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LAWRENCE LIVERMORE NATIONAL LABORATORY UNDERGROUND COAL GASIFICATION DATA BASE

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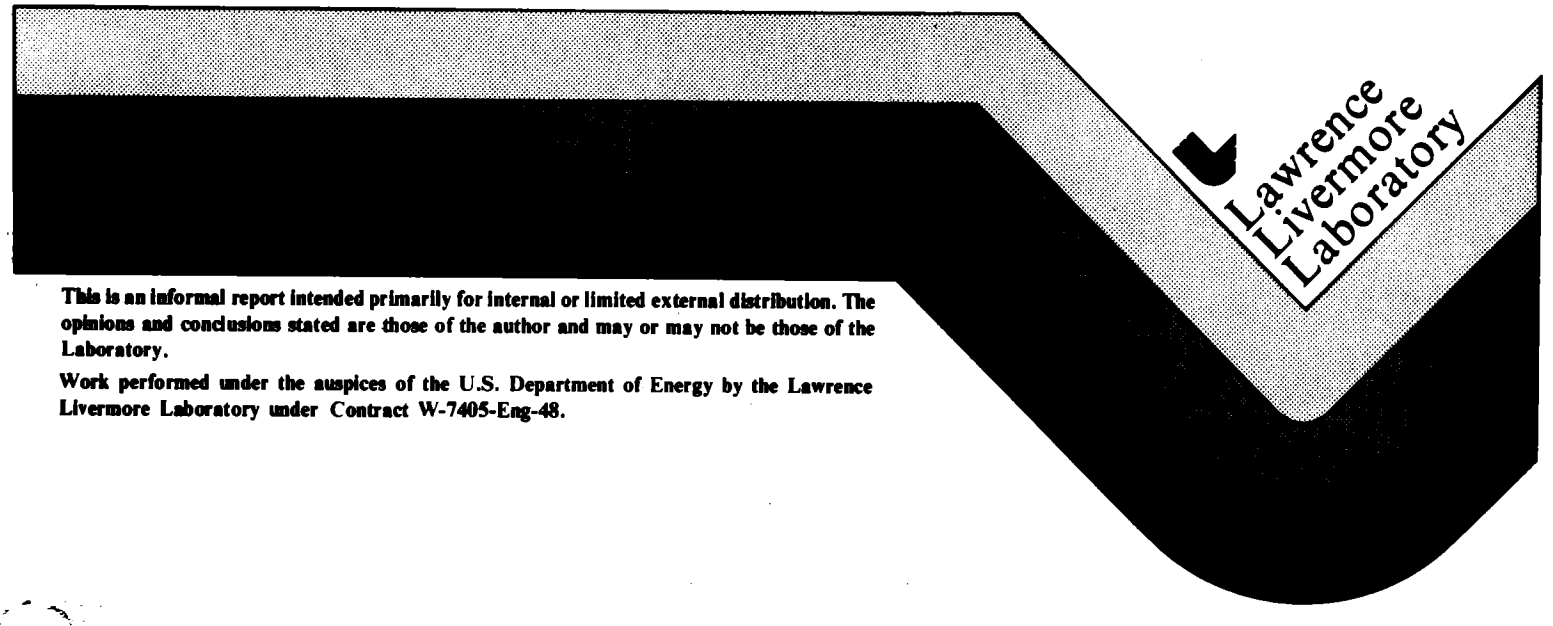
AUGUST 21, 1981



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Lawrence Livermore National Laboratory

Underground Coal Gasification

Data Base

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ABSTRACT

The Lawrence Livermore National Laboratory has developed a data base containing results from thirteen DOE-sponsored underground coal gasification (UCG) field tests. Included in the data base are process, material and energy balance results for each test on a consistent basis. Highlights of the data base and comparison results for each test are discussed.

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ACKNOWLEDGEMENTS

We would like to acknowledge the Larimie Energy Technology Center, the Morgantown Energy Technology center and the Gulf Research and Development Company for supplying us with computer recorded process data covering their respective tests.

We would also like to thank Dr. D. R. Stephens for supplying us with extensive chronological information concerning the LETC experiments.

UNDERGROUND COAL GASIFICATION DATA BASE

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1. INTRODUCTION

The Department of Energy has sponsored a number of field projects to determine the feasibility of converting the nation's vast coal reserves into a clean efficient energy source via underground coal gasification (UCG). Due to these tests, a significant data base of process information has developed covering a range of coal seams (flat subbituminous, deep flat bituminous and steeply dipping subbituminous) and processing techniques. A summary of all DOE-sponsored tests to date is shown in Table I.1.

The development of UCG on a commercial scale requires involvement from both the public and private sectors. However, without detailed process information, accurate assessments of the commercial viability of UCG cannot be determined. To help overcome this problem the DOE has directed the Lawrence Livermore National Laboratory (LLNL) to developed a UCG data base containing raw and reduced process data from all DOE-sponsored field tests. It is our intent to make the data base available upon request to interested parties, to help them assess the true potential of UCG.

TABLE I.1 SUMMARY OF DOE SPONSORED UNDERGROUND COAL GASIFICATION FIELD TESTS

Test	UCG Data Base Abbreviation	Dates (Decimal days)	Well Spacing	Linking Technique	Coal Type
o Laramie Energy Technology Center - Hanna Wyoming site					
Hanna I	HA1	3-29-73 to 3-22-74 (88 to 446)	30 m (100 ft)	Reverse combustion	C Bituminous
Hanna II Phase IA	HA2.1A	5-21-75 to 7-11-75 (141 to 192)	18 m (60 ft)	Reverse combustion	C Butuminous
Hanna II Phase IB	HA2.1B	7-11-75 to 8-28-75 (192 to 240)	18 m (60 ft)	Reverse combustion	C Butuminous
Hanna II Phase II	HA2.2	12-03-75 to 5-31-76 (337 to 152)	18 m (60 ft)	Reverse combustion	C Butuminous
Hanna II Phase III	HA2.3	5-31-76 to 7-31-76 (152 to 213)	18 m (60 ft)	Reverse combustion	C Butuminous
Hanna III	HA3	6-07-77 to 8-27-77 (157 to 178)	18 m (60 ft)	Reverse combustion	C Butuminous
Hanna IV.A	HA4.A	1-24-78 to 6-04-78 (24 to 155)	30 m (100 ft)	Reverse combustion	C Butuminous
Hanna IV.B	HA4.B	4-20-79 to 7-12-79 (110 to 193)	30 m (100 ft)	Reverse combustion	C Butuminous
o Lawrence Livermore National Laboratory - Gillette, Wyoming site					
Hoe Creek I	HCI	10-15-76 to 10-26-76 (289 to 300)	10 m (34 ft)	Explosive fracturing	Subbituminous
Hoe Creek II	HCII	10-14-77 to 12-25-77 (287 to 359)	18 m (60 ft)	Reverse combustion	Subbituminous
Hoe Creek III	HCIII	8-14-79 to 10-10-79 (226 to 283)	30 m (100 ft)	Drilled hole	Subbituminous
o Morgantown Energy Technology Center - Pricetown, West Virginia site					
Pricetown I	METC	6-09-79 to 10-05-79 (160 to 278)	17 m (57 ft)	Reverse combustion	Bituminous
o GULF/TRW - Rawlins, Wyoming site					
Rawlins I	GULF	10-24-79 to 12-05-79 (297 to 342)	18 m (60 ft)	Drilled hole/ Reverse combustion	Steeply dipping subbituminous

2. THE DATA BASE

Input to the data base consists of all pertinent process parameters as a function of time for each experiment. These include 1) all system flow rates, 2) all flow stream compositions and 3) all process stream temperatures and pressures. (Due to size contraints, the subsurface diagnosic measurements have not been included. This information is available, however, from the respective laboratories responsible for the tests.) The raw process data is collected for each experiment and arranged into a standard formatted file called !EXP. Once the raw data is available in !EXP, material and energy balances around the entire process are performed. The balance results on a differential and integral basis are stored in a second standard formatted file called !RED.

The standard history files* !EXP and !RED contain multiple records with each record representing a group of data at a specific point in time and as a result represent averaged and/or interpolated data. A list of data items contained in each record of !EXP is shown in Table 2.1.

As shown in the table the process streams in !EXP are divided into three categories, 1) injection into the underground system, 2) production from the underground system and 3) product cooling water injection. The injection stream components considered are argon, nitrogen, oxygen, water and carbon dioxide. The product stream components are divided into two categories representing condensible and non-condensible components. The major non-condensible components are shown in the table along with C_6 and H_{10} which are pseudo compounds to account for additional species measured but not explicity accounted for. The condensible products are divided between water and condensible hydrocarbon compounds (tar). The tar component is again a pseudo compound with physical properties proportional to a selected model compound 1,3,5 tri-methyl benzene.

A list of data items contained in each record of !RED is described in Table 2.2 As shown in the table, items 4 through 100 represent differential

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* A description of standard history files is given in Appendix I.

Table 2.1 DATA ITEMS CONTAINED IN FILE !EXP

ITEM (S)	DESCRIPTION	UNITS
1	Time - Julian days	Days
	FLOW METER NAMES	
2-4	Flow meter 1 name	Ascii
5-7	Flow meter 2 name	Ascii
8-10	Flow meter 3 name	Ascii
11-13	Flow meter 4 name	Ascii
14-16	Flow meter 5 name	Ascii
17-19	Flow meter 6 name	Ascii
20-22	Flow meter 7 name	Ascii
23-25	Flow meter 8 name	Ascii
26-28	Flow meter 9 name	Ascii
	FLOW METER GEOMETRY	
29-30	Flow meter 1 geometry	Ascii
31-32	Flow meter 2 geometry	Ascii
33-34	Flow meter 3 geometry	Ascii
35-36	Flow meter 4 geometry	Ascii
37-38	Flow meter 5 geometry	Ascii
39-40	Flow meter 6 geometry	Ascii
41-42	Flow meter 7 geometry	Ascii
43-44	Flow meter 8 geometry	Ascii
45-46	Flow meter 9 geometry	Ascii
	METER FLOW RATES	
47	Flow meter 1 - Flow rate	Moles/sec
48	Flow meter 2 - Flow rate	Moles/sec
49	Flow meter 3 - Flow rate	Moles/sec
50	Flow meter 4 - Flow rate	Moles/sec
51	Flow meter 5 - Flow rate	Moles/sec
52	Flow meter 6 - Flow rate	Moles/sec
53	Flow meter 7 - Flow rate	Moles/sec
54	Flow meter 8 - Flow rate	Moles/sec
55	Flow meter 9 - Flow rate	Moles/sec
	OVERALL FLOW RATES	
56	Overall injection rate	Moles/sec
57	Overall production rate	Moles/sec
58	Cooling water injection rate	Moles/sec
59-60	Open	

TABLE 2.2 DATA ITEM CONTAINED IN FILE !RED (continued)

ITEM (S)	DESCRIPTION	UNITS
	WELL GEOMETRY	
30	Wells in overall material group (Default: Injection & Production)	None
31-43	Well sequence numbers (Default: 1&2)	None
	MATERIAL BALANCE PARAMETERS	
44	Coal - Consumption rate	Moles/sec
45	Char - Accumulation rate	Moles/sec
46	Ash - Accumulation rate	Moles/sec
47	Water - Insitu influx rate	Moles/sec
48	Water - Input from coal	Moles/sec
49	Water - Used in reaction	Moles/sec
50	Gas recovery	Percent
51	Gas loss rate	Moles/sec
52	Gas leak parameter	Mol/s/kPa**2
53	Gas loss tracer (0=NONE,1=AR,2=N2)	None
54	Oxygen tracer (0=NONE,1=AR,2=N2)	None
55	Char flag (0=OFF -No char in overall balances) 1=ON -Use char in overall balances)	None
60	O2 to coal ratio - Overall reaction	None
61	H2O to coal ratio - Overall reaction	None
62	Char to coal ratio - Overall reaction (Calculated only if char flag on)	None
63	Char to coal ratio (Always calculated but not used in overall reaction	None
64	Char rate based on item 63 - (not used in overall reaction)	Moles/s
65-71	Open	

TABLE 2.2 DATA ITEM CONTAINED IN FILE !RED (continued)

ITEM (S)	DESCRIPTION	UNITS
	ENERGY BALANCE PARAMETERS	
72	Consumed coal heat of combustion	kJ/sec
	FRACTIONS OF CONSUMED COAL ENERGY	
73	Produced tar heat of combustion	None
74	Product heat of combustion - dry tar free	None
75	Heat loss - Excluding char and ash	None
76	Sensible heat of product	None
77	Net produced steam	None
78	Sensible heat accumulated in hot char and ash (underground)	None
79	Accumulated char heat of combustion	None
80	Steam from cooling water	None
81	Product heat of combustion - dry tar free	kJ/mole
82	Product heat of combustion - dry tar and H2S free	kJ/mole
83	Product heat of combustion - dry tar, H2S and nitrogen free	kJ/mole
84	Heat of combustion per O2 injection (HC / (O2 * Recovery)	kJ/mole
85	(CO + H2) / CO2 - Ratio	None
86	Water-gas-shift equilibrium temperature	Celsius
87-90	Open	
	OPERATING PARAMETERS	
90	Injection rate - All gas streams	Moles/sec
91	Production rate - All gas streams	Moles/sec
92	Water rate - Into injection wells	Moles/sec
93	Water rate - Into production wells	Moles/sec
94	Injection temperature	Celsius
95	Production temperature	Celsius
96	Injection pressure	kPa
97	Production pressure	kPa
98	Injection gas temperature	Celsius
99	Injection steam temperature	Celsius
100-103	Open	None

TABLE 2.2 DATA ITEM CONTAINED IN FILE !REU (continued)

ITEM (S)	DESCRIPTION	UNITS
	PROCESS INTEGRALS	
	INJECTION GAS TOTALS	
104	AR - Total injected	Moles
105	N2 - Total injected	Moles
106	O2 - Total injected	Moles
107	Steam - Total injected	Moles
108	CO2 - Total injected	Moles
109	Open - Total injected	Moles
	PRODUCTION GAS TOTALS	
110	AR - Total produced	Moles
111	N2 - Total produced	Moles
112	O2 - Total produced	Moles
113	H2 - Total produced	Moles
114	CH4 - Total produced	Moles
115	CO - Total produced	Moles
116	CO2 - Total produced	Moles
117	C2H4 - Total produced	Moles
118	C2H6 - Total produced	Moles
119	C6 - Total produced	Moles
120	H1O - Total produced	Moles
121	H2S - Total produced	Moles
122	Open - Total produced	Moles
123	Open - Total produced	Moles
124	Tar - Total produced	Moles
125	Steam - Total produced	Moles
	INJECTION ATOM TOTALS	
126	Oxygen - Total injected	Gram atoms
127	Carbon - Total injected	Gram atoms
128	Nitrogen - Total injected	Gram atoms
129	Hydrogen - Total injected	Gram atoms
130	Argon - Total injected	Gram atoms
131	Sulfur - Total injected	Gram atoms
	PRODUCTION ATOM TOTALS	
132	Oxygen - Total proudced	Gram atoms
133	Carbon - Total produced	Gram atoms
134	Nitrogen - Total produced	Gram atoms
135	Hydrogen - Total produced	Gram atoms
136	Argon - Total produced	Gram atoms
137	Sulfur - Total produced	Gram atoms
138-143	Open	

TABLE 2.2 DATA ITEM CONTAINED IN FILE !RED (continued)

ITEM	DESCRIPTION	UNITS
	MATERIAL BALANCE PARAMETERS	
144	Coal - Consumption total	Moles
145	Char - Accumulation total	Moles
146	Ash - Accumulation total	Moles
147	Water - Insitu influx total	Moles
148	Water - Input from coal	Moles
149	Water - Used in reaction	Moles
150	Gas recovery	Percent
151	Coal consumption volume - Based on overall material balance	Meters**3
152	Coal consumption volume - Based on carbon count in product gas	Meters**3
153	Coal consumption volume - Based on material balance * recovery	Meters**3
154	Coal consumption volume - Based on carbon count * recovery	Meters**3
155-163	Open	None
164	Total char irrespective of char flag	Moles
165-171	Open	
	ENENRGY BALANCE PARAMETERS	
172	Consumed coal heat of combustion	kJ
	FRACTIONS OF CONSUMED COAL ENERGY	
173	Produced tar heat of combustion	None
174	Product heat of combustion - dry tar free	None
175	Heat loss - Excluding char & ash	None
176	Sensible heat of product	None
177	Net produced steam	None
178	Sensible heat of accumulated hot char and ash	None
179	Accumulated char heat of combustion	None
180	Steam from cooling water	None
181	Product heat of combustion - dry tar free	kJ/mole
182	Product heat of combustion - dry tar and H2S free	kJ/mole
183	Product heat of combustion - dry tar, H2S and nitrogen free	kJ/mole
184	Heat of combustion per O2 injection (HC / (O2 * Recovery)	kJ/mole
185	(CO + H2)/CO2 - Ratio	None
186-189	OPEN	

TABLE 2.2 DATA ITEM CONTAINED IN FILE !RED (continued)

ITEM (S)	DESCRIPTION	UNITS
	OPERATING PARAMETERS	
190	Total gas injection	Moles
191	Total gas production	Moles
192	Total liquid water injected - Into injection wells	Moles
193	Total liquid water injected - Into production wells	Moles
	FLOW WEIGHTED AVERAGES:	
194	Injection temperature	Celsius
195	Production temperature	Celsius
196	Injection pressure	kPa
197	Production pressure	kPa
198-200	Open	None

data with much of the !EXP data repeated for convience, and items 104 through 200 represent integral and integral averaged data. The material balance parameters include such items as coal consumption, char and ash accumulation, water influx and gas loss on a differential and integral basis. The energy balance parameters consider the energy associated with the consumed coal, combustible products, produced steam, accumulated char/ash and insitu heat loss. Also provided in !RED are integral and integral averaged operating parameters. The material and energy balance results in !RED are calculated assuming no modifed coal left undergound. Also provided in !RED however, are char/coal estimates which may be used to determine results with char accumulation included.

Details of the material and energy balance conventions used to calculate !RED results are given in Appendix II.

3. THE EXPERIMENTS

The construction of !EXP and !RED files for each experiment requires detailed process information. The source and frequency of this information is important especially when data trends rather than overall performance are being studied. Complete data was not available for all of the experiments. In these instances, the missing data was approximated using supplementary information. Table 3.1 summarizes the availability and frequency of data currently in the UCG data base. The table shows that complete data was not available for some of the early UCG tests. Care should be exercised, therefore in utilizing these early tests results.

In the following, each experiment currently in the UCG data base is discussed. The experimental plan and chronology are first discussed* followed by a description of the data sources used to construct !EXP. Summary plots and tables for each experiment are then presented. In most instances, the reduced data is plotted versus total produced carbon rather than time.

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* The experimental plan and chronology are provided as a quick reference guide of process events. The original references should be consulted if more detailed information is required.

TABLE 3.1 UCG DATA BASE SOURCE AND FREQUENCY SUMMARY

	SOURCE - DATA FREQUENCY (HOURS)								
EXPERIMENT	INJECTION RATE	PRODUCTION RATE	PRODUCT GAS COMPOSITION	H_2O/DRY RATIO	TAR/DRY RATIO	INJECTION TEMPERATURE	PRODUCTION TEMPERATURE	INJECTION PRESSURE	PRODUCTION PRESSURE
Hanna I	Digitized-12	Digitized-12	Calculated See Note 1	Calculated See Note 2	No Data	No Data	No Data See Note 3	Digitized-12	No Data
Hanna II Phase 1A	Computer-1	Computer-1	Digitized-12	No Data	No Data	Computer-1	Computer-1	Computer-1	No Data
Hanna II Phase 1B	Digitized-24	Digitized-24	Calculated See Note 4	No Data	No Data	No Data	No Data	Digitized-24	No Data
Hanna II Phase II	Computer-1	Computer-1	Computer-1	No Data	No Data	Computer-1	Computer-1	Computer-1	No Data
Hanna II Phase III	Computer-1	Computer-1	Computer-1	No Data	No Data	Computer-1	Computer-1	Computer-1	Computer-1
Hanna III	Computer-1	Computer-1	Computer-1	No Data	No Data	Computer-1	Computer-1	Computer-1	Computer-1
Hanna IV-A	Digitized-12	Digitized-12	Calculated See Note 4	No Data	No Data	No Data	No Data See Note 5	Digitized-12	No Data
Hanna IV-B	Computer-1	Computer-1	Computer-1	Table-8	Table-8	No Data	No Data	Computer-1	Computer-1
Hoe Creek I	Computer-3	Computer-3	Computer-1	Computer-12	Computer-48	Computer-3	Computer-3	Computer-3	Computer-3
Hoe Creek II	Computer-1	Computer-1	Computer-1	Computer-5	Computer-24	Computer-1	Computer-1	Computer-1	Computer-1
Hoe Creek III	Computer-1	Computer-1	Computer-1	Computer-2	Computer-2	Computer-1	Computer-1	Computer-1	Computer-1
Pricetown I	Computer-1	Computer-1	Computer-1	Computer-1	No Data	Computer-1	Computer-1	Computer-1	Computer-1
Rawlins I	Computer-1	Computer-1	Computer-1	Computer-5	Computer-5	No Data	Computer-24 See Note 6	Computer-1	Computer-1

(1) 5-day averages day 90-349, derived from digitized heating value plot day 349-446.
(2) Difference in wet-dry production rates digitized day 213-359. 15 day averages day 359-446.
(3) Estimated to match reported overall sensible heat.
(4) Derived from digitized heating value plot.
(5) Data available during reverse burn only (day 111-194).
(6) Derived from product sensible heat.

We feel that this treatment more appropriately highlights the periods over which significant coal consumption occurred. Also, trends in the data are more readily correlated with coal consumption than time. The summary tables present integral and integral averaged results on a char and no char basis.

4. HANNA I

General

The Laramie Energy Technology Center with assitance from Sandia Laboratories, conducted the Hanna experiments at a gasification site located in south central Wyoming about 2 miles south of the town of Hanna. The gasification site layout for all the LETC tests is shown in Figure 4.1. The Hanna No. 1 coal seam is a 9.1 meter (30 ft) thick aquifer 120 meters (400 ft) below the surface at the Hanna I site. The coal was originally classified as subbituminous A, but has since been reclassified as a non-swelling high volatile C bituminous coal. Properties of the seam vary with depth, particularly with regard to ash content. A composite sample analysis is shown in Table 4.1.

Chronology

Site preparation for the experiment consisted of drilling 16 wells, shown in Figure 4.2 with relation to the natural fracture pattern of the seam. Well 3 was the originally designated injection well. Because of very low air acceptance rates, the well was stimulated by hydraulic fracturing using 1.3 x 10^5 litres of water and 7000 kg of sand at rates up to 5000 litres per minute and pressures up to 3600 kPa (525 psi)[4.1] Following this the coal was ignited at well 3 on March 29, 1973. Forward gasification was maintained until May 30, with air injection in well 3 and production from the other wells. Plugging was a problem in this mode, even at injection pressures as high as 3500 kPa (500 psi). Due to leaks in the well casings and the presence of uncased, uncemented holes, 90% of the products were lost until the end of May, when the wells were recompleted. [4.1, 4.2]

On May 30, 1973, reverse combustion was initiated with air injection in well 5 and primary production from well 3. Wells 3, 5, and 7 were used at various times for injection or production. These links were apparently completed on September 19. On September 20, injection was changed to wells 9 and 15 with production from well 5, in order to draw links to these wells.

Well 9 linked on September 28, well 15 linked on October 5, and well 12 linked during January, 1974. Forward gasification with various injection and production wells was carried out between October 5, 1973 and March 22, 1974. The linking and gasification chronology for Hanna I are shown in Figure 4.3 and Table 4.2.

The Data

The Hanna I process data was not available in computer form. As an alternate tables and plots from reports concerning Hanna I[4.1, 4.5] were used to construct !EXP. Tabular data was used directly whereas a digitizer converted the plotted data to digital form.

A summary of source data used to construct !EXP in shown in Table 4.3. The table shows that Hanna I results are based on very sketchy process data, particularily with regards to gas composition and water content. Despite these shortcomings, we feel that the overall performance of the experiment represents a reasonable extrapolation of the existing data.

Summary results for Hanna I are shown in Table 4.4 through 4.7 and Figures 4.4 through 4.15.

TABLE 4.1 HANNA I COAL ANALYSIS

Proximate analysis - wt%	
Moisture	9.51
Ash	23.76
Volatile mater	32.64
Fixed carbon	34.09
	100.00
Ultimate analysis moisture, ash free - wt%	
Carbon	74.33
Hydrogen	6.04
Oxygen (by difference)	16.67
Sulfur	1.02
Nitrogen	1.94
	100.00
Pseudo coal molecule	$C_1 H_{.968} O_{.168} S_{.005} N_{.022}$
Molecular wt	16.15
Heat of combustion (kJ/mole)	438.
Density (kg/m^3)	1363.

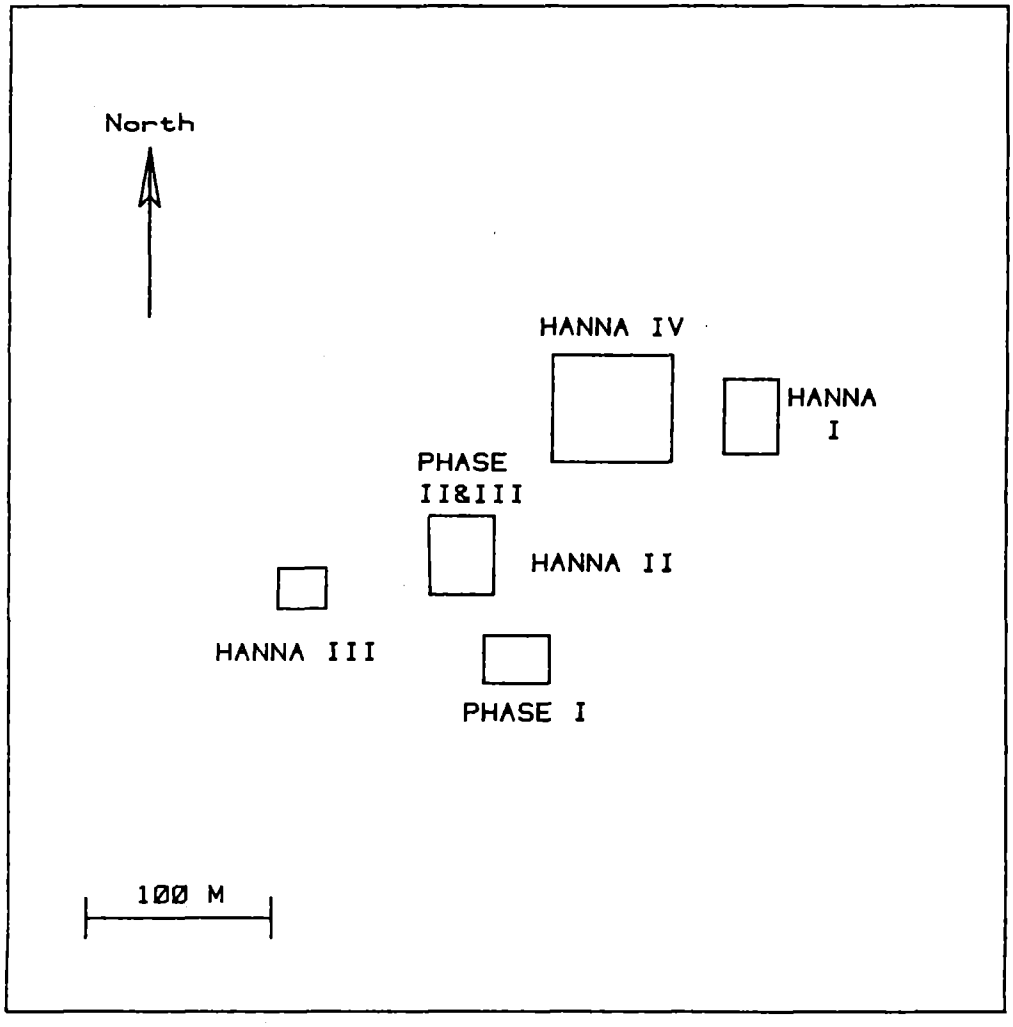
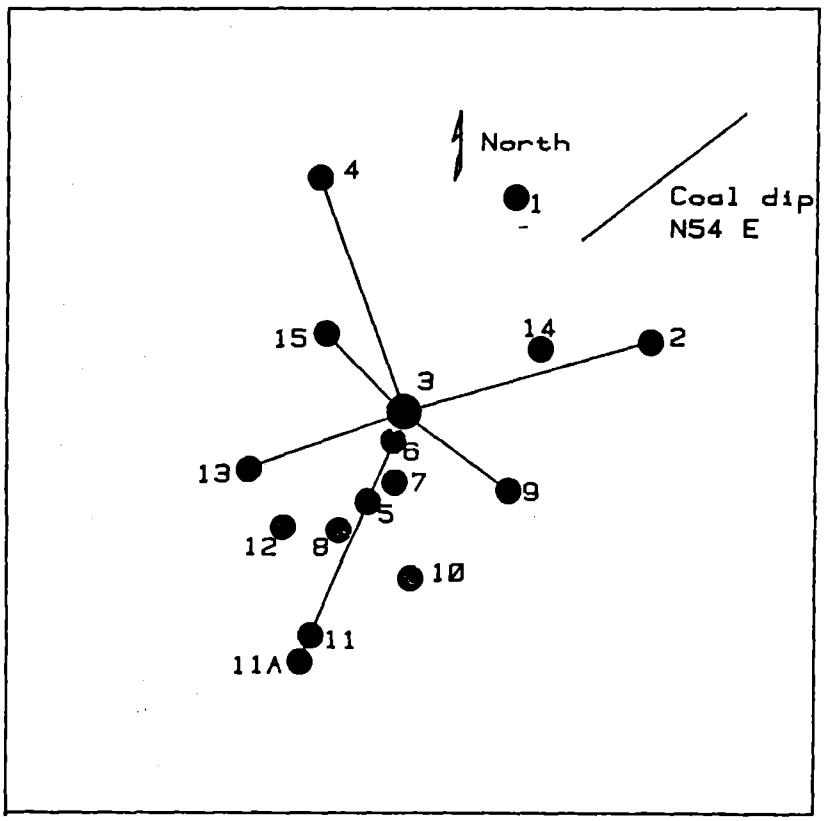
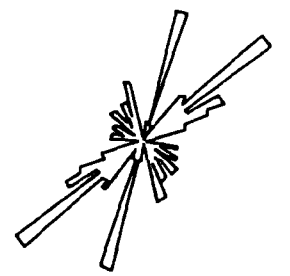


Figure 4.1 Site layout for Hanna I through Hanna IV.

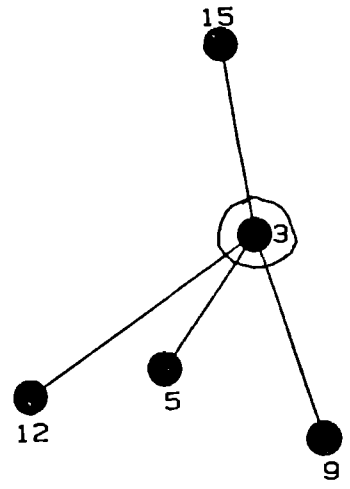


SCALE - 200 METER SQUARE

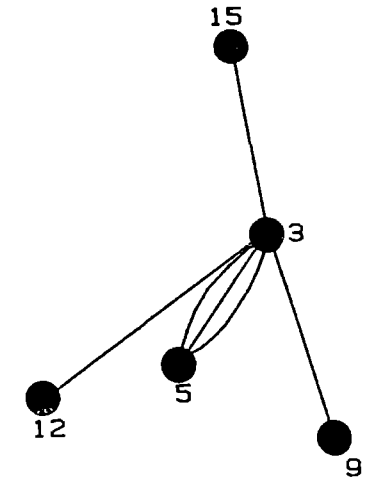


Fracture pattern
Core Hole No 3

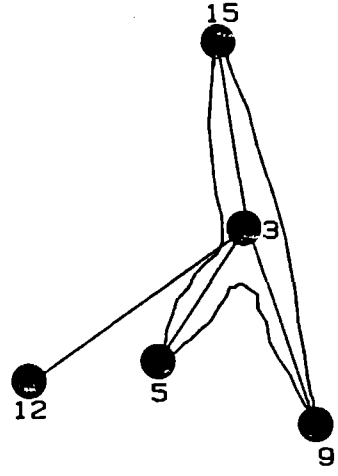
Figure 4.2 Well layout for Hanna I (HA1).



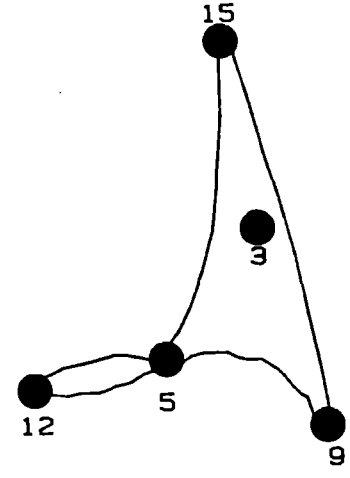
(A) Ignition at well 3.



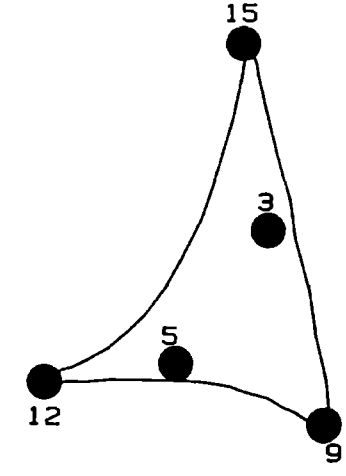
(B) Linkage and gasification wells 3 - 5.



(C) Linkage and gasification wells 3 - 5 and wells 3 - 15.



(D) Linkage and gasification wells 5 - 12.



(E) Experiment terminated.

Figure 4.3 Schmetic of Hanna I gasification events.

TABLE 4.2 ABBREVIATED CHRONOLOGY FOR HANNA I

DATES	DECIMAL DAYS	EVENT	INJECTION WELL	PRODUCTION WELL
3-29-73	88	Ignition in Well 3	3	Several
3-31-73 to 5-30-73	90 - 150	Forward Gasfication	3	Several
5-30-73 to 9-19-73	150 - 262	Reverse Combustion	3,5,7	3,5,7
9-20-73 to 9-28-73	263 - 271	Reverse Combustion Link 9	9 & 15	5
9-20-73 to 10-05-73	263 - 278	Reverse Combustion Link 15	9 & 15	5
10-05-73 to 3-22-74	278 - 446*	Forward Gasification	Various	Various
January, 1974	----	Reverse Combustion	12	5

* January 1, 1974 is day 366

TABLE 4.3 LETC - HANNA 1
PROCESS DATA SOURCES

ITEM	COMPUTER FILE NAME - POSITION	DESCRIPTION
Injection Rate	!INJ -2	Moles/s - Digitized from reference 1 - Day 90-213 Reference 2 day 213-446.
Production Rate	!PRD -2	Moles/s - Digitized from reference 1 Day 90-213 Reference 2 day 213-446.
Gas Composition	!GAS	Mole fraction - Table (ref 1) 5 day averages day 90 to 349 Calculated from digitized product heat of combustion(1) reference 2 day 349-446.
	-2	Mole fraction - Ar - Calculated Proportional to N2
	-3	Mole fraction - N2
	-4	Mole fraction - O2
	-5	Mole fraction - H2
	-6	Mole fraction - CH4
	-7	Mole fraction - CO
	-8	Mole fraction - CO2
	-9	Mole fraction - C2H4 - Assume 0.
	-10	Mole fraction - C2H6
	-11	Mole fraction - C6 - from C3H8
	-12	Mole fraction - H10 - from C3H8
H_2O/DRY	!H2 -2	Calculated from wet and dry production rates. Digitized wet (ref 1) and dry (ref 2) day 213-349. Table 15 day averages (ref 5) day 349-446.
TAR/DRY	No Data	Assume no tar
Injection Pressure	!PRES -2	Digitized from reference 1 day 90-349 - kPa
Production Pressure	No Data	Assume equal to injection pressure
Injection Temperature	No Data	Assume 10 degrees Celsius
Production Temperature	!TEMP -2	No Data - Attempt to match reported overall sensible heat fraction (ref 1).

(1) Major gas composition estimated from heating value curve assuming:
A) Water-Gas-Shift Equilibrium
B) Char/Coal Ratio
C) Gas components proportional to changes in heating value

Table 4.4

HANNA I - FIRST FORWARD BURN
90.00 TO 150.00

TIME (days)	60.000	
Average product heat of combustion (kJ/mol)	95.	
Total flows (Mmols)		
Injection	45.7	
Production	7.6	
Total dry gas production (Mmols)	7.6	
Coal		(+Char)
(Mg)	45.0	(137.9)
(Gas loss corrected Mg)	267.1	(818.1)
Dry gas composition		
AR	0.0000	
N2	.6667	
O2	.0324	
H2	.0651	
CH4	.0668	
CO	.0110	
CO2	.1491	
C2H4	0.0000	
C2H6	.0066	
C6	.0008	
H10	.0015	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	0.0000	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.734	(.240)
Char/Coal	0.000	(.674)
H2O/Coal	.440	(-.148)
Gas recovery (%)	14.2	
Energy distribution (%)		(+Char)
Combustible gas	88.9	(29.0)
Combustible tar	0.0	(0.0)
Heat loss in-situ	5.8	(2.7)
Gas sensible heat	4.0	(1.3)
Net steam	0.0	(0.0)
Char + ash sensible heat	.9	(3.8)
Char combustion energy	0.0	(63.1)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	531.	

HANNA I - FIRST FORWARD BURN
90.00 TO 150.00

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	33.0	(101.2)
(Mmol)	1.9	(5.7)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	.8	(2.5)
Water parameters (mol/s)		(+Char)
Insitu influx	.11	(-.30)
From consumed coal	.05	(.14)
Consumed in reactions	.16	(-.16)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	1713.	
Production	1822.	
Average temperatures (deg c)		
Injection	10.0	
Production	0.0	
Average gas flows (mol/s)		
Injection	8.8	
Production	1.5	

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Table 4.5

HANNA I - REVERSE BURN
151.00 TO 277.00

TIME (days)	126.000	
Average product heat of combustion (kJ/mol)	99.	
Total flows (Mmols)		
Injection	108.1	
Production	95.9	
Total dry gas production (Mmols)	81.5	
Coal		(+Char)
(Ms)	598.5	(678.7)
(Gas loss corrected Ms)	1053.7	(1194.8)
Dry gas composition		
AR	0.0000	
N2	.5870	
O2	.0120	
H2	.1043	
CH4	.0491	
CO	.0526	
CO2	.1887	
C2H4	0.0000	
C2H6	.0044	
C6	.0008	
H10	.0012	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.1770	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.520	(.459)
Char/Coal	0.000	(.118)
H2O/Coal	.246	(.166)
Gas recovery (%)	56.8	
Energy distribution (%)		(+Char)
Combustible gas	74.2	(65.4)
Combustible tar	0.0	(0.0)
Heat loss in-situ	15.0	(13.6)
Gas sensible heat	3.8	(3.3)
Net steam	5.8	(5.2)
Char + ash sensible heat	.9	(1.4)
Char combustion energy	0.0	(11.1)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	624.	

HANNA I - REVERSE BURN
151.00 TO 277.00

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	439.1	(497.9)
(Mmol)	24.8	(28.1)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	10.8	(12.3)
Water parameters (mol/s)		(+Char)
Insitu influx	1.59	(1.42)
From consumed coal	.29	(.33)
Consumed in reactions	.56	(.43)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	1300.	
Production	1088.	
Average temperatures (deg c)		
Injection	10.0	
Production	0.0	
Average gas flows (mol/s)		
Injection	9.9	
Production	8.8	

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Table 4.6

HANNA I - SECOND FORWARD BURN
278.00 TO 446.00

TIME (days)	168.000	
Average product heat of combustion (kJ/mol)	113.	
Total flows (Mmols)		
Injection	226.5	
Production	447.4	
Total dry gas production (Mmols)	348.2	
Coal		(+Char)
(Ms)	2471.8	(3374.6)
(Gas loss corrected Ms)	2420.1	(3304.1)
Dry gas composition		
AR	.0040	
N2	.5223	
O2	.0072	
H2	.1782	
CH4	.0413	
CO	.0608	
CO2	.1812	
C2H4	0.0000	
C2H6	.0033	
C6	.0006	
H10	.0010	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.2849	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.479	(.351)
Char/Coal	0.000	(.268)
H2O/Coal	.455	(.217)
Gas recovery (%)	102.9	
Energy distribution (%)		(+Char)
Combustible gas	87.8	(64.3)
Combustible tar	0.0	(0.0)
Heat loss in-situ	-7.9	(-5.3)
Gas sensible heat	9.2	(6.7)
Net steam	9.7	(7.1)
Char + ash sensible heat	.9	(2.1)
Char combustion energy	0.0	(25.1)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	803.	

HANNA I - SECOND FORWARD BURN
278.00 TO 446.00

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	1813.5	(2475.9)
(Mmol)	102.3	(139.6)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	44.8	(61.1)
Water parameters (mol/s)		(+Char)
Insitu influx	9.14	(7.70)
From consumed coal	.90	(1.23)
Consumed in reactions	3.20	(2.09)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	699.	
Production	474.	
Average temperatures (deg c)		
Injection	10.0	
Production	297.5	
Average gas flows (mol/s)		
Injection	15.6	
Production	30.8	

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Table 4.7

HANNA I - FULL EXPERIMENT
90.00 TO 446.00

TIME (days)	366.000	
Average product heat of combustion (kJ/mol)	110.	
Total flows (Mmols)		
Injection	390.1	
Production	556.4	
Total dry gas production (Mmols)	441.6	
Coal		(+Char)
(Ms)	3146.1	(4231.6)
(Gas loss corrected Ms)	3840.2	(5165.0)
Dry gas composition		
AR	.0031	
N2	.5368	
O2	.0086	
H2	.1625	
CH4	.0432	
CO	.0585	
CO2	.1819	
C2H4	0.0000	
C2H6	.0036	
C6	.0007	
H10	.0010	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.2600	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.490	(.365)
Char/Coal	0.000	(.257)
H2O/Coal	.415	(.197)
Gas recovery (%)	77.9	
Energy distribution (%)		(+Char)
Combustible gas	85.2	(63.4)
Combustible tar	0.0	(0.0)
Heat loss in-situ	-3.4	(-2.0)
Gas sensible heat	8.1	(6.0)
Net steam	8.8	(6.6)
Char + ash sensible heat	.9	(2.0)
Char combustion energy	0.0	(24.0)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	761.	

HANNA I - FULL EXPERIMENT
90.00 TO 446.00

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	2308.2	(3104.6)
(Mmol)	130.2	(175.1)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	57.0	(76.7)
Water parameters (mol/s)		(+Char)
Insitu influx	4.81	(4.02)
From consumed coal	.53	(.71)
Consumed in reactions	1.71	(1.09)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	814.	
Production	599.	
Average temperatures (deg c)		
Injection	10.0	
Production	241.0	
Average gas flows (mol/s)		
Injection	12.3	
Production	17.6	

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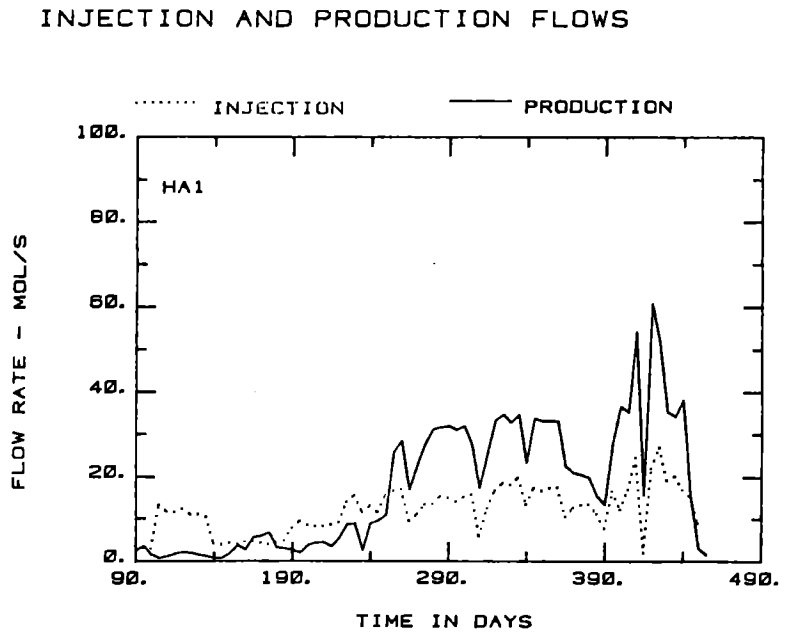


Figure 4.4 !RED items 90 and 91 versus time.

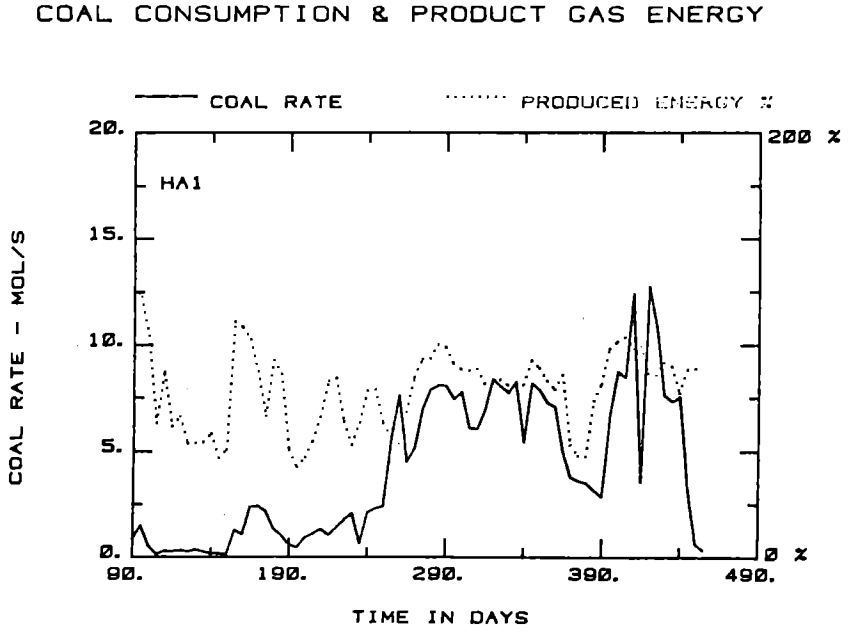


Figure 4.5 !RED item 44 and item 74 x 100 versus time.

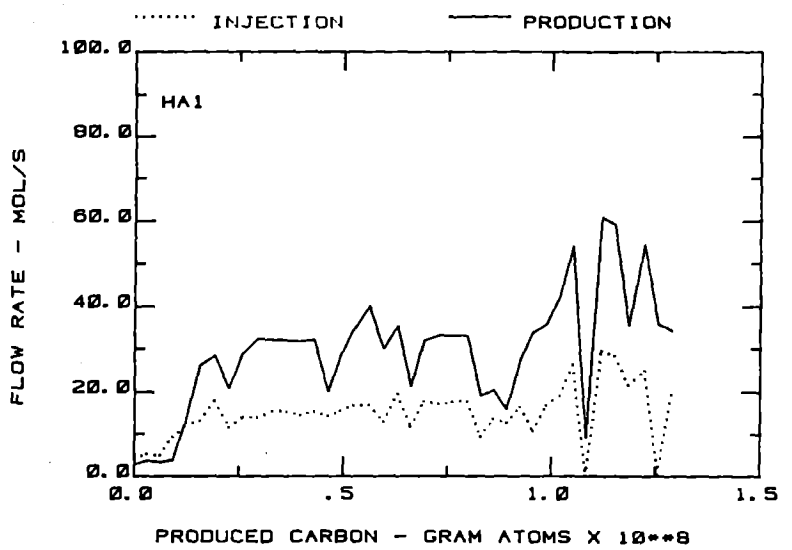


Figure 4.6 !RED items 90 and 91 versus item 133.

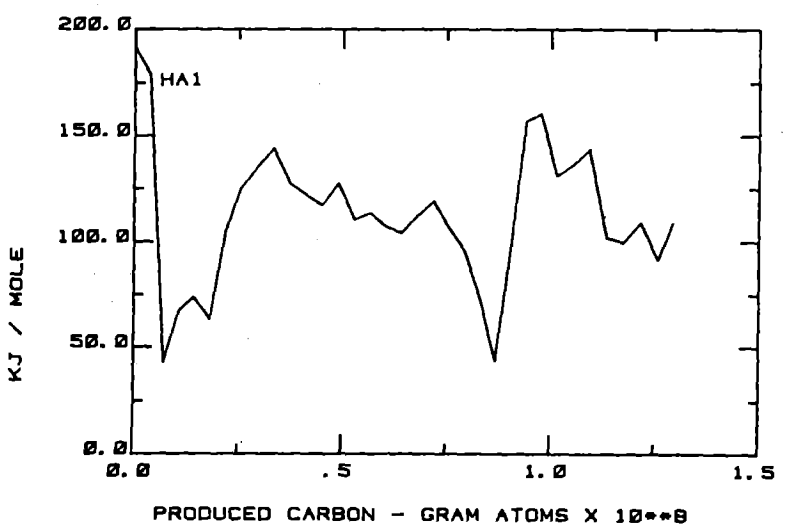


Figure 4.7 !RED items 81 versus item 133.

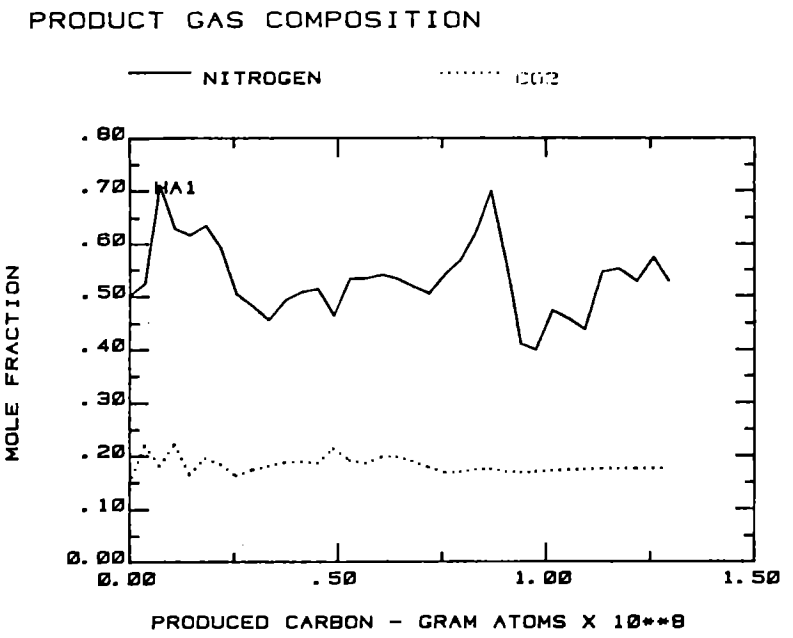


Figure 4.8 !RED items 11 and 16 versus item 133.

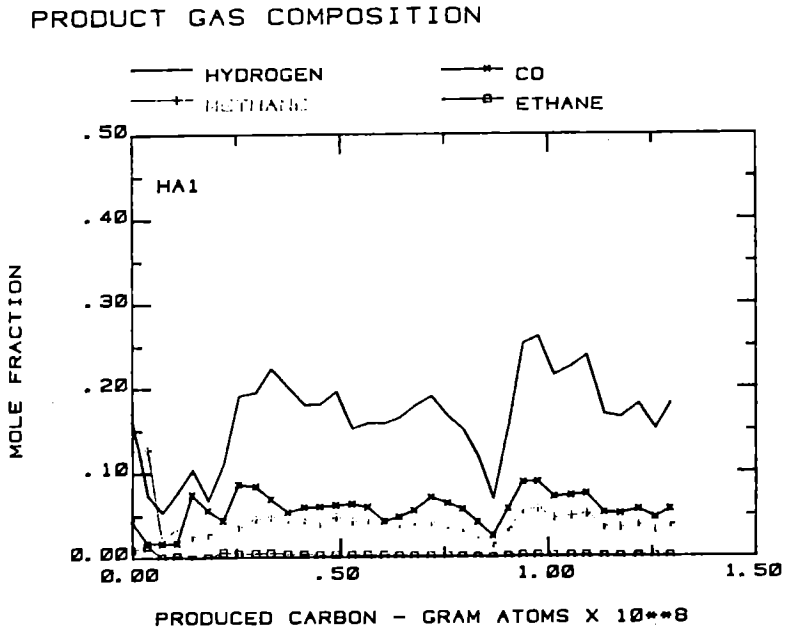


Figure 4.9 !RED items 13, 14, 15 and 18 versus item 133.

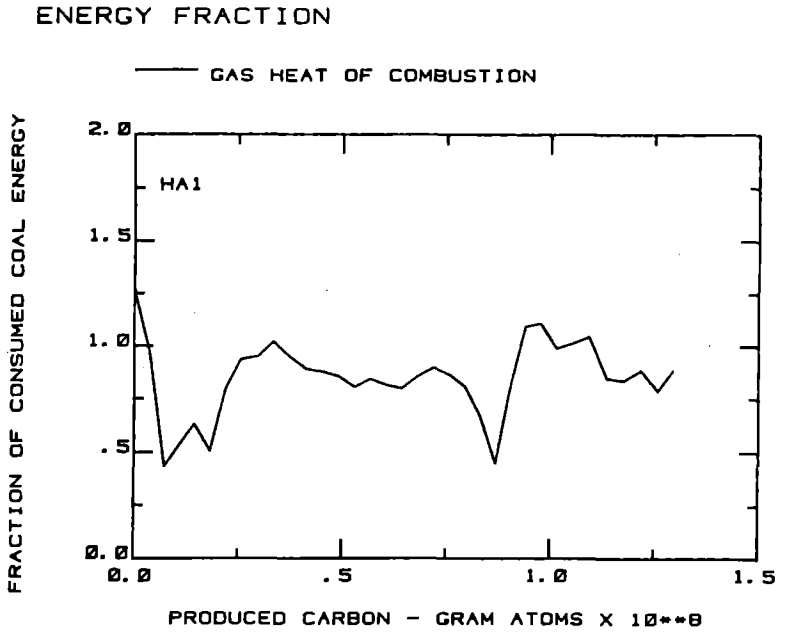


Figure 4.10 !RED item 74 versus item 133.

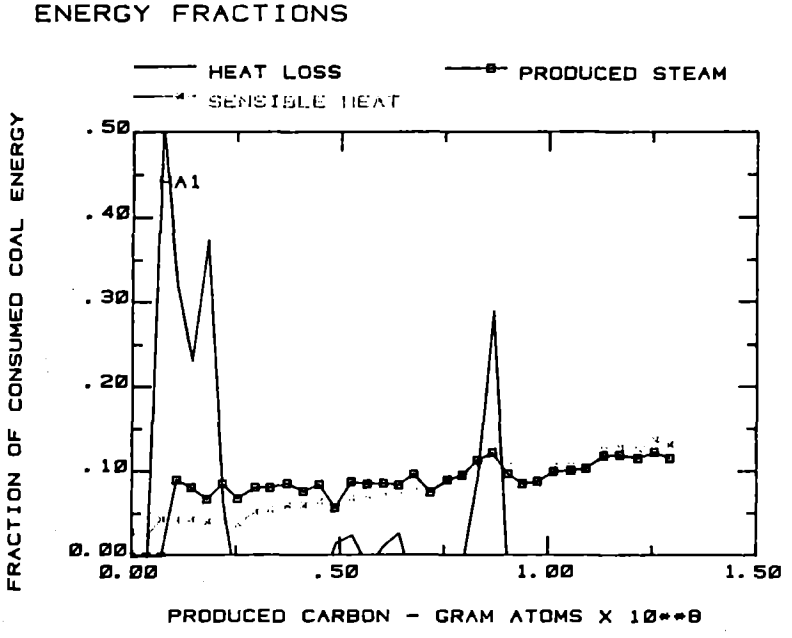


Figure 4.11 !RED items 75 - 78 versus item 133.

WATER INFLUX

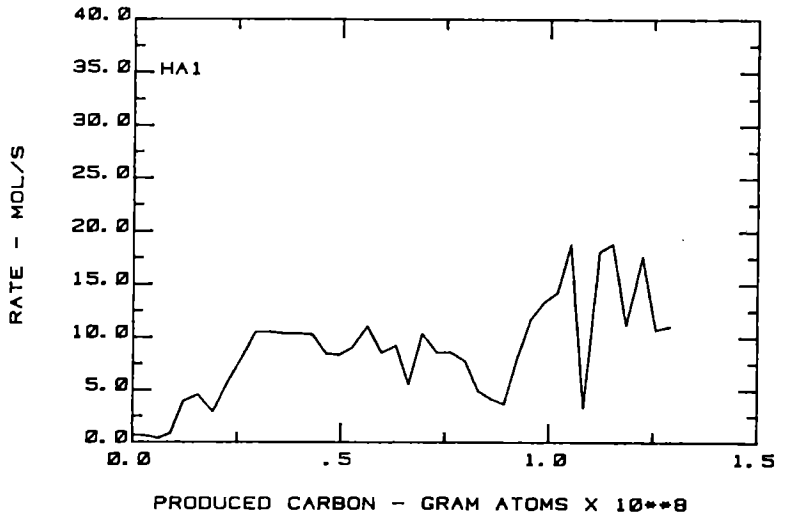


Figure 4.12 !RED item 47 versus item 133.

