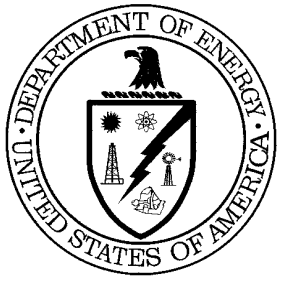

U.S. Department of Energy
National Energy Technology Laboratory

Early Entrance Co-Production Plant – Decentralized Gasification Cogeneration Transportation Fuels and Steam From Available Feedstocks

DOE Cooperative Agreement DE-FC26-00NT40693

Quarterly Technical Progress Report
July to September 2003

WMPI PTY., LLC

December 2003

DISCLAIMER

ABSTRACT

Waste Processors Management, Inc. (WMPI), along with its subcontractors Texaco Power & Gasification (now ChevronTexaco), SASOL Technology Ltd., and Nexant Inc. entered into a Cooperative Agreement DE-FC26-00NT40693 with the U. S. Department of Energy (DOE), National Energy Technology Laboratory (NETL) to assess the techno-economic viability of building an Early Entrance Co-Production Plant (EECP) in the United States to produce ultra clean Fischer-Tropsch (FT) transportation fuels with either power or steam as the major co-product. The EECP design includes recovery and gasification of low-cost coal waste (culm) from physical coal cleaning operations and will assess blends of the culm with coal or petroleum coke.

The project has three phases. Phase I is the concept definition and engineering feasibility study to identify areas of technical, environmental and financial risk. Phase II is an experimental testing program designed to validate the coal waste mixture gasification performance. Phase III updates the original EECP design based on results from Phase II, to prepare a preliminary engineering design package and financial plan for obtaining private funding to build a 5,000 barrel per day (BPD) coal gasification/liquefaction plant next to an existing co-generation plant in Gilberton, Schuylkill County, Pennsylvania.

The current report covers the period performance from July 1, 2003 through September 30, 2003. The DOE\WMPI Cooperative Agreement was modified on May 2003 to expand the project team to include Shell Global Solutions, U.S. and Uhde GmbH as the engineering contractor. The addition of Shell and Uhde strengthen both the technical capability and financing ability of the project. Uhde, as the prime EPC contractor, has the responsibility to develop a LSTK (lump sum turnkey) engineering design package for the EECP leading to the eventual detailed engineering, construction and operation of the proposed concept.

Major technical activities during the reporting period include: 1) finalizing contractual agreements between DOE, Uhde and other technology providers, focusing on intellectual-property-right issues, 2) Uhde's preparation of a LSTK project execution plan and other project engineering procedural documents, and 3) Uhde's preliminary project technical concept assessment and trade-off evaluations.

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Section 1 Introduction

1 INTRODUCTION

WMPI, along with its subcontractors Texaco (now ChevronTexaco), Sasol, and Nexant entered into a Cooperative Agreement DE-FC26-00NT40693 with the U. S. Department of Energy (DOE), National Energy Technology Laboratory (NETL), to assess the technical and economic viability of building an Early Entrance Co-Production Plant (EECP) in the U. S. to produce ultra clean Fischer-Tropsch (FT) transportation fuels with either power or steam as the major co-product. The EECP design emphasizes on recovery and gasification of low-cost coal wastes (culm) from coal cleaning operations, and will assess blends of the culm with coal or petroleum coke as feedstocks. The project has three phases.

1.1 Phase I – Concept Definition and RD&T Planning

Phase I objectives include concept development, technology assessment, conceptual designs and economic evaluations of a Greenfield commercial co-production plant and of a site specific demonstration EECP to be located adjacent to the existing Gilberton Power Station. There are very few expected design differences between the Greenfield commercial co-production plant versus the EECP plant other than:

- The Greenfield commercial plant will be a stand-alone FT/power co-production plant, potentially with larger capacity than the EECP to take full advantage of economies of scale.
- The EECP plant, on the other hand, will be a nominal 5,000 bpd plant, fully integrated into the Gilberton Power Company's Cogeneration Plant's existing infrastructure to reduce cost and minimize project risks. The Gilberton EECP plant will be designed to use eastern Pennsylvania anthracite coal waste and/or a mixture of culm and other fuels as feedstock.

Phase I includes 11 tasks and the following major deliverables.

