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Report To The Congress

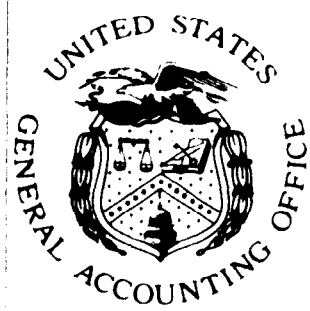
OF THE UNITED STATES

Status Of The Great Plains Coal Gasification Project--December 31, 1984

The Department of Energy (DOE)-sponsored construction of the Great Plains coal gasification project--designed to produce synthetic natural gas from coal in North Dakota--was completed in December 1984 on schedule. However, technical problems prevented Great Plains from meeting the in-service (commercial operation) target date of December 1, 1984. DOE believes the in-service date could occur in June 1985.

Faced with deteriorating financial projections in the wake of declining energy prices, Great Plains applied to the U.S. Synthetic Fuels Corporation (SFC) for additional assistance. In April 1984 SFC tentatively agreed to provide Great Plains up to \$790 million in price guarantee assistance. In return, the Great Plains partners would contribute more equity, and Great Plains would repay the DOE-guaranteed loan faster and make profit-sharing payments to SFC.

However, since SFC's tentative agreement for price guarantees, several events that could affect the project's financial outlook have occurred. For example, SFC and DOE have revised their energy price forecasts downward. In addition, Great Plains and SFC are negotiating a final agreement that could change some conditions of the tentative agreement.



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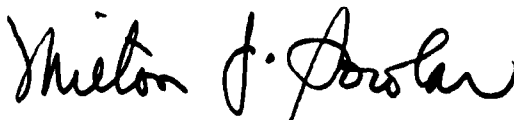
COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

B-207876

To the President of the Senate and
The Speaker of the House of Representatives

This is the seventh report on the loan guarantee for an alternative fuels demonstration project awarded to Great Plains Gasification Associates. The report is required by the Department of Energy Act of 1978--Civilian Applications (Public Law 95-238). The report discusses the status of the project, including its financial viability, and matters relating to these issues through December 31, 1984, except where noted.

We are sending copies of this report to the Director, Office of Management and Budget; the Secretary of Energy; the Chairman, U.S. Synthetic Fuels Corporation; and other interested parties.

for 
Charles A. Bowsher
Comptroller General
of the United States



D I G E S T

In January 1982 the Department of Energy (DOE) awarded a loan guarantee for up to \$2.02 billion to Great Plains Gasification Associates-- a partnership of five companies--to build the nation's first commercial plant producing synthetic natural gas from coal. The Department of the Treasury's Federal Financing Bank is lending up to 75 percent (not to exceed \$2.02 billion) of the money to construct the project, and Great Plains is financing the rest. As of December 1984, Great Plains had borrowed about \$1.3 billion and had contributed about \$480 million¹ in equity. Great Plains estimates that under the loan agreement, it will ultimately borrow about \$1.5 billion and contribute about \$553 million in equity. (See p. 1.)

The price of the synthetic natural gas is tied to the prices of other energy products. Because of a drop in forecasted energy prices, Great Plains' outlook for financial viability is less optimistic than it was in January 1982. Consequently, Great Plains requested, in September 1983, price-guarantee assistance from the U.S. Synthetic Fuels Corporation (SFC), a quasi-government corporation established by the Energy Security Act of 1980. In April 1984 Great Plains and SFC signed a letter of intent by which they reached a tentative agreement for up to \$790 million of such assistance. As of April 30, 1985, SFC had not finalized Great Plains' assistance request. (See pp. 1 and 2.)

This is the seventh in a series of semiannual GAO reports required by the Department of Energy Act of 1978--Civilian Applications (Public Law 95-238)--on the Great Plains project. GAO reviewed

¹Great Plains contributed a total of \$524 million in equity. This includes about \$44 million that DOE, prior to signing the loan guarantee agreement, determined was not eligible as equity for the project.

- the status of the project's construction, disbursements of loan guarantee funds, and operational startup activities;
- the status of SFC's proposed price-guarantee assistance; and
- the project's financial viability.

PROJECT CONSTRUCTION COMPLETED ON SCHEDULE; COSTS ARE LESS THAN EXPECTED

The project consists of a gasification plant, a synthetic natural gas pipeline, and a coal mine. Construction of the project was completed in December 1984 on schedule. Under the startup and testing program, Great Plains began producing synthetic natural gas in July 1984 and, as of December 31, 1984, had produced and sold 7.4 billion cubic feet of gas. However, startup testing disclosed technical problems that prevented the plant from achieving sustained production of synthetic natural gas at the planned level of an average of 96 million cubic feet per day. As a result, Great Plains did not place the plant in service (commercial operation) by the target date of December 1, 1984. DOE believes the in-service date could occur in June 1985. (See pp. 5 to 7.)

The project's original estimated maximum cost was \$2.76 billion. Through December 31, 1984, actual cost was \$1.93 billion. Great Plains now estimates that final project costs will amount to \$2.081 billion. (See p. 10.)

GREAT PLAINS' REQUEST FOR SFC ASSISTANCE

As part of the loan guarantee agreement, DOE requires Great Plains to submit a variety of financial data showing net income, distribution of funds to partners, capital investment requirements, and other information. (See p. 13.)

Although the cash-flow projection Great Plains submitted in January 1982 when the agreement was signed indicated a favorable financial outlook for the project, projections in March and September 1983 were less favorable-- primarily because of decreasing energy price projections. Because of the effect this would

have on earnings, credit rating, and capital investment, Great Plains in September 1983, requested price guarantees from SFC. In November 1983 Great Plains notified DOE that the partners were considering terminating their participation in the project unless price guarantee assistance was provided on a timely basis. (See pp. 15 and 16.)

