarthy.

MR. McCARTHY: My name is Bernard McCarthy. I live here in Lexington.

I just want to say, first of all, I think burning garbage as a fuel is a lot more sensible than burying the garbage in landfills and then having to use other fuels.

I think that while coal is not as good of a fuel source as the garbage, in that coal has to be mined, I still would rather see coal-fired power plants than have natural gas used up generating electricity, because natural gas can be used so easily for so many other things from home heating and cooking, to even as an alternative to gasoline in powering vehicles is used.

You press it into the right kind of tanks and get the right kind of vehicles.

Now, having said that, if a plant were to primarily burn coal, it would make the most sense to put it as close to the coal mine as you can, instead of the electricity by live wire to wherever it is going to be used. That way, we would not wear out and clog up our highways near as bad.

27

27/16

28/10

Comment No. 27 **Issue Code: 16**
Comment noted.

Comment No. 28 **Issue Code: 10**
Comment noted. For this project, KPE selected the J.K. Smith Site due to the initial grading and development that occurred during the construction on the previously discontinued J.K. Smith plant. KPE determined that the project costs would be much higher and the environmental impacts greater if an undisturbed area was chosen.

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If on the other hand, you are going to burn a higher percentage of garbage, then it makes sense to put the plant wherever the garbage is coming from. Although, I am pretty sure the garbage is being produced everywhere and the thing to do might be to go ahead and build the plant here, but instead of hauling in garbage from another state, burn the garbage generated right here in Kentucky that is currently going into landfills and then somebody else build another plant in those other states to burn their garbage.

And if you are planning on burning a 50/50 mixture of garbage and coal so that one or the other has to be transported long distances, which is going to burn up various other fuels to power the trucks or the trains.

And probably the best thing to do is put the plant wherever you have the most number of unemployed persons to meet the work, which I think about east of here should readily qualify.

I would also like to point out that if the environmentalist, various firms object to it, it tells me that it is probably the right thing to do, by all means build this thing.

28

29/16

28/10 (cont.)

30/02

Comment No. 29 **Issue Code: 16**

Comment noted. Because of DOE's limited role of providing cost-shared funding for the proposed Kentucky Pioneer IGCC Demonstration Project, alternative sites were not considered. KPE selected the existing J.K. Smith Site because the costs would be much higher and the environmental impacts would likely be greater if an undisturbed area was chosen. Also, the relatively small amounts and generally widely dispersed nature of MSW in Kentucky does not economically support exclusive utilization of Kentucky-generated MSW to produce RDF supplies. Importing RDF from a densely populated metropolitan area is more economically viable in order to supply the necessary amount of RDF required to operate the plant.

Comment No. 30 **Issue Code: 02**

Comment noted. The unemployment rates for the counties within the socioeconomic ROI are presented in Chapter 4 of the EIS, Table 4.3-2. The rates have risen since 2000, with recent figures presented by the Kentucky Department for Employment Services showing unemployment rates of 5.3 percent for Clark County, 3.0 percent for Fayette County, and 4.5 percent for Madison County as of December 2001. The ROI rate has risen to 3.5 percent and the State of Kentucky's rate is 5.2 percent. This increase in the unemployment rate indicates that the jobs are needed in the area.

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MR. SPEARS: Thank you very much, Mr. McCarthy.

The next commenter is Chris Huestis. And I hope that I pronounce your last name correctly.

MR. HUESTIS: You got it.

My name is Chris Huestis. I am from Lexington.

I wrote down a few notes, I don't know if I can read my own notes, but I will try.

There is an interesting history in terms of the environmental protection in Kentucky. Basically, it does not happen.

We have had environmental disasters from Paducah and the radiation from the nuclear power plants. We have had all the way to eastern Kentucky with the coal slurries spilling out into the river and streams and having incredible disasters all over this state that EPA has already failed the people in Kentucky to protect the environment.

Our local and state government is also a part of that. We have failed everyone. Even our local people often are dumping their waste in various places in rivers and streams. Go to Red River Gorge, you will find tires in the Red River in the place

31/22

31/22 (cont.)

Comment No. 31 **Issue Code: 22**

Comment noted.

that is supposed to be preserved for natural beauty.

We are under a toxic siege. Our leadership has really failed us. There is really a real lack of leadership in protecting the environment.

One of my main questions is, how can we expect any protection or of any promises in the future from the federal government, from the local government, from the state government, where we have had one disaster after another?

It seems that Kentucky is wanting to be a toxic dump. And the leadership creates a chain reaction. It can go toxic or it can provide a habitat for change. A habitat for life. There is a biologist, his name is Edward O. Wilson, he is a naturalist. He has taught had Harvard for about, I don't know, 45 years. He has won a couple of Pulitzer Prizes. One of his books, Diversity of Life, is worth checking out.

But in that he states, that we are under a massive extinction on the planet, it has gone through it several times, about five or six times at the level of what he is talking about.

Wherein, incredible numbers of species,

30

32/11

Comment No. 32 **Issue Code: 11**

The primary purpose of federal, state, and local environmental regulations is to protect the public health and safety, the environment, and to reduce the likelihood and impacts of accidents. The past performance of federal, state, and local governments on disasters is beyond the scope of this EIS.

80 percent, 90 percent of the species of life, are wiped out.

The current one that he says we are in through his research is essentially caused by the humans, by people, by the way we live. If we can take $78 million for research for a power plant, why not take $78 million for some environmental protection in Kentucky?

I think that is my main comment is that we have lost our leadership for the environment and there is no credibility within the corporate world when they say they can produce clean safe energy in the environment in Kentucky.

So I think that is what is essentially is missing. Another comment I would like to make is when you have these public hearings there needs to be more attention drawn to the public hearing itself. More notice in the newspapers, or television, or the media to get the word out.

I found out about this through a friend, personal word of mouth, which is fine for me, but what I want to know is how many other people in the community know about this, or if they have even heard about this meeting. I think it is important for

31

33/14

31/22 (cont.)

34/21

Comment No. 33 **Issue Code: 14**

The Kentucky Pioneer IGCC Demonstration Project is a CCT selected by DOE to demonstrate the efficiency and environmental performance of new technologies. The issues of alternative uses of the Nation's funds are beyond the scope of the EIS.

Comment No. 34 **Issue Code: 21**

The public hearing dates, times, and locations were announced in the *Federal Register*, in local newspapers the *Winchester Sun* and *Lexington Herald-Leader*, and in public service announcements. All requirements in state and federal laws, rules, and regulations regarding announcements for public hearings were satisfied or surpassed.

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people to know so that they can come down and make a comment.

Thank you.

MR. SPEARS: Thank you very much.

I appreciates everybody's comments.

We have our last signed up commenter, at least.

I am not sure about the name here, Chetan Talwalker.

MR. TALWALKER: Hi. My name is Chetan Talwalker. I am a member of the Kentucky Environmental Foundation and a member of the board of the Kentucky Resources Council.

I want to express my concern about the proposal that has been offered. I found out about this from a group of folks who are interested in the issues of the Daniel Boone National Forest. I am a frequent user of the forest. I spend a lot of time in that area. I am very concerned about the impact that this kind of combustion facility is going to have, both of the aesthetic and public health aspect of the forests.

And as someone who for the last 10 years has been promoting alternative to building a

35/04

36/08

Comment No. 35 **Issue Code: 04**

Comment noted. Impacts to the visual setting of the project area are presented in Section 5.5, Aesthetic and Scenic Resources, of the EIS. Due to the hilly nature of the terrain and the reduced visibility associated with forests, the project would have negligible aesthetic and scenic impacts to the forests of the region.

Comment No. 36 **Issue Code: 08**

Potential impacts to local forest health would result primarily through the air emissions pathway. Air Quality Permit Number V-00-049 terms and conditions address operational limitations and conditions including monitoring and testing requirements. The air permit was issued based on a high level of sulfur removal and recovery from the syngas stream prior to its use. Additionally, a component of the air quality permit includes a Phase II Acid Rain Permit. Adherence with permit conditions would limit air pollutant emissions in the local area and reduce the likelihood of adverse impacts to forest health.

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pipeline, I am certainly very much in support of efficient use of natural resources and energy. I think efficiency is an energy option that is vastly under utilized in Kentucky, and is something that would be a much better alternative, a much better use, a much better way of getting the electricity that might otherwise be supplied in keeping the electricity that might otherwise be supplied by this facility.

In other words, what I am saying is, spend your $78 million, or however much it is going to end up costing on measures that reduce the need for the electricity, instead of spending money in a supply site option that may or may not work, and is going to have significantly greater health consequences.

I will also be submitting written comments. And I thank you for your time.

MR. SPEARS: Okay. Thank you very much.

Our next speaker is Erin McKenzie.

MS. McKENZIE: My name is Erin McKenzie. I am a student at the University of Kentucky.

37/22

Comment No. 37 **Issue Code: 22**

Comment noted. The issue of alternative power sources is outside the scope of the Kentucky Pioneer IGCC Demonstration Project EIS.

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I would just like to say that I am outraged at the fact that I didn't have any idea that this was being planned or discussed in a public forum, until this afternoon when I checked my e-mail.

It is only because I am on a list of a particular citizens' group that I found out about this.

I think it is very wrong that there is not more mention of this in the media, that citizens don't know that this is going in their own community.

And furthermore, on behalf of my fellow students, I would like to say that it is also an outrage that this takes place without the consideration of the students, without the consideration of the young population of Lexington.

Because contrary to popular belief, we do care about social issues and we are concerned about what happens to our environment.

We do plan on having children and I, for one, don't like the idea of garbage being burned in my backyard that my children my have to breathe several years down the road.

And I look at the flowchart over here

38/21

38/21 (cont.)

39/11

Comment No. 38 **Issue Code: 21**

The public hearing dates, times, and locations were announced in the *Federal Register*, in local newspapers the *Winchester Sun* and *Lexington Herald-Leader,* and in public service announcement information made available to local media outlets. All requirements in state and federal laws, rules, and regulations regarding announcements for public hearings were satisfied or surpassed.

Comment No. 39 **Issue Code: 11**

No significant impacts to the general public's health and safety would be expected from the gasification of RDF. The proposed project is not an incinerator or conventional power plant burning coal or RDF. The gasifier operates as a completely enclosed pressurized system. Gasification occurs at high temperatures which ensures complete destruction of toxic organic compounds and incorporation of heavy metals in molten slag, recovered by quenching as a nonleachable glassy frit. Since gasification occurs in a carefully controlled environment, the process produces no air emissions. Furthermore, the high temperatures achieved during gasification from the use of oxygen instead of air prevent the formation of dioxins/furans. The resulting product of the gasification process is syngas, consisting mainly of CO and H_2. Minor amounts of wastewater consisting primarily of salts are generated by the process. The wastewater would be treated and discharched to the Kentucky River in accordance with the KPDES permit. Sludge generated from the treatment process is expected to be nonhazardous.

and I don't understand all the chemistry behind it, but sounds to me like burning garbage cannot be the cleanest possible alternative.

Furthermore, I would like to see maybe some more evidence that this power plant is really needed. Do we really have a demand for the electricity and if so, certainly can we please explore other options that take into account our fragile environment in Kentucky?

I think it is often taken for granted that the State of Kentucky is a very backwards place. That is something that we, as citizens of the Commonwealth have to share and have to change.

Building power plants near schools, power plants that threaten our fragile natural resources, does not tell the rest of the country that we are anything but backward, and only invites corporations and other states to come in and take advantage of us.

MR. SPEARS: Thank you very much, Ms. McKenzie.

That is all I have down on my list here for commenters. Does anyone else wish to make another comment?

35

40/16

41/14

42/22

Comment No. 40 **Issue Code: 16**

Chapter 3 of the EIS explains the BGL gasification process. The RDF pellet and coal cofeed is heated in a carefully controlled, low oxygen environment, which causes a chemical conversion process that results in the formation of the syngas. The syngas product is combusted in the combined cycle turbines to produce electricity.

Comment No. 41 **Issue Code: 14**

Chapter 2 of the EIS discusses EKPC's 1998 Power Requirements Study which indicates that the electrical load for the region is expected to increase by 3.0 percent per year through 2017. Net winter peak demand is expected to increase by 3.3 percent per year and net summer peak demand is expected to increase by 3.0 percent per year. Peak demand is expected to increase from 2,031 MW in 1998 to 2,394 MW in 2003 and 3,478 MW in 2015. Based on this load growth, EKPC will need additional power supply resources of 625 MW in 2003. The need is further shown by EKPC's plans to construct four new CT electric generating units to provide peaking service alongside their three existing peaker CTs at the J.K. Smith Site. The issue of alternative energy options is outside the scope of the EIS. The purpose of the CCT Program is to demonstrate technologies with the potential to provide cleaner and more efficient energy from coal resources.

Comment No. 42 **Issue Code: 22**

Comment noted.

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Mr. Crewe?

MR. CREWE: If you can bear with me, if I can make a few additional comments, I would appreciate it.

Global Energy and Kentucky Pioneer and the authors of this Draft Environmental Impact Statement makes the claims that this process, or gasification of coal and natural waste, does not involve combustion. From my knowledge, that is a misleading statement.

The temperature at the bottom of the combuster is 3,000 degrees fahrenheit, at the top it is 900 degrees fahrenheit. Fed in from the top are combustible material, coal and refuse-derived fuel pellets.

Fed in at two places, at least, according to the flow chart on the opposite page of seven, is oxygen. By any reasonable definition, inductothermic reaction that occurs from 3,000 to 900 degrees in the presence of oxygen combustible material is combustion.

Which you know some combustion occurs in the presence of this drained and injected oxygen. And I believe it is a matter of public relations and

43/16

43/16 (cont.)

Comment No. 43 **Issue Code: 16**

Chapter 3 of the EIS has been revised to expand the discussion of the BGL gasification process. RDF pellets and coal are heated in a carefully controlled, low oxygen environment, which causes a chemical conversion process and the chemical element for formation of the syngas.

not precision, to claim that this does not involve combustion. I think this is more about public relations. This does involve some combustion and it involves burning garbage in Kentucky.

Also I am concerned about the production, as the representative from the Kentucky Environmental Foundation talked about, dioxins can be produced under certain conditions.

There has been no specific information furnished to us to dissuade our concerns, only maybe general comments.

What assurance do we have that this process will not produce dioxins? I am curious about what the power plant will produce. What facility is this scale, without having been done somewhere, so that we know what the outcome is?

And what outcome shows that dioxins and uraniums will not be produced? Will not, say, exit in the slip stream from the gasification process and there is an obvious influence.

And at some point in this statement, I don't know the page right now, it says that they do not know what the characteristics of the operation of the plant will be. So that seems rather vague.

43/16 (cont.)

44/06

44/06 (cont.)

45/16

44/06 (cont.)

46/16

Comment No. 44 **Issue Code: 06**

The Final PSD/Title V Permit for the Kentucky Pioneer IGCC Demonstration Project sets a very low limit on allowable dioxin emissions (0.01 nanograms per dry standard cubic meter of stack exhaust gas). Compliance with this limit must be demonstrated by an initial source test at project startup and by annual source tests thereafter. Because the potential uranium content of fuel materials is so low, neither EPA nor the state require any specific monitoring for uranium.

Dioxin discharges are presented in Chapter 5 of the EIS, Table 5.7-4. The value given in this table overstates the actual emissions that will occur because it is the maximum limit established by the PSD/Title V Air Permit. No data is available for plant design to allow for modeling of actual dioxin emission rates, so the permit limit was used for the analysis.

Comment No. 45 **Issue Code: 16**

An important consideration during site selection was to meet DOE's purpose for the proposed project to generate technical, environmental, and financial data from the design, construction, and operation of facilities at a sufficiently large enough scale to allow the power industry. Emissions and pollutants are discussed in Section 5.7, Air Resources, and 5.8, Water Resources and Water Quality, of the EIS.

Comment No. 46 **Issue Code: 16**

KPE engineering and plant design are subject to international contractual secrecy agreements, and are therefore business confidential and not available. This project would be the first commercial-scale application of the cofeed BGL technology in the United States. Similar technology has also been used at the Schwarze Pumpe facility in Germany and the Westfield facility in the United Kingdom.

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What are the characteristics of a power plant stage, what has been done, I think it will be helpful to know how this plant will work. It does not appear in what I have been able to read about it so far.

Also, and this may be a complaint about the process and environmental law in general about other projects, I would have been very interested in knowing about the scoping meeting that occurred in May of 2000. I didn't know that. It was apparently published in an obscure section of the paper where things like this get publicized, but most people don't read that and don't know about that.

The process doesn't seem to be tailored to inform the broadest possible group of the public that would be concerned. I certainly would have been at a scoping meeting had I known that it was occurring.

There have been several fairly critical articles in the local newspaper here, The Herald Leader, but nothing that informed me that there was a scoping meeting held in May of 2000, I believe that is when it was. Because I certainly would have gone to that at that time had I known about it.

46/16 (cont.)

47/21

Comment No. 47 **Issue Code: 21**

The date, time, and location of the May 2000 scoping meeting was announced in the *Federal Register*, in local newspapers the *Winchester Sun* and *Lexington Herald-Leader,* and in flyers distributed to the local community. Community groups and local elected officials are included on the project mailing list.

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And I believe that is all I have to say. I will have some other things before the 4th.

MR. SPEARS: Thanks again, Mr. Crewe.

Do I have anyone else?

Yes, the gentleman in the back.

MR. HERRICK: Thank you. My name is Will Herrick and I live on the north fork of the Kentucky River.

MR. SPEARS: Can you repeat your name, so that our reporter --

MR. HERRICK: Will Herrick. H-E-R-R-I-C-K.

MR. SPEARS: Thank you.

I live in Lee County, which puts me upstream and upwind.

And having observed the other comments, I think that one of the questions that I was left with was a specific question about the Ph of the water being returned to the Kentucky River.

There was discussion about particulate matter as it being used to scrub gases and to cool gases, manifestly is going to have some contamination. I would be very interested in

48/07

49/06

48/07 (cont.)

Comment No. 48 **Issue Code: 07**

The pH of the wastewater would be specified in the KDPES permit. Wastewater would be treated to adjust the pH so that it would fall within limits allowed in the KDPES permit.

Comment No. 49 **Issue Code: 06**

The suspended particulate matter contained in the gas stream from the gasification units would contain most of the metals and low volatility compounds emitted during the gasification process. The cooling of the gas stream produced by the gasification unit would cause condensation of low volatility compounds onto the particles already present, and would also cause much of the water vapor in the gas stream to condense on the suspended particulate matter. Gravitational settling would remove the condensed droplets and associated particulate matter, thus cleaning the gas before it is processed by the sulfur recovery facility.

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characterizing that water.

Kentucky River is in the State of Kentucky, there is three tiers of water quality, and it is pretty much a burden on the public to improve the quality of the water in this state.

It basically goes all the way to the bottom of that tier before the state will become involved. So it is up to the public, and perhaps the federal government, to help improve the quality of that water.

I am also particularly interested in the permitting events, and again, it is getting the feds to support the notion that this is a demonstration facility, and that the federal government has expressly said our interest here is in the demonstration of this, and it is clear from the documents and the air quality permit and other documents, that East Kentucky Power would very much like to keep rolling at the moment that demonstration part is done, under the same body of permits.

And it is something that I think everybody should stand up and know, this is a demonstration. It is there to demonstrate the technology, and at the end of the demonstration, we

48/07 (cont.)

50/21

50/21 (cont.)

Comment No. 50 **Issue Code: 21**

KPE has a contract in place with EKPC to provide power continuously for a 20-year period. The facility would not shut down after the 1-year demonstration period, but would continue to operate to honor the commitment to EKPC. There would not be a new round of permitting following the end of the 1-year demonstration period. The PSD/Title V Air Permit issued by the Kentucky Division of Air Quality is final and does not require renewal following the demonstration. At the close of the demonstration period, the KPDES permit for water usage would also be final and not require renewal. Any required fuel feed component changes following the 1-year demonstration period would likely require modification of the air and water permits.

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have a chance to review this, and it is a new round of permits and I would very much like the feds to stand up and join in that.

I guess I would just like to say that also there are bad economics for the public of Kentucky. It is irrefutable that no matter how you deal with the body of waste, whether it is atmospheric, put in the water, put in the ground, the majority of the waste product from this facility will be landfilled. And driving up the cost of landfills in Kentucky does not serve the public in Kentucky well.

So, again, there are considerations that I don't see being addressed to the virtue of the residents of Kentucky.

Manifestly, there are scarcities of air quality and there are comparative issues about what other industries may or may not be eliminated from siting in Kentucky because they are denied access to the quality air or the introduction to the quantity of pollutants. And that is a burden to the economic environment of Kentucky.

And particularly also the discovery of what is the toxicity of the frit resemble. Much of

50/21 (cont.)

51/12

49/06 (cont.)

52/02

53/12

Comment No. 51 **Issue Code: 12**

The project produces primarily vitrified frit which is considered a commercial product, not a waste stream. The waste generated at the proposed facility that would be landfilled in the State of Kentucky would be solid waste. It is difficult to determine whether waste from this project would drive up the cost of landfilling. Landfill cost increases are dependent on a number of factors, not just the waste generated from this proposed facility.

Comment No. 52 **Issue Code: 02**

All waste streams (air, water, and solid) generated by the project would be in compliance with federal, state, and local guidelines and ordinances. The presence of the facility should have no impact on future siting decisions for other businesses or industries in Clark County or Kentucky. No burdens to the economic health of the region as a result of this project have been identified. According to the *Cumulative Assessment of the Environmental Impacts Caused by Kentucky Electric Generating Units* prepared by the Kentucky Natural Resources and Environmental Protection Cabinet, further electric generation capacity often facilitates the development of the area economy.

Comment No. 53 **Issue Code: 12**

The constituents of the frit are immobilized in a glassy matrix making them nonleachable and resistant to corrosion in the environment. Analyses of the gasification process utilizing other feed stocks have found that the frit is nonhazardous and rarely fails the TCLP for metals. The frit from this facility is expected to not only pass the TCLP criteria but also the more rigorous TCLP Universal Treatment Standards criteria.

that burden may, in fact, fall on the average Kentuckian.

There are no guarantees from the federal government, or from anybody else, that should this prove to be -- that there, in fact, are definitive quantities of metals and leaching materials, that is anybody's burden but the county that signs the host agreement that accepts the waste from the landfill.

I would like to see that investigated much more thoroughly by the federal government as to what the true nature and outcome of long-term storage of frit under landfill-type conditions.

53/12 (cont.)

Thank you.

MR. SPEARS: Thank you very much for your comment.

Do we have anyone else that would like to make any additional comments.

I left this slide up intentionally so that perhaps this January 4, 2002, would jump out at you and you would be assured that the January 4 date of turning in your comments.

We really appreciate everyone being here tonight. I appreciate your interest in your local community and the technology that we hope to have in

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this community at some point in time.

With no one else desiring to comment, I am going to -- I am sorry, I thought we had one more commenter back there.

With no other comment, I would like to for the record show that this public meeting ended at approximately 7:55 p.m., on the 10th day of December.

We will be around after the meeting here if you would like to address any of those that I introduced a while ago, for points of clarification or whatever.

So we would welcome your interaction with those folks that are here.

Thank you very much.

(Meeting adjourned.)

STATE OF WEST VIRGINIA, To-wit:

I, Michele G. Hankins, a Notary Public and Court Reporter within and for the State aforesaid, do hereby certify that the proceeding was taken by me and before me at the time and place specified in the caption hereof.

I do further certify that said proceeding was correctly taken by me in stenotype notes, that the same was accurately transcribed out in full and reduced to typewriting, and that said transcript is a true record of the testimony.

I further certify that I am neither attorney or counsel for, nor related to or employed by, any of the parties to the action in which these proceedings were had, and further I am not a relative or employee of any attorney or counsel employed by the parties hereto or financially interested in the action.

My commission expires the 29th day of December 2003.

Given under my hand and seal this 7th day of January 2002.

Michele G. Hankins
Notary Public
Court Reporter

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U.S. DEPARTMENT OF ENERGY

Kentucky Pioneer
Integrated Gasification Combined Cycle
Demonstration Project
Draft Environmental Impact Statement
Public Scoping Meeting

Trapp, Kentucky
December 11, 2001

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APPEARANCES:

FOR THE U.S. DEPARTMENT OF ENERGY:

Roy Spears, U.S. Department of Energy
John Preston, Corps of Engineers, Project Manager
Jim Watts, Project Manager
Gordon Lorenzi, Compliance Officer

The U.S. Department of Energy public meeting was held at 7:00 p.m., December 11, 2001, at Trapp Elementary School in Trapp, Kentucky, before Michele G. Hankins, Court Reporter.

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P R O C E E D I N G S

MR. SPEARS: Before we get into the program, I have a couple of housekeeping chores, if you will.

If anybody needs to take a restroom break, please feel free to do so. It is at the far end of the hall towards the Christmas tree and to the right.

In the event of an emergency evacuation of any kind -- we don't know what that might be, and we certainly hope nothing happens -- but in the event, we have some exits just out this door and to the right and to the left. Just in the event that anything would happen.