- A project management plan.
- A process feasibility design package with sufficient details to determine order-of-magnitude cost estimates for preliminary economic and market analyses.
- A preliminary environmental and site analysis.
- A Research, Development and Testing (RD&T) plan for Phase II tasks.
- A preliminary project financing plan.

1.2 Phase II – R&D and Testing

The Phase II objective is to perform research, development and process performance verification testing of any design deficiencies identified in Phase I. Due to the relative maturity of the two key technologies (Texaco's coal gasification and SASOL's FT) proposed for the EECP designs, Phase II activities will focus on feedstock characterization and gasification process performance testing rather than research and development. Specific Phase II goals include:

- Characterization of anthracite culm and its mixture with other fuels as feedstocks for the Texaco gasifier.

- Gasification performance (pilot plant) testing of design anthracite culm feedstocks at an existing Texaco facility to verify its performance.

1.3 Phase III – Preliminary Engineering Design

The objective in Phase III is to upgrade the accuracy of the Phase I site-specific Gilberton EECP capital cost from plus or minus 35% to plus or minus 20%. The increased cost estimation accuracy is achieved by updating the Phase I inside battery limits (ISBL) processing plant design packages to incorporate Phase II findings, by refining the outside battery limits (OSBL) utility and offsite support facility design packages to include final and updated ISBL unit demands, by obtaining actual budgetary quotes for all major equipment, and by further engineering to define the actual bulk commodities requirements.

The upgraded Phase III capital cost estimate, together with the updated operating and maintenance cost estimate, are crucial elements to finalize the EECP Project Financing Plan needed to proceed with detailed engineering, procurement and construction of the EECP.

The Phase III goals and deliverables include the development of:

- Preliminary Engineering Design package of the EECP.
- A Project Financing Plan.
- An EECP Test Plan.

The project scope of work consists of sixteen tasks organized into the three phases as shown in Table 1-1. The table also shows the project team members responsible for the leading role for each task. The specific task description details were discussed in the Project Management Plan.

Table 1-1
Original EECP Scope of Work Task Summary

Phase/Task	Description	Task Leaders
Phase I	**Concept Definition and RD&T Planning**	
Task 1	Project Plan	Nexant
Task 2	Concept Definition, Design Basis & EECP Process Configuration Development	Nexant
Task 3	System Technical Assessment (Trade-off Analysis)	Nexant
Task 4	Feasibility Study Design Package Development	Nexant (w/individual Process Design package from Texaco and Sasol)
Task 5	Market Assessment	Texaco
Task 6	Preliminary Site Analysis	WMPI and Consultants
Task 7	Preliminary Environmental Assessment	WMPI and Consultants
Task 8	Economic Assessment	WMPI and Consultants
Task 9	Research Development and Test Plan	Texaco
Task 10	Preliminary Project Financing Plan	WMPI and Consultants
Task 11	Phase I - Concept Report	Nexant
Phase II	**R&D and Testing**	
Task 1	Feedstock Mix Characterization and Gasification Performance Verification	Texaco (w/ support from Nexant and WMPI)
Task 2	Update RD&T Plan	Texaco
Phase III	**EECP Engineering Design**	
Task 1	Preliminary Engineering Design Package Development	Nexant – with a) Texaco – Gasification Design Package b) Sasol – FT Design Package c) Nexant – BOP and cost estimate
Task 2	Project Financing Plan	WMPI and Consultants
Task 3	EECP Test Plan	Nexant

2 COOPERATIVE AGREEMENT MODIFICATION

The DOE\WMPI Cooperative Agreement was modified on May 2003 to expand the project technical team to include Shell Global Solutions, U.S. as a gasification technology provider and Uhde GmbH, as the prime engineering contractor with a U.S. engineering subcontractor to be identified later. These changes were driven by both technical and business [project financing] needs. ChevronTexaco remains as a member of the project team as a technology provider for F-T product upgrading, working closely with Sasol.

The core WMPI EECP project objectives remain unchanged, as well as with the DOE's portion of the project costs. WMPI remains on track to engineer, construct and operate a first-of-a-kind gasification\liquefaction facility in the U.S. The new project team members and their respective responsibility are as follows:

WMPI	Project owner\financer
Shell Global Solutions	Gasification technology provider
Sasol	Fischer-Tropsch (F-T) technology provider
ChevronTexaco	F-T product upgrading technology provider
Uhde GmbH	General EPC engineering contractor
Nexant Inc.	Engineering consultant

The remaining EECP work scope and tasks were modified. Table 2-1 shows a revised project work scope summary. Major elements\rationales for the work scope changes include:

- Changing gasifier for the project, from Texaco to Shell - This was driven by both technical and business factors. WMPI\DOE is fortunate to be able to make such a change as needed. Switching to the use of a Shell gasifier will enhance the technical success of the EECP project leading to the eventuality of building the plant. The change, however, necessitates the repeat of some of the front-end Phase I technical activities. The original EECP Phase I process design, which has been essentially completed, was based on the use of a Texaco gasifier.