On April 26, 1984, Great Plains and SFC signed a letter of intent for up to \$790 million in price-guarantee assistance over a maximum of 10 years. The letter of intent guaranteed gas prices to Great Plains of \$10 per million British thermal units (Btu)² for the first 3 years of the price guarantee period and \$7.50 per million Btu's thereafter.³ In exchange for this assistance,

--the Great Plains partners would, during the first 3 years of the price guarantee period, contribute an additional \$100 million in equity and all positive cumulative after-tax cash flow to accelerate repayment of the DOE-guaranteed loan;

--after 3 years, Great Plains would use 90 percent of project-related positive cumulative after-tax cash flow to accelerate repayment of the loan balance; and

--Great Plains would pay SFC--after the loan is repaid--70 percent of the positive cumulative after-tax cash flow not to exceed \$1.58 billion (in March 1984 dollars). (See pp. 16 and 17.)

SFC expects to finalize Great Plains' assistance contract in the spring of 1985. (See p. 19.)

²A Btu is the quantity of energy required to raise the temperature of 1 pound of water 1 degree Fahrenheit at a specified temperature.

³According to the Energy Information Administration's Annual Energy Outlook for 1983, the price residential customers paid for natural gas in 1983 was \$5.80 per million Btu's, commercial users paid \$5.42 per million Btu's, and industrial users, \$4.18 per million Btu's.

PROJECT'S FINANCIAL VIABILITY

In May 1984 Great Plains submitted to DOE a cash-flow projection that differed in several respects from its previous projections. For example, Great Plains included the proposed terms of SFC price-guarantee assistance, changed its method of calculating synthetic gas prices, and considered the impact of production tax credits. In contrast to the January 1982 projection, the May 1984 projection showed the following:

- The project would lose \$240 million rather than realize net income of \$2.2 billion through 1996. However, through the year 2009, net income would total \$1.4 billion.
- Distribution of funds to the partners would be \$38 million through 1996 rather than \$1.5 billion. By the year 2009 cumulative distributions to the partners would total \$2.4 billion.
- Additional capital, totaling \$811 million, would be needed over 11 years to meet general cash requirements instead of \$86 million over 3 years.

The May 1984 projection showed these losses even though it indicated Great Plains would receive \$790 million in price-guarantee assistance between 1985 and 1989. It also shows that Great Plains would make profit-sharing payments to SFC between the years 2000 and 2009 amounting to \$1.2 billion. (See pp. 17 and 18.)

Since April 1984 when the letter of intent was signed and since the Great Plains cash-flow projection in May 1984, several events that could have an effect on the project's financial outlook have occurred. For example, Great Plains and SFC are negotiating a final agreement that could change some conditions set forth in the letter of intent, and SFC and DOE revised their energy price forecasts downward. (See p. 18.)

In August 1984 the Chairman, Subcommittee on Environment, Energy, and Natural Resources, House Committee on Government Operations, requested that GAO review Great Plains' May 1984 cash-flow projection and determine the

effect of SFC's proposed price-guarantee assistance on the project's financial viability. (See p. 18.)

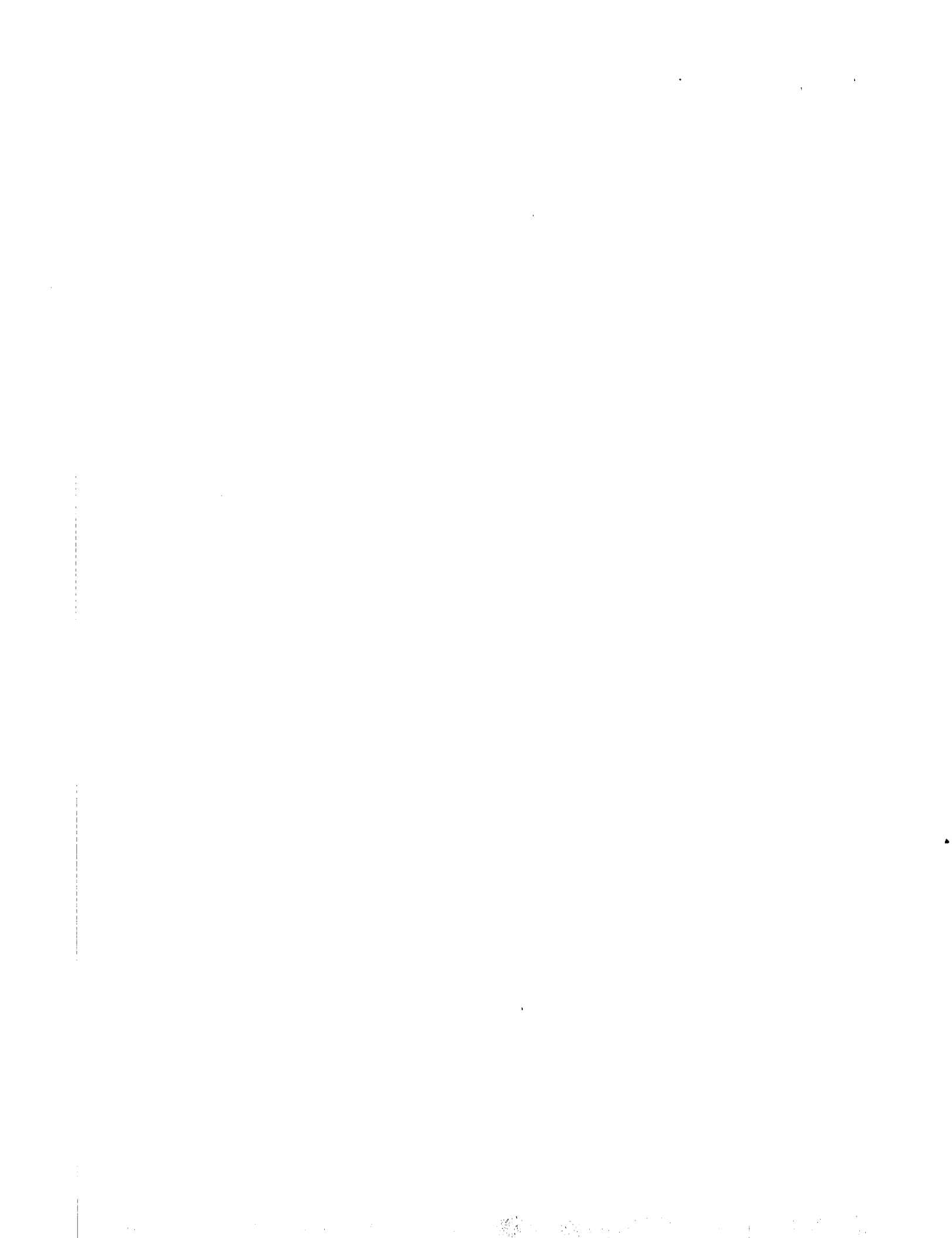
In response to that request, GAO reported in February 1985 that, among other things, the May 1984 cash-flow projection showed that, even with the proposed SFC assistance, the project would still not be as financially viable as anticipated in January 1982. (See p. 18.)

