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FE-415-T-7



MASTER

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CONTENTS

Monthly Progress Reports 68 through 79 covering each month January 1 through December 30, 1970, respectively

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FE--415-T7

MACTE

CONSOL LIGNITE GASIFICATION
PROCESS DEVELOPMENT

Monthly Progress Reports for the
Period January - December, 1970

Consolidation Coal Company
Library, Pennsylvania 15129

Prepared for:

Office of Coal Research
U. S. Department of the Interior

OCR Contract No. 14-01-0001-415(3)

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CEDC-MPR -- 68

PROGRESS REPORT NO. 68
OCR CONTRACT NO. 14-01-0001-415(3)
CONSOL LIGNITE GASIFICATION PROCESS DEVELOPMENT

January 1 to 31, 1970

A. Summary

Phase I - Feasibility Study

Complete.

Phase II - Bench-Scale Experiments

Current Phase complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

Delays continue in engineering, vendor inquiry and purchasing; this work is now six weeks behind schedule. Projected completion date remains the same (March 22, 1971).

Field work was started on January 15, caisson work is 40% complete.

Financial

Estimated expenditures in January were \$10,000 by Consol and \$78,200 by Stearns. Cumulative total expense is \$2,332,704.

Lignite Gasification
Progress Report No. 68

-2-

January, 1970

B. Technical Results and Program

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

1. Supporting Process and Economic Analyses (Project No. 533.00)

An OCR Utilization Division Contractors' Meeting was held at BCR on January 29-30, 1970. The main emphasis of the meeting was on projected economics of the various processes under OCR sponsorship.

Under the Consol 415 contract, the economics of pipeline gas by lignite gasification as presented in our May, 1969 evaluation were presented. Seven tables and graphs from the May report were distributed, and four additional tabulations of plant investment details were also prepared and distributed.

2. Supporting Patent and Legal Activities (Project No. 534.00)

The current reports and memoranda were reviewed for Subject Inventions.

3. Consol Assistance on Construction of Lignite Pilot Plant (Project No. 536.00)

Monitoring of Stearns' activities continued; a review meeting, attended by Mr. Staber, was held in Denver on January 22.

Considerable Consol effort was spent in re-reviewing mechanical flowsheets which are not yet correct in final form.

4. Stearns-Roger Subcontract (Project No. 700)

Progress report by Stearns is attached.

C. Subject Inventions

None.

Lignite Gasification
Progress Report No. 68

-3-

January, 1970

D. Financial Status

<u>Expenses</u>	<u>Actual</u>	<u>Budget</u>
Cumulative through December, 1969	\$ 2,244,504	\$ 2,294,626
Expended in period		
Consol	10,000	15,585
Stearns	78,200	112,000
Cumulative through January, 1970	\$ 2,332,704	\$ 2,422,211

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
February 11, 1970

PROJECT REPORT SUMMARY

Work now in progress includes engineering design, receipt and evaluation of inquiries to vendors, purchasing of equipment, approval of vendor drawings and drafting layout. These phases are about six weeks behind schedule. This will shift more work into the fall construction months, but should not delay completion of the project.

ENGINEERINGProcess

The major process design problems that have been under study during the past three months have been solved or agreements have been reached regarding the methods to be used for solution of the problems.

Flow diagrams for the process functions and for the major utility systems have been reviewed by Consol and now serve as a firm basis of design. Minor revisions will be made to conform with details of packaged equipment items.

Mechanical

Details on engineering, inquiries, recommendations, approvals, and purchasing are covered by the Equipment Status issued on February 10 which may be summarized as follows:

Att. - Stearns-Roger Progress Report
Progress Chart
T. 2/13/70

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 February 11, 1970

EQUIPMENT LIST SUMMARY

Description	No. Items	Specifications		On		Consol	
		In Prog	Comp.	Inq.	Recc.	App.	Purch
Agitators	1	--	--	-	--	-	1
Bins, Hprs	8	--	--	7	--	1	--
Boiler	1	--	--	-	--	-	1
Cooling Twr	1	--	--	-	--	-	1
Cyclones	4	--	--	-	4	-	--
Comprs	9	--	--	1	--	-	8
Conveyors	4	--	--	-	--	1	3
Hoists	2	--	--	2	--	-	--
Crushers	2	--	--	-	--	-	2
Dryers	4	--	--	3	--	-	1
Exchgrs	9	--	--	4	--	-	5
Feeders	7	--	--	-	--	-	7
Fired Htrs	6	--	--	-	--	-	6
Elec. Gen	1	--	--	1	--	-	--
Misc.	7	--	--	3	--	1	3
Pkg Systems	3	--	--	-	--	-	2
Pumps	21	--	--	-	--	1	20
Scale	1	--	--	-	--	-	1
Screens	1	--	--	-	--	-	1
Flare Stk	1	--	--	1	--	-	--
Tanks	3	--	--	-	--	-	3
Vessels	34	--	--	9	--	1	24
Water Trt	2	--	--	-	--	1	1
Percent of Total	100	0	0	23	3	5	69
	192						20

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 February 11, 1970

Mechanical - continued

Equipment design and drafting layout engineers were sent to the home offices of the lignite grinding package vendor to obtain design details that were holding up drafting. For further details on materials, please refer to Material Status Report No. 3 issued on January 28.

Drafting

Layout drawings for underground have been approved, and materials for underground piping have been requisitioned. Detailed piping specifications have been approved. Layout work and checking vendor drawings is in progress for all areas.

Structural steel drawings have been released to the fabricator for mill rolling of the heavy structural members. Foundation drawings for the buildings have been issued to the Subcontractor. Planning sketches describing and proving the rigging methods for setting the three reactors are now being prepared.

Electrical single line power distribution diagrams and power distribution details are sufficiently complete to be used as a basis for subcontract inquiry. Similar details for control circuits have been delayed because they depended upon scope and interlock information from the flow diagrams that were issued in mid-January. These drawings will be sufficient for the inquiry for the electrical subcontract to be sent out the first week in March. This will still allow the Subcontractor to be available for work on the building in mid-to-late April.

Instrumentation

Supplier for the 1700°F gate valves was selected after representatives from Conoco, Consol and Stearns-Roger visited the Manufacturer's factory and agreed that his facilities and engineering experience seemed adequate for this difficult work. Analyzer recommendation has been sent to Consol. Sizing and specification of control and relief valves is now in progress.

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
February 11, 1970

PROJECT MANAGEMENT

The arrow diagram network schedule attached to this report has been updated with the decorative line relocated to separate the completed and the unfinished work.

Subcontracts for extension of the city water main to the plantsite, refractory lining for the reactors, prefabricated steel buildings, curb cut and gutter at plant entrance and reinforced concrete and general building work have been awarded. Building subcontractor plans to have a pre-job conference with the unions on February 19.

Negotiations have been completed with the Rapid City Building Inspector and Fire Prevention Bureau concerning modifications to the Catalytic Construction Co. drawings that are required for conformance to the Uniform Building Code.

Cost report for the period ending December 31, 1969, is attached.

CONSTRUCTION

Stearns-Roger field personnel started construction January 15. Temporary buildings and curb cut and entrance work are about 60% complete.

Good construction weather has allowed caisson work to proceed faster than usual, and the work is now about 40% complete.

PROJECT CHANGES

Now that the flow diagrams have been approved as a firm basis for detail design, work on more precise definition and estimating of project changes has started. Close cost definitive estimates to cover most of the pending Change Notices should be submitted to Consol during the next month.

D. H. Dawson

D. H. Dawson
Project Manager

Attachments: Summary of Proj. Changes
Cost Report Thru 12-31-69
Progress Chart, 1-31-70
Master Plan Schedule

Distribution:

<u>Consol - 5</u>	<u>Continental Oil Company - 6</u>	<u>Stearns-Roger - 5</u>
C. A. Schulz	E. E. Ellington, CED D. F. Wegner, CED L. Thompson, MED	J. B. Hambleton, CED B. D. Robertson, CED Dr. C. V. Foster, PED
		FCP/RFD/CNS/IGS File CFL/JIM/VLS/HAR/ESH ALC, FAN, JAP, DED

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
February 11, 1970

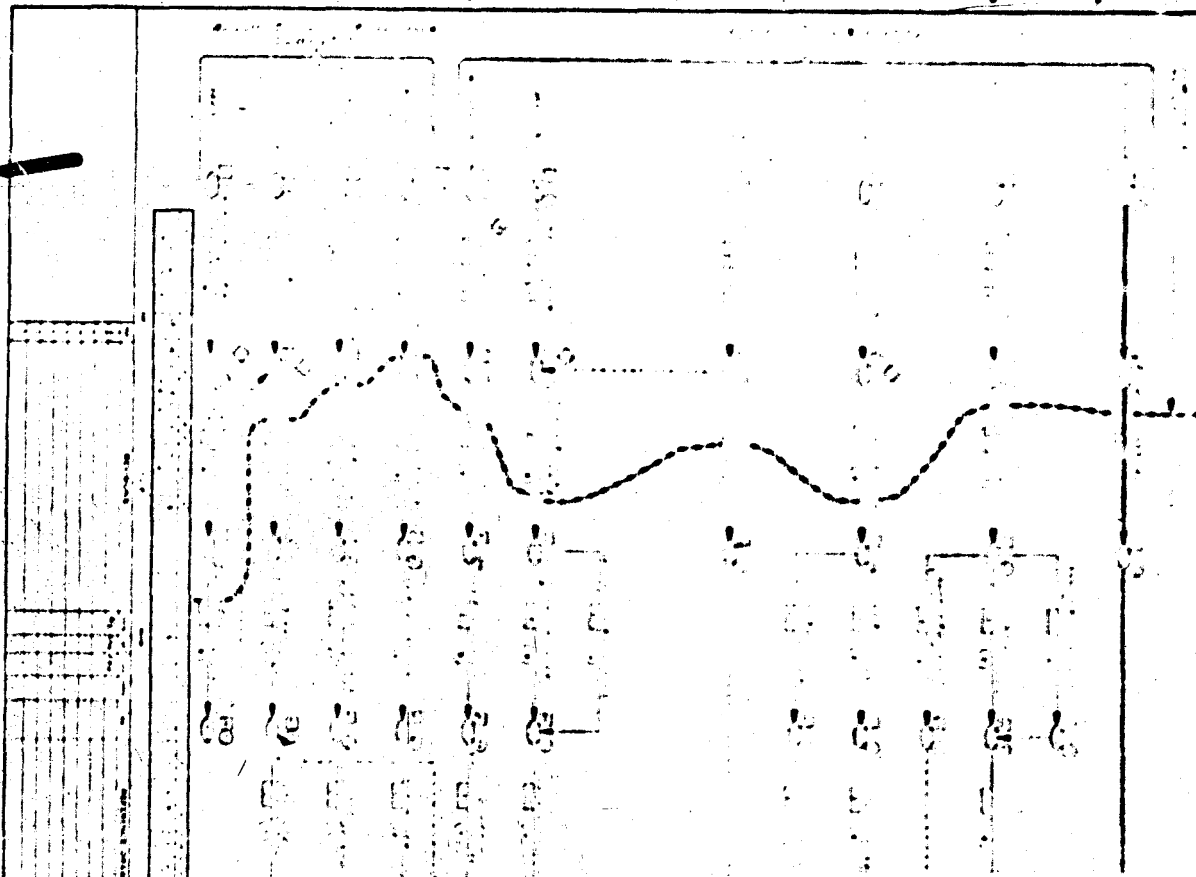
SUMMARY OF PROJECT CHANGES

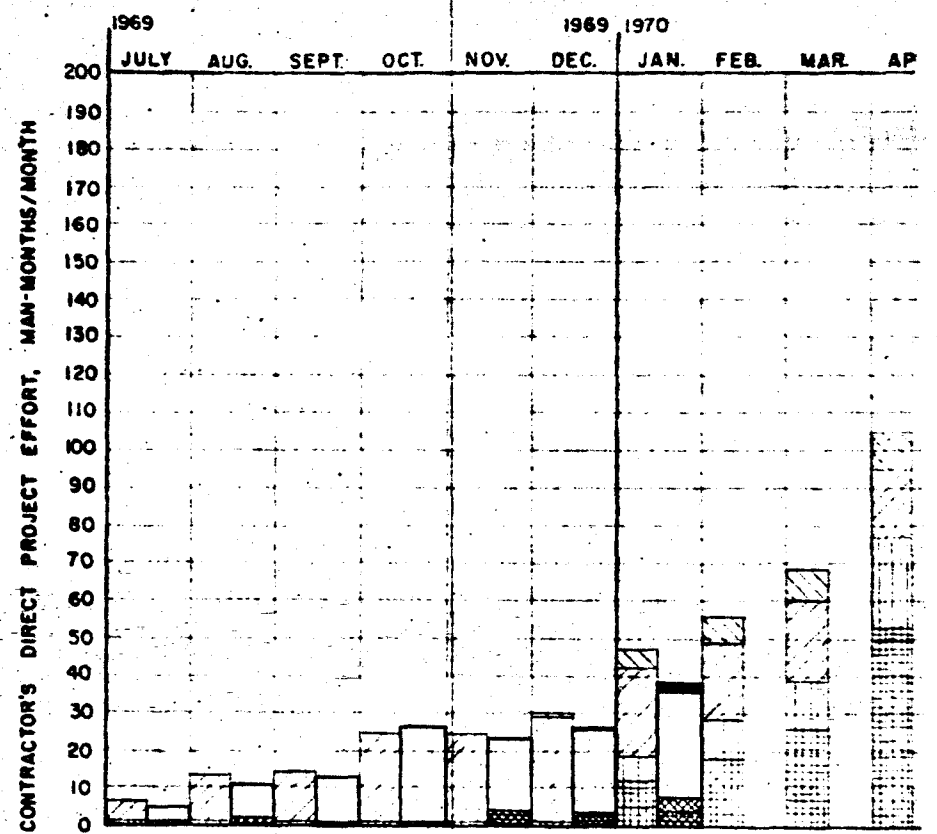
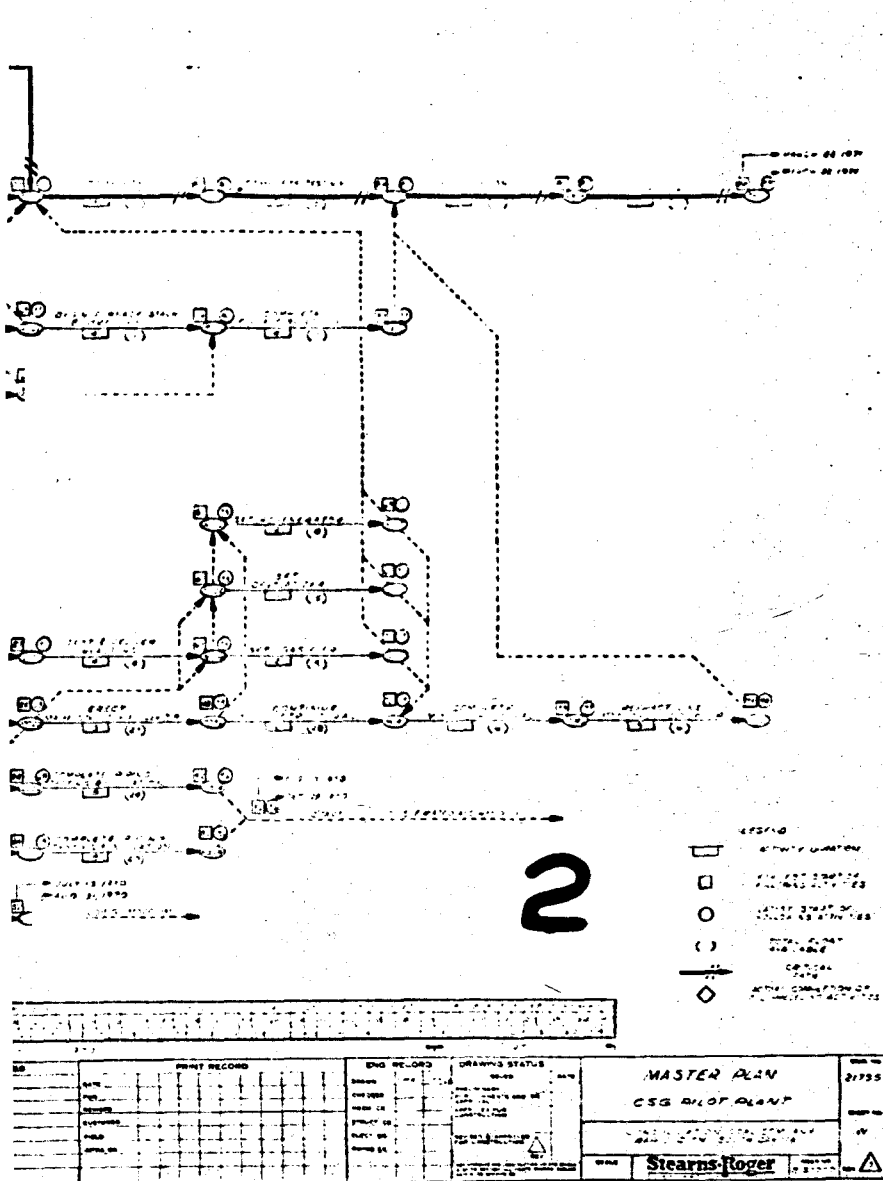
<u>Approved Change Orders</u>	<u>Increase</u>	<u>Decrease</u>
1. Reactor system study	8,828	
Original Maximum Price	8,465,129	
Presently Approved Total	\$8,473,957	
<u>Pending Change Notices</u>		
5. Delete roof at heaters		16,000
6. Add'l Regen. Nozzles	600	
7. Incr. disch. pressure prehr compr	2,700	
8. Redesign purge gas systems	30,000	
9. Add instr & duct, lignite crush & grind	13,000	
10. Boiler controls, 2 element pneu type	1,000	
11. Delete Fuel Gas Booster Blower		7,800
12. Add two PC & PCV	1,000	
13. Revise Canteen to Fallout Shelter	4,000	
14. Perspective Drawing for OCR	900	
15. Revise 32 Pres & Temp Transmtrrs	3,000	
16. Revise Hammermill specs	1,900	
17. Redesign expansion joints		160,000
18. Delete car puller		14,330
19. Revise Fire System per F Mutual	7,000	
20. Frt. Elev vs. Manlift & Hoist	6,200	
21. Study reactor offgas prequench	1,000	
22. Study Rand Corp Surplus Equip	200	
23. Incr Size F-209	800	
24. Subs. Goulds for Aurora J-314	200	
25. Revise reactor refractory specs	13,000	
26. Redesign reactors		16,000
27. Heavier tubes on exchangers	600	
28. Delete Car Thaw pit		3,000
29. Revise htr controls & ESD system		13,000
32. Incr capacity IG system	20,600	
33. Water service to site	2,300	
34. Revisions to conform with Uniform Bldg Code	5,000	
35. Upgrade quality & incr walls htr tubes	15,000	
36. Miscellaneous instrument changes		30,000
37. Revise design & decr quan hot valves		160,000
Net Pending Changes		\$ 268,130
Estimated Total		\$8,185,827

JOB COST STATUS SUMMARY

Period Ending Dec. 31, 1969

Acct. No.	Description	Total Commitments	Estimate to Complete	Total Probable Cost	Original Estimate	Project Price Revisions Thru No.		Revised Estimate	Variance +Increase -Decrease
						App.	Unapp.		
A	Earthwork	123,587	41,260	164,847	151,160			151,160	+ 13,687
B	Concrete	39,606	309,550	349,156	380,130			380,130	- 30,974
C	Buildings & Structures	342,346	654,968	997,314	867,690			867,690	+ 129,624
D	Process Equipment	462,897	1,707,128	2,170,025	2,250,210			2,250,210	- 80,185
E	Piping	9,117	1,121,645	1,130,762	1,261,645			1,261,645	- 130,883
F	Electrical		415,800	415,800	415,800			415,800	
G	Painting		43,480	43,480	51,480			51,480	- 8,000
L	Plant Items	34,871	2,457	37,328	47,685			47,685	- 10,357
N	Instruments & Controls		688,890	688,890	809,890			809,890	- 121,000
P	Insulation		164,710	164,710	159,710			159,710	+ 5,000
	Total Direct Field Cost	1,012,424	5,149,888	6,162,312	6,395,400			6,395,400	- 233,088
H	Field Expense		227,450	227,450	227,450			227,450	- 5,000
H	All Risk Ins. P/R Tax, Bond		156,230	156,230	131,760			131,760	+ 24,470
K	Construction Supplies		27,000	27,000	27,000			27,000	
M	Start Up		2,310	2,310	2,310			2,310	
S	Temporary Facilities	300	56,780	57,080	53,000			53,000	+ 4,080
V	Construction Facilities		77,360	77,360	77,360			77,360	
W	Construction Equipment		182,910	182,910	172,910			172,910	+ 10,000
	Total Indirect Field Cost	300	730,400	730,400	686,890			686,890	+ 43,510
J	Engineering		446,013	446,013	378,470	8,572		387,042	+ 58,971
	Total Field & Eng. Cost	1,012,724	5,322,291	7,338,625	7,501,150	8,572		7,509,722	- 171,127
	Undistributed C/O's						247,010	247,010	- 247,010
Q	Sales Tax								
R	Premium Pay		13,000	13,000	13,000			13,000	
	Contingency		430,000	430,000	430,000			430,000	
	G & A Overhead 3%		229,136	229,136	229,136	217		229,353	- 217
	Fee		136,000	136,000	136,000			136,000	
	TOTAL (Estimated G.M.P.)	1,012,724	7,136,027	8,156,861	8,565,129	8,789	-247,010	8,318,119	+ 248,710





		1969	1969	1969	1969	1969	1969	1970	1970	1970	1970
		JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
PREDICTED	MONTHLY EXPENDITURES	6.0M	25.0M	32.8M	42.6M	59.7M	126.1M	78.1M	76.1M	193.6M	248.1M
ACTUAL	MONTHLY EXPENDITURES	6.2M	25.0M	32.8M	42.6M	59.7M	126.1M	78.1M	76.1M	193.6M	248.1M

		1969	1969	1969	1969	1969	1969	1970	1970	1970	1970
		JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
PREDICTED	CUMULATIVE EXPENDITURES	6.0M	31.0M	63.8M	106.4M	166.1M	292.2M	370.3M	446.4M	639.0M	887.1M
ACTUAL	CUMULATIVE EXPENDITURES	6.2M	31.2M	64.0M	106.6M	166.3M	292.5M	370.6M	446.7M	640.3M	887.4M

* EXPENDITURES INCLUDE ALL COSTS & FEES

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1970 1971

JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
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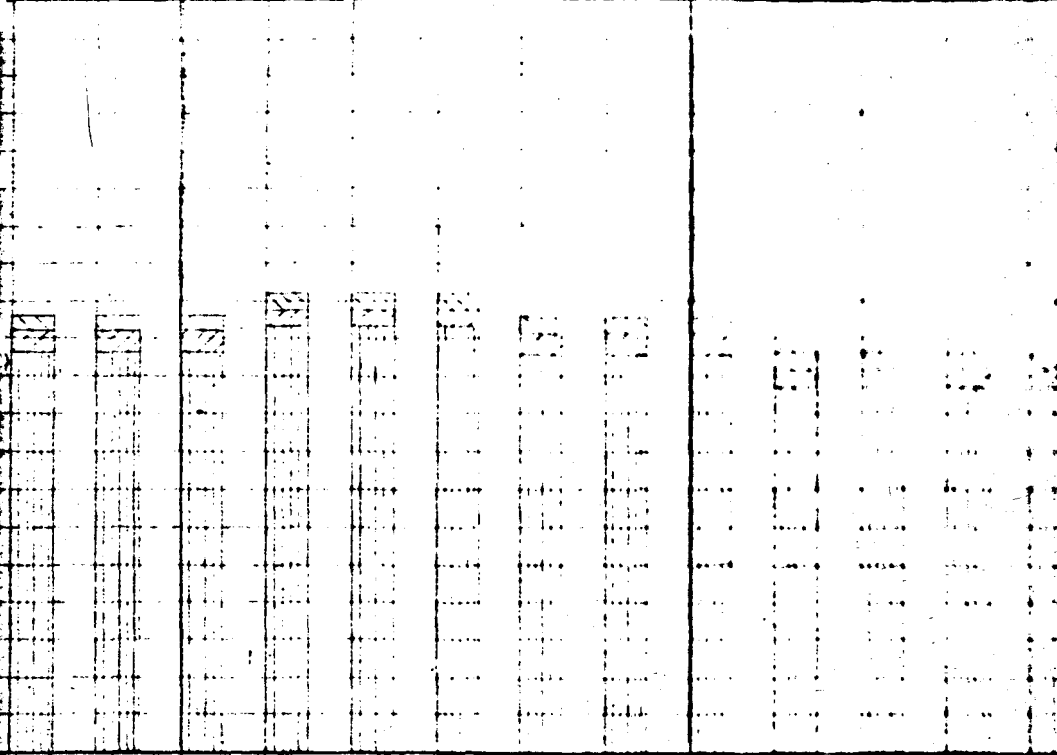
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MONTHLY PROGRESS CHART (CONSTRUCTION & OPERATION)

CONTRACT NO 14-01-C001-315 (9)

1971 1972

MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN FEB MAR APR M



1971 1972 1971 1972 1971 1972 1971 1972 1971 1972 1971 1972 1971 1972 1971 1972

MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN FEB. MAR APR M

1971 1972 1971 1972 1971 1972 1971 1972 1971 1972 1971 1972 1971 1972 1971 1972

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DATE: 1/20/1976

1975

APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

PREDIC

- SUPERVISING
- PROFESSIONAL
- TECHNICIAN S-R
- TECHNICIAN S/C

- INCLUDES SUPERVISOR
- INCLUDES CLERICAL

CONSTRUCTION — STEAM
OPERATIONS — STEAM

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MONTHLY

OFFICE
U. S. DEPARTMENT

CONSOLIDATED
RESEARCH DIVISION

CONTRACT

APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

5

DATE: Jan 1970

1973

PT. OCT. NOV. DEC.

	PREDICTED	ACTUAL
SUPERVISING		
PROFESSIONAL		
TECHNICIAN S-R		
TECHNICIAN S/C		

- INCLUDES SUPERVISORY EXEMPT TECHNICIANS
- INCLUDES CLERICAL

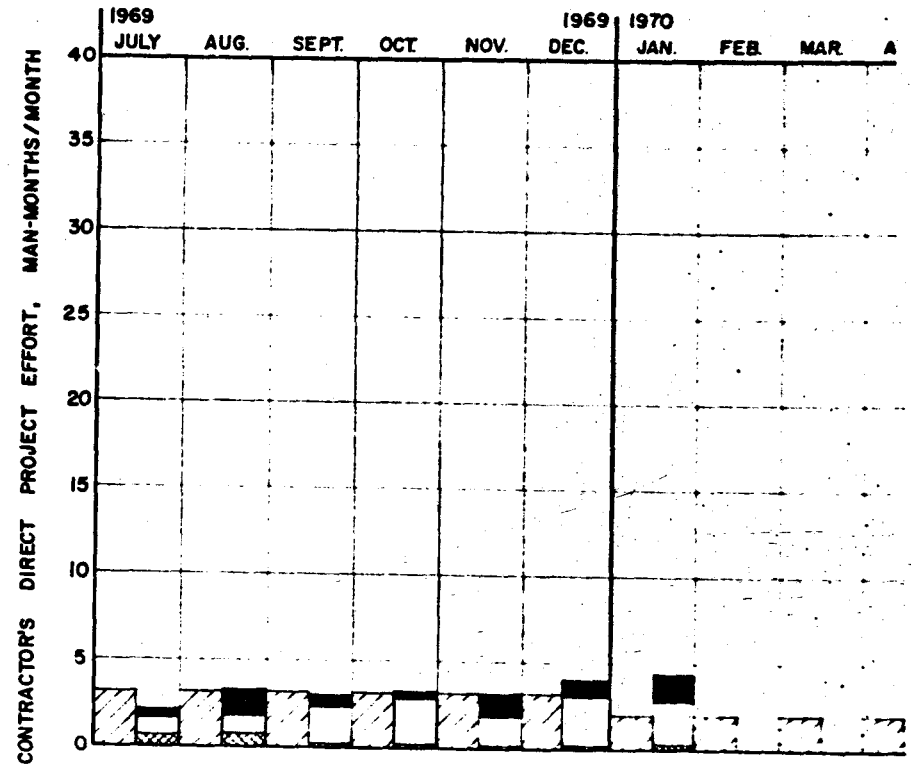
CONSTRUCTION — STEARNS-ROGER JOB B-37000
 OPERATIONS — STEARNS-ROGER JOB B-37400

MONTHLY PROGRESS CHART

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 U.S. DEPARTMENT OF THE INTERIOR

CONSOLIDATION COAL CO.
 RESEARCH DIVISION LIBRARY, PA.

CONTRACT NO. 14-01-0001-415 (3)



MONTHLY EXPENDITURES*

	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
PREDICTED	16,215	14,695	14,965	13,155	14,385	17,065	15,585	5,595	2,615	1,745
ACTUAL	11,745	34,734	9,609	11,925	10,130	15,205	6,000			

CUMULATIVE EXPENDITURES*

* Expenditures Include All Costs & Fees

MONTHLY

CONTRACT

	1970						1971						
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
13.	12,655	13,315	12,835	12,505	12,505	12,505	20,155	20,135	23,295	22,295	21,45	18,705	955
MA	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
160.	173,650	186,965	199,800	212,305	224,810	237,315	257,470	277,605	300,900	323,195	344,340	363,045	1,000

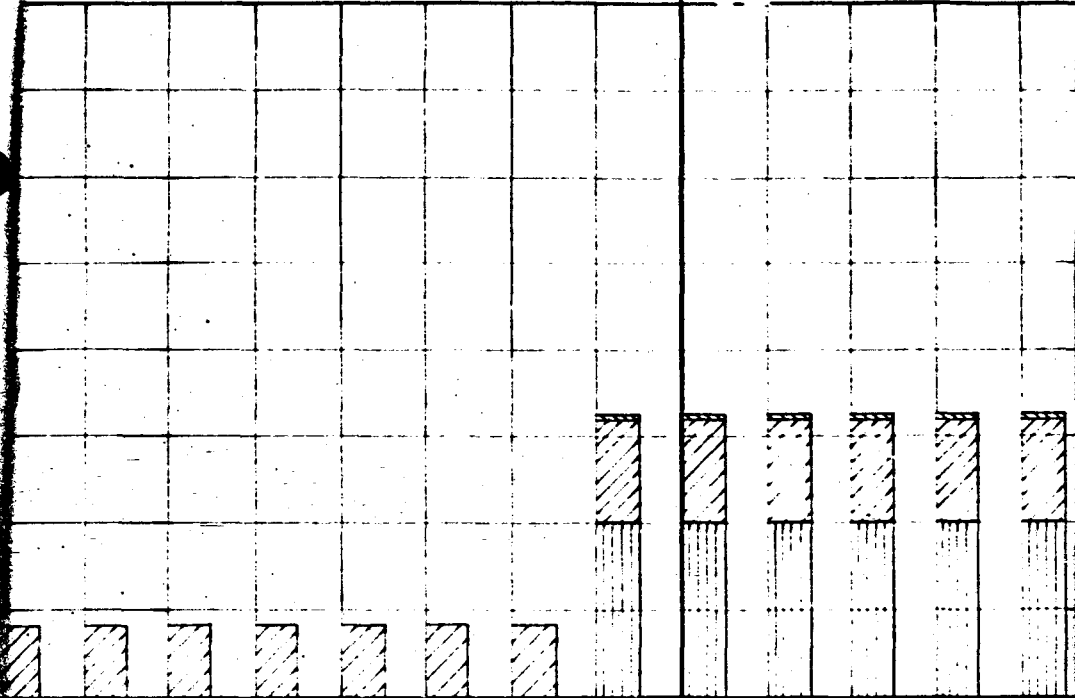
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MONTHLY PROGRESS CHART (SUPERVISION)

CONTRACT No. 14-01-0001-415 (3)

MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. 1971 JAN. 1972 FEB. MAR. APR. MAY



16,705	15,955	14,875	14,975	14,975	14,875	14,875	39,475	33,475	39,475	33,475	39,475	39,475
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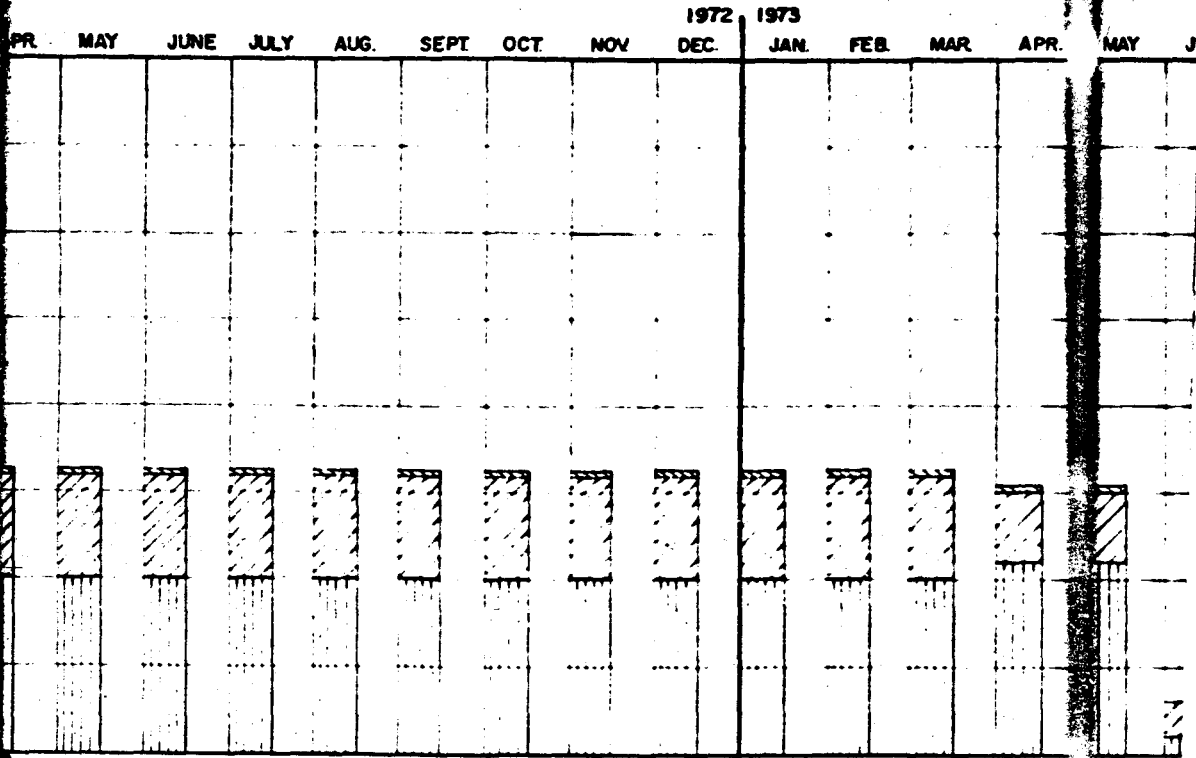
MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY
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363,045	379,000	393,875	408,750	423,625	438,500	453,375	468,250	532,325	577,800	611,275	650,750	690,225
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ION & LAB WORK)

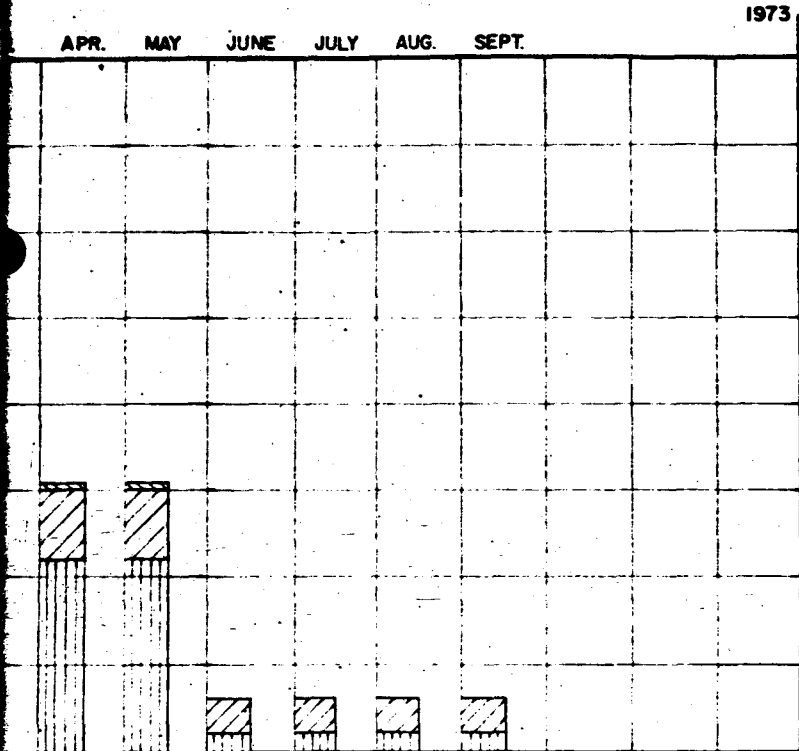


APR	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV	DEC.	JAN.	FEB.	MAR.	APR	MAY
39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	36,075	36,075
690,750	690,225	729,700	769,175	808,650	848,125	887,600	927,075	966,550	1,006,025	1,045,500	1,084,975	1,124,450	1,163,925

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DATE: Jan. 41



PRECED

SUPERVISING

PROFESSIONAL

TECHNICIAN

⊕ Includes Supervisory

⊗ Includes Cleric

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	APR	MAY	JUNE	JULY	AUG	SEPT
36,075	36,075	11,475	11,475	11,475	41,120	
1,121,050	1,157,125	1,168,600	1,180,075	1,191,550	1,232,670	

MONTH & PR

OFFICE OF CC
DEPARTMENT C

CONSOLIDATI
RESEARCH DIVISION

CONTRACT No. 14

5

DATE: Jan 4 1973

1973

SEPT.

	PREDICTED	ACTUAL
SUPERVISING		
PROFESSIONAL		
TECHNICIAN		

Includes Supervisory Exempt Technicians.
 Includes Clerical.

6

MONTHLY PROGRESS CHART

OFFICE OF COAL RESEARCH
DEPARTMENT OF THE INTERIOR

CONSOLIDATION COAL CO.
RESEARCH DIVISION LIBRARY, PA

CONTRACT No. 14-01-0001-415 (3)

PROGRESS REPORT NO. 69
OCR CONTRACT NO. 14-01-0001-415(3)
CONSOL LIGNITE GASIFICATION PROCESS DEVELOPMENT

February 1 to 28, 1970

A. Summary

Phase I - Feasibility Study

Complete.

Phase II - Bench-Scale Experiments

Current effort complete

Phase III - Pilot Plant Engineering

Complete

Phase IV - Pilot Plant Construction

At Rapid City, caisson work is 70% completed and the railroad spur is 50% complete. Building work will be initiated in early March.

Equipment specification and purchase remains about six weeks behind schedule. However, projected delivery of the critical items (reactors) remains as scheduled; projected construction completion date is unchanged (March 22, 1971).

The projected GMP is \$8,203,627.

Financial

Estimated expenditures in February were \$110,500 by Stearns and \$14,000 by Consol. Cumulative total expense is \$2,503,882.

41,120			
SEPT.			
232,670			

February, 1970

B. Technical Results and Program

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

1. Supporting Process and Economic Analyses (Project No. 533.00)

No work was done on this project during the report period.

2. Supporting Patent and Legal Activities (Project No. 534.00)

The current reports and memoranda were reviewed for Subject Inventions.

3. Consol Assistance on Construction of Lignite Pilot Plant (Project 535.00)

Monitoring of Stearns' activities has continued; Consol effort on the review of revised flowsheets is largely completed.

Despite the delays in equipment specification and purchasing, project completion by March 22, 1971 is projected. The "critical path" in this schedule is the fabrication and installation of the reactors; the vendor has advised (as of March 4, 1970) that the target delivery date will be met.

Referring to the attached Stearns' "Summary of Project Changes" the estimated GMP of \$8,453,627 is incorrect, since pending Change Notice No. 40 ("Accumulated Costs for Future Transfer to Operations Contract B-37400") should have no significant influence on the construction contract. Thus an estimated GMP of \$8,203,627 is more nearly correct.

Change Notice 40 includes those operation-related items which Stearns projects should be expanded or purchased before completion of construction, as broken down below:

Office Furniture	\$ 17,600
Spare Parts	100,000
Lab Furniture	28,000
Mobile Equipment	55,400
Operating Staff Salaries	49,000
	<u>\$ 250,000</u>

February, 1970

Stearns will prepare a detailed listing and recommended schedule of purchasing such items so that an appropriate time for activating the operations contract can be selected.

4. Stearns-Roger Subcontract (Project No. 700)

Progress reports by Stearns are attached.

C. Subject Inventions

None.

D. Financial Status

<u>Expenses</u>	<u>Actual</u>	<u>Budget</u>
Cumulative through January, 1970	\$ 2,379,382	\$ 2,422,211
Expended in Period		
Consol	14,000	15,595
Stearns	110,500	273,000
Cumulative through February, 1970	\$ 2,503,882	\$ 2,710,806

Att. - Stearns-Roger Progress Report
Progress Charts
T: 3/16/70

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 March 6, 1970

PROJECT REPORT SUMMARY

Work now in progress includes engineering design, receipt and evaluation of inquiries to equipment vendors, purchasing of equipment, approval of vendor drawings, drafting layout and detail drafting. Design revisions have delayed completion of flow diagrams and equipment specification and purchase by about six weeks. This delay will shift more construction work into the less efficient fall construction months, but should not delay project completion.

ENGINEERINGProcess

Flow diagrams for the process have been reviewed by Consol. Final instrumentation details on vendor packaged equipment is required before the diagrams are final.

Mechanical

We are still experiencing extreme difficulty in obtaining design details, mode of control and startup for the lignite grinding system. Only other major unsolved mechanical design problem is that neither Consol nor Stearns-Roger has yet been able to determine a way to prevent the lockhopper weighing devices from being affected by the connecting piping. For further details on materials, please refer to Material Status Report No. 4 issued on February 18.

Details on engineering, inquiries, recommendations, approvals, and purchasing are covered by the Equipment List issued on March 6 which is summarized as follows:

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 March 6, 1970

EQUIPMENT LIST SUMMARY

Description	No.	Specifications		On		Consol	
	Items	In Prog	Comp.	Inq.	Recc.	App.	Purch
Agitators	1	--	--	-	--	-	1
Bins, Hoppers	8	--	--	7	--	1	-
Boiler	1	--	--	-	--	-	1
Cooling Twr	1	--	--	-	--	-	1
Cyclones	4	--	--	-	--	-	4
Comprs	9	--	--	-	--	-	9
Conveyors	4	--	--	-	--	-	4
Hoists	1	--	--	1	--	1	-
Crushers	2	--	--	-	--	-	2
Dryers	4	--	--	-	3	-	1
Exchgrs	9	--	--	4	--	-	5
Feeders	7	--	--	-	--	-	7
Fired Htrs	6	--	--	-	--	-	6
Elec. Gen	1	--	--	1	--	-	-
Misc.	5	1	--	-	--	2	2
Pkg Systems	4	--	--	2	--	-	2
Pumps	19	--	--	-	-	-	19
Scale	1	--	--	-	-	-	1
Screens	1	--	--	-	-	-	1
Flare Stk	1	--	--	1	-	-	-
Tanks	3	--	--	-	-	-	3
Vessels	34	--	--	7	-	1	26
Water Trt	2	--	--	-	-	-	2
Percent of Total	100	0	0	19	2	2	77

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 March 6, 1970

Drafting

Detail drawings for the underground piping, cooling tower, process structure and solids handling building are in progress. Piping drafting is about 45% complete.

Work continues on miscellaneous foundations, checking of vendor equipment drawings, and structural steel shop drawings. The structural group has also been assisting in the optimization study of ways to erect the reactor vessels.

Electrical drawings for the subcontract are ready for the issue of the inquiry on March 6.

Instrumentation

Data sheets for the case instruments and transmitters are ready for final issue. Inquiry specifications for control valves and relief valves are 70% complete. Recommendations to purchase hot service butterfly valves, analyzers and level controllers have been approved by Consol.

Alarm annunciator has been ordered. Design drawings from Dally Engineering Company, supplier of hot service gate and butterfly valves, are three weeks overdue and may be delayed another week.

PROJECT ENGINEERING

The arrow diagram network schedule attached to this report has been updated with the decorative line relocated to separate the completed and the unfinished work.

Computer updating of the detailed schedule is being held up until the week of March 18, so that revisions to the logic for the optimum method of setting the reactor vessels can be included.

Comments by Consol have been passed on to the gas utility company for revision of the proposed contract for extension to the gas main to the plant site.

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 March 6, 1970

CONSTRUCTION (Started January 15)

Temporary buildings and area lighting are complete. Caisson subcontractor is about 70% complete. Caisson work will resume when remaining drawings are released in mid-April. Subcontractor for railroad spur is about 50% complete. Building subcontractor started excavating for caisson caps and grade beams during the week of March 2. Subcontracts for fence, curb cut, gutter and off-site water main are complete.

PROJECT CHANGES

Definition of project changes based on changes from flow diagrams in the Bid Documents has resulted in listing 272 separate changes which have been grouped into some of the change orders listed on the attached summary. Work is now in progress toward preparing definitive cost estimates for these change orders.

D. H. Dawson
 D. H. Dawson
 Project Manager

Attachments: Summary of Project Changes - 2 pages
 Progress Chart, 2-28-70
 Master Plan Schedule

Distribution:

Consol - 5
 C. A. Schulz

Continental Oil Company - 6

E. E. Ellington, CED
 D. F. Wegner, Field
 L. Thompson, MED

J. B. Hambleton, CED
 B. D. Robertson, CED
 Dr. C. V. Foster, PED

Stearns-Roper - 7
 FCP/RED, CSB, COS, FOLS
 CFL/JIN/VLS, HAN, JON
 ALC, FAN/JAP, DED
 WEPowell, Field

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 March 6, 1970

SUMMARY OF PROJECT CHANGES

<u>Approved Change Orders</u>	<u>Increase</u>	<u>Decrease</u>
1. Reactor System Study	8,828	
Original Maximum Price	8,465,129	
Presently Approved Total	\$8,473,957	
<u>Pending Change Notices</u>		
5. Delete roof at heaters		14,000
6. Add'l Regen. Nozzles	600	
7. Incr. disch. pressure pretr compr	2,700	
8. Redesign purge gas systems	30,000	
9. Add instr & duct, lignite crush & grind	13,000	
10. Boiler controls, 2 element pneu type	1,000	
11. Delete Fuel Gas Booster Blower		7,800
12. Add two PC & PCV	1,000	
13. Revise Canteen to Fallout Shelter	4,000	
14. Perspective Drawing for OCR	900	
15. Revise 32 Pres & Temp Transmitters	3,000	
16. Revise Hammermill specs	1,900	
17. Redesign expansion joints		160,000
18. Delete car puller		14,330
19. Revise Fire System per F Mutual	7,000	
20. Frt. Elev vs. Manlift & Hoist	6,200	
21. Study reactor offgas prequench	1,000	
22. Study Rand Corp Surplus Equip	200	
23. Incr. Size F-209	800	
24. Subs. Coulds for Aurora J-314	200	
25. Revise reactor refractory specs	13,000	
26. Redesign reactors		16,000
27. Heavier tubes on exchangers	600	
28. Delete Car Thaw pit		3,000
29. Revise htr controls & ESD system		13,000
32. Incr. capacity IG system	20,600	
33. Water service to site	2,300	
34. Revisions to conform with Uniform Bldg Code	5,000	
35. Upgrade quality & incr wall htr tubes	30,000	

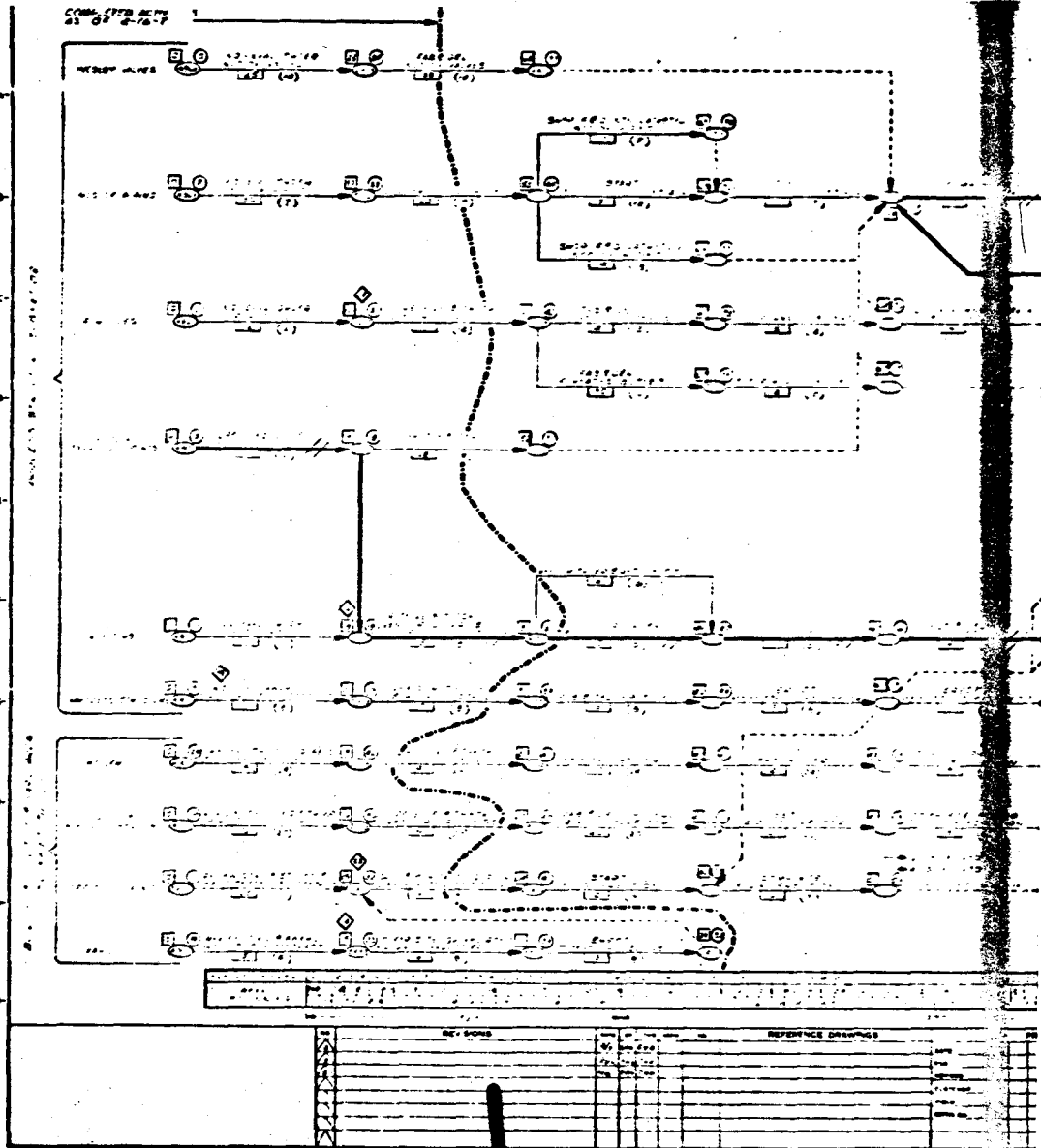
PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

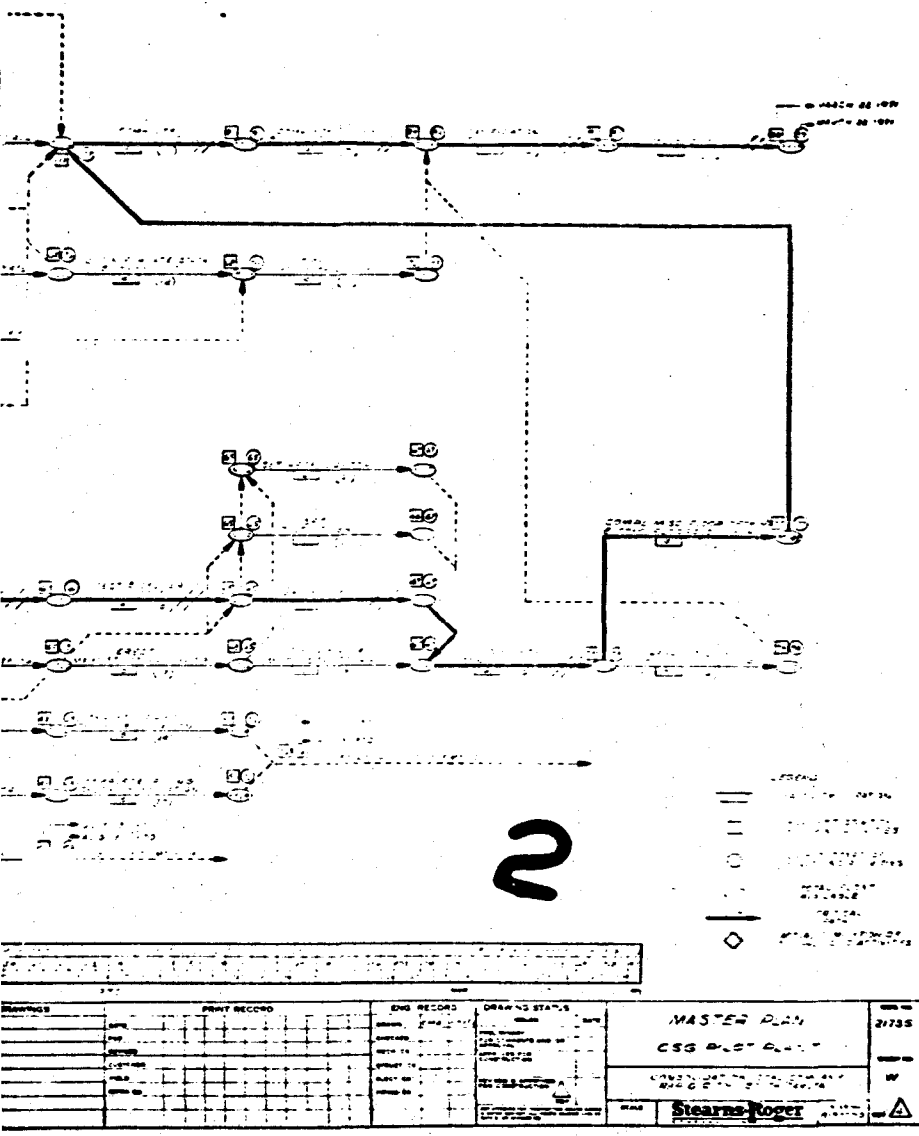
CCC Project No. 536
 S-R Job No. B-37000
 March 6, 1970

SUMMARY OF PROJECT CHANGES - continued

<u>Pending Change Notices</u>	<u>Increase</u>	<u>Decrease</u>
36. Miscellaneous instrument changes		30,000
37. Revise design & decr quan hot valves		160,000
38. Revise Sanitary Disp. System	9,000	
39. Revise Waste System	7,000	
40. Accum Costs for future transfer to oper contr. B-37400	250,000	
41. Revise Solids Handling	3,000	
42. Misc. changes in pipe specs, sizes, deletions & additions	10,000	
43. Revise Reactor System Piping Design		20,000
44. Revise Reactor System Auxiliary Vessels	12,000	
45. Revise Misc. Reactor Internals		2,000
46. Revise Jacket Water Piping System	2,000	
47. Delete C-206		1,000
48-2 Delete Vendor supplied heater inst. & add equiv. items to Instr. Acct	500	
49. Revise Flare System	1,000	
50. Add'l htg & ventlg elec room, proc struc & solids handling bldg	1,000	
51. Revise 1st Floor Layout Proc Structure	2,000	
52. Stress relieve F-134	300	
53. Change flue gas quench from CS to Stainless	5,000	
Net Pending Changes		20,330
Estimated Total		\$8,453,627



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STEARNS-ROGER CORPORATION
FIELD PROGRESS REPORT

Page 1 of 6

Date February 25, 1970

Project Location Rapid City, South Dakota

Job No. B-37000

Customer Consolidation Coal Company

Week Ending February 24, 1970

By Superintendent Roger Cornett
Roger Cornett

Distribution

- 1 - JAP/EAN
- 1 - PM/FCP
- 1 - Superintendent

FIELD PROGRESS REPORTJob No. R-37003

Page 2 of 6

Acct. Description	S-R Manhours				Subcontract Manhours**			
	Base Est.	Forecast Total	Spent Total	% Compl.	Base Est.	Forecast Total	Spent Total	% Compl.
A Earthwork								
*B Concrete								
*C Bldgs. & Struc.								
D Process Equip.								
*E Piping								
*F Electrical								
G Painting								
L Plant Facil.								
N Instruments								
P Insulation								
Total Directs								

	S-R Money				Subcontract \$\$\$			
	Base Est.	Forecast Total	Spent Total	% Compl.	Base Est.	Forecast Total	Spent Total	% Compl.
H Field Expense								
L Plant Facil.								
M Startup								
O Cleanup								
S Temp. Facil.								
V Const. Camp								
W Const. Equip.								
Total Indirects								
Total Directs								
Total Job								

% Complete is the ratio of Total Manhours spent to date - Total Manhours Forecast to be spent.

*The Total Manhours forecast to be spent in these accounts comes from the Progress-Efficiency Reports when they are available. Prior to this, use the estimate of manhours as a guide.

**Report this information on cost plus subcontracts or when the data can be obtained on lump sum.

FIELD PROGRESS REPORTJob No. R-37003

Page 3 of 6

List Any Engineering Information or Help Needed

1. Approved caisson drawings.
2. Approved HVAC drawings.
3. Approved underground pipe drawings - Building and Yard.
4. Vendor drawings of arriving material.

List Any Materials Information NeededList Delays Beyond Field Control

Approved drawings.

Labor Relations

Specific Work stoppages and jurisdictional claims. Give time lost by date and craft.

FIELD PROGRESS REPORT

Job No. B-37000

Page 4 of 6

Extra Work (List by number and give number status)

Construction Equipment and Tools

List major construction equipment and comment on any equipment needed. List any idle equipment and state why idle.

Job No. B-37000

Page 5 of 6

Work Accomplished Last Week

Report briefly by account work accomplished last week.

B-802 Railroad Spur - Chicago and Northwestern Railroad
Installed switch in yard track, placed ties and rail as far as car charging shed.
Awaiting delivery of ballast.

B-804 Caissons - Caissons, Inc.
Subcontractor drilled final caisson of this phase 2-18-70. Will move back on site
when remainder of caissons are released for construction.

00503000 - Carpenters manufacturing sawn boxes and tool boxes.

FIELD PROGRESS REPORT

Job No. B-37000

Page 6 of 6

WEEKLY WEATHER SUMMARY	Clear	Cloudy	Wind	Temp.	Prec.
Monday	X			60°F High	
Tuesday		X		8°F Low	Trace
Wednesday		X			
Thursday		X			
Friday		X			
Saturday	X				

List Any Time Lost Due to Weather by Craft and Date.

