

GAS GENERATOR RESEARCH AND DEVELOPMENT

Progress Report No. 11
July 1972
(BCR Report L-479)

Submitted to the
Office of Coal Research
Department of the Interior
Washington, D. C.

August 22, 1972

Bituminous Coal Research, Inc.
350 Hochberg Road
Monroeville, Pennsylvania

BITUMINOUS COAL RESEARCH, INC.
PITTSBURGH, PENNSYLVANIA

JAMES R. GARVEY
PRESIDENT
JOHN W. IGOE
EXECUTIVE VICE PRESIDENT
D. PAUL MCCLOSKEY
SECRETARY AND TREASURER



PLEASE ADDRESS REPLY TO:
350 HOCHBERG ROAD
MONROEVILLE, PA.
15146
PHONE: 412 327-1600

August 1, 1972

Dr. George R. Hill
Director
Office of Coal Research
U.S. Department of the Interior
Washington, D. C. 20240

SUBJECT: Monthly Progress Report No. 11
OCR Contract No. 14-32-0001-1207

Dear Dr. Hill,

The process and equipment development of the Phase II studies is continuing according to schedule.

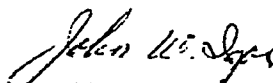
A draft of a summary report of the results obtained from the cold model studies of the 5 ton/hr gasifier has been prepared. This report should be included in next month's progress report.

Four tests were made in the bench-scale methanator to evaluate catalyst supports and another catalyst. Harshaw Chemical Company and Chemetron Corporation continue to aid in planning a catalyst improvement program for methanation. Cold model studies are being held in abeyance because of the increased work load on the methanation FEDU.

Construction of the methanation FEDU continues. Detail engineering has almost been completed and all of the necessary permits have been obtained from the Borough of Monroeville and the Allegheny County Bureau of Air Pollution Control.

Stearns-Roger Corporation of Denver, Colorado, was approved by OCR and AGA as the engineering contractor for construction and operation of the BI-GAS pilot plant at Homer City, Pennsylvania.

Yours very truly,


John W. Igoe

JWI:bic
8016

TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION.....	608
A. Work Schedule.....	608
B. Monthly Progress Charts.....	608
II. PHASE II PROGRESS ACHIEVED DURING MONTH ENDING JULY 25, 1972....	609
A. Laboratory-scale Process Studies.....	609
1. Gas Processing (M. S. Graboski).....	609
a. Bench-scale Studies.....	609
b. PEDU Studies.....	616
c. Model Studies.....	618
d. Future Work.....	618
2. Analytical Services (J. E. Noll).....	619
3. Gas Chromatographic Procedures (J. E. Noll).....	619
a. Equipment.....	619
b. Determination of Analytical Conditions.....	619
c. Retention Time.....	621
d. Sensitivity.....	621
e. Future Work.....	628
B. Cold Flow Model Experiments - 5 ton/hr Two-stage Gasifier (R. J. Grace, R. D. Harris, R. L. Zahradnik, and E. E. Donath).....	628
C. Data Processing (R. K. Young and D. R. Hauck).....	628
1. Automated Data Acquisition.....	628
2. Future Work.....	628
D. Engineering Design and Evaluation.....	631
1. BI-GAS Process.....	631
2. OCR/BCR Gasification--Power Generation.....	631
E. Multipurpose Research Pilot Plant Facility (MPRF).....	631
1. Pilot Plant.....	631
2. Materials Evaluation Program.....	631
F. Literature Search (V. E. Gleason).....	631
G. Outside Engineering and Services.....	631
1. Koppers Company, Inc.....	631
2. Brigham Young University.....	632

TABLE OF CONTENTS (Continued)

	<u>Page</u>
H. Other.....	633
1. Prime Contract Matters.....	633
2. FPC National Gas Survey - Economics of Manufacturing SNG from Coal.....	633
3. Patent Matters.....	633
4. Reports and Papers.....	636
I. Visitors During July, 1972.....	636
J. Trips, Visits, and Meetings During July, 1972.....	637
K. Requests for Information.....	637
III. WORK PLANNED FOR AUGUST, 1972.....	638
A. Trips and Meetings Planned.....	638
B. Papers to be Presented.....	638
C. Visitors Expected.....	638
APPENDIX A-1 MANHOURS.....	639
APPENDIX A-2 CUMULATIVE EXPENDITURES.....	640
APPENDIX B ADDITIONS TO ABSTRACT FILE, JULY 1972.....	B-641
APPENDIX C PROGRESS REPORT NO. 36.....	C-642

LIST OF TABLES

<u>Table</u>		<u>Page</u>
132	Data and Results for BSM Test 75, Period 1, Conducted at 918 F and 1010 psig.....	613
133	Summary of Results for BSM Test 75. Catalyst No. 2915.....	615
134	Summary of Status of PEDU Equipment Items.....	617
135	Response Factors and Retention Times for Gases Using Neon as a Carrier Gas.....	620
136	Retention Time for Some Gases Using Neon as a Carrier Gas.....	622
137	Comparison of Retention Times Using Helium and Neon as a Carrier Gas.....	625
138	Comparison of Response Values Using Helium and Neon as Carrier Gases.....	627
139	Plant Investments and Capital Requirements -- BCR/OCR BI-GAS Process for Synthetic Gas-Coal Task Force Review.....	
140	Summary of Gas Costs -- BCR/OCR BI-GAS Process for Synthetic Gas-Coal Task Force Review.....	

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
148	Gas Processing Work Schedule for Calendar 1972.....	610
149	Retention Time for Porpak Q Column as a Function of Flow of Neon Carrier Gas at an Oven Temperature of 75 C.....	623
150	Retention Time for Molecular Sieve 5A Column as a Function of Flow of Neon Carrier Gas at an Oven Temperature of 75 C..	624
151	Response of Chromatograph to Various Gases with Neon Carrier Gas.....	626
152	Response of Chromatograph to Various Gases with Neon Carrier Gas at Various Filament Currents.....	629
153	Response on Integrator for Volume of Gas Injected with Neon Carrier Gas.....	630