- The inclusion of Uhde GmbH as an engineering contractor to the project as the Shell gasification technology supplier and general EPC contractor. Uhde will develop a Shell gasification based WMPI EECP design under the revised EECP Phase I scope with sufficient engineering details for lump-sum-turnkey (LSTK) EPC (engineering, procurement and construction) bidding.

- Additional activities under the revised Phase I Task 6 scope, as part of Uhde's LSTK engineering design. This involves, for example, a more in-depth analysis of road access survey (from U.S. East Coast ports to the Gilberton site) via existing Pennsylvania highway and road infrastructure. Preliminary site analysis was a task under the original EECP Phase I scope. It was completed and a topical report issued summarizing its findings. As part of the LSTK engineering design activities, a more detailed site analysis

maybe needed to explore cost reduction opportunities via transporting large shop-fabricated economies-of-scale equipment to site.

- Expanding the original EECP Phase I Task 5 activities of Market Analysis to include securing various (FT diesel and jet) fuel 'off-take' contract agreements. This is a key requirement for project financing to obtain needed private sector funding for the project. Original Phase I Task 5 work scope was focused mainly on assessing the market value of the EECP produced FT diesel.

- Expanding the original EECP Phase I Task 7 activity of Preliminary Environmental Analysis to include completion of all necessary environmental assessment (NEPA, EIS) and permitting (Pennsylvania DEP) processes. Completion of above activities is required by private banking institutions to finalize project financing.

- Re-prioritizing Phase II technical activities - With Shell gasification, processing (gasifying) high-ash culm is deemed less of a problem because of the higher temperature operation associated with a Shell gasifier. Shell and Uhde are confidential of scale up and do not foresee the need of pilot plant testing. Additional feed characterization and Shell gasification process modeling based on WMPI anthracite culm feed and feed mixtures, however, will be required.

- Re-prioritizing Phase III technical activities - To expedite the development of a Gilberton site-specific Shell gasification based WMPI EECP gasification/liquefaction engineering design, Phase III of EECP Preliminary Engineering Design is to be combined into Phase I. Uhde is to develop a LSTK Gilberton EECP design with engineering details that would exceed or equivalent to that are expected for Phase III work scope.

- Finalizing Project Financial Plan and EECP Test Plan activities as included in the original EECP Phase III task scope.

Major deliverables for the revised scope include:

- A Gilberton site-specific EECP LSTK engineering design package based on Shell gasification technology,
- EECP project EIS 'Environmental Impact Statement' and associated environmental permits required for commencement of project construction, and **a**n overall project concept report.

Table 2-1
Revised EECP Scope of Work
Cooperative Agreement DE-FC26-00NT40693

Deleted	
Phase/Task	Description
Phase I/Task 9	Research Development and Test Plan
Phase II/Task 2	Update Research Development and Test Plan
Phase III/Task 1	Preliminary Engineering Design Package based on Texaco gasification technology

Added		
Phase/Task	Description	Deliverables
Phase I/Task 2	EECP Design Basis and process Configuration (Shell Gasifier Based)	Revised per change in gasification technology; results will be reported as part of an integrated LSTK design package.
Phase I/Task 3	EECP Design Technical Assessment (Shell Gasifier Based)	Assessment and analysis per change in gasification technology; results will be reported as part of an integrated LSTK design package.
Phase I/Task 4	EECP Shell Gasifier Based LSTK Design	A Gilberton Site-Specific EECP LSTK Design Package based on Shell Gasification Technology with design details equivalent to the Original Proposed EECP Phase III Task 1 Scope. Results will be reported in Quarterly Technical Progress Report as the LSTK design is being developed. A summarize Phase I EECP design report based on Shell gasification technology.
Phase I/Task 7	NEPA Environmental Impact Statement (EIS) and PA EPA (Environmental Protection Agency) Permits	Complete preparation of NEPA EIS and PA EPA permits as prerequisites for private sector project financing. An EIS document report.
Tasks to be Completed under Original Scope		
Phase II/Task 1	Feed Characterization per Shell Gasification	As needed for Shell EECP design development. Results will be included in Phase I design report.
Phase III/Task 2	Project Financing Plan	Overall EECP project financial closure for commencement of project construction in 2004.
Phase III/Task 3	EECP Test Plan	A project demonstration plan and report. Phase III report.