NONE

Attach

Attendance Report

Work Plan for Next Week

WEEKLY
MAN HOUR REPORT

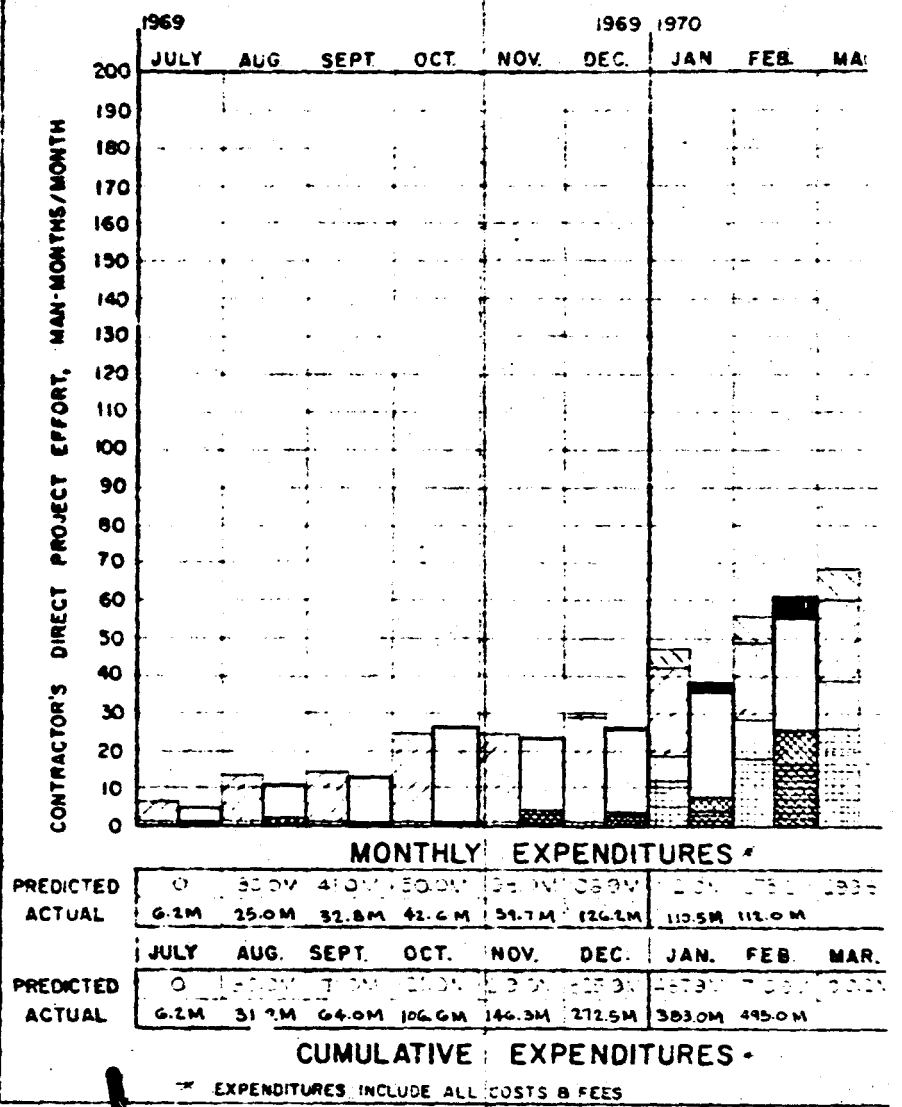
PROJECT NO. B-37000 LOCATION Rapid City, So. Dak. DATE W/S 2-21-70

CRAFTS	CARRIED FORWARD	EXPENDED THIS PAY PERIOD	TOTAL TO DATE
BOILERMAKERS	-0-	-0-	-0-
CARPENTERS	789½	36	825½
CEMENT MASONS	13	3	16
IRONWORKERS	-0-	-0-	-0-
LABORERS	363½	-0-	363½
MILLWRIGHTS	-0-	-0-	-0-
OPERATING ENGINEERS	-0-	-0-	-0-
PAINTERS	-0-	-0-	-0-
PIPEFITTERS	-0-	-0-	-0-
ROCKEN	333½	16	349½
TEAMSTERS	-0-	-0-	-0-
TOTALS	1499½	55	1554½
ACCUMULATIVE TOTALS			

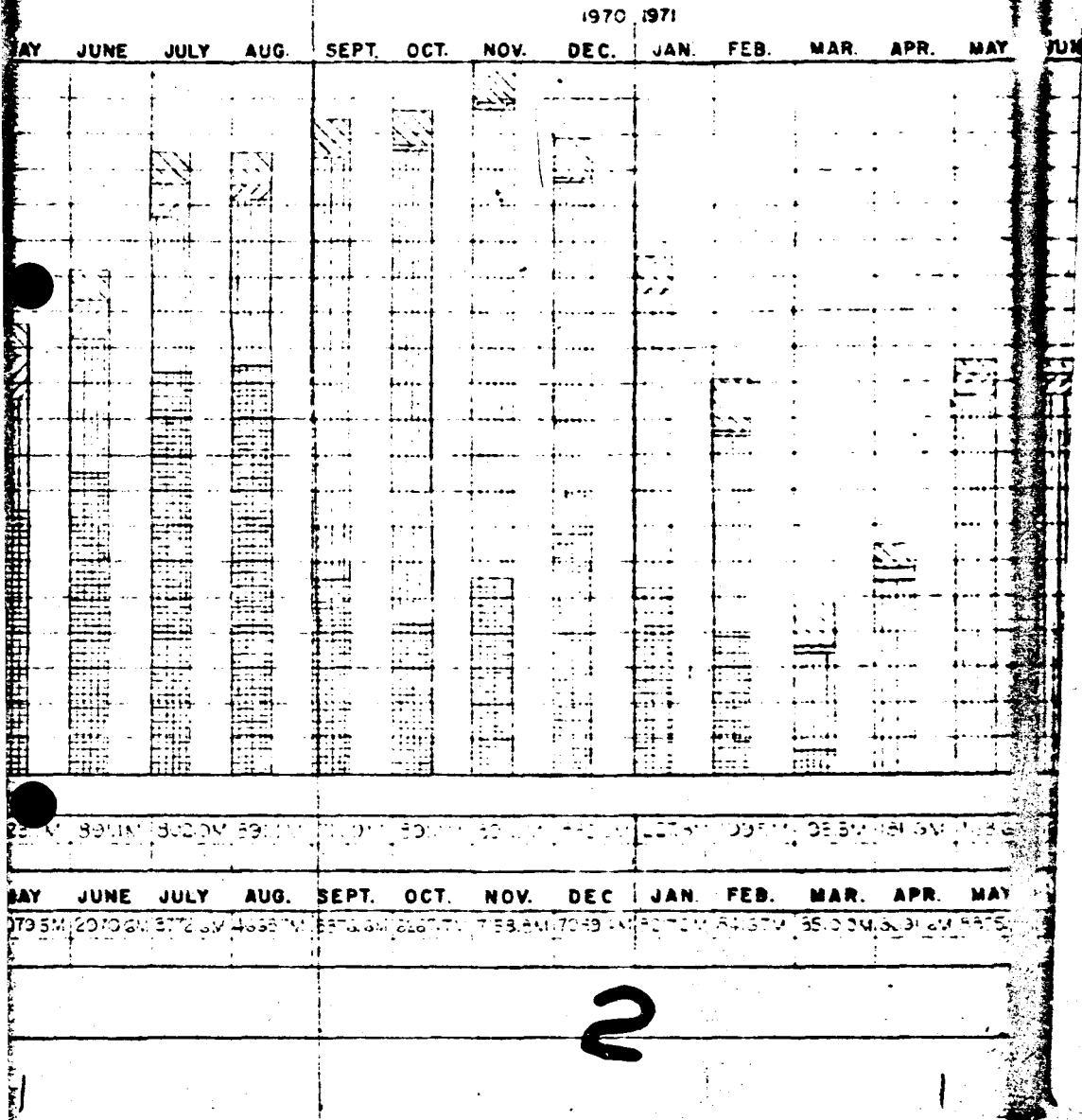
Form No. 103.03
 WEEK ENDING 2-28-70
 P.R. NO. 8
 TOTAL EMPLOYEES 5

Job Description	Boilermaker	Carpenter	Electrician	Finisher	Inspector	Ironworker	Labor	Millwright	Painter	Operator	Pipefitter	Welder	Total Hours
Steel Consolidation													
Coal Company													
Object No. 1-37000													
Location Rapid City,													
South Dakota													
Earthwork													
Concrete													
Buildings													
Equipment													
Pipes													
Electrical													
Brickwork													
Plant Facilities													
Instrument & Cont.													
Insulation													
Fluid Systems													
Start Up													
Close Up													
Maintenance													
Boiler Repair													
PAID PAID PAID													
Grand Total		16		1									17
		16											33
													33
													33

PAID PAID PAID
 PAID ACCOUNTANT: D. B. Dietrich



MONTHLY PROGRESS CHART (1)



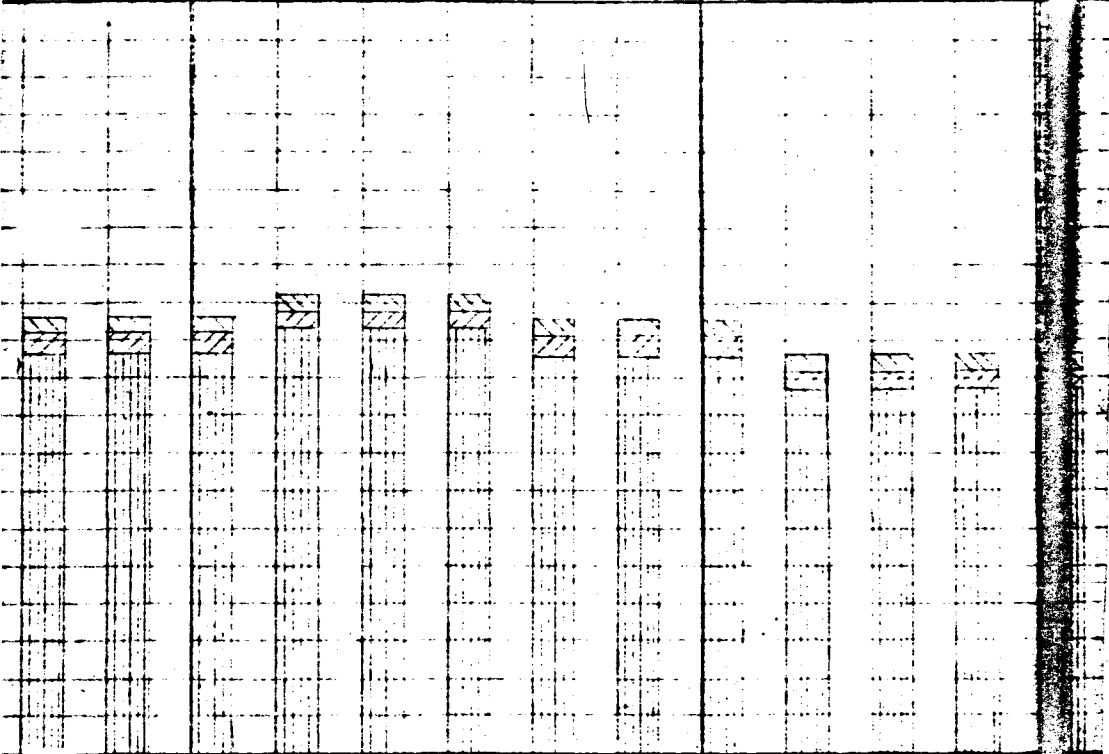
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MONTHLY PROGRESS CHART (CONSTRUCTION & OPE

CONTRACT NO. 14-01-0001-415 (3)

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MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY

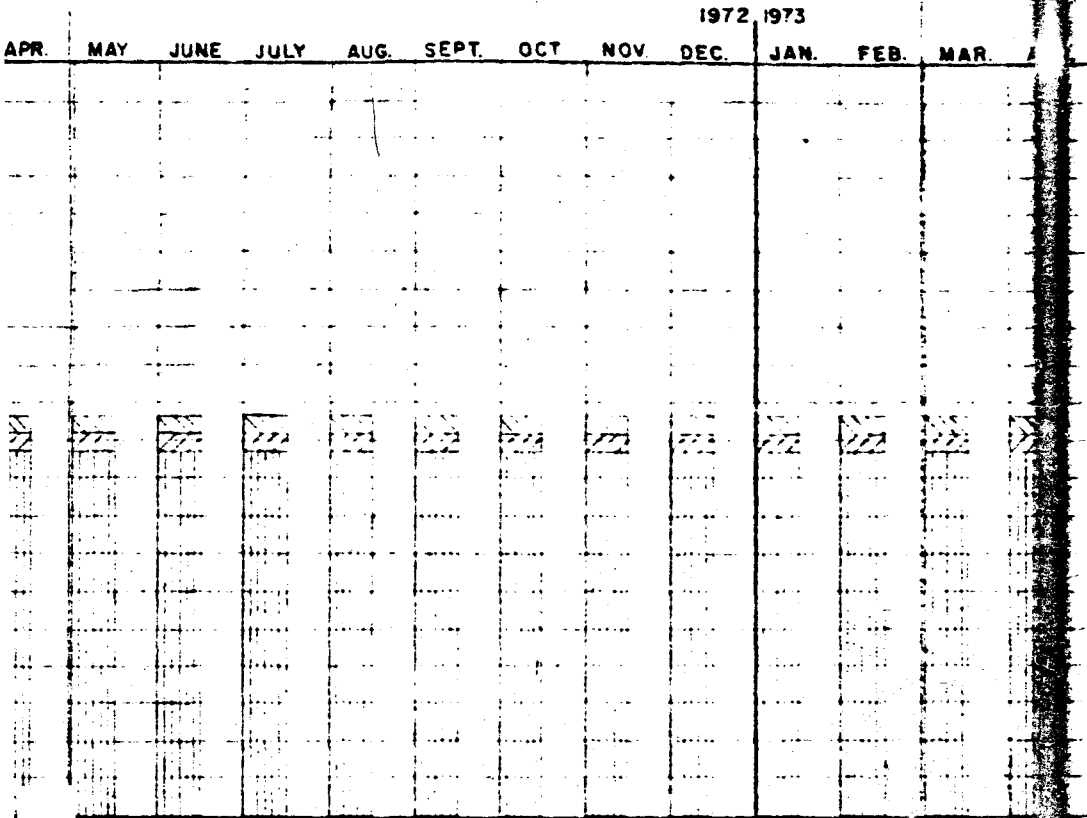


MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY
163.6M	138.7M	165.5M	203.1M	208.0M	209.1M	201.0M	201.0M	101.5M	75.1M	74.1M	91.7M	13.9M
855.2M	9018.9M	1162.7M	13390.5M	19506.8M	19807.9M	10009.6M	1021.5M	104.85M	10557.9M	10730.0M	10927.1M	161.1M

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(CONSTRUCTION & OPERATION)



1972 1973

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DATE: Feb 1970

1973

SEPT. OCT. NOV. DEC.

	PREDICTED	ACTUAL
SUPERVISING		
PROFESSIONAL		
TECHNICIAN S-R		
TECHNICIAN S/C		

- ⊕ INCLUDES SUPERVISORY EXEMPT TECHNICIANS
- ⊕ INCLUDES CLERICAL

CONSTRUCTION — STEARNS-ROGER JOB B-37000
 OPERATIONS — STEARNS-ROGER JOB B-37400

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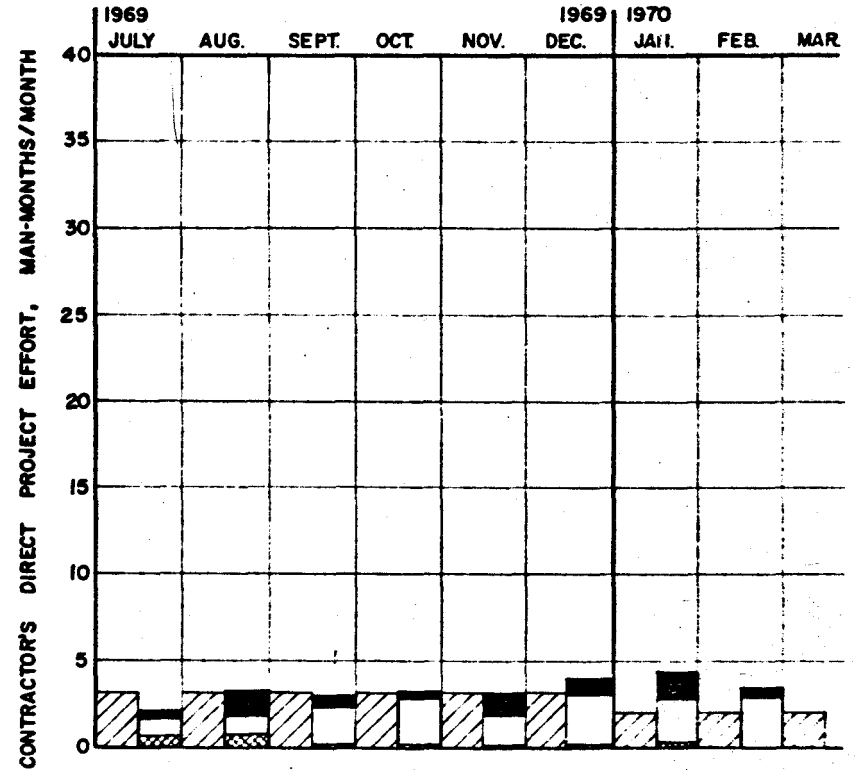
MONTHLY PROGRESS CHART

OFFICE OF COAL RESEARCH
 U.S. DEPARTMENT OF THE INTERIOR

CONSOLIDATION COAL CO.
 RESEARCH DIVISION LIBRARY, PA

CONTRACT NO. 14-01-0001-415 (3)

SEPT. OCT. NOV. DEC.



MONTHLY EXPENDITURES*

	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.
PREDICTED	16,215	14,685	14,965	13,155	14,385	17,065	15,585	5,595	2,655
ACTUAL	11,745	34,734	9,609	11,825	10,130	15,205	14,378	14,200	
PREDICTED	16,215	30,900	45,865	59,020	73,405	90,470	106,055	121,650	134,305
ACTUAL	11,745	46,479	56,038	67,913	78,043	93,248	107,626	121,826	

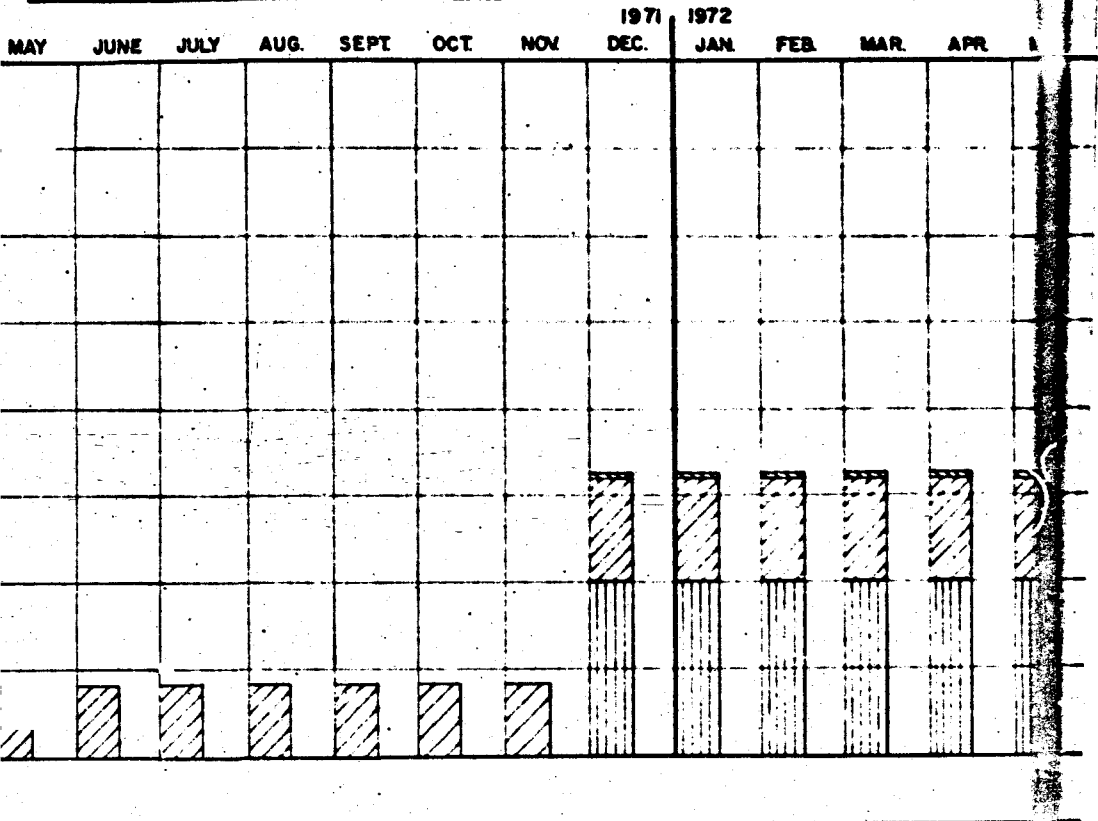
CUMULATIVE EXPENDITURES*

* Expenditures Include All Costs & Fees

(See 415 Chart)

MONTHLY PROGRESS CHART (SUPERVISION)

CONTRACT No. 14-01-0001-415 (3)

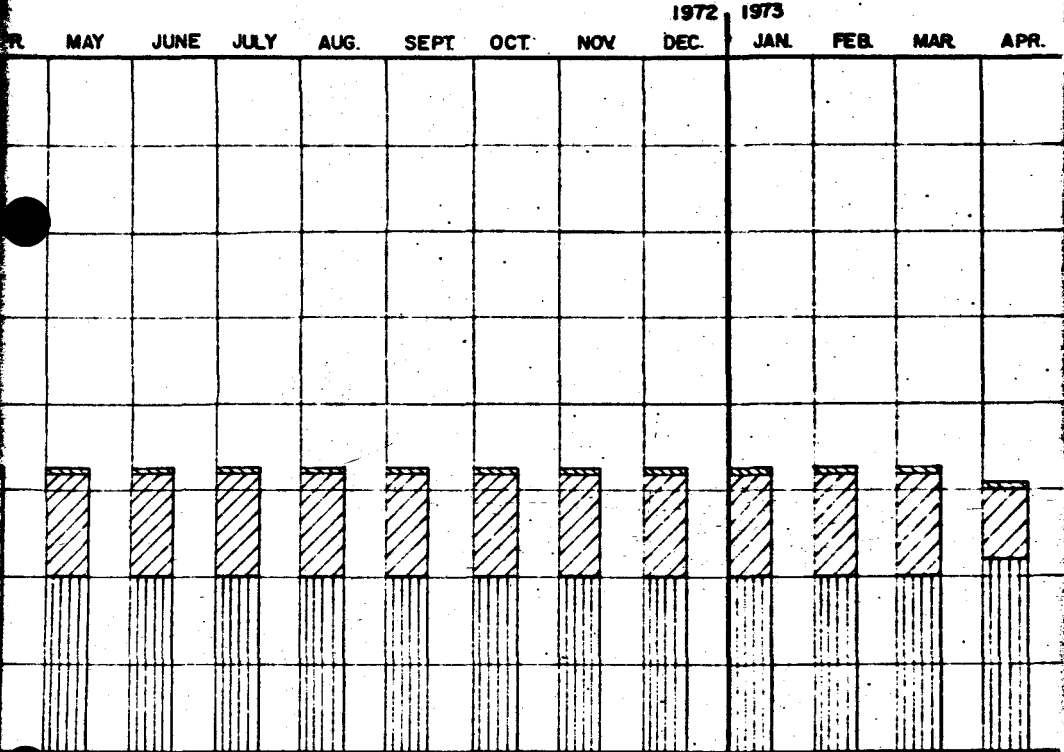


18,705	15,955	14,875	14,875	14,875	14,875	14,875	39,475	39,475	39,475	39,475	39,475	39,475	39,475
MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.		
363,045	379,000	393,875	408,750	423,625	438,500	453,375	492,850	532,325	571,800	611,275	650,750		

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475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	36,075
APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
750	690,225	729,700	769,175	808,650	848,125	887,600	927,075	966,550	1,006,025	1,045,500	1,084,975	1,121,050

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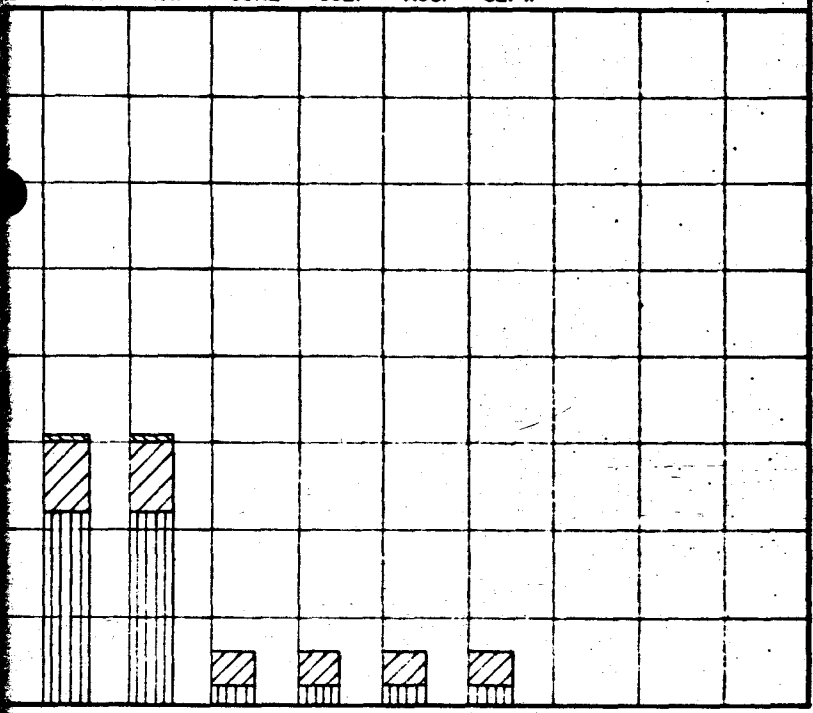
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DATE: Feb.

1973

APR. MAY JUNE JULY AUG. SEPT.



- PRE
- SUPERVISING
- PROFESSIONAL
- TECHNICIAN
- ⊕ Includes Super
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73	36,075	36,075	11,475	11,475	11,475	41,120			
	APR	MAY	JUNE	JULY	AUG.	SEPT.			
75	1,121,050	1,157,125	1,168,600	1,180,075	1,191,550	1,232,670			

5

MONTH
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B. Technical Results and Program

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

1. Supporting Process and Economic Analyses (Project No. 533.00)

No work was done on this project in the report period.

2. Supporting Patent and Legal Activities (Project No. 534.00)

The current reports and memoranda were reviewed for Subject Inventions.

3. Consol Assistance on Construction of Lignite Pilot Plant (Project 536.00)

Major Consol effort during the month has been devoted to revisions of the pilot plant design to eliminate potential stream and air pollution. Additions to the facilities include:

- a) provision to remove all SO₂ from regeneration offgases.
- b) stripping of effluent quench water to remove dissolved H₂S, phenols, CO₂, etc..
- c) incineration of gas product (including the stripped gases and phenol-containing water).

The above additions will delay somewhat the completion of the Stearns' layout work and detail drafting; however, they should have no effect on the critical path and plant completion date.

A progress review meeting was held at Stearns' offices on March 31. Two of the unresolved mechanical design problems mentioned in the Stearns' Status Report (page 1, Mechanical) were resolved at that meeting. OCR has arranged an information exchange with IGT on the subject of heating electrode design to gain additional insight on this problem.

Stearns has submitted an outline of a planned buildup of operating personnel and supplies for Consol review. Comments on this plan as well as a definition of Consol's concept of the pilot plant program are to be submitted to Stearns in early May.

Definitive estimates on the first 15 pending change orders have been received from Stearns and are under scrutiny. Recommendations from Consol to approve these items will be submitted to OCR in late April.

4. Stearns-Roger Subcontract (Project No. 700)

A progress report by Stearns is attached.

C. Subject Inventions

None.

D. Financial Status

<u>Expenses</u>	<u>Actual</u>	<u>Budget</u>
Cumulative through February, 1970		
Through June, 1969		
Consol	\$ 1,878,256	\$ 1,878,256
Stearns	121,653	121,650
	<u>459,700</u>	<u>710,900</u>
Total Cumulative Expense	\$ 2,459,609	\$ 2,710,806
Expended in Period		
Consol	15,500	12,655
Stearns	<u>86,800</u>	<u>299,300</u>
Cumulative through March, 1970	\$ 2,561,909	\$ 3,022,761

Att.-Stearns-Roger Progress Report
Progress Charts
T: 4/15/70

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 March 31, 1970

PROJECT REPORT SUMMARY

Work now in progress includes engineering design, receipt and evaluation of inquiries to equipment vendors, purchasing of equipment, approval of vendor drawings, drafting layout and detail drafting. Design revisions have delayed completion of flow diagrams and equipment specification and purchase by about eight weeks. This delay will shift more construction work into the less efficient fall construction months. Consol is now working on additional design changes to waste system which will probably delay the project a few weeks. Extent of delay will be estimated when scope of change is finalized.

ENGINEERINGProcess

Final instrumentation details on vendor packaged equipment is required before flow diagrams for the process units can be issued final. Surveys of liquid and gaseous plant waste flows are being summarized in preparation for submittal to the municipal authorities.

Mechanical

Major unsolved mechanical design problems include: (1) method of isolating the lockhopper weighing devices from affects of the connecting piping, (2) locating a fabrication source for the small, but very high operating temperature, raw gas test cooler, (3) design of reactor internal supports for the supplementary heating electrodes and for the cyclone dip legs and the thermocouple wells. For further details on materials, please refer to Material Status Report No. 5 issued on March 19, 1970.

Details on engineering, inquiries, recommendations, approvals and purchasing of equipment are covered by the Equipment List issued March 12 which is brought up to date and summarized as follows:

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 March 31, 1970

EQUIPMENT LIST SUMMARY

Description	No. Items	Specifications		On Inq.	Recc.	Consol	
		In Prog	Comp.			App.	Purch
Agitators	1	--	--	-	--	-	1
Bins, Hoppers	8	--	--	3	4	-	1
Boiler	1	--	--	-	--	-	1
Cooling Twer	1	--	--	-	--	-	1
Cyclones	4	--	--	-	--	-	4
Comprs	9	--	--	-	--	-	9
Conveyors	4	--	--	-	--	-	4
Elevator	1	--	--	1	--	-	-
Crushers	2	--	--	-	--	-	2
Dryers	4	--	--	-	--	-	4
Exchgrs	9	--	--	2	2	-	5
Feeders	7	--	--	-	--	-	7
Fired Htrs	6	--	--	-	--	-	6
Elec. Gen	1	--	--	-	--	1	-
Misc.	8	--	--	-	3	-	5
Pkg Systems	5	--	--	-	2	-	3
Pumps	19	--	--	-	--	-	19
Scale	1	--	--	-	--	-	1
Screens	1	--	--	-	--	-	1
Flare Stk	1	--	--	1	--	-	-
Tanks	4	--	--	-	--	-	4
Vessels	34	--	--	-	--	5	29
Water Trt	2	--	--	-	--	-	2
Percent of Total	100	0	0	5	8	5	82

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 March 31, 1970

Drafting - - - Approximately 55% complete

Piping drawings for underground work have been issued. Layout drawings for the process structure have been sent to Consol for approval. Changes by Consol to the metallurgy for six pumps, three exchangers and adding one vessel may extend piping drafting by at least two weeks. Detail drawings and material take-off for preparation of estimates for Change Orders are in progress for all work areas.

Structural steel detail drawings through the second level of the structure have been released for fabrication. Drawings for the next three levels are complete except for final checking of the bracing. Lack of foundation information for some of the equipment, recently ordered or yet to be ordered, is holding up work on foundation design.

Electrical drafting progress has included completion of control logic diagrams for the dryer furnace, dolomite and lignite grinding and transfer systems, checking of inquiry drawings for electrical subcontract, estimating for Change Orders and preparation of purchase requisition for 90% of the major electrical equipment items to be purchased by Stearns-Roger.

Instrumentation

Data sheets for case instruments and transmitters have been issued to the manufacturer. Data sheets for control valves and relief valves have been issued for inquiry. Sonic level indicators, density analyzer and weighing systems have been recommended to Consol. Analyzers, butterfly valves, level controllers and temperature indicating switches have been purchased. Preliminary design drawings from Dally Engineering Co., supplier of the high temperature service gate valves, have been reviewed and found to be unsatisfactory. Revised design drawings are promised from Dally by April 2.

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 March 31, 1970

PROJECT ENGINEERING

The arrow diagram network schedule attached to this report has been updated with the decorative line relocated to separate the completed and unfinished work. Schedule was printed before the effect of the design changes described on page four could be evaluated.

The detailed schedule was revised to cover erection of the reactors using a guy derrick mast for the crawler crane. Resulting computer monitor run and Critograph schedule printout were issued on March 13.

Gas service agreement revised as requested by Consol has been resubmitted for approval. Formal approval is anticipated by April 13.


Nine of Stearns-Roger standard welding procedures covering material to be welded have been submitted to Consol for approval. Work is in progress to prepare four new procedures to cover welding of some of those dis-similar metals to each other.

CONSTRUCTION (Started January 15)

Building subcontractor has completed about 70% of excavation, and has poured about 20% of the grade beams for the building. Stearns-Roger has started excavation for the gas service line and for the storm sewer. Materials for underground piping and a very few equipment items have been received.

PROJECT CHANGES

Of the 46 pending project Change Orders, 15 definitive estimates have been submitted to Consol for approval, 17 more are scheduled for completion of estimates during April and the remaining 14 should be completed during May. On March 26, Consol placed a "hold" on the manufacture of the flare stack, one pump, two vessels and a feeder which are involved with possible additions of a pump, vessel, and piping to the waste treatment facilities. When Consol defines the scope of the change, an estimate of the amount of delay to the project will be prepared.


 D. H. Dawson
 Project Manager

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 March 31, 1970

SUMMARY OF PROJECT CHANGES

<u>Approved Change Orders</u>	<u>Increase</u>	<u>Decrease</u>
1. Reactor System Study	8,828	
20. Ftt. Elev vs. Manlift & Hoist	6,180	
Original Maximum Price	<u>8,465,129</u>	
Presently Approved Total	<u>\$8,480,137</u>	

Pending Change Notices and Change Orders Awaiting Approval

5. Delete roof at heaters		14,490
6. Add'l Regen. Nozzles	600	
7. Incr. disch. pressure prehtr compr	5,100	
8. Redesign purge gas systems	30,000	
9. Add instr & duct, lignite crush & grind	13,000	
10. Boiler controls, 2 element pneu type	1,300	
11. Delete Fuel Gas Booster Blower		8,250
13. Revise Canteen to Fallout Shelter	4,500	
14. Perspective Drawing for OCR	780	
16. Revise Hammermill specs	760	
17. Redesign expansion joints		160,000
18. Delete car puller		16,270
19. Revise Fire System per F Mutual	7,000	
21. Study reactor offgas prequench	1,000	
22. Utilize Surplus Forklift & Tote bins		14,000
23. Incr. Size F-509; Revise boiler burners	1,500	
24. Subs. Gouids for Aurora J-314	235	
25. Revise reactor refractory apcs	13,920	
26. Redesign reactors		16,000
27. Heavier tubes on exchangers	1,420	
28. Delete Car Thaw pit		5,560
29. Revise htr controls & ESD system		13,000
32. Incr. capacity IG system	20,600	
33. Water service to site	2,430	
34. Revisions to conform with Uniform Bldg Code	3,490	
35. Upgrade quality & incr wall htr tubes	30,000	

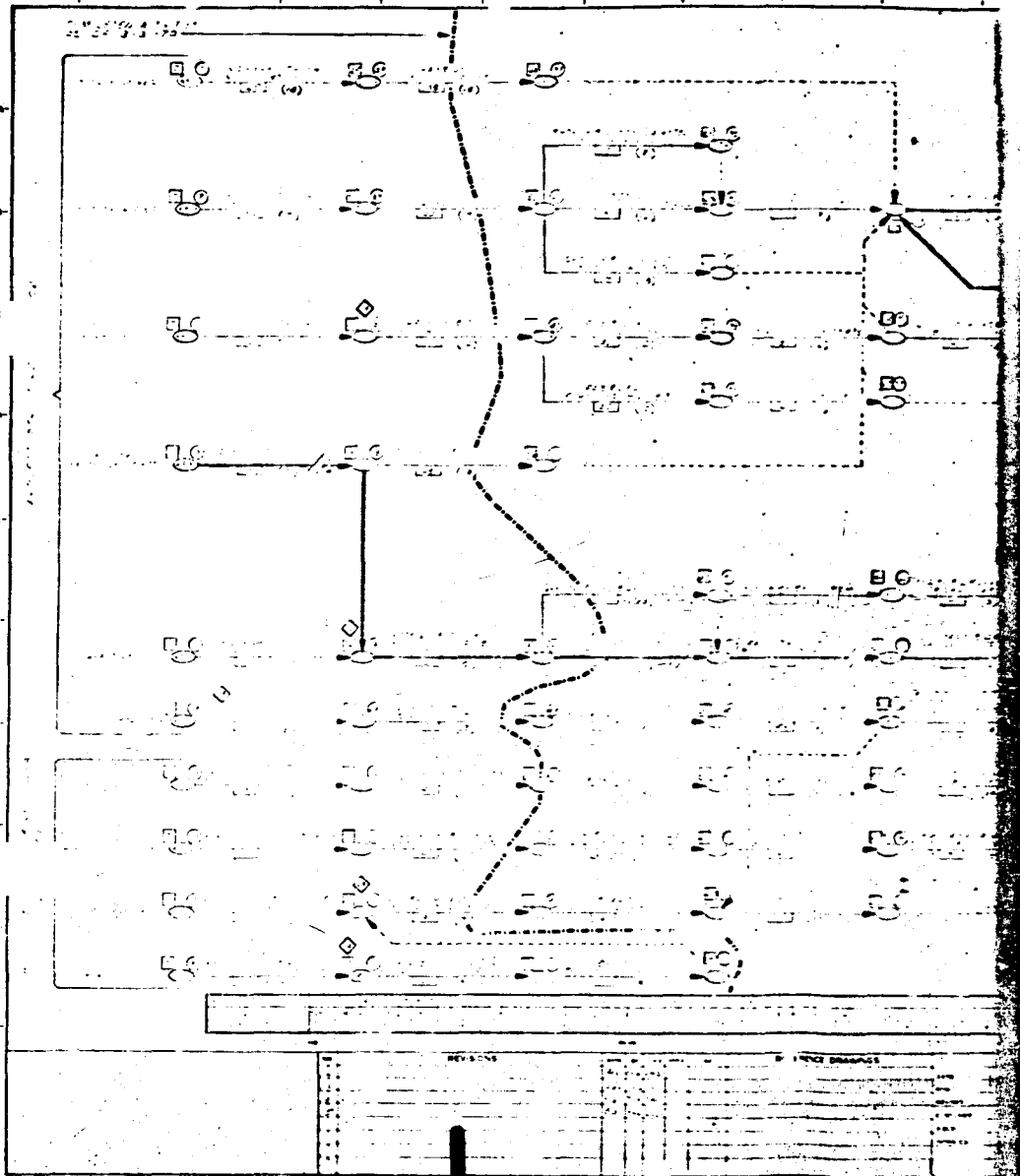
PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

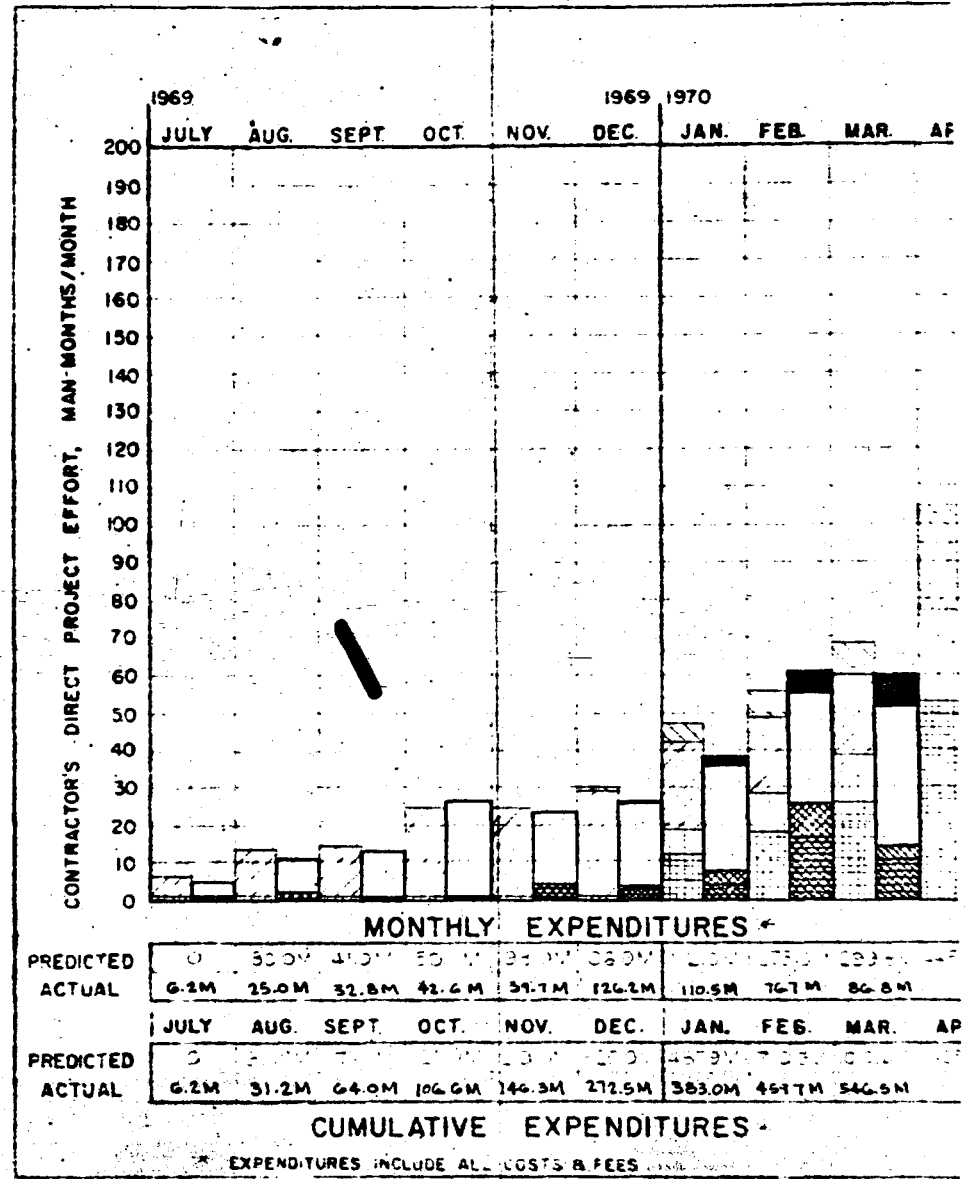
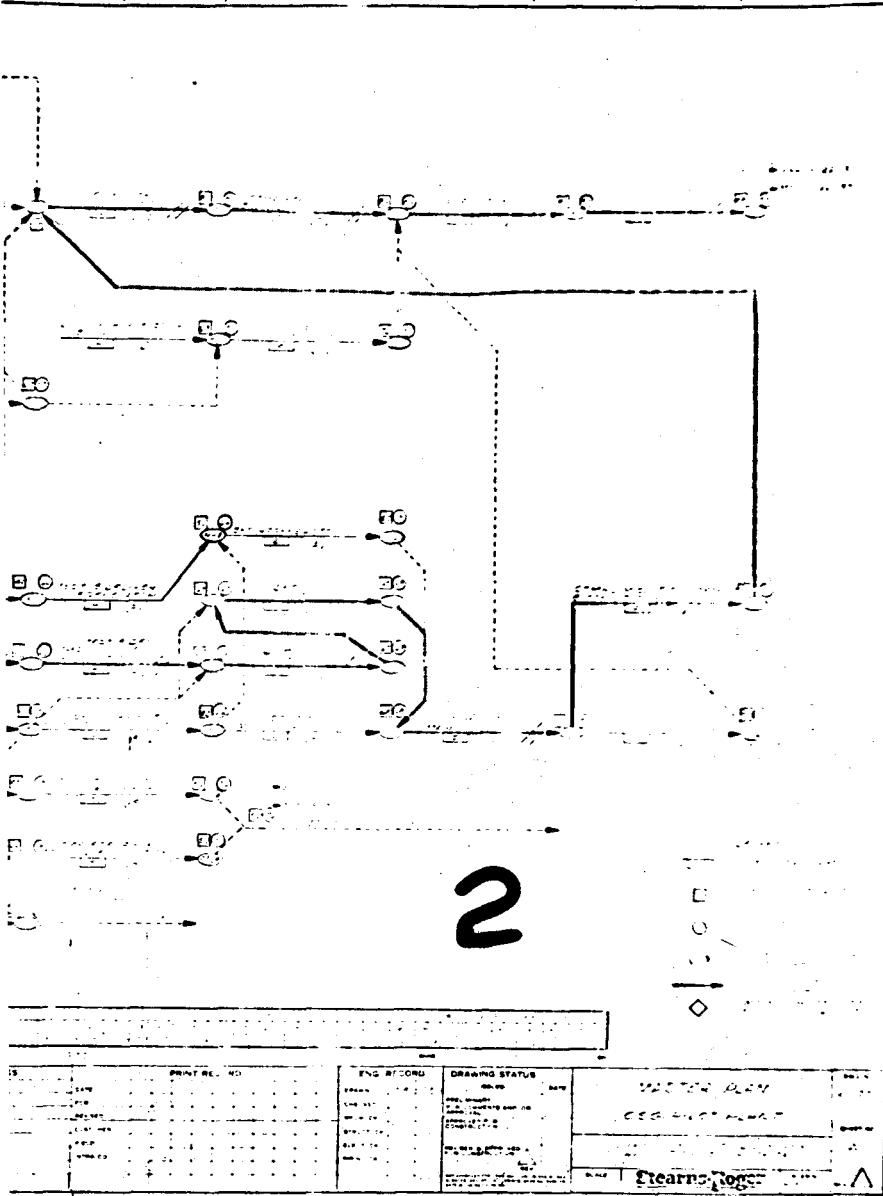
CCC Project No. 536
 S-R Job No. B-37000
 March 31, 1970

SUMMARY OF PROJECT CHANGES - continued

<u>Pending Change Notices and Change Orders Awaiting Approval</u>	<u>Increase</u>	<u>Decrease</u>
36. Miscellaneous instrument changes		26,000
37. Revise design & decr quan hot valves		160,000
38. Revise Sanitary Disp. System	9,200	
39. Revise Waste System	7,000	
40. Accum Costs for future transfer to oper contr. B-37400	250,000	
41. Revise Solids Handling	3,000	
42. Misc. changes in pipe specs, sizes, deletions & additions	10,000	
43. Revise expansion joint quantity & design		20,000
44. Revise Reactor System Auxiliary Vessels	12,000	
45. Revise Misc. Reactor Internals		2,000
46. Revise Jacket Water Piping System	2,000	
47. Delete C-206		1,000
48-2. Delete Vendor supplied heater inst. & add equiv. items to Instr. Acct	500	
49. Revise Flare System	1,000	
50. Add'l htg & ventlg elec room, proc struc & solids handling bldg	1,000	
51. Revise 1st Floor Layout Proc Structure	2,000	
52. Stress relieve F-314	300	
53. Revise gas quench syst. metalg, des.	25,000	
54. Redesign dolomite & lignite silos	<u>5,000</u>	
Net Pending Changes	9,065	
Estimated Total	\$8,489,202	
40. Future transfer of 1970 charges applicable to operating contract B-37400		250,000
Construct Costs only, Estimated Total		\$8,239,202

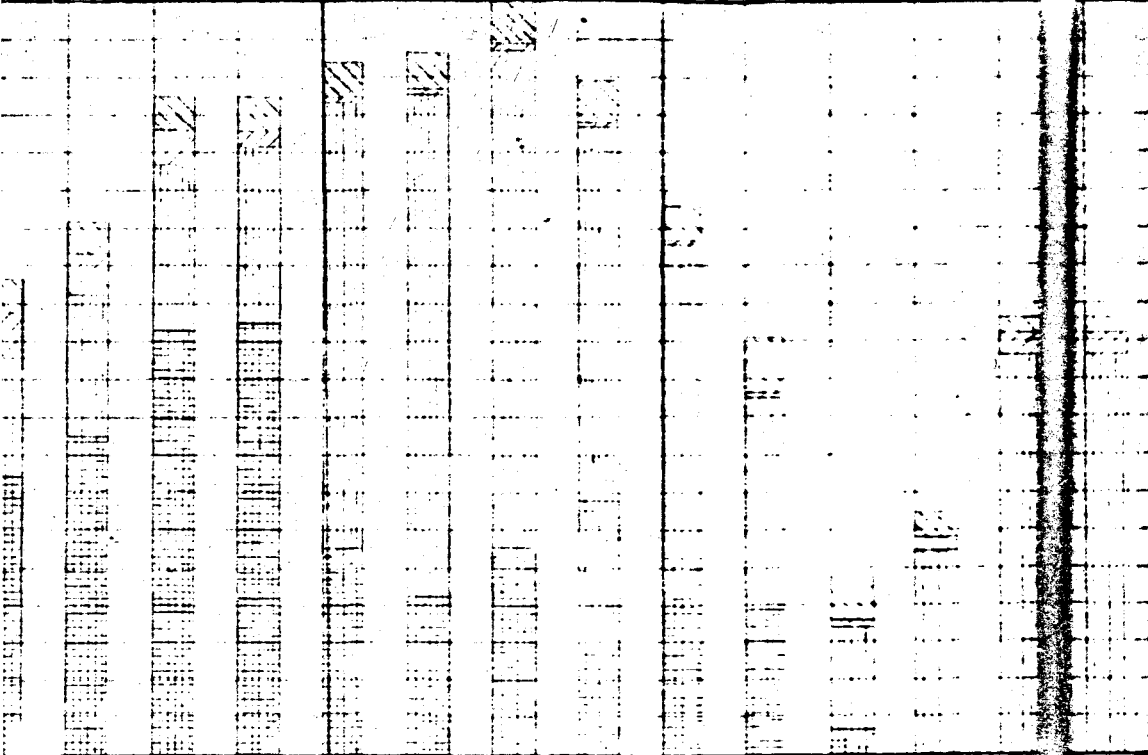


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DATA POINTS: MAY 1970: 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000, 2100, 2200, 2300, 2400, 2500, 2600, 2700, 2800, 2900, 3000, 3100, 3200, 3300, 3400, 3500, 3600, 3700, 3800, 3900, 4000, 4100, 4200, 4300, 4400, 4500, 4600, 4700, 4800, 4900, 5000, 5100, 5200, 5300, 5400, 5500, 5600, 5700, 5800, 5900, 6000, 6100, 6200, 6300, 6400, 6500, 6600, 6700, 6800, 6900, 7000, 7100, 7200, 7300, 7400, 7500, 7600, 7700, 7800, 7900, 8000, 8100, 8200, 8300, 8400, 8500, 8600, 8700, 8800, 8900, 9000, 9100, 9200, 9300, 9400, 9500, 9600, 9700, 9800, 9900, 10000

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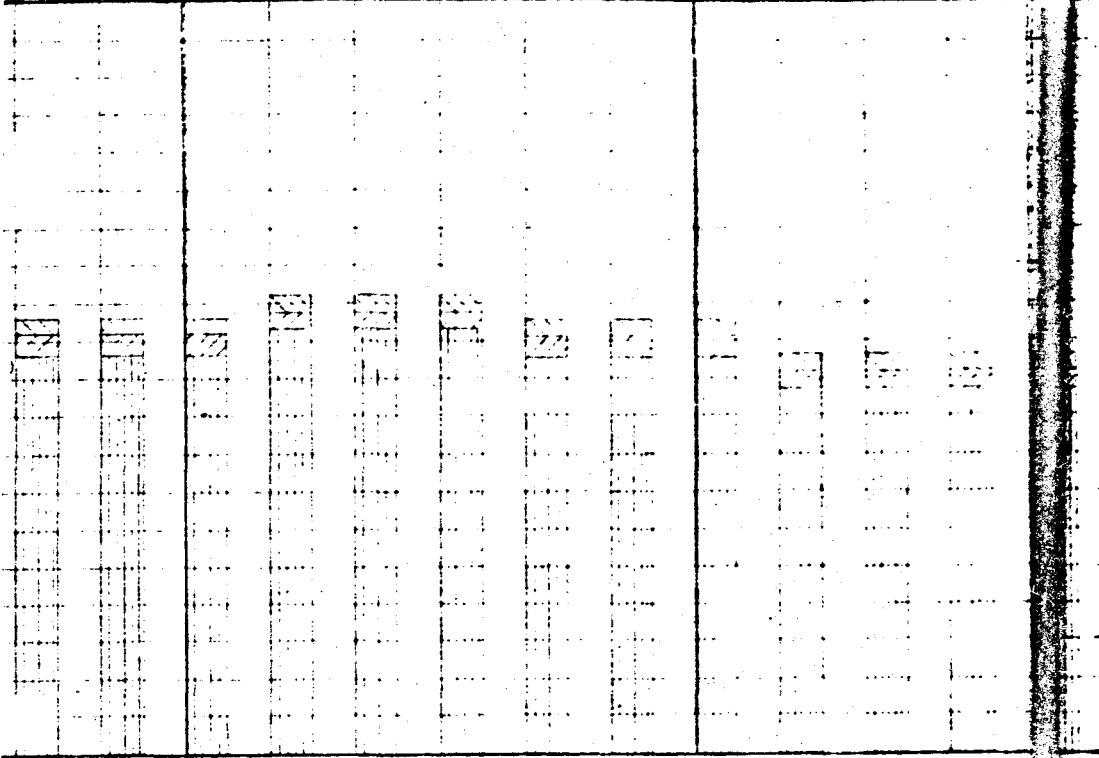
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MONTHLY PROGRESS CHART (CONSTRUCTION & OPERA

CONTRACT NO. 14-01-0001-415 (3)

1971 1972

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3

(CONSTRUCTION & OPERATION)

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1972 1973

APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR.

APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.

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APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR.

APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR.

4

DATE: MARCH 1973

1973

APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

PRED

SUPERVISING

PROFESSIONAL

TECHNICIAN S-R

TECHNICIAN S/C

INCLUDES SUPERV

INCLUDES CLERK

CONSTRUCTION — STEA

OPERATIONS — STEA

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MONTH

OFFICE
U.S. DEPARTMENT OF

CONSTRUCTION
RESEARCH DIVISION

CONTRACT

5

DATE: MARCH, 1970

1973

OCT. NOV. DEC.

	PREDICTED	ACTUAL
SUPERVISING	██████	██████
PROFESSIONAL	██████	██████
TECHNICIAN S-R	██████	██████
TECHNICIAN S/C	██████	██████

• INCLUDES SUPERVISORY EXEMPT TECHNICIANS
 • INCLUDES CLERICAL

CONSTRUCTION — STEARNS ROGER JOB B-37000
 OPERATIONS — STEARNS-ROGER JOB B-37400

6

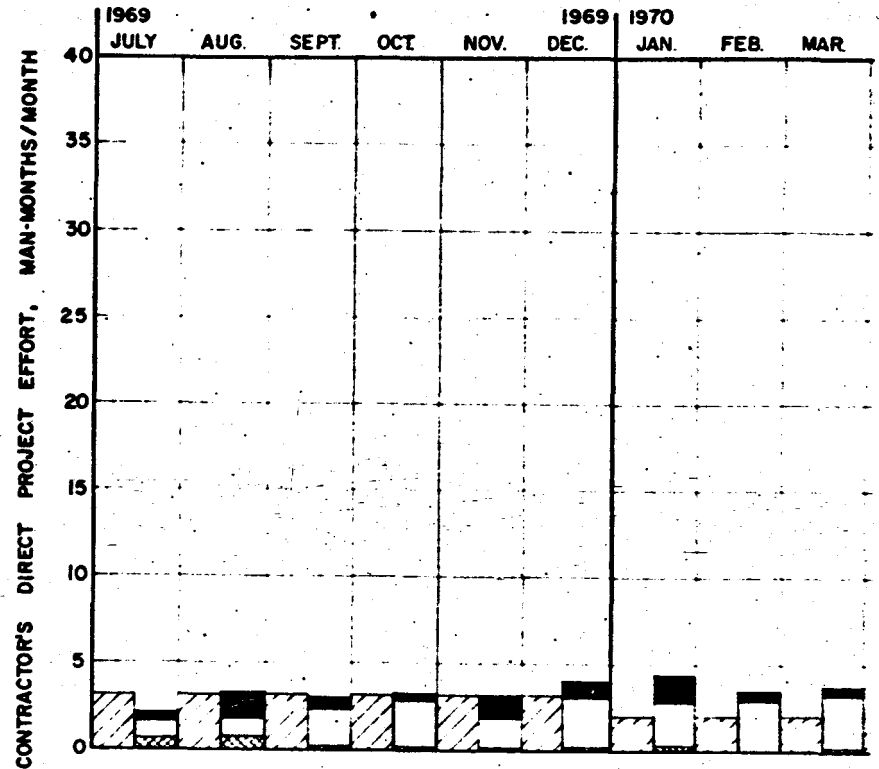
MONTHLY PROGRESS CHART

OFFICE OF COAL RESEARCH
 U.S. DEPARTMENT OF THE INTERIOR

CONSOLIDATION COAL CO.
 RESEARCH DIVISION LEBANON, PA

CONTRACT NO. 14-01-0001-415 (3)

OCT. NOV. DEC.



MONTHLY EXPENDITURES*

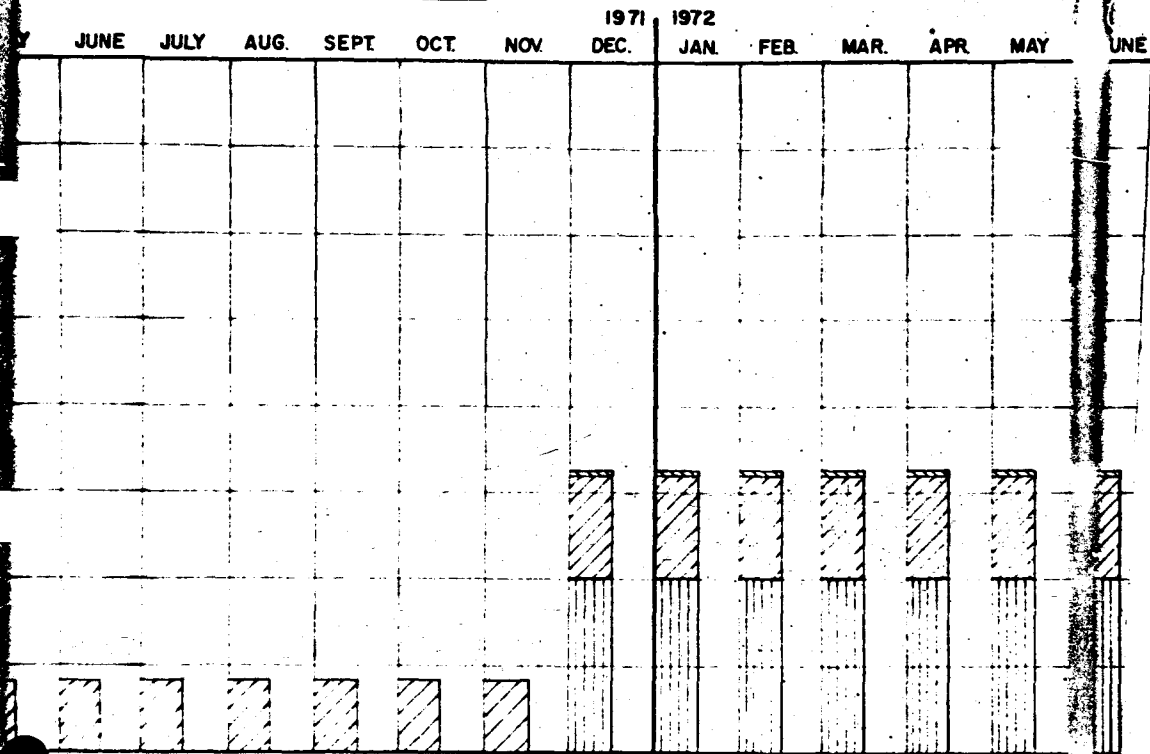
	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.
PREDICTED	16,215	14,695	14,965	13,155	14,385	17,065	15,595	5,595	12,655
ACTUAL	11,745	14,734	9,609	11,825	10,130	15,205	14,578	14,027	5,600
PREDICTED	16,215	30,900	45,865	59,020	73,405	90,470	106,055	121,650	134,305
ACTUAL	11,745	46,479	56,088	67,913	78,043	93,249	107,828	121,853	127,453

CUMULATIVE EXPENDITURES*

* Expenditures Include All Costs & Fees

MONTHLY PROGRESS CHART (SUPERVISION & LABOR)

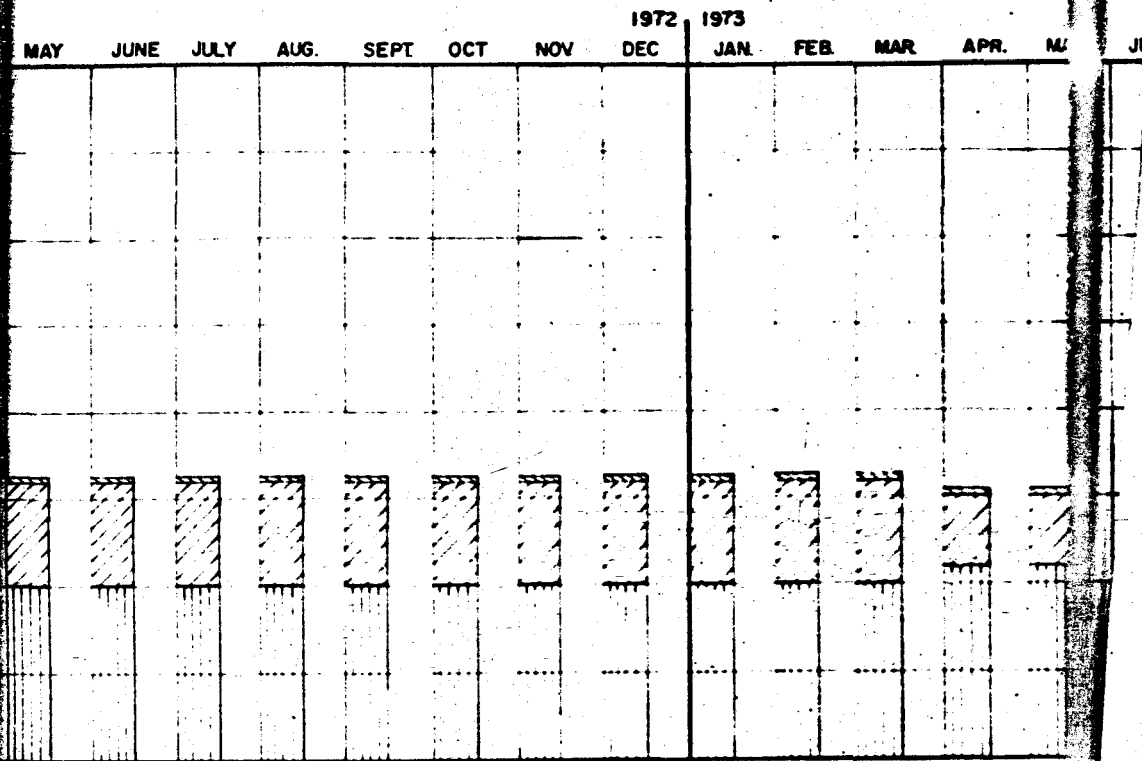
CONTRACT No. 14-01-0001-415 (3)



Year	Month	Cumulative Progress
1971	JUNE	15,255
1971	JULY	14,875
1971	AUG.	14,875
1971	SEPT.	14,875
1971	OCT.	14,875
1971	NOV.	14,875
1971	DEC.	39,475
1972	JAN.	39,475
1972	FEB.	39,475
1972	MAR.	39,475
1972	APR.	39,475
1972	MAY	39,475
1972	JUNE	39,475

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8- LAB WORK)



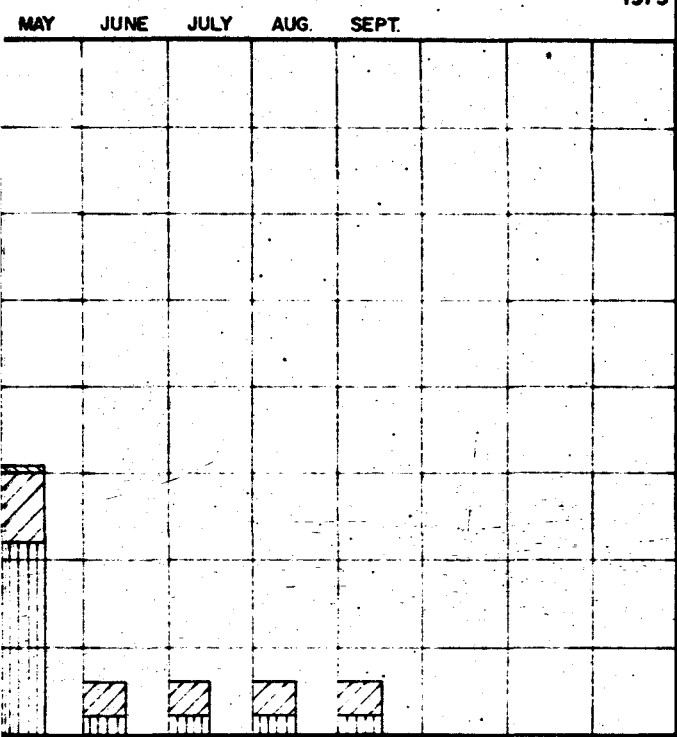
39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475
MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUN.
690,225	729,700	769,175	808,650	848,125	887,600	927,075	966,550	1,006,025	1,045,500	1,084,975	1,124,450	1,163,925	1,203,400

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(New Report)


DATE: MARCH, 1970


1973





PREDICTED

SUPERVISING 

PROFESSIONAL 

TECHNICIAN 

 Includes Supervisory

 Includes Clerical.

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36,075	11,475	11,175	11,475	41,120			
MAY	JUNE	JULY	AUG.	SEPT.			
1,157,125	1,168,600	1,190,075	1,191,550	1,232,670			

5

MONTHLY PE GR

OFFICE OF C AL
DEPARTMENT F TI

CONSOLIDATION
RESEARCH DIVISION

CONTRACT No. . -OI

(See 415 Chart)

DATE: MARCH, 1970

1973

	PREDICTED	ACTUAL
SUPERVISING		
PROFESSIONAL		
TECHNICIAN		

- ⊗ Includes Supervisory Exempt Technicians.
- ⊗⊗ Includes Clerical.

6

MONTHLY PROGRESS CHART

OFFICE OF COAL RESEARCH
DEPARTMENT OF THE INTERIOR

CONSOLIDATION COAL CO.
RESEARCH DIVISION LIBRARY, PA.

CONTRACT No. 14-01-0001-415 (3)

PROGRESS REPORT NO. 71
OCR CONTRACT NO. 14-01-0001-415(3)
CONSOL LIGNITE GASIFICATION PROCESS DEVELOPMENT

April 1 to 30, 1970

A. Summary

Phase I - Feasibility Study

Complete.