GAO also reported that according to an SFC April 1984 analysis, Great Plains, over the life of the project, would realize a lower rate of return with the \$790 million in assistance (14 percent) than without it (19 percent). The factors that contribute to the lower rate of return are the additional equity the partners would contribute, accelerated debt repayment, and sharing of profits. (See p. 18.)

However, GAO further reported that the Great Plains partners are willing to accept a lower rate of return because SFC's assistance provides additional income during the first 10 years of operations (1985-94) and helps alleviate the short-term losses. Although the project offers potential long-term profitability, the partners were more concerned about possible large after-tax losses during the first 10 years. (See p. 19.) For GAO's full analysis of the impact of the SFC assistance on the Great Plains project, see Financial Status of the Great Plains Coal Gasification Project (GAO/RCED-85-70, Feb. 21, 1985).

As of April 30, 1985, Great Plains and SFC were continuing their negotiation of a price-guarantee assistance contract, which SFC expects to finalize in the spring of 1985. (See p. 19.)

GAO obtained comments on this report from DOE, ANG Coal Gasification Company, and SFC. DOE and SFC had no formal comments but did offer clarifications in specific areas. Their remarks are incorporated where appropriate. DOE's and SFC's full comments are included as appendixes I and II, respectively. ANG did not submit written comments but offered clarifications that were incorporated.



C o n t e n t s

		<u>Page</u>
DIGEST		i
CHAPTER		
1	INTRODUCTION	1
	Project description and ownership	2
	Project management and oversight	3
	Objectives, scope, and methodology	4
2	PROJECT STATUS AS OF DECEMBER 31, 1984	5
	Construction completed and	
	operational startup in progress	5
	Project costs	10
	DOE audits of costs	10
3	GREAT PLAINS' REQUEST FOR SFC ASSISTANCE	13
	Reduced financial viability prompts	
	request for SFC assistance	13
	Great Plains and SFC reach tentative	
	agreement	16
	May 1984 cash-flow projection	17
APPENDIX		
I	Letter dated April 5, 1985, from the	
	Department of Energy	20
II	Letter dated April 4, 1985, from the	
	U.S. Synthetic Fuels Corporation	21
	<u>ILLUSTRATIONS</u>	
	Great Plains Gasification Associates'	
	partners and percentage of equity	2
	Costs of the period December 1983 through	
	August 1984 which the DOE Office of	
	Inspector General questioned as	
	ineligible	11
	Summary of results of Great Plains cash-	
	flow reports, January 1982-	
	September 1983	14

ABBREVIATIONS

ANG	ANG Coal Gasification Company
Btu	British thermal unit
DOE	Department of Energy
GAO	General Accounting Office
NEPP	National Energy Policy Plan
OIG	Office of the Inspector General
SFC	U.S. Synthetic Fuels Corporation

CHAPTER 1

INTRODUCTION

The Department of Energy Act of 1978--Civilian Applications (Public Law 95-238)--authorizes the Department of Energy (DOE) to provide loan guarantees for alternative fuel demonstration projects. The Secretary of Energy awarded a loan guarantee under the act to Great Plains Gasification Associates of Detroit, Michigan, on January 29, 1982, for up to 75 percent of construction and startup costs for a project to produce synthetic natural gas from coal. The loan was not to exceed \$2.02 billion of the estimated \$2.76 billion cost. The act requires the Comptroller General of the United States to audit recipients of the guarantees and to report to the Congress every 6 months on the status of the loan.¹

The Department of the Treasury's Federal Financing Bank agreed to lend Great Plains up to \$2.02 billion, which DOE agreed to guarantee. Great Plains was to finance the remaining costs with its own equity. As of December 31, 1984, Great Plains had borrowed about \$1.34 billion, and the partners had contributed \$480² million in equity to the project. As of February 28, 1985, Great Plains estimated it would ultimately borrow about \$1.5 billion and the partners would contribute about \$553 million in equity under the loan guarantee agreement. The loan and guarantee are "nonrecourse," meaning that DOE's recourse is limited to the project's assets if Great Plains defaults.

In September 1983 Great Plains sought financial assistance from the U.S. Synthetic Fuels Corporation (SFC), a quasi-government corporation established by the Energy Security Act of 1980 (Public Law 96-294) to accelerate development of a synthetic fuels industry. This was done because the project's financial outlook was less favorable than estimated at the time of the loan agreement. In April 1984 Great Plains and SFC signed a nonbinding letter of intent setting forth financial terms and conditions of possible assistance. Under the letter's terms, Great Plains could receive up to \$790 million of assistance in the form of price guarantees and SFC could receive profit-sharing payments of up to \$1.58 billion

¹Our previous reports are: GAO/EMD-82-55, Mar. 6, 1982; GAO/EMD-82-117, Sept. 14, 1982; GAO/RCED-83-112, Apr. 8, 1983; GAO/RCED-83-212, Sept. 20, 1983; GAO/RCED-84-113, Mar. 22, 1984; and GAO/RCED-84-85, Sept. 18, 1984.

²Great Plains contributed a total of \$524 million in equity. This includes about \$44 million that DOE, prior to signing the loan guarantee agreement, determined was not eligible as equity for the project.

(in March 1984 dollars). As of April 30, 1985, SFC and Great Plains had not reached final agreement on such assistance.

PROJECT DESCRIPTION AND OWNERSHIP

The Great Plains coal gasification plant will be the nation's first commercial-scale facility producing synthetic natural gas from coal. Construction began in August 1981 and was completed by December 31, 1984. The facility, located in Mercer County, North Dakota, has three components: a gasification plant, a lignite coal surface mine, and a pipeline connecting the plant to an interstate network of natural gas pipelines. The synthetic gas is produced through a gasification process using crushed lignite coal. Smaller pieces of coal not used in the process are sold to a steam-powered, electric-generating plant owned by Basin Electric Power Cooperative, located next to the coal gasification plant. Basin Electric has agreed to buy about one-half of the coal mine production and share proportionally in the mine's development cost and related facilities.