Section 3 Phase I Task 1 – Project Plan

TASK COMPLETED under the original EECP work scope. Project schedule revised per Cooperative Agreement modification.

A Project Management Plan was prepared, issued and approved by DOE. A copy was submitted to the AAD Document Control Office of DOE/NETL on May 15, 2001.

This plan provides a road map for the overall project execution delineating the project:

- Objectives.
- Detailed work breakdown structure and obligated deliverables.
- Technical and management approach.
- Control plan – scheduling, budget and reporting.
- Administration details.

Section 4 Phase I Task 2 – Concept Definition, Design Basis & EECP Process Configuration

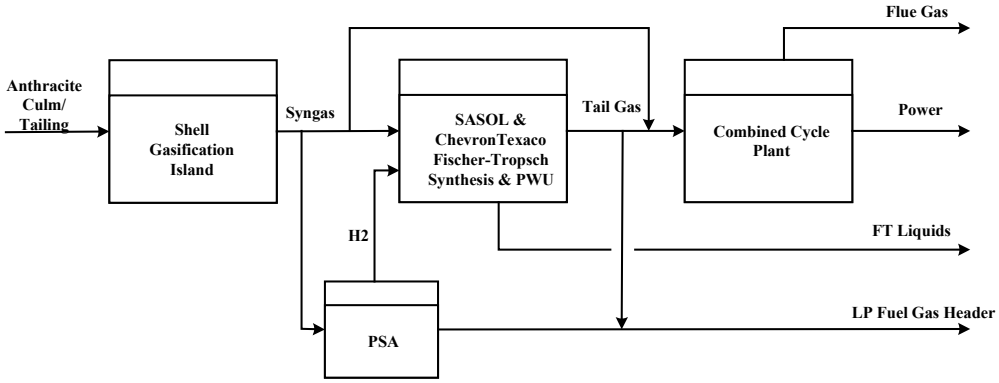
TASK COMPLETED for the original Texaco-gasification-based EECP design.

With the revised EECP design using the Shell gasifier, Uhde has:

- Revised the EECP Design Basis and entered it as a formal engineering document in preparation of the LSTK design.
- Continued the series of 'Open Points' technical concept & definition exchanges with WMPI and Nexant in attempt to finalize this Phase 1Task 2 activity of defining the Shell gasification-based EECP process configuration. Some of the Open Point issues included:
  - WMPI's design feedstock quality and the presence of heavy metal trace elements.
  - Needed additional feed characterizations by Shell.
  - Various design and processing plant battery limits.
  - Environmental emissions limits.
  - Mine pool water availability and discharged regulations.
  - Design co-feeding petroleum coke limits.
  - Offsite feed and product loading & storage needs.
  - On-site geotechnical survey work requirements.
  - Forms of sulfur product desired.
  - Integration of WMPI culm beneficiation plant design and operations.

Figure 4-1 shows an overall process configuration of the Shell-gasification-based EECP design which in principle differs from the Texaco-based design only in the details within the gasification island, and the overall balance of plant.

Figure 4-1
Overall EECP Process Configuration



The gasification island concept definition and process configuration is shown in Figure 4-2. It consists of a total of twelve major processing plants –

- Air Separation Section
- Feed Preparation Facilities Section
  - Anthracite Culm Beneficiation

  - Milling and Drying
- Gasification and Syngas Cooling Section
  - Pressurization and Feeding
  - Shell Gasification
  - High Temperature Gas Cooling
  - Fly Ash Removal
  - Syngas Scrubbing
  - Sour Water Stripping
- Sour Shift and Gas Cooling Section
- Acid Gas Removal Section
- Sulfur Recovery and Tail Gas Treating Section

Process descriptions of the various processing plants within the gasification island were discussed in the last Quarterly Technical report.