Phase II - Bench-Scale Research

Current effort complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

At Rapid City, work on underground piping, foundations, and embedded electrical conduit has continued. Despite adverse weather, field work is on schedule.

The addition of waste disposal and pollution abatement systems has delayed completion of S-R engineering by about ten weeks. While this will have little impact on the project completion date, delays in projected alloy steel deliveries have extended this projected date to April 12, 1971.

The projected GMP is increased to \$8,491,707, as a result of additions for improved disposal of gaseous and liquid waste products.

Financial

Estimated expenditures in April were \$224,600 by Stearns and \$51,000 by Consol; the latter figure includes a \$32,400 payment to Montana-Dakota utilities. Cumulative total expense is \$2,853,128.

April, 1970

B. Technical Results and Program

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

1. Supporting Process and Economic Analyses (Project No. 533.00)

No work was done on this project in the report period.

2. Supporting Patent and Legal Activities (Project No. 534.00)

The current reports and memoranda were reviewed for Subject Inventions.

3. Consol Assistance on Construction of Lignite Pilot Plant (Project No. 536)

Primary Consol effort has been devoted to monitoring the S-R work on P&I diagrams, logic diagrams, equipment selections, etc. The addition of waste disposal and pollution control facilities to the pilot plant is considered a "Change in Scope" of the Stearns-Roger subcontract. Approval to proceed with engineering and a cost estimate on this basis was received from OCA on April 27, 1970.

Letters were exchanged with IGT re heating electrode design; some concern exists in relation to the possibility of "shorting" through the refractory to the gasifier shell. The design of the penetration of the electrode leads through the shell has been finalized and S-R can proceed with vessel procurement.

Work has continued on the design of the Rapid City development program and on preparing a preliminary list of analytical apparatus.

Planning was initiated to test at Library a prototype control valve under simulated process conditions.

The finalization of estimates on 15 pending change orders has been delayed; S-R wishes to resolve the question of state and local taxes on the Rapid City facility before submitting the change order estimates.

April, 1970

4. Stearns-Roger Subcontract (Project No. 700)

A progress report by Stearns is attached.

C. Subject Inventions

None.

D. Financial Status

<u>Expenses</u>	<u>Actual</u>	<u>Budget</u>
<u>Cumulative through March, 1970</u>		
Through June, 1969	\$ 1,878,256	\$ 1,878,256
Consol	136,672	134,305
Stearns	562,600	1,010,200
Total Cumulative Expense	\$ 2,577,528	\$ 3,022,761
<u>Expended in Period</u>		
Consol	\$ 51,000	\$ 12,875
Stearns	224,600	445,600
Cumulative through April, 1970	\$ 2,853,128	\$ 3,481,236

T - 5/18/70

Att. - Monthly Progress Charts
Stearns-Roger Progress Report

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
May 12, 1970

PROJECT REPORT SUMMARY

Work now in progress includes engineering design, receipt and evaluation of revised equipment and instrument inquiries, purchasing of all classes of materials, approval of vendor drawings, revisions to drafting layout and continuation of detail drafting. Recent design revisions by Consol to the quench water and liquid waste disposal systems have extended the engineering phase of the project by approximately ten weeks.

Delivery promises from the single source for Incoloy 800, International Nickel's subsidiary, Huntington Alloy Products, have extended duration of the project by about three to four weeks. Expediting efforts, including trips and calls to the regional and home offices, are being made. Truck strike has extended delivery promises on stainless steel, and alternate sources are being explored.

ENGINEERING

Process

Changes to the quench water and liquid waste treating systems have been incorporated into the flow diagrams which were issued for review on May 8. During the week of May 18, there will be a meeting of Consol, Stearns-Roger and Continental Oil personnel in Ponca City for the purpose of familiarization, review and operational comment by Continental Oil engineering personnel.

Mechanical

Only major unsolved mechanical design problem is the final design for the supplemental heating electrodes in the reactors. For further details on materials please refer to Material Status Report No. 7 issued on May 8.

Details on engineering, inquiries recommendations, approvals and purchasing are covered by the Equipment List issued on May 1 which may be summarized as follows:

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
May 12, 1970

EQUIPMENT LIST SUMMARY

	<u>Spec In Prog</u>	<u>On Inq.</u>	<u>Recom. For App.</u>	<u>Total Equip Items</u>	<u>Purch</u>
Items	2	8	1	139	128
Per Cent of Total	1	6	1	100	92

ENGINEERING - continued

Drafting - - - Approximately 58% complete

Layout drawings are about 90% complete and approved. Revisions to the liquid waste disposal system required reduction to the drafting personnel due to the lack of final design data. Long delivery items such as stainless steel pipe materials, Incoloy 800 pipe and fittings and almost all of the valves have been ordered. Sixty percent of the expansion joints have been released for construction.

Structural steel detail drawings through the sixth level of the structure have been released for fabrication. All caisson drawings have been released for fabrication of reinforcing steel. Release of the same drawings for location and drilling of caissons has been scheduled for May 18 due to late receipt of vendor data on equipment for revisions to the liquid waste disposal system.

Electrical drafting has been mainly concerned with the completion of the logic diagrams that are the basis for preparation of the electrical schematic control diagrams. Plant intercommunication and telephone system has been purchased. Drawings for electrical subcontract have been issued for construction.

Instrumentation

Recommendations for control valves and densitometers have been submitted to Consol. Central control panel board is on inquiry. Revised design drawings for the high temperature service gate valves have been reviewed and returned to the fabricator. Logic diagrams prepared by electrical group were developed by instrument personnel.

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
May 12, 1970

PROJECT ENGINEERING

The arrow diagram schedule attached to this report has been updated with the decorative line relocated to separate the completed and unfinished work. Long delivery for the Incoloy 800 tubes in the fired heaters may extend their delivery also and make them near-critical items. Computer monitor run and Critograph schedule printout will be issued by May 15.

Subcontract has been issued to cover erection of structural which must be in place to allow the building subcontractor to complete the maintenance and utilities areas. A subcontract for the underground portion only of the fire protection sprinkler system has been issued.

CONSTRUCTION

Building subcontractor is forming and pouring grade beams on the process structure area, working on rough plumbing and masonry in the administrative and laboratory wings and pouring miscellaneous foundations in the yard areas. Electrical subcontractor has established his field office and started on installation of embedded duct and conduit. Sprinkler system subcontractor has started work on underground mains. Initial shipment of structural steel is expected by May 14. Large anchor bolts, held up by the truck strike in Chicago, had to be cancelled from the structural steel supplier and purchased by Stearns-Roger from a Denver fabricator.

Stearns-Roger construction personnel continued to receive and warehouse materials, and to work on underground piping such as storm sewer, chemical sewer, cooling water, potable water and sanitary sewer. In spite of a 22" deep snow and the resulting mud, field progress is excellent and slightly ahead of schedule.

D. H. Dawson
Project Manager

Attachments: Summary of Project Changes - 2 pages
Progress Chart, 4-30-70
Master Plan Schedule

Distribution:

<u>Consol - 5</u>	<u>Continental Oil Company - 6</u>	<u>Stearns-Roger - 7</u>
C. A. Schulz	E. E. Ellington, CED J. B. Hambleton, CED D. F. Wegner, Field L. Thompson, MED	FCP/HFD/CNS/TCS File CPL/ITM/ULB/HAR/DCM ALC, FAN/JAP, DHD WEPowell, Field

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
May 12, 1970

SUMMARY OF PROJECT CHANGES

<u>Approved Change Orders</u>	<u>Increase</u>	<u>Decrease</u>
1. Reactor System Study	8,828	
20. Prt. Elev vs. Manlift & Hoist	6,180	
Original Maximum Price	8,465,129	
Presently Approved Total	\$8,480,137	

Pending Change Notices and
Change Orders Awaiting Approval

5. Delete roof at heaters		15,600
6. Add'l Regen. Nozzles	600	
7. Incr. disch. pressure prehr compr	4,315	
8. Redesign purge gas systems	67,860	
9. Add instr & duct, lignite crush & grind	13,000	
10. Boiler controls, 2 element pneu type	1,300	
11. Delete Fuel Gas Booster Blower		8,670
13. Revise Canteen to Fallout Shelter	4,770	
14. Perspective Drawing for OCR	780	
16. Revise Hammermill specs	725	
17. Redesign expansion joints		160,000
18. Delete car puller		17,200
19. Revise Fire System per F Mutual	11,970	
21. Study reactor offgas prequench	1,000	
22. Utilize Surplus Forklift & Tote bins		12,600
23. Incr. Size F-509; Revise boiler burners	1,500	
24. Subs. Coulds for Aurora J-314	225	
26. Redesign reactors		16,000
27. Heavier tubes on exchangers	1,480	
28. Delete Car Thaw pit		5,395
29. Revise htr controls & ESD system		13,000
32. Incr. capacity IG system	20,600	
33. Water service to site	2,430	
34. Revisions to conform with Uniform Bldg Code	3,390	
35. Upgrade quality & incr wall htr tubes	30,000	

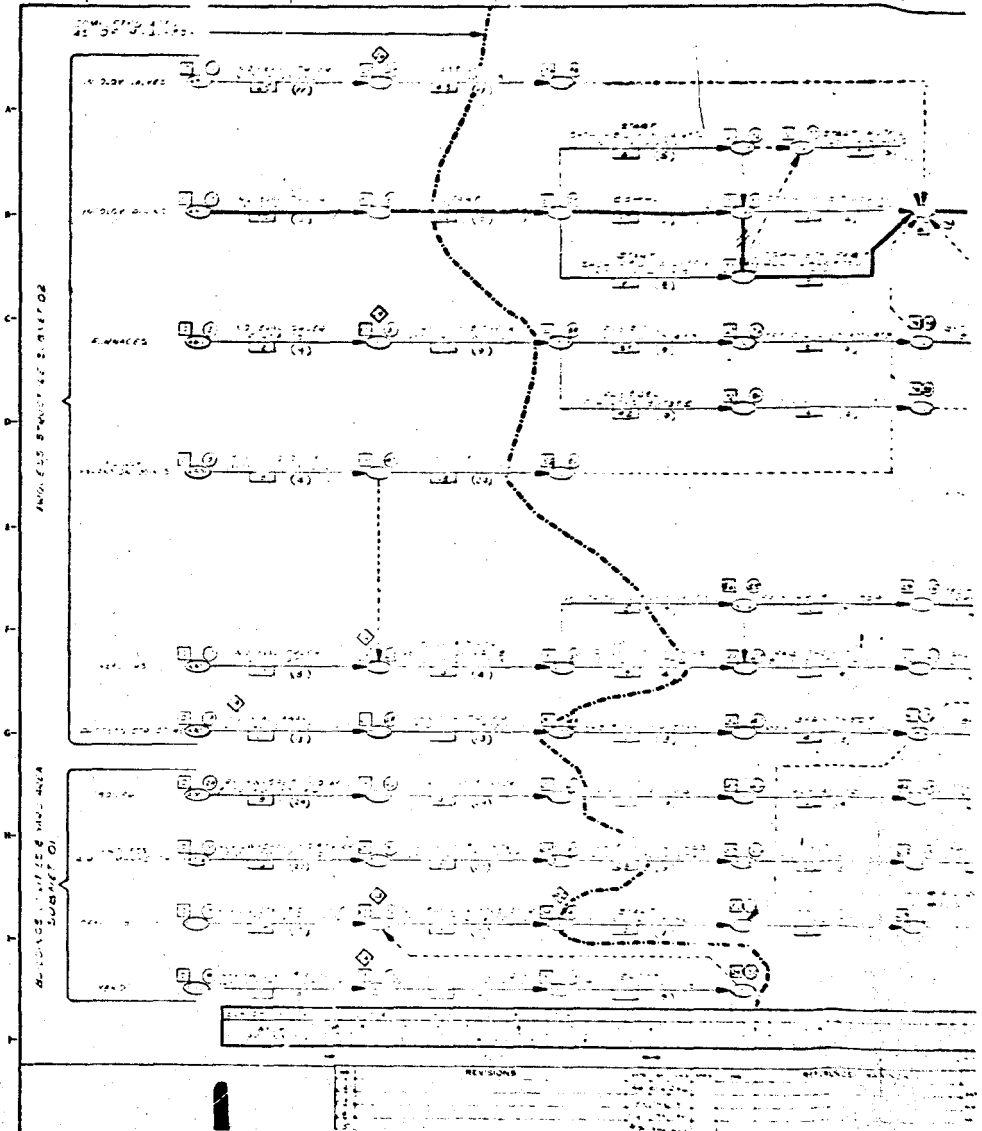
PROJECT STATUS REPORT

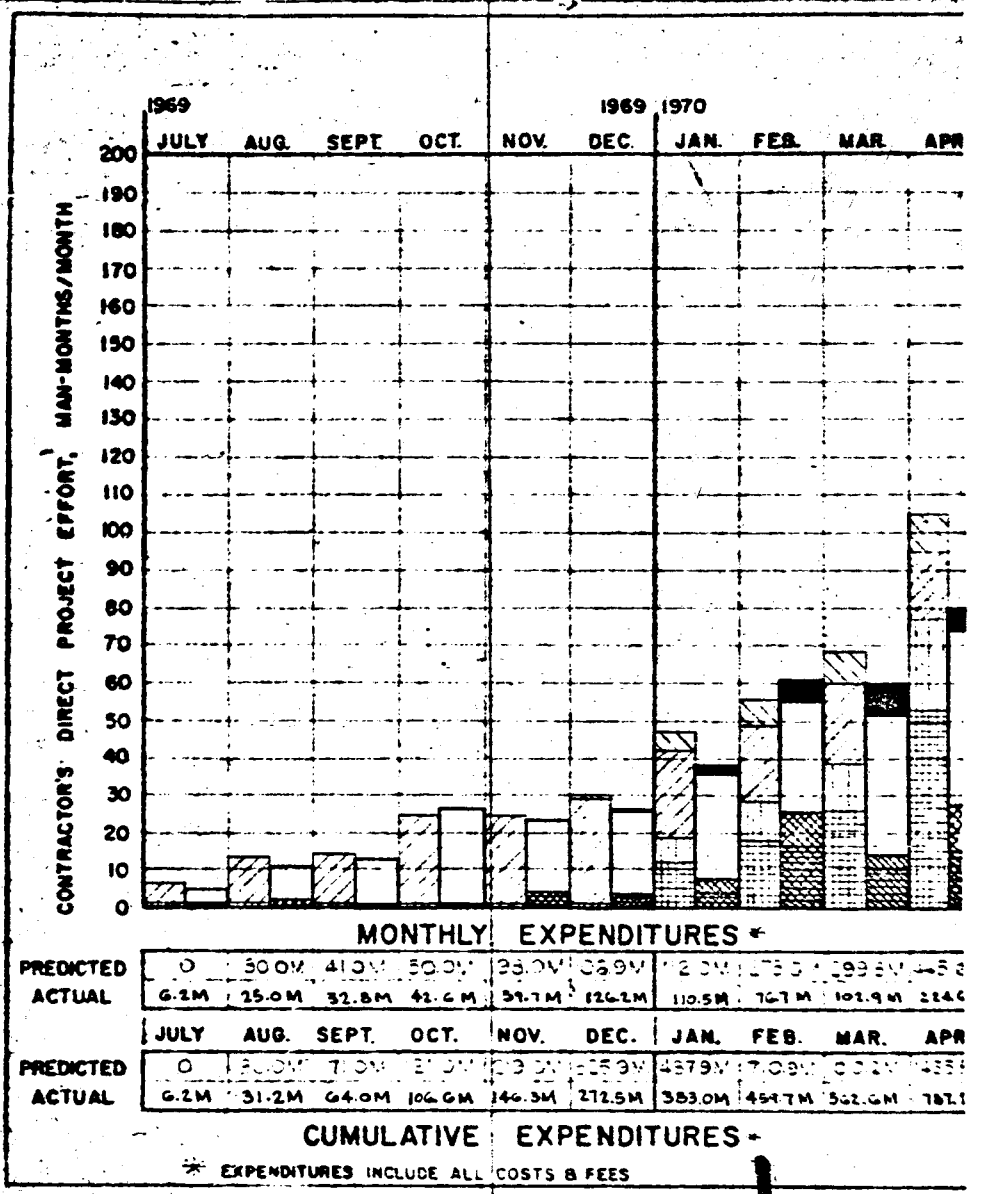
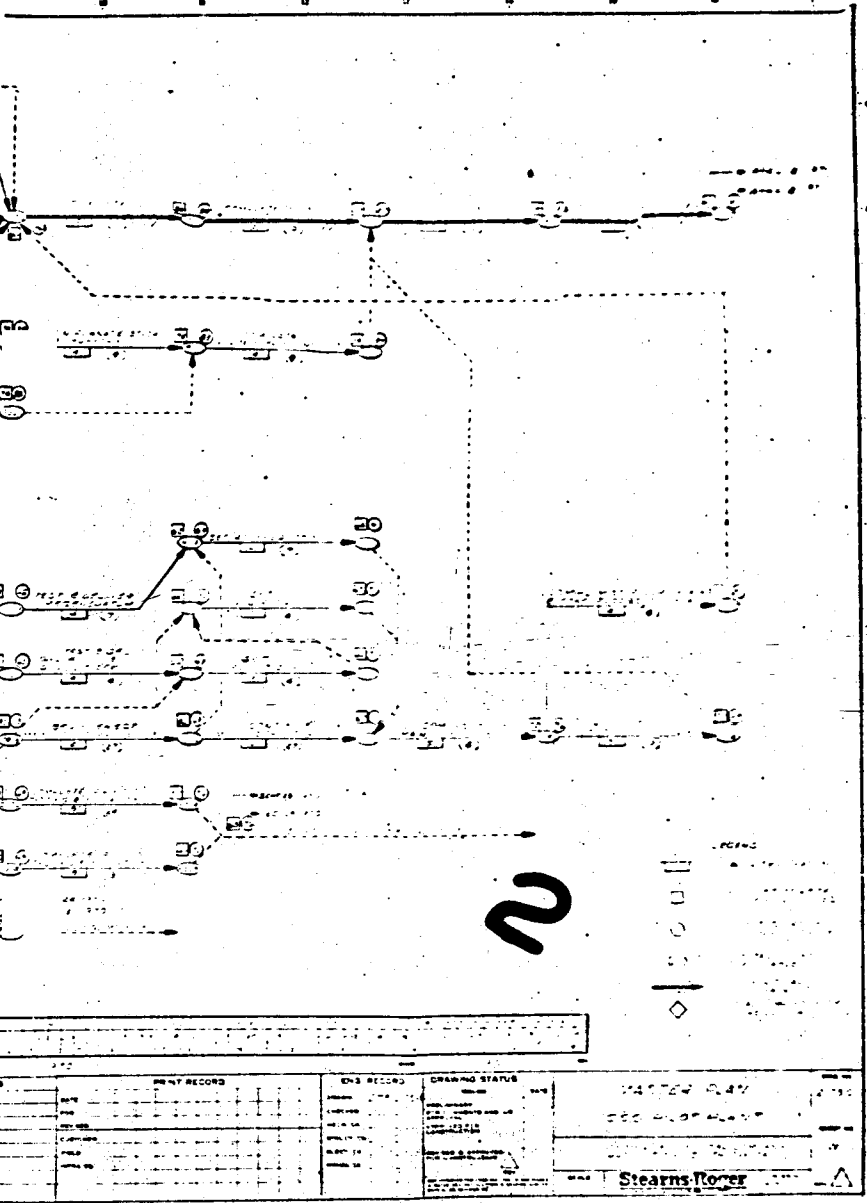
**CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA**

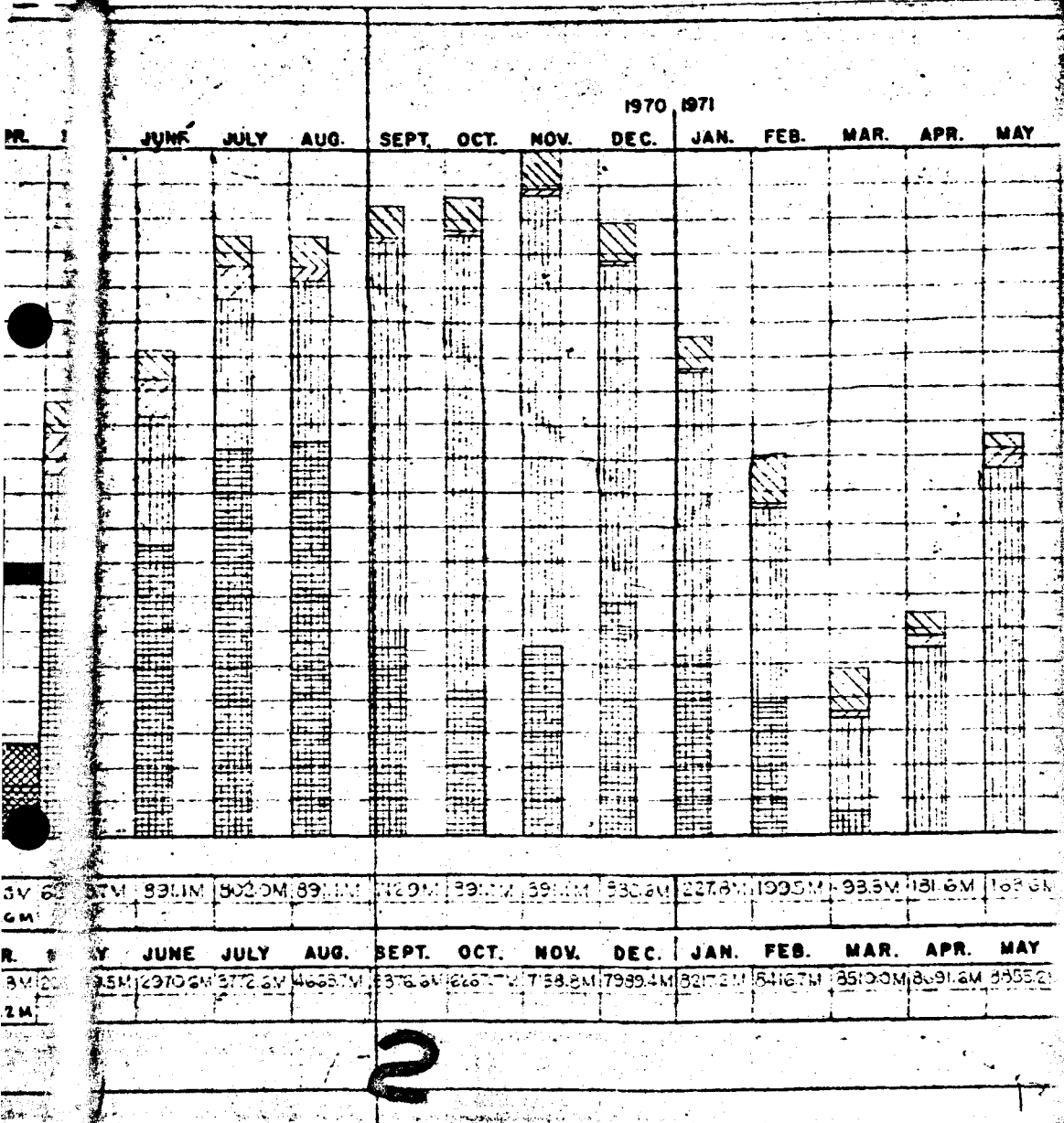
CCC Project No. 536
S-R Job No. B-37000
May 12, 1970

SUMMARY OF PROJECT CHANGES - continued

Pending Change Notices and Change Orders Awaiting Approval	Increase	Decrease
36. Miscellaneous instrument changes		26,000
37. Revise design & decr quan hot valves		160,000
38. Revise Sanitary Disp. System	9,200	
39. Revise Waste System	7,000	
40. Accum Costs for future transfer to oper contr. B-37400	250,000	
41. Revise Solids Handling	3,000	
42. Misc. changes in pipe specs, sizes, deletions & additions	10,000	
43. Revise expansion joint quantity & design		20,000
44. Revise Reactor System Auxiliary Vessels	12,000	
45. Revise Misc. Reactor Internals		2,000
46. Revise Jacket Water Piping System	2,000	
47. Delete C-206		995
48-2. Delete Vendor supplied heater inst. & add equiv. items to Instr. Acct	500	
49. Revise Flare System	1,000	
50. Add'l htg & ventlg elec room, proc struc & solids handling bldg	1,000	
51. Revise 1st Floor Layout Proc Structure	2,000	
52. Stress relieve F-314	685	
53. Revise gas quench syst. metalg. des.	115,000	
54. Redesign dolomite & lignite silos	5,000	
55. Revise Liq. Waste Disp.	120,000	
56. Add facil to pull Exch bundle	1,000	
57. Add'l Heat Trace & Ins	7,000	
58. Add two doors Maint-Proc Area	1,700	
59. Revise elec classif-Proc Struc	4,000	
60. Subs gas turbine mtr for densitometer	1,000	
Net Pending Changes	261,570	
Estimated Total	\$8,741,707	
40. Future transfer of 1970 charges applicable to operating contract B-37400		250,000
Construct Costs only, Estimated Total		\$8,491,707







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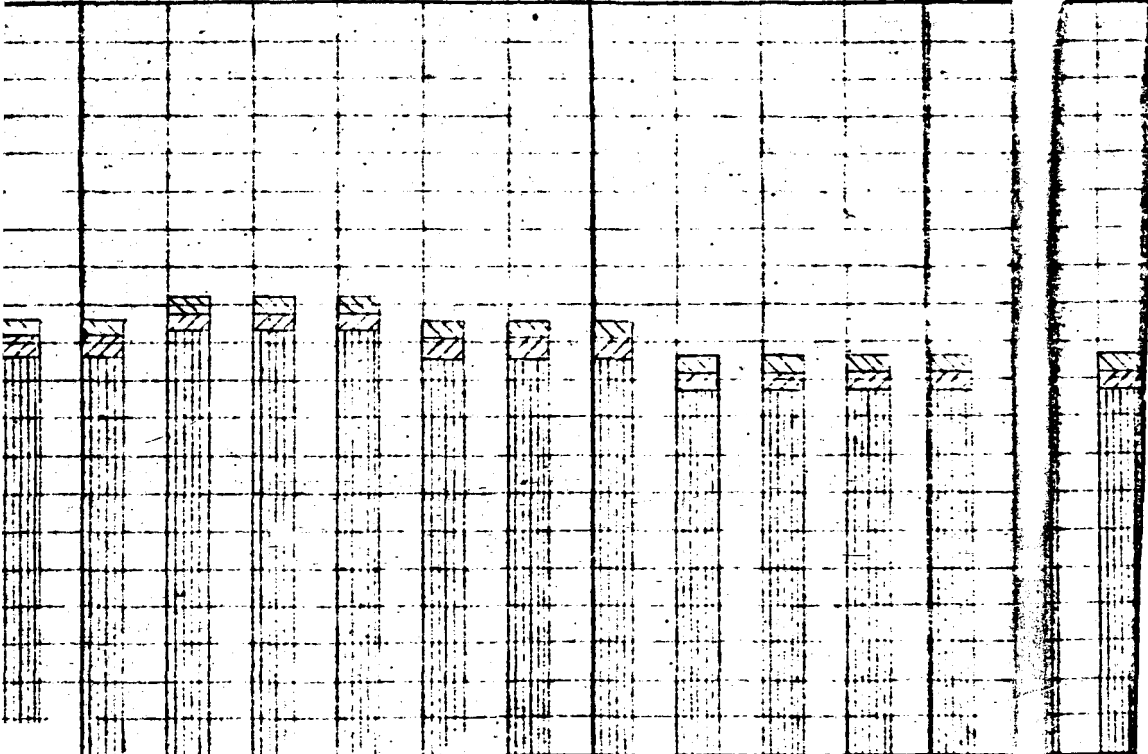
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MONTHLY PROGRESS CHART (CONTRACT)

CONTRACT NO. 14-01-0001-415 (9)

1971 1972

JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUNE JULY



168.7M 168.5M 203.1M 208.0M 209.1M 201.9M 201.5M 201.5M 174.5M 191.7M 198.9M 201.1M 191.1M

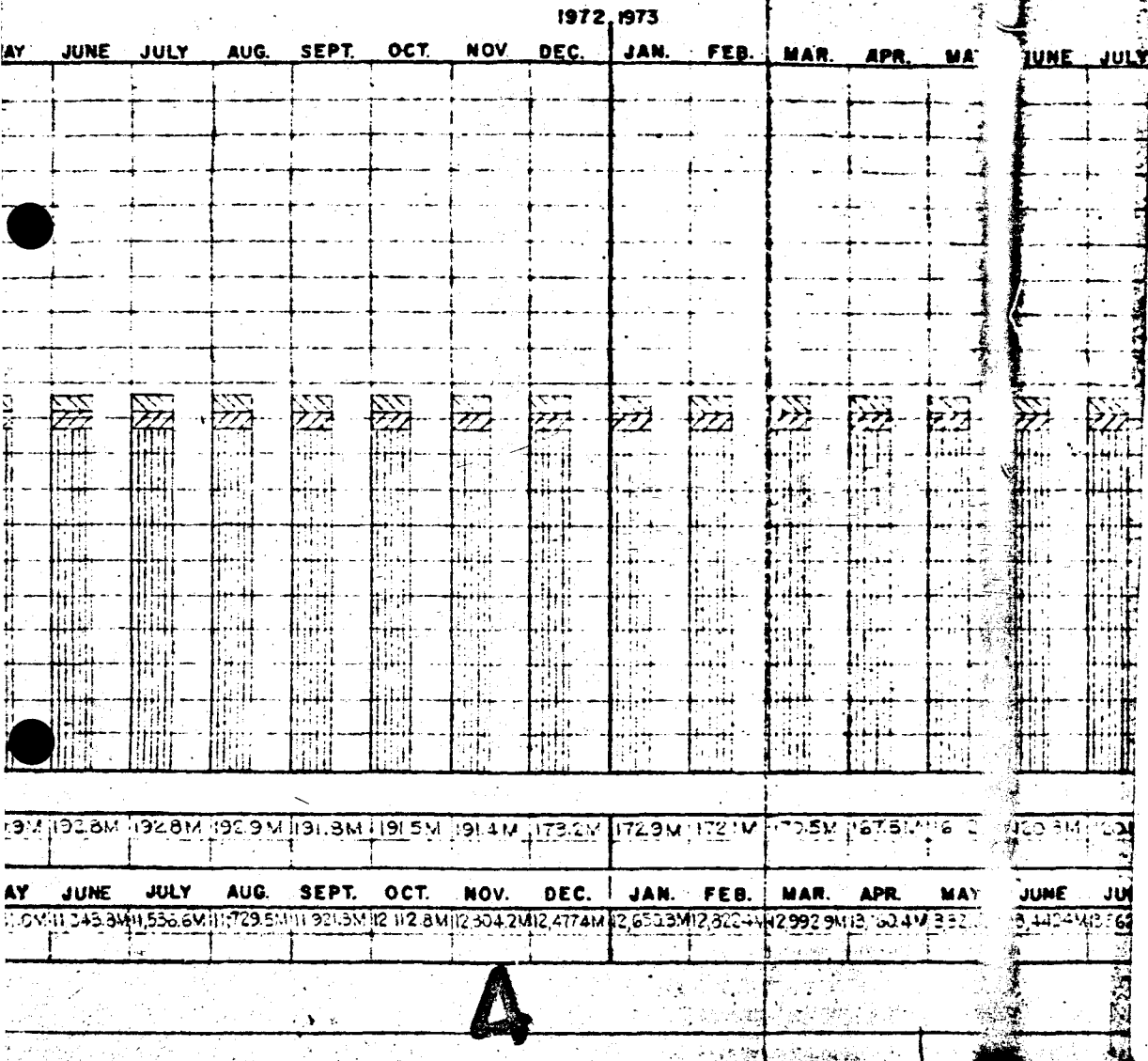
JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUNE

2018.2M 2132.7M 2390.2M 2523.5M 2550.9M 2009.6M 2213.5M 2042.8M 2058.9M 2073.4M 2095.2M 2115.0M 2135.0M

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CONSTRUCTION & OPERATION)



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DATE: April 1970


1973

MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.


PREDICTED

SUPERVISING 

PROFESSIONAL 

TECHNICIAN S-R 

TECHNICIAN S/C 

 INCLUDES SUPERVISORY

 INCLUDES CLERICAL

CONSTRUCTION — STEARNS-R

OPERATIONS — STEARNS-R

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MONTHLY P

OFFICE OF
U.S. DEPARTMENT

CONSOLIDAT
RESEARCH DIVISION

CONTRACT NO.

5

DATE: April 1970

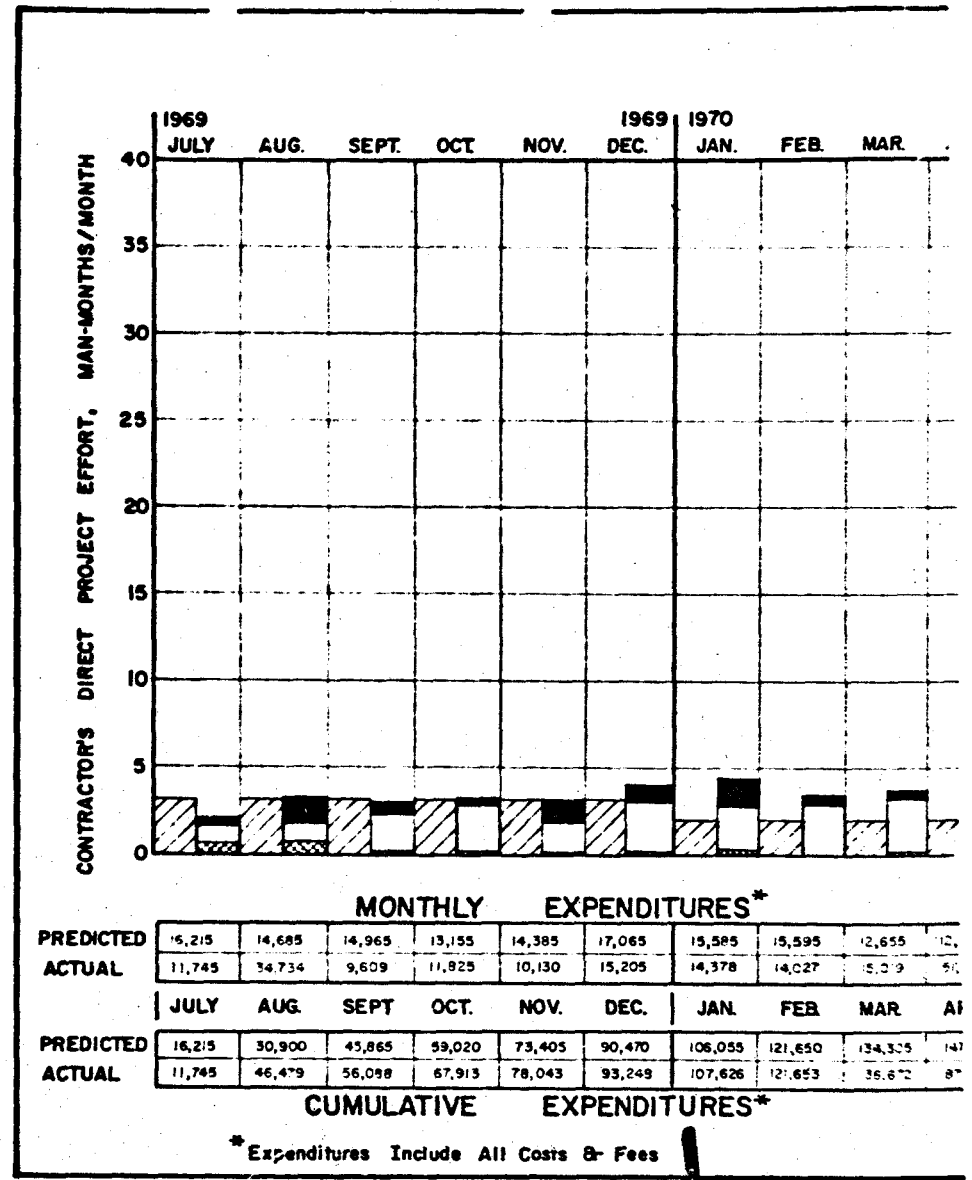
1973			PREDICTED	ACTUAL
OCT.	NOV.	DEC.		
			SUPERVISING	
			PROFESSIONAL	
			TECHNICIAN S-R	
			TECHNICIAN S/C	

⊕ INCLUDES SUPERVISORY EXEMPT TECHNICIANS
 ⊕ INCLUDES CLERICAL

CONSTRUCTION — STEARNS-ROGER JOB B-37000
 OPERATIONS — STEARNS-ROGER JOB B-37400

6

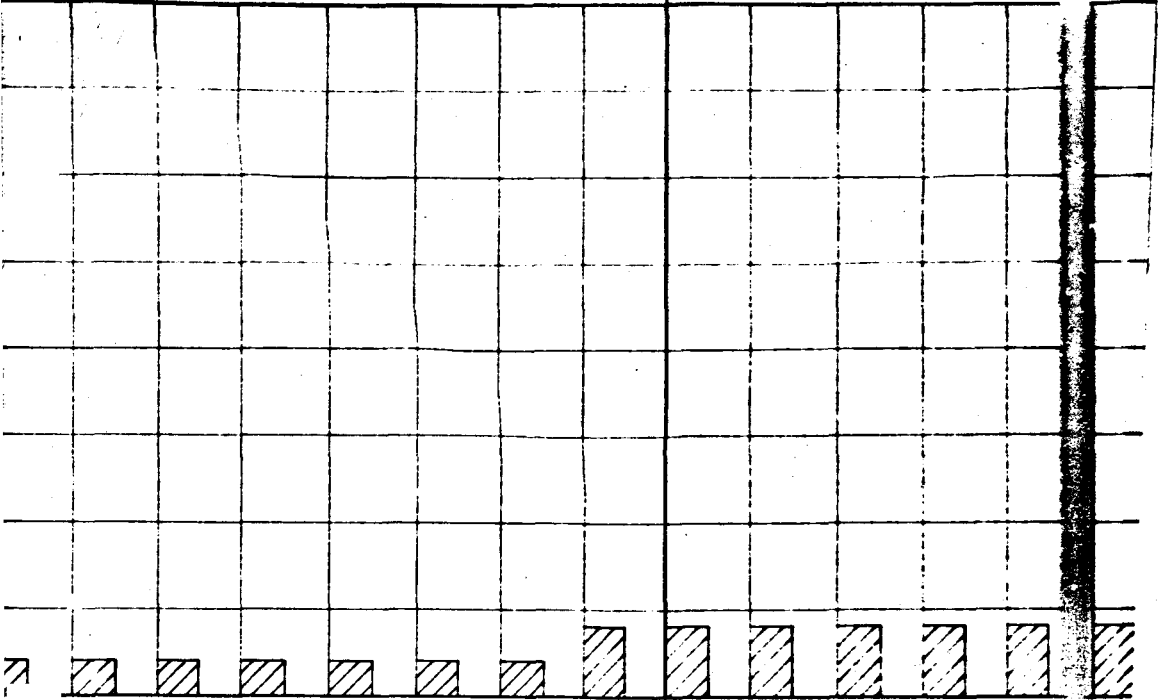
MONTHLY PROGRESS CHART		
OFFICE OF COAL RESEARCH U.S. DEPARTMENT OF THE INTERIOR		
CONSOLIDATION COAL CO. RESEARCH DIVISION LIBRARY, PA		
CONTRACT NO. 14-01-0001-415 (3)		



MONTHLY

CONTRACT

							1970	1971							
MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE		



13,815	12,655	13,315	12,835	12,505	12,505	12,505	20,155	20,135	23,295	22,295	21,445	18,700	15,000
MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
10,995	173,650	186,965	199,800	212,305	224,810	237,315	257,470	277,605	300,900	323,195	344,340	363,000	378,000

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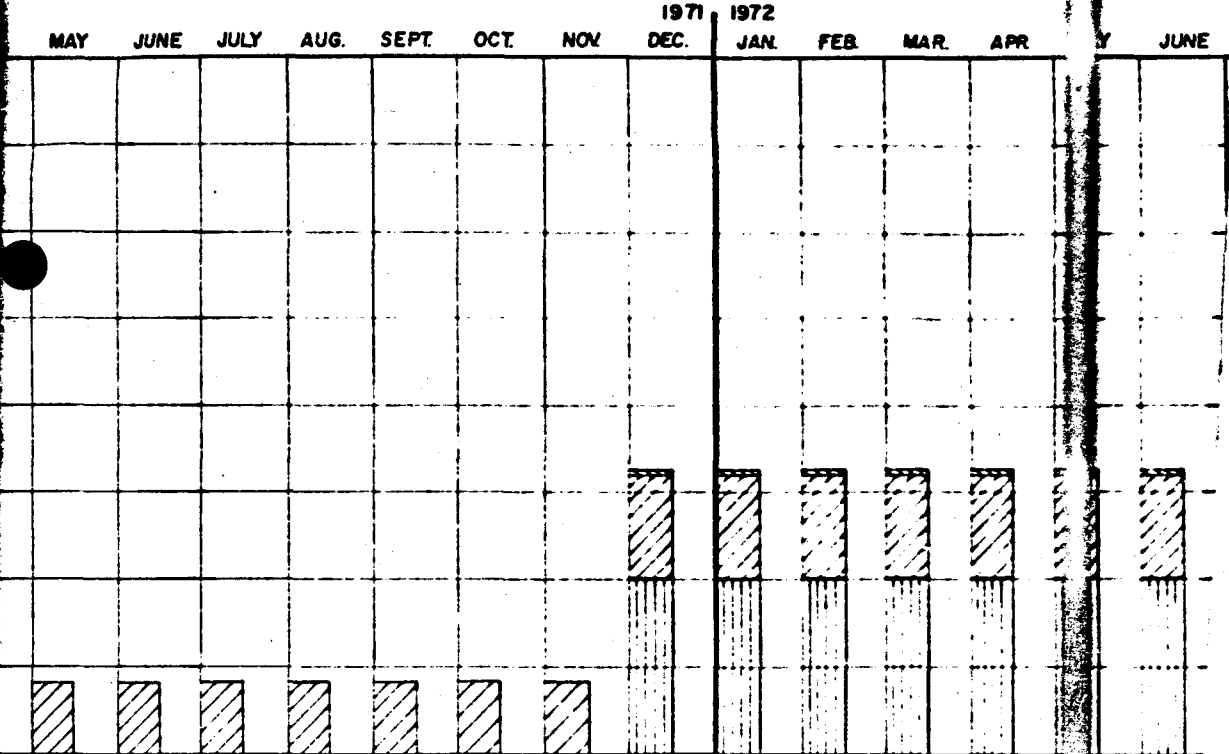
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MONTHLY PROGRESS CHART

(SUPERVISION & LAP WORK)

DATE:

CONTRACT No. 14-01-0001-415 (3)

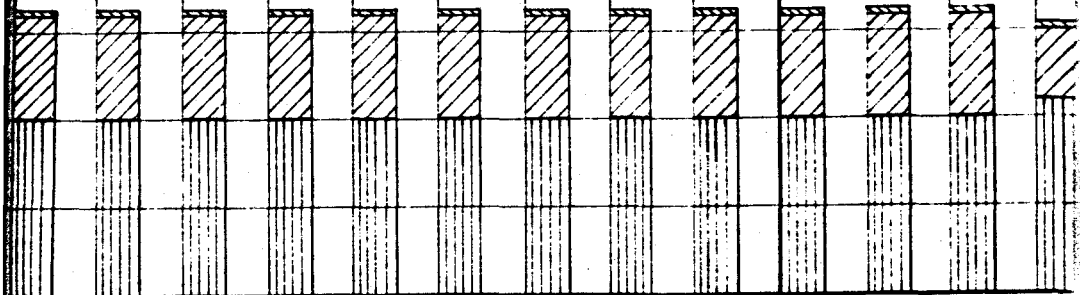


	18,705	15,955	14,875	14,875	14,875	14,875	14,875	39,475	39,475	39,475	39,475	39,475	39,475	39,475
	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUN.
NO	363,045	379,000	393,875	408,750	423,625	438,500	453,375	492,850	532,325	571,800	611,275	650,750	690,225	729,700

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SION & LAB WORK

APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. **1972** **1973** JAN. FEB. MAR. AP



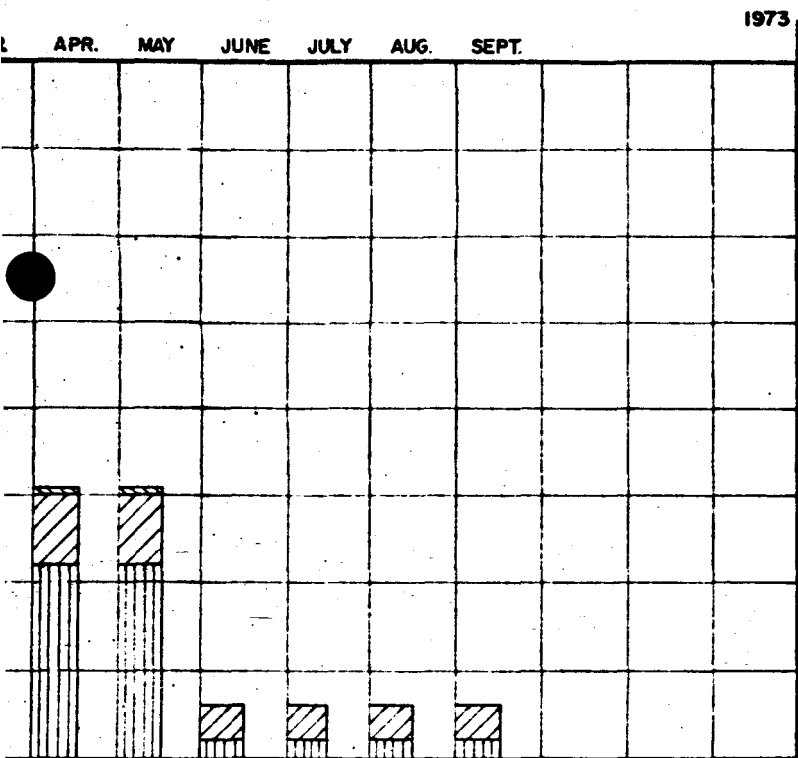
	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475
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APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
650,750	690,225	729,700	769,175	808,650	848,125	887,600	927,075	966,550	1,006,025	1,045,500	1,084,975	1,124,450

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DATE: Apr



1973

SUPERVISING
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⊗ Includes C

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	APR	MAY	JUNE	JULY	AUG.	SEPT.			
5	1,121,050	1,157,125	1,164,600	1,180,075	1,191,950	1,232,670			

5

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May, 1970

B. Technical Results and Program

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

1. Supporting Process and Economic Analyses (Project No. 533.00)

No work was done on this project in the report period.

2. Supporting Patent and Legal Activities (Project No. 534.00)

The current reports and memoranda were reviewed for Subject Inventions.

3. Consol Assistance on Construction of Lignite Pilot Plant (Project No. 536)

The primary effort of Consol was monitoring the completion of the 30 mechanical flow sheets. Consol and Stearns-Roger personnel spent three days in Ponca City reviewing this work with Conoco process, instrument and mechanical engineers.

In addition, Consol visited the site in Rapid City to review progress and to establish procedures for preserving stored equipment.

Preliminary operating and start-up procedures were discussed and analytical requirements established. A suggested list of analytical equipment was submitted to the Stearns-Roger operating group.

Considerable effort was expended in reviewing accounting procedures:

- a. To expedite the billings and payments in the construction contract.
- b. To establish procedures for the operations contract.

May, 1970

Some effort was devoted to resolving the South Dakota and Rapid City sales and use tax questions which were incurred by ambiguity in the construction contract language. A meeting was held in Washington and appropriate instructions are expected to be issued by OCR in the near future.

Consol is continuing to negotiate with Stearns-Roger to finalize change orders. To date, two have been approved, an additional 11 are ready for review by OCR and 38 remain unsolved.

4. Stearns-Roger Subcontract (Project No. 700)

A progress report by Stearns is attached.

C. Subject Inventions

None.

D. Financial Status

<u>Expenses</u>	<u>Actual</u>	<u>Budget</u>
<u>Cumulative through April 1970</u>		
Through June, 1969		
Consol	\$ 1,878,256	\$ 1,878,256
Stearns	189,900	147,180
	<u>771,800</u>	<u>1,455,800</u>
Total Cumulative Expense	\$ 2,839,956	\$ 3,481,236
<u>Expended in Period</u>		
Consol	\$ 17,000	\$ 13,815
Stearns	233,700	623,700
Cumulative through May, 1970	\$ 3,090,656	\$ 4,118,751

T: 6/15/70

Att. - Monthly Progress Charts
Stearns-Roger Progress Report

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
June 4, 1970

PROJECT REPORT SUMMARY

Work now in progress includes detail engineering design, receipt and evaluation of revised equipment and instrumentation inquiries, purchasing of all classes of materials, approval of vendor drawings and continuation of detail drafting. Delivery promises from the single source for Incoloy 800, International Nickel's subsidiary, Huntington Alloy Products, have now extended duration of the project by about three to four weeks. The vendor's sales promises are vastly different from production department statements. Expediting efforts during the past month have included telephone calls and trips to the regional and home offices, and the result has improved the promises by about one month over previous schedules.

ENGINEERINGProcess

Review of flow diagrams by Consol, Stearns-Roger and Continental Oil personnel in Ponca City during the week of May 18 resulted in a very small number of minor additions to the piping and instrumentation. Work is in progress to prepare a detailed itemization of the composition, quantity and frequency of discharge of the liquid, gas and solids waste streams from the plant.

Mechanical

Lack of vendor-drawings for the inert gas generator and for the fired heaters is holding up detail drafting in these areas. Drawings, 1-2 weeks overdue, are now expected by June 12. For further details on materials please refer to Material Status Report No. 8 issued on June 8.

Details on engineering, inquiries, recommendations, approvals and purchasing of equipment are covered by the Equipment List issued on June 3 which may be summarized as follows:

EQUIPMENT LIST SUMMARY

	On Inq.	Recom. For App	Consol App	Purch	Total Equip Items
Items	6	2	4	128	140
Per Cent of Total	4	1	3	92	100

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
June 4, 1970

ENGINEERING - continuedDrafting - - - Approximately 65% complete

All underground piping drawings have been issued for construction. Detail drafting is in progress in all areas except the inert gas generator and fired heaters.

Structural drafting is about 80% complete. Steel detail drawings for all, except the seventh level and the roof have been released to the fabricator. Stack foundation design differences with the fabricator have been resolved. All caisson drawings have been released for construction.

Electrical drafting, about 70% complete, continues on schematic diagrams for controls and control panel details.

Instrumentation - - - Approximately 85% complete

Specifications in progress include pressure gauges, thermowells, thermocouples, flow switches, level switches and pressure switches. Items on inquiry include the analyzer sample systems, local and central control panels, butterfly valves, pinch valves, ball valves, pressure regulators and special gas flow meter. Control valves and relief valves have been approved for purchase. All instrument items are estimated to be purchased by July 10.

PROJECT ENGINEERING

The arrow diagram schedule attached to this report has been updated with the decorative line relocated to separate the completed and unfinished work. Improved delivery promises for the Incoloy 800 furnace tubes will improve the indicated completion by 2-3 weeks.

Inquiry for the subcontract above ground portion of the sprinkler system is being prepared. Manpower requirement curves for the various crafts are being prepared. Tentative plans have been made to meet with representatives of the crafts in Rapid City during the week of June 15 to agree on detailed work jurisdiction assignments for construction.

CONSTRUCTION

Underground piping is about 65% complete. Lack of fire hydrants held up by the truckers' strike makes completion indefinite.

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 June 4, 1970

CONSTRUCTION - continued

Building subcontractor is forming and pouring grade beams and caisson caps in the process area, working on rough plumbing and masonry in the administrative and maintenance areas, and pouring miscellaneous foundations in the yard area. Caisson subcontractor has returned for the final phases of his work which should be complete by June 19. About 160 tons of structural steel have been received, and steel erection should start by June 15.


 D. H. Dawson
 Project Manager

Attachments: Summary of Project Changes - 2 pages
 Progress Chart, 5-31-70
 Master Plan Schedule

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 June 4, 1970

SUMMARY OF PROJECT CHANGES

<u>Approved Change Orders</u>	<u>Increase</u>	<u>Decrease</u>
1. Reactor System Study	8,820	
20. Fvt. Elev. vs. Manlift & Hoist	6,180	
Original Maximum Price	<u>8,465,129</u>	
Presently Approved Total	<u>\$8,480,129</u>	

Pending Change Notices and
Change Orders Awaiting Approval

3. Delete roof at heaters		15,600
6. Add'l Regen. Nozzles	600	
7. Incr. disch. pressure prehr compr	4,315	
8. Redesign purge gas systems	67,860	
9. Add instr & duct, lignite crush & grind	16,000	
10. Boiler controls, 2 element pneu type	1,300	
11. Delete Fuel Gas Booster Blower		8,670
13. Revise Canteen to Fallout Shelter	4,770	
14. Perspective Drawing for OCR	780	
16. Revise Hammermill specs	725	
17. Redesign expansion joints		160,000
18. Delete car puller		17,200
19. Revise Fire System per F Mutual	11,970	
21. Study reactor offgas prequench	1,000	
22. Utilize Surplus Forklift & Tote bins		12,600
23. Incr. Size F-509; Revise boiler burners	2,000	
24. Sub. Coulds for Aurora J-314	225	
26. Redesign reactors		40,000
28. Delete Car Thaw pit		5,395
29. Revise htr controls & ESD system		13,000
32. Incr. capacity IG system	20,600	
33. Water service to site	2,430	
34. Revisions to conform with Uniform Bldg Code	3,390	
35. Upgrade quality & incr wall htr tubes	30,000	

PROJECT STATUS REPORT

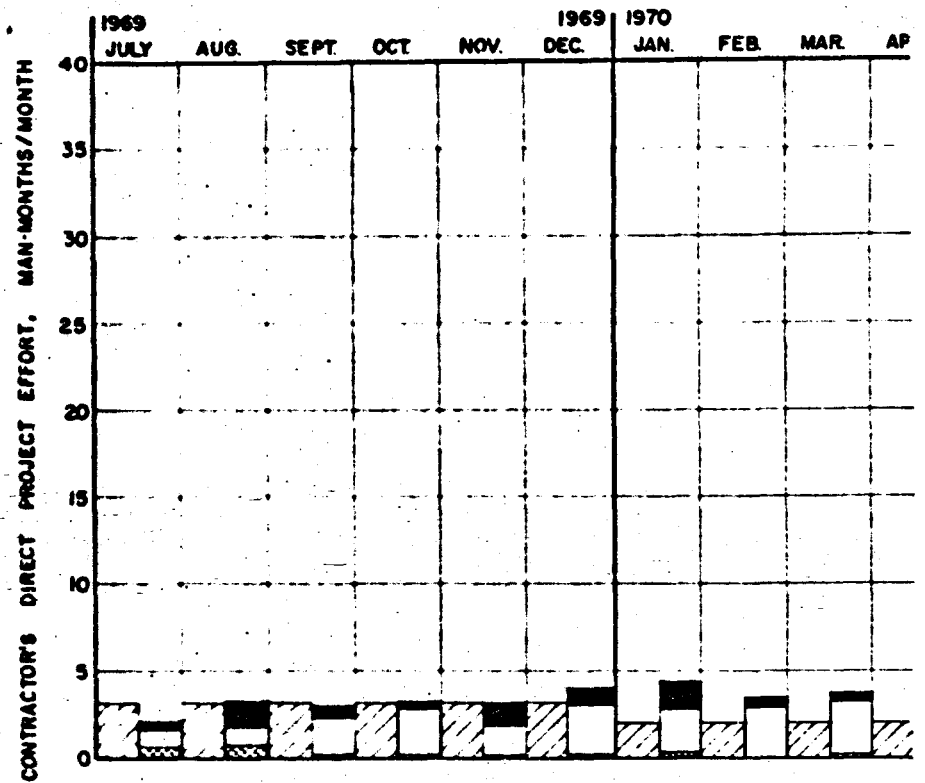
CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 June 4, 1970

SUMMARY OF PROJECT CHANGES - continued

<u>Pending Change Notices and Change Orders Awaiting Approval</u>	<u>Increase</u>	<u>Decrease</u>
36. Miscellaneous instrument changes		26,000
37. Revise design & descr quan hot valves		160,000
38. Revise Sanitary Disp. System	10,000	
39. Revise Waste System	7,000	
40. Accum Costs for future transfer to oper contr. B-37400	250,000	
41. Revise Solids Handling	3,000	
42. Misc, changes in pipe specs, sizes, deletions & additions	36,000	
43. Revise expansion joint quantity & design		20,000
44. Revise Reactor System Auxiliary Vessels		18,000
45. Revise Misc. Reactor Internals		2,000
46. Revise Jacket Water Piping System	40,000	
47. Delete C-206		995
48-2. Delete Vendor supplied heater inst. & add equiv. items to Instr. Acct	500	
49. Revise Flare System	1,000	
50. Add'l htg & ventlg elec room, proc struc & solids handling bldg	1,000	
51. Revise 1st floor layout Proc Structure	2,000	
52. Stress relieve F-314	685	
53. Revise gas quench syst. metalg. des.	115,000	
54. Redesign dolomite & lignite silos	5,000	
55. Revise Liq. Waste Disp.	120,000	
56. Add facil to pull Exch bundle	1,000	
57. Add'l Heat Trace & Ins	7,000	
58. Add two doors Maint-Proc Area	1,700	
59. Revise elec classif-Proc Struc	4,000	
60. Subs gas turbine mtr for densitometer	1,000	
61. Incr capacity emer gener & switch	1,000	
Net Pending Changes	275,390	
Estimated Total	\$8,755,519	
40. Future transfer of 1970 charges applicable to operating contract B-37400		250,000
Construct Costs only, Estimated Total		\$8,505,519

2



MONTHLY EXPENDITURES*

	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
PREDICTED	4,215	14,685	4,365	15,55	14,385	17,085	15,585	15,595	12,855	12,8
ACTUAL	11,745	34,714	8,609	11,925	10,130	15,205	14,378	14,027	15,019	53,2

	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
PREDICTED	16,215	30,900	45,265	59,020	73,405	90,470	106,055	121,650	134,305	147,
ACTUAL	11,745	46,419	56,028	67,913	78,043	93,249	107,626	121,653	136,672	89,

CUMULATIVE EXPENDITURES*

* Expenditures Include All Costs & Fees

MONTHLY PI
CONTRACT N

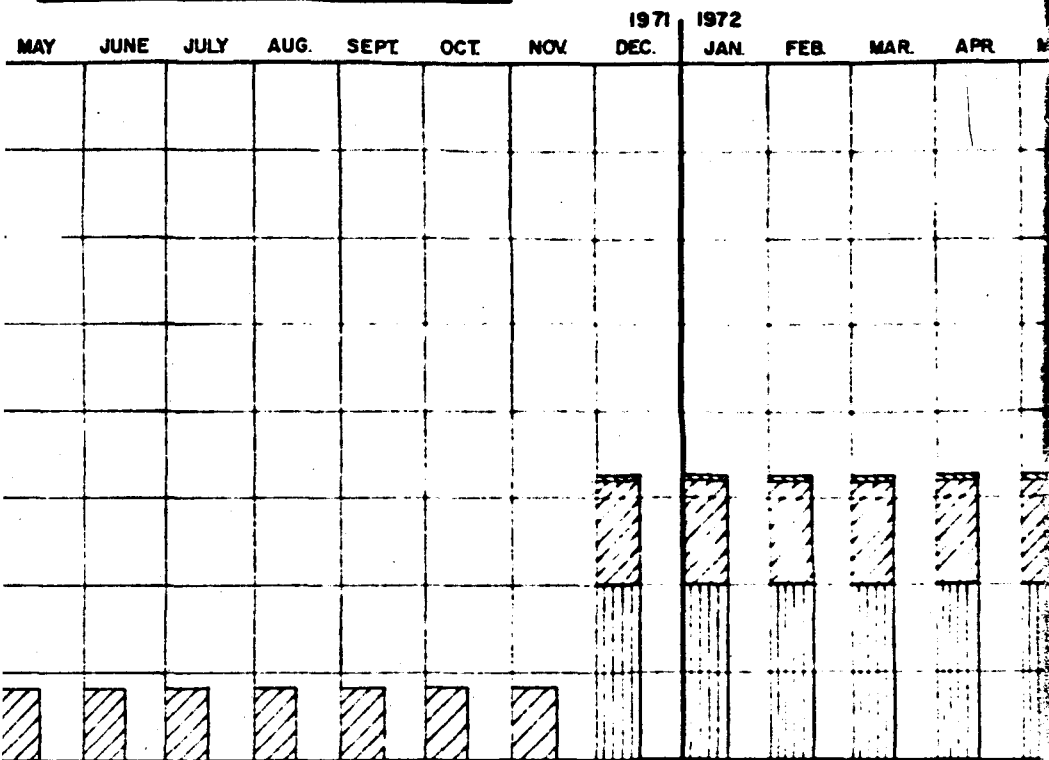
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5	12,655	13,315	12,835	12,505	12,505	12,505	20,155	20,135	23,295	22,295	21,145	18,700	15,955	
10														
15	173,650	186,965	199,800	212,305	224,810	237,315	257,470	277,605	300,900	323,195	344,340	363,000	379,000	
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MONTHLY PROGRESS CHART (SUPERVISION)

CONTRACT No. 14-01-0001-415 (3)

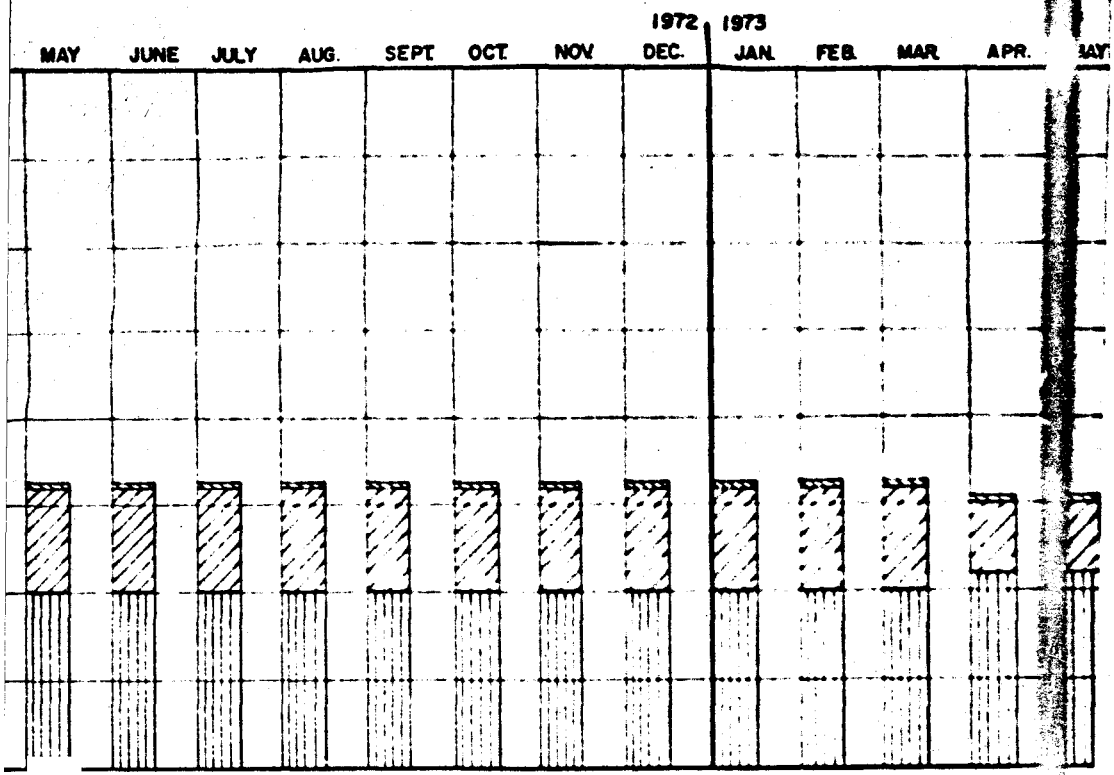


MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
18,705	15,955	14,875	14,875	14,875	14,875	14,875	39,475	39,475	39,475	39,475	39,475
363,045	379,000	393,875	408,750	423,625	438,500	453,375	492,850	532,325	571,800	611,275	650,750

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1972	1973										
MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV	DEC.	JAN.	FEB.	MAR.	APR.
690,225	729,700	769,175	808,650	848,125	887,600	927,075	966,550	1,006,025	1,045,500	1,084,975	1,124,450

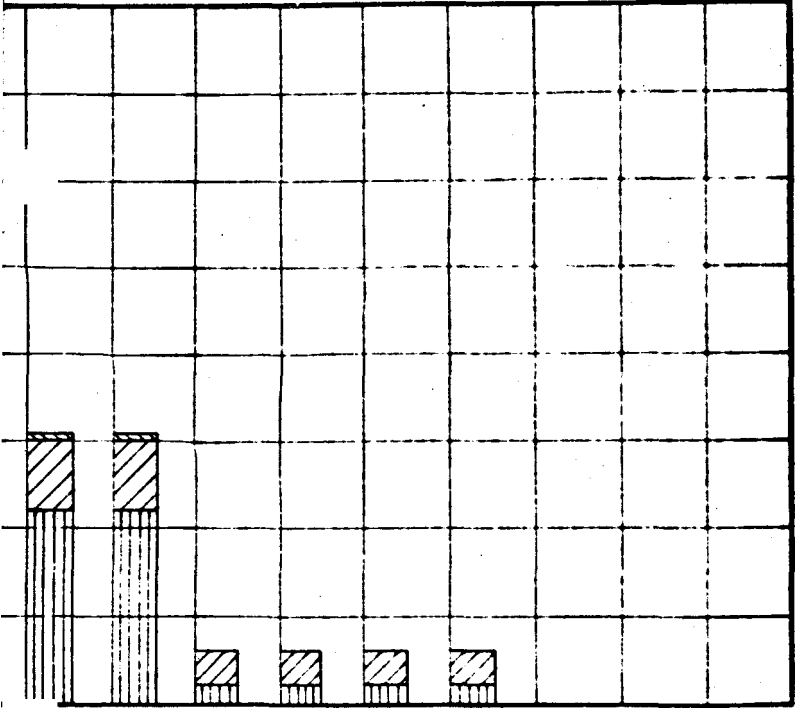
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DATE: May 1973

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APR. MAY JUNE JULY AUG. SEPT.