I am Roy Spears with the Department of Energy out of our Morgantown Office of the National Energy Technology Laboratory.

And we were responsible for seeing that the Environmental Impact Statement, or the Draft Environmental Impact Statement was prepared for this project.

About a year and a half ago -- and I recognize some faces here tonight -- about a year and a half ago we had the scoping, the original scoping

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meeting, in May of 2000. In the meantime, we have been preparing the Draft Environmental Impact Statement.

Some folks that have assisted greatly in the preparation of this document, I would like to recognize, Mr. Rich Bailey. He is with Kentucky Pioneer Energy.

Dwight Lockwood, Kentucky Pioneer Energy and Mike Muslin, President of Kentucky Pioneer.

Lloyd Lorenzi, who is our NEPA compliance officer of our national lab.

John Preston is here. John is with the Corps of Engineers, and he is the project manager for the Environmental Impact Statement.

He is the one that actually saw that this thing was completed. And of course, Jim Watts, who is the overall project manager for this project.

We do have some folks here from Techni Tech, as well, Maher, Andrew and Jackie. And they, of course, are the ones who actually got things on paper. And that is very important that occurs, we truly appreciate everyone's effort in getting to this point.

We recognize that it has taken a long

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time, a lot of agencies that we have to deal with and it just a time-consuming process, but we feel that we have made some progress.

Two other folks that I would like to recognize this evening, and appreciate your attendance, County Judge Executive, Drew Graham. And state representative from this district Tom Pavney.

Thank you very much for showing an interest and coming out. We really appreciate it.

Are there any other officials that we are unaware of that might like to be recognized?

If not, we will march forward.

John Preston will now give us somewhat of an overview of what has happened in this NEPA process and he will bring us up to date on where we are at this point in time.

MR. PRESTON: Thank you.

Roy mentioned NEPA. It is a National Environmental Policy Act, put in action by Congress in 1969. Which basically required anytime there was a federal action, which there would be an expenditure of federal funds, or some decision made by the government, to consider the environment in project planning and that is what we are here for tonight.

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It is an important part of the NEPA process.

It began about April of 2000, when we issued a notice of intent that the Department of Energy felt we needed to prepare an Environmental Impact Statement, in order to adequately address the impact of a project of this magnitude.

We were here, as Roy mentioned, in May of 2000, to have our public scoping meeting. And the purpose for that for those who did not attend, we wanted your input on what we could look at, what we should evaluate.

Since then, we have been preparing this document that Roy mentioned, the Draft Environmental Impact Statement, and it is a draft. And it is a draft because we are now in the public comment period, which began on November 16th, we published it. This thing was ready for the public's review for the other federal agencies to review, other state agencies.

And tonight, the important part of the NEPA process is because we are here to get your oral comments on how we did in preparing that, did we consider everything fully?

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There are several ways to comment besides orally tonight. You have a form in your packet that you can write your comments and submit them here tonight. You can also e-mail them.

AUDIENCE MEMBER: Can we get a copy of that?

MR. PRESTON: Yeah, I will get to that.

You can e-mail your comments or you can write them down. These are available, if you want to request one, we will get one to you. They are also in the library, they are in the Lexington Public Library, they are in the Winchester Public Library, and we will send you one if you do not have access to those in the library.

The public comment period ends on January 4, 2002. And we would appreciate your comments by that date so that it gives us time to adequately consider them.

The purpose of the meeting tonight again is to receive your comments. We came early to answer questions, but this part of the meeting is just to get your comments, or statements and concern.

We will take each and every comment. A recorder will record them verbatim, and we will

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address them and in our final document, which will be the document that the Department of Energy makes their decision on whether or not to partially fund this project, we will have addressed each and every comment. So you will have a chance to see it again.

AUDIENCE MEMBER: May I ask a question?

I don't understand how we can comment on this if we have not read it?

MR. PRESTON: I am going to explain a little bit to you all. I appreciate that. And that is often the problem, but we did try to make this available by putting it in the library.

AUDIENCE MEMBER: There is no copy of it at the Clark County Public Library.

AUDIENCE MEMBER: We are from the library, and there is no copy in the library.

AUDIENCE MEMBER: We do not have a copy of this in the Clark County Public Library.

Sorry.

MR. PRESTON: Well, one was sent.

Let me just tell you briefly about the content of what is in the document then.

We considered three plans, or alternatives. There is one that NEPA requires you to

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consider which is no action, which means there is no -- the federal government does nothing.

In this case, the decision on the federal government is due, they partially fund this project to demonstrate the technology.

The No Action I, Alternative was the Department of Energy decides not to fund the project.

Well, Kentucky Pioneer Energy says that without DOE funding, they will go ahead and build a plant and fire it with natural gas, that is No Action II, that would occur whether the federal government takes any action or not so that we dubbed that No Action II, that is the name that we gave it.

The proposed action is what we are here to discuss, as well as the No Action, the proposed action is DOE would provide $78 million funding to demonstrate the technology.

The technology is gasification, using combined materials of coal and refuse derived fuel and that gasification process makes what is called a synthetic gas. It is that synthetic gas that is combusted to produce the power.

The gasification takes the raw materials

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and creates a synthetic gas.

And we have analyzed this and I want to show you the categories of environmental areas that we considered. A lot of you all are probably thinking, environmental areas, well, that is the streams, and the air, and those are indeed very important. But we also look at socioeconomics, cultural resources, occupational health and safety, traffic and transportation. This is a broad category and each one is discussed in detail in the document.

There is obviously not enough time to go through that, there was about a year and a half of analysis and you will have to get the document. Hopefully, this overview will give you some idea about what we are anticipating. I will say that in summary we do not believe any of the impacts from this project are significant impacts.

There are impacts, no doubt, some positive, some negative. Traffic, transportation, you will see a cooling tower out there, that is a visual impact. Noise, there may be some noise during construction. We have tried to recognize all of these, but we do believe they are minor, and that is our summary.

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I am going to turn it back over to Roy, but again, we would like to hear your feedback on this and your comments.

And if you have not had a chance to read the document, we will make it available to you.

So, please, if you want, just leave your name, we will get you one. We have a few that we can possibly pass out, but they are limited here on what we could carry on the plan, so we will make sure that you get the document and have it available.

Thank you.

MR. SPEARS: Thank you, John.

I would like to reiterate just a little bit, before you leave, we do have a few here, but we may not have enough for everybody, but if you will just --

AUDIENCE MEMBER: Whatever number we have, subtract three to five for the library.

MR. SPEARS: Okay.

MR. PRESTON: We will take them over there tomorrow and make sure the library has some.

Are you all with the library?

AUDIENCE MEMBER: Yes.

MR. PRESTON: Okay, great.

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MR. SPEARS: That will be taken care of tonight then.

But anyway, in your packet, there are addresses, and phone numbers, and so forth, and just jot them down and we will make sure that you get one.

Because we want everybody to have an opportunity to read this and comment and we do not want this to be an impediment to your looking at things.

Thank you, again, John.

In a moment, I have sign-up sheets for those of you who signed up to make a comment.

But first, I would like to -- it is a little bit of a different room configuration than we normally have here in the school, this is in the library.

When you comment, if you would come up to right here and state so that everybody would be able to hear you, and that puts you a little bit closer to our court reporter, who then would be able to make sure that she gets everything down.

We have several speakers here. Our original request is to limit your comments to about five minutes, five or six minutes. And if after all

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of the commenters have completed and get done, then if you have other comments, then we can come back up.

We want to give everyone ample time to speak and speak your mind here tonight.

The handout, I think, if anybody did not get a handout, it looks like this, we have plenty of handouts and I want to make sure that we get those.

One of the very important things, as John mentioned, the public comment period ends January 4.

And we would like to have those comments in by the 4th, or certainly that Monday or Tuesday after the 4th, if you have them on that Thursday or Friday. We encourage you to mail them as soon as you can.

That way, it gives us a little bit more time to evaluate those comments and make sure that they get incorporated into the final document.

I am going to leave this up here and maybe this January 4th will jump out at you a little bit more as we go through this presentation.

After I put my glasses on, I will read the first name.

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I hope everybody is comfortable in our over-sized chairs in here. We appreciate your patience with us here tonight.

Bobby Bailey.

MR. BAILEY: Yes, sir.

MR. SPEARS: If you would come up and introduce yourself.

MR. BAILEY: My name is Bobby Bailey. I live along Iron Works Road.

I have several questions I would like to ask.

I just found out about this tonight. I noticed that you refer to it in here as solid waste as a fuel? Am I correct that that is garbage? And if it is garbage, where is this garbage coming from?

And I understand gas from a pipeline, coal can be hauled by big trucks, but this garbage -- and I have had quite a bit of dealings with garbage -- some of these state officials, and some of the county officials -- and I don't mind telling you, some of them has lied to me.

I don't know what you people are going to do, who owns Global Energy? Who is Global Energy? Is it owned by the federal government, or is it

1/16

Comment No. 1 **Issue Code: 16**

Global Energy, Inc., is a privately-owned energy company. As discussed in Chapter 3, RDF is manufactured in a process that includes controlled steps for the processing of MSW or common household waste. White goods (e.g., refrigerators) are removed, cans and glass are also removed for recycling, and plastics are retained for their energy content. The remaining material, including the plastic, is then processed in a type of pressure cooker in which temperature and moisture of the RDF product is controlled. The result is a sterile "mulch type material" that is then formed into dense pellets by being forced through a mold at high pressures. RDF pellets would be shipped from a single manufacturer located on the east coast of the United States.

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private enterprise?

Can nobody tell me?

MR. SPEARS: What we are attempting here to do, is to receive all the comments and then when we get all the comments received, and the court reporter will close that part of the meeting, then you will be able to ask the appropriate people here and we have the individuals here to be able to answer those.

MR. BAILEY: Like I say, the garbage just has to be stockpiled, so I have a lot of problem with stockpiling waste, hazardous waste. It don't even need to be there. That is what I am concerned about.

I would like to hear from some of these state people that try to convince me that everything is stored underground, won't show up anyplace else, it stays right where it is at.

Most of us Kentucky people, we just don't believe this. There are underground streams. If you stockpile something out here, your waste, whatever it is that comes out of this plant, it has got to go someplace.

And what I am up here doing is that it

16

2/12

2/12 (cont.)

3/07

Comment No. 2 **Issue Code: 12**

Any hazardous waste stored onsite would be stored in accordance with state and RCRA regulations. Once a waste has been tested or is determined to be hazardous it would be stored in proper containers (e.g., 55 gallon drums) and labeled as "hazardous waste" with applicable hazardous waste codes and the date the accumulation period began. Based on generator status, the facility would have a maximum of 90 or 180 days for on-site storage of hazardous waste prior to disposal. During that time, the facility would be required to keep containers with hazardous waste in good condition and closed, inspect containers on a weekly basis, and keep a log of inspection. Regulations also require that facilities generating hazardous waste to have spill contingency and emergency response plans, which include procedures to notify the state regulators and the public in the event of a spill. KPE waste management activities would be in accordance with applicable state and RCRA regulations. Compliance with state and RCRA regulations significantly reduces the risk of leakage of hazardous waste.

Comment No. 3 **Issue Code: 07**

All raw materials and waste would be stored and handled in enclosed areas that would be isolated from local soil, water, and rainfall. Therefore, no impacts to local water quality would be expected from operation of the plant.

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is going into the water, I already have problems with water. There is a lot of questions I would like to ask somebody.

3/07 (cont.)

Where is this garbage coming from? Winchester doesn't have that much garbage.

1/16

MR. SPEARS: Those folks that I introduced earlier with Global and so forth, and we have a couple of folks from --

MR. BAILEY: January 4th don't give us a whole lot of time.

I don't use e-mail, folks. If I didn't voice my comments tonight, you won't hear from me.

MR. SPEARS: You can do it by regular mail.

I appreciate your comments.

I understand that you would like some other dialogue and I am sure there are lots of questions.

MR. BAILEY: Yes.

MR. SPEARS: And you will have the opportunity, after a little while, to do that.

We will be here after we close the formal meeting. You can feel free to ask, and I will make sure that we know who the folks are that you can

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talk with.

Thank you, again, Bob for your comments.

Tommy Rector.

MR. RECTOR: It may be redundant from the questions that gentleman has, but I think in general, we are all coming in on the backside of trying to get the information here before we get to draw any conclusions.

I live fairly close to the power plant and immediately I was concerned about off gases from anything that may be burning and/or stored, like the gentleman mentioned. 4/06

As well as specifically what kind of garbage, in detail, what DOE has to -- they will be laying it on trucks, or if it is railroad, or whatever. 5/16 6/10

So upfront, we as a community, should have access to that information. And, if it is going to be stockpiled, in what mode of transportation is it going to be brought in here on? 6/10 (cont.)

If this is a cut and done deal by the Department of Energy, or our federal government, I think it has not taken the feel of the community and their -- I don't want to say approval, but it is 7/21

Comment No. 4 **Issue Code: 06**
The handling and storage of coal, RDF pellets, limestone, petroleum coke, and vitrified frit would not produce any significant quantity of off-gases. The storage and handling of sulfur from the sulfur recovery facility would produce a small quantity of hydrogen sulfide emissions, as indicated in Chapter 5, Table 5.7-2 of the EIS. The Final PSD/Title V Permit for the facility includes emission limits for the sulfur recovery facility and sulfur storage and handling operations.

Comment No. 5 **Issue Code: 16**
As discussed in Chapter 3, RDF is manufactured in a process that includes controlled steps for the processing of MSW or common household waste. White goods (e.g., refrigerators) are removed, cans and glass are also removed for recycling, and plastics are retained for their energy content. The remaining material, including the plastic, is then processed in a type of pressure cooker in which temperature and moisture of the RDF product is controlled. The result is a sterile "mulch type material" that is then formed into dense pellets by being forced through a mold at high pressures. RDF pellets would be shipped from a single manufacturer located on the east coast of the United States.

Comment No. 6 **Issue Code: 10**
Comment noted. An Emergency Response Plan, which documents procedures for providing emergency response and cleanup for any project related spills during materials transport, has not yet been developed by KPE. The plan will be developed during the engineering and construction phase of the project and would adhere to local, state, and federal regulations. Section 5.11, Traffic and Transportation, has been modified to discuss the Emergency Response Plan.

Comment No. 7 **Issue Code: 21**
The public can provide comments on the project at any time during the process. Two formal opportunities for the public to provide input have

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still America, and I think we are entitled to all the questions to be answered, as well as the interrogation of you all, and the motives of the company, and the whole big picture. Hopefully it is not forced upon us against the will of the people. That is my main concern.

When you say environment, like you say, it entails a whole lot. Specifically, what is going to be burning going up in the sky? Is it going down in the water? What is burning? As well, as what may fall off trucks, the railroad cars, or whatever means they are planning to bring it in here.

That is, in general, what I was wanting to say.

MR. SPEARS: Thank you very much.

There are legitimate concerns in the community here.

Tim Walters.

MR. WALTERS: Thank you. I think first of all, I would like to make sure that we understand the problem and the basic science that is involved here.

I am primarily concerned here with the make of the carbon dioxide, that results from the

Comment No. 7 (cont.) **Issue Code: 21**

7/21 (cont.)

been provided during the scoping period from April 14 through May 21, 2000, and the public comment period from November 16, 2001, through January 25, 2002. All comments received during the public comment period have been considered during preparation of the Final EIS and addressed in this comment response document.

Comment No. 8 **Issue Code: 07**

4/06 (cont.)

8/07

6/10 (cont.)

All raw materials and wastes would be stored and handled in enclosed areas that would be isolated from local soil, water, and rainfall. Therefore, no impacts to local water quality would be expected from operation of the plant. Wastewater discharges would be required to meet all pollutant limitations specified in the KDPES permit.

Comment No. 9 **Issue Code: 06**

As noted in the EIS, the proposed project would produce about 1.45 million metric tons (1.6 million tons) of greenhouse gas emissions per year (mostly carbon dioxide). This would be about 25 percent less than the amount produced by a comparable natural gas fueled power plant. Greenhouse gas emissions from an equivalent coal fired power plant would be more than twice as high.

9/06

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burning of coal.

I think the answer to the gentleman that just spoke here, the garbage is going to get burned out here is going to come from New York and New Jersey. So Clark County is going take care of the garbage from New York and New Jersey, but that is another problem.

The problem that is presented here, and the way I see it, is that coal is almost pure carbon. And the problem is that when coal is attempted to convert to energy, it is not an efficient process.

You cannot convert 100 percent of a pound of coal to heat. Therefore, what you are going to have left over is a mixture of carbon and oxygen, which is carbon dioxide.

It is estimated that when you burn a pound of coal, you are only going to convert about one-third of that pound of coal to energy.

The two-thirds of that pound, is going to go up into the atmosphere in the form of carbon dioxide.

Now, to my knowledge, I don't think there is a any method, scientific method, that you

20

9/06 (cont.)

10/16

9/06 (cont.)

9/06 (cont.)

Comment No. 10 **Issue Code: 16**

Comment noted. The relatively small amounts and generally widely dispersed nature of MSW in Kentucky does not economically support exclusive utilization of Kentucky-generated MSW to produce RDF supplies. Importing RDF from a densely populated metropolitan area is more economically viable in order to supply the necessary amount of RDF required to operate the plant.

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can use, to try to convert coal to energy without a substantial amount of carbon dioxide resulting in it.

So, what is the mischief here? The problem is that the carbon dioxide goes into the atmosphere, it is lighter than the rest of the gasses in the atmosphere, so the carbon dioxide then goes up into the stratosphere. There it traps heat.

Now the earth has a beautiful system of making it an equilibrium, with respect to the heat that has escaped from outerspace and then the heat that stays. But the problem is that the abundance of carbon dioxide that is produced by humans each year, which is seven billion -- seven billion, now -- tons of carbon dioxide is put up into the atmosphere as a result of human activity during the year.

Four billion tons of those are consumed by the oceans and forests. Three billion tons remain in the atmosphere.

So you can see easily what is happening here. The equilibrium between the heat that is escaping and the heat that is staying is out of kilter.

In the last century, the parts per million of carbon dioxide that has been added to the

9/06
(cont.)

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atmosphere is almost 100.

The United States, although we have four percent of the population, we put into the atmosphere 21 percent of the total carbon dioxide.

So what is going to happen here? The earth is going to keep heating up, and what does this have to do with us with Trapp? What does it have to do with anybody?

Eventually, what is going to happen is that we are going to have a greenhouse effect and you are going to start melting icebergs up in the North Pole, and you can forget about every city down the east coast and down the west coast, they are going to be inundated with water when you raise the temperature of the earth.

And I notice here, and I was flabbergasted when I read this to indicate that apparently the legislatures, or the government, had deleted the effect of carbon dioxide from consideration of this power plant out here. That is the way I read this. I hope that is not correct.

Because of all the three dangerous gasses here, sulfur dioxide, nitric oxide and carbon dioxide, carbon dioxide is much worse. The other two

22

9/06 (cont.)

11/11

Comment No. 11 **Issue Code: 11**

Dispersion modeling conducted for the PSD/Title V Permit application covered an area of about 12 kilometers (7.5 miles) from the project site, including the area of maximum impact. The maximum air pollutant increments associated with emissions from the proposed project indicate that no significant short-term or long-term air quality impacts would occur. Locations 24 to 40 kilometers (15 to 25 miles) away would be exposed to lower pollutant increments than the area covered by the dispersion modeling analysis. The emissions of SO_2 and NO_x from the proposed facility would be less than 1 percent of the applicable federal and state ambient air quality standards. This negligible incremental increase in No_x and SO_2 emissions is not expected to contribute to respiratory illnesses.

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are bad because they contribute to respiratory illnesses in people.

But there has been a study that was conducted by the Oakridge National Laboratory down in Oakridge, that estimates that for every 500 watts of electricity that is produced by the power plant through the conversion of coal to energies, one pound of carbon dioxide is produced.

So when you convert that to the potential of this plant out here, which is 540 megawatts, which is 540 million tons per year that this power plant is going to produce. Simple math is going to tell you that this power plant is going to produce into the atmosphere 1,080,000 of carbon dioxide up into the atmosphere.

Somewhere around 3,400 pounds of nitric oxide is going to be produced and somewhere around 1,620 pounds of sulfur dioxide is going to be produced.

So, I guess I have problems with number one, taking care of New York and New Jersey's garbage down here. And then turning a blind eye to what this plant is going to do to our earth that we all have to live on and have to share, for the sake of some jobs

23

Comment No. 12 **Issue Code: 02**

11/11 (cont.)

Comment noted. The EIS is designed to present all of the possible environmental impacts of the various alternatives relating to the proposed federal action, both beneficial and detrimental. The economic benefits associated with the project are not intended as justification for the environmental costs of the project; however, they are presented as one of many resource areas impacted by the project.

9/06 (cont.)

11/11 (cont.)

10/16 (cont.)

11/11 (cont.)

12/02

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that they say is going to result permanently out here, I am not quite sure.

I know jobs are important, but I guess my point is this: When you counterbalance the grave potential for harm that can be done to the earth against the temporary benefits of some jobs, I think it is obvious as to what the conclusion should be.

Now, I know I am taking some time here, but I wanted to suggest -- I want to talk about something else before I sit down.

This is supposed to be an environmental impact. Probably about a third of you do not live in Trapp here, you drove out on Highway 89. Did you see that ridiculous mess that you drove on?

That is the worst road in Clark County. The worst road. What happened was, back when they first built this power plant out here, the first time they built it, whoever it was, called down at Frankfurt and got them to reclassify the road so that heavier trucks could travel the road and bring that heavy equipment out here, in heavier loads than the infrastructure of the road was capable of holding. So the road tore up.

Then they, what? Built it back. That

24

12/02 (cont.)

13/10

Comment No. 13 **Issue Code: 10**

Comment noted. The trucks would haul a maximum of 18 metric tons (20 tons) of cargo each, which would place the overall weight below the Kentucky-mandated maximum weight for Kentucky Highway 89 of 36,288 kilograms (80,000 pounds) for a five-axle vehicle. The Kentucky Transportation Cabinet indicated any vehicle below that weight traveling along that road would not be expected to cause damage to the roadway. Should damage occur from vehicles carrying more than the maximum weight allowance, the operator of the trucks, in this case KPE, would be responsible for any repairs to the road surface. Section 5.11 of the EIS, Traffic and Transportation, has been modified to address the concerns of damage to the local roads.

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is a loose term for reconstructing a road. The construction company that built it went bankrupt. But at any rate, you can see what kind of road they built.

Last winter, they started bringing some more things out here at the power plant, and they absolutely in front our own eyes, crumbled that road.

That road has a classification that cannot, under any circumstances, contain and maintain the heavy trucks that are bringing in the equipment and material over.

So, who is going to build the roads? I wish the government would contemplate what is going to happen to the road and who is going to build it?

Somewhere around $250 damage is done to the average car per year from roads, the average road in the country. This road here, you can multiply it. You could multiply it and you are going to get at least $500 damage to your car.

Plus, it doesn't make any difference to these people that get to leave after they build it, when they go back to Cincinnati, or wherever. But the people that live out here at Trapp and have to

13/10 (cont.)

13/10 (cont.)

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drive this road everyday, your car is going to suffer damage.

But at any rate, I think we all know the history of it, and I am not downing east Kentucky, they are good people out there. And I know them, and they are well-meaning people, and I don't mean this to be personal.

But honest to God, that first attempt of the power plant out here was an absolute disaster. Even up here when they borrowed $1 billion from the government for a project that was not even feasible, and they quit it.

So, I think you should make sure, number one, that the economy of this country requires this to be built.

Number two, we should rethink our priorities. When it comes to supplying energy and the permanent damage that we do to our country and our earth.

So having said that, thank you very much and I appreciate your patience.

MR. SPEARS: Thank you, Mr. Walters, for your comments.

I note on the sign-up sheet,

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13/10 (cont.)

Comment No. 14 **Issue Code: 14**

The Kentucky Pioneer IGCC Demonstration Project is a CCT Program selected by DOE to demonstrate the efficiency and environmental performance of new technologies utilizing coal resources. The current state of the Nation's economy and alternative uses of the Nation's funds are beyond the scope of the Kentucky Pioneer IGCC Demonstration Project EIS.

Comment No. 15 **Issue Code: 22**

Comment noted.

14/14

15/22

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Mr. Walters, that you were down for personally and for an organization; is that correct?

MR. WALTERS: Excuse me? I probably put down self. I just represent myself.

MR. SPEARS: Okay.

MR. HERRICK: I am going to present on behalf of Kentucky Resource Council first.

This is actually from Tom Fitzgerald of the Kentucky Resources Council and I will hand this to you in writing.

I am going to read this verbatim, and then I will talk for a minute after that.

Before The Department of Energy National Energy Technology Laboratory.

Comments Concerning DEIS for Proposed Kentucky Pioneer Energy Integrated Gasification Combined Cycle Demonstration Project.