Great Plains Gasification Associates--a partnership of five companies--owns the project. The partners and their percentage of equity are as follows:

	<u>Percentage of equity</u>
Tenneco SNG Inc. (an indirect subsidiary of Tenneco Inc.)	30
ANR Gasification Properties Company (a subsidiary of American Natural Resources Company)	25
Transco Coal Gas Company (a subsidiary of Transco Energy Company)	20
MCN Coal Gasification Company (a subsidiary of MidCon Corporation, formerly Peoples Energy Corporation)	15
Pacific Synthetic Fuel Company (a subsidiary of Pacific Lighting Corporation)	<u>10</u>
Total	<u>100</u>

The project has been designed to produce 137.5 million cubic feet of synthetic gas per day, the equivalent of about 23,000 barrels of oil. All the gas produced during the project's initial 25 years of operation will be purchased by four

pipeline companies, which are subsidiaries of four parent companies³ of the Great Plains partners. The prices are set by a formula⁴ that is tied to the prices of other energy products. The formula sets a base price of \$6.75 per million British thermal units (Btu)⁵ in 1980 dollars, which is then adjusted quarterly for inflation and subject to various "caps."⁶

PROJECT MANAGEMENT AND OVERSIGHT

Great Plains appointed the ANG Coal Gasification Company (ANG)⁷ of Detroit, Michigan, as project administrator. ANG is responsible for the construction, startup, and operation of the gasification plant. Great Plains provides overall direction to ANG through a management committee composed of representatives from each of the partners.

The Lummus Company and Kaiser Engineers, Inc., were the prime contractors for engineering, procurement, and construction of the gasification plant. The Coteau Properties Company, a subsidiary of North American Coal Corporation, is responsible for developing and operating the coal mine. ANR Pipe Line Company, formerly Michigan Wisconsin Pipe Line Company, provided construction management services for the pipeline.

³Pacific Synthetic Fuel Company will not purchase any gas.

⁴This formula has been approved by the Federal Energy Regulatory Commission.

⁵A Btu is the quantity of energy required to raise the temperature of 1 pound of water 1 degree Fahrenheit at a specified temperature.

⁶During the first 5 years after the initial delivery of the gas, the price cannot exceed the unregulated price of No. 2 fuel oil. From year 6 to 10, the price will be the greater of the average prices paid by the pipeline companies for the highest 10 percent of domestic natural gas or for Canadian and Mexican gas but in neither case higher than the unregulated price of No. 2 fuel oil. After 10 years, the price will be based on the price of unregulated domestic natural gas. If gas prices are regulated at that time, then the price paid for Canadian and Mexican gas will set the ceiling.

⁷ANG is a wholly owned subsidiary of American Natural Resources Company.

At the federal level, DOE's Office of Oil, Gas, Shale, and Coal Liquids, Office of the Assistant Secretary for Fossil Energy, is responsible for monitoring the construction and operation of the Great Plains project. DOE headquarters delegated responsibility to its Chicago Operations Office for the day-to-day monitoring of the project, which includes determining that a reasonable assurance of debt repayment exists.

OBJECTIVES, SCOPE, AND METHODOLOGY

Our objectives were to (1) update information on the status of the project's construction, disbursements of loan guarantee funds, and ANG's operational startup activities as of December 31, 1984, (2) determine the status of Great Plains' attempt to obtain additional financial assistance from SFC, (3) assess the project's financial viability, and (4) review the actions DOE took in response to the DOE Office of Inspector General (OIG) reports on incurred costs. We made our review between September 1984 and February 1985 in accordance with generally accepted government auditing standards. We covered the project's progress from June 1, 1984, to December 31, 1984.

The information provided is based partly on interviews with DOE project monitoring officials in Chicago, Illinois; SFC officials in Washington, D.C.; ANG project management officials in Detroit, Michigan, and Mercer County, North Dakota; and the Chairman of the Great Plains Management Committee. We reviewed (1) Great Plains' monthly and quarterly reports submitted to DOE, (2) DOE's reports, (3) DOE's monitoring of operational startup activities, (4) the April 26, 1984, letter of intent between SFC and Great Plains, and (5) Great Plains' May 29, 1984, cash-flow projection.

Our review of the project's financial viability focused on an analysis of Great Plains' May 1984 cash-flow projection and the effect of SFC's proposed price-guarantee assistance. For a full description of the scope and methodology of our analysis see our report entitled Financial Status of the Great Plains Coal Gasification Project (GAO/RCED-85-70, Feb. 21, 1985).

We obtained comments on a draft of this report from DOE, ANG, and SFC. DOE and SFC had no formal comments but did offer clarifications in specific areas. Their remarks are incorporated where appropriate. DOE's and SFC's full comments are included as appendixes I and II, respectively. ANG did not submit written comments but offered clarifications that were incorporated.

CHAPTER 2

PROJECT STATUS AS OF DECEMBER 31, 1984

Construction of the Great Plains plant was completed in November 1984, on schedule. However, startup testing disclosed technical problems that prevented the plant from achieving sustained production of synthetic natural gas at an acceptable level. Consequently, the plant was not placed in service (commercial operation) by the target date of December 1, 1984. Great Plains identified a number of plant modifications--estimated to cost \$43 million during 1985--that are needed to correct problems disclosed during startup testing. It estimates that the plant will be placed in service by June 1985. Total project costs through December 31, 1984, were \$1.93 billion. Great Plains estimated as of February 28, 1985, that final project costs will total \$2.081 billion.¹

CONSTRUCTION COMPLETED AND OPERATIONAL STARTUP IN PROGRESS

Construction of the pipeline was completed in August 1983, 2 months ahead of schedule. The gasification plant was completed in November 1984, and the coal mine in December 1984; both were completed as scheduled. As of December 31, 1984, both Great Plains and DOE considered the plant still in the operational startup and testing phase, which began in August 1983. Operational startup and testing involves those activities needed to make the plant's systems ready to operate at planned levels. These activities include testing on a system-by-system basis, solving initial operating problems, and training operations personnel.

