

Resources, Community, and
Economic Development Division

B-278137

October 31, 1997

The Honorable Frank H. Murkowski
Chairman, Committee on Energy
and Natural Resources
United States SenateThe Honorable Don Young
Chairman, Committee on Resources
House of RepresentativesSubject: Federal Land Management: Estimates of Mineral Values and of the Economic Effects of Developing Minerals in the Grand Staircase-Escalante National Monument

On September 18, 1996, President Clinton designated about 1.7 million acres of federal land in southern Utah as the Grand Staircase-Escalante National Monument. The monument, which is administered by the Department of the Interior's Bureau of Land Management (BLM), contains energy and mineral resources. Although new mineral leases and claims are prohibited on land within the monument, the oil and gas, coal, and other mineral leases and claims that predated the monument's designation remain valid.^{1,2} Within the monument, approximately 176,000 acres are owned by the state of Utah and are managed by the School and Institutional Trust Lands Administration. These lands—referred to as "school trust lands"—are scattered throughout the

¹Federal Land Management: Authorized Uses in the Grand Staircase-Escalante National Monument (GAO/RCED-97-117R, Apr. 17, 1997).

²Mineral leases for oil, gas, and coal production have finite terms and eventually expire unless they are suspended or developed. According to BLM's interim management guidance for the monument, existing mineral leases are governed by valid existing rights, and plans of operation may be approved for mining claims determined to be valid.

monument. Revenues generated from the school trust lands are paid into a permanent school trust fund; income from the fund is used to finance public education in Utah. The Secretary of the Interior has been directed by the President and congressional appropriation conferees to exchange these lands for other federal lands or resources within Utah that are of comparable value. Controversy has surrounded the monument's designation, in part because of concern over its effect on mineral development in the area.³

To respond to your request that we obtain available estimates of the value of the energy and mineral resources associated with the Grand Staircase-Escalante National Monument and of the jobs, payrolls, taxes, and permanent school trust fund revenues that could be anticipated if these resources were to be developed, we contacted federal land management agencies, state agencies in Utah, major mineral developers, and environmental groups. Only two of these contacts—both of which were Utah state agencies—had estimated the value of the monument's mineral resources: (1) the Utah Geological Survey had prepared a preliminary assessment in 1997 that included estimates of the value of energy and mineral resources in the monument, including coal, coal-bed methane, oil and gas, tar sand deposits (from which oil is extracted), and nonfuel minerals, including gold, copper, titanium, and zirconium,⁴ and (2) the Utah Governor's Office of Planning and Budget had reported value estimates in 1993 (which it updated 1996) of the coal that would be developed within the monument's boundaries at a mine proposed by a coal development company, Andalex Resources, Inc. (Andalex).^{5,6} Estimates of the effects of mineral development in the monument on employment, payrolls, taxes, and permanent

³The Utah School and Institutional Trust Lands Administration and the Utah Association of Counties have filed lawsuits against the federal government alleging, among other things, that the President exceeded his authority in his designation of the monument.

⁴M. Lee Allison et al., A Preliminary Assessment of Energy and Mineral Resources within the Grand Staircase-Escalante National Monument, Circular 93, Utah Geological Survey, Utah Department of Natural Resources (Jan. 1997).

⁵Andalex Resources and the Proposed Smoky Hollow Mine: A Fiscal Impact Analysis and Economic Overview, Governor's Office of Planning and Budget, Demographic and Economic Analysis (Oct. 1993).

⁶School Trust Land Payments and the Proposed Andalex Mine in Smoky Hollow, Governor's Office of Planning and Budget (Oct. 16, 1996).

school trust fund revenues were available only for potential coal development in the monument and were prepared by three Utah state agencies—the Utah Geological Survey, the Governor's Office of Planning and Budget, and the Utah Energy Office.

Estimating the value of a mineral resource involves a number of variables, including the amount of the resource to be developed, the price of the resource, the accessibility of the minable reserves, the time required to develop the resource, the costs to develop and transport the resource, and the method of computing the value of the resource. Because assumptions about these variables can vary widely, the resulting estimates of value can also vary widely. Of the two estimates we obtained, one is based on the assumption that all coal that could be recovered in the monument would be mined and sold at current prices; it also projects amounts of other mineral resources that could be developed and their associated current sales value. The other estimate is based on a specific mining proposal and assumes that the coal from that mine would be sold at current prices over a 30-year period. Neither estimate addresses the economic feasibility of developing the resources. We did not evaluate the appropriateness or reasonableness of the assumptions and methodologies used in computing the estimates of resource value.

In brief, the Utah Geological Survey estimated in 1997 that the value of all energy and mineral resources within the monument ranges from \$223 billion to \$331 billion. These values, which were computed on the basis of the Survey's estimates of mineral resource reserves and their values, are not discounted to a net present value. The Governor's Office of Planning and Budget estimated in 1996 that the cumulative value of the coal that would be mined at Andalex's proposed Smoky Hollow project over 30 years is about \$1.4 billion, which has a present value of about \$574 million (in 1993 dollars).

