

**TECHNICAL PROGRESS REPORT
HEALY CLEAN COAL PROJECT**

**DOE COOPERATIVE AGREEMENT
DE-FC-22-91PC90544**

**QUARTERLY REPORT NO. 5
FOR THE PERIOD
JANUARY - MARCH 1992**

MAY 1992

ALASKA INDUSTRIAL DEVELOPMENT AND EXPORT AUTHORITY

Prepared by

STONE & WEBSTER ENGINEERING CORPORATION

LEGAL NOTICE

This report was prepared by Stone & Webster Engineering Corporation (SWEC) pursuant to a Cooperative Agreement between the U.S. Department of Energy and the Alaska Industrial Development and Export Authority (AIDEA). Neither SWEC, AIDEA nor any of their subcontractors nor the U.S. Department of Energy, nor any person acting on their behalf:

(A) Makes any warranty or representation, express or implied, with respect to the accuracy, completeness, or usefulness of the information contained in this report, or that the use of any information, apparatus, method, or process disclosed in this report may not infringe privately-owned rights; or

(B) Assumes any liabilities with respect to the use of, or for damages resulting from the use of, any information, apparatus, method or process disclosed in this report.

Reference herein to any specific commercial product, process or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by SWEC, AIDEA or the U.S. Department of Energy. The views and opinions of authors expressed herein do not necessarily state or reflect those of the U.S. Department of Energy.

SECTION 1 - SUMMARY

Please refer to Quarterly Technical Progress Report No. 1, January to June 1991 for the project background and objectives. This report covers January to March 1992 Phase IA activities.

The Prevention of Significant Deterioration (PSD) permit and Air Quality control permit to operate continued to be prepared for agency review issue in April.

Engineering and design continued on the boiler, combustion, flue gas desulfurization (FGD), and turbine/generator systems. Balance of plant equipment procurement specifications continue to be prepared.

A meeting was held in SWEC's Denver office to satisfy DOE's Cooperative Agreement requirement for a 20% complete design review. The meeting also addressed the continuation application submitted in March.

The HCCP construction contracting plan has been agreed upon. Three contracts will be utilized: 1) civil/foundation, 2) structural steel, and 3) general balance of plant contract.

Project management activities including contracting, financing, and DOE reporting continued.

SECTION 2 - INTRODUCTION

Please refer to quarterly Technical Progress Report No. 1, January to June, 1991.

SECTION 3 - PROJECT STATUS

The following status is for Phase I work from January to March, 1992.

Project Management

The HCCP team participants and their primary roles include:

- Alaska Industrial Development and Export Authority (AIDEA) - Ownership, overall project management and financing.
- Golden Valley Electric Association, Inc. (GVEA) - Design input and review, operator and purchaser of the HCCP electrical output.
- Usibelli Coal Mine, Inc. (UCM) - Design input and review, coal supplier and ash disposal.
- TRW, Inc. (TRW) - Entrained combustion system technology supplier.
- Joy Technologies, Inc. (JOY) - Spray dryer, fabric filter and ash recycle system technology supplier.
- Stone & Webster Engineering Corporation (SWEC) - Architect/Engineer.

In addition Foster Wheeler Energy Corporation (FWEC) has been contracted for design, supply and erection of the boiler. Sumitomo Corporation of America (SCA) has been contracted for design, supply, and erection of the turbine/generator.

AIDEA's board of directors met during this reporting period. The board approved the DOE continuation application including the total project budget capital cost estimate and financing plan.

The required monthly reporting under the terms of the Cooperative Agreement, Article XV, reporting requirements were fulfilled during this reporting period. The engineering and design schedule is currently being updated to reflect the agreed upon construction contracting plan and efforts to reduce cash flow in 1992 until encouraging signs are apparent in the Alaska Public Utilities filing (APUC) and in the permitting and NEPA areas. The construction schedule remains unchanged.

PERMITTING/NEPA COMPLIANCE

ENVIRONMENTAL PROGRAMS

- Air Quality and Meteorological Monitoring Program

The final Air Quality Monitoring Program Annual Data Report was received from ENSR during February 1992. The data in this report was used in the air quality modeling for the PSD.

- Best Available Control Technology (BACT) Analysis

PSD regulations required that the HCCP, a new major stationary source, apply BACT for each pollutant subject to regulation under the Clean Air Act and the Alaska Administrative Code (AAC). A BACT Analysis is required for each pollutant emitted at or above "significant" rates. The pollutants found to be subject to a BACT Analysis were determined to be SO₂, NO_x, CO, PM₁₀, TSP, and beryllium. The final BACT Analysis was completed in March 1992.

