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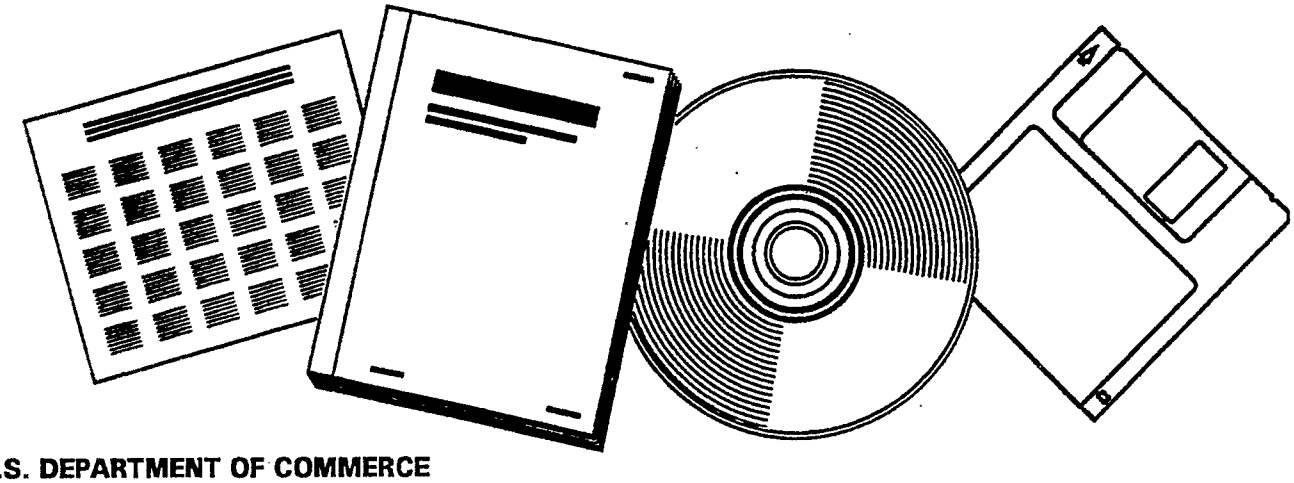
TRI-STATE SYNFUELS PROJECT REVIEW: VOLUME 1A. EXECUTIVE SUMMARY AND OVERALL PROJECT REVIEW

TRI-STATE SYNFUELS CO.
HOUSTON, TX

JUN 1982



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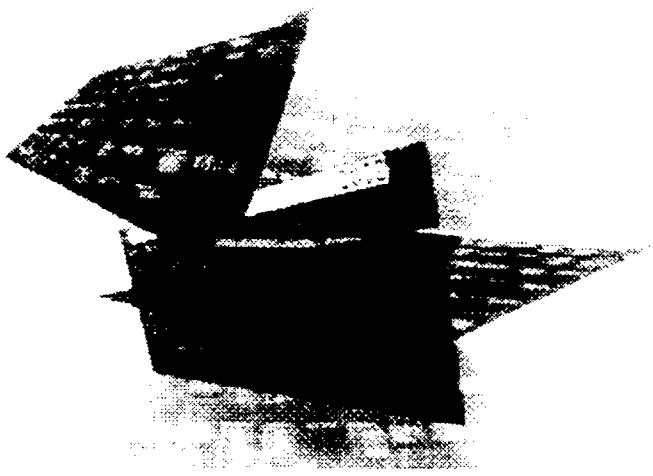

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TRI-STATE SYNFUELS PROJECT REVIEW

VOLUME 1A

EXECUTIVE SUMMARY AND OVERALL PROJECT REVIEW

JUNE 1982

TRI-STATE SYNFUELS COMPANY

PREPARED FOR U.S. DOE
UNDER COOPERATIVE
AGREEMENT NO. DE-FC05-81OR20807

DOE/OR/20807--T1-Vol.1A

DISCLAIMER

NOTICE

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DISCLAIMER

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II. INTRODUCTION

Tri-State Synfuels Company and its principle contractors, Fluor Engineers and Constructors, Radian Corporation, Sasol and Lurgi have developed a detailed and comprehensive set of Project Review Reports of which this volume is the first of a series of 14. These volumes contain project information and documentation covering all aspects of the project beginning with the initiation of the U.S. DOE Cooperative Agreement on February 6, 1981 and extending through the termination of that agreement on June 7, 1982.

1.0 PROJECT REVIEW REPORTS

The objective of the Project Review Reports is to address each of the major work areas in the following manner:

History - A description of the nature and scope of the work beginning February 6, 1981 listing major goals and objectives of the work area, and a record of all individuals and entities involved in the work effort. A description of the work plan, the work completed, major accomplishments and key decisions reached is also included. A review of the alternatives considered for major decisions and a discussion of the rationale for what was done and the decisions reached is presented. Where appropriate, an identification of major problems, what was done to overcome such problems, and discussion of how they could have been avoided is addressed.

Current Status - Special effort has been made to take a "snapshot" of the project status as of May 1982. The reports contain discussions as to the current focus of work activities, key decisions pending, open issues and decision dates. An identification of what was planned, completed, and left undone as of May 1982 is also included. Where applicable, a description of special actions or measures that have been taken to "package" the project to facilitate a start-up in the future.

Future - In the more critical aspects of the project a discussion as to the future plans and activities for completion of Phase I of the project are presented. This includes an outline of the future work program, future milestones/master schedule, and future long lead/critical path activities. This section also addresses new areas that deserve special attention in the future, critical items and important tasks that should be undertaken if and when the project is

restarted and future recommendations for changes in the nature, content, and methodology of the work.

A list of the titles, volume numbers and author of each of the Project Review Reports is presented in Exhibit II-A. A brief description of Volumes 2 through Volume 14 of this series is presented below:

Volume 2 - Engineering & Process Summary

This volume, written principally by Fluor with input from the Tri-State Irvine Engineering team is in effect an Executive Summary of the engineering aspects of the project. The volume summarizes the major aspects of Case 13 - Lurgi gasification of 8,200 tons per day of coal to produce synthesis gas upgraded through Lurgi's methanation and methanol synthesis and Mobil's methanol-to-gasoline processes to produce 9,300 bpd of liquid fuels, 37 MMscfd of high-Btu pipeline quality gas and 250 TPD of chemical feedstock and products. Included are process and facilities descriptions, cost estimates, capital, operating and maintenance estimates, and construction schedules. A narrative of the evolution of the Sasol Feasibility Study of the final selected process configuration, Case 13, is included along with major issues affecting the development of Case 13.

Major Sections include:

- Project Definition
- Evaluation of Case 13
- Major Project Issues

Volume 3 - Process Evaluation, Selection, and Design

This volume prepared by Fluor contains detailed information for the major process areas of the plant.

Included in each of these sections, where relevent, are the subsections listed below:

- Process Description
- Flow Sheets
- Material Balances
- Accomplishments and Decisions
- Current Status
- Licensors and Evaluations

Information contained in this volume is relevent to the current project and would be used to continue process design work.

Major Sections include:

- Gasification
- Sulfur Recovery
- Methanol Synthesis
- MTG
- SNG
- Methanol Purification (Case 14)
- Tank Farm
- Steam System
- Oxygen Plant
- Flue Gas
- Cooling Systems
- Water Management
- Progress Design Criteria

Volume 4-A - Design Engineering

This volume prepared by Fluor contains two major sections:

- Civil Engineering
- Piping Engineering

The civil section of volume 4-A contains preliminary civil/structural data used to support development of the Tri-State facilities. The vast majority of civil work relates to site development work used to support the plot plan layout work. This site development work was also used for environmental work. The proposed site plan and related grading/drainage scheme is included for Cases 13 and 7R.

The piping section of Volume 4-A contains information related to plot plan development. Included is information which outlines the reasoning behind the evolution of the full size Fischer-Tropsch (Sasol) plot into Case 13. Standard drawings completed in this phase of the project are included for future use.

Volume 4-B, Design Engineering

This volume prepared by Fluor contains two major sections:

- Environmental Engineering
- Mechanical Engineering

The environmental section of Volume 4-B summarizes the current status of all environmental support work handled by Fluor. Also included is any information prepared by Fluor for Radian's use. Portions of this work were supplied to Radian during this phase of the project. All environmental data included in Volume 4-B is based on Case 13 unless otherwise noted.

The mechanical section of Volume 4-B deals foremost with the material handling aspects, including coal receiving, coal handling, coal storage, final coal preparation and handling, ash handling, and other minor solids, i.e., lime, pot ash, etc.

An additional mechanical section is devoted to information related to cooling towers.

Volume 5 - Engineering Cost, Budgets, and Schedules

Volume 5 prepared by Fluor contains the latest capital cost and operating cost estimates for Cases 13, 14, and 15. Supporting data is included for Case 13. Project/construction schedules for Case 13/14 are also included.

A portion of Volume 5 is devoted to the Phase I budget and schedule.

Major sections include:

- Cost Estimates for 13, 14, and 15
- Project Schedules
- Phase I Budget
- Back-up Data (Case 13)
- Construction Labor Survey

Volume 6 - Environmental, Health, Safety, and Socioeconomic Review

This volume provides the environmental information developed by Radian Corporation during the project. Included is detailed information on the natural and man-made environment, a detailed Health/Safety Management Plan outline, a conceptual plan for the development of a non-hazardous waste disposal site, the general strategy to be utilized to obtain air permits, and a site selection analysis describing the process used to select the Geneva site. Little environmental impact analysis was performed prior to project demobilization, hence the impacted sections are not fully developed.

Major sections include:

- Natural Environment
- Manmade Environment
- Health and Safety Management
- Solid Waste Management
- Air Pollution Strategy
- Site Selection Analysis

Volume 7 - Permits, Environmental Impact Statement, and Related Environmental Information

This volume prepared by Tri-State summarizes permit and environmental impact statement (EIS) status prior to project demobilization. A brief discussion regarding each major environmental permit is provided, together with appropriate supporting documentation. The status of the EIS is addressed, along with the agencies involved and the comments received regarding the scope of the EIS. Offsite transportation corridors are also addressed in this volume.

Major sections include:

- Review of each permit required.
- Environmental Impact Statement
  - o Agencies
  - o Procedures
  - o Content
  - o Scoping Program
  - o Schedule
- Offsite Transportation Corridor
- Wastewater Treatability Study

Volume 8 - Commercial Status of Licensed Process Units

Volume 8 prepared by Fluor contains brief process descriptions and lists commercial installations for licensed units. All major units required for Case 13 are included.

Volume 9-A - Subcontract Information

Volume 9-A prepared by Fluor contains information relevant to the Ranney and soil boring contracts. Each contract section contains the following subsections:

- Purpose of Contract
- Bidder's List
- Bid Summary
- Contract
- Final Report
- Contract Evaluation

Major Sections:

- Hydrogeological Survey (Ranney)
- Geotechnical Investigation (Soil and Material)

Volume 9-B - Subcontract Information

Volume 9-B prepared by Fluor contains information relevant to the mapping and land survey contracts. Each contract section contains the following sub-sections:

- Purpose of Contract
- Bidder's List
- Bid Summary
- Contract
- Final Report
- Contract Evaluation

Major Sections:

- Aerial Photographing and Mapping (Western Air Maps)
- Legal Survey (Morley)

Volume 10 - Narrative Specifications

Volume 10, prepared by Fluor, lists all narrative specifications and indicates their completion status. All approved for construction (AFC) specifications are included.

Major Sections:

- Summary and Status
- AFC Specifications

Volume 11 - A - Engineering and Processing Alternatives

Volume 11 - A, prepared by Fluor, contains a list of all Phase I studies and their status, i.e., final, draft, preliminary draft, cancelled. Copies of all studies in final or draft status are included. The included studies are:

- Half size plant
- Methanol/SNG production
- Economics of export power generation
- Air/water cooling breakpoint
- Comparison of mechanical and natural draft cooling towers
- River intake versus Ranney wells
- Concrete versus fireproofed structural steel
- Upgrade creosote to diesel
- Ethane/Ethylene to sales
- Carbon dioxide compression for enhanced oil recovery
- Nitrogen compression for enhanced oil recovery
- Alcohol for direct sales/blend
- Solid waste disposal study

Major Sections:

- Status of Studies
- Individual Studies

Volume 11-B - Process Development Studies

Volume 11-B, prepared by Fluor, contains Fluor Process Development Study 26A. The latest revisions and up-dates are included. This volume contains Case Studies 1-12 and 1R-8R.

Major Sections include:

- Management Summary
- Study Basis
- Case Studies
- Reduced Plant Case Studies

Volume 11-C - Cost Reduction Studies

Volume 11-C, prepared by Fluor, contains Fluor Process Development Study 27A. The latest revisions and up-date are included. This volume contains Case Studies 7R1-7R12.

Major Sections include:

- Management Summary
- Study Basis
- Case Studies
- Detailed Analyses

Volume 12 - Fluor Project Status

Volume 12, prepared by Fluor, is to be used by Fluor/ Tri-State to recover the work to facilitate in restarting the project. This volume is structured around Fluor operations and work packages.

Major Sections include:

- Introduction
- Statistical History of the Project
- Present Status of the Project
- Location of Project Data and Materials
- Project Engineering Files
- Project Personnel Directory
- Scope of Work
- Detail Status of Project by Fluor Operation
- Status of Licensor Work

- Status of Subcontracts
- Status of Deliverables
- Recovery Plan

Volume 13 - Coal Sampling and Testing

This report, prepared by Tri-State with input from Lurgi, Paul Weir Company, and Commerical Testing & Engineering Co. focuses on the sampling and testing program for run-of-mine Illinois Basin coals which was conducted for the supply and design program. The report covers work scope, objectives and goals, work efforts and actual costs as well as a summary of the completed, on-going and future work.
The review of the work plan consists of detailed summaries which also appear in Volumes 1 and 2, Coal Sampling and Testing Report.

Ten mines representative of future coal production were sampled, tested and evaluated. The mines represented a mix of underground - both continuous and conventional mining - and strip mining.

The overall program was conducted to identify coals suitable for Lurgi gasification which would supplement the data from the Camp 1 coal being used as the design coal for the Tri-State Synfuels Project. Estimates are presented for design purposes on size consist and coal quality range and maximum heat and flow rates for major equipment for typical Illinois Basin coals were developed. The work effort is complete.

Major Sections include:

- Coal Sampling and Results
- Analytical Testwork Review

Volume 14 - Commercial Scale Coal Test

This volume, prepared by Tri-State, with input from Lurgi, Sasol, Paul Weir, Commercial Testing & Engineering Co., and McLachlan & Lazar focuses on the overall program consisting of planning, implementing and supervising the activities surrounding the commerical scale test of Kentucky 9 coal in the Lurgi Mark IV gasifier at the Sasol One plant in Sasolburg, Republic of South Africa.

The report covers work scope, objectives and goals, work efforts and actual costs as well as a summary of the completed, on-going and future work.

The review of the work plan consists of detailed summaries which also appear in Volumes 1 through 5 of the Commercial Scale Coal Test Report. Volumes 6 and 7, Export Sample

Program and Wastewater Treatability Study, are still on-going so no summaries are available.

The program was conducted to confirm the gasifiability of Kentucky 9 coal, and provided gasification design and environmental criteria bases for the project. Design recommendations are presented on coal source, coal preparation, coal quality, size consist, fines generation, steam consumption, oxygen consumption, gas flow rate and composition, materials of construction, control measures, fines utilization, coal weathering, coal leaching and spontaneous ignition.

The information was used to develop the heat and material balances for the design coal from gasification through syngas.

Major Sections include:

- Selection of Camp 1 Coal
- Collection and Shipment
- Gasification Test at Sasolburg
- Coal Fines Utilization in Furnace Boilers
- Kentucky Stockpile Tests
- Export Sample Program
- Wastewater Treatability Study

EXHIBIT II-B

COAL TESTING REPORTS

Volume	Title	Author(s)
Coal Sampling and Testing Program		
1	Sampling and Results	Tri-State
2	Analytical Testwork	Tri-State
Commercial Scale Coal Test		
1	Selection of Camp 1 Coal	Tri-State
2A	Collection & Shipment Mine, Barge, Ship & Train Programs	Tri-State, CT&E, Paul Weir Co., Texas Gas
2B	Collection & Shipment Analytical Testwork	Tri-State, CT&E, Paul Weir Co.
2C	Collection & Shipment Photographic Review	Tri-State
3A	Gasification Test at Sasolburg Overview	Tri-State, Sasol, Lurgi
3B*	Gasification Test at Sasolburg Full Report	Sasol
3C*	Gasification Test at Sasolburg Test Results & Analyses	Sasol
4	Coal Fines Utilization in Furnace Boilers	Paul Weir
5	Kentucky Stockpile Tests	Tri-State, Texas Gas, Paul Weir Co., Lurgi

*Non-Deliverable, Proprietary Reports

2.0 COAL SAMPLING AND TESTING REPORTS

Also included in the series of Tri-State published documents are a number of detailed and comprehensive reports covering all activities associated with Tri-State coal sampling; analytical testwork; test coal selection, mining, and shipment; the gasification test at Sasolburg and other related work. Titles, volume numbers, and authors of these reports are presented in Exhibit II-B and are summarized below:

2.1 COAL SAMPLING AND TESTING PROGRAM

Volume 1 - Sampling and Results

This report focuses on the sampling and results for run-of-mine Illinois Basin coals which was conducted for the supply and design program.