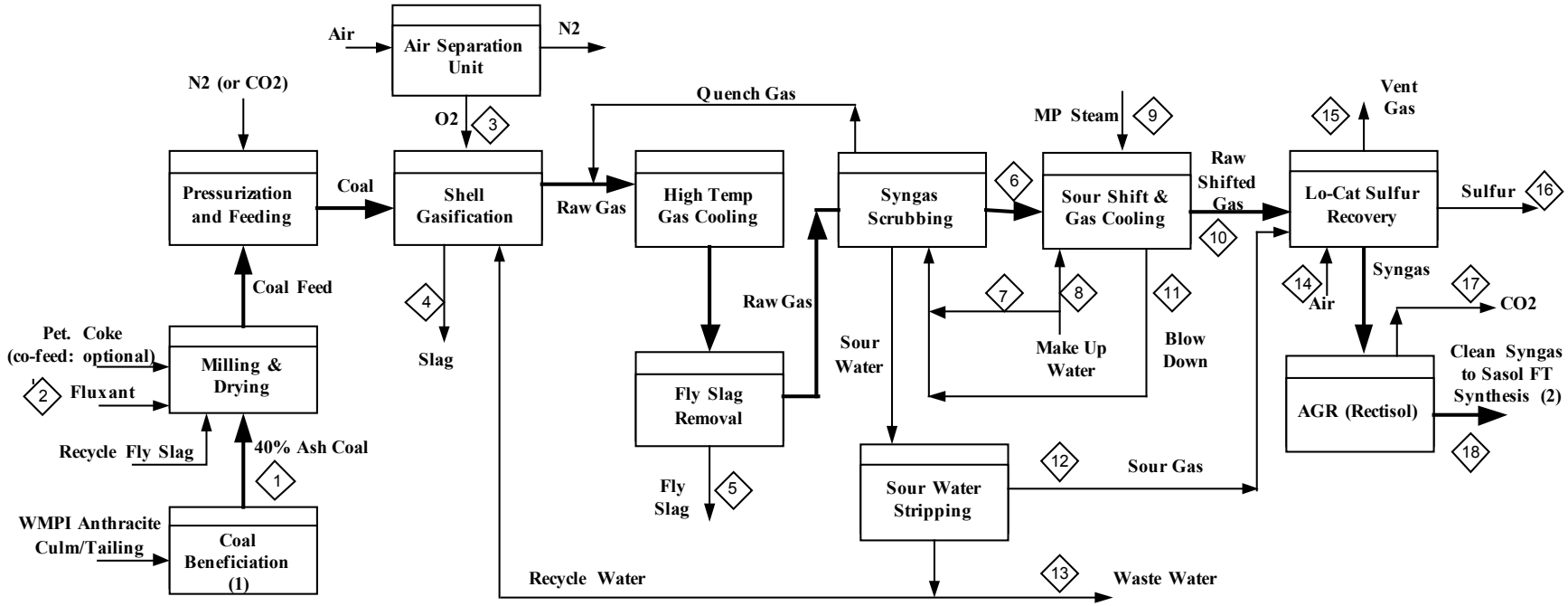


Figure 4-2 Shell Gasification Island Block Flow Diagram

Fischer-Tropsch Synthesis and Product Work-Up Area

The overall block flow configuration for the Fischer Tropsch Synthesis and Product Work-Up Area is shown below in Figure 4-3, which is essentially identical to that of the Texaco-based EECP design. A description of its process configuration has been given in details in the past, and will not be repeated here.

Uhde has evaluated several of the process subsystems presented above and their integration effects as part of the Shell-gasification based EECP concept assessment. These are presented as part of the revised activities of Phase I Task 3 work.