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	APR	MAY	JUNE	JULY	AUG.	SEPT.			
36,075	36,075	11,475	11,475	11,475	41,120				
1,121,050	1,157,125	1,168,600	1,180,075	1,191,550	1,232,670				

5

MONTH
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(New 415 Chart)

DATE: May 1970

1973

	PREDICTED	ACTUAL
SUPERVISING		
PROFESSIONAL		
TECHNICIAN		

- ⊛ Includes Supervisory Exempt Technicians.
- ⊙ Includes Clerical.

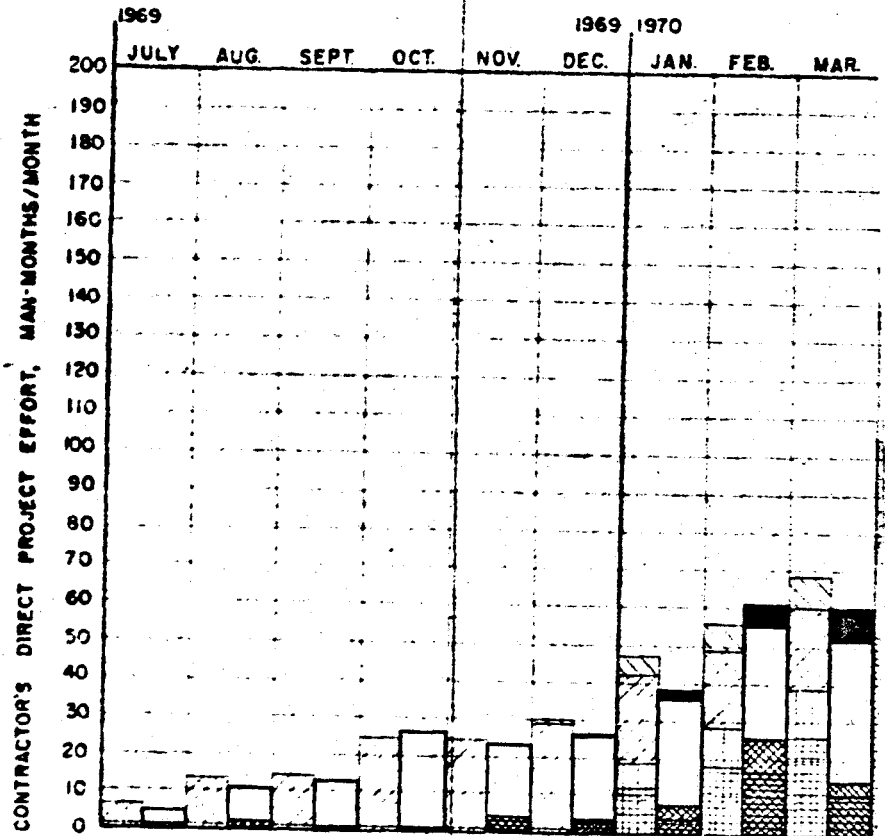
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MONTHLY PROGRESS CHART

OFFICE OF COAL RESEARCH
DEPARTMENT OF THE INTERIOR

CONSOLIDATION COAL CO.
RESEARCH DIVISION LIBRARY, PA.

CONTRACT No. 14-01-0001-415 (3)



MONTHLY EXPENDITURES -

	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.
PREDICTED	30.0M	40.0M	50.0M	60.0M	70.0M	80.0M	90.0M	100.0M	110.0M
ACTUAL	6.2M	15.0M	32.0M	42.0M	31.7M	126.2M	110.5M	76.7M	102.9M

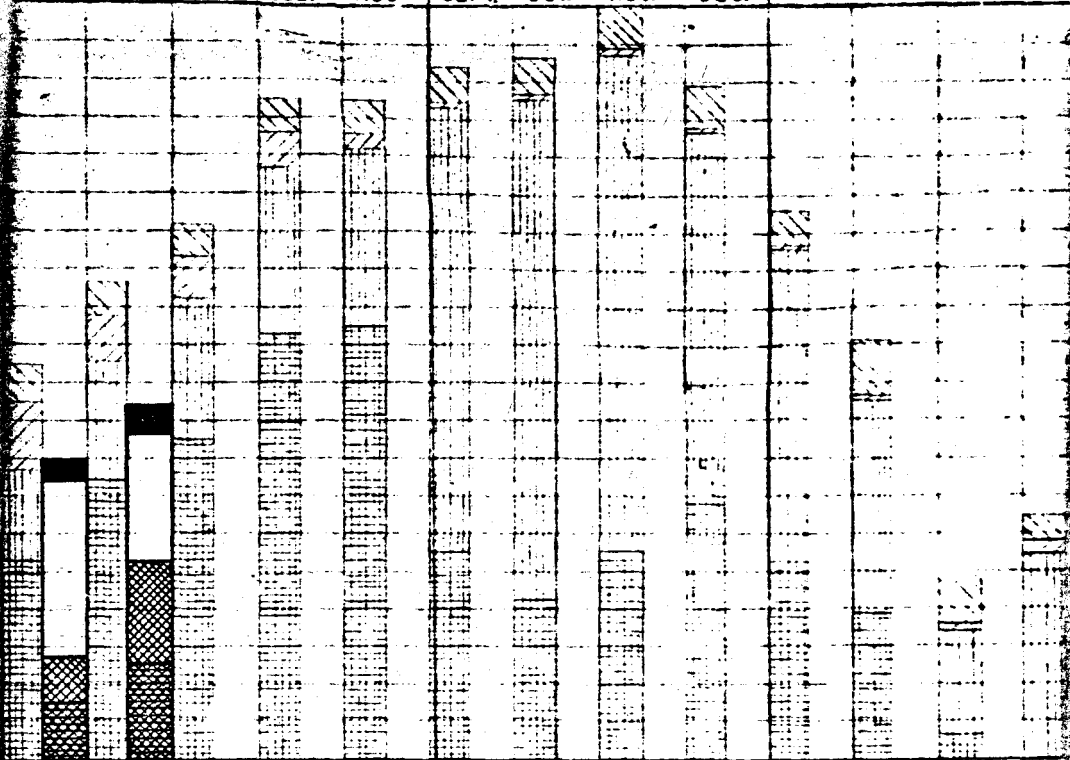
	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.
PREDICTED	30.0M	70.0M	120.0M	180.0M	250.0M	330.0M	420.0M	520.0M	630.0M
ACTUAL	6.2M	31.2M	64.0M	106.0M	146.3M	272.5M	383.0M	459.7M	562.6M

CUMULATIVE EXPENDITURES -

EXPENDITURES INCLUDE ALL COSTS & FEES

1970 1971

APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. AP



445.8M 628TM 890IM 902DM 890IM 110M 890IM 100M 110M 120M 130M 140M 150M 160M 170M 180M 190M 200M 210M 220M 230M 240M 250M 260M 270M 280M 290M 300M 310M 320M 330M 340M 350M 360M 370M 380M 390M 400M 410M 420M 430M 440M 450M 460M 470M 480M 490M 500M 510M 520M 530M 540M 550M 560M 570M 580M 590M 600M 610M 620M 630M 640M 650M 660M 670M 680M 690M 700M 710M 720M 730M 740M 750M 760M 770M 780M 790M 800M 810M 820M 830M 840M 850M 860M 870M 880M 890M 900M 910M 920M 930M 940M 950M 960M 970M 980M 990M 1000M

APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. A

445.8M 628TM 890IM 902DM 890IM 110M 890IM 100M 110M 120M 130M 140M 150M 160M 170M 180M 190M 200M 210M 220M 230M 240M 250M 260M 270M 280M 290M 300M 310M 320M 330M 340M 350M 360M 370M 380M 390M 400M 410M 420M 430M 440M 450M 460M 470M 480M 490M 500M 510M 520M 530M 540M 550M 560M 570M 580M 590M 600M 610M 620M 630M 640M 650M 660M 670M 680M 690M 700M 710M 720M 730M 740M 750M 760M 770M 780M 790M 800M 810M 820M 830M 840M 850M 860M 870M 880M 890M 900M 910M 920M 930M 940M 950M 960M 970M 980M 990M 1000M

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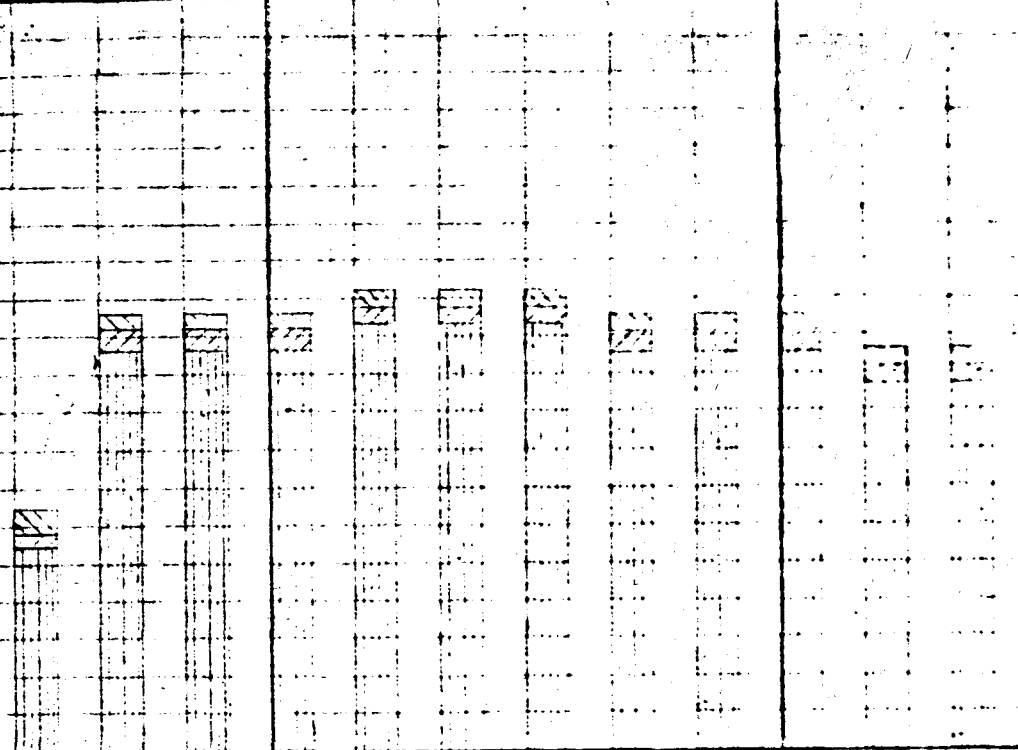
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MONTHLY PROGRESS CHART

CONTRACT NO. 14-01-0001-415 (3)

1971 1972

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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

R. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR.

31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

3

RT (CONSTRUCTION & OPERATION)

1972, 1973												
MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	M
74.8M	94.7M	108.9M	102.8M	108.9M	157.9M	107.8M	91.0M	91.4M	75.0M	71.0M	75.0M	75.0M
MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	
70.75M	102.75M	115.4M	144.5M	155.6M	179.5M	192.5M	202.5M	160.4M	112.4M	113.5M	144.4M	144.4M

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DATE: May

1975

AR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

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CONSTRUCTION

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1973
PT. OCT. NOV. DEC.

	PREDICTED	ACTUAL
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PROFESSIONAL		
TECHNICIAN S-R		
TECHNICIAN S/C		

⊕ INCLUDES SUPERVISORY EXEMPT TECHNICIANS
⊕ INCLUDES CLERICAL

CONSTRUCTION— STEARNS-ROGER JOB B-37000
OPERATIONS— STEARNS-ROGER JOB B-37400

MONTHLY PROGRESS CHART

OFFICE OF COAL RESEARCH
U S DEPARTMENT OF THE INTERIOR

CONSOLIDATION COAL CO.
RESEARCH DIVISION L BRARY, PA

CONTRACT NO. 14-01-0001-415 (3)

6

PROGRESS REPORT NO. 73
OCR CONTRACT NO. 14-01-0001-415(3)
CONSOL LIGNITE GASIFICATION PROCESS DEVELOPMENT

June 1 to 30, 1970

A. Summary

Phase I - Feasibility Study

Complete.

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

Field work at Rapid City has continued on underground piping, foundations and steel erection. Progress has been somewhat delayed by late deliveries. Projected completion date is still May, 1971.

Twenty change orders were negotiated, increasing the approved GMP to \$8,510,134. Pending change orders are now estimated to total \$300,000 (increase); the major increases are associated with revisions in the gas cleanup and ancillary systems.

Financial

Estimated expenditures in June were \$618,500 by Stearns and \$18,000 by Consol. Cumulative total project expense is \$3,727,498.

June, 1970

B. Technical Results and Program

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

1. Supporting Process and Economic Analyses (Project No. 533)

No work was done on this project in the report period.

2. Supporting Patent and Legal Activities (Project No. 534)

The current reports and memoranda were reviewed for Subject Inventions.

3. Consol Assistance on Construction of Lignite Pilot Plant (Project No. 536)

Consol devoted considerable time in reviewing final purchase specification and selection of vendors primarily in instrumentation. This included control valves, relief valves, panelboards, flowmeters, thermal devices, and analyzer systems.

Final flow sheet corrections were submitted and incorporated by Stearns-Roger.

A review was made of data requirements and a memorandum was submitted to Stearns giving location of sample devices. A program design for Rapid City operations was completed.

Negotiations continued on change orders. Consol agreed on costs of 20 out of a total of 50, and obtained approval from OCR to formally revise the GMP to reflect these changes. This added \$36,185 to the GMP.

The Stearns-Roger report shows an increase in estimated GMP of approximately \$300,000 over the report submitted in early June. This predicted increase is largely due to increases in Change Notices 41, 53, and 55. Stearns has not as yet submitted sufficient detail describing these changes for Consol to exercise judgment on the validity of the costs. All of the remaining change orders will be reviewed thoroughly before approval.

June, 1970

4. Stearns-Roger Subcontract (Project No. 700)

The progress report by Stearns is attached.

C. Subject Inventions

None.

D. Financial Status

<u>Expense</u>	<u>Actual</u>	<u>Budget</u>
<u>Cumulative through May, 1970</u>		
Through June, 1969	\$ 1,878,256	\$ 1,878,256
Consol	207,242	160,995
Stearns	1,005,500	2,079,500
Total through May, 1970	\$ 3,090,998	\$ 4,118,751
<u>Expended in Period</u>		
Consol	\$ 18,000	\$ 12,655
Stearns	618,500	891,100
Cumulative through June, 1970	\$ 3,727,498	\$ 5,022,506

T: 7/13/70

Att. - Stearns-Roger Progress Report
Monthly Progress Charts

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 July 2, 1970

PROJECT REPORT SUMMARY

Work now in progress includes detail drafting and checking, receipt and evaluation of instrumentation inquiries, purchasing of routine piping items and approval of vendor drawings. Status of critical material items such as Incoloy furnace tubes and piping and reactor vessels remains unchanged.

ENGINEERINGProcess

Mechanical flow diagrams were approved by Consol on July 1. Consol is studying a request from the South Dakota State Board of Health for assurances that the plant effluent streams will meet the required water quality standards. No process evaluation, explanation, justification or design work by Stearns-Roger has been authorized.

Mechanical

Lack of vendor drawings for recent revisions and additions to equipment for six items is holding up detail drafting in the gas purification, waste treatment and utilities areas. For further details on materials, please refer to Material Status Report No. 9 issued on July 10.

Details on engineering, inquiries, recommendations, approvals, and purchasing of equipment are covered by the Equipment List issued on July 2 which may be summarized as follows:

EQUIPMENT LIST SUMMARY

	<u>On</u> <u>Inq.</u>	<u>Consol</u> <u>App</u>	<u>Purch</u>	<u>Total</u> <u>Equip</u> <u>Items</u>
Items	4	3	131	141
Per Cent of Total	3	2	95	100

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 July 2, 1970

ENGINEERING - continued

Drafting - - - Approximately 70% complete

Isometric piping drawings are about 40% complete. Checking has started in the gasification and gas purification areas. Work force continues at the maximum of nine draftsmen

Design work on 60 sample point connections requested by Consol on July 1 will start when formal authorization is received during the week of July 6.

Structural drafting is about 85% complete. Structural steel and Q-deck drawings have all been issued to the fabricator for preparation of shop drawings.

Electrical drafting is about 75% complete. Work of two men continues on schematic diagrams for controls and control panel details.

Instrumentation - - Approximately 87% complete

Specifications in progress include flow and pressure switches, thermometers and miscellaneous minor items. On inquiry are pressure gauges, thermowells, central control panel, thermocouples, level switches, analyzer sample system and differential pressure switches. Volumetric flow meters, heater control panels, butterfly valves, and flow tube have been recommended for purchase. Instrument items are estimated to be purchased by July 24.

PROJECT ENGINEERING

The arrow diagram schedule normally attached to this report has been omitted because the progress this month on the large summary type items on the diagram would show very little relative change from the status issued last month.

Inquiry for the subcontract for above-ground portion of the sprinkler system has been issued. Manpower curves for the various crafts have been prepared. Meeting with representatives of the craft unions in Rapid City on June 23 established detailed work jurisdiction assignments for receiving and construction work.

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 July 2, 1970

PROJECT ENGINEERING - continued

Cost report for the period ending May 31 will be issued July 6. Accuracy of the report suffers due to assumed values for some of the change orders that are pending approval. Present indications are that if the pending change orders are approved, about one third of the contingency will be saved.

CONSTRUCTION

Underground piping is about 75% complete. Lack of fire hydrants held up by the truckers' strike makes completion indefinite. Building subcontractor, about 35% complete, is forming and pouring grade beams and caisson caps in the process area, working on the rough plumbing and masonry in the administrative areas, and pouring cooling tower miscellaneous foundations in the yard area. Caisson work is complete. Steel base columns for the process structure arrived over a week late, and caused delay of work on masonry for the utilities area. Late engineering changes to the Q-deck have delayed fabrication and shipment which will delay construction of the structure by 2-3 weeks. Prefabricated buildings for gas meter and chemical storage are essentially complete. Considering availability of materials, field construction progress is good.

D. H. Dawson
 D. H. Dawson
 Project Manager

Attachments: Summary of Project Changes - 2 pages
 Progress Chart, 6-30-70

Distribution:

<u>Consol - 5</u>	<u>Continental Oil Company - 6</u>	<u>Stearns-Roger - 7</u>
C. A. Schulz	E. E. Ellington, CED D. F. Wegner, Field L. Thompson, MED	J. B. Hambleton, CED G. E. Fagerburg, CED Dr. C. V. Foster, PED
		FCP/HFD/CNS/TGS/File CFL/JTM/VLB/BAH/JCM ALC, FAN/JAP, DHD WEPowell, Field

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 July 7, 1970

SUMMARY OF PROJECT CHANGES

<u>Approved Change Orders</u>	<u>Increase</u>	<u>Decrease</u>
1. Reactor System Study	\$ 8,820	
5. Delete roof at heaters		15,600
7. Iner. Disch. Pressure Prehtr compr	4,315	
11. Delete Fuel Gas Booster Blower		8,670
13. Revise Canteen to Fallout Shelter	4,770	
14. Perspective Drawing for OCR	780	
16. Revise Hammermill specs	725	
18. Delete Car Puller		17,200
19. Revise Fire System per F. Mutual	11,970	
20. Frt. Elev. vs. Manlift & Hoist	6,180	
21. Study reactor offgas prequench	2,110	
23. Iner. Size F-509; add vent line to flare	15,735	
24. Subs. Coulds for Aurora J-314	225	
28. Delete Car Thaw Pit		5,395
33. Water Service to Site	2,430	
34. Revision to conform with Uniform Bldg Code	3,390	
35. Upgrade quality & incr. wall htr tubes	33,910	
38. Revise Sanitary Disp. System	18,820	
44. Revise Reactor System Auxiliary Vessels		22,000
47. Delete C ₂ 206		995
52. Stress relieve F-314	685	
	<hr/>	
Original Maximum Price	\$8,465,129	
Presently Approved Total	\$8,510,134	

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
July 7, 1970

SUMMARY OF PROJECT CHANGES

Pending Change Notices and
Change Orders Awaiting Approval

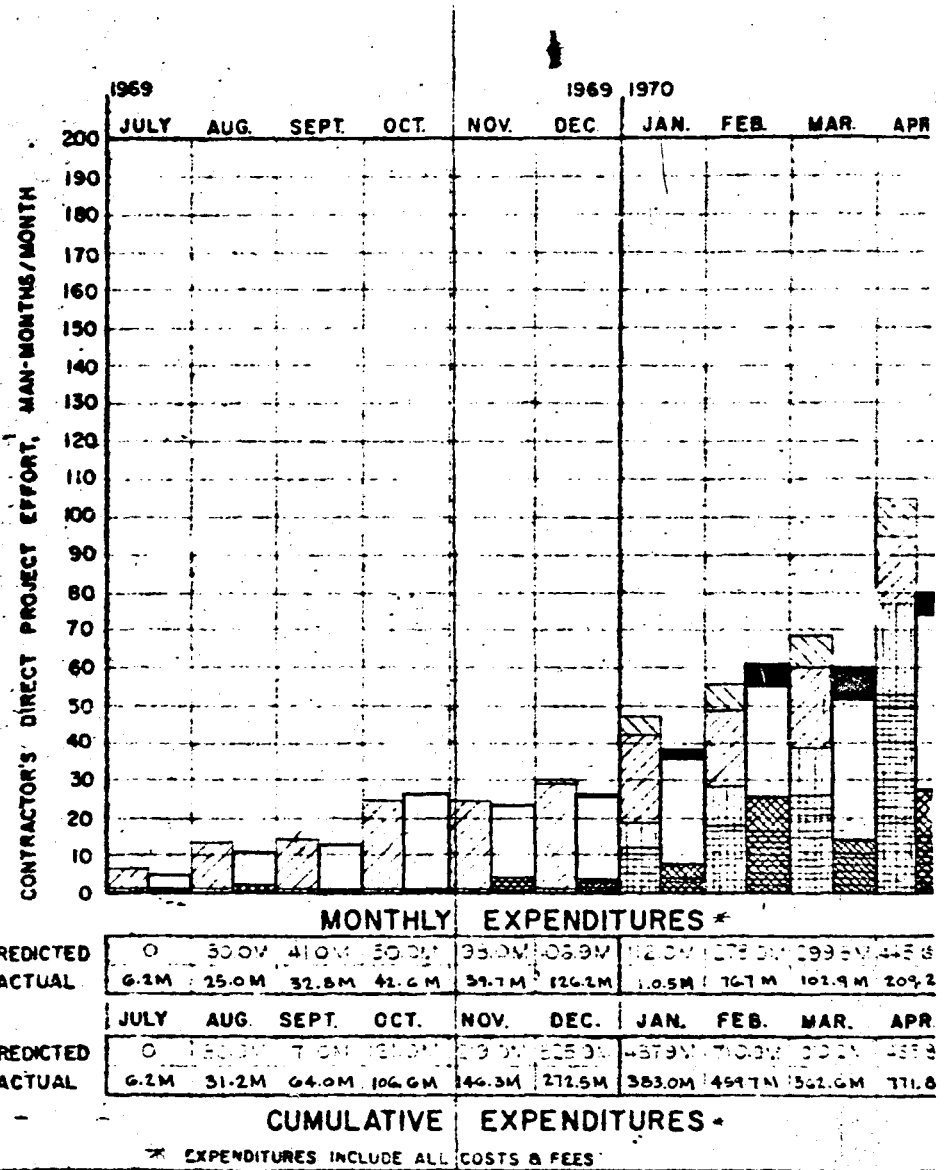
	<u>Increase</u>	<u>Decrease</u>
8. Redesign Purge Gas Systems	\$ 67,860	
9. Add Instr. & Duct, Lignite crush & grind	35,300	
10. Boiler controls, 2 element pneu type	1,470	
17. Redesign Expansion Joints		229,169
22. Utilize Surplus Forklift & Tote Bins		11,090
26. Redesign Reactors		34,000
29. Revise Htr controls & FSD System	28,000	
32. Incr. Capacity IG System	41,431	
36. Miscellaneous Instrument Changes		6,385
37. Revise design & Decr. quan hot valves		155,000
39. Revise Waste System	16,950	
40. Accum Costs for future transfer to Oper. Contract B-37400	250,000	
41. Revise Solids Handling	55,000	
42. Misc, Changes in Pipe Specs, Sizes, deletions & additions	36,000	
43. Revise hot piping		40,000
45. Revise Misc. Reactor Internals	2,200	
46. Revise Jacket Water Piping System	50,600	
49. Revise Flare System	23,970	
50. Add'l htg & vent'lg elect. room, proc structure & solids handling bldg	16,300	
51. Revise 1st floor layout Proc. Structure	10,245	
53. Revise gas quench syst. metalg, des.	170,476	
54. Redesign dolomite & lignite silos	13,000	
55. Revise Lig. Waste Disp.	153,705	
56. Add facil to pull Exch bundle	5,000	
57. Add'l Heat Trace & Ins.	11,000	
58. Add two doors Maint-Proc Area	1,000	
59. Revise Elect Classif-Proc. Struct	4,000	
60. Subs Gas Turbine Ntr for Densitometer	5,500	
61. Incr. capacity Emer. Generator & Switch	2,300	
62. Add acid storage tank @ Cooling Twr	8,400	
63. Revise boiler burners & controls	7,000	

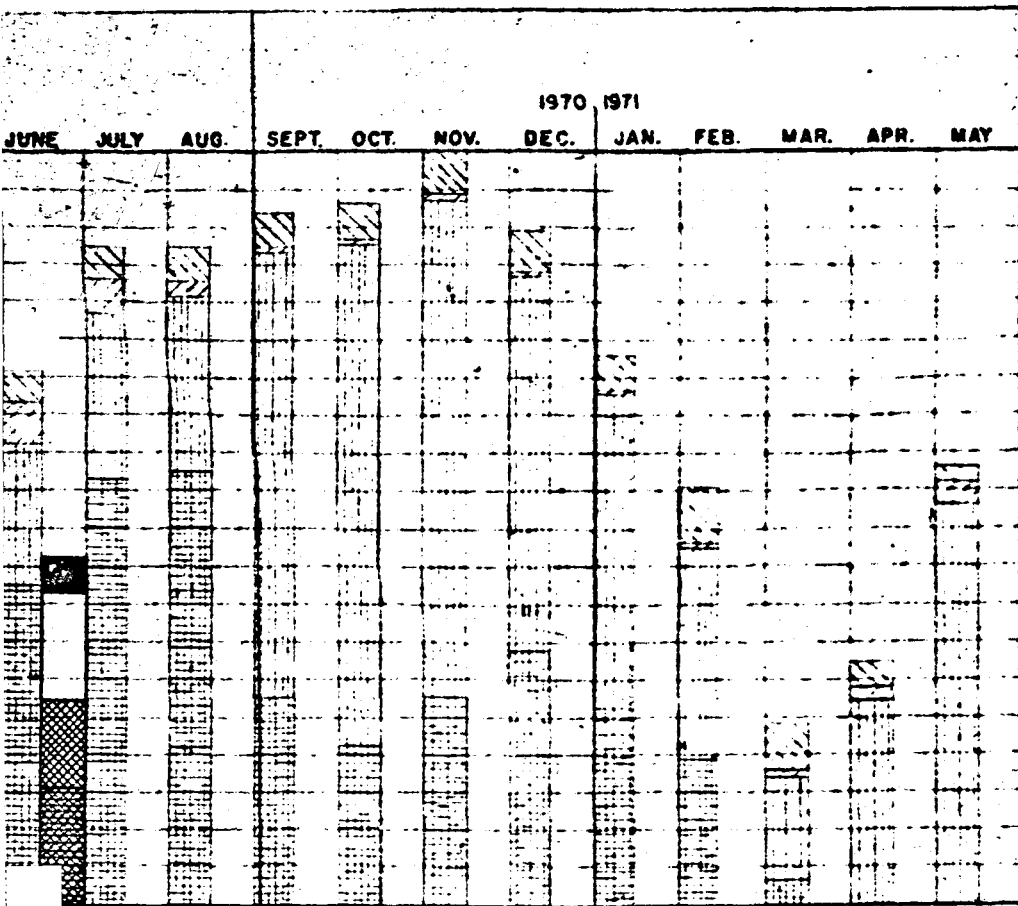
Net Pending Changes \$ 541,063

Estimated Total \$9,051,197

40. Future transfer of 1970 charges applicable
to Operating Contract B-37400 250,000

Construction Costs only, Estimated Total \$8,801,197





89.1M 100.2M 59.1M 119.1M 29.1M 39.1M 180.0M 207.5M 109.5M 98.5M 151.6M 135.0M
 618.5M

JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY
 29.10 26.37 22.6M 4.35 11.27 6.26 11.7 53.8M 70.3M 130.7M 74.67M 55.10M 30.91M 25.55M
 1671.0M

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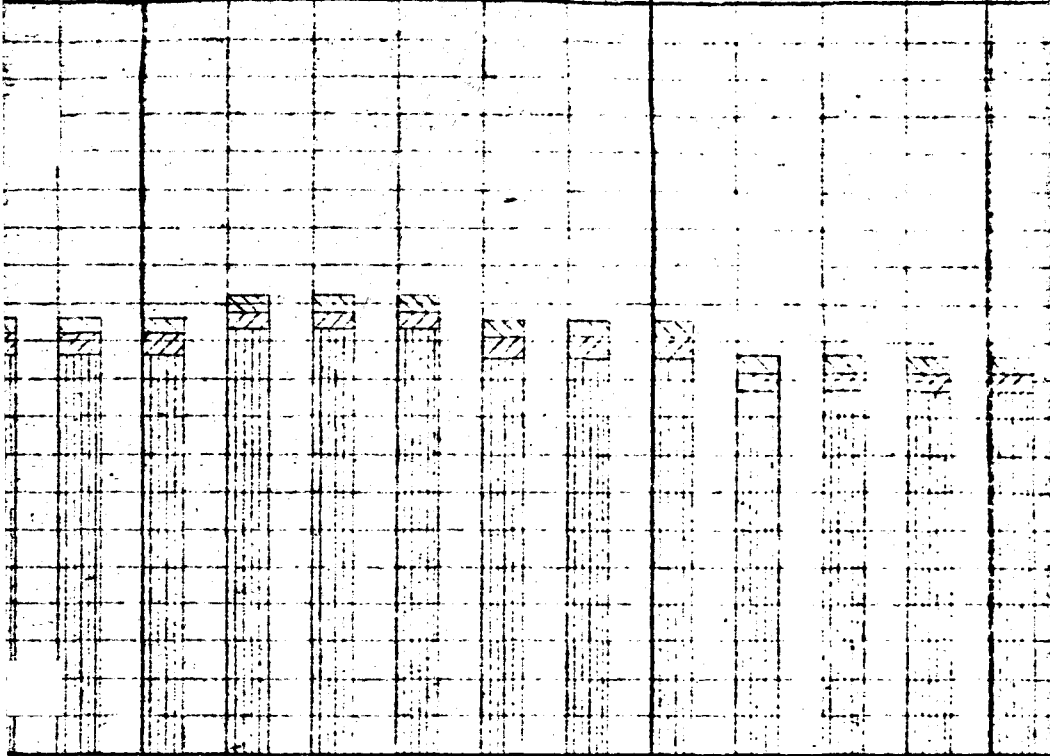
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MONTHLY PROGRESS CHART (CONSTRUCTION & OPERATION)

CONTRACT NO. 14-O-0001-415 (3)

1971 1972

MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY



166.7M 123.5M 203.1M 208.0M 209.1M 201.9M 20.5M 101.5M 175.1M 74.5M 94.7M 103.3M

MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY

15.2M 2018.9M 0142.7M 3590.5M 3533.8M 3507.9M 10069.5M 40.3M 104.25M 1055.9M 0180.2M 1095.7M 11.5M

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DATE: June 1970

1973

MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

PREDICTED

SUPERVISING

PROFESSIONAL

TECHNICIAN S-R

TECHNICIAN S/C

3. INCLUDES SUPERVISORY EXE

4. INCLUDES CLERICAL

CONSTRUCTION — STEARNS-ROGE

OPERATIONS — STEARNS-ROGE

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MONTHLY PRG

OFFICE OF COA
U.S. DEPARTMENT OF

CONSOLIDATIO
RESEARCH DIVISION

CONTRACT NO. 14

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DATE: June 1970

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SEPT. OCT. NOV. DEC.

	PREDICTED	ACTUAL
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PROFESSIONAL		
TECHNICIAN S-R		
TECHNICIAN S/C		

INCLUDES SUPERVISORY EXEMPT TECHNICIANS

INCLUDES CLERICAL

CONSTRUCTION — STEARNS-ROGER JOB B-37000
 OPERATIONS — STEARNS-ROGER JOB B-37400

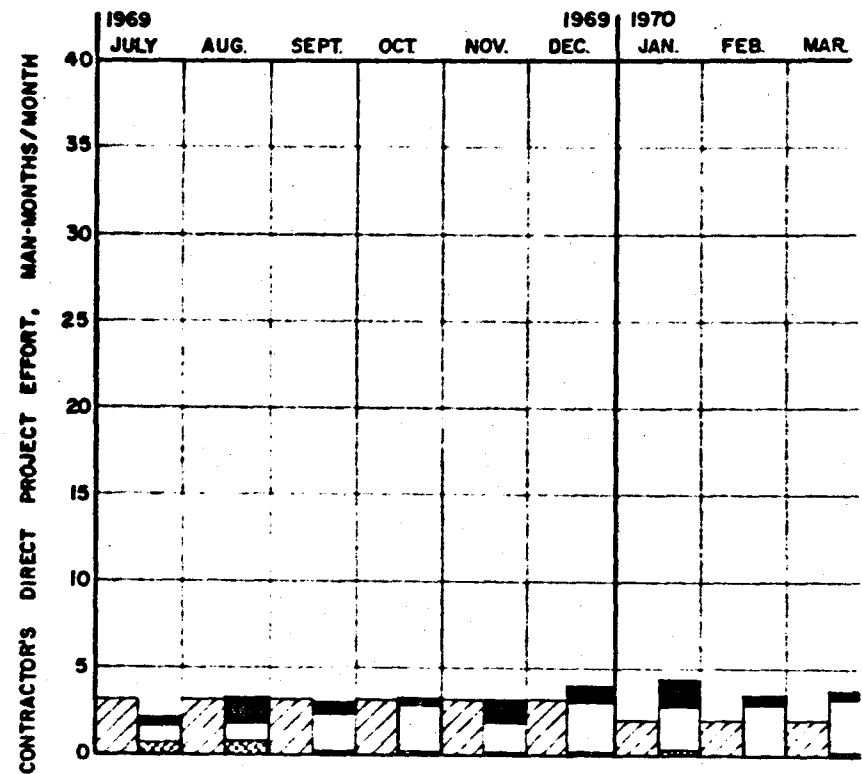
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MONTHLY PROGRESS CHART

OFFICE OF COAL RESEARCH
 U.S. DEPARTMENT OF THE INTERIOR

CONSOLIDATION COAL CO.
 RESEARCH DIVISION LIBRARY, PA.

CONTRACT NO. 14-01-0001-415 (3)



MONTHLY EXPENDITURES*

	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.
PREDICTED	6,215	14,685	14,965	13,155	14,385	17,065	15,585	15,595	12,655
ACTUAL	11,745	34,724	9,679	11,925	10,130	15,205	14,378	14,027	15,019

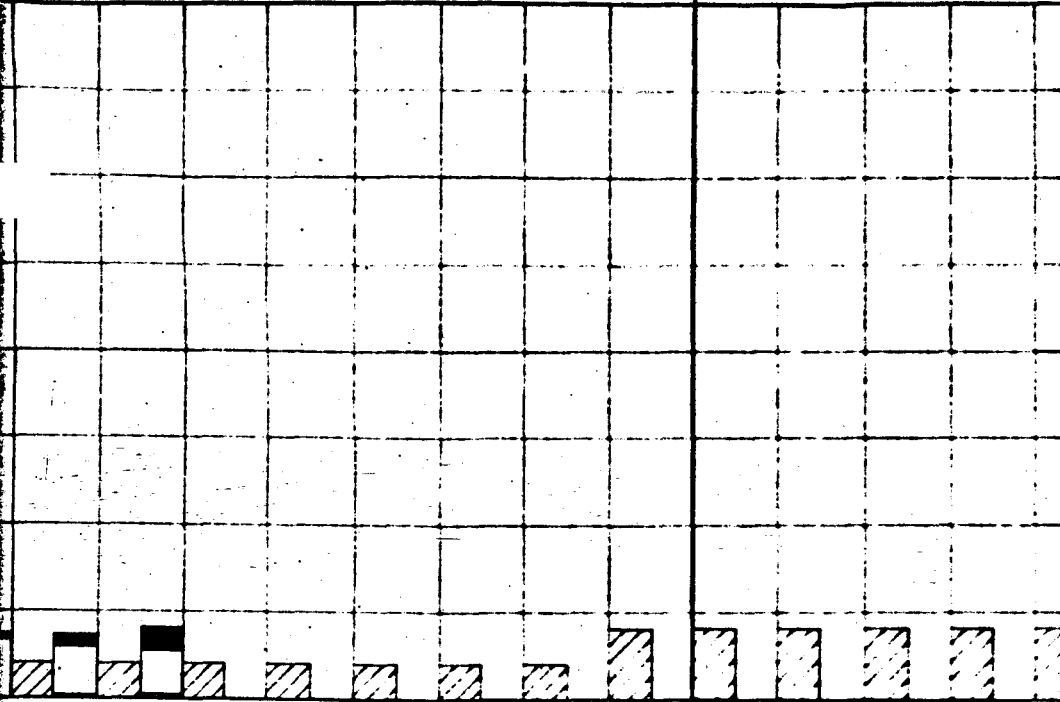
CUMULATIVE EXPENDITURES*

	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.
PREDICTED	16,215	30,900	45,865	59,020	73,405	90,470	106,055	121,650	134,305
ACTUAL	11,745	46,479	56,098	67,913	78,043	93,248	107,626	121,653	136,672

* Expenditures Include All Costs & Fees

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MAY JUNE JULY AUG. SEPT. OCT. NOV. 1970 DEC. 1971 JAN. FEB. MAR. APR. M



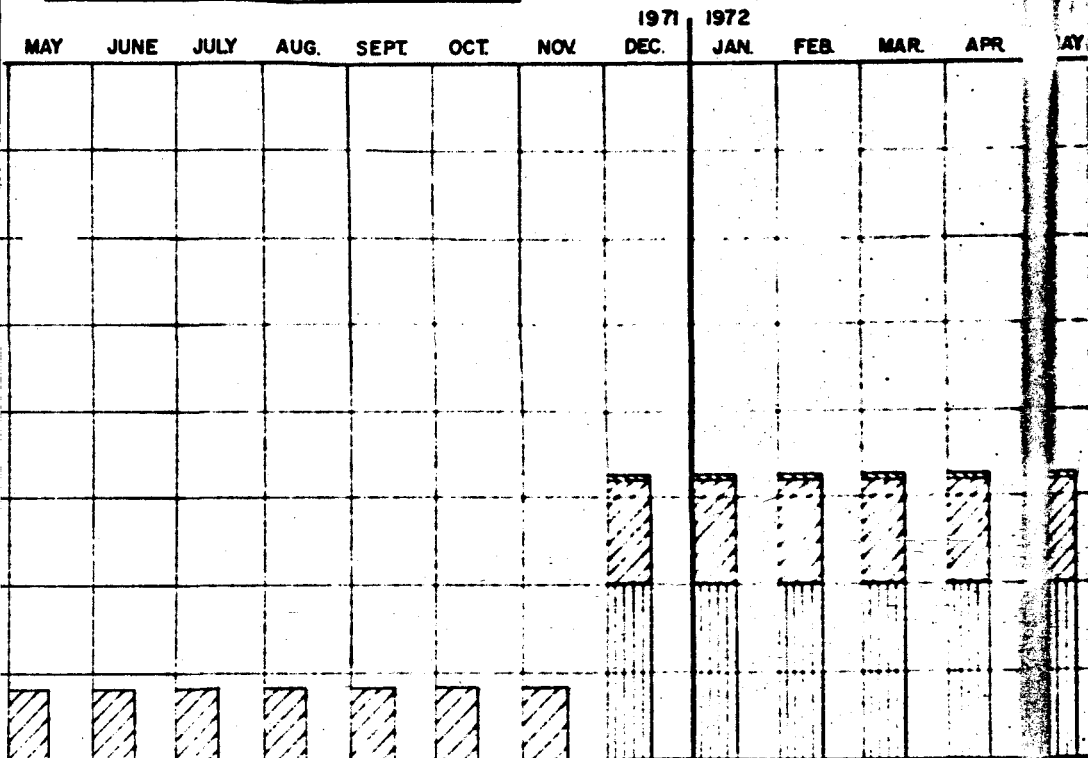
13,815	12,655	13,315	12,835	12,505	12,505	12,505	20,155	20,135	23,295	22,295	2,45
17,342	18,000										
MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
160,995	173,650	196,965	199,800	212,305	224,810	237,315	257,470	277,605	300,900	323,195	44,540
207,242	225,242										

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MONTHLY PROGRESS CHART (SUPERVISOR)

CONTRACT No. 14-01-0001-415 (3)

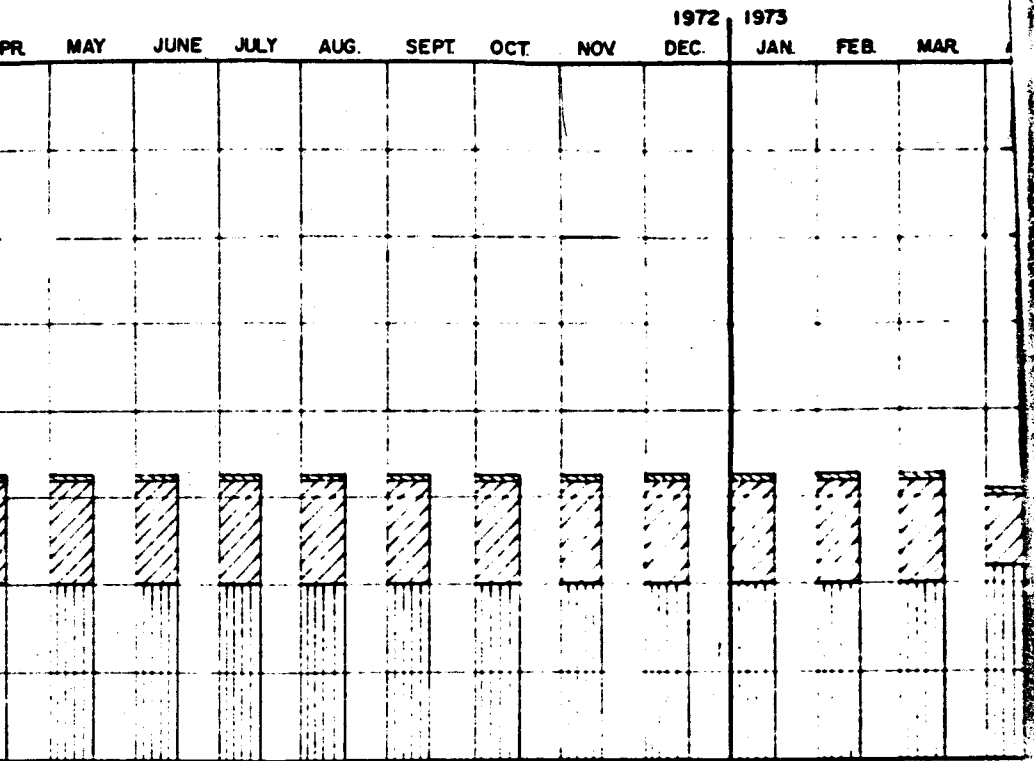


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MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY
18,705	15,955	14,875	14,875	14,875	14,875	14,875	39,475	39,475	39,475	39,475	39,475	39,475
363,044	579,000	393,875	408,750	423,625	438,500	453,375	492,850	532,325	571,800	611,275	650,750	690,225

3

ION & LAB WORK)



39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475
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APR	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
39,475	630,225	729,700	769,175	808,650	848,125	887,600	927,075	966,550	1,006,025	1,045,500	1,084,975	1,124,450

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(New 415 Chart)

DATE June 1970

1973

	PREDICTED	ACTUAL
SUPERVISING		
PROFESSIONAL		
TECHNICIAN		

- Includes Supervisory Exempt Technicians.
- Includes Clerical.

MONTHLY PROGRESS CHART

OFFICE OF COAL RESEARCH
DEPARTMENT OF THE INTERIOR

CONSOLIDATION COAL CO.
RESEARCH DIVISION LIBRARY, PA.

CONTRACT No. 14-01-0001-415 (3)

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CADC-MFR--74

PROGRESS REPORT NO. 74
OCR CONTRACT NO. 14-01-0001-415(3)
CONSOL. LIGNITE GASIFICATION PROCESS DEVELOPMENT

July 1 to 31, 1970

A. Summary

Phase I - Feasibility Study

Complete.

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

Field work at Rapid City is approximately four-five weeks behind schedule as a result of delays in structural steel deliveries. The projected completion date of the project is still May, 1971.

As a result of a directive from the State of South Dakota Water Pollution Authority, a revision in the pilot plant disposal system for sewage and effluent liquid streams may be required. A meeting with state and municipal officials is scheduled for August 3 to review the effluent stream compositions and to obtain agreement on a proposed plan of handling these materials.

The estimated GMP for the construction is \$8,797,432; this is an increase of approximately \$44,000 over the corresponding figure presented in the June report. This projected increase is largely associated with the estimated cost of revisions to the liquid disposal system.

Financial

Estimated expenditures in June were \$700,600 by Stearns and \$18,000 by Consol. Cumulative total project expense is \$4,196,017.

B. Technical Results and Program

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

1. Supporting Process and Economic Analysis (Project No. 533)

Work was initiated on the preparation of two papers on the CO₂ Acceptor Process; one at the Chicago ACS Meeting on September 13, and one at the Denver AIChE Meeting on September 1-2.

2. Supporting Patent and Legal Activities (Project No. 534)

The current reports and memoranda were reviewed for Subject Inventions.

3. Consol Assistance on Construction of Lignite Pilot Plant (Project No. 536)

Consol continued to monitor S-R effort with representatives at the Denver offices and in Rapid City. Vendor quotations were reviewed to establish conformity to specifications and flow sheets. Mechanical flow sheets were formally approved.

A prototype of the pilot plant solids slide valve was tested hot and under pressure at Library. The valve performed successfully although changes were incorporated in the design to improve the internal insulation.

The design of an experimental program for Rapid City was prepared and submitted to Stearns to facilitate their planning regarding the 1971 operating program. A computer program was prepared and "debugged" which represents a mathematical model of the pilot plant. This will be utilized in connection with the planning of specific pilot plant operations and the interpretation of results.

The State of South Dakota has advised that sewage and plant liquid effluents at the pilot plant must be disposed of via the Rapid City municipal sewage plant. This is contrary to the plans previously approved by the Rapid City officials which involved sewage disposal in an on-site treatment plant and other liquid effluents discharging to nearby surface streams after treatment. Laboratory and engineering effort was completed to define the composition of the plant liquid wastes and to establish their

apparent suitability for inclusion in the feed to a sewage disposal plant. A meeting to obtain approval of both State and municipal officials on the revised disposal plan is scheduled for August 3.

4. Stearns-Roger Subcontract (Project 700)

The progress report by Stearns is attached. A current delay of four-five weeks in field effort is indicated as a result of delays in obtaining structural steel. Projected plant completion date is still early May, 1971 per Stearns' master plan. Delivery and installation of furnaces and incoloy piping represent the critical path.

The projected GMP is \$8,786,432 as per the Stearns-Roger statement; addition of the numbers presented gives a figure of \$8,797,432. This represents an increase of \$44,175 over the corrected GMP presented in the June report resulting from:

C.O. 54 - reestimate	\$ - 4,920
C.O. 55 - increased due to revisions in disposal systems	+ 46,295
C.O. 64 - new change order	+ 2,800
	\$ 44,175

The validity of the increase in C.O. 55 has not been examined.

Work in finalizing the change orders for approval is delayed at Stearns. The debate over the proper calculation of the change orders associated with expansion joints (C.O. 17), hot valves and piping (C.O. 37, 43) and reactors (C.O. 26) has not been resolved.

C. Subject Inventions

None.

Lignite Gasificat. +
Progress Report No. 74

-4-

July, 1970

D. Financial Status

<u>Expense</u>	<u>Actual</u>	<u>Budget</u>
<u>Cumulative through June, 1970</u>		
Through June, 1969	\$ 1,878,256	\$ 1,878,256
Consol	226,561	173,650
Stearns-Roger	<u>1,372,600</u>	<u>2,970,600</u>
Total through June, 1970	\$ 3,477,417	\$ 5,022,506
<u>Expended in Period</u>		
Consol	\$ 18,000	\$ 13,315
Stearns	<u>700,600</u>	<u>891,100</u>
Cumulative through July, 1970	\$ 4,196,017	\$ 5,926,921

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
August 4, 1970

PROJECT REPORT SUMMARY

Engineering work now in progress includes detail drafting and checking. Instruments and routine piping and structural items are being purchased. Building and structural work by subcontractors is 4-5 weeks behind schedule due to late additions which delayed steel design work. Delivery promises for critical material items, such as the Incoloy furnace tubes and piping, and the resulting project completion date remain unchanged.

ENGINEERINGProcess

Summaries for the gaseous, solids and liquid waste streams have been sent to Consol. The South Dakota State Board of Health wants Consol to arrange for extension of about 4,000 lineal feet of city sewer line to the plant, and then to discharge both chemical and sanitary sewage wastes to this sewer. Consol will discuss this problem with state officials in Rapid City during the week of August 3.

Mechanical

Lack of complete vendor drawings is holding up final checking of piping drawings for the fired heaters. A design engineer will go to the Thermal Transfer home office this week to expedite and approve vendor drawings. For further details on materials, refer to Material Status Report No. 10 to be issued on August 10. Of the 142 major equipment items, only the two thermal oxidizer feed pumps remain to be purchased.

Drafting - - - Approximately 80% complete

Isometric piping drawings are about 45% complete. There is a total of about 800 isometric drawings; 132 have been issued and about 250 are ready for checking. Isometric drawings should be complete by September 11. Work force is eight draftsmen. Consol has authorized design and engineering for 43 additional sample connections.

Structural drafting is about 90% complete. Critical work in progress is the detail design for the medium weight miscellaneous structural steel supports for equipment. About 80% of the work on these is complete; the checking and issue are scheduled to be complete by August 10. Major foundation drawings have been issued. Anchor bolt locations for foundations in the structure will be added to issued drawings by August 14.

T: 8/14/70

Att. - Stearns-Roger Progress Report
Monthly Progress Charts

PROJECT STATUS REPORT

Page 2 of 2

CONSOLIDATION COAL COMPANY
CSC PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
August 4, 1970

Drafting (Continued)

Electrical drafting is about 85% complete. Work of two men continues on schematic diagrams, detail design of local control panels, checking instrument vendor drawings and evaluation of subcontractor work estimates.

Instrumentation - - - About 90% complete

Pressure switches, level switches and pressure gauges are on inquiry. Flow switches, thermocouples and thermowells have been recommended to Consol.

Purchase requisitions for instruments are about 70% complete.

PROJECT ENGINEERING

The diagram schedule attached to this report has been updated to show completed and unfinished work separated by the decorative line. Detailed, time oriented schedule as monitored by computer was issued on July 29.

Recommendation for the aboveground portion of the sprinkler system went to Consol August 3. Bids for erection of the last 680 tons of structural steel are due August 7.

CONSTRUCTION

Underground piping is about 90% complete. Fire hydrants held up by truckers' strike are installed. Building and concrete subcontractor, about 50% complete, has completed masonry work in the office and laboratory areas. Heating, ventilating and painting is in progress. Masonry and rough plumbing continues in the maintenance and utilities areas. Concrete work for the cooling tower and car thawing area is about 60% complete. About 250 tons of heavy structural steel for the first three levels of the process structure have been erected. Gas company has run supply line to the meter house.