MODIFIED COAL PRODUCTION

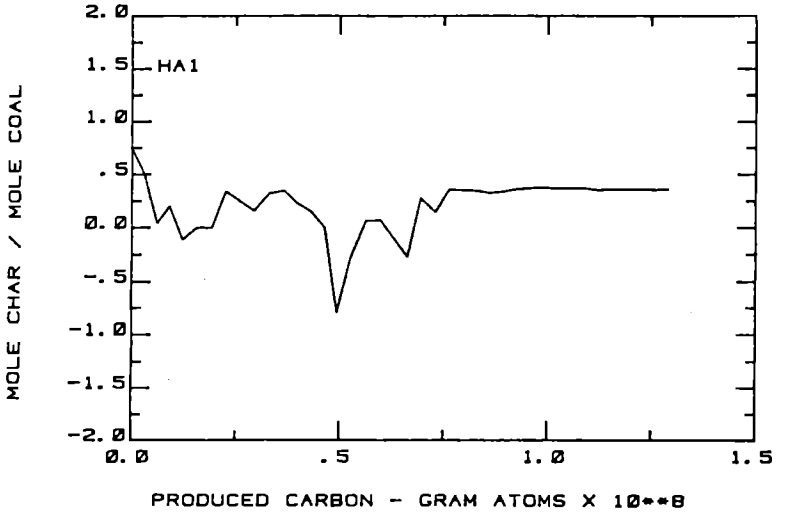


Figure 4.13 !RED item 63 versus item 133.

OXYGEN UTILIZATION

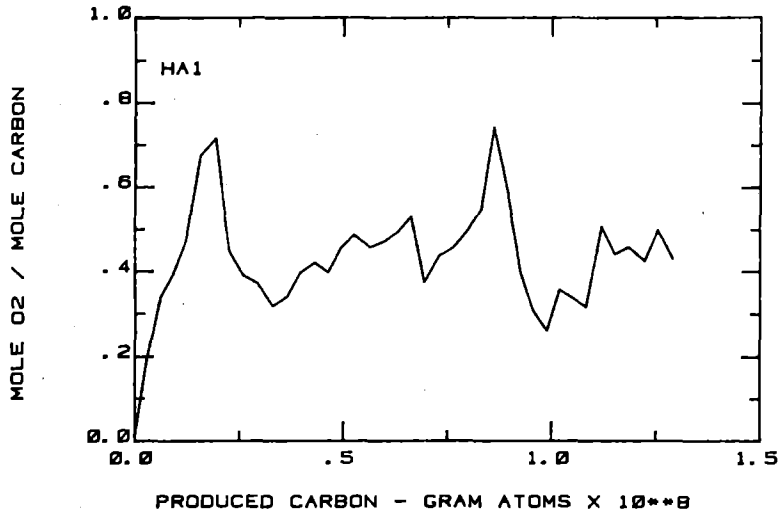


Figure 4.14 !RED item 60 versus item 133.

GAS HEAT OF COMBUSTION PER MOLE OF O2

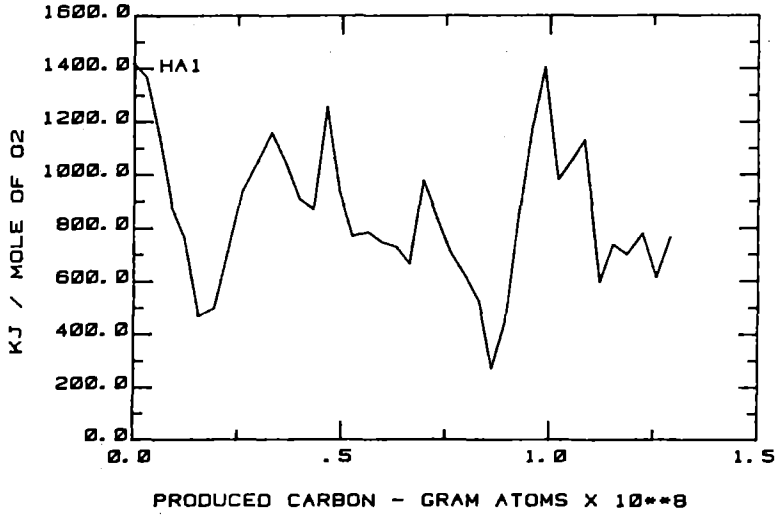


Figure 4.15 !RED item 84 versus item 133.

Hanna I References

4.1 Campbell, G.G., C.F. Brandenburg, and R.M. Boyd, Preliminary Evaluation of Underground Coal Gasification at Hanna, Wyoming," BuMines TPR 82 (October 1974).

4.2 Schrider, L.A., J.W.Jennings, C.F. Brandenburg, and D.D. Fischer, "An Underground Coal Gasification Experiment, Hanna, Wyoming," SPE 4993, presented at the SPE Fall Meeting of AIME, Houston, TX (Oct. 6-9, 1974).

4.3 Schrider, L.A., and J. Pasini, "Underground Gasification of Coal Pilot Test Hanna, Wyoming," presented at the American Gas Association Fifth Synthetic Pipeline Gas Symposium, Chicago, ILL, (Oct. 1973).

4.4 Schrider, L.A. C.B. Brandenburg, D.D. Fischer, R.M. Boyd, and G.G. Campbell, "The Outlook for Underground Coal Gasification," presented at the 1974 Lignite Symposium, Grand Forks, ND (may 1975).

4.5 Fischer, D.D. and L.A. Schrider, "Comparison of Results from Underground Coal Gasification and From a Stirred-Bed Producer," presented at The National AIChE Meeting, Houston, Texas, (March 1975).

5. HANNA II PHASE IA

General

Hanna II was carried out in the Hanna No. 1 coal seam at a depth of 84 m (275 ft) below the surface. A composite analysis of the seam at the Hanna II site is shown in Table 5.1.

Chronology

The well pattern for Hanna II is shown in Figure 5.1 with wells 1 through 4 being the main process wells. Air flow tests carried out between April 7 and May 18, 1975 indicated that the preferred flow direction was between wells 1 and 3 or along the direction of dip.[5.1] This result was consistent with Hanna I, but contrary to directional permeability measurements taken previously at the site.

Following an unsuccessful air flow linking attempt between wells 1 and 3 on April 17 through May 18, the coal was ignited at the base of well 1 on May 21, 1975. Once the fire was established air injection was switched to well 3. on May 25, with a reverse combustion link completed on June 4, 1975.

After linking, forward gasification with injection in well 3 and production from well 1 began on June 4. The forward gasification phase lasted for 37 days with termination on July 11, 1975. An abbreviated chronology for Hanna II Phase IA is shown in Table 5.2

The Data

The Hanna II Phase IA process data was provided by LETC in computer form. The data consisted of files - one for each day of the experiment. Each file contained 48 records, two records for each hour of the day. Each hourly record pair contained 99 items of data.

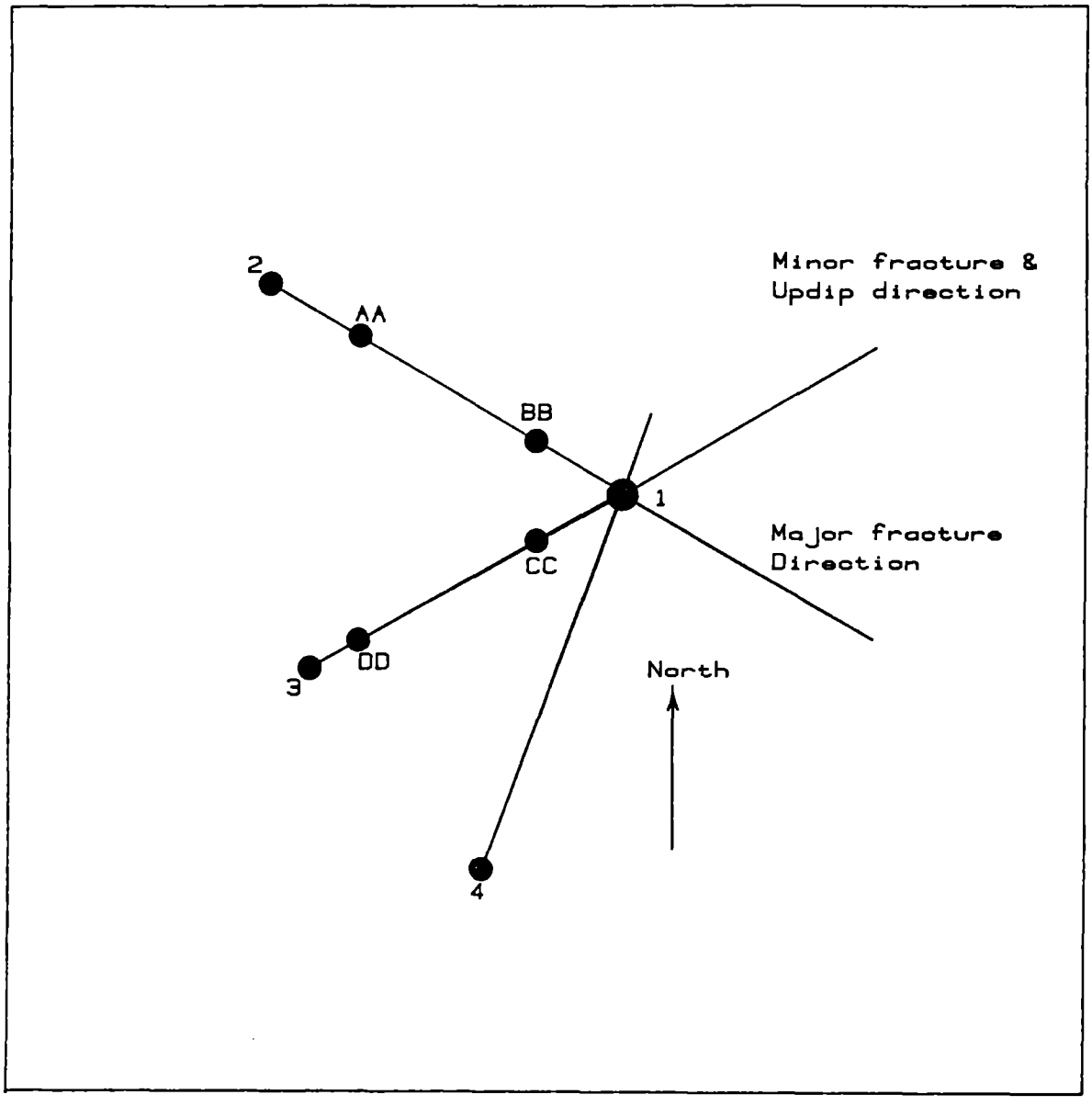
As a first step in the data reduction, the daily files were converted to a standard history file (!H2P1) containing 99 items per record, with one record for each reported time. !EXP was then constructed as outlined in Table 5.3.

The computer data did not include valid gas compositions or water/tar content. Product gas composition was obtained by digitizing plots in a LETC report.(5.1) Two values of water/tar content were obtained from a second report.(5.2)

Summary results for Hanna II Phase IA are shown in Tables 5.4 through 5.6 and Figures 5.2 through 5.13.

TABLE 5.1 HANNA II COAL ANALYSIS

Proximate analysis - wt%	
Moisture	8.62
Ash	28.92
Volatile mater	31.67
Fixed carbon	30.79
	100.00
Ultimate analysis moisture, ash free - wt%	
Carbon	72.59
Hydrogen	5.88
Oxygen (by difference)	18.60
Sulfur	1.11
Nitrogen	1.82
	100.00
Pseudo coal molecule	$C_1 H_{.965} O_{.192} S_{.006} N_{.022}$
Molecular wt	16.56
Heat of combustion (kJ/mole)	476.
Density (kg/m^3)	1363.



SCALE - 50 METER SQUARE

Figure 5.1 Well layout for Hanna II Phase I (HA2.1A & HA2.1B).

TABLE 5.2 ABBREVIATED CHRONOLGY FOR HANNA II PHASE IA

DATES	DECIMAL DAYS	EVENT	INJECTION WELL	PRODUCTION WELL
5-21-75	141	Ignition in Well 1	1	3
5-21-75 to 6-04-75	145 - 155	Reverse Combustion	3	1
6-04-75 to 7-11-75	155 - 192	Forward Gasification	3	1
7-11-75	192	Experiment Terminated	--	--

TABLE 5.3 LETC - HANNA II PHASE IA
PROCESS DATA SOURCES

ITEM	COMPUTER FILE NAME - POSITION	DESCRIPTION
Injection Rate	!H2P1 -81	Flow meter 2 rate - mol/s
Production Rate	!H2P1 -85	Flow meter 4 & 5 rates - mol/s
Gas Composition	!GAS	Merged file of digitized gas composition - Day 152-192 (ref 1)
	-3	Mole fraction - N2
	-5	Mole fraction - H2
	-6	Mole fraction - CH4
	-7	Mole fraction - CO
	-8	Mole fraction - CO2
H_2O/DRY	No Data	Use two values from reference 2
TAR/DRY	No Data	Use two values from reference 2
Injection Pressure	!H2P1 -36	Flow meter 2 pressure - kPa
Production Pressure	No Data	Use injection pressure
Injection Temperature	!H2P1 -4	Meter 2 temperature - Celsius
Production Temperature	!H2P1 -6	Meter 4 temperature - Celsius

Table 5.4

HANNA II - PHASE IA - REVERSE BURN
145.67 TO 155.46

TIME (days)	9.798	
Average product heat of combustion (kJ/mol)	130.	
Total flows (Mmols)		
Injection	1.3	
Production	2.0	
Total dry gas production (Mmols)	2.0	
Coal		(+Char)
(Mg)	16.3	(27.3)
(Gas loss corrected Mg)	16.9	(28.2)
Dry gas composition		
AR	0.0000	
N2	.4970	
O2	0.0000	
H2	.1910	
CH4	.0448	
CO	.1267	
CO2	.1404	
C2H4	0.0000	
C2H6	0.0000	
C6	0.0000	
H10	0.0000	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.0229	
Tar/dry	.0001	
Reaction stoichiometry		(+Char)
O2/Coal	.428	(.256)
Char/Coal	0.000	(.402)
H2O/Coal	.416	(.076)
Gas recovery (%)	94.9	
Energy distribution (%)		(+Char)
Combustible gas	87.6	(52.4)
Combustible tar	.2	(.1)
Heat loss in-situ	9.5	(9.4)
Gas sensible heat	.5	(.3)
Net steam	.7	(.4)
Char + ash sensible heat	1.1	(2.7)
Char combustion energy	0.0	(34.6)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	974.	

HANNA II - PHASE IA - REVERSE BURN
145.67 TO 155.46

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	12.0	(20.0)
(Mmol)	.6	(1.0)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	.3	(.5)
Water parameters (mol/s)		(+Char)
Insitu influx	.26	(-.01)
From consumed coal	.09	(.15)
Consumed in reactions	.30	(.09)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	1747.	
Production	1711.	
Average temperatures (deg c)		
Injection	12.6	
Production	0.0	
Average gas flows (mol/s)		
Injection	1.6	
Production	2.4	

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Table 5.5

HANNA II - PHASE IA - FORWARD BURN
155.47 TO 193.96

TIME (days)	38.491	
Average product heat of combustion (kJ/mol)	122.	
Total flows (Mmols)		
Injection	87.7	
Production	122.3	
Total dry gas production (Mmols)	102.5	
Coal		(+Char)
(Ms)	873.6	(1249.4)
(Gas loss corrected Ms)	1133.3	(1620.9)
Dry gas composition		
AR	.0001	
N2	.5157	
O2	0.0000	
H2	.1757	
CH4	.0331	
CO	.1510	
CO2	.1243	
C2H4	0.0000	
C2H6	0.0000	
C6	0.0000	
H10	0.0000	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.1917	
Tar/dry	.0015	
Reaction stoichiometry		(+Char)
O2/Coal	.431	(.302)
Char/Coal	0.000	(.301)
H2O/Coal	.290	(.073)
Gas recovery (%)	77.3	
Energy distribution (%)		(+Char)
Combustible gas	79.9	(55.9)
Combustible tar	4.7	(3.3)
Heat loss in-situ	2.4	(4.6)
Gas sensible heat	6.0	(4.2)
Net steam	5.5	(3.8)
Char + ash sensible heat	1.1	(2.3)
Char combustion energy	0.0	(25.9)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	882.	

HANNA II - PHASE IA - FORWARD BURN
155.47 TO 193.96

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	640.9	(916.7)
(Mmol)	33.0	(47.2)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	15.7	(22.5)
Water parameters (mol/s)		(+Char)
Insitu influx	7.53	(5.15)
From consumed coal	1.26	(1.80)
Consumed in reactions	2.88	(1.04)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	267.	
Production	278.	
Average temperatures (deg c)		
Injection	23.6	
Production	261.7	
Average gas flows (mol/s)		
Injection	26.4	
Production	36.8	

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Table 5.6

HANNA II - PHASE IA - FULL EXPERIMENT
145.67 TO 193.96

TIME (days)	48.288	
Average product heat of combustion (kJ/mol)	123.	
Total flows (Mmols)		
Injection	89.0	
Production	124.3	
Total dry gas production (Mmols)	104.5	
Coal		(+Char)
(Mg)	889.9	(1276.7)
(Gas loss corrected Mg)	1150.1	(1650.1)
Dry gas composition		
AR	.0001	
N2	.5154	
O2	0.0000	
H2	.1760	
CH4	.0333	
CO	.1505	
CO2	.1246	
C2H4	0.0000	
C2H6	0.0000	
C6	0.0000	
H10	0.0000	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.1885	
Tar/dry	.0015	
Reaction stoichiometry		(+Char)
O2/Coal	.431	(.301)
Char/Coal	0.000	(.303)
H2O/Coal	.292	(.073)
Gas recovery (%)	77.5	
Energy distribution (%)		(+Char)
Combustible gas	80.1	(55.8)
Combustible tar	4.6	(3.2)
Heat loss in-situ	2.6	(4.7)
Gas sensible heat	5.9	(4.1)
Net steam	5.4	(3.8)
Char + ash sensible heat	1.1	(2.3)
Char combustion energy	0.0	(26.1)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	884.	

HANNA II - PHASE IA - FULL EXPERIMENT
145.67 TO 193.96

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	652.9	(936.7)
(Mmol)	33.6	(48.2)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	16.0	(23.0)
Water parameters (mol/s)		(+Char)
Insitu influx	6.06	(4.10)
From consumed coal	1.02	(1.47)
Consumed in reactions	2.36	(.84)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	291.	
Production	301.	
Average temperatures (deg c)		
Injection	23.4	
Production	257.5	
Average gas flows (mol/s)		
Injection	21.3	
Production	29.8	

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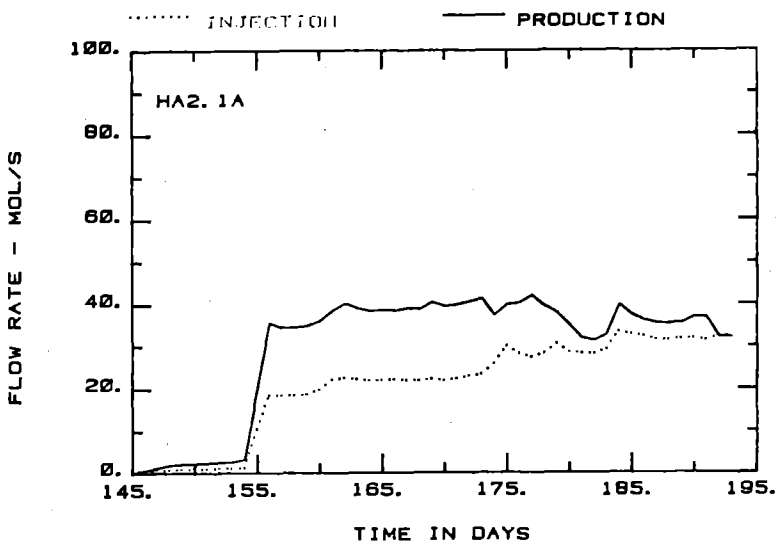

Figure 5.2 !RED items 90 and 91 versus time.

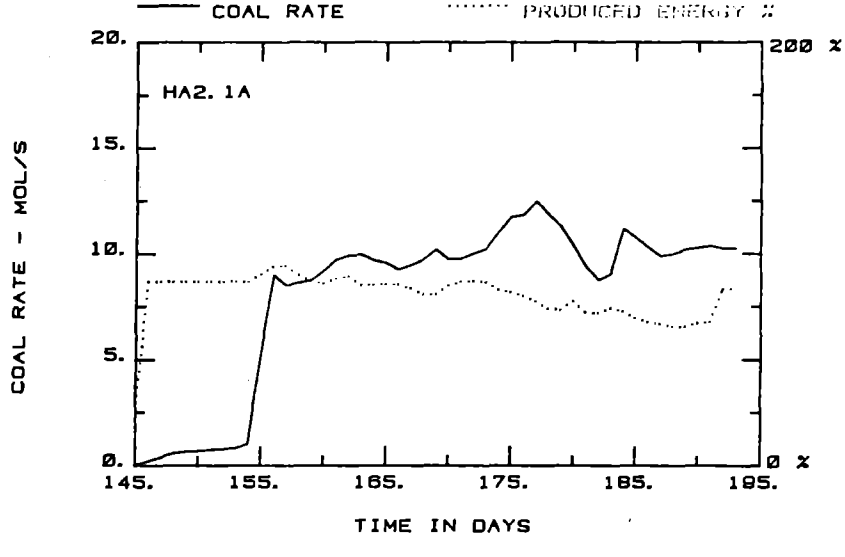

Figure 5.3 !RED item 44 and item 74 x 100 versus time.

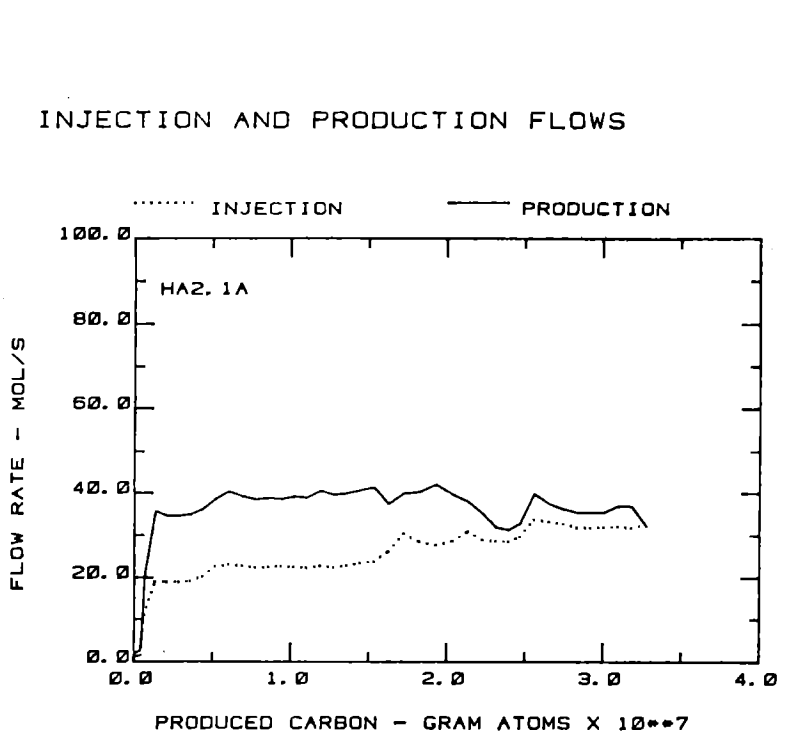

Figure 5.4 !RED items 90 and 91 versus item 133.

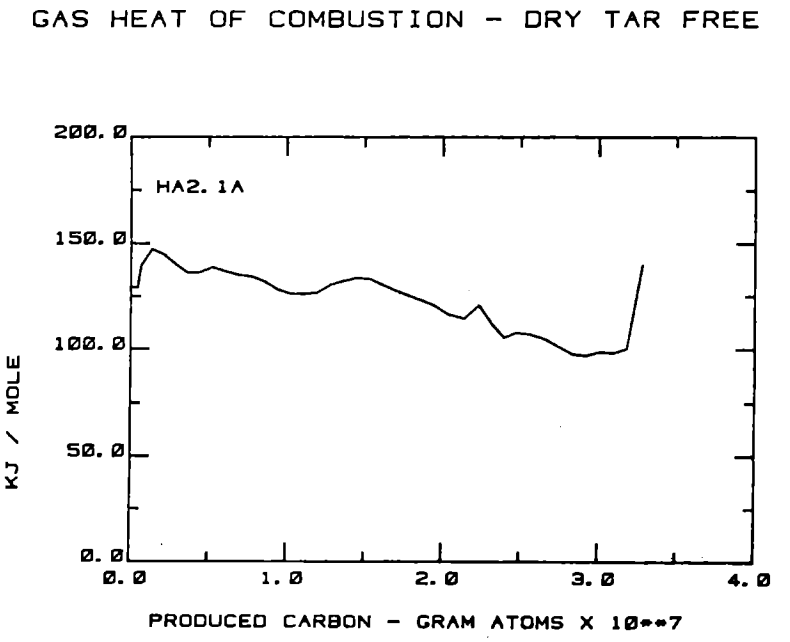

Figure 5.5 !RED items 81 versus item 133.

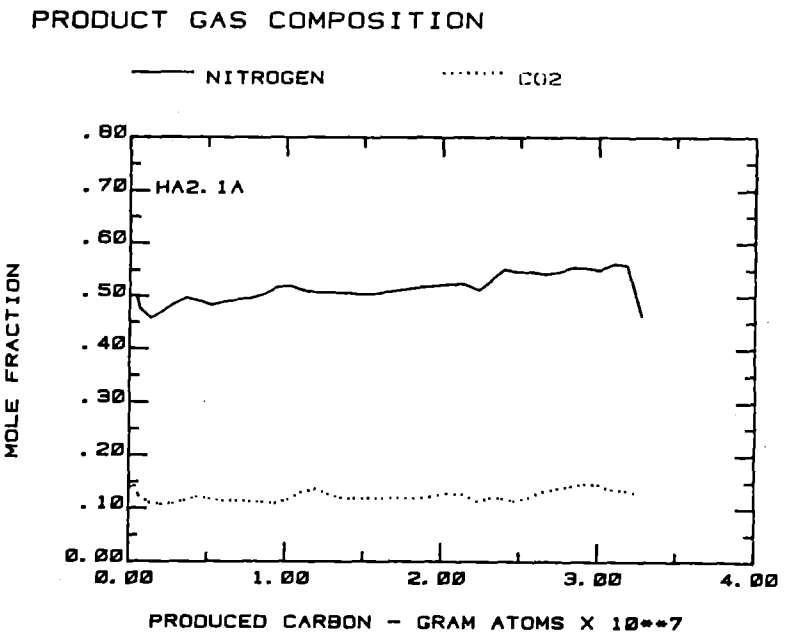

Figure 5.6 !RED items 11 and 16 versus item 133.

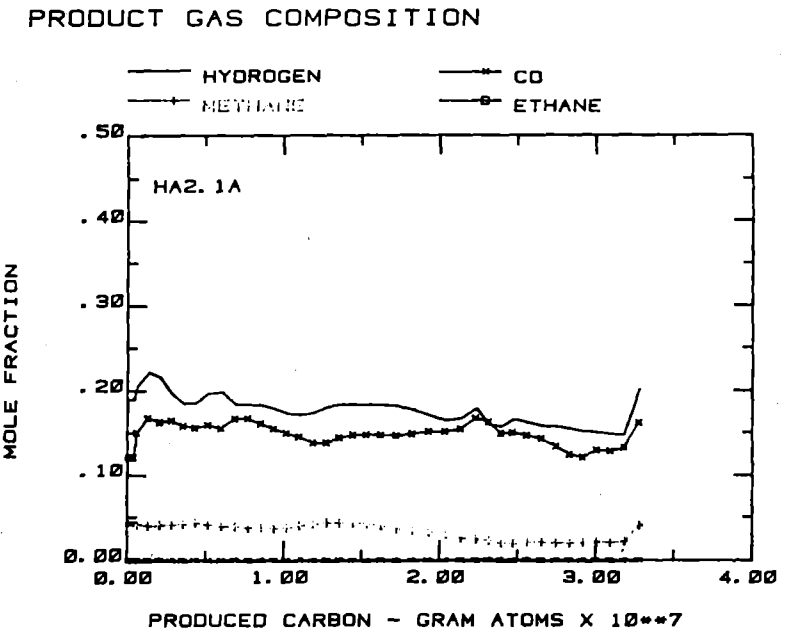

Figure 5.7 !RED items 13, 14, 15 and 18 versus item 133.

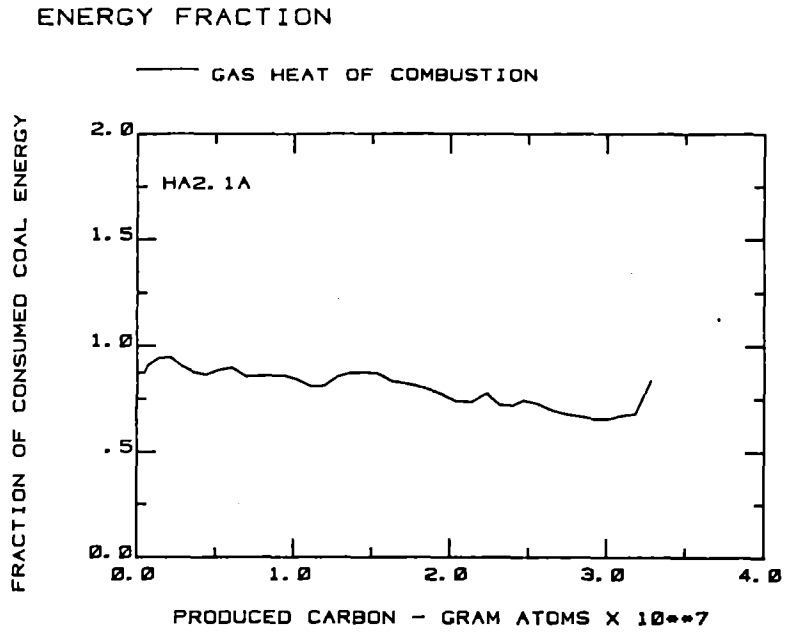

Figure 5.8 !RED item 74 versus item 133.

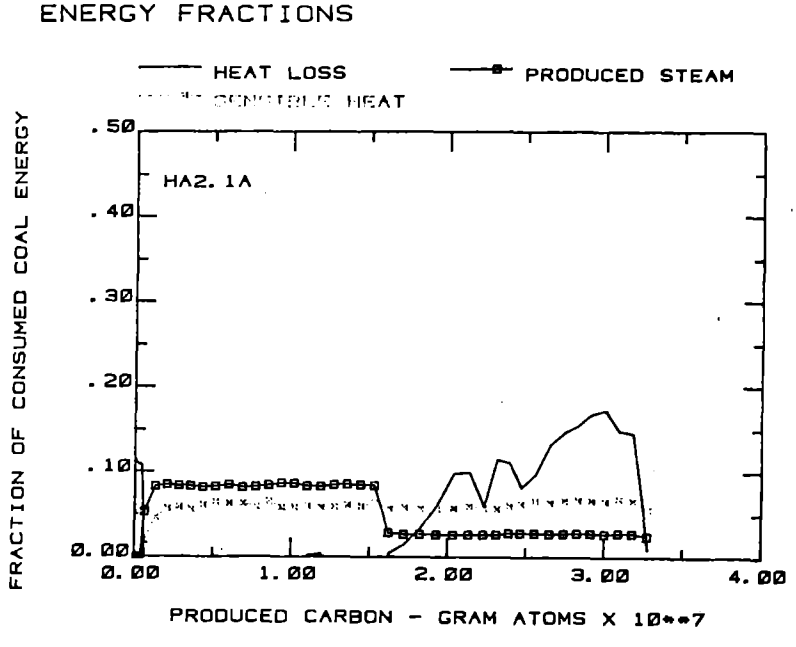

Figure 5.9 !RED items 75 - 78 versus item 133.

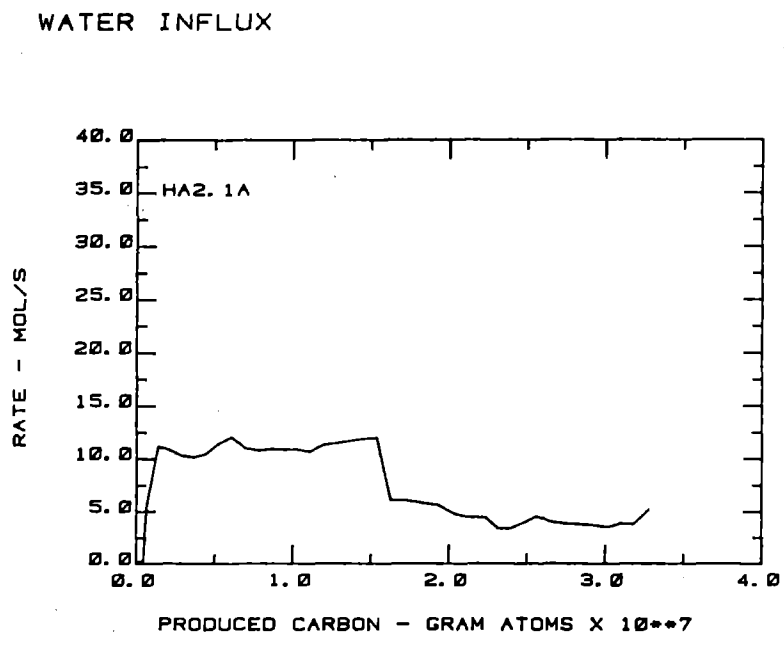

Figure 5.10 !RED item 47 versus item 133.

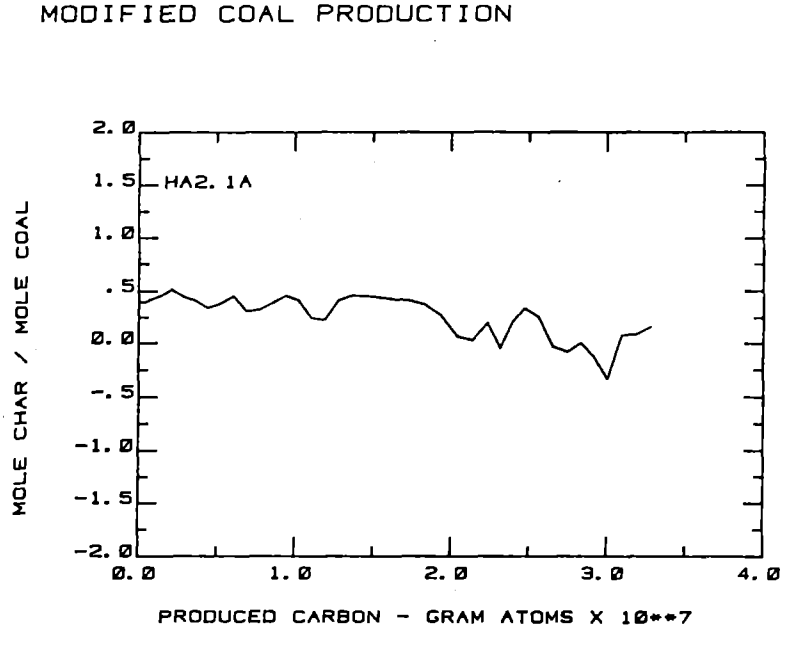

Figure 5.11 !RED item 63 versus item 133.

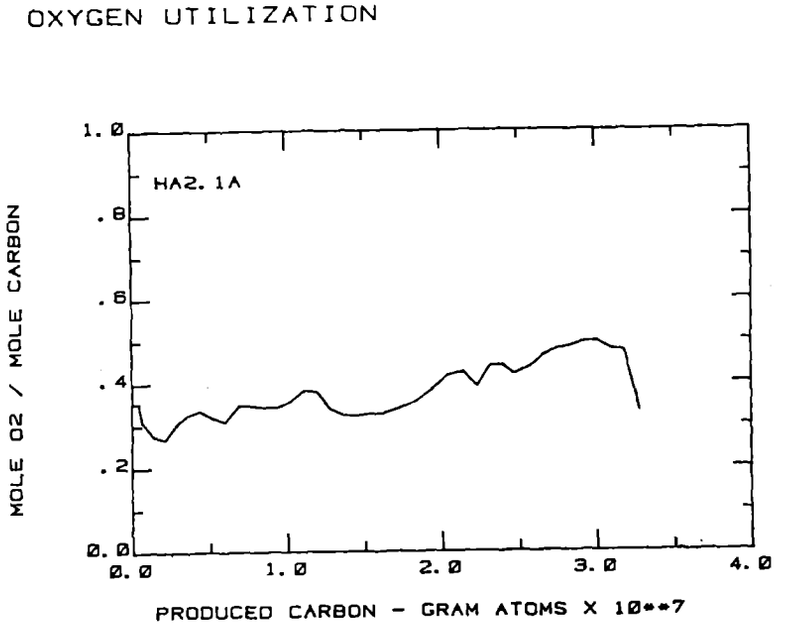

Figure 5.12 !RED item 60 versus item 133.

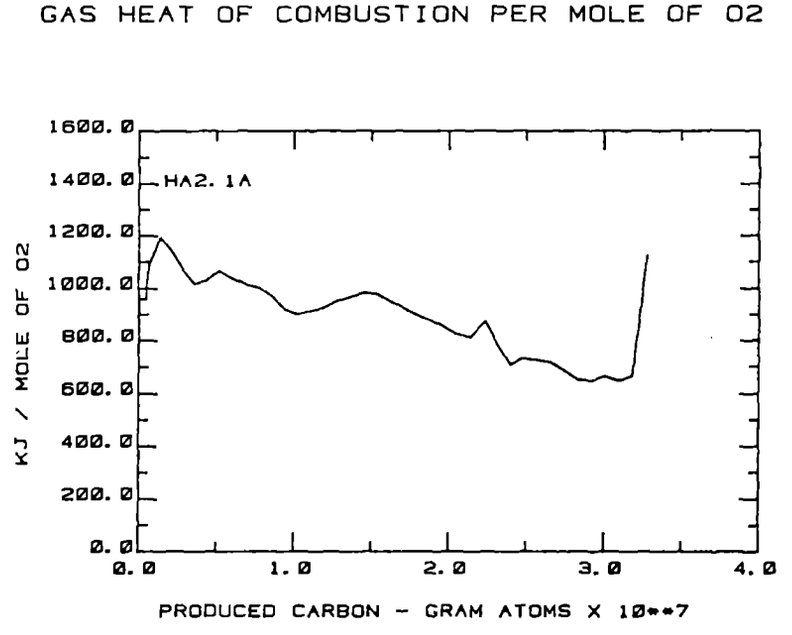

Figure 5.13 !RED item 84 versus item 133.

Hanna II, Phase IA References

5.1 Brandenburg, C.F., Reed, R.P., Boyd, R.M., Northrop, D.A., and Jennings, J.W., "Interpretation of Chemical and Physical Measurements from an In Situ Coal Gasification Experiment," SPE 5654, presented at the SPE Fall Meeting of AIME, Dallas, TX, (Sept. 28-Oct. 1, 1975).

5.2 Laramie Energy Research Center, Internal Quarterly Progress Report, LERC/QTR-7511 (October, 1975).

6. HANNA II PHASE IB

Chronology

Upon completion of Hanna II Phase IA, Phase IB was carried out. The experiment consisted of linking and gasification between well 2 and the burned out region from Phase IA, (see Figure 5.1). The chronology of the experiment is given in Table 6.1

The Data

No computer data was available for Phase IB. Published results [6.1] in the form of plots were digitized and used to construct !EXP as summarized in Table 6.2 The table points out the lack of product gas composition data for Phase IB. To overcome this problem typical gas compositions were generated which were consistent with the reported product heating value. This allowed total coal consumption to be estimated. (A similar process was employed for a portion of the Hanna I test).

Summary results for Hanna II Phase IA are shown in Table 6.3 and Figures 6.1 through 6.12.

TABLE 6.1 ABBREVIATED CHRONOLOGY FOR HANNA II PHASE IB.

DATES	DECIMAL DAYS	EVENT	INJECTION WELL	PRODUCTION WELL
7-11-75 to 7-22-75	192 - 203	Reverse Combustion	2	1
7-22-75 to 8-28-75	203 - 240	Forward Combustion	2	1
8-28-75	240	Experiment Terminated	--	--

TABLE 6.2 LETC - HANNA II PAHSE IB
PROCESS DATA SOURCES

ITEM	COMPUTER FILE NAME - POSITION	DESCRIPTION
Injection Rate	!INJ -2	Moles/s - Digitized from reference 1
Production Rate	!PDY2 -2	Moles/s - Digitized (ref 1)
Gas Composition	!GAS	Derived from digitized heating value plot(1) (ref 1)
H_2O/DRY	No Data	Assumed value of 0.10
TAR/DRY	No Data	Assumed no tar
Injection Pressure	!PRES2 -2	kPa - Digitized (ref 1)
Production Pressure	No Data	Assume equal to injection pressure
Injection Temperature	No Data	Assume 40 degrees Celsius
Production Temperature	No Data	Assume values based on previous experiments

(1) Major gas components estimated from heating value curve assuming:
A) Water-Gas-Shift Equilibrium
B) Char/Coal Ratio
C) Gas components proportional to changes in heating value.

Table 6.3

HANNA II - PHASE IB - FULL EXPERIMENT
203.00 TO 241.00

TIME (days)	38.000	
Average product heat of combustion (kJ/mol)	128.	
Total flows (Mmols)		
Injection	40.5	
Production	92.3	
Total dry gas production (Mmols)	82.0	
Coal		(+Char)
(Mg)	708.2	(982.7)
(Gas loss corrected Mg)	554.3	(769.2)
Dry gas composition		
AR	.0064	
N2	.4976	
O2	.0000	
H2	.1787	
CH4	.0422	
CO	.1401	
CO2	.1351	
C2H4	0.0000	
C2H6	0.0000	
C6	0.0000	
H10	0.0000	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.1250	
Tar/dry	.0010	
Reaction stoichiometry		(+Char)
O2/Coal	.410	(.296)
Char/Coal	0.000	(.279)
H2O/Coal	.337	(.122)
Gas recovery (%)	129.0	
Energy distribution (%)		(+Char)
Combustible gas	82.6	(59.5)
Combustible tar	3.1	(2.2)
Heat loss in-situ	3.0	(4.9)
Gas sensible heat	6.3	(4.6)
Net steam	3.5	(2.5)
Char + ash sensible heat	1.1	(2.2)
Char combustion energy	0.0	(24.1)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	957.	

HANNA II - PHASE IB - FULL EXPERIMENT
203.00 TO 241.00

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	519.6	(721.0)
(Mmol)	26.7	(37.1)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	12.7	(17.7)
Water parameters (mol/s)		(+Char)
Insitu influx	4.83	(3.07)
From consumed coal	1.03	(1.43)
Consumed in reactions	2.75	(1.38)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	237.	
Production	237.	
Average temperatures (deg c)		
Injection	40.0	
Production	304.9	
Average gas flows (mol/s)		
Injection	12.3	
Production	28.1	

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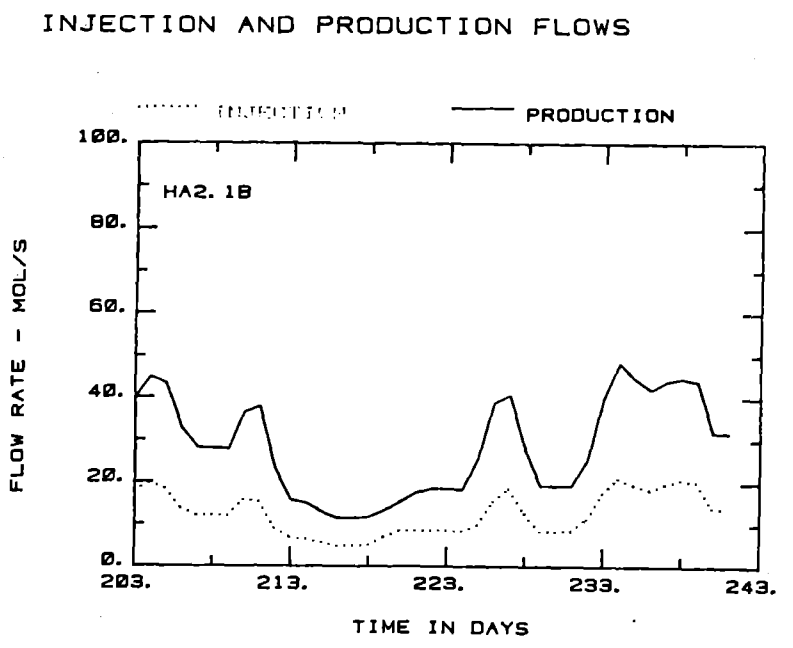


Figure 6.1 !RED items 90 and 91 versus time.

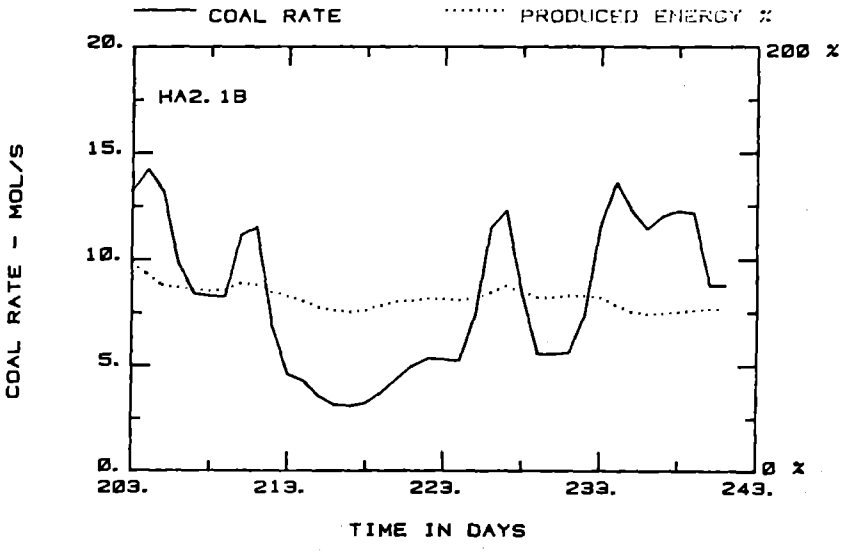


Figure 6.2 !RED item 44 and item 74 x 100 versus time.

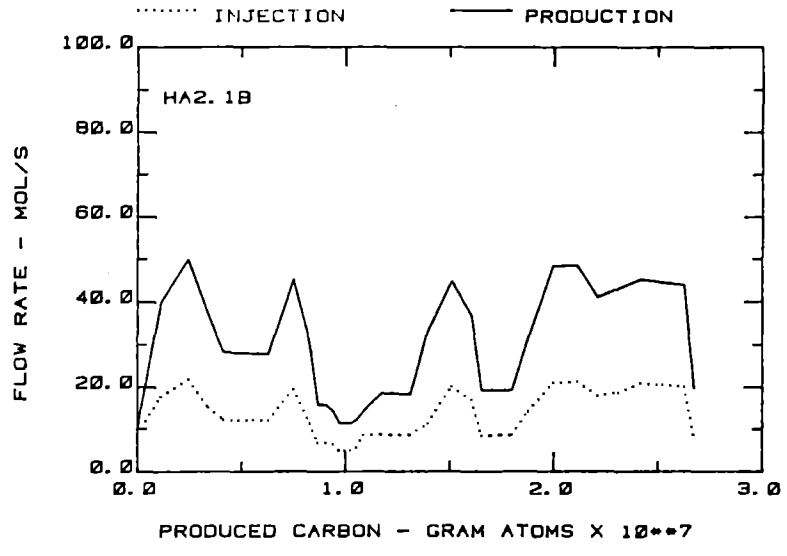


Figure 6.3 !RED items 90 and 91 versus item 133.

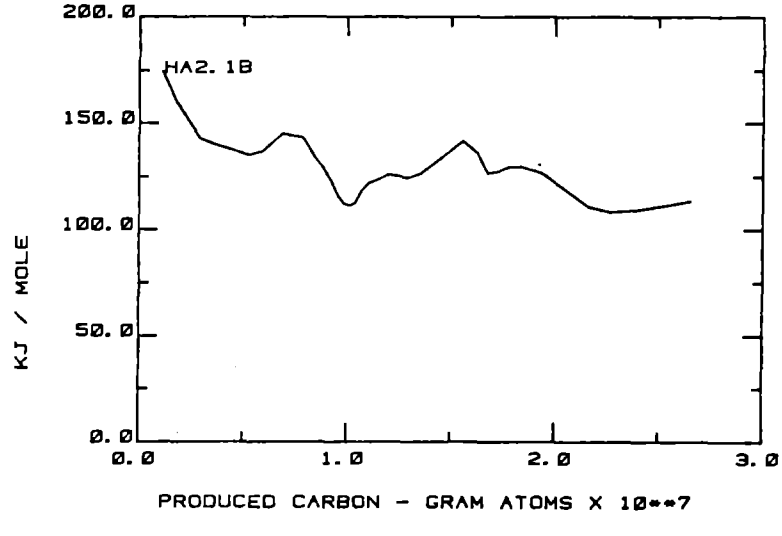


Figure 6.4 !RED items 81 versus item 133.

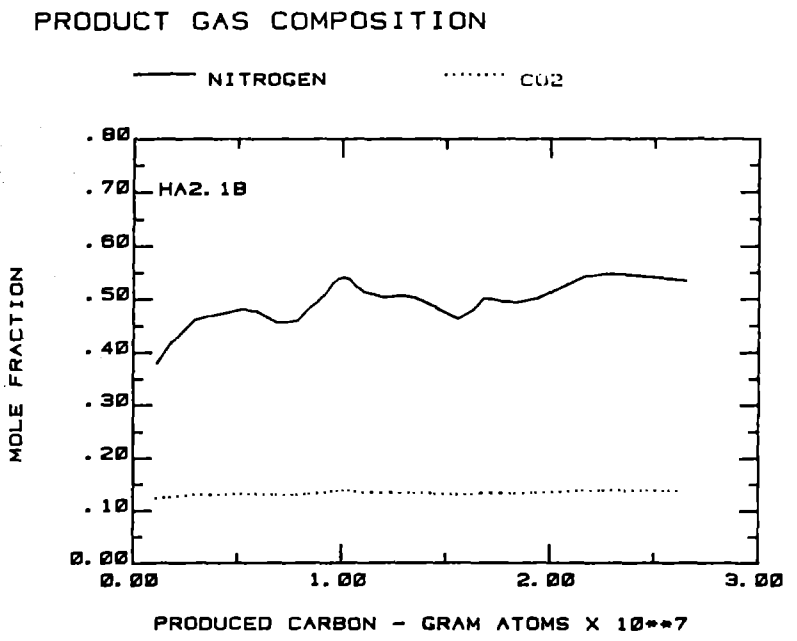


Figure 6.5 !RED items 11 and 16 versus item 133.

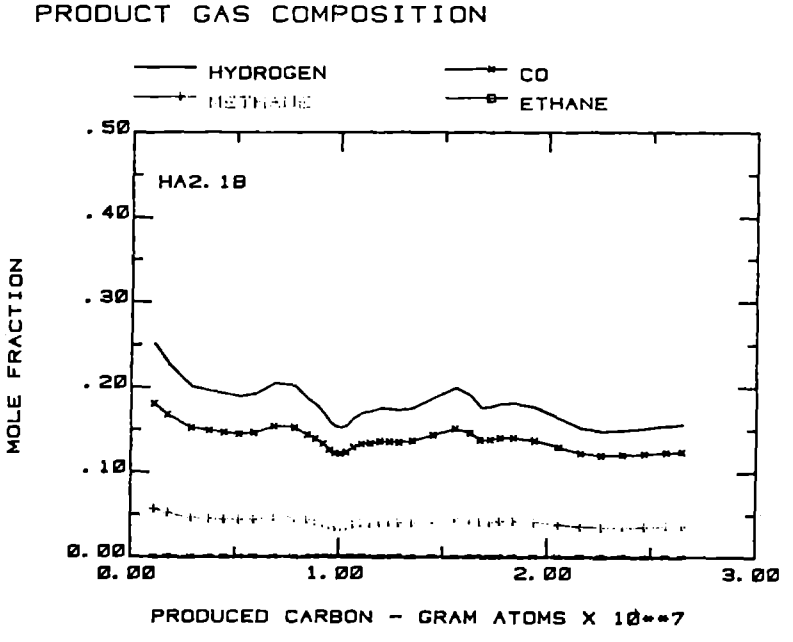


Figure 6.6 !RED items 13, 14, 15 and 18 versus item 133.

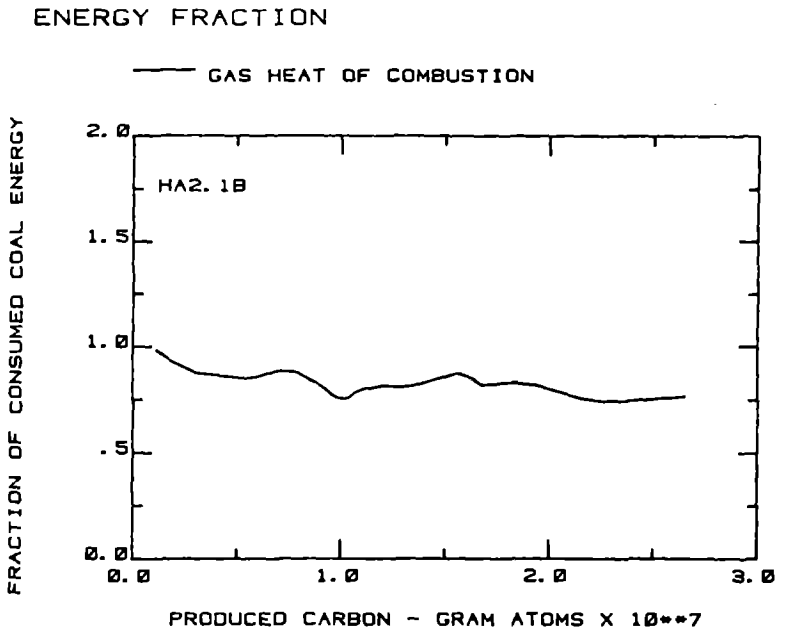


Figure 6.7 !RED item 74 versus item 133.

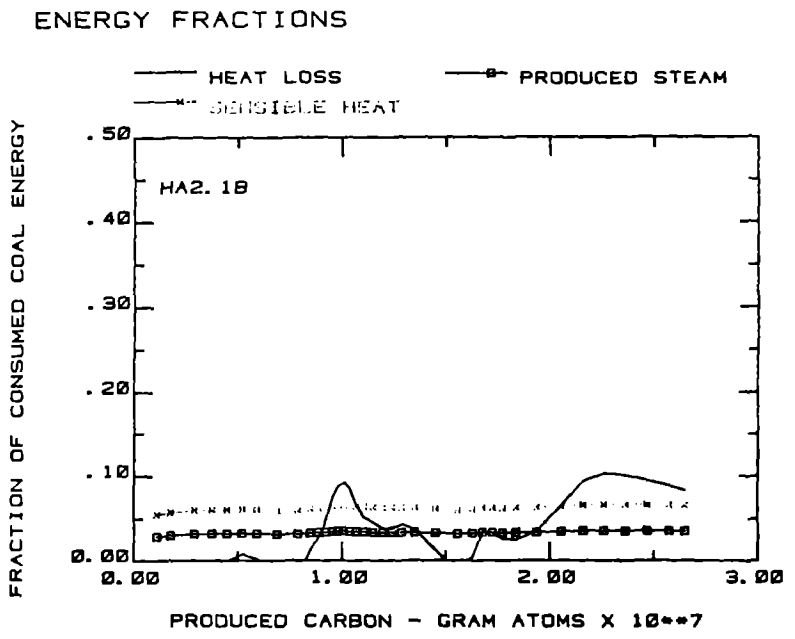


Figure 6.8 !RED items 75 - 78 versus item 133.

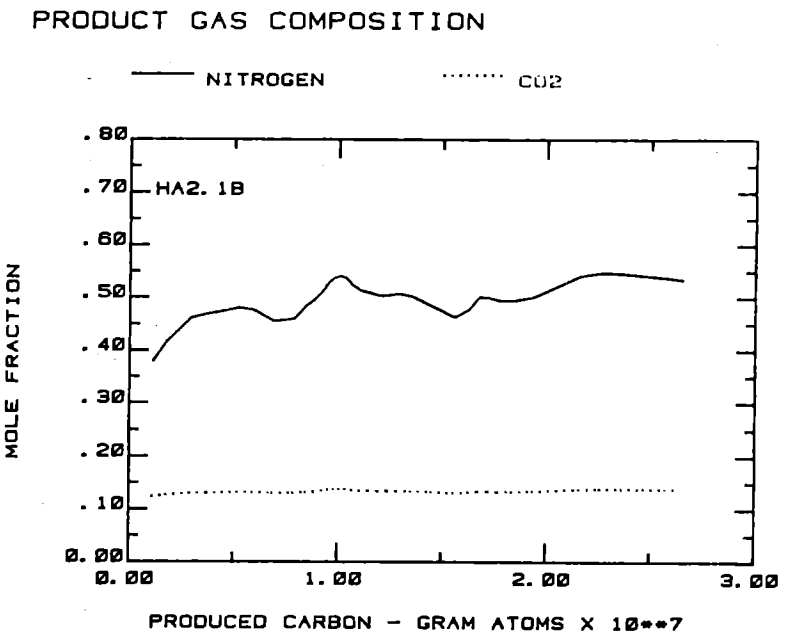


Figure 6.5 !RED items 11 and 16 versus item 133.