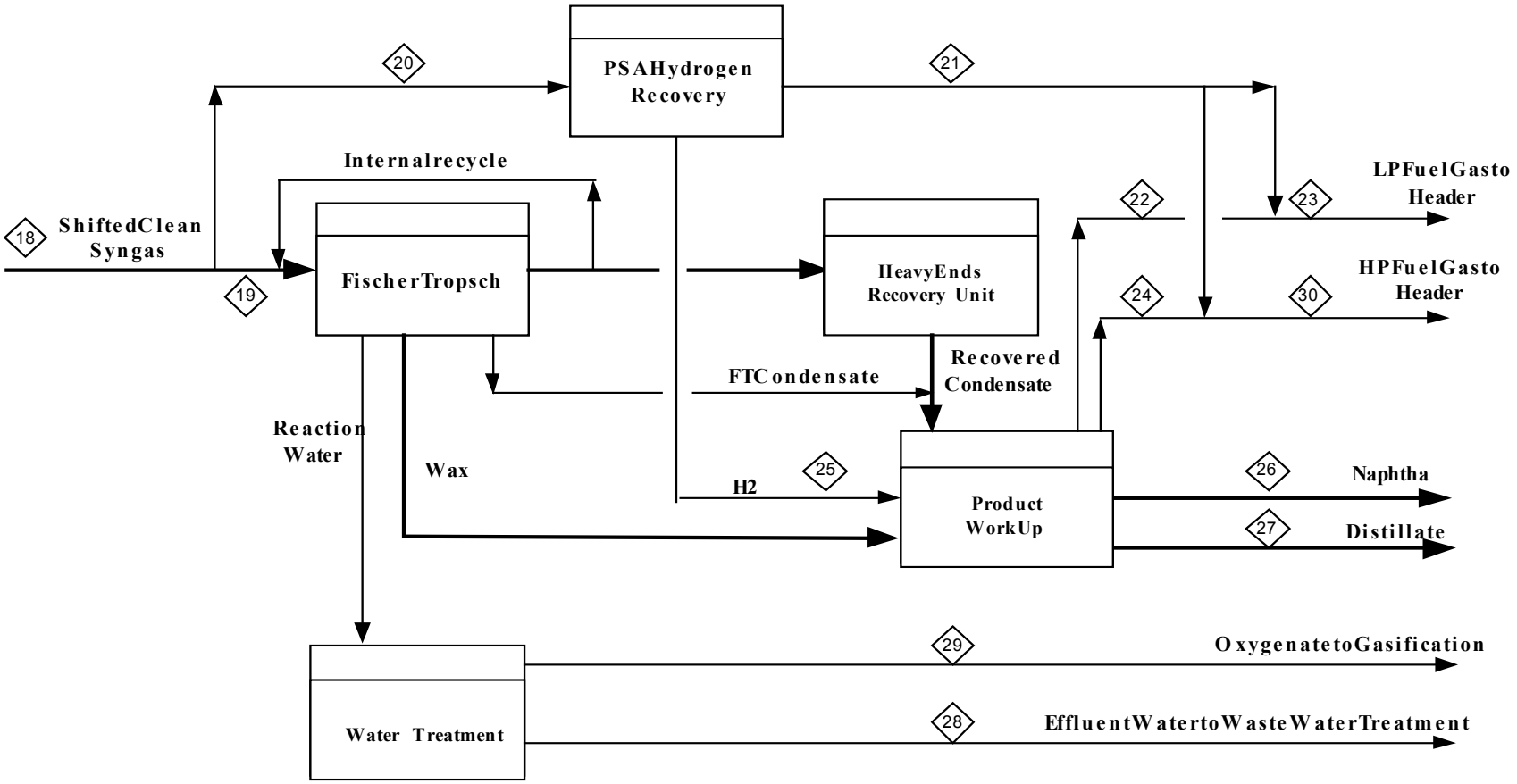


Figure 4-3 Block Flow Configuration of the FT and PWU Area

Section 5 Phase I Task 3 – System Technical Assessment

Under this task, major technical systems identified in the Phase I Task 2 concept configuration were re-assessed to consider the impact of the change in the gasification technology from Texaco to Shell. Primary focus thus far has been set on the following processing plants:

- Gasification - use of one versus two gasifiers evaluated, based on the following design analysis:
  - RAM (reliability, availability and maintenance analysis)
  - Transportation limitation against site fabrication
  - Slag handling design limitation for one large gasifier
  - Other design aspects and the scale-up of upstream and downstream processing unit from other operating plants
  - Cost comparison
  - Deliverables from Shell specified/contract prepared
  - Gasification performance simulated by Uhde
    - Normal case (16% moisture feedstock)
    - Max. moisture case (25% moisture feedstock)
    - Max. sulfur case (25% petcoke/75% culm)
- ASU (air separation unit)
  - Design questions floated to vendors (Linde, Praxair and Air Products)
  - Linde replied at end of July
- Coal handling and storage
  - Concept prepared with support from Louise/Schade, based on a closed storage with one stacker and two reclaimers; petcoke handling at a later project stage; fluxant deloading facility under ground.
- Syngas treatment and sulfur recovery
  - CO shift and gas cooling
    - PFD prepared
    - Equipment sizes estimated and compared with other projects
    - Reactor design under progress
  - Rectisol
    - Inquiry specification prepared
  - Sulfur recovery
    - Five different schemes were evaluated
    - Uhde recommends the scheme involving Clause tail gas recycling based on its cost benefits and demonstrated performance at the Puertollano IGCC plant

Technical memorandum summarizing these assessments, when completed, can be made available for review by DOE on as-needed basis.