As part of the startup and testing program, production of synthetic natural gas began during July 1984. However, Great Plains did not meet the December 1, 1984, date for placing the plant in commercial operation because the plant was not able to demonstrate a sustained acceptable level of production.

Synthetic natural gas being produced

Great Plains began producing synthetic natural gas under the startup and testing program on July 28, 1984. From July 28 through December 31, 1984, Great Plains produced and sold 7.4 billion cubic feet of synthetic natural gas, or an average of 47 million cubic feet a day. In November and December 1984, the average daily amount was 78 million and 93 million cubic feet, respectively. The November and December average rates represent 57 percent and 68 percent of design capacity.

¹The project's originally estimated maximum cost was \$2.76 billion.

According to its project management plan, Great Plains is to operate the plant at a rate of 125 million cubic feet of synthetic natural gas daily (91 percent of design capacity) but is not to achieve that rate of production until 1988, the fourth year of operation. For 1985, the scheduled first year of commercial operation, the plan calls for Great Plains to produce synthetic natural gas at the average rate of 96 million cubic feet a day or 70 percent of design capacity.

Plant's in-service date revised

The initial target date for placing the plant in service was December 1, 1984. The loan guarantee agreement defined the in-service date as the date upon which the facilities are placed into commercial operation which, according to the project management plan, would occur when the startup testing program was completed and full plant production achieved (i.e., production at the design capacity of 137.5 million cubic feet per day of synthetic natural gas).

In November 1984 Great Plains notified DOE that the December 1, 1984, date was no longer attainable. Under the terms of the loan guarantee agreement, Great Plains can borrow funds for project construction and startup activities for up to 1 year after the in-service date. Under the terms of the letter of intent between Great Plains and SFC, Great Plains could begin receiving SFC price-guarantee payments the month after the in-service date, provided Great Plains has stopped borrowing DOE-guaranteed loan funds.

Great Plains advised DOE that modifications would be required in certain of the plant's process, utility, and mechanical areas to correct various problems experienced during the startup testing program. In a December 1984 memorandum, Great Plains further explained that full plant production had never been achieved on any single day, much less on a sustained basis. It pointed out that the current 1-day production record was 111.5 million cubic feet, set on November 12, 1984, and that production the following day dropped to 70 million cubic feet. Great Plains also noted that recent average production had been near 90 million cubic feet per day. Great Plains told DOE that substantial completion and startup testing of the necessary modifications would be required to provide reasonable assurance that operations were sufficiently reliable to put the plant in commercial operation.

Great Plains advised DOE that it believed the in-service date would occur by June 1, 1985. In doing so, Great Plains specified that a financially viable commercial operation could not be assured without the execution of a price-guarantee agreement with SFC. DOE acknowledged that the target in-service date was not met but did not agree with the new date Great Plains had proposed. DOE wanted a clearer definition of the

date, more specifically, a definition that provides the plant will be placed in service when it achieves a specified level of production for a specified length of time.

As of February 28, 1985, DOE and Great Plains tentatively agreed that the in-service date would be the date when the plant has operated for 90 consecutive days commencing after December 1, 1984, (excluding scheduled maintenance and systems modification days) at an average of 70 percent of production capacity and after each train of the plant (the plant has two trains with seven gasifiers each) has produced an average of 68.75 million cubic feet of gas per day (100 percent of production capacity) for 3 consecutive days. DOE and Great Plains had not reached agreement as to a schedule for testing the two trains at 100 percent of capacity. DOE believes the in-service date could occur in June 1985.

Technical problems delay
in-service date

Both Great Plains and DOE agreed that the plant was not in an in-service condition because of certain technical problems disclosed in the plant's testing. Great Plains estimated that \$43 million will be needed for modifications in 1985. These estimates generally were developed prior to completion of detailed engineering and therefore are very likely to change. Great Plains capital budget for 1986 and 1987 included \$25 million and \$15 million, respectively, for proposed plant modifications.

As of December 31, 1984, the most serious of these problems limiting production of synthetic natural gas and requiring solution involved the following four systems or areas:

1. Coal fines separation. The gasifier units being used at the Great Plains facility require lignite coal crushed to about 2-inch-diameter sizes. Smaller size coal (known as coal fines) is to be used by the Basin Electric Company's generating plant located next to the Great Plains gasification plant. However, Great Plains' coal separation system allows too large a quantity of coal fines to reach the gasification units. This has resulted in frequent shut downs. Great Plains employed a consultant to evaluate the coal-handling system and recommend modifications to the system. It estimates that these modifications cost approximately \$150,000.
2. Ash disposal. The gasification process creates coal ashes, which must be removed. The Great Plains ash disposal system was designed to flush the ashes from the gasification system through sluiceways under the gasifiers. However, the system has been experiencing

an excessive buildup of fine ash particles and clay in the sluiceway. The ash particles and clay buildup tend to plug off the sluiceway pumps, piping, and equipment. This causes erratic operations and disrupts gas production. To deal with the problem, Great Plains plans to (1) increase the horsepower of the ash sump pumps, (2) design a separation system to reduce the amount of suspended solids in the water used in the system, and (3) construct two ponds to provide an alternative method for disposing of ash slurry. Budgeted costs to correct this problem total \$4.5 million.

3. Waste water treatment. Great Plains has experienced problems in this area because the quantity of wastewater being generated by various units of the gasification plant has been greater than anticipated. As a result, Great Plains is concerned that process and wastewater treatment facilities will not be able to treat and dispose of the waters expected when the plant is operating at a 100-percent level. For 1985 Great Plains has a number of water management modifications planned with budgeted costs of over \$10 million.
4. Boiler feed water. Inadequate steam/water separation equipment in the low-pressure boilers results in poor-quality condensate that cannot be used as boiler feedwater. In turn, the condensate treatment units are being overloaded. Great Plains believes it will have the boiler feedwater capacity deficiency corrected in May 1985. The prime contractors have accepted responsibility for correcting this deficiency under their contracts for the construction of the plant.

Great Plains has experienced other problems needing correction that do not directly limit its ability to produce synthetic natural gas. An example is the rectisol unit. The primary function of this unit is to remove certain elements or impurities such as sulfur, naphtha, and carbon dioxide from the synthetic natural gas. Great Plains reported to DOE that at higher production levels, sulfur compounds build up, making it impossible to properly clean the gas before it goes to the next processing step. As of February 1985, Great Plains was analyzing the rectisol unit to determine the cause or causes of its problems. When the analyses are complete, Great Plains will prepare estimated budget costs for the necessary modifications.

