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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-151071

The Honorable Henry Bellmon
United States Senate

Dear Senator Bellmon:

In a letter dated April 25, 1975, you asked that we make a limited review of the factors leading to the decision to locate a coal liquification plant in Catlettsburg, Kentucky. Your office was briefed on the results of our inquiries into this area, and as you requested, a summary of our findings follows.

Background

The Office of Coal Research was established in 1961 in the Department of the Interior to develop technology for new and more efficient methods of mining, preparing, and utilizing coal. Under the Energy Reorganization Act of 1974, the functions of the Office of Coal Research have been transferred to the Energy Research and Development Administration, effective January 19, 1975. A majority of the Coal Research programs transferred to Energy Research are in the Division of Coal Conversion and Utilization, under the Assistant Administrator for Fossil Energy.

Since its establishment, the Division's research efforts have been directed primarily toward converting coal to more environmentally acceptable energy forms, specifically to synthetic gas. However, in recent years, emphasis has been given to research aimed at converting coal to synthetic oil and electricity. A more comprehensive discussion of Federal coal research activities is contained in our report to the Congress, February 18, 1975, entitled "Federal Coal Research - Status and Problems to be Resolved" (RED-75-322).

H-Coal project

Hydrocarbon Research Incorporated developed a process (H-Coal process) for converting coal to heavy fuel oil. This process was based on a technique it had previously developed to upgrade heavy oil. The H-Coal project is a three-phased project for designing, constructing, and operating a 600-ton per day pilot plant for testing the commercial potential of the H-Coal process. It is the largest of five Energy Research efforts to develop advanced processes for converting

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coal to liquid fuels. Hydrocarbon Research estimates that when completed the total project will cost about \$80 million.

The H-Coal project is a Government/industry cost-sharing venture. Energy Research is contributing about two-thirds of the cost and five industry participants are contributing the remaining one-third. In addition, Kentucky, the State in which the plant is to be located, is contributing about \$8 million to the project in cash and coal. The State's contributions proportionally reduce the industry and Government share of the cost.

In 1965 the Office of Coal Research started sponsoring the development of the H-Coal process. It spent about \$1.7 million on the process over the next 2-1/2 years including \$120,000 for the construction of a 2-1/2-ton per day process development unit. In September 1967 Government sponsorship ended because of budgetary limitations. However, between 1967 and 1973, Hydrocarbon Research and five industry participants continued work on the process at a cost of about \$6.8 million.

In June 1973 Hydrocarbon Research submitted a proposal to the Office of Coal Research for the design, construction, and operation of a 600-ton per day pilot plant using the H-Coal process (H-Coal pilot plant). In May 1974 Coal Research authorized Hydrocarbon Research to begin plant design work, to conduct a laboratory research program, to recommend a plant site, and to provide environmental data on the recommended site. Shortly thereafter, it entered into a cost-plus-fixed-fee contract with Hydrocarbon Research to carry out this work and to develop and provide to the Office of Coal Research (1) information and data for an independent economic evaluation and technical feasibility study of the H-Coal process and (2) a management plan containing recommendations on necessary pilot plant operations. The cost of performing this work is estimated at about \$8.1 million. Energy Research plans to award contracts for constructing and operating the H-Coal pilot plant later and expects that such a facility will be completed by 1979.

Project status

As of March 27, 1975, design work on the pilot plant was about 25 percent complete and approximately \$5.4 million had been obligated of which \$3.5 million has been expended. Of the total amount expended, Energy Research contributed \$1.9 million, Kentucky \$0.75 million, and private participants \$0.9 million.

Plant site selection

The Office of Coal Research requested the five H-Coal project participants to submit sites for the proposed demonstration plant. Three participants offered sites. Ashland Oil offered a site adjacent to its refinery at Catlettsburg and an alternative site 3 miles from the refinery (this latter location was not included in the site evaluations); Standard Oil of Indiana offered a site in Wood River, Illinois; and Sun Oil offered a site in Tulsa, Oklahoma.

The Office of Coal Research had no formal guidelines for selecting sites for pilot plants at the time the H-Coal plant site was chosen. The evaluation of the three proposed sites was based upon cost factors and methodology developed by the contractor, Hydrocarbon Research. The Office of Coal Research instructed the contractor to follow two general criteria in evaluating the three sites: the location had to be environmentally acceptable and should be the least-cost site.

In its site evaluation, the contractor had determined that from an environmental consideration, the three proposed locations were essentially equal. After the Catlettsburg site was selected, the Office of Coal Research prepared a detailed analysis of the potential environmental impacts of the proposed plant. It determined that the H-Coal pilot plant at Catlettsburg would not constitute a major Federal action significantly affecting the quality of the human environment and therefore it would not be necessary to file an environmental impact statement pursuant to the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). Our work did not include a review of the above determination or whether this determination complied with the National Environmental Policy Act.