- Prevention of Significant Deterioration (PSD)

A complete PSD analysis was performed for all HCCP emission pollutants that are anticipated to exceed the significant emission rates of the EPA and ADEC. These pollutants are those that were evaluated in the BACT Analysis. The air quality analysis consisted of demonstrating compliance with the National Ambient Air Quality Standards (NAAQS) and PSD increments through atmospheric dispersion modeling and evaluation of measured existing air quality data. These analyses were completed in March 1992.

- Air Quality Related Values (AQRVs)

A section of the PSD Permit Application examined the potential effects of the HCCP on associated growth, soils, vegetation, visibility, noise, and odor. An analysis of the emissions and air quality impacts of commercial, industrial, residential, and other growth associated with the HCCP was assessed as required in 40 CFR 52.21 and 18 AAC 50.300(c)(2). An analysis of the emissions and air quality impacts on vegetation and soils was assessed using projected deposition of emissions over the life of the HCCP. Noise and odor were also evaluated as AQRVs.

A visibility analysis was also conducted as part of the AQRV evaluation of the HCCP. Visibility modeling was conducted to provide an analysis of the potential effects of HCCP emissions on visibility in DNPP. The presentation is included in the PSD Permit Application and includes three distinct analyses:

plume visibility, ice crystal plumes, and regional haze. An analysis was also presented on the visual effects of HCCP air emissions on identified DNPP integral vistas. Visibility modeling was approximately 90 percent completed during the first quarter of 1992. Modeling and evaluations of the visibility data were completed during April 1992.

- **Visibility Monitoring Program**

Cameras for a visibility monitoring program were installed at two locations on January 16, 1992. One camera system facing south and up the Nenana River Valley and one camera system facing north and down the Nenana River Valley were placed at the DNPP Visitor Access Center. At the second location, Garner Hill, one camera system consisting of two 8 mm time-lapse movie cameras was oriented with a panoramic view of the Nenana River Valley in the Healy area. Air Resources Specialists, Inc. was awarded a contract to supply the equipment, install the cameras, and analyze the data collected.

One month of data were received during the first quarter of 1992. The film processed represented the month of January. Photographs and film collected to date do not show anything that could be identified as a plume or haze created by emissions from the existing GVEA Healy Unit No. 1 power plant.

- **Temporary Ash Pond**

Environmental issues related to moving the ash pond to a new temporary location immediately south of the coal pile were addressed. ADEC has indicated that they would consider the temporary ash pond and an overflow pond between the Healy Spur Highway and the Suntrana Spur Railroad under a General Wastewater Disposal Permit if there would not be a surface discharge to the Nenana River. This permit would be issued with the understanding that the existing ash ponds would be removed and that the new pond would be temporary during construction.

PERMITTING STATUS

A Permit Application Status Report, dated March 31, 1992 is attached as part of this Technical Progress Report. With the exception of the PSD and Permit to Operate, all permit applications which were to have been submitted by the end of March were sent to appropriate agencies. The PSD and Permit to Operate applications were approximately 90 percent complete. They subsequently have been completed and submitted to appropriate agencies.

A written response to the permit application for a Fish Habitat Permit was received from the Alaska Department of Fish and Game.

The response stated that no Fish Habitat Permit would be necessary for the HCCP. Also, from correspondence received from the U.S. Army Corps of Engineers (Corps), the Corps has indicated that they are considering activities at the cooling water intake and discharge structures under a Nationwide Section 404 Permit and activities for areas south of the Suntrana Spur of the Alaska Railroad under an individual Section 404 Permit. However, the exact type of permits to be issued will not be finalized until the review process is completed. The Corps plans to make their review process correspond with the review process for the EIS.

Progress was made on securing Special Land Use Permits from the Alaska Railroad Corporation (ARR) for the construction camp and for the laydown areas south of the Healy Spur Highway and south of the Suntrana Spur Railroad. The first drafts of these permits were received from ARR and have been reviewed by AIDEA, SWEC, and other Participants. Suggested changes have been made and are presently being evaluated by the ARR. These Special Land Use Permits are expected to be approved in May 1992.

PERMITTING SCHEDULE

PERMIT APPLICATIONS YET TO BE SUBMITTED MARCH 31, 1992

This permit schedule is based on the construction schedule used in the environmental impact statement (EIS). In the event that the construction schedule changes, the dates for submitting permit applications will be adjusted accordingly. All permits and licenses will be in place for construction and/or operation.