Samples from ten mines in Kentucky, Illinois and Indiana representative of future mining were selected, collected, prepared and analyzed.

Coals suitable for Lurgi gasification which would supplement the Camp 1 coal data being used as the design coal have been identified.

Paul Weir Company provided the work plan and instructions and Commercial Testing & Engineering Co. conducted the detailed analytical testwork. Reports by Paul Weir on sample collection, sampling and preparation, screen analysis and coal quality are presented. Samples were provided to Lurgi for analytical testing and evaluation and their laboratory test reports are provided. Sasol offered advice on critical items needed to select coal.

The Lurgi report on ranking of these coals and other previous samples was based primarily in terms of steam and oxygen consumption. Paul Weir Company provided recommendations on fines content and coal quality.

Major Sections include:

- Work Plans
- Design Coal Recommendations
- Results of Mine Sampling Program
- Procedures for Mine Sampling

Volume 2 - Analytical Testwork

This volume contains detailed results on coal size analyses and analytical test work by Commercial Testing & Engineering Co. for the total, coarse and fine fractions.

The ASTM standard methods include the proximate and ultimate analyses, equilibrium moisture, gross calorific value, surface forms, tumbler test, free swelling index, Hardgrove grindability, ash mineral analysis, and ash fusion temperatures. The special analyses are caking number, water soluble alkalies, spark source, mass spectrography, atomic absorption spectroscopy, fluorine, mercury and Fischer assay.

University of Kentucky - Institute for Mining and Minerals Research data on coal and ash are presented including maceral analysis, microlithotype analysis, reflectances, and anistropy.

Major Sections include:

- CT&E size analysis
- CT&E coal and coal ash
- U of K coal and coal ash

2.2 COMMERCIAL SCALE COAL TEST

Volume 1 - Selection of Camp 1 Coal

This report focuses on the rationale for selecting the Camp 1 coal for the commercial scale coal test and design basis. The report briefly describes the scope of the November 1980 preliminary collection of Illinois Basin coal quality data and the results of three coals from this list examined by Commercial Testing & Engineering Co., Lurgi, Sasol and Paul Weir Company. The reasons for selection of the Camp 1 mine are provided.

Major Sections include:

- Candidate Coals
- Recommendation - Results
- Instructions

Volume 2-A - Collection and Shipment
Mine, Barge, Ship and Train Programs

This report covers the collection of the 22,500 ton sample of Camp 1 coal at the mine in Morganfield, Kentucky and shipment of the sample to Sasolburg, Republic of South Africa from February through April 1981. The collection and shipment

phase covers the inspection, sampling, preparation and analytical testwork on coal quality and size at the mine, barge, ship and train locations.

The detailed work plans and instructions developed by Paul Weir Company are given. Reports on the loading and sampling at each location are provided by Paul Weir and by Texas Gas at the Uniontown loading.

Several design recommendations on coal preparation, coal analysis and fines generation are offered.

Major Sections include:

- Work Plan
- Design Recommendations - Mine Program
- Barge Program
- Train Program
- Stockpile Program

Volume 2-B - Collection and Shipment Analytical Testwork

This report covers the detailed analytical test work conducted by CT&E and M&L for control purposes during the collection and shipment phase as well as the result obtained on the composite barge sample. The testwork covers the complete screen, physical and chemical characterization and leaching of the barge composit sample and its coarse (gasification) and fine (steam generation) fractions as well as the quality control measures during loading and transloading.

Splits of the samples representing the barge shipment were sent to Lurgi, Sasol, University of Kentucky - Institute for Mining and Minerals Research, and the Pennsylvania State University and the laboratory result are provided.

The results of a quality comparison between CT&E and M&L are presented. An evaluation of mineral specimens collected at the Camp 1 mine and Sasolburg stockpile is reported.

Major Sections include:

- Lurgi Laboratory Results
- Sasol Laboratory Results - Commercial Testing & Engineering Results
- University of Kentucky - Institute for Mining and Mineral Research
- Pennsylvania State University Results
- Program Comparison

Volume 2-C - Collection and Shipment
Photographic Review

This report is a photographic review of the collection and shipment phase. It covers the locations at Morganfield and Uniontown, Kentucky; Darrow, Louisiana; Port Elizabeth and Sasolburg, Republic of South Africa.

Major Sections include:

- Tour of Mine and Terminal
- Morganfield, Kentucky
- Uniontown, Kentucky
- Darrow, Louisiana
- Port Elizabeth, Republic of South Africa
- Sasolburg, Republic of South Africa

Volume 3-A - Gasification Test at Sasolburg
Overview

This report focuses on the commercial scale gasification at Sasolburg between July and November 1981.

Three test reports were prepared by Sasol Technology (Proprietary) Limited and the non-confidential version is included in this volume. This summary report includes an executive summary, test results, description of the test runs and log sheets for all three phases. A program plan is also included.

Lurgi reports on the coal shipment and Sasolburg test samples taken by Lurgi are provided. Lurgi's comments on the Sasol summary report are given. Supplemental information on the Lurgi gasification process and Mark IV gasifier is given.

The confidential Sasol reports entitled "Full Report" and "Test Results and Analyses Only" are included in Volume 3B and 3C. Volume 3C may be examined by U.S. Department of Energy and Kentucky Department of Energy.

Major sections of Volume 3A include:

- Sasol Reports
  - o Summary
  - o Process Description
  - o Process Flow
  - o Analytical Protocol
- Lurgi Reports
  - o Laboratory Results
  - o Sasol Test

Volume 4 - Coal Fines Utilization in Furnace Boilers

This report focuses on the technical feasibility of coal fines utilization as a boiler fuel in both cyclone and pulverized fuel furnace boilers.

The coal fines examined were representative of the fine fraction of the Camp 1 coal shipment. Paul Weir Company directed the study and Commercial Testing & Engineering Co. conducted the experimental work on raw and washed fines.

A comparison of the coal quality with the specifications for cyclone and pulverized fuel furnace boilers was made. A tabulation of existing power plants capable of handling these fines is presented.

Several design provisions were recommended in the areas of storage handling and transportation.

Major sections include:

- Objectives and Plans
- Conclusion and Recommendations
- Results
- Potential Coal Users
- Sulfur Emission Regulations
- Utilization Constraints

Volume 5 - Kentucky Stockpile Tests

This report covers the weatherability and leaching tests conducted on the compacted stockpile built at Uniontown with a 200-ton sample representative of Camp 1 coal shipped to Sasolburg.

The tests provided observations over a one-year period on spontaneous combustion; surface oxidation and weathering; oxidation as measured by chemical, physical and gasification property changes; size degradation; acid run off; pH of rainwater and leachate and extent of leaching.

Reports by Texas Gas Transmission on stockpile construction and observations; Paul Weir Company on sampling, screening, analytical testing and leaching; Commercial Testing & Engineering Co. on detailed analytical testwork; Lurgi on influence of weathering on the gasification characteristics and University of Kentucky - Institute for Mining and Mineral Research on characteristics are provided.

Conclusions and design recommendations for the long term storage of compacted coal are provided on oxidation and weathering stability, minimal leaching due to rainwater,

limited impact on gasification characteristics and effective methods to minimize spontaneous combustion.

Major Sections include:

- Objectives and Plans
- Design Recommendations
- Results
- Photographic Review
- Testwork Details

III
SUMMARY

Prepared by: Michael D. Burke - Project Director
Paul M. Anderson - President, Texas Eastern Synfuels

This section is not an attempt to summarize all of the major aspects of the project as presented in Section IV through Section XVIII of the Tri-State Synfuels Project Review Volumes 1A and 1B. Those sections, in fact, contain summaries and condensed highlights of the critical aspects of each particular element or work program of the project.

This section contains a brief history of the project, the rationale for project formation and process configuration changes, and the rationale for cancellation of the U.S. DOE Cooperative Agreement and project termination. Also included is a summary of the major project advantages and risks associated with the Tri-State project, a listing of the major accomplishments, and a Master Timing Schedule of the Phase I of the project at the time of demoblization.

1.0 BACKGROUND AND PROJECT HISTORY

Tri-State Synfuels Company, a partnership composed of affiliates of Texas Eastern Corporation (project manager) and Texas Gas Transmission Corporation, has been actively engaged over the last four years in a program for the design, construction and operation of a world-scale, coal-based synthetic fuels plant on a site near Henderson, Kentucky. In 1979, Texas Eastern commissioned a study by the South African Coal, Oil and Gas Corporation (SASOL) and Fluor Engineers and Constructors, Inc. (FLUOR) to determine the feasibility of building an indirect liquefaction plant based on SASOL and Lurgi technology in the Ohio River Valley. The study concluded that Lurgi gasification of Illinois Basin coal was technically feasible, commercially viable, and that the plant could be operated in an environmentally acceptable manner. The choice of location and technology was predicated on the belief that the overriding objective of the synthetic fuels industry in the U.S. was strategic. The sponsors felt the Government was willing to support that objective and that it could best be met quickly by constructing plants to utilize the vast Illinois Basin coal reserves to provide synthetic fuels in a region with a large market for liquid fuels. It was recognized that a plant in this region based on proven technology could come on stream approximately two years earlier than a similar plant in the Western United States.

At the time the Cooperative Agreement was proposed in early 1980, there existed a need to consider an expedited effort to put into operation in the U.S. a commercial-sized plant based on commercially proven, environmentally acceptable

technology. The most expeditious means of achieving this was to replicate the SASOL II facility in Secunda, Republic of South Africa as closely as possible adjusting only for feedstock, site and environmental differences between South Africa and the U.S. As a result, Tri-State adopted the same capacity and process configuration (including Fischer-Tropsch liquefaction) as SASOL II, even though it was known that this process was slightly less efficient and was more capital intensive than liquefaction processes based on methanol synthesis.

In February 1981, Tri-State signed a Cooperative Agreement with the U.S. Department of Energy (DOE) covering financial assistance for an approximate two-year and $46 million program which included: economic and engineering analysis to select a specific process configuration; engineering design to determine optimum plant size and product slates, site specific studies including environmental, health, safety and socio-economic analyses; negotiation of contracts for coal and other resource requirements; development of capital and operating cost estimates; and completion of economic evaluation and a financing plan necessary for making a decision regarding construction of the proposed plant. At this time the base case configuration was considered to be the process combination of Lurgi gasification and the Fischer-Tropsch liquefaction process. The plant operations would have included a small refinery producing approximately 28,000 bpd of transportation and heating fuels, a 350-400 MM lb./year ethylene plant, and a chemical work-up facility producing a variety of oxygenated chemicals (alcohols and ketones). Unlike the SASOL II facility, however, the syngas would not be reformed to liquid products but instead would be upgraded (through a methanation process) to high BTU natural gas. The major process alternatives to this base case configuration that were considered during the Cooperative Agreement study was the replacement of the Fischer-Tropsch liquefaction process with one of the following alternatives:

- o Methanation of all syngas to SNG
- o Methanol-fuel and/or chemical grade
- o Mobil (MTG) methanol to gasoline

An important element of the process configuration analysis was also an investigation of the investment cost, production efficiency, and economics of plant capacities downsized from the "world scale" SASOL II facility of approximately 56,000 bpd crude oil equivalent.

In February 1981, Texas Eastern and Texas Gas entered into a formal partnership agreement in the form of the Tri-State Synfuels Company with each sponsor having a fifty percent interest. It was recognized at the time that additional equity partners would eventually be required before Tri-State would be able to commit to a multi-billion dollar synfuels

facility. During this period Tri-State executed Engineering Agreements with Fluor, as the major Contractor, and Lurgi as the designer of gasification and related facilities, specifically related to work under the Cooperative Agreement. Radian was employed as environmental consultant to assist in the work program related to preparation of the environmental impact statement and the securing of all required permits. Consulting and coal test agreements were executed between the Tri-State partnership and SASOL.

In May 1981 the Commonwealth of Kentucky entered into a formal Agreement with Tri-State under which the Commonwealth agreed to reimburse Tri-State for a commercial scale coal test at the SASOL facility and to assist in acquiring options to real estate in western Kentucky on which to locate the plant site.

In August 1981, a full-scale coal gasification test on 22,000 tons of Illinois Basin coal began in a Lurgi gasifier at the SASOL I plant in Sasolburg, Republic of South Africa. The test was successfully completed in November 1981 and confirmed the technical feasibility and viability of the project. The coal, mined in western Kentucky, was selected as being representative of the coal to be utilized by the Tri-State plant.

After conducting an extensive review of process alternatives through December 1981, Tri-State decided to make a significant change to the process configuration and product slate of the project. By this time, the environment for synfuels development had shifted dramatically from the atmosphere of early 1980, the time of the Cooperative Agreement proposal:

- Perceptions of future trends in both energy prices and supply changed dramatically and therefore suggested a need to adopt a less expedited program.

- The Reagan administration was advocating a significantly reduced role for government in any synfuels development as compared to that proposed by President Carter.

- The Synthetic Fuels Corporation appeared to be assigning a higher priority to minimum cost per BTU of output versus diversity of technology.

- It became apparent that the level of financial support available to any one project would not be sufficient to allow a full-sized Fischer-Tropsch plant at a cost of over $18 billion to be prudently financed.

As a result of this changed environment Tri-State management proposed to modify the Project to adopt the methanol to gasoline (MTG) process and reduce its size significantly. While we did not at that time establish the optimum capacity, we felt that the total investment in a commercial plant must be held to less than $5 billion. This move was made to improve the changes of obtaining financing for the plant, enhance its economic viability, and make it more attractive to potential partners. Tri-State management reviewed, with DOE project representatives including appropriate Oak Ridge personnel, the detail of the studies of various process configurations/ capacities which support this recommendation.

The impact of this proposed change on the DOE Cooperative Agreement work program was as follows:

- Changing to the SNG/MTG configuration did not affect the front-end process, the site or coal to be used. The Lurgi gasification process remained unchanged. The results of the full-scale coal tests that were completed remained valid. In fact, the great majority of all work done to that date was valuable and relevant to continuation of the project.

- The effect of this change on the roles of the existing major contractors and licensors was minimal. The only new licensor anticipated was Mobil. Tri-State had conducted initial discussions with Mobil and believed there would be no difficulty in obtaining a license at the appropriate time.

- The primary products would continue to be gasoline and SNG, however, many of the other transportation fuels and chemicals associated with the Fischer-Tropsch process would not be produced.

- The change required some adjustments in the environmental assessment work since the proposed plant would be smaller in size, involve fewer construction workers, and different end products. In fact, the change was viewed as beneficial to the environmental assessment and would not delay the project significantly. However, in this connection, EPA advised that the final EIS, based on the existing work statement, would not be forthcoming until September 1983, as opposed to the original Tri-State estimate of November 1982. Thus, it was proposed that under any circumstances, completion of the work program be delayed until the first quarter of 1984.

- The change necessitated revision of Statement of Work, deliverables, examinables, cost estimates, manpower plans and project schedules.

Pending DOE decision regarding this proposal, it was also recommended that the rate of spending on the project be held to a minimum

In this way work continued which was required to protect critical portions of the project which was not directly affected by the downstream process.

It was further recognized in January 1982, that it would be difficult to justify the continuation of the project at anything above a minimal expenditure level unless additional partners were brought in the Tri-State project. Texas Eastern and Texas Gas Executive management deemed the partnership search a top priority and set a deadline of April 15 to establish any companies' sincere and strong interest in joining the partnership. It was felt that the change in process configuration to methanol/MTG gasoline and downsizing would be very helpful steps in attracting additional partners. Unfortunately, the current economic climate and the significantly changing perception of future energy prices to much lower levels presented a very bleak atmosphere for the partnership search.

In February 1981, the U.S. Department of Energy approved Tri-State's request for a change in the project's process configuration, product slate, and reduction in plant size. This change necessitated a modification in some of the Cooperative Agreement Articles and a revision of the Statement of Work, Deliverables, Examinables and project schedule, cost and manpower plans. DOE also advised Tri-State of the need for a new Advance Waiver of Patent Rights clause.

In early February 1982, Tri-State met with Dillon, Read and Co. to discuss their participation in the partnership development program. Dillon, Read reviewed a list of potential partners developed by Tri-State and assisted in contacting some high potential candidates. Tri-State also prepared a formal project brochure to assist in the partnership development program.

Meetings were held in late February 1982 with representatives of

An Executive Committee Meeting was held in Houston on March 2, 1982 to review the status and potential future of the project. The proposed budget and work plan was approved through April 15, 1982. The decision to continue beyond that date was primarily influenced by the potential for additional

partner(s) participation and funding and the perceived prospects for loan guarantees and price supports from the SFC. continued to express interest in joining the project but cautioned that approval was uncertain.

Tri-State personnel met with in Fluor's Irvine offices March 10 to discuss MTG and methanol plant estimates, Cases 13 and 14. appeared to be most satisfied with their findings and scheduled a meeting for March 26, 1982 with Tri-State in Houston to discuss the terms and conditions of a potential partnership agreement.