Dear Mr. Spears: These preliminary comments are submitted regarding the proposed Kentucky Pioneer Energy IGCC Project Draft Environmental Impact Statement and will be supplemented with extensive written comments concerning the project prior to the close of

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the comment period.

As a preliminary matter, however, the Council was asked to address the relationship of the proposed project and the utilization of a shredded, milled and palletized municipal solid waste fuel, to Kentucky's solid waste disposal statute and the requirement of maintaining consistency with local solid waste plans.

After a review of the position paper submitted by Global Energy to the state Division for Waste Management, and after review of the applicable statute and case law, I believe that the facility is subject to the solid waste regulations and is required to obtain a determination of consistency from the solid waste management governing body of Clark County before importing and disposing of the solid waste fuel.

By letter dated October 9, 2000, Global Energy Inc., Suite 2000, 312 Walnut Street, Cincinnati, Ohio 45202, through its manager of Regulatory Affairs, Dwight Lockwood, requested a determination from the Kentucky Division of

16/21

Comment No. 16 **Issue Code: 21**

KPE is not attempting to circumvent KRS 224, or any other state or local laws. KPE has appealed to the state for an interpretation of the language of applicable solid waste laws regarding RDF. The Kentucky Natural Resources and Environmental Protection Cabinet has determined that the RDF is a recovered material and not waste. The Kentucky Pioneer IGCC Demonstration Project facility will be considered a recovered material processing facility and the gasification process will not require a waste permit as long as the RDF conforms to the statuary definition. A discussion of this issue has been added to Chapters 1 and 6 of the EIS.

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Waste Management as to the applicability of KRS 224.40 to the proposed integrated gasification combined cycle (IGCC) power plant project in Clark County.

The request letter from Global Energy (Hereafter Global) asserted that the proposed project was exempt from waste regulations. The 2-paged letter contained an attached Analysis of the Non-Applicability of KRS 224.40 to the Kentucky Pioneer Project.

16/21 (cont.)

The determination of applicability of the waste regulations rests in the first instance with the Natural Resources and Environmental Protection Cabinet, subject to review by the courts.

KRS Chapter 224 is a statute that is remedial in nature and its protections are to be broadly construed consistent with the public and environmental protection goals of the statute. Exemptions from its reach are to be narrowly construed.

The question of whether the proposed coal and waste-fueled facility is subject to the requirements of KRS Chapter 224, as a

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waste management and waste disposal facility, is of significance to the residents of Trapp and of Clark County, since if exempted from the ambit of the term municipal solid waste facility, the planned importation of processed municipal solid waste from northeastern states representing the equivalent of roughly half of the residential waste generated in the entire Commonwealth of Kentucky, will not be subject to its scrutiny and a determination by the local governing body of Clark County, for the consistency with that county's approved solid waste plan. 16/21 (cont.)

When enacted in 1991, Senate Bill 2 substantially revised state and local solid waste management, requiring of local communities that they plan for the proper management of solid waste generated within their borders and promising, in return, that the local governing body responsible for solid waste planning would have the ability to control the manner and extent to which waste generated outside of the boundary of the planning unit would be managed and disposed of

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within the planning area.

The proposal to thermally treat and to combust the volatile fraction of one million tons or more per year of treated municipal solid waste falls squarely within the type of facility intended by the General Assembly to be scrutinized under the solid waste planning process.

KRS 224.40-315 mandates that:

No permit to construct or expand a municipal solid waste disposal facility shall be accepted for processing by the Cabinet unless the application contains a determination from the governing body of the solid waste management area in which the facility is or will be located concerning the consistency of the application within the area of the solid waste management plan.

The scope of this statute and the requirement for a determination of consistency with the approved solid waste plan, is defined by the term municipal solid waste disposal facility, which is defined in KRS 224.01-010 (15) to include:

16/21 (cont.)

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Any type of waste site or facility where the final deposition of any amount of municipal solid waste occurs, whether or not mixed with, or including, other waste allowed under subtitle D of the Federal Resource Conservation and Recovery Act of 1976, as amended, and includes, but is not limited to, incinerators and waste-to-energy facilities that burn municipal solid waste.

The term is broadly inclusive of all types of waste sites, or facilities, where the final deposition of any amount of municipal solid waste occurs.

There can be no serious argument that the feed material to be combined with the coal is a solid waste, which is to say, that the material is garbage, refuse, sludge and other discarded material.

The waste that is to be processed, according to the applicant, at the facility in a state other than Kentucky, where it will be manufactured from municipal solid waste by removing large objects and white goods, as well as glass and metal.

16/21 (cont.)

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The remaining material, including chlorinated plastics, will be milled and shredded. These pellets are municipal solid waste processed as an intermediate step to the thermal treatment of the waste to produce a gas for combustion.

The proposed facility is utilizing a fuel stream comprised of partially separated and shredded and shaped municipal solid waste used as a fuel source. Disposing of the waste through thermal treatment at high temperature to drive off the volatile fraction for combustion.

16/21 (cont.)

As such, it is engaged in disposal of a municipal solid waste stream and falls within the ambit of a municipal solid waste disposal facility the siting and operation of which should be reviewed from consistency with local solid waste plans.

The applicant claims exemption for the waste fuel from the waste programs as a recovered material, yet the clearly better reading of the statute, and the intent to carefully regulate the disposal of solid waste

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by thermal treatment, as well as other means, militates against the exemption of the material from regulation as a solid waste.

The material is not a refuse-derived fuel, notwithstanding the claim by the applicant to the contrary, since the applicant has indicated that it intends to retain the recoverable plastics in the waste (likely for the Btu value), and thus is outside of the ambit of recovered material, since that definition specifically excludes materials diverted or removed for purposes of energy recovery or combustion from being considered recovered material.

16/21 (cont.)

Assuming, for the sake of argument, that the waste were further processed over what is proposed, in order to meet the state definition of refuse derived fuel by removing all recoverable plastics and other recoverable material, such as mixed paper, corrugated paper and newsprint, the definition of recovered material still would not apply to exempt the entire waste stream from regulation since only 15 percent of the material

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processed by the facility creating the pellets could be credited as RDF.

While the acceptance by the applicant of regulation under EPA's Municipal Solid Waste Combustor standards makes it difficult to accept at face value the assertion of non-applicability of state waste designation, commenter concurs that the state law itself determines how this facility is to be characterized for purposes of state regulation.

16/21 (cont.)

Because the material is not a refuse derived fuel under KRS 224.01-010 (23) in that it has not been subject to extensive separation of municipal solid waste including the extraction of recoverable materials for recycling, the processing of the municipal solid waste stream to create the palletized fuel does not make the material a recovered material under KRS 224.01-010 (20).

The proposed gasification step in the process and the cleaning of the volatile fraction of the waste for combustion, does not make the facility a recovered material

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processing facility, so as to exempt it from the definition of a municipal solid waste disposal facility, or to avoid the obligation to be consistent with the local solid waste plan.

Beyond the specific failure of the application to meet the criteria for an exempt recovered material processing facility, because the waste feed will retain recoverable materials, including all plastics and paper, the context in which municipal solid waste disposal facilities are regulated under KRS Chapter 224 makes clear that the attempt to shoehorn this substantial waste-fueled energy facility into the category of a recovered materials processing facility is an ill-fit from a public policy standpoint.

16/21 (cont.)

KRS 224.01-010, which contains many of the definitions for this chapter, is prefaced with the caveat, a, used in this chapter unless the context clearly indicates otherwise.

The statutory provision requiring a determination of local consistency for

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disposal facilities was plainly intended to cover thermal treatment of municipal solid wastes with and without energy recovery, and to segment the facility into the component processes in order to exclude from the application of KRS 224.40-315, a facility which uses a sequential process of thermal treatment followed by combustion of volatile gases, and which presents many similar concerns in management of air, water and solid waste biproducts from a heterogeneous fuel source such as municipal solid waste (even if homogenous in shape), is contrary to the intent of the statute and the public policy behind it. 16/21 (cont.)

In sum, the palletized mixed municipal solid waste does not fall within the ambit of the state statutory definition of refuse derived fuel and is this not a recovered material. By definition, the facility is a municipal solid waste disposal facility under KRS 224.40-315(1), KRS 224.40-310 and KRS 224.01-010(15).

Commenter suggests that DOE undertake

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these actions in order to assure full compliance with applicable state laws prior to engaging in funding support for this project:

One, request and await final determination by the Natural Resources and Environmental Protection Cabinet as to the applicability of the waste statutes to the proposed facility;

Two, assuming the applicability of the statutes, defer the funding decision until the applicant demonstrates the viability of the project by obtaining a determination of consistency from the governing body of the solid waste management area covering Clark County of the proposed importation and utilization of the solid waste material for the facility; and

Three, extending to the Governing Body of that solid waste management area the opportunity to participate in the EIS review process as a cooperating agency.

That is the sum of Mr. Fitzgerald's comments.

Shall I move into my five minutes?

16/21 (cont.)

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MR. SPEARS: Sure.

MR. HERRICK: Thank you, sir.

Okay. I am Will Herrick. I live in Lee County. I am about 35 miles upwind from you.

I guess the first thing I would like to point out, you have presented, last night and tonight that you have three options for what EPA can do; nothing, slightly nothing, and passive.

And you said in your second issue that you believe that this facility would be built with or without EPA approval or the island production.

I am going to quote you from the DOE document, Notice of Intent Environmental Impact Statement for the Kentucky Pioneer Gasification Combined Cycle Demonstration Plant in Kentucky and Notice of Involvement, U.S. Department of Energy. Let me see, "In absence of DOE funding, the Kentucky Pioneer, IGCC Demonstration Plant, will probably not be constructed."

Okay. So that completely contradicts the second proposal that something would be constructed. In fact, the DOE should look at these two documents together.

DOE does not think the value of

17/18

18/14

Comment No. 17 **Issue Code: 18**
After the issuance of the NOI and during the scoping process, a third alternative, in addition to the No Action Alternative 1 and the Proposed Action, was identified. The alternative was determined to be a reasonably foreseeable future action.

Comment No. 18 **Issue Code: 14**
Because of DOE's limited role of providing cost-shared funding for the proposed Kentucky Pioneer IGCC Demonstration Project, alternative sites were not considered. KPE selected the existing J.K. Smith Site because the costs would be much higher and the environmental impacts would likely be greater if an undisturbed area was chosen.

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alternative sites for the proposed plan. Site selection was governed primarily by benefit that Eastern Kentucky Power Co-op could realize.

The Eastern Kentucky Power Co-op serviced the proposed site because the cost would be much higher and the environmental impacts would be great from an undisturbed area.

So, DOE has said that they haven't actually looked around for a better site.

Okay, I am holding in my hand the Clark County Solid Waste Ordinance.

This document is filed at the State of Kentucky at the Department of Natural Resources Environmental Protection.

Section 6 permit: No person shall engage in the business of collection and transportation or processing solid waste within the county, without a permit secured from the director. And I believe that probably means the solid waste director.

No such permit shall be issued until or unless the applicant -- therefore, unless the applicant -- therefore, in addition to all the requirements set forth, shall file and maintain with

18/14 (cont.)

19/21

Comment No. 19 **Issue Code: 21**
Comment noted.

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the director evidence of a satisfactory liability insurance policy, which goes on to talk about how much that is.

Section 6.1. Permit Issuance:

If the application shows that the applicant will collect, transport and process solid waste, without hazard to public health or damage to the environment, and in conformancy with the laws of the State of Kentucky and this ordinance, the director may issue a permit authorized by the ordinance.

19/21 (cont.)

The director shall have the authority to limit the number of permits issued to preserve the health, comfort, safety and welfare of the residents to promote energy conservation, and to provide information on good management practices.

That is what you guys have in Clark County as your local law. The dialogue I read you from Kentucky Resource Council basically speaks to you as to why this law is germane.

You have here, the obligation for your fiscal court and your magistrate to permit, or not permit, the 5,000 tons of New York garbage a day. That is a very difficult decision for the fiscal

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court, given the circumstances.

I would like to just tell you some stories about other counties.

In about 1988, Owsley County, sought to start a very large landfill. That was a struggle that nearly changed government, and it went away.

In 1990, the County of Wolfe, signed off for a facility very much like this one, a waste to energy site from a West Virginia company.

2,000 people met in the streets on that one, and the county backed away very quickly and it went away in about a month.

In Magoffin County, it took about four years, and a change in government, as I recall, to eliminate the Florida-based mega landfill.

Lee County recently had an issue with a gasoline dump, it went away.

Estill County has had political troubles over their landfill.

I believe that it is an accurate statement that no county government has survived importing large quantities of waste.

And I would ask Global Energy to stand behind their samaritan belief that they are here to

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20/22

Comment No. 20 **Issue Code: 22**

Comment noted. The EIS is intended to analyze public and environmental impacts. DOE will consider the impacts and all public comments before issuing the ROD.

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help, and invite them to walk away from the solid waste component of this plant, in the spirit of not causing the kind of conflict that will come about the local government there.

To the EPA, I would like to make the point that the vitrified frit is easily contaminated metal that changes its leeching characteristics.

You get very much copper in that, and you will find, according to the literature that I read, that it very much changes its ability to leech.

Manifestly, there is a significant solid waste stream that is going to have an exotic array of metals, many of which, you don't want to leech out; led, cadmium, linium.

And what I have found is that there is plenty of data on the quality of frit and its long-term behavior in a landfill or in a roadbed, or anywhere else.

So I would very much ask you to seriously review the heterogenous nature of this thing called solid waste, and the impact on this off product. I believe it may be qualified as hazardous waste.

In the event that it is a hazardous

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20/22 (cont.)

21/12

Comment No. 21 **Issue Code: 12**

Vitrified frit from gasifiers operating on other feedstocks rarely fails TCLP for metals and is found to be nonhazardous. The frit generated by this facility is also expected to meet all TCLP criteria. The constituents of the molten slag from the gasification process are immobilized in a glassy matrix which is nonleachable by EPA standards. The Proposed Action does not include construction of a landfill. Solid waste generated from the proposed project would be disposed of at a licensed disposal facility in state. Hazardous waste would be disposed of at an out-of-state permitted disposal facility since there are no hazardous waste disposal facilities in the State of Kentucky.

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waste, that brings to this reason the likelihood of a hazardous waste landfill.

These guys are looking at producing-- the air quality permits allows them 500 tons a day of frit.

Once you open a landfill, basically its -- all bets are off. Anybody who can get their name on the permit of that landfill can dump in that landfill.

So, there is a strong likelihood that by permitting this plant, you, or an adjacent county, in fact, will end up with becoming the victim of a landfill that they don't want. That can take pretty much anything ugly that people want to get rid of.

Hazardous landfills are a real burden to close. Many of those federally super-sized sites are hazardous landfills and they can be a real expensive proposition.

The air quality permit describes that the start up and shut down of this facility can only be out of compliance for a period of two hours.

That seems very difficult to reconcile with the physics as far as starting up and cooling down facilities like this. So, I have a very strong

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Comment No. 22 **Issue Code: 06**

The Kentucky Division for Air Quality has primary regulatory jurisdiction over air quality issues during all aspects for facility operations. Existing regulations allow emissions to exceed the normal operating limits for no more than 2 hours during facility startup, shutdown, or equipment malfunction periods. Emissions of the major criteria pollutants will be tracked by continuous emission monitoring equipment.

21/12 (cont.)

22/06

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question about who is, in fact, going to be governing the emissions during those two hours, and particularly beyond the two hours that the State of Kentucky says that is all we are going to call start up and shut down.

I was told that Global Energy had spoken to the director of the Big Smokey National Park, I believe that is what I was told. And that begs the question why the federal parks in the State of Kentucky, for which the Daniel Boone and the Wild and Scenic Red, have not been equally considered in the impact of what is coming out of the atmosphere.

The Wild and Scenic Red, in particular, is a textbook protected zone that, I, for one, would very much like to see not be impacted by heavy metals or acid rain.

In regard to Mr. Walters comments about Co2, I have to say that I am equally concerned with the concentrations of metals.

The total tonnage of mercury and led and cadmium, being offered in the import of municipal solid waste over the many years that this looks like it may happen is an extraordinary burden.

Heavy metals affect our central nervous

22/06 (cont.)

23/06

24/11

Comment No. 23 **Issue Code: 06**

Dispersion modeling conducted for the PSD/Title V Permit application covered an area of about 12 kilometers (7.5 miles) from the project site, including the area of maximum impact. The maximum air pollutant increments associated with emissions from the proposed project indicated that no significant air quality impacts would occur on either a short-term or long-term basis. Locations existing 24 to 40 kilometers (15 to 25 miles) away (Wild and Scenic Red River area) would be exposed to lower pollutant increments than the area covered by the dispersion modeling analysis. Total heavy metal deposition in areas downwind of the project would be much less than 1.1 kilogram per hectare (1 pound per acre) accumulated over 20 years. Acid deposition impacts downwind of the project would be too small to produce any measurable change in existing acid deposition conditions. Additional discussion of metal deposition and acid deposition issues has been added to Section 5.7.4 for the Final EIS.

Comment No. 24 **Issue Code: 11**

The gasification process would produce a small amount of wastewater containing primarily dissolved salts. Heavy metals and mercury would be emitted only from the power island component (CTs) of the Kentucky Pioneer IGCC Demonstration Project. Total heavy metal deposition in areas downwind of the project would be much less than 1.1 kilogram per hectare (1 pound per acre) accumulated over 20 years and present little risk to human health and the environment. Incremental ambient air quality impacts would be a very small fraction of the relevant federal and state ambient air quality standards (less than 1 percent for gaseous pollutants such as nitrogen dioxide, sulfur dioxide, and carbon monoxide and less than 4 percent of the federal 24-hour PM_{10} standards). Therefore, the overall increase in air emissions due to operation of the plant would be very low and present little risk to human health and the environment.

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system, mad hatter disease, mercury is bad news.

They typically bioaccumulate, plants take them up and concentrate them. They do not degrade over time.

My family and I own about a square mile and a half of land, 35 miles upwind from here. I am confident over the course of the proposed 20 years that East Kentucky Power Plant is talking about running this plant, or longer, that my burden from heavy metal from you, from this site, is measured in pounds.

If somebody came to my property and poured a pound of mercury on it, we would have the police in there right now, and it would be a crime.

You need to persuade me somehow that it is not a crime if you do it in a timespan over the course of 20 years.

That is the extent of my comments and I thank you for your time.

MR. SPEARS: Thank you.

Julie Maruskin.

MS. MARUSKIN: I do not have much to say except that I work at the Clark County Public Library and this came as a surprise to those of us who work

24/11 (cont.)

25/06

Comment No. 24 (cont.) **Issue Code: 11**

Furthermore, the air quality permit for the project requires continuous emission monitoring for major criteria pollutants and annual emissions testing for cadmium, lead, mercury, hydrogen chloride, and dioxins/furans. Noncompliance with permitted emission levels would result in a plant shutdown.

Comment No. 25 **Issue Code: 06**

No direct modeling of particulate matter deposition was conducted for the air quality permit application. However, Table 5.7-2 in the EIS indicates that annual emissions of heavy metals would be only 0.53 kilograms per hour (1.18 pounds per hour) (4.68 metric tons [5.16 tons] per year). There are 325,370 hectares (804,000 acres) within 32 kilometers (20 miles) of the project site, and 1.0 million hectares (2.5 million acres) within 56 kilometers (35 miles) of the site. Even if the wind blew toward a single compass sector continuously for 20 years and all of the emitted particulate matter was deposited within 56 kilometers (35 miles) of the plant, heavy metal deposition would average a total of 0.75 kilograms per hectare (0.67 pounds per acre), or 756.6 grams per hectare (10.7 ounces per acre) over the 20-year period. Using this conservative high-end bounding estimate, the total amount of heavy metal disposition for the 3.9-square kilometer (1.5-square mile) tract of land would be 291.4 kilograms (643.2 pounds) over the 20-year operation period. The actual quantity would be far lower; however, because the winds would vary, thus dispersing the heavy metals over a greater area than one compass sector, and the tract of land is upwind from the facility. All emissions from the facility would be within established federal and state statutory limits.

Additional discussion of metal deposition issues has been added to Section 5.7.4 for the Final EIS.

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at the library.

And since we are in the business of disseminating information, we wanted to come here and get as much information as we possibly could.

We thought that we would have a lot of concerned citizens who wanted more, especially, hopefully, if we will get the document.

That would be nice.

And hopefully by tomorrow everyone will be able to check out the documents that we take back, take them home, have a look at them, read them in the library.

This is of a special concern to me because I am a Kentuckian. Tonight, I was driving back from Lexington, I heard Kentucky referred to as a third-world country.

One of the things that happens in a third-world country, is that other countries who have more power, more money, send their garbage to third-world countries that they are not living in.

I don't think Kentucky is a third-world country, but I think other people have that concept of us.

I would rather not have other people's

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Comment No. 26 **Issue Code: 21**

One copy each of the Draft EIS was sent to Trapp Elementary School, Clark County Public Library (the designated project reading rooms) and Lexington Public Library while the general distribution was made on November 7, 2001. Additional copies were sent to the Clark County Public Library following public comments at the Trapp public hearing. The comment period was extended through January 25, 2002. All requirements in state and federal laws, rules, and regulations regarding distribution were satisfied.

26/21

Comment No. 27 **Issue Code: 16**

Comment noted. The concrete-floored storage building for the RDF pellets will be located within the 4.8-hectare (12-acre) project site and would be capable of housing a 10-day supply of coal and RDF pellets. The 4.8-hectare (12-acre) project site is located within the larger 1,263-hectare (3,120-acre) J.K. Smith Site and is approximately 1.6 kilometers (1.0 mile) from the closest residence.

27/16

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garbage in my backyard.

So that is one thing that I hope comes of this tonight. I live on Iron Works Road. I am very proud of our community and I don't want any more problems than we have now environmentally.

I thank you for your time. And thank you for having the meeting. And I hope more people come into the library to get more information about this before January the 4th.

I appreciate your time.

Thank you.

MR. SPEARS: Thank you very much for your comments. Rest assured that we will have those copies for you shortly after the meeting here.

John Maruskin.

MR. MARUSKIN: I am John Maruskin and I am the adult services librarian at the Clark County Public Library.

When you listen tonight to the people from Global and Eastern Kentucky Power, stop and think if you hear the word combustion.

What is happening here is that we are sort of being deceived, and the state is being deceived, into believing that this is going to be a

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27/16 (cont.)

Comment No. 28 **Issue Code: 16**

Chapter 3 of the EIS explains the BGL gasification process. The RDF pellet and coal co-feed are heated in a carefully controlled, low oxygen environment, which causes a chemical conversion process that results in the chemical element for formation of the syngas.

28/16

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non-combustion plant.

But as Tim Walters was telling a little bit earlier here, there is no way that you can fire coal into a gas and not have combustion.

It if it is not a combustion plant, then the people who want to import the sewage from New York and New Jersey can do that without permit.

Once that becomes a solid waste that is going to be combusted, then they need the permit.

As Will Herrick pointed out, and I want to emphasize is that we can stop this plant from being built if we decide as a community that we do not want these permits issued to bring the solid waste in. And that can be done, as Will pointed out, through our local sanitization plan, our local solid waste plan.

One of the things that we can do in this room, or to make sure that that does not happen is to contact our local magistrate.

It is very easy to get the number for the local magistrate, it is 745-0200.

Call the office and ask them and they will send you a list, just like they sent me, with all their names, addresses and telephone numbers.

28/16 (cont.)

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And I think it really behooves us to start an action now to make sure that our local officials know that we do not want solid waste brought in here.

One of the things that always amazes me when I walk around here and people walk up and say to me, You are not from around here, are you? And I am not, I have only lived here for 25 years.

And one of the reasons that I moved here is because where I come from in western Pennsylvania, the landscape had already been destroyed by power plants, and by factories, and by chemical plants, and by the importation of waste. 29/22

And when he was talking about the environmental impact of a large smoke stack, it is dreadful. There is particulate matter going through the air all the time and you do not know what it is. 30/06

I grew up in an area where we had carbon dioxide, coal products falling on us continuously. I mean, the houses were always gray with dirt and with the kind of particulate matter that used to fall. 29/22 (cont.)

Of course, the plant that they are going to be building, they would tell you that it is going

Comment No. 29 **Issue Code: 22**
Comment noted.

Comment No. 30 **Issue Code: 06**
Although a full chemical characterization of PM_{10} associated with any fossil fuel combustion process is not possible, most of the hazardous air pollutants listed in Table 5.7-2 of the EIS would be found in the PM_{10} emissions from the proposed project. Maximum impacts from the proposed project on PM_{10} concentrations would be less than 4 percent of the federal 24-hour PM_{10} standard and less than 1.5 percent of the federal annual average PM_{10} standard. Table 5.7-4 of the EIS identifies estimated maximum downwind concentrations of hazardous pollutants expected to be emitted by the proposed facility and the associated maximum lifetime cancer risks. The air quality permit for the project requires continuous emission monitoring for major criteria pollutants and annual emissions testing for cadmium, lead, mercury, hydrogen chloride, and dioxins/furans.