D. H. Dawson
D. H. Dawson
Project Manager

Attachments: Summary of Project Changes - 2 pages
Progress Chart, 7-31-70

Distribution:

<u>Consol - 5</u>	<u>Continental Oil Company - 6</u>	<u>Stearns-Roger - 7</u>	
C. A. Schulz	E. E. Ellington, CED D. F. Wegner, Field L. Thompson, MED	J. B. Hambleton, CED G. E. Fagerburg, CED Dr. C. V. Foster, PED	FCP/HFD/GMS/TCS/FILE CFL/JTM/VLB/HAB/JCM ALC, FAN/JAP, DHD WEPowell, Field

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSC PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
August 4, 1970

SUMMARY OF PROJECT CHANGES

<u>Approved Change Orders</u>	<u>Increase</u>	<u>Decrease</u>
1. Reactor System Study	\$ 8,820	
5. Delete roof at heaters		15,600
7. Incr. Disch. Pressure Prehtr compr	4,315	
11. Delete Fuel Gas Booster Blower		8,670
13. Revise Canteen to Fallout Shelter	4,770	
14. Perspective Drawing for OCR	780	
16. Revise Hammermill specs	725	
18. Delete Car Puller		17,200
19. Revise Fire System per F. Mutual	11,970	
20. Frt. Elev. vs. Manlift & Hoist	6,180	
21. Study reactor offgas prequench	2,110	
23. Incr. Size F-509; add vent line to flare	15,735	
24. Subs. Goulds for Aurora J-314	225	
28. Delete Car Thaw Pit		5,395
33. Water Service to Site	2,430	
34. Revision to conform with Uniform Bldg Code	3,390	
35. Upgrade quality & incr. wall htr tubes	33,910	
38. Revise Sanitary Disp. System	18,820	
44. Revise Reactor System Auxiliary Vessels		22,000
47. Delete C-206		995
52. Stress relieve F-314	685	
	<u>Original Maximum Price</u>	<u>\$8,465,129</u>
	<u>Presently Approved Total</u>	<u>\$8,510,134</u>

PROJECT STATUS REPORT

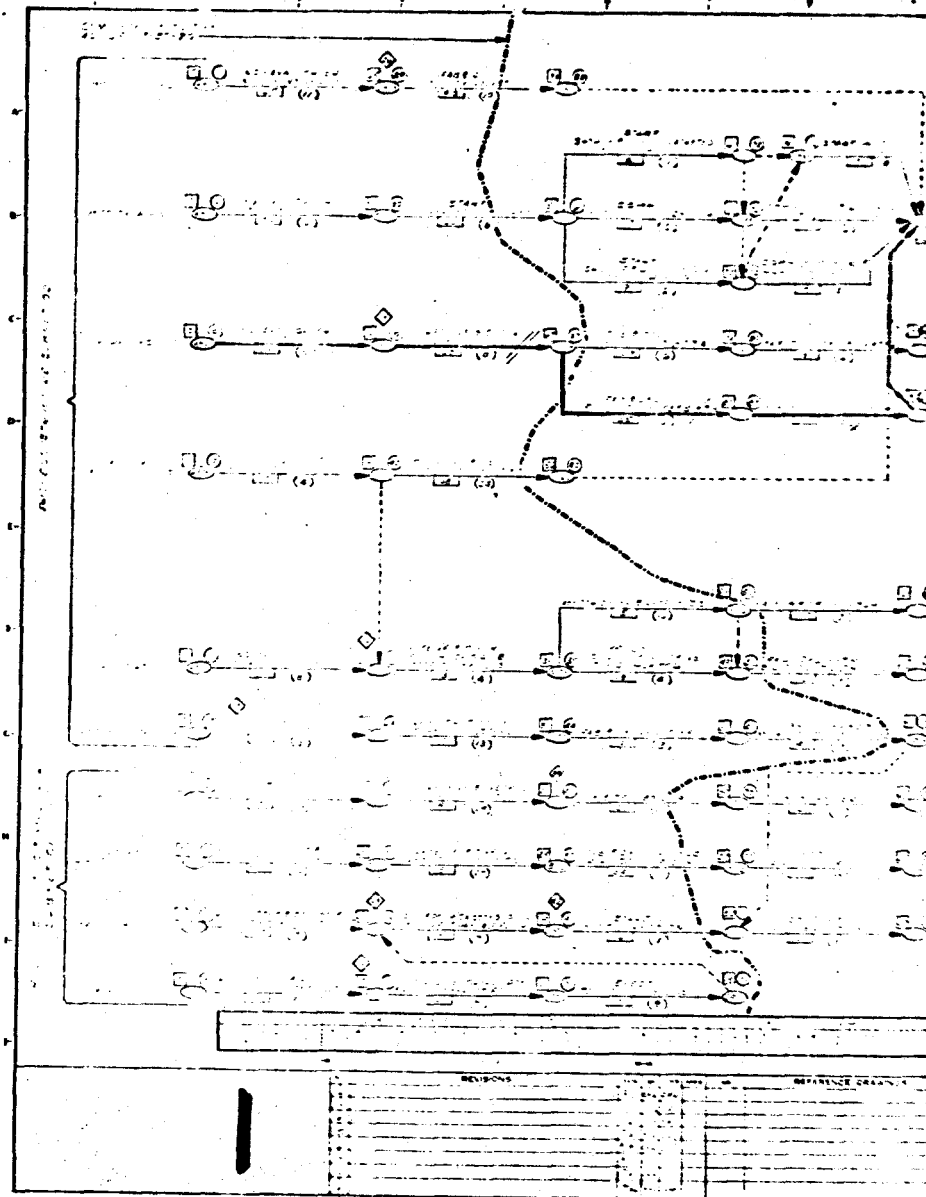
CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

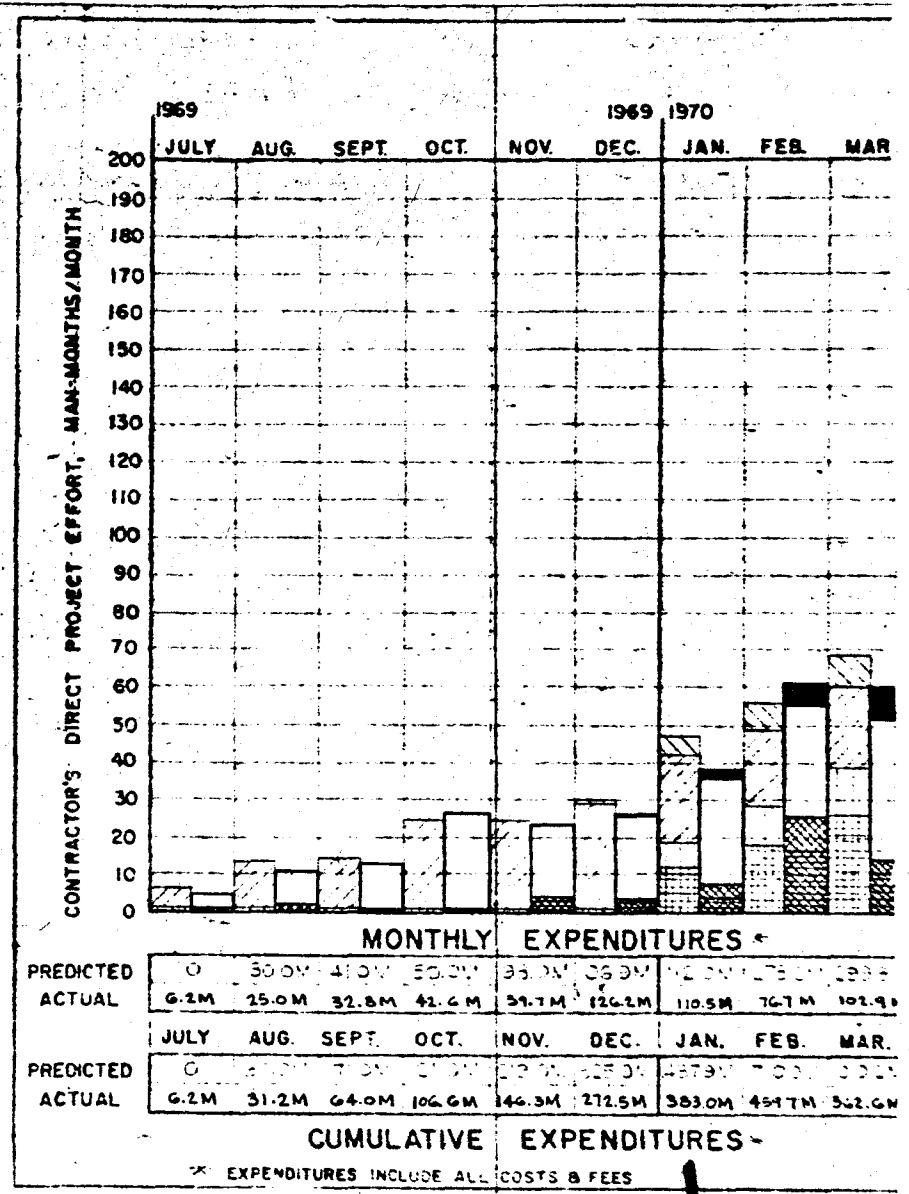
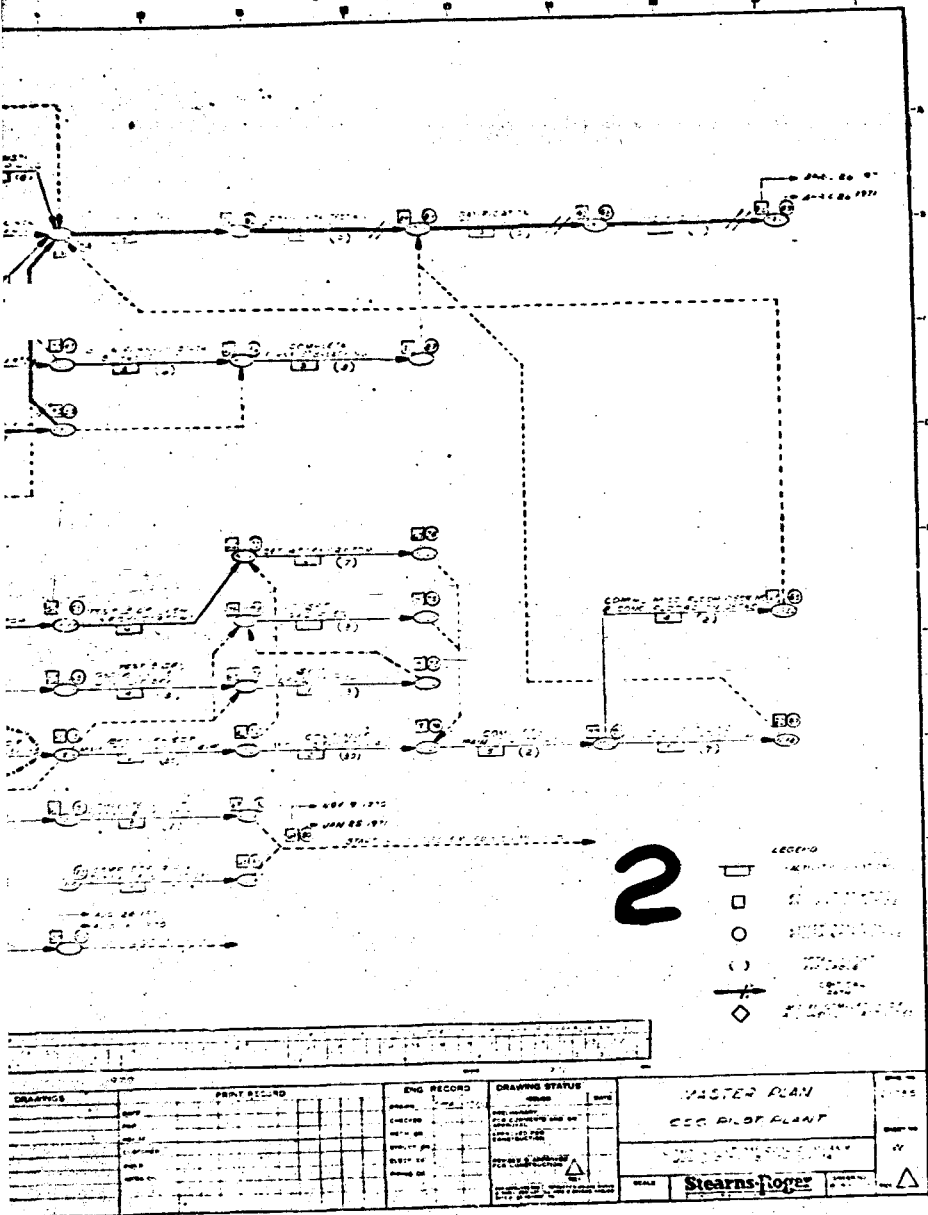
CCO Project No. 536
 S-R Job No. B-37000
 August 4, 1970

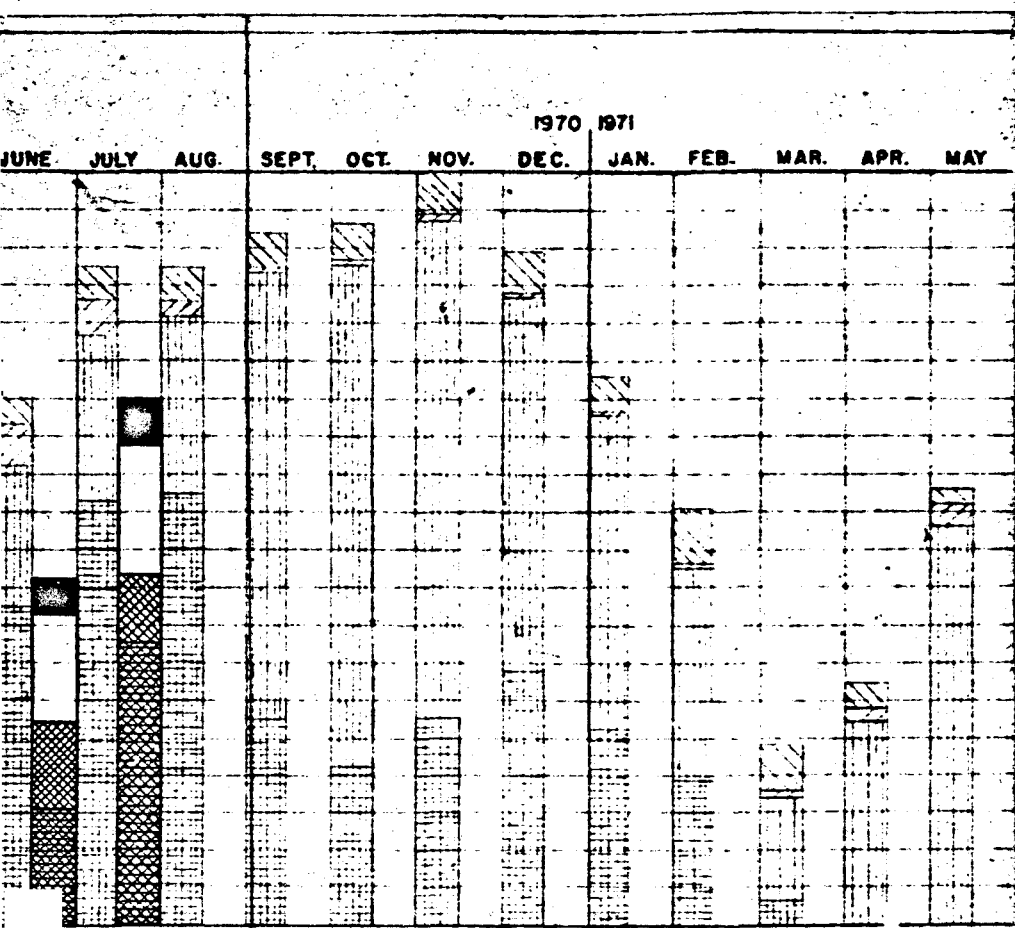
SUMMARY OF PROJECT CHANGES

Pending Change Notices and
Change Orders Awaiting Approval

	<u>Increase</u>	<u>Decrease</u>
8. Redesign Purge Gas Systems	\$ 67,860	
9. Add Instr. & Duct, Lignite crush & grind	35,300	
10. Boiler controls, 2 element pneu type	1,470	
17. Redesign Expansion Joints		229,169
22. Utilize Surplus Forklift & Tote Bins		11,000
26. Redesign Reactors		36,000
29. Revise Htr controls & FSD System	28,000	
32. Incr. Capacity IG System	41,431	
36. Miscellaneous Instrument Changes		6,385
37. Revise design & Decr. quan hot valves		155,000
39. Revise Waste System	16,950	
40. Accum Costs for future transfer to Oper. Contract B-37400	125,000	
41. Revise Solids Handling	55,000	
42. Misc. Changes in Pipe Specs, Sizes, deletions & additions	36,000	
43. Revise hot piping		40,000
45. Revise Misc. Reactor Internals	2,200	
46. Revise Jacket Water Piping System	50,600	
49. Revise Flare System		23,970
50. Add'l htg & vent'lg elect. room, proc structure & solids handling bldg	16,300	
51. Revise 1st floor layout Proc. Structure	10,255	
53. Revise gas quench syst. metalg. des.	170,476	
54. Redesign dolomite & lignite silos	8,080	
55. Revise Lig. Waste Disp.	200,000	
56. Add facil to pull Exch bundle	5,000	
57. Add'l Heat Trace & Ins.	11,000	
58. Add two doors Maint-Proc Area	1,000	
59. Revise Elect Classif-Proc. Struct	4,009	
60. Subs Gas Turbine Mtr for Densitometer	5,500	
61. Incr. capacity Emer. Generator & Switch	2,300	
62. Add acid storage Tank @ Cooling Tr	8,400	
63. Revise boiler burners & controls	7,000	
64. Add 2 clrs; enrg for 43 sample coun.	2,800	
Net Pending Changes	\$ 401,298	
Estimated Total	\$8,911,432	
40. Future transfer of 1970 charges applicable to Operating Contract B-37400		125,000
Construction Costs only, Estimated Total		\$8,786,432







891.1M 1902.0M 591.1M 191.1M 591.1M 591.1M 237.5M 109.7M 93.5M 181.3M 165.3M

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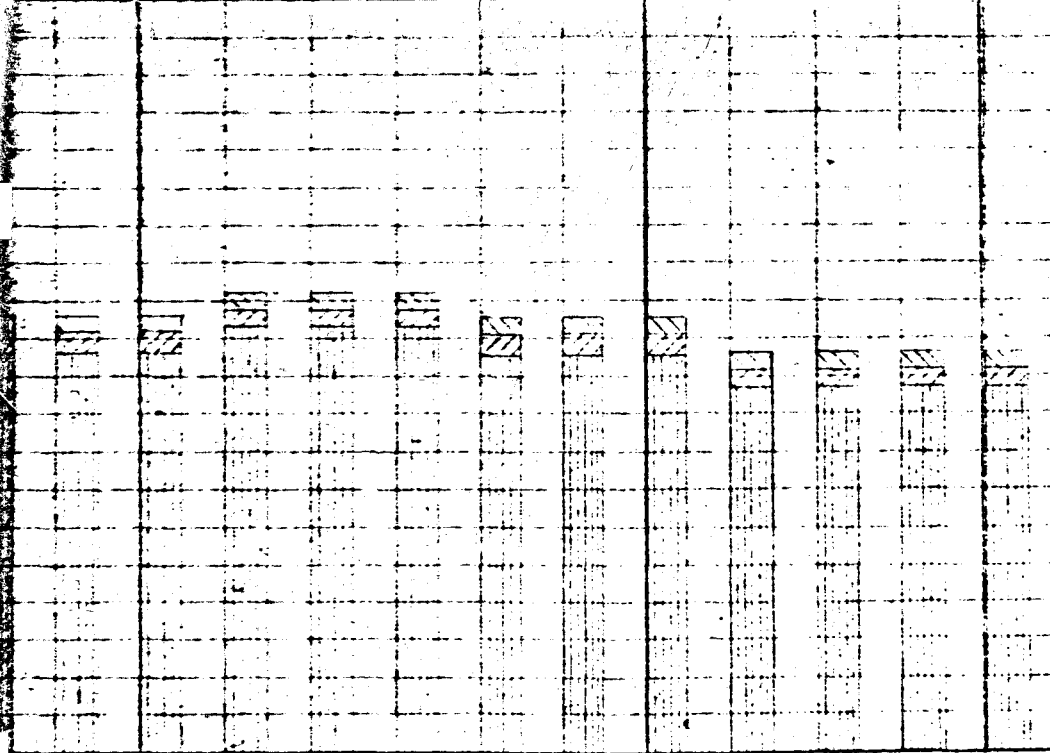
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MONTHLY PROGRESS CHART (CON)

CONTRACT NO. 14-G-0001-415 (3)

1971 1972

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36 25 7M 165 5M 205 7 205 0M 209 1M 201 0M 20 5M 205 0M 175 1M 174 5M 91 7M 08 9M
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55 2M 20 10 2M 0 12 7M 33 90 5 7 32 0 5 13 5 0 7 9M 00 0 2 3M 00 0 5M 10 4 3 5M 0 5 5 0 0M 0 0 0 4 1M 0 0 7 1M 0 0 0 0

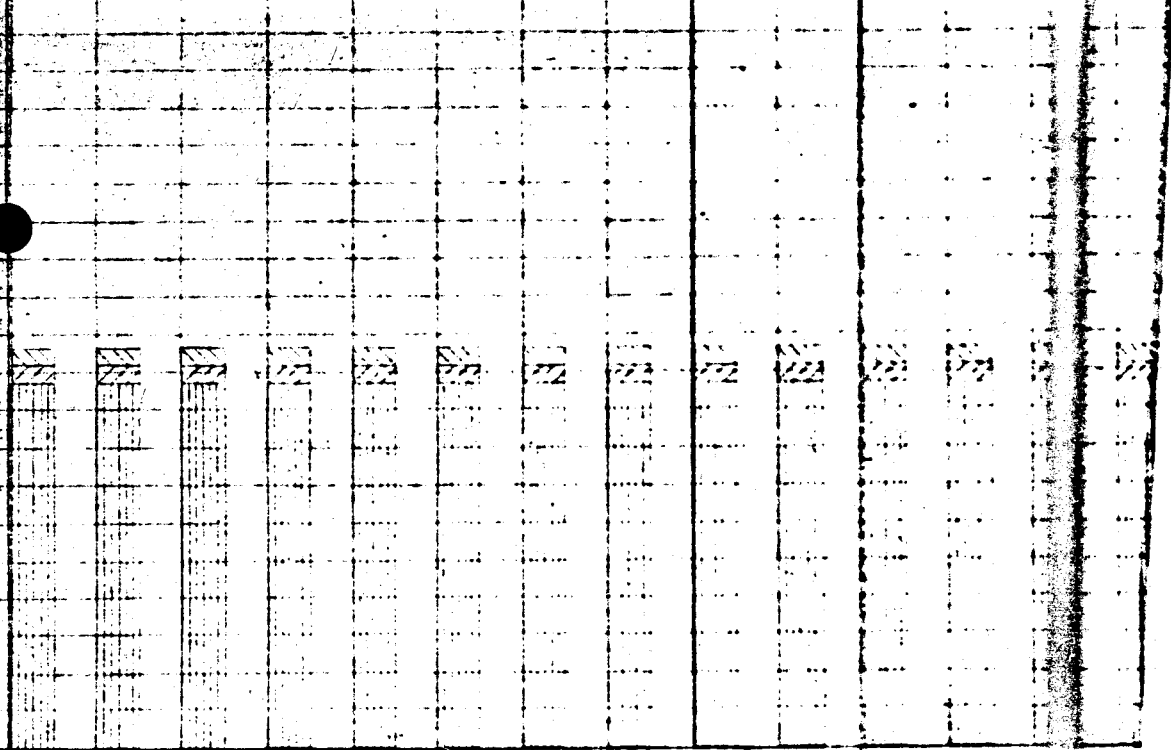
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CONSTRUCTION & OPERATION)

DATE: July 1970

1972 1973

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1973											
APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.			
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DATE: *July 1970*

- PREDIC
- SUPERVISING
 - PROFESSIONAL
 - TECHNICIAN S/R
 - TECHNICIAN S/C

- INCLUDES SUPERVISOR
- INCLUDES CLERICAL

CONSTRUCTION — STEARN
 OPERATIONS — STEARN

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67.5M	67.5M	120.5M	120.5M								
APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.			
60.4M	330.6M	440.4M	602.5M	673.5M							

MONTHLY
 OFFICE
 U.S. DEPARTMENT OF
 CONSOLIDATED
 RESEARCH DIVISION
 CONTRACT

5

DATE: July 1970

1973

OCT. NOV. DEC.

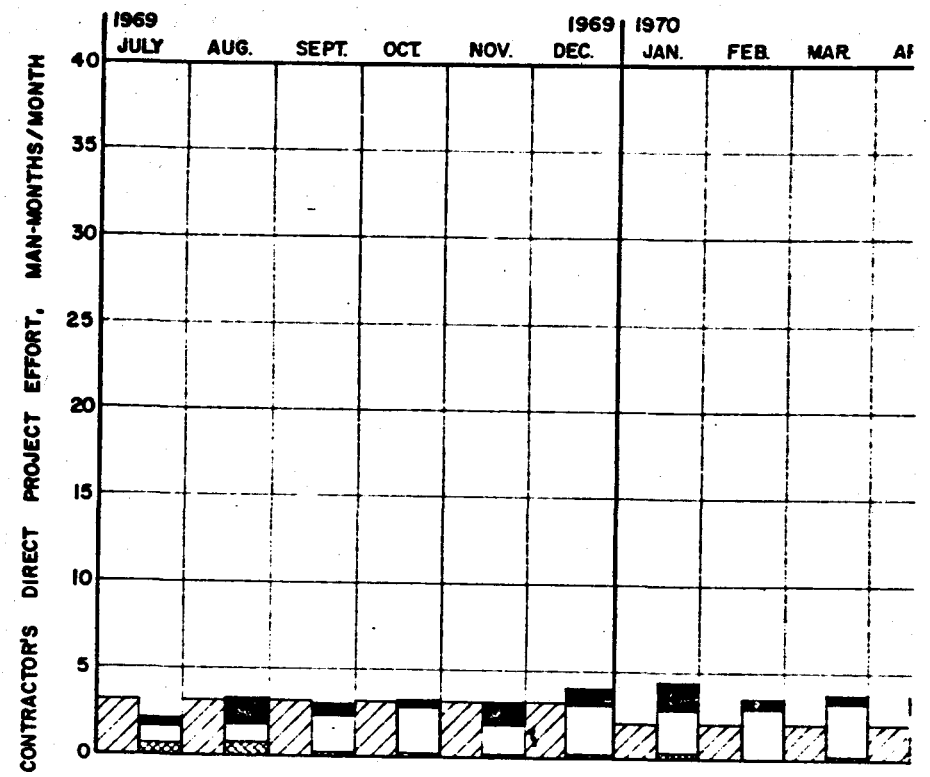
	PREDICTED	ACTUAL
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TECHNICIAN S-R		
TECHNICIAN S/C		

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 ⊙ INCLUDES CLERICAL

CONSTRUCTION — STEARNS-ROGER JOB B-37000
 OPERATIONS — STEARNS-ROGER JOB B-37400

MONTHLY PROGRESS CHART
 OFFICE OF COAL RESEARCH
 U.S. DEPARTMENT OF THE INTERIOR
CONSOLIDATION COAL CO.
 RESEARCH DIVISION LIBRARY, PA.
6
 CONTRACT NO. 14-01-0001-415 (3)

OCT. NOV. DEC.



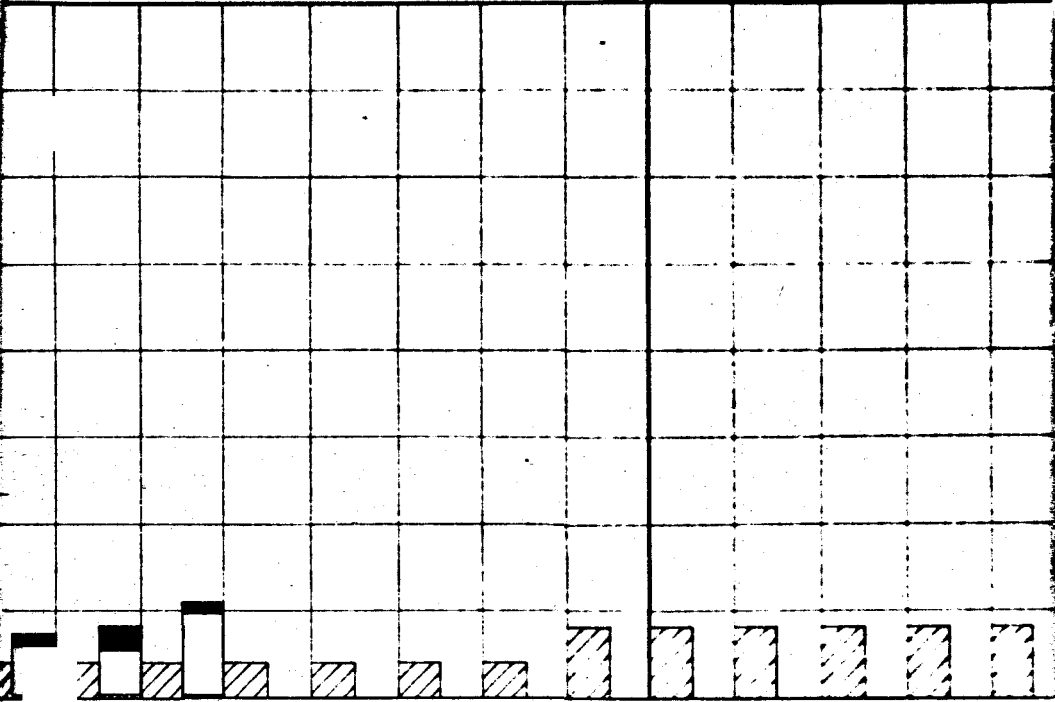
		MONTHLY EXPENDITURES*										
		1969	1969					1970				
		JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	
PREDICTED		16,215	14,685	14,965	13,155	14,385	17,065	15,595	15,595	12,655	12,815	
ACTUAL		11,745	34,734	9,609	11,825	10,130	15,205	14,378	14,027	15,019	53,215	
PREDICTED		16,215	30,900	45,865	59,020	73,405	90,470	106,055	121,650	134,305	147,120	
ACTUAL		11,745	46,479	56,088	67,913	78,043	93,249	107,626	121,653	136,672	89,905	

CUMULATIVE EXPENDITURES*

* Expenditures Include All Costs & Fees

MONTH

1970 1971
 DEC. JAN. FEB. MAR. APR. MAY
 JUNE JULY AUG. SEPT. OCT. NOV.



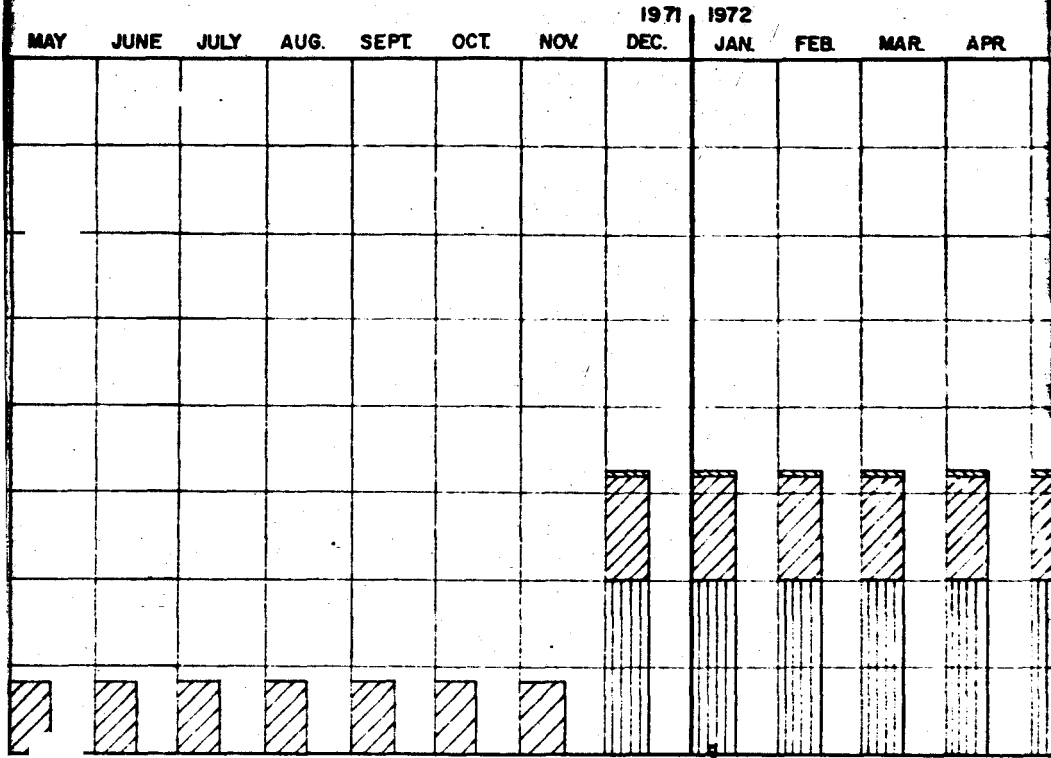
1,815	12,655	13,315	12,835	12,505	12,505	12,505	20,155	20,155	23,295	22,295	21,145	4,700
2,342	19,319	18,000										
1,905	173,650	186,965	199,800	212,305	224,810	237,315	257,470	277,605	300,900	323,195	344,340	363,040
2,242	226,561	244,561										

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MONTHLY PROGRESS CHART (SUPERVISION)

CONTRACT No. 14-01-0001-415 (3)

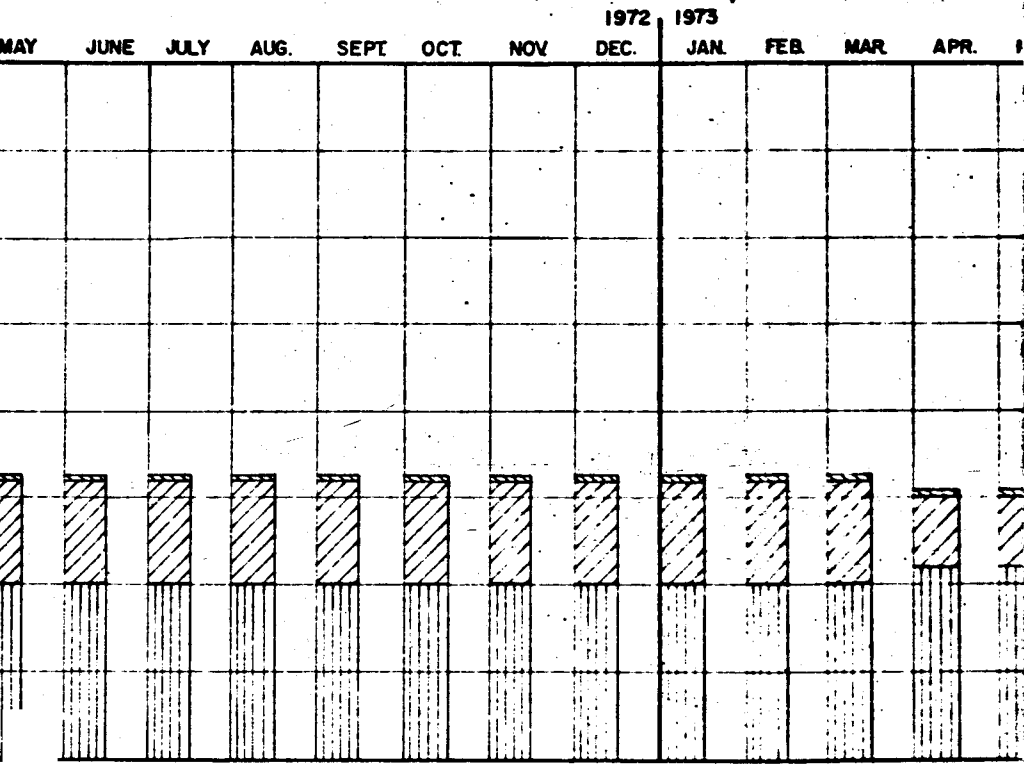


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18,705	15,955	14,875	14,875	14,875	14,875	14,875	39,475	39,475	39,475	39,475	39,475
MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
363,045	379,000	393,875	408,750	423,625	438,500	453,375	492,850	532,325	571,800	611,275	650,750

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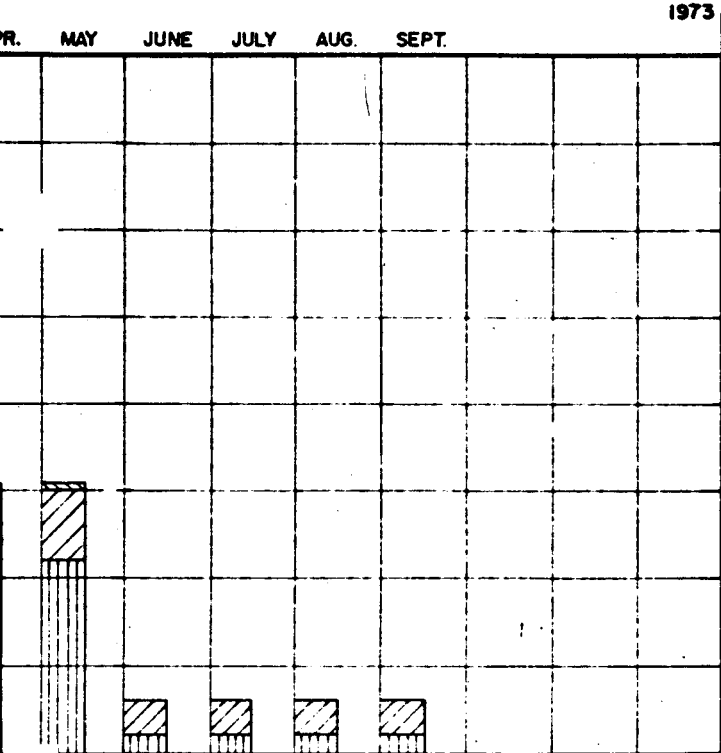
39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	36,075
MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
90,225	729,700	769,175	808,650	848,125	887,600	927,075	966,550	1,006,025	1,045,500	1,084,975	1,124,450

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VISION
No. 1

DATE: July 1973



1973

PREDICT

SUPERVISING

PROFESSIONAL

TECHNICIAN

⊕ Includes Supervis

⊗ Includes Clerical

APR.	MAY	JUNE	JULY	AUG.	SEPT.
75	56,075	11,475	11,475	11,475	41,120

MONTHLY

OFFICE DEPARTM

CONSOL RESEARCH DIV

CONTRACT

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(New 415 Chart)

DATE: July 1970

1973

	PREDICTED	ACTUAL
SUPERVISING		
PROFESSIONAL		
TECHNICIAN		

⊛ Includes Supervisory Exempt Technicians.
 ⊛⊛ Includes Clerical.

SEPT.			

1,120			
SEPT.			
32,670			

6

MONTHLY PROGRESS CHART
 OFFICE OF COAL RESEARCH
 DEPARTMENT OF THE INTERIOR
CONSOLIDATION COAL CO.
 RESEARCH DIVISION LIBRARY, PA.
 CONTRACT No. 14-01-0001-415 (3)

PROGRESS REPORT NO. 75
 OCR CONTRACT NO. 14-01-0001-415(3)
CONSOL LIGNITE GASIFICATION PROCESS DEVELOPMENT

August 1 to 31, 1970

A. Summary

Phase I - Feasibility Study

Complete.

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

Field work at Rapid City continues to be four to five weeks behind schedule. The office building will be ready for occupancy in early October, utilizing temporary power. Sanitary facilities for the building will not be available until perhaps December. Projected completion date for the project is still May, 1971.

Approval has been obtained from State and City authorities for the revised pilot plant liquid effluent disposal system, and plans are proceeding along this line. Mr. Marwig of Consol and Messrs. Lawless, Johnson and Powell of S-R have moved to Rapid City. Concentrated effort on the preparation of operating manuals can therefore be initiated.

The attached Stearns-Roger's progress report projects an increase in the GMP of about \$440,000. Consol believes this is substantially in error, but has no basis at the present time for examining the details of the figures presented. The progress in processing change orders to the point where they can be submitted to OCR for examination is very poor, and a meeting of appropriate Stearns-Roger and Consol officials is planned in the near future to resolve this problem.

Financial

Estimated expenditures in July were \$725,200 by Stearns and \$22,000 by Consol. Cumulative total project expense is \$4,809,271.

B. Technical Results and Program

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

1. Supporting Process and Economic Analysis (Project No. 533)

Papers were finalized for presentation at the Chicago ACS Meeting on September 13 and at the Denver AIChE Meeting on September 1-2.

2. Supporting Patent and Legal Activities (Project No. 534)

The current reports and memoranda were reviewed for Subject Inventions.

3. Consol Assistance on Construction of Lignite Pilot Plant (Project No. 536)

Consol representatives continued to monitor Stearns-Roger effort at the Denver offices and in Rapid City. Expediting trips were undertaken to assure the schedule of structural steel delivery which was critical. Other inspection trips were made to vessel fabricators.

Meetings were held with representatives of the State of South Dakota and the City of Rapid City to obtain approval of a revised disposal scheme to handle the pilot plant process waste and sewage. The revised system involves the clarification and treatment of process waste streams, which are then sent to the city sewer system along with untreated sanitary waste. This system was approved by all of the pertinent authorities.

The gaseous pilot plant effluents were defined and are believed to be in compliance with Federal regulations. A definition of the composition of these effluents was forwarded to OCR for review.

Mr. Marwig moved to Rapid City (in advance of the school year) to initiate work with Stearns-Roger representatives on the preparation of pilot plant operating manuals.

A considerable amount of time has been spent examining change orders presented by Stearns. These change orders have not been finalized because of inadequate documentation and because of improper classification of certain work as part of change orders, in Consol's opinion.

4. Stearns-Roger Subcontract (Project No. 700)

The project report by Stearns is attached. Completion of the process structure and office building continues to be four to five weeks behind schedule; however, the target completion date (May, 1971) remains unchanged on the Stearns' master plan.

According to the S-R August report (after correction of arithmetic errors), the projected GMP is \$9,237,970 which is an increase of about \$440,000 over last month's figure (also after correction for arithmetic errors). By comparison of the project change notice tabulation in the July and August S-R reports, the increase arises as follows:

Reestimate of Previous Changes

Change Order Number	Item	July Estimate	August Estimate	Difference
26	Redesign Reactors	\$ - 34,000	\$ + 6,180	\$ 40,180
36	Misc. Instrument Changes	- 6,385	+ 13,010	19,395
41	Revised Solids Handling	+ 55,000	+113,090	58,090
45	Revised Reactor Internals	+ 2,200	+ 41,350	39,150
55	Revised Lignite Waste Disposal	+200,000	+292,010	92,010
57	Heat Tracing & Insulation	+ 11,000	+126,360	115,360
	Cumulative Other Additions	--	23,265	23,265
		\$ 227,815	\$ 615,265	\$ 387,450

New Change Orders

65	Additional Expansion Joints	--	\$ 42,320
66	Windbreak and Heaters	--	1,000
68	Eng'g Drafting - Flow Diagrams	--	4,000
69	Supporting Hangers	--	3,390
70	Emergency Power, Elevator	--	2,000
			\$ 52,710

Consol has no basis for verification of the above-indicated dollar volume for change orders at the present time. All of the change orders shown to be received by Consol on June 12 and August 14 (pages 2 and 3 of the S-R tabulation) have been rejected because of inadequate documentation, errors, or unjustifiable charges. (The single exception is Change Order No. 10 which was recently accepted in the amount of \$1,470.) It is also noted that S-R has not revised their method of calculation of savings in connection with Change Orders No. 17, 37, 43, and 26, as was recently agreed upon in Denver.

A meeting with appropriate Stearns-Roger officials to straighten out the change order situation is planned in the near future.

August, 1970

C. Subject Inventions

None.

D. Financial Status

<u>Expense</u>	<u>Actual</u>	<u>Budget</u>
<u>Cumulative through July, 1970</u>		
Through June, 1969	\$ 1,878,256	\$ 1,878,256
Consol	248,815	186,965
Stearns-Roger	<u>1,629,441</u>	<u>3,772,600</u>
	\$ 4,062,071	\$ 5,837,821
<u>Expended in Period (estimate)</u>		
Consol	\$ 22,000	\$ 12,835
Stearns-Roger	<u>725,200</u>	<u>891,100</u>
	\$ 747,200	\$ 903,935
Cumulative through August, 1970	4,809,271	6,741,756

Att. - Stearns Roger Construction and Operation Progress Reports
Monthly Progress Charts
T: 9/15/70

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
September 2, 1970

PROJECT REPORT SUMMARY

Engineering work now in progress includes detail drafting and checking instruments and routine piping and structural items are being purchased. Delivery promises for critical material items, such as the Incoloy furnace tubes and piping, and the resulting project completion date remain unchanged.

ENGINEERING

Process

Two possible routes for extending the city sewer line to the plant are under consideration by Consol. A decision will be made soon as to which route will be acceptable. Engineering will proceed as soon as a decision is reached.

Mechanics

Major equipment is all purchased.

For further details on delivery of equipment refer to Material Status Report No. 11 which will be issued on about September 10.

Drafting - - - Approximately 85% complete

Isometric piping drawings are about 66% drawn. Estimated total of isometric drawings is 850; 560 have been drawn; 267 have been issued; 79 have been checked but not issued; 214 are being checked or are ready for check. No steam-traced isometric drawings have been drawn or issued.

Structural drafting is 93% complete. Both drawings for the medium weight miscellaneous structural steel supports for equipment have been issued. All structural steel design work is scheduled to be complete by September 18.

Electrical drafting is 91% complete. Two men are continuing to check instrument vendor drawings and evaluation of subcontractor work estimates.

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

OCC Project No. 536
 S-R Job No. B-37000
 September 2, 1970

ENGINEERING - continued

Instrumentation - about 96% complete

Orders for pressure switches and pressure gauges for the Control Panel have been placed. Requotes or clarification of quotes have been requested for level switches, thermowells and thermocouples. Recommendation for purchase of pressure gauges has been submitted to Consol for approval. Currently, miscellaneous instruments and missed or added items are being inquired and ordered.

PROJECT ENGINEERING

The diagram schedule attached to this report has been updated to show completed and unfinished work separated by the decorative line. Detailed oriented schedule as monitored by computer was issued on August 28.

Recommendation for the miscellaneous structural steel erection has been submitted to Consol for approval. This is the last of the major sub-contracts except for painting and insulation.

Sprinkler subcontract has been awarded for Cooling Tower and Materials Handling Area.

CONSTRUCTION

Underground piping is complete. Underground electrical is 95% complete. Office and Laboratory Area is 97% complete. The concrete covered by the subcontract is 90% complete. Masonry, painting, heating, ventilating and air conditioning and plumbing in Office and Laboratory Area is 95% complete. Pump House walls are completely erected. Approximately 120 tons of fabricated steel are at the job and another 50 tons are enroute. Block and masonry work are complete in the Process Area through second floor and some work has been started above second floor. Railroad spur is essentially complete. Power company is installing permanent power. Gas company has installed the meter station. Telephone company is in the process of getting service to the office. Several pieces of major equipment have been placed over the bolts on the first floor.

D. H. Dawson
 D. H. Dawson
 Project Manager

Attachments: Summary of Project Changes - 3 pages
 Progress Chart, 9-2-70
 Master Plan Schedule

<u>Consol - 5</u>	<u>Continental Oil Company - 6</u>	<u>Stearns-Rover - 7</u>
C. A. Schulz	E. E. Ellington, CED D. F. Wegner, Field L. Thompson, MED	J. B. Hambleton, CED C. E. Fagerburg, CED Dr. C. V. Foster, PED
		FCP/HFD/CMS/FGS/FILE CFL/JTM/VLB/BAH/JC: ALC, FAN/JAP, DID WEPowell, Field

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

OCC Project No. 5
 S-R Job No. B-37C
 September 10, 1970

SUMMARY OF PROJECT CHANGES

<u>Approved Change Orders</u>	<u>Increase</u>	<u>Decrease</u>
1. Reactor System Study	\$ 8,820	
5. Delete roof at heaters		15,600
7. Incr. Disch. Pressure Prehtr compr	4,315	
11. Delete Fuel Gas Booster Blower		8,670
13. Revise Canteen to Fallout Shelter	4,770	
14. Perspective Drawing for OCR	780	
16. Revise Hammermill specs	725	
18. Delete Car Puller		17,200
19. Revise Fire System per F. Mutual	11,970	
20. Frt. Elev. vs. Manlift & Hoist	6,180	
21. Study reactor offgas prequench	2,110	
23. Incr. Size F-509; add vent line to flare	15,735	
24. Subs. Couolds for Aurora J-314	225	
28. Delete Car Thaw Pit		5,395
33. Water Service to Site	2,430	
34. Revision to conform with Uniform Bldg Code	3,390	
35. Upgrade quality & incr. wall htr tubes	33,910	
38. Revise Sanitary Disp. System	18,820	
44. Revise Reactor System Auxiliary Vessels		22,000
47. Delete C-206		995
52. Stress relieve P-314	685	
	<u>Original Maximum Price</u>	\$8,465,129
	<u>Presently Approved Total</u>	\$8,510,134

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
September 10, 1970

SUMMARY OF PROJECT CHANGES

Pending Change Notices and Change Orders Awaiting Approval	Increase	Decrease	Refer To Note
8. Redesign Purge Gas Systems	59,085		1
9. Add Instr. & Duct. Lignite crush & grind	35,290		3
10. Boiler controls, 2 element pneu type	1,470		4
17. Redesign Expansion Joints		229,169	4
22. Utilize Surplus Forklift & Tote Bins		12,820	2
26. Redesign Reactors	6,180		
29. Revise Htr controls & ESD System	29,900		2
32. Incr. Capacity IG System	48,740		2
36. Miscellaneous Instrument Changes	13,010		2
37. Revise design & Decr. quan hot valves		155,000	
39. Revise Waste System	16,200		2
40. Accum Costs for future transfer to Oper. Contract B-37400	125,000		
41. Revise Solids Handling	113,090		5
42. Misc. Changes in Pipe Specs, Sizes, deletions & additions	34,900		3
43. Revise hot piping		41,250	5
45. Revise Misc. Reactor Internals	41,350		5
46. Revise Jacket Water Piping System	50,600		4
49. Revise Flare System		23,970	2
50. Add'l htg & vent'lg elect. room, proc structure & solids handling bldg	16,340		2
51. Revise 1st floor layout Proc. Structure	3,380		3
53. Revise gas quench syst. metalg, des.	176,530		2
54. Redesign dolomite & lignite silos	8,080		3
55. Revise Lig. Waste Disp.	292,010		5
56. Add facil to pull Exch bundle	4,970		2
57. Add'l Heat Trace & Ins.	126,360		5
58. Add two doors Maint-Proc Area	590		5
59. Revise Elect Classif-Proc. Struct	16,040		3

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
September 10, 1970

SUMMARY OF PROJECT CHANGES - Continued

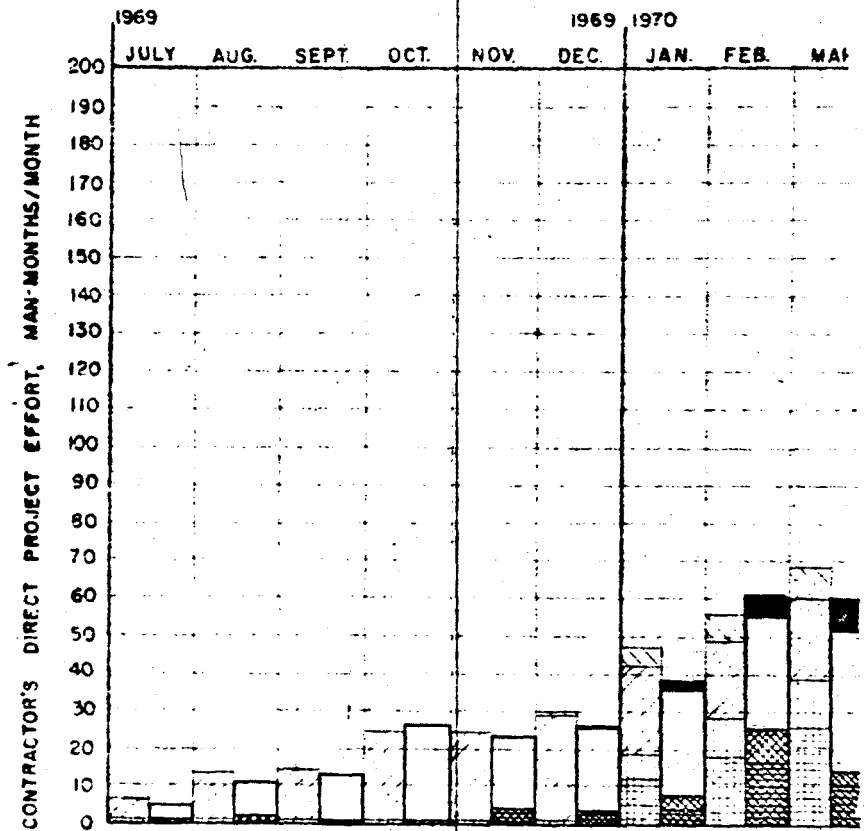
Pending Change Notices and Change Orders Awaiting Approval	Increase	Decrease	Refer To Note
60. Subs Gas Turbine Mtr for Densitometer	9,910		3
61. Incr. capacity Emer. Generator & Switch	7,450		3
62. Add acid storage tank & cooling twr	10,670		3
63. Revise boiler burners & controls	9,980		3
64. Add 3 clrs; enrg for 43 sample conn.	5,110		3
65. Add'l 19 Exp. Jts.	42,320		5
66. Windbrk, hrs @ RR spur	1,000		
67. Enrg for elec schematic diagrams			3
68. Enrg drftg-Flow Diagrams	4,000		
69. Spring hgrs F-213, F-215, F-216	3,390		3
70. Emer. power for Elevator	2,000		
Net Pending Changes	872,861		
Estimated Total	\$9,382,995		
40. Future transfer of 1970 charges applicable to Operating Contract B-37400		125,000	
Construction Costs only, Est. Total	\$9,257,995		

GENERAL NOTES ON CHANGE ORDERS

1. Revised Change Order sent to Consol -- 9-8.
2. Definitive estimate Change Order sent to Consol -- 8-14.
3. " " " " " " " " 9-8.
4. " " " " " " " " 6-12.
5. " " " " " " " " scheduled to Consol -- 9-11.

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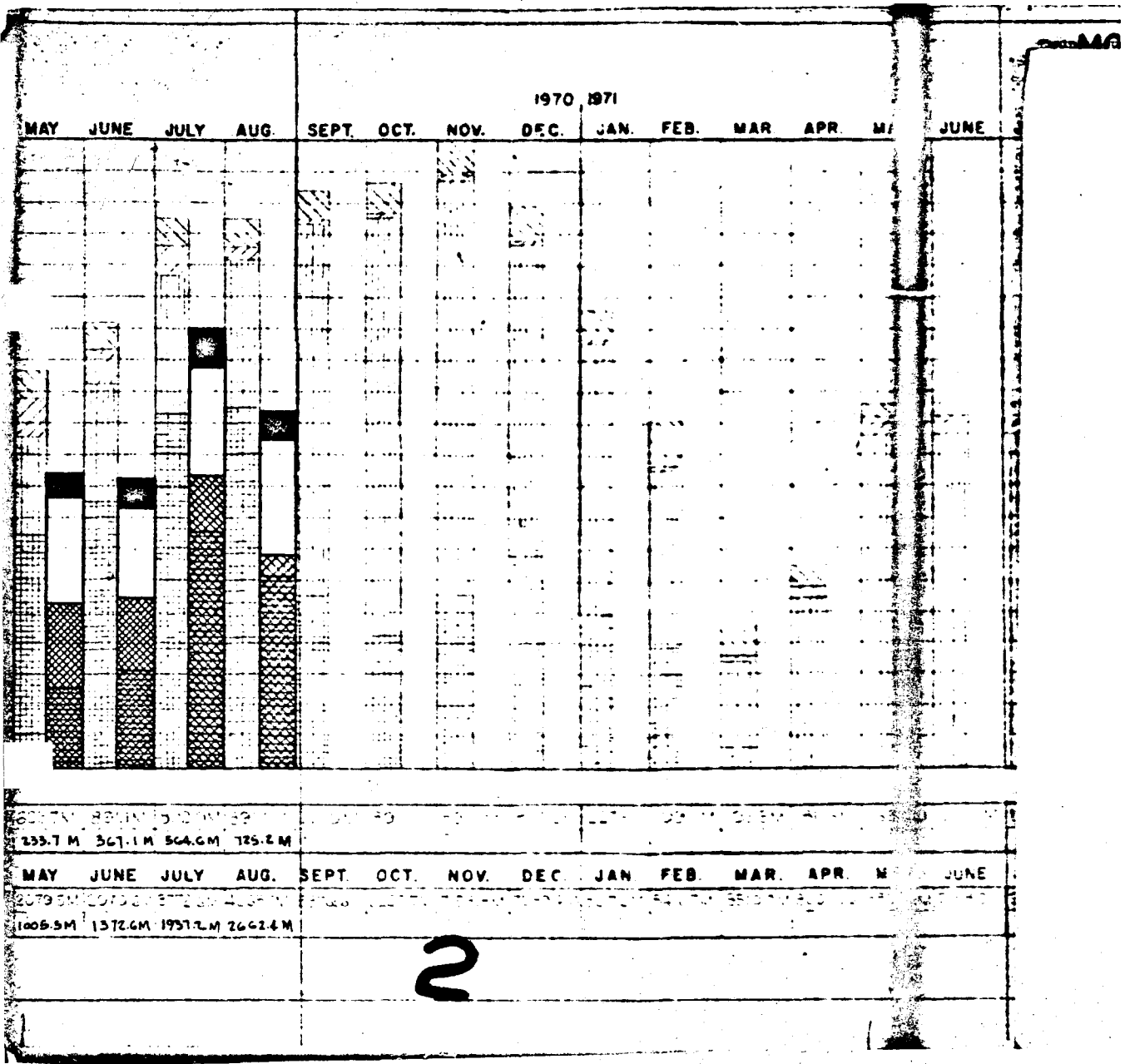
2



		MONTHLY EXPENDITURES *								
		JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.
PREDICTED		30.0M	41.0M	45.0M	53.0M	58.0M	66.0M	75.0M	85.0M	95.0M
ACTUAL		6.2M	25.0M	32.8M	42.6M	59.7M	126.2M	110.5M	76.7M	102.9M
PREDICTED		30.0M	71.0M	116.0M	169.0M	227.0M	293.0M	368.0M	453.0M	548.0M
ACTUAL		6.2M	31.2M	64.0M	106.6M	146.3M	272.5M	383.0M	459.7M	562.6M

CUMULATIVE EXPENDITURES -

* EXPENDITURES INCLUDE ALL COSTS & FEES



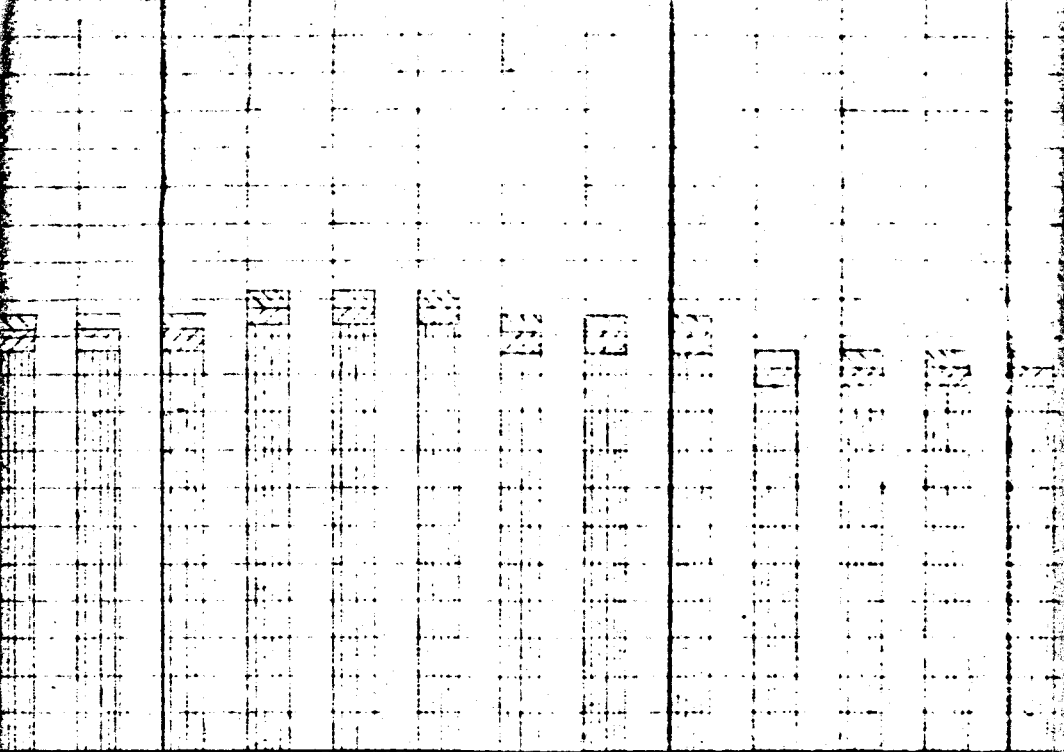
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MONTHLY PROGRESS CHART (CC)

CONTRACT NO. 14-OI-0001-415 (3)

1971 1972

MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY



1971 1972

MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY

1971 1972

3

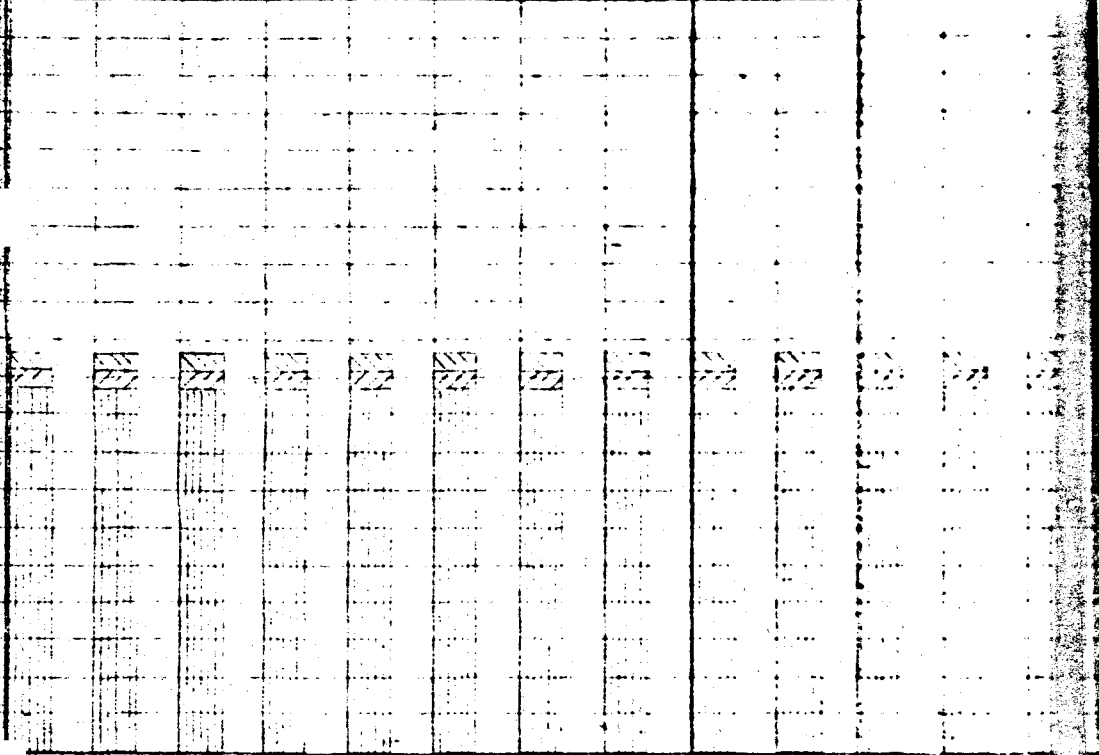
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CONSTRUCTION & OPERATION)

DATE: 9/2/72

1972 1973

MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR.



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103.9M	100.8M	102.8M	100.9M	101.8M	99.5M	101.4M	73.1M	72.9M	72.9M				
MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.		
111.5M	111.345.8M	111.558.8M	109.5M	108.8M	112.2.8M	110.4.2M	112.477.8M	112.670.3M	112.810.0M	111.991.0M	111.811.0M	111.811.0M	111.811.0M

4

DATE: Aug 1970

1973

EPT. OCT. NOV. DEC.

	PREDICTED	ACTUAL
SUPERVISING	████████	████████
PROFESSIONAL	████████	████████
TECHNICIAN S-R	████████	████████
TECHNICIAN S/C	████████	████████

INCLUDES SUPERVISORY EXEMPT TECHNICIANS

INCLUDES CLERICAL

CONSTRUCTION — STEARNS-ROGER JOB B-37000

OPERATIONS — STEARNS-ROGER JOB B-37400

MONTHLY PROGRESS CHART

OFFICE OF COAL RESEARCH
U.S. DEPARTMENT OF THE INTERIOR

CONSOLIDATION COAL CO.
RESEARCH DIVISION LIBRARY, PA

6

CONTRACT NO. 14-01-0001-415 (3)

STEARNS-ROGER CORPORAT

CONSOLIDATION COAL COMPANY PROJECT
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37400
August 26, 1970

OPERATIONS REPORT #6

A confirmed purchase order for the laboratory furniture was placed with Kewaunee Scientific Company on August 25, 1970. This order was placed subject to change of desk tops in case this material for the top does not pass some tests which are now being carried out by Consolidation Coal Company at Library, Pennsylvania. According to our latest information, this laboratory furniture will be delivered to the job site sometime in February unless there are further delays. Assuming it takes one month to set up this furniture the laboratory would be completed sometime in March. No equipment.

The process operating manual is about 15% complete. For some reason or other, vendor information seems to be very hard to get. For example, the Williams Equipment alone is involved in about fifteen different vendors. Now since we will be in the field we can go take a look and probably come up with an operating procedure. However, in some cases it won't be that simple, because looking at the outside, doesn't give one all the story.

The specifications for the laboratory equipment and supplies are about 15% complete. Catalogue information from companies that have contracts with the General Services Administration are sometimes hard to come by. Hopefully, we will have most of this information before we have to start placing orders.

Lawless, Johnson and Powell moved their household furniture and facilities to Rapid City during the month of August. For this reason the accomplishments for the month are on the short side.

The office building at the plant site could be occupied by the middle or last of September as temporary power will be available by that time. The power over there now will only handle a few lights. Since these windows cannot be opened fans will have to be made available before anyone can stay in this building any length of time. The office furniture is being held in Denver until we are sure we will have an office. There will be no sanitary facilities for this building, probably until sometime in December.

A revised copy of the budget is attached to this report.