Final drafts of the modified Cooperative Agreement and advance Patent Waiver agreements were submitted to the U.S. DOE on March 24, 1982.

On March 25, 1982 notified Tri-State that they have decided not to join the project at this time. A meeting was scheduled with the Executive Committee on April 5 to determine the future of the Tri-State partnership and project.

met with T. E. and Tri-State representatives on March 30 to explain their decision not to join the project. In essence, although they considered Tri-State the "best synfuels project in the U.S." their executive management had decided to drastically reduce commitment to synfuels. was subsequently dissolved, and they are no longer participants in any major synfuels project.

A presentation on the status of the Tri-State project was made to Texas Eastern's Management Committee on March 31. At this meeting decision not to join the Project was discussed as were possible demobilization plans for Tri-State. The Management Committee recommended that Tri-State notify DOE of its intent to be released from the Cooperative Agreement. A decision was also made to continue the Texas Eastern and Texas Gas Partnership and the Tri-State project at some minimal effort.

On April 8 Tri-State Synfuels notified the U.S. Department of Energy of its election to terminate Cooperative Agreement No. DE-FC05-81OR20807 and to withdraw the Petition for Advance Waiver of Patent Rights, dated March 24, 1982, and the proposed Modified Cooperative Agreement of the same date. Tri-State served notice of termination of the Cooperative Agreement effective June 7, 1982.

In the judgment of Tri-State's management, continuation of the project at this point in time would not produce beneficial results commensurate with the projected espenditure of funds. Tri-State believed that continued

investment of substantial monies in the project could not be justified in light of:

- o The present uncertainties of obtaining adequate financing of the plant investment;
- o Of our inability to acquire additional partners, given currently projected energy prices and continuing uncertainties surrounding the nature and ultimate amount of financing;
- o Of government support for the planned facility.

Tri-State further proposed to initiate project demobilization immediately to be completed by mid-June 1982.

We did not feel that it was prudent to continue the expenditure of funds for the continuation of the Cooperative Agreement work program over the next 60 days for two reasons. First, in most instances very little value would have been gained from the current work program during April and May, 1982 if the project did not proceed directly to a decision to construct. Second, we were at a point in the project development that called for initiation of a new and revised work program as was reflected in the proposed Modified Cooperative Agreement. We did not feel it was appropriate to waste money in initiating a new work program that would have been cancelled 60 days later. A detailed project Demobilization Plan was prepared by Tri-State and presented to DOE on April 8, 1982. The final version of that plan was approved by DOE on April 26, 1982 and is included in the Appendix of Volume 1B.

On May 18, 1982 Tri-State submitted a Project Synopsis to the U.S. Synthetic Fuels Corporation in order to:

- o Update them on the status of the project - Highlight the project advantages and potential to support the Country's specific needs.
- o To serve notice that the work program would be put on hold until Tri-State attracted additional partners and acquired the necessary financial assistance and support from the U.S. Synthetic Fuels Corporation.

We expressed to SFC that in our opinion the nucleus of a synfuels industry is still a critical strategic U.S. need and that Tri-State should be a part of that nucleus. We also encouraged SFC to investigate the project through third parties we had dealt with, such as other government agencies and potential partners who had reviewed the project.

Our interpretation of the maturity criteria and selection negotiation process for the May 31, 1982 solicitation led us

to believe that pursuing a formal filing would require significant expenditures on our part. We were not, however, prepared to consider further investment in Tri-State without an indication that sufficient Government support will be made available.

A comprehensive and detailed accounting of all major activities and issues of the Tri-State project from January, 1981 through April, 1982 can be found in the Tri-State Weekly Activities Reports presented in the appendix, Volume 1B.

2.0 PROJECT ADVANTAGES

It was widely believed that the Tri-State project was ideally positioned to quickly satisfy the Country's strategic needs. Through May 1982 over $22 million had been spent to develop the Tri-State Project. Based on our work to date we are confident that the project is technically sound. Also, the project is quite conducive to replication given the strong resource base for this area of the country.

It was the feeling of Tri-State management as well as an opinion expressed by representatives of state, federal and local governmental agencies, contractors, consultants, and other corporations that the Tri-State project had one of the best chances of any synfuels project in the U.S. for reaching commercialization due to the following inherent advantages:

Commercially Proven Technology

The combination of proven Lurgi gasification technology and SASOL's long term commercial utilization affords Tri-State the greatest certainty of bringing a synfuels plant into successful operation in the shortest possible time with minimal technical risks. With the start-up of the nearly completed SASOL III, there will be 100 Lurgi gasifiers operating throughout the world.

SASOL Assistance

During its 25 years of operating experience in Sasolburg, together with two new world-scale complexes in Secunda, South Africa, SASOL has developed numerous process refinements. Tri-State will benefit from these and future developments. In addition the existing SASOL operations will make it possible to train Tri-State personnel under actual plant operating conditions prior to plant completion. Equally important, experienced operators, engineers and consultants from SASOL will be available to assist in a smooth start-up of the Tri-State facility.

Experienced Contractors

Tri-State's prime contractor, Fluor, has been directly and significantly involved in the engineering design, equipment procurement and construction of the SASOL II and III complexes. This experience is invaluable in ensuring that the Tri-State plant is designed and constructed in a timely and cost-effective manner.

Commercial-Scale Coal Test Successfully Completed

Tri-State is one of very few projects in the United States that has had an opportunity to test a specific feed coal in a

large-scale commercial operation. The coal test completed last year in South Africa not only proved the technical feasibility of the project, but also established site-specific design criteria for operation and environmental control. The test effectively eliminated coal feed properties as a major element of uncertainty and risk for the Tri-State plant.

Demonstrated Federal and State Support

The Federal government demonstrated its support for the Tri-State project by selecting it for Cooperative Agreement funding under the DOE's Synthetic Fuels Commercialization Program. The Commonwealth of Kentucky, through the offices of its governor, elected state officials and the Kentucky Department of Energy (KDOE), has given the Tri-State project invaluable assistance and support.

Local Community Acceptance

The Tri-State project enjoys an outstanding relationship with the Henderson, Kentucky area. A public opinion survey conducted in 1981 showed that a majority of the citizens favored development of the synthetic fuels industry in general, and the Tri-State project in particular. The metropolitan area including Henderson and Evansville, Indiana would profit economically while the project would benefit from the ability of the communities to absorb the socio-economic impact related to plant construction and operation.

Abundant Coal and Water Resources

The coal would be supplied primarily from new deep mines in western Kentucky. A significant portion of the plant's requirement would be transported via conveyor belts from coal resources in the immediate area, jointly owned by Texas Gas Transmission Corporation and Consolidation Coal Company. Other coal reserves in the Illinois Basin also are readily accessible to the site by conveyor belt, barge, and rail. Enough coal reserves exist within 50 miles of the plant to supply approximately 20 world-scale synfuel projects for 30 years. Water for the plant would be withdrawn from the nearby Ohio River at a rate of 13,000 acre-feet per year, which is insignificant when compared with the normal and low flows of the river.

Superior Transportation/Logistics

The plant site, near the Ohio River in western Kentucky, offers ready access to Midwestern and Eastern energy and chemical markets through existing pipelines, and rail, barge and highway transportation sytems. High-Btu natural gas would be moved through proposed lateral gas pipeline tie-ins of less than 40 miles each to the existing natural gas

pipeline systems of Texas Eastern and Texas Gas. Texas Eastern's nearby products pipeline would also offer a strong advantage in marketing the plant's gasoline output in the Midwest and Northeastern United States.

Project Partners' Synfuels Experience

As a result of their separate and independent project development and research programs over the past 15 to 20 years, Texas Eastern and Texas Gas have been recognized as leaders in the emerging synthetic fuels industry.

3.0 PROJECT RISKS, CONCERNS, AND CONSIDERATIONS

While Tri-State was in an enviable position to bring a plant on stream in the shortest possible time, it suffered an inherent economic disadvantage. Tri-State management was convinced that the unit product cost for Tri-State would be significantly greater than that of a similar plant located in a Western coal basin due to the following disadvantages of Illinois Basin coal versus most Western coals:

- o Higher cost and level of fines due to the requirement for underground mining.
- o Higher sulfur and chlorine levels requiring more extensive clean-up operations.

Nevertheless, the most efficient deployment of our Nation's coal resources, it seemed to us, would be to apply low-sulfur Western coals in technologies that produce low-sulfur liquid and gaseous fuels. Therefore, the need for Government assistance and financial support of an Illinois Basin synfuels plant appears to be even greater than that required for a synfuels plant in the West.

With its choice of processes, location and ample supply resources, the Tri-State project had been formulated to minimize technical risks and environmental and socio-economic impacts. There were, however, a number of risks associated with a synfuel project of this magnitude:

Forecasts of Abundant, Cheaper Conventional Energy

Energy economists have recently revised their forecasts of future energy prices to reflect much lower real price growth than they had forecast two years ago. The current perception of an abundance of conventional energy supplies has significantly reduced the concern of the potential for major disruptions in world crude oil supplies. These views and their resulting forecast could again change dramatically with a short term tightness in the current market, a drop in production, etc.

High Costs/Low Conversion Efficiency of Illinois Basin Coal

The relatively high cost and low conversion efficiency of Illinois Basin coal vis-a-vis a surface mined western coal is

a major concern. Any coal conversion project based on Illinois Basin coal and proven technology will require some level of real price increase to be profitable.

Potential for Increase in Plant Investment

Few synfuel projects have a better understanding of their investment and operating costs than does Tri-State. It will be mid-1984, however, before the project would have cost estimates supporting a commitment to construction decision.

Availability and Cost of Capital

Current projections show a tight capital market with high interest rate levels over the next one to three years.

Mobil MTG Process

The Mobil methanol-to-gasoline process was proven to be technically successful during a two-year pilot plant operation in Paulsboro, New Jersey in 1980-81. Proven operation on a large, commercial scale, however, will not be accomplished before 1985.

4.0 STATUS OF DEVELOPMENT

The Tri-State Project is in an advanced state of development and significant progress has been made since the initiation of the project work program in 1979. One of the most notable accomplishments is the successful completion of a full-scale test on 22,000 tons of Illinois Basin coal in commercial Lurgi gasifier, proving that the feedstock anticipated for the project is technically viable. Other major acomplishments include:

TRI-STATE MAJOR ACCOMPLISHMENTS

Contracts

Fluor Engineering Agreement Executed
Radian Environmental Contract Executed
Sasol Consulting Agreement Executed
Sasol Coal Test Agreement Executed
Lurgi Engineering Contract Executed
Lurgi License Agreement Executed
Lurgi Proprietary Equipment Agreement Executed
AEP/KDOE Land Option Agreement Executed

Project Controls

Established CPM Network/FAST System
Cost Accounting and Reporting System Implemented
DOE Reporting System Established
Modified Letter Agreement Executed
Special Bank Account (Operating Procedures) Established
General Bank Account (Short-Term Investments) Established

Financial/Economics

SFC Proposal for Financial Assistance Filed
Synfuels Economic Evaluation Model Developed
Financial Work Plan Developed
Response to SFC Request Submitted
Synfuels Economic Evaluation Model - Phase II Completed
Economic Analysis of All Process Alternative Studies Completed
Project Synopsis Submitted

Environmental

Detailed Workplan Developed
Socioeconomic Baseline Report Published
New Source Determination Established
EPA Lead Agency for EIS Established
Environmental Information Document Published
Regulatory Compliance Plan Published
Sampling and Testing Programs (By-Products, Ash, Coal) Conducted
PSD Air Quality Monitoring Program Completed
Biology/Ecology Field Campaign Completed
Health And Safety Work Program Developed
Permit Scheduling and Timing Program Established
Tocsin Health & Safety Agreement Drafted
Wastewater Treating Scheme Established
Cultural Resource Subcontract Let

Coal Testing

Sasol Commercial Scale Coal Tests Completed
Lurgi Lab Coal Tests Completed
Large Scale Coal Test Report Completed
Gasifier Review and Design Cycle Established

Coal Supply

Major Coal Supply Reserves Analyzed and Identified
Coal Supplier Presentation Programs Completed
Design Coal Recommendations Established
Coal Supplier Information Packets Distributed

Land Acquisition

Plant Site and Airport Site Options Obtained
Coring Locations Established
Surveying and Core Drilling Permits Obtained
25% Plot Plan Completed
Title Search Program Initiated
Surveying Program Initiated
Preliminary Airport Relocation Study Issued

Engineering

Process Flow Diagrams Completed
Project Procedures Manual Issued
Major Licensor Design Criteria Established
Preliminary Plot Plan Developed
Geotechnical Core Sampling Program Conducted
Process Licensor Evaluation RFQ's Issued
Preliminary Process Design Basis Established
Pre-Construction Labor Survey Conducted
Process/Product/Size Configuration Set

Engineering Studies

Mechanical vs Natural Draft Cooling Towers
Cooling Transition Study
Water Intake Systems
Concrete vs Structural Steel Pipe Supports
Export Power
Upgrade Creosotes to Diesel
Recovery of N_2 For Enhanced Oil Recovery
Ethane/Ethylene Recovery
Alcohols Disposition
CO_2 Recovery and Compression For Enhanced Oil Recovery
Benzene Extraction for Lurgi Naphthas
Half Size Fischer Tropsch
SNG/Methanol Plant
SNG/Mobil MTG Plant

MARKETING

Marketability of Products Established
Long Term Price Forecasts For All Products Developed
Detailed Market Study Report Published
Product Slate Established

COMMUNITY RELATIONS

Public Attitude Survey Conducted
Public Participation Program Established
T. V. Film Presentation Produced
Henderson Citizens' Advisory Committee Established
Tri-State Henderson Office Established
Report of Energy Impact Assistance To Communities Drafted

PARTNERSHIP DEVELOPMENT

Strategy/Position Paper Completed
Formulation of Outline on New Partnership Provisions
Publication of Project Brochure

5.0 MASTER TIMING SCHEDULE

The Master Timing Schedule for the Project Development Phase of the project (initiation of the Cooperative Agreement with the DOE in February 1981 through the commit to construction date in March, 1984) is presented in Exhibit III-A.

Key events in support of the Phase I timing schedule included:

- Identification of partners by July, 1982
- Successful SFC negotiations (mid 1981 through mid 1983)
- Completion of cost estimates and economic analysis (September, 1983)
- PSD applications in late 1982
- ESD by April 1983, EIS by December 1984 and permits issued by February, 1984
- Negotiation of coal contracts by mid 1983
- Completion of land permit, survey and title search by October, 1983
- Product purchase letters of intent/conditional contracts by December, 1983

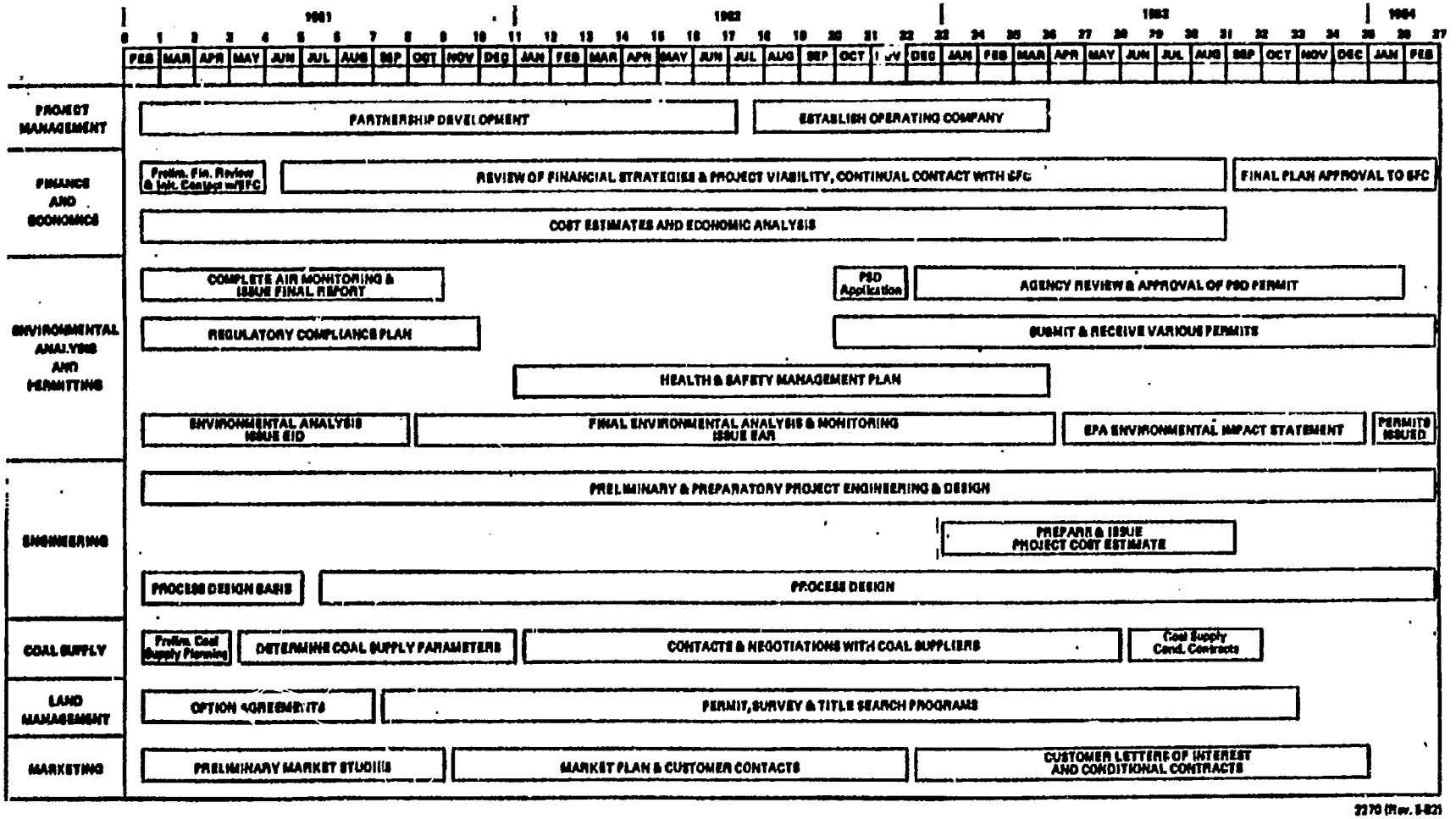
Completion of Phase I as planned would have permitted a commitment to construction in March, 1984. Actual mechanical completion is projected in 1987. Plant start-up was planned for the January 1987 - April 1988 period. Full production rate would have been achieved during 1989.