Section 6 Phase I Task 4 – LSTK Design Package Development

LSTK design package development based on Shell gasification technology commences.

Texaco gasifier-based EECP Design Package COMPLETED.

Section 7 Phase I Task 5 – Market Analysis

TASK COMPLETED.

Purvin & Gertz, Inc. completed this task under a subcontract to Texaco. Final report was delivered to WMPI. The report contains sensitivity business information that WMPI would prefer not to report it in writing. Under an agreement, DOE can review the report and its findings with WMPI.

Section 8 Phase I Task 6 – Preliminary Site Analysis

TASK COMPLETED.

A separate technical Topical Report was issued on February 2003.

Section 9 Phase I Task 7 – Preliminary Environmental Assessment

Technical activities focus on the development of environmental permit applications to the Pennsylvania (PA) Department of Environmental Protection (DEP). EECP design emissions data were reviewed, examined and analyzed in light of all anticipated environmental regulations. Preliminary permitting requirements were identified and forms/documents drafted.

Specific activities include:

- Filed a Ground Water Withdrawal Applications for the project with the local water authority of SRBC (Susquehanna River Basin Commission) on April 2003.

- Filed a Air Quality Permit Application to the PA DEP for the project on May 2003.

Section 10 Project Management

10.1 BIWEEKLY PROJECT STATUS REPORT

Informal Biweekly Project Status Reports are transmitted to keep the DOE Project Manager updated of all work in progress.