William E. Powell

William E. Powell
Plant Manager

WEP/br

Distribution:

Consol - 5

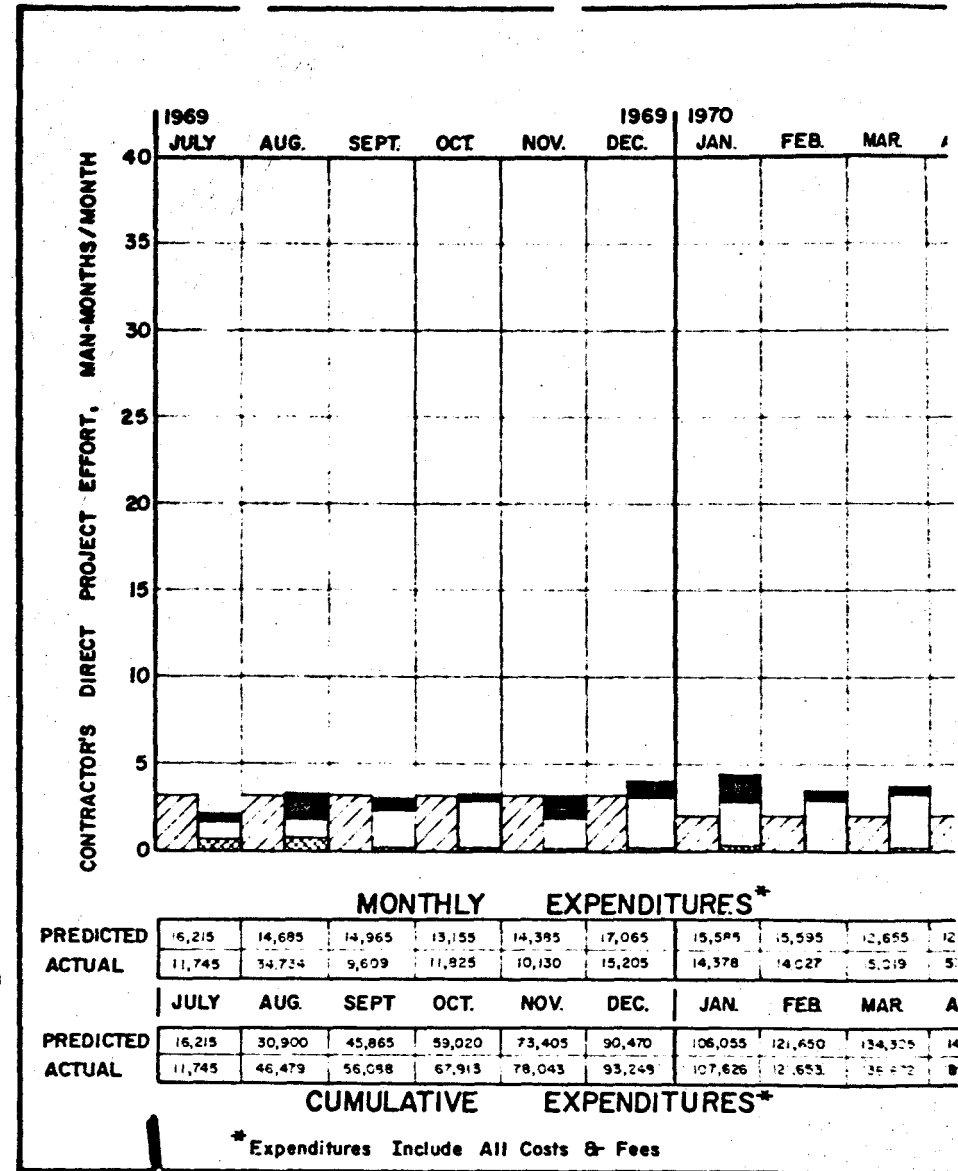
Continental Oil Company - 6

Stearns-Roger - 7

C.A. Schulz

E.E. Ellington, CED
D.F. Wegner, Field
L. Thompson, MED
J.B. Hambleton, CED
G.E. Fagerburg, CED
Dr. C.V. Foster, PED

FCP/HFD/CMS/TGS/FILE
CFL/JDM/VLB/HAH/JCM
ALC, FAN/JAP, DHD
WEP, Field



MONTHLY CONTRACT

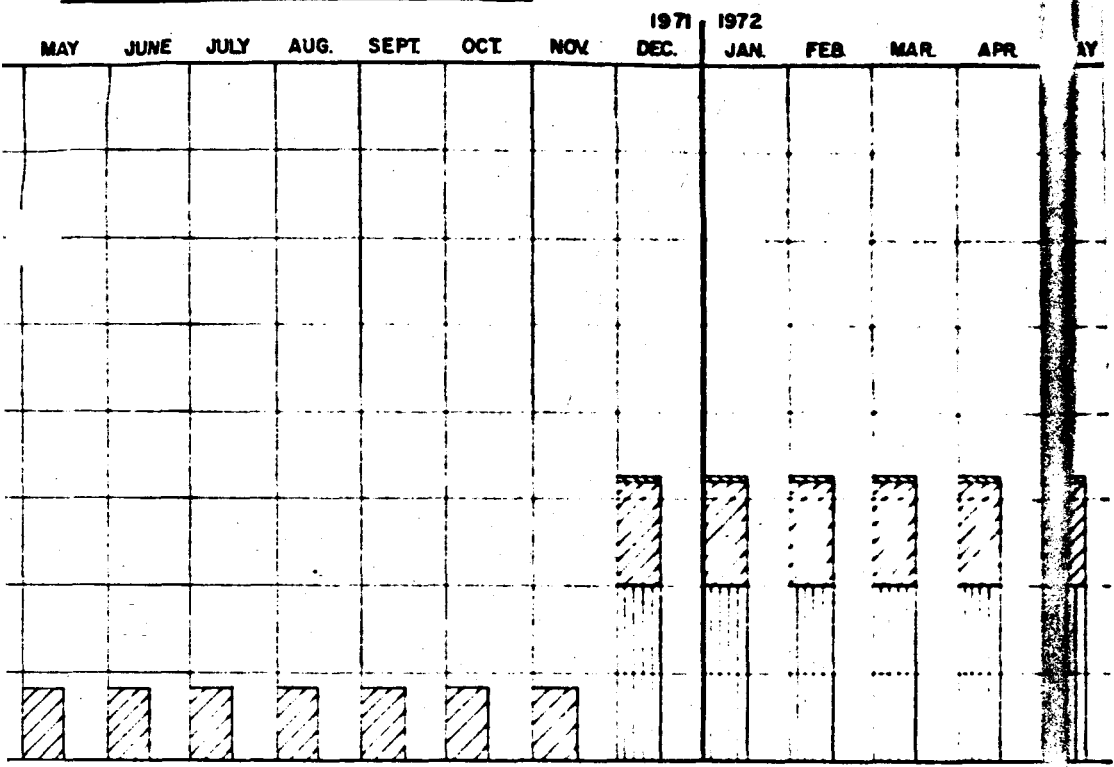
MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	1970 DEC.	1971 JAN.	FEB.	MAR.	APR.	MAY	JUNE
13,815	12,655	13,315	12,835	12,505	12,505	12,505	20,155	20,135	23,295	22,295	21,145	18,145	14,955
17,342	19,319	20,054	22,000										
MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
160,995	173,650	186,965	199,800	212,305	224,810	237,315	257,470	277,605	300,900	323,195	344,340	363,145	379,000
207,242	226,561	246,615	268,615										

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MONTHLY PROGRESS CHART (SUPERVISOR'S)

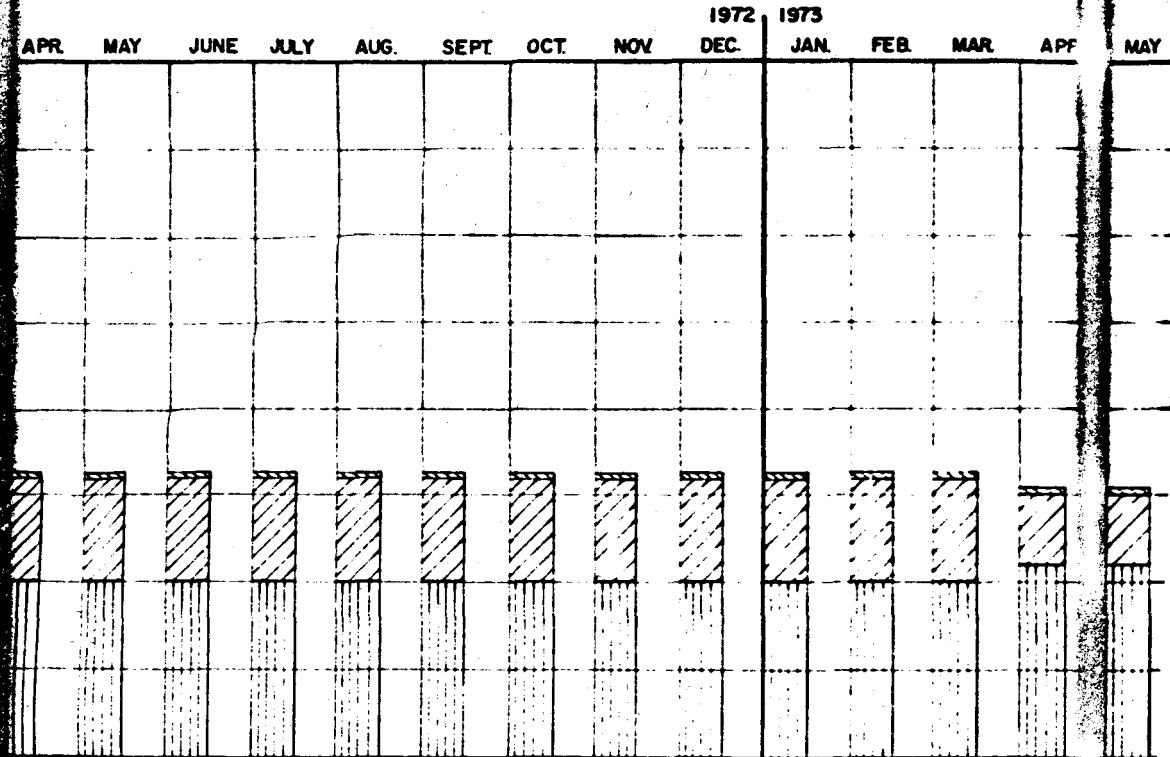
CONTRACT No. 14-01-0001-415 (3)



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18,705	18,955	14,875	14,875	14,875	14,875	14,875	39,475	39,475	33,475	39,475	39,475	39,475	39,475
MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	
363,045	379,000	393,875	408,750	423,625	438,500	453,375	492,850	532,325	571,800	611,275	650,750	690,225	

SION & LAB WORK)



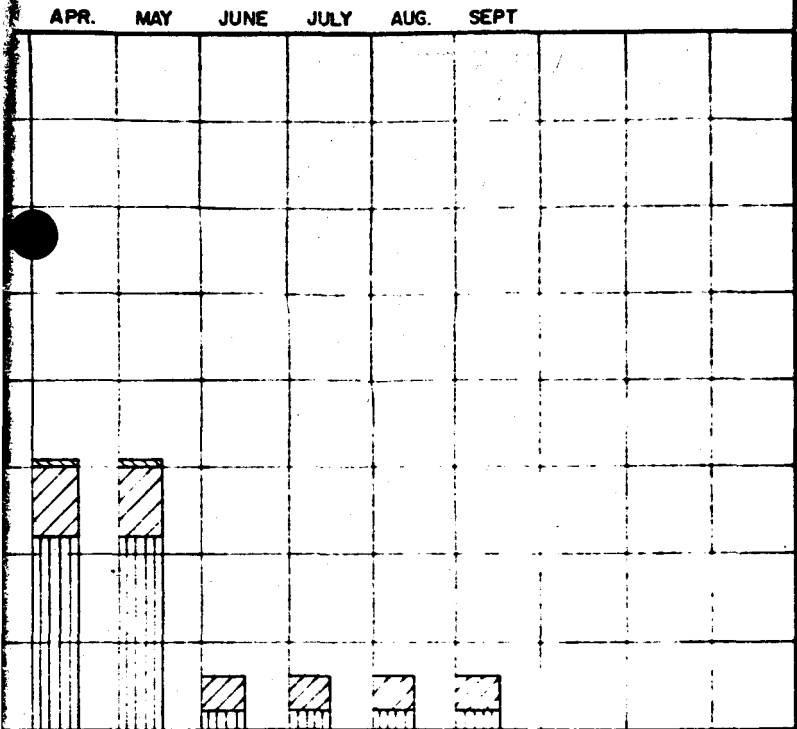
APR	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR	MA
50,750	690,225	729,700	769,175	808,650	848,125	887,600	927,075	966,550	1,006,025	1,045,500	1,084,975	1,124,450	1,157,925

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DATE: *August 1973*

1973



PREDK
 SUPERVISING
 PROFESSIONAL
 TECHNICIAN
 ⊕ Includes Super
 ⊗ Includes Cleric

MONTH	APR	MAY	JUNE	JULY	AUG.	SEPT.
36,075	36,075	11,475	11,475	11,475	41,120	
1,121,050	1,157,125	1,168,600	1,180,075	1,191,550	1,232,670	







MONTH
 OFFICE
 DEPART
 CONSC
 RESEARCH D
 CONTRACT

5

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DATE: Aug 1970

1973

	PREDICTED	ACTUAL
SUPERVISING		
PROFESSIONAL		
TECHNICIAN		

- ⊕ Includes Supervisory Exempt Technicians.
- ⊗ Includes Clerical.

MONTHLY PROGRESS CHART
 OFFICE OF COAL RESEARCH
 DEPARTMENT OF THE INTERIOR
CONSOLIDATION COAL CO.
 RESEARCH DIVISION LIBRARY, PA.
 CONTRACT No. 14-01-0001-415 (3)

PROGRESS REPORT NO. 76
 OCR CONTRACT NO. 14-01-0001-415(3)
CONSOL LIGNITE GASIFICATION PROCESS DEVELOPMENT

September 1 to 30, 1970

A. Summary

Phase I - Feasibility Study

Complete.

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

Field work at Rapid City is further behind schedule as a result of delays in deliveries and the need to replace substandard concrete. The target completion date (May, 1971) remains unchanged under Stearns' Master Plan; however, almost all of the projected float time has now been absorbed.

In the attached Stearns-Roger's construction progress report, the projected GMP is now \$8,896,334, or a total of \$342,000 less than that projected in the August report. About half of this reduction is associated with the decision to defer painting and pipe insulation and tracing until after the pilot plant construction is complete.

Considerable progress has been made in resolving the outstanding change orders (exclusive of engineering costs), and it is anticipated that essentially all of these items will be ready for review and approval by the end of October.

A progress report from Stearns on the operating phase of the project is attached. It is apparent that accelerated effort on the preparation of pilot plant operating manuals is desirable.

Financial

Estimated expenditures in September were \$937,800 by Stearns and \$28,000 by Consol. Cumulative total project expense is \$5,767,026.

B. Technical Results and Program

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

1. Supporting Process and Economic Analysis (Project No. 533)

No work was done on this project.

2. Supporting Patent and Legal Activities (Project No. 534)

The current reports and memoranda were reviewed for Subject Inventions.

3. Consol Assistance on Construction of Lignite Pilot Plant (Project No. 536)

Consol representatives continued to monitor Stearns-Roger effort at the Denver offices and in Rapid City. Expediting effort was expended in connection with the completion of the reactor construction at Belmas. In addition, a specialist visited Rapid City to assist in and witness the alignment of the major compressors.

A considerable effort was expended in an attempt to resolve the change orders and the total project cost. There are a total of 72 change orders; of these, 21 have been approved, 12 were cancelled, and 39 are yet to be resolved. During negotiations, the cost of engineering the changes proved to be the most contentious item. Procedure was therefore established whereby the resolution of engineering costs would be set aside, and negotiations would be on material and labor costs only. As a result, agreement was reached on 24 of the remaining change orders, and agreement is expected on all of the remainder by the end of October.

Stearns-Roger was instructed to delete the painting and the insulation and tracing of piping from the present construction subcontract. This was done in an attempt to reduce the mounting plant construction costs; it is believed this work can profitably be done by the plant maintenance crew during the inevitable periods of shutdown during the pilot plant startup.

Consol's operating representative has been at Rapid City during most of September and is currently housed in a temporary location in one of the construction offices until the main pilot plant buildings are completed for occupancy. The primary objective of current effort is to assist and

expedite the preparation of pilot plant operating manuals by the Stearns-Roger operating crew. A secondary objective is to become familiar with the details of the plant layout and to compile a list of potential field changes as the construction is completed.

4. Stearns-Roger Subcontract (Project No. 700)

a. Construction

The construction project report by Stearns is attached. Field work is considerably delayed by virtue of the need to replace substandard concrete and by failure to meet delivery promises on the reactors (Belmas) and on the Incoloy furnace tubes and piping. The target completion date (May, 1971) remains unchanged on the Stearns master plan; however, it appears that almost all of the float time has now been absorbed.

After correction of arithmetic errors, the Stearns-Roger GMP is now projected to be \$8,896,344 or a total of \$342,000 less than the corrected August report. The source of changes is as follows:

(1) Deletion of painting, pipe insulation and tracing, and test exchanger piping	\$ 182,000
(2) Correction of error in calculating savings in purchase of reactors, expansion joints and hot valves	112,000
(3) Correction for error in Change Order #43 (hot piping)	44,000
(4) Correction for error in Change Order #41 (solids handling)	4,000
Total	\$ 342,000

It is noted that the dollar adjustment for the savings associated with the purchase of reactors, expansion joints, and hot valves is now calculated in accordance with the procedure agreed upon by Stearns-Roger, OCR, and Consol.

b. Operations

The operations project report by Stearns is attached. It is apparent that very little progress has been made to date in preparing operating manuals for the pilot plant.

C. Subject Inventions

None.

Lignite Gasification
Progress Report No. 76

-4-

September, 1970

D. Financial Status

<u>Expense</u>	<u>Actual</u>	<u>Budget</u>
<u>Cumulative through August, 1970</u>		
Through June, 1969	\$ 1,878,256	\$ 1,878,256
Consol	260,570	199,800
Stearns-Roger	<u>2,662,400</u>	<u>4,663,700</u>
	\$ 4,801,226	\$ 6,741,756
<u>Expended in Period (estimate)</u>		
Consol	\$ 28,000	\$ 12,505
Stearns-Roger	<u>937,800</u>	<u>712,900</u>
	\$ 965,800	\$ 725,405
<u>Cumulative through September, 1970</u>	\$ 5,767,026	\$ 7,467,161

Att. - Stearns-Roger Construction and Operating Progress Reports
Monthly Progress Chart

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
October 7, 1970

PROJECT REPORT SUMMARY

Delivery promises for critical material items, such as the Incoloy furnace tubes and piping, have slipped 1-2 weeks. Assignment of a full time expeditor to the shop of the heater fabricator, and closer scheduling of piping dependent on these heaters may keep the project completion date unchanged.

ENGINEERINGProcess

Remaining process engineering consists of review of the plant operating instructions now being prepared under the operations contract.

Mechanical

Major equipment is all purchased. For further details on delivery of equipment, refer to Material Status Report No. 12 dated October 9.

Drafting - - - About 87% complete.

Isometric piping drawings are about 90% drawn and 60% checked. Of the estimated total of 820, 470 have been issued. Instrumentation isometrics are about 75% issued. Steam tracing isometrics are about 30% complete.

Structural drafting is 91% complete. Remaining work is for transite siding details, piping supports, hangers and guides. Drawings for chutes and ducts will be issued to the fabricator on October 8. Delivery is promised for November 2.

Electrical drafting is 91% complete. Remaining work includes controls for recently purchased instruments and evaluation of subcontractor estimates for additional work.

Instrumentation - - - About 98% complete.

Consol has approved purchase of solenoid valves, pressure and level switches, thermowells, rotometers, thermocouples and pressure gauges. Lack of dimensions and design details for the analyzer sample systems is holding up instrument drafting and purchase of the analyzer shelter buildings.

PROJECT STATUS REPORT

Page 2 of 2

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTACCC Project No. 536
S-R Job No. B-37000
October 7, 1970PROJECT ENGINEERING

The diagram schedule attached to this report has been updated to show completed and unfinished work separated by the decorative line. Extended delivery promises on heaters and Incoloy pipe make all of the jobs associated with this material become close to critical for project completion.

Our second meeting with local and regional representatives of the four craft unions involved in conflicting work-jurisdictional claims was held in Rapid City on October 1. Relatively little progress was made toward general agreement. Stearns-Roger will evaluate the evidence and arguments presented, and we are prepared to make work assignments where agreements cannot be reached.

Meeting of Consol people in Denver on September 23 and 24 resulted in agreement in principle on 30 of the 38 pending Change Orders. Six of the remaining ones were too recent for Consol to have comments. Agreement on all Change Orders through No. 70 is anticipated by mid-October.

CONSTRUCTION

Work has been delayed by about four weeks due to concrete poured by our subcontractor for the materials handling building and some equipment not meeting minimum strength. Removal and replacement is in progress. Shift of the work that follows foundations to be later in the winter will result in less efficient use of our work force when our manpower total is at the maximum. Masonry, painting, heating, ventilating and air conditioning for the Office, Laboratory, Maintenance and Utilities Areas is about 88% complete. Pumps are installed in the Cooling Tower pump house. Erection of the process structure is about 50% complete with some steel erected to the seventh floor. Heavy structural steel is delivered, and medium weight miscellaneous steel is enroute. Power for welding is now available through the permanent transformers and switchgear. Equipment in place is approximately as follows: Utility--55%, 1st Floor--60%, 2nd Floor--6%, 3rd Floor--35%, 4th Floor--30%, 5th Floor--70%, 6th Floor--10%.


D. H. Dawson
Project ManagerAttachments:

Summary of Project Changes - 3 pages
Progress Chart - 9/30/70
Master Plan Schedule - 9/30/70
Equal Employment Opportunity Report

Distribution:Consol - 5Continental Oil Company - 6Stearns-Roger - 7

C. A. Schulz	E. E. Ellington, CED	J. B. Hambleton, CED	FCP/HFD/CNS/IGS/File
	D. F. Wegner, Field	G. E. Fagerburg, CED	CFL/JTN/VLB/RAH/JCN
	L. Thompson, MHD	Dr. C. V. Foster, MHD	ALC, FAN/JAP, DHD
			WEPowell, Field

PROJECT STATUS REPORTCONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTACCC Project No. 536
S-R Job No. B-37000
October 8, 1970SUMMARY OF PROJECT CHANGES

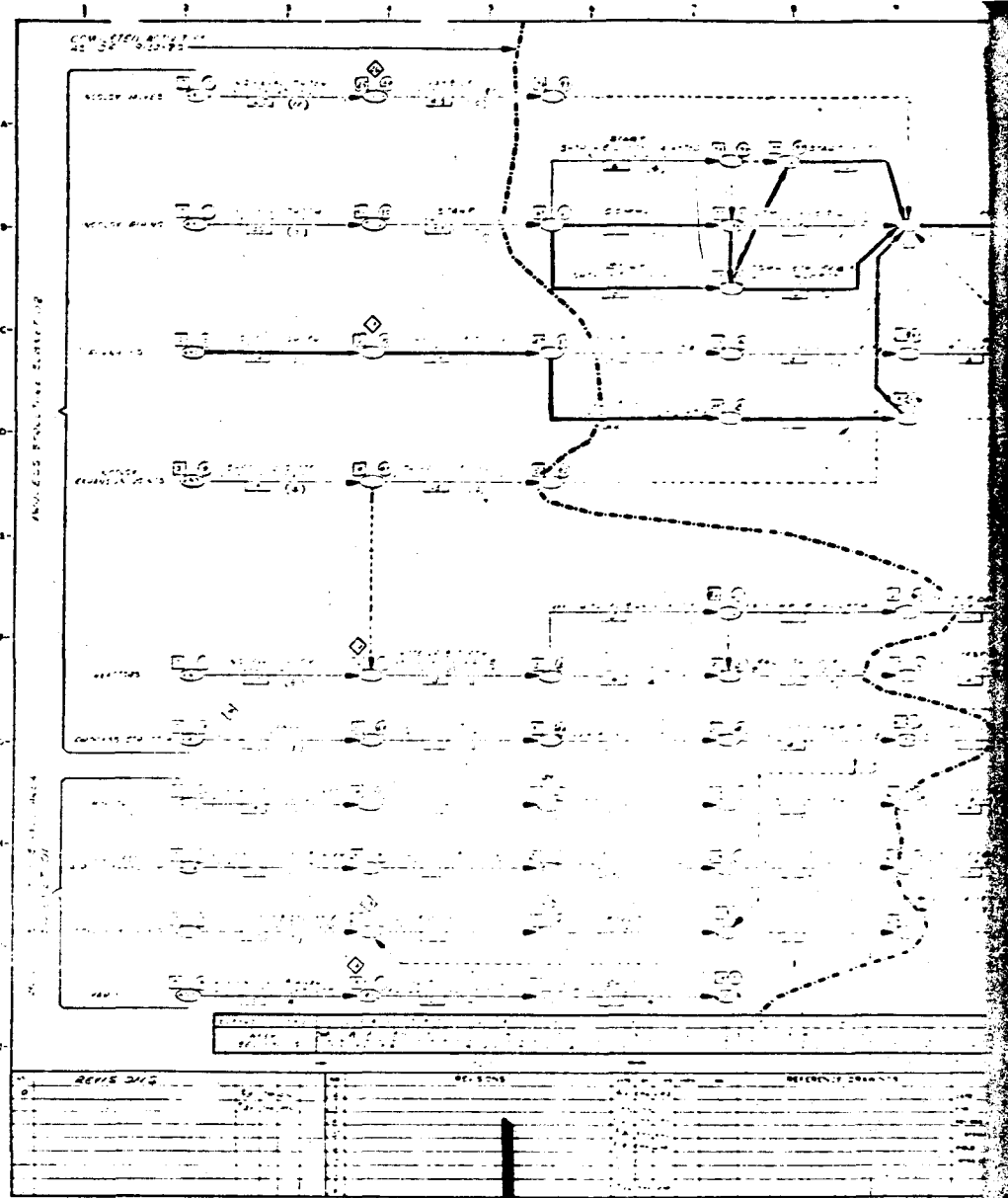
<u>Approved Change Orders</u>	<u>Increase</u>	<u>Decrease</u>
1. Reactor System Study	\$ 8,820	
5. Delete roof at heaters		15,600
7. Incr. Disch. Pressure Prehtr compr	4,315	
11. Delete Fuel Gas Booster Blower		8,670
13. Revise Canteen to Fallout Shelter	4,770	
14. Perspective Drawing for OCR	780	
16. Revise Hammermill specs	725	
18. Delete Car Puller		17,200
19. Revise Fire System per F. Mutual	11,970	
20. Frt. Elev. vs. Manlift & H&Ist	6,180	
21. Study reactor offgas prequench	2,110	
23. Incr. Size F-509; add vent line to flare	15,735	
24. Subs. Goulds for Aurora J-314	225	
28. Delete Car Thaw Pit		5,395
33. Water Service to Site	2,430	
34. Revision to conform with Uniform Bldg Code	3,390	
35. Upgrade quality & incr. wall htr tubes	33,910	
38. Revise Sanitary Disp. System	18,820	
44. Revise Reactor System Auxiliary Vessels		22,000
47. Delete C-206		995
52. Stress relieve F-314	685	
	<u>Original Maximum Price</u>	<u>\$8,465,129</u>
	<u>Presently Approved Total</u>	<u>\$8,510,134</u>

PROJECT STATUS REPORTCONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTACCC Project No. 538
S-R Job No. B-3700
October 8, 1970SUMMARY OF PROJECT CHANGES

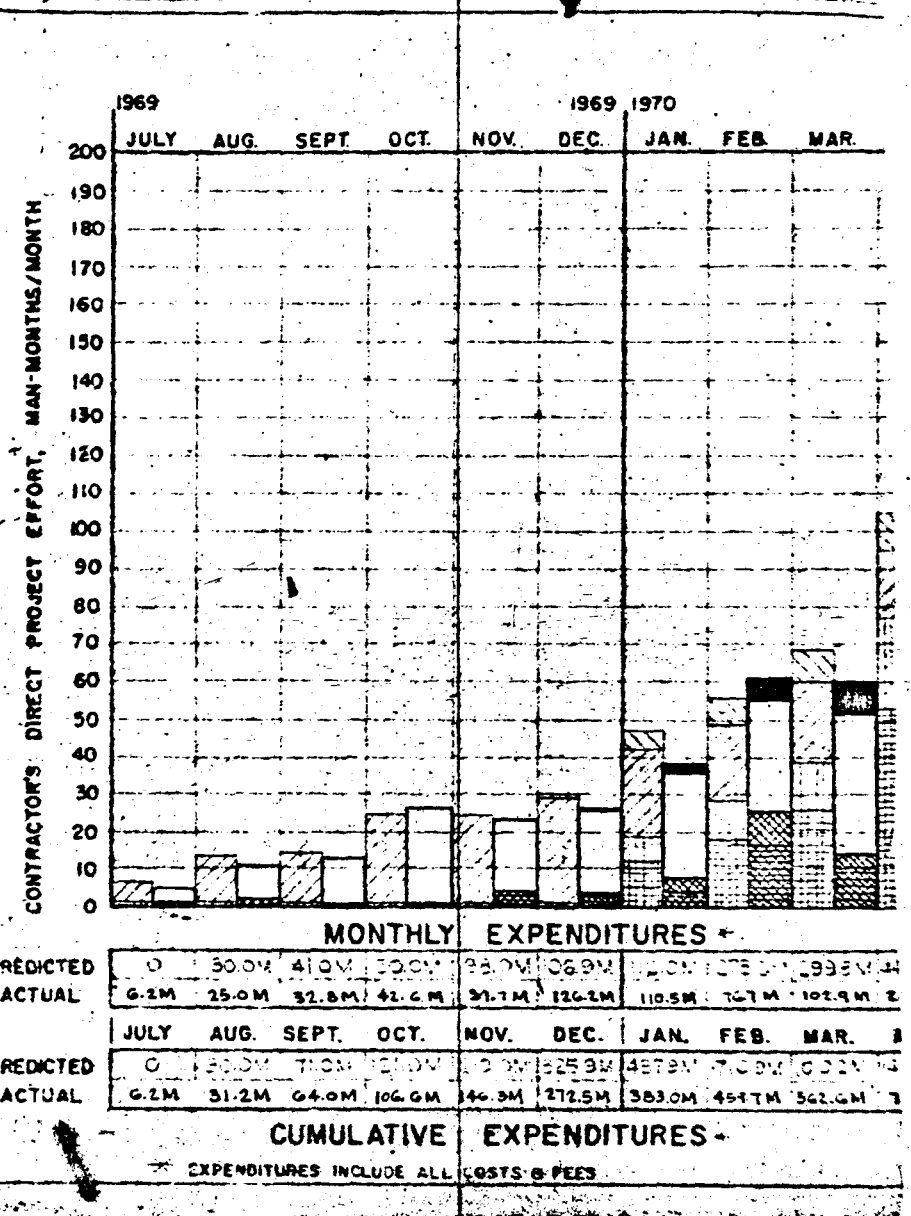
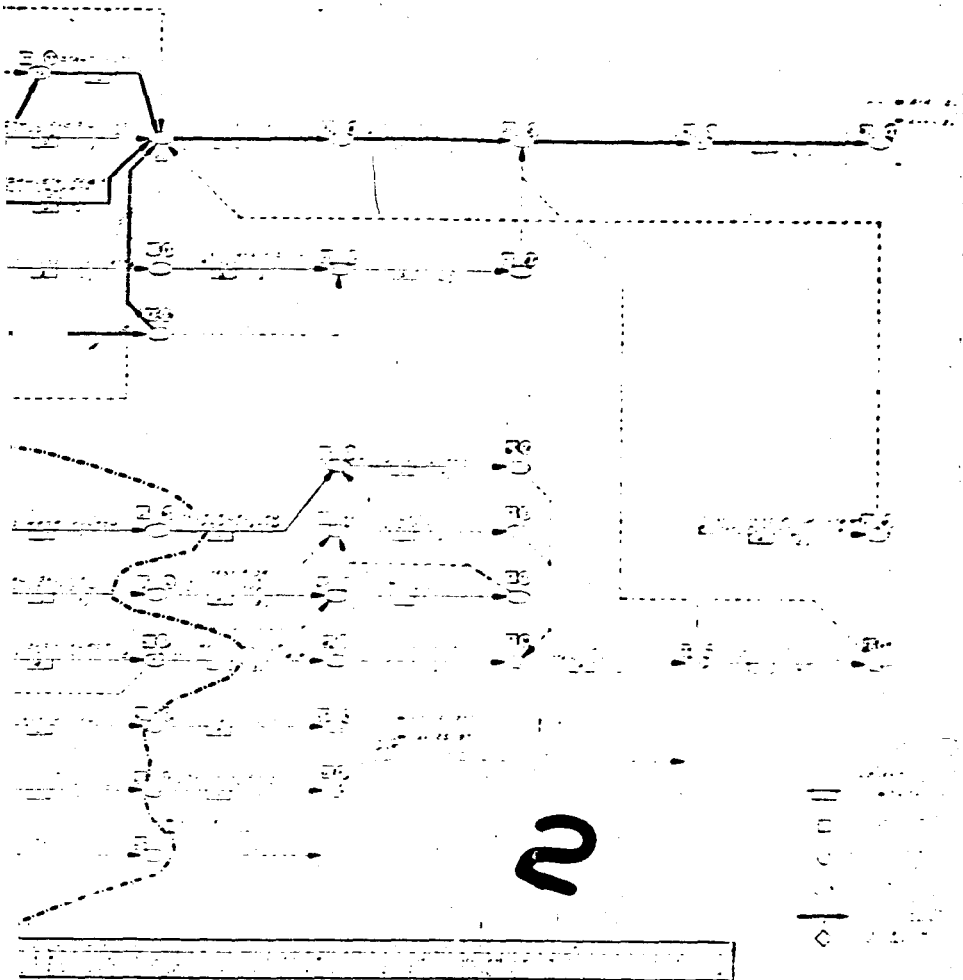
Pending Change Notices and Change Orders Awaiting Approval	Increase	Decrease	Refer To Note
8. Redesign Purge Gas Systems	59,085		1
9. Add Instr. & Duct, Lignite crush & grind	35,290		3
10. Boiler controls, 2 element pneu type	1,470		4
17. Redesign Expansion Joints	27,000		4
22. Utilize Surplus Forklift & Tote Bins		12,820	2
26. Redesign Reactors	5,900		
29. Revise Htr controls & ESD System	29,900		2
32. Incr. Capacity IG System	48,740		2
36. Miscellaneous Instrument Changes	13,010		2
37. Revise design & Decr. quan hot valves		22,400	
39. Revise Waste System	16,200		2
40. Accum Costs for future transfer to Oper. Contract B-37400	125,000 109,430		
41. Revise Solids Handling			5
42. Misc. Changes in Pipe Specs, Sizes, deletions & additions	34,900	85,640	3
43. Revise hot piping			5
45. Revise Misc. Reactor Internals	41,350		5
46. Revise Jacket Water Piping System	50,600		4
49. Revise Flare System		23,970	2
50. Add'l htg & vent'lg elect. room, proc structure & solids handling bldg	16,340 3,380		2 3
51. Revise 1st floor layout Proc. Structure			2
53. Revise gas quench syst. metalg. des.	176,530		2
54. Redesign dolomite & lignite silos	8,080		3
55. Revise Lig. Waste Disp.	292,010		5
56. Add facil to pull Exch bundle	4,970		2
57. Add'l Heat Trace & Ins.	126,360		5
58. Add two doors Maint-Proc Area	590		5
59. Revise Elect Classif-Proc. Struct	16,040		3

PROJECT STATUS REPORTCONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTACCC Project No.
S-R Job No. B-37
October 8, 1970SUMMARY OF PROJECT CHANGES - continued

Pending Change Notices and Change Orders Awaiting Approval	Increase	Decrease
60. Subs Gas Turbine Mtr for Densitometer	9,910	
61. Incr. capacity Emer. Generator & Switch	7,450	
62. Add acid storage tank & cooling twr	10,670	
63. Revise boiler burners & controls	9,980	
64. Add 3 elrs; engrg for 43 sample conn.	5,110	
65. Add'l 19 Exp. Jts.	42,320	
66. Windbrk, htrs @ RR spur	1,000	
67. Engrg for elec schematic diagrams		
68. Engrg drftg-Flow Diagrams	4,000	
69. Spring hgrs F-213, F-215, F-216	3,390	
70. Emer. power for Elevator	2,000	
71. Delete Heat Trace, painting & piping insul.		180,000
72. Delete piping for C-213		2,000
Proposal to transfer the shop cost only of high temp valves, reactors and special exp. joints from CO's 10, 26, and 37		
		499,965
Net Pending Changes	508,210	
Estimated Total	\$9,018,344	
40. Future transfer of 1970 operating charges to Operating Contract B-37400		125,000
Construction Costs only, Est. Total	\$8,893,344	



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	MONTHLY EXPENDITURES *									
	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	
PREDICTED	0	30.0M	41.0M	50.0M	33.0M	106.9M	112.0M	178.0M	199.6M	214
ACTUAL	6.2M	25.0M	32.8M	42.4M	31.7M	124.2M	110.5M	167M	102.9M	2
PREDICTED	0	30.0M	71.0M	121.0M	154.0M	260.9M	438.9M	616.9M	816.5M	1031
ACTUAL	6.2M	31.2M	64.0M	106.4M	138.1M	272.3M	382.8M	549.8M	652.7M	7

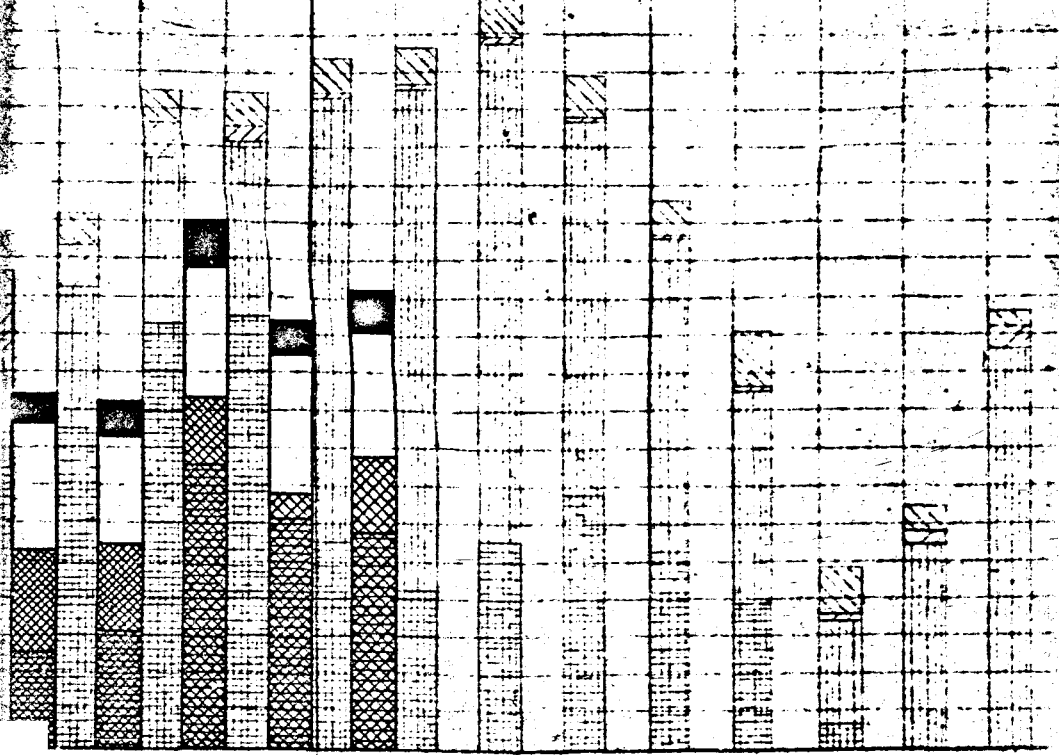
CUMULATIVE EXPENDITURES *

* EXPENDITURES INCLUDE ALL COSTS & FEES

REFERENCE SYMBOL	REVISED	END PROJECT	ISSUANCE STATE	DATE	BY

Stearns-Roger

1970 1971
 JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY



87.1M 89.1M 502.0M 89.1M 71.0M 89.1M 89.1M 89.1M 89.1M 89.1M 89.1M 89.1M 89.1M
 5.7M 367.1M 564.6M 725.2M 957.6M

JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MA
 79.5M 2970.6M 3772.6M 4638.7M 5575.6M 6267.7M 7153.8M 7989.4M 8272.1M 8416.7M 8510.0M 8691.5M 8908.1M
 15.5M 1372.6M 1951.1M 2662.4M 3600.2M

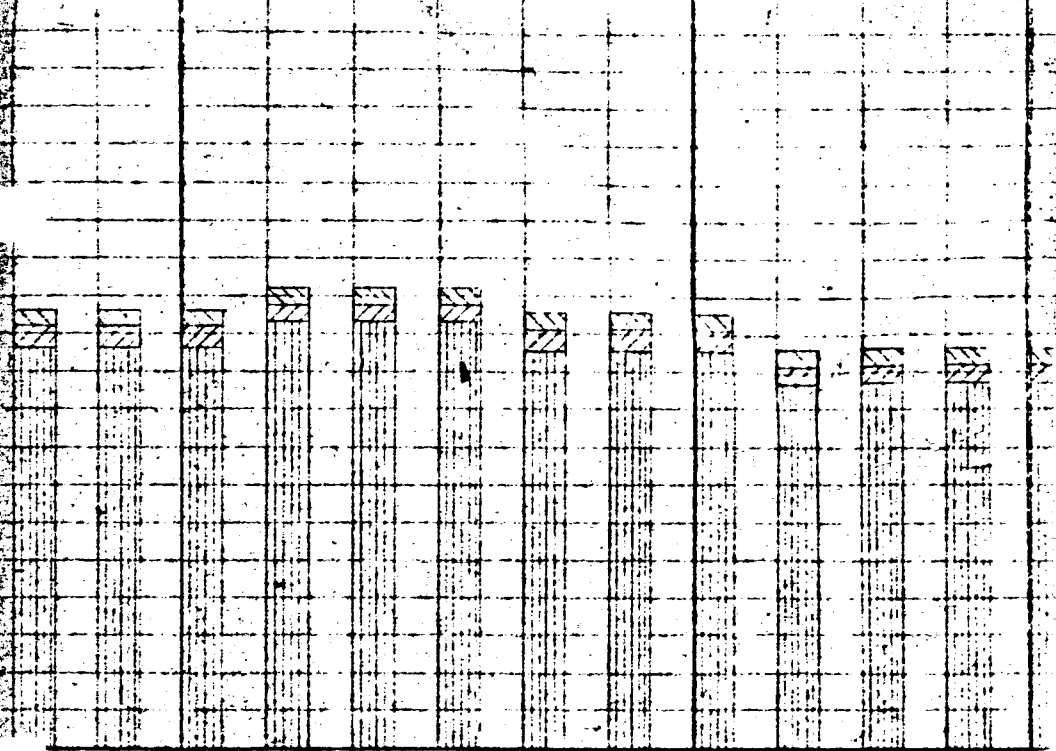
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MONTHLY PROGRESS CHART (C)

CONTRACT NO. 14-01-0001-415 (3)
1971 1972

MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR.



163.6M	168.7M	163.5M	208.0M	209.0M	201.9M	201.5M	201.5M	175.1M	174.5M	194.7M	195.7M
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MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
163.6M	168.7M	163.5M	208.0M	209.0M	201.9M	201.5M	201.5M	175.1M	174.5M	194.7M	195.7M

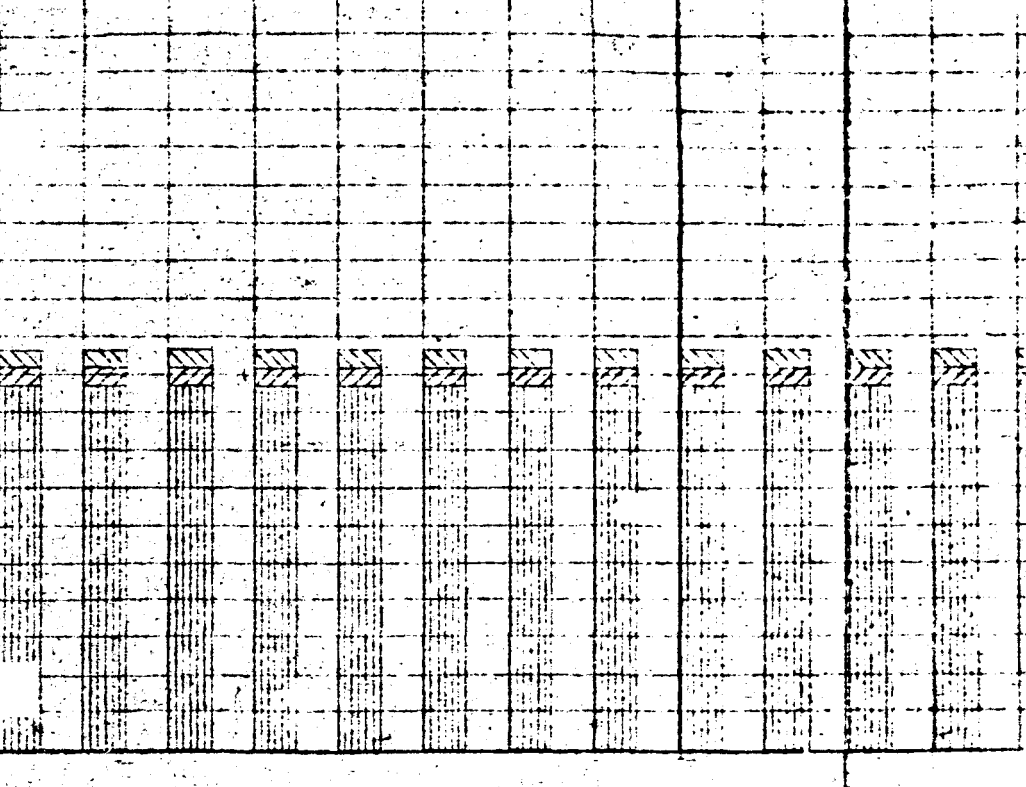
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CONSTRUCTION & OPERATION)

DATE: Sept 1970

1972 1973
 MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR.



193.9M 192.8M 192.8M 192.9M 191.3M 191.5M 191.4M 173.2M 172.9M 172.1M 70.5M 127.5M

MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR.

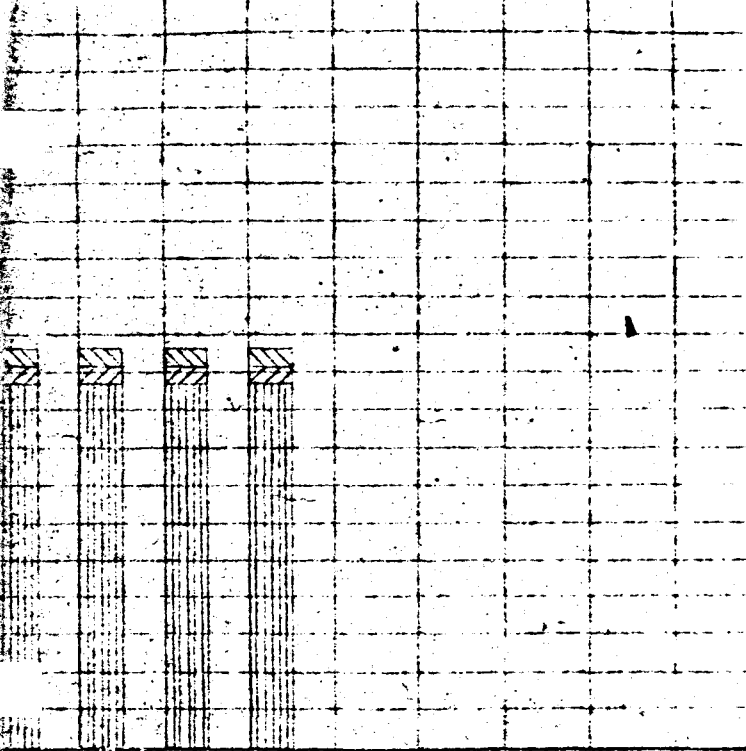
115.0M 134.8M 155.6M 172.9M 192.3M 212.8M 233.4M 247.7M 265.2M 282.4M 299.9M 316.4M

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DATE: Sept 1970

1973

PR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.



PREDIC

SUPERVISING

PROFESSIONAL

TECHNICIAN S-R

TECHNICIAN S/C

- INCLUDES SUPERVISOR
- INCLUDES CLERICAL

CONSTRUCTION — STEARN
OPERATIONS — STEARN

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27.5M 1672M 120.8M 1207M 13.0M

APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

3760.4M 3321.6M 18,442.4M 3562.5M 3,578.5M

MONTHLY

OFFICE
U.S. DEPARTMENT

CONSOLIDATED
RESEARCH DIVISION

CONTRACT

5

DATE: Sept 1970

1970
SEPT. OCT. NOV. DEC.

	PREDICTED	ACTUAL
SUPERVISING	██████	██████
PROFESSIONAL	██████	██████
TECHNICIAN S-R	██████	██████
TECHNICIAN S/C	██████	██████

- ⊕ INCLUDES SUPERVISORY EXEMPT TECHNICIANS
- ⊕ INCLUDES CLERICAL

CONSTRUCTION — STEARNS-ROGER JOB B-37000
 OPERATIONS — STEARNS-ROGER JOB B-37400

MONTHLY PROGRESS CHART

OFFICE OF COAL RESEARCH
 U.S. DEPARTMENT OF THE INTERIOR
 CONSOLIDATION COAL CO.
 RESEARCH DIVISION LIBRARY, PA.
 CONTRACT NO. 14-01-0001-415 (3)



CONSOLIDATION COAL COMPANY PROJECT
 CCG PILOT PLANT
 RAPID CITY, SOUTH DAKOTA

CCG Project No. 536
 S-R Job No. B-37400
 September 30, 1970

OPERATIONS REPORT #1

The tests carried out by Consol on the laboratory desk tops were satisfactory and the order that was placed with Kewanee Scientific Company has been release in its entirety. The specifications for the laboratory equipment is about 50% completed. Quotations have been received for some materials not covered by G.S.A. Contracts.

The operating manual for the Hot Pot Process has been completed. The Section 100, Unloading, Crashing and Grinding is about 20% complete. Some of the information needed for a good write up is missing from the Process Flow Sheets. A great deal of time is spent trying to find this information. For the present time the operation manual will have to be written in three or four complete sections and then combined at a later date.

A secretary was added to the staff about the middle of the month. The files have now been set up in a systematic manner. A review of these files indicated that there is not enough information to start writing the Off Sites Manual, or to make up a Spare Parts List. Denver is aware of missing items and they are working on it.

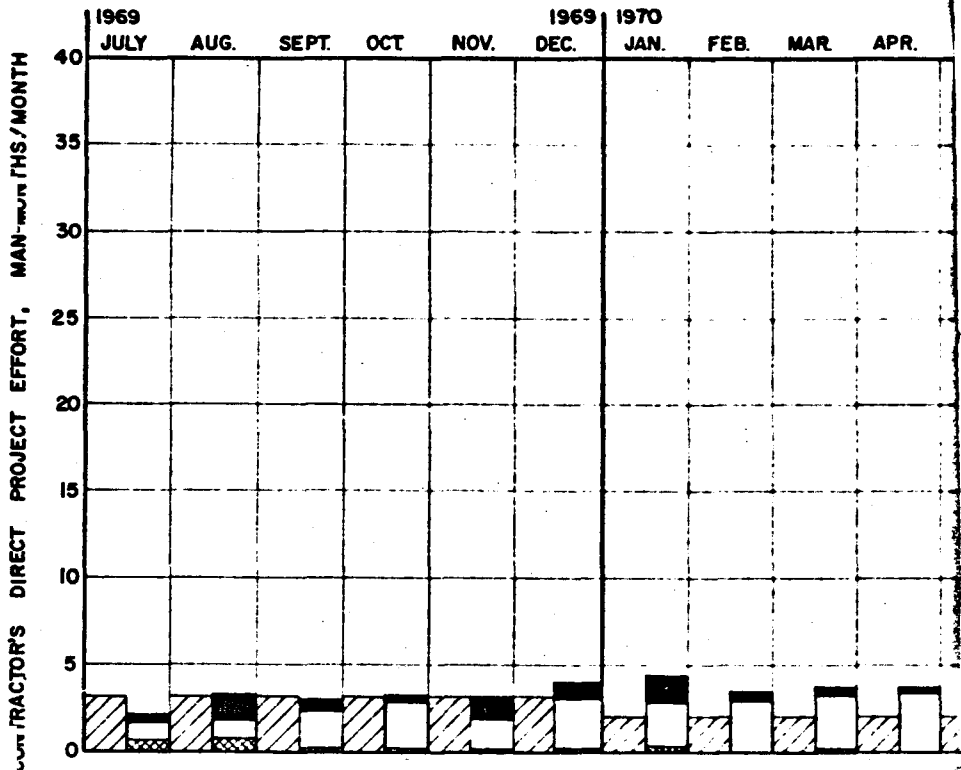
The office building that was supposed to be ready in September was delayed until about the middle of October. First, the gas company pointed out that their line pressure was not constant and a pressure regulator had to be purchased, secondly the power company got the power installed out of phase. This is being corrected and reducing station ordered.

Mr. Hoadly Dean, President of Western South Dakota Development Company was very gracious and offered us office space in the Bank of South Dakota Building until our office building is completed.

William E. Powell
 William E. Powell
 Plant Manager

WEP/dgh

MON



MONTHLY EXPENDITURES*

	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
PREDICTED	16,215	14,685	14,965	13,155	14,385	17,065	15,545	15,595	12,655	12,875
ACTUAL	11,745	34,734	9,609	11,825	10,130	15,205	14,378	14,027	15,019	53,228

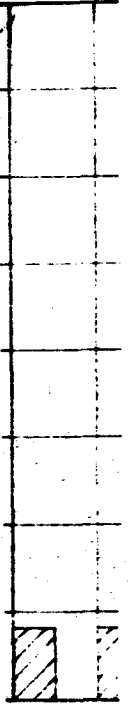
CUMULATIVE EXPENDITURES*

	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
PREDICTED	16,215	30,900	45,865	59,020	73,405	90,470	106,055	121,650	134,305	147,180
ACTUAL	11,745	46,479	56,088	67,913	78,043	93,248	107,626	121,653	136,672	89,900

*Expenditures Include All Costs & Fees

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21,745 1

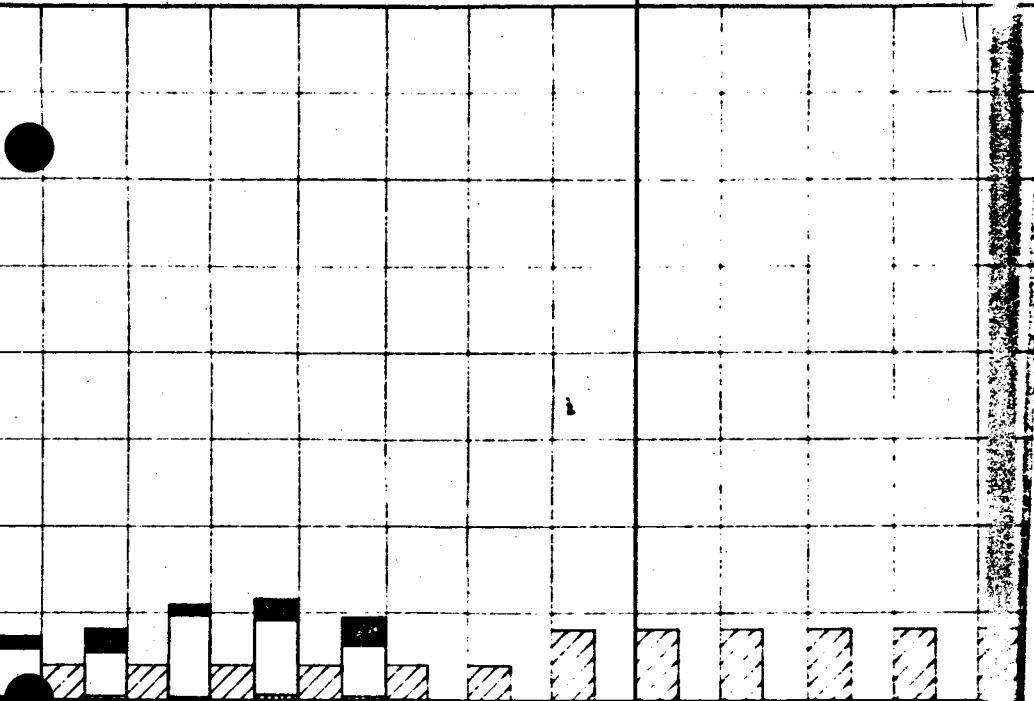
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Y JUNE JULY AUG. SEPT. OCT. NOV. 1970 DEC. 1971 JAN. FEB. MAR. APR. Y



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15	12,655	13,315	12,835	12,505	12,505	12,505	20,155	20,135	23,295	22,295	21,145
42	19,319	20,054	13,955	28,000							

Y	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
95	173,650	186,965	199,800	212,305	224,810	237,315	257,470	277,605	300,900	323,195	344,340
42	226,561	246,615	260,570	288,570							

2

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30,475 35

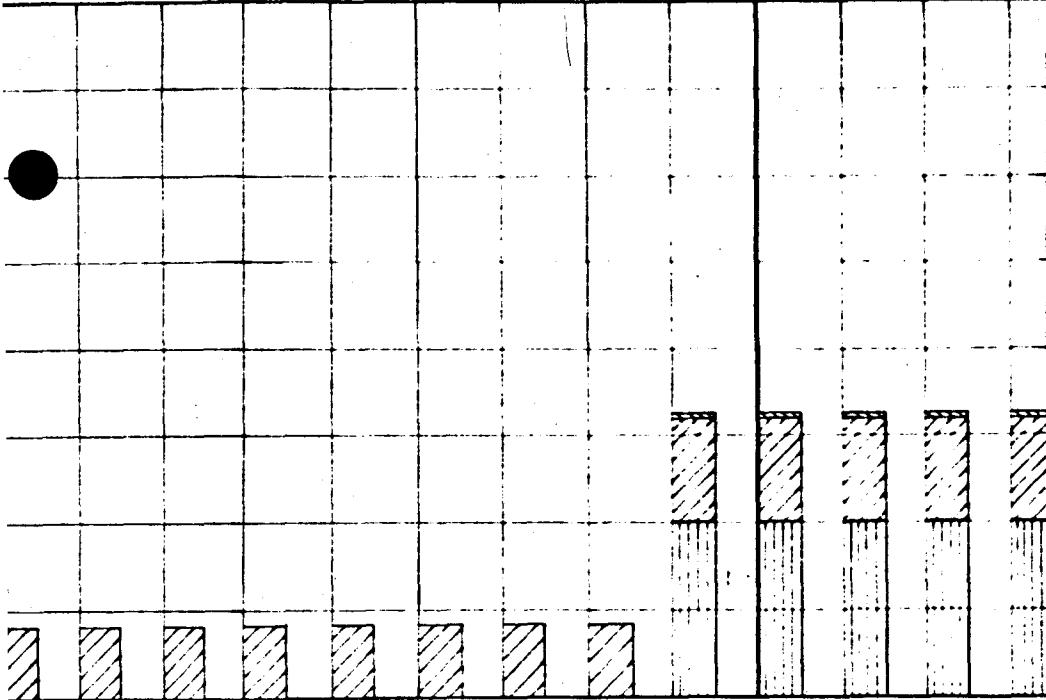
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MONTHLY PROGRESS CHART (SUPERVIS)

CONTRACT No. 14-01-0001-415 (3)

APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. 1971 JAN. FEB. MAR. A 1972



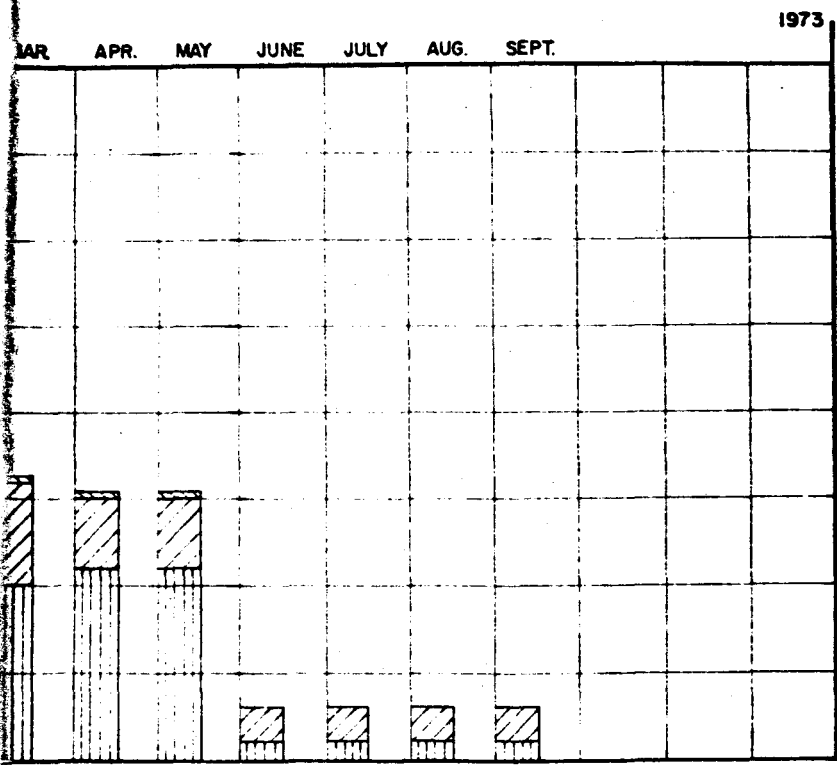
21,145	18,700	15,955	14,875	14,875	14,875	14,875	14,875	14,875	53,475	53,475	39,475	33,475	39,475
APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	A	
144,540	363,045	379,000	393,875	408,750	423,625	438,500	453,375	468,250	532,325	571,800	611,275	650,750	

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(New 415 Chart)

DATE: SEPT 1973



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⊗ Includes Cle

1973	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
39,475	36,075	36,075	11,475	11,475	11,475	41,120	
384,975	1,121,050	1,157,125	1,168,600	1,180,075	1,191,550	1,232,670	

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B. Technical Results and Program

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

1. Supporting Process and Economic Analysis (Project No. 533)

No work was done on this project.

2. Supporting Patent and Legal Activities (Project No. 534)

The current reports and memoranda were reviewed for Subject Inventions.

3. Consol Assistance on Construction of Lignite Pilot Plant (Project No. 536, 702)

Monitoring of engineering and field work by Stearns-Roger continued through the month; in addition, cooperative effort in Rapid City with the Stearns-Roger's operating people was begun in the preparation of drafts of the pilot plant operating manual. Piping and electrical drawings were given a final review. Welding procedures and qualification tests were checked and approved.

Work continued on the negotiations concerning 39 unresolved change orders. As of the end of the month substantial agreement has been reached on 24 and these will be forwarded to OCR for review and approval early in November. It is planned to attempt to resolve the remaining 15 change orders in November, with the exception of the item covering the engineering costs involved in the change order work; it is recommended that this item be deferred until substantially greater progress has been made in job completion.

Uwe Marwig, Consol's operating representative, is now situated in the pilot plant office building, together with the Stearns operating people. For reference, the Consol phone number is 805-342-6416.

4. Stearns-Roger Subcontract (Project No. 700)

a. Construction

The construction project report by Stearns is attached. Stearns now projects the completion date of construction to be May 31, 1971.

(Consol's estimate is one-three months later.) Stearns projects that the major source of the delay will be in piping work, partly due to a shortage of welders and pipefitters in the area. Of the major items of equipment (totalling 211), all have been purchased, 70 have been received and are awaiting installation, and 62 have been installed.

The current projected GMP is \$9,039,898 which is an increase of \$146,000 over last month's figure. It will be noted that in prior months the engineering for each projected change order was included in the cost for that change order; in the October report all engineering has been consolidated into pending Change Order No. 74. The figure shown is highly controversial in Consol's opinion, and this number is the major source of the apparent increase in GMP.

b. Operations

Due to Mr. Powell's illness, no progress report on operations effort was received from Stearns.

C. Subject Inventions

None.

D. Financial Status

<u>Expense</u>	<u>Actual</u>	<u>Budget</u>
<u>Cumulative through September, 1970</u>		
Through June, 1969	\$ 1,878,256	\$ 1,878,256
Consol	285,573	212,303
Stearns-Roger	<u>3,456,600</u>	<u>5,676,600</u>
Total	\$ 5,620,429	\$ 7,767,161
<u>Expended in Period (estimate)</u>		
Consol	21,000	12,505
Stearns	<u>888,500</u>	<u>891,100</u>
Total	<u>\$ 909,500</u>	<u>\$ 903,605</u>
Cumulative through September, 1970	\$ 6,529,929	\$ 8,670,766

Att. - Stearns-Roger Construction Progress Report
Monthly Progress Charts

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
November 6, 1970

PROJECT ENGINEERING

The diagram schedule attached to this report has been updated to show completed and unfinished work separated by the decorative line. Duration of piping installation in the Gasification Area is restricted by the maximum number of men that can work efficiently there. Extended delivery of the Incoloy for the long hot solids trans-lines may hold up installation of a major portion of the work in this area.

Welding procedures for ten combination of similar and also dis-similar metals have been approved by Consol, and issued approved. Inquiries have been sent out for a subcontract for roofing and also for asbestos siding.

Cost report for the period ending September 30 was issued on November 5. Our computer does not allow for acceptance of both approved and pending change order revisions to the original estimate. The totals on this cost estimate should be considered rather approximate until the base estimate can be revised to show the affects of the 43 pending change orders listed on the attached summary.

CONSTRUCTION

Work in the Materials Handling Building has been delayed four weeks due to replacement of low strength concrete poured by our subcontractor. Steel erection was just started. Lack of this available work area will result in less efficient manpower use and more work in bad weather. Office and laboratory section of the main building were occupied on October 22. Building work in the Maintenance and Utilities Areas is about 93% complete. Erection of the steel process structure is about 75% complete, with some steel erected to the ninth floor. Reactor vessels were set the week of November 2. Equipment in place is summarized in the following table:

AREA	TOTAL PIECES	RECEIVED		INSTALLED	Z INSTALLED
		BEING FABRICATED	AND NOT SET		
UTILITIES	23	4	3	16	70
Proc. Struc. 1st Floor	52	17	19	16	31
2nd Floor	23	21	1	1	4
3rd Floor	10	1	3	6	60
4th Floor	7	4	1	2	28
5th Floor	7	0	3	4	57
6th Floor	12	6	4	2	17
7th Floor	8	2	6	0	0
8th Floor	6	0	6	0	0
9th Floor	3	0	3	0	0
Roof	4	3	1	0	0
Pump House	11	5	2	4	16
Mat'ls. Receiving & Handling	14	13	16	5	15
Yard Area	11	3	2	6	55
TOTALS	211	79	70	62	
PERCENT	100	37	33	30	

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
November 6, 1970

PROJECT REPORT SUMMARY

More detailed evaluation of the piping work and the maximum number of men that can work efficiently in the process structure have led to the conclusion that the completion of construction for this job will extend to the week of May 31. This conclusion is based on an evaluation projected from 54% of the detailed major piping drawings. Short supply of welders and pipe fitters in our entire six state area tends to decrease the chance of earlier completion. Consideration is being given to ways to attract welders to this job.

ENGINEERING

Process

The only remaining process work of reviewing plant operating instructions is about 10% complete.

Mechanical

Major equipment is all purchased. For further details on delivery of equipment, refer to Material Status Report No. 13 dated November 3.

Drafting - - - About 93% complete

Isometric piping drawings are about 99% drawn and 93% checked. Of the estimated total of 833, 781 have been issued. Instrumentation isometrics are about 90% issued. Steam tracing isometrics are about 55% complete.

Structural drafting is 97% complete. Remaining work is for shelters for the analyzers and their sample systems.

Electrical drafting is 95% complete. Remaining work includes details for electrical heat tracing and final checking of recently purchased instruments.