This timing schedule reflected the project plan as of mid April, 1982. Termination of the Cooperative Agreement with the DOE at that time seriously disrupted the timing plan, which would have to be renegotiated should the project be reactivated.

EXHIBIT III-A

Tri-State Synfuels Company

Master Timing Schedule



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IV

PROJECT DESCRIPTION

Prepared by: Michael D. Burke - Project Director

1.0 PROCESS CONFIGURATION

The Tri-State project consists of the following major process configurations shown in Exhibit IV-A:

- Gasification of free swelling, moderately caking Illinois Basin Coal in Lurgi Mark IV gasifiers to produce medium BTU synthesis gas and gasification by-products. Lurgi gasifiers have been successfully employed in large scale commercial operations at Sasol I for over 25 years. Additionally, Sasol II and Sasol III currently employ a total of 72 Lurgi Mark IV gasifiers, which have started up over the period 1980 through early 1982.

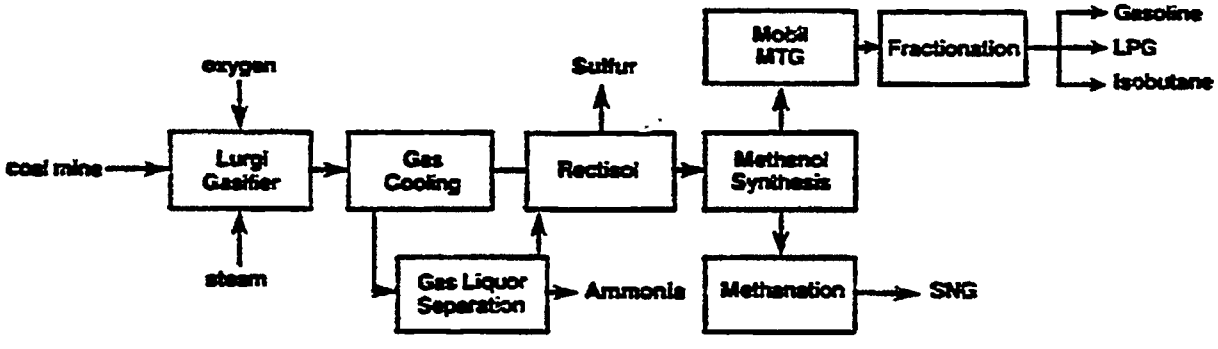
- Lurgi methanation and methanol process for converting synthesis gas to high BTU gas and fuel and chemical grade methanol. Lurgi's methanation has been in successful operation since the mid 1950's. The Lurgi methanol synthesis process has been successfully utilized throughout the world since 1973.

- The Mobil MTG process to convert methanol to gasoline has not yet been operated on a commercial basis but demonstration size units have performed well. Commercial size units are currently under construction for start-up in the early to mid 1980's.

A brief description of each of the major process units is presented in Section 8.0.

EXHIBIT IV-A

Tri-State Process/Product Flow



2.0 MAJOR PRODUCTS

The Tri-State Synfuels Project will produce primarily SNG and gasoline with smaller amounts of easily marketable industrial chemicals (i.e., sulfur, ammonia, butanes and propane). In total, the plant will produce the energy equivalent of 15,500 bpd of crude oil.

Product Mix by BTU's is as follows:

	Percent of Total BTU's
Liquid Fuels	54%
SNG	43%
Chemicals	3%

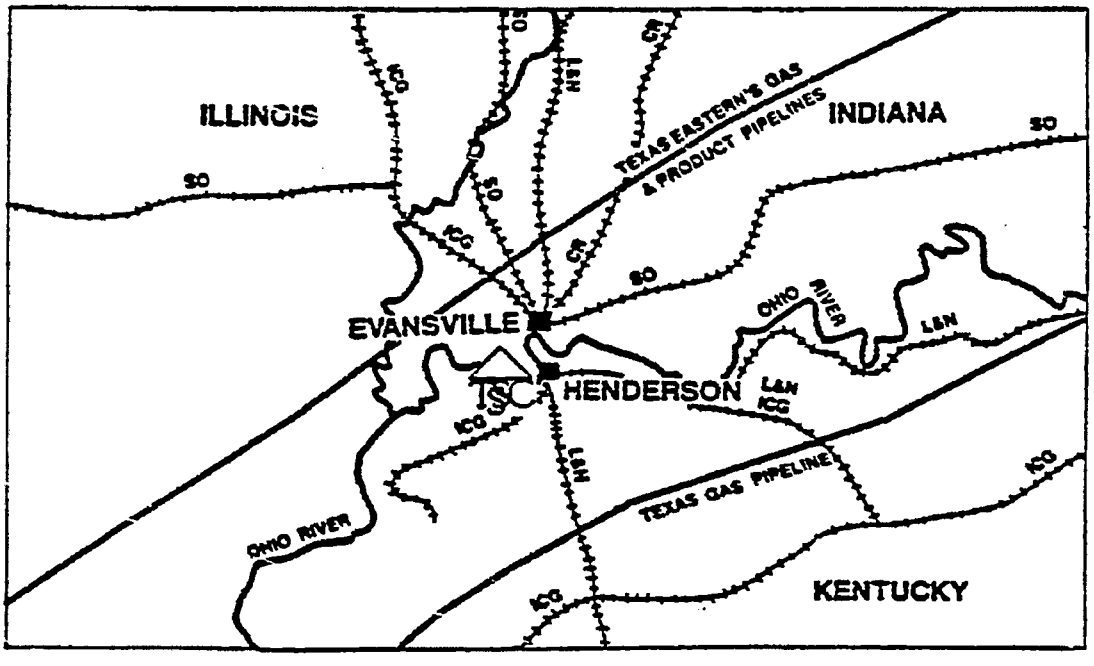
The volumes of specific products are presented below:

Products	Daily Production
SNG	37 MMscf
Gasoline	8,100 Barrels
LPGas	600 Barrels
Sulfur	200 Tons
Ammonia	65 Tons
Isobutane	600 Barrels

The multi-state market area around the plant site provides excellent opportunities for marketing the products Tri-State will produce. The region currently imports a portion of its requirements for virtually all of these products and forecasts indicate it will continue to do so. Therefore, Tri-State will enjoy a significant transportation advantage over the traditional suppliers outside the region. Also, with access to the Midwestern and Eastern markets through Texas Eastern and Texas Gas' refined products and natural gas pipelines, Tri-State could market its SNG and gasoline throughout much of the eastern United States.

EXHIBIT IV-B

Tri-State Plant Site and Logistics

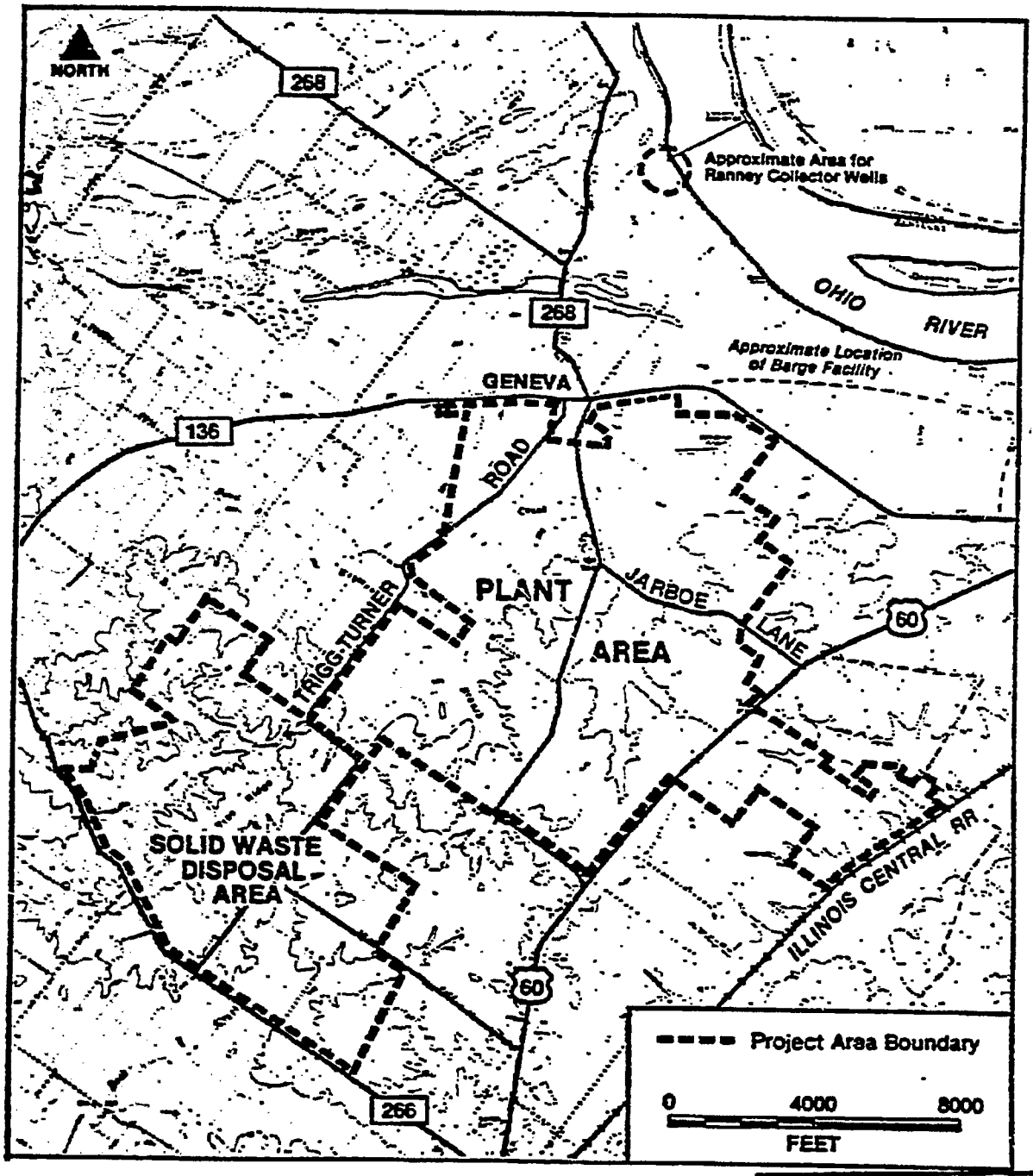


3.0 LOCATION

The Tri-State Synfuels plant, to be located near Henderson in western Kentucky, would have excellent access to the coal supplies of the Illinois Basin and to major markets for its products. As shown in Exhibit IV-B the plant site is located on the Ohio River and adjacent to the Illinois Central Gulf Railroad (ICG). This allows coal supplies to be received by barge or rail, as well as by truck or conveyor from nearby mines. Through the ICG and its connecting railroads the plant will have excellent access to Midwestern and Eastern markets. Because of its location on the Ohio River, Tri-State can market its products in the upper reaches of the Ohio River Valley as well as in the upper Mississippi River Valley, the Chicago and Great Lakes area, and the Gulf Coast markets. Also, Texas Eastern Corporation's products and natural gas pipelines pass within 30 miles of the plant boundary to the north, and Texas Gas Transmission Corporation's natural gas pipeline is only 12 miles east of the plant site, providing additional means of marketing the plant's products.

EXHIBIT IV-C

Tri-State Synfuels Project Site Plan



4.0 LAND

The Kentucky Department of Energy has provided considerable assistance in securing a desirable plant site and the associated properties. The project requires approximately 3,500 acres of land to meet the plant site and solid waste disposal requirements and to provide an adequate buffer zone around the facility (see Exhibit IV-C).

A large tract of land (approximately 7,000 acres) currently owned by the American Electric Power Company (AEP) representing a substantial portion of the required land is available to Tri-State through an option agreement. The Commonwealth of Kentucky has a two-year purchase option agreement with AEP through August 24, 1983, with a two-year renewal option clause through August 1985. Under a separate agreement with Tri-State, the Commonwealth will assign their options to Tri-State at a mutually agreeable and appropriate time.

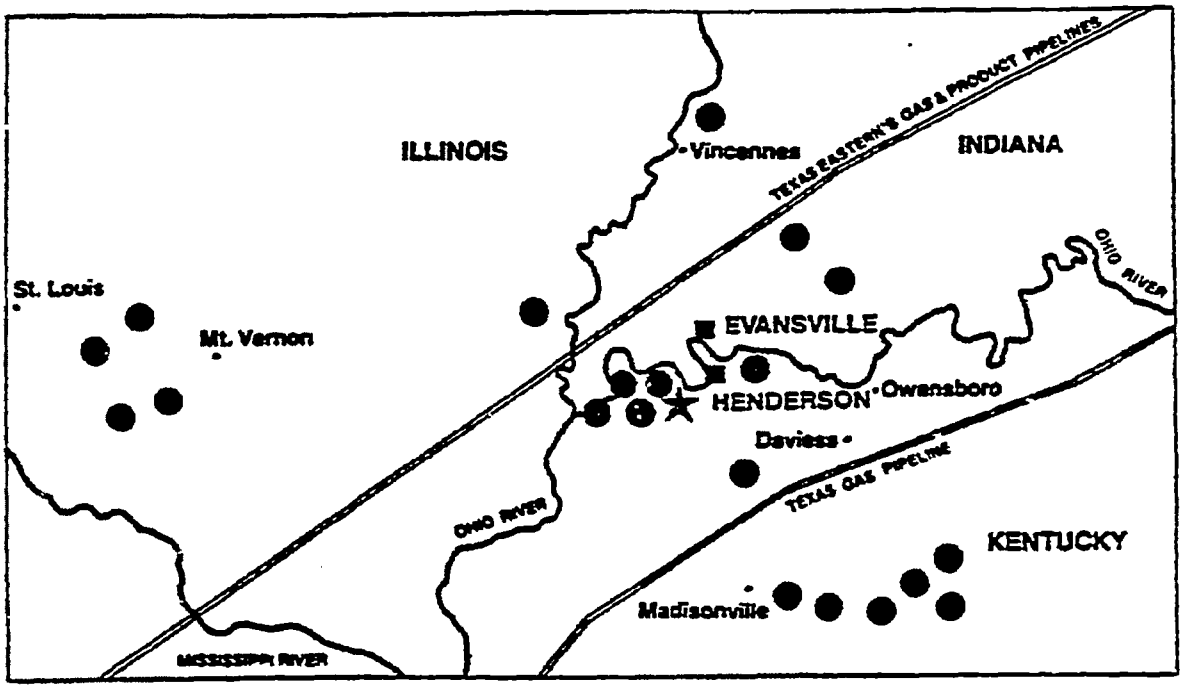
There is some private acreage that will be required in addition to the AEP property to provide ample space for solid waste disposal, coal storage and an optional barge site installation. The Kentucky Department of Energy will, once again, take the lead in optioning this private land and has made property appraisals which is the first step in the optioning process.

Prior to plant construction it will be necessary to secure a clear title to all property critical to the siting of the plant. Title opinions have been written on all of AEP property tracts that are located where the main process area of the plant is to be sited and a property boundary survey program has been completed on these AEP tracts.

Tri-State's termination of the DOE Cooperative Agreement in no way jeopardized the availability of the core tract of land currently owned by AEP. The option to purchase this land does not expire until August 1983, and could be extended for an additional two years at that time.