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to be a lot cleaner. Okay? In fact, it is known as one of the most economical and one of the most efficient power plants that there are.

The studies by the RAN Corporation suggests that probabilistic studies have not been done enough on what will happen as far as building these plants are concerned.

What the cost overrides will be, and what the environmental effects will be. There has never been a plant in operation for people to know what the real long-term effects of this are.

It can always be feasible to do this if we have like a two-year plan, where we say, is this going to work or not, and then get rid of it.

But after listening to Tim, that seems to be unfeasible, too. If they are going to destroy the roads, and destroy the environment around our community, there is no sense in letting it get started in the first place to even test it.

So what I suggest doing is that if you feel strongly about this, is get in touch with our local magistrate, and tell them that we do not want permits given to people who are going to import the waste.

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31/16

32/10

33/11

Comment No. 31 **Issue Code: 16**
Comment noted. The Kentucky Pioneer IGCC Demonstration Project was selected for further consideration under DOE's fifth solicitation (CCT-V) of the CCT Program. DOE concludes that the project falls under CCT Program requirements due to use of the co-fed BGL technology. The purpose of the CCT Program is to demonstrate the efficiency and performance of new technologies. Plant design is not available or necessary at this point because the project is still in the planning stage. It will not be available until after the ROD is issued. This project would be the first commercial-scale application of the co-fed BGL technology in the United States. Similar technology has also been used at the Schwarze Pumpe facility in Germany and the Westfield facility in the United Kingdom.

Comment No. 32 **Issue Code: 10**
Comment noted. The trucks would haul a maximum of 18 metric tons (20 tons) of cargo each, which would place the overall weight below the Kentucky-mandated maximum weight for Kentucky Highway 89 of 36,288 kilograms (80,000 pounds) for a five-axle vehicle. The Kentucky Transportation Cabinet indicated any vehicle below that weight traveling along that road would not be expected to cause damage to the roadway. Should damage occur from vehicles carrying more than the maximum weight allowance, the operator of the trucks, in this case KPE, would be responsible for any repairs to the road surface. Section 5.11 of the EIS, Traffic and Transportation, has been expanded to address the concerns of damage to the local roads.

Comment No. 33 **Issue Code: 11**
The syngas from the gasification process would be the fuel combusted in the gas turbine generator system. As illustrated in Chapter 5, Table 5.7-3, maximum air quality impacts from the proposed project would be less than 1 percent of the relevant federal air quality standards for gaseous pollutants such as NO_x, SO_2, and CO. Maximum impacts from the proposed project on PM_{10} concentrations would be less than 4

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And, please, don't fall for this idea that somehow this plant is going to be clean and nothing is going to happen. This is what we have heard all of our lives, and it does not work.

And I think as Tim Walters also said, it is time to start thinking of some more really creative ways of generating electricity, and ways that we can improve our environment by conserving, or finding new sources of energy, instead of always going for incredibly expensive, and not really practical solution to energy problems that we don't even have at the moment.

We are ready to be importing solid waste from New York and New Jersey, what is going to happen to this power? Anybody experiencing any power outages when they plug in their Christmas lights? I don't think so.

If you need any information, again, as Julie said, please come to the library and see us and we will be glad to give you all the information that you need. We also take phone calls.

MR. SPEARS: Thank you for your comments there.

Lisa Collins.

Comment No. 33 (cont.) **Issue Code: 11**
percent of the federal 24-hour PM_{10} standard and less than 1.5 percent of the federal annual average PM_{10} standard. Therefore, the proposed project is expected to have minimal impact on public health and safety and the environment.

Comment No. 34 **Issue Code: 22**
Comment noted. The issue of alternate power sources is beyond the scope of the EIS.

34/22

Comment No. 35 **Issue Code: 14**
Chapter 2 of the EIS discusses EKPC's 1998 Power Requirements Study which indicates that the electrical load for the region is expected to increase by 3.0 percent per year through 2017. Net winter peak demand is expected to increase by 3.3 percent per year and net summer peak demand is expected to increase by 3.0 percent per year. Peak demand is expected to increase from 2,031 MW in 1998 to 2,394 MW in 2003 and 3,478 MW in 2015. Based on this load growth, EKPC will need additional power supply resources of 625 MW in 2003. The need is further shown by EKPC's plans to construct four new CT electric generating units to provide peaking service alongside their three existing peaker CTs at the J.K. Smith Site. Power generated by the project will be used to support Kentucky's energy needs.

35/14

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MS. COLLINS. I wasn't sure if I wanted to speak tonight or not because I am a newcomer to your community and I wanted to hear what you as a community had to say about what was happening in Trapp.

But since I have heard you speak, I did want to go ahead and say that I, too, was broadsided by this.

The first I heard about it was Sunday, and I thought surely that the people here had heard about this. But now I am hearing that even your local library did not have this document for you all to read.

I have had an advantage over you, I have had it for 24 hours. And it truly something you need to get and read.

I went back into the Herald Leader archives today because I still could not imagine how that this had just escaped my attention, even though this has been in the works since 1998.

And I found a sum total of five articles in the Herald Leader archives about this project, two of which were commentaries and the other three articles of which they gave very little information

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Comment No. 36 **Issue Code: 21**

Copies of the Draft EIS were sent to Trapp Elementary School, Clark County Public Library (the designated project reading rooms) and Lexington Public Library while the general distribution was made on November 7, 2001. All requirements in state and federal laws, rules, and regulations regarding distribution were satisfied.

36/21

36/21 (cont.)

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about this project.

When I look at this document that has been prepared -- and I have lost my page.

There are a few things in here that I want to bring to your attention and you will be able to read these in more detail when you get this document.

First of all, this plant is an experiment. There is no other plant like this in the United States and this experiment will be happening here in your community.

Second of all, this document indicates that there is a potential for an increase in traffic associated with construction of 500 to 830 vehicle trips per work shift.

If they have two shifts at the plant, you can multiply that by two. If they have three shifts, multiply that by three.

There will be 40 to 60 heavy-duty truck trips per day to the site.

Now, driving out here tonight we came out 89 from Winchester. There was an accident or a breakdown heading in -- down towards Winchester, with four or five vehicles. We were almost in an accident

54

36/21 (cont.)

37/16

38/10

Comment No. 37 **Issue Code: 16**

The EIS is intended to be used as a planning tool that analyzes the environmental impacts from a proposed project. DOE will consider the document and public comments while making the decision of whether or not to proceed with the project in the ROD.

Comment No. 38 **Issue Code: 10**

Comment noted. Impacts to traffic levels along Kentucky Highway 89 are addressed in Section 5.11 of the EIS, Traffic and Transportation. As stated, during construction, 500 to 1,000 vehicle trips would occur along Kentucky Highway 89 at the beginning and end of the construction workday. The exact number would depend on the staffing levels required onsite. Construction schedules typically call for workers to be onsite relatively early in the morning to avoid morning schoolbus traffic, until early afternoon. The Transportation Division of the Clark County School Board indicates that schoolbuses utilize Kentucky Highway 89 during the period when construction workers would be leaving the site. Section 5.11, Traffic and Transportation, has been modified to reflect the impacts of added vehicles on schoolbus usage.

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right there at that site tonight on that road. A lot of the area has bad shoulders or no shoulders.

This road out here is not designed to carry this kind of traffic. And you all have your children getting on and off of school buses along this artery.

Approximately 160 additional vehicle trips per day will be made utilizing Kentucky Highway 89.

Another comment -- and in my 24 hours that I have had this, I have not had time to read all of it, so if I am getting my facts wrong, please forgive me.

But I believe it says in one place that the towers, the cooling towers would stack -- and I am not sure if it is one stack or multiple stacks, I haven't been able to figure that out yet, will be visible either from eight miles away or from 12 miles away, all the way to Winchester you will see these stacks.

One of the things in my brief time period in the community, as land owners near here, and the plant would be, I think, one and a half miles from my door, is the beauty of your area. That is

38/10 (cont.)

39/04

Comment No. 39 **Issue Code: 04**

Comment noted. Impacts to the visual setting of the project area are presented in Section 5.5, Aesthetic and Scenic Resources, of the EIS.

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the thing when we came here that impressed us about this place. You all have a wonderful, wonderful, unspoiled area here.

We bring guests here from all around Kentucky and from out of the state and they are always impressed with the beauty that is here. We can Estill County, we can see Madison County, we can see Clark County from near where we live, and the one thing that everybody says is, Look at this beautiful, unspoiled place you have here.

And when that stack, or stacks, or cooling tower goes in, that is there forever, and that is going to absolutely ruin this area here.

Another thing from this document, Typical industry measures would be implemented to minimize waste generation. Hazardous waste would be disposed of in approved hazardous waste landfills outside of Kentucky.

So not only will this material come here via -- assumeably railroad, according to this -- then it will also leave here again with a double jeopardy, bringing the bad stuff in and taking the bad stuff back out. Not that we want the bad stuff to stay here, but there are dangers associated with

39/04 (cont.)

39/04 (cont.)

40/10

Comment No. 40 **Issue Code: 10**

Comment noted. An Emergency Response Plan, which documents procedures for providing emergency response and cleanup for any project related spills during materials transport, has not yet been developed by KPE. The plan will be developed during the engineering and construction phase of the project and would adhere to local, state, and federal regulations. Section 5.11, Traffic and Transportation, has been modified to present a discussion of the Emergency Response Plan.

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transporting these materials back out.

"Should the vitrified frit be shown to be hazardous -- " should it be shown to be hazardous? In other words, they are not sure.

"It would also be disposed in approved hazardous waste landfill." They don't know all the answers to this project. It is truly an experiment.

The power line that would be generated, according to this document, to Montgomery County from the plant, the 17-mile power line, according to this, the location for that power line has not been determined.

So, after this thing is constructed, three years or three shifts of 1,000 workers on 89, and the construction noise, and the dirt, and when the plant becomes operational, and we are dealing with all these things that all these folks have talked about, Mr. Walters and others, the leeching, and the waste, and we do not know what will be in the air, and we don't know what will be in the water, we don't know what will be in our systems, then they are going to build this line. And I don't know how many of you are in the pathway of that line, as well, because that yet has not been determined.

57 40/10 (cont.) 41/12 42/16 38/10 (cont.) 43/09 41/12 (cont.) 44/06 45/07 46/11 42/16 (cont.)

Comment No. 41 **Issue Code: 12**
Vitrified frit from gasifiers operating on other feedstocks rarely fails the TCLP for metals and is nonhazardous, exhibiting none of the characteristics of hazardous waste. The frit from this project is expected to meet the TCLP criteria. The constituents of the vitrified frit are immobilized in a glassy matrix resistant to corrosion in the environment. The frit is nonleachable by EPA standards.

Comment No. 42 **Issue Code: 16**
Pursuant to RUS NEPA regulations, a NEPA document would be prepared that would address the impacts from the transmission line. Information in the NEPA document will be used to assure impacts are avoided and solutions integrated to refrain from adverse public and environmental impacts.

Comment No. 43 **Issue Code: 09**
Comment noted. As discussed in Section 5.10.4 of the EIS, construction activities would not have any significant impact on noise levels beyond the boundaries of the J. K. Smith Site.

Comment No. 44 **Issue Code: 06**
The major criteria pollutant emissions and hazardous air pollutant emissions associated with the proposed project are identified in Tables 5.7-1 and 5.7-2 of the EIS. Table 5.7-4 of the EIS identifies estimated maximum downwind concentrations of hazardous pollutants expected to be emitted by the proposed facility and the associated maximum lifetime cancer risks. The air quality permit for the project requires continuous emission monitoring for major criteria pollutants and annual emissions testing for cadmium, lead, mercury, hydrogen chloride, and dioxins/furans.

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So, the unknown extends much further out than the three-year construction phase. As some of you have said, this has long-term ramifications and people said at last night's hearing that I also went to, this has generational impacts for your children and your grandchildren.

Thank you.

MR. SPEARS: Thank you very much, Ms. Collins.

Are there others in attendance that would like to speak?

Yes, ma'am?

MS. BACK: Good evening.

My name is Neelie Back, and I am also from Lee County.

And like John and others, I want to tell you why I don't sound like I am a home girl. I live and a mile and a half from where my dad grew up out the Big Andy in Lee County and he left during the World War II and went off and became a fighter pilot and I was raised everywhere. But I am a home girl.

And I wanted to come down and talk to you all.

My discipline is solid waste, that is

58

46/11 (cont.)

Comment No. 45 **Issue Code: 07**

As stated in Section 5.8, Water Resources and Water Quality, of the EIS, treated wastewater is expected to contain conventional pollutants such as nitrogen, phosphorus, total dissolved solids, and biological and chemical oxygen demand.

Comment No. 46 **Issue Code: 11**

The gasification process would produce a small amount of wastewater containing primarily dissolved salts. The CT engines and cooling towers (see Table 5.7.3 of the EIS) produce criteria and hazardous air pollutant emissions. Dispersion modeling conducted for the PSD/Title V Permit application covered an area about 12 kilometers (7.5 miles) from the project site, including the area of maximum air quality impact. Incremental ambient air quality impacts from the proposed project would be a very small fraction of the relevant federal and state ambient air quality standards (less than 1 percent for gaseous pollutants such as nitrogen dioxide, sulfur dioxide, and carbon monoxide and less than 4 percent of the federal 24-hour PM_{10} standard). Total heavy metal deposition in areas downwind of the project would be much less than 1.1 kilogram per hectare (1 pound per acre) accumulated over 20 years. The maximum air pollutant increase associated with emissions from the proposed project would have no significant short- or long-term air quality impacts and the health risks are expected to be minor.

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what I do in Lee County, I am the person who is responsible for the permitting of and the evaluation of and the participation in by my community of developments such as this.

And just like your community, we are really concerned about jobs. And we are concerned having a good way of life and a good quality of life I know that East Kentucky Power has been a very good corporate partner in your community in some areas.

They have done a lot of good things for you, and I applaud them for that.

I believe that I am correct when I say that both Southeast Kentucky Power and myself were recipients at the Governor's Environmental Award for excellence in the field.

So, I at least share that company with them. And I want to tell you this, in Lee County, we have what is called a siting ordinance and that ordinance is very explicit about what we do and what local folks have a chance to say about solid waste.

Earlier, Mr. Herrick alluded to a gasoline farm, they wanted to put a storage place for contaminated soil that came out of all of these gas stations where they have put in new tanks -- you all

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have all seen them -- well, the company that was doing them wanted a place to store this and they wanted to put it in Lee County. And that was my first experience with really being able to exercise local control.

I am telling you, it is important for you all to have that option, and that option is guaranteed to you in Senate Bill 2, it has already been discussed. And I, for one, am a bit alarmed that the State of Kentucky, did not alert the people who were doing this to the fact that solid waste was going to be an issue.

When you have a siting agreement, what it does -- and I will give it to you in a very general sense and you may have a copy of this, I brought it with me, I will leave it with the librarian, you can make a copy of it -- if you don't actually want to suggest that we adopt this ordinance in your area, you might get some good ideas about how to organize how you approached it.

I would like to say for the record that I do have objections the way this meeting was held. I for one, would have listened to the questions, particularly the first gentleman who spoke, who

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Comment No. 47 **Issue Code: 21**

NEPA requires that the public have the opportunity to comment on Draft EISs. The formal hearing was designed to obtain input from the public. Each of the public hearings was preceded by an informal open house during which members of the project staff were available to answer questions. All requirements in state and federal laws, rules, and regulations regarding public meetings were satisfied.

47/21

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wanted some answers from the people who are going to build this plant, and we are being denied listening to this as a collective whole.

And for me, it is very important when I go to a conference, I want the speaker to talk to me, and I want to be able to turn my next door neighbor, or the person sitting next to me and saying, Did you hear what I heard? And I think we have been denied that by this format.

I am not saying that it was intended, but I think it was done just the same and I would like to register my protest. I would like for them to answer to all of us, so that we have that advantage.

The next thing is that I would very much like for you to supply for us an opportunity to have the names and addresses and e-mails of the people who are here.

We can leave a pad out there and if you want to, you can sign up -- and you folks with the library, you are welcome to take that with you if you want and I will put my name on that.

I want to say one small thing about economic development. I am very interested in

47/21 (cont.)

48/21

Comment No. 48 **Issue Code: 21**

The names and affiliations of individuals and organizations providing comments during the public comment period will be included in the Final EIS, along with the names of all individuals and organizations that have requested a copy of the Final EIS.

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economic development.

I am from Lee County and the difference between the really secure way of life that you all have here in Clark County, we look to you in so many ways as being very innovative and very capable and a head of the game and you are sort of a role model in that way.

And we are struggling to come out of economic devastation that was brought on by the fact that we are, in a large extent, still want us to be an extraction economy, and there are problems with people who come from extraction economies, which has been alluded earlier here, also.

But I think that it is really, really, really important that you all understand Hal Rogers, who is the representative, he does not represent Clark County, but he does represent fifth congressional district. He is chair of ways and means, okay? He is also chair of transportation. Those are two extremely powerful committee positions.

He is pumping in hundreds of millions of dollars into the southeast Kentucky economy to clean it up. And he has just announced from his summerset place his latest initiative called Companies Coming

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in which we intend to entice the tourists of the northeastern corridor, up there in New York, and all up and down that corridor there, to come and visit us in southeast Kentucky and leave their money.

I am telling you, folks, there is more than one way to skin a cat. And one more important thing, when you are a community that has a facility like a landfill, guess what? One of the things that you get to do, usually, is write a host agreement. And in that agreement, you tell the company what you want to make sure that your infrastructure stays in good shape. To make sure that you have monitoring capabilities.

When we were looking at the gasoline farm, we said to the people who were putting it in, we want you to do this kind of testing, and we want you to report that testing to us. We want to have a chance to evaluate our water. So those tools are available to you and I will leave a copy.

I want you to know that you have friends, upwind.

Thank you very much.

MR. SPEARS: I think I saw another hand back here.

49/21

Comment No. 49 **Issue Code: 21**
Comment noted.

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MR. WILLIAMS: My name is Sam Williams. I sound like I am from Clark County and I am.

But during the course of my life, I have traveled as an officer of the Navy, as a mining engineer, as a fuel procurement official for a utility company, and I see a lot fallacies in what is in this draft plan that we have here.

First, I would like to discuss -- they talk about the RDF, they say it is going to come out of New York and New Jersey.

When I was a civil engineer corps officer, stationed at Philadelphia Naval Shipyard in 1981, there was a problem then. Garbage trucks left Philadelphia, going over the bridges into New Jersey, massive landfills.

I mean, landfills probably a tenth the size of Clark County, just stacks and stacks of garbage. They have to get rid of that stuff.

If you recall some of the news back at that time there were garbage barges that they were taking out to sea trying to get rid of it. So that is a problem, but that is their problem, that shouldn't be our problem.

Number two, the coal that is coming into

50/16

50/16 (cont.)

Comment No. 50 **Issue Code: 16**

Comment noted. The relatively small amounts and generally widely dispersed nature of MSW in Kentucky does not economically support exclusive utilization of Kentucky-generated MSW to produce RDF supplies. Importing RDF from a densely populated metropolitan area is more economically viable in order to supply the necessary amount of RDF required to operate the plant.

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this plant. From what I read, and from what I understand about the lerky system, it requires high sulfur coal. That high sulfur coal will come from Indiana or Illinois, or west Kentucky. It will not come from our region in eastern Kentucky.

The third thing that came as a surprise to me, they have to have petroleum coke to start this plant up. I don't know if you know what petroleum coke is, but that is a biproduct of the refining process of crude oil.

And petroleum coke is a very strange component of a waste component. It is very dusty, it is very high in sulfur, it is a very hard material to handle.

And the petroleum coke generators have been trying to pawn that off on the utility industry for 20 years that I know of. It is a waste biproduct and we don't need it here in Clark County. It is very dusty and it is very hard to handle.

So the point that I want to make here, this is a transportation nightmare. You are going to have to bring this material from New York, New Jersey, up over the Appalachia mountains or either down the coast and up the Mississippi River. It is

51/16

52/16

52/16 (cont.)

53/10

Comment No. 51 **Issue Code: 16**
KPE intends to use high-sulfur coal as the coal fuel co-feed. Western Kentucky coal is generally considered the high-sulfur coal region; however, Eastern Kentucky may also provide high-sulfur coal supplies. KPE intends to use Kentucky coal to supply the 2,268 metric tons (2,500 tons) per day required for gasifier operation.

Comment No. 52 **Issue Code: 16**
Comment noted.

Comment No. 53 **Issue Code: 10**
Comment noted. As discussed in Section 5.11 of the EIS, Traffic and Transportation, KPE intends to ship all required fuels to the site via rail transport. KPE feels that this is more economically beneficial and that truck transportation of all fuel feeds is not a viable alternative. KPE intends to adhere to the community desire to avoid use of significant truck transport.

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going to be very expensive to get here.
And it is going to have to be transloaded to bring in by railroad car. What are you going to do? What is going to happen? They are going to end up on trucks because you cannot work out -- if you recall, I hope you remember this, a company I was affiliated with, had a power plant down near Danville and they could not negotiate reasonable rates with the railroad, so they ended up bringing all the coal into this power plant for a period of two years by truck.
We were talking about 5- to 700 trucks a day coming in and out to basically generate the same amount of electricity that we are talking about here.
So you are looking at a tremendous amount of impact if that comes to pass.
Let's talk about the coal. It will have to be transloaded, probably originate by barge, transloaded to railcar to bring it in. What is going to happen? It is going to be on trucks. And the petroleum coke, it is originated in barges and it will come in probably by trucks, also.
That is just some observations there.
The one lady mentioned about the frit, and the other

53/10 (cont.)

53/10 (cont.)

54/12

Comment No. 54 **Issue Code: 12**

The vitrified frit produced from the quenching of molten slag from the gasification process utilizing other feedstocks rarely fails the TCLP for metals and is nonhazardous. The frit produced by this facility would result from a coal and RDF co-feed and is expected to meet all TCLP criteria. The frit consists primarily of ash (99.2 percent by weight) composed of oxides of the following elements silicon (SiO_2), aluminum (Al_20_3), titanium (TiO_2), iron (Fe_20_3), calcium (CaO), magnesium (MgO), potassium (K_2O) and sodium (Na_2O). It also consists of chloride, fluoride, antimony, arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, mercury, molybdenum, nickel, silver, thallium, vanadium and zinc. All constituents of the frit are immobilized in a glassy matrix which is non-leachable in the environment. Vitrified frit would pass the more stringent Universal Treatment Standards criteria of the EPA-TCLP analytical method. Chapter 3 of the EIS has been revised to include a more detailed description of the frit. The frit is considered a commercial product, not a waste, and is expected to be marketable. Since there are no hazardous waste landfills in Kentucky, any hazardous waste generated onsite would be disposed of at a licensed out-of-state hazardous waste disposal facility.

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biproducts, talks about them being potentially hazardous.

What is going to happen? If it is hazardous, what are they going to do with it? There are no hazardous landfills in the State of Kentucky, we have already heard that. So it is going to have to be stored somewhere. If it is going to be stored, it is going to be a hazardous landfill, it is going to have be generated somewhere in this region.

Also, it talks about ethereal effluent, what is that? They talk about an ethereal effluent, it hasn't been addressed at all, how to treat that, what it is?

So, I think there are too many questions here that remain unanswered. If the tests goes on, it will probably make it work so they can get their $78 million or whatever from the federal government, then us folks in Clark County are going to be sitting here with a gray elephant, or a blue elephant, or whatever color it is painted, and there is somebody going to come in here and try to make it work and they will cut corners, they won't be bringing it in on the railroad, they won't be disposing of the material, they will have to haul the material out and

54/12 (cont.)

55/22

Comment No. 55 **Issue Code: 22**

The EIS is intended to be used as a planning tool. The DOE will use the document and public comments to address concerns and answer questions. DOE will consider all public comments before the ROD is issued. The ROD will be issued no sooner than 30 days after the Final EIS is distributed and a notice of its availability is issued.

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55/22 (cont.)

it just won't work.

That is my thoughts. By the way, I appreciate -- I have one of my former science teachers here and hopefully I haven't bundled up any of the science.

But, as a citizen of Clark County, and like I say, I am 49 years old, moved here when I was five. And Clark County is a great place. And I am tickled to death to see our county judge here and our newly elected state representative. And it is good to see that our leaders are interested in what is going on.

With that, I will let you go.

By the way, I got my book about two weeks ago, so I got a chance to read it.

MR. STICKLING: My name is Jack Stickling. I live in Estill County, about four or five miles downwind of this area. Upstream, I guess you call it, but downwind.

I live on a farm about 130 acres, me and my wife and our two-year-old child.

And when I heard about this -- I have been kind of following this plant for several years, three or four years I have been reading it in the

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paper and certain journals and stuff.

But I realized that it was coming down the line, but my first concern -- well, first, I am in kind of in a quandary.

Because I feel here in this part of the state, obviously, we need the jobs, and plus my environmental background, I applaud the DOE to a certain extent, for looking at alternative energy project like this, and for taking care of some of our solid waste issues and the fact that we need more electricity, and I appreciate that.