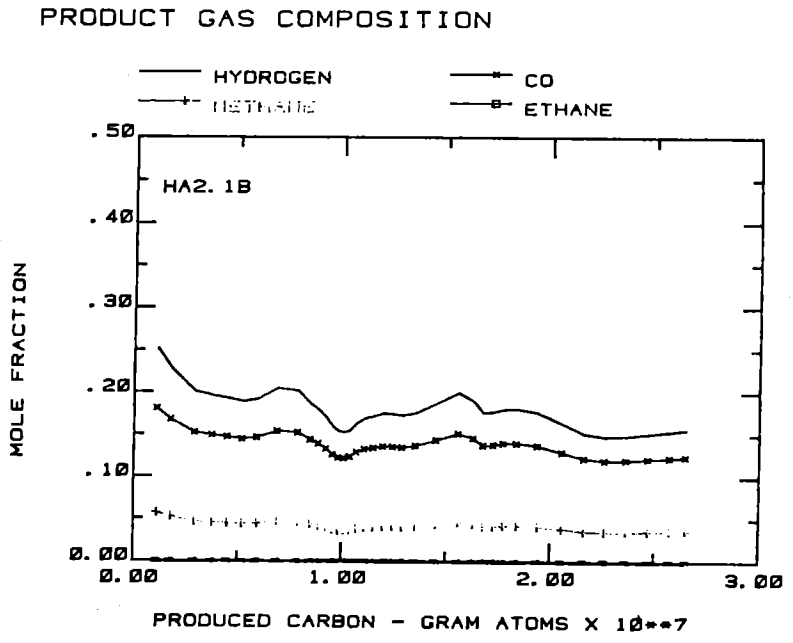


Figure 6.6 !RED items 13, 14, 15 and 18 versus item 133.

OXYGEN UTILIZATION

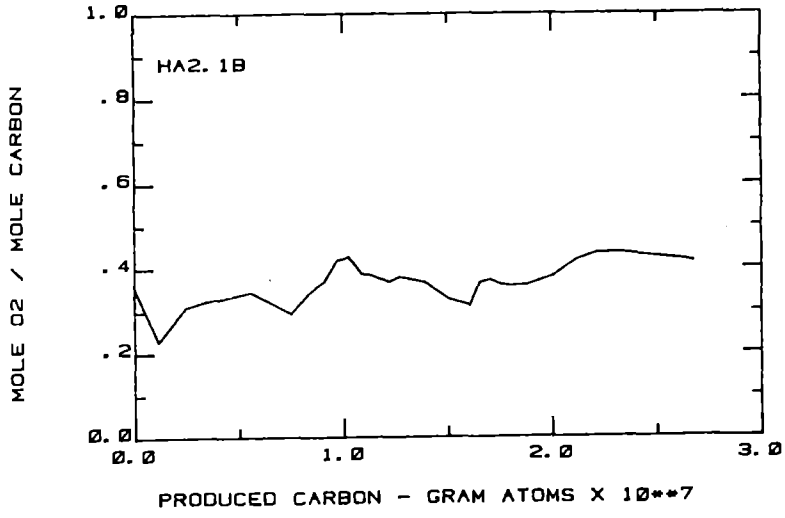


Figure 6.11 !RED item 60 versus item 133.

GAS HEAT OF COMBUSTION PER MOLE OF O2

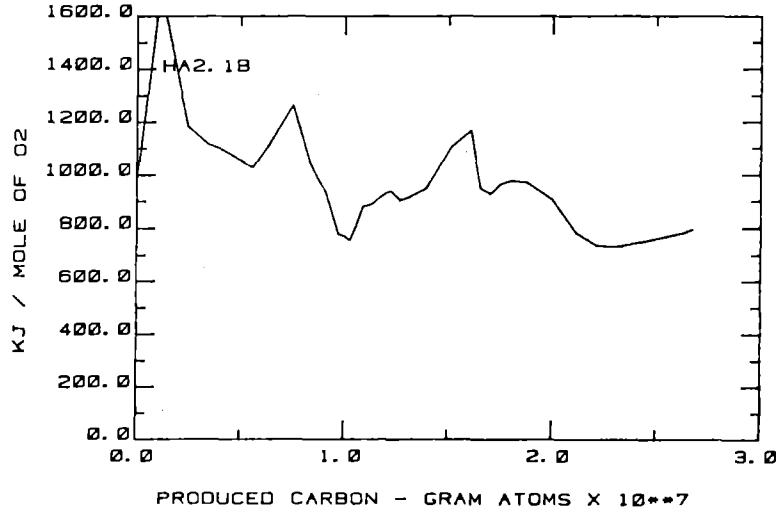


Figure 6.12 !RED item 84 versus item 133.

WATER INFLUX

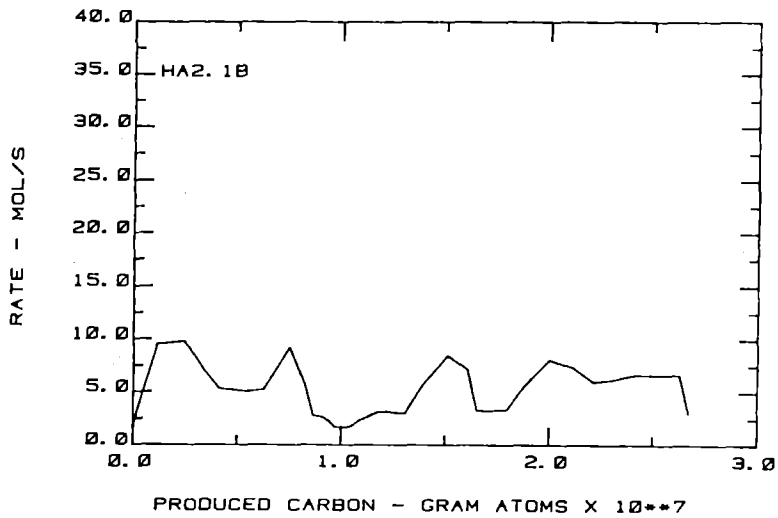


Figure 6.9 !RED item 47 versus item 133.

MODIFIED COAL PRODUCTION

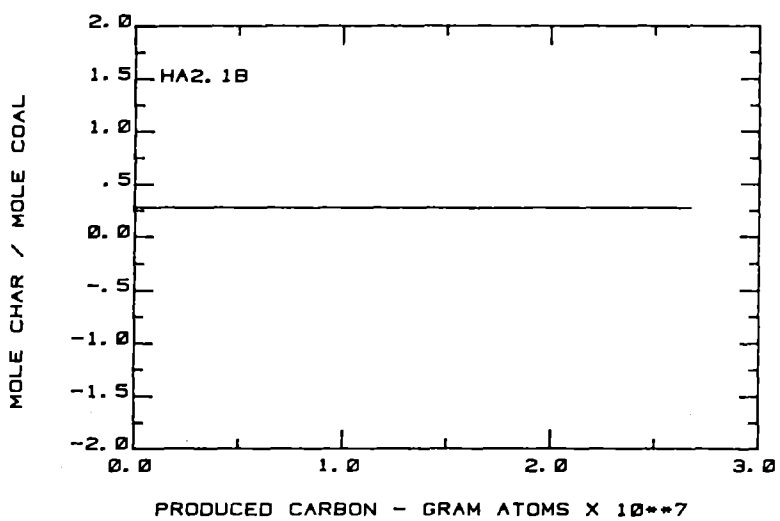


Figure 6.10 !RED item 63 versus item 133.

7. HANNA II PHASE II

General

Hanna II Phases II and III utilized a square 60' x 60' well pattern shown in Figure 7.1. Wells 5 through 8 were the primary injection and production wells, with all others being instrument wells fielded by Sandia Laboratories. (See Table 5.1 for a composite seam analysis).

Chronology

The Phase II plans called for:[7.1]

- o Linking wells 7 and 8, with ignition occurring at well 7.
- o Linking wells 5 and 6, with ignition occurring at well 5.
- o Gasification from well 6 to well 5.

Hanna II Phase II was ignited at the base of well 7 on December 3, 1975. A reverse combustion link to well 8 may have been completed on December 10, but the decrease in pressure drop observed upon linking during Hanna I and Hanna II, Phase IA, was not observed.[7.2] An improved link was achieved on December 18 by pulsing air injection at well 8. The combustion zone was extinguished by water injection in January 1976. Beginning on March 26, 1976, air flow tests were carried out in well 5. Well 5 was ignited on April 4 and injection switched to well 6 on April 6[7.2]. Injection pressure decreased from 1725 kPa (250 psi) to 275 kPa (40 psi) on April 15, but there was no temperature indication of a 5-6 link at well 6. From April 23 to May 4, increased air flows followed by switching air injection to well 5 completed the link.

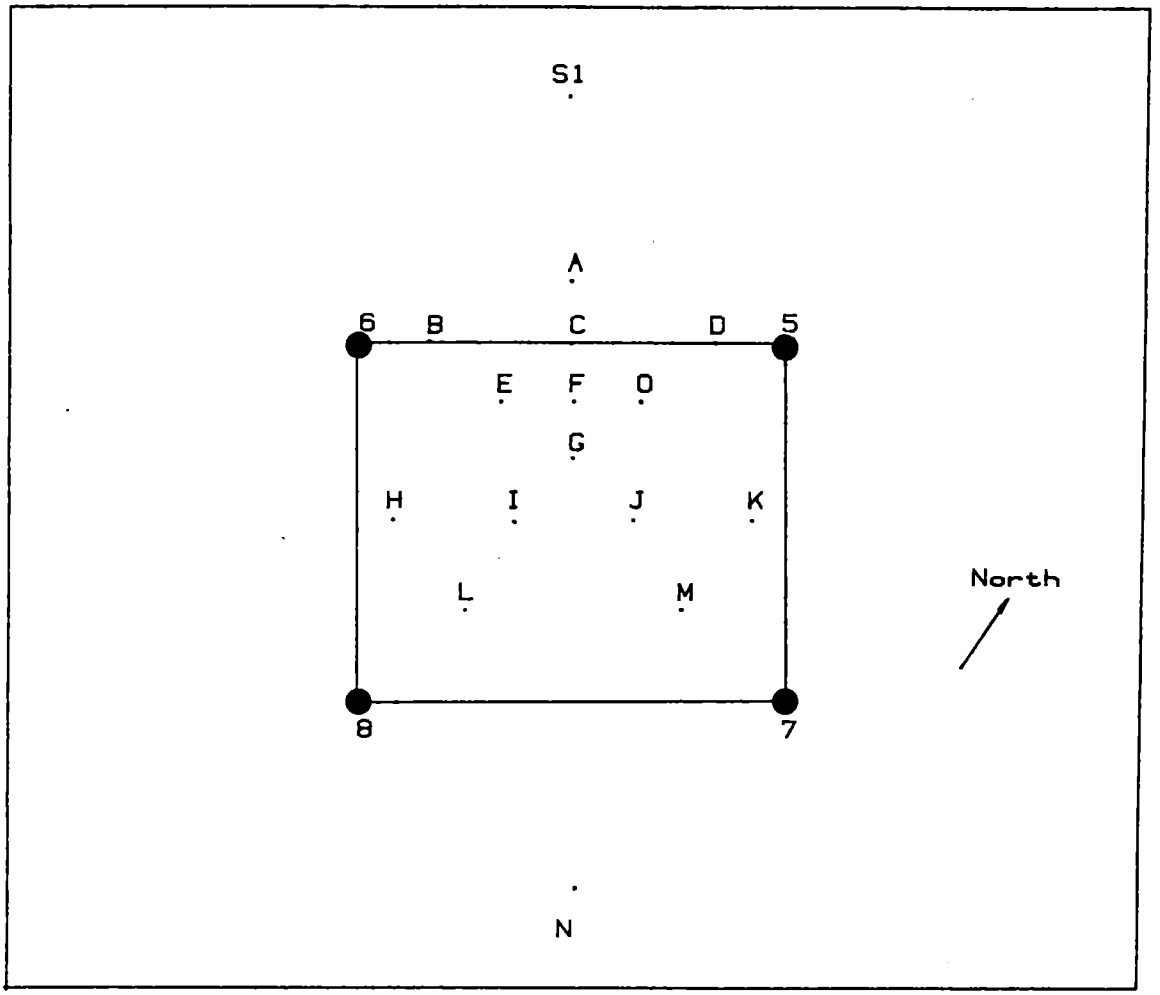
The forward gasification between wells 6 and 5 lasted for 27 days with injection in well 6 and production from well 5. The experiment terminating on May 31, 1976. An abbreviated chronology is shown in Table 7.1.

The Data

The Hanna II Phase II process data was provided by LETC in a form similar to Phase IA. Each daily file contained 72 records, with three records for each hour of the day. As done with Phase IA, the daily files were first converted to a standard history file !H2P2 containing 279 items per record.

The data sources used to construct !EXP are summarized in Table 7.2 The most notable omission in the data is the water and tar content of the product. The water content was calculated, assuming 100% gas recovery and no produced tar was assumed. Also, computer results were not available prior to day 116. In this instance, daily summary sheets, available beginning on day 106 were utilized.

The Hanna II Phase II results are summarized in Tables 7.3 through 7.5 and Figures 7.2 through 7.13.



SCALE - 50 METER SQUARE

Figure 7.1 Well layout for Hanna II Phases II and III (H2.2 & HA2.3).

TABLE 7.1 ABBREVIAYED CHRONOLOGY FOR HANNA II PHASE II

DATES	DECIMAL DAYS	EVENT	INJECTION WELL	PRODUCTION WELL
12-03-75	337	Ignition in Well 7	7	8
12-04-75 to 12-18-75	338 - 352	Reverse Combustion	8	7
January, 1976	---	Extinguished Combustion	--	--
4-04-76	95	Ignition Well 5	5	5
4-06-76 to 4-23-76	97 - 114	Reverse Combustion	6	5
4-23-76 to 5-04-76	114 - 125	Link Enhancement	6,5	5,6
5-04-76 to 5-30-76	125 - 151	Forward Gasification	6	5
5-30-76	151	Shut in for repairs	--	--
5-30-76 to 5-31-76	151 - 152	Forward Gasification	5	6

TABLE 7.2 LETC - HANNA II PHASE II
PROCESS DATA SOURCES

ITEM	COMPUTER FILE NAME - POSITION	DESCRIPTION
Injection Rate	!H2P2 -262	Flow meter 4 rate - mol/s
	!FLW23 -2	Daily summaries prior to day 116 - mcf/d
Production Rate	!H2P2 -259 & 261	Flow meter 1 and 3 rates - mol/s
	!FLW23 -4	Daily summaries prior to day 116. - mcf/d
Gas Composition	!H2P2 & !GAS23	Components after and prior to day 116, respectively
	-279 & 10	Volume % - Ar
	-269 & 4	Volume % - N2
	-268 & 3	Volume % - O2
	-267 & 2	Volume % - H2
	-270 & 5	Volume % - CH4
	-271 & 6	Volume % - CO
	-273 & 8	Volume % - CO2
	-272 & 7	Volume % - C2H6
	-274 & 9	Volume % - C3H8
	-275	Volume % - C3H6
	-276	Volume % - ISO-Butane
	-277	Volume % - N-Butane
	-278	Volume % - H2S
H_2O/DRY	No Data	Calculated assuming 100% gas recovery
TAR/DRY	No Data	Assume no tar
Injection Pressure	!H2P2 -213	Meter 1 pressure - kPa
	!FLW23 -5	Daily summaries prior to day 116 - psia
Production Pressure	No Data	Assume equal to injection pressure
Injection Temperature	!H2P2 -5	Meter 5 temperature - Degrees Celsius No Data prior to day 116
Production Temperature	!H2P2 -2	Meter 1 temperature - Degress Celsius No Data prior to day 116

Table 7.3

HANNA II - PHASE II - REVERSE BURN
106.00 TO 125.25

TIME (days)	19.251	
Average product heat of combustion (kJ/mol)	163.	
Total flows (Mmols)		
Injection	19.5	
Production	41.1	
Total dry gas production (Mmols)	33.3	
Coal		(+Char)
(Mg)	303.9	(610.2)
(Gas loss corrected Mg)	307.9	(618.3)
Dry gas composition		
AR	.0056	
N2	.4515	
O2	.0026	
H2	.2039	
CH4	.0602	
CO	.1355	
CO2	.1330	
C2H4	0.0000	
C2H6	.0061	
C6	.0007	
H10	.0009	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.2361	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.352	(.175)
Char/Coal	0.000	(.502)
H2O/Coal	.524	(.044)
Gas recovery (%)	98.8	
Energy distribution (%)		(+Char)
Combustible gas	99.0	(49.3)
Combustible tar	0.0	(0.0)
Heat loss in-situ	-13.8	(-2.3)
Gas sensible heat	7.0	(3.5)
Net steam	6.3	(3.1)
Char + ash sensible heat	1.1	(3.1)
Char combustion energy	0.0	(43.3)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	1337.	

HANNA II - PHASE II - REVERSE BURN
106.00 TO 125.25

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	222.9	(447.7)
(Mmol)	11.5	(23.0)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	5.5	(11.0)
Water parameters (mol/s)		(+Char)
Insitu influx	7.46	(3.58)
From consumed coal	.87	(1.76)
Consumed in reactions	3.61	(.61)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	863.	
Production	213.	
Average temperatures (deg c)		
Injection	32.2	
Production	330.6	
Average gas flows (mol/s)		
Injection	11.7	
Production	24.7	

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Table 7.4

HANNA II - PHASE II - FORWARD BURN
125.26 TO 152.00

TIME (days)	26.744	
Average product heat of combustion (kJ/mol)	150.	
Total flows (Mmols)		
Injection	137.5	
Production	232.0	
Total dry gas production (Mmols)	219.5	
Coal		(+Char)
(Mg)	1997.4	(3280.3)
(Gas loss corrected Mg)	2242.2	(3682.3)
Dry gas composition		
AR	.0053	
N2	.4833	
O2	.0013	
H2	.1719	
CH4	.0540	
CO	.1579	
CO2	.1212	
C2H4	0.0000	
C2H6	.0044	
C6	.0003	
H10	.0003	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.0568	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.379	(.231)
Char/Coal	0.000	(.391)
H2O/Coal	.376	(.060)
Gas recovery (%)	98.9	
Energy distribution (%)		(+Char)
Combustible gas	91.6	(55.8)
Combustible tar	0.0	(0.0)
Heat loss in-situ	-.7	(3.2)
Gas sensible heat	6.0	(3.7)
Net steam	1.5	(.9)
Char + ash sensible heat	1.1	(2.7)
Char combustion energy	0.0	(33.7)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	1152.	

HANNA II - PHASE II - FORWARD BURN
125.26 TO 152.00

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	1465.5	(2406.7)
(Mmol)	75.4	(123.9)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	35.9	(59.0)
Water parameters (mol/s)		(+Char)
Insitu influx	13.53	(1.82)
From consumed coal	4.14	(6.80)
Consumed in reactions	12.27	(3.22)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	612.	
Production	347.	
Average temperatures (deg c)		
Injection	49.7	
Production	328.6	
Average gas flows (mol/s)		
Injection	59.5	
Production	100.4	

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Table 7.5

HANNA II - PHASE II - FULL EXPERIMENT
106.00 TO 152.00

TIME (days)	45.995	
Average product heat of combustion (kJ/mol)	152.	
Total flows (Mmols)		
Injection	157.0	
Production	273.1	
Total dry gas production (Mmols)	252.8	
Coal		(+Char)
(Mg)	2301.3	(3890.4)
(Gas loss corrected Mg)	2550.2	(4311.2)
Dry gas composition		
AR	.0053	
N2	.4791	
O2	.0015	
H2	.1761	
CH4	.0548	
CO	.1550	
CO2	.1228	
C2H4	0.0000	
C2H6	.0047	
C6	.0003	
H10	.0004	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.0804	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.375	(.222)
Char/Coal	0.000	(.408)
H2O/Coal	.395	(.058)
Gas recovery (%)	98.9	
Energy distribution (%)		(+Char)
Combustible gas	92.6	(54.8)
Combustible tar	0.0	(0.0)
Heat loss in-situ	-2.4	(2.3)
Gas sensible heat	6.2	(3.7)
Net steam	2.2	(1.3)
Char + ash sensible heat	1.1	(2.7)
Char combustion energy	0.0	(35.2)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	1175.	

HANNA II - PHASE II - FULL EXPERIMENT
106.00 TO 152.00

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	1688.4	(2854.3)
(Mmol)	86.9	(146.9)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	41.4	(69.9)
Water parameters (mol/s)		(+Char)
Insitu influx	10.99	(2.56)
From consumed coal	2.77	(4.69)
Consumed in reactions	8.65	(2.13)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	650.	
Production	327.	
Average temperatures (deg c)		
Injection	47.1	
Production	328.9	
Average gas flows (mol/s)		
Injection	39.5	
Production	68.7	

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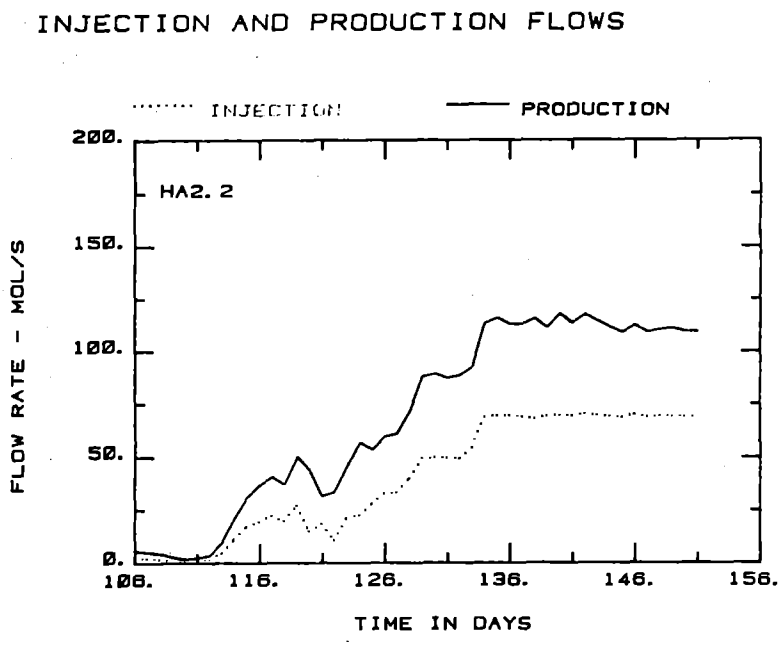

Figure 7.2 !RED items 90 and 91 versus time.

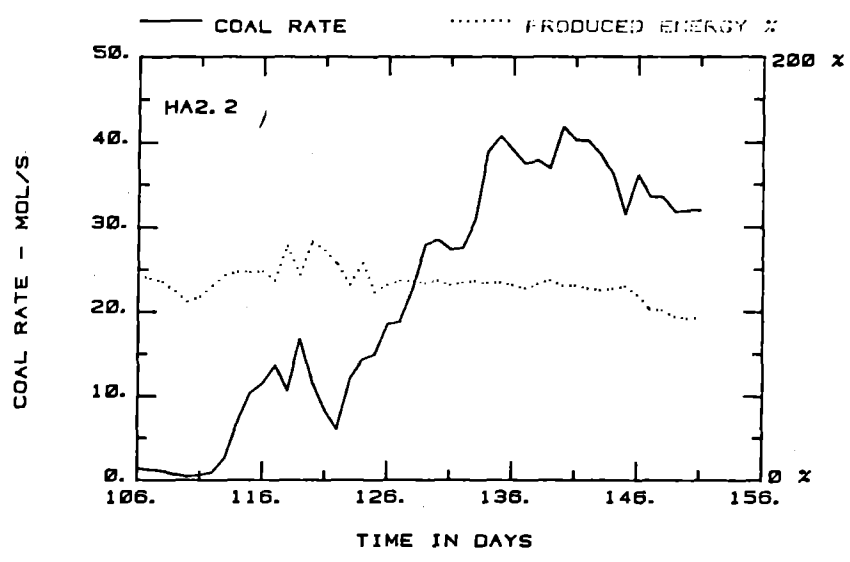

Figure 7.3 !RED item 44 and item 74 x 100 versus time.

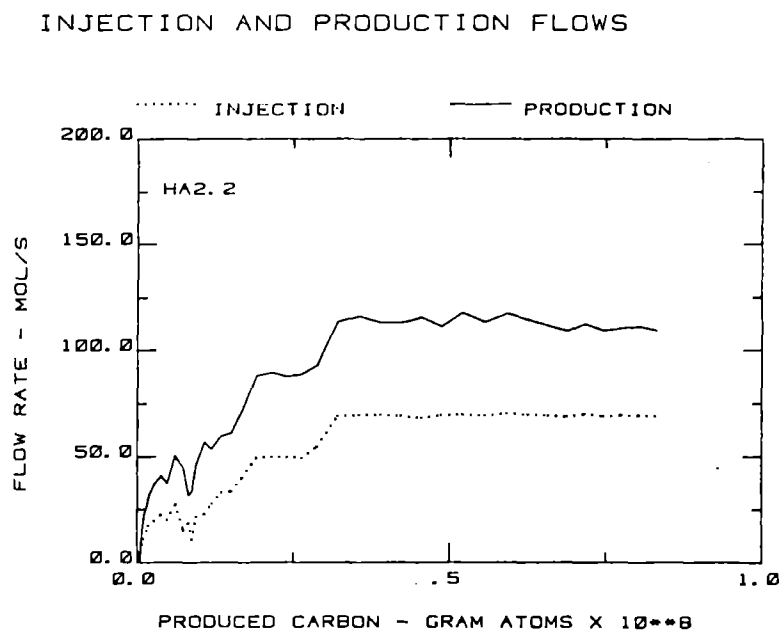

Figure 7.4 !RED items 90 and 91 versus item 133.

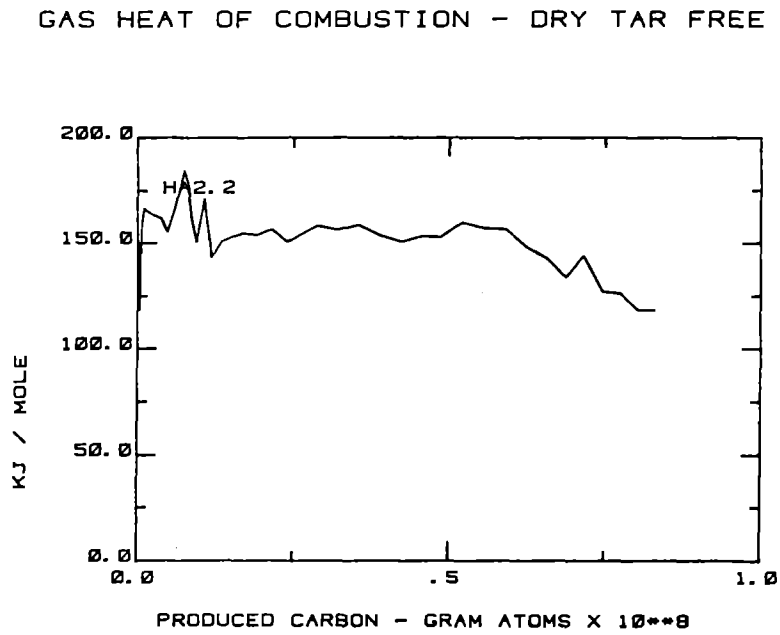

Figure 7.5 !RED items 81 versus item 133.

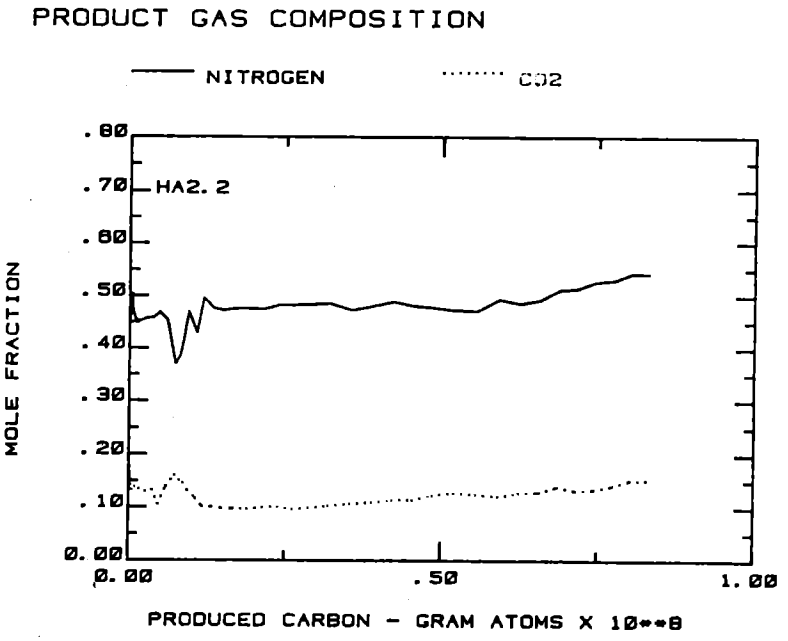

Figure 7.6 !RED items 11 and 16 versus item 133.

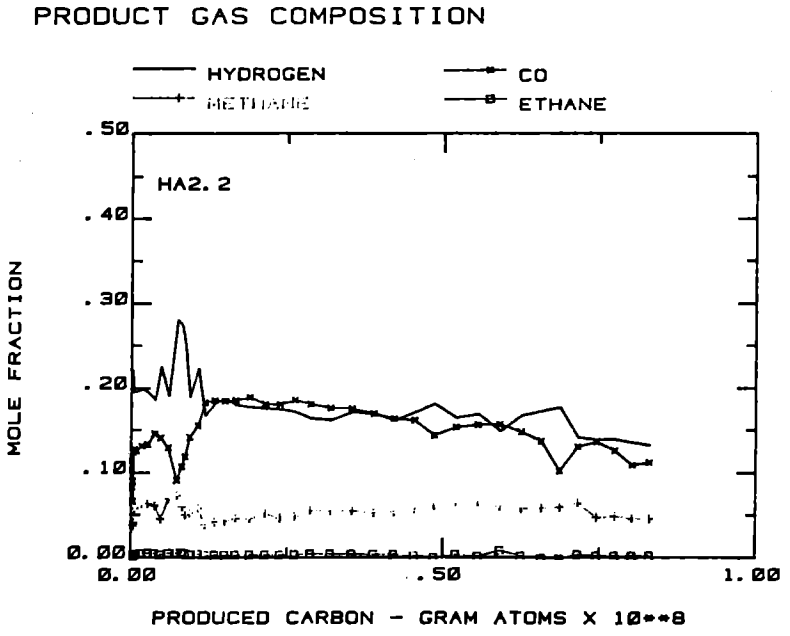

Figure 7.7 !RED items 13, 14, 15 and 18 versus item 133.

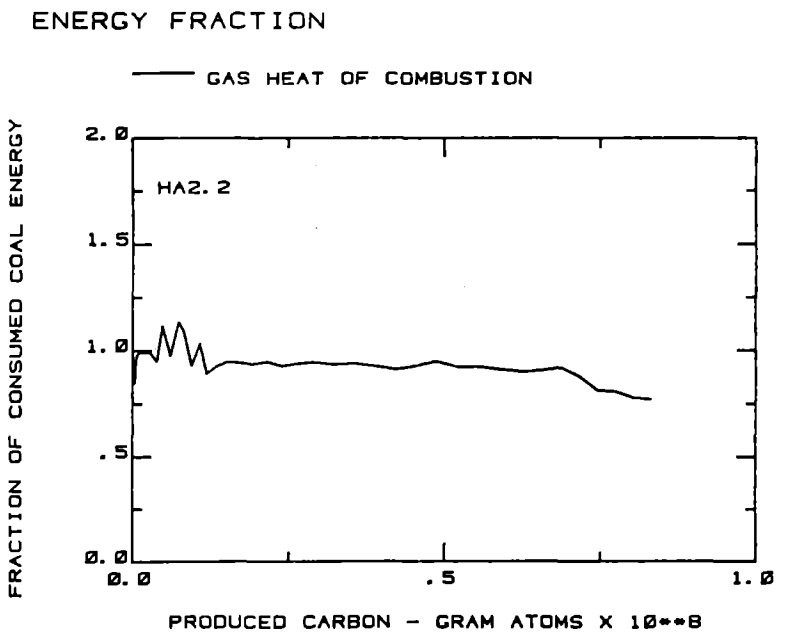

Figure 7.8 !RED item 74 versus item 133.

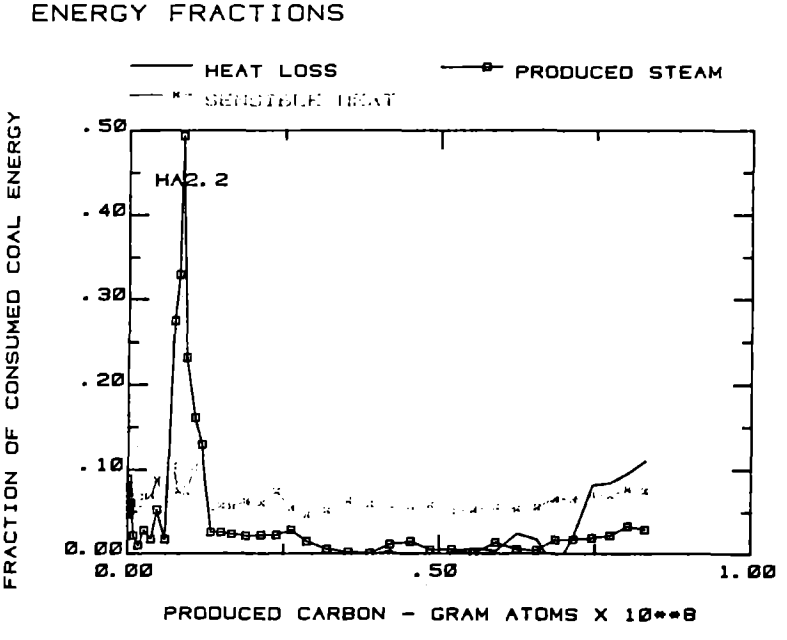

Figure 7.9 !RED items 75 - 78 versus item 133.

WATER INFLUX

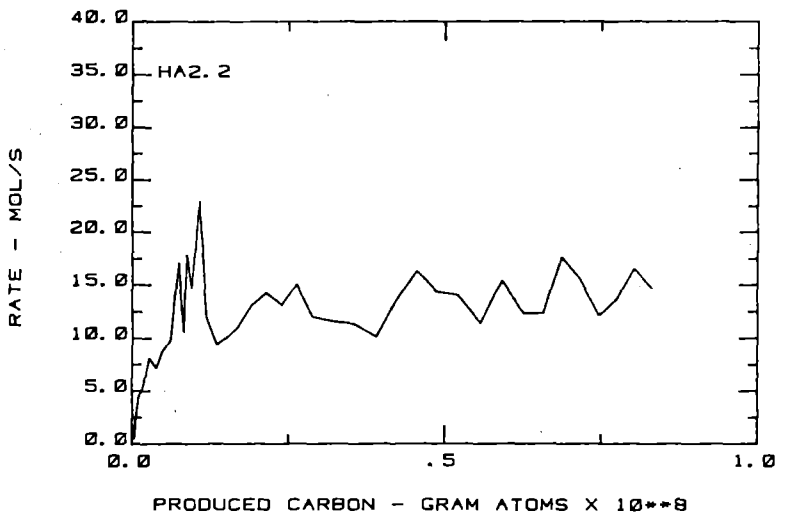

Figure 7.10 !RED item 47 versus item 133.

MODIFIED COAL PRODUCTION

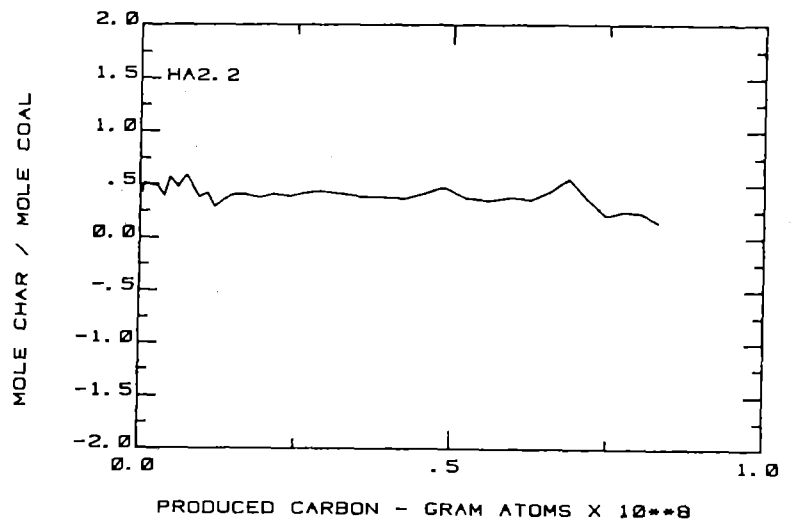

Figure 7.11 !RED item 63 versus item 133.

OXYGEN UTILIZATION

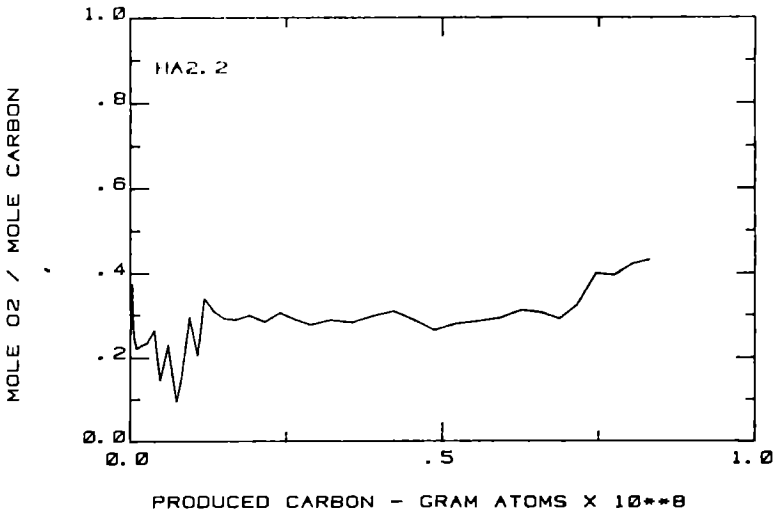

Figure 7.12 !RED item 60 versus item 133.

GAS HEAT OF COMBUSTION PER MOLE OF O2

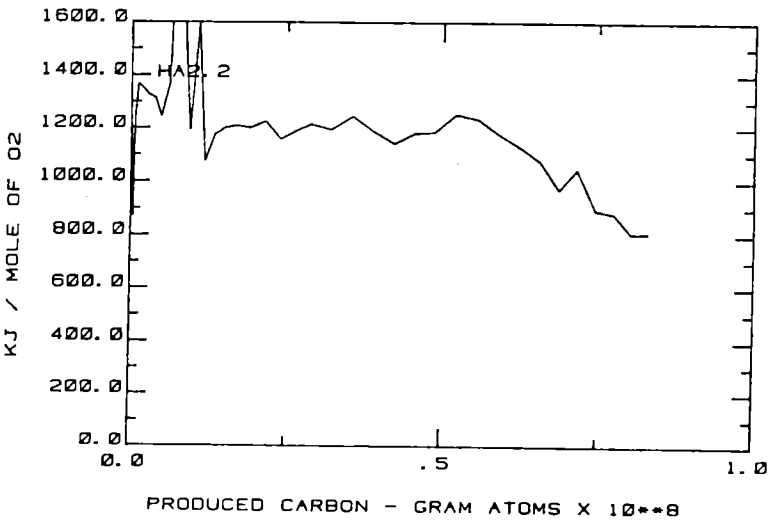

Figure 7.13 !RED item 84 versus item 133.

Hanna II Phase II References

7.1 Brandenburg, C.F., Fischer, D.D., Northrop, D.A., and Schrider, L.A., "Results and Status of the Second Hanna In Situ Coal Gasification Experiment," Proc. Second Annual UCG Symposium, MERC/SP-7613, Morgantow, V. WA (August 10-12, 1976), pp. 36-52.

7.2 Fischer, D.D., Brandenburg, C.F., King, S.B., Boyd, R.M., and Hutchinson, H.L., "Status of the Link Vertical well Process in Underground Coal Gasofication," Proc. Second Annual UCG Symposium, MERC/SP-7613, Morgantown, W. VA (August 10-12, 1976), pp. 354-371.

8. HANNA II PHASE III

Chronology

The Phase III plan called for:

- o Simultaneous injection at wells 7 and 8 to form a broad front, reverse combustion link from the Phase II gasified zone to the 7-8 line.
- o Gasification from the 7-8 line back toward the 5-6 line, again by simultaneous injection at wells 7 and 8.

It was felt that if a broad front linkage path could be created between the 5-6 and 7-8 lines, then the entire coal resource in the 5-6/7-8 square could be effectively gasified.

The Phase III experiment commenced immediately after completion of Phase II.[8.1,8.2] A reverse combustion link with the Phase II gasification zone was accomplished with injection in well 7 and 8 from May 31 to June 3, 1976. Air flow tests showed that the link was closer to well 8 than well 7. From June 5 to June 16, invection was in well 8 and production from well 7 to enhance the 7-8 link formed at the beginning of Phase II.

On June 16, a "line drive" forward gasification was attempted with injection in both wells 7 and 8 and production from wells 5 and 6. However, the coal at well 7 apparently did not ignite and the attempt was abandoned. Forward gasification with air injection in well 8 and production in well 7 commenced on June 22 and continued uintil the experiment was terminated on July 31, 1976. An abbreviated chronology for Phase III is shown in Table 8.1.

The Data

The Hanna II Phase III process data was provided by LETC in the same form as Phase II. Table 8.2 summarizes the data sources used to construct !EXP. As with Phase II, the product water content was not available, and no computer results were recorded prior to day 169. Daily summary sheets supplemented the Phase III data prior to day 169.

The Phase III results are summarized in Table 8.3 through 8.6 and Figures 8.1 through 8.12.

TABLE 8.1 ABBREVIATED CHRONOLOGY FOR HANNA II PHASE III

DATES	DECIMAL DAYS	EVENT	INJECTION WELL	PRODUCTION WELL
5-31-76 to 6-03-76	152 - 155	Reverse Combustion	7,8	5,6
6-04-76 to 6-16-76	156 - 168	Link Enhancement	7,8	7,8
6-16-76 to 6-22-76	168 - 174	Line Drive Forward Gasification	7,8	5,6
6-22-76 to 7-31-76	174 - 213	Forward Gasification	8	7

TABLE 8.2 LETC - HANNA II PHASE III
PROCESS DATA SOURCES

ITEM	COMPUTER FILE NAME - POSITION	DESCRIPTION
Injection Rate	!H2P3 -262, 263	Flow meter 4 & 5 rates - mol/s
	!FLW23 -2	mcf/d - Daily summaries prior to day 169
Production Rate	!H2P3 -260, 261, 264	Flow meter 2, 3 & 6 rates - mol/s
	!FLW23 -4	mcf/d - Daily summaires prior to day 169
Gas Composition	!H2P3 & !GAS23	Components after and prior to day 169, respectively.
	-279 & 10	Volume % - Ar
	-269 & 4	Volume % - N2
	-268 & 3	Volume % - O2
	-270 & 5	Volume % - CH4
	-271 & 6	Volume % - CO
	-273 & 8	Volume % - CO2
	-272 & 7	Volume % - C2H6
	-274 & 9	Volume % - C3H8
	-275	Volume % - C3H6
	-276	Volume % - ISO-Butane
	-277	Volume % - N-Butane
	-278	Volume % - H2S
H_2O/DRY	No Data	Assume 100% gas recovery
TAR/DRY	No Data	Assume no tar
Injection Pressure	!H2P3 -216	Meter 4 pressure - kPa
	!FLW23 -5	psia - Daily summaries prior to day 169
Production Pressure	!H2P3 -223	Meter 6 pressure - kPa
	!FLW23 -6	psia - Daily summaries prior to day 169
Injection Temperature	!H2P3 -5	Meter 4 temperature - Celsius No data prior to day 169
Production Temperature	!H2P3 -7	Meter 6 temperature - Celsius No data prior to day 169

Table 8.3

HANNA II - PHASE III - REVERSE BURN
152.00 TO 168.64

TIME (days)	16.646	
Average product heat of combustion (kJ/mol)	137.	
Total flows (Mmols)		
Injection	16.8	
Production	34.9	
Total dry gas production (Mmols)	27.2	
Coal		(+Char)
(Ms)	229.3	(382.8)
(Gas loss corrected Ms)	229.3	(382.9)
Dry gas composition		
AR	.0031	
N2	.4825	
O2	.0025	
H2	.2015	
CH4	.0370	
CO	.1233	
CO2	.1427	
C2H4	0.0000	
C2H6	.0048	
C6	.0010	
H10	.0015	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.2819	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.408	(.244)
Char/Coal	0.000	(.401)
H2O/Coal	.452	(.098)
Gas recovery (%)	100.0	
Energy distribution (%)		(+Char)
Combustible gas	90.5	(54.2)
Combustible tar	0.0	(0.0)
Heat loss in-situ	-5.5	(.4)
Gas sensible heat	5.3	(3.2)
Net steam	8.2	(4.9)
Char + ash sensible heat	1.1	(2.7)
Char combustion energy	0.0	(34.6)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	1056.	

HANNA II - PHASE III - REVERSE BURN
152.00 TO 168.64

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	168.2	(280.8)
(Mmol)	8.7	(14.5)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	4.1	(6.9)
Water parameters (mol/s)		(+Char)
Insitu influx	7.29	(5.04)
From consumed coal	.76	(1.27)
Consumed in reactions	2.72	(.98)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	368.	
Production	146.	
Average temperatures (deg c)		
Injection	40.0	
Production	221.4	
Average gas flows (mol/s)		
Injection	11.7	
Production	24.2	

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Table 8.4

HANNA II - PHASE III - FORWARD BURN 1
168.65 TO 174.64

TIME (days)	5.999	
Average product heat of combustion (kJ/mol)	156.	
Total flows (Mmols)		
Injection	23.6	
Production	49.1	
Total dry gas production (Mmols)	40.7	
Coal		(+Char)
(Mg)	352.7	(792.6)
(Gas loss corrected Mg)	352.7	(792.6)
Dry gas composition		
AR	.0047	
N2	.4521	
O2	.0012	
H2	.2222	
CH4	.0552	
CO	.1108	
CO2	.1463	
C2H4	0.0000	
C2H6	.0075	
C6	.0001	
H10	.0001	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.2069	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.372	(.165)
Char/Coal	0.000	(.555)
H2O/Coal	.603	(.029)
Gas recovery (%)	100.0	
Energy distribution (%)		(+Char)
Combustible gas	100.0	(44.5)
Combustible tar	0.0	(0.0)
Heat loss in-situ	-13.0	(-.8)
Gas sensible heat	5.7	(2.5)
Net steam	5.8	(2.6)
Char + ash sensible heat	1.1	(3.3)
Char combustion energy	0.0	(47.8)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	1281.	

HANNA II - PHASE III - FORWARD BURN 1
168.65 TO 174.64

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	258.8	(581.5)
(Mmol)	13.3	(29.9)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	6.3	(14.2)
Water parameters (mol/s)		(+Char)
Insitu influx	28.46	(10.56)
From consumed coal	3.26	(7.32)
Consumed in reactions	15.49	(1.65)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	314.	
Production	156.	
Average temperatures (deg c)		
Injection	39.8	
Production	265.7	
Average gas flows (mol/s)		
Injection	45.5	
Production	94.7	

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Table 8.5

HANNA II - PHASE III - FORWARD BURN 2
174.65 TO 213.98

TIME (days)	39.340	
Average product heat of combustion (kJ/mol)	118.	
Total flows (Mmols)		
Injection	249.4	
Production	446.5	
Total dry gas production (Mmols)	364.8	
Coal		(+Char)
(Mg)	3098.0	(3468.0)
(Gas loss corrected Mg)	3095.8	(3465.5)
Dry gas composition		
AR	.0060	
N2	.5347	
O2	.0015	
H2	.1413	
CH4	.0373	
CO	.1332	
CO2	.1417	
C2H4	0.0000	
C2H6	.0042	
C6	.0000	
H10	.0000	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.2242	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.448	(.400)
Char/Coal	0.000	(.107)
H2O/Coal	.231	(.160)
Gas recovery (%)	100.1	
Energy distribution (%)		(+Char)
Combustible gas	77.3	(69.0)
Combustible tar	0.0	(0.0)
Heat loss in-situ	7.6	(8.1)
Gas sensible heat	7.2	(6.4)
Net steam	6.4	(5.8)
Char + ash sensible heat	1.1	(1.5)
Char combustion energy	0.0	(9.2)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	821.	

HANNA II - PHASE III - FORWARD BURN 2
174.65 TO 213.98

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	2272.9	(2544.4)
(Mmol)	117.0	(131.0)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	55.7	(62.3)
Water parameters (mol/s)		(+Char)
Insitu influx	27.63	(25.33)
From consumed coal	4.36	(4.89)
Consumed in reactions	7.94	(6.16)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	778.	
Production	382.	
Average temperatures (deg c)		
Injection	61.6	
Production	319.3	
Average gas flows (mol/s)		
Injection	73.4	
Production	131.4	

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Table 8.6

HANNA II - PHASE III - FULL EXPERIMENT
152.00 TO 213.98

TIME (days)	61.985	
Average product heat of combustion (kJ/mol)	123.	
Total flows (Mmols)		
Injection	289.7	
Production	530.5	
Total dry gas production (Mmols)	432.6	
Coal		(+Char)
(Mg)	3680.0	(4643.4)
(Gas loss corrected Mg)	3677.7	(4640.6)
Dry gas composition		
AR	.0057	
N2	.5237	
O2	.0015	
H2	.1527	
CH4	.0390	
CO	.1305	
CO2	.1422	
C2H4	0.0000	
C2H6	.0046	
C6	.0001	
H10	.0001	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.2262	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.438	(.347)
Char/Coal	0.000	(.207)
H2O/Coal	.280	(.132)
Gas recovery (%)	100.0	
Energy distribution (%)		(+Char)
Combustible gas	80.3	(63.6)
Combustible tar	0.0	(0.0)
Heat loss in-situ	4.8	(5.9)
Gas sensible heat	6.9	(5.5)
Net steam	6.5	(5.1)
Char + ash sensible heat	1.1	(1.9)
Char combustion energy	0.0	(17.9)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	872.	

HANNA II - PHASE III - FULL EXPERIMENT
152.00 TO 213.98

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	2699.9	(3406.8)
(Mmol)	139.0	(175.4)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	66.2	(83.5)
Water parameters (mol/s)		(+Char)
Insitu influx	22.25	(18.45)
From consumed coal	3.29	(4.15)
Consumed in reactions	7.27	(4.33)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	708.	
Production	346.	
Average temperatures (deg c)		
Injection	58.2	
Production	307.9	
Average gas flows (mol/s)		
Injection	54.1	
Production	99.1	

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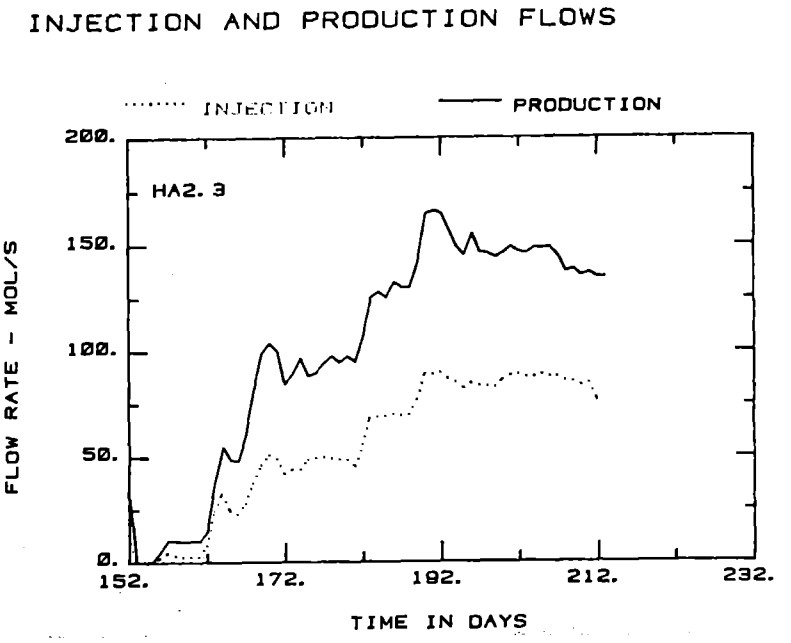

Figure 8.1 !RED items 90 and 91 versus time.

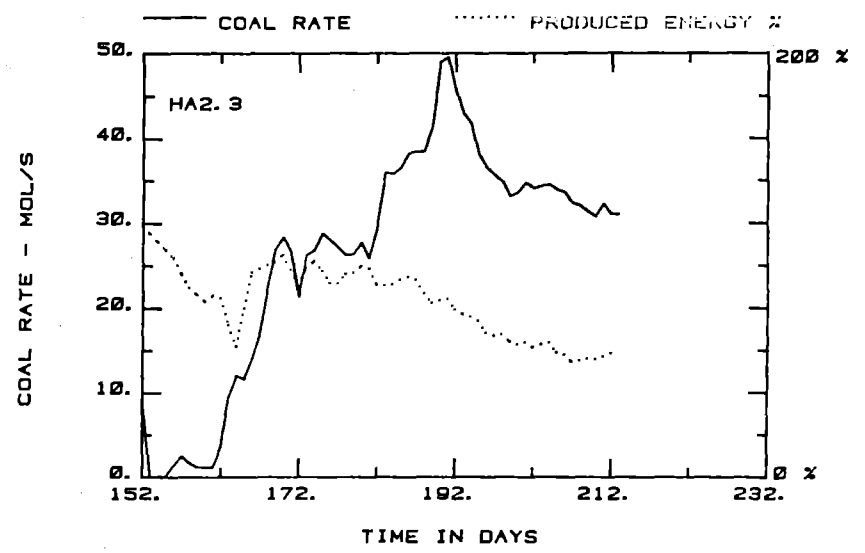

Figure 8.2 !RED item 44 and item 74 x 100 versus time.

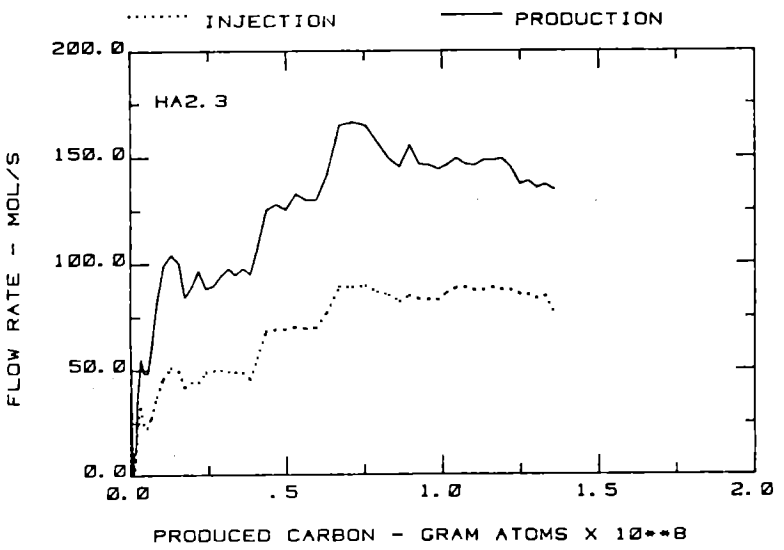

Figure 8.3 !RED items 90 and 91 versus item 133.

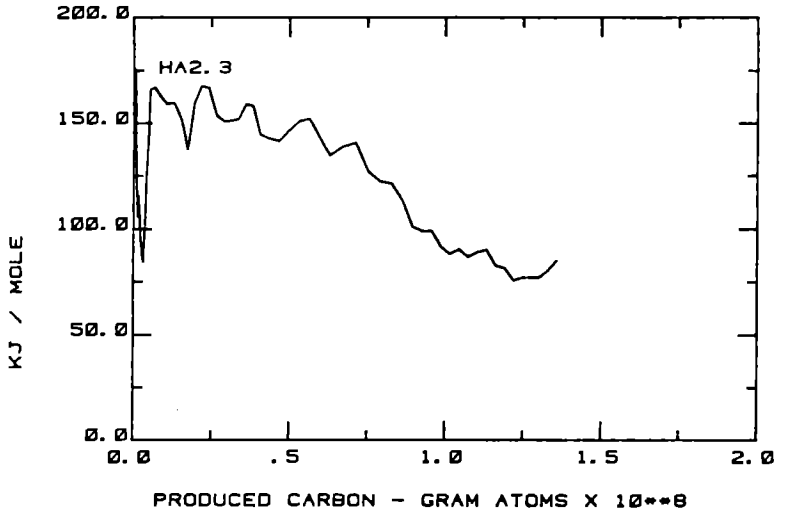

Figure 8.4 !RED items 81 versus item 133.