EXHIBIT IV-D

Tri-State Synfuels Potential Coal Supply



Map Key:

Proposed Coal Mine ●

Tri-State Synfuels Plant Site ★

5.0 COAL

The Tri-State plant will require approximately three million tons of coal annually to fuel its boilers and feed its gasifiers. The plant will be located at the center of one of the largest coal reserve basins in the United States, the Illinois Basin, comprised of western Kentucky, southern Illinois and southern Indiana. The Illinois Basin is one of the oldest coal producing regions of the U.S. and contains large undeveloped reserves of high BTU (10,000 - 11,000 on an as received basis), relatively high sulfur (2-4%) coal. Most of the planned new production in the region will come from underground mines.

Coal producers in this region are actively marketing their planned production. Competition among coal producers is high for supplying the proposed synthetic fuels industry because they are slowly losing their traditional growth market--new electric power plants. Because of the relatively high sulfur content of Illinois Basin coals and increasingly stringent clean air regulations limiting sulfur dioxide emissions from power plants, the demand for Illinois Basis coal has grown only modestly during the latter half of the 1970's. These regulations are continuing to limit the outlook for Illinois Basin coal in the utility market.

Since coal producers are now focusing on the synthetic fuels market for their new mines, competitive pressure is helping keep coal prices down and should help to minimize the long term costs of feedstock for synthetic fuel plants located within the region. Tri-State has been offered over 50 million tons of annual production from over 30 proposed new coal mines, of which 30 million tons are of a quality that can be successfully gasified by the Lurgi process. All of these mines are within one hundred miles of the plant and many, including the Texas Gas/Consolidated Towhead Island Coal reserves dedicated to the project are within a radius of ten miles or less. (See Exhibit IV-D.)

Besides the 30 proposed coal mines potentially providing coal to Tri-State, Texas Gas has dedicated a part of its share of reserves at a nearby coal property (Towhead Island) to the Tri-State Project. This property contains over 260 million tons of recoverable reserves and is located less than ten miles from the Tri-State plant. Texas Gas owns the reserves jointly with Consolidation Coal Co. and proposes to develop a new mine or mines on the property to serve Tri-State. Tri-State is evaluating this coal along with the others offered to determine the optimal supply sources.

Many meetings have been held with the potential coal suppliers and preliminary technical evaluations of the proposed reserves have begun. Preliminary discussions of contract terms have also been held and negotiations could commence as soon as Tri-State narrows the list of potential suppliers to a more limited number of suppliers.

EXHIBIT IV-E

Chem Systems Price Forecast

(mid 1980 dollars)

Product	Units	Kentucky Netback Prices/Unit	Average Annual Growth Rate In Real Prices				Memo: Kentucky Nett Prices/MMBT
			1980-85	1985-90	1990-95	1995 +	
SNG	MCF	$ 2.85	13.1%	6.8%	1.4%	1.2%	$ 2.90
Gasoline (Premium/Unleaded)	BBL	39.90	5.5%	1.5%	1.2%	1.2%	7.60
Propane	BBL	18.60	9.4%	2.9%	0.6%	1.2%	4.59
Isobutane	BBL	34.55	0.5%	3.1%	1.0%	1.2%	8.70
Ammonia	Ton	180.00	4.2%	9.6%	0.9%	1.2%	9.28
Sulfur	Ton	93.00	2.9%	3.2%	2.5%	1.2%	12.24

The analyses using current market prices and conditions was based on January, 1982 prices and conditions.

January, 1982 Prices

Product	Units	MMBTU/Unit	Gulf Coast Price/Unit	Transportation to Kentucky/Unit	Kentucky Netback Prices/Unit	Kentuck $/MMBT
SNG*	MCF	1.02	*	*	$ 4.50	$ 4.42
Gasoline**	BBL	5.25	$43.68	$ 1.10	44.79	8.45
Propane	BBL	3.84	18.48	0.84	19.32	5.03
Isobutane	BBL	3.79	21.84	0.42	22.26	5.60
Ammonia	Ton	19.4	150	11.00	161	8.45
Sulfur	Ton	7.6	128	11.00	139	18.29

* SNG is calculated on the basis of BTU-equivalence with low-sulfur #6 fuel oil which had a January, 1982 Kentucky market value of $28.50/bbl and contained 6.4 MMBTU/BBL

** Premium/Unleaded

6.0 MARKET CONDITIONS & PRODUCT PRICES

Two product price assumptions were used in the economic analysis of the Tri-State Project. The first assumption was based on the project's forecast of future conditions. This required a forecast of future market prices based on local market conditions and plant location. The second assumption was based on current market conditions.

The eight-state area around the Tri-State plant is a significant net importer of all of the products to be produced. A portion of the current supply of these products is imported from the Gulf Coast and forecasts indicate that this will not only continue but also increase during the remainder of the century. Therefore, production from the Tri-State plant will have a transportation advantage over the traditional suppliers outside of the region. This advantage has been added to both sets of Gulf Coast prices to yield a plant-gate netback product price.

The forecast prices were prepared by Chem Systems, Inc. as part of a market study commissioned in 1980 and published in mid-1981. The prices were based on a mid-1980 average from which real growth rates were projected. The base prices were partially regulated; Chem Systems assumed that deregulation would take full effect by 1990. Also, Chem Systems assumed that SNG would sell at a price comparable on a BTU basis to that of low-sulfur #6 fuel oil.

The prices used in the work and analysis presented in Section XIII - Economic Analysis are presented in Exhibit IV-E.

7.0 TRANSPORTATION SYSTEM

The Tri-State plant has excellent access not only to the regional market around the plant but also to major distant markets, if Tri-State should decide to market its products outside of the region. Because of its location on the Ohio River, Tri-State can market its products in the upper reaches of the Ohio River Valley as well as in the upper Mississippi River Valley, the Chicago and Great Lakes area, and the Gulf Coast Markets. Also, Texas Eastern Corporation's refined product pipeline passes within 30 miles of the project and opens up the Northeast market to Tri-State's liquid products.

Texas Eastern's natural gas pipeline also passes within 30 miles of the project and Texas Gas Transmission Corporation's natural gas pipeline is only 12 miles east of the plant site, thus providing easy interties to the entire Midwest and Northeast markets for gas. Through the ICG and its connecting railroads the plant will have an additional, excellent means of access to Midwestern and Eastern markets.

8.0 PROCESS UNIT DESCRIPTION

A brief description of each of the major process units shown in Exhibit IV-F is presented below.

8.1 COAL HANDLING & SCREENING

As-mined coal delivered to the site is screened to 2-inch size and the oversized coal is broken to 2 inches in Bradford-type breakers which will reject stones and pieces of shale for dumping.

Coal enters the plant via conveyor or railroad and is placed in a covered storage area with a capacity of eight days at full plant operation. Partitioning will separate the two coals and the start-up coal to allow selective reclaiming. After dry screening, fines are stored in bins or silos before being routed to the boilers. Three days of live storage for fines is provided. Dead coal storage capacity is planned for 60 days.

In the wet screening system, coal is washed with water over vibrating screens. The graded coal drops on conveyor belts feeding the gasifiers. Coal to each gasifier feed bunker is distributed by a system of belt trippers. The undersize coal slurry is dewatered.

8.2 ASH HANDLING SYSTEMS

Ash from the Lurgi gasifiers is discharged from the ash locks directly into a low velocity sluiceway. The ash is sluiced with water, which also serves to quench the hot ash and to suppress dust. The sluiceway is totally enclosed and sealed. Steam generated from quenching of the hot ash is exhausted by a fan. The fan discharge is free of dust.

8.3 COAL GASIFICATION

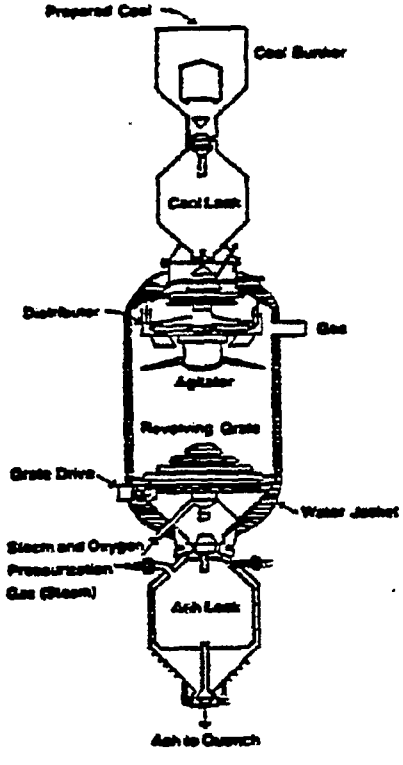
The Lurgi process for coal gasification is used. The gasifier design is the largest commercial model (Mark IV) and is illustrated in Exhibit IV-G. Mark IV gasifiers are operating at both the Sasol I and II facilities. The Sasol gasifiers operate on noncaking, nonswelling coal. Because the Tri-State Synfuels Project will use bituminous coal typical of the Kentucky-Illinois area which is weakly caking and swelling, a special mechanism inside the gasifier, consisting of a coal distributor and stirrer, is required to overcome the swelling and caking tendencies of the coal. Similar devices for swelling and caking coal have been used successfully on Lurgi gasifiers in Scotland and Germany and no mechanical problems were encountered with the stirrer/distributor during the Tri-State test in Sasol in 1981.

FOLDOUT

EXHIBIT IV-F

EXHIBIT IV-G

Lurgi Mark IV Gasifier



The Lurgi gasification process is a counter-current operation, which helps improve thermal efficiency. Coal, graded to the correct size distribution, is fed batchwise from coal locks at the top. As the coal moves down the reactor it is successively heated and dried. The volatile matter in the coal is distilled off and eventually the char formed is gasified.

The gasification agent is a mixture of oxygen and superheated steam entering from the bottom through a rotating grate which supports the ash and coal bed. The gasification agent cools the grate and then the descending ash before it reacts with the char. The oxygen burns part of the coal to supply the heat for the endothermic gasification reactions.

The ash is removed by the rotating grate and drops into the ash lock. The ash lock is emptied batchwise.

Crude gas leaving the gasifier is quenched and scrubbed with recycled gas liquor, which is the term used for the water phase condensed from the crude gas stream on cooling. This water vapor is unreacted gasification steam and moisture from the coal. Also condensing from the gas stream are tar and oils derived from the volatile matter in the coal.

The crude gas is cooled and joins gas from other gasifiers for further cooling in the gas cooling section.

Gas liquor containing tars, oils and dissolved chemicals such as phenols and ammonia is routed to the gas liquor separation plant.

Steam is used for pressurizing the ash lock in the batch operation for discharging ash. On depressurizing, this steam is condensed in a direct contact water condenser. As a result no dust or gas is generated in this operation. This coal lock, however, is pressurized with crude gas. On depressurizing, this crude gas is released to low pressure. It contains a small quantity of coal dust. This coal lock gas is routed to the boilers and burned.

8.4 GAS COOLING

The gasification product gas leaving the waste heat boiler is further cooled in the Gas Cooling Unit. The gas is cooled in a tempered water system, by air cooling and finally by water cooling. This cooled gas then goes to Rectisol (Gas Purification Unit) for purification.

The Gas Cooling Unit condenses gas liquor and light oil during the cooling process. The gas liquor product is sent to the Gas Liquor Separation Unit for further processing.

8.5 GAS PURIFICATION UNIT (RECTISOL)

For gas purification the Lurgi standard (nonselective) Rectisol process is used. Impurities in the crude gas are removed in basically two washing steps with cold methanol.

In the first step, a limited amount of medium-cold methanol is used to wash the so-called gas naphtha from the gas stream. Naphtha is a mixture of pentanes, hexanes, benzene, toluene and heavier aromatics. Along with the naphtha, other light organics are also removed. Their removal is essential to prevent buildup of compounds and eventual fouling in the main methanol wash circuit.

The prewashed gas then enters the main wash system where the bulk of the carbon dioxide and hydrogen sulfide is removed by washing with very cold methanol. Heat of solution is removed partially by refrigeration from a propylene refrigeration system and partially by auto-refrigeration from flashed methanol.

Flashed gas from the first stage is recompressed and recycled for recovery of carbon monoxide, hydrogen and methane. All other flash gases and hot regenerator offgas, which contain all the hydrogen sulfide and carbon dioxide removed from crude gas, are routed to the sulfur recovery unit for hydrogen sulfide removal.

8.6 GAS LIQUOR SEPARATION UNIT

This unit uses gravity separation to split the gas condensate produced in the gasification and gas cooling units into tar, oil and water phases.

8.7 TAR DISTILLATION UNIT

The Tar Distillation Unit is designed to fractionate the tar/oil mixture fed from the Gas Liquor Separation Unit. A small recycle stream of residue oil from the Naphtha Hydrogenation Unit is also fed to this unit.

The unit produces six basic products: light naphtha, heavy naphtha, medium creosote, heavy creosote, residue oil and pitch.

The light and heavy naphthas are sent to the Naphtha Hydrogenation Unit. Medium and heavy creosotes are sent to product storage. Pitch and residue oil are used as fuel in the incinerator.

8.8 NAPHTHA HYDROGENATION UNIT

This unit is designed to remove the sulfur, nitrogen and oxygen from the raw naphtha by catalytic reaction with hydrogen. The feed to the unit comprises naphtha recovered in the Rectisol Unit and in the Tar Distillation Unit. The unit consists of a hydrogenation section and a fractionation section in a single stream configuration.

8.9 PHENSOLVAN UNIT

The function of this unit, licensed by Lurgi, is to remove phenolic compounds dissolved in the gas liquor. These fractions are:

- A phenol fraction containing mainly C_6H_5OH for sale.
- A cresol fraction containing mainly ortho, meta and para cresols for sale.
- A pitch fraction containing heavy aromatic compounds which is used in the plant as fuel oil.

The raffinate (extracted gas liquor) passes to the Ammonia Recovery Unit.

8.10 AMMONIA RECOVERY UNIT

The extracted gas liquor contains, apart from the ammonia, the impurities, carbon dioxide and hydrogen sulfide that would contaminate the ammonia product obtained by a straight distillation. The process uses basically two distillation steps to obtain separation between ammonia and the other gases.

8.11 SULFUR RECOVERY UNIT

This unit converts hydrogen sulfide in the Rectisol off-gas to elemental sulfur. In the process, carbon dioxide in the Rectisol off-gas which is approximately 97 percent carbon dioxide is reduced to a value below 50 ppm. This renders the off-gas suitable for discharge to atmosphere after incineration. Other small off-gas streams containing hydrogen sulfide are also treated in the unit.

Hydrogen sulfide is absorbed as sodium sulfide and the solution is regenerated by oxidizing with air which frees elemental sulfur. The sulfur is recovered in the molten form for sale.

8.12 OXYGEN PLANT

The purpose of the Oxygen Plant is to supply high pressure oxygen, nitrogen, instrument air and plant air to the plant.

8.13 STEAM GENERATION AND POWER GENERATION

The Process Steam Generation Unit produces high pressure superheated steam for use as process reaction steam and in-plant power requirements.

8.14 COOLING SYSTEM

One natural draft cooling tower supplies the entire plant (process and utility areas) with cooling water. Cooling water is supplied to the plant at 88°F and returned at 108°F, placing a design heat load of 2.52×10^9 Btu/hr on the tower. Water, clarified to remove suspended solids is used as make-up water. Organics are controlled in the circulation water and tower by chlorine addition.

8.15 FLUE GAS DESULFURIZATION

The FMC Double-Alkali FGD process comprises two distinct sections, the sulfur dioxide absorbtion section and the sodium regeneration section. Sodium is the alkali reagent in the absorbtion section, and calcium is the reagent in the regeneration section.

8.16 METHANOL SYNTHESIS

The purified synthesis gas from the Rectisol unit is converted to methanol with the Lurgi methanol process. Methanol synthesis is a recycle operation (i.e., the unconverted reactants are recycled back to the inlet after condensing out the methanol). Nonreactive compounds, such as methane and nitrogen, build up in concentration and must be purged from the system. An appreciable quantity of CO_2, CO, and H_2 are also part of the purge gas stream. The purge gas stream is the feed to the methanation unit.

8.17 METHANATION

The purge gas stream contains all the methane produced by the Lurgi gasifiers (roughly 1/2 the Btu content of the synthesis gas). The CO, H_2, and CO_2 also in the purge gas are converted to methane with a nickel-containing methanation

catalyst. The gas from the methanation reaction is cooled, then sent to a separate absorber tower in the Rectisol unit for CO_2 removal. This serves to dry the gas stream.

8.18 MOBIL MTG

The methanol produced in the methanol synthesis unit is converted in a Mobil MTG unit into primarily gasoline, but also small amounts of fuel gas and LPG. In the Mobil MTG unit, crude methanol flows from the methanol plants into a surge drum and flashed gases are returned to the methanol plants into a surge drum and flashed under flow control in a reactor effluent methanol exchanger where it is vaporized and superheated. Methanol vapor is catalytically converted to an equilibrium mixture of dimethyl ether, methanol, and water and sent to the M-gasoline reactors. The M-gasoline reactors use a shape-selective zeolite catalyst to complete the conversion of methanol to hydrocarbons and water. A conversion of +99% is achieved in a single pass. The M-gasoline reaction products are cooled and separated into a hydrocarbon vapor phase, and liquid hydrocarbon and water phase.