The quandary, the other flip side causes are more negative than it is positive. We are concerned about the air quality of being so close downwind.

I haven't had a chance to read the document yet, and I certainly will as soon as I do get a chance, but any time you have incinerators, there are going to be off gas, there are going to be problems. Things don't run the way you want them to run all the time. So there is going to be problems with off gases, that is my first concern.

My second concern is, I think, here in this part of the state, we are also close to the

56/02

57/22

58/06

58/06 (cont.)

59/20

Comment No. 56 **Issue Code: 02**
Comment noted. The unemployment rates for the counties within the socioeconomic ROI are presented in Chapter 4 of the EIS, Table 4.3-2. The rates have risen since 2000, with recent figures presented by the Kentucky Department for Employment Services showing unemployment rates of 5.3 percent for Clark County, 3.0 percent for Fayette County, and 4.5 percent for Madison County as of December 2001. The ROI rate has risen to 3.5 percent and the State of Kentucky's rate is 5.2 percent. This increase in unemployment indicates that jobs are needed in the area.

Comment No. 57 **Issue Code: 22**
Comment noted.

Comment No. 58 **Issue Code: 06**
The air quality permit for the project requires that conditions which upset the process be reported to the Kentucky Division for Air Quality. If the problem cannot be remedied within 2 hours, the affected facilities would have to be shut down to avoid being found in violation of the requirements of the air quality permit. Conditions in the air quality permit are enforceable under both state and federal laws.

Comment No. 59 **Issue Code: 20**
Comment noted. A review of the Kentucky Division for Air Quality website did not identify any Title V operating permit or state-issued air quality permit for facilities at either the Bluegrass Army Depot in Richmond, Kentucky or the now closed Lexington Bluegrass Army Depot. A review of the EPA Region 4 Waste Management Division website identified some clean-up programs at the Lexington Bluegrass Army Depot facility which the Army has closed and which was subsequently leased to the Kentucky Division of Military Affairs. None of the information from these website searches identifies any activities or facilities which would have meaningful cumulative air quality impacts when considered in conjunction with the proposed project.

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Bluegrass Army Depot, I think that it is inevitable that we are going to have some type of incinerator, or some type of a disposal system there that is also going to cause negative impact to the air quality.

And I have not read the document, but I think it ought to address any effect of those two airstreams of contaminations. What do you call it where you have the cumulative effect? And I think those ought to be looked at closely what the cumulative effect of people downwind, which will just a small part of Clark County, but a large part of Powell County and a large part of Estill County and further to the east.

And my guess is that it does not look at the cumulative effect of contamination that we are going to have to see down in the next few years.

Another thing that I learned tonight, I didn't realize the waste stream was going to be coming from areas outside of Kentucky.

As a Kentuckian, one of the reasons I was not so negatively concerned about this plant, I figure we would be taking local solid waste.

I think we need to take care of our own environment, take care of our own problems. Hearing

59/20 (cont.)

60/16

Comment No. 60 **Issue Code: 16**

Comment noted. The relatively small amounts and generally widely dispersed nature of MSW in Kentucky does not economically support exclusive utilization of Kentucky-generated MSW to produce RDF supplies. Importing RDF from a densely populated metropolitan area is more economically viable in order to supply the necessary amount of RDF required to operate the plant. The RDF pellets will be stored within a concrete-floored storage facility on the 4.8-hectare (12-acre) project site that would be capable of housing a 10-day supply of coal and RDF pellets. The 4.8-hectare (12-acre) project site is located within the larger 1,263-hectare (3,120-acre) J.K. Smith Site and is approximately 1.6 kilometers (1.0 mile) from the closest residence.

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that it is coming from out of state also concerns me. And I don't think we need to be the dumping grounds of the United States here in Kentucky. I think we have paid our dues a lot, especially in eastern Kentucky in supplying in our coal resources and in our timber resources.

And I don't think we need to be the dumping grounds of waste.

The third point that I am a little concerned about, and I also learned tonight, was this term called the frit, glass frit. And it kind of came together when I was listening to this. I know DOE, pretty much one of their main endeavors is dealing with hazardous and radioactive materials in the state, radioactive waste. And I know that DOE has been looking into the technology of gasification of radioactive waste, mixed waste.

And I am afraid that this incinerator may be just kind of a learning ground in the technology for rad and mixed waste disposal in the future.

And I think this environmental impact statement ought to address that and confirm to us that there is no chance of that. Again, that is a

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60/16 (cont.)

61/22

62/12

Comment No. 61 **Issue Code: 22**
Comment noted.

Comment No. 62 **Issue Code: 12**
The purpose of the Proposed Action is to demonstrate and determine the reliability, availability, and maintainability of a utility-scale IGCC system using high-sulfur bituminous coal and an RDF blend as a co-feed to produce the syngas that will run the CTs. Neither DOE nor KPE has plans to incinerate radioactive and mixed waste at the proposed facility.

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concern that I have that this could be used for a dumping ground of radioactive materials in the future. And definitely the hazardous waste issue in dealing with the frit. I would like to know where the proposed disposed of those. I certainly don't want them disposed here in my community, here in Estill County. And I am sure you all in Clark County don't want it either. 62/12 (cont.)

That is about it for my comments.

Thank you.

MR. SPEARS: Do we have anyone else that would be interested in making a comment?

MR. FISHER: Hi. My name is Robert Fisher and I was born here in Clark County in 1959. I am like a lot of you all, I was kind of broadsided by this, too.

I really learned a lot more tonight than I really probably thought I probably would. Me and my wife, we came down, and I told her, I said, Well, I don't know what to expect. If I am going to look up and see four or five people, or 200 people.

But the main thing I wanted to stand up too, that I wanted to commend everyone of you all for being here and representing your community and we

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have to push, to me, on this issue in this town bitterly. To make this a bigger issue than what it is, or what it seems to be.

There should be 200 people here. You are here representing your future. We are coming up on an election year. The legislation is going in Frankfurt, it is a heck of an opportunity for us all to get together in big numbers.

We can all sit around and whine and moan, and gripe, and stay out here at the store and drink an Ale-8 and talk amongst ourselves and nothing is going to happen.

But if we continue to get together and not just wait on these type of meetings, we keep our names together and get accountability from our local officials -- which we are blessed to have a couple here -- let's get them involved. At the beginning of an election year, let them know.

And up to the state officials. That is the only way -- it seems to me that we can stop it, if that is what we want. That is not going to be on a 101 or 202 basis, we have got to do it in large numbers and let's not let it be just a one and a half year meetings like I understand of them happening.

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Let's kind of stay together on this thing, that is all I have to say.

Thank you.

MR. SPEARS: Thank you very much for those comments. They were very good.

Anyone else?

MR. HERRICK: The EIS said that trains are typically going to be the mode of transport for the million tons of garbage a day. The State of Kentucky, of course, regulates garbage trucks to the extent that they cannot leave a drop.

I would like for the EIS to address the velocity of the average train car and the long-term effect -- these train lines run along the rivers of Kentucky mostly. And years and years of leeching of untreated solid waste in an area is going to be kind of an issue.

And I guess the discussion of gasification reminded me of the normally reoccurring radioactive materials issue comment in the oil fields and are not uncommon in coal.

And in the event that there is a capsule of metals that the normally required radioactive materials will not be concentrated to some degree in

63/10

64/12

65/11

Comment No. 63 **Issue Code: 10**
Comment noted. An Emergency Response Plan, which documents procedures for providing emergency response and cleanup for any project related spills during materials transport, has not yet been developed by KPE. The plan will be developed during the engineering and construction phase of the project and would adhere to local, state, and federal regulations. Section 5.11 of the EIS, Traffic and Transportation, has been revised to include a discussion of the Emergency Response Plan.

Comment No. 64 **Issue Code: 12**
Chapter 3 of the EIS, Section 3.1.2.1, describes the handling and storage of raw materials. Primary and secondary measures (e.g., unloading in a closed area) would be taken to prevent PM_{10} from becoming airborne.

Comment No. 65 **Issue Code: 11**
The combustion of coal releases naturally occurring radioactive material such as uranium. Since the coal would be converted to syngas and frit in the carefully controlled environment of the closed-loop high pressure and temperature gasifier, much of the radioactive material would be returned in the frit. Radioactive emissions from the proposed project were not evaluated in the permit. These emissions would be very small and below regulatory thresholds, and would not be expected to result in any health effects.

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65/11 (cont.)

that process and I would like the EIS address that.

MR. SPEARS: Okay. We have that so noted.

Thank you very much for those comments.

AUDIENCE MEMBER: Is there an East Kentucky Power representative here?

Hello?

AUDIENCE MEMBER: I work at East Kentucky Power and I am here to learn right along with everybody else.

And I am not here to be tarred and feathered.

MR. SPEARS: Two or three things that I would like to mention here before we close this part of this forum.

My apologies go out to the library for not having received your Draft Environmental Impact Statement.

In the back of those, you will note that the mailing lists are there of those -- they were mailed from Washington, D.C., from our headquarters and I don't know what happened from there to you, but something did and I will assure you that we will get you a copy.

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I also apologize for some of you perhaps not becoming aware of the meeting. We published in the Louisville, Lexington and Winchester papers for three consecutives weeks. Which is more than our regulations say we need to, but we wanted to publish it, we wanted to get the word out in other parts of the media.

Perhaps this type of situation tells us that maybe next time we have to do a better job, maybe we have to call every radio station. I don't know. We will have to analyze that and see how we can better do that.

I can truly appreciate everybody being here. This is the purpose for this kind of meeting is to receive your comments.

And I just want to say one other thing to the young lady that said she didn't know why we don't answer questions.

We have this in about three different schedules, if you will. From 4 to 7 we had the informal, which allows you to come in and ask questions and look and see things and get a little bit prepared, if you will, for the comment period.

The comment period then is the legal

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part where we have the court reporter, take everything is verbatim, it is all on record.

As soon as I close here in a moment, please feel free to ask questions of those folks that I introduced while ago.

And that is one of the reasons that we introduce folks is to let you know that they are here and that it is an open meeting. We can have some dialogue, we just don't do that in this formal session because of the court reporter and that sort of thing. It can drag on for a long time.

So we separate that out, that is how our headquarters folks recommend that we conduct these meetings.

So in a moment, I am going to close this formal portion. Please feel free to talk to the representatives of Kentucky Pioneer Energy.

We are going to be here for a while. So please feel free to do so. There are three of us here from the Department of Energy and one is from the Corps of Engineers and three from Kentucky Pioneer.

So please feel free to do that and stay as you wish.

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AUDIENCE MEMBER: I am looking at the agenda and it says, open house, welcome, introductions, overview and formal comment period, and I assume that the formal comment period is what we just completed?

MR. SPEARS: We have.

AUDIENCE MEMBER: And I would like for Mr. Bailey, the first speaker, to be able to ask his questions so that these folks to come and answer the questions now.

MR. SPEARS: That is fine. I am going to close this part of it and then we can continue that dialogue.

I want to let the record show that at 8:34 p.m., the formal session has ended.

(Public hearing adjourned.)

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STATE OF WEST VIRGINIA, To-wit:

I, Michele G. Hankins, a Notary Public and Court Reporter within and for the State aforesaid, do hereby certify that the public meeting was taken by me and before me at the time and place specified in the caption hereof.

I do further certify that said testimony was correctly taken by me in stenotype notes, that the same was accurately transcribed out in full and reduced to typewriting, and that said transcript is a true record of the testimony.

I further certify that I am neither attorney or counsel for, nor related to or employed by, any of the parties to the action in which these proceedings were had, and further I am not a relative or employee of any attorney or counsel employed by the parties hereto or financially interested in the action.

My commission expires the 29th day of December 2003.

Given under my hand and seal this 7th day of January 2002.

Michele G. Hankins
Notary Public
Court Reporter

Shoebrooks, Jeff and Robin
Winchester, KY
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Kentucky Pioneer Integrated Gasification
Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

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Written Comment Form
Must be received by January 4, 2002.

Date 1/3/02

Dear Ms Spears,

I am writing this letter to state my opinion against the planned Combined Cycle Project slated for Trapp, KY. I am a registered nurse and work for the Veterans Hospital in Lexington, KY. I have a wife, daughter 11 years, son 8 years, and infant twin sons. We have lived in Winchester KY for six years after moving from Lexington, KY. We moved to get away from the city and the traffic. We both longed to live in a smaller town, closer to the country, as I grew up.

Recently, we found the property we have longed dreamed for. We sold our house in downtown Winchester and bought a home in the County with five acres. After moving I heard

Please use other side if more space is needed.

1/16

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

Comment No. 1 **Issue Code: 16**
Comment noted.

Shoebrooks, Jeff and Robin
Winchester, KY
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Kentucky Pioneer Integrated Gasification
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Must be received by January 4, 2002.

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about this planned electricity plant but was
unable to attend the public discussion due to
work. We now live at 366 Old Rockville Rd.
Winchester. The serenity and peace of this property
is hard to find in this area. It was a
dream come true for us to raise our children
in this setting and experience life to the fullest
as our parents did. The wildlife is wonderful
and the previous owner was a wildlife photographer.
He catalogued all the wildlife species and I
have attached this list for your viewing.
Now, as I learn more about this proposed
project I am saddened to think of how our
lives will be effected. My son will attend
Hopp Elementary School which is about eight

Please use other side if more space is needed.

2/08

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Comment No. 2 **Issue Code: 08**

DOE appreciates the provided list of wildlife species in the project area. Section 4.9, Ecological Resources, of the EIS provides information regarding species that are typically found in the region as well as special interest species. Section 5.9, Ecological Resources, provides an assessment of impacts to species common to the region and special interest species. The submitted list of wildlife species will be retained for reference in the project administrative record.

Shoebrooks, Jeff and Robin
Winchester, KY
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miles from our house. The roads leading to this area consist of 2 lane curves, not guard rails, steep hillsides with creeks running along side. It is a dangerous road (Highway 89) leading from downtown Winchester to Trapp. Just last week an ice storm hit the area hard with no warning. As I was coming to work that morning I witnessed numerous accidents on this road. One such accident was a fire engine in the ditch at the bottom of the hill. It couldn't stop due to the steep decline leading out of Winchester. The planned hauled waste route leading from I-64 to Trapp would travel over railroads, bridges, through 2 school zones with crossings, and a lengthy 35 mile/hr area with numerous horses sitting practically on the road.

Please use other side if more space is needed.

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(304) 285-4403

4/03

3/10

3/10 (cont.)

Comment No. 3 **Issue Code: 10**

Comment noted. Solid waste would be transported to landfills via trucks. An Emergency Response Plan, which documents procedures for providing emergency response and cleanup for any project related spills during materials transport, has not yet been developed by KPE. The plan will be developed during the engineering and construction phase of the project and would adhere to local, state, and federal regulations. Section 5.11, Traffic and Transportation, has been revised to discuss the Emergency Response Plan.

Comment No. 4 **Issue Code: 03**

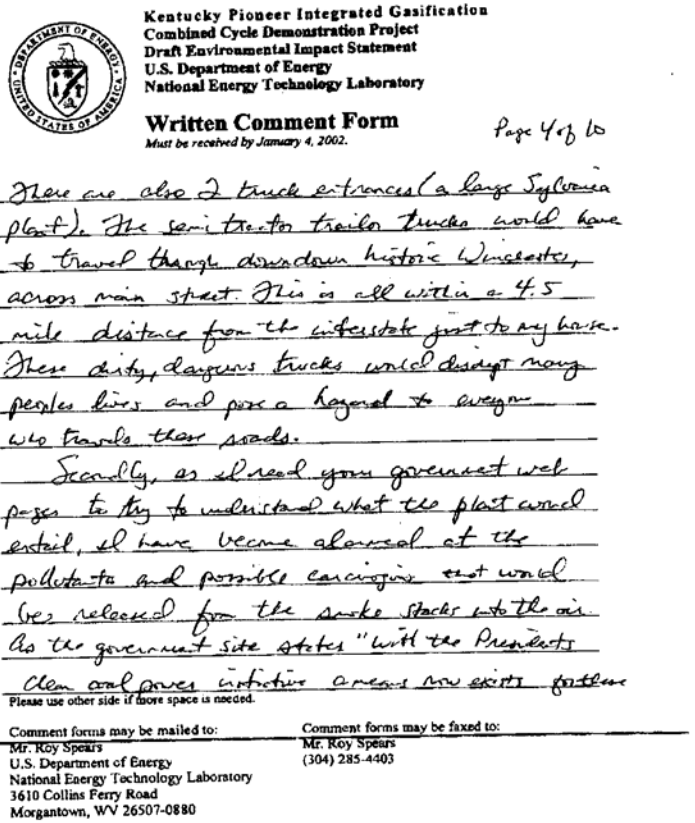
The commentor's concern regarding the potential for impacts to any cultural resources in the vicinity of downtown Winchester has been addressed as part of the consultation with the Kentucky Heritage Council. The Section 106 Review process has been completed and the Kentucky SHPO has issued a finding of no effect on historic properties from this project.

Chapter 4 has been revised to clarify that impacts to the entire Area of Potential Effect have been addressed as part of the Section 106 process.

Comment No. 5 **Issue Code: 06**

Comment noted. As detailed in Table 5.7-3 of the EIS, maximum air quality impacts from the proposed project would be less than 1 percent of the relevant federal air quality standards for gaseous pollutants such as NO_x, SO_2, and CO. Maximum impacts of the proposed project on PM_{10} concentrations would be less than 4 percent of the federal 24-hour PM_{10} standard and less than 1.5 percent of the federal annual average PM_{10} standard. As noted in the EIS, the carbon content of the syngas is expected to be less than that of natural gas. Consequently, greenhouse gas emissions from the proposed project would be less than from a comparable facility using natural gas.

Shoebrooks, Jeff and Robin
Winchester, KY
Page 4 of 10



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There are also 2 truck entrances (a large Sylvania plant). The semi tractor trailer trucks would have to travel through downtown historic Winchester, across main street. This is all within a 4.5 mile distance from the interstate just to my house. These dirty, dangerous trucks would destroy many peoples lives and pose a hazard to everyone who travels these roads.

Secondly, as I read your government web pages to try to understand what the plant would entail, I have become alarmed at the pollutants and possible carcinogens that would be released from the smoke stacks into the air. As the government site states "with the Presidents clean coal power initiative a means now exists for the

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3/10 (cont.)

3/10 (cont.)

5/06

Comment No. 5 (cont.) **Issue Code: 06**

Table 5.7-4 of the EIS identifies estimated maximum downwind concentrations of hazardous pollutants expected to be emitted by the proposed facility and the associated maximum lifetime cancer risks. Most of these compounds (all except benzene, carbon disulfide, carbonyl sulfide, formaldehyde, and hydrogen sulfide) would be associated with PM_{10} emissions. Dispersion modeling conducted for the PSD/Title V Permit application indicates that the location of maximum 24-hour average and maximum annual average PM_{10} concentrations would be within 0.8 kilometers (0.5 miles) of the facility, within the boundaries of the J. K. Smith Site property. PM_{10} concentrations (and consequently most hazardous air pollutant concentrations) beyond the boundaries of the J. K. Smith Site property would be less than the maximum values. The area of maximum annual average concentration for gaseous emissions would be about 9.1 kilometers (5.7 miles) downwind of the facility.

Section 5.7 of the EIS, Air Resources, has been revised to discuss the general downwind distances to areas of maximum pollutant impact.

Shoebrooks, Jeff and Robin
Lexington, KY
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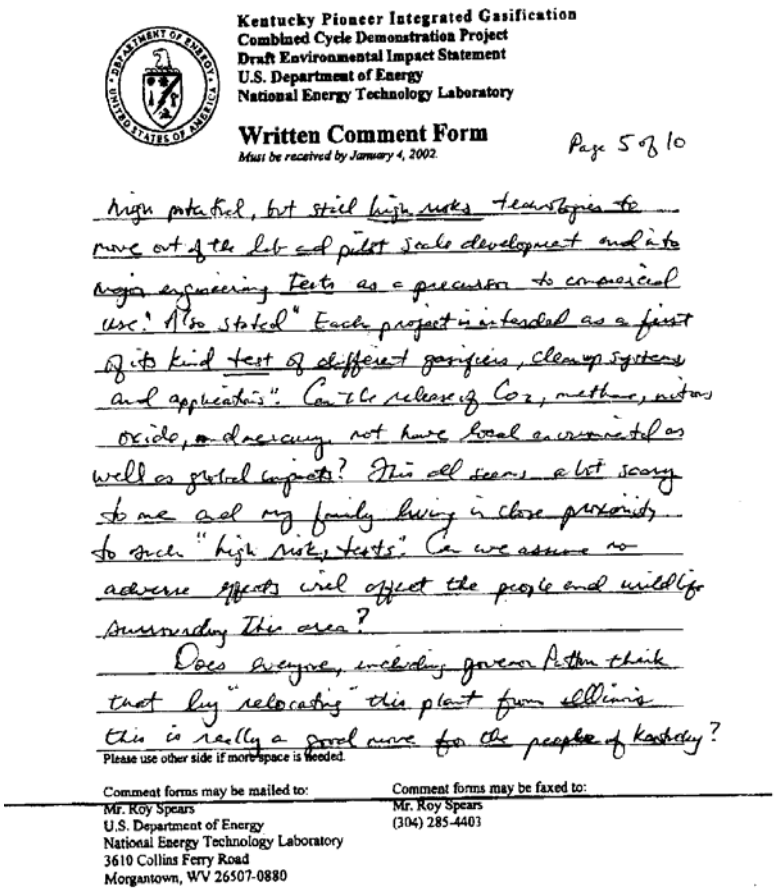

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high potential, but still high risks technologies to move out of the lab and pilot scale development and into major engineering tests as a precursor to commercial use." Also stated" Each project is intended as a first of its kind test of different gasifiers, cleanup systems and applications". Can the releasing CO_2, methane, nitrous oxide, and mercury not have local environmental as well as global impacts? This all seems a bit scary to me and my family living in close proximity to such "high risk, tests". Can we assume no adverse effects will effect the people and wildlife surrounding this area?

Does everyone, including governor Patton think that by "relocating" this plant from Illinois this is really a good move for the people of Kentucky?

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5/06 (cont.)

6/11

7/08

8/22

Comment No. 6 **Issue Code: 11**

No impacts to health and safety of the general public would be expected from the operation of the proposed facility. Wastes generated at the plant would be managed in accordance with applicable state and federal regulations. Air and wastewater permits would limit these emissions to protect the public health and safety as well as the environment.

The gasification process would produce a small amount of wastewater containing primarily dissolved salts. Emissions would be primarily from the CT engines and cooling towers (see Table 5.7.3 of the EIS). Dispersion modeling conducted for the PSD/Title V Permit application covered an area about 12 kilometers (7.5 miles) from the project site, including the area of maximum air quality impact. Incremental ambient air quality impacts from the proposed project would be a very small fraction of the relevant federal and state ambient air quality standards (less than 1 percent for gaseous pollutants such as nitrogen dioxide, sulfur dioxide, and carbon monoxide and less than 4 percent of the federal 24-hour PM_{10} standard). Total heavy metal deposition in areas downwind of the project would be much less than 1.1 kilogram per hectare (1 pound per acre) accumulated over 20 years.

Therefore, the overall increase in air emissions due to operation of the plant would be very low and present little risk to human health and the environment. Possible public health effects that could occur as a result of fire or a natural gas explosion would be minimized through basic facility design considerations.

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9/16
I think not! Not only are you planning on contaminating our area with pollutants but the electricity is planned for use outside of Kentucky. No local benefit shall be derived from this
8/22 (cont.)
endeavor. Is the bottom line money for the state? Surely there are alternatives for relocating to a less populated area. As a registered Republican who helped vote Mr. Bush into office, I am behind the president in finding new fuel technologies but I cannot back this project as
10/16
it is planned. Why bring in out of state trash to Kentucky? Don't we have our own to get rid of?

Since I am playing catch up to these developments I will be pursuing every possible action with my fellow citizens, friends, neighbors, and family to

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Comment No. 7 **Issue Code: 08**

Based on the impacts analysis in the Draft EIS, Sections 5.7 through 5.9, and 5.12 and 5.13, potentially adverse impacts to wildlife would be minimized or avoided through the project design, implementation of various management plans, and compliance with permit conditions. By design, there would be no discharges into the groundwater and surface water discharges would be regulated by KPDES permit. Prior to surface discharge, pollutant loads on the river would be examined and discharge limits established to protect water quality. An SPCC plan would be in place prior to operation. This plan would set forth a series of response activities that would reduce or avoid potential impacts to groundwater and surface water during a spill event. The terms and conditions set forth in Air Quality Permit Number V-00-049 specify operational limitations and conditions, including monitoring and testing requirements that regulate the emission of air contaminants. The air permit is based on a high level of sulfur removal and recovery from the syngas stream prior to its use. The air permit application included an assessment of air toxics and a screening evaluation of risk from possible stack emission constituents. The Kentucky Department of Air Quality determined that this risk was insignificant and that no further evaluation was required. While this evaluation is specific to human health concerns, it is an additional indicator for a low probability of adverse impacts to wildlife. Additionally, a component of the air quality permit includes a Phase II Acid Rain Permit. Adherence with permit conditions would limit air pollutant emissions in the local area and reduce the likelihood of adverse impacts to both plants and animals. Prior to plant operation, the effluent temperature of discharges into the Kentucky River would also be established and regulated to minimize impacts to the aquatic organisms.