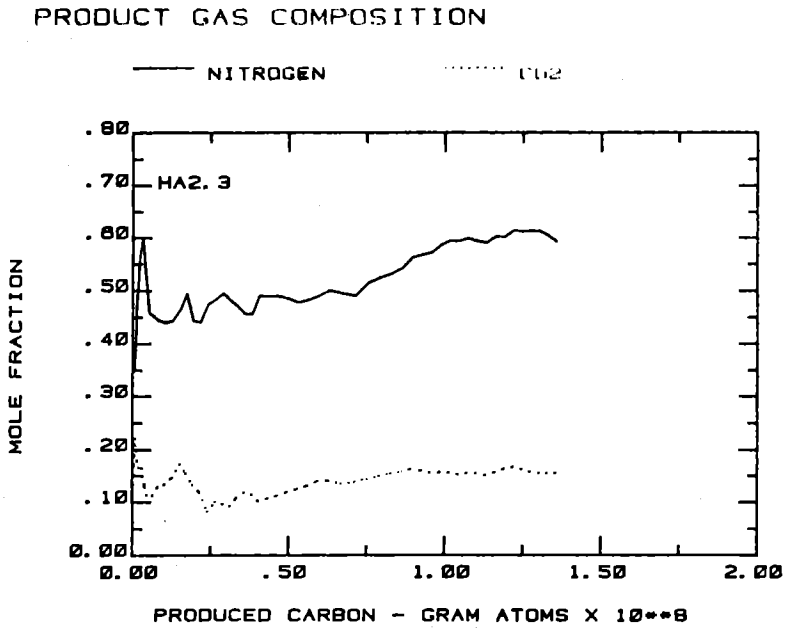

Figure 8.5 !RED items 11 and 16 versus item 133.

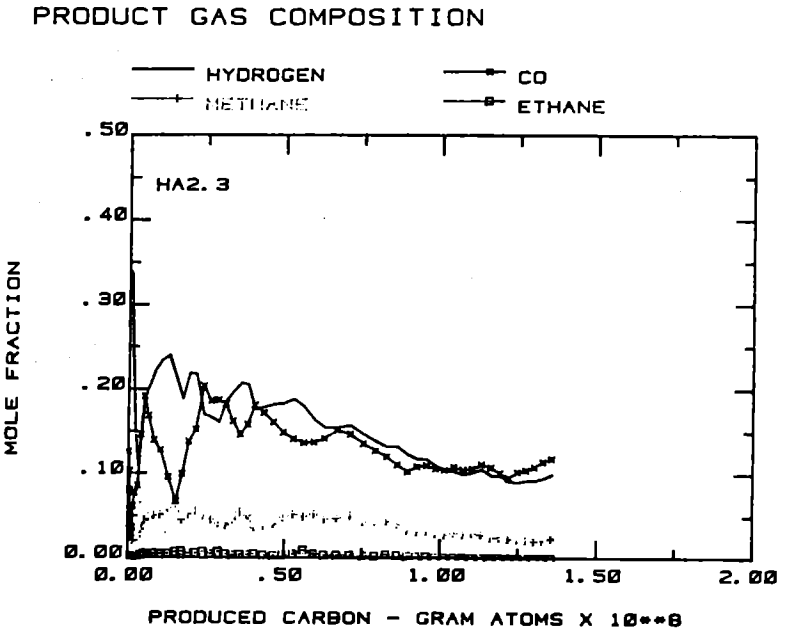

Figure 8.6 !RED items 13, 14, 15 and 18 versus item 133.

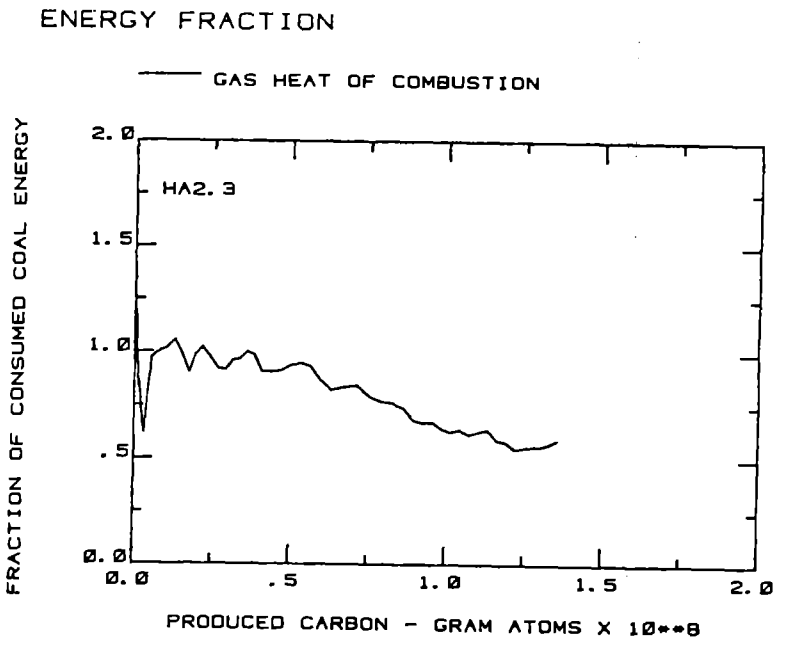

Figure 8.7 !RED item 74 versus item 133.

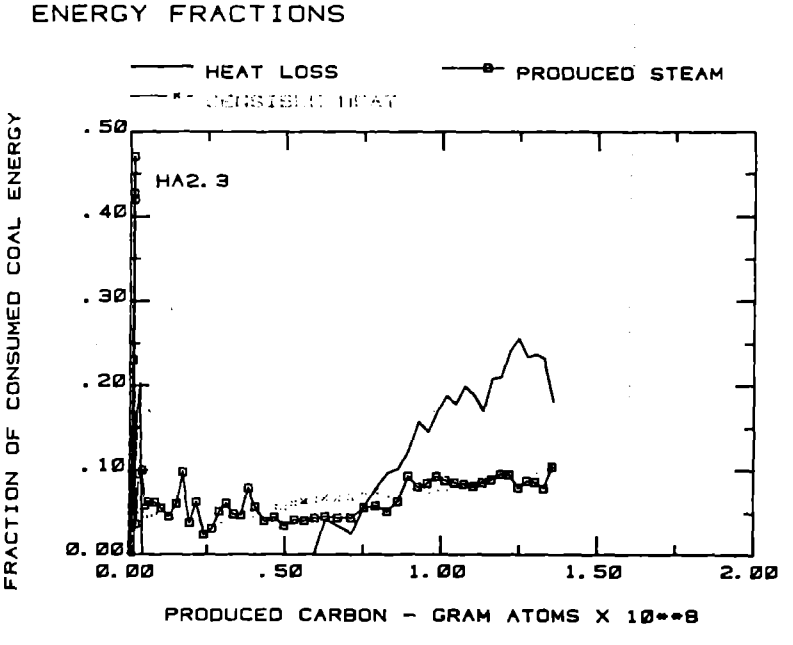

Figure 8.8 !RED items 75 - 78 versus item 133.

WATER INFLUX

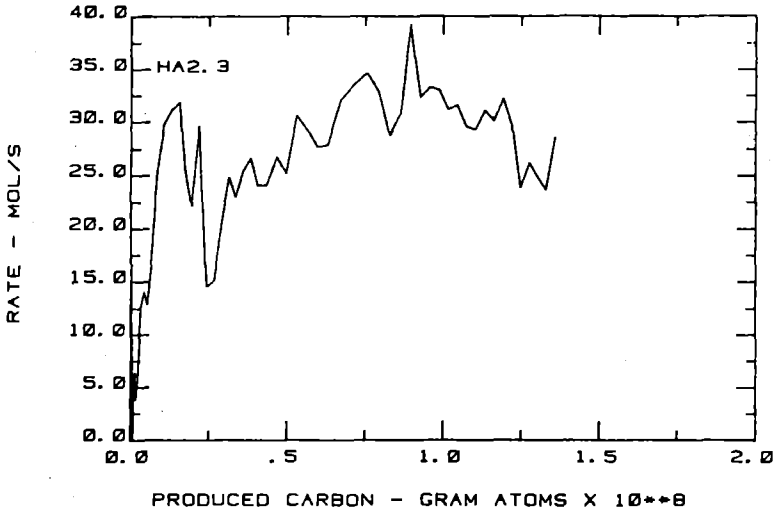

Figure 8.9 !RED item 47 versus item 133.

MODIFIED COAL PRODUCTION

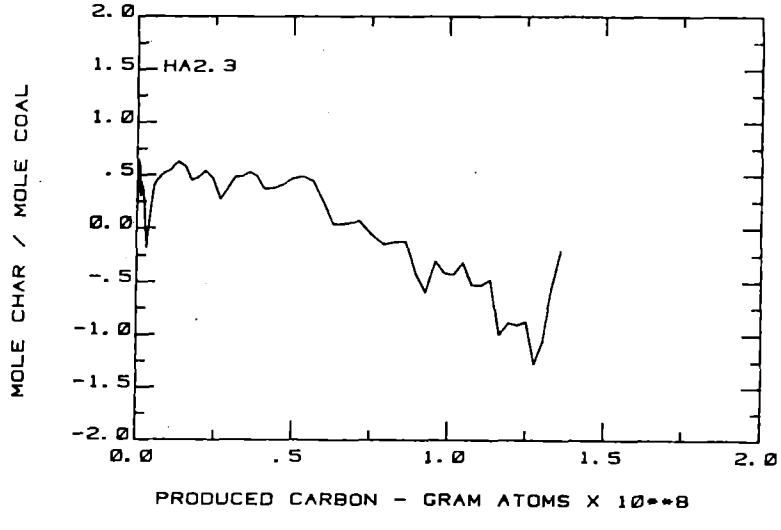

Figure 8.10 !RED item 63 versus item 133.

OXYGEN UTILIZATION

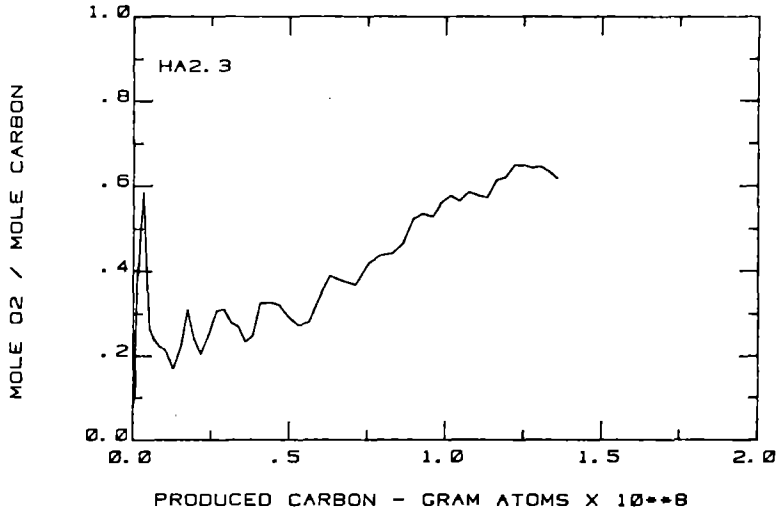

Figure 8.11 !RED item 60 versus item 133.

GAS HEAT OF COMBUSTION PER MOLE OF O2

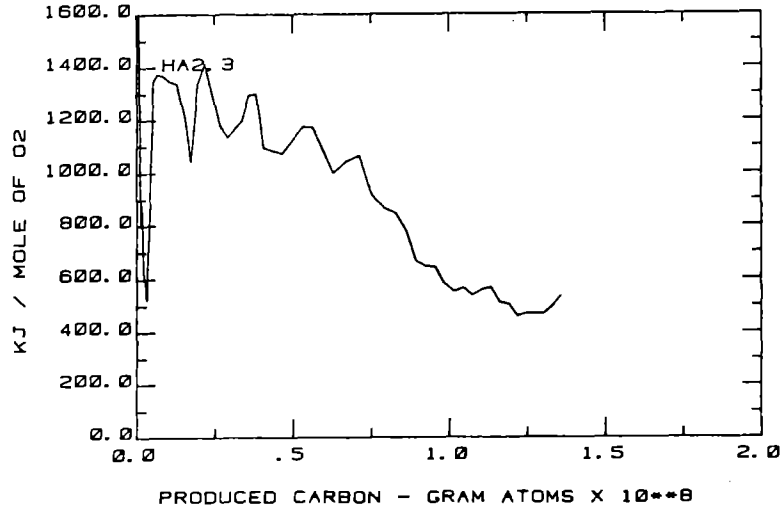

Figure 8.12 !RED item 84 versus item 133.

"Results and Status of the Second Hanna In Situ Coal Gasification Experiment," Proc. Second Annual UCG Symposium, MERC/SP-7613, Morgantown, W. VA (August 10-12, 1976), pp. 36-52.

8.2 Fischer, D.D., Brandenburg, C.F., King, S.B., Boyd, R.M., and Hutchinson, H.L., "Status of the Link Vertical well Process in Underground Coal Gasification," Proc. Second Annual UCG Symposium, MERC/SP-7613, Morgantown, W. VA (August 10-12, 1976), pp. 354-371.

9. HANNA III

Chronology

The Hanna III test was designed primarily to assess the environmental consequences of UCG.[9.1 - 9.4] The process layout is shown in Figure 9.1 with wells 1 and 2 being the main process wells. (See Table 5.1 for a composite seam analysis).

The project plan was to ignite the coal at well 2 and link to well 1. However, because of low air acceptance, the coal was originally ignited at well 1 on June 6, 1977 to increase the local permeability. After quenching the well 1 fire, ignition in well 2 was attempted with air injection into well 1. However, reignition of the well 1 fire forced a switch in injection to well 2 with reverse combustion from well 1 to well 2. This was accomplished on June 22, 1977.

On June 22, well 1 was reignited and forward gasification initiated. On June 27 wellhead temperatures at well 2 increased to 620°C. The system was temporarily shut down to rig for water injection. Water was added to the injection well 1 and also in well 10, which was behind the production well. By July 30, 1977, the production wellhead again reached 620°C and the system was shut down.[9.3] An abbreviated chronology is shown in Table 9.1.

The Data

The Hanna III process data was provided by LETC in computer form. The data consisted of files - one for each day of the experiment. Each file contained 72 records, three records for each hour of the day.

As a first step in the data reduction, the daily files were converted to a standard history file (!HA3) containing 51 items per record. Table 9.2 summarizes the data sources used to construct !EXP.

The Hanna III results are summarized in Tables 9.3 through 9.5 and Figures 9.2 through 9.13.

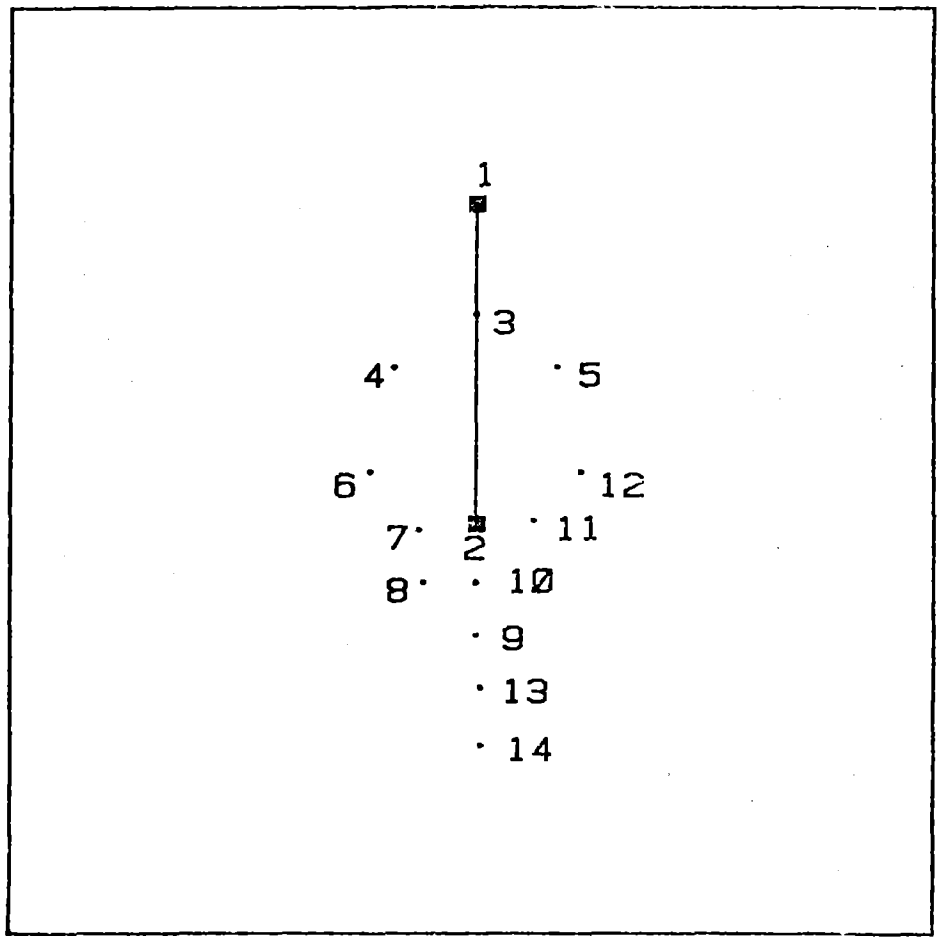

Figure 9.1 Well layout for Hanna III (HA3).

TABLE 9.1 ABBREVIATED CHRONOLOGY FOR HANNA III

DATES	DECIMAL DAYS	EVENT	INJECTION WELL	PRODUCTION WELL
6-06-77	157	Ignite at Well 1 to increase air acceptance Burn zone quenched	1	2
6-08-77	159	Ignition at Well 2	2	1
6-08-77 to 6-11-77	159 - 162	Reverse Combustion	1	2
6-11-77 to 6-22-77	162 - 173	Reverse Compbustion	2	1
6-22-77 to 7-30-77	173 - 211	Reignite Coal at Well 1 Forward Gasification	1	2
7-30-77	211	Experiment Terminated	--	--

TABLE 9.2 LETC - HANNA III
PROCESS DATA SOURCES

ITEM	COMPUTER FILE NAME - POSITION	DESCRIPTION
Injection Rate	!FLOWS -6	Total injection rate - mol/s Based on ascii designator - H or L
Production Rate	!FLOWS -7	Total production rate - mol/s Based on ascii designator - P
Gas Composition	!HA3	Component mole fractions.
	-27	Mole fraction - H2
	-28	Mole fraction - N2
	-29	Mole fraction - O2
	-30	Mole fraction - AR
	-31	Mole fraction - CO
	-32	Mole fraction - CH4
	-33	Mole fraction - CO2
	-34	Mole fraction - C2H4
	-35	Mole fraction - C2H6
	-36	Mole fraction - H2S
	-37	Mole fraction - C3H6
	-38	Mole fraction - C3H8
	-39	Mole fraction - Iso-Butane
	-40	Mole fraction - N-Butane
H_2O/DRY	No Data	Assume 100% gas recovery
TAR/DRY	No Data	Assume no tar
Injection Pressure	!HA3 -14,15	Meter 1 or 2 pressure - kPa
Production Pressure	!HA3 -16,17	Meter 3 or 4 pressure - kPa
Injection Temperature	!HA3 -10,11	Meter 1 or 2 temperature - Celsius
Production Temperature	!HA3 -22	Production gas temperature - Celsius

Table 9.3

HANNA III - REVERSE COMBUSTION
162.00 TO 173.69

TIME (days)	11.697	
Average product heat of combustion (kJ/mol)	98.	
Total flows (Mmols)		
Injection	1.7	
Production	2.3	
Total dry gas production (Mmols)	1.9	
Coal		(+Char)
(Ms)	15.1	(23.2)
(Gas loss corrected Ms)	16.8	(25.8)
Dry gas composition		
AR	.0066	
N2	.6067	
O2	.0035	
H2	.1026	
CH4	.0366	
CO	.0587	
CO2	.1733	
C2H4	.0018	
C2H6	.0046	
C6	.0025	
H10	.0032	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.1757	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.552	(.360)
Char/Coal	0.000	(.348)
H2O/Coal	.224	(-.004)
Gas recovery (%)	89.8	
Energy distribution (%)		(+Char)
Combustible gas	69.7	(45.5)
Combustible tar	0.0	(0.0)
Heat loss in-situ	23.4	(18.6)
Gas sensible heat	-.1	(-.0)
Net steam	5.5	(3.6)
Char + ash sensible heat	1.1	(2.5)
Char combustion energy	0.0	(30.0)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	601.	

HANNA III - REVERSE COMBUSTION
162.00 TO 173.69

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	11.1	(17.0)
(Mmol)	.6	(.9)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	.3	(.4)
Water parameters (mol/s)		(+Char)
Insitu influx	.39	(.22)
From consumed coal	.07	(.11)
Consumed in reactions	.13	(-.00)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	990.	
Production	247.	
Average temperatures (deg c)		
Injection	22.9	
Production	0.0	
Average gas flows (mol/s)		
Injection	1.7	
Production	2.2	

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Table 9.4

HANNA III - FORWARD GASIFICATION
173.70 TO 212.99

TIME (days)	39.290	
Average product heat of combustion (kJ/mol)	123.	
Total flows (Mmols)		
Injection	195.6	
Production	304.4	
Total dry gas production (Mmols)	269.7	
Coal		(+Char)
(Mg)	2416.3	(2096.8)
(Gas loss corrected Mg)	5454.9	(4733.6)
Dry gas composition		
AR	.0058	
N2	.5189	
O2	.0001	
H2	.1428	
CH4	.0351	
CO	.1523	
CO2	.1400	
C2H4	.0008	
C2H6	.0028	
C6	.0006	
H10	.0008	
H2S	.0000	
Product gas mole ratios		
H2O/dry	.1287	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.413	(.476)
Char/Coal	0.000	(-.152)
H2O/Coal	.189	(.283)
Gas recovery (%)	91.7	
Energy distribution (%)		(+Char)
Combustible gas	76.5	(88.2)
Combustible tar	0.0	(0.0)
Heat loss in-situ	10.2	(10.8)
Gas sensible heat	8.4	(9.6)
Net steam	3.5	(4.0)
Char + ash sensible heat	1.1	(.5)
Char combustion energy	0.0	(-13.1)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	882.	

HANNA III - FORWARD GASIFICATION
173.70 TO 212.99

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	1772.8	(1538.4)
(Mmol)	91.3	(79.2)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	43.4	(37.7)
Water parameters (mol/s)		(+Char)
Insitu influx	11.89	(13.87)
From consumed coal	3.41	(2.96)
Consumed in reactions	5.07	(6.60)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	436.	
Production	321.	
Average temperatures (deg c)		
Injection	60.7	
Production	411.9	
Average gas flows (mol/s)		
Injection	57.6	
Production	89.7	

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Table 9.5

HANNA III - FULL EXPERIMENT
162.00 TO 212.99

TIME (days)	50.988	
Average product heat of combustion (kJ/mol)	123.	
Total flows (Mmols)		
Injection	197.2	
Production	306.7	
Total dry gas production (Mmols)	271.6	
Coal		(+Char)
(Mg)	2431.5	(2120.0)
(Gas loss corrected Mg)	5471.7	(4770.9)
Dry gas composition		
AR	.0058	
N2	.5195	
O2	.0001	
H2	.1425	
CH4	.0351	
CO	.1516	
CO2	.1402	
C2H4	.0008	
C2H6	.0028	
C6	.0006	
H10	.0008	
H2S	.0000	
Product gas mole ratios		
H2O/dry	.1291	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.414	(.474)
Char/Coal	0.000	(-.147)
H2O/Coal	.189	(.280)
Gas recovery (%)	91.7	
Energy distribution (%)		(+Char)
Combustible gas	76.5	(87.7)
Combustible tar	0.0	(0.0)
Heat loss in-situ	10.2	(10.9)
Gas sensible heat	8.3	(9.5)
Net steam	3.5	(4.0)
Char + ash sensible heat	1.1	(.5)
Char combustion energy	0.0	(-12.7)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	880.	

HANNA III - FULL EXPERIMENT
162.00 TO 212.99

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	1783.9	(1555.4)
(Mmol)	91.8	(80.1)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	43.7	(38.1)
Water parameters (mol/s)		(+Char)
Insitu influx	9.25	(10.74)
From consumed coal	2.64	(2.30)
Consumed in reactions	3.94	(5.09)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	440.	
Production	321.	
Average temperatures (deg c)		
Injection	60.4	
Production	408.9	
Average gas flows (mol/s)		
Injection	44.8	
Production	69.6	

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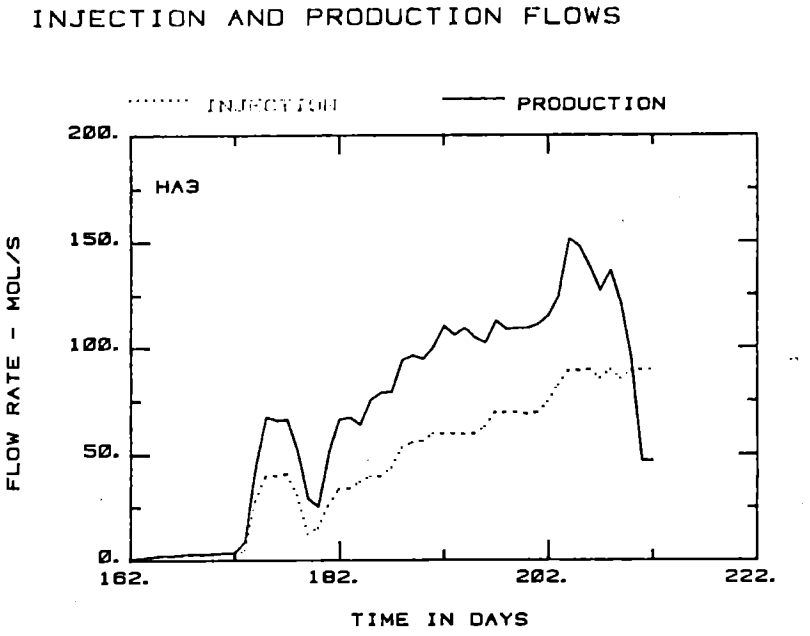


Figure 9.2 !RED items 90 and 91 versus time.

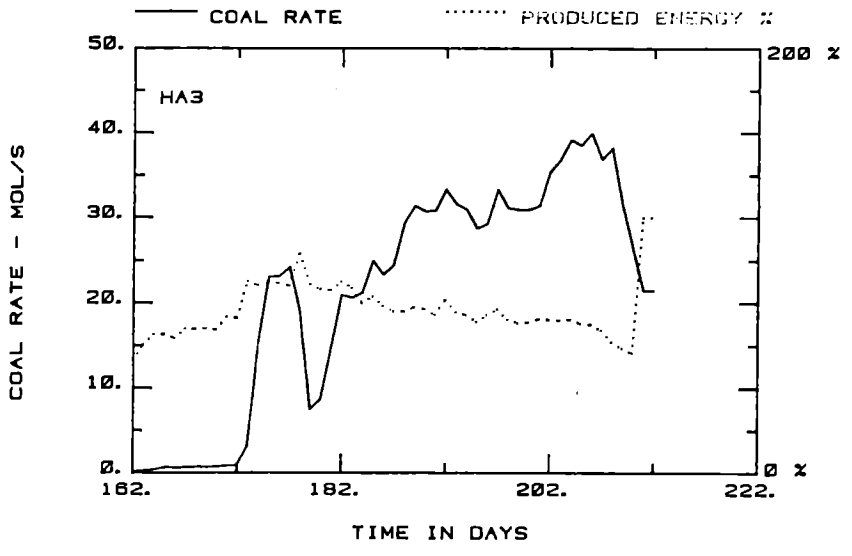


Figure 9.3 !RED item 44 and item 74 x 100 versus time.

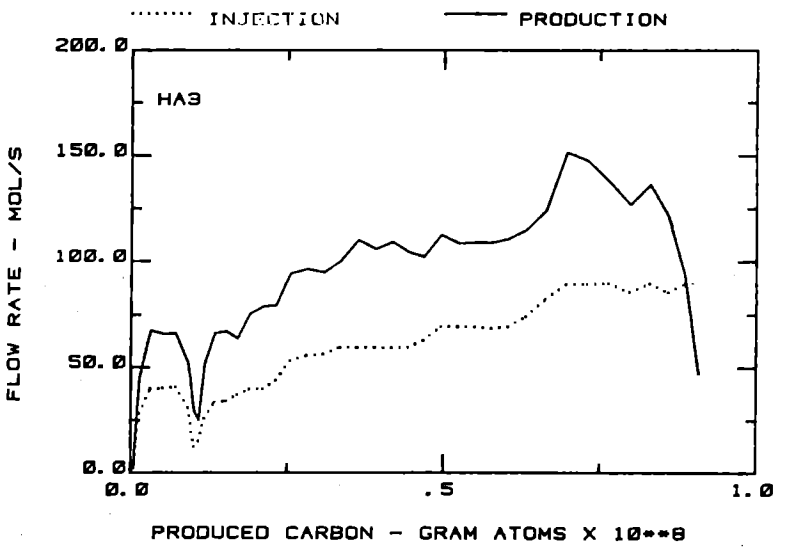


Figure 9.4 !RED items 90 and 91 versus item 133.

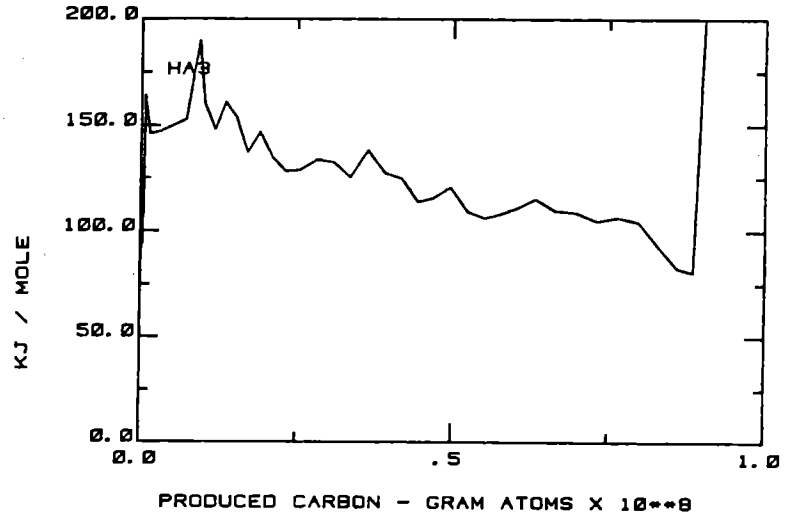


Figure 9.5 !RED items 81 versus item 133.

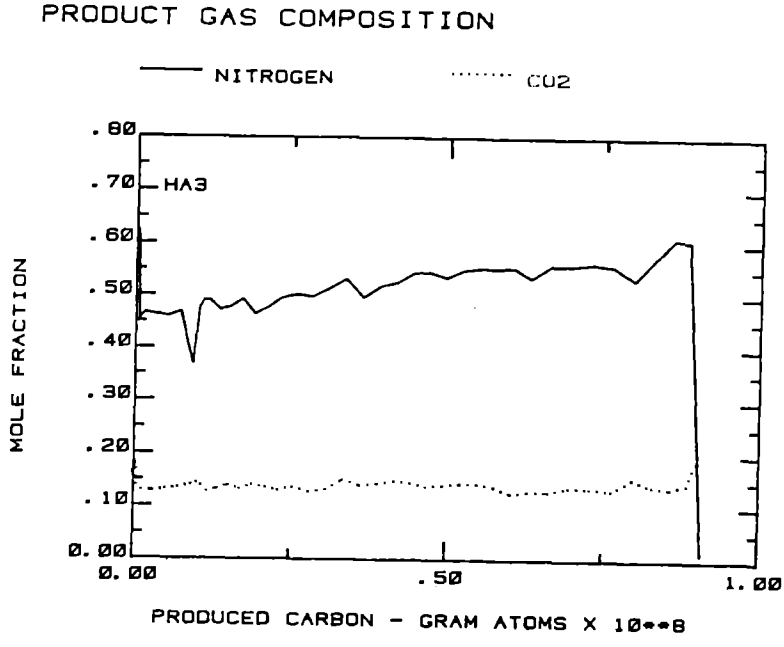


Figure 9.6 !RED items 11 and 16 versus item 133.

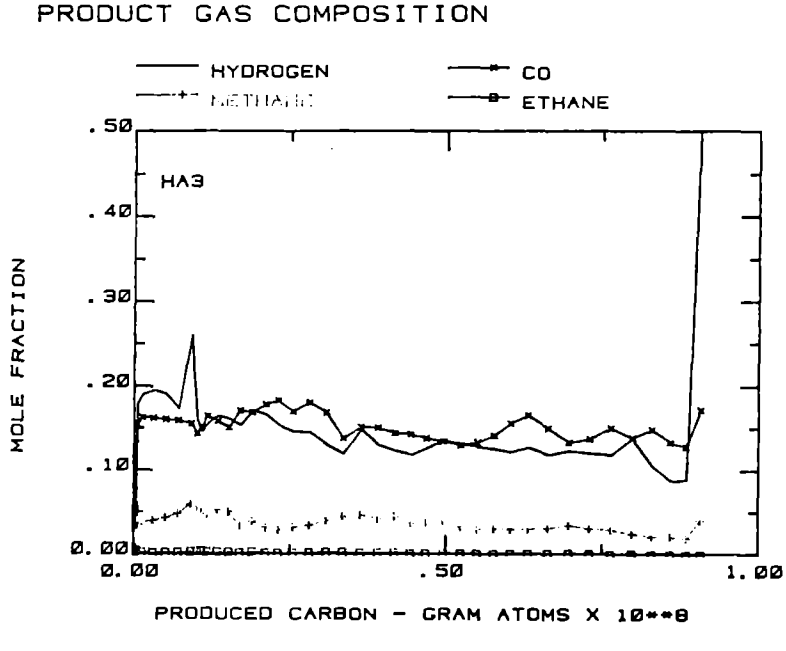


Figure 9.7 !RED items 13, 14, 15 and 18 versus item 133.

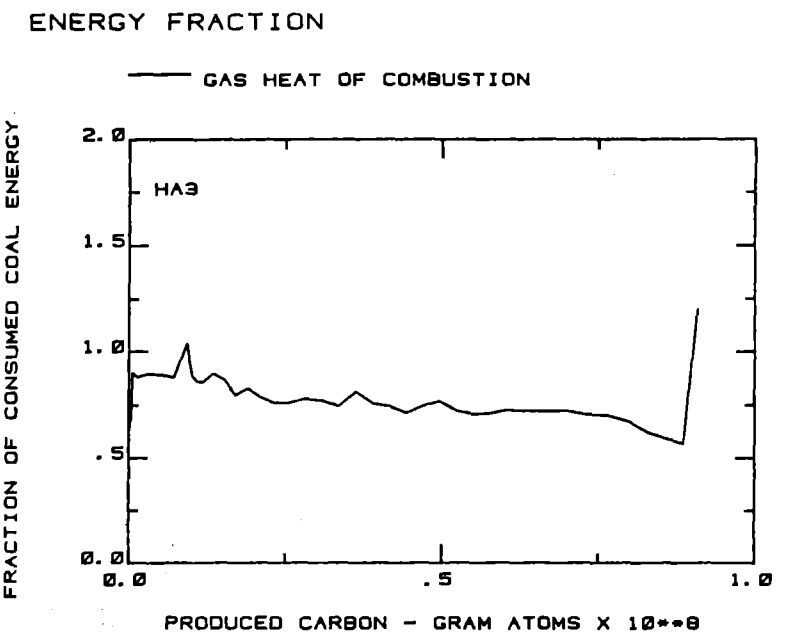


Figure 9.8 !RED item 74 versus item 133.

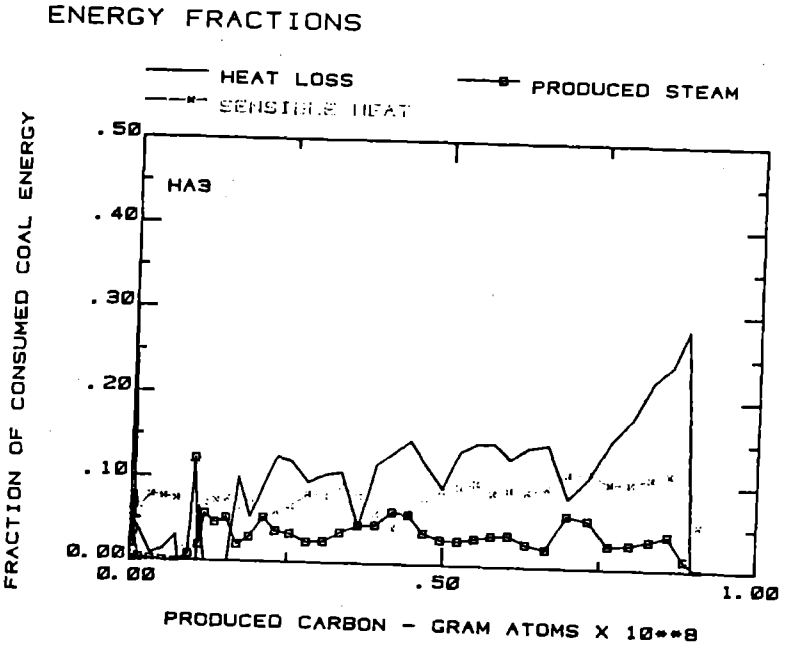


Figure 9.9 !RED items 75 - 78 versus item 133.

WATER INFLUX

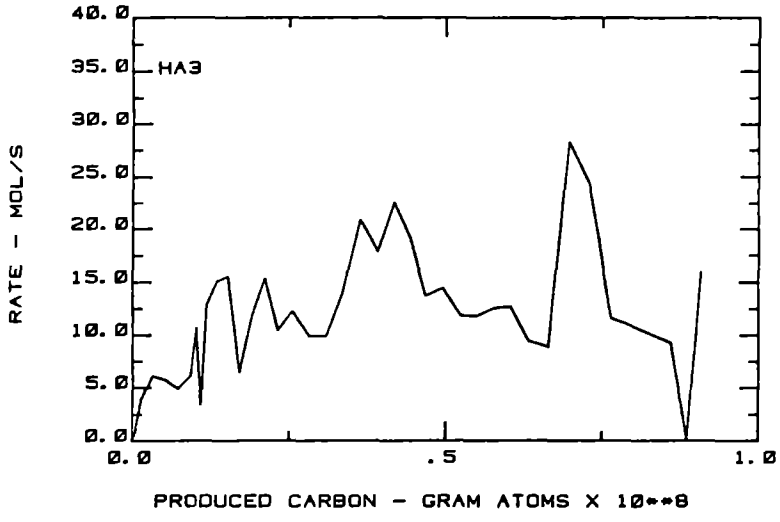


Figure 9.10 !RED item 47 versus item 133.

MODIFIED COAL PRODUCTION

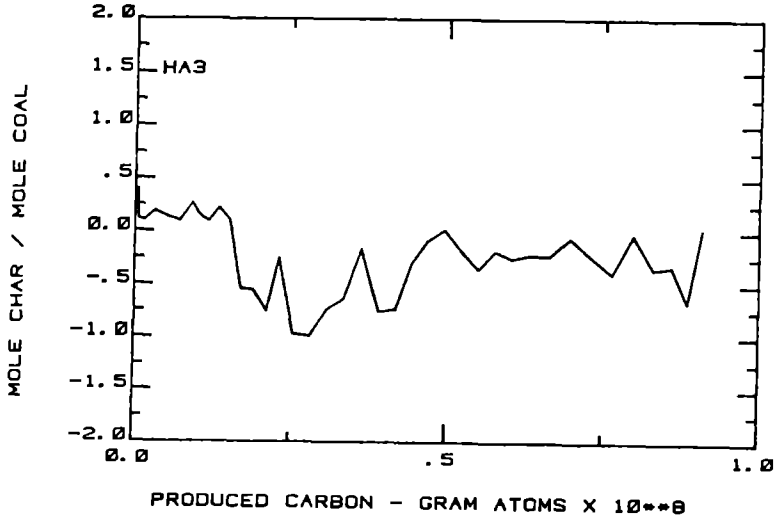


Figure 9.11 !RED item 63 versus item 133.

OXYGEN UTILIZATION

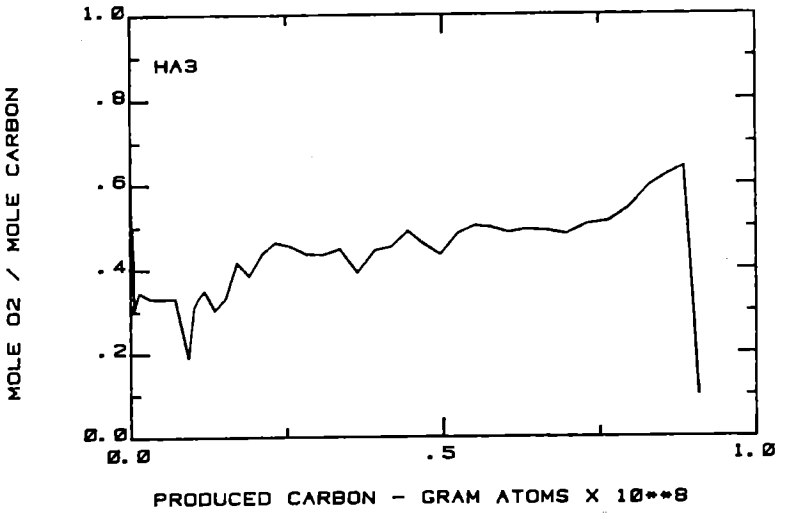


Figure 9.12 !RED item 60 versus item 133.

GAS HEAT OF COMBUSTION PER MOLE OF O2

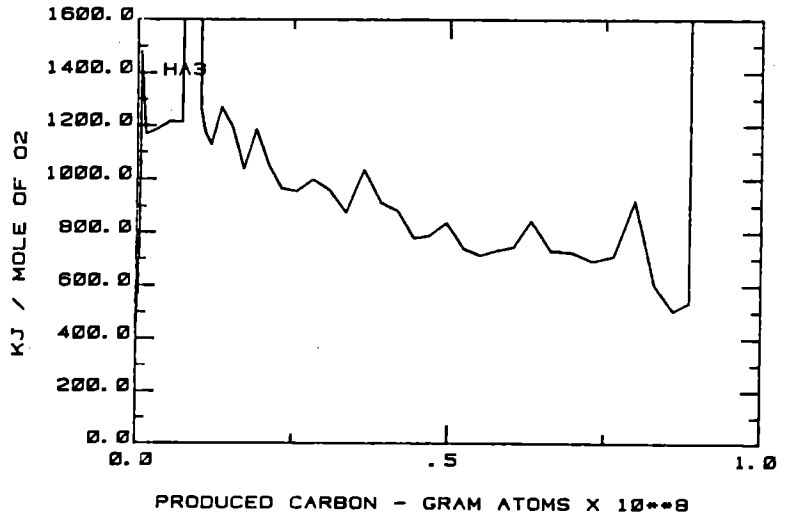


Figure 9.13 !RED item 84 versus item 133.

Hanna III References

9.1 Brandenburg, C.F., Fischer, D.D., Boyd, R.M., King, S.B., and Humphrey, A.E., "A Review of LERC's In Situ Coal Gasification Project," Proc. Thrid Annual UCC Symposium, CONF-770652, Fallen Leaf Lake, CA)June 6-9, 1977), pp. 66-76.

9.2 Hutchinson. H.L., Boyd, R.M., and Fischer D.D., "Hydrologic Characterization for Hanna III, Proc. Third Annual UCC Symposium, CONF-770652, Fallen Leaf Lake, CA (June 6-9), 1977) pp. 469-475.

9.3 Bartke, T.C., Docter, L., Sterner, T.E. Virgona, J.E., and Wojdac, L.F., "Status Report on the Hanna III and Hanna IV Underground Coal Gasification Experiments," Proc. Fourth Annual UCC Symposium, SAND 78-0941, Steamboat Springs, CO (July 17-20, 1978), pp. 41-49.

9.4 Gunn, R.D., Bell, G.J., Bartke, T.C., Camp, D.W., and Krantz, W.B., "A Technical Analysis of the Hanna III Field Test Data," in Proc. Sixth Annual UCC Sumposium, CONF-800716, Shangri-La, OK, (July 13-17, 1980), pp. VIII 6-13.

10. HANNA IV-A

General

The Hanna IV site was located approximately midway between the Hanna I and II areas. A composite coal analysis is shown in Table 10.1. The depth to the top of the coal seam was about 100 m (330 ft) and the process wells were aligned along the dip direction in a similar manner to the Hanna II and Hanna III tests. Process wells 1-2 were spaced at 30 m (100 ft) while wells 2-3 were spaced at 46 m (150 ft). These and thirty-one instrumentation wells, designed and fielded by Sandia Laboratories are shown in Figure 10.1.

The Hanna IV experiment called for:

- o Linking wells 1 and 2, with ignition at well 2.
- o Gasification from well 1 to well 2.
- o Linking wells 2 and 3, with injection in well 3 during the 1-2 gasification.
- o Gasification from well 2 to well 3.

Due to a complex series of events, the actual sequence was different from the plan and extended over a period of almost three years. Hanna IV is divided into two periods, Hanna IV-A and Hanna IV-B.

Chronology for Hanna IV-A

Reverse combustion attempts were initiated on December 4, 1977, first at well 1 and later at well 2. In each case influxing water quenched the ignitions. A considerable cavity was burned out at well 2 during these attempts, and a TV scan in well 2 showed that the casing had cracked. After repairs, the coal was reignited at well 2 on January 24, 1978, and injection was then switched to well 1 with production from well 2 [10.1] These conditions were maintained until March 16, 1978, without completion of the link over the 30 m well spacing.[10.1-10.3]

On March 16, 1978, forward gasification linking was attempted by injecting up to 20 mol/s (1000 scfm) of air at 3000 kPa (430 psi) into well 2 with production from well 1. The system linked on March 19, 1978.

On March 23, 1978, injection flow was switched to well 1 with production from well 2, according to the original plan. Forward gasification lasted from March 23 until March 26 when the experiment was shut down due to an override situation.

Following shutdown two new wells were drilled (5 and 6) in an attempt to link along the bottom of the coal seam. Reverse and forward combustion linking from well 6 to well 5 were carried out during April 12-17, 1978. Temperature responses at well A, between wells 5 and 6, were above midseam, indicating a potential override. Forward gasification from well 6 to well 2 again produced an override situation and the experiment was terminated on June 4, 1978. (An abbreviated chronology for Hanna IV-A is shown in Table 10.2).

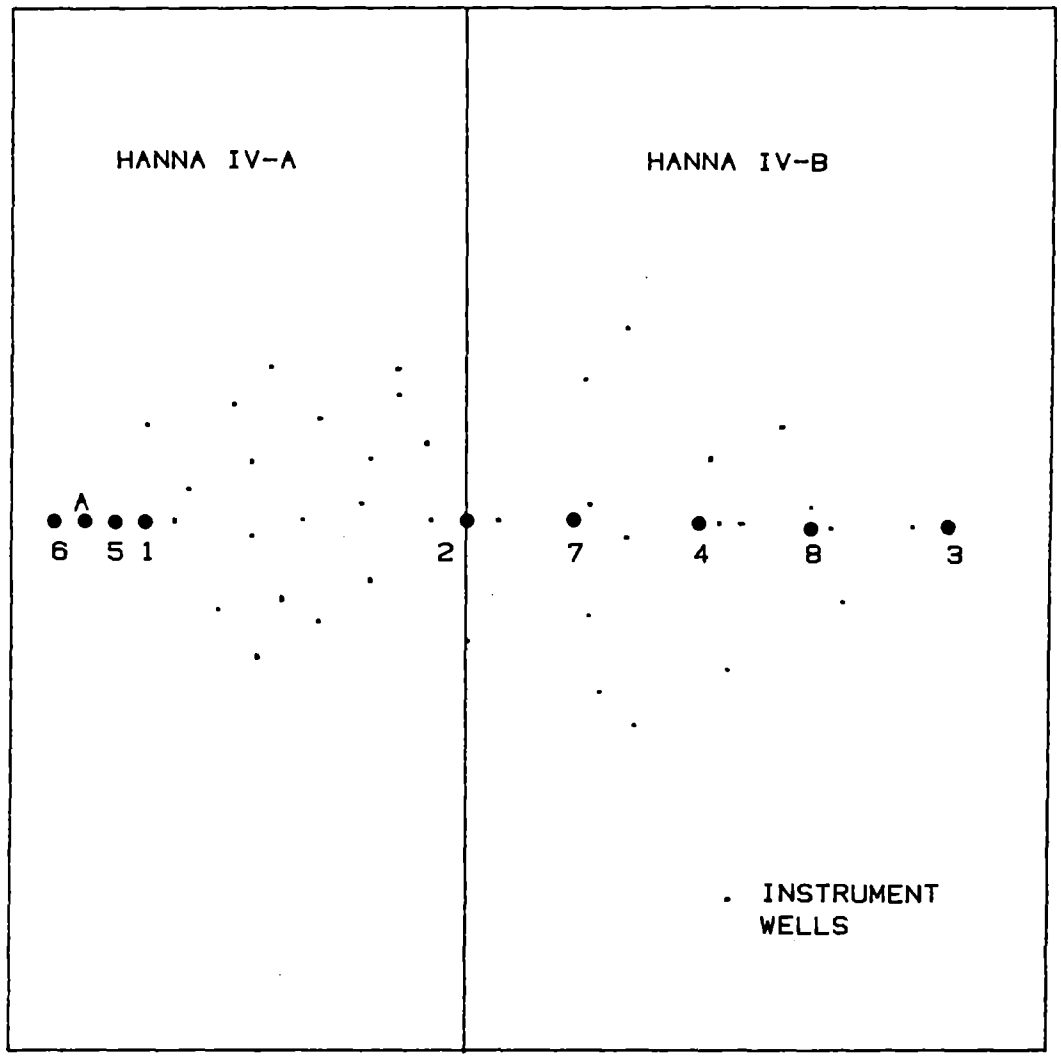
The Data

Daily summary sheets provided the bulk of information concerning Hanna IV-A. Table 10.3 summarizes the available process information.

The results from the experiment are shown in Tables 10.4 through 10.8 and Figures 10.2 through 10.13.

TABLE 10.1 HANNA IV COAL ANALYSIS

Proximate analysis - wt%	
Mositure	8.55
Ash	27.48
Volatile mater	33.21
Fixed carbon	30.76
	100.00
Ultimate analysis moisture, ash free - wt%	
Carbon	74.23
Hydrogen	5.85
Oxygen (by difference)	16.95
Sulfur	1.17
Nitrogen	1.80
	100.00
Pseudo coal molecule	$C_1 H_{.939} O_{.171} S_{.006} N_{.021}$
Molecular wt	16.16
Heat of combustion (kJ/mole)	437.
Density (kg/m^3)	1363.



SCALE - 100 METER SQUARE

Figure 10.1 Well layout for Hanna IV (HA4.A & HA4.B).

TABLE 10.2 ABBREVIED CHRONOLGY FOR HANNA IV-A

DATE	DECIMAL DATE	EVENT	INJECTION WELL	PRODUCTION WELL
12-04-77 to 12-06-77	338 - 340	Ignition attempt Well 1	1	2
12-06-77 to 1-21-78	340 - 21	Ignition attempt Well 2	2	1
1-24-78 to 3-16-78	24 - 75	Reverse Combustion	1	2
3-16-78 to 3-19-78	75 - 78	Forward Combustion Linking	2	1
3-19-78 to 3-26-78	78 - 82	Forward Gasification	2	1
3-23-78 to 3-26-78	82 - 85	Forward Gasification	1	2
3-26-78 to 4-11-78	85 - 101	Shut down to drill Well 5 & 6	--	--
4-12-78 to 4-17-78	102 - 107	Reverse Combustion	5	6
4-17-78 to 4-18-78	107 - 108	Forward Gasification	5	6
4-18-78 to 5-09-78	108 - 129	Forward Gasification	6	2
5-09-78 to 5-13-78	129 - 133	Forward Gasification	1	2
5-13-78 to 6-4-78	133 - 155	Forward Gasificatin	6	2
6-04-78	155	Experiment Terminated	--	--

TABLE 10.3 LETC - HANNA IV-A
PROCESS DATA SOURCES

ITEM	COMPUTER FILE NAME - POSITION	DESCRIPTION
Injection Rate	!FLX4A -2	Meter 1 - scfm - Daily report
	-3	Meter 2 - scfm - Daily report
Production Rate	!FLX4A -4	Meter 3 - scfm - Daily report
	-5	Meter 4 - scfm - Daily report
	-6	Meter 5 - scfm - Daily report
Gas Composition	!GAS4A -2	Mole fraction - AR - Daily report
	-3	Mole fraction - N2 - Daily report
	-4	Mole fraction - O2 - Daily report
	-5	Mole fraction - H2 - Daily report
	-6	Mole fraction - CH4 - Daily report
	-7	Mole fraction - CO - Daily report
	-8	Mole fraction - CO2 - Daily report
	-9	Mole fraction - C2H4 - Daily report
	-10	Mole fraction - C2H6 - Daily report
	-11	Mole fraction - H2S - Daily report
	-12	Mole fraction - C6 - Daily report (composite)
	-13	Mole fraction - H10 - Daily report (composite)
H_2O/DRY	!HTDRY -12	Calculated from water and gas weight % - Daily report
TAR/DRY	No Data	Assume no tar - Daily report values invalid.
Injection Pressure	!PRS4A -2	Injection meter - psi
	-4	Barometer - psia
Production Pressure	!PRS4A -3	Production meter - psi
	-4	Barometer - psia
Injection Temperature	No Data	Assume 40 degrees Celsius
Production Temperature	!FLX4A -6	Product temperature - Fahrenheit - Daily report

Table 10.4

HANNA IV-A - REVERSE BURN
24.00 TO 75.00

TIME (days)	51.000	
Average product heat of combustion (kJ/mol)	80.	
Total flows (Mmols)		
Injection	40.6	
Production	6.0	
Total dry gas production (Mmols)	5.7	
Coal		(+Char)
(Mg)	32.0	(118.6)
(Gas loss corrected Mg)	246.1	(912.8)
Dry gas composition		
AR	.0083	
N2	.6710	
O2	.0165	
H2	.0904	
CH4	.0412	
CO	.0282	
CO2	.1383	
C2H4	.0004	
C2H6	.0042	
C6	.0006	
H10	.0009	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.0407	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.819	(.221)
Char/Coal	0.000	(.730)
H2O/Coal	.395	(-.199)
Gas recovery (%)	12.2	
Energy distribution (%)		(+Char)
Combustible gas	83.2	(22.4)
Combustible tar	0.0	(0.0)
Heat loss in-situ	14.5	(4.5)
Gas sensible heat	-1.0	(-.3)
Net steam	1.9	(.5)
Char + ash sensible heat	1.1	(4.3)
Char combustion energy	0.0	(68.6)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	444.	

HANNA IV-A - REVERSE BURN
24.00 TO 75.00

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	23.5	(87.0)
(Mmol)	1.3	(4.7)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	.6	(2.1)
Water parameters (mol/s)		(+Char)
Insitu influx	.13	(-.29)
From consumed coal	.03	(.13)
Consumed in reactions	.11	(-.21)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	1615.	
Production	1696.	
Average temperatures (deg c)		
Injection	40.0	
Production	0.0	
Average gas flows (mol/s)		
Injection	9.2	
Production	1.4	

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Table 10.5

HANNA IV-A - FIRST FORWARD BURN
75.00 TO 85.00

TIME (days)	10.000	
Average product heat of combustion (kJ/mol)	97.	
Total flows (Mmols)		
Injection	25.0	
Production	40.1	
Total dry gas production (Mmols)	37.2	
Coal		(+Char)
(Ms)	266.4	(378.4)
(Gas loss corrected Ms)	246.4	(349.9)
Dry gas composition		
AR	.0067	
N2	.5788	
O2	.0002	
H2	.1336	
CH4	.0302	
CO	.0961	
CO2	.1516	
C2H4	.0003	
C2H6	.0020	
C6	.0002	
H10	.0003	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.0792	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.549	(.387)
Char/Coal	0.000	(.296)
H2O/Coal	.243	(.047)
Gas recovery (%)	110.4	
Energy distribution (%)		(+Char)
Combustible gas	78.0	(54.9)
Combustible tar	0.0	(0.0)
Heat loss in-situ	10.8	(8.1)
Gas sensible heat	6.9	(4.8)
Net steam	2.8	(2.0)
Char + ash sensible heat	1.1	(2.4)
Char combustion energy	0.0	(27.8)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	620.	