The contractor's site evaluations were based on questionnaires completed by the three oil companies and site visits were made by an evaluation team. According to the H-Coal Project Director, the site evaluation team reviewed its analysis with the three companies. However, he said that because of the proprietary nature of some of the company cost data involved, only aggregate cost figures were reviewed with each company.

The Office of Coal Research anticipated that the States where the proposed sites were located would offer to contribute to the project. However, Coal Research did not set a cutoff date for the acceptance of State offers and the only guidance it gave the contractor in handling State

contributions was that they were not to be solicited. By the July 17, 1974, site selection recommendation, the Governor of Kentucky, under authority granted him by the State legislature, had made a firm commitment of \$7.98 million in cash and coal contributions to the project; Oklahoma through its Governor and legislative leaders had indicated that it would seek to appropriate up to \$1 million for the project; and a representative of Illinois had indicated that his State would offer a contribution at a later date.

The site evaluation team determined that the Tulsa location was the least-cost site from a technical standpoint. However, when the evaluation was adjusted to include State contributions, the contractor determined that Catlettsburg was the least-cost site.

The July 17, 1974, site recommendation compared the estimated operating and capital costs of the three sites under operating modes covering a 2- to 3-year period. According to the recommendation, on the average, the Catlettsburg location would cost about \$4.48 million less than Tulsa and about \$8.51 million less than Wood River.

The Project Director told us that Tulsa would have been recommended for the plant site had it not been for the State contributions. Energy Research officials told us that they have no official position showing which site would have been selected if State contributions had not been factored into the site evaluations. According to them, elimination of State contributions as a factor in the site selection would require a reevaluation of the three sites. They said that such a reevaluation would take 2 to 3 months.

On July 17, 1974, the contractor recommended that Coal Research approve Catlettsburg as the site for the pilot plant. However, on September 27, 1974, before the Catlettsburg site had been approved by Coal Research, Illinois offered a contribution valued by the contractor at \$11.1 million. Coal Research directed the contractor to reevaluate the sites in light of the Illinois offer.

In accordance with its May 1974 authorization from Coal Research, the contractor had been working on the pilot plant since the July site recommendation. Therefore, in its reevaluation of the three sites, the contractor included delay costs it estimated would be associated with changing the proposed plant site from Catlettsburg to Wood River.

The labor productivity rates were also reexamined and adjusted during the reevaluation. Productivity factors are a method of comparing the amount of work produced in one area to that produced in another during the same period. The productivity factors used by the contractor for each of the three proposed sites in its July evaluation did not vary considerably. However, in the reevaluation of the proposed sites after the Illinois offer, the contractor used different productivity factors which did vary considerably. It obtained these factors from a major engineering corporation that had participated in a confidential July 1974 industry survey on productivity. The survey showed a productivity factor of 2.00 for Wood River, 1.30 for Catlettsburg, and 1.20 for Tulsa. These productivity factors were based on the time required to perform 1 standard man-hour of work on the Gulf Coast from 1962 to 1963. For example, according to the survey, for Wood River it would take 2 man-hours in 1974 to perform 1 man-hour of equivalent work on the Gulf Coast from 1962 to 1963.

According to the contractor's H-Coal Project Director, the contractor was aware that the original productivity factors were not realistic at the time of the July recommendation but did not change them because they would not have changed the site recommendation. We verified this statement by applying the revised productivity factors to the contractor's computations in the July evaluation report.

In a letter to Coal Research dated October 21, 1974, the contractor reiterated its earlier recommendation that the H-Coal pilot plant be constructed in Catlettsburg. On November 4, 1974, the Secretary of the Interior announced the selection of Catlettsburg as the site for the H-Coal pilot plant.

Catlettsburg plant site

The Catlettsburg site is located next to the Big Sandy River adjacent to Ashland Oil's Catlettsburg Refinery. Aerial photographs of the proposed site are enclosed.

The site is separated from the refinery by Interstate Highway 64. However, Kentucky has agreed to build an access road from the plant site to a road which passes under Interstate Highway 64 and leads to the refinery. Cost of this

road was not included in the site evaluation or in the contractor's evaluation of Kentucky's financial and coal contributions.

The Catlettsburg site is approximately 40 acres. The upper 12 acres of the site is subject to intermediate regional flooding (once every 100 years) and the lower 28 acres is subject to seasonal flooding. The H-Coal pilot plant will be built on the lower 28 acres and will require the construction of a dike, 31 feet high and 2,500 feet long, to protect it. No such dike construction would be required at the other two sites. The dike will cost approximately \$775,000 excluding fill material which will be provided by Kentucky at no cost to the project. The cost of dike construction was included in the evaluation of the three sites. However, the fill material was not included in the site evaluation or in the contractor's evaluation of Kentucky's contribution. According to the H-Coal Project Director, once the dike is built, the risk of economic loss from flooding at the Catlettsburg site will be no greater than that of the Tulsa site which is located behind an Arkansas River levee.