We obtained two estimates of total employment in the state of Utah resulting from coal development at Andalex's proposed Smoky Hollow mine. The Utah Energy Office's 1989 estimate included 378 jobs, with a total payroll of about \$10.1 million annually.⁷ The Governor's Office of Planning and Budget's 1993 estimate included about 599 jobs in Utah, with a total annual payroll of about \$16.7 million. The Governor's Office of Planning and Budget provided the only estimate of taxes; it estimated that a total of about \$108.4 million (in 1993

⁷Report to the Energy Conservation and Development Council on Underground Coal Mining on the Kaiparowits Plateau, Utah Energy Office (May 1989).

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dollars) in state and local taxes and state fees would result from the proposed mine over 30 years.

The Utah Geological Survey estimated that coal development in the monument would provide up to \$2 billion in royalty payments to Utah's permanent school trust fund. The Governor's Office of Planning and Budget estimated that the proposed Smoky Hollow coal mine would provide a total of \$18.0 million in coal royalties to the trust fund over the life of the mine.⁸ The Office also estimated that the Smoky Hollow mine would generate a total of about \$43.9 million in royalties to the federal government, and \$40.6 million to the state, from federal land.⁹

BACKGROUND

According to the Utah Geological Survey, the Kaiparowits Plateau, which covers approximately 1,650 square miles and lies mostly within the monument, contains the largest reserve of high-quality coal in Utah. In its preliminary assessment, the Survey estimated about 11.4 billion to 16.0 billion tons of the coal in the Kaiparowits Plateau could be recovered, and recommended that a detailed, combined geologic-engineering evaluation of the coal and other resources be conducted. This estimate uses information from an assessment prepared by the U. S. Geological Survey, which estimated that the coal field contained within the Kaiparowits Plateau contains over 62 billion tons of coal.¹⁰ The Utah Geological Survey assumed a recovery rate of more than 18 percent

⁸Revenue from state lands in the monument is paid to the permanent school trust fund to finance public education in Utah. Only the income on the trust fund may be spent. According to the Governor's Office of Planning and Budget, the cumulative royalties from Andalex's proposed mine would generate a total of about \$15.4 million in expendable income over the mine's coal production period. Subsequently, this revenue would annually generate \$1 million in interest in perpetuity.

⁹The Governor's Office of Planning and Budget estimated that the royalties that Utah would receive from this subsurface coal development on federally managed land would be reduced by a federal administrative fee of 7.5 percent, or \$3.3 million.

¹⁰R. D. Hettinger et al., Preliminary Investigations of the Distribution and Resources of Coal in the Kaiparowits Plateau, Southern Utah, U.S. Department of the Interior, U.S. Geological Survey Open-File Report 96-539 (1996).

of the coal resource, whereas the U.S. Geological Survey suggested a recovery rate of less than 10 percent.

The Department of the Interior disputes the Survey's estimate, stating that proprietary drill-hole information suggests that a significant amount of the coal in the monument is not of high quality because it is high in sulfur, relatively low in heating value, and does not comply with air quality standards. Furthermore, BLM estimates that over 25 percent of the coal field contained in the plateau may lie outside the monument.¹¹

The Utah Geological Survey estimated that about 876 million to 1.3 billion tons of coal are located on school trust lands within the monument. In addition to coal, the Survey estimated, the coal beds within the Kaiparowits Plateau contain between 2.6 trillion and 10.5 trillion cubic feet of methane, 67 percent of which could be recoverable. These estimates of coal-bed methane volumes were made on the basis of data extrapolated from another Utah coal field. The Survey also reported that the monument contains all of the elements necessary for major oil and gas accumulations, based on geologic evidence and the production history of a nearby oil field, as well as tar sand deposits and nonfuel minerals.

According to the Department of the Interior, the Survey's estimates of coal-bed methane and oil and gas reserves are speculative and have not been supported by exploration, and the potential for nonfuel minerals in the monument is low.

Eighteen coal leases lie within the monument, none of which has been developed. These leases had all been suspended before the monument was designated because of ongoing reviews of environmental issues or potential designations of wilderness areas. Seventeen of the leases—covering almost 35,000 acres—are held by Andalex Resources, Inc., which is negotiating with the federal government to exchange the leases for federal property outside the monument.¹² The other lease—covering over 18,000 acres—is held by PacifiCorp, which had begun negotiations with BLM to exchange the lease for credits to be used in bidding for federal coal leases before the monument was designated. PacifiCorp may use these bidding credits to acquire other federal coal leases or

¹¹The Kaiparowits Plateau extends into the Dixie National Forest, which is not included in the monument.

¹²The President's proclamation and BLM's regulations provide that federal land within the monument may be exchanged for land outside the monument if such an exchange would protect the monument's values.

may transfer the credits to another coal developer.