HANNA IV-A - FIRST FORWARD BURN
75.00 TO 85.00

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	195.5	(277.6)
(Mmol)	10.5	(15.0)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	4.6	(6.5)
Water parameters (mol/s)		(+Char)
Insitu influx	4.91	(2.15)
From consumed coal	1.46	(2.08)
Consumed in reactions	2.97	(.82)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	1361.	
Production	951.	
Average temperatures (deg c)		
Injection	40.0	
Production	247.6	
Average gas flows (mol/s)		
Injection	28.9	
Production	46.4	

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Table 10.6

HANNA IV-A - REVERSE BURN NO 2
85.00 TO 107.00

TIME (days)	22.000	
Average product heat of combustion (kJ/mol)	65.	
Total flows (Mmols)		
Injection	6.5	
Production	2.2	
Total dry gas production (Mmols)	2.0	
Coal		(+Char)
(Mg)	7.4	(19.2)
(Gas loss corrected Mg)	43.6	(112.9)
Dry gas composition		
AR	.0081	
N2	.6476	
O2	.1067	
H2	.0962	
CH4	.0232	
CO	.0418	
CO2	.0733	
C2H4	.0004	
C2H6	.0020	
C6	.0003	
H10	.0005	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.1101	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	1.202	(.464)
Char/Coal	0.000	(.614)
H2O/Coal	.577	(-.035)
Gas recovery (%)	25.7	
Energy distribution (%)		(+Char)
Combustible gas	102.6	(39.6)
Combustible tar	0.0	(0.0)
Heat loss in-situ	-15.6	(-5.5)
Gas sensible heat	7.3	(2.8)
Net steam	4.2	(1.6)
Char + ash sensible heat	1.1	(3.8)
Char combustion energy	0.0	(57.7)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	373.	

HANNA IV-A - REVERSE BURN NO 2
85.00 TO 107.00

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	5.4	(14.1)
(Mmol)	.3	(.8)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	.1	(.3)
Water parameters (mol/s)		(+Char)
Insitu influx	.19	(.06)
From consumed coal	.02	(.05)
Consumed in reactions	.09	(-.01)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	687.	
Production	905.	
Average temperatures (deg c)		
Injection	40.0	
Production	288.8	
Average gas flows (mol/s)		
Injection	3.4	
Production	1.2	

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Table 10.7

HANNA IV-A - SECOND FORWARD BURN
107.00 TO 155.00

TIME (days)	48.000	
Average product heat of combustion (kJ/mol)	91.	
Total flows (Mmols)		
Injection	351.0	
Production	533.4	
Total dry gas production (Mmols)	400.7	
Coal		(+Char)
(Ms)	2889.1	(3739.9)
(Gas loss corrected Ms)	3244.3	(4199.7)
Dry gas composition		
AR	.0073	
N2	.5922	
O2	.0006	
H2	.1175	
CH4	.0296	
CO	.0929	
CO2	.1571	
C2H4	.0004	
C2H6	.0021	
C6	.0001	
H10	.0002	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.3312	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.559	(.432)
Char/Coal	0.000	(.227)
H2O/Coal	.178	(.043)
Gas recovery (%)	86.7	
Energy distribution (%)		(+Char)
Combustible gas	72.7	(56.2)
Combustible tar	0.0	(0.0)
Heat loss in-situ	1.4	(1.5)
Gas sensible heat	12.7	(9.8)
Net steam	11.7	(9.0)
Char + ash sensible heat	1.1	(2.1)
Char combustion energy	0.0	(21.4)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	569.	

HANNA IV-A - SECOND FORWARD BURN
107.00 TO 155.00

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	2119.7	(2743.9)
(Mmol)	114.4	(148.0)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	50.0	(64.7)
Water parameters (mol/s)		(+Char)
Insitu influx	33.61	(29.24)
From consumed coal	3.31	(4.28)
Consumed in reactions	4.92	(1.52)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	628.	
Production	552.	
Average temperatures (deg c)		
Injection	40.0	
Production	402.0	
Average gas flows (mol/s)		
Injection	84.6	
Production	128.6	

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Table 10.8

HANNA IV-A - FULL EXPERIMENT
24.00 TO 155.00

TIME (days)	131.000	
Average product heat of combustion (kJ/mol)	91.	
Total flows (Mmols)		
Injection	423.2	
Production	581.7	
Total dry gas production (Mmols)	445.6	
Coal		(+Char)
(Mg)	3195.0	(4256.1)
(Gas loss corrected Mg)	3780.4	(5035.9)
Dry gas composition		
AR	.0073	
N2	.5923	
O2	.0012	
H2	.1184	
CH4	.0298	
CO	.0921	
CO2	.1560	
C2H4	.0004	
C2H6	.0021	
C6	.0002	
H10	.0002	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.3055	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.562	(.422)
Char/Coal	0.000	(.249)
H2O/Coal	.187	(.036)
Gas recovery (%)	80.0	
Energy distribution (%)		(+Char)
Combustible gas	73.3	(55.0)
Combustible tar	0.0	(0.0)
Heat loss in-situ	2.3	(2.2)
Gas sensible heat	12.1	(9.1)
Net steam	10.8	(8.1)
Char + ash sensible heat	1.1	(2.2)
Char combustion energy	0.0	(23.4)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	570.	

HANNA IV-A - FULL EXPERIMENT
24.00 TO 155.00

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	2344.1	(3122.6)
(Mmol)	126.5	(168.5)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	55.3	(73.6)
Water parameters (mol/s)		(+Char)
Insitu influx	12.77	(10.77)
From consumed coal	1.34	(1.79)
Consumed in reactions	2.09	(.53)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	689.	
Production	593.	
Average temperatures (deg c)		
Injection	40.0	
Production	386.8	
Average gas flows (mol/s)		
Injection	37.4	
Production	51.4	

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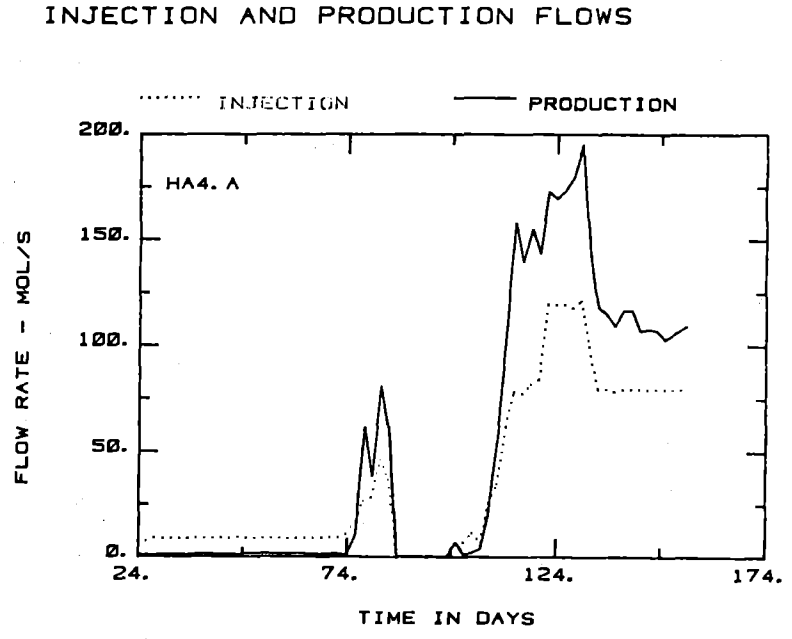

Figure 10.2 !RED items 90 and 91 versus time.

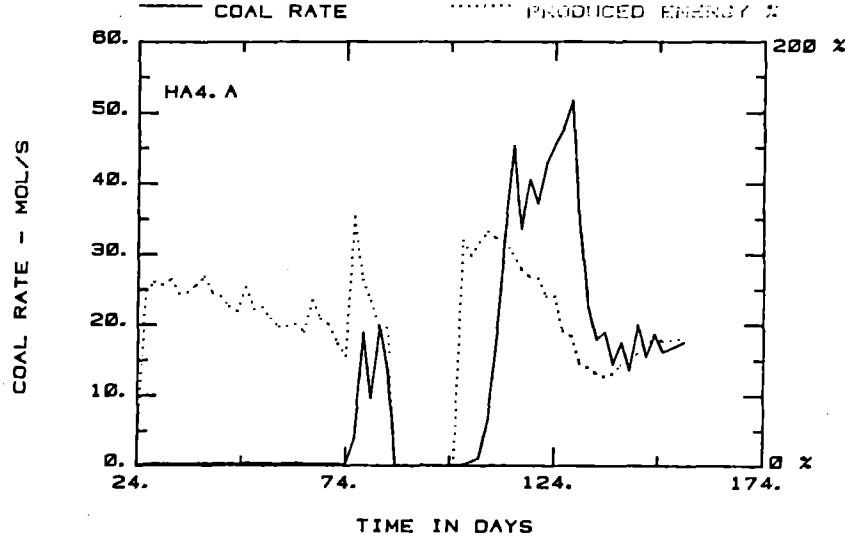

Figure 10.3 !RED item 44 and item 74 x 100 versus time.

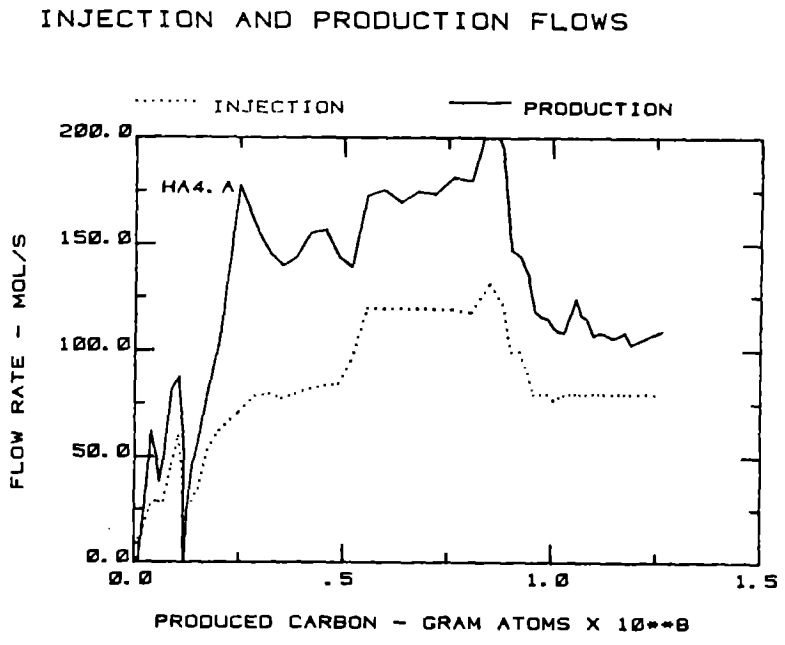

Figure 10.4 !RED items 90 and 91 versus item 133.

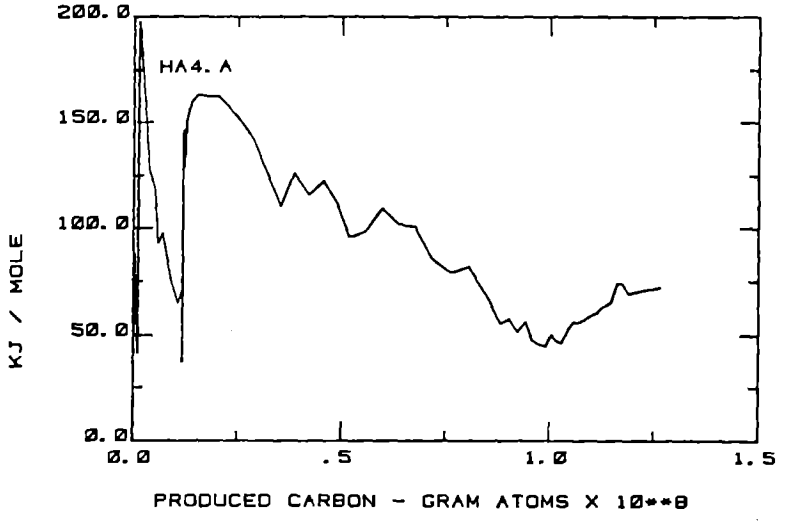

Figure 10.5 !RED items 81 versus item 133.

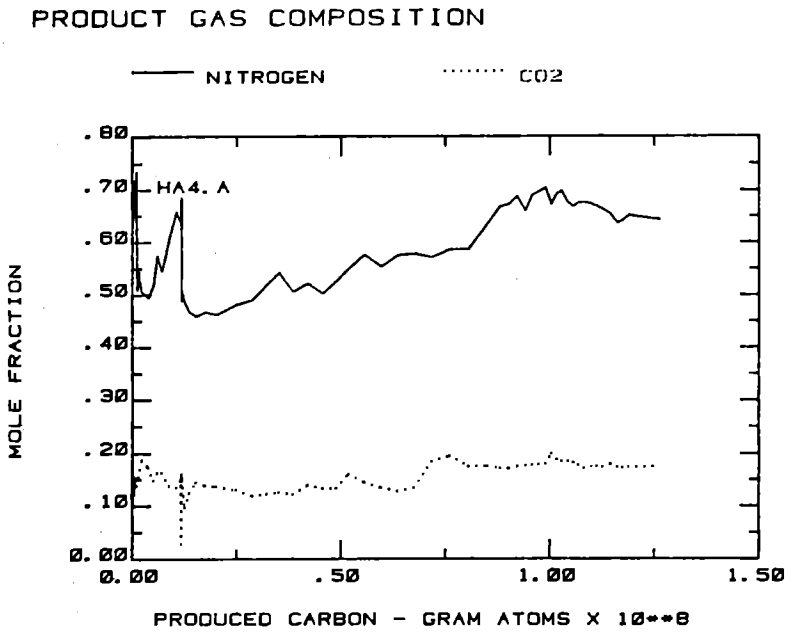

Figure 10.6 !RED items 11 and 16 versus item 133.

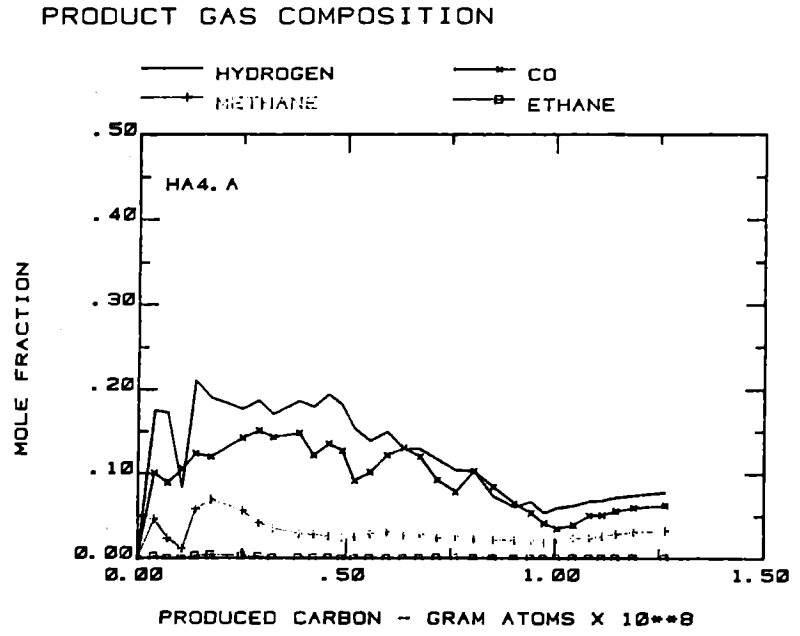

Figure 10.7 !RED items 13, 14, 15 and 18 versus item 133.

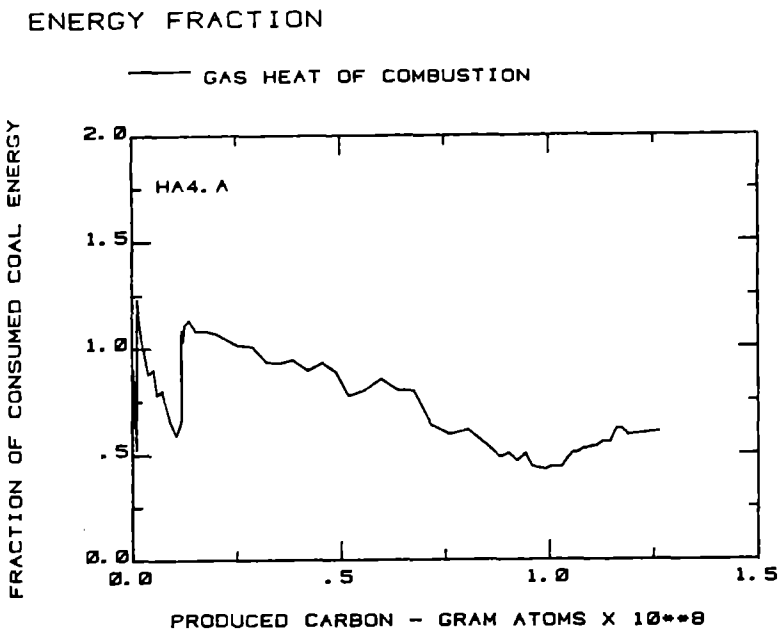

Figure 10.8 !RED item 74 versus item 133.

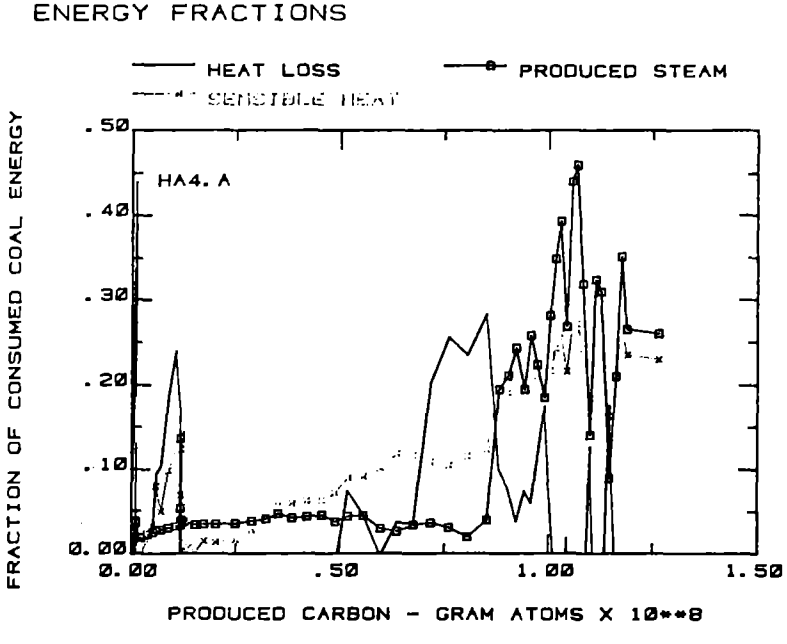

Figure 10.9 !RED items 75 - 78 versus item 133.

WATER INFLUX

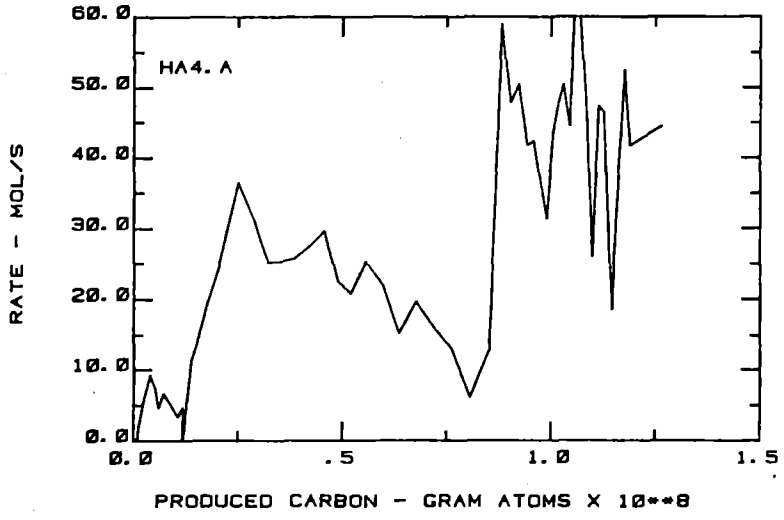

Figure 10.10 !RED item 47 versus item 133.

MODIFIED COAL PRODUCTION

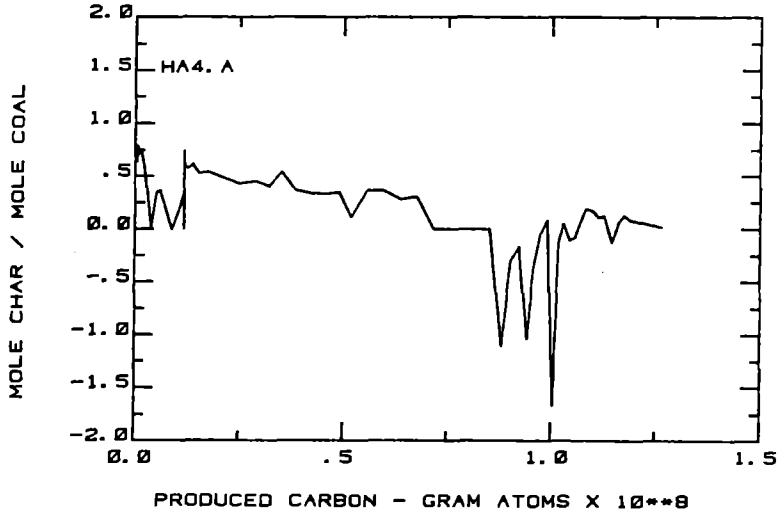

Figure 10.11 !RED item 63 versus item 133.

OXYGEN UTILIZATION

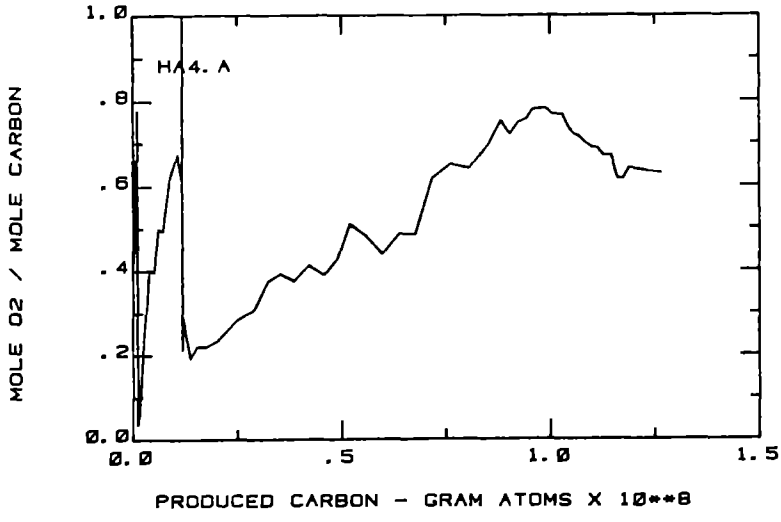

Figure 10.12 !RED item 60 versus item 133.

GAS HEAT OF COMBUSTION PER MOLE OF O2

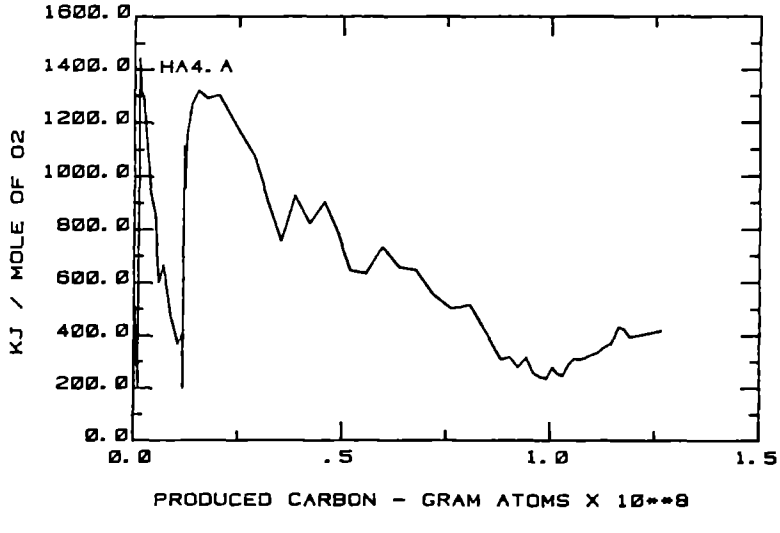

Figure 10.13 !RED item 84 versus item 133.

Hanna IV-A References

10.1 Bartke, T.C., Docter, L., Sterner, T.E., Virgona, J.E., and Wojdac, L.F., "Status Report on the Hanna III and Hanna IV Underground Coal Gasification Experiments," Proc. Fourth Annual ECC Symposium, Steamboat Springs, CO, SAND 78-0941 (July 17-20, 1978), pp. 41-49.

10.2 Hommert, P.J., and Northrop, D.A., "Sandia Laboratories Project Review: Instrumentation and Process Control Development for In Situ Coal Gasification," Proc. Fourth Annual UCC Symposium, Steamboat Springs, CO SAND-78-0941 (July 17-20, 1978), 103-114.

10.3 Bartke. T.C., Docter, L., Sterner, T.E., and Rigona, J.E., "Status of the Fourth Underground Coal Gasification Experiment at Hanna, Wyoming, SPE7510, Presented at the SPE Fall Meeting of ASME, Houston, TX (Oct. 1-3, 1978).

11. HANNA IV-B

Chronology

After termination of Hanna IV-A, two new process wells 7 and 8 were drilled, and five additional instrumentation wells, NN, PP, RR, SS, TT, and ZZ were completed, all during 1978. See Figure 10.1.

The plan was to sequentially relay the link from well 7 to wells 4, 8, and 3, using short (11.5 m) increments.[11.1] However, due to poor air acceptance at well 4, it was decided to link wells 8 and 7 (23 m spacing) and then link well 3 to well 8 (11.5 m).

On April 20, 1979, the coal in well 7 was ignited, and reverse burn from well 7 was begun with air injection in wells 3, 4, and 8. The link was achieved with difficulty, as in the case of Hanna IV-A. Wells 7 and 8 linked, or nearly so, in 10 days, but wells 8 and 3 did not link until 73 days later, on July 12, 1979. In general, well 3 was used for injection and either well 8 or 7 was used for production.

After linking, a six day forward gasification phase between wells 3 and 7 was terminated when a gas leak developed in the production system due to erosion from heavy particulate production. After repairs, forward gasification with injection in well 8 and production from well 7 commenced on September 3, 1979. The experiment was terminated on September 19, 1979 due to declining heating valve caused by gas override. (An abbreviated chronology for Hanna IV-B is shown in Table 11.1)

The Data

The Hanna IV-B data was supplied by LETC in computer form. As a first step the data were converted to a standard history file !H4B02 containing 50 items. The data sources used to construct !EXP are summarized in Table 11.2.

Results of the experiment are shown in Tables 11.3 through 11.6 and Figures 11.1 through 11.12.

TABLE 11.1 ABBREVIATED CHRONOLOGY FOR HANNA IV-B

DATES	DECIMAL DAYS	EVENT	INJECTION WELL	PRODUCTION WELL
4-20-79	110	Ignition in Well 7	3,4,7,8	--
4-21-79 to 4-25-79	111 - 115	Reverse Combustion	3,4,8	7
4-25-79	115	Reverse Combustion	4	7
4-26-79 to 4-27-79	116 - 117	Reverse Combustion	3,8	7
4-27-79 to 4-30-79	117 - 120	Reverse Combustion Link Completed	8	7
5-01-79 to 7-12-79	121 - 193	Reverse Combustion	3	7,8
7-13-79 to 7-28-79	194 - 209	Shut Down	--	--
7-28-79 to 8-04-79	209 - 216	Forward Gasification	3	7
8-04-79 to 9-03-79	216 - 246	Shut Down for Repairs	--	--
9-03-79 to 9-19-79	246 - 262	Forward Gasification	8	7

TABLE 11.2 LETC - HANNA IV-B
PROCESS DATA SOURCES

ITEM	COMPUTER FILE NAME - POSITION	DESCRIPTION
Injection Rate	!H4B02 -33	High pressure air injection - Meter 1 - scfm
	-34	Low pressure air injection - Meter 2 - scfm
Production Rate	!H4B02 -35	12" Production - Meter 3 - scfm
Gas Composition	!H4B02 -3	Mole fraction - H2
	-4	Mole fraction - N2
	-5	Mole fraction - O2
	-6	Mole fraction - AR
	-7	Mole fraction - CO
	-8	Mole fraction - CH4
	-9	Mole fraction - CO2
	-10	Mole fraction - C2H4
	-11	Mole fraction - C2H6
	-12	Mole fraction - H2S
	-13	Mole fraction - C3H6
	-14	Mole fraction - C3H8
	-15	Mole fraction - ISO-Butane
	-16	Mole fraction - N-Butane
H_2O/DRY	!HUM -12	Tar/water cleanup data sheets - Day 211-262
TAR/DRY	!HUM -11	Tar/water cleanup data sheets - Day 211-262
Injection Pressure	!H4B02 -38	Meter 1 - psi
	-39	Meter 2 - psi
Production Pressure	!H4B02 -40	Meter 3 - psi
Injection Temperature	No Data	Assumed 10 degrees Celsius
Production Termperature	!TOUT -2	Data sheets - Day 111-194

Table 11.3

HANNA IV-B - REVERSE BURN
110.80 TO 194.28

TIME (days)	83.485	
Average product heat of combustion (kJ/mol)	107.	
Total flows (Mmols)		
Injection	33.2	
Production	9.1	
Total dry gas production (Mmols)	8.7	
Coal		(+Char)
(Ms)	63.4	(122.7)
(Gas loss corrected Ms)	311.5	(602.4)
Dry gas composition		
AR	.0066	
N2	.5635	
O2	.0117	
H2	.1414	
CH4	.0454	
CO	.0508	
CO2	.1732	
C2H4	.0007	
C2H6	.0047	
C6	.0008	
H10	.0012	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.0425	
Tar/dry	.0003	
Reaction stoichiometry		(+Char)
O2/Coal	.519	(.268)
Char/Coal	0.000	(.483)
H2O/Coal	.417	(.013)
Gas recovery (%)	18.7	
Energy distribution (%)		(+Char)
Combustible gas	85.0	(43.9)
Combustible tar	1.3	(.7)
Heat loss in-situ	10.2	(5.8)
Gas sensible heat	.5	(.3)
Net steam	1.5	(.8)
Char + ash sensible heat	1.1	(3.2)
Char combustion energy	0.0	(45.3)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	715.	

HANNA IV-B - REVERSE BURN
110.80 TO 194.28

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	46.5	(90.0)
(Mmol)	2.5	(4.9)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	1.1	(2.1)
Water parameters (mol/s)		(+Char)
Insitu influx	.15	(-.02)
From consumed coal	.04	(.08)
Consumed in reactions	.15	(.01)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	2726.	
Production	303.	
Average temperatures (deg c)		
Injection	37.7	
Production	0.0	
Average gas flows (mol/s)		
Injection	4.6	
Production	1.3	

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Table 11.4

HANNA IV-B - FIRST FORWARD BURN
209.04 TO 216.12

TIME (days)	7.098	
Average product heat of combustion (kJ/mol)	133.	
Total flows (Mmols)		
Injection	31.5	
Production	56.0	
Total dry gas production (Mmols)	51.6	
Coal		(+Char)
(Ms)	425.2	(711.0)
(Gas loss corrected Ms)	403.6	(675.0)
Dry gas composition		
AR	.0060	
N2	.5065	
O2	.0001	
H2	.1737	
CH4	.0475	
CO	.1084	
CO2	.1513	
C2H4	.0006	
C2H6	.0043	
C6	.0007	
H10	.0010	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.0861	
Tar/dry	.0006	
Reaction stoichiometry		(+Char)
O2/Coal	.418	(.250)
Char/Coal	0.000	(.402)
H2O/Coal	.420	(.083)
Gas recovery (%)	106.3	
Energy distribution (%)		(+Char)
Combustible gas	93.3	(55.8)
Combustible tar	2.0	(1.2)
Heat loss in-situ	-10.4	(-5.7)
Gas sensible heat	11.0	(6.6)
Net steam	2.7	(1.6)
Char + ash sensible heat	1.1	(2.8)
Char combustion energy	0.0	(37.7)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	975.	

HANNA IV-B - FIRST FORWARD BURN
209.04 TO 216.12

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	311.9	(521.6)
(Mmol)	16.8	(28.1)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	7.4	(12.3)
Water parameters (mol/s)		(+Char)
Insitu influx	15.48	(5.54)
From consumed coal	3.29	(5.51)
Consumed in reactions	11.53	(3.81)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	1569.	
Production	260.	
Average temperatures (deg c)		
Injection	26.8	
Production	454.4	
Average gas flows (mol/s)		
Injection	51.4	
Production	91.4	

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Table 11.5

HANNA IV-B - SECOND FORWARD BURN
246.73 TO 262.46

TIME (days)	15.746	
Average product heat of combustion (kJ/mol)	109.	
Total flows (Mmols)		
Injection	46.8	
Production	85.7	
Total dry gas production (Mmols)	78.2	
Coal		(+Char)
(Mg)	601.2	(768.0)
(Gas loss corrected Mg)	515.5	(658.5)
Dry gas composition		
AR	.0059	
N2	.5440	
O2	.0001	
H2	.1516	
CH4	.0360	
CO	.0971	
CO2	.1612	
C2H4	.0003	
C2H6	.0027	
C6	.0004	
H10	.0006	
H2S	.0000	
Product gas mole ratios		
H2O/dry	.0959	
Tar/dry	.0002	
Reaction stoichiometry		(+Char)
O2/Coal	.481	(.377)
Char/Coal	0.000	(.217)
H2O/Coal	.306	(.149)
Gas recovery (%)	116.5	
Energy distribution (%)		(+Char)
Combustible gas	82.2	(64.3)
Combustible tar	.6	(.5)
Heat loss in-situ	.5	(.8)
Gas sensible heat	12.1	(9.4)
Net steam	3.2	(2.5)
Char + ash sensible heat	1.1	(2.0)
Char combustion energy	0.0	(20.4)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	746.	

HANNA IV-B - SECOND FORWARD BURN
246.73 TO 262.46

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	441.1	(563.4)
(Mmol)	23.8	(30.4)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	10.4	(13.3)
Water parameters (mol/s)		(+Char)
Insitu influx	8.77	(6.16)
From consumed coal	2.10	(2.68)
Consumed in reactions	5.36	(3.33)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	754.	
Production	515.	
Average temperatures (deg c)		
Injection	5.6	
Production	454.3	
Average gas flows (mol/s)		
Injection	34.4	
Production	63.0	

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Table 11.6

HANNA IV-B - FULL EXPERIMENT
110.80 TO 262.47

TIME (days)	151.668	
Average product heat of combustion (kJ/mol)	120.	
Total flows (Mmols)		
Injection	136.4	
Production	205.7	
Total dry gas production (Mmols)	189.1	
Coal		(+Char)
(Mg)	1509.0	(1976.6)
(Gas loss corrected Mg)	1559.0	(2042.1)
Dry gas composition		
AR	.0057	
N2	.5202	
O2	.0006	
H2	.1657	
CH4	.0402	
CO	.1010	
CO2	.1615	
C2H4	.0005	
C2H6	.0034	
C6	.0004	
H10	.0006	
H2S	.0000	
Product gas mole ratios		
H2O/dry	.0875	
Tar/dry	.0003	
Reaction stoichiometry		(+Char)
O2/Coal	.443	(.338)
Char/Coal	0.000	(.237)
H2O/Coal	.360	(.176)
Gas recovery (%)	92.4	
Energy distribution (%)		(+Char)
Combustible gas	86.7	(66.2)
Combustible tar	1.1	(.8)
Heat loss in-situ	-3.1	(-1.9)
Gas sensible heat	11.0	(8.4)
Net steam	2.8	(2.1)
Char + ash sensible heat	1.1	(2.1)
Char combustion energy	0.0	(22.2)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	855.	

HANNA IV-B - FULL EXPERIMENT
110.80 TO 262.47

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	1107.1	(1450.2)
(Mmol)	59.7	(78.2)
Density (kG/M**3)	1363.	
Energy in consumed coal (TJ)	26.1	(34.2)
Water parameters (mol/s)		(+Char)
Insitu influx	2.36	(1.59)
From consumed coal	.55	(.72)
Consumed in reactions	1.64	(1.05)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	1128.	
Production	365.	
Average temperatures (deg c)		
Injection	13.2	
Production	434.2	
Average gas flows (mol/s)		
Injection	10.4	
Production	15.7	

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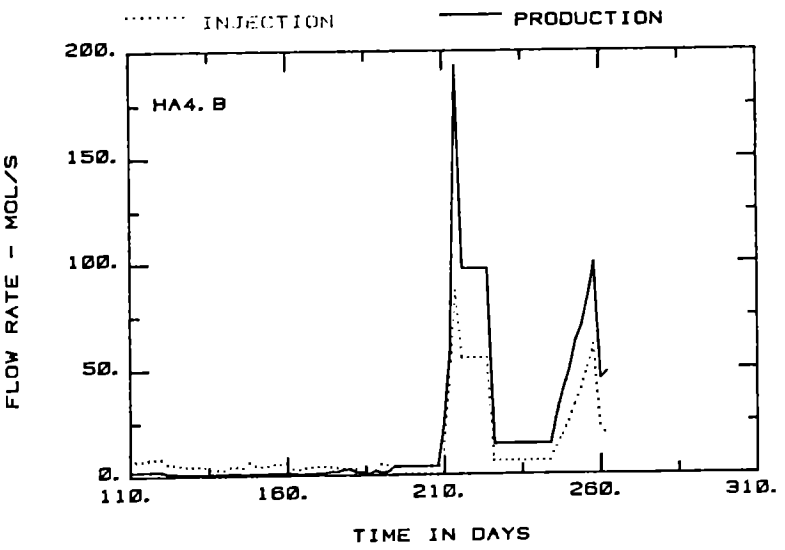


Figure 11.1 !RED items 90 and 91 versus time.

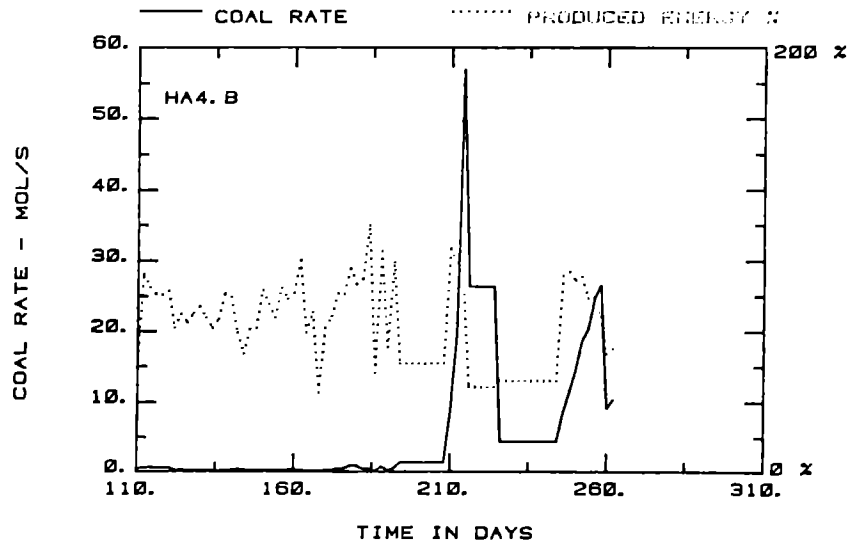


Figure 11.2 !RED item 44 and item 74 x 100 versus time.

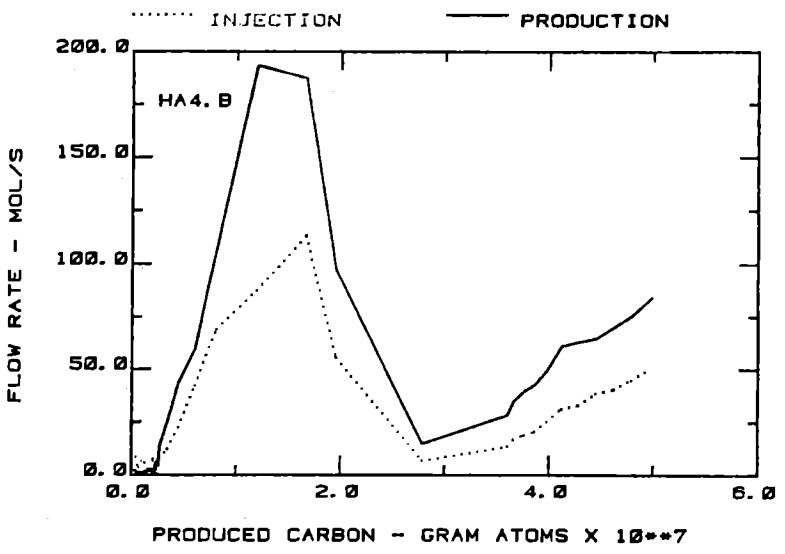


Figure 11.3 !RED items 90 and 91 versus item 133.

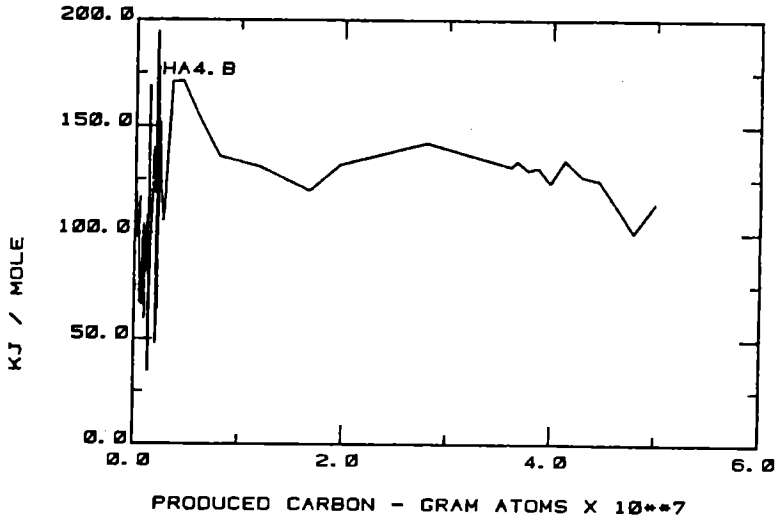


Figure 11.4 !RED items 81 versus item 133.

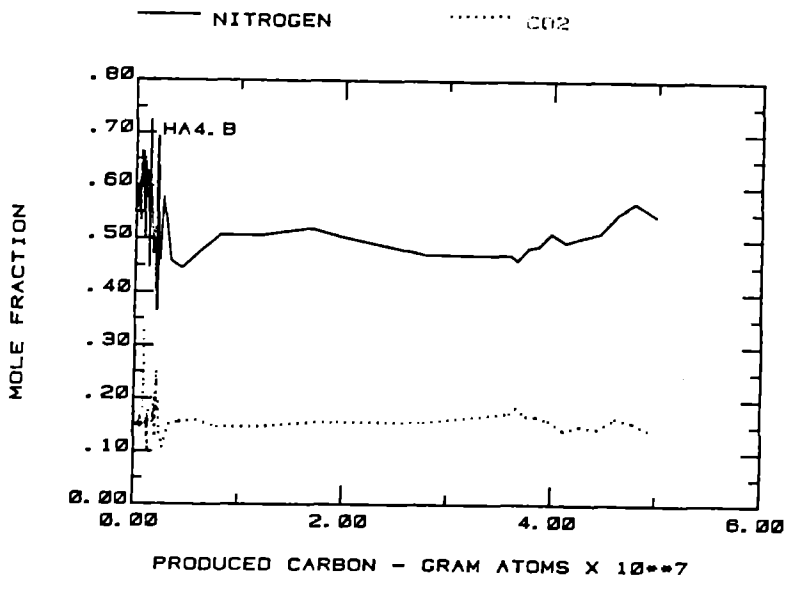


Figure 11.5 !RED items 11 and 16 versus item 133.

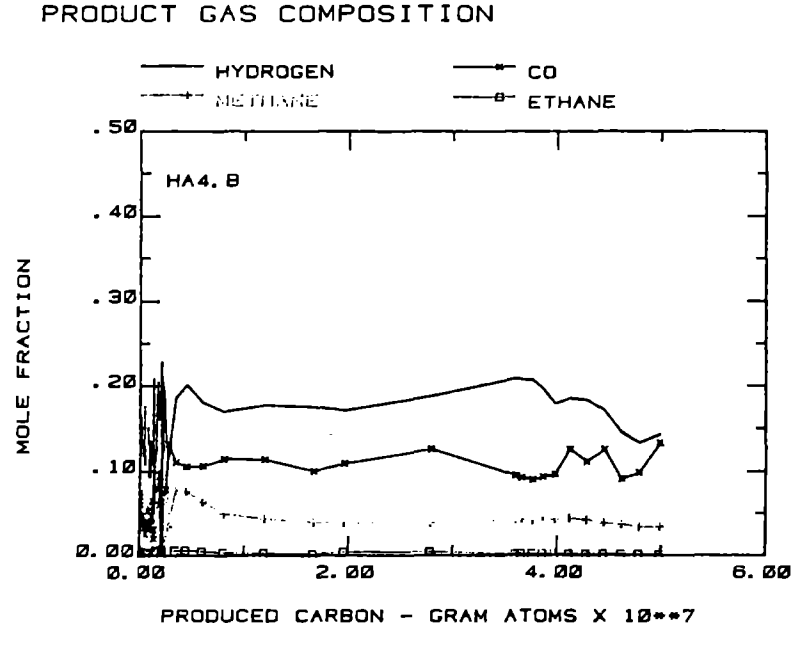


Figure 11.6 !RED items 13, 14, 15 and 18 versus item 133.

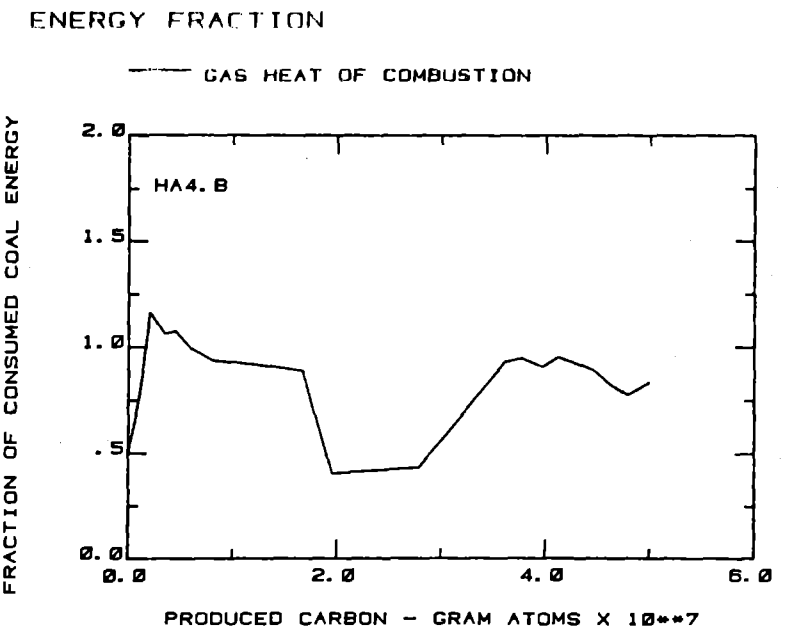


Figure 11.7 !RED item 74 versus item 133.

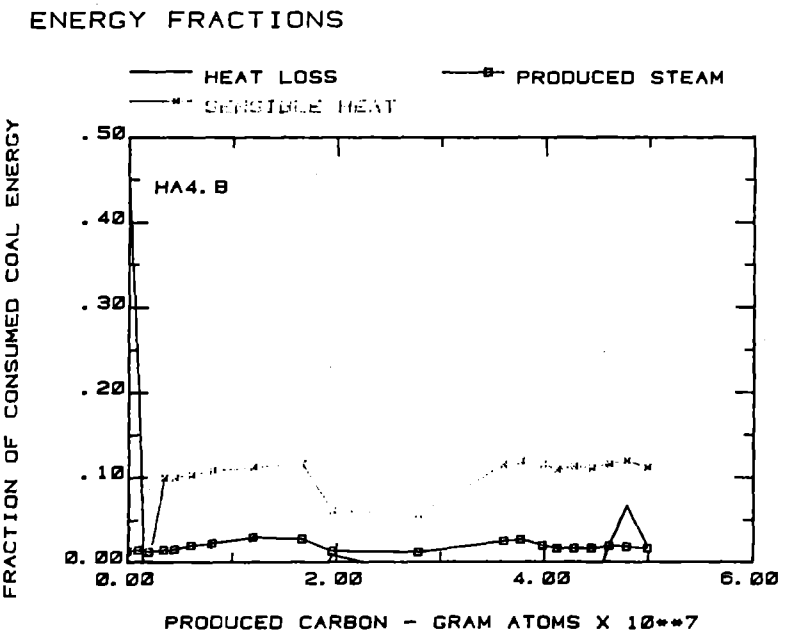


Figure 11.8 !RED items 75 - 78 versus item 133.

WATER INFLUX

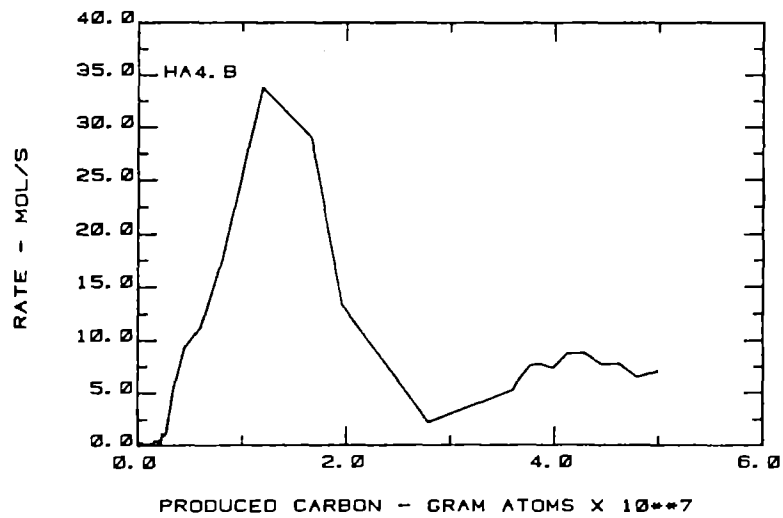


Figure 11.9 !RED item 47 versus item 133.

MODIFIED COAL PRODUCTION

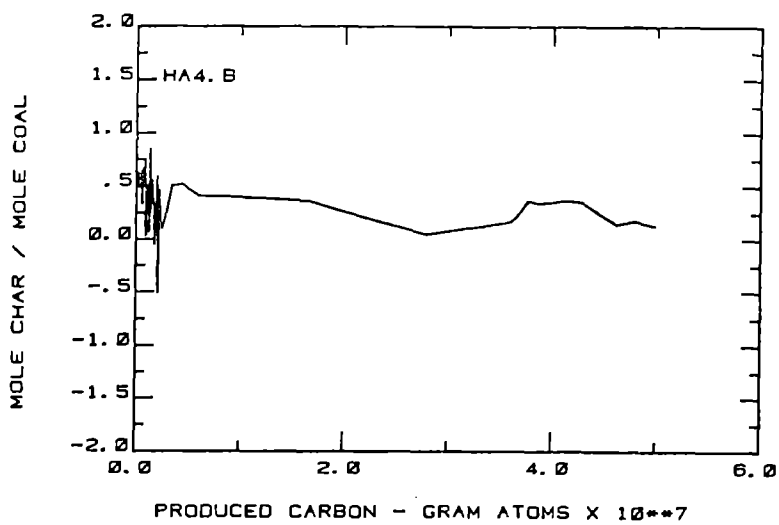


Figure 11.10 !RED item 63 versus item 133.

OXYGEN UTILIZATION

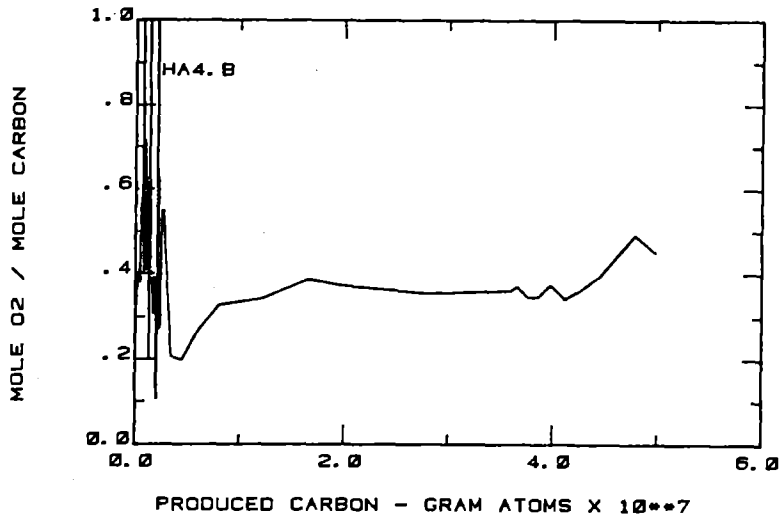


Figure 11.11 !RED item 60 versus item 133.

GAS HEAT OF COMBUSTION PER MOLE OF O2

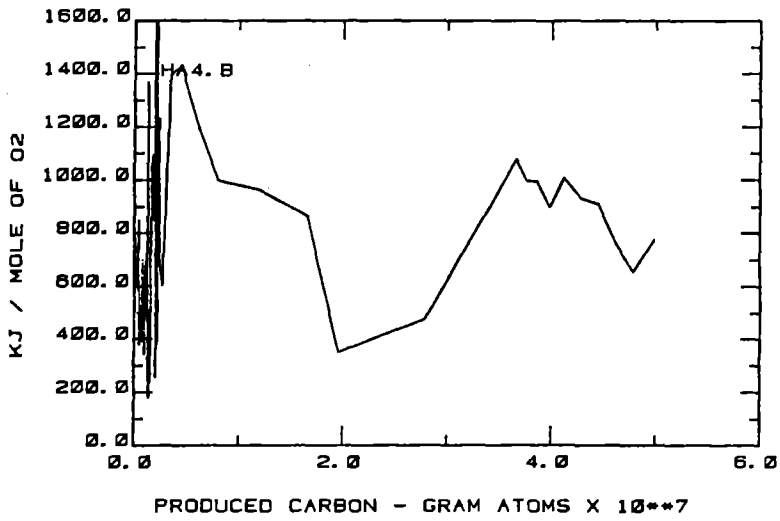


Figure 11.12 !RED item 84 versus item 133.

Hanna IV-B References

11.1 Covell, J.R., Wojdac, L.F., Barbour, F.A., Gardner, G.W., Glass, R. and Hommert, P.J., "Results of the Fourth Hanna Field Test," Proc Sixth Annaul UCC Symposium, CONF-800716, Shangri-La, OK (July 13-17, 1980).

12. HOE CREEK I

General

The Lawrence Livermore National Laboratory conducted the Hoe Creek experiments at a gasification site located in north eastern, Wyoming about 20 miles south of the town of Gillette.

The Felix No. 2 seam, chosen for the tests lies 40 m (130 ft) below the surface. The seam is 7.5 m (25 ft) thick lying nearly flat and overlaid with 5 m of fine grained sandstone. Above the sandstone is the 3 m (10 ft) thick Felix No. 1 coal seam. Both seams are aquifers with high (> 30%) water content. Analysis of the Felix coals are shown in Tables 12.1 and 12.2.

Chronology

Permeability enhancement prior to gasification was accomplished during Hoe Creek I by explosive fracturing the coal. A plan view of the post-shot well locations is shown in Figure 12.1 with the P-1 injection well and I-O production well 10 m (33 ft) apart. Gasification was started on October 15, 1976 and ended on October 26, 1976 due to a burn front override situation.[12.1] (An abbreviated chronology is given in Table 12.3).

The Data

The Hoe Creek I data was available from two computer files [HCI1 and [HCIP. The process data sources used to construct !EXP are shown in Table 12.4.

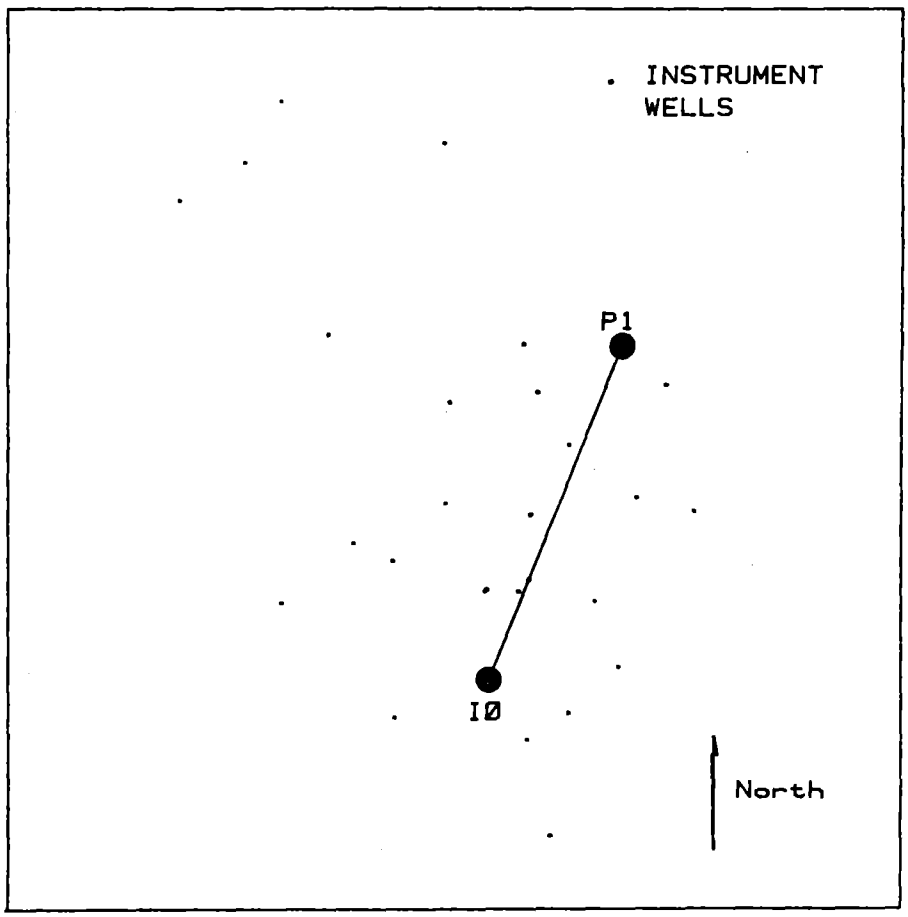
Summary results for Hoe Creek I are shown in Table 12.5 and Figures 12.2 through 12.13.