Permit Requirements^a			
Agency/Permit Type	Date Application to be Completed	Date Application to be Submitted to Agency	Scheduled Date for Final Permit
Federal			
Environmental Protection Agency			
National Pollution Discharge Elimination System			
• Construction Camp Sewage Plant	14 Apr 92	15 May 92	Feb 93
Spill Prevention, Control, and Countermeasures Plan for Oil Storage Facilities	10 July 92	20 July 92	Feb 93
Hazardous Waste	10 July 92	20 July 92	Feb 93
U.S. Army Corps of Engineers			
Section 404 Permit			
• Construction Camp Wastewater Discharge	14 Apr 92	15 May 92	Feb 93
Federal Aviation Administration			
Hazards to Air Traffic from Construction of Structures			
• Construction Camp	14 Apr 92	15 May 92	Sept 92
• HCCP Stack and Boiler Building	14 Apr 92	15 May 92	Sept 92
State of Alaska			
Department of Natural Resources			
Temporary Permits to Appropriate Water			
• Construction Camp and Potable Water Supply	14 Apr 92	15 May 92	Oct 92
Material Sale Contract for Gravel Extraction	15 July 92	1 Aug 92	Feb 93
State of Alaska Lots 7 & 8 Lease update for GVEA	8 May 92	17 May 92	Sept 92

Permit Requirements*			
Agency/Permit Type	Date Application to be Completed	Date Application to be Submitted to Agency	Scheduled Date for Final Permit
Department of Environmental Conservation			
Prevention of Significant Deteriation	24 April 92	24 April 92	Feb 93
Air Quality - Permit to Operate	24 April 92	24 April 92	Feb 93
Wastewater Disposal Permits			
• Construction Camp Sewage Plant	14 Apr 92	15 May 92	Feb 93
Plan Review for Wastewater Systems	1 Aug 92	15 Aug 92	Feb 93
401 Water Quality Certification	1 June 92	1 June 92	Feb 93
Solid Waste Disposal Permit	15 July 92	20 July 92	Feb 93
Fuel Storage, Transfer, and Handling	15 July 92	20 July 92	Feb 93

*Based on March 1, 1993 as the date for start of construction.

PERMITTING SCHEDULE

PERMIT APPLICATIONS SUBMITTED

MARCH 31, 1992

Permit Requirements*			
Agency/Permit Type	Date Application Completed	Date Application Submitted to Agency	Scheduled Date for Final Permit
Federal			
Environmental Protection Agency			
National Pollution Discharge Elimination System			
• Batch Plant	18 Oct 91	14 Feb 92	Feb 93
• Wastewater Discharge for Once-through Cooling	29 Aug 91	9 Oct 91	Feb 93
• Wastewater Discharge for Treated Plant Service Water	29 Aug 91	9 Oct 91	Feb 93
• Coal Pile Runoff Discharge	29 Aug 91	9 Oct 91	Feb 93
U.S. Army Corps of Engineers			
Section 404 Permit			
• Construction of Intake and Discharge Facilities	11 Nov 91	7 Jan 92	Feb 93
• Lands Classified as Wetlands			
- Laydown/Storage Area	11 Nov 91	7 Jan 92	Feb 93
Federal Aviation Administration			
Hazards to Air Traffic from Construction of Structures			
• Air Monitoring Site, 90-AAL-65-OE	May 90	4 June 90	22 Sept 90
State of Alaska			
Department of Natural Resources			
Temporary Permits to Appropriate Water			
• Concrete Batch Plant	11 Dec 91	14 Feb 92	Aug 92
• Dust Control	11 Dec 91	14 Feb 92	Aug 92
Permanent Permits to Appropriate Water			
• Once-through Cooling	11 Dec 91	24 Jan 92	July 92
• Boiler Feed Water	11 Dec 91	24 Jan 92	July 92
• Potable Water	11 Dec 91	24 Jan 92	July 92
• Dust Control	11 Dec 91	24 Jan 92	July 92
Temporary Land Use Permit for Air Monitoring Site	June 90	11 July 90	Aug 90

Permit Requirements*			
Agency/Permit Type	Date Application Completed	Date Application Submitted to Agency	Scheduled Date for Final Permit
Land Use Lease			
• Air Monitoring Site, LAS 12874	May 90	5 June 90	July 90
• Air Monitoring Site, ADL 414438	May 90	4 June 90	April 91
Department of Fish and Game			
Fish Habitat Permit	24 Dec 91	11 Feb 92	Not Required
Department of Environmental Conservation			
Wastewater Disposal Permits			
• Batch Plant	18 Oct 91	14 Feb 92	Feb 93
• Once-through Cooling	18 Oct 91	22 Oct 91	Feb 93
• Treated Plant Service Water	18 Oct 91	22 Oct 91	Feb 93
• Coal Pile Runoff	18 Oct 91	22 Oct 91	Feb 93
Alaska Railroad Corporation			
Land Use Lease			
• Air Monitoring Site, RRC# 6337	May 90	5 June 90	1 July 90
• Air Monitoring Site, RRC# 6337 Sup #1	May 91	12 June 91	1 July 91
• Garner Hill Visibility Camera Site	10 Dec 91	10 Dec 91	25 Mar 92
• Construction Camp Site	8 Oct 91	1 Feb 92	15 Apr 92
• Laydown/Storage Area	8 Oct 91	1 Feb 92	15 Apr 92

* Based on March 1, 1993 as the date for start of construction.