According to the Department of the Interior, appraisals of the fair market value of these leased properties are under way, and any exchanges that will occur for property and interests within the monument must be based on equal value and use nationally recognized appraisal standards. Federal appraisal standards provide for several methods of determining fair market value, including analyses of comparable sales or prior sales of the identical property. If such analyses are not available, the value could be estimated from the present value of the future income anticipated from production, such as the income from royalties.

In 1989, Andalex approached the state of Utah, proposing to develop and mine coal in the Smoky Hollow area, which lies within what is now the monument.¹³ The mine was expected to begin operating in 1996 after a 3-year construction period; the proposed underground mine was expected to produce about 75 million tons of coal over 30 years from state and federal leases within the mining area.¹⁴ The mine site was to include office and warehouse buildings, coal storage and truck-loading facilities, and a sediment pond. Average production of about 2.5 million tons per year would have required an average of about 155 trucks per day to be loaded and dispatched from the mine. The coal was to be transported to a railroad facility and conveyed by train to its final destinations. BLM initiated an environmental impact statement for the mine proposal, but the process was discontinued after the monument was designated and the Department of the Interior and Andalex began discussing a possible property exchange. The company withdrew its application for a permit from the state in January 1997.

In addition to the coal leases, the monument contains 89 oil and gas leases; 6 of these leases have operating oil wells.¹⁵ One lessee, Conoco, received approval from BLM in September 1997 to drill an exploratory well on one of its leases within the monument. The monument also contains claims for minerals such as gold and silver, as well as mineral material sites for producing sand

¹³According to an official with the Utah Division of Oil, Gas, and Mining, the company's application was complete in 1992.

¹⁴Information on Andalex's proposed project was obtained from the Utah Governor's Office of Planning and Budget's reports.

¹⁵These oil wells may continue to operate in the monument because existing authorizations continue to be valid.

and gravel, boulders, and building stone.

ESTIMATES OF COAL VALUES FOR THE MONUMENT AND FOR THE PROPOSED MINE

The Utah Geological Survey estimated a range of total values from \$221 billion to \$312 billion for all coal within the monument. This estimate of the value of coal in the monument is based on the quantity of coal the Survey estimated could be recovered, multiplied by its current market value. Specifically, the Survey estimated that from 11.4 billion to 16 billion tons of coal are recoverable and then multiplied this estimated recoverable tonnage by a price of \$19.50 per ton to compute the range of value for coal.¹⁶ The Utah Geological Survey also estimated ranges of total values for other resources—\$2 billion to \$17.5 billion for coal-bed methane, \$20 million to \$1.1 billion for oil and gas, and \$4.5 million or more for nonfuel minerals.

The Governor's Office of Planning and Budget estimated a total value of \$1.4 billion for the coal that was to be mined at Andalex's Smoky Hollow mine. This estimate was based on several key assumptions, including the assumptions that about 72 million tons of coal would be mined over 30 years and sold for an average price of \$19.50 per ton.¹⁷ This estimate of value does not reflect the expected costs to operate the mine. Enclosure I presents specific information about the estimated values of mineral resources at the proposed Smoky Hollow mine and in the monument.

ESTIMATES OF THE EFFECT OF MINERAL RESOURCE DEVELOPMENT IN THE MONUMENT ON JOBS, PAYROLLS, AND TAXES WERE AVAILABLE ONLY FOR THE PROPOSED SMOKY HOLLOW COAL MINE

The two estimates we obtained of the total employment in the state of Utah that would be associated with coal development at Andalex's proposed Smoky Hollow mine were 378 and 599 jobs, with associated payrolls of about \$10.1 million and \$16.7 million annually.^{18,19} In 1989, the Utah Energy Office

¹⁶Estimates prepared by the Utah Geological Survey are not discounted to a net present value.

¹⁷The coal would have a present value of about \$574.4 million, computed on the basis of a 30-year revenue stream and a real discount rate of 5.29 percent.

¹⁸Other jobs are assumed to be held by Arizona residents.

estimated a total of 561 jobs associated with the proposed mine, including about 378 in Utah; the total annual payroll would be about \$15.2 million, of which about \$10.1 million would be for jobs in Utah.²⁰ Of the 561 jobs, 395 would be directly related to the mine and 166 would be indirect employment.²¹

In 1993, the Governor's Office of Planning and Budget estimated a total of 599 jobs in Utah associated with the proposed mine, with a total annual payroll of about \$16.7 million. Of the total Utah employment, 303 jobs would be direct, with an estimated annual payroll of about \$12.3 million, and 296 jobs would be indirect, with an estimated annual payroll of about \$4.4 million. The Office's report defines direct employment to include mine workers, truckers, and rail workers who work on the mine and coal transportation operations, and indirect employment to include workers who supply goods and services to the mine's suppliers. Specific information about these employment and payroll estimates is presented in enclosures II and III.

The Governor's Office of Planning and Budget estimated that state and local tax revenues from the proposed mine would total about \$108.4 million over the life of the mine. Of this amount, about \$52.3 million was estimated to be for state taxes and fees and \$56.1 million for local taxes.