Instrumentation - - - About 99% complete

Instruments will be 100% purchased by November 13. Dimension details for the six analyzer sample systems were received November 2. Installation drawings for these analyzers should be complete by November 20.

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

GCC Project No. 536
 S-R Job No. B-37000
 November 6, 1970

SUMMARY OF PROJECT CHANGES

<u>Approved Change Orders</u>	<u>Increase</u>	<u>Decrease</u>
1. Reactor System Study	\$ 8,820	
5. Delete roof at heaters		15,600
7. Incr. Disch. Pressure Prehtr compr	4,315	
11. Delete Fuel Gas Booster Blower		8,670
13. Revise Canteen to Fallout Shelter	4,770	
14. Perspective Drawing for OCR	780	
16. Revise Hammermill specs	725	
18. Delete Car Puller		17,200
19. Revise Fire System per F. Mutual	11,970	
20. Frt. Elev. vs. Manlift & Hoist	6,180	
21. Study reactor offgas prequench	2,110	
23. Incr. Size F-509; add vent line to flare	15,735	
24. Subs. Goulds for Aurora J-314	225	
28. Delete Car Thaw Pit		5,395
33. Water Service to Site	2,430	
34. Revision to conform with Uniform Bldg Code	3,390	
35. Upgrade quality & incr. wall htr tubes	33,910	
38. Revise Sanitary Disp. System	18,820	
44. Revise Reactor System Auxiliary Vessels		22,000
47. Delete C-206		995
52. Stress relieve F-314	685	
Original Maximum Price	\$8,465,129	
Presently Approved Total	\$8,510,134	

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

GCC Project No. 536
 S-R Job No. B-37000
 October 30, 1970

SUMMARY OF PROJECT CHANGES

<u>Gen'l Note</u>	<u>Pending Change Notices and Change Orders Awaiting Approval</u>	<u>Increase</u>	<u>Decrease</u>
(1)	8. Redesign Purge Gas Systems	49,110	
(1)	9. Add Instr. & Duct, Lignite crush & grind	32,090	
(1)	10. Boiler controls, 2 element pneu type	1,030	
(1)	17. Redesign Expansion Joints	26,810	
(1)	22. Utilize Surplus Forklift & Tote Bins		14,220
(2)	26. Redesign Reactors	1,810	
(1)	29. Revise Htr controls & ESD System	60	
(1)	32. Incr. Capacity IG System	40,110	
(1)	36. Miscellaneous Instrument Changes		6,750
(1)	37. Revise design & Decr. quan hot valves		22,300
(1)	39. Revise Waste System		2,450
	40. Accum Costs for future transfer to Oper. Contract B-37400	125,000	
(1)	41. Revise Solids Handling	90,570	
(1)	42. Misc. Changes in Pipe Specs, Sizes, deletions & additions	41,260	
	43. Revise hot piping		85,640
(1)	45. Revise Misc. Reactor Internals	36,840	
(1)	46. Revise Jacket Water Piping System	39,040	
	49. Revise Flare System	13,340	
(1)	50. Add'l htg & vent'lg elect. room, proc structure & solids handling bldg	11,690	
(1)	51. Revise 1st floor layout Proc. Structure	1,110	
(1)	53. Revise gas quench syst. metalg, des.	146,670	
(2)	54. Redesign dolomite & lignite silos	8,770	
(2)	55. Revise Liq. Waste Disp.	250,160	
(1)	56. Add facil to pull Exch bundle	2,780	
(1)	57. Add'l Heat Trace & Ins.	114,330	
(1)	58. Add two doors Maint-Proc Area	370	
(1)	59. Revise Elect Classif-Proc. Struct	12,610	

PROJECT STATUS REPORT

**CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA**

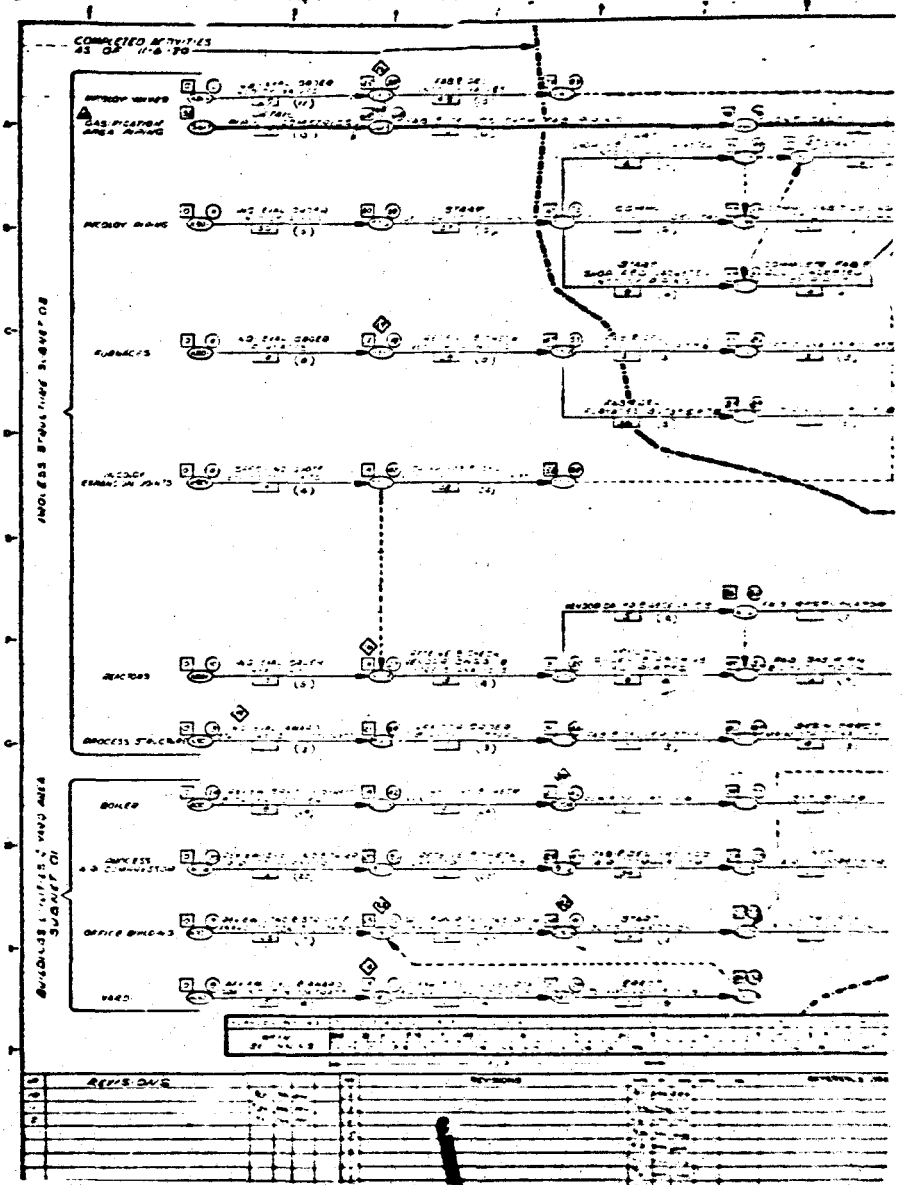
CCC Project No. 536
S-R Job No. B-37000
November 6, 1970

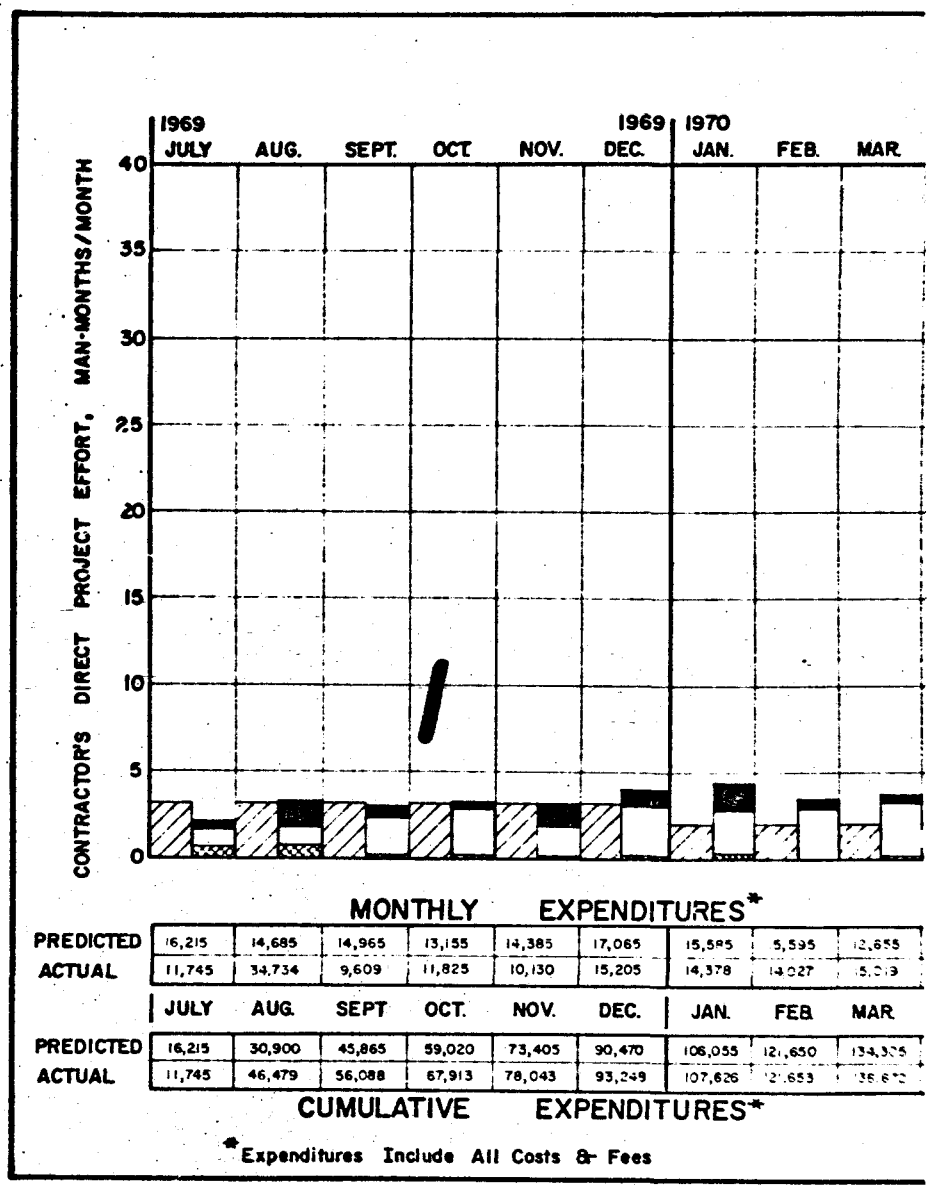
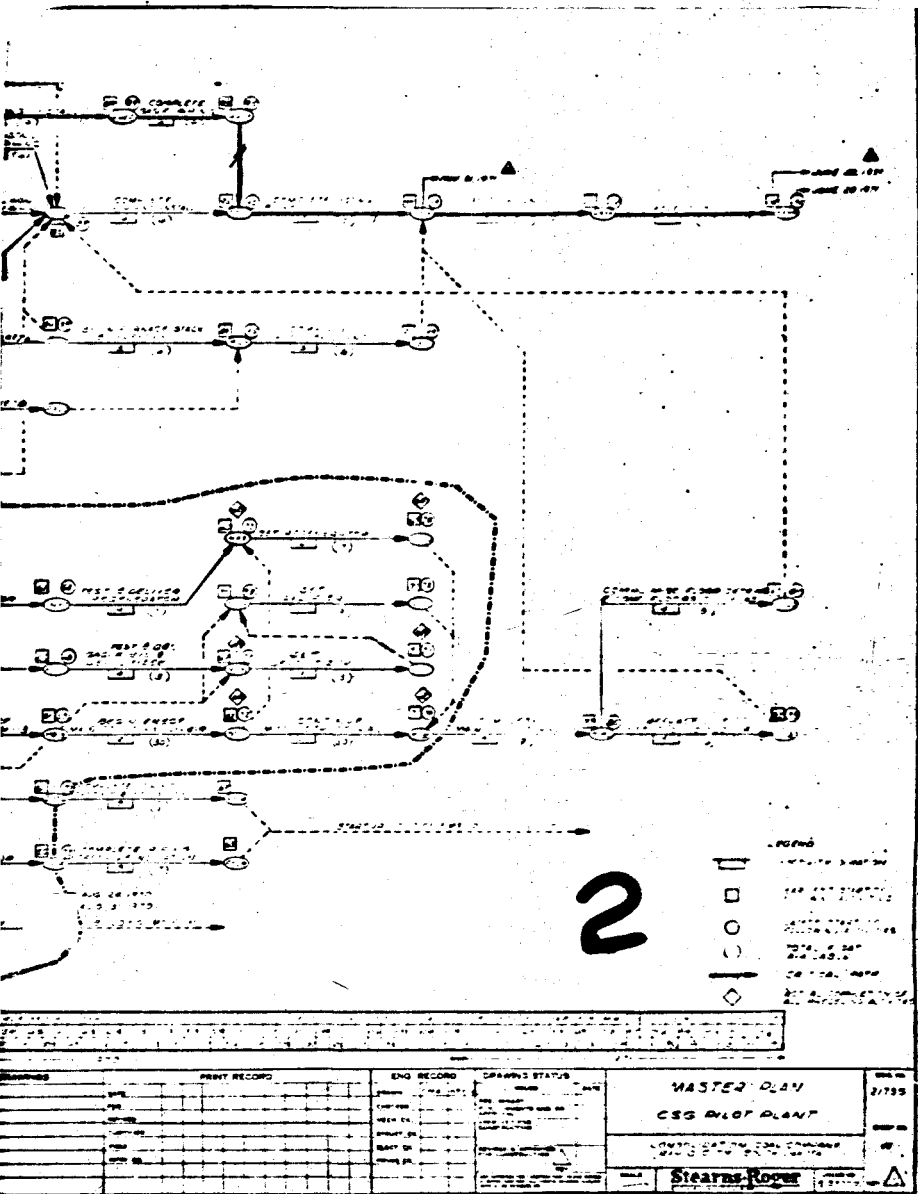
SUMMARY OF PROJECT CHANGES - continued

Gen'l Note	Pending Change Notices and Change Orders Awaiting Approval	Increase	Decrease
(1)	60. Sub Gas Turbine Mtr for Densitometer	8,950	
(1)	61. Incr. capacity Emer. Generator & Switch	5,740	
(1)	62. Add acid storage tank & cooling twr	8,240	
(1)	63. Revise boiler burners & controls	8,260	
(1)	64. Add 3 clrs; engrg for 43 sample conn.	2,420	
(1)	65. Add 19 Exp. Jts.	34,370	
	66. Received hrs at RR spur		3,000
	67. Engrg for elec schematic diagrams		
(1)	69. Spring hgrs F-213, F-215, F-216	2,420	
(2)	70. Emer. power for Elevator	2,020	
	71. Delete Heat Trace, painting & piping insul.		180,000
	72. Delete piping for		2,000
	73. Incr. wall thickness reactor T/W's. Proposal to transfer the shop cost only of high temp valves, reactors and special exp. joints from CO's 10, 26, and 37	7,500	
	74. Consolidated engineering for all C.O.'s approved after October 1.	345,609	499,965
	Net Pending Changes	654,764	
	Estimated total	\$9,164,898	
40.	Future transfer of 1970 operating charges to Operating Contract B-37400		125,000
	Construction Costs only. Est. Total	\$9,039,898	

General Notes

- (1) Transmitted to Consol for Approval, SR-CCC-800, 10/27/70.
- (2) Transmitted to Consol for Approval, SR-CCC-807, 10/30/70.



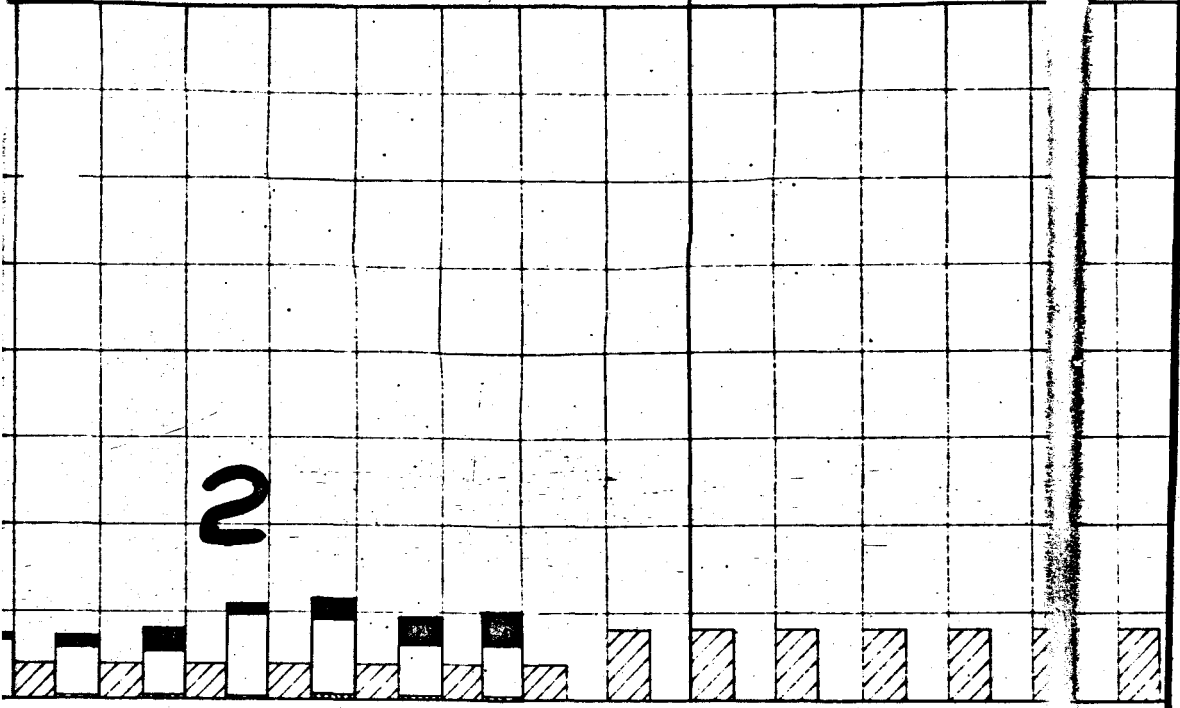


MON THLY

CONTRACT

MAY JUNE JULY AUG. SEPT. OCT. NOV. 1970 DEC. 1971 JAN. FEB. MAR. APR. JUNE

2



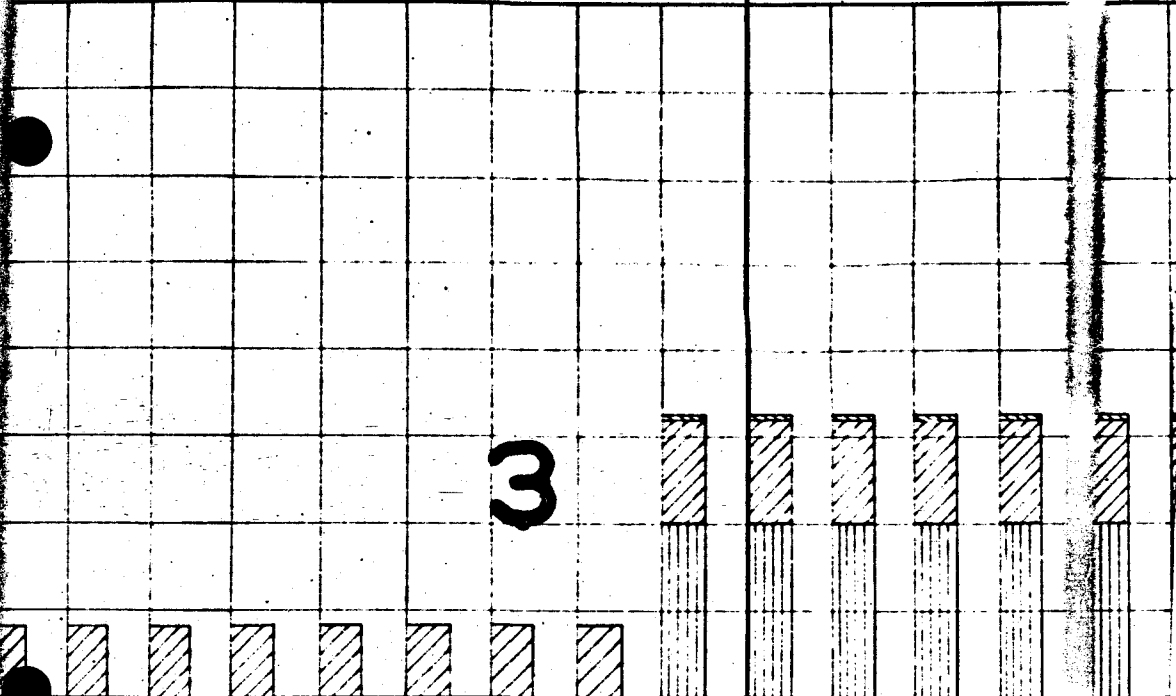
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13,815	12,655	13,315	12,835	12,505	12,505	12,505	20,155	20,135	23,295	22,295	21,145	705	15,9
17,342	19,319	20,054	13,955	25,003	21,000								
MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUN
160,995	173,650	186,965	199,800	212,305	224,810	237,315	257,470	277,605	300,900	323,195	344,340	365,045	379,
207,242	226,561	246,615	260,570	285,573	306,573								

MONTHLY PROGRESS CHART (SUPERVISOR)

CONTRACT No. 14-01-0001-415 (3)

1971 1972
 APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY



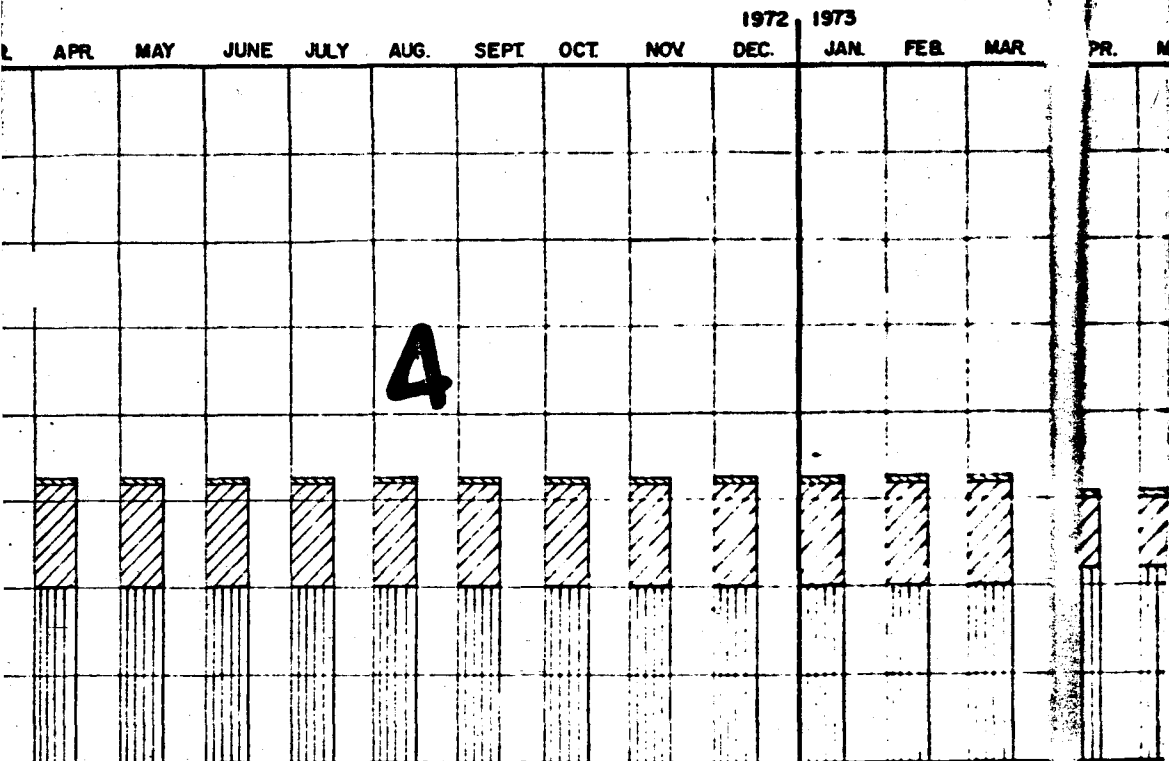
21,145	18,705	19,955	14,875	14,875	14,875	14,875	14,875	39,475	39,475	39,475	39,475	39,475	39,475
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APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY
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44,340	363,045	379,000	393,875	408,750	423,625	438,500	453,375	492,850	532,325	571,800	611,275	650,750	690,225
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VISION & LAB WORK)



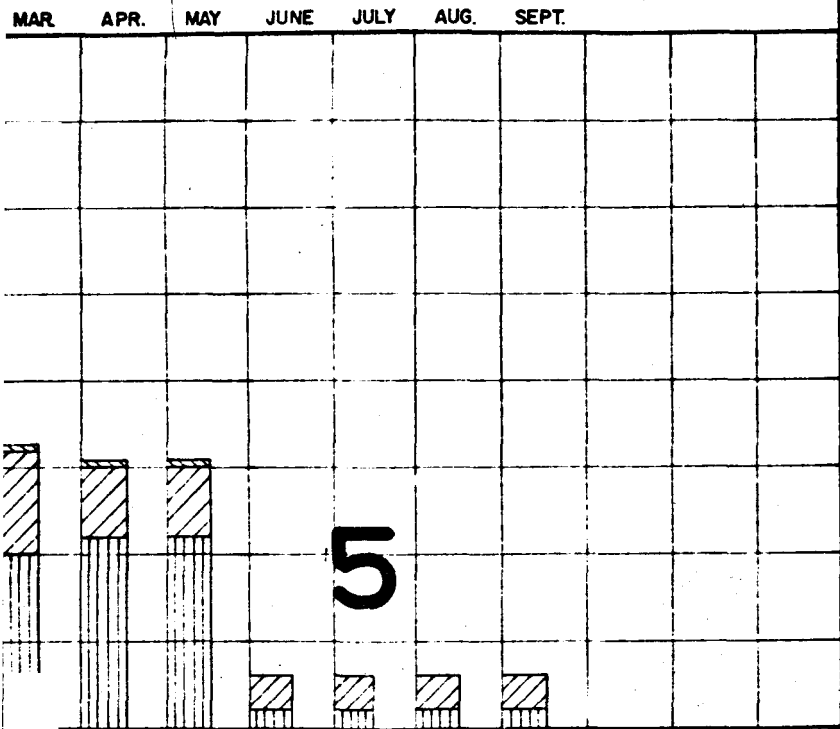
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	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV	DEC.	1972	1973	JAN.	FEB.	MAR.	APR.	MAY
	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475	39,475
	650,750	690,225	729,700	769,175	808,650	848,125	887,600	927,075	966,550	1,006,025	1,045,500	1,084,975	1,124,450	1,163,925	1,203,400	1,242,875

DATE: Oct 1970

1973



PREDICTED
 SUPERVISING 
 PROFESSIONAL 
 TECHNICIAN 
 ⊕ Includes supervisory
 ⊗ Includes technical.

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39,475	36,075	36,075	11,475	11,475	11,475	41,120			
MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.			
1,084,975	1,121,050	1,157,125	1,168,600	1,190,075	1,191,550	1,232,670			



MONTHLY
 OFFICE
 DEPARTMENT
 CONSOLIDATED
 RESEARCH DIVISION
 CONTRACT



(New 415 Chart)



DATE: Oct 1970

1973

PREDICTED ACTUAL

SUPERVISING  

PROFESSIONAL   ⊕

TECHNICIAN   ⊕ ⊕

⊕ Includes Supervisory Exempt Technicians.
 ⊕ ⊕ Includes Clerical.

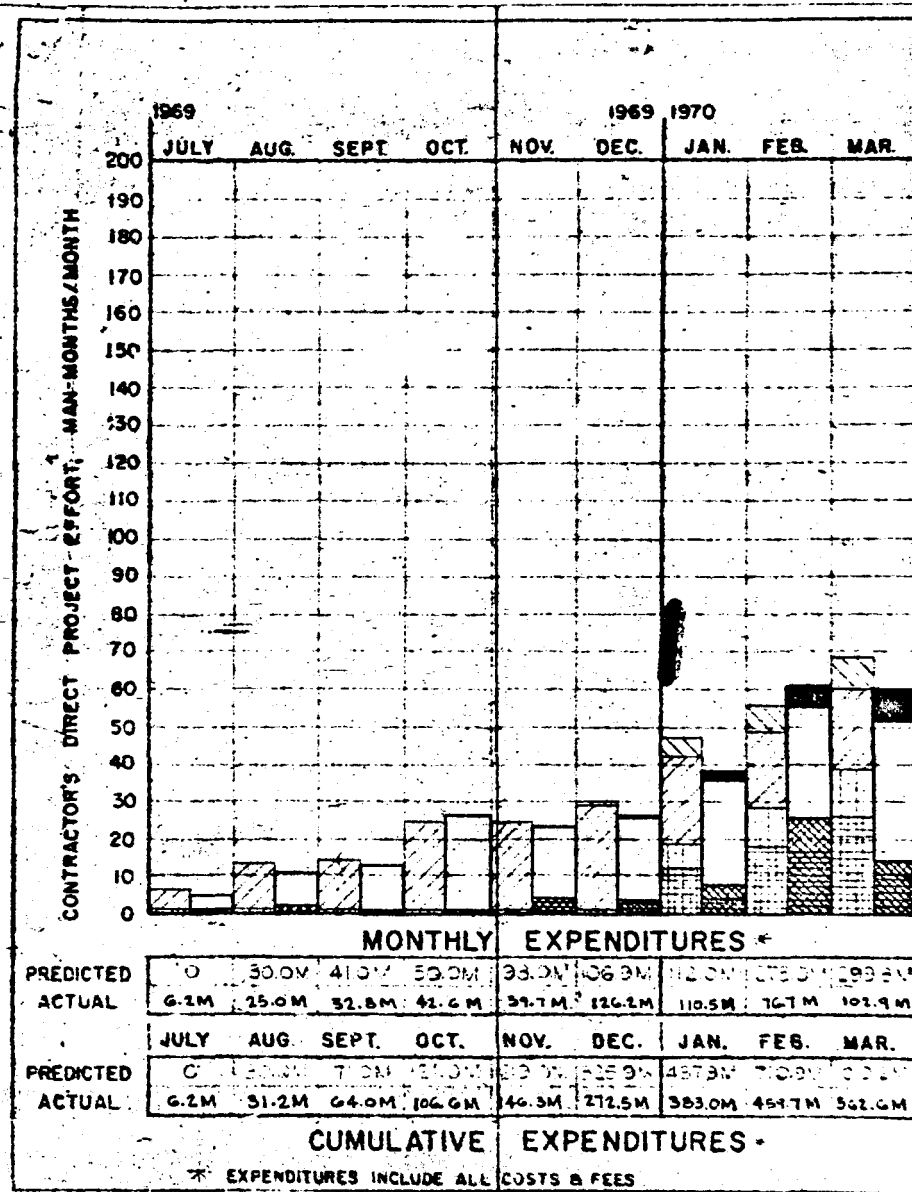
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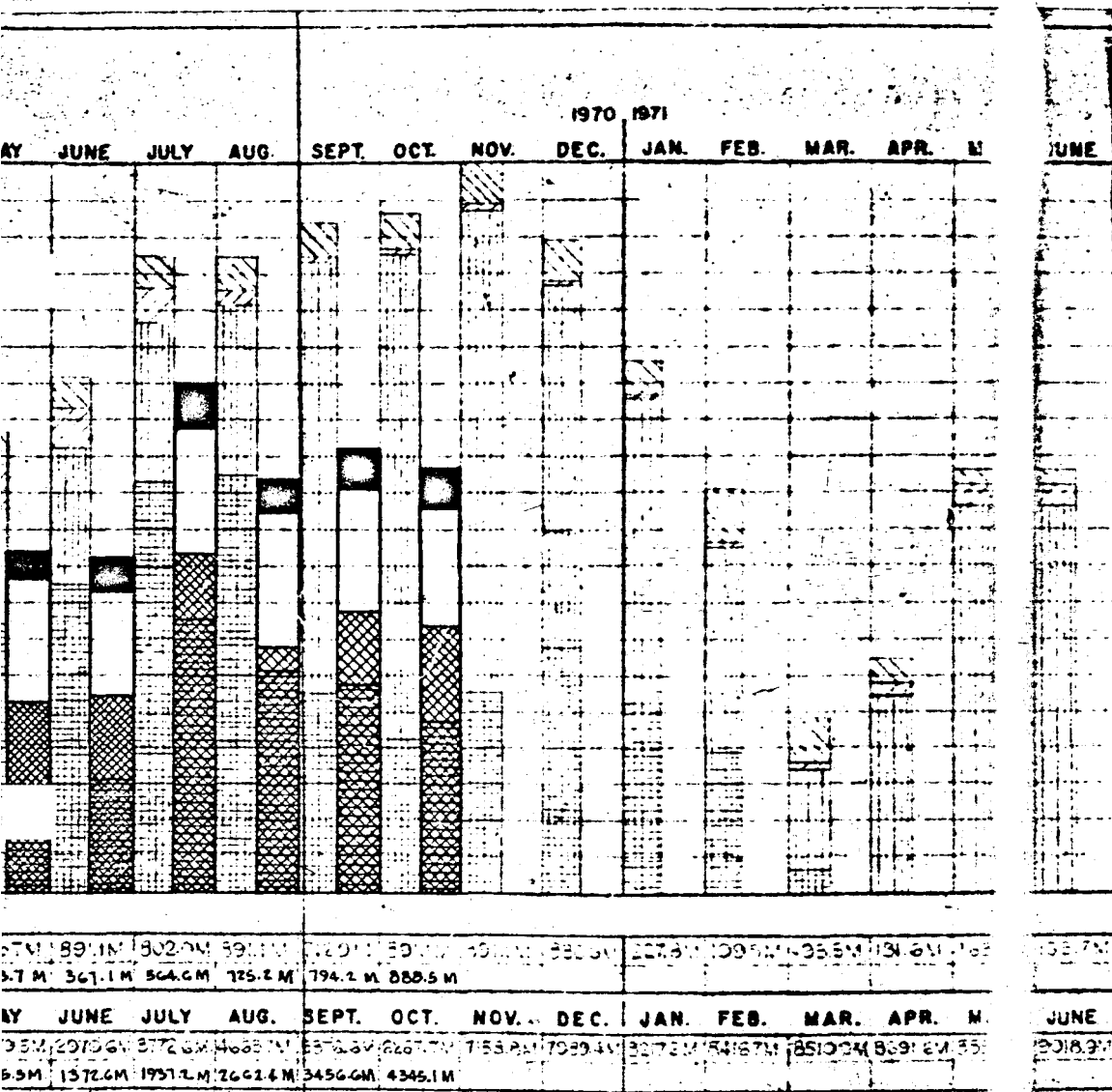
MONTHLY PROGRESS CHART

OFFICE OF COAL RESEARCH
 DEPARTMENT OF THE INTERIOR

CONSOLIDATION COAL CO.
 RESEARCH DIVISION LIBRARY, PA.

CONTRACT No. 14-01-0001-415 (3)





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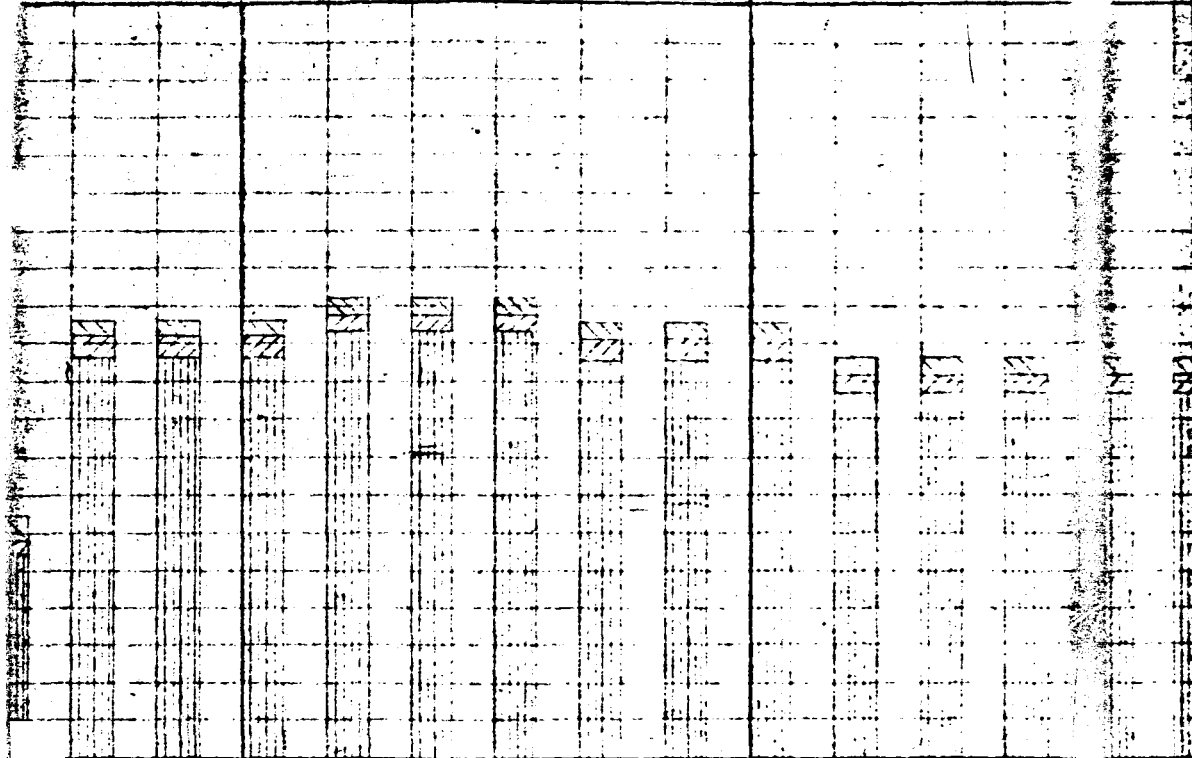
MONTHLY PROGRESS CHART

CONTRACT NO. 14-01-0001-415 (9)

1971 1972

ONS

PR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY



6M 168.6M 158.7M 168.5M 208.1M 208.0M 209.1M 201.0M 200.5M 201.5M 175.0M 174.5M 94.7M 95.3M 95

APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY

91.6M 8555.2M 9018.9M 9192.7M 9390.8M 9705.3M 9350.0M 10000.5M 91.1M 91.4.2.2M 10567.2M 10776.4M 10005.1M 1010.0M 11

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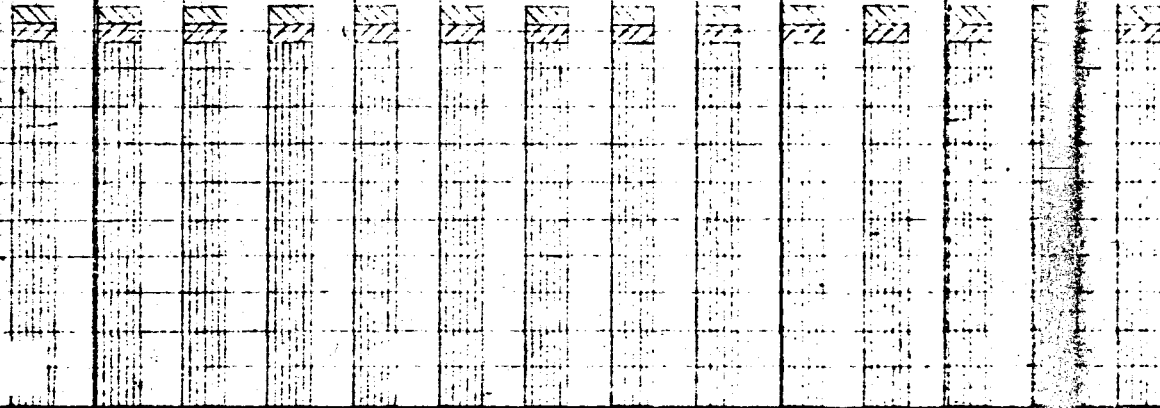
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(CONSTRUCTION & OPERATION)

1972 1973

APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. MAY

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194.7M 195.9M 198.8M 192.8M 190.9M 191.8M 191.5M 191.4M 173.2M 172.0M 178.1M 170.5M 151.6M

APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY

195.7M 195.0M 194.8M 195.6M 179.5M 192.8M 192.8M 193.4M 177.4M 175.8M 178.2M 179.2M 194.8M

DATE: Oct 1970

1973

	PREDICTED	ACTUAL
SUPERVISING		
PROFESSIONAL		
TECHNICIAN S-R		
TECHNICIAN S/C		

- ⊕ INCLUDES SUPERVISORY EXEMPT TECHNICIANS
- ⊕ INCLUDES CLERICAL

CONSTRUCTION — STEARNS-ROGER JOB B-37000
 OPERATIONS — STEARNS-ROGER JOB B-37400

6

MONTHLY PROGRESS CHART

OFFICE OF COAL RESEARCH
 U.S. DEPARTMENT OF THE INTERIOR

CONSOLIDATION COAL CO.
 RESEARCH DIVISION L 3RARY, PA

CONTRACT NO. 14-01-0001-415 (3)

PROGRESS REPORT NO. 78
 OCR CONTRACT NO. 14-01-0001-415(3)
 CONSOL LIGNITE GASIFICATION PROCESS DEVELOPMENT

November 1 to 30, 1970

170

A. Summary

Phase I - Feasibility Study

Complete.

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

June, 1971 remains the construction completion date projected by Stearns, despite the current shortage of welders and pipefitters in the Rapid City area. Approval has been given to expend \$60,000 in premium time pay to be associated with a 50-hour week for welders and pipefitters in an effort to augment the work force. Including this \$60,000 premium, the current projection of the GMP is \$9,060,185 on the assumption that all of the unresolved change orders will be resolved in line with Stearns' figures. Included in this total is the figure of \$345,609 for the engineering cost associated with change orders; this number appears questionable to Consol.

Seventeen change orders remain to be resolved and negotiated through an approval by OCR. Effort will continue on these items during December.

Financial

Estimated expenditures in November were \$792,800 by Stearns and \$10,000 by Consol. Cumulative project expense is \$7,173,425.

B. Technical Results and Program

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

1. Supporting Process and Economic Analysis (Project 533)

No work was done on this project.

2. Supporting Patent and Legal Activities (Project 534)

The current reports and memoranda were reviewed for Subject Inventions.

3. Consol Assistance on Construction of Lignite Pilot Plant (Project No. 536, 702)

Monitoring of final engineering and of field work by Stearns-Roger continued throughout the month. Technical experts from Continental Oil were employed on a part-time basis to follow the installation of refractory in the gasification reactors, to expedite the panel board instruction, and to continue checking of welding qualification tests.

Continued efforts on resolution of change orders resulted in the successful negotiation of 23 items which were subsequently approved by OCR. This resulted in a net decrease of \$338,825 in the projected GMP. Seventeen change orders are yet to be resolved; on the basis of Stearns-Roger figures, this could represent an increase in the GMP of \$888,776.

In view of the shortage of pipefitters and welders in the Rapid City area, Stearns requested and approval was given by Consol and OCR to offer a fifty hour week to these crafts. The permissible premium time pay, allowable as an addition to the GMP, was limited to \$60,000.

Consol's representative in Rapid City was involved in the interviewing of Stearns-Roger candidates for the Pilot Plant Operating Superintendent and Technical Superintendent. Both candidates were hired by Stearns and will report to work in Rapid City in December. Other activities involved a review of the proposed laboratory equipment, the preparation of a lubrication schedule for vendor selection, and initial work on a projection of the appropriate buildup of operating forces in 1971 consistent with a projected pilot plant completion date of June, 1971. This latter effort is aimed at jointly developing with Stearn-Roger in early January a firm projection of the costs associated with the Rapid City project in the period January 1 through June 30, 1971

4. Stearns-Roger Subcontract (Project No. 700)

a. Construction

The construction progress report by Stearns is attached. The target date for the completion of construction is May 31, 1971. The critical path in the remaining construction lies in the area of piping installation, and in view of the current shortage of welders and pipefitters the Stearns' projected completion date seems optimistic.

Stearns current projected GMP is \$9,060,185 including the added \$60,000 of cost associated with the fifty hour work week. Again, this includes a provision of \$315,609 for the cost of engineering change orders; this number is subject to considerable question, in Consol's opinion.

b. Operations

Due to Mr. Powell's continued illness, no progress report on operations effort was received from Stearns.

C. Subject Inventions

None

D. Financial Status

<u>Expense</u>	<u>Actual</u>	<u>Budget</u>
<u>Cumulative through October, 1970</u>		
Through June, 1969	\$ 1,878,256	\$ 1,878,256
Consol	306,869	224,810
Stearns-Roger	<u>4,185,300</u>	<u>6,267,700</u>
Total	\$ 6,370,625	\$ 8,370,766
<u>Expended in Period (estimate)</u>		
Consol	10,000	12,505
Stearns - Roger	<u>792,800</u>	<u>891,100</u>
Total	<u>\$ 802,800</u>	<u>\$ 903,605</u>
Cumulative through November, 1970	\$ 7,173,425	\$ 9,274,371

Att: Stearns-Roger Construction Progress Report
Monthly Progress Chart

PROJECT STATUS REPORT
CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 December 3, 1970

PROJECT REPORT SUMMARY

Extensive advertising in the six state area newspapers for pipe-fitter welders the past three weekends has not resulted in any additions to the three qualified welders on the job. Consol has, today, approved our recommendation of a fifty-hour work week for pipe fitters as a means of helping to attract more welders. Increase of welders up to twenty within the next week is necessary to keep the revised schedule of completion of construction to the week of May 31.

ENGINEERINGProcess

The only remaining process work of reviewing plant operating instructions is about 15% complete.

Mechanical

Major equipment is all purchased and about 85% delivered. For further details on delivery of equipment, refer to Material Status Report No. 14 dated December 4.

Drafting - - - About 97% complete.

The total of approximately 870 major piping isometric drawings has been issued for construction. The 200 steam tracing isometric drawings are being checked, and estimated for completion by December 11. Instrumentation isometric drawings have been issued. Mechanical flow diagrams are being back checked against the isometric drawings and revised accordingly.

Structural drafting is complete.

Electrical drafting is 97% complete. Remaining work is for the supply circuits and details for heat tracing.

Instrumentation - - - 100% purchased.

Index will be issued in preliminary form on December 4, and then on January 15 as checked against final flow diagrams.

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 December 3, 1970

PROJECT ENGINEERING

The diagram schedule attached to this report has been updated to show completed and unfinished work separated by the decorative line. Duration of piping installation in the Gasification Area is restricted by the maximum number of men that can work efficiently there, and to a lesser extent may be restricted by availability and sequence of installing the jacketed Incoloy pipe spools.

Subcontracts for built-up roofing and for asbestos siding have been issued. Inquiries and specifications for painting and insulation subcontracts are being prepared. They could be issued by January 17, but Consol may request delay of these inquiries until total cost of the project can be forecast more accurately.

Cost report for the period ending October 30 was issued on November 25. Accuracy of the report is subject to the approximations made to adjust for the unapproved change orders listed on the attached summary. Compared to the anticipated revised Guaranteed Maximum Price, the total probable cost should result in savings of about half of the original contingency.

CONSTRUCTION

Materials Handling Building structural steel framework is about 90% complete. Steel work in main process structure and the cooling tower should be complete by December 9. Refractory work on the dump hoppers and reactors started November 9. Subcontracted masonry, floor slabs and precast panels in the process structure are about 60% complete. The 300-ton capacity crawler crane with 280' boom was used November 4-14 to set the three reactors, two scrubbers, lignite preheater, lignite cyclone separator and the stack for the fired heaters. About 60% of the snap-fabricated pipe has been received. Major piping, which excludes instrumentation and steam tracing, is about 15% complete. Equipment status is summarized in the following table:

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
 CSC PILOT PLANT
 RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 December 3, 1970

REA	TOTAL PIECES	BEING FABRICATED	RECEIVED AND		2 INSTALLED
			NOT SET	INSTALLED	
Utilities	26	5	1	20	77
Proc. Struc.	41	3	8	30	73
1st Floor	25	13	4	8	32
2nd Floor	10	1	2	7	70
3rd Floor	8	0	6	2	25
4th Floor	7	0	2	5	71
5th Floor	16	3	10	3	19
6th Floor	9	0	9	0	0
7th Floor	8	0	6	2	25
8th Floor	3	0	3	0	0
9th Floor	4	3	0	1	25
Roof	8	0	2	6	75
Pump House	36	3	16	17	47
Mat's Receiving & Handling	13	0	3	10	77
Yard Area					
TOTALS	214	31	72	111	
PERCENT	100	14	34	52	

D. H. Dawson
 D. H. Dawson
 Project Manager

Attachments:

Summary of Project Changes - 3 pages
 Progress Chart - 11-30-70
 Master Plan Schedule - 12-1-70
 Equal Employment Opportunity Report

Distribution:

Consol - 5	Continental Oil Company - 6
C. A. Schulz	E. E. Ellington, CED
U. D. Marwig	J. B. Hambleton, CED
	D. F. Wegner, Field
	G. E. Fagerberg, CED
	L. Thompson, MED
	Dr. C. V. Foster, PED

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
 CSC PILOT PLANT
 RAPID CITY, SOUTH DAKOTA

CCC Project No.
 S-R Job No. B-37
 December 3, 1970

SUMMARY OF PROJECT CHANGES

Approved Change Orders	Increase	Decrease
1. Reactor System Study	\$ 8,820	
5. Delete roof at heaters		15,600
7. Incr. Disch. Pressure Prehrtr compr	4,315	
11. Delete Fuel Gas Booster Blower		8,670
13. Revise Canteen to Fallout Shelter	4,770	
14. Perspective Drawing for OCR	780	
16. Revise Hammermill specs	725	
18. Delete Car Puljer		17,200
19. Revise Fire System per F. Mutual	11,970	
20. Frt. Elev. vs. Manlift & Hoist	6,180	
21. Study reactor offgas prequenched	2,110	
23. Incr. Size F-509; add vent. line to flare	15,735	
24. Subs. Gouids for Aurora J-314	225	
28. Delete Car Tnaw Pit		5,395
33. Wafer Service to Site	2,430	
34. Revision to conform with Uniform Bldg Code	3,390	
35. Upgrade quality & incr. wall htr tubes	33,910	
38. Revise Sanitary Disp. System	18,820	
44. Revise Reactor System Auxiliary Vessels		22,000
47. Delete C-206		995
52. Stress relieve F-314	685	
	Original Maximum Price	\$8,465,129
	Presently Approved Total	\$8,510,134

PROJECT STATUS REPORTCONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTACCC Project No. 536
S-R Job No. B-37000
December 3, 1970SUMMARY OF PROJECT CHANGES

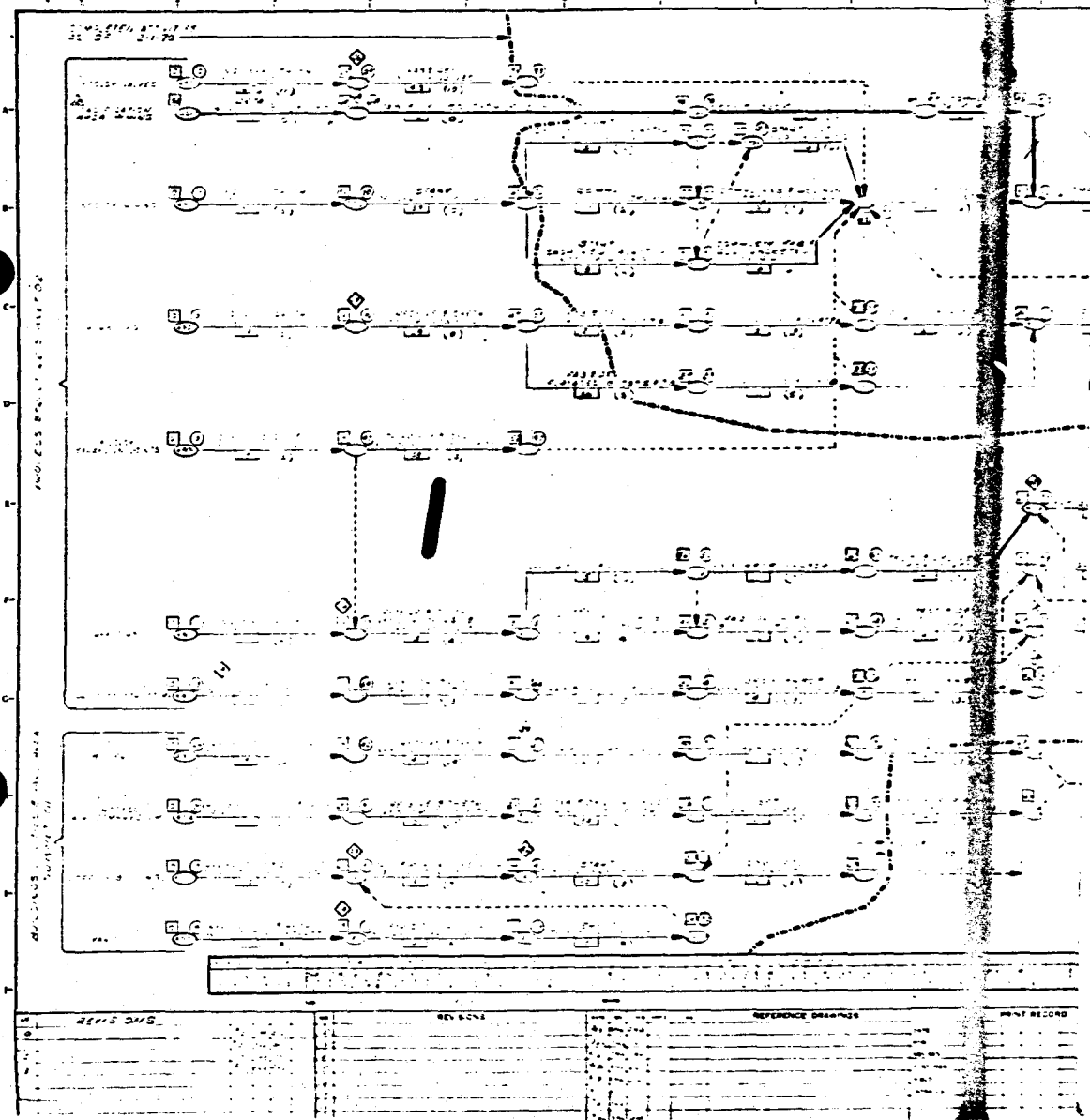
Note	Pending Change Notices and Change Orders Awaiting Approval	Increase	Decrease
(1)	8. Redesign Purge Gas Systems	49,110	
(1)	9. Add Instr. & Duct, Lignite crush & grind	32,090	
(1)	10. Boiler controls, 2 element pneu type	1,030	
(1)	17. Redesign Expansion Joints	13,640	
(1)	22. Utilize Surplus Forklift & Tote Bins		14,220
(2)	26. Redesign Reactors	1,810	
(1)	29. Revise Htr controls & ESD System	60	
(1)	32. Incr. Capacity IG System	40,110	
(1)	36. Miscellaneous Instrument Changes		6,750
(1)	37. Revise design & Decr. quan hot valves		22,300
(1)	39. Revise Waste System		2,450
	40. Accum Costs for future transfer to Oper. Contract B-37400	125,000	
(1)	41. Revise Solids Handling	90,570	
(1)	42. Misc. Changes in Pipe Specs, Sizes, deletions & additions	41,260	
	43. Revise hot piping		85,640
(1)	45. Revise Misc. Reactor Internals	30,840	
(1)	46. Revise Jacket Water Piping System	39,040	
(1)	49. Revise Flare System	13,340	
(1)	50. Add'l htg & vent'lg elect. room, proc structure & solids handling bldg	11,090	
(1)	51. Revise 1st floor layout Proc. Structure	1,110	
(1)	53. Revise gas quench syst. metalg, des.	146,670	
	54. Redesign dolomite & lignite silos	8,770	
	55. Revise Liq. Waste Disp.	247,740	
(1)	56. Add facil to pull Exch bundle	2,760	
(1)	57. Add'l Heat Trace & Ins.	114,330	
(1)	58. Add two doors Maint-Proc Area	370	
(1)	59. Revise Elect Classif-Proc. Struct	12,610	

PROJECT STATUS REPORTCONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTACCC Project No. 536
S-R Job No. B-37000
December 3, 1970SUMMARY OF PROJECT CHANGES - continued

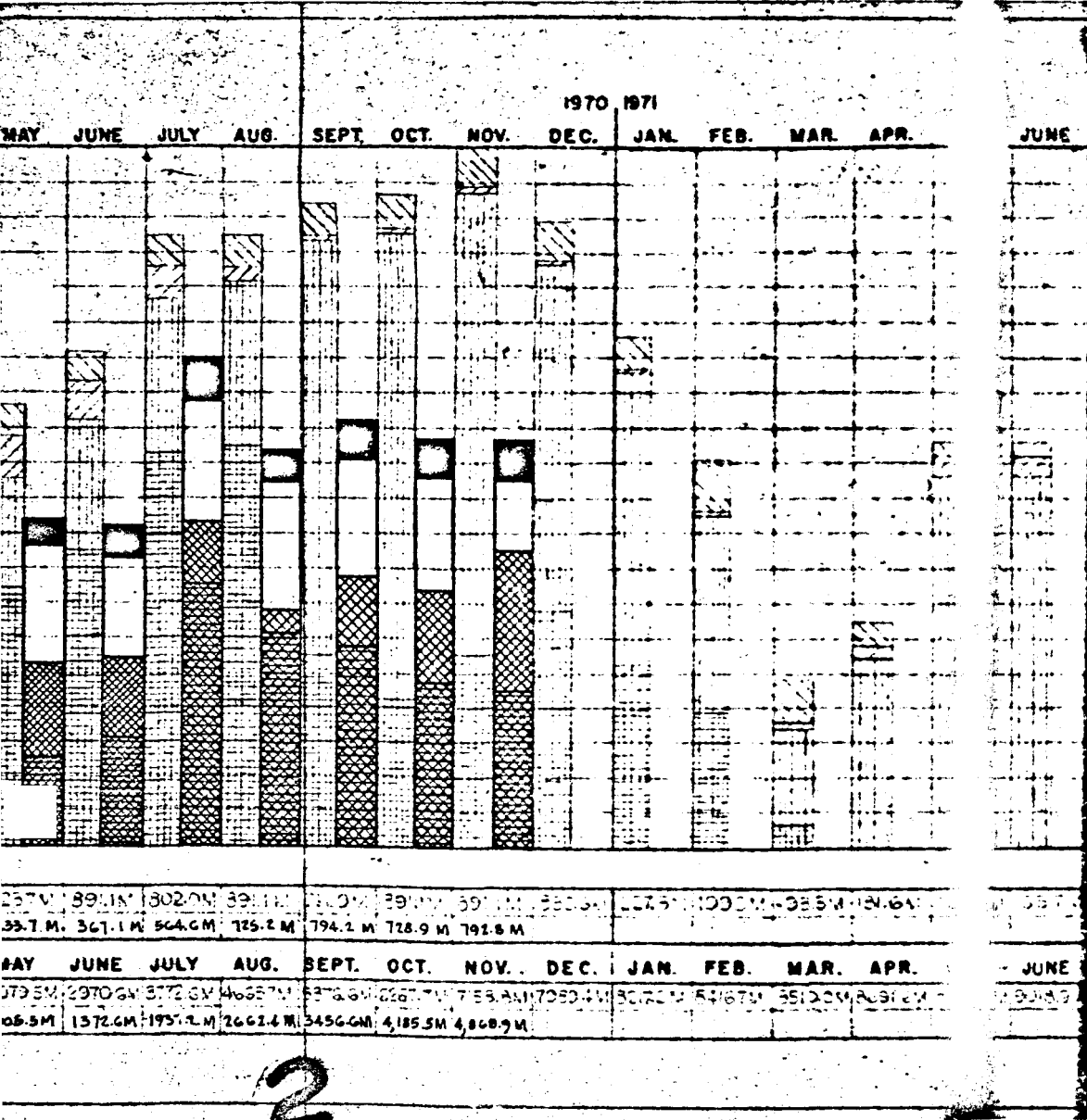
Gen'l Note	Pending Change Notices and Change Orders Awaiting Approval	Increase	Decrease
(1)	60. Subs Gas Turbine Mtr for Densitometer	8,950	
(1)	61. Incr. capacity Emer. Generator & Switch	5,740	
(1)	62. Add acid storage tank & cooling twr	8,240	
(1)	63. Revise boiler burners & controls	8,260	
(1)	64. Add 3 clrs; engrg for 43 sample conn.	2,420	
(1)	65. Add'l 19 Exp. Jts.	34,370	
	* 66. Revised htgs @ RR spur		5,000
	67. Engrg for elec schematic diagrams		
(1)	69. Spring htrs F-213, F-215, F-216	2,420	
(2)	70. Emer. power for Elevator	2,020	
	71. Delete Heat Trace, painting & piping insul.		180,000
	72. Delete piping for C-213		24,550
	73. Incr. wall thickness reactor T/W's. Proposal to transfer the shop cost only of high temp valves, reactors and special exp. joints from CO's 10, 26, and 37	7,927	
	74. Consolidated engineering for all C.O.'s approved after October 1.	345,609	
	75. Extend work week to 50 hours	60,000	
	Net Pending Changes	675,051	
	Estimated Total	9,185,185	
	40. Future transfer of 1970 operating charges to Operating Contract B-37400		125,000
	Construction Costs only, Est. Total	9,060,185	

General Notes

- (1) Transmitted to Consol for Approval, SR-CCC-800, 10/27/70.
(2) Transmitted to Consol for Approval, SR-CCC-807, 10/30/70.