Engineering

TRW Services:

TRW prepared and submitted a proposal for a direct coal feed system (DCFS). TRW proceeded with engineering activities associated with the incorporation of the DCFS. These activities occurred concurrently with negotiations on the terms and conditions for the DCFS contract.

Fabrication of the precombustor cold flow modeling hardware was completed. Initial test results on the precombustor secondary mixing looks very good.

TRW Evaluated and awarded a contract to FWEC to fabricate and deliver a low NO_x burner and air register as the baseline for the DVT precombustor. The mill air spool, swirl dampers and housing DVT precombustor hardware drawings were completed. Preparation of the Capistrano Test Site (CTS) cell 3 test facility is proceeding along with modification to existing facility hardware.

The scaling criteria and performance assessment report were completed and submitted. The preparation of the draft cold flow modeling report continued. A preliminary stress analysis on the combustor has started.

FWEC Services:

FWEC completed initial boiler flow model tests. Based on the test results and the revised combustor arrangement, the boiler flow model was modified and the test plan was revised for the flow model study. Two boiler flow model tests for bottom firing with NO_x ports moved to the sidewall were completed.

FWEC completed the preliminary functional descriptions, control/logic diagrams and combustor general arrangements. The furnace sizing criteria for determining combustion cooling circuit analysis was completed. Preliminary review of the Critical Furnace Design information (CFDI) for its effect on the boiler design and control has finished.

JOY Services:

Joy continued work on the absorber system, dust collection system, dry recycle system, reagent slurry system, electrical and instrumentation design. Joy awarded the tower mill and has released the vendor to begin work on the tower mill loading diagram and general arrangement drawing. Procurement of the recycle conveying system has been re-bid due to problems with the contract specification. The final mechanical equipment and valve lists were submitted.

SCA Services:

SCA continued engineering efforts on the turbine, turbine auxiliary and piping, generator, embedded materials, electrical equipment and instrumentation.

SWEC Services:

SWEC continued preparation of the preliminary piping and instrumentation diagrams (P&ID's) in conjunction with the corresponding system descriptions. The main one-line diagrams and station service study continue to evolve. The electrical physical drawings have commenced. Underground piping drawings continue to be prepared. Piping drawings for the main steam, boiler, turbine and FGD areas have commenced. The updated design criteria was issued.

The development of the site plan and civil drawings continue to be prepared as information becomes available. Concrete and steel drawings continue for the administration/control building and powerhouse areas.

The roof over the deaerator and the turbine hall was lowered by 10 ft to eliminate excessive dead space. The operating floor and turbine pedestal were also lowered 3 feet to take advantage of a smaller than anticipated condenser. Architectural drawings continued to be prepared. The UBC code analysis report requested by the Alaska Fire Marshall was a major effort this period.

The Unit 1 bottom ash and coal handling studies continue to be prepared and evaluated internally. The ash pond rework drawings and civil specification continued to be prepared. The test well specification preparation continued.

Procurement bids were received for the condenser, combustion air preheater, plant control system and turbine building bridge crane (rebid).

The lube oil conditioning equipment, induced draft fans, travelling screen, trash rake, car and hoist, trash rack & steel stop logs specifications were issued for bids.

The expansion joint, feedwater heaters, deaerator, power transformers and 138 kv power circuit breakers specification were issued for participant review.

The construction camp supply and erection specification continues to be prepared.

SECTION 4 PLANS FOR NEXT QUARTER (APRIL - JUNE 1992)

The following highlights activities planned for next quarter:

Environmental

- Continue required DOE reporting submittals.
- Continue administration of SWEC environmental subcontractors.
- Complete the visibility modeling report.
- Submit the PSD Permit Application to ADEC.
- Continue the Visibility Monitoring Program.
- Submit construction camp permit applications.
 - a. CORPS Section 404 permit
 - b. ADNR Temporary Permit to Appropriate Water
 - c. ADEC Wastewater Disposal Permit
 - d. NPDES Wastewater Discharge Permit
 - e. FAA Notice of Proposed Construction Permit
- Submit other HCCP permit applications.
 - a. FAA NPC permit for Stack Height
 - b. State of Alaska Lots 7&8 Lease Update
- Initiate work on the environmental Monitoring Plan (EMP).
- Continue support and review of EIS documents.

TRW

- Continue engineering and design efforts associated with the DCFS.
- Continue testing for the fabricated precombustor.
- Continue preparation of the CTS cell 3 test facility.
- Issue the draft cold flow model report.
- FWEC to continue design for the low NO_x burner fabrication and delivery to be used for the DVT precombustor.

FWEC

- Cont
- Issu
draw

Joy

- Issu
load
- Eval
- Cont

- Continue SWEC civil, architectural, concrete and steel drawings.
- Continue updating engineering and design schedule.
- Continue participant reviews as required.