ESTIMATES OF THE EFFECT OF COAL DEVELOPMENT ON UTAH'S PERMANENT SCHOOL TRUST FUND AND OTHER STATE AND FEDERAL REVENUES FOR THE MONUMENT AND THE PROPOSED MINE

The Utah Geological Survey estimated that revenues to the permanent school trust fund would range from \$1.4 billion to over \$2 billion if all recoverable coal contained on school trust lands in the monument were developed. This estimate was based on the assumption that from 876 million to 1.3 billion tons

¹⁹These may or may not be "new" jobs in the economy.

²⁰The 1989 report assumes that the mine's production of coal would increase over time, from a total of 400,000 tons in 1993 (initial production) to an annual total of 2 million tons in 1995 (full production).

²¹In this report, we use the term "indirect employment" to include both indirect and induced employment. The Governor's Office of Planning and Budget defines indirect employment to include the work of those who supply goods and services to the mine's suppliers. It defines induced employment to include the work of those, such as supermarket and other employees, whose services are needed to support an area's increased economic activity.

of coal would be mined from school trust lands within the monument. For the mined coal, the Survey assumed that the permanent school trust fund would receive a royalty of 8 percent on the value of production. Specific information about permanent school trust fund revenues is presented in enclosure IV.

The Governor's Office of Planning and Budget estimated that the permanent school trust fund would receive royalty payments totaling \$18.0 million over the 30-year life of the mine if the Smoky Hollow mine were developed.²² This estimate of permanent school trust fund revenues is based on the assumptions that 16 percent of the approximately 72 million tons of coal in the proposed Smoky Hollow mine is on state lands and that the coal's development would generate royalties to the state at the rate of 8 percent.

Coal development on federal land in the monument would have generated royalty revenue to both the federal and the state governments. The Utah Geological Survey reported that the federal and state governments each would receive a total of \$9.25 billion in royalties from coal within the monument.²³ The Governor's Office of Planning and Budget estimated that the federal government would receive a total of \$43.9 million in royalties over the life of the proposed Smoky Hollow coal mine and that Utah would receive net royalties of \$40.6 million; the Utah Energy Office estimated that \$1 million in royalties would be paid to Utah each year. Specific information about estimates of federal and state royalty revenue is presented in enclosure V.

AGENCY COMMENTS

We provided a draft of this report to the Department of the Interior and to the Forest Service for their review and comment. In written comments, the Department of the Interior objected to our reliance on the two estimates of resource values prepared by the Utah Geological Survey and the Governor's Office of Planning and Budget. In particular, Interior commented that it takes strong exception to the state's estimates, which it described as significantly inflated and as overstating the economic effects of developing minerals in the monument.

As agreed with our congressional requesters, we are presenting the available

²²The \$18.0 million would have had a present value of \$7.4 million in 1993 dollars, given a real discount rate of 5.29 percent and 30 years' production.

²³This estimate was prepared by the Utah Office of Energy and Resource Planning and was included in the Utah Geological Survey's report.

estimates of the mineral resource values and are not evaluating the appropriateness of the assumptions or the methodologies used in computing these estimates. As we state in our scope and methodology section, we approached federal, state, and local government officials; resource developers; and environmental groups for available estimates of the mineral resource values in the monument. The estimates that we discuss in this report are the only published values that were provided. Interior also provided technical clarifications, which we incorporated as appropriate. Interior's comments (without technical enclosures) and our responses appear in enclosure VI. The Forest Service had no comments on the draft.

SCOPE AND METHODOLOGY

To obtain estimates of the value of the energy and mineral resources and of the economic effects of mineral development in the Grand Staircase-Escalante National Monument, we contacted federal, state, and local government officials; representatives of several mineral development companies; and representatives of environmental groups. Specifically, we sought estimates from (1) BLM's headquarters in Washington, D.C., and state office in Utah; (2) the Forest Service's headquarters in Washington, D.C., and the Manti-La Sal National Forest in Price, Utah; and (3) the Department of the Interior's Office of the Solicitor. We also contacted officials with the Utah Governor's Office of Planning and Budget, the Utah School and Institutional Trust Lands Administration, and the Utah Geological Survey; a county commissioner with Garfield County, Utah, and a representative of Kane County, Utah; and officials with Andalex Resources, Inc., PacifiCorp, Conoco Oil Company, Citation Oil Company, and 3R Minerals; and representatives of the Grand Canyon Trust and the Southern Utah Wilderness Alliance. We also contacted officials at the Department of Justice and the Council on Environmental Quality to ascertain whether they could provide other valuation or economic estimates.

From our contacts with these sources, we obtained estimates of mineral values from (1) a 1997 study on minerals (primarily coal) in the monument, prepared by the Utah Geological Survey and (2) a 1993 study on Andalex's proposed Smoky Hollow coal mine, together with a 1996 update to that study, prepared by the Governor's Office of Planning and Budget. For these resource value estimates, we did not ascertain the appropriateness or reasonableness of the assumptions and methodologies. We also did not address other potential economic and social effects of not developing the energy and mineral resources in the monument.