TABLE 12.1 HOE CREEK FELIX NO. 1
COAL ANALYSIS

Proximate analysis - wt%	
Moisture	31.88
Ash	4.36
Volatile mater	31.38
Fixed carbon	32.38
	100.00
Ultimate analysis moisture, ash free - wt%	
Carbon	73.55
Hydrogen	5.58
Oxygen (by difference)	18.32
Sulfur	0.73
Nitrogen	1.82
	100.00
Pseudo coal molecule	$C_1 H_{.904} O_{.187} S_{.004} N_{.021}$
Molecular wt	16.33
Heat of combustion (kJ/mole)	433.
Density (kg/m^3)	1350.

TABLE 12.2 HOE CREEK FELIX NO. 2
COAL ANALYSIS

Proximate analysis - wt%	
Moisture	30.11
Ash	4.05
Volatile mater	32.12
Fixed carbon	33.72
	100.00
Ultimate analysis moisture, ash free - wt%	
Carbon	73.49
Hydrogen	5.56
Oxygen (by difference)	18.89
Sulfur	0.52
Nitrogen	1.54
	100.00
Pseudo coal molecule	$C_1 H_{.903} O_{.193} S_{.003} N_{.017}$
Molecular wt	16.34
Heat of combustion (kJ/mole)	433.
Density (kg/m^3)	1350.



SCALE - 25 METER SQUARE

Figure 12.1 Well layout for Hoe Creek I (HCI).

TABLE 12.3 ABBREVIATED CHRONOLOGY FOR HOE CREEK I

DATES	DECIMAL DAYS	EVENT	INJECTION WELL	PRODUCTION WELL
10-15-76	289	Ignition	P-1	I-0
10-15-76 to 10-26-76	289 - 300	Forward Gasification	P-1	I-0
10-26-76	300	Experiment Teminated	--	--

TABLE 12.4 LLNL - HOE CREEK I
PROCESS DATA SOURCES

ITEM	COMPUTER FILE NAME - POSITION	DESCRIPTION
Injection Rate	!INJF -2	Air rate - scfm - [HCI1 Lines (406-500) Col. 2.
Production Rate	!PRF -2	Product rate - scfm - [HCI1 Lines (505-615) Col. 2.
Gas Composition	!GAS	Wet composition - [HCI1 Lines (621-940) Col. 2-9.
	-2	Mole fraction - N2
	-3	Mole fraction - H2O
	-4	Mole fraction - H2
	-5	Mole fraction - CH4
	-6	Mole fraction - CO
	-7	Mole fraction - CO2
	-8	Mole fraction - C2H6
	-9	Ratio TAR/H2O
H_2O/DRY	!GAS -3	Calculated from wet composition
TAR/DRY	!GAS -9	Calculated from wet composition
Injection Pressure	!PRES -9	Injection meter pressure - psia - [HCIP Lines (9-1900) Col. 6.
	!INJTP -3	Injection well pressure - psia - [HCI1 Lines (6-84) Col. 3.
Production Pressure	!PRTP -3	Production well pressure - psia - [HCI1 Lines (90-169) col. 6.
Injection Temperature	!INJTP -2	Injection well temperature - Celsius - [HCI1 Lines (6-84) Col. 5.
Production Temperature	!PRTP -2	Product well temperature - Celsius - [HCI1 Lines (90-169) Col. 5.

Table 12.5

HOE CREEK I - FULL EXPERIMENT
289.70 TO 300.50

TIME (days)	10.797	
Average product heat of combustion (kJ/mol)	90.	
Total flows (Mmols)		
Injection	11.9	
Production	22.6	
Total dry gas production (Mmols)	15.7	
Coal		(+Char)
(Mg)	111.8	(178.2)
(Gas loss corrected Mg)	119.1	(189.9)
Dry gas composition		
AR	.0071	
N2	.5532	
O2	0.0000	
H2	.1732	
CH4	.0161	
CO	.0888	
CO2	.1607	
C2H4	0.0000	
C2H6	.0008	
C6	0.0000	
H10	0.0000	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.4385	
Tar/dry	.0023	
Reaction stoichiometry		(+Char)
O2/Coal	.517	(.324)
Char/Coal	0.000	(.373)
H2O/Coal	.312	(.052)
Gas recovery (%)	93.2	
Energy distribution (%)		(+Char)
Combustible gas	72.4	(45.4)
Combustible tar	9.2	(5.7)
Heat loss in-situ	-7.0	(-4.5)
Gas sensible heat	9.6	(6.0)
Net steam	15.5	(9.7)
Char + ash sensible heat	.2	(1.8)
Char combustion energy	0.0	(35.8)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	606.	

HOE CREEK I - FULL EXPERIMENT
289.70 TO 300.50

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	82.8	(132.0)
(Mmol)	4.5	(7.2)
Density (kG/M**3)	1350.	
Energy in consumed coal (TJ)	2.0	(3.1)
Water parameters (mol/s)		(+Char)
Insitu influx	6.86	(4.56)
From consumed coal	2.00	(3.20)
Consumed in reactions	1.51	(.40)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	221.	
Production	147.	
Average temperatures (deg c)		
Injection	36.0	
Production	272.9	
Average gas flows (mol/s)		
Injection	12.8	
Production	24.2	

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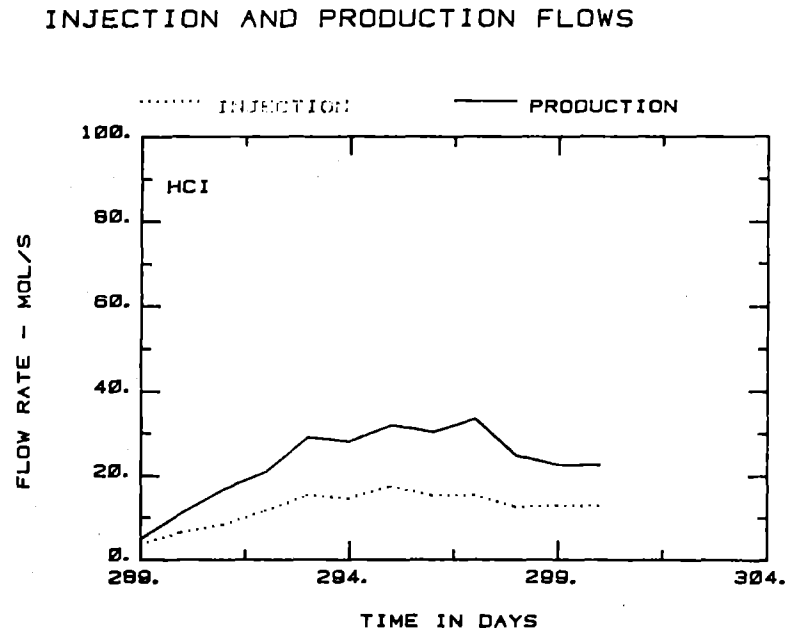


Figure 12.2 !RED items 90 and 91 versus time.

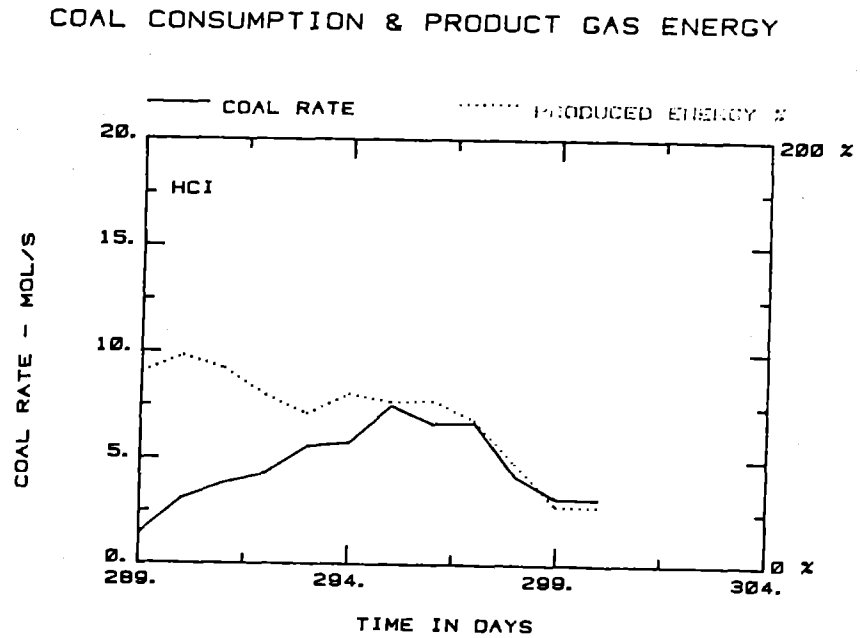


Figure 12.3 !RED item 44 and item 74 x 100 versus time.

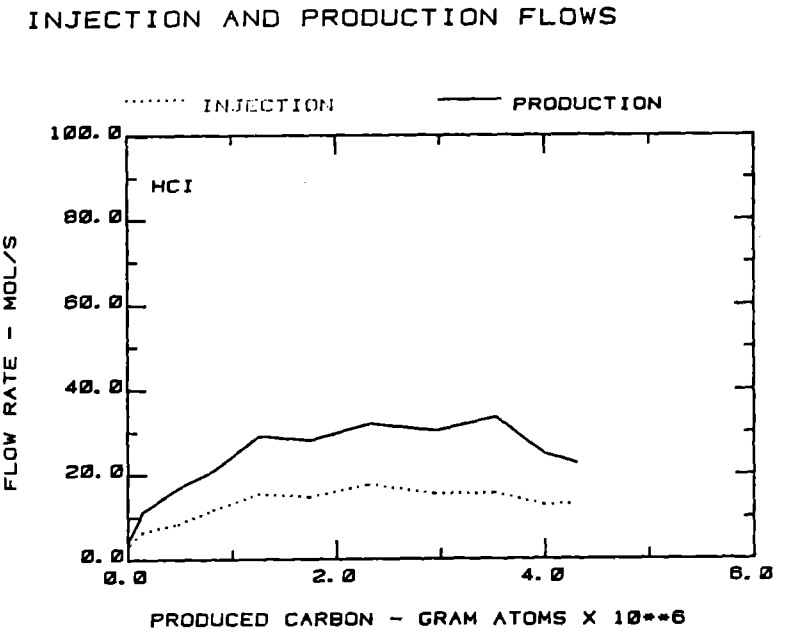


Figure 12.4 !RED items 90 and 91 versus item 133.

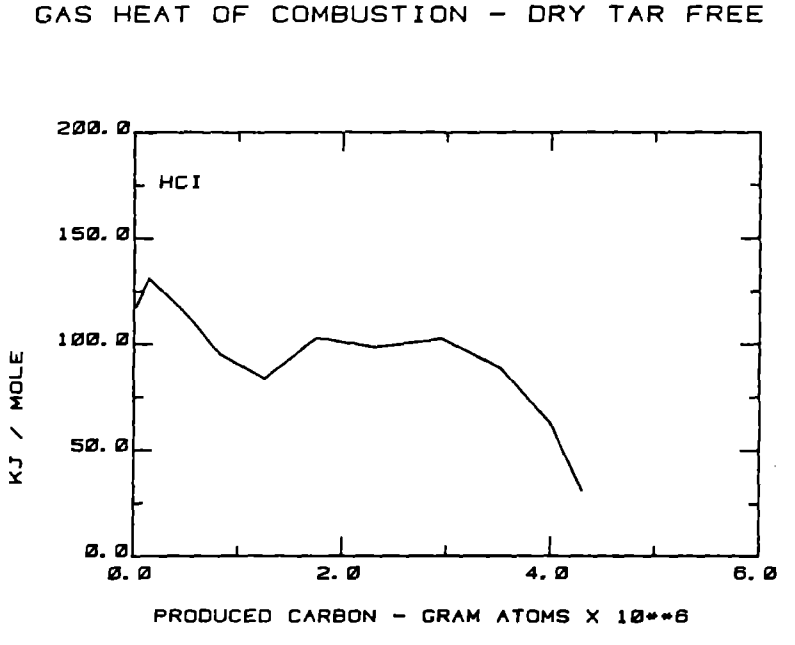


Figure 12.5 !RED items 81 versus item 133.

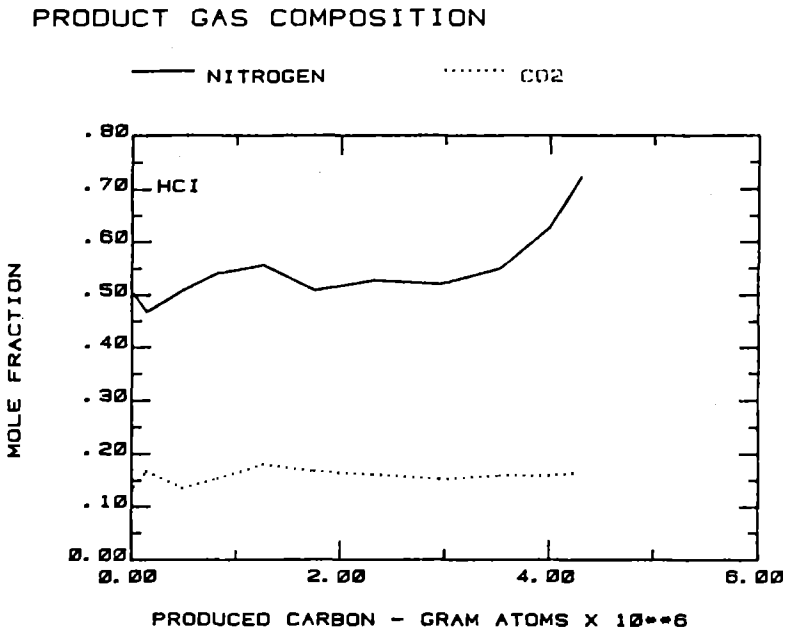


Figure 12.6 !RED items 11 and 16 versus item 133.

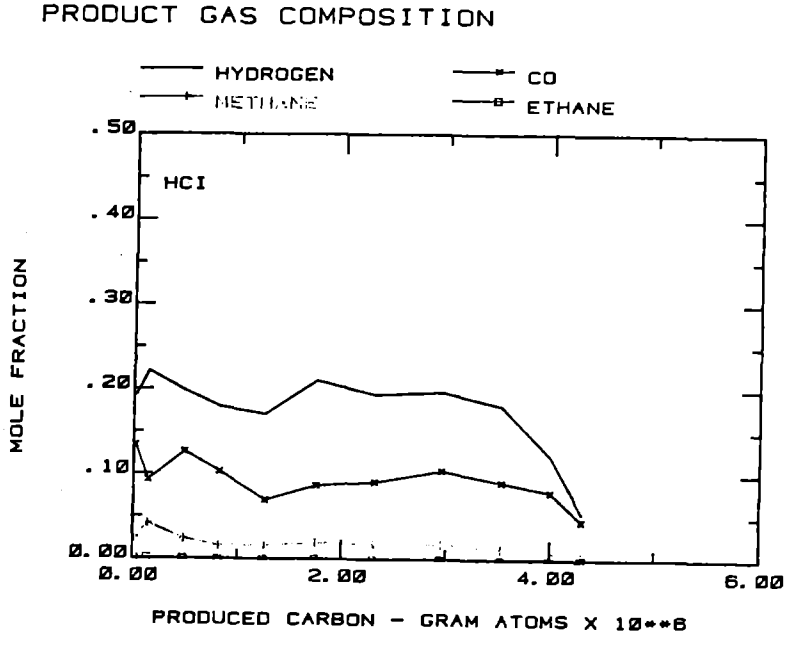


Figure 12.7 !RED items 13, 14, 15 and 18 versus item 133

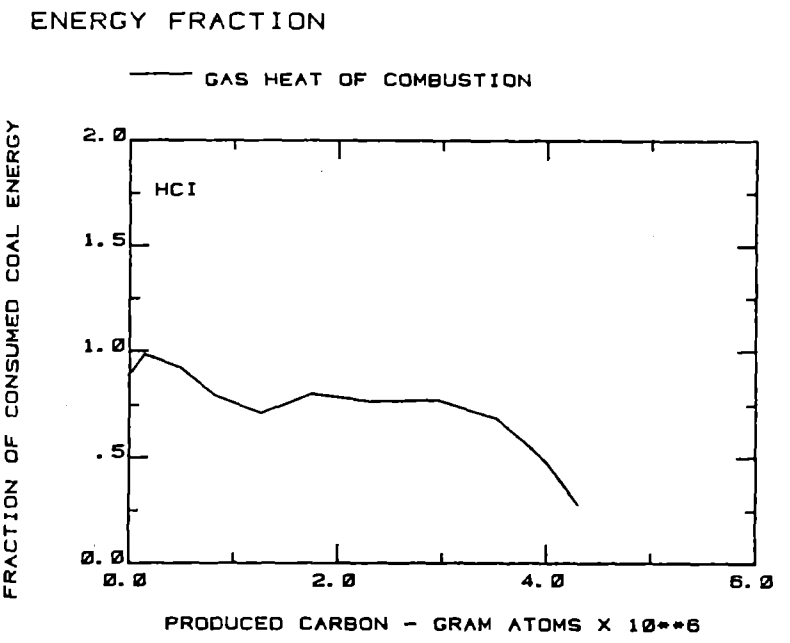


Figure 12.8 !RED item 74 versus item 133.

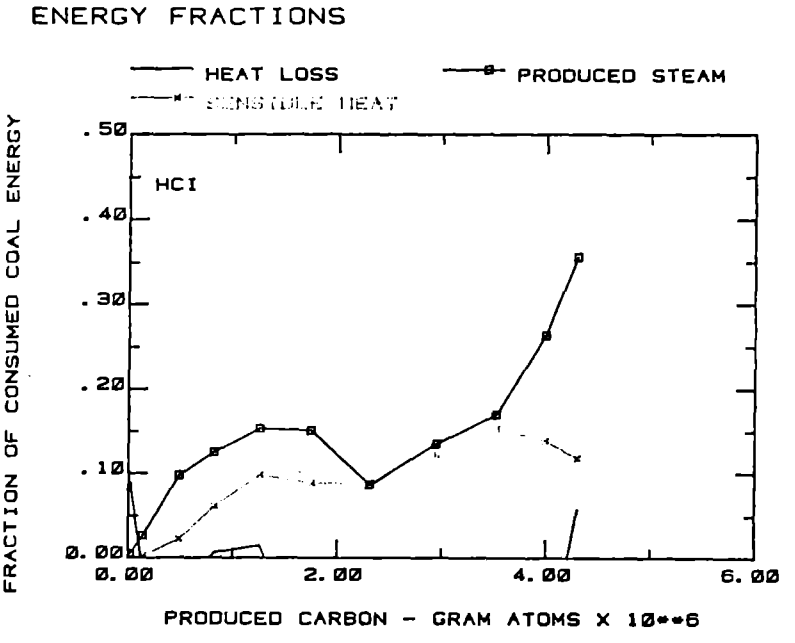


Figure 12.9 !RED items 75 - 78 versus item 133.

WATER INFLUX

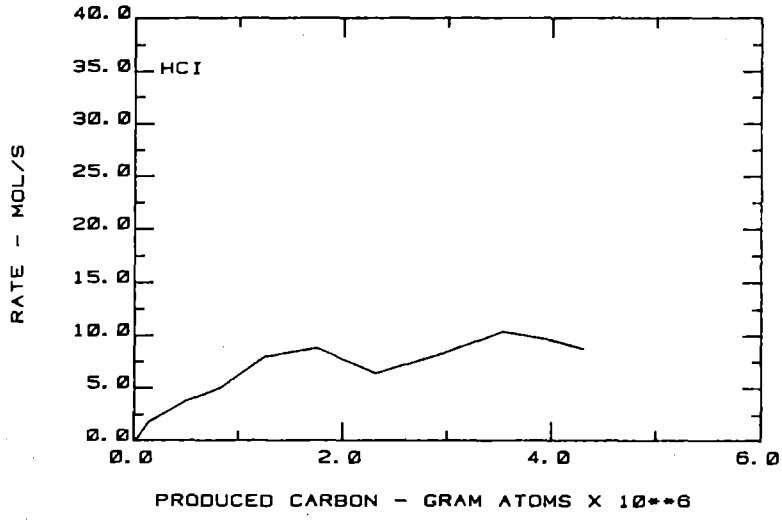


Figure 12.10 !RED item 47 versus item 133.

MODIFIED COAL PRODUCTION

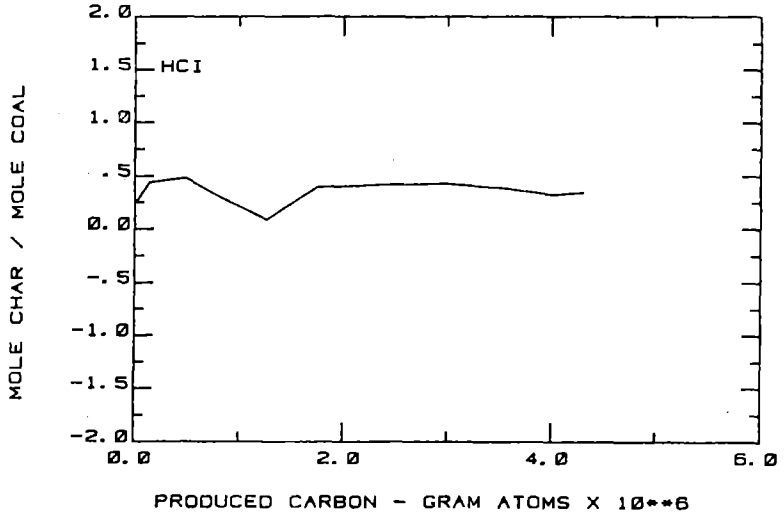


Figure 12.11 !RED item 63 versus item 133.

OXYGEN UTILIZATION

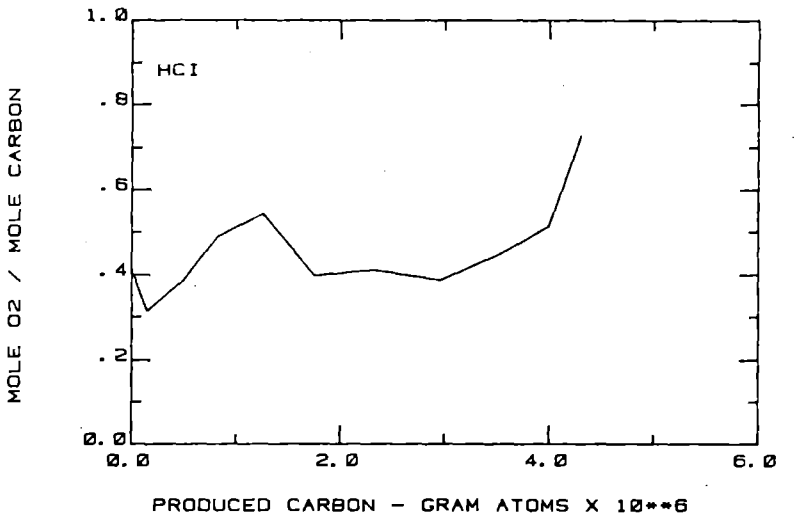


Figure 12.12 !RED item 60 versus item 133.

GAS HEAT OF COMBUSTION PER MOLE OF O2

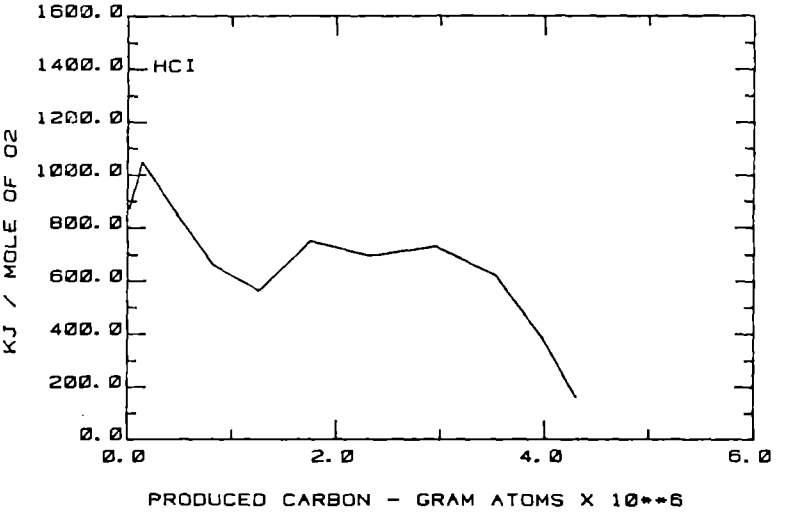


Figure 12.13 !RED item 84 versus item 133.

Hoe Creek I References

12.1 Hill, R.W., and Thorsness, C.B., "Results from an In Situ Coal Gasification Experiment Involving Explosive Fracturing: Hoe Creek Experiment No. 1," Lawrence Livermore Laboratory, Rept. UCRL-52229 (1977).

HOE CREEK II

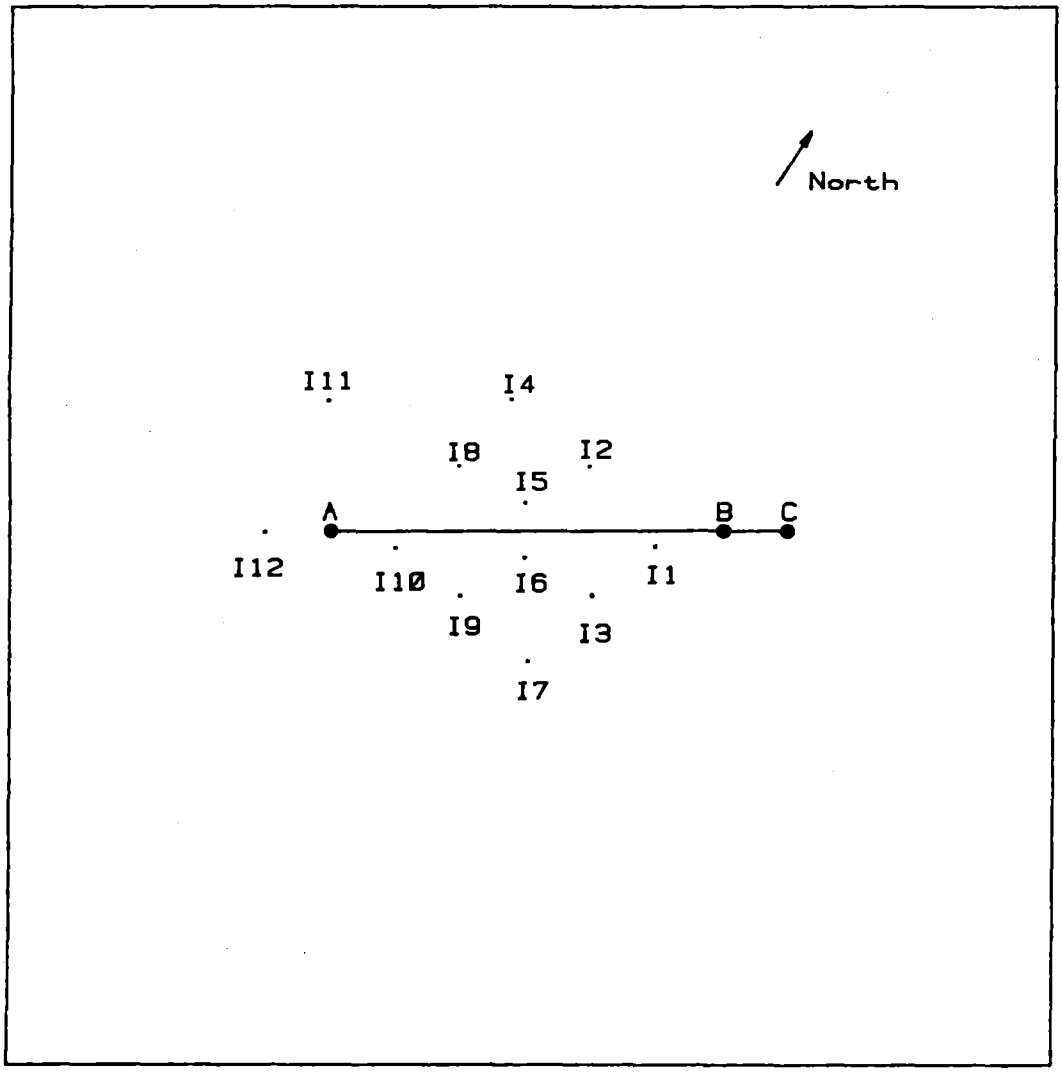
Chronology

The Hoe Creek II well layout is shown in Figure 13.1. Wells A and B, 15 m (50 ft) apart were the main injection and production wells, respectively. Well C was originally designed as a dewatering well, but was used during the experiment as an alternate production well. Air flow testing began on October 4, 1977 with successful ignition at well B on October 14. The reverse combustion link to well C was completed on October 16 and to well A on October 28. Forward gasification began on October 28 and proceeded to December 25, 1977. During forward gasification a short oxygen/steam injection experiment was carried out from October 10-12.[13.1] (An abbreviated chronology for Hoe Creek II is shown in Table 13.1).

The Data

The Hoe Creek II data was collected and stored on the computer in files similar to !EXP and !RED. Table 13.2 summarizes the data sources used to construct !EXP.

Results from the experiment are shown in Tables 13.3 through 13.7 and Figures 13.2 through 13.13.



SCALE - 50 METER SQUARE

Figure 13.1 Well layout for Hoe Creek II (HCII)

TABLE 13.1 ABBREVIATED CHRONOLOGY FOR HOE CREEK II

DATES	DECIMAL DAYS	EVENT	INJECTION WELL	PRODUCTION WELL
10-04-77	277	Begin Air Flow Testing	A,C	B
10-14-77 to 10-16-77	287 - 289	Reverse Combustion to C	C	B
10-16-77 to 10-28-77	289 - 301	Reverse Combustion to A	A	B,C
10-28-77 to 11-10-77	301 - 314	Air Forward Gasification	A	B
11-10-77 to 11-12-77	314 to 316	Oxygen Gasification Experiment	A	C
11-12-77 to 12-25-77	316 - 359	Air Forward Gasification	A	B,C

TABLE 13.2 LLNL - HOE CREEK II
PROCESS DATA SOURCES

ITEM	COMPUTER FILE NAME - POSITION	DESCRIPTION
Injection Rate	!FLO -2	Air meter - Moles/sec
	-6	Steam meter - Moles/sec
	-7	Oxygen meter - Moles/sec
	!FLM -3	Air meter status
	-6	Steam meter status
	-7	Oxygen meter status
Production Rate	!FLO -3	Main production meter - Moles/sec
	-4	C-well production meter - Moles/sec
	!FLM -4	Main production meter status
	-5	C-well production meter status
Gas Composition	!GCDAT -2	Mole fraction - N2
	-3	Mole fraction - O2
	-4	Mole fraction - H2
	-5	Mole fraction - CH4
	-6	Mole fraction - CO
	-7	Mole fraction - CO2
	-8	Mole fraction - C2H4
	-9	Mole fraction - C2H6
	-10	Mole fraction - C3H6
	-11	Mole fraction - C3H8
	-12	Mole fraction - C5H12
H_2O/DRY	!HUMN -2	Condenser - Ratio
TAR/DRY	!HUMN -3	Condenser - Ratio
Injection Pressure	!VIDAT -162	A wellhead pressure - psia
Production Pressure	!VIDAT -163	B wellhead pressure - psia
Injection Temperature	!VIDAT -132	Air injection meter - Main side - Celsius
	-133	Air injection meter - Bypass side - Celsius
	-138	Oxygen injection meter - Celsius (Choose based on meter status)
Production Temperature	!VIDAT -134	Production meter - Main side - Celsius
	-135	Production meter - Bypass side - Celsius (Choose based on meter status)

Table 13.3

HOE CREEK II - REVERSE BURN
287.40 TO 301.39

TIME (days)	13.997	
Average product heat of combustion (kJ/mol)	85.	
Total flows (Mmols)		
Injection	8.6	
Production	2.3	
Total dry gas production (Mmols)	1.8	
Coal		(+Char)
(Mg)	12.1	(26.7)
(Gas loss corrected Mg)	70.5	(156.0)
Dry gas composition		
AR	.0079	
N2	.6168	
O2	.0033	
H2	.1200	
CH4	.0236	
CO	.0427	
CO2	.1749	
C2H4	.0012	
C2H6	.0020	
C6	.0031	
H10	.0045	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.2813	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.623	(.282)
Char/Coal	0.000	(.548)
H2O/Coal	.292	(-.079)
Gas recovery (%)	16.7	
Energy distribution (%)		(+Char)
Combustible gas	74.1	(33.5)
Combustible tar	0.0	(0.0)
Heat loss in-situ	14.1	(6.2)
Gas sensible heat	.7	(.3)
Net steam	10.7	(4.8)
Char + ash sensible heat	.2	(2.6)
Char combustion energy	0.0	(52.6)
Cooling water to steam	.0	(.0)
Product heat of combustion per mole O2 (kJ/mol)	515.	

HOE CREEK II - REVERSE BURN
287.40 TO 301.39

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	8.9	(19.8)
(Mmol)	.5	(1.1)
Density (kG/M**3)	1350.	
Energy in consumed coal (TJ)	.2	(.5)
Water parameters (mol/s)		(+Char)
Insitu influx	.38	(-.01)
From consumed coal	.17	(.37)
Consumed in reactions	.12	(-.07)
Injected	0.00	
Prod gas cooling	.00	
Average pressures (kPa)		
Injection	548.	
Production	320.	
Average temperatures (deg c)		
Injection	35.6	
Production	0.0	
Average gas flows (mol/s)		
Injection	7.2	
Production	1.9	

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Table 13.4

HOE CREEK II - FORWARD BURN TO 02
301.40 TO 314.59

TIME (days)	13.197	
Average product heat of combustion (kJ/mol)	96.	
Total flows (Mmols)		
Injection	36.3	
Production	62.1	
Total dry gas production (Mmols)	43.6	
Coal		(+Char)
(Ms)	344.5	(516.6)
(Gas loss corrected Ms)	384.1	(576.0)
Dry gas composition		
AR	.0074	
N2	.5780	
02	.0000	
H2	.1348	
CH4	.0191	
CO	.0915	
CO2	.1605	
C2H4	.0017	
C2H6	.0011	
C6	.0024	
H10	.0035	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.4214	
Tar/dry	.0031	
Reaction stoichiometry		(+Char)
O2/Coal	.488	(.326)
Char/Coal	0.000	(.333)
H2O/Coal	.217	(.016)
Gas recovery (%)	88.9	
Energy distribution (%)		(+Char)
Combustible gas	69.4	(46.3)
Combustible tar	11.1	(7.4)
Heat loss in-situ	-.4	(-.3)
Gas sensible heat	6.1	(4.1)
Net steam	13.1	(8.7)
Char + ash sensible heat	.2	(1.6)
Char combustion energy	0.0	(31.9)
Cooling water to steam	.3	(.2)
Product heat of combustion per mole O2 (kJ/mol)	616.	

HOE CREEK II - FORWARD BURN TO 02
301.40 TO 314.59

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	255.2	(382.7)
(Mmol)	13.9	(20.8)
Density (kG/M**3)	1350.	
Energy in consumed coal (TJ)	6.0	(9.0)
Water parameters (mol/s)		(+Char)
Insitu influx	13.34	(8.47)
From consumed coal	5.05	(7.58)
Consumed in reactions	2.64	(.29)
Injected	0.00	
Prod gas cooling	.36	
Average pressures (kPa)		
Injection	362.	
Production	278.	
Average temperatures (deg c)		
Injection	54.8	
Production	223.8	
Average gas flows (mol/s)		
Injection	31.9	
Production	54.5	

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Table 13.5

HOE CREEK II - OXYGEN BURN
314.95 TO 316.49

TIME (days)	1.550	
Average product heat of combustion (kJ/mol)	235.	
Total flows (Mmols)		
Injection	2.1	
Production	5.9	
Total dry gas production (Mmols)	3.3	
Coal		(+Char)
(Ms)	56.5	(56.5)
(Gas loss corrected Ms)	54.5	(54.5)
Dry gas composition		
AR	.0000	
N2	.0009	
O2	.0001	
H2	.3675	
CH4	.0570	
CO	.2269	
CO2	.3388	
C2H4	.0003	
C2H6	.0023	
C6	.0025	
H10	.0037	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.7728	
Tar/dry	.0055	
Reaction stoichiometry		(+Char)
O2/Coal	.396	(.396)
Char/Coal	0.000	(0.000)
H2O/Coal	.322	(.322)
Gas recovery (%)	103.6	
Energy distribution (%)		(+Char)
Combustible gas	78.3	(78.3)
Combustible tar	9.2	(9.2)
Heat loss in-situ	1.1	(1.3)
Gas sensible heat	1.7	(1.7)
Net steam	8.4	(8.4)
Char + ash sensible heat	.2	(.2)
Char combustion energy	0.0	(0.0)
Cooling water to steam	1.0	(1.0)
Product heat of combustion per mole O2 (kJ/mol)	857.	

HOE CREEK II - OXYGEN BURN
314.95 TO 316.49

Injection gas composition		
AR	.0058	
N2	.4541	
O2	.4093	
STEAM	.1308	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	41.9	(41.9)
(Mmol)	2.3	(2.3)
Density (kG/M**3)	1350.	
Energy in consumed coal (TJ)	1.0	(1.0)
Water parameters (mol/s)		(+Char)
Insitu influx	12.47	(15.69)
From consumed coal	7.06	(7.06)
Consumed in reactions	5.48	(5.48)
Injected	0.00	
Prod gas cooling	1.73	
Average pressures (kPa)		
Injection	350.	
Production	324.	
Average temperatures (deg c)		
Injection	48.5	
Production	215.8	
Average gas flows (mol/s)		
Injection	15.9	
Production	43.7	

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Table 13.6

HOE CREEK II - END OF O2 TO SHUT DOWN
316.70 TO 359.78

TIME (days)	43.089	
Average product heat of combustion (kJ/mol)	93.	
Total flows (Mmols)		
Injection	172.5	
Production	245.0	
Total dry gas production (Mmols)	183.5	
Coal		(+Char)
(Mg)	1391.8	(1452.7)
(Gas loss corrected Mg)	1814.5	(1893.8)
Dry gas composition		
AR	.0073	
N2	.5690	
O2	0.0000	
H2	.1371	
CH4	.0236	
CO	.0707	
CO2	.1850	
C2H4	.0005	
C2H6	.0015	
C6	.0022	
H10	.0032	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.3340	
Tar/dry	.0010	
Reaction stoichiometry		(+Char)
O2/Coal	.501	(.480)
Char/Coal	0.000	(.042)
H2O/Coal	.238	(.212)
Gas recovery (%)	77.6	
Energy distribution (%)		(+Char)
Combustible gas	69.9	(66.9)
Combustible tar	4.0	(3.8)
Heat loss in-situ	7.6	(7.5)
Gas sensible heat	7.1	(6.8)
Net steam	9.3	(8.9)
Char + ash sensible heat	.2	(.3)
Char combustion energy	0.0	(4.0)
Cooling water to steam	1.8	(1.7)
Product heat of combustion per mole O2 (kJ/mol)	604.	

HOE CREEK II - END OF O2 TO SHUT DOWN
316.70 TO 359.78

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	1031.0	(1076.1)
(Mmol)	56.1	(58.6)
Density (kG/M**3)	1350.	
Energy in consumed coal (TJ)	24.3	(25.4)
Water parameters (mol/s)		(+Char)
Insitu influx	11.17	(10.64)
From consumed coal	6.25	(6.53)
Consumed in reactions	3.59	(3.33)
Injected	0.00	
Prod gas cooling	2.63	
Average pressures (kPa)		
Injection	298.	
Production	279.	
Average temperatures (deg c)		
Injection	65.5	
Production	280.3	
Average gas flows (mol/s)		
Injection	46.3	
Production	65.8	

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Table 13.7

HOE CREEK II - FULL EXPERIMENT
287.40 TO 359.78

TIME (days)	72.382	
Average product heat of combustion (kJ/mol)	95.	
Total flows (Mmols)		
Injection	220.7	
Production	316.8	
Total dry gas production (Mmols)	233.0	
Coal		(+Char)
(Mg)	1813.5	(2062.2)
(Gas loss corrected Mg)	2337.9	(2658.4)
Dry gas composition		
AR	.0072	
N2	.5627	
O2	.0000	
H2	.1397	
CH4	.0232	
CO	.0765	
CO2	.1830	
C2H4	.0007	
C2H6	.0014	
C6	.0022	
H10	.0032	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.3583	
Tar/dry	.0015	
Reaction stoichiometry		(+Char)
O2/Coal	.496	(.436)
Char/Coal	0.000	(.121)
H2O/Coal	.236	(.161)
Gas recovery (%)	77.5	
Energy distribution (%)		(+Char)
Combustible gas	69.9	(61.5)
Combustible tar	5.5	(4.9)
Heat loss in-situ	6.1	(5.5)
Gas sensible heat	6.7	(5.9)
Net steam	9.9	(8.7)
Char + ash sensible heat	.2	(.7)
Char combustion energy	0.0	(11.6)
Cooling water to steam	1.5	(1.3)
Product heat of combustion per mole O2 (kJ/mol)	611.	

HOE CREEK II - FULL EXPERIMENT
287.40 TO 359.78

Injection gas composition		
AR	.0100	
N2	.7763	
O2	.2118	
STEAM	.0020	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	1343.4	(1527.6)
(Mmol)	73.1	(83.2)
Density (kG/M**3)	1350.	
Energy in consumed coal (TJ)	31.7	(36.0)
Water parameters (mol/s)		(+Char)
Insitu influx	9.37	(8.23)
From consumed coal	4.85	(5.52)
Consumed in reactions	2.76	(2.14)
Injected	0.00	
Prod gas cooling	1.74	
Average pressures (kPa)		
Injection	313.	
Production	280.	
Average temperatures (deg c)		
Injection	62.8	
Production	265.7	
Average gas flows (mol/s)		
Injection	35.3	
Production	50.7	

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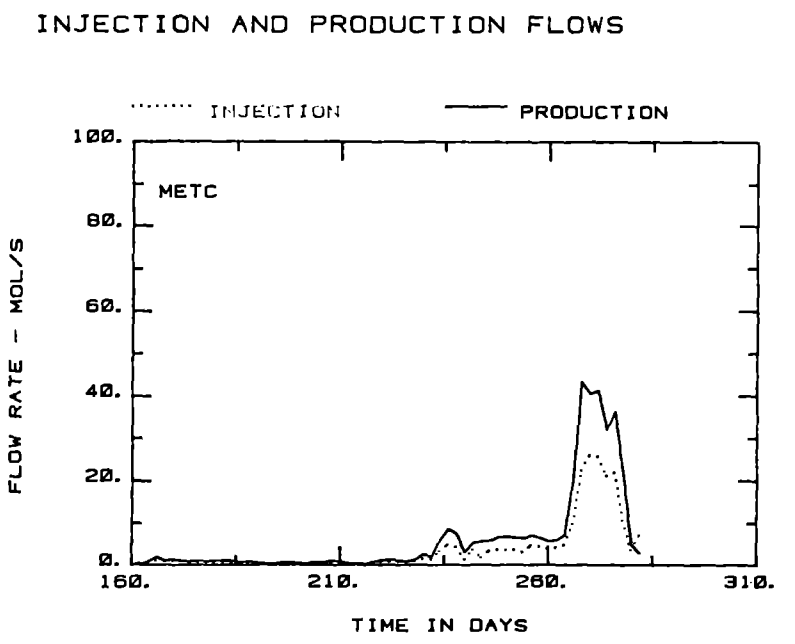


Figure 13.2 !RED items 90 and 91 versus time.

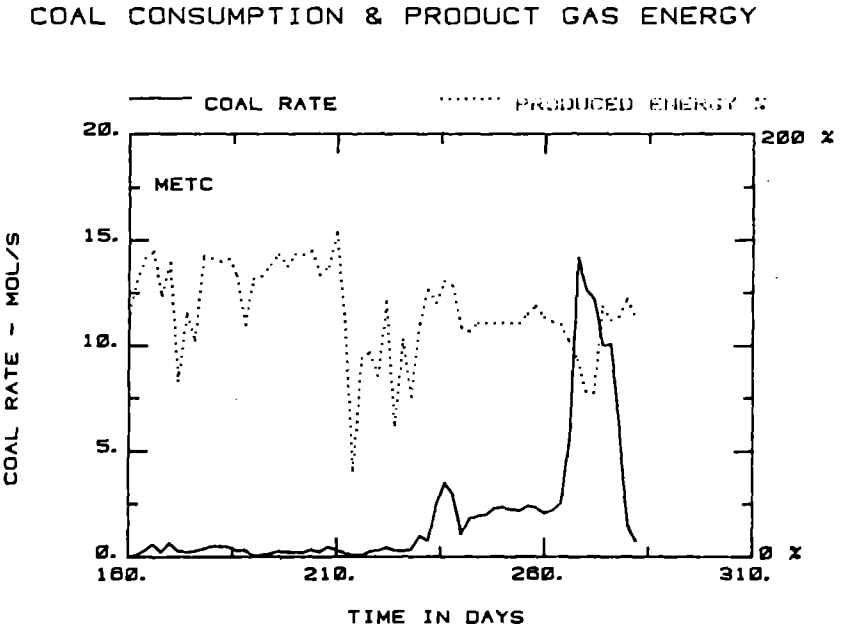


Figure 13.3 !RED item 44 and item 74 x 100 versus time.

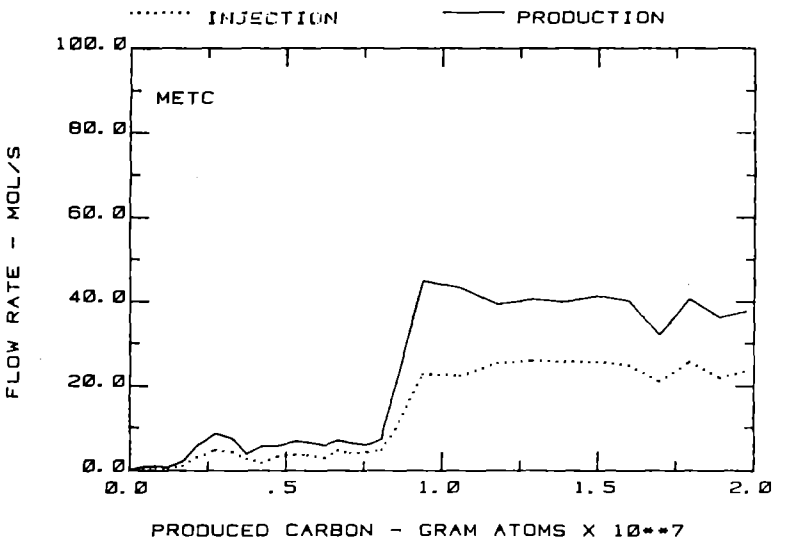


Figure 13.4 !RED items 90 and 91 versus item 133.

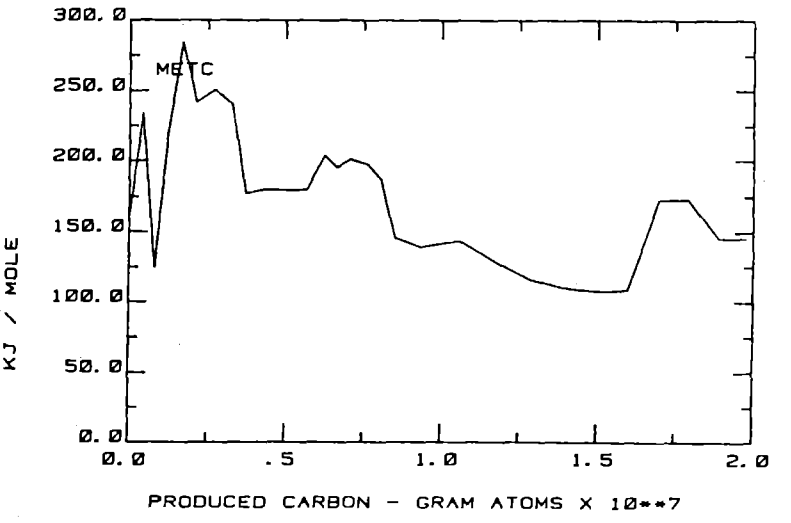


Figure 13.5 !RED items 81 versus item 133.

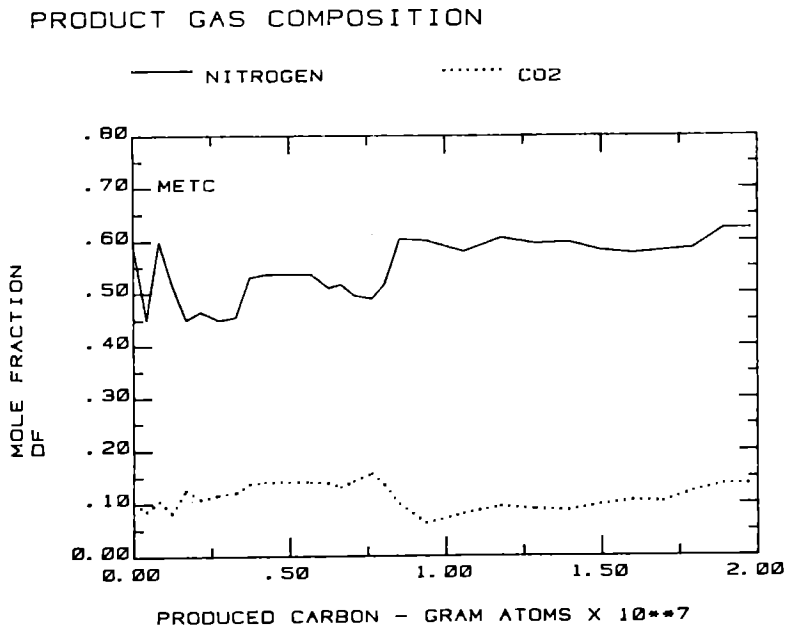


Figure 13.6 !RED items 11 and 16 versus item 133.

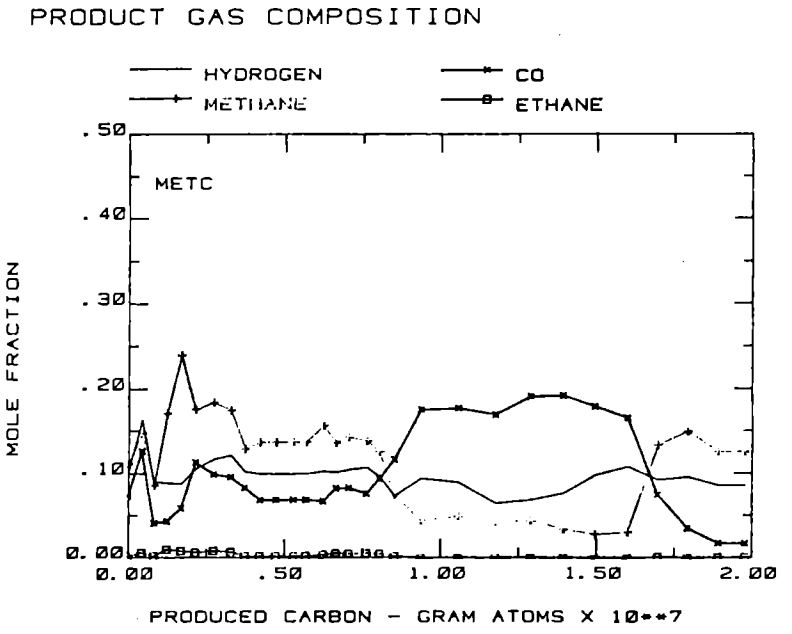


Figure 13.7 !RED items 13, 14, 15 and 18 versus item 133.

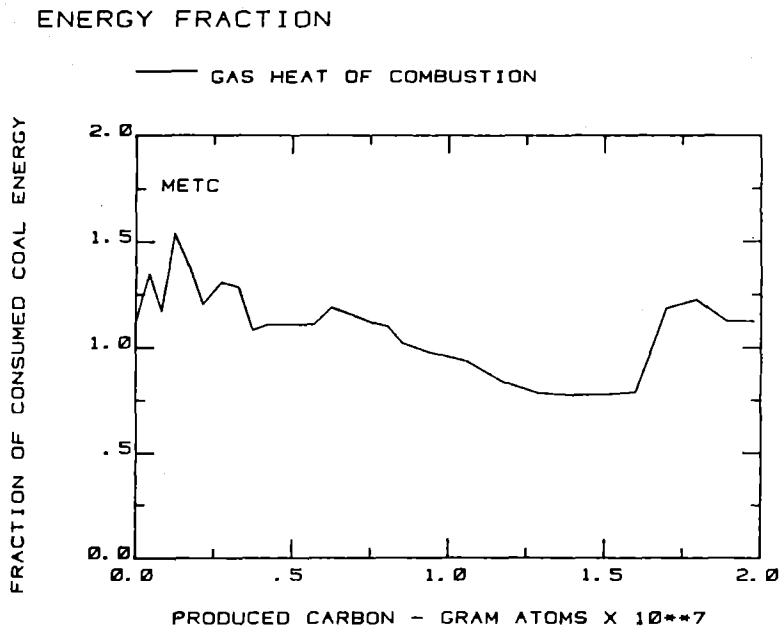


Figure 13.8 !RED item 74 versus item 133.

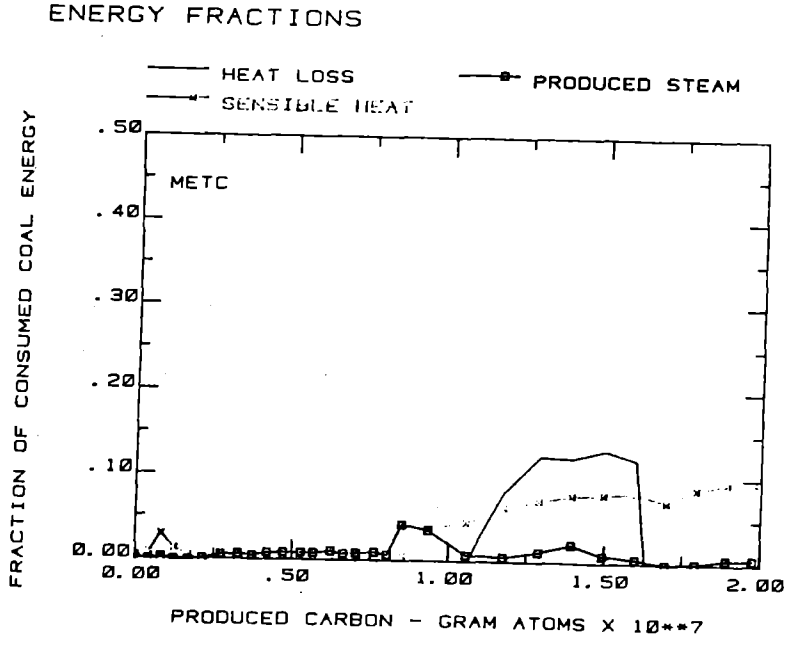


Figure 13.9 !RED items 75 - 78 versus item 133.

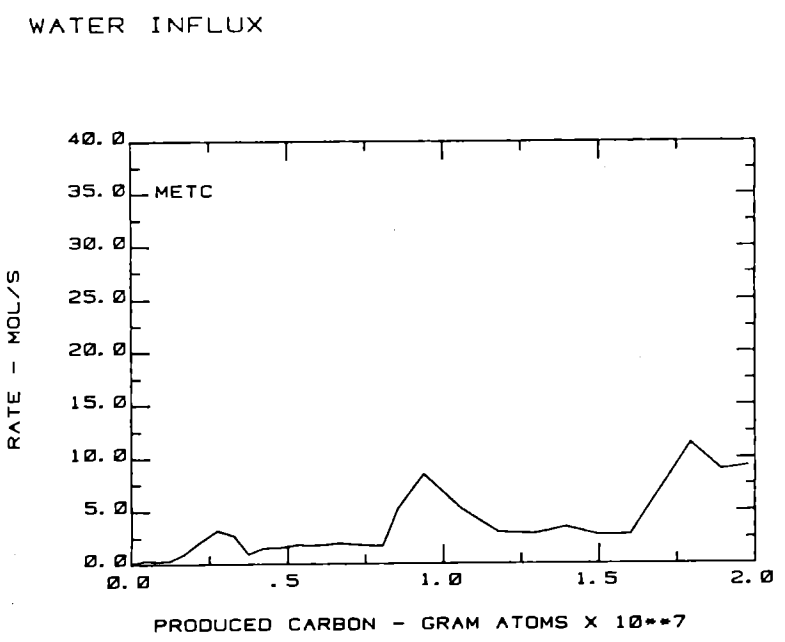


Figure 13.10 !REU item 47 versus item 133.