Shoebrooks, Jeff and Robin
Lexington, KY
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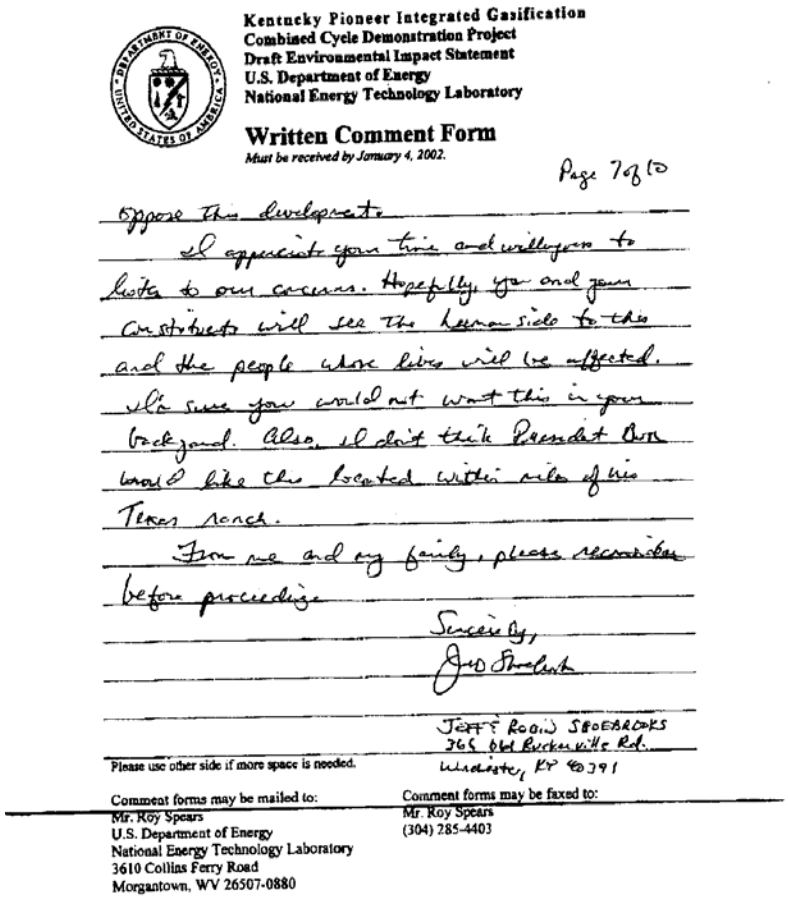

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Oppose this development.
I appreciate your time and willingness to listen to our concerns. Hopefully you and your constituents will see the human side to this and the people whose lives will be affected. I'm sure you would not want this in your backyard. Also, I don't think President Bush would like this located within site of his Texas ranch.
From me and my family, please reconsider before proceeding.

Sincerely,
Jeff Shoebrooks

JEFF & ROBIN SHOEBROOKS
765 Old Buckhorn Rd.
Winchester, KY 40391

Please use other side if more space is needed.

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U.S. Department of Energy
National Energy Technology Laboratory
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Comment forms may be faxed to:
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8/22 (cont.)

1/16 (cont.)

Comment No. 8 **Issue Code: 22**
Comment noted. The benefits associated with the proposed project are increased tax revenues for the State of Kentucky and additional jobs.

Comment No. 9 **Issue Code: 16**
The purpose of this EIS is to evaluate public and environmental impacts caused by the proposed project. DOE will consider the information provided in the EIS and public comments in this decision process. Chapter 2 discusses EKPC's 1998 Power Requirements Study which indicates that the electrical load for the region is expected to increase by 3.0 percent per year through 2017. Net winter peak demand is expected to increase by 3.3 percent per year and net summer peak demand is expected to increase by 3.0 percent per year. Peak demand is expected to increase from 2,031 MW in 1998 to 2,394 MW in 2003 and 3,478 MW in 2015. Based on this load growth, EKPC will need additional power supply resources of 625 MW in 2003. The need is further shown by EKPC's plans to construct four new CT electric generating units to provide peaking service alongside their three existing peaker CTs at the J.K. Smith Site. The power generated by the project will be used to support Kentucky's energy needs. Because of DOE's limited role of providing cost-shared funding for the proposed Kentucky Pioneer IGCC Demonstration Project, alternative sites were not considered.

Comment No. 10 **Issue Code: 16**
The relatively small amounts and generally widely dispersed nature of MSW in Kentucky does not economically support exclusive utilization of Kentucky-generated MSW to produce RDF supplies. Importing RDF from a densely populated metropolitan area is more economically viable in order to supply the necessary amount of RDF required to operate the plant.

Shoebrooks, Jeff and Robin
Lexington, KY
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Wildlife of 366 Old Ruckerville Road Page 8 of 10

BIRDS (* = at feeders) 92 species

Great Blue Heron
Green Heron (4-22) (4-17)
Turkey Vulture
Black Vulture (5-21)
Canada Goose
Wood Duck
Osprey (5-21)
Sharp-shinned Hawk
Red-tailed Hawk
American Kestrel
Wild Turkey
Northern Bobwhite
Killdeer
Solitary Sandpiper (4-23)
American Woodcock (2-25)
[redacted]
Great Horned Owl
Eastern Screech-Owl
Yellow-billed Cuckoo (5-29)(5-6)
Black-billed Cuckoo (5-20)
Common Nighthawk (5-5)
Chimney Swift (4-30) (4-27)
Ruby-throated Hummingbird (4-27) (nest)
Belted Kingfisher
[redacted]
Red-headed Woodpecker
[redacted]
Hairy Woodpecker
Northern Flicker
Pileated Woodpecker
Eastern Wood-Pewee (5-17)
Eastern Phoebe (3-27)(3-4-00)
Eastern Kingbird (4-30) (5-2)
Great Crested Flycatcher (5-22)
Tree Swallow (4-5)(4-6)
Northern Rough-winged Swallow (4-23)
Barn Swallow (4-25)
Blue Jay (nest,00)
American Crow
Carolina Chickadee
Tufted Titmouse
White-breasted Nuthatch
Carolina Wren (nest 99,00)
House Wren (4-25)
Golden-crowned Kinglet
Ruby-crowned Kinglet
Blue-gray Gnatcatcher (4-27) (4-23) (nest)
Eastern Bluebird
American Robin (nest)
Gray Catbird
Northern Mockingbird
Brown Thrasher
European Starling (nest)
Cedar Waxwing
Red-eyed Vireo (5-10)
White-eyed Vireo (4-25
Tennessee Warbler
[redacted]
Black-throated Green Warbler
Magnolia Warbler
Black-and-white Warbler (4-27)
Palm Warbler (4-29) (5-3)
Prairie Warbler (4-25) (5-3)
Yellow Warbler (5-10) (5-3)
Blackpoll Warbler (5-10)
Morning Warbler (10-4)
Common Yellowthroat (4-27) (4-23)
Yellow-breasted Chat (5-7) (5-1)
[redacted]
Field Sparrow (4-2-00)
Savannah Sparrow
[redacted]
Swamp Sparrow (4-23-00)
[redacted]
Baltimore Oriole (5-2) (nest) (5-3)
Orchard Oriole (5-9)
Eastern Meadowlark
Common Grackle
Brown-headed Cowbird
House Finch
American Goldfinch
Blue Grosbeak
Indigo Bunting (5-2)
Rose-breasted Grosbeak
House Sparrow

2/08
(cont.)

Shoebrooks, Jeff and Robin
Lexington, KY
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MAMMALS 18 species
Virginia Opossum
Bat sp.
Man
Woodchuck
Eastern Chipmunk
Eastern Gray Squirrel
Eastern Fox Squirrel
White-footed Mouse
Deer Mouse
Domestic Dog
Coyote
Common Gray Fox
Common Raccoon
Mink
Striped Skunk
Domestic Cat
White-tailed Deer
Eastern Cottontail

REPTILES 4 species
Common Snapping Turtle
Eastern Box Turtle
Common Garter Snake
Northern Water Snake
Eastern Rat Snake
Milk Snake

AMPHIBIANS 8 species
Streamside Salamander
Southern Two-lined Salamander
Ravine Salamander
American Toad (4-19)(4-2-00)
Cope's Gray Treefrog (5-17)
Spring Peeper (warm nights all winter)
Bull Frog (first call: 5-10)
Green Frog (first call: 5-23)

FISHES 6 species
Emerald Shiner
Creek Chub
Fathead Minnow
White Sucker
Green Sunfish
Orangethroat Darter

BUTTERFLIES 21 species
Eastern Tiger Swallowtail
Zebra Swallowtail
Black Swallowtail
Falcate Orangetip
Cabbage White
Orange Sulfur
Spring Azure
Meadow Fritillary
Great Spangled Fritillary
Silvery Checkerspot (5-18)
Question Mark
Mourning Cloak
Red Admiral
Red-spotted Admiral
Hackberry Emperor
Tawny Emperor
Monarch
Little Wood Satyr
Silver-spotted Skipper
Least Skipper
American Snout

2/08
(cont.)

Shoebrooks, Jeff and Robin
Lexington, KY
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	# of Species
Mammals	18
Birds	92
Reptiles	6
Amphibians	8
Fishes	6
Total Vertebrates	129

Butterflies	21

Total Species	151

Trees of 366 Old Ruckerville Road

Slippery Elm	13 species (incomplete)
Black Walnut	
Eastern Sycamore	
Shellbark Hickory	
Chinquapin Oak	
Hackberry	
Eastern Redcedar	
Black Cherry	
Silver Maple	
Box Elder	
Flowering Dogwood	
Black Locust	
Green Ash	

2/08
(cont.)

Sierra Club Cumberland Chapter
Lexington, KY
Page 1 of 12

Sierra Club Cumberland Chapter

Ramesh Bhatt, Ph.D.
1000 Rain Court
Lexington, KY 40515
e-mail: rbhatt@prodigy.net
Phone: (859) 245-6254

January 20, 2002

DOE-National Energy Technology Laboratory
Attn.: Roy Spears
Kentucky Pioneer IGCC Demonstration Project EIS Document Manager
P.O. Box 880
Morgantown, WV 26507-0880

Re: Kentucky Pioneer IGCC Demonstration Project draft Environmental Impact Statement

Dear Mr. Spears:

I am writing on behalf of the 4500 members of the Cumberland (Kentucky) Chapter of the Sierra Club. Approximately a third of our members live within 30 miles from the proposed power plant in Trapp, Kentucky. We are extremely concerned about this experimental facility. We feel that the draft Environmental Impact Statement (DEIS) generated by the Department of Energy (DOE) is seriously lacking in specifics and underestimates or ignores potentially significant negative impacts of the proposed facility. The DOE has not ensured that a complete identification and analysis of direct, indirect, and cumulative impacts from the demonstration and full commercial operation of this plant has been evaluated in the DEIS. Also, not enough attention has been paid to the monitoring of this facility and the evaluation of this demonstration/experiment. In the following paragraphs, we discuss our concerns in detail. 1/16

Vitrified Frit
Vitrified frit will be the major solid byproduct of the British Gas Lurgi gasification process that will be used in this plant[1]. Concerning this waste product, the DEIS states the following:

> The vitrified frit would undergo leach testing to determine if it is considered hazardous material. Should the leach testing indicate that the frit is not hazardous, KPE (Kentucky Pioneer Energy) would market the product for use in road paving and construction. If the frit is determined to be hazardous, KPE would have 90 days to manage the material (page 3-17)[2].

[1] *Kentucky Pioneer integrated gasification combined cycle demonstration project draft environmental impact statement.* U. S. Department of Energy (DOE/EIS-0318). Page 3-17.
[2] Ibid. Page 3-17.

1

Comment No. 1 **Issue Code: 16**

DOE believes that the Kentucky Pioneer IGCC Demonstration Project EIS adequately analyzes the full scope of environmental impacts from the proposed project. Chapter 3 has been revised to provide more detail on the gasification process, including the production of the vitreous frit. KPE plant designs and engineering work are subject to international contractual secrecy agreements and are therefore confidential and not available.

Sierra Club Cumberland Chapter
Lexington, KY
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In other words, it is unclear as to whether this frit will be inert or hazardous. We feel that the absence of specific information about the nature of this waste makes the DEIS incomplete; it is impossible to judge the environmental impact of this project without this information. Given the fact that there are no proposed waste acceptance criteria for the refuse that is converted to the fuel used in this facility (see below), we are concerned that there may be residual contaminants in the frit that may exceed RCRA Toxicity Characteristic regulatory levels.

2/12

The DEIS further states that if the frit is found to be hazardous, KPE, the owner of this plant, will have 90 days to manage this material[3]. However, no information is provided about the environmental impacts of managing this material (storage for a number of months, transportation of this hazardous material across the countryside to a waste facility, and the disposal of this material). Once again, we feel that the lack of specific and complete information about the management of the frit makes the DEIS incomplete.

Further gaps in the DEIS concern the mechanics of the testing of the frit. When will the frit be tested and, given the potential for significant variability in the quality and composition of the fuel pellets, how will DOE and Pioneer ensure that sampling is representative? Who will conduct the tests? How often should these tests be conducted and under what conditions? Answers to questions of this nature are missing from the DEIS.

Refuse Derived Fuel

KPE proposes to gasify fuel pellets derived from municipal waste (RDF) in this facility. RDF will be obtained from one or more manufacturers from out of state. The DEIS does not specify the nature of this RDF. There are *no* proposed waste acceptance criteria or visual and/or chemical analytical analysis to ensure that hazardous waste, including household hazardous waste, nonhazardous industrial waste, and polychlorinated biphenyl waste is not accepted. The DEIS does not specify whether there is any kind of quality control involved in the manufacture of these pellets. It appears to rely solely upon KPE's assertion that these pellets are suitable for gasification.[4]

3/16

Moreover, the DEIS assumes that variability in the composition of the RDF will not have an impact on the resulting syngas and byproducts, even though there is no independent evidence provided to support this assumption.[5] This lack of information about the nature of RDF is especially troubling because KPE has indicated that even waste from *industrial facilities* might be included in the manufacture of these pellets.[6]

Another major gap in the DEIS concerns the ratio of high-sulfur coal to RDF used as raw material. During the 1-year demonstration period of the project, it is assumed that the ratio of coal to RDF will be 1:1 and the draft EIS bases its analyses on this assumption. However, KPE has indicated that proportionally more RDF might be used in the future. Will this change the nature of the waste produced by this plant? If so, what are the environmental consequences?

4/16

[3] Ibid. Page 5-41.
[4] Ibid. Page 3-21.
[5] Ibid. Page 3-22.
[6] Kentucky Pioneer Energy's written responses to questions raised at the Subpart Eb Siting Analysis public meeting on June 28, 2001. Page 8.

2

Comment No. 2 **Issue Code: 12**

Chapter 3 of the EIS has been revised to include a more detailed description of the frit. As discussed in Chapter 3, vitrified frit, produced from the gasification process, is nonhazardous and would be sold as a marketable product for use as road aggregate. The vitrified frit consists primarily of ash (99.2 percent by weight) composed of oxides of the following elements silicon (SiO_2), aluminum (Al_20_3), titanium (TiO_2), iron (Fe_20_3), calcium (CaO), magnesium (MgO), potassium (K_2O) and sodium (Na_2O). The frit also contains chloride, fluoride, antimony, arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, mercury, molybdenum, nickel, silver, thallium, vanadium and zinc. Analysis of the gasification process has shown that frit is nonhazardous and rarely fails the TCLP for metals. The vitrified frit is nonleachable by EPA standards and is expected to pass the more stringent Universal Treatment Standards criteria of the EPA-TCLP analytical method.

Variability in the RDF content is dependent on the MSW supply. However, RDF production methods inherently yield fairly uniform and homogeneous RDF. Due to the vitreous nature of the frit, there would be no particular variability when a leaching test is conducted regardless of the composition of the feed.

Any hazardous waste stored onsite would be stored in accordance with state and RCRA regulations. Once a waste has been tested or is determined to be hazardous, it would be stored in proper containers (e.g., 55 gallon drums) and labeled as "hazardous waste" with applicable hazardous waste codes and the date the accumulation period began. Based on generator status, the facility would have a maximum of 90 or 180 days for onsite storage of hazardous waste prior to disposal. During that time, the facility would be required to keep containers with hazardous waste in good condition and closed; inspect

Sierra Club Cumberland Chapter
Lexington, KY
Page 3 of 12

Transmission Line
A 27-kilometer transmission line, with a 40 to 45 meter wide right of way, will be built in conjunction with this plant. Therefore, this element of the project does not have utility independent of the power plant and must be included in the DOE's NEPA analysis. Otherwise, DOE is impermissibly segmenting its NEPA analysis. The draft EIS alludes to the possibility that this transmission line might impact a designated wild river in this area and therefore might be required to obtain a permit form the Kentucky Division of Water.[7] However, not enough information is provided to assess the exact nature of this impact.

Visual Pollution
The gasification facility stacks and plumes will be visible from the city of Winchester and from the Pilot Knob State Nature Preserve.[8] The view from Pilot Knob is of special significance not only in the present day context, but also because Daniel Boone is thought to have gazed at the bluegrass region for the first time ever from its heights. Thus, from both recreational and historical perspectives, the visual pollution by the gasification stacks will be of great significance. Yet, the draft EIS dismisses this impact as insignificant. The DOE is responsible under Section 106 of the National Historic Preservation Act (NHPA) to ensure that this project's impact on eligible and listed historic properties and sites are considered. At minimum, indirect impacts to potentially historic viewsheds are an adverse effect from this project that is subject to the NHPA process.

Air Pollution
The draft EIS concludes that the increase in air pollution caused by the proposed plant is insignificant and well within "applicable standards."[9] However, the 1100 tons/year of Nox, 800 tons/year of CO, 500 tons/year of Sox and 9.07 tons/year of hazardous air pollutants generated by this plant will lead to increases in acid rain and adverse human health effects. Indeed, a recent report by the Kentucky Natural Resources and Environmental Protection Cabinet indicates that if this KPE facility and another power plant that has already been proposed to be built in close proximity go into operation, levels of Arsenic and Nickel will exceed risk-based screening values for human inhalation exposure.[10] Moreover, the pollution generated by this power plant will displace the ability of less polluting and more economically beneficial industries from locating in the region because of its use of pollution credits.

Water Use and Pollution
The proposed plant will withdraw 15.1 million liters/day from the Kentucky River.[11] In recent years, Kentucky has experienced recurring droughts. Consequently, water supply for the residents of this region, including those in Lexington, has been affected by the low flow in the Kentucky River. The withdrawal of additional water from the system will significantly intensify the problems when the flow is low in the river. Although the DEIS indicates that the water intake by this plant

[7] *Kentucky Pioneer integrated gasification combined cycle demonstration project draft environmental impact statement.* U. S. Department of Energy (DOE/EIS-0318). Page 6-4.
[8] Ibid. Page 3-27.
[9] Ibid. Page S-18.
[10] *A cumulative assessment of the environmental impacts caused by Kentucky electric generating units.* Report published by the Kentucky Natural Resources and Environmental Protection Cabinet in response to Executive Order 2001-771. December, 2001. Page 36.
[11] *Kentucky Pioneer integrated gasification combined cycle demonstration project draft environmental impact statement.* U. S. Department of Energy (DOE/EIS-0318). Page 5-24.

3

5/21
6/07
7/04
8/03
9/06
10/20
11/22
12/07

Comment No. 2 (cont.) **Issue Code: 12**
them on a weekly basis and keep a log of inspection. Regulations also require that facilities generating hazardous waste have spill contingency and Emergency Response Plans, which include procedures to notify state regulators and the public in the event of a spill. KPE waste management activities would be in accordance with applicable state and RCRA regulations. Compliance with regulations significantly reduces the risk of leakage of hazardous waste.

Comment No. 3 **Issue Code: 16**
Chapter 3, Section 3.2.2.2, discusses the production and composition of the RDF pellets using all available and relevant data. KPE intends to supply all RDF pellets for this project from the same manufacturer. Variation in RDF pellet composition due to different manufacturing processes should not be an issue for this project. The gasification technology used produces a very consistent syngas product, regardless of the variability of the feed.

Comment No. 4 **Issue Code: 16**
The Cooperative Agreement between DOE and KPE requires the fuel feed to contain a minimum of 50 percent coal. The EIS provides analysis and impacts based on the fuel feed used for the 1-year demonstration.

The impacts presented in this EIS are based on the full 20-year timeframe that the plant is expected to be operating. Changes in the ratio of RDF to coal in the fuel feed after the demonstration period would not significantly alter the impacts discussed in the EIS.

Comment No. 5 **Issue Code: 21**
Pursuant to RUS NEPA regulations, a NEPA document would be prepared that would address the impacts from the transmission line. Information in the NEPA document will be used to assure impacts are

Sierra Club Cumberland Chapter
Lexington, KY
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will amount to 4% of the water flow during the 7-day low flow *average* measure, it fails to address the impact of water withdrawal when the water flow is at its *lowest*.

Also, measures of average flow in this area of the river used by the draft EIS are based on a study from 20 years ago[12] and it is unclear as to whether there has been a significant change in the quantity of water in the river at this point.

Moreover, according to the draft EIS, withdrawal of water from the Kentucky River for thermoelectric production constitutes over 60% of all water withdrawn from the river (133 of the 203 million gallons withdrawn from the river/day).[13] The proposal to withdraw even more water from the river and to discharge treated warm water back into the river will have significant cumulative impacts, especially given that there are many mussel beds downstream of the proposed project.[14]

Monitoring

Most importantly, the draft EIS fails to address issues concerning the monitoring of the operations of the proposed plant. Ostensibly, this project will be a demonstration project for a year. What will be the nature of monitoring during this period? What are the criteria that will be used to judge whether this project is a success? What input will be public have on the evaluation of this project? How long will it take to evaluate the project? If the evaluation takes some time, will the plant be shut down during this period of evaluation? We understand that the DOE typically requires an Environmental Monitoring Plan (EMP) and Program for its recipients of innovative gasification funding, which includes all regulatorily-required monitoring and DOE-required monitoring. The EMP should be made a part of the DEIS and included for public comment, particularly given the tremendous variability possible in the feed to the gasification system, which could impact the quality of the effluent, air emissions, and frit composition.

Conclusion

According to a recent study, Kentucky leads the nation in per capita premature deaths due to air pollution.[15] This study indicates that the mortality rate is 44.1 per 100,000 adults in Kentucky, which is over 30 times the rate in California. In this context, we are extremely concerned about a new experimental facility that is classified as a Municipal Waste Combuster facility [16], which will be located within a mile from a school,[17] and which proposes to utilize municipal and possibly industrial waste as fuel.

As residents of this area, we will be the guinea pigs in this experiment. Too many questions remain to be answered before this project can go forward. We need more specific, complete, and unbiased

[12] *Kentucky Pioneer integrated gasification combined cycle demonstration project draft environmental impact statement*. U. S. Department of Energy (DOE/EIS-0318). Page 4-27.
[13] Ibid. Page 4-31.
[14] Letter from Lee Barkley, Field Supervisor, Fish and Wildlife Service, U.S. Department of the Interior, regarding the EIS. *Kentucky Pioneer integrated gasification combined cycle demonstration project draft environmental impact statement*. U. S. Department of Energy (DOE/EIS-0318). Page A-3.
[15] Clear the Air Organization. *Death, disease, and dirty power: Mortality and health damage due to air pollution from power plants*. November, 2000.
[16] *Kentucky Pioneer integrated gasification combined cycle demonstration project draft environmental impact statement*. U. S. Department of Energy (DOE/EIS-0318). Page 3-21.
[17] Ibid. Page S-10.

4

12/07 (cont.)
13/07

Comment No. 5 (cont.) **Issue Code: 21**

avoided and solutions integrated to avoid adverse public and environmental impacts. DOE believes that this is not a segmentation of the NEPA analysis as the transmission line is a related action and bounding estimates of impacts have been included in the relevant sections and chapters of the EIS.

14/20

Comment No. 6 **Issue Code: 07**

Impacts from the transmission line would be addressed in the NEPA document being prepared subject to RUS NEPA regulations. All impacts, including those to the Wild and Scenic Red River, would be addressed in this NEPA document. It is unlikely, however, that any impacts would occur since the transmission line would run northeast from the project site into Montgomery County, and the Red River lies to the south and east of the project site.

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17/21

Comment No. 7 **Issue Code: 04**

18/11

Comment noted. Impacts to the visual setting of the project area are presented in Section 5.5, Aesthetic and Scenic Resources, of the EIS.

Comment No. 8 **Issue Code: 03**

1/16 (cont.)