Another example is the stretford unit. To produce synthetic natural gas, various elements or impurities in the raw gas coming from the gasifiers must be removed. The rectisol unit removes sulfur and other elements, which are then sent to the stretford unit. The primary purpose of the stretford unit

is to recover the sulfur for sale as a by-product. However, sulfur buildup within the stretford unit has resulted in significant plugging problems.

To deal with the plugging problems, Great Plains is trying various methods of operating the unit. Since Great Plains believes the unit's sulfur removal efficiency is below design, it is studying possible redesign to improve efficiency as well as to reduce the plugging problems. Included as part of Great Plains' 1985 plant modification plans are seven projects on the stretford unit. Budgeted costs for these projects total \$3.6 million.

Another problem is related to excessive and unanticipated odor emissions. Modifications of the flares, the stretford sulfur recovery unit, the boilers, the main stack, and certain scrubbers and tank vents are underway. Great Plains plans to complete these modifications by early 1986. Additional modifications are expected to be required as odor sources are more specifically identified. As of January 1985, estimated costs for these modifications were \$6.5 million.

Operational staffing level increased substantially

The size of the labor force needed to operate the plant has increased substantially over original estimates. Great Plains has advised DOE that it would be increasing its operations staff by 100--from 773 to 873--for the year 1985. As of March 1, 1985, DOE's technical monitor was assessing the reasons for this increase in staff, including whether reductions in contract labor would offset this increase. This assessment should be completed in May 1985.

Environmental testing and permit to operate delayed

As a result of startup problems, Great Plains does not expect to complete, within its original schedule, the environmental testing necessary to obtain a permit from the state of North Dakota to operate the plant. The original schedule called for Great Plains to receive a permit by September 1985. Great Plains officials expect a delay of up to 1 year from this date.

In the meantime, the state has granted Great Plains environmental permit variances and, according to state officials, will continue to do so as long as they believe reasonable and diligent efforts are being made to correct the problems. In February 1985 Great Plains and North Dakota officials were negotiating a revised schedule for completing the environmental testing program.

PROJECT COSTS

The project's originally estimated maximum cost was \$2.76 billion. Through December 31, 1984, actual costs were \$1.93 billion. On the basis of its estimate that the plant's in-service date would occur by June 1, 1985, Great Plains as of February 28, 1985, estimated that the project's total cost will amount to \$2.081 billion.

Actual cost has been less than anticipated for a variety of reasons. These included (1) lower than expected interest expenses because the amount of loans needed was less than anticipated and more favorable interest rates were obtained than anticipated, (2) lower prices on some subcontracts than originally budgeted, (3) less indirect labor expense than budgeted, and (4) lower costs than anticipated for engineered equipment.

The \$1.93 billion total net project cost as of December 31, 1984, included the startup and testing cost of about \$193 million. Great Plains capitalized this cost, as planned, because the facility was not in commercial operation. More specifically, Great Plains added to the construction and development cost the expenses incurred during startup and testing, including operation and maintenance expenses. Great Plains also deducted the revenue received from sales of the synthetic natural gas and by-products produced during the startup activities and from charges for transporting the gas to the interstate pipeline via the connecting pipeline. These revenues amounted to about \$44 million, including \$41.8 million from sales of synthetic gas.

Funds received through December 31, 1984, totaled \$1.86 billion. Of that amount, the Federal Financing Bank lent \$1.34 billion and the partners contributed \$480 million in equity. As of February 28, 1985, Great Plains estimated that it would ultimately borrow about \$1.5 billion and contribute about \$553 million in equity under the loan agreement.

DOE AUDITS OF COSTS

In a previous report² we recommended that DOE initiate audits to determine the eligibility of costs incurred by Great Plains that are to be paid out of the loans DOE guaranteed. In response to our recommendation, DOE's Office of the Inspector General (OIG) began to audit the eligibility of costs in November 1982.

²Status of the Great Plains Coal Gasification Project--August 1982 (GAO/EMD-82-117, Sept. 14, 1982).

As of December 31, 1984, the OIG had completed five audits. The first was a programmatic review, and the next three covered costs incurred every 6 months from the start of the project through August 31, 1984. The OIG's latest report covered the 9-month period, December 1983 through August 1984. We have commented on the results of the first three audits in previous reports.³

In August 1984 the OIG issued its fourth audit report, covering costs from June through November 1983. The OIG reported that Great Plains claimed costs totaling \$322 million. Of this amount, \$63,353 was questioned by the OIG as ineligible. The questioned costs were donations by Great Plains of \$34,280 and imputed interest of \$29,073. The DOE Chicago Operations Office, which is responsible for making the final determination of cost eligibility, concluded that the \$63,353 was ineligible.

In January 1985 the OIG issued its fifth report, covering costs from December 1983 through August 1984. The OIG reported that Great Plains claimed costs totaling \$367 million. Of this amount, \$538,536 was questioned by the OIG as ineligible. The costs were questioned on the following bases:

Interest costs not authorized by the loan agreement	\$ 57,347
Costs of seeking price supports from SFC	287,248
Return on investment	4,844
Severance allowances based on work unrelated to the Great Plains project	27,756
Donations	28,526
Early retirement costs based on work unrelated to the Great Plains project	1,169
Billing of costs by a vendor which the vendor and Great Plains agreed to withdraw	90,825
Legal costs associated with a possible sale of ANG, the project administrator, to Great Plains Gasification Associates, the project owner	7,146
Costs of legal advice on the tax effect of abandonment and the production tax credit	33,675
Total	<u>\$538,536</u>

³Status of the Great Plains Coal Gasification Project--Summer 1983 (GAO/RCED-83-212, Sept. 20, 1983), and Status of the Great Plains Coal Gasification Project (GAO/RCED-84-113, Mar. 22, 1984).

On January 18, 1985, DOE determined that all of the questioned costs except the \$287,248 were ineligible. DOE accepted the \$287,248 on the basis that Great Plains' efforts to obtain price supports were for safeguarding repayment of the DOE-guaranteed loan.