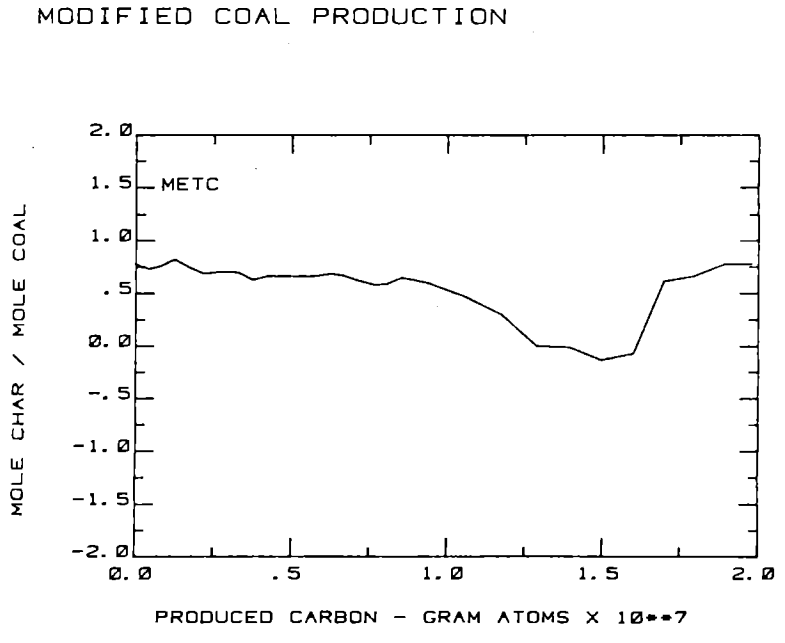


Figure 13.11 !RED item 63 versus item 133.

OXYGEN UTILIZATION

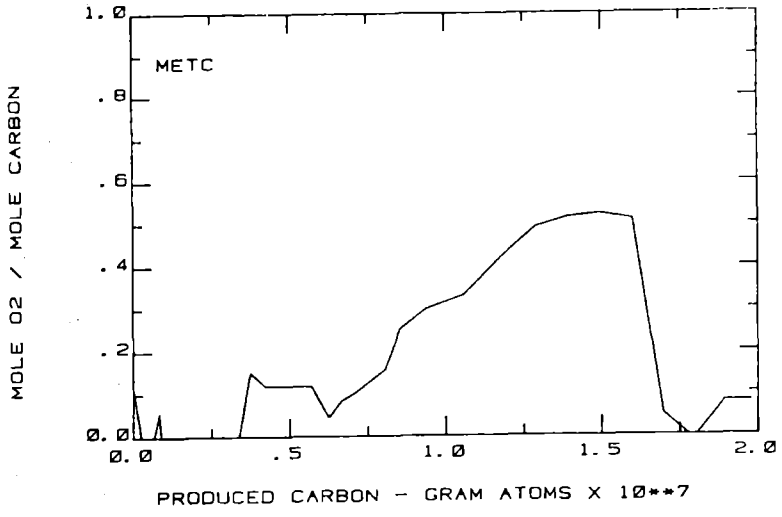


Figure 13.12 !RED item 60 versus item 133.

GAS HEAT OF COMBUSTION PER MOLE OF O2

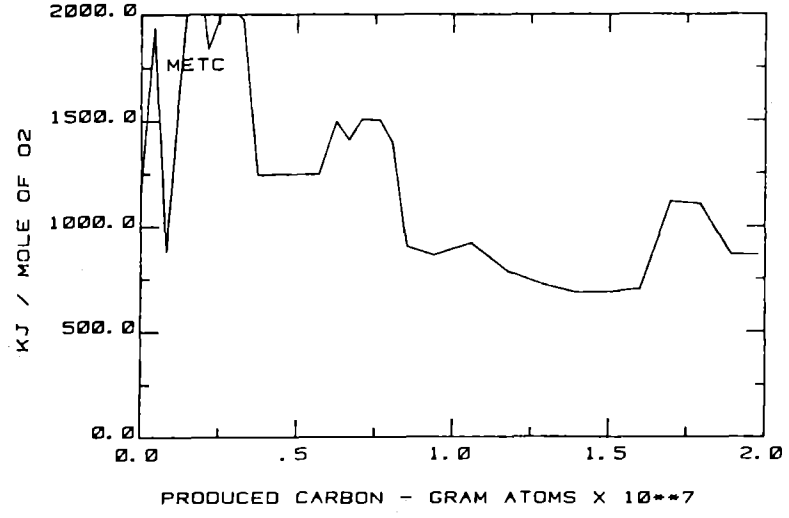


Figure 13.13 !RED item 84 versus item 133.

Hoe Creek II References

13.1 Thorsness, C.B., et al, "Hoe Creek No. 2: Underground Coal Gasification Experiment with Air and Oxygen/Steam Injection Periods," Lawrence Livermore National Laboratory Preprint UCRL-80921, (June 1978).

14. HOE CREEK III

Chronology

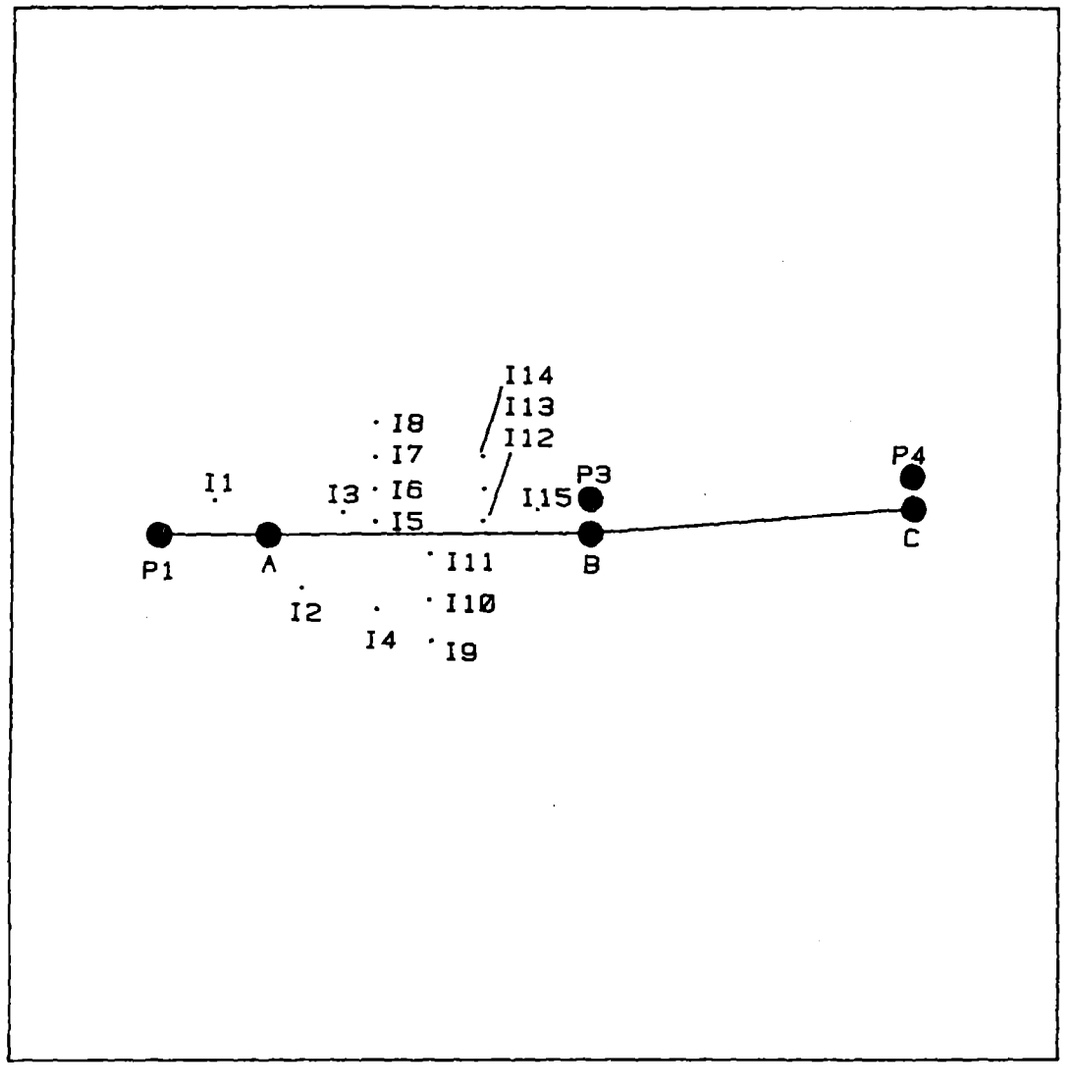
The Hoe Creek III experiment tested oxygen gasification along a horizontally drilled borehole. Five process wells A, B, C, P-1 and P-2 were drilled to intersect the borehole (DD-1), as shown in Figure 14.1.

Reverse combustion was begun on August 14, 1979 to enhance the horizontal hole between wells A and B. Air injection was in well A and production from well B. Forward gasification was initiated on August 14, 1979 with air injection in well A and production from well B. Due to a plugged oxygen lance in well A, the oxygen/steam phase of the experiment utilized well P-1 for injection beginning on August 27, 1979. The injection was switched to well A on August 14 after removal of the plug. However, this produced gasification of the overlying Felix No. 1 coal seam. Injection was returned to well P-1 on September 7, 1979. The experiment was terminated after 48 days of oxygen/steam injection on October 10, 1979. (A abbreviated chronology for Hoe Creek III is shown in Table 14.1).

The Data

The Hoe Creek III data was collected and stored on the computer in files similar to !EXP and !RED. Table 14.2 summarizes the data sources used to construct !EXP.

Results from the experiment are shown in Tables 14.3 through 14.6 and Figures 14.2 through 14.13.



SCALE - 100 METER SQUARE

Figure 14.1 Well layout for Hoe Creek III (HCIII)

TABLE 14.1 ABBREVIATED CHRONOLOGY FOR HOE CREEK III

DATES	DECIMAL DAYS	EVENTS	INJECTION WELL	PRODUCTION WELL
8-14-79	226	Ignition at Well B	A	B
8-14-79 to 8-17-79	226 - 229	Reverse Combustion Hole Enlargement	A	B
8-17-79 to 8-24-79	229 - 236	Air Forward Gasification	A	B
8-24-79 to 8-31-79	236 - 243	Oxygen Forward Gasification	P-1	B
8-31-79 to 9-07-79	243 - 250	Oxygen Forward Gasification	A	B
9-07-79 to 10-10-79	250 - 283	Oxygen Forward Gasification	P-1	B
10-10-79	283	Experiment Terminated	--	--

TABLE 14.2 LLNL - HOE CREEK III
PROCESS DATA SOURCES

ITEM	COMPUTER FILE NAME - POSITION	DESCRIPTION
Injection Rate	!FLO -23	Total injection rate - Moles/sec
Production Rate	!FLO -25	Total production rate - Moles/sec
Gas Composition	!GCDAT -5	Mole fraction - N2
	-6	Mole fraction - O2
	-7	Mole fraction - H2
	-8	Mole fraction - CH4
	-9	Mole fraction - CO
	-10	Mole fraction - CO2
	-11	Mole fraction - C2H4
	-12	Mole fraction - C2H6
	-13 to 27	Mole fraction - C6 -H10 components Constituents are: C3H6, C3H8, iso-butane, n-butane, 1-Butene, trans-butene-2, cis-butene-2, 1-3-butidiene, 3-methyl-butene, iso-pentane, n-pentane, n-hexane, iso-hexane (composite), C7H16 (composite), pentene-1.
	!MSDAT -2	Mass spec mole fraction - H2S
	!MSDAT -21	Mass spec mole fraction - O2 (Use mass spec O2)
H_2O/DRY	!HUM -12	Condenser - Ratio
TAR/DRY	!HUM -11	Condenser - Ratio
Injection Pressure	!FLO -61	A wellhead pressure - psia
Production Pressure	!FLO -62	B wellhead pressure - psia
Injection Temperature	!TCDAT -321	Air injection meter - Main side - Celsius
	-322	Air injection meter - Bypass side - Celsius
	-317	Oxygen injection meter - Main side - Celsius
	-318	Oxygen injection meter - Bypass side - Celsius (Choose based on meter status)
Production Temperature	!TCDAT -242	B wellhead temperature - Celsius

Table 14.3

HOE CREEK III - REVERSE BURN
226.50 TO 229.29

		(+Char)
TIME (days)	2.799	
Average product heat of combustion (kJ/mol)	72.	
Total flows (Mmols)		
Injection	1.0	
Production	1.2	
Total dry gas production (Mmols)	1.1	
Coal		(+Char)
(Mg)	6.4	(7.4)
(Gas loss corrected Mg)	6.8	(7.9)
Dry gas composition		
AR	.0075	
N2	.5819	
O2	.0585	
H2	.1145	
CH4	.0101	
CO	.0967	
CO2	.1293	
C2H4	.0007	
C2H6	.0004	
C6	.0004	
H10	.0001	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.1588	
Tar/dry	.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.786	(.683)
Char/Coal	0.000	(.131)
H2O/Coal	.119	(.053)
Gas recovery (%)	84.1	
Energy distribution (%)		(+Char)
Combustible gas	68.7	(59.7)
Combustible tar	.1	(.1)
Heat loss in-situ	21.4	(18.8)
Gas sensible heat	2.7	(2.4)
Net steam	-12.1	(-10.6)
Char + ash sensible heat	.2	(.7)
Char combustion energy	0.0	(12.5)
Cooling water to steam	18.8	(16.4)
Product heat of combustion per mole O2 (kJ/mol)	378.	

HOE CREEK III - REVERSE BURN
226.50 TO 229.29

		(+Char)
Injection gas composition		
AR	.0097	
N2	.7531	
O2	.2372	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	4.8	(5.5)
(Mmol)	.3	(.3)
Density (kG/M**3)	1350.	
Energy in consumed coal (TJ)	.1	(.1)
Water parameters (mol/s)		(+Char)
Insitu influx	-1.60	(-1.73)
From consumed coal	.44	(.51)
Consumed in reactions	.13	(.07)
Injected	0.00	
Prod gas cooling	1.99	
Average pressures (kPa)		
Injection	282.	
Production	242.	
Average temperatures (deg c)		
Injection	16.0	
Production	0.0	
Average gas flows (mol/s)		
Injection	4.2	
Production	5.1	

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Table 14.4

HOE CREEK III - AIR FORWARD BURN
229.30 TO 236.39

TIME (days)	7.098	
Average product heat of combustion (kJ/mol)	101.	
Total flows (Mmols)		
Injection	21.2	
Production	48.6	
Total dry gas production (Mmols)	31.8	
Coal		(+Char)
(Mg)	232.2	(363.1)
(Gas loss corrected Mg)	213.8	(334.4)
Dry gas composition		
AR	.0073	
N2	.5664	
O2	.0002	
H2	.1404	
CH4	.0245	
CO	.1123	
CO2	.1443	
C2H4	.0022	
C2H6	.0016	
C6	.0004	
H10	.0004	
H2S	.0001	
Product gas mole ratios		
H2O/dry	.5313	
Tar/dry	.0004	
Reaction stoichiometry		(+Char)
O2/Coal	.517	(.331)
Char/Coal	0.000	(.361)
H2O/Coal	.236	(.012)
Gas recovery (%)	108.7	
Energy distribution (%)		(+Char)
Combustible gas	79.0	(50.5)
Combustible tar	1.6	(1.0)
Heat loss in-situ	-9.2	(-5.9)
Gas sensible heat	10.0	(6.4)
Net steam	13.8	(8.8)
Char + ash sensible heat	.2	(1.8)
Char combustion energy	0.0	(34.6)
Cooling water to steam	4.5	(2.9)
Product heat of combustion per mole O2 (kJ/mol)	661.	

HOE CREEK III - AIR FORWARD BURN
229.30 TO 236.39

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	172.0	(268.9)
(Mmol)	9.4	(14.6)
Density (kG/M**3)	1350.	
Energy in consumed coal (TJ)	4.1	(6.3)
Water parameters (mol/s)		(+Char)
Insitu influx	18.02	(11.13)
From consumed coal	6.33	(9.90)
Consumed in reactions	3.60	(.29)
Injected	0.00	
Prod gas cooling	6.76	
Average pressures (kPa)		
Injection	291.	
Production	282.	
Average temperatures (deg c)		
Injection	45.9	
Production	298.9	
Average gas flows (mol/s)		
Injection	34.6	
Production	79.3	

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Table 14.5

HOE CREEK III - OXYGEN FORWARD BURN
236.40 TO 283.54

TIME (days)	47.138	
Average product heat of combustion (kJ/mol)	189.	
Total flows (Mmols)		
Injection	166.1	
Production	423.5	
Total dry gas production (Mmols)	192.4	
Coal		(+Char)
(Mg)	2949.7	(2949.7)
(Gas loss corrected Mg)	3655.4	(3655.4)
Dry gas composition		
AR	.0002	
N2	.0184	
O2	.0001	
H2	.3682	
CH4	.0506	
CO	.1132	
CO2	.4397	
C2H4	.0006	
C2H6	.0023	
C6	.0005	
H10	.0004	
H2S	.0058	
Product gas mole ratios		
H2O/dry	1.2003	
Tar/dry	.0006	
Reaction stoichiometry		(+Char)
O2/Coal	.537	(.537)
Char/Coal	0.000	(0.000)
H2O/Coal	.339	(.339)
Gas recovery (%)	81.0	
Energy distribution (%)		(+Char)
Combustible gas	71.6	(71.6)
Combustible tar	1.2	(1.2)
Heat loss in-situ	5.2	(4.7)
Gas sensible heat	8.4	(8.4)
Net steam	13.2	(13.2)
Char + ash sensible heat	.2	(.2)
Char combustion energy	0.0	(0.0)
Cooling water to steam	.7	(.7)
Product heat of combustion per mole O2 (kJ/mol)	577.	

HOE CREEK III - OXYGEN FORWARD BURN
236.40 TO 283.54

Injection gas composition		
AR	.0010	
N2	.0316	
O2	.4751	
STEAM	.4923	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	2185.0	(2185.0)
(Mmol)	119.0	(119.0)
Density (kG/M**3)	1350.	
Energy in consumed coal (TJ)	51.5	(51.5)
Water parameters (mol/s)		(+Char)
Insitu influx	35.89	(52.58)
From consumed coal	12.12	(12.12)
Consumed in reactions	9.89	(9.89)
Injected	0.00	
Prod gas cooling	1.91	
Average pressures (kPa)		
Injection	299.	
Production	135.	
Average temperatures (deg c)		
Injection	110.3	
Production	349.1	
Average gas flows (mol/s)		
Injection	40.8	
Production	104.0	

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Table 14.6

HOE CREEK III - FULL EXPERIMENT
226.50 TO 283.54

TIME (days)	57.036	
Average product heat of combustion (kJ/mol)	176.	
Total flows (Mmols)		
Injection	188.4	
Production	473.4	
Total dry gas production (Mmols)	225.3	
Coal		(+Char)
(Mg)	3188.3	(3320.1)
(Gas loss corrected Mg)	3876.1	(4036.4)
Dry gas composition		
AR	.0013	
N2	.0983	
O2	.0004	
H2	.3348	
CH4	.0467	
CO	.1130	
CO2	.3966	
C2H4	.0008	
C2H6	.0022	
C6	.0005	
H10	.0004	
H2S	.0050	
Product gas mole ratios		
H2O/dry	1.1010	
Tar/dry	.0006	
Reaction stoichiometry		(+Char)
O2/Coal	.536	(.515)
Char/Coal	0.000	(.040)
H2O/Coal	.331	(.331)
Gas recovery (%)	82.5	
Energy distribution (%)		(+Char)
Combustible gas	72.2	(69.3)
Combustible tar	1.2	(1.2)
Heat loss in-situ	4.2	(3.6)
Gas sensible heat	8.5	(8.2)
Net steam	13.2	(12.7)
Char + ash sensible heat	.2	(.3)
Char combustion energy	0.0	(3.8)
Cooling water to steam	1.0	(.9)
Product heat of combustion per mole O2 (kJ/mol)	583.	

HOE CREEK III - FULL EXPERIMENT
226.50 TO 283.54

Injection gas composition		
AR	.0021	
N2	.1198	
O2	.4439	
STEAM	.4342	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	2361.7	(2459.4)
(Mmol)	128.6	(133.9)
Density (kG/M**3)	1350.	
Energy in consumed coal (TJ)	55.7	(58.0)
Water parameters (mol/s)		(+Char)
Insitu influx	31.83	(45.53)
From consumed coal	10.82	(11.27)
Consumed in reactions	8.63	(8.98)
Injected	0.00	
Prod gas cooling	2.51	
Average pressures (kPa)		
Injection	298.	
Production	151.	
Average temperatures (deg c)		
Injection	103.5	
Production	343.0	
Average gas flows (mol/s)		
Injection	38.2	
Production	96.1	

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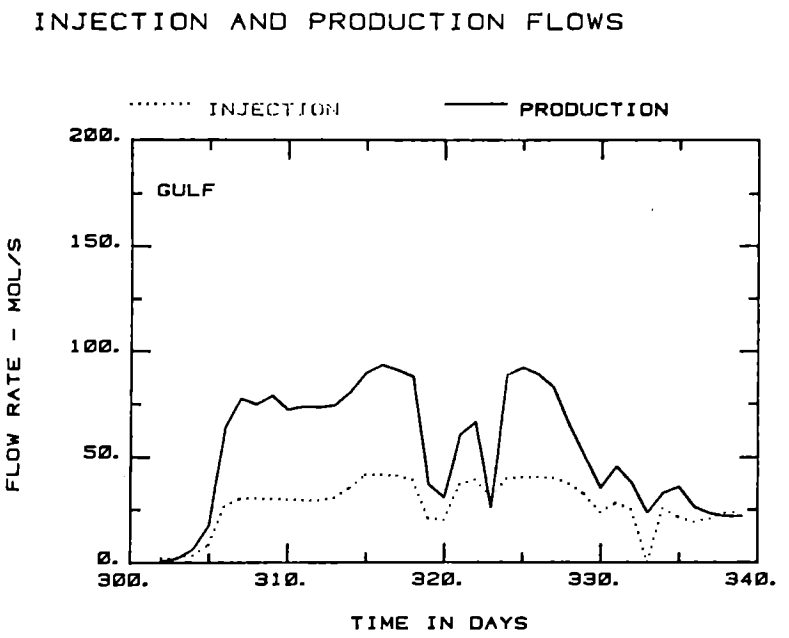


Figure 14.2 !RED items 90 and 91 versus time.

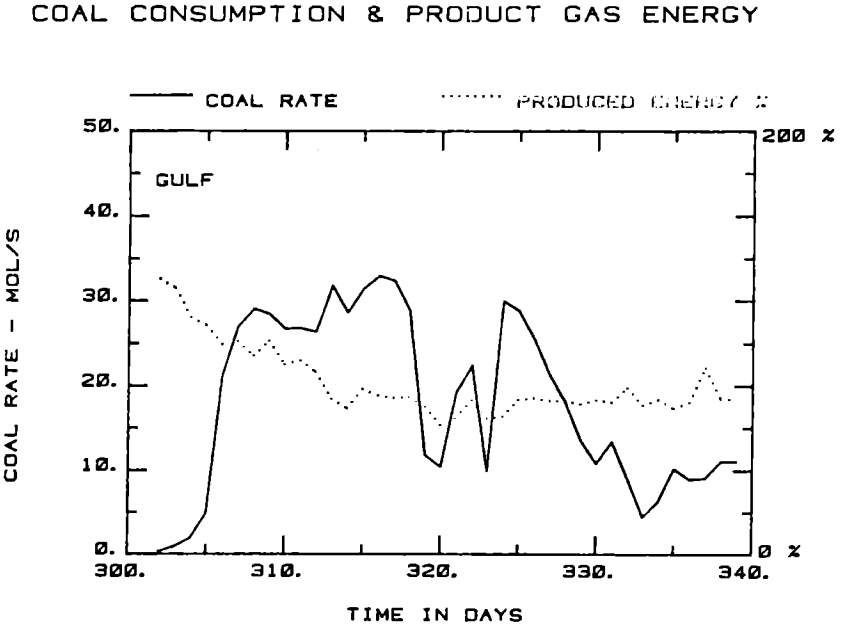


Figure 14.3 !RED item 44 and item 74 x 100 versus time.

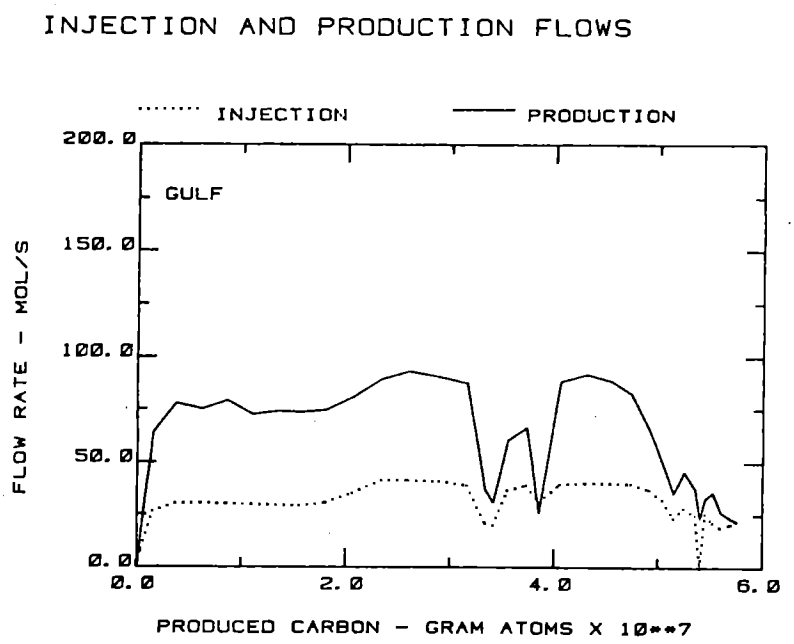


Figure 14.4 !RED items 90 and 91 versus item 133.

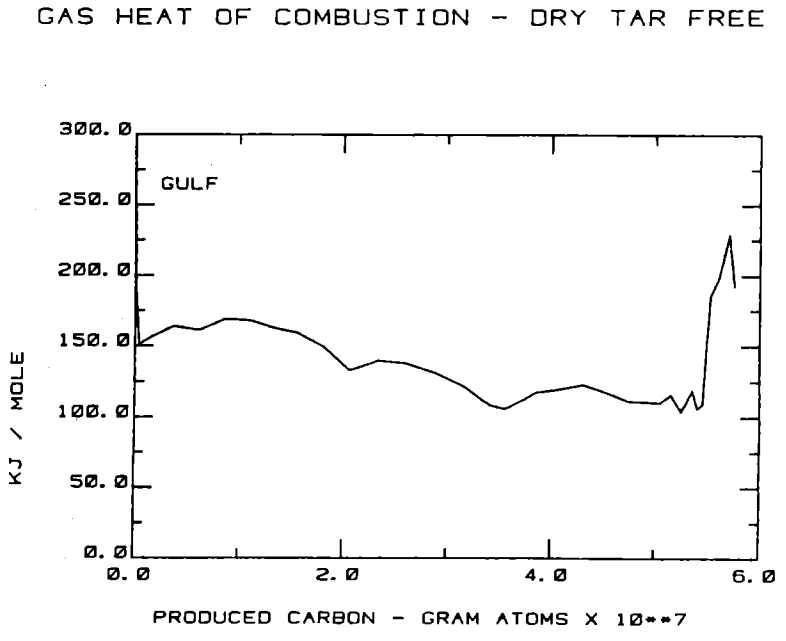


Figure 14.5 !RED items 81 versus item 133.

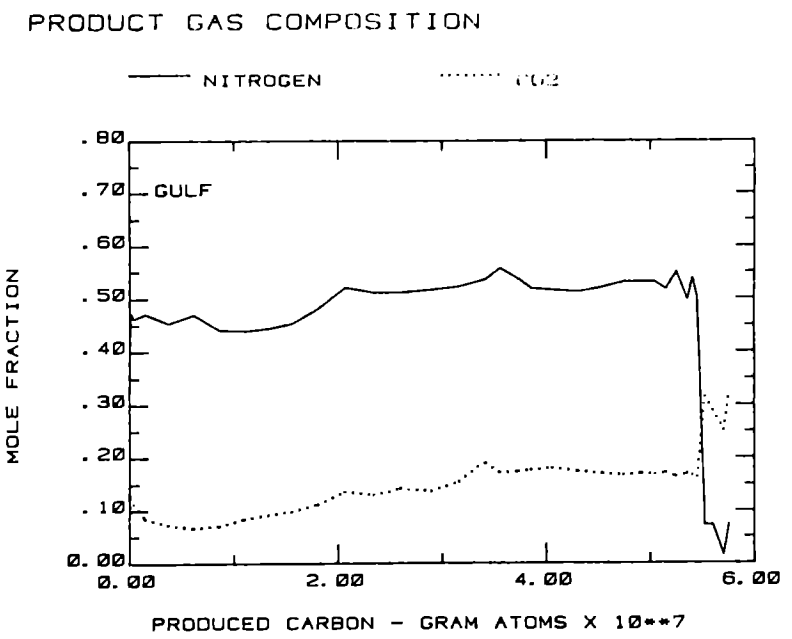


Figure 14.6 !RED items 11 and 16 versus item 133.

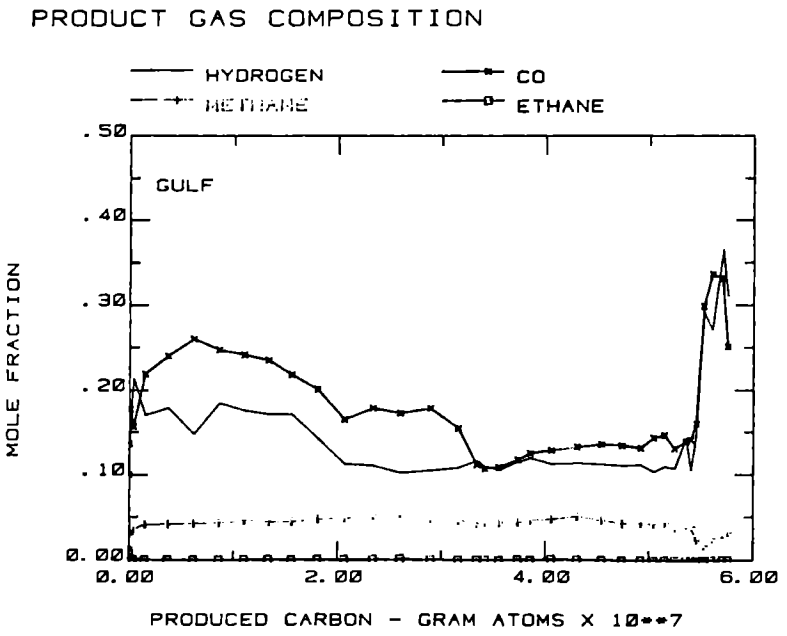


Figure 14.7 !RED items 13, 14, 15 and 18 versus item 133.

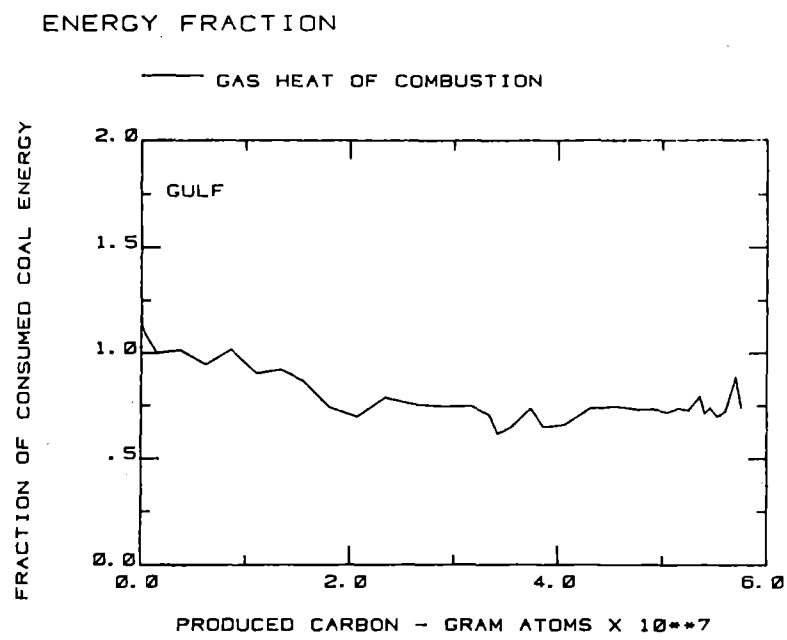


Figure 14.8 !RED item 74 versus item 133.

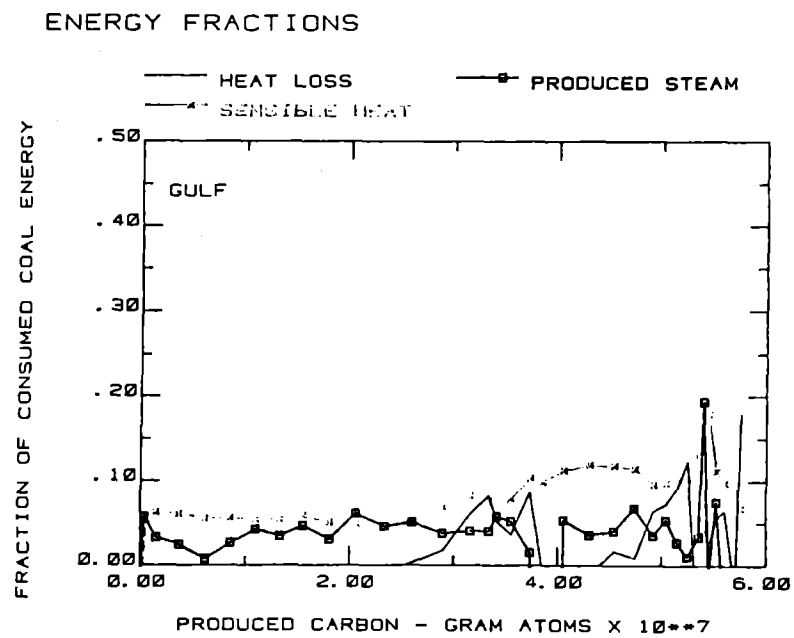


Figure 14.9 !RED items 75 - 78 versus item 133.

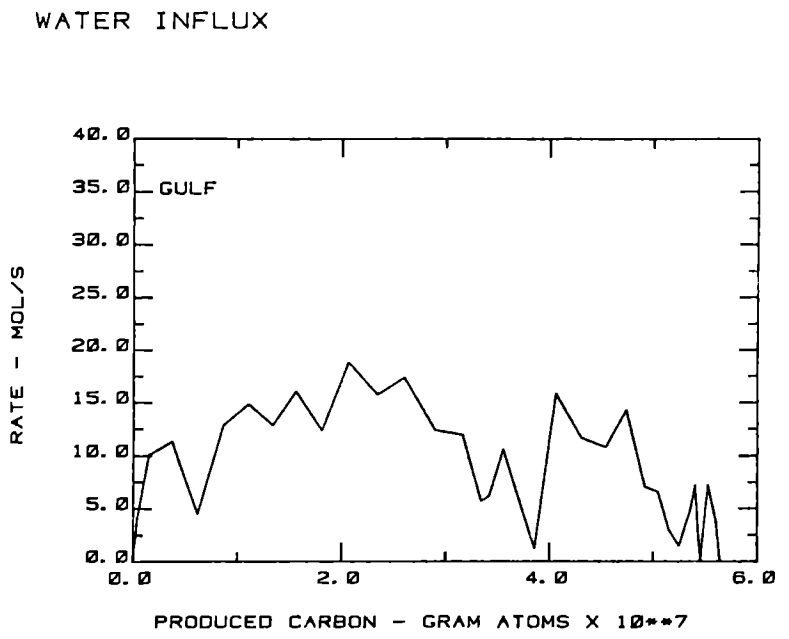


Figure 14.10 !RED item 47 versus item 133.

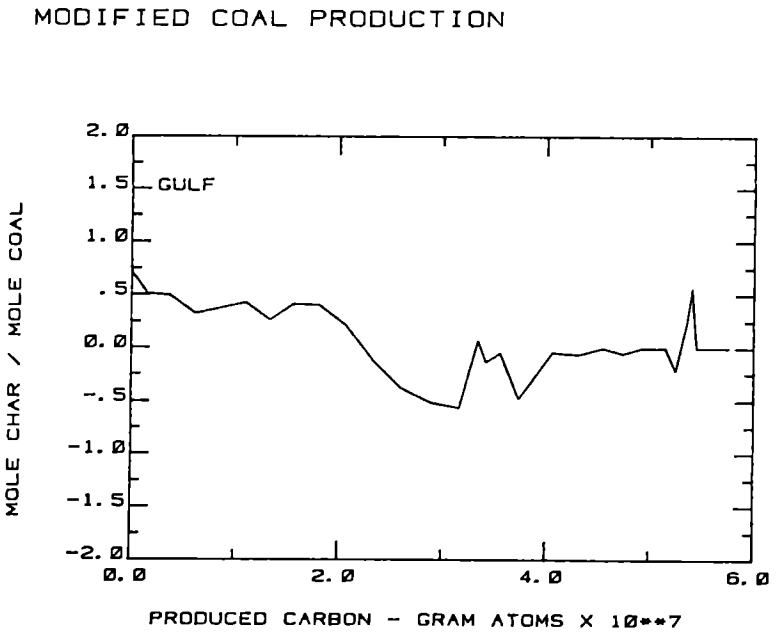


Figure 14.11 !RED item 63 versus item 133.

OXYGEN UTILIZATION

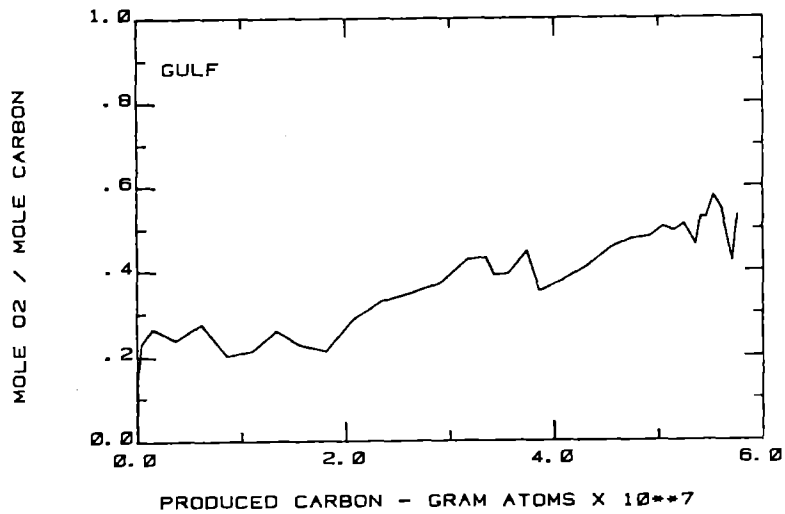


Figure 14.12 !RED item 60 versus item 133.

GAS HEAT OF COMBUSTION PER MOLE OF O2

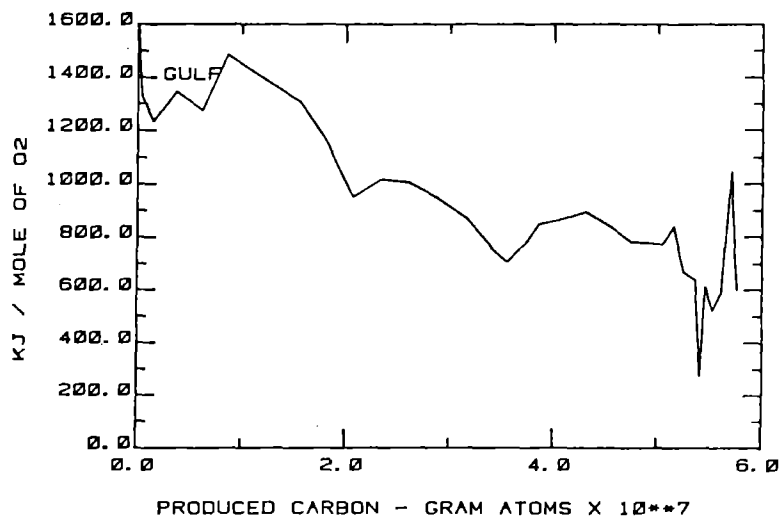


Figure 14.13 !RED item 84 versus item 133.

15. PRICETOWN I

General

The Morgantown Energy Technology Center conducted Pricetown I in the Pittsburg coal seam, at a site near Pricetown, West Virginia. The swelling bituminous coal is located 270 meters (900 ft) below the surface with an average thickness less than 1.8 meters (6 ft). A composite analysis of the seam is given in Table 15.1

Chronology

The well geometry for Pricetown I is shown in Figure 15.1 with the three process wells designated PI-1, PI-2 and PI-3.

The coal seam was ignited in well PI-2 on June 9, 1979 with air injection in well PI-3. The reverse combustion link between the two wells was completed on June 15. This was followed by a period of reverse burning with air injection into well PI-2 and production from PI-3 which ended on July 9, 1979

Reverse combustion with air injection in well PI-1 and production from PI-2 was initiated on July 9 and ended on July 23, 1979. A link enhancement phase was initiated on July 23 and continued until September 23 with injection and production from various wells

The gasification phase of the experiment commenced on September 23, 1979 with injection in PI-1 and production primarily from PI-2. The experiment was terminated on October 5, 1979. (An abbreviated chronology of the experiment is shown in Table 15.2).

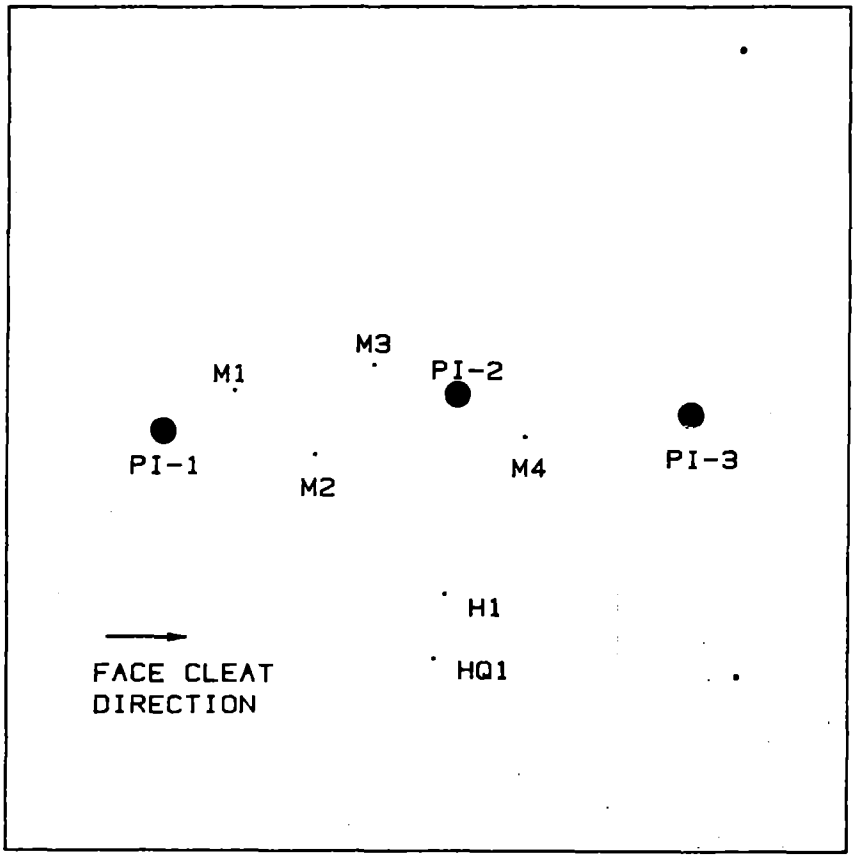
The Data

Computer tapes of Pricetown I results were supplied by METC. The tapes were divided into four file types: 1) Process variables 2) gas chromatograph #1, 3) gas chromatograph #2 and 4) mass spectrometer. Data items from each file were read versus time and stored in standard history files: 1) !FLOW1, 2) !GS2MO, 3) !GS3MO and 4) !GS4MO. The process data sources used to construct !EXP are shown in Table 15.3.

Results from the experiment are shown in Tables 15.3 through 15.8 and Figures 15.2 through 15.13.

TABLE 15.1 PRICETOWN I COAL ANALYSIS

Proximate analysis - wt%	
Moisture	1.36
Ash	11.03
Volatile mater	38.08
Fixed carbon	49.53
	100.00
Ultimate analysis moisture, ash free 0 wt%	
Carbon	82.33
Hydrogen	5.51
Oxygen (by difference)	5.99
Sulfur	4.90
Nitrogen	1.27
	100.00
Pseudo coal molecule	$C_1 H_{.797} O_{.055} S_{.022} N_{.013}$
Molecular wt	14.58
Heat of combustion (kJ/mole)	455.
Density (kg/m^3)	1340.



SCALE - 50 METER SQUARE

Figure 15.1 Well layout for Pricetown I (METC).

TABLE 15.2 ABBREVIATED CHRONOLOGY FOR PRICETOWN I

DATES	DECIMAL DAYS	EVENT	INJECTION WELL	PRODUCTION WELL
6-09-79	160	Ignition PI-2	PI-2	PI-2
6-09-79 to 6-17-79	160 - 169	Reverse Combustion	PI-3	PI-2
6-17-79 to 7-09-79	168 - 190	Reverse Link Enhancement	PI-2	PI-3
7-09-79 to 7-23-79	190 - 204	Reverse Combustion	PI-1	PI-2
7-23-79 to 9-23-79	204 - 266	Reverse Link Enhancement	Various	Various
9-23-79 to 10-15-79	206 - 278	Forward Gasification	PI-1	PI-2,3
10-15-79	278	Experiment Terminated	--	--

TABLE 15.3 METC - PRICETOWN I
PROCESS DATA SOURCES

ITEM	COMPUTER FILE NAME - POSITION	DESCRIPTION
Injection Rate	!FLOW1 -25	Satellite #1 Channel 292 - scfm
Production Rate	!FLOW1 -26	Satellite #1 Channel 293 - scfm
Gas Composition	!GS2MO -2	Volume % - N2 - Satellite #2 Channel 0
	-3	Volume % - AR - Satellite #2 Channel 1
	-4	Volume % - N2 - Satellite #2 Channel 2
	-5	Volume % - CH4 - Satellite #2 Channel 3
	-6	Volume % - CO - Satellite #2 Channel 4
	-7	Volume % - CO2 - Satellite #2 Channel 5
	-8	Volume % - H2O - Satellite #2 Channel 6
	!GS3MO -2	Volume % - C2H6 - Satellite #3 Channel 0
	-3	Volume % - H2S - Satellite #3 Channel 1
	-5	Volume % - C3H8 - Satellite #3 Channel 3
	-8	Volume % - C4H10 - Satellite #3 Channel 6
H_2O/DRY	Calculated	From wet composition
TAR/DRY	No Data	Assume no tar
Injection Pressure	!FLOW1 -16	Well P/I-1 pressure - psia - Satellite #1 Chammel 15
	!FLOW1 -18	Well P/I-2 pressure - psia - Satellite #1 Channel 17
	!FLOW1 -20	Well P/I-3 pressure - psia - Satellite #1 Channel 19 (Use Maximum)
Production Pressure	!FLOW1 -14	System back pressure - psia - Satellite #1 Channel 13
Injection Temperature	!FLOW1 -8	HPLV injection meter - Satellite #1 Channel 7
	!FLOW1 -4	LPHV injection meter - Satellite #1 Channel 3
Production Temperature	!FLOW1 -24	Product gas header temperature - Satellite #1 Channel 123

Table 15.3

PRICETOWN I - REVERSE BURN 2 TO 3
160.53 TO 168.32

TIME (days)	7.795	
Average product heat of combustion (kJ/mol)	194.	
Total flows (Mmols)		
Injection	.5	
Production	.5	
Total dry gas production (Mmols)	.5	
Coal		(+Char)
(Ms)	2.6	(13.5)
(Gas loss corrected Ms)	3.7	(18.8)
Dry gas composition		
AR	.0457	
N2	.5411	
O2	0.0000	
H2	.0967	
CH4	.1423	
CO	.0521	
CO2	.0929	
C2H4	0.0000	
C2H6	.0114	
C6	.0016	
H10	.0025	
H2S	.0139	
Product gas mole ratios		
H2O/dry	.0095	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.456	(.089)
Char/Coal	0.000	(.804)
H2O/Coal	.985	(-.088)
Gas recovery (%)	69.2	
Energy distribution (%)		(+Char)
Combustible gas	138.8	(27.1)
Combustible tar	0.0	(0.0)
Heat loss in-situ	-38.5	(-3.5)
Gas sensible heat	.6	(.1)
Net steam	.3	(.1)
Char + ash sensible heat	.3	(3.7)
Char combustion energy	0.0	(72.5)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	1384.	

PRICETOWN I - REVERSE BURN 2 TO 3
160.53 TO 168.32

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	2.0	(10.1)
(Mmol)	.2	(.8)
Density (kG/M**3)	1340.	
Energy in consumed coal (TJ)	.1	(.4)
Water parameters (mol/s)		(+Char)
Insitu influx	.24	(-.11)
From consumed coal	.00	(.02)
Consumed in reactions	.23	(-.11)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	5042.	
Production	740.	
Average temperatures (deg c)		
Injection	10.1	
Production	0.0	
Average gas flows (mol/s)		
Injection	.7	
Production	.7	

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Table 15.4

PRICETOWN I - REVERSE BURN 3 TO 2
168.33 TO 190.56

TIME (days)	22.245	
Average product heat of combustion (kJ/mol)	229.	
Total flows (Mmols)		
Injection	1.2	
Production	1.7	
Total dry gas production (Mmols)	1.7	
Coal		(+Char)
(Ms)	11.3	(43.5)
(Gas loss corrected Ms)	12.9	(49.6)
Dry gas composition		
AR	.0207	
N2	.4881	
O2	0.0000	
H2	.0934	
CH4	.1863	
CO	.0668	
CO2	.1207	
C2H4	0.0000	
C2H6	.0090	
C6	.0008	
H10	.0014	
H2S	.0127	
Product gas mole ratios		
H2O/dry	.0064	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.331	(.086)
Char/Coal	0.000	(.740)
H2O/Coal	.893	(-.025)
Gas recovery (%)	93.0	
Energy distribution (%)		(+Char)
Combustible gas	130.9	(34.1)
Combustible tar	0.0	(0.0)
Heat loss in-situ	-31.5	(-4.4)
Gas sensible heat	.8	(.2)
Net steam	.2	(.0)
Char + ash sensible heat	.3	(3.4)
Char combustion energy	0.0	(66.7)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	1802.	

PRICETOWN I - REVERSE BURN 3 TO 2
168.33 TO 190.56

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	8.4	(32.4)
(Mmol)	.7	(2.6)
Density (kG/M**3)	1340.	
Energy in consumed coal (TJ)	.3	(1.2)
Water parameters (mol/s)		(+Char)
Insitu influx	.32	(-.05)
From consumed coal	.00	(.02)
Consumed in reactions	.32	(-.03)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	3713.	
Production	888.	
Average temperatures (deg c)		
Injection	10.0	
Production	0.0	
Average gas flows (mol/s)		
Injection	.6	
Production	.9	

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Table 15.5

PRICETOWN I - REVERSE BURN 2 TO 1
190.57 TO 204.51

		(+Char)
TIME (days)	13.947	
Average product heat of combustion (kJ/mol)	258.	
Total flows (Mmols)		
Injection	.3	
Production	.5	
Total dry gas production (Mmols)	.5	
Coal		(+Char)
(Ms)	3.5	(16.5)
(Gas loss corrected Ms)	3.4	(16.1)
Dry gas composition		
AR	.0072	
N2	.5103	
O2	0.0000	
H2	.0769	
CH4	.2104	
CO	.0221	
CO2	.1284	
C2H4	0.0000	
C2H6	.0198	
C6	.0026	
H10	.0042	
H2S	.0181	
Product gas mole ratios		
H2O/dry	.0021	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.330	(.071)
Char/Coal	0.000	(.786)
H2O/Coal	1.034	(-.053)
Gas recovery (%)	97.7	
Energy distribution (%)		(+Char)
Combustible gas	141.7	(30.3)
Combustible tar	0.0	(0.0)
Heat loss in-situ	-41.7	(-5.0)
Gas sensible heat	1.2	(.2)
Net steam	.0	(.0)
Char + ash sensible heat	.3	(3.6)
Char combustion energy	0.0	(70.9)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	1953.	

PRICETOWN I - REVERSE BURN 2 TO 1
190.57 TO 204.51

		(+Char)
Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	2.6	(12.3)
(Mmol)	.2	(1.0)
Density (kG/M**3)	1340.	
Energy in consumed coal (TJ)	.1	(.5)
Water parameters (mol/s)		(+Char)
Insitu influx	.18	(-.05)
From consumed coal	.00	(.01)
Consumed in reactions	.18	(-.04)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	5265.	
Production	953.	
Average temperatures (deg c)		
Injection	10.0	
Production	0.0	
Average gas flows (mol/s)		
Injection	.3	
Production	.4	

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Table 15.6

PRICETOWN I - LINK ENHANCEMENT
204.52 TO 266.50

TIME (days)	61.985	
Average product heat of combustion (kJ/mol)	188.	
Total flows (Mmols)		
Injection	12.4	
Production	20.6	
Total dry gas production (Mmols)	20.0	
Coal		(+Char)
(Mg)	123.2	(369.2)
(Gas loss corrected Mg)	117.0	(350.7)
Dry gas composition		
AR	.0067	
N2	.5157	
O2	0.0000	
H2	.1011	
CH4	.1428	
CO	.0790	
CO2	.1361	
C2H4	0.0000	
C2H6	.0056	
C6	.0002	
H10	.0003	
H2S	.0126	
Product gas mole ratios		
H2O/dry	.0309	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.375	(.125)
Char/Coal	0.000	(.666)
H2O/Coal	.729	(.011)
Gas recovery (%)	106.8	
Energy distribution (%)		(+Char)
Combustible gas	115.8	(38.6)
Combustible tar	0.0	(0.0)
Heat loss in-situ	-15.9	(-2.0)
Gas sensible heat	-.2	(-.1)
Net steam	.8	(.3)
Char + ash sensible heat	.3	(3.1)
Char combustion energy	0.0	(60.1)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	1407.	

PRICETOWN I - LINK ENHANCEMENT
204.52 TO 266.50

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	91.9	(275.5)
(Mmol)	7.4	(22.2)
Density (kG/M**3)	1340.	
Energy in consumed coal (TJ)	3.4	(10.1)
Water parameters (mol/s)		(+Char)
Insitu influx	1.11	(.11)
From consumed coal	.02	(.05)
Consumed in reactions	1.01	(.05)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	2272.	
Production	372.	
Average temperatures (deg c)		
Injection	83.9	
Production	0.0	
Average gas flows (mol/s)		
Injection	2.3	
Production	3.9	

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Table 15.7

PRICETOWN I - FORWARD BURN
266.51 TO 283.99

TIME (days)	17.496	
Average product heat of combustion (kJ/mol)	133.	
Total flows (Mmols)		
Injection	26.6	
Production	43.0	
Total dry gas production (Mmols)	41.4	
Coal		(+Char)
(Mg)	212.8	(550.0)
(Gas loss corrected Mg)	178.2	(460.6)
Dry gas composition		
AR	.0073	
N2	.5981	
O2	0.0000	
H2	.0861	
CH4	.0746	
CO	.1213	
CO2	.1028	
C2H4	0.0000	
C2H6	.0010	
C6	.0015	
H10	.0023	
H2S	.0050	
Product gas mole ratios		
H2O/dry	.0397	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.520	(.201)
Char/Coal	0.000	(.613)
H2O/Coal	.426	(-.049)
Gas recovery (%)	119.4	
Energy distribution (%)		(+Char)
Combustible gas	96.8	(37.4)
Combustible tar	0.0	(0.0)
Heat loss in-situ	-5.6	(1.3)
Gas sensible heat	7.0	(2.7)
Net steam	1.2	(.5)
Char + ash sensible heat	.3	(2.9)
Char combustion energy	0.0	(55.3)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	846.	