V

PROJECT ORGANIZATION AND MANAGEMENT

Prepared by: Michael D. Burke, Project Director

1.0 GENERAL PROJECT MANAGEMENT PHILOSOPHY

Texas Eastern and Texas Gas recognized the importance of providing a strong management team for the successful implementation and execution of a major, complex and capital intensive project such as represented by the Tri-State Synfuels Project. The partners felt that such a management team would be needed not only for the preliminary design stage proposed for the Cooperative Agreement, but also for execution of the total project through the plant construction and start-up phases.

The partners of Tri-State Synfuels Company ("Tri-State") feel strongly that vesting broad management authority in an independent project team provided the essential responsiveness and flexibility necessary for fast and positive decision making. Texas Eastern Synfuels, Inc. ("Texas Eastern") provided the project management team which had the clear authority and responsibility required for effective management of the Cooperative Agreement scope of work, subject to the overall directives of an Executive Committee. The single focus provided by such an arrangement resulted in the development of a cohesive project management team which provided the management controls and policy guidance necessary for the various subcontractors and which provided the management interfaces required by the managements of the Department of Energy and the sponsors' parent companies.

The overall management philosophy emphasized a relatively small group of professionals who had demonstrated competence in project management and also in the broad management areas applicable to this type of undertaking of joint venture operation, technology development, plant engineering and construction, general business management, and economic analysis. This management philosophy, which emphasizes the nomination of team members from the partners' existing organizations with broad experience, as contrasted with a team composed of specialists, reduced both the size and costs of the project management effort. The intent was to develop a program that would provide the required specialists from the affiliated companies of Tri-State's sponsors and to make available technical and professional management as required throughout the life of the project. Use of a small but multi-skilled team of professionals was set up to avoid risks associated with ineffective internal communication, reduce decision-making delays, and effectively provide single point

contact for the Department of Energy's project representative.

The size of the project dictated that its sponsors utilize a Project Management Contractor experienced in management of the engineering, design, purchasing, construction, and project control functions in large, complex and capital intensive projects. Fluor Engineers and Constructors, Inc.'s ("Fluor") outstanding reputation, track record, and unique experience in the type of synfuels plant proposed made their involvement in this function a key strength of the project. Fluor, as the Project Management Contractor, provided a project management organization which effectively interfaced with the project management team.

TRI-STATE SYNFUELS PROJECT
ORGANIZATIONAL STRUCTURE

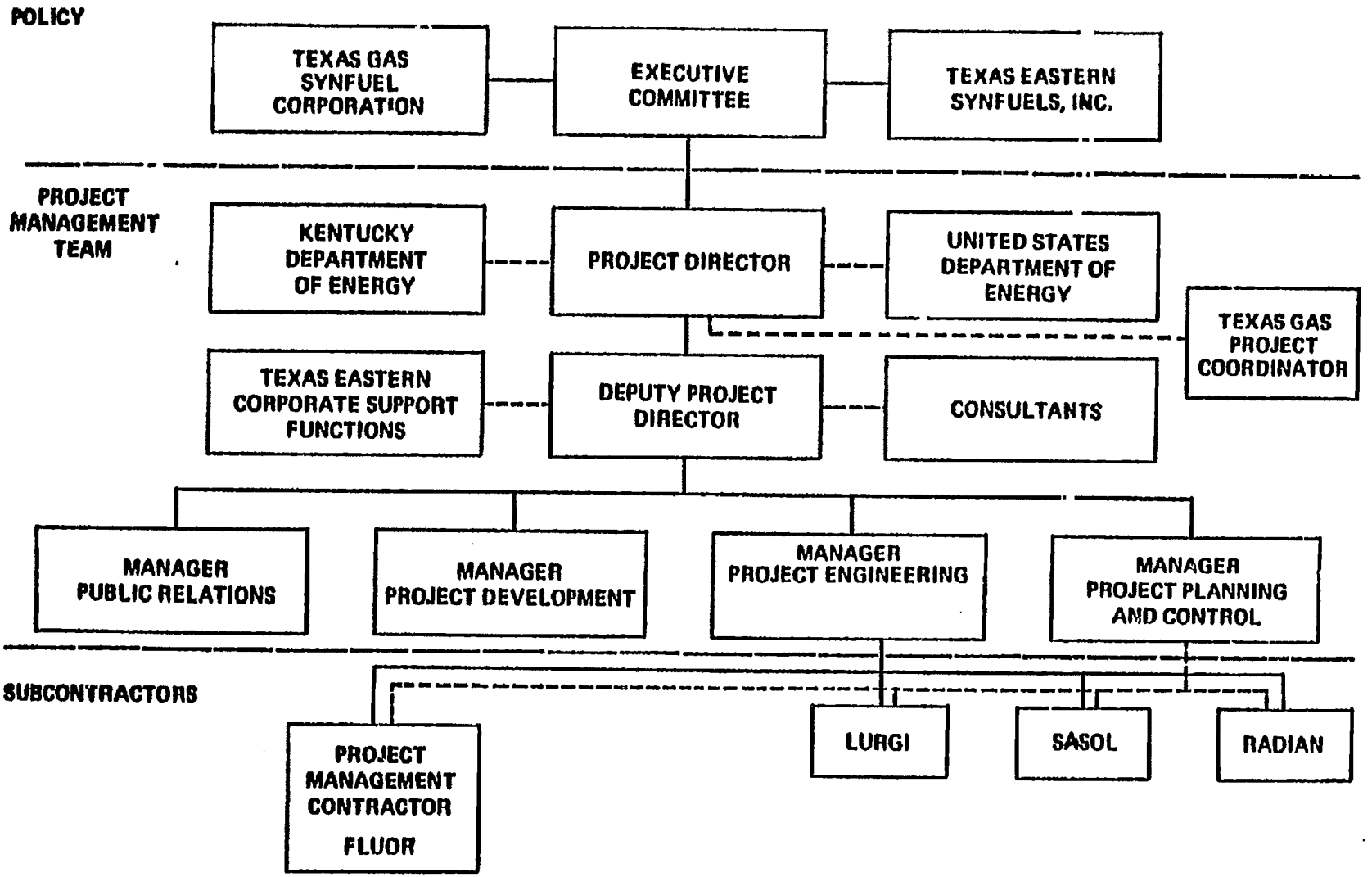


EXHIBIT V-A

2.0 MANAGEMENT STRUCTURE

2.1 Policy Level

The project's management structure involved three tiers of responsibility shown on Exhibit V-A (Policy, Project Management Team and Subcontractors). Fluor served as Project Management Contractor for all subcontractors other than Radian, Lurgi and Sasol.

The scope of work under the Cooperative Agreement was managed at the policy level by an Executive Committee composed of a senior management representative and an alternate from each of the sponsoring companies. The Executive Committee functions in a manner similar to the Board of Directors of a corporation, making all policy decisions required during the scope of work. The Executive Committee meets on a regular basis, usually once a month, to provide policy guidance to the Project Management Team.

2.2 Project Management Team Level

The Project Management Team has the responsibility of providing the day-to-day management and control for the overall scope of work. The overall responsibility is to accomplish the project objectives and to carry out the policy directives of the sponsors' parent companies as directed by the Executive Committee. Organization charts of Tri-State project management are shown for the period February 1981 to March 1982 in Exhibit V-B and for the period March 1982 and thereafter in Exhibit V-C.

The Project Director is a key management position in the Project Management Team organization structure and has ultimate responsibility for overall project management and control. The Project Director is responsible for the performance of the work as defined in the Statement of Work included in the U.S. DOE Cooperative Agreement. The Project Director is also responsible for the execution of policy decisions concerning all aspects of the project. He provides the primary interface between the Executive Committee, the Department of Energy and the project organization. Texas Gas Synfuel Corporation ("Texas Gas") appointed a Project Coordinator who served as the primary interface between Texas Gas and the Project Management Team.

The Deputy Project Director reports to the Project Director and has responsibility for all operating, control, and management aspects of the project. Reporting to the Deputy Project Director is the project management team necessary to manage and control the scope of work proposed under the Cooperative Agreement. The management team functions as an overall management staff to assist the Project Director and

TRI-STATE SYNFUELS COMPANY
(February 1981 - March 1982)

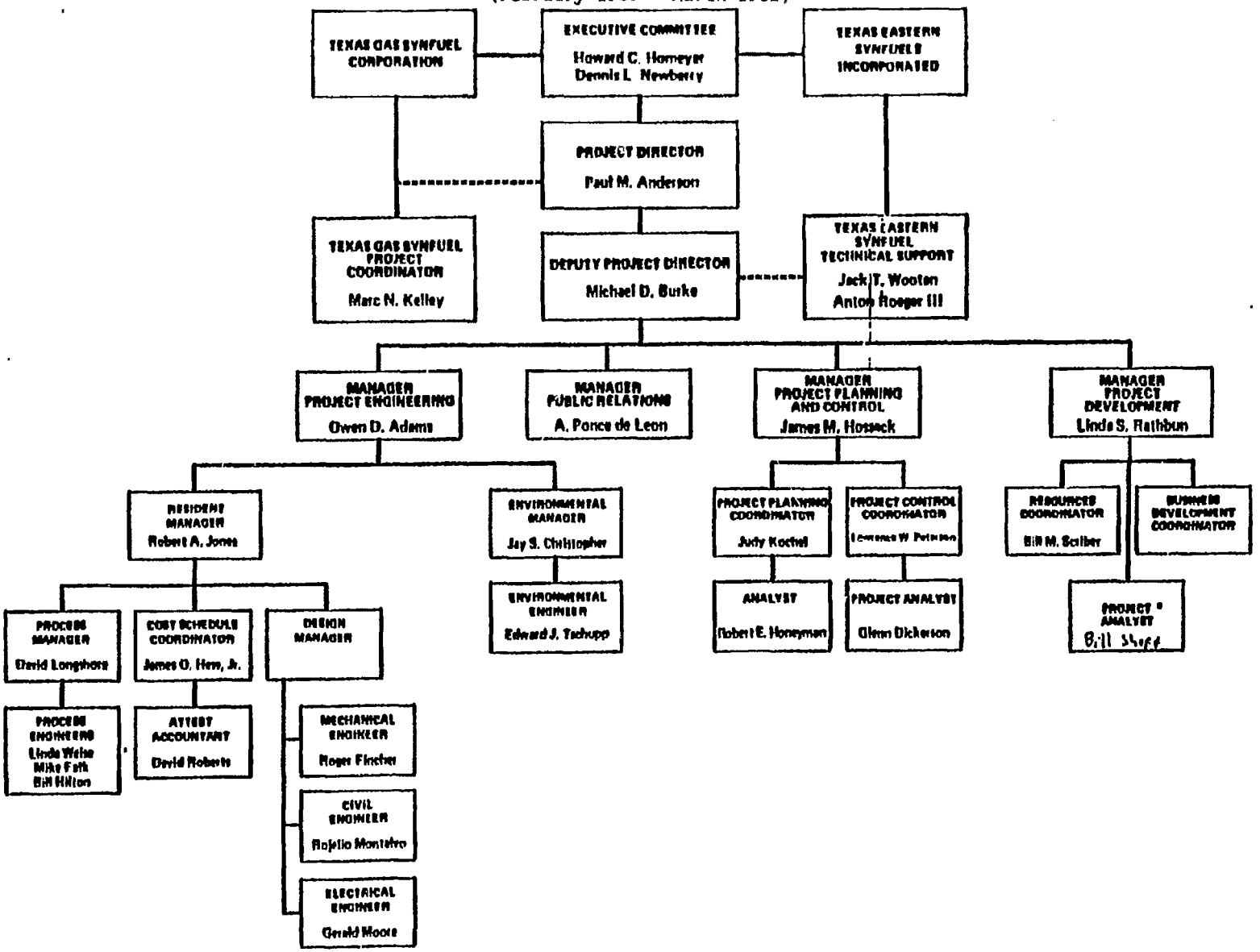


EXHIBIT V-B

TRI-STATE SYNFUELS COMPANY
(Effective March 1982)

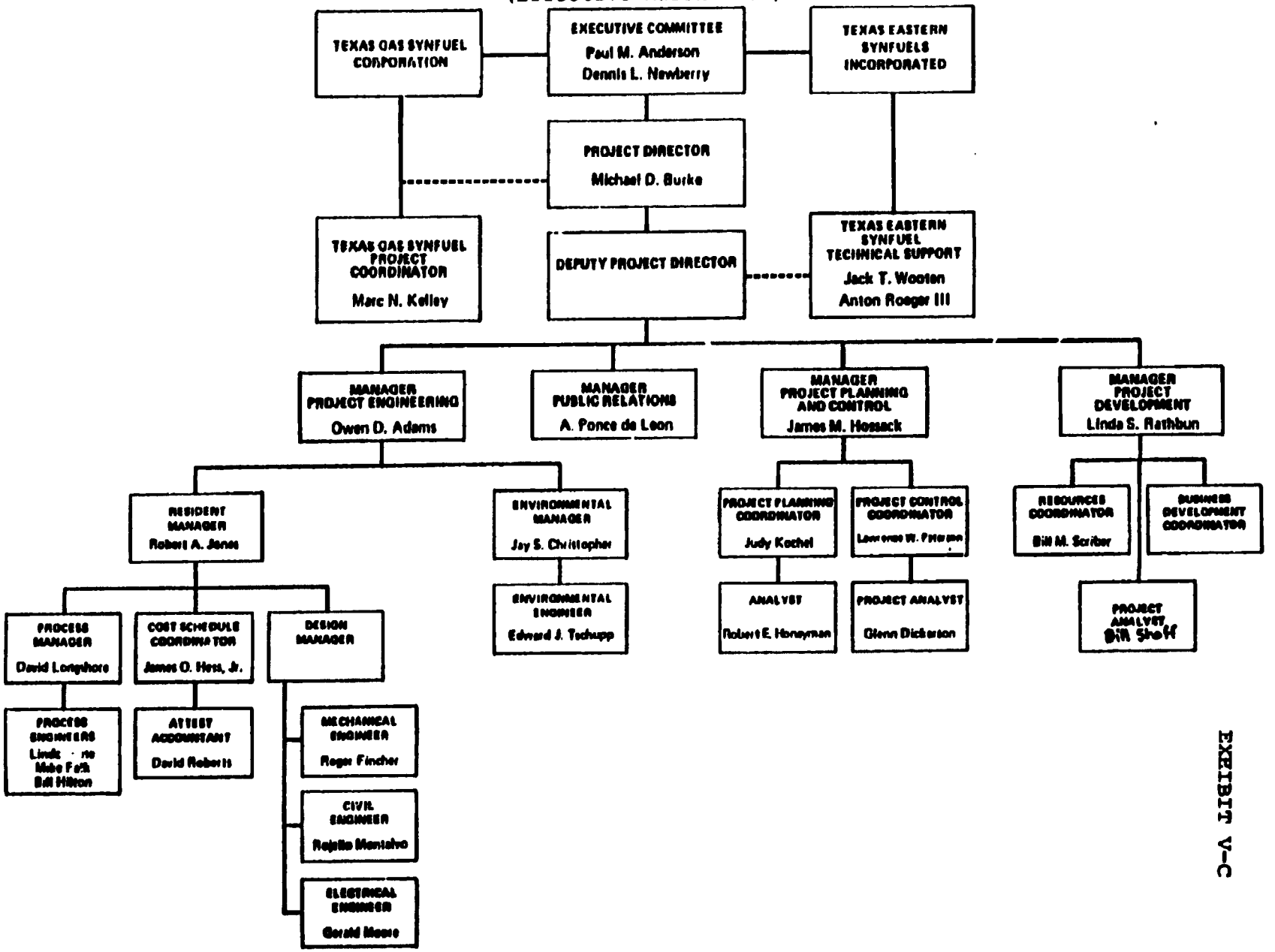


EXHIBIT V-C

Deputy Project Director in carrying out their responsibilities to achieve the project's goals and objectives. This group coordinates, monitors and controls the activities of the project. The Project Management team also provides the basic nucleus necessary for a smooth transition of the communication and control networks proven during the prior phases of work.

Although the size of the management team would increase as the project reaches the execution phase, the basic management philosophy would not have changed throughout the project. This structure would have provided for effective continuation of the management requirements dictated by a project of this scope and nature.

The Project Management Team has access to the necessary resources within the sponsors' parent companies and the principal subcontractors to accomplish all tasks encompassed by the Project. Research and engineering functions centralized within Texas Eastern contain approximately 300 professionals from which to draw. Also included are specialized finance, legal, accounting and computer services divisions to provide the support required by the Project Director. Texas Gas has comparable support resources available.

Reporting to the Deputy Project Director are Managers of Public Relations, Project Engineering, Project Development, and Project Planning and Control. The Manager of Public Relations was responsible for conducting a public information program which involved coordination with local public officials, attendance at various public meetings and responses to inquiries from the public. The Manager of Project Engineering along with an Assistant Manager of Project Engineering was responsible for the technical aspects of the project including overseeing all necessary interfaces with the project's subcontractors. The Manager of Project Development was responsible for the project's marketing studies, acquisition of coal resources and contract review. The Manager of Project Planning and Control oversaw the project scheduling and control efforts along with economic evaluation and financial planning.