As discussed in Section 5.5, Aesthetic and Visual Resources, the gasifier stacks may be visible from Pilot Knob. This has been addressed in consultations with the Kentucky Heritage Council. The criteria of adverse effect, as described in Section 5.4, Cultural Resources, has been applied to determine whether the undertaking would diminish the integrity of the resource. The Section 106 Review process has been completed and the Kentucky SHPO has issued a finding of no effect on historic properties from this project.

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Lexington, KY
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information. We request that the DIES be reissued for public comment with a full identification and explanation of impacts, in accordance with NEPA. 19/21

Sincerely,

Ramesh Bhatt, Ph.D.
Sierra Club

cc: Heinz Mueller, Chief, Environmental Accountability Division, EPA, Region 4 (61 Forsyth St., S.W., Atlanta, GA 30303-8960.)

5

Comment No. 9 **Issue Code: 06**

As detailed in Table 5.7-3 of the EIS, maximum air quality impacts from the proposed project would be less than 1 percent of the relevant federal air quality standards for gaseous pollutants such as NO_x, SO_2 and CO. Maximum impacts of the proposed project on PM_{10} concentrations would be less than 4 percent of the federal 24-hour PM_{10} standard and less than 1.5 percent of the federal annual average PM_{10} standard.

A screening analysis of acid deposition issues has been made by using the following very conservative assumptions: that wind directions would blow continuously into a single 45 degree compass sector for the entire year, and that all sulfur compound emissions would be converted into sulfuric acid and deposited within 96 kilometers (60 miles) of the project site. Since the annual average wind speed for the Lexington region is 14.6 kilometers (9.1 miles per hour) (NCDC 2001), this represents less than 7 hours of transport time as an annual average. The resulting sulfur deposition rate would be an average of 1.9 kilograms per hectare (1.7 pounds per acre) of sulfuric acid per year. If this were dissolved in the annual average precipitation (113.16 centimeters [44.55 inches] per year), the resulting rainfall would have a pH increment of 5.47 attributable to the project's sulfur emissions. This is only slightly more acidic than the pH of precipitation through clean air in balance with existing atmospheric carbon dioxide concentrations. Even under unrealistically conservative assumptions, the proposed project would not have any significant impacts on acid deposition patterns in areas downwind from the facility.

The Kentucky Natural Resources and Environmental Protection Cabinet report on cumulative impacts from electric generating plants does not separate emissions from the KPE facility from those of the existing and proposed EKPC units at the J.K. Smith Site. Nevertheless, the analysis presented in the Kentucky Natural Resources and Environment Protection Cabinet report is consistent with the cancer

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Comment No. 9 (cont.) **Issue Code: 06**

risk evaluation presented in Table 5.7-4 of the EIS. However, the EIS presents a more conservative analysis based on 5 years of site data and the use of the official ISCST3 model as opposed to the 1 year of data and newer ISC model, which is not yet officially specified for permit applications, used for the Kentucky Natural Resources and Environmental Protection Cabinet report. The hazardous air pollutant risk evaluation in the Kentucky Natural Resources and Environmental Protection Cabinet report uses a lifetime cancer risk of 1 in a million as a conservative screening threshold. Table 5.7-4 of the EIS identifies five hazardous air pollutants that would exceed that screening threshold: arsenic, cadmium, chromium, nickel, and dioxins/furans.

The sulfur emission allowances that will have to be obtained by KPE for this facility apply only to electric generating plants. Since such emission allowances can be transferred on a national level, KPE's acquisition of these allowances will not significantly diminish the availability of such emission allowances. The PSD increment consumption by the proposed project also is small, and would not affect any proposed industrial facility that has emissions lower than the relevant major source thresholds. Thus, it is unlikely that the proposed project would affect the ability of "less polluting and more economically beneficial" industries to locate in the region.

Additional discussion of acid deposition and metal deposition issues has been added to Section 5.7.4 of the Final EIS.

Comment No. 10 **Issue Code: 20**

The *Cumulative Assessment of the Environmental Impacts Caused by Kentucky Electric Generating Units* report issued by the Kentucky Natural Resources and Environmental Protection Cabinet on December 17, 2001, has been reviewed and relevant sections of the EIS, including Section 5.14, Cumulative Impacts, have been updated to reflect issues presented by the report. The report raises concerns about arsenic and

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Comment No. 10 (cont.) **Issue Code: 20**
nickel levels exceeding risk-based screening values in the area should both the Kentucky Pioneer IGCC Demonstration Project and proposed peaker units operated by EKPC begin operation. These concerns have been added to Section 5.14, Cumulative Impacts; however, it should be noted that the Kentucky Natural Resources and Environmental Protection Cabinet report states that the majority of the arsenic and nickel emissions would be produced by EKPC's peaker units. The emission estimates determined in that report are based on continuous firing of a 90 percent natural gas and 10 percent fuel oil feed. These units would only operate during times of peak electrical demand, which translates to roughly 500 hours per year. EKPC intends to run the units using a 100 percent natural gas feed. They would only use fuel oil, the source of the hazardous air pollutants of concern, as a back-up fuel.

Comment No. 11 **Issue Code: 22**
All waste streams (air, water, and solid) generated by the project would be in compliance with federal, state, and local guidelines and ordinances. The presence of the facility should have no impact on future siting decisions for other businesses or industries in Clark County or Kentucky. No burdens to the economic health of the region as a result of this project have been identified. According to the *Cumulative Assessment of the Environmental Impacts Caused by Kentucky Electric Generating Units* prepared by the Kentucky Natural Resources and Environmental Protection Cabinet, further electric generation capacity often facilitates the development of the area economy.

Comment No. 12 **Issue Code: 07**
The cumulative effects of withdrawals from the Kentucky River by power plants have been discussed by the Kentucky Natural Resources and Environmental Protection Cabinet in their cumulative assessment report (KNREPC 2001), addressed in Section 5.14, Cumulative Impacts. The Cabinet acknowledges that because many of Kentucky's

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Lexington, KY
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Comment No. 12 (cont.) **Issue Code: 07**
power plants are exempt from water withdrawal requirements, the Cabinet does not have an accurate inventory of the volume of water being removed each day by the existing power plants. However, the KDEP is able to limit withdrawals from permitted sources during periods of abnormally low flow. Although the proposed plant would not be a permitted withdrawal source, KPE has stated that they would cease water withdrawals if requested to by the state.

Comment No. 13 **Issue Code: 07**
Data provided in Section 4.8, Water Resources and Water Quality, on the mean flow of the Kentucky River at Lock 10 is from the U.S. Geological Survey from 1961 to 1999. This timeframe is inclusive of the timeframe used in the J.K. Smith EA (1961 to 1977). Therefore, the average annual flow estimated at the proposed site during that study is still assumed to be valid.

Comment No. 14 **Issue Code: 20**
In light of the projected population growth and associated industries in the affected area, the EIS acknowledges the cumulative effects of water withdrawal. It is a potential problem in all regions of the country, especially in those locations with declining water quality, including thermal pollution. The Kentucky River Authority website indicates that the annual average river flow at Lock and Dam 10 (Lexington) is 12.9 BLD (3.4 BGD). KPE's use, at 15.1 MLD (4 MGD), is about 0.1 percent of that flow. As discussed in Section 4.8, Water Resources and Water Quality, the 7-day low flow with a recurrence interval of 10 years is 371.5 MLD (98.2 MGD). Under these conditions, the plant withdrawals would be equivalent to about 4.0 percent of the low flow average. Thermal plumes have the potential to kill mobile aquatic and benthic organisms and shift aquatic populations. This effect can be cumulative and a statement to this effect has been added to Section 5.14, Cumulative Impacts, of the Final EIS.

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Comment No. 14 (cont.) **Issue Code: 20**

The Kentucky Natural Resources and Environmental Protection Cabinet has established regulatory limits relative to the Kentucky River, which explicitly provide them with a mechanism to establish thermal impact parameters. Kentucky regulations (401 KAR 5:031) contain specific seasonal (generally month to month) temperature limits, and on which permitted effluent limits are based. Project specific information will not be available until an application for a KPDES permit is submitted approximately 1 year (minimum time is 180 days) before plant operation. This will occur after the project is financed and the plant designed. However, effluent temperature will be limited, and will be established to avoid impacting the monthly Kentucky River receiving stream limits. Should low flow or drought conditions require the cessation of water withdrawal from the Kentucky River, an event that has not yet occurred, the plant would be shut down for that period of time.

Comment No. 15 **Issue Code: 21**

The Final PSD/Title V Air Permit, issued by the Kentucky Division for Air Quality on June 7, 2001, requires continuous emissions monitors for NO_x, SO_x, CO, O_2, and PM_{10}. Annual stack tests for all pollutants with emission limits established by the permit are also required. The KPDES permit, which will be obtained at least 180 days prior to commencing of construction, will also have effluent limits and monitoring requirements established by state regulations. Along with the required monitoring under the permit, KPE would monitor the levels of biological and chemical oxygen demand, pH, and temperature in any wastewater generated by the facility. Any monitoring and measurements would be based on usage limits and flows associated with natural gas-fired plants.

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Comment No. 16 **Issue Code: 21**

KPE has a contract in place with EKPC to provide power continuously for a 20-year period. The facility would not shut down after the 1-year demonstration period, but would continue to operate to honor the commitment to EKPC. As discussed in Chapters 1 and 2 of the EIS, the performance, technical, and economic data would be used to determine the commercial viability of the BGL gasifier at other new and existing facilities. Should the facility prove commercially viable, the demonstration would be considered a success. There would not be a new round of permitting following the end of the 1-year demonstration period. The PSD/Title V Air Permit issued by the Kentucky Division of Air Quality is final and does not require renewal following the demonstration. At the close of the demonstration period, the KPDES permit for water usage would also be final and not require renewal. Any required fuel feed component changes following the 1-year demonstration period would likely require modification of the air and water permits.

Comment No. 17 **Issue Code: 21**

An Environmental Management Plan will be required for the KPE project and must be approved by DOE before operation of the plant begins. Because the Plan would not be prepared until detailed design is complete, it was not available for inclusion in the Draft EIS. The Plan will be posted on DOE's Clean Coal Technology Compendium Website when complete (http://www.lanl.gov/projects/cctc/).

Comment No. 18 **Issue Code: 11**

There are distinct differences between gasification and incineration. Incineration occurs at atmospheric pressures and temperatures and mineral matter or ash in the waste is not completely fused. With incineration, there is increased production and emission of criteria pollutants. In contrast, gasification occurs at high temperatures and pressures which significantly reduces the formation of oxidative

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Lexington, KY
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Comment No. 18 (cont) **Issue Code: 11**

species such as SO_x and NO_x. Incineration produces semi-volatile and volatile organic compounds and dioxin/furan compounds. Ash from hazardous waste incinerators is considered hazardous waste under RCRA. Analysis of vetrified frit produced from gasification processes has consistently been proven to be nonhazardous as defined by RCRA. In gasification, nonvolatile trace metals concentrate in the vitrified frit and are effectively immobilized eliminating or reducing their leachability.

The proposed project is not a conventional power plant burning coal or RDF. Instead of burning such fuels in a boiler system, the proposed project would use gasification technologies to chemically convert the coal and RDF mix into a syngas fuel consisting primarily of CO and H_2. The gasifier operates as a completely enclosed pressurized system. Gasification occurs at high temperatures which ensures complete destruction of toxic organic compounds and incorporation of heavy metals in molten slag. The molten slag is recovered by quenching as a nonleachable glassy frit. Gasification occurs in a carefully controlled environment. The process produces no air emissions. Furthermore, the high temperatures achieved during gasification prevent the formation of dioxins furans. A description of the gasification process can be found in Section 3.1.2.2 of the EIS.

The gasification of RFD and coal occurs at high temperatures and pressures and produces no air emissions. Incremental ambient air quality impacts from the proposed project (CTs and cooling towers) would be a very small fraction of the relevant federal and state ambient air quality standards (less than 1 percent for gaseous pollutants such as SO_2, NO_x, and CO and less than 4 percent of the federal 24-hour PM_{10} standard). The maximum air pollutant increments associated with emissions from the proposed project indicate that no significant short- or long-term air quality impacts would occur and health risks are expected to be minor.

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Lexington, KY
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Comment No. 19 **Issue Code: 21**

DOE believes that the EIS fully addresses all impacts of the Proposed Action and No Action Alternative, as required by NEPA. The public comment period was extended through January 25, 2002. DOE will consider all public comments before issuing the ROD. The ROD will be issued no sooner than 30 days after the Final EIS is distributed and a notice of its availability is issued.

Smith, Bobbye W.
Winchester, KY
Page 1 of 1

Kentucky Pioneer Integrated Gasification
Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

Written Comment Form
Must be received by January 4, 2002.

Bobbye W Smith
316 Snowden Dr
Winchester Ky 40391

As a resident of Winchester & Clark County I am not in favor of burning garbage or coal trucked here from another state. If we are going to spend the time & money we should use our own garbage or try other options such as wind power or solar power. I do not want my tax money going to fund Kentucky Pioneer Integrated Gasification. 1/16 2/22 1/16 (cont.)

Please use other side if more space is needed.

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

Comment No. 1 **Issue Code: 16**
Comment noted. The relatively small amounts and generally widely dispersed nature of MSW in Kentucky does not economically support exclusive utilization of Kentucky-generated MSW to produce RDF supplies. Importing RDF from a densely populated metropolitan area is more economically viable in order to supply the necessary amount of RDF required to operate the plant. The issue of the Nation's funds are beyond the scope of the EIS.

Comment No. 2 **Issue Code: 22**
Comment noted. The issue of alternate power sources are outside the scope of the EIS.

Taulbee, Dan and Lisa
Lexington, KY
Page 1 of 1

Kentucky Pioneer Integrated Gasification
Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

Written Comment Form
Must be received by January 7, 2002.

Dear Sir,

I wanted to let you know I oppose the trash burning facility being considered near Winchester, Ky. I have friends who live near the proposed area and they are concerned about health issues such as air quality and long term effects on the environment.

Sincerely,

Dan Taulbee
1766 Blue Lick Rd
Lexington, Ky 40504

Please use other side if more space is needed.

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

1/16

2/11

Comment No. 1 **Issue Code: 16**
Comment noted.

Comment No. 2 **Issue Code: 11**
No impacts to the general public's health and safety would be expected from the combustion of RDF. Incremental increases in air emissions from operation of the CTs and cooling tower would be a very small fraction of the relevant federal and state ambient air quality standards (less than 1 percent for gaseous pollutants such as nitrogen dioxide, sulfur dioxide, and carbon monoxide and less than 4 percent of the federal 24-hour PM_{10} standard). There would be no significant short- or long-term air quality impacts and health risks are expected to be minor.

U.S. Department of the Interior
Washington, DC
Page 1 of 1

Comment No. 1 **Issue Code: 21**
The comment period was extended through January 25, 2002.

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

ER 01/1096

DEC 20 2001

Mr. Roy Spears
NEPA Document Manager
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
Morgantown, West Virginia 26507-0880

Dear Mr. Spears:

This is in regard to the request for the Department of the Interior's comments on the Draft Environmental Impact Statement for the Proposed Kentucky Pioneer Integrated Gasification Combined Cycle (IGCC) Demonstration Project in Clark County, Kentucky.

This is to inform you that the Department will have comments, but will be unable to reply within the allotted time. Please consider this letter as a request for an extension of time in which to comment. 1/21

Our comments should be available by January 25, 2002.

Sincerely,

Terence N. Martin, P.E.
Team Leader, Natural Resources
Management
Office of Environmental Policy
and Compliance

United States Department of the Interior
Atlanta, GA
Page 1 of 1

United States Department of the Interior

OFFICE OF THE SECRETARY
OFFICE OF ENVIRONMENTAL POLICY AND COMPLIANCE
Richard B. Russell Federal Building
75 Spring Street, S.W.
Atlanta, Georgia 30303

January 18, 2002

ER 01/1096

Mr. Roy Spears
NEPA Document Manager
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
Morgantown, WV 26507

RE: Draft EIS for the Proposed Kentucky Pioneer Integrated Gasification Combined Cycle Demonstration Project, Clark County, KY

Dear Mr. Spears:

The Department of the Interior has reviewed the Draft EIS for referenced document. We have no comments at this time. Thank you for the opportunity to review this document. 1/16

Sincerely,

Gregory L. Hogue
Acting Regional Environmental Officer

cc:
FWS, Atlanta
OEPC, WASO

Comment No. 1 **Issue Code:16**
Comment noted.

United States Environmental Protection Agency, Region 4
Atlanta, GA
Page 1 of 3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

JAN 23 2002

Mr. Roy Spears
NEPA Document Manager
U.S. Department of Energy
626 Cochrans Mill Road
Box 10940
Pittsburgh, PA 15236-0940

RE: EPA Review and Comments of
Draft Environmental Impact Statement
Kentucky Pioneer Integrated Gasification Combined
Cycle Demonstration Project
CEQ No. 010426

Dear Mr. Spears:

Pursuant to Section 102(2)(C) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the U.S. Environmental Protection Agency (EPA) has reviewed the subject Draft Environmental Impact Statement (DEIS). The document provides information on the construction and operating of a 540 megawatt integrated gasification combine-cycle (IGCC) plant to be situated in Trapp, Kentucky, near the city of Lexington. The document evaluates environmental impacts of a Clean Coal Technology Program demonstration proposed to be partially funded by the Department of Energy (DOE). This technology uses fuel in the form of pelletized municipal solid waste heated with high sulfur coal and limestone forming a gas which is scrubbed of its sulfur prior to combustion in the IGCC turbines. The IGCC Demonstration Project is described as a waste minimization facility whereby inert ash from the gasification process would be converted into small amounts vitrified "frit", a glass-like waste material formed as slag in the bottom of the gasifying reactor vessels. Waste hydrogen sulfide discharge is converted into elemental sulfur of sufficiently purity as to be suitable for sale to commercial users. A two-megawatt molten carbonate fuel cell, a unit that generates electric power without using turbines and having negligible gaseous discharge to the environment, is also proposed as part of the project. The DEIS reports that there would be no significant waste stream associated with the molten carbonate fuel cell component of the Project.

EPA has the following comments about the IGCC project.

Wetlands - The DEIS states that there are no wetlands associated with the proposed site. The IGCC and gasification plant will be located on a previously-cleared and graded site that was to hold a conventional power plant which was never built because of lack of anticipated demand.

United States Environmental Protection Agency, Region 4
Atlanta, GA
Page 2 of 3

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While the plant site itself harbors no wetlands, attendant structures such as transmission lines may impact wetlands (see below). 1/07

Transmission Lines and Towers - The East Kentucky Power Cooperative (facility owners) would have to build approximately 17 miles of 138 kV transmission lines to support the IGCC Project. The environmental impacts of these lines may be excluded from NEPA review under the U. S. Department of Agriculture's Rural Utility Service (RUS) policies and procedures allowing transmission lines of less than 230 kV and less than 25 miles to be categorically excluded from the requirement to prepare an EIS. To address environmental issues, the RUS normally requires an Environmental Report (ER) that provides an environmental assessment for the application process for this size of transmission line.

EPA requests that the ER provides an examination of threatened and endangered (T & E) species that may be impacted by the 138 kV power transmission lines and associated towers associated with the proposed Project. Volant endangered species indigenous to Kentucky include the gray bay, the Indiana bat, the Virginia big-eared bat, American eastern peregrine falcon, arctic peregrine falcon, Bachman's warbler, Kirkland's warbler, and the ivory billed woodpecker. EPA encourages DOE's coordination with the U. S. Fish & Wildlife Service (FWS) on T & E issues as appropriate. There may also be wetland impacts associated with the construction of the transmission line towers as well; coordination with the Louisville Army Corps of Engineers would be advised to determine if Section 404 jurisdictional wetlands might be impacted. 2/08, 1/07 (cont.)

The following comments relate to specific items found in the DEIS.

Cooling Tower Discharge - The document did not clearly identify how much cooling tower discharge will be produced, and how the discharge blow-down will be disposed. The proposed IGCC plant will use1 million gallons per day (mgd) for condenser cooling and 3 mgd in process and cooling water makeup. To prevent mineral buildup within the system, cooling towers must regularly discharge mineralized water, and in conventional fossil fuel plants, blow-down is often discharged with the condenser cooling water. The final EIS would be improved if the means of disposal cooling tower blow-down were clarified. 3/07

Need to Reference Final Permit in the Final EIS - DOE references the "Draft PSD/Title V" permit issued for the project. The Kentucky Division for Air Quality (KDAQ) issued a final permit for prevention of significant deterioration (PSD) purposes on June 7, 2001. The final permit should be referenced in the final EIS. Any conclusions or recommendations in the DEIS based on the draft permit should be reviewed in comparison with the conditions of the final permit and revised as needed. 4/06

Restatement of Wind Direction Data - In Section 4.7.1 (page 4-20), DOE refers to six months of meteorological data collected in 1979 at a location near the Kentucky Pioneer site. Based on these data, winds at the site are described as "predominantly" from the south-southwest or northeast. Generally speaking, six months of meteorological data are not enough to establish 5/06

Comment No. 1 **Issue Code: 07**
The exact location of transmission line structures will be determined during the detailed design stage of the project. Typically, transmission lines can span sensitive areas such as floodplains and wetlands. If it were necessary to place structures in floodplains or wetlands, EKPC would apply for the necessary permits from the USACE.

Comment No. 2 **Issue Code: 08**
A NEPA document will be prepared in accordance with RUS NEPA regulations that will assess the potential impacts to threatened and endangered species from the transmission line. This assessment should be coordinated with the U.S. Fish and Wildlife Service (USFWS). Prior to transmission line construction, the NEPA document will be submitted to the USFWS for comment and/or concurrence.

Comment No. 3 **Issue Code: 07**
KPE states that the specific details on the cooling tower and associated blowdown cannot be identified until the plant design is in more advanced stages. However, KPE states that the volume of cooling tower blowdown is accounted for in the estimated 1.5 MLD (0.4 MGD) of wastewater produced by the plant. Cooling tower blowdown typically contains elevated levels of trace metals and salts. This waste stream would be treated along with all wastewater prior to discharge into the Kentucky River. Impacts to river biota are unlikely, as discussed in Section 5.8, Ecological Resources, of the EIS. Pollutant discharge limitations would be set by the Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water's Water Resources Branch and would be identified in the KPDES permit. These limitations would be established based on site-specific computer modeling of the expected effect on water quality of the Kentucky River at the proposed discharge point and in the mixing zone immediately downgradient. The limits specified in the permit would protect existing water quality.

United States Environmental Protection Agency, Region 4
Atlanta, GA
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3

wind direction predominance. DOE could state simply that the most common wind directions during the period of measurement were south-southwest and northeast, consistent with the alignment of the valley where the meteorological tower was located.

Inappropriate Citation - In Section 6.1.2 (page 6-3), DOE cites the general Kentucky regulation governing construction and operating permits for air emission sources. The citation is 401 KAR 50:035. This regulation no longer exists. DOE should consult the current set of Kentucky regulations and cite the appropriate regulation.

Need to Reassess BACT - When EPA Region 4 reviewed the draft PSD/title V permit for the project, our main concern was KDAQ's proposal to allow operation without the use of selective catalytic reduction (SCR) as best available control technology (BACT) to control emissions of nitrogen oxides. In the final permit, KDAQ allowed the facility owner to operate initially without SCR. After sufficient operating data have been obtained, however, the owner will be required to re-assess BACT for nitrogen oxides emissions and re-propose BACT for continued operation. DOE may wish to acknowledge this requirement in the final EIS.

Summary - Based on this review, EPA rates the draft EIS "EC-2", that is, environmental concerns about the project have been identified, and more information is needed to fully assess project impacts. Coordination should be done with FWS on T & E species potentially impacted by the proposed Project transmission line. Additional details of disposal of mineralized cooling tower blow-down is requested. Conclusions or recommendations in the DEIS based on the draft PSD/title V permit should be reviewed in comparison with the conditions of the final permit and revised as needed. Section 4.7.1 might be edited to simply state that the most common wind directions during the period of measurement were south-southwest and northeast, consistent with the alignment of the valley where the meteorological tower was located. After sufficient operating data have been obtained for nitrogen oxides, the owner will be required to re-assess BACT for nitrogen oxides emissions and re-propose BACT for continued operation; DOE may wish to acknowledge this requirement in the final EIS.

Thank you got the opportunity to review this project. If you have any questions or require technical assistance you may contact John Hamilton of my staff (404) 562-9617, or Jim Little at (404) 562-8576 for questions on air quality.

Sincerely,

Heinz Mueller, Chief
Office of Environmental Assessment

5/06 (cont.)

6/21

7/06

8/21
2/08 (cont.)
3/07 (cont.)
4/06 (cont.)
5/06 (cont.)
7/06 (cont)

Comment No. 4 **Issue Code: 06**
Appropriate revisions have been made in the Final EIS. Additional text has been added in Section 5.7.4 of the EIS to reflect changes made in the final permit.

Comment No. 5 **Issue Code: 06**
Appropriate revisions to Section 4.7 have been made in the Final EIS.