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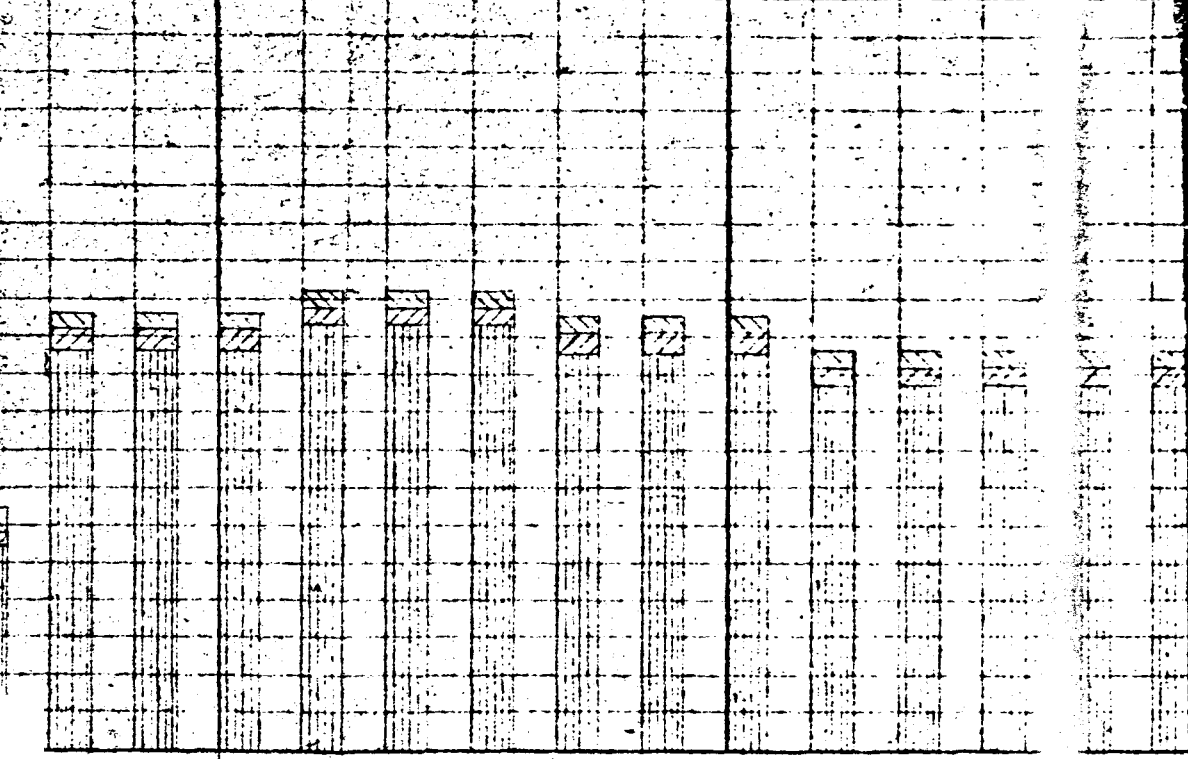
MONTHLY PROGRESS CHART

CONTRACT NO. 14-01-0001-415 (3)

1971, 1972

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R. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUNE



CGM 153.6M 156.7M 163.8M 203.1M 208.0M 209.1M 201.9M 201.3M 201.5M 174.5M 194.7M 194.3M 190.0M

PR. MAY - JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUNE

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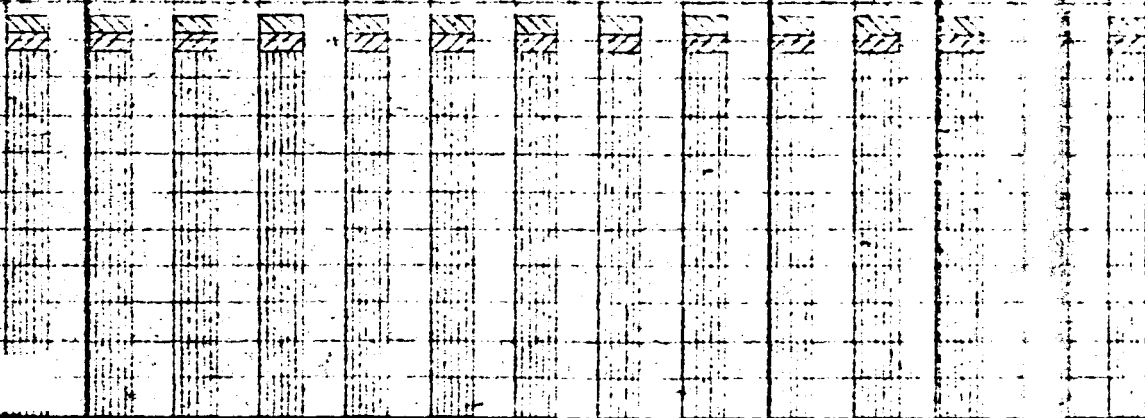
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(CONSTRUCTION & OPERATION)

1972 1973

APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY



191.7M 193.9M 192.8M 192.8M 190.9M 191.9M 191.5M 191.4M 173.2M 172.9M 172.1M 170.5M

APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY

1095.1M 1151.0M 1154.6M 1155.6M 1172.9M 1192.3M 1211.2M 1230.4M 1247.4M 1265.3M 1292.4M 1299.2M

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DATE: Nov, 1970

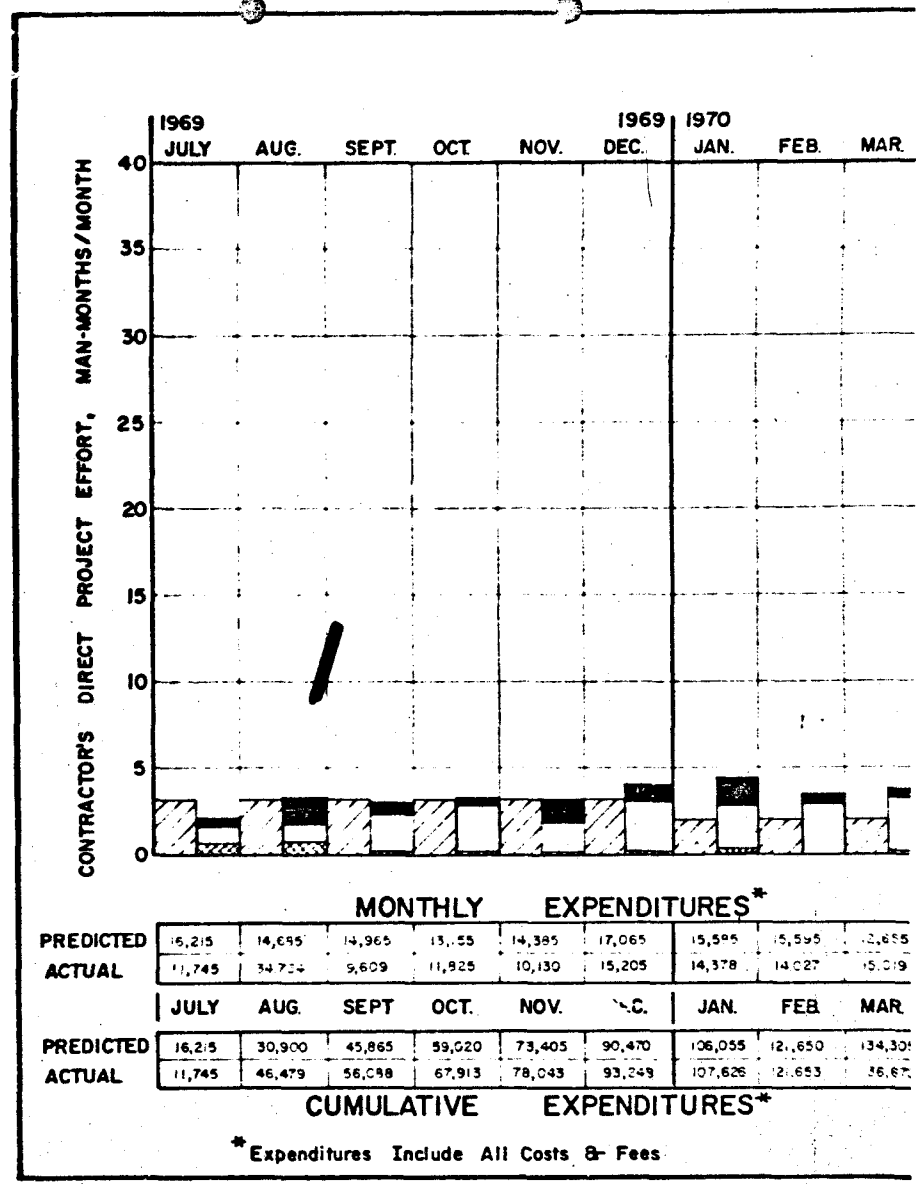
1970			PREDICTED	ACTUAL
OCT.	NOV.	DEC.		
			SUPERVISING	
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⊕ INCLUDES SUPERVISORY EXEMPT TECHNICIANS
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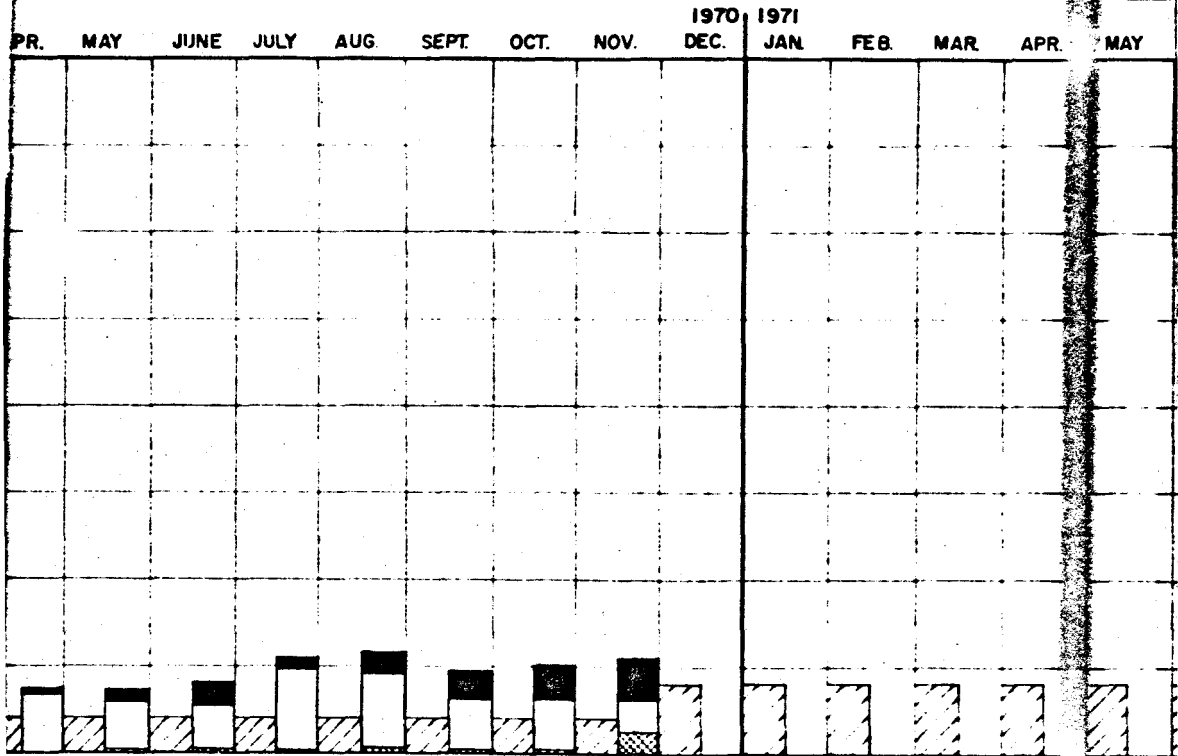
CONSTRUCTION — STEARNS-ROGER JOB B-37000
 OPERATIONS — STEARNS-ROGER JOB B-37400

6

MONTHLY PROGRESS CHART			
OFFICE OF COAL RESEARCH U.S. DEPARTMENT OF THE INTERIOR			
CONSOLIDATION COAL CO. RESEARCH DIVISION		LIBRARY, PA	
CONTRACT NO. 14-01-0001-415 (3)			



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	PR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY
1970	17,180	160,995	173,650	186,965	199,800	212,305	224,810	237,315	257,470	277,605	300,900	323,195	344,34	363,045
1971	18,900	207,242	226,561	246,615	260,570	285,573	306,869	316,869						

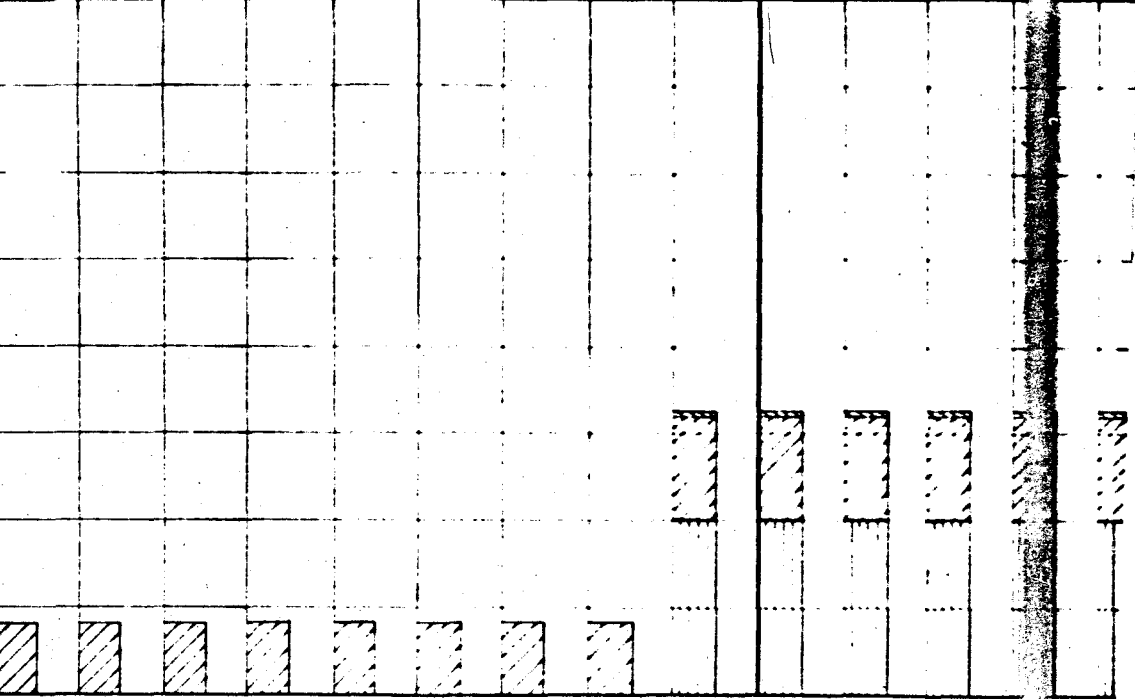
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MONTHLY PROGRESS CHART (SUPERVISION)

CONTRACT No. 14-01-0001-415 (3)

1971 1972
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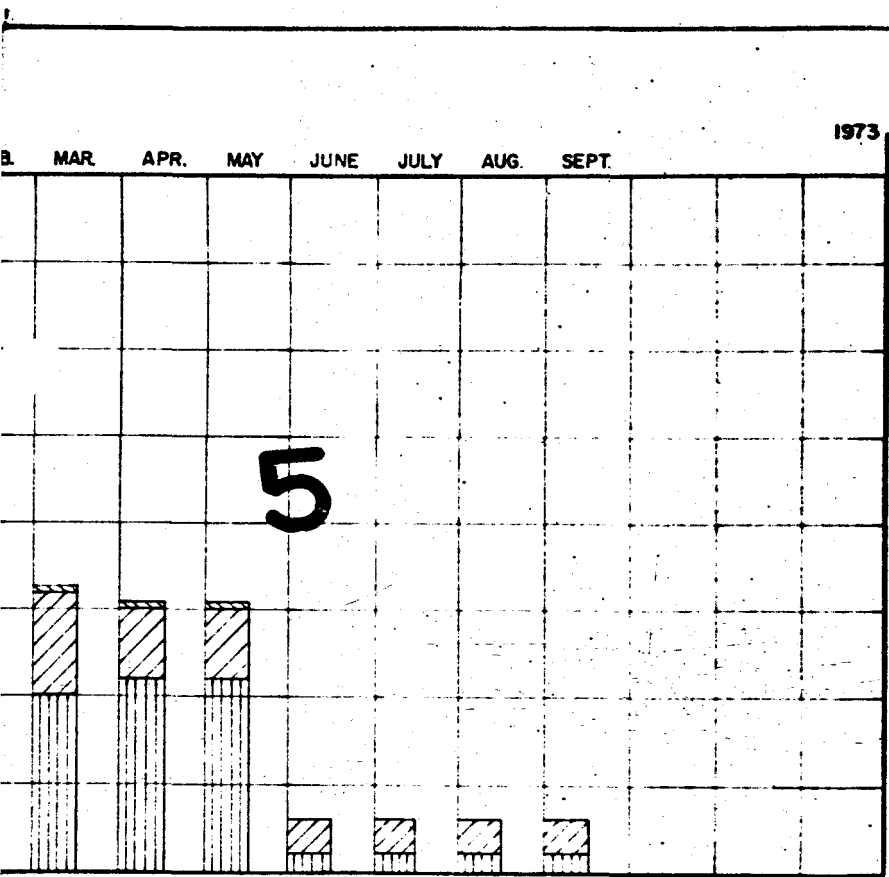


21,145	18,705	15,955	14,875	14,875	14,875	14,875	14,875	14,875	32,475	32,475	32,475	32,475	475
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APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY
344,340	363,045	379,000	393,875	408,750	423,625	439,500	453,375	462,850	532,325	57,800	61,075	11,750	

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5	39,475	36,075	36,075	11,475	11,475	11,475	41,120		
	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.		
100	1,084,975	1,121,050	1,157,125	1,168,600	1,190,075	1,191,550	1,232,670		

DATE: 1970

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(New 415 Chart)

DATE: Dec 1970

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TECHNICIAN		

⊗ Includes Supervisory Exempt Technicians.
 ⊗ ⊗ Includes Clerical.

6

MONTHLY PROGRESS CHART
 OFFICE OF COAL RESEARCH
 DEPARTMENT OF THE INTERIOR
CONSOLIDATION COAL CO.
 RESEARCH DIVISION LIBRARY, PA.
 CONTRACT No. 14-01-0001-415 (3)

PROGRESS REPORT NO. 79
 OCR CONTRACT NO. 14-01-0001-415(3)
CONSOL. LIGNITE GASIFICATION PROCESS DEVELOPMENT

December 1 to 30, 1970

A. Summary

Phase I - Feasibility Study

Complete.

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

The Stearns projected completion date for construction is now July 5, 1971; this presumes the acquisition of some 15 welders in the next two months in an area which seems deficient in these skills.

The current projected GMP is \$9,054,155; this includes a controversial item of \$345,609 for engineering of changes. Fourteen of the remaining seventeen change notices have been negotiated and will be submitted to OCR for approval in mid-January.

Effort is under way to define the magnitude of the funds which will be expended in the first half of calendar 1971; the principal uncertainty is the pace of construction in view of the uncertain labor supply.

Financial

Estimated expenditures in December were \$779,500 by Stearns and \$23,000 by Consol. Cumulative project expense is \$7,605,609.

B. Technical Results and Progress

Phase II - Bench-Scale Research

Complete.

Phase III - Pilot Plant Engineering

Complete.

Phase IV - Pilot Plant Construction

1. Supporting Process and Economic Analysis (Project 533)

No work was done on this project.

2. Supporting Patent and Legal Activities (Project 534)

The current reports and memoranda were reviewed for Subject Inventions.

3. Consol Assistance on Construction of Lignite Pilot Plant (Projects No. 536, 702)

a. Construction

At the end of the report period, the Stearns-Roger home office engineering and drafting was 99% complete. Accordingly, Consol's home office activity in monitoring the project is rapidly diminishing, but the field monitoring is increasing. During the month of December, Consol home office required only one man month. The field effort continues with one man plus miscellaneous part-time experts and expeditors.

A refractory specialist was required to inspect the installation of refractories in the three major reactors. Welding experts are being used to resolve the welding qualification difficulties at the furnace manufacturer (Thermal Transfer Company). Instrument experts examined and tested the major instrument panel boards.

Additional progress was made in resolving some of the differences on change orders. Fourteen of the remaining seventeen are acceptable and will be presented to OCR for approval in mid-January.

The largest unresolved change is \$345,609 for added engineering. The final negotiation for this will be delayed for several months until total job costs are relatively well defined.

A meeting was held in Denver on January 4, 1971 to discuss the projected project costs for the next six months (through June 30, 1971). If the construction job proceeds without delays, and if the Stearns operating forces are built up to full level prior to July 1, 1971, cumulative total Stearns expenditures for this contract will exceed \$9,000,000. Thus, the total Contract 14-01-0001-415(3) expense since inception (including Consol costs) could exceed \$11,000,000 by June 30, 1971.

However, there is considerable question whether construction will proceed on schedule in view of the current shortage of welders; thus both construction and operating costs may occur at a significantly slower rate than the above projection. Information on the expected equipment deliveries and costs in the next six months is being worked up by Stearns; this represents a significant portion of the remaining construction costs which will be independent of the pace of construction.

b. Operations

Stearns was authorized to set up the accounting for the operating subcontract (B-37400) as of January 1, 1971 and to isolate the costs associated with preparations for operations in the future. A cumulative expense of about \$85,000 has occurred through December, 1970 and will be transferred to this account.

The current Stearns operating personnel totals five; running charges are currently about \$18,000 per month. Consol's current operating effort in Rapid City consists of daily training meetings with Stearns to review technology, flowsheets and start-up procedures.

4. Stearns-Roger Subcontract (Project No. 700)

a. Construction

The construction progress report by Stearns is attached. The current target date for completion of construction is July 5, 1971; however, this assumes immediate acquisition of some sixteen welders in what appears to be a tight labor market.

The current projected GMP is \$9,054,155; this includes the controversial \$345,609 item for engineering of changes. The Stearns Monthly Progress Chart (which has been revised) projects a total construction cost of \$8,800,000; this suggests that Stearns has estimated the difference between GMP and plant cost to be ca \$340,000 (before savings are split).

b. Operation

The Stearns progress report on operations has not been received.

December, 1970

C. Subject Inventions

None.

D. Financial Status

<u>Expense</u>	<u>Actual</u>	<u>Budget</u>
<u>Cumulative through November, 1970</u>		
Through June, 1969	\$ 1,878,256	\$ 1,878,256
Consol	316,453	237,315
Stearns-Roger	4,608,400	7,158,800
Total through November, 1970	\$ 6,803,109	\$ 9,274,371
<u>Expended in Period (estimate)</u>		
Consol	\$ 23,000	\$ 20,135
Stearns-Roger	779,500	758,200
Total, December, 1970	\$ 802,500	\$ 778,335
Cumulative through December, 1970	\$ 7,605,609	\$10,052,726

1/11/71
Att. - Stearns-Roger Construction Progress Report
Monthly Progress Chart

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
S-R Job No. B-37000
December 31, 1970

PROJECT REPORT SUMMARY

Shift to the fifty hour week for pipefitters on December 15 did not result in the immediate availability of more welders, but we have several indications that during the next three weeks we will be able to hire the sixteen more welders needed to meet our requirements. This delay in securing workmen plus the limit of the maximum number of pipefitters which can work in the process structure has forced us to extend the schedule of completion of construction to the week of July 5.

ENGINEERING

Process

The remaining process engineering work of reviewing plant operating instructions is about 30% complete.

Mechanical

Major equipment is all purchased and about 87% delivered.

Drafting - - - About 99% complete.

Mechanical flow diagrams have been revised to agree with piping isometric drawings. The 200 steam tracing isometric drawings have been checked. Piping and instrumentation isometric drawings have been processed by the material control people. Final material requisitions for a small number of routine "clean-up" items have been issued. Line index with test data is ready for issue. Remaining work is to check final vendor drawings and parts lists to be included in the mechanical catalogs.

Electrical drafting is 98% complete. Remaining work is for the supply circuits for heat tracing. As a part of operations contract B-37400, we will do the electrical engineering for the power supplies to the hood fans and tempering heaters for the laboratory furniture.

Instrumentation - - - 100% purchased.

Index is scheduled for issue in final form on January 15.

PROJECT STATUS REPORT
CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 December 31, 1970

SUMMARY OF PROJECT CHANGES

<u>Approved Change Orders</u>	<u>Increase</u>	<u>Decrease</u>
1. Reactor System Study	\$ 8,820	
5. Delete roof at heaters		15,600
7. Incr. Disch. Pressure Prehtr. compr.	4,315	
9. Add Instr. & Duct, Lignite crush & grind	32,090	
10. Boiler controls, 2 element pneu type	1,030	
11. Delete Fuel Gas Booster Blower		8,670
13. Revise Canteen to Fallout Shelter	4,770	
14. Perspective Drawing for OCR	780	
16. Revise Hammermill specs	725	
18. Delete Car Puller		17,200
19. Revise Fire System per F. Mutual	11,970	
20. Frt. Elev. vs. Manlift & Hoist	6,180	
21. Study reactor offgas prequench	2,110	
22. Utilize Surplus Forklift & Tote Bins		14,220
23. Incr. Size F-509; add vent line to flare	15,735	
24. Subs. Coulds for Aurora J-314	225	
26. Redesign Reactors	1,810	
28. Delete Car Thaw Pit		3,395
29. Revise Htr controls & ESD System	60	
32. Incr. Capacity IG System	40,110	
33. Water Service to Site	2,430	
34. Revision to conform with Uniform Bldg Code	3,390	
35. Upgrade quality & incr. wall htr tubes	33,910	
36. Miscellaneous Instrument Changes		6,750
37. Revise design & Decr. quan hot valves		22,300
38. Revise Sanitary Disp. System	18,820	
39. Revise Waste System		2,450
44. Revise Reactor System Auxiliary Vessels		22,000
46. Revise Jacket Water Piping System	39,040	
47. Delete C-206		995
50. Add'l htg & vent'lg elect. room, proc structure & solids handling bldg	11,690	
51. Revise 1st floor layout Proc. Structure	1,110	
57. Stress relieve F-314	685	
56. Add facie to pull Exch bundle	2,760	
58. Add two doors Maint-Proc Area	370	
59. Revise Elect Classif-Proc. Struct	12,610	
60. Subs Gas Turbine Mtr for Densitometer	8,950	

PROJECT STATUS REPORT
CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

CCC Project No. 536
 S-R Job No. B-37000
 December 31, 1970

SUMMARY OF PROJECT CHANGES - continued

<u>Approved Change Orders</u>	<u>Increase</u>	<u>Decrease</u>
61. Incr. capacity Emer. Generator & Switch	\$ 5,740	
62. Add acid storage tank & cooling twr	8,240	
64. Add 3 cirs; enrg for 43 sample conn.	2,420	
65. Add'l 19 Exp. Jts.	34,370	
69. Spring hgrs F-213, F-215, F-216	2,420	
70. Emer. power for Elevator	2,020	
75. Extend work week to 50 hours	60,000	
- Contr. Adjustmt: Hi Temp Valves, reactors & special exp joints		499,965
Net Approved Changes, (Decr.)		\$ 233,820
Original Maximum Price		\$8,465,129
Presently Approved Total		\$8,231,309

*Guaranteed Maximum Price will be increased by the amount actually expended for premium pay. Total increase is not authorized to exceed \$60,000

PROJECT STATUS REPORT

CONSOLIDATION COAL COMPANY
CSG PILOT PLANT
RAPID CITY, SOUTH DAKOTA

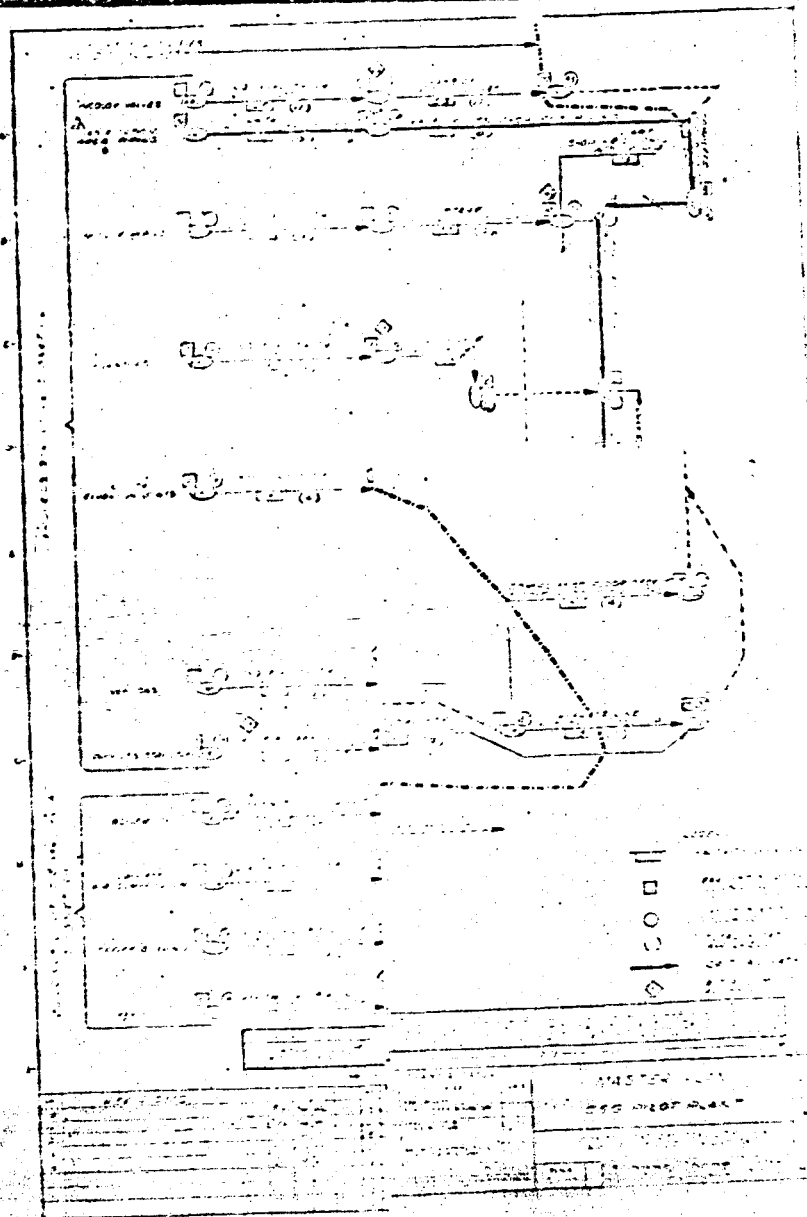
CCC Project No. 536
 S-R Job No. B-37000
 December 31, 1970

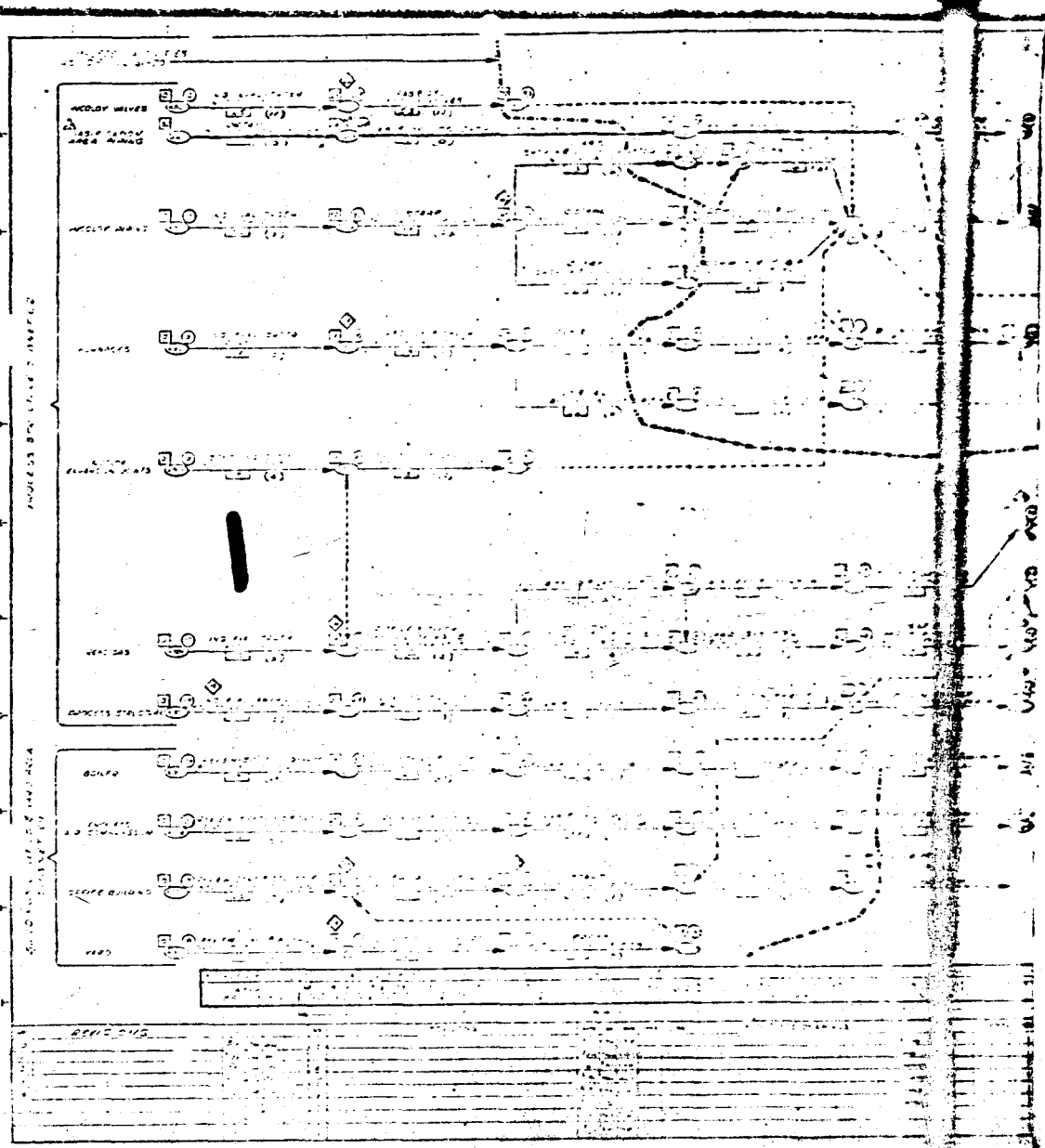
SUMMARY OF PROJECT CHANGES - continued

Gen'l Note	Pending Change Notices and Change Orders Awaiting Approval	Increase	Decrease
(2)	8. Redesign Purge Gas Systems	48,550	
(2)	17. Redesign Expansion Joints	13,640	
(2)	40. Accum Costs for future transfer to Oper. Contract B-37400	125,000	
(4)	41. Revise Solids Handling	90,240	
(3)	42. Misc. Changes in Pipe Specs, Sizes, deletions & additions	44,040	
(1)	43. Revise hot piping		85,640
(2)	45. Revise Misc. Reactor Internals	29,020	
(2)	49. Revise Flare System	14,180	
(1)	53. Revise gas quench syst. metalg. des.	146,670	
(1)	54. Redesign dolomite & lignite silos	8,770	
(2)	55. Revise Liq. Waste Disp.	248,290	
(1)	57. Add'l Heat Trace & Ins.	114,330	
(2)	63. Revise boiler burners & controls	8,260	
(2)	66. Revised httrs @ RR spur		6,490
(2)	71. Delete Heat Trace, painting & piping insulation		180,000
(2)	72. Delete piping for C-313		24,550
	73. Incr. wall thickness reactor T/W's.	7,927	
74.	Consolidated engineering for all C.O.'s approved after October 1.	345,609	
	Net Pending Changes (Increase)	\$ 947,846	
	Estimated Project Cost	9,179,155	
40.	Future Transfer of 1970 Operating Charges to Operating Contract B-37400		125,000
	Construction Cost only	\$9,054,155	

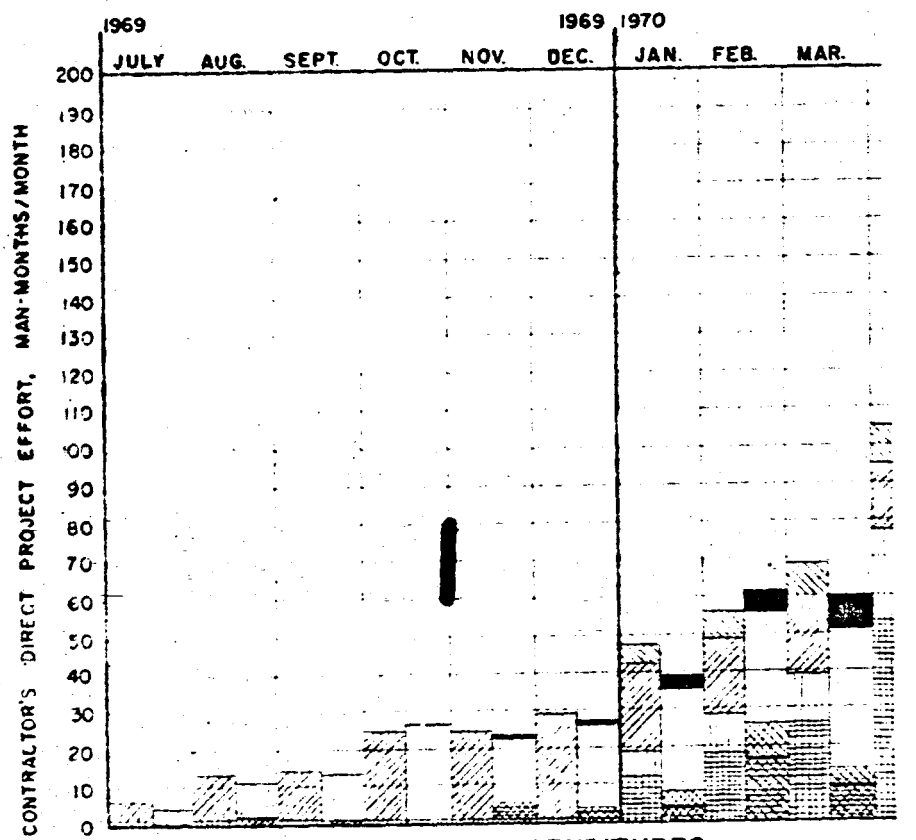
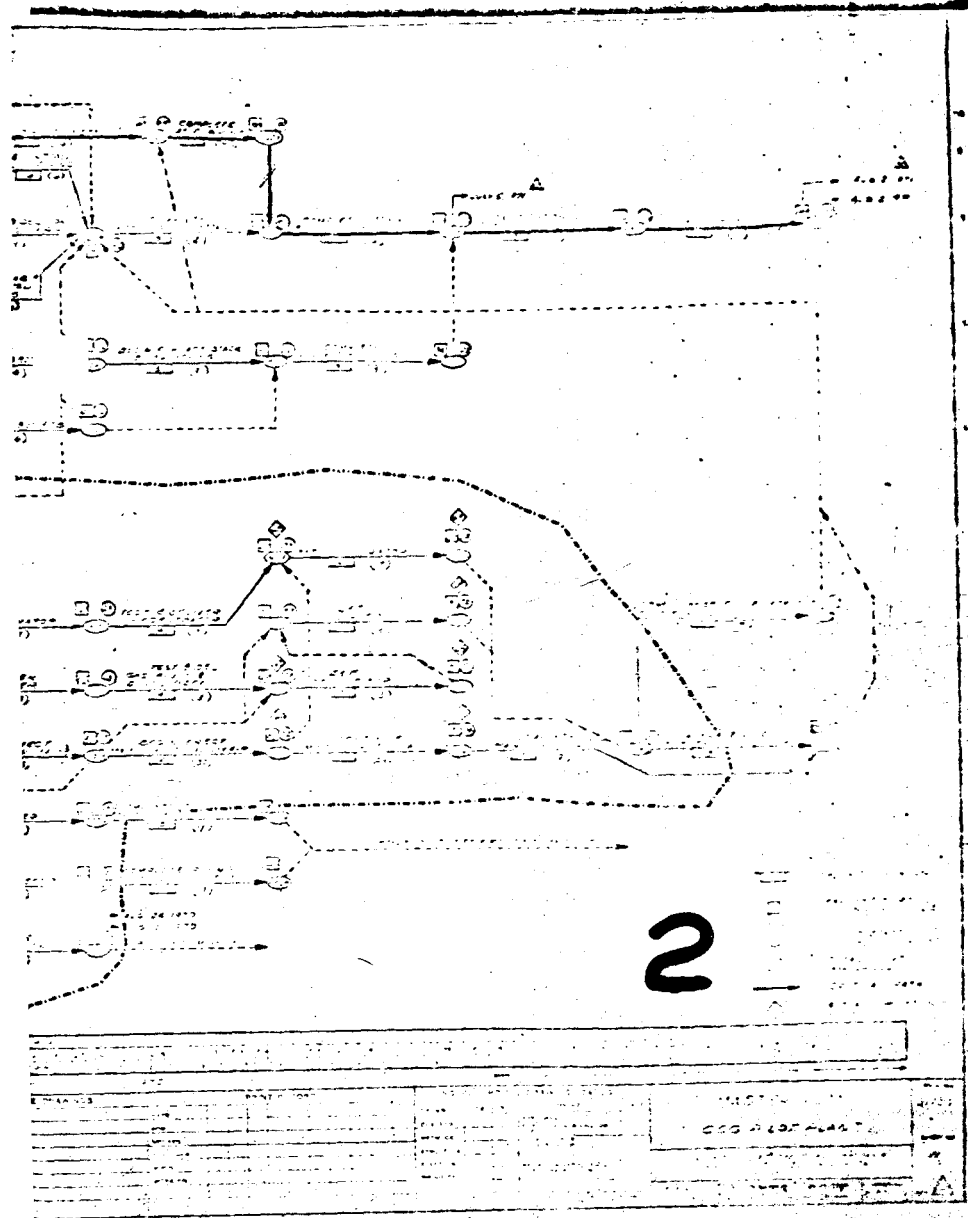
General Notes

- (1) Transmitted to Consol for Approval, SR-CCC-500, 10/27/70
- (2) Transmitted to Consol for Approval, SR-CCC-300, 12/18/70
- (3) Transmitted to Consol for Approval, SR-CCC-800, 12/24/70
- (4) Transmitted to Consol for Approval, SR-CCC-800, 12/29/70
- (5) Transmitted to Consol for Approval, SR-CCC-800, 11/12/70





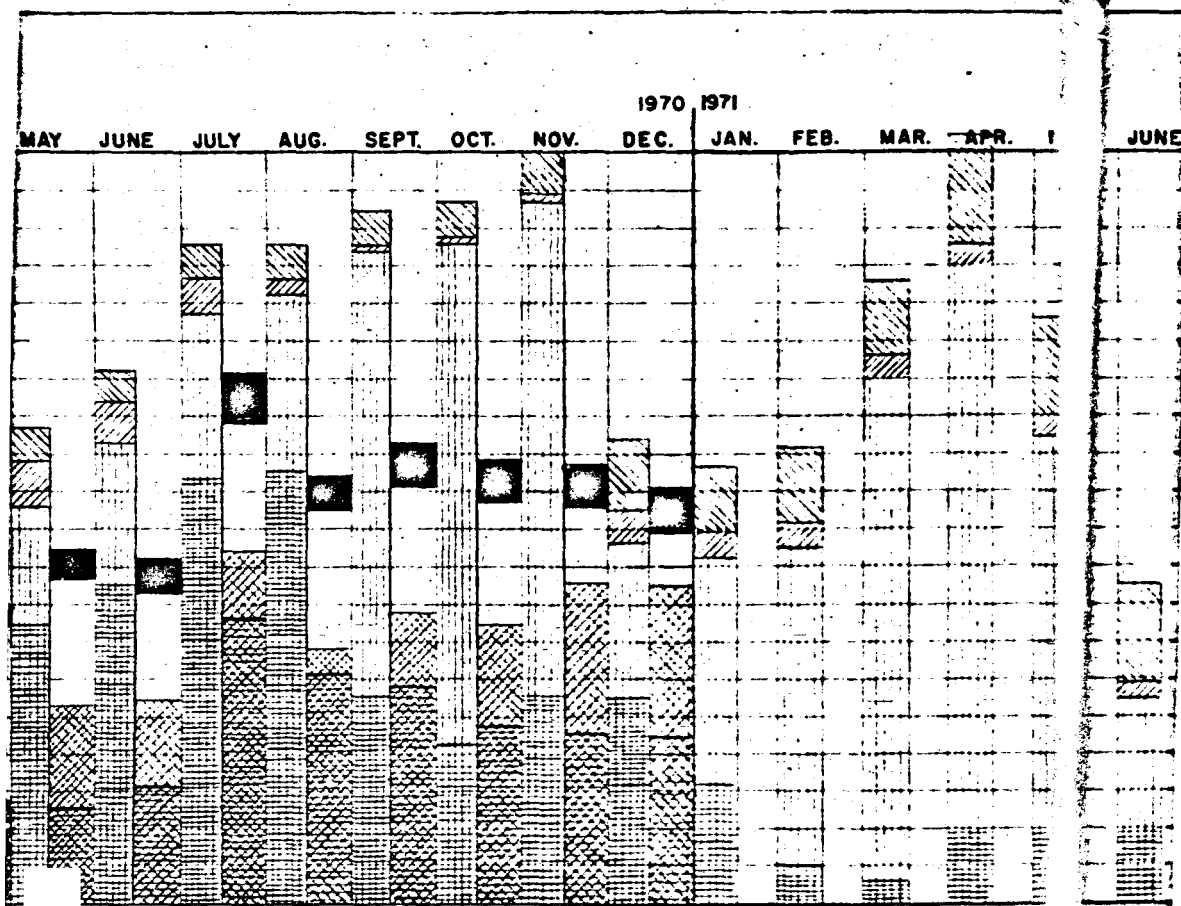
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	MONTHLY EXPENDITURES +										
	1969	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	1970	JAN.	FEB.	MAR.
PREDICTED	0	30.0M	41.0M	50.0M	58.0M	106.9M	112.0M	173.0M	299.3M	4	
ACTUAL	6.2	25.0	32.5	42.6	39.7	126.2	110.5	76.7	102.9	2	
PREDICTED	0	30.0M	71.0M	121.0M	179.0M	325.9M	437.9M	710.9M	1002.2M	4	
ACTUAL	6.2	31.2	64.0	106.6	146.3	272.5	383.0	459.7	562.6	7	

CUMULATIVE EXPENDITURES +

* EXPENDITURES INCLUDE ALL COSTS & FEES



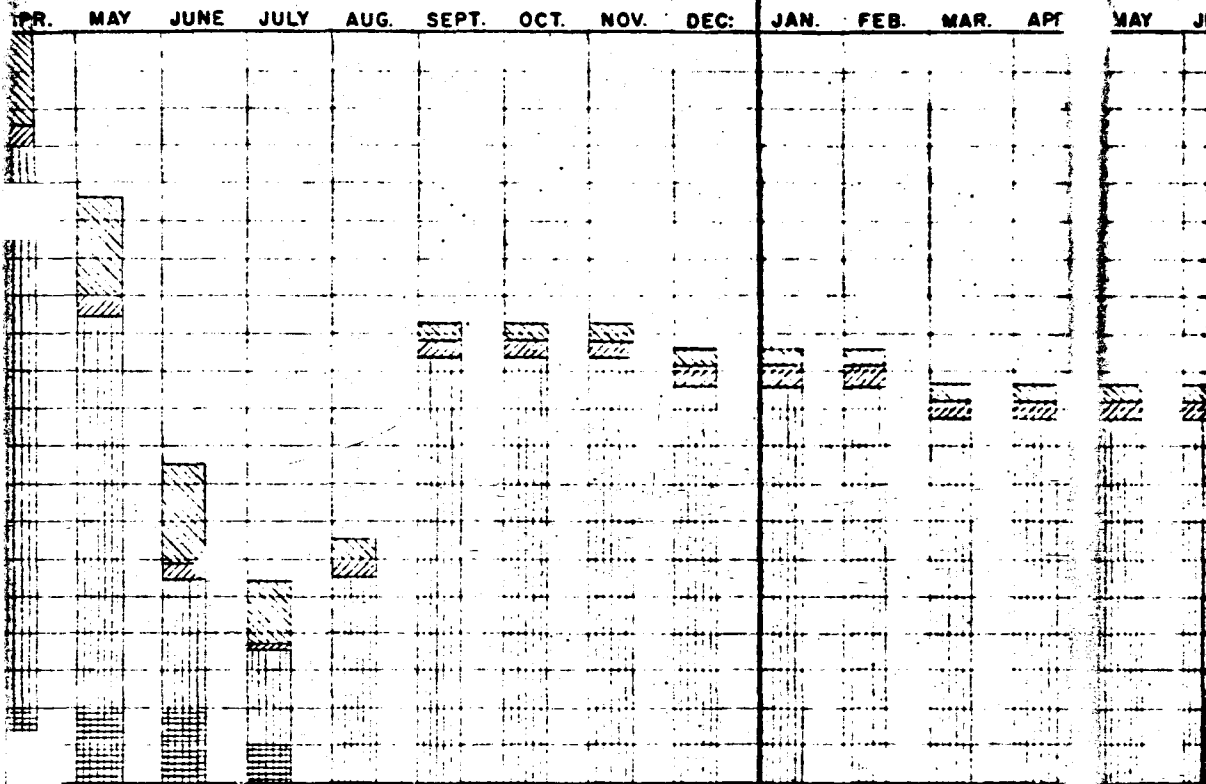
1970												1971											
MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE										
623.7M	891.1M	802.0M	891.1M	712.9M	891.1M	891.1M	758.2M	793.5M	777.0M	702.4M	554.9M												
233.7	367.1	564.6	725.2	794.2	728.9	422.9	779.5						44.8										
MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE										
2079.5M	2970.6M	3772.6M	4663.7M	5376.6M	6267.7M	7158.8M	5366.6M	5928.8M	6863.1M	7565.5M	8100.4M		8979										
1005.5	1972.6	1937.2	2662.4	3456.6	4185.5	4608.4	5397.9																

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MONTHLY PROGRESS CHART (CONST)

CONTRACT NO. 14-01-0001-415 (3)

1971 1972



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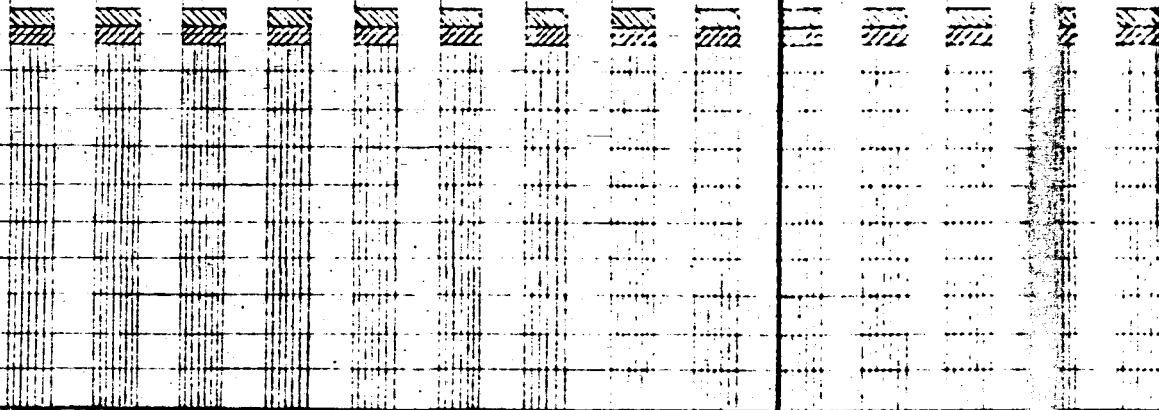
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(CONSTRUCTION & OPERATION)

(REVISED 12/31/70)

1972 1973

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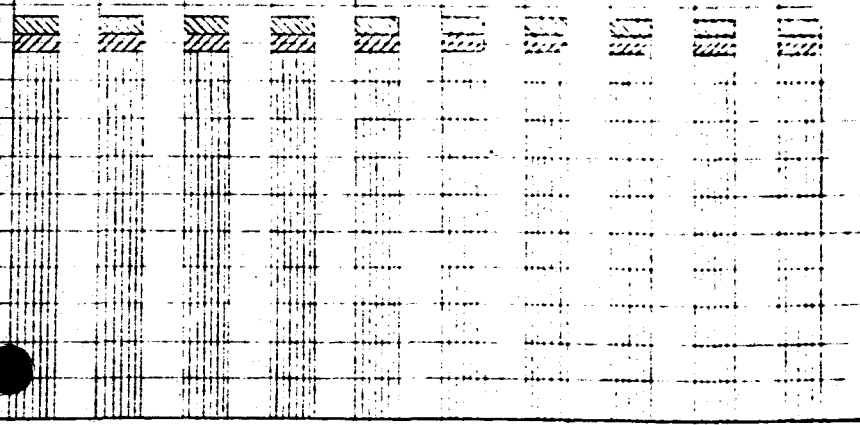
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2M	11,145.4M	11,350.1M	11,554.0M	11,756.8M	11,959.6M	12,162.5M	12,364.3M	12,565.8M	12,767.2M	12,950.4M	13,133.3M	13,315.4M	13,495.9M	13,673.1M

4

DATE: 12-31-70

1973
 MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

5



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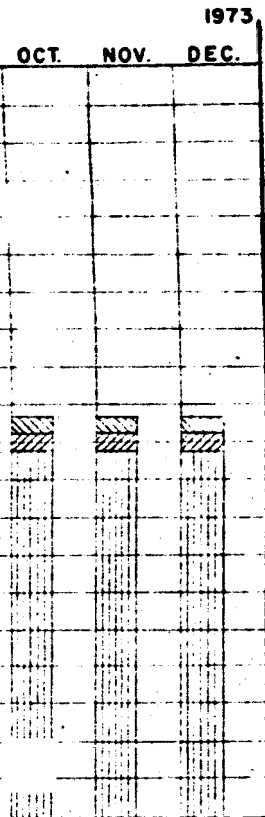
MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
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APPROXIMATE TOTAL CONSTRUCTION ≈ 8,800,000
 APPROXIMATE TOTAL OPERATIONS ≈ 5,760,400
 14,560,400

MONTHLY
 OFFICE
 U.S. PART
 ISOI
 RESEARCH DIV
 CONTRACT

(REVISED 12/31/70)

DATE: 12-31-70



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TECHNICIAN S-R		
TECHNICIAN S/C		

⊕ INCLUDES SUPERVISORY EXEMPT TECHNICIANS
 ⊙ INCLUDES CLERICAL

CONSTRUCTION — STEARNS-ROGER JOB 8-37000
 OPERATIONS — STEARNS-ROGER JOB 8-37400

6

MONTHLY PROGRESS CHART

OFFICE OF COAL RESEARCH
 U.S. DEPARTMENT OF THE INTERIOR

CONSOLIDATION COAL CO.
 RESEARCH DIVISION LIBRARY, PA.

CONTRACT NO. 14-01-0001-415 (3)

(REVISED 12/31/70)

OCT. NOV. DEC.

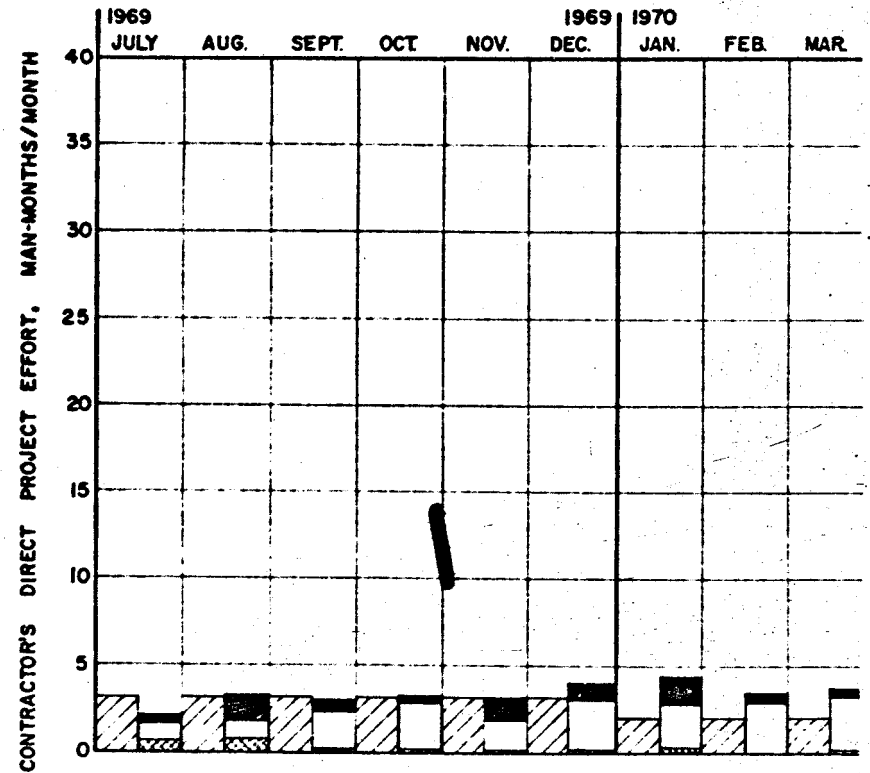
OCT. NOV. DEC.

14,405.5M 14,535.5M 14,560.4M

CONSTRUCTION ≈ 8,800,000

OPERATIONS ≈ 5,760,400

14,560,400



MONTHLY EXPENDITURES*

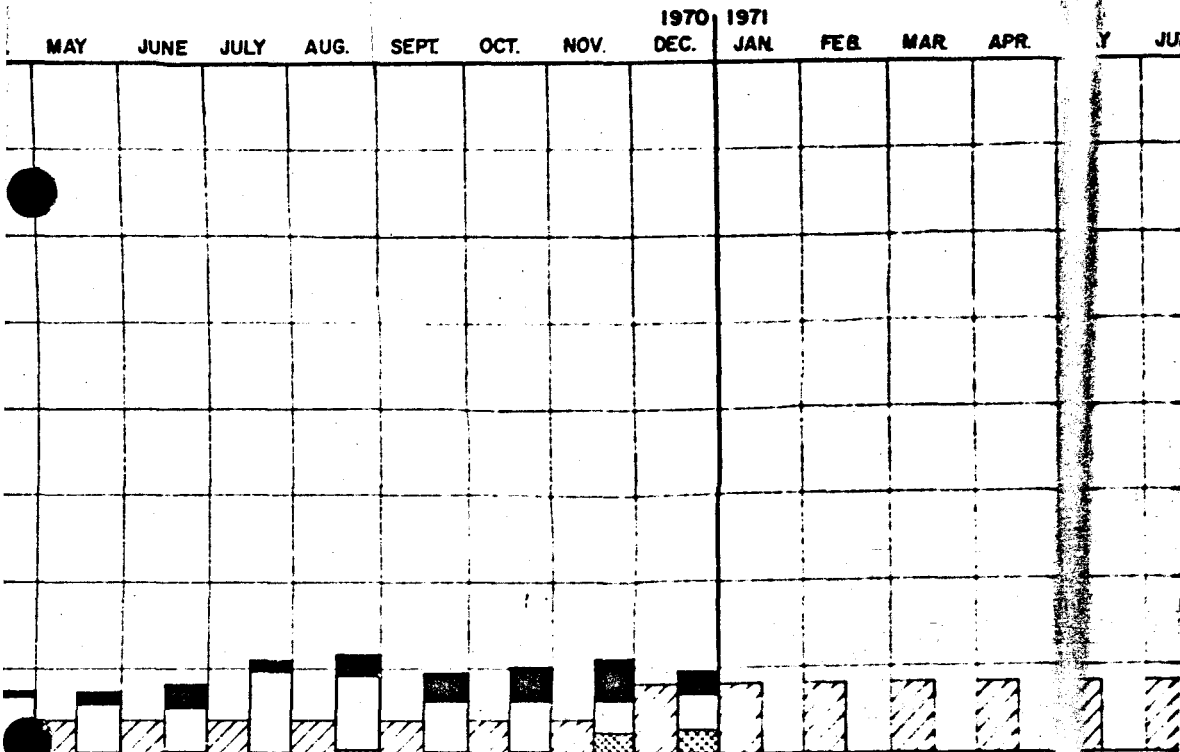
	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.
PREDICTED	5,215	14,685	14,965	13,155	14,385	17,065	15,595	15,595	12,655
ACTUAL	11,745	34,734	9,609	11,925	10,130	15,205	14,378	14,027	15,019

CUMULATIVE EXPENDITURES*

	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.
PREDICTED	16,215	30,900	45,865	59,020	73,405	90,470	106,065	121,660	134,305
ACTUAL	11,745	46,479	56,088	67,913	78,043	93,249	107,626	121,653	136,672

* Expenditures Include All Costs & Fees

MOI HLY
CONTR



	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	J
5	13,815	12,655	13,315	12,835	12,505	12,505	12,505	20,155	20,135	23,295	22,295	21,45	8,705	15
28	17,342	19,319	20,054	13,955	25,003	21,296	9,584	23,000						
80	160,995	173,650	186,965	199,800	212,305	224,810	237,315	257,470	277,605	300,900	323,125	344,340	33,045	37
00	207,242	226,561	246,615	260,570	285,573	306,263	316,453	339,453						

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MONTHLY PROGRESS CHART (SUPERVISOR 8)

CONTRACT No. 14-01-0001-415 (3)

APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. 1971 1972 JAN. FEB. MAR. A. MAY

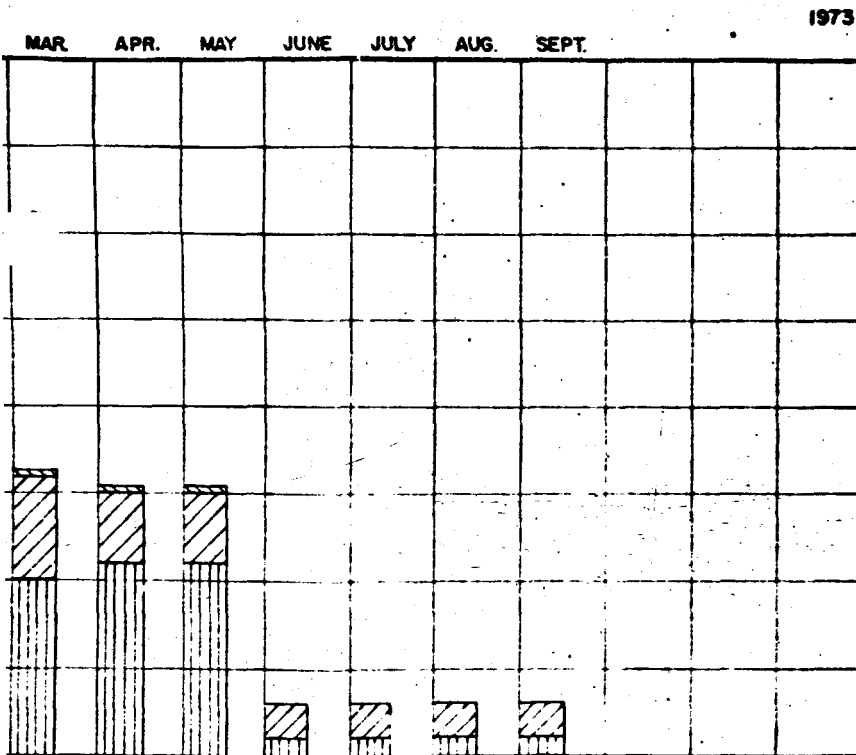


21,145	18,705	15,955	14,875	14,875	14,875	14,875	14,875	39,475	39,475	39,475	39,475	39,475	39,475
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APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	A.	MAY
344,340	363,045	379,000	393,875	408,750	423,625	438,500	453,375	492,850	532,325	571,800	611,275	650,750	690,225

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DATE: 1973



SUPERVISOR
 PROFESSIONAL
 TECHNICIAN
 Includ
 Includ
 Superv
 Clerical

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39,475	36,075	36,075	11,475	11,475	11,475	41,120			
MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.			
1,084,975	1,121,050	1,157,125	1,168,600	1,180,075	1,191,550	1,232,670			







5

MONTHLY
 OFFICE
 DEPARTMENT
 CONSOLIDATED
 RESEARCH DIVISION
 CONTRACT

(New 415 Chart)

DATE: Dec 1975

1973

	PREDICTED	ACTUAL
SUPERVISING		
PROFESSIONAL		
TECHNICIAN		

⊕ Includes Supervisory Exempt Technicians.
 ⊕⊕ Includes Clerical.

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MONTHLY PROGRESS CHART

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DEPARTMENT OF THE INTERIOR

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RESEARCH DIVISION LIBRARY, PA.

CONTRACT No. 14-01-0001-415 (3)

END

DATE FILMED

12 / 5 / 75