2.3 Subcontractor Level

Fluor, as Project Management Contractor, assigned a Project Director who was responsible for all Fluor work. This would have included both the home office and field phases of the work. The Project Director's immediate staff consisted of Deputy Project Director, Controls; Deputy Project Director, Engineering; Deputy Project Director, Administration and Finance; and Procurement Manager. Each of these managers were responsible for the timely execution of the particular portions of the job described below. The organization for

FLUOR MANAGEMENT ORGANIZATION

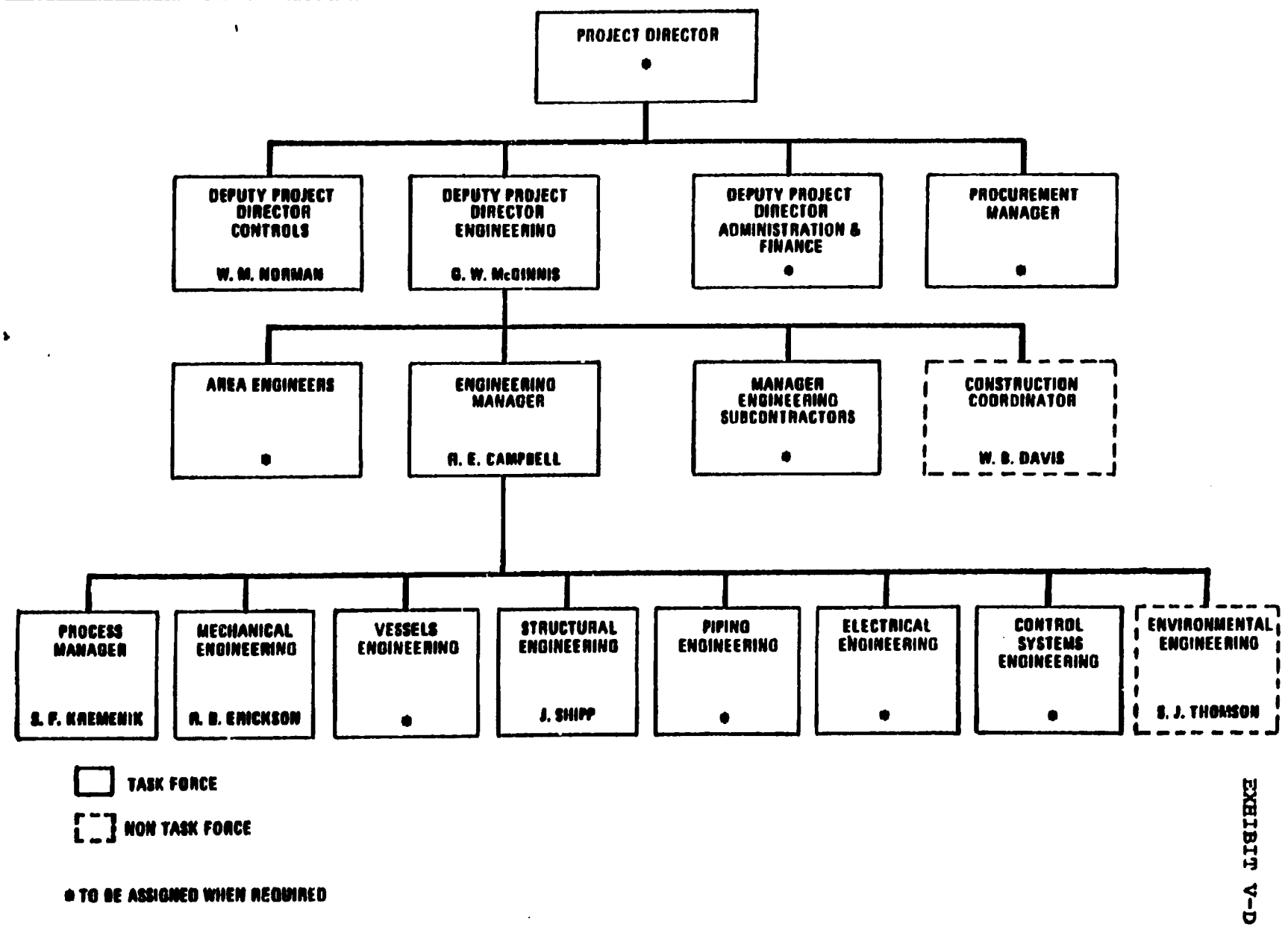


EXHIBIT V-D

the Project Management Contractor effort is shown in Exhibit V-D.

The Deputy Project Director, Engineering managed various engineering groups and was responsible for all technical aspects of the Fluor designs. The design basis, to be developed with and approved by the Project Management Team, would have provided design standards for Fluor and other subcontractors for the development of the design. The Deputy Project Director, Engineering also initiated evaluation studies to ensure that the final design would achieve maximum cost effectiveness. He assumed overall project responsibility in the absence of the Project Director, and he was responsible for performing engineering work within budget and schedule.

The Deputy Project Director, Administration and Finance, was responsible for maintenance of the Project Procedure Manual. Various sections of the Project Procedure Manual were written by appropriate members of the task force and described all administrative aspects such as distribution of all documents, approval authority for the various decisions required, numbering systems to be used, and drawing requirements.

The Deputy Project Director, Controls, supervised an experienced team of cost and scheduling engineers who assisted the Project Director in the planning and control of the project.

3.0 The Management Process

The execution of the Cooperative Agreement scope of work included a well-coordinated project management system which incorporated the elements of planning, estimating, scheduling, trending, forecasting, analysis and reporting essential to effective project management and control. Through the use of these elements, the Project Management Team was able to quickly identify deviations from the plan to ensure that the management team could respond in a timely and effective manner.

The project management plan was established to define, monitor and control the overall project based on the statement of work, milestone schedule, cost plan and manpower plan. The project was controlled through the utilization of several manual and computerized techniques that have been proven to accomplish the following five objectives:

- Planning - define what has to be done and when
- Reporting - report what has been done and when
- Forecasting - measure what remains to be done and when
- Analyzing - know what is wrong early and why
- Controlling - take corrective action

An important part of the project's management system was the continuous monitoring and control of each subcontractors' work effort. The Project Management Team maintained a professional technical staff at the Project Management Contractors' offices to review the technical work and to provide for continuous monitoring and control of the work effort. Weekly meetings were held to review and discuss status of the subcontractors' work. The Project Management staffing for this function would have increased as more of the scheduled work was implemented.

In addition to the monitoring of the project's subcontractors by engineering personnel, several automated management systems were utilized. The Project Management Team, in conjunction with Fluor, Radian and other subcontractors, have developed a detailed Critical Path Method network (CPM) utilizing the Fluor Analytical Scheduling Technique (FAST) system. FAST is a computerized method for the integration of project planning and control that was specifically designed to meet the sophisticated demands of modern industrial plant design and construction. Using the FAST system, CPM scheduling was applied to develop a cohesive plan for the project's Cooperative Agreement effort. The project's CPM reflects a systematic coordination of all efforts identified

in the Statement of Work. This integrated approach to information processing has provided for the early identification of the project's critical path and potential critical path activities, and allows the project management team to practice the principles of management by exception.

In addition to the CPM, the Project Management Team utilized a Cost and Reporting System (CARS) designed by Texas Eastern's Computer Services Division. CARS provided a budgeting, cost control and reporting capability for the project. Permanent files of actual and planned costs were maintained and updated. Variances between actual and planned costs were calculated for project management and reporting needs. Costs budgeted and incurred by the project were identified by major category, as defined in the CPM, for the contractor and each subcontractor. To the extent necessary for project management control, costs were further defined by cost element within each major category. The CARS system provides the Project Management Team with timely and accurate information for its management and reporting needs along with a consistent basis for comparison of actual and planned costs.

Each subcontractor submitted a monthly progress and cost report to the Project Management Team which outlined the man-hours incurred for each reporting category listed in the CPM, the actual cost incurred in connection with the work during the immediately preceding month, the estimated dates of commencement and completion of each of the subtasks listed in the CPM and a revised forecast of the total cost to complete their portion of the Cooperative Agreement effort. These reports along with similar data generated by the Project Management Team and the sponsoring companies were input into the CPM and CARS systems.

The primary objective of the use of the CPM and CARS systems was to provide the Project Management Team with a realistic plan for the performance of the project. They also provided an early warning system for possible deviations from the project's plan. Emphasis was placed on the early warning features of the systems in order that effective action may be taken at the earliest possible date. The utilization of CPM and CARS provided the Project Management Team with a well-defined control base, accurate and timely reports of expenditures, an effective method of identifying deviations from the control base, a practical system for initiating corrective action and a forecasting mechanism which accurately reflects the current cost outlook.

Each month during the project the Project Management Team met with the subcontractors to review and evaluate the status of the project. The subcontractors' monthly progress reports will be combined with data produced by the FAST and CARS systems into a monthly project report. These monthly reports

were further summarized into quarterly reports for review by the Executive Committee and the DOE with respect to the status of the project's plans, costs, and technical results.

EXHIBIT V-E

PROJECT PERSONNEL

TEXAS GAS SUPPORT

Name	Title	Area/Type Assistance	Role
Dennis L. Newberry	President, TG Synfuels	Executive Committee	Project Management
Marc N. Kelley	Vice-Pres., TG Synfuels	Coordination, Management, Engineering	Project Advisor and Monitor
John W. MacKenzie	General Counsel, TG Synfuels	Executive Committee Alternate, Legal	Contract Developer
Paul A. Fedde	Vice-Pres., TG Synfuels	Engineering, Coal Supply	Consultant
H. Dean Jones, II	Manager, Gas Process Studies	Engineering, Management	Advisor, Monitor
Michael D. Falk	Engineer	Irvine Team	Engineering review and Development
Ernie Talliaferro	Senior Analyst	Accounting, Economics	Monitor, Scoping Studies
Josh Rattray	Engineer	Engineering	Advisor, Monitor
Walker E. Meacham	Superintendent, Engineering Research	Coal Stockpile Testing	Manager
C. W. Brown	Director	Environmental	Advisor, Monitor
David Roberts	Accountant	Irvine Team	Accounting, costs & schedules
Oscar Chappel		Land	Permit Obtainer
Elizabeth Goodaker	Clerk	Files	Filing, Copying, & Distribution
Robert Hagerman	Supervisor, Technical Information	Coal Stockpile Testing	Data Collection

4.0 PROJECT MONITORING REVIEW REPORT

Prepared by: Marc N. Kelley, Vice President - Texas Gas Synfuel

H. Dean Jones, II, - Texas Gas Synfuel Manager, Gas Process Studies

4.1 Introduction

The role of Texas Gas in the Tri-State Synfuels Project is that of advisor, financial partner, and project monitor. The latter of these roles has been by far the most manpower intensive and is intended to accomplish the following objectives:

1. To assist Texas Eastern in putting together a financially attractive energy project.

2. To keep Texas Gas's upper management aware of the project's status so that informed decisions can be made on executive committee matters.

3. To assist the Project Director in any facet of the project as directed.

4. To provide the necessary manpower from Texas Gas when requested by the project director.

5. To provide Texas Eastern with ongoing constructive criticism and suggestions for improved project management.

To accomplish these objectives, Texas Gas assigned four individuals to the project full time while a much larger group was used on an as-needed basis. A listing of Texas Gas individuals who have participated in Tri-State can be found in Exhibit V-E. Also, attached in Exhibit V-F is a summary of the estimated and actual levels of manpower that have been used through April, 1982, on the project and the associated allowable costs incurred by Texas Gas.

4.2 Summary

Texas Gas's overall evaluation of the Tri-State Synfuels Project is that it has been very well managed. Texas Gas appreciates the excellent effort that has been given by all the members of the Tri-State management team. We look forward in continuing our excellent working relationship with Texas Eastern.

EXHIBIT V-F

ESTIMATED AND ACTUAL EXPENDITURES FOR PROJECT MONITORING

Direct Labor Hours

Period	Budgeted	Actual
1st Q '81		
2nd Q '81		
3rd Q '81		
4th Q '81		
1st Q '82		
April '82		

(1) Revised for Demobilization

Costs

Major Categories	Expenditures 2/6/81-4/30/82 Budget	Actual	To Complete Demobilization Estimate
Direct Labor			
Labor Loading			
G & A Expense			
Travel Expense			
Other Direct Costs			

4.3 History

The following is a list of tasks that have been completed by TGSC during the TSSP:

- Assisted in arranging the transportation of 22 thousand tons of coal to SASOL for the large scale coal test.
- Assisted in monitoring the coal shipment from mine site to SASOL.
- Provided engineering assistance in planning, operating, and monitoring of large scale coal test.
- Provided management and engineering of long-term coal stockpile test at Uniontown, Kentucky, and issued a full report.
- Supplied one engineer and one accountant to the project team in Irvine, California.
- Supplied land man to secure access agreements for surveying, coring, and drilling.
- Reviewed all contracts and provided comments and recommendations.
- Prepared budgets for Texas Gas and reviewed the overall Tri-State Synfuels Project budget.
- Reviewed and commented on all engineering process alternative studies.
- Assisted in public relations effort in Owensboro, Henderson and Evansville area.

4.4 Current Status

The most recent activities of TGSC have been to monitor the demobilization and termination of the project with emphasis on insuring that the work product is packaged in such a way that it can easily be resumed, if necessary. Another area that TGSC has been working on is a critique of the project management by Texas Eastern. This evaluation is meant to serve as constructive criticism that will be beneficial to the project if resumed. The following is a list of the major strengths and weaknesses of the project's management as seen by Texas Gas. No significance should be given to the order in which items appear in the lists or to the number of items in one list as opposed to the other.

4.4.1 Strengths

- The project director has been given the needed authority to go with his responsibilities. This is generally true at the lower managerial levels with one exception that will be discussed under weaknesses.
- The project director has provided outstanding leadership to the project team which is reflected in their morale and willingness to work hard.
- The project director - deputy project director organizational structure has worked very well as has the interface with the Executive Committee.
- Project staff meetings and weekly activities reports have been very valuable communication tools.
- The public relations effort was well received in Henderson, and would have been a real plus to the project had we gone to construction.
- The decision to conduct a full-scale coal test early in the project proved to be a very good one.
- The development of a computerized economic model (SEEM) allowed for timely and valuable economic comparisons.
- Project documentation is very good.
- The series of high-level management meetings with Fluor in the fall of 1981 were very effective in improving Fluor's performance and in communicating to them what we expected from our engineering manager.
- All team members have been frank and honest with Texas Gas. We are always treated with courtesy and respect which makes for an excellent working relationship.

4.4.2 Weaknesses

- The project engineering structure as it was used did not place the authority that was needed at the proper level. We believe that the "Resident Engineering Manager at Irvine" and the "Environmental Manager" should have reported directly to the "Deputy Project Director."

- Project control tools have not been used as effectively as they could have been to control task completions and budgets.

- The "Manager of Project Development" whose primary responsibility was to secure the plant's coal supply, should have had a much stronger background in the Illinois Basin coal business.

- In general, contract negotiations were unnecessarily protractive which cost time, money and project momentum. This was caused in many instances by external, uncontrollable factors.

- Major project decisions were sometimes "made" by Texas Eastern and were then "sold" to Texas Gas. Earlier involvement in the decision making process would have been a more efficient way to manage changes in project direction.

VI

CONTRACTS AND AGREEMENTS

Prepared by: Paul M. Anderson - President
Texas Eastern Synfuels

1.0 INTRODUCTION

A major effort in the early stages of the Tri-State Project was devoted to developing and negotiating the contracts and agreements necessary to pursue the project. While these agreements concentrated on the Cooperative Agreement effort, many of them laid the foundation for future agreements and business conditions which would apply to the construction phase of the project. The overriding objective was to provide the framework for performing the work which was proposed to the DOE in April 1980.

As shown on Exhibit VI-A, this effort involved senior members of the project team and representatives from each partner. Inside and outside legal counsels became integral members of the negotiating teams. While costs for this activity were not tracked directly, the vast majority of the legal costs detailed on Exhibit VI-B went to support this effort.