CHAPTER 3

GREAT PLAINS' REQUEST FOR SFC ASSISTANCE

As part of the loan guarantee agreement, DOE requires Great Plains to submit a variety of financial data, including cash-flow projections showing future net income, distribution of funds to partners, capital investment requirements, and other information demonstrating both its ability to repay the loan DOE guaranteed and the project's profitability. Cash-flow projections prepared subsequent to the signing of the agreement have reflected a progressively downward trend in energy prices. Because of decreased energy price projections, Great Plains sought additional assistance from SFC. As of April 30, 1985, SFC and Great Plains were negotiating the final terms and conditions of a contract for price guarantee assistance. SFC expects to finalize the contract in the spring of 1985.

REDUCED FINANCIAL VIABILITY PROMPTS REQUEST FOR SFC ASSISTANCE

The cash-flow projection Great Plains prepared in January 1982 when the loan guarantee agreement was signed indicated a favorable financial outlook for the project. However, subsequent projections prepared in March and September 1983 indicated a less optimistic outlook. Key data from these projections are compared in the following table. It summarizes the changes in projected net income, funds distributed to the partners, and capital investment requirements through the last year of each of the cash-flow projections Great Plains has submitted and through 1996 (the last year covered by the January 1982 projection and the last year used for comparative purposes with the other cash-flow projections).

	<u>January 1982</u>	<u>March 1983</u>		<u>September 1983^a</u>	
	1981 through <u>1996^b</u>	1981 through <u>1996^c</u>	1997 through <u>2000^d</u>	1981 through <u>1996^c</u>	1997 through <u>2009^e</u>
----- (millions of undiscounted dollars) -----					
Net income	\$2,200	\$(382)	\$1,700	\$(1,200)	\$9,800
Distribution of funds to partners	1,500	0 ^f	942	0 ^f	8,800
Capital investment requirements by partners after inservice date	86	841	0 ^g	1,300	0 ^g

^aProjection based on estimated mid-level energy prices.

^bThe January 1982 cash-flow projection stopped with 1996 because Great Plains estimated that the DOE-guaranteed debt would be fully repaid by that time.

^c1996 was the last year of the January 1982 cash-flow projection and is shown for comparative purposes.

^dThe March 1983 cash-flow projection stopped with 2000 because Great Plains estimated that the DOE-guaranteed debt would be fully repaid by that time.

^eThe September 1983 cash-flow projection ended in 2009—the last year of the plant's expected operating life.

^fNo distributions of funds to the partners through 1996.

^gNo additional capital investments required.

The main reason for the changes shown in the cash-flow projections was that the energy prices used to estimate the project's synthetic gas prices were lower than those used in January 1982. As noted in our prior reports, Great Plains' ultimate financial success is extremely sensitive to changes in future energy prices.¹ The March 1983 projection was based on future mid-level energy prices as forecasted in DOE's preliminary National Energy Policy Plan IV (NEPP IV).² The September 1983 projection was based on revised preliminary NEPP IV energy price forecasts made in June 1983. These forecasted prices were lower than those Great Plains used in its March 1983 projection.

In addition to information on project net income, distributions, and capital from partners, Great Plains' September 1983 cash-flow projection provided analyses that considered tax implications for the parent companies. It indicated that should the forecast mid-level prices occur, the parent companies could experience a cumulative after-tax net loss of \$718 million during the first 10 years (1985-94) of the project's expected 25-year operating life. However, the after-tax losses would eventually be offset by after-tax income of \$5.2 billion during the last 15 years of the project's expected life--1995 to 2009. This includes \$4.7 billion of after-tax income in the last 10 years resulting from sharply higher forecast synthetic gas prices in those years.

Although Great Plains recognized the project's potential for long-term profitability, its partners were more concerned that the large after-tax losses during at least the first 10 years of operations and the risk of potentially lower energy prices would diminish their consolidated earnings, tend to weaken their credit rating, increase their cost of capital, and drain capital from their other businesses. According to the partners, they gave more weight to these factors than to the speculative profits the project might generate in the future. The partners believed that the near-term problems posed too great a risk especially since the long-term profitability could be realized only if the forecast rise in energy prices actually occurred.

¹Economics of the Great Plains Coal Gasification Project
(GAO/RCED-83-210, Aug. 24, 1983).

²The Department of Energy Organization Act (Public Law 95-91) requires DOE to prepare analyses of future energy trends. These analyses are called National Energy Policy Plans. DOE released its final NEPP IV projections in October 1983. The trends are presented in terms of estimated high-, mid-, and low-case energy prices.

In September 1983 Great Plains applied to SFC for additional assistance in the form of price guarantees. In November 1983 the partners notified DOE that because of the projected reductions in profitability as shown in the September 1983 cash-flow projection, they were considering terminating their participation in the project unless additional federal assistance was received on a timely basis.

GREAT PLAINS AND SFC
REACH TENTATIVE AGREEMENT

Following a period of negotiations, Great Plains and SFC signed a letter of intent³ in April 1984 outlining the general terms and conditions of possible assistance. The major elements of the letter of intent follow:

--SFC would provide up to \$790 million in price guarantees for up to 10 years after the date of initial synthetic gas production. The guaranteed payments would be the difference between the guaranteed price and the market price of the gas sold. The guaranteed prices were set at \$10 per million Btu's for the first 3 years and \$7.50 per million Btu's for the remaining 7 years.⁴ The prices will be adjusted monthly for inflation.

--During the first 3 years of the price guarantee period, Great Plains' partners would contribute an additional \$100 million in equity, and all project-related positive cumulative after-tax cash flow⁵ (including that generated from price guarantee receipts) would be used by Great Plains to accelerate repayment of the

³A nonbinding statement documenting the financial terms negotiated by SFC staff and Great Plains management. The letter also discusses the various conditions that Great Plains must meet before SFC's board of directors will consider approving financial assistance. As of April 30, 1985, SFC's board of directors had not approved the assistance contract.

⁴According to the Energy Information Administration's Annual Energy Outlook for 1983, the price residential customers paid for natural gas in 1983 was \$5.80 per million Btu's, commercial users paid \$5.42 per million Btu's, and industrial users, \$4.18 per million Btu's.