Site selection guidelines

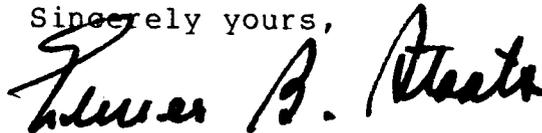
With the establishment of Energy Research, the Division of Coal Conversion and Utilization has adopted Energy Research's overall site selection guidelines. The guidelines list various factors to consider in selecting the site for all types of construction projects. These factors include such things as economics, environmental, and seismic acceptability, and availability of manpower.

Energy Research plans to start construction of at least two coal conversion pilot plants within the next 3 years. Energy Research officials emphasized that its overall guidelines would be used to develop specific criteria for selecting the site for each of these two pilot plants. In addition, they stated that as part of their determination of the overall economics of a site, State contributions would be considered to their fullest extent.

Although our review revealed no basis for disagreeing with the Catlettsburg site selection, the site selection guidelines recently adopted by the Division of Coal Conversion and Utilization, if followed, should afford a better basis for evaluating the propriety of such site selections in the future.

We discussed the contents of this report with Energy Research officials and their comments have been considered in finalizing this report.

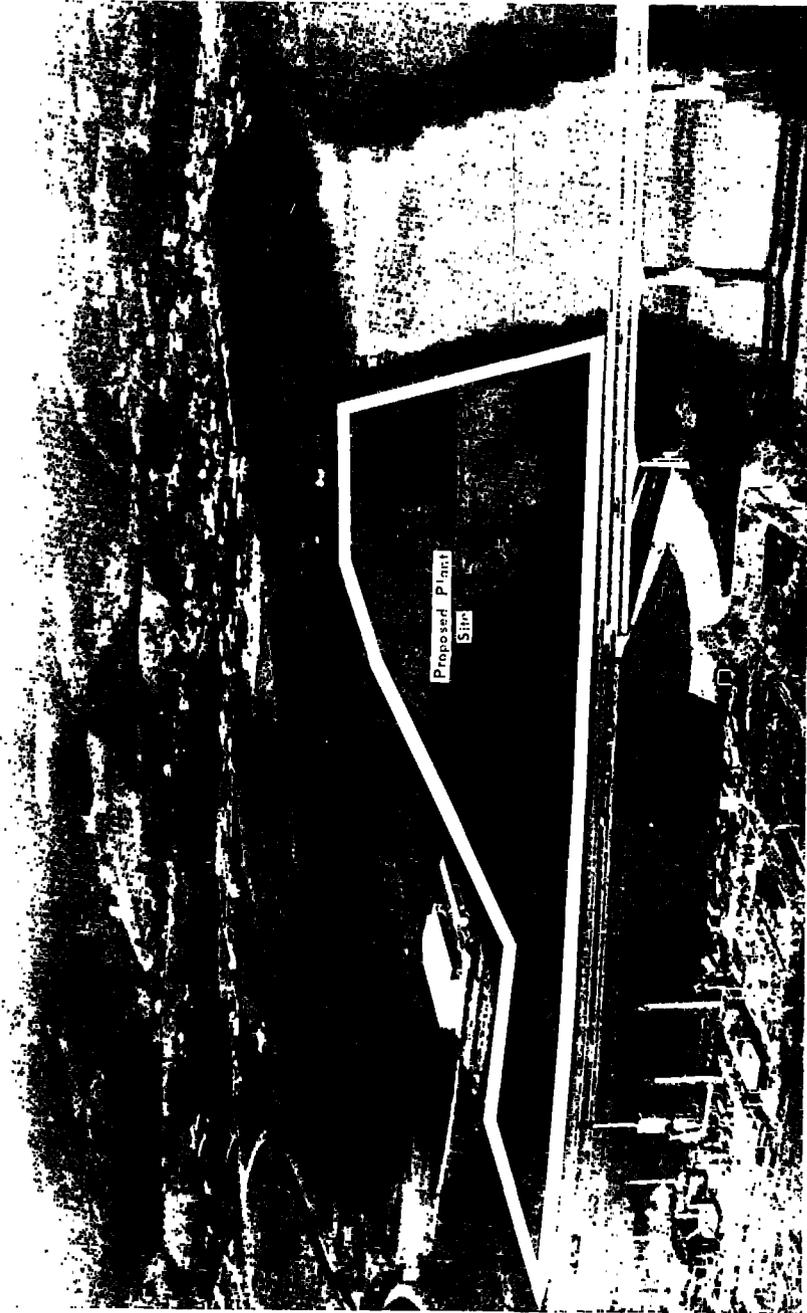
Sincerely yours,

A handwritten signature in black ink, appearing to read "Thomas A. Atkins". The signature is written in a cursive style with a large initial 'T'.

Comptroller General
of the United States

Enclosures - 2

AERIAL PHOTOGRAPH OF PROPOSED PLANT SITE



Source: Energy Research and Development Administration

AERIAL PHOTOGRAPH OF PROPOSED PLANT SITE



Source : Energy Research and Development Administration