We obtained projections of employment, annual payrolls, taxes, permanent

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school trust fund revenues, and state and federal royalties associated with the Smoky Hollow coal mine from the report by the Governor's Office of Planning and Budget. We also obtained employment and payroll estimates from a 1989 report by the Utah Energy Office. As with the estimates of value, we did not ascertain the appropriateness or reasonableness of the assumptions and methods used to compute these estimates.

We performed our review from April through October 1997 in accordance with generally accepted government auditing standards.

As arranged with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this report for 14 days. At that time we will make copies available to the Secretaries of the Interior and of Agriculture and to other interested parties. We will also make copies available to others on request.

If you or your staff have any questions, please call me at (202) 512-3841. Major contributors to this report were Jennifer L. Duncan, Diane S. Lund, Sue Ellen Naiberk, and Victor S. Rezendes.



Barry T. Hill
Associate Director, Energy,
Resources, and Science Issues

**UTAH'S ESTIMATES OF ENERGY AND MINERAL RESOURCE VALUES
FOR THE GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT**

Resource	Energy and mineral resource values for Andalex's proposed Smoky Hollow mine		Energy and mineral resource values for the entire monument
	Governor's Office of Planning and Budget's estimate		Utah Geological Survey's estimate
	1993 ^a	1996 ^b	1997 ^{c,d}
Coal	\$1.3 billion ^e	\$1.4 billion ^f	\$221 billion to \$312 billion ^g
Net present value of coal	\$585.5 million ^h	\$574.4 million ^h	i
Coal-bed methane	j	j	\$2 billion to \$17.5 billion ^k
Oil and gas	j	j	\$20 million to \$1.1 billion ^l
Nonfuel minerals	j	j	At least \$4.5 million
Total	j	j	\$223 billion to \$331 billion

Note: These estimates assumed that the minerals would be developed.

^aAndalex Resources and the Proposed Smoky Hollow Mine: A Fiscal Impact Analysis and Economic Overview, Governor's Office of Planning and Budget, Demographic and Economic Analysis (Oct. 1993). Commissioned by the Five County Association of Governments, which consists of Utah's Beaver, Garfield, Iron, Kane, and Washington counties.

^bSchool Trust Land Payments and the Proposed Andalex Mine in Smoky Hollow, Governor's Office of Planning and Budget (Oct. 16, 1996).

^cM. Lee Allison, et al., A Preliminary Assessment of Energy and Mineral Resources within the Grand Staircase-Escalante National Monument, Circular 93, Utah Geological Survey, Utah Department of Natural Resources (Jan. 1997).

^dReport does not state whether estimated amounts are in current dollars.

^eCumulative value of about 67 million tons of coal over 28 years of production, sold for \$19.50 per ton (in 1993 dollars).

^fCumulative value of about 72 million tons of coal over 30 years of production, sold for \$19.50 per ton (in 1993 dollars).

^gAssumed that 11.4 billion to 16.0 billion tons of coal were recoverable and would be sold for \$19.50 per ton.

^hNet present value of a 30-year revenue stream using a real 5.29-percent discount rate.

ENCLOSURE I

ENCLOSURE I

¹Not computed.

¹Not applicable.

^{*}Assumed that coal in the monument might contain from 2.6 trillion to 10.5 trillion cubic feet of coal-bed methane gas, assuming 100 to 400 cubic feet of gas per ton of coal. Given a recovery factor of 67 percent and market prices of \$1.20 to \$2.50 per thousand cubic feet, estimated value is \$2 billion to \$17.5 billion.

¹Range is based on calculations applied to published estimates of oil in a group of geologic formations within the monument. Applying a 20-percent recovery rate to the oil it projected would be trapped in place, the Utah Geological Survey estimated that 1 million to 54 million barrels of oil could be recovered and sold for \$20 per barrel.

UTAH'S ESTIMATES OF DIRECT AND INDIRECT EMPLOYMENT
ASSOCIATED WITH THE PROPOSED SMOKY HOLLOW MINE

Type of employment	Number of jobs			
	Utah Energy Office's estimate, 1989 ^a		Governor's Office of Planning and Budget's estimate, 1993 ^b	
	Total (including Utah) ^c	Utah ^d	Total (including Utah) ^c	Utah
Direct				
Mine/loadout	165	83	170 ^e	95
Trucking	230	184	260	195
Rail	^f	^f	25	13
Total direct	395	267	455	303
Indirect and induced	166 ^g	111 ^{g,h}	445	296
Total	561	378	900ⁱ	599

Note: These estimates assumed that the coal would be developed.

^aReport to the Energy Conservation and Development Council on Underground Coal Mining on the Kaiparowits Plateau, Utah Energy Office (May 1989).

^bAndalex Resources and the Proposed Smoky Hollow Mine: A Fiscal Impact Analysis and Economic Overview, Governor's Office of Planning and Budget, Demographic and Economic Analysis (Oct. 1993).

^cOther jobs would be held by Arizona residents.

^dThese figures were not shown in the 1989 report, but estimates were provided in support of payroll calculations.