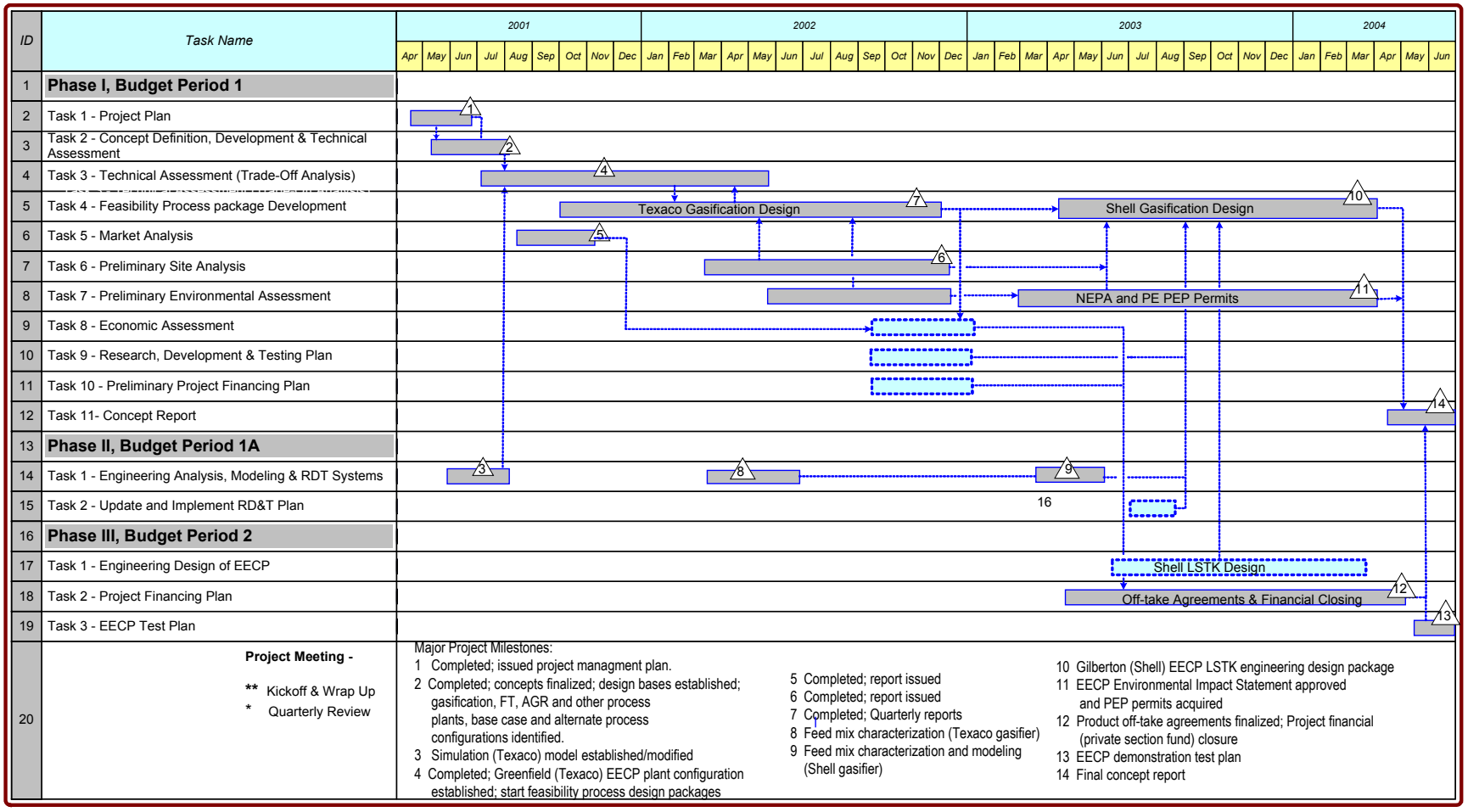
10.2 PROJECT MILESTONE PLAN AND LOG

Project schedule and milestone were revised with concurrence from DOE on May 1, 2003 (Contract Mod 12.) Figure 10.1 shows the revised EECP project schedule.

Project Milestone Plan and Milestone Log are submitted on time as prescribed by the contract to keep DOE management informed of work-in-progress and accomplishments against major project milestones planned.

Figure 10.1

EXHIBIT "B" - Revised 3/27/2003
WMPI/EECP [DE-FC26-00NT40693] M004 AMENDED PROJECT SCHEDULE



Section 11 Experimental

EXECUTIVE SUMMARY

11.1 EXPERIMENTAL

11.2 RESULTS AND DISCUSSION

11.3 CONCLUSION

11.4 REFERENCE

NOT APPLICABLE - The current project is a design feasibility and economics study, leading to detailed engineering, construction and operation of an EECP plant. It's not a typical research and development (R&D) project where a topical report format described in this section applied. There was no experimental work performed. This section is included only to fulfill DOE's prescribed reporting format.

List of Acronyms and Abbreviations

AGR	Acid Gas Removal
Bbls, bbls	Barrels
BEDD	Basic Engineering Design Data
BOD	Biological Oxygen Demand
BOP	Balance Of Plant
BPD	Barrel Per Day
BFW	Boiler Feed Water
CFB	Circulating Fluidized Bed
DEP	Department of Environmental Protection
DOE	U.S. Department of Energy
EECP	Early Entrance Co-Production Plant
ft	Feet
F-T	Fischer-Tropsch
GPM	Gallons per Minute
GT	Gas Turbine
HC	Hydrocracking
HER	Heavy End Recovery
HHP	High High Pressure
HP	High Pressure, Horse Power
HRSG	Heat Recovery Steam Generator
ISBL	Inside Battery Limits
kV	Kilo Volts
Lb/CF	Pounds per Cubic Feet
LHV	Lower-Heating Value
LSTK	Lum sum turnkey
LTFT	Low-Temperature Fischer-Tropsch
LTGC	Low-Temperature Gas Cooling
MMSCFD	Million Standard Cubic Feet Per Day
MW	Mega Watt
NEPA	National Environmental Policy Act
NETL	National Energy Technology Laboratory
OSBL	Outside Battery Limits
OSHA	US Occupational Safety and Health Administration
PA	Pennsylvania
PPM	Parts per Million
PSA	Pressure Swing Absorption
PSIG, psig	Pounds per Squared Inch, gauge
PWU	Product Work Up
RD&T	Research, Development & Testing
RON	Research Octane Number
RVP	Reid Vapor Pressure
SCFM	Standard Cubic Feet per Minute
SCR	Selective Catalytic Reduction
SRBC	Susquehanna River Basin Commission

SRU ..... Sulfur Recovery Unit
STPD ..... Short Tons Per Day
SWS ..... Sour Water Stripper
TGTU ..... Tail Gas Treating Unit
WMPI ..... Waste Processors Management, Inc.
wt% ..... Weight Percent