Comment No. 6 **Issue Code: 21**
Comment noted. Section 6.1 has been revised.

Comment No. 7 **Issue Code: 06**
The Best Available Control Technology (BACT) study condition added in the Final PSD/Title V Permit has been referenced in the Final EIS. In addition, monitoring requirements identified in the Final PSD/Title V Permit have also been summarized.

Comment No. 8 **Issue Code: 21**
Appropriate sections have been revised throughout the EIS.

Vickery, Jon P.
Winchester, KY
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Mr. Roy Spears
NEPA Document Manager
U.S. Department of Energy
Morgantown, WV 26507-0880
FAX: 304-285-4403

JAN 2 5 2002

Comments on Kentucky Pioneer
Environmental Impact Statement

Page S-4, ¶1 "If enough data is generated . . ."
The word data is plural and requires the plural verb are. See Page 5-29, Section 5.10.1, line 1 for an example of correct usage.

Page 2-2, ¶4 "If enough data is generated . . ."
The word data is plural and requires the plural verb are. See Page 5-29, Section 5.10.1, line 1 for an example of correct usage.

Page 3-17, ¶3 and ¶4 Discussion of the frit produced in the gasification process states the metals present in the feed material become metal in the frit. If the frit is found to be hazardous, one must conclude that the incoming feed materials, especially the RDF, must contain these hazardous metals. The on-site storage addresses the possibility of leaching from RDF, but what safeguards are in place during the transport of the that material to the site? In particular, regardless of the direction the material arrives by rail car, there are streams and rivers to cross, communities to pass through, etc., etc. How will leakage, spillage, derailments, etc. be handled? Will Kentucky Pioneer be responsible for cleanup or is the rail carrier CSX responsible? Are there firms/agencies knowledgeable and prepared for RDF cleanups?

Page 3-17, ¶5 "Steam is produced . . ., enters the cooling tower, and is cooled . . ."
Flow charts on pages S-6 and 3-14 do not show a cooling tower in the usual understanding of a tower producing volumes of hot water/water vapor, the latter being then carried away by the local atmospheric movements. Is this somehow combined with the stack carrying away the combustion products/exhaust gases?

Page 3-22, Section 3.2.2.3 "The facility would require about 2,500 TPD of RDF, which equates to approximately 25 rail cars per day." Figures from earlier discussions of the bulk properties of RDF, most recently Page 3-21, Section 3.2.2. predict 31 or 32 cars is required to carry that tonnage. This is assuming that CSX open hopper cars are indeed carrying their maximum of 100 tons of coal. I live along the CSX line just south of the proposed site and watching coal cars go by on an hourly basis, I can't see that these cars could carry an additional 20% by volume. If the RDF must be shipped in closed container cars, I feel that closed hopper cars have even less capacity. This results in three unit trains per week and 150 units trains for the one-year demonstration period.
This same argument must be applied to the figures quoted for the impact if the RDF must be trucked to the site. See page 5-32, Section 5.11.1, paragraph 4

1/23

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4/16

5/10

5/10 (cont.)

Comment No. 1 **Issue Code: 23**
According to the Merriam Webster Dictionary, verb usage with the word "data" is acceptable in either the singular or plural form.

Comment No. 2 **Issue Code: 10**
Comment noted. An Emergency Response Plan, which documents procedures for providing emergency response and cleanup for any project related spills during materials transport, has not yet been developed by KPE. The plan will be developed during the engineering and construction phase of the project and would adhere to local, state, and federal regulations. Section 5.11, Traffic and Transportation, has been modified to discuss the Emergency Response Plan.

Comment No. 3 **Issue Code: 12**
Chapter 3, Section 3.1.2.1, describes the handling and storage of raw materials, including RDF. Emergency Response Plans would be developed by KPE to address accidental spills, leaks, and derailments. KPE would be responsible for cleanup of all leaks and spills.

Comment No. 4 **Issue Code: 16**
The exact physical location of the cooling tower and the decision of whether or not it would be combined with facility stacks will be made during final design for the project. Detailed design is not conducted at this stage of planning as the NEPA process has not been completed. The entire facility footprint is only 4.8 hectares (12 acres), so the area in which it can actually be located is small.

Comment No. 5 **Issue Code: 10**
Comment noted. Calculations have been refigured using volume as a limiting factor for transportation.

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Page 4-3, ¶1 "The ROI is a **three-county area in Kentucky comprised of Clark, Fayette, and Madison counties** . . ." The site is much closer by road to Estill, Powell, and Montgomery counties than Madison and Fayette Watching and driving in work traffic along KY highway 89 suggests these other counties will be impacted more than Madison and Fayette. Factory workers from these counties must travel to Clark, Fayette. Madison, and Scott counties already to find employment. This site would be more desirable to them simply from a lessening of commute time if nothing else.

Changing the ROI to Clark, Estill, Powell, and Montgomery counties with minor influences in Madison and Fayette makes the presentations in Sections 4.3.1, 4.3.2, and 4.3.3 sadly misstated. 6/02

Page 4-30, Section 4.8.2, ¶3, line 5 "More recent **data** . . . area **is** not available. ¶8, line 4: "Water quality **data** . . . **is** available for . . . " The word **data** is plural and requires the plural verb **are**. See Page 5-29, Section 5.10.1, line 1 for an example of correct usage. 1/23

Page 4-38, Section 4.11.1 ¶2 "All **data was** obtained from the Kentucky . . ." "The actual count **data** presented . . . **is** the average . . ." "**Data is** only presented to MP 9.7 for . . . " "**Data** for Kentucky Highway 52 **is** presented . . ." "Capacity **data** for Kentucky Highways **is** unavailable . . ." The word **data** is plural and requires the plural verb **were**. See Page 5-29, Section 5.10.1, line 1 for an example of correct usage. (cont.)

Page 4-38, Section 4.11.2 "**The** line segment . . . has been operating in the region for an extended period of time." Of greater concern should be the bridges the this segment pass over. Both steel bridges were built in 1912 and local residents recall few if any structural repairs/improvements to the framework. True. CSX periodically replaces rails and timbers (cross ties), but is not seen working on the framework. Since both bridges cross tributaries of the Kentucky River, upstream of both Lexington and Winchester water intakes, concern over the increased traffic leading to derailment and carloads of RDF falling into the waterways is a concern. 7/10

Plans call for the RDF to be stored on concrete at the site to eliminate the possibility of leaching suggesting there is concern over RDF components. If hazardous materials can leach out from rain on stockpiled RDF, what will happen if the material is spilled into a creek or river? Are there government agencies or private contractors who can get to an accident site under these bridges and clean up the RDF materials before contamination of the watershed and/or waterway occur? Who's responsible for clean up - CSX or Kentucky Pioneer? 8/07 3/12 (cont.)

Page 4-41, Section 4.13 Although Estill and Montgomery Counties are not considered in the ROI, they have the closest landfills to accept wastes generated during construction and operation. Since they will be affected by the traffic to and from those landfills, aren't they part of the ROI of this project? 9/10

Page 5-5, Section 5.3.3.1 "support structures are assumed to be constructed at the site, which is approximately **3.2 kilometers (2 miles) west of Trapp**, Kentucky. Where is the site really? Earlier in the EIS (page S-4), the site is located **1.6 kilometers (1 mile) west of the community of Trapp**, Kentucky. 10/16

Page 5-6, Section 5.3.4.1, ¶1, line 4 ". . . cost $432 million and would take 30 **month** to . . ." Common usage would expect ". . .months to construct. . ." 11/23

(2)

Comment No. 6 **Issue Code: 02**

The three-county ROI was established based on population and employment patterns determined from the U.S. Census Bureau's County Business Patterns. Based on the large population of Fayette and, to a lesser degree, Madison Counties (with respect to other counties in the area) and the large number of individuals employed in these counties in the construction field, these counties were selected for the ROI. Other counties in the area (Estill, Powell, and Montgomery) were not included because the smaller populations and county employment figures indicated that few workers would come from these counties. It is likely that several workers from these counties may find employment at the project site, but that number is expected to be minimal in comparison to the number employed from within the ROI. Section 5.3 of the EIS, Socioeconomics, addresses impacts to the ROI from any employees coming from outside the ROI for employment at the site.

Comment No. 7 **Issue Code: 10**

Comment noted. An Emergency Response Plan, which documents procedures for providing emergency response and cleanup for any project related spills during materials transport, has not yet been developed by KPE. The plan will be developed during the engineering and construction phase of the project and would adhere to local, state, and federal regulations. Section 5.11, Traffic and Transportation, has been modified to discuss the Emergency Response Plan.

Comment No. 8 **Issue Code: 07**

All materials transported on land would be enclosed in vehicles and would not be released to the environment under normal circumstances. In the event of an accident, some materials could be released to the environment. KPE would develop an Emergency Response Plan and an SPCC Plan during the project engineering and construction phase.

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Page 5-6, Section 5.3.4.1, Entire section relates to impacts on the ROI, but the ROI used is grossly inaccurate, especially during construction phases. The jobs will draw more workers from Estill, Powell, Bell, Montgomery moreso than from Fayette and Madison. Unemployment and underemployment for those counties needs to be addressed. Those workers would most likely commute daily and have little impact on housing, schools, hospitals, etc., but a great effect on traffic.

Page 5-7, Section 5.3.4.1, ¶7 "The project location, **3.2 kilometers (2 miles) west of Trapp**. . ." Same question as Page 5-5, Section 5.3.3.1 above.

Page 5-12, Section 5.5.4, ¶3. "There would be visible plumes associated with the **cooling towers**." Same question as earlier: Where are the cooling towers in the diagrams of Page S-6 and 3-14? What is the content of the plumes? Is it just condensed water vapor or is it mixed with the exhaust combustion products?

Page 5-17, Section 5.7.4, ¶6, last line: "A **cooling tower** unit would be associated with the heat exchanger facility." Same question as above: Where are these towers in the diagrams?

Page 5-18, Section 5.7.4, 3rd paragraph on page: Cooling tower function finally described and identified in text and Table 5.7-1 as the major source of particulate matter pollution. Still not located on diagrams.

Page 5-22, Table 5.7-4: Nickel is listed as being the largest hazardous component downwind of the facility. The table lists only cancer risks from the exposure, but nickel is also a known producer of skin allergies/rashes. Where is mention made of that risk and data on the expected severity?

Page 5-24, Section 5.8-4, ¶2 "The Kentucky Pioneer . . . withdraw a total of **15.1 (4MGD)** . ." The statement is missing the units **MLD**.

Page 5-25, Section 5.8-4, ¶6: "The storage and handling of . . . RDF could present potential new groundwater contamination sources . . ." If the RDF can contaminate water when stored on site, there then exists the possibility of contamination of water during **transportation** to the site. What precautions and procedures will be in place in case of spill due to accidents, derailments, etc.? See page 4-39, Section 4.11.2 above.

Page 5-29, Section 5.10.1 " . . . and the community of Trapp is **about 3.2 kilometers (2 miles)** from the main facility site." Which is it: 1 mile (page S-4) or 2 miles?

Page 5-30, Section 5.10.4, ¶7 "The facility would require . . . **25 rail cars per day each of RDF pellets** and coal." Earlier in the EIS, the densities of coal and RDF were compared and to get equal weight of RDF will require 56/44 greater volume or number of rail cars per day. See Page 3-22, Section 3.2.2.3 above.

Page 5-32, Section 5.11.1, ¶1 "The commuting periods are established as **7:30 a.m. to 9:30 a.m** for the morning commute, and **4:30 p.m. to 6:30 p.m.** for the evening commute. In reality, the morning commute period for Highway 89 between the Trapp site and Winchester is pretty much over by 7:30 a.m. as the majority of that traffic is factory workers coming up from Estill and Lee counties to work in factories in Georgetown, Lexington, and Winchester. Since most factory shifts begin in the 6 to 7 a.m. range, workers will be traveling much earlier than that. The same is true for evening commute; the majority of the factory traffic will be thru Trapp by 4:30 p.m.
What this means is that construction worker traffic will be added to the

(3)

6/02 (cont.)
10/16 (cont.)
4/16
12/06
4/16 (cont.)
13/11
14/23
8/07 (cont.)
10/16 (cont.)
5/10 (cont.)
15/10

Comment No. 8 (cont.) **Issue Code: 07**

These plans would detail KPE's planned response and clean-up methods for any spills or emergencies that occur on the J.K. Smith Site. In addition, the Kentucky Division of Water's Emergency Response Team should be called ([502] 564-2380 or 1-800-928-2380) in event of an "environmental emergency." The spill or unexpected discharge of a hazardous material that threatens the life, health, or safety of citizens or the environment is considered an environmental emergency. More information on the Emergency Response Team can be found on the Internet at http://water.nr.state.ky.us/dow/dwert.htm.

Comment No. 9 **Issue Code: 10**

The three-county ROI was established based on population and employment patterns determined from the U.S. Census Bureau's County Business Patterns. Based on the large population of Fayette and, to a lesser degree, Madison Counties (with respect to other counties in the area) and the large number of individuals employed in these counties in the construction field, these counties were selected for the ROI. The ROI is established for the analysis of social and economic impacts resulting from the project and is referenced in the traffic and transportation analysis. It is not meant as a limiting region for traffic impacts. Section 5.11, Traffic and Transportation, has been revised to include the method of waste transport offsite.

Comment No. 10 **Issue Code: 16**

The distance presented in the Summary of the EIS, on page S-4, refers to the distance from Trapp to the boundary line of the J.K. Smith site. The distance presented in Section 5.10.1, page 5-29, refers to the distance from Trapp to the main facility, which is a mile within the J.K. Smith Site boundary.

Comment No. 11 **Issue Code: 23**

Comment noted. The change has been made to the document.

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existing traffic along Highway 89. In addition, Clark County school buses begin using that route before 7 a.m. and after 3 p.m. Granted, some of the construction traffic may be in the opposing lane both times, but this limits the speeder's ability to pass and will ultimately lead to increased accidents.

Page 5-32, Section 5.11.1, ¶3 "Based on established traffic data . . . it is assumed that each vehicle is occupied by **1.2 individuals.**" That number may be valid when all traffic during a week is counted, i.e., commuters, school buses, family trips to shop or attend church, etc. are included but if only commuter traffic is counted, that occupancy drops to just slightly over 1.0. My informal counts of recent construction worker traffic toward this site yielded about 1 vehicle in 20 having more than 1 individual or a 1.05 occupancy. Thus unless the contractor provides mass transport or an incentive to truck pool, this figure (1.05) should be used to calculate the traffic volume changes produced by construction at the site.

Page 5-32, Section 5.11.1, ¶4 "For delivery purposes, a truck is assumed to haul **18 metric tons (20 tons)** of cargo per load and a rail car is assumed to haul **91 metric tons (100 tons)** of cargo per load." Again, referring to the bulk density of RDF compared to coal, a container can hold only about 78% the weight of coal when filled with RDF. Since usage is measured in weight, not volume, additional truck and rail car loads of RDF will be required over those quoted in this paragraph. This leads to additional daily/hourly truck traffic in and out of the site. The arithmetic needs to be redone for both truck and rail traffic.

Page 5-33, Section 5.11.4, ¶1 "During periods of average construction worker staffing, an additional **1000 vehicle trips** . . . **500** at the beginning . . .and **500** at the end . . . . This number would increase to **1,666** vehicle trips per day . . .,**833** at the beginning of the shift and **833** at the end of the shift." These numbers were computed based on a 1.2 vehicle occupancy. As pointed out in Section 5.11.1, the correct number for commuter, construction worker traffic is probably closer to **1.05**. Recomputing with this occupancy rate raises the average construction time to **570** vehicle trips morning and afternoon and during peak construction to **950** vehicle trips morning and afternoon.

Page 5-33, Section 5.11.4, ¶2 "Another reason that traffic generated . . . should not impact existing traffic flows is that the typical construction shift . . . **around 7:00 a.m. and 3:00 p.m.**" This is true, but the existing traffic flow on Highway 89 peaks during those same time periods as the **commuters** are factory workers traveling to Winchester and beyond for shifts in that same time period. Thus both lanes, toward and away from Winchester, will be full. See similar discussion under Page 5-32, Section 5.11.1, ¶1 above.

Page 5-34, Section 5.11.4, ¶4 "The trucks disposing of construction wastes . . . located in Montgomery County. . . . New truck traffic . . . should have little or no impact on existing traffic." Earlier this paragraph states truck traffic will be **one every 7.5 minutes during the work day.**" Since Montgomery County is affected, shouldn't they be included in the ROI? Have they been made aware of their role in construction and operation? Were they even invited to the scoping sessions? Were they provided with copies of this EIS?

Page 5-34, Section 5.11.4, ¶7 "As stated earlier, the facility would require 51.4 rail cars of material supplies per day to operate, **25 cars of RDF pellets**, 25 cars of coal, and 1.4 cars of limestone." Previous sections pointed out the lower bulk density of RDF pellets compared to coal, 44/56 the fraction quoted. Thus identical rail cars, one carrying 100 tons of coal will only hold about **78 tons of RDF pellets**. Thus to achieve 2500 tons of RDF pellets will require about **32 carloads of RDF** per day increasing daily rail traffic to about 58.4 rail cars per day.

(4)

15/10 (cont.)

16/10

5/10 (cont.)

16/10 (cont.)

15/10 (cont.)

9/10 (cont.)
17/21

5/10 (cont.)

Comment No. 12 **Issue Code: 06**

The plume will be visible on occasion because of condensed water vapor. All of the emissions associated with operation of the gas turbines also will be present in the plume.

Comment No. 13 **Issue Code: 11**

No reference to noncancer endpoints for nickel were evaluated in the EIS. Some nickel compounds (e.g., nickel chloride) can penetrate skin, especially if the skin has been damaged. Skin exposures to the general public are predominantly to nickel metal found in jewelry, coins, buttons, zippers, and cooking utensils. Allergies and rashes due to nickel exposure are due to sensitization from frequent or prolonged contact with nickel-containing or nickel-plated consumer products. In persons not sensitive to nickel, normal, long-term oral, inhalation, and skin exposure to low levels of this element have not been associated with adverse health effects. Nickel metal does not readily penetrate the skin and, thus, the likelihood of developing skin allergies and rashes would be extremely low.

Comment No. 14 **Issue Code: 23**

Comment noted. The change has been made to the document.

Comment No. 15 **Issue Code: 10**

The construction commute times are based on estimates of shift times provided by KPE and those determined from other construction work performed throughout the region. Commuting patterns and times used in the analysis are statistically derived from standard traffic commute patterns throughout the region. As discussed in Section 5.11 of the EIS, Traffic and Transportation, the construction shift typically starts very early in the morning, approximately 7 a.m., and ends early in the afternoon, approximately 3 p.m. This would require workers to be onsite before this time, thus limiting interference with morning commutes, and leave the site early in the afternoon, which limits interference with evening commutes.

Vickery, Jon P.
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Page 5-35, Section 5.11.4, ¶8 "As stated earlier, the equivalent number of trucks required is . . .257." Again, as stated earlier, the **lesser bulk density of RDF** will permit the same size truck to carry **15.6 tons of RDF** compared to 20 tons of coal. Thus to provide 2500 tons per day of RDF will require **158** truck loads per day, raising the toal to **290** per day or one truck trip every **2 1/2 minutes** during a 24-hour period. | 5/10 (cont.)

Page 5-37, Section 5.12.3, ¶4 "Since EMF **attenuates** with distance . . ." Your own glossary, page viii, defines EMF as electric and magnetic **fields**, the plural form. Thus the statement above should be "Since EMF **attenuate** with distance . . ." | 18/23

Page 5-37, Section 5.12.3,¶4 "Because there is still **scientific uncertainty about EMF**, . . ." The uncertainty is not about EMF, but about their long term effects on plants and animals. I feel this could be stated: "**Because there is still scientific uncertainty about the long term effects of EMF on plants and animals, the human effects of EMF from the proposed facility cannot be fully evaluated at this time.**" | 19/23

Page 5-38, Section 5.12.4, ¶3 "Although there is some potential for **fire or ignitability from coal storage**, . . . " This suggests there is **no potential for fire from RDF storage**. Really? Aren't the pellets going into the same reactor as the coal? Don't paper and plastic (a major fraction of RDF) have lower kindling temperatures than coal? | 20/12

Page 5-49, Section 5.17, ¶3 "The gasifier requires feeds of 2,268(2.500 tons) per day . . . " The quantity mentioned has no primary units; the alternative quantity specified suggests the intent was 2,268 **metric tons** (2,500 tons) | 21/23

Submitted by:
Jon P. Vickery
13544 Irvine Road
Winchester, KY 40391-8020

(5)

Comment No. 15 (cont.) **Issue Code: 10**
The Transportation Division of the Clark County School Board indicates that schoolbuses utilize Kentucky Highway 89 when construction workers would be leaving the site. Section 5.11, Traffic and Transportation, has been modified to reflect the impacts of added vehicles on schoolbus usage.

Comment No. 16 **Issue Code: 10**
The vehicle occupancy rates utilized in the analysis were statistically derived from regional and national traffic and passenger count data. The section has been modified to reflect sampling error in the statistics used. The vehicle occupancy rate of 1.2 passengers per vehicle is now used as a low-end estimate for impacts. See Section 5.11 of the EIS, Traffic and Transportation, for a revised impact estimate.

Comment No. 17 **Issue Code: 21**
The public hearing dates, times, and locations were announced in the *Federal Register*, in local newspapers *The Winchester Sun* and *The Lexington Herald-Leader*, and in public service announcements. The Final EIS will be distributed to elected officials and any interested parties in neighboring counties.

Comment No. 18 **Issue Code: 23**
Comment noted. The change has been made to the document.

Comment No. 19 **Issue Code: 23**
Comment noted. The change has been made to the document.

Comment No. 20 **Issue Code: 12**
Comment noted. The probability of spontaneous combustion of RDF pellets in storage is low. Adequate fire safety prevention measures would be implemented to reduce the likelihood of spontaneous combustion of RDF pellets.

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Winchester, KY
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Comment No. 21 **Issue Code: 23**
Comment noted. The change has been made to the document.

Wurtenberger, Patty Rae
Winchester, KY
Page 1 of 1

Kentucky Pioneer Integrated Gasification
Combined Cycle Demonstration Project
Draft Environmental Impact Statement
U.S. Department of Energy
National Energy Technology Laboratory

Written Comment Form
Must be received by January 4, 2002.

18 DECEMBER 2001

RE: BURNING OF GARBAGE & COAL AT JK SMITH PLANT IN CLARK COUNTY, KY

I FEEL THAT IT WOULD BE DETRIMENTAL TO MY AREA TO BRING IN GARBAGE FROM OTHER STATES AND OTHER COUNTIES IN MY STATE TO BURN IN MY COUNTY. I ALSO FEEL THAT BURNING COAL WOULD VERY MUCH CONTAMINATE THE ATMOSPHERE OF MY LOCAL AREA. THE THOUGHT OF BURNING BOTH OF THESE TOGETHER IS OBNOXIOUS TO ME. I DO NOT THINK IT IS OUR PROBLEM TO TAKE ON OTHER STATE'S GARBAGE. I IMAGINE WE HAVE ENOUGH OF OUR OWN.

I WOULD ALSO LIKE TO KNOW WHERE THE EPA STANDS ON THIS ISSUE. I STRONGLY OPPOSE THIS PLAN.

Patty Rae Wurtenberger
315 Graves St
Winchester (Clark Co) Ky 40391

Please use other side if more space is needed.

Comment forms may be mailed to:
Mr. Roy Spears
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Comment forms may be faxed to:
Mr. Roy Spears
(304) 285-4403

1/16

2/06

1/16 (cont.)

3/21

Comment No. 1 **Issue Code: 16**
The relatively small amounts and generally widely dispersed nature of MSW in Kentucky does not economically support exclusive utilization of Kentucky-generated MSW to produce RDF supplies. Importing RDF from a densely populated metropolitan area is more economically viable in order to supply the necessary amount of RDF required to operate the plant.

Comment No. 2 **Issue Code: 06**
Comment noted. The proposed project is not a conventional power plant burning coal or RDF. Instead of burning such fuels in a boiler system, the proposed project would use gasification technologies to convert the solid fuels into a syngas rather similar to natural gas. That syngas fuel would be the fuel burned in the gas turbine generator system. As illustrated in Table 5.7-3 of the EIS, maximum air quality impacts from the proposed project would be less than 1 percent of the relevant federal air quality standards for gaseous pollutants such as NO_x, SO_x, and CO. Maximum impacts from the proposed project on particulate matter concentrations would be less than 4 percent of the federal 24-hour PM_{10} standard and less than 1.5 percent of the federal annual average PM_{10} standard. Table 5.7-4 of the EIS identifies estimated maximum downwind concentrations of hazardous pollutants expected to be emitted by the proposed facility and the associated maximum lifetime cancer risks.

Comment No. 3 **Issue Code: 21**
Comments provided by EPA and DOE's responses to those comments are included in this appendix. EPA's comments are on page D-407.