^eBased on Andalex's "most-case" scenario, according to which the operation, at full capacity, would employ 150 people at the mine and 20 people at the rail loadout.

^fNot computed.

^gThe Utah Energy Office's report uses the terms "secondary" and "induced" employment. We categorize these figures as "indirect and induced" in this report to facilitate comparison.

^hA multiplier of 1.42 (developed in a 1983 study) was used in the 1993 report to estimate the number of induced jobs.

ⁱThis figure was not in the 1993 report; it was derived by applying the multiplier for the number of Utah jobs. The 1993 estimate of the number of direct jobs was based on an economic model developed in 1990; a multiplier of 1.98 was used to estimate the number of indirect and induced jobs.

**UTAH'S ESTIMATES OF ANNUAL PAYROLLS
ASSOCIATED WITH THE PROPOSED SMOKY HOLLOW MINE**

Dollars in millions

Type of employment	Annual payroll			
	Utah Energy Office's estimate, 1989 ^a		Governor's Office of Planning and Budget's estimate, 1993 ^b	
	Total (including Utah) ^c	Utah	Total (including Utah) ^c	Utah
Direct				
Mine/loadout	\$ 5.8	\$ 2.9	^d	\$ 5.4
Trucking	\$6.9	\$5.5	^d	\$ 6.3
Rail	^e	^e	^d	\$0 .6
Total direct	\$12.7^f	\$8.4^f	\$18.5	\$12.2
Indirect and induced	\$ 2.5	\$1.7	^d	\$4.4 ^g
Total	\$15.2	\$10.1	^d	\$16.7

Note: These estimates assumed that the coal would be developed. Numbers may not add up to the total because of rounding.

^aReport to the Energy Conservation and Development Council on Underground Coal Mining on the Kaiparowits Plateau, Utah Energy Office (May 1989).

^bAndalex Resources and the Proposed Smoky Hollow Mine: A Fiscal Impact Analysis and Economic Overview, Governor's Office of Planning and Budget, Demographic and Economic Analysis (Oct. 1993).

^cOther jobs would be held by Arizona residents.

^dNot available.

^eNot computed.

^fThese figures were not shown in the cited report but were computed by GAO and are included here to facilitate comparisons.

^gThis figure was not shown in the cited report but was computed by GAO and is included here to facilitate comparisons.

UTAH'S ESTIMATES OF THE EFFECTS OF COAL DEVELOPMENT
IN THE GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT
ON UTAH'S PERMANENT SCHOOL TRUST FUND

Effect	Development in Andalex's proposed Smoky Hollow mine		Development in the entire monument
	Governor's Office of Planning and Budget's estimate		Utah Geological Survey's estimate
	1993 ^{a, b}	1996 ^{b, c}	1997 ^d
Volume of coal produced on state lands in monument	10.7 million tons ^e	11.5 million tons ^e	876 million to 1.3 billion tons ^f
Total value of coal produced on state lands in monument	\$209 million	\$225 million	\$17 billion to \$25 billion
Net present value of coal produced	\$94 million ^g	\$92 million ^h	ⁱ
Total royalty payments to trust fund	\$16.7 million	\$18.0 million	\$1.4 billion to \$2 billion ^j
Net present value of royalty payments to trust fund	\$7.5 million ^g	\$7.4 million ^h	ⁱ

^aAndalex Resources and the Proposed Smoky Hollow Mine: A Fiscal Impact Analysis and Economic Overview, Governor's Office of Planning and Budget, Demographic and Economic Analysis (Oct. 1993).

^bIn 1993 dollars.

^cSchool Trust Land Payments and the Proposed Andalex Mine in Smoky Hollow, Governor's Office of Planning and Budget (Oct. 16, 1996).

^dM. Lee Allison, et al., A Preliminary Assessment of Energy and Mineral Resources within the Grand Staircase-Escalante National Monument, Circular 93, Utah Geological Survey, Utah Department of Natural Resources (Jan. 1997).

^eComputed by GAO on the basis of Andalex's estimate that 16 percent of the mine's total production would come from state lands.

^fEstimate of recoverable coal on school trust lands in the monument.

^gNet present value computed assuming 28 years of coal production and a real discount rate of 5.29 percent.

^hNet present value computed assuming 30 years of coal production, an 8-percent royalty rate, and a real discount rate of 5.29 percent.

ENCLOSURE IV

ENCLOSURE IV

Not computed.

Assumed that the permanent school trust fund would receive an 8-percent royalty on the value of production.

UTAH'S ESTIMATES OF THE EFFECTS OF COAL DEVELOPMENT
IN THE GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT
ON ROYALTY REVENUE FROM FEDERAL LAND

Royalty revenue	Development in Andalex's proposed Smoky Hollow mine	Development in the entire monument
	Governor's Office of Planning and Budget's estimate, 1993 ^{a,b}	Utah Geological Survey's estimate, 1997 ^{c,d}
Federal share	\$43.9 million	\$9.3 billion
State share	40.6 million	9.3 billion ^e

Note: These estimates assumed that the minerals would be developed.