EXHIBIT 7I-A
PROJECT PERSONNEL

Tri-State

Name	Title	Service Date	Area of Responsibility
P. M. Anderson	Project Director	8/80 - 4/82	Overall contract Development/ Negotiations
M. D. Burke	Deputy Project Director	11/80 - 4/82	Chief negotiator for Radian, AEP, & Chem Systems
J. M. Conaway	Mgr. Plng. & Control	9/80 - 9/81	Contract Development
O. D. Adams	Mgr. Project	8/80 - 4/82	Statement of work for Engineering agreements

Texas Eastern Support

Name	Title	Area/Type Assistance	Role*
E. C. Homeyer	Dir. of Synfuels Div.	Overall responsibility	3
R. F. Wornson	General Attorney	Overall legal responsibility	3
R. A. Lawhon	Sr. Attorney	Legal assistance for real estate issues	1

Texas Gas Support

M. N. Kelley	Coordinator, VP TG Synfuels	Overall contract development	3
J. W. MacKenzie	General Coun. TG Synfuels	Legal	2
D. L. Newberry	Pres., TG Synfuels	Negotiations	2

Vinson & Elkins Support

R. F. Bartlett	Partner	Overall legal assistance	3
W. R. Robins	Partner	Patent/license counsel	2
H. Wilfong	Partner	Environmental	1

Morgan, Lewis Support

O. S. Heistand	Partner	Government contracts Counsel	2

*3 - Key
2 - Important but on "as required basis"
1 - Occasional use

Exhibit VI-B

TRI-STATE SYNFUELS COMPANY
SCHEDULE OF LEGAL COSTS

	Actual Payments thru 4/30/81	Estimated Accruals thru 4/14/82	Total
Boehl, Stopher Graves & Diendoerfer			
Cubbage & Thomason[1]			
Morgan Lewis & Bockius			
Vinson & Elkins			
Sub-Total			
Texas Eastern			
Total Costs on Tri-State Books			
LEGAL COSTS ON PARTNERS' BOOKS RELATED TO THE TRI STATE PROJECT			
Texas Eastern[2]			
Texas Gas[3]			
Sub-Total			
Total Project Legal Costs			

[1]Land option work in Henderson Kentucky

[2]Texas Eastern's internal legal costs billed to Tri-State

[3]The majority of this cost is Pre-Cooperative Agreement cost and consists of invoices from various legal firms as well as Texas Eastern's internal legal costs.

2.0 SUMMARY AND HIGHLIGHTS

2.1 HISTORY

A brief description of key contracts and agreements negotiated is given below. Except as noted on Exhibit VI-A, all negotiations were led by either Homeyer and/or Anderson. For the general partnership agreement, Newberry led the Texas Gas negotiating team.

- General Partnership Agreement between Texas Eastern Synfuels, Inc. and Texas Gas Synfuel Corporation - Executed February 6, 1981 this agreement formed Tri-State Synfuels Company as a partnership. The agreement is detailed as to the operation of the partnership prior to commitment to construction, but very general thereafter. The agreement would require amending in order to effectively add a new partner or to enter into the construction phase. A side letter from D. L. Newberry dated February 3, 1981 contains confidential information describing the coal reserves dedicated by Texas Gas in the partnership agreement.

- U.S.D.O.E. Cooperative Agreement No. DE-FC05-81ORZ0807 - Executed February 6, 1981, this agreement formed the basis for the work performed and the cost sharing with DOE for most of the Phase I effort. Incorporated in this agreement by reference are a Small Business and Small Disadvantaged Business Subcontracting Plan dated February 6, 1981, which was transmitted under separate cover to Mr. R. E. Lynch, DOE, and a cost and manpower plan dated March 13, 1981, which was also transmitted separately. The Cooperative Agreement was terminated prior to its completion, effective June 7, 1982. A major modification to the Cooperative Agreement was proposed and developed during the first quarter of 1982 but was never executed.

- Agreement between Commonwealth of Kentucky and Tri-State Synfuels Company - Executed May 18, 1981, this agreement confirmed verbal agreements reached between William B. Sturgill and David D. Drake of Kentucky and Howard Homeyer approximately one year earlier. The agreement details Kentucky's commitment to fund the coal test at Sasolburg and to option the plant site and substitute airport site from AEP. An assignment agreement, assigning the foregoing options to Tri-State, was negotiated and drafted, but not executed.

- Plant Site Option and Substitute Airport Site Option - These agreements dated August 24, 1981, are between the Commonwealth of Kentucky and Franklin Real Estate Company, a subsidiary of American Electric Power Inc. (AEP). While these options are not directly with Tri-State, Tri-State played a major role in their negotiation as they are assignable to Tri-State under the agreement between Tri-State and the Commonwealth of Kentucky. The initial term of the options will expire in August 1983 at which time they may be renewed for an additional two years.

- Tri-State Synfuel Project Commercial Scale Coal Test Gasification Project - This agreement with Sasol was executed on February 11, 1981 along with an accompanying secrecy agreement of the same date. This agreement detailed the terms and conditions for the full scale coal test at Sasolburg. The work under this agreement was completed prior to terminating the Cooperative Agreement.

- Supplemental Agreement between Sasol and Texas Eastern Synfuels - This agreement, executed on February 11, 1981, acted as a supplement to the Study Agreement between Sasol and Texas Eastern Development Inc. dated August 22, 1979. The Study Agreement provided for licensing and consulting arrangements between Texas Eastern and Sasol for the construction phase of a project which subsequently became the Tri-State Project. However, it did not envision an interim stage prior to construction as was undertaken through the Cooperative Agreement. The Supplemental Agreement was therefore developed to take care of this interim period. The Supplemental Agreement was formerly terminated by a telex dated April 29, 1982.

- Reimbursable Cost Contract for Engineering Design Services Relating to an Indirect Coal Liquefaction Plant By and Between Tri-State Synfuels Company and Fluor Engineers and Constructors Inc. - This contract was executed to become effective on February 6, 1981 and formed the basis for the majority of work to be performed under the Cooperative Agreement. While the terms and conditions of the contract were primarily oriented to the work being performed under the Cooperative Agreement, some of the terms related to use of the work beyond the Cooperative Agreement Program and lay the basis for a construction contract. A letter agreement dated January 26, 1981 between Fluor and Texas Eastern Synfuels and Texas Gas

Synfuel Corporation formed the basis for the terms of this contract as well as establishing an understanding regarding Fluor's role during the construction phase of the project. It is anticipated that the major contract will be terminated subsequent to the termination date of the Cooperative Agreement.

- Consulting Contract for Environmental, Health, Safety, Socioeconomic and Permits Support Services Relating to an Indirect Coal Liquefaction Plant By and Between Tri-State Synfuels Company and Radian Corporation - This contract dated February 6, 1981 was the basis for the environmental work to be performed under the Cooperative Agreement. It is anticipated that this contract will be terminated subsequent to the termination of the Cooperative Agreement.

- Chem Systems Study Agreement - This agreement was executed March 1, 1981 and supported by a separate secrecy agreement dated March 10, 1981. The agreement covered a market study which was completed prior to termination of the Cooperative Agreement.

- License Agreement Between Lurgi Kohle und Mineraloeltechnik and Tri-State Synfuels Company - This agreement was executed September 24, 1981. The License granted covers the Lurgi process as it applies to a Sasol type plant. As such it does not cover methanol synthesis which is required for the configuration ultimately adopted for Tri-State. The term of the agreement is twenty years unless licensee terminates earlier or defaults under the agreement. If the agreement is not terminated, the first installment payment of the license must be made within thirty-six months of the effective date of the agreement.

- Proprietary Equipment Agreement Between Lurgi Kohle und Mineraloeltechnik and Tri-State Synfuels Company - This agreement is also effective September 24, 1981 and must be taken in conjunction with the License Agreement and also refers to the Engineering Agreement to be described later. This agreement covers Lurgi's role in the specification and procurement of proprietary equipment required for the Lurgi process. The agreement will remain in force for twenty years unless terminated by mutual consent of the parties.

- Engineering Agreement By and Between Tri-State Synfuels and Lurgi Kohle und Mineraloeltechnik - This agreement was executed in September concurrent with the License Agreement and Proprietary Equipment Agreement. However, the effective date of this agreement is April 10, 1981, as Lurgi began work under a letter of intent which was executed on that date. The Engineering Agreement concentrated on the Cooperative Agreement work effort with some general provisions relating to Lurgi's role during the construction phase. A side letter dated August 24, 1981 detailed the adjustment formula for manhour and daily rates. It is anticipated that the Engineering Agreement will be terminated shortly after the termination of the Cooperative Agreement.

- Guarantee Agreement By and Between Tri-State Synfuels Company and Lurgi Kohle und Mineraloeltechnik - The text of this agreement was negotiated, but the supporting schedules detailing the specific performance to be guaranteed was never finalized. This agreement was to be taken in conjunction with the previous three agreements as a total package.

The most noteworthy observation that can be made with regard to the effort devoted to negotiating the above agreements is that the process was very slow and time consuming. A great deal of management effort was required to complete all of the agreements and the elapsed time required greatly exceeded our original estimates. The reasons contributing to this included:

Given the benefit of hindsight the following approach would have been helpful:

2.2 CURRENT STATUS

It is anticipated that many of the agreements above which have not been satisfied will be terminated shortly after the termination of the Cooperative Agreement. Exceptions along with required actions are noted below:

- General Partnership Agreement - Should be maintained unless project is totally abandoned with no hope of being reactivated. At some point, the partners may wish to amend the agreement to modify some of the provisions.

- Commonwealth of Kentucky Agreement - Agreement will be effectively terminated if and when we serve notice that we have abandoned the project.

- Plant Site Option - Will lapse in August 1983 unless a renewal fee is paid. This is a key decision date.

- Lurgi License and Proprietary Equipment Agreements- While these agreements have a term of twenty years, it would be prudent to terminate them if the plant site option is not renewed. If they are not terminated, a license fee payment will be due in September 1984.

2.3 FUTURE

If the project is reactivated, new engineering agreements will be required to satisfy whatever workprogram is adopted. The Partnership Agreement will certainly need to be amended. The Lurgi License and Proprietary Equipment Agreements must be amended to reflect the addition of methanol synthesis. The Lurgi Guarantee Agreement must be completed. Licenses must be negotiated with Mobil for the Mobil-M Process and with FMC for flue gas desulfurization in addition to other minor process licenses. Key contacts associated with all agreements negotiated or contemplated to date are shown in Exhibit VI-C.

Exhibit VI-C

Major Contacts

Company & Address	Individual	Title/Position	Telephone
Flour Engineers & Contractors 4620 North Braeswood Blvd. P. O. Box 35000 Houston, TX 77035	*W. M. (Bill) McDaniel T. (Ted) Weaver	Senior Mgr./Sales Dir. of Licensing	713/662-4006 714/975-6981
Kentucky Department of Energy P. O. Box 11888 Iron Works Pike Lexington, KY 40578	*David D. Drake	Secy. of Energy	606/252-5535
United States Department of Energy Oak Ridge Operations Administrative Road, Federal Building P. O. Box E Oak Ridge, TN 37830	*R. E. (Bob) Lynch W. L. (Bill) Brown R. M. (Bob) Poteet	Contracting Off. Legal Counsel Patent Counsel	615/576-0758 615/576-1204
Radian Corporation P. O. Box 9948 8501 Mo-Pac Boulevard Austin, TX 78766	*W. F. (Kirk) Holland	Project Manager	512/454-4797
Sasol Limited Sanlam Building Corner of Commissioner & Sauer Streets P. O. Box 5486 Johannesburg 2000 Republic of South Africa	*P. C. (Chris) van der Walt P. Naude D. F. (Dirk) Mostert	Commercial Mgr. Gen. Mgr. Tech. General Manager	(011-27-11) 836-7414 (011-27-11) 836-7414 (011-27-11) 836-7414

Exhibit VI-C

Major Contacts

Company & Address	Individual	Title/Position	Telephone
Lurgi Kohle und Mineraloeltechnik GmbH Bockenheimer Landstrasse 42 Postfach 11 91 81 D-6000 Frankfurt am Main 1 Federal Republic of Germany	*Paul Rudolph Wolfgang D. Tiffert P. K. (Peter) Herbert H. W. (Heinrich) Mathes	 Mgr. Coal Gasifi. Dir. Commercial	(011-49-611) 711-9221 (011-49-611) 711-9789 (011-49-611) 711-9533 (011-49-611) 711-9221
AEP Corporation P. O. Box 487 Canton, OH 44701	*W. J. (Bill) Prochaska R. H. (Bob) Walters Charles Scates	Asst. to Gen. Counsel Dir.-Land Mgmt. Henderson Property Overseer	212/440-9000 216/452-5721 502/533-9262
FMC Corporation 231 North Martingale Rd. Schaumberg, IL 60194	*Jack Englick		312/843-1700
Mobil Research & Development 150 East 42nd Street New York, New York 10017	*Gus Weiss	Licensing Manager	212/883-2771

VII

BUDGETS AND CONTROLS

Prepared by: Larry W. Peterson, Project Control Coordinator
Glenn H. Dickerson, Project Analyst

1.0 INTRODUCTION

1.1 SCOPE OF WORK

The responsibilities of the project controls area of Tri-State Synfuels Company included: development, monitoring and controlling of budgets and schedules; performing general accounting functions.

1.2 OBJECTIVES AND GOALS

The major objectives, grouped by the work areas, were as follows:

1.2.1 Cost Controls

- To create a cost conscious atmosphere.
- Evaluate contractors' cost control organization.
- Appraise, in detail, the cost reporting analysis, and forecasting performance of the contractors.
- To ensure positive corrective actions by contractors.
- Report and analyze cost trends for items for which Tri-State Synfuels Company is directly responsible.
- Review contractor estimates for alternate design studies.
- Review and approve change orders.
- Coordinate and interpret the control estimate.
- Report monthly - Budgets, Commitments and Forecasts.

1.2.2 Schedule Control

- Evaluate contractors' schedule implementation and control.

- Appraise the progress reporting analysis and forecasting performance of the contractors.

- Recommend and ensure positive corrective actions by contractors.

- Develop and coordinate schedule implementation and control for Tri-State activities.

- Prepare independent progress analyses.

1.2.3 General Accounting

- Prepare journal entries to record all transactions related to Tri-State.

- Prepare financial statements to keep the management of Texas Eastern and Texas Gas informed of the financial position of Tri-State.

- Process and pay invoices from various firms and vendors.

- Prepare United States Department of Energy drawdowns and Kentucky Department of Energy invoices, to satisfy these agencies' obligations to the Project.

- Prepare cash requests to partners to keep the partnership adequately funded in order to meet current obligations.

- Prepare United States Department of Energy Monthly Progress Reports to keep DOE informed on the progress, status and direction of the Project.

- Maintain records of bank balances for Tri-State.

BUDGET AND CONTROLS

EXHIBIT VII A

PROJECT PERSONNEL

Tri-State

Key	Name	Title	Dates of Service	Areas of Responsibility
(3)	L. W. Peterson	Coordinator	08/81 - 06/82	Cost & Schedule Control
(3)	G. H. Dickerson	Project Analyst	04/81 - 06/82	Accounting & Reporting
(3)	J. O. Hess	Coordinator	07/81 - 05/82	Fluor Cost & Schedule Control
(4)	D. N. Roberts	Accountant	08/81 - 12/81	Accounting & Reporting

Texas Eastern Support

Name	Title	Area/Type Assistance	Role
J. Little	Manager	Special Project Accounting	Coordinate all accounting activities related to Tri-State and Texas Eastern
D. Norris	Accountant	Corporate Accounting	Performs accounting functions for Texas Eastern which relate to Tri-State
R. Patton	Accountant	Corporate Accounting	Performs accounting functions for Tri-State
C. Staples	Analyst	Treasury	Performs treasury functions for Tri-State, i.e., write all Tri-State checks and keep bank account balance
M. Andrews	Clerk	Treasury	Performs treasury functions for Tri-State, i.e., write all Tri-State checks and keep bank account balance

BUDGET AND CONTROLS

EXHIBIT VII A

PROJECT PERSONNEL

Texas Gas Support

E. Taliaferro	Senior Planning Analyst	Special Project Accounting	Supply Tri-State with accounting information pertaining to Texas Gas

EXHIBIT VII-B

ESTIMATED EXPENDITURES FOR WORK AREA

Major Areas	Expenditures 2/6/81 - 6/15/82		To Complete Phase I
	Budget ($000's)	Actual ($000's)	Estimate
Scheduling/Cost Control			

2.0 SUMMARY

2.1 HISTORY

2.1.1 Work Plan

2.1.1.1 Project Controls

The two primary concerns of the Project Controls group were:

- to ensure that a well thought out, logical, execution plan/schedule was developed and monitored.
- that a realistic budget was developed and controlled to meet the needs of the plan/schedule.

The workplan needed to accomplish the above was not as strictly structured as the other Tri-State Synfuels Company groups, but was generally a monitoring role.

2.1.1.2 General Accounting

The primary concern of General Accounting for Phase I of the Tri-State Project was to incorporate adequate accounting procedures so that:

- records of transactions were maintained in order to assist in a thorough review of project expenditures.
- financial statements and other summary reports were prepared to inform management and other outside parties (i.e., U.S. DOE, KDOE, perspective partners, interested individuals) of the financial status of the project in order for these parties to make accurate and timely decisions.

2.1.2 Description of Work Completed

- Phase I budget revised through March 31, 1982
- CPM schedule revised through March 31, 1982
- Fluor cost reports updated through March, 1982
- CARS - TSSC cost reports updated through March, 1982
- Issuance of DOE Monthly Reports through April, 1982

EXHIBIT VII-C

MAJOR ACCOMPLISHMENTS/MILESTONES COMPLETED

Description	DATE	
	Initiated	Completed
1st issue Project CPM - Phase I	March 81	July 81
1st issue Fluor Cost Report	August 81	November 81
1st issue CARS Cost Report	April 81	July 81
2nd Revised Project CPM - Phase I	November 81	March 82
2nd Revised Phase I Budget Estimates	November 81	March 82