⁵Cash generated by the project plus tax benefits available to the parent companies of the Great Plains partners. Prepayment of the debt and profit-sharing payments are made only when Great Plains' cumulative after-tax cash flow is positive and increasing. A payment of either is based on any increase that occurs in the after-tax cash flow since the last time a payment was made-- called the positive cumulative after-tax cash flow.

DOE-guaranteed loan. Thereafter, until the DOE-guaranteed loan is fully repaid, Great Plains would use 90 percent of the positive cumulative after-tax cash flow to accelerate repayment of the loan balance.

--After the debt is paid, Great Plains would make profit-sharing payments to SFC amounting to 70 percent of the positive cumulative after-tax cash flow over the remaining useful life of the project, up to a maximum of \$1.58 billion in March 1984 dollars.

MAY 1984 CASH-FLOW PROJECTION

In May 1984 Great Plains submitted to DOE a cash-flow projection that differed in several respects from its previous projections. For example, Great Plains included the proposed terms of SFC price guarantee assistance, changed its method of calculating synthetic natural gas prices, and considered the impact of production tax credits.⁶

The previous projections did not consider production tax credits because Great Plains did not believe that the partners were eligible for them. However, in July 1984, the Internal Revenue Service ruled that Great Plains is entitled to the tax credits and could pass them on to the partner companies. Great Plains, DOE, and SFC officials believe this ruling means that the partners are eligible to use the credits. Since the May projection was submitted prior to the ruling, Great Plains assessed the project's finances two ways--with and without tax credits being used. The discussion that follows is limited to the portion of the projection that assumed the partners would utilize 100 percent of the production tax credits available.

In contrast to the January 1982 projection, the May 1984 cash-flow projection showed the following:

--The project would lose \$240 million rather than realize net income of \$2.2 billion by 1996. However, by the year 2009, net income would total \$1.4 billion.

--Distribution of funds to the partners would be \$38 million through 1996 rather than \$1.5 billion. By the year 2009, cumulative distributions to the partners would total \$2.4 billion.

⁶The Crude Oil Windfall Profits Tax Act of 1980 (Public Law 96-223) authorizes production tax credits. They apply to qualified fuels sold between January 1, 1980, and December 31, 2000. The amount of the credits is deducted from taxes owed.

--Additional capital, totaling \$811 million, would be needed over 11 years to meet general cash requirements instead of \$86 million over 3 years.

The May 1984 projection showed these losses even though it indicated Great Plains would receive \$790 million in price-guarantee assistance between 1985 and 1989. It also showed that Great Plains would make profit-sharing payments to SFC between the years 2000 to 2009 amounting to \$1.2 billion.

Since April 1984, when the letter of intent was signed and since the Great Plains cash-flow projection in May 1984, several events have occurred, which could affect the project's financial outlook. For example, Great Plains and SFC are negotiating a final agreement that could change some conditions set forth in the letter of intent. SFC has revised its energy price forecast downward,⁷ and DOE issued a draft of NEPP V, which also projected a downward trend in energy prices.

In August 1984 the Chairman, Subcommittee on Environment, Energy, and Natural Resources, House Committee on Government Operations, requested that we review Great Plains' May 1984 cash-flow projection and determine the effect of SFC's proposed price-guarantee assistance on the project's financial viability. In summary, we reported to the Chairman, among other things, that the May 1984 cash-flow projection showed that, even with the proposed SFC assistance, the project would still not be as financially viable as anticipated in January 1982. For example, the projection showed that the project would lose \$240 million through 1996 rather than realize net income of \$2.2 billion, as projected in January 1982.

We also reported that according to an SFC April 1984 analysis, Great Plains, over the life of the project, would realize a lower internal rate of return⁸ with the \$790 million in assistance (14 percent) than without it (19 percent).⁹ The factors that contribute to the lower internal rate of return are the additional equity the partners would contribute, accelerated debt repayment, and sharing of profits. However, we further reported that the Great Plains

⁷We previously reported in Economics of the Great Plains Coal Gasification Project (GAO/RCED-83-210, Aug. 24, 1983) that the finances of this project are extremely sensitive to energy price changes.

⁸An internal rate of return is the interest rate that equates the present value of future cash flows or receipts to the initial capital investment.

⁹Both analyses are based on SFC's April 1984 mid-level energy price scenario and assume 77 percent production tax credits.

partners are willing to accept a lower rate of return because SFC's assistance would provide additional income during the first 10 years of operations (1985-94) and help alleviate the impact of short-term losses. As explained earlier, although the project offers potential long-term profitability, the partners are more concerned about possible large after-tax losses during the first 10 years. For our full analysis of the effect of the SFC assistance on the Great Plains project, see our report Financial Status of the Great Plains Coal Gasification Project (GAO/RCED-85-70, Feb. 21, 1985).

As of April 30, 1985, Great Plains and SFC were continuing their negotiation of a price-guarantee assistance contract, which SFC expects to finalize in the spring of 1985.



Department of Energy
Washington, D.C. 20545

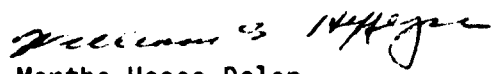
APR - 5 1985

Mr. J. Dexter Peach
Director, Resources, Community, and
Economic Development Division
U. S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Peach:

The Department of Energy (DOE) appreciates the opportunity to review and comment on the GAO draft report entitled "Status of the Great Plains Coal Gasification Project" - December 31, 1984. DOE has no formal comments. Comments of an editorial nature have been provided directly to members of the GAO audit staff.

Sincerely,


Martha Hesse Dolan
Assistant Secretary
Management and Administration



United States Synthetic Fuels Corporation

2121 K Street, N.W. Washington, District of Columbia 20586 Telephone: (202) 822-6600

April 4, 1985

Mr. J. Dexter Peach
Director
Resources, Community and
Economic Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Peach:

Thank you for the opportunity to review your draft report on the status of the Great Plains Coal Gasification Project. Other than some suggested corrections which have been transmitted to your staff, the Corporation has no comments.

If we can be of any further assistance, please do not hesitate to call.

Sincerely,

A handwritten signature in black ink, appearing to read 'E. Noble', with a long horizontal flourish extending to the right.

Edward E. Noble
Chairman of the Board

(301676)





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