^aAndalex Resources and the Proposed Smoky Hollow Mine: A Fiscal Impact Analysis and Economic Overview, Governor's Office of Planning and Budget, Demographic and Economic Analysis (Oct. 1993).

^bAssumed that production would yield royalties of 8 percent and that the federal and state governments would each receive half of the royalties from subsurface coal development on federally managed land. Royalties to the state were reduced by an administrative fee of \$3.3 million, based on the 7.5-percent average rate for administrative fees charged over the preceding 2 years.

^cM. Lee Allison, et al., A Preliminary Assessment of Energy and Mineral Resources within the Grand Staircase-Escalante National Monument, Circular 93, Utah Geological Survey, Utah Department of Natural Resources (Jan. 1997).

^dAssumed that production would yield royalties of 8 percent and that the federal and state governments would each receive half of the royalties from subsurface coal development on federally managed land.

^eThe Utah Geological Survey did not compute the administrative fee that would be deducted from the state's portion of the royalties but stated that the fee was 5.9 percent in 1995.

COMMENTS FROM THE DEPARTMENT OF THE INTERIOR
AND OUR RESPONSE

Note: GAO's comments supplementing those in the report's text appear at the end of this enclosure.



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

OCT 23 1997

Mr. Victor S. Rezendes
Director, Energy, Resources,
and Science Issues
General Accounting Office
Washington, D.C. 20548

Dear Mr. Rezendes:

Thank you for the opportunity to respond to the draft report entitled "Federal Land Management: Estimates of Mineral Values and Economic Effects of Developing Minerals in the Grand Staircase-Escalante National Monument" (GAO/RCED-98-5R).

See comment 1.

The Department of the Interior is concerned over the General Accounting Office's apparently exclusive reliance on two estimates prepared by the State of Utah, one by the Utah Geological Survey and the other by the Governor's Office of Planning and Budget, for the value estimates of mineral resources in the Monument. Although the General Accounting Office does not endorse the appropriateness or reasonableness of the assumptions and methodologies used in preparation of the State estimates, the data in the report appear to be derived primarily from those estimates. The Department takes strong exception to the State estimates, which are significantly inflated and overstate the economic effects of developing minerals in the Monument. We believe the General Accounting Office has erred by using this flawed information, and object to the General Accounting Office using it as a basis for its report.

See comment 2.

We are concerned that the report does not discuss relevant information about markets and standard appraisal methods that would place the State's estimates in proper perspective. Among other things, the report does not reflect available information on mineral commodity markets. This calls into serious question the validity of the State of Utah's value estimates presented in your report. Further, the report does not assess the State's estimates in light of accepted and standard valuation methods. For these reasons, merely presenting the State's estimates gives the reader a highly inaccurate and overly optimistic expectation of future mineral development.

See comment 2.

To take perhaps the most obvious example, the State's estimates assume that all minable coal in the Monument can be produced and sold today at today's prices. This method of valuation is simplistic, inaccurate, and unacceptable for mineral appraisal purposes. The Utah Geological Survey estimate completely neglects to consider the many factors that determine mineral values. These include:

- quality of the coal;
- extent and technical accessibility of minable reserves;
- market needs;
- distances to markets;
- transportation costs;
- period of time required to establish a mine and produce the minerals; and
- exploration, permitting, mining, and reclamation costs.

See comment 3.

The Utah Geological Survey describes the Monument coal resource as having the highest quality and assumes that all the minable coal would be in compliance with air quality standards for clean burning coal. Proprietary drill hole information suggests, however, that a significant amount of Monument coal is, in fact, high in sulfur and relatively low in Btu content and, thus, would not be in compliance with air quality standards. Noncompliance coal is economically disadvantaged in the coal market. Available information also suggests that much of the coal in the Monument is of higher sulfur and lower heating value than most central Utah coal currently being mined.

See comment 3.

Transportation costs particularly would be high because of the extremely remote location of the Kaiparowits Plateau and the lack of an established infrastructure. Recently published information on the marketability of the coal resources in the Monument (Kaiparowits Coal Supply and Demand, BXG, Inc. (1997)) shows that those resources could not begin to compete in the coal market until at least the year 2020. This drastically reduces the present value of the coal in the Monument.

See comment 2.

In addition, the uncertainty of the coal export market, a lack of long-term contractual commitments by existing and planned power-generating facilities, and the distance and cost of moving coal to market, all suggest Kaiparowits coal will continue to be uneconomic in the foreseeable future (i.e., before 2020), especially given its high delivery cost and generally lower quality.

See comment 3.

Regarding oil and gas, available estimates are highly speculative. Yet, the Utah Geological Survey values those potential resources as though they were guaranteed to exist, were being produced today, and every drop could be extracted and sold. In fact, 47 oil and gas test holes drilled in the Monument have not identified any producible resources, other than at Upper Valley. Moreover, the Utah Geological Survey estimate is based on unproven Precambrian source rocks. To date, no commercial oil has been produced from this source in any Monument location, including Upper Valley.

See comment 2.

Since the Utah Geological Survey estimate does not utilize any widely accepted valuation method, its estimate of value bears no relation to an appraised fair market value. A fair market value appraisal, by contrast, is determined either on the basis of the sale value of comparable properties or on the net present value of the future income from the property.

See comment 4.

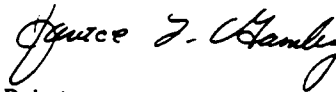
Any exchanges that will occur for Monument property and interests must be based on equal value and the use of nationally recognized appraisal standards as required by Section 206 of the Federal Land Policy and Management Act, 43 U.S.C. 1716.

See comment 2.

The State's estimates are not based on standard valuation practices. Without discussing those practices in this report, the reader is not presented with sufficient relevant information to judge the reliability or accuracy of such estimates. To provide Congress with reliable estimates of mineral values and economic effects of developing minerals in the Monument, the General Accounting Office would need to address the appropriateness or reasonableness of any estimates brought forward.

Please refer to the enclosures to this letter for specific comments concerning the report (Enclosure 1), analyses of the Utah Geological Survey estimate (Enclosure 2), and a summary of the BXG study (Enclosure 3). If you have any questions of a technical nature, please contact Doug Koza, Deputy State Director, Natural Resources, Bureau of Land Management Utah State Office at (801) 539-4034. Other questions should be referred to Gwen Midgett, the Bureau's Audit Liaison Officer, at (202) 452-7739.

Sincerely,



Acting Deputy Bob Armstrong
FS Assistant Secretary, Land and
Minerals Management

Enclosures

The following are GAO's comments on the Department of the Interior's letter dated October 23, 1997.

1. The Department of the Interior objected to our reliance on the two estimates of resource values prepared by the Utah Geological Survey and the Governor's Office of Planning and Budget. Specifically, Interior took strong exception to the state's estimates, characterizing them as "significantly inflated" and as overstating the economic effects of developing minerals in the monument.

We agreed with our congressional requesters to present the available estimates of the values of mineral resources in the monument, together with the assumptions and methodologies used, and not evaluate the appropriateness of these assumptions and methodologies. As stated in our scope and methodology section, we approached federal, state, and local government officials; resource developers; and environmental groups for available estimates of the mineral resource values in the monument. The reports we discuss here are the only estimates of value that were provided. While the Department of the Interior's comments present a number of arguments against the estimates we obtained, at no time during our fieldwork did Interior provide its own estimates.

2. Interior expressed concern that we do not discuss relevant information about markets and standard appraisal methods that would "place the State's estimates in proper perspective." Interior also remarked upon the state's assumption that all minable coal in the monument could be produced and sold today at today's prices. To address these concerns, we discuss in greater detail (p. 3) some of the factors that would affect mineral resource values. We also clarify the assumptions and methods used by the Utah Geological Survey and the Governor's Office of Planning and Budget. Furthermore, as we indicate on page 4, the Survey's preliminary assessment of the monument's resources recommends that a detailed, combined geologic-engineering evaluation of the energy and mineral resources be conducted. Interior provided us with two studies that raise questions about the marketability of coal in the Kaiparowits Plateau and at Andalex's proposed Smoky Hollow mine; however, we do not discuss the studies in this report because they did not include estimates of the coal's value.

Interior also commented that we do not assess the state's estimates in light of accepted and standard valuation practices and that merely presenting these estimates gives the reader a "highly inaccurate and overly optimistic expectation of future mineral development." Additionally, Interior commented that the Survey's estimate bears no relation to "an appraised fair market value." We do not represent the state's estimates as an appraised fair market value; furthermore, it was not our intention to give the reader expectations, optimistic or otherwise, of future mineral development in

the monument. As agreed with our congressional requesters, we presented the estimates of mineral values that were provided to us during our fieldwork; we did not assess the appropriateness of the assumptions in light of "accepted and standard valuation practices".

3. According to Interior, the Survey's report incorrectly describes the monument's coal resources as having "the highest quality," and it does not consider the effect of high transportation costs on the coal's value. Interior also characterized available oil and gas estimates as "highly speculative." We did not assess the appropriateness of the Survey's assumptions because such an assessment was not within the scope of this work. Furthermore, Interior did not provide an alternative estimate of the values of the monument's mineral resources.

Interior also commented that recently published information on the marketability of the monument's coal resources states that these resources could not begin to compete in the coal market until at least the year 2020. Interior further commented in an enclosure that the coal resources would never be considered for development until approximately that year. However, according to an official in the Utah Office of Oil, Gas, and Mining, Andalex requested permission in 1991 to mine coal in the monument, and its application was recognized as complete in 1992. The company withdrew its application in January 1997, after the monument's designation.

4. Interior commented that any exchanges that will occur for monument property must be based on equal value and the use of nationally recognized appraisal standards. We incorporated this comment and added a brief discussion of federal appraisal standards on page 6.

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