PRICETOWN I - FORWARD BURN
266.51 TO 283.99

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	158.8	(410.5)
(Mmol)	12.8	(33.1)
Density (kG/M**3)	1340.	
Energy in consumed coal (TJ)	5.8	(15.1)
Water parameters (mol/s)		(+Char)
Insitu influx	4.58	(-.26)
From consumed coal	.11	(.27)
Consumed in reactions	3.60	(-1.07)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	2170.	
Production	422.	
Average temperatures (deg c)		
Injection	46.4	
Production	319.5	
Average gas flows (mol/s)		
Injection	17.6	
Production	28.5	

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Table 15.8

PRICETOWN I - FULL EXPERIMENT
160.53 TO 284.00

TIME (days)	123.466	
Average product heat of combustion (kJ/mol)	154.	
Total flows (Mmols)		
Injection	40.9	
Production	66.4	
Total dry gas production (Mmols)	64.1	
Coal		(+Char)
(Mg)	353.4	(992.7)
(Gas loss corrected Mg)	315.2	(885.3)
Dry gas composition		
AR	.0077	
N2	.5683	
O2	0.0000	
H2	.0910	
CH4	.1005	
CO	.1053	
CO2	.1138	
C2H4	0.0000	
C2H6	.0029	
C6	.0010	
H10	.0017	
H2S	.0078	
Product gas mole ratios		
H2O/dry	.0355	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.461	(.164)
Char/Coal	0.000	(.644)
H2O/Coal	.557	(-.026)
Gas recovery (%)	114.0	
Energy distribution (%)		(+Char)
Combustible gas	105.3	(37.5)
Combustible tar	0.0	(0.0)
Heat loss in-situ	-10.6	(-.4)
Gas sensible heat	4.2	(1.5)
Net steam	1.0	(.4)
Char + ash sensible heat	.3	(3.0)
Char combustion energy	0.0	(58.0)
Cooling water to steam	0.0	(0.0)
Product heat of combustion per mole O2 (kJ/mol)	1039.	

PRICETOWN I - FULL EXPERIMENT
160.53 TO 284.00

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	263.8	(740.8)
(Mmol)	21.3	(59.7)
Density (kG/M**3)	1340.	
Energy in consumed coal (TJ)	9.7	(27.2)
Water parameters (mol/s)		(+Char)
Insitu influx	1.30	(-.00)
From consumed coal	.03	(.07)
Consumed in reactions	1.11	(-.15)
Injected	0.00	
Prod gas cooling	0.00	
Average pressures (kPa)		
Injection	2287.	
Production	425.	
Average temperatures (deg c)		
Injection	56.6	
Production	207.0	
Average gas flows (mol/s)		
Injection	3.8	
Production	6.2	

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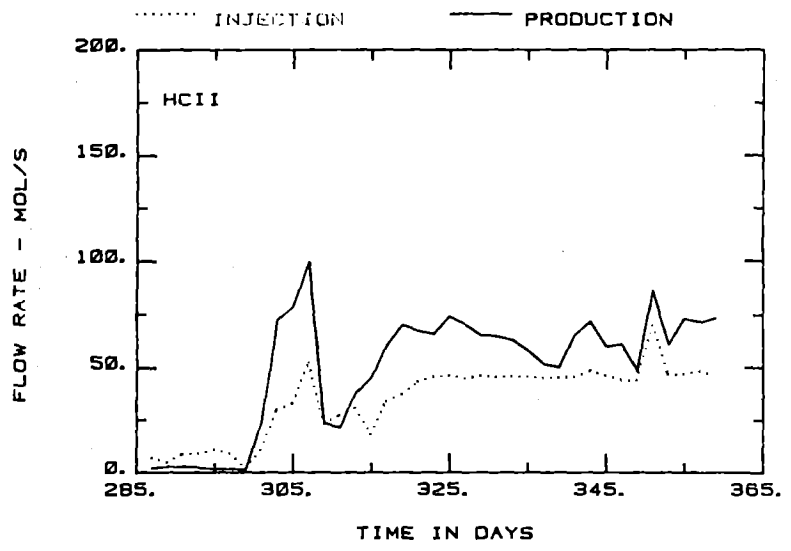

Figure 15.2 !RED items 90 and 91 versus time.

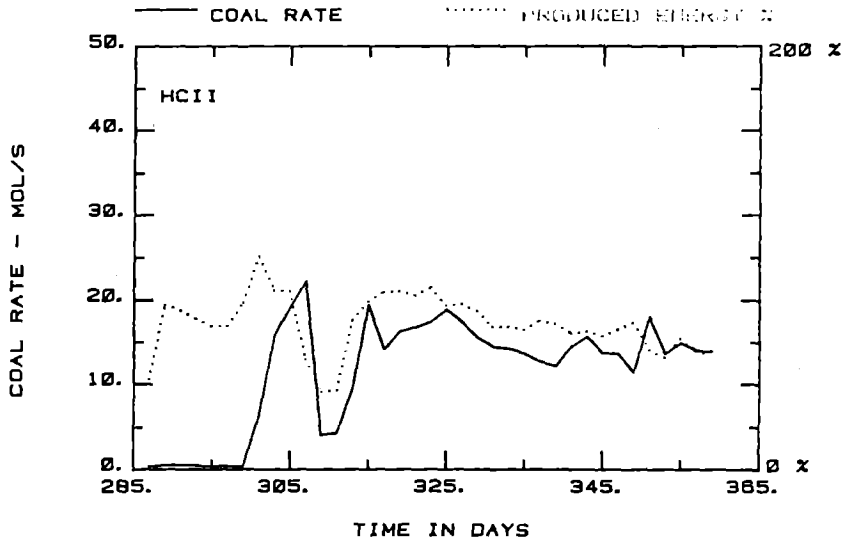

Figure 15.3 !RED item 44 and item 74 x 100 versus time.

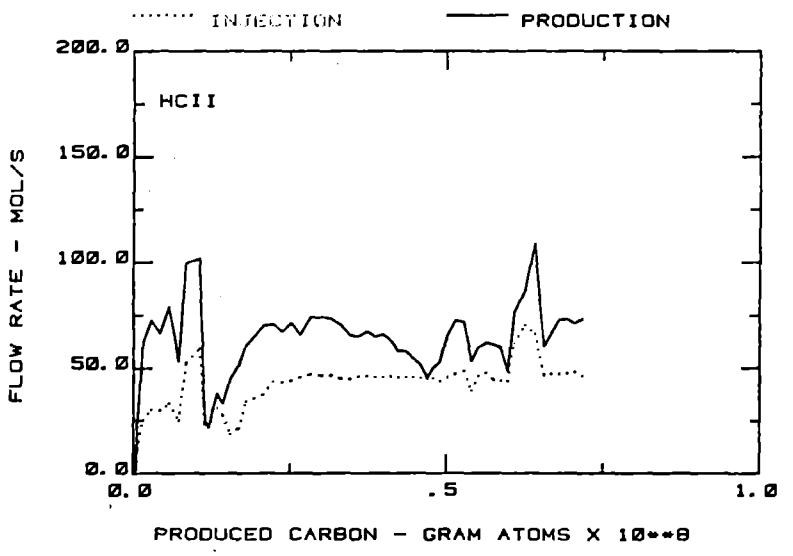

Figure 15.4 !RED items 90 and 91 versus item 133.

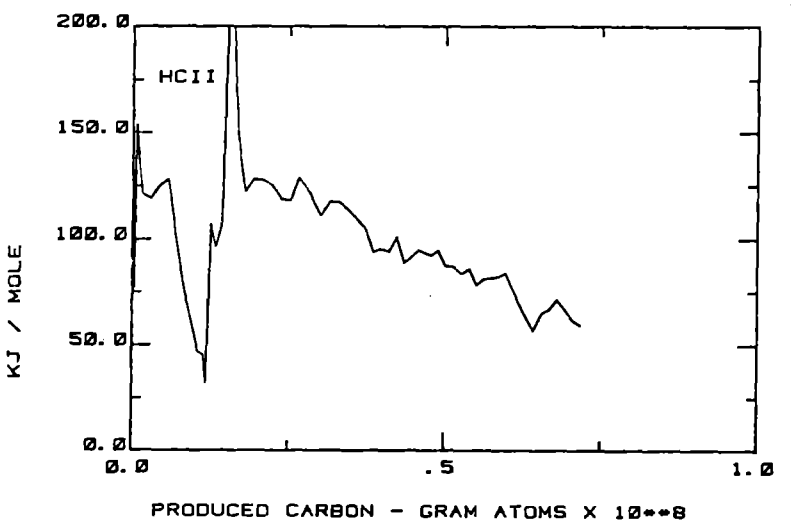

Figure 15.5 !RED items 81 versus item 133.

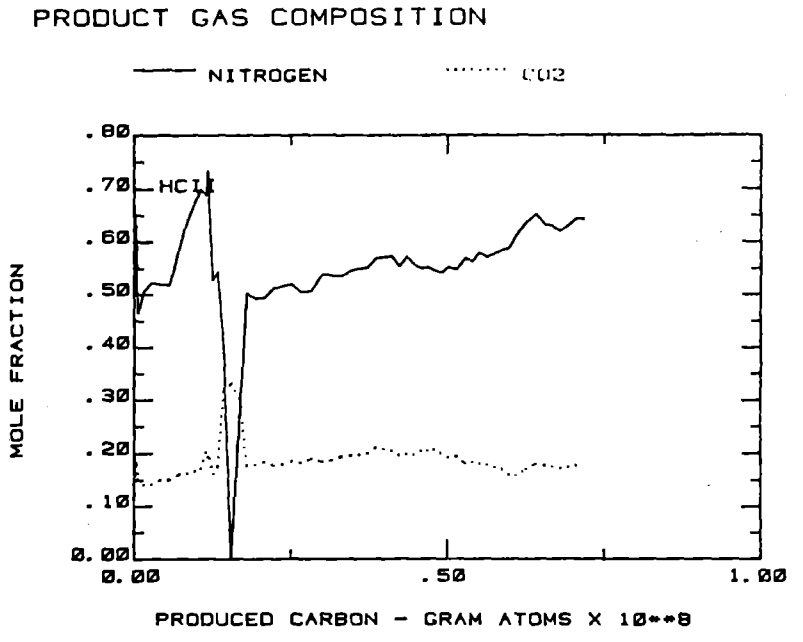

Figure 15.6 !RED items 11 and 16 versus item 133.

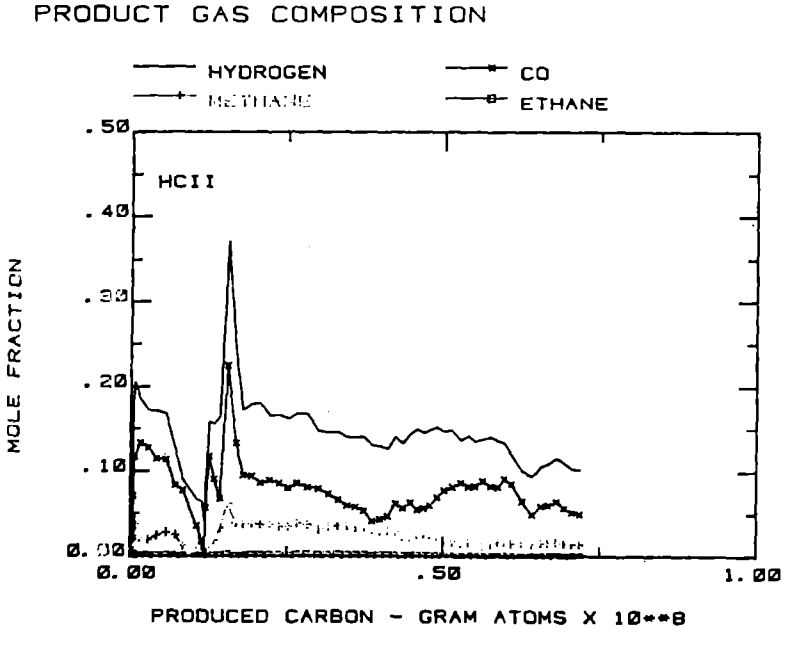

Figure 15.7 !RED items 13, 14, 15 and 18 versus item 133.

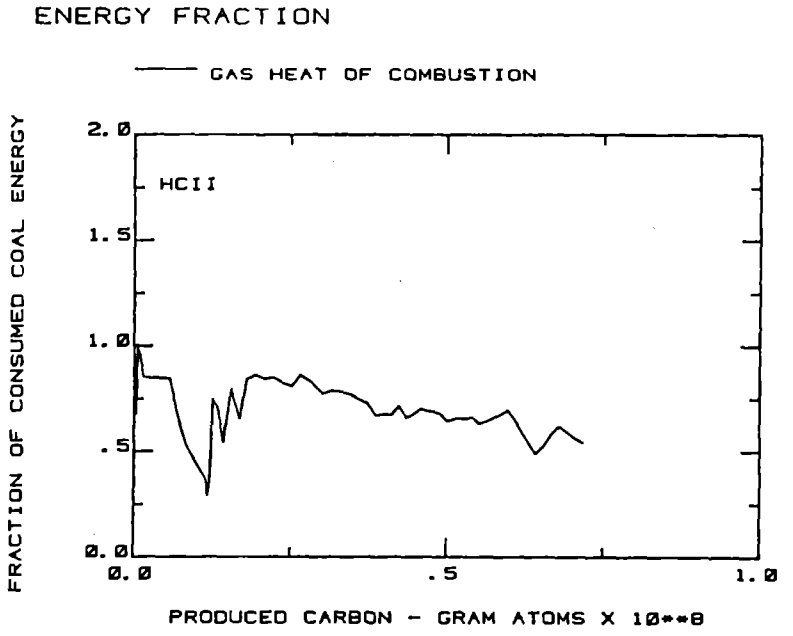

Figure 15.8 !RED item 74 versus item 133.

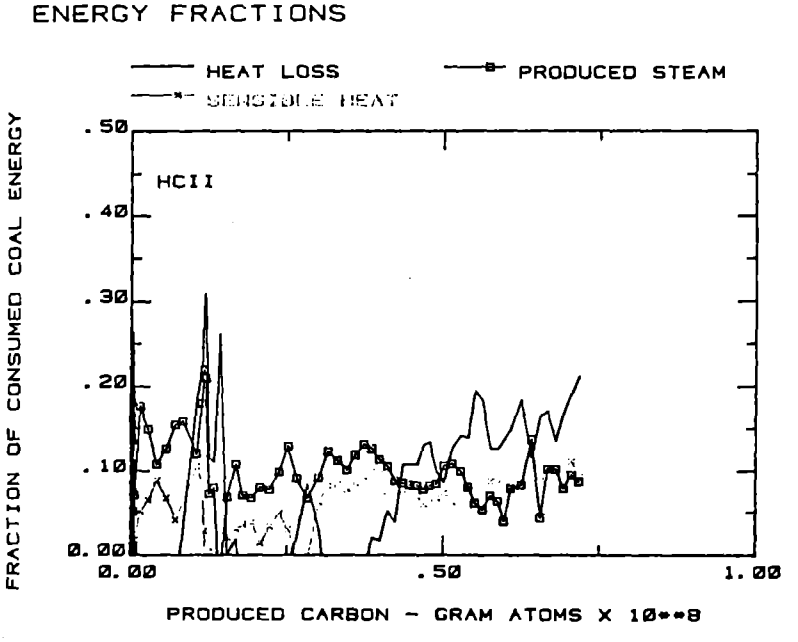

Figure 15.9 !RED items 75 - 78 versus item 133.

WATER INFLUX

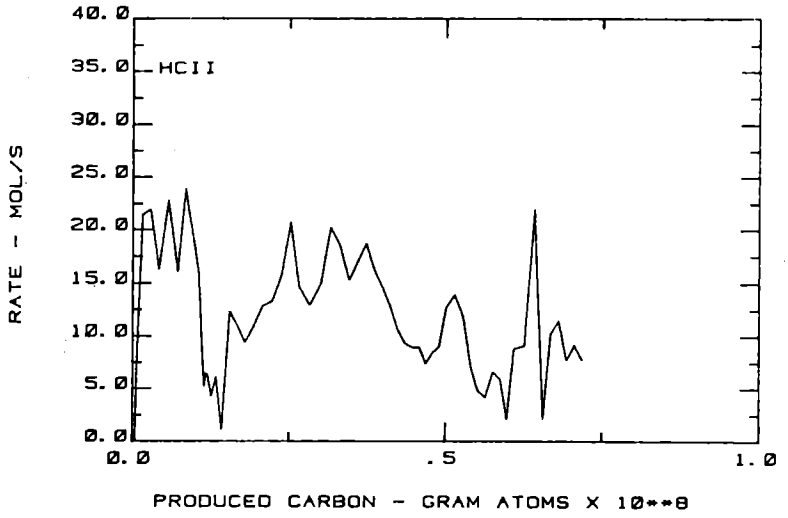

Figure 15.10 !RED item 47 versus item 133.

MODIFIED COAL PRODUCTION

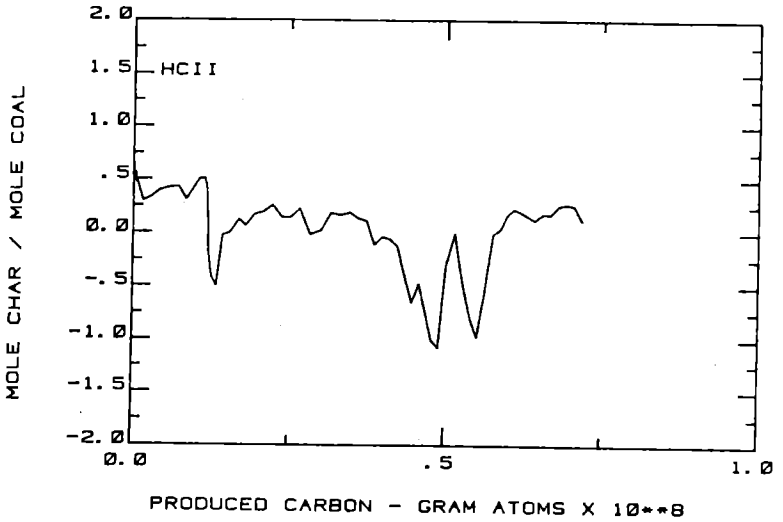

Figure 15.11 !RED item 63 versus item 133.

OXYGEN UTILIZATION

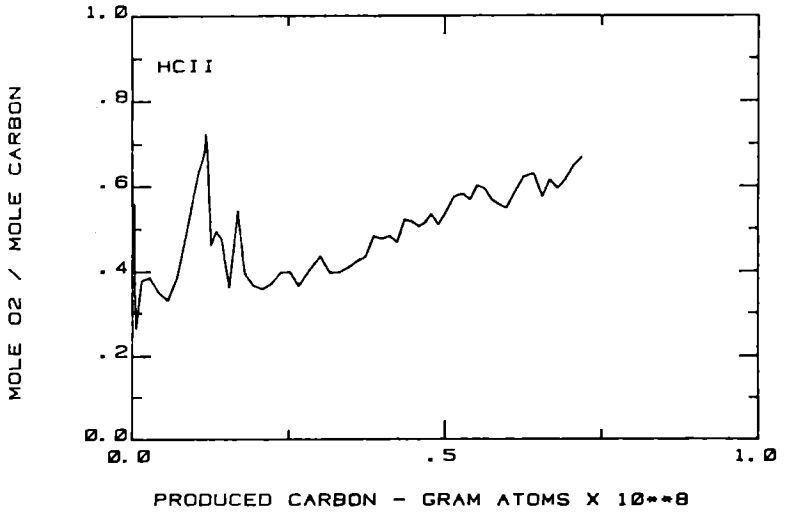

Figure 15.12 !RED item 60 versus item 133.

GAS HEAT OF COMBUSTION PER MOLE OF O2

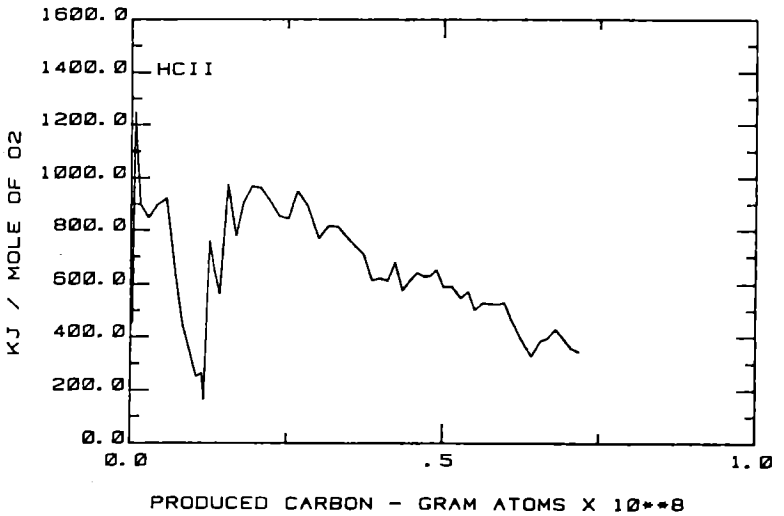

Figure 15.13 !RED item 84 versus item 133.

16. RAWLINS I

General

The first DOE sponsored field test in steeply dipping coal was performed by the Gulf Research and Development Company and TRW at a site located 8 miles west of the town of Rawlins in south central Wyoming.

The nominally 18 m (30 ft) thick coal seam in the Fort Union Formation was selected for gasification. The seam is classified subbituminous B and lies at a dip of 63 degrees. A composite analysis of the coal is given in Table 16.1.

Chronology

The well configuration for Rawlins I is shown in Figure 16.1. An initial attemp to ignite the coal at the base of the air injection well (AIW) failed on October 24, 1979. Over the next four days, approximately 200 litres of mixed xylenes, 100 liters of gasoline-diesel fuel mix and 25 kg of Triethyl borane were injected with successful ignition of the coal on October 28.

Following ignition, a reverse combustion linking phase was initiated with air injection in the product gas well (PGW) and through a 2" tube in the AIW. Production was through the AIW casing. The PGW and AIW were successfully linked on October 31.

Air gasification began on October 31 and ended on November 28. During this period, on November 16, 1300 litres of diesel fuel were injected in an attempt to arrest declining product heating value.

Repair of eroded production piping took place on November 29 and 30, followed by 6 hours of air/steam injection to clear the oxygen delivery system. Oxygen/steam gasification began on December 1, and continued for five days. The experiment was terminated on December 5, 1979. (An abbreviated chronology of Rawlins I is shown in Table 16.2).

The Data

A computer tape of the Rawlins I test results was supplied by The Gulf Research and Development Company. The tape contained multiple files, one for each measured process variable versus time. A summary of source data used to construct !EXP is shown in Table 16.3. The main data omissions were the steam injection rate and process temperatures. The steam rate and product temperature were derived by other means as shown in the Table.

Results from the experiment are shown in Tables 16.4 throug 16.7 and Figures 16.2 through 16.13.

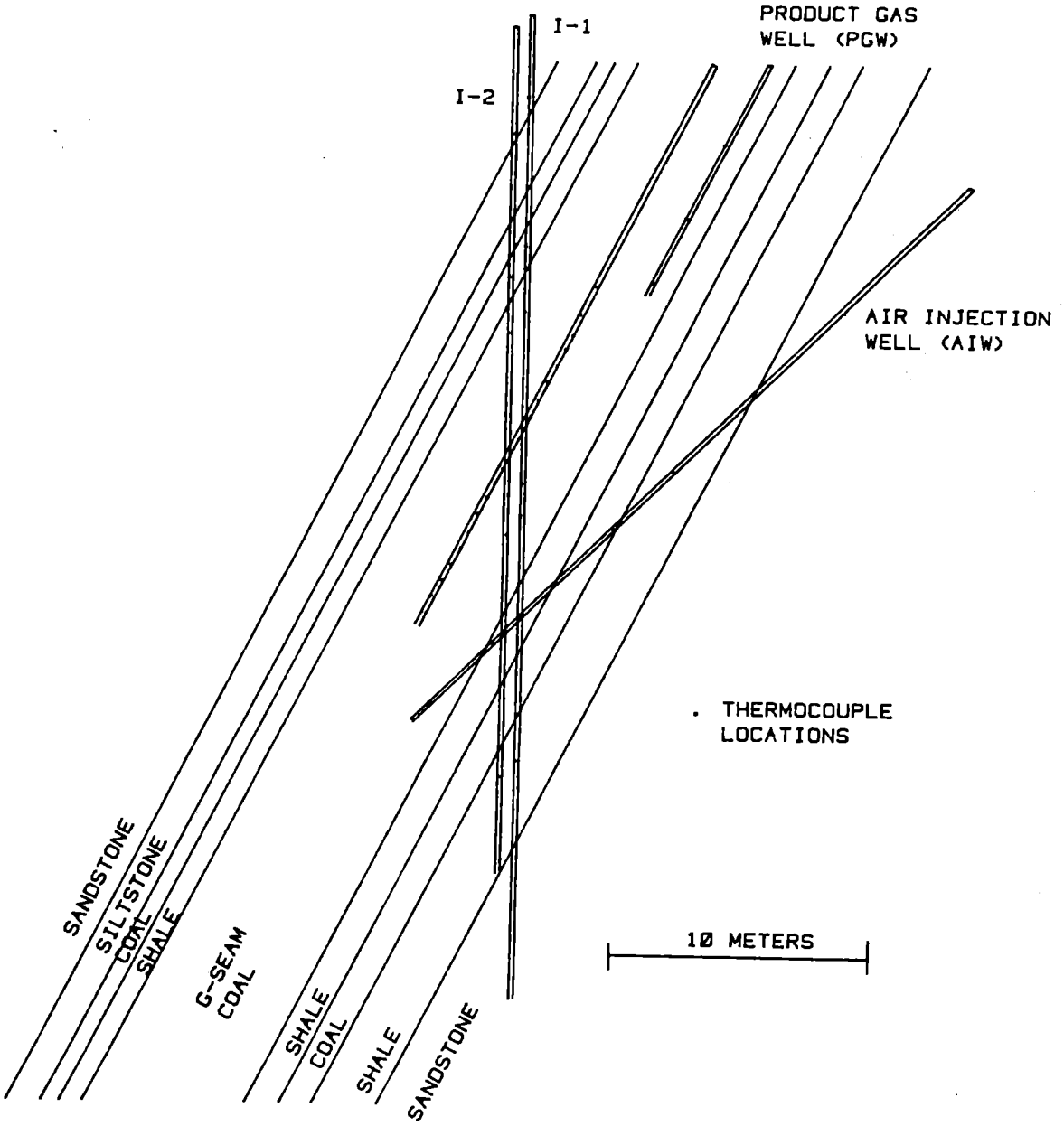

Figure 16.1 Well layout for Rawlins I (GULF).

TABLE 16.2 ABBREVIATED CHRONOLOGY FOR RAWLINS I

DATE	DECIMAL DAYS	EVENT	INJECTION WELL	PRODUCTION WELL
10-24-79	297	Initial Igniton Attempt (Process day 1)	--	--
10-28-79 to 10-31-79	301 - 304	Reverse Combustion	PGW	AIW
10-31-79 to 11-28-79	304 - 332	Air Gasification	AIW	PGW
11-16-79	320	Diesel Fuel Injection (12 hours)	AIW	PGW
11-30-79	334	Air/Steam Gasification	AIW	PGW
12-01-79 to 12-05-79	335 - 339	Oxygen/Steam Gasification	AIW	PGW
12-05-79	339	Experiment Terminated	--	--

TABLE 16.3 GULF - RAWLINS I
PROCESS DATA SOURCES

ITEM	COMPUTER FILE NAME	DESCRIPTION
Injection Rate	FL103	Air rate - scfm
	FT02B	Oxygen rate - scfm
	!STEAM	Digitized steam rate - See note (1)
Production Rate	FL107	Wet product rate - scfm
	FE102	Cooling water rate - gal/min
Gas Compoisiton	N2	Volume % - Nitrogen
	H2	Volume % - Hydrogen
	C3H8	Volume % - Propane
	C3H6	Volume % - Propylene
	ISOBU	Volume % - ISO-Butane
	H2S	Volume % - Hydrogen Sulfide
	NBU	Volume % - N-Butane
	BU1	Volume % - Butene-1
	TBU2	Volume % - Trans-Butene-2
	!GAS1	Merged file of above 9 gases
	CBU2	Volume % - CIS-Butene-2
	BU13	Volume % - 1-3 Butadiene
	ARGOX	Volume % - Oxygen/Argon
	CH4	Volume % - Methane
	FLUSH	Volume % - Back flush-assume C5H10
	CO2	Volume % - Carbon dioxide
	C2H4	Volume % - Ethlyene
	C2H6	Volume % - Ethane
	CO	Volume % - Carbon Monoxide
	!GAS2	Merged file of above 9 gases
	!GASAL	Merged file all 18 gases
H_2O/DRY	TWWTS	Total weight of sample
	TWWTW	Weight of water in smaple
TAR/DRY	MFH2O	Mole fraction water in wet gas
	MFGAS	Mole fraction non-condensibles in wet gas
		Calculated ratio assuming Tar = C_9H_{12}
Injection Pressure	PIT203	Pressure - psia
Production Pressure	PT407	Pressure - psia
Injection Temperasture	No Data	Assumed 20°C air and 100°C steam
Production Temperature	SHPGS	No data - Back calculated from product sensible heat on a daily average basis

(1) No steam data on computer tape. Digitized from plot in Gulf Report San 13108-54 UC-90c

Table 16.4

RAWLINS I - REVERSE BURN
302.80 TO 304.64

TIME (days)	1.850	
Average product heat of combustion (kJ/mol)	261.	
Total flows (Mmols)		
Injection	.4	
Production	.3	
Total dry gas production (Mmols)	.3	
		(+Char)
Coal		
(Mg)	2.7	(10.0)
(Gas loss corrected Mg)	7.5	(27.5)
Dry gas composition		
AR	.0077	
N2	.4399	
O2	0.0000	
H2	.1603	
CH4	.0366	
CO	.1585	
CO2	.1114	
C2H4	.0074	
C2H6	.0065	
C6	.0295	
H10	.0369	
H2S	.0052	
Product gas mole ratios		
H2O/dry	.2115	
Tar/dry	0.0000	
		(+Char)
Reaction stoichiometry		
O2/Coal	.232	(.063)
Char/Coal	0.000	(.727)
H2O/Coal	.483	(-.106)
Gas recovery (%)	42.7	
		(+Char)
Energy distribution (%)		
Combustible gas	121.6	(33.2)
Combustible tar	0.0	(0.0)
Heat loss in-situ	-26.4	(-9.7)
Gas sensible heat	1.0	(.3)
Net steam	.1	(.0)
Char + ash sensible heat	.2	(3.6)
Char combustion energy	0.0	(71.5)
Cooling water to steam	4.2	(1.1)
Product heat of combustion per mole O2 (kJ/mol)	2231.	

RAWLINS I - REVERSE BURN
302.80 TO 304.64

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
		(+Char)
Coal		
(cubic metres)	2.0	(7.4)
(Mmol)	.1	(.5)
Density (kG/M**3)	1350.	
Energy in consumed coal (TJ)	.1	(.2)
		(+Char)
Water parameters (mol/s)		
Insitu influx	.28	(-.83)
From consumed coal	.14	(.51)
Consumed in reactions	.41	(-.33)
Injected	0.00	
Prod gas cooling	.34	
Average pressures (kPa)		
Injection	635.	
Production	2077.	
Average temperatures (deg c)		
Injection	20.0	
Production	0.0	
Average gas flows (mol/s)		
Injection	2.2	
Production	2.0	

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Table 16.5

RAWLINS I - AIR FORWARD BURN
304.65 TO 332.79

TIME (days)	28.143	
Average product heat of combustion (kJ/mol)	135.	
Total flows (Mmols)		
Injection	78.1	
Production	160.4	
Total dry gas production (Mmols)	134.2	
Coal		(+Char)
(Mg)	1077.2	(1366.2)
(Gas loss corrected Mg)	966.1	(1225.2)
Dry gas composition		
AR	.0083	
N2	.5006	
O2	0.0000	
H2	.1309	
CH4	.0457	
CO	.1758	
CO2	.1343	
C2H4	.0006	
C2H6	.0023	
C6	.0006	
H10	.0008	
H2S	.0000	
Product gas mole ratios		
H2O/dry	.1910	
Tar/dry	.0039	
Reaction stoichiometry		(+Char)
O2/Coal	.336	(.265)
Char/Coal	0.000	(.212)
H2O/Coal	.233	(.114)
Gas recovery (%)	110.1	
Energy distribution (%)		(+Char)
Combustible gas	79.3	(62.5)
Combustible tar	11.9	(9.4)
Heat loss in-situ	-3.9	(-3.7)
Gas sensible heat	7.5	(5.9)
Net steam	3.9	(3.1)
Char + ash sensible heat	.2	(1.2)
Char combustion energy	0.0	(20.8)
Cooling water to steam	1.0	(.8)
Product heat of combustion per mole O2 (kJ/mol)	1002.	

RAWLINS I - AIR FORWARD BURN
304.65 TO 332.79

Injection gas composition		
AR	.0100	
N2	.7800	
O2	.2100	
STEAM	0.0000	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	798.0	(1012.0)
(Mmol)	53.7	(68.1)
Density (kG/M**3)	1350.	
Energy in consumed coal (TJ)	22.8	(28.9)
Water parameters (mol/s)		(+Char)
Insitu influx	9.92	(7.02)
From consumed coal	3.60	(4.56)
Consumed in reactions	5.13	(3.19)
Injected	0.00	
Prod gas cooling	2.16	
Average pressures (kPa)		
Injection	670.	
Production	524.	
Average temperatures (deg c)		
Injection	20.0	
Production	344.4	
Average gas flows (mol/s)		
Injection	32.1	
Production	65.9	

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Table 16.6

RAWLINS I - OXYGEN BURN
334.90 TO 339.99

TIME (days)	5.099	
Average product heat of combustion (kJ/mol)	189.	
Total flows (Mmols)		
Injection	10.0	
Production	14.1	
Total dry gas production (Mmols)	9.3	
Coal		(+Char)
(Mg)	113.0	(113.0)
(Gas loss corrected Mg)	228.1	(228.1)
Dry gas composition		
AR	.0067	
N2	.1089	
O2	0.0000	
H2	.2824	
CH4	.0272	
CO	.2898	
CO2	.2836	
C2H4	.0000	
C2H6	.0012	
C6	.0001	
H10	.0001	
H2S	0.0000	
Product gas mole ratios		
H2O/dry	.5143	
Tar/dry	0.0000	
Reaction stoichiometry		(+Char)
O2/Coal	.537	(.537)
Char/Coal	0.000	(0.000)
H2O/Coal	.152	(.152)
Gas recovery (%)	54.5	
Energy distribution (%)		(+Char)
Combustible gas	73.7	(73.7)
Combustible tar	.0	(.0)
Heat loss in-situ	13.4	(13.4)
Gas sensible heat	8.2	(8.2)
Net steam	-3.0	(-3.0)
Char + ash sensible heat	.2	(.2)
Char combustion energy	0.0	(0.0)
Cooling water to steam	7.5	(7.5)
Product heat of combustion per mole O2 (kJ/mol)	584.	

RAWLINS I - OXYGEN BURN
334.90 TO 339.99

Injection gas composition		
AR	.0010	
N2	.0802	
O2	.5527	
STEAM	.3660	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	83.7	(83.7)
(Mmol)	5.6	(5.6)
Density (kG/M**3)	1350.	
Energy in consumed coal (TJ)	2.4	(2.4)
Water parameters (mol/s)		(+Char)
Insitu influx	-3.88	(1.54)
From consumed coal	2.08	(2.08)
Consumed in reactions	1.95	(1.95)
Injected	0.00	
Prod gas cooling	9.21	
Average pressures (kPa)		
Injection	85.	
Production	30.	
Average temperatures (deg c)		
Injection	60.9	
Production	439.5	
Average gas flows (mol/s)		
Injection	22.8	
Production	32.1	

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Table 16.7

RAWLINS I - FULL EXPERIMENT
302.80 TO 339.99

TIME (days)	37.191	
Average product heat of combustion (kJ/mol)	138.	
Total flows (Mmols)		
Injection	90.4	
Production	179.8	
Total dry gas production (Mmols)	146.6	
Coal		(+Char)
(Mg)	1211.7	(1507.9)
(Gas loss corrected Mg)	1215.4	(1512.6)
Dry gas composition		
AR	.0082	
N2	.4763	
O2	0.0000	
H2	.1403	
CH4	.0443	
CO	.1824	
CO2	.1442	
C2H4	.0006	
C2H6	.0022	
C6	.0006	
H10	.0008	
H2S	.0000	
Product gas mole ratios		
H2O/dry	.2230	
Tar/dry	.0035	
Reaction stoichiometry		(+Char)
O2/Coal	.356	(.286)
Char/Coal	0.000	(.196)
H2O/Coal	.224	(.224)
Gas recovery (%)	96.6	
Energy distribution (%)		(+Char)
Combustible gas	78.8	(63.3)
Combustible tar	10.6	(8.5)
Heat loss in-situ	-2.4	(-2.5)
Gas sensible heat	7.7	(6.2)
Net steam	3.3	(2.7)
Char + ash sensible heat	.2	(1.1)
Char combustion energy	0.0	(19.3)
Cooling water to steam	1.7	(1.4)
Product heat of combustion per mole O2 (kJ/mol)	940.	

RAWLINS I - FULL EXPERIMENT
302.80 TO 339.99

Injection gas composition		
AR	.0089	
N2	.6927	
O2	.2461	
STEAM	.0523	
CO2	0.0000	
Coal		(+Char)
(cubic metres)	897.5	(1117.0)
(Mmol)	60.4	(75.1)
Density (kG/M**3)	1350.	
Energy in consumed coal (TJ)	25.7	(31.9)
Water parameters (mol/s)		(+Char)
Insitu influx	7.20	(8.48)
From consumed coal	3.06	(3.81)
Consumed in reactions	4.21	(5.24)
Injected	0.00	
Prod gas cooling	3.11	
Average pressures (kPa)		
Injection	614.	
Production	476.	
Average temperatures (deg c)		
Injection	24.2	
Production	354.1	
Average gas flows (mol/s)		
Injection	28.1	
Production	55.9	

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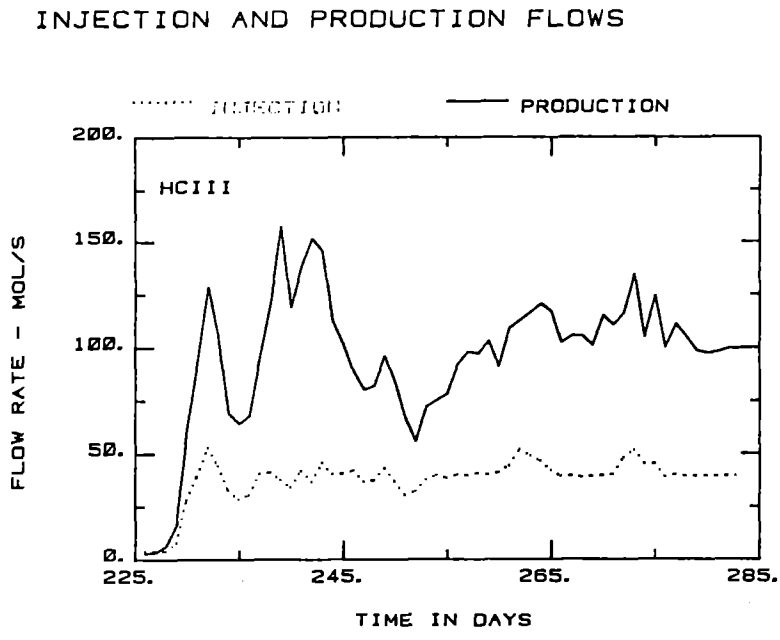


Figure 16.2 !RED items 90 and 91 versus time.

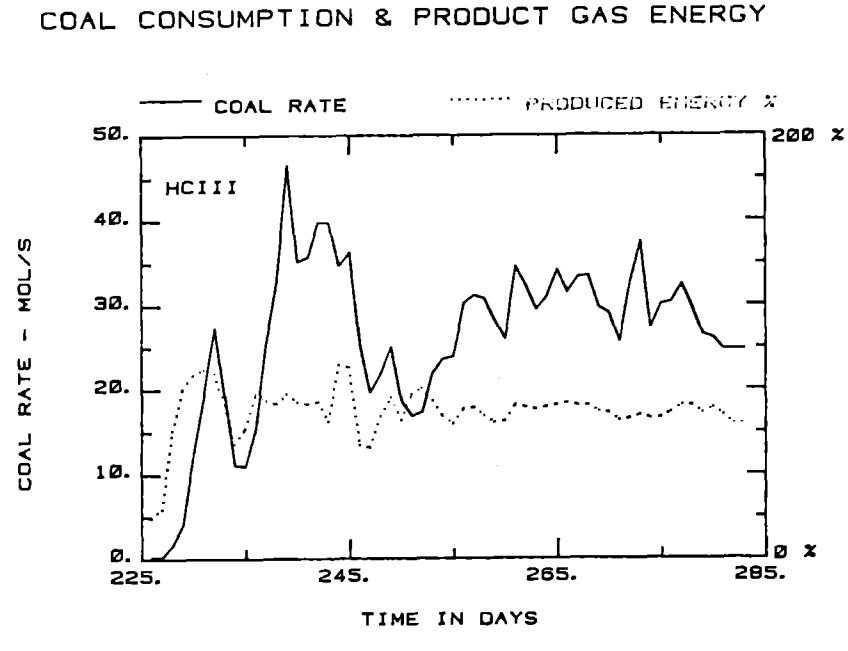


Figure 16.3 !RED item 44 and item 74 x 100 versus time.

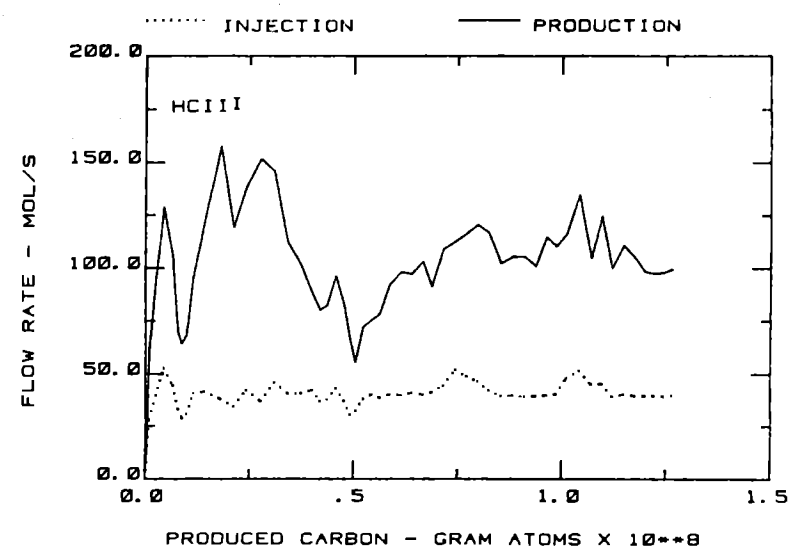


Figure 16.4 !RED items 90 and 91 versus item 133.

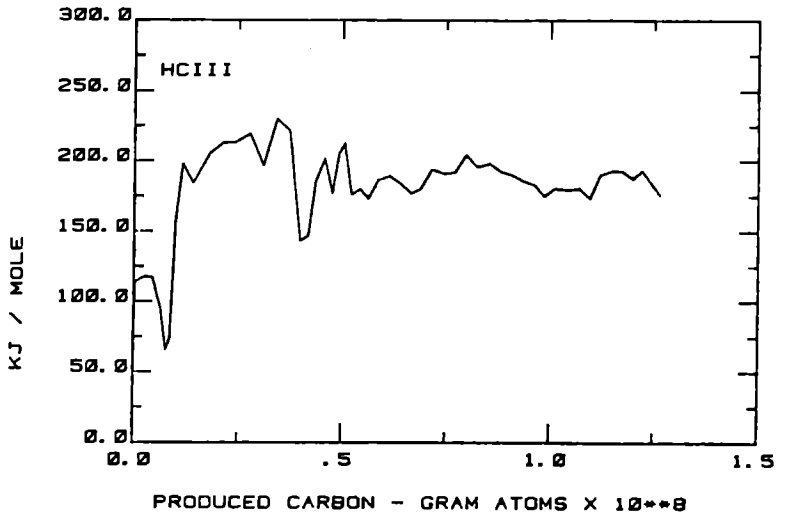


Figure 16.5 !RED items 81 versus item 133.

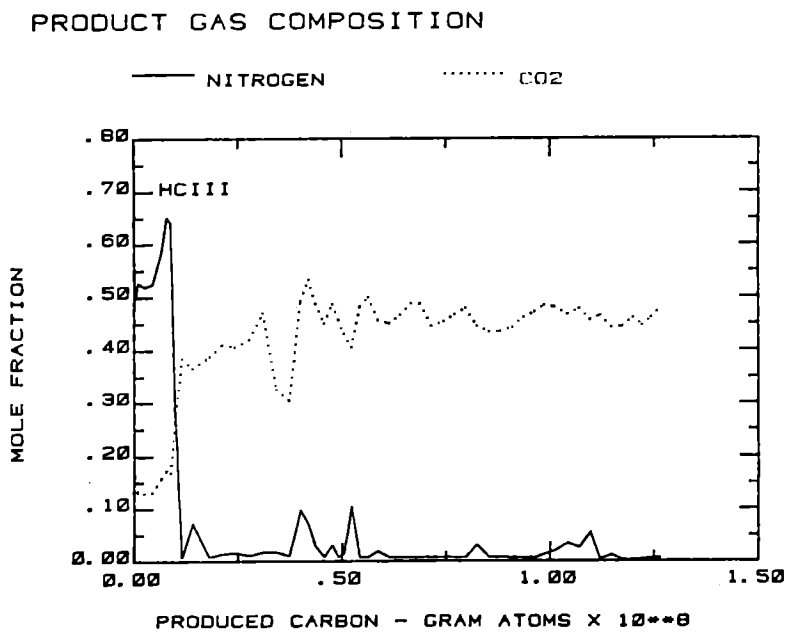


Figure 16.6 !RED items 11 and 16 versus item 133.

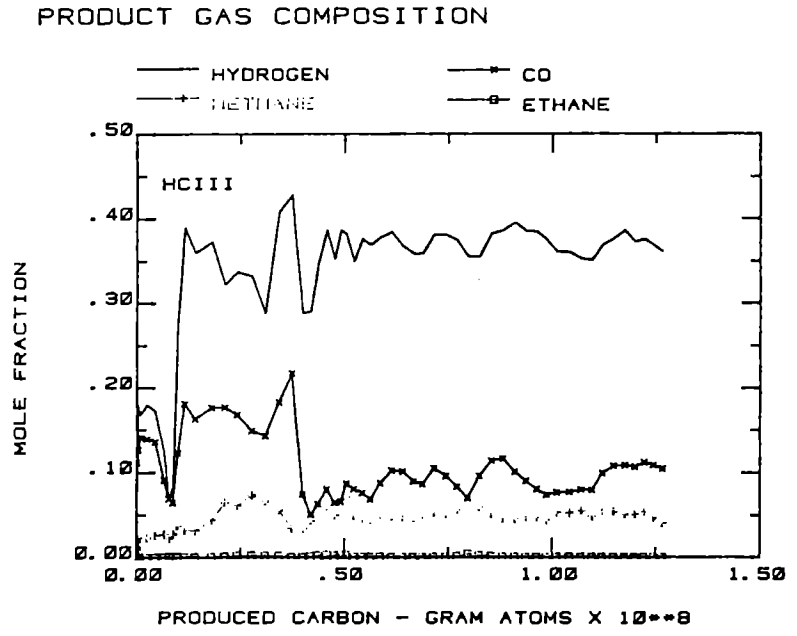


Figure 16.7 !RED items 13, 14, 15 and 18 versus item 133.

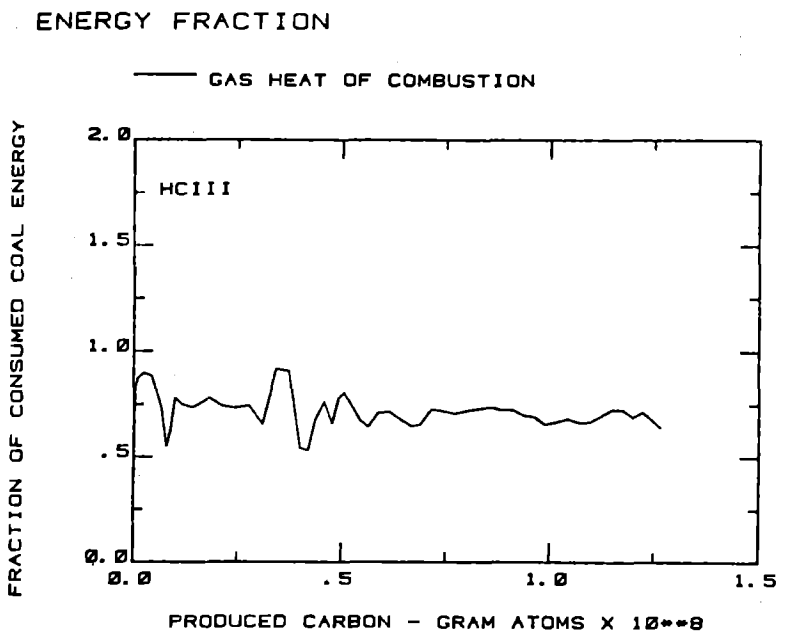


Figure 16.8 !RED item 74 versus item 133.

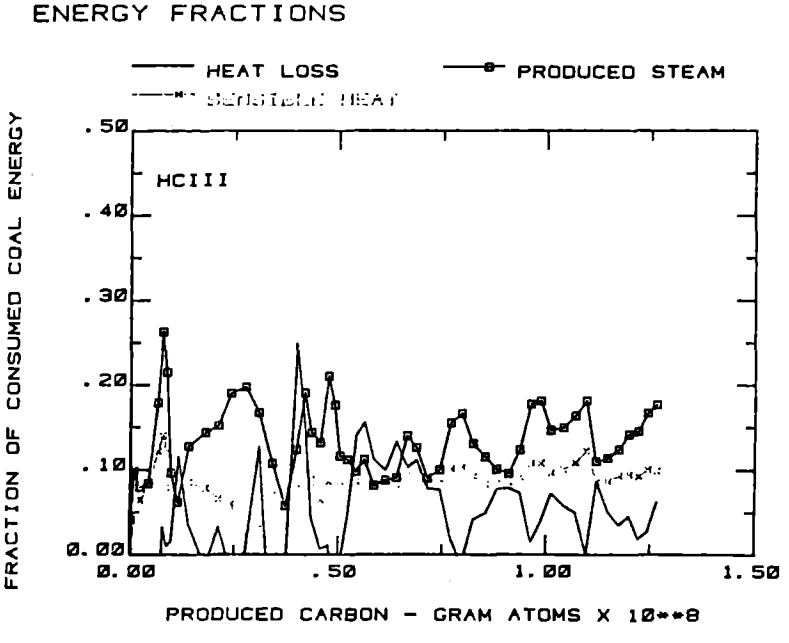


Figure 16.9 !RED items 75 - 78 versus item 133.

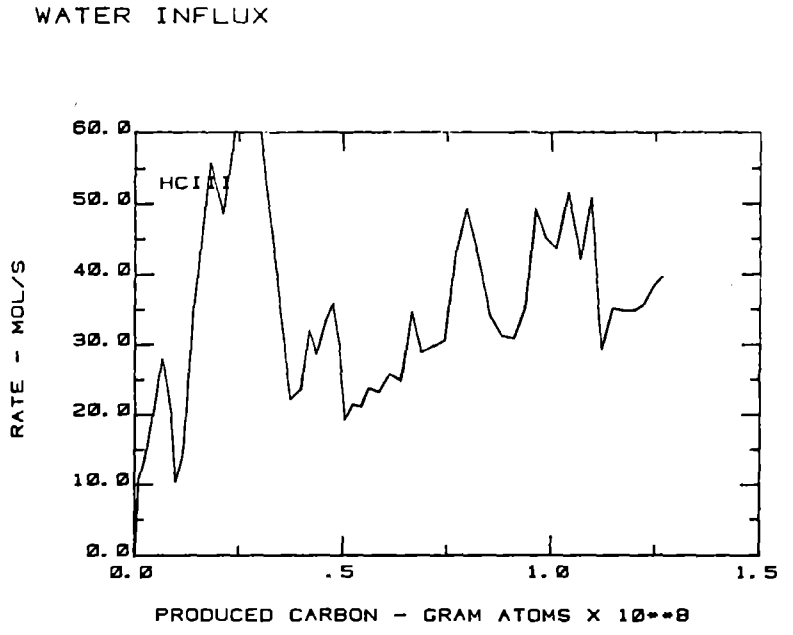


Figure 16.10 !RED item 47 versus item 133.

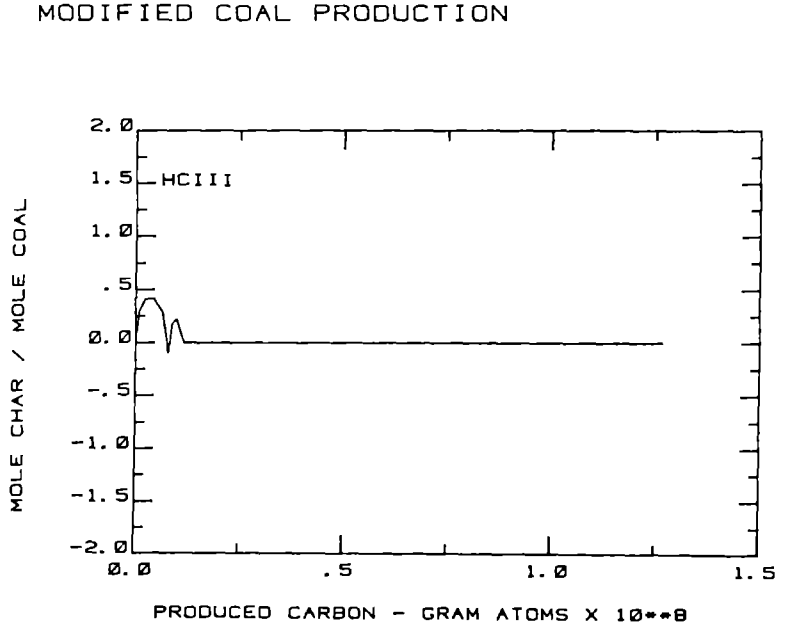


Figure 16.11 !RED item 63 versus item 133.

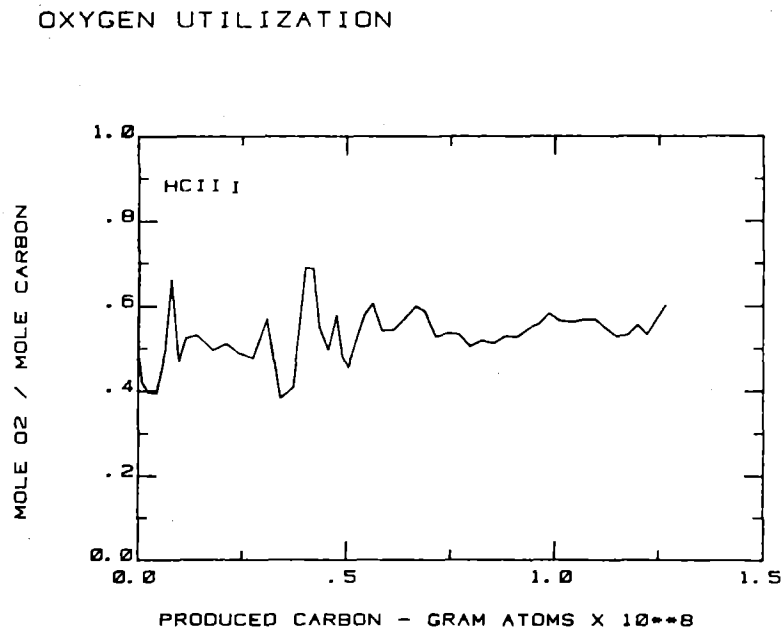


Figure 16.12 !RED item 60 versus item 133.

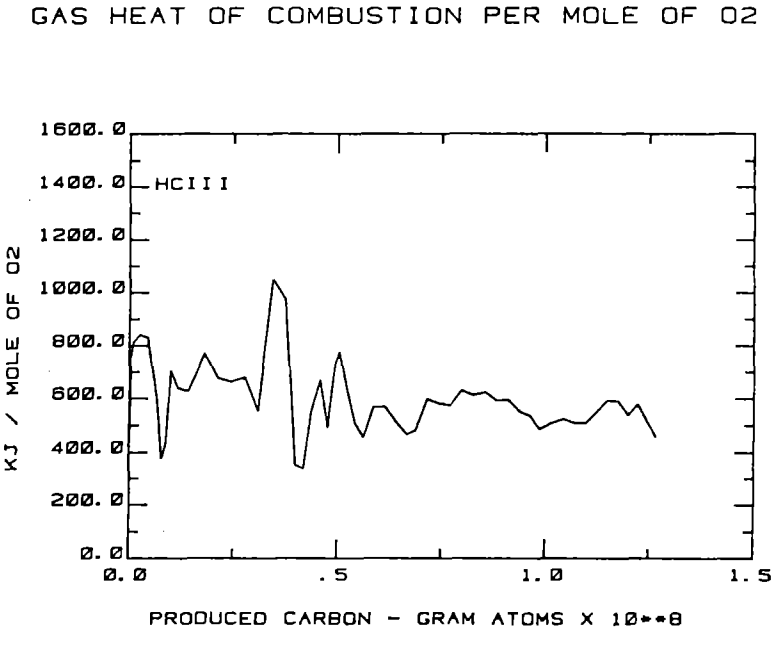


Figure 16.13 !RED item 84 versus item 133.

Rawlins I References

16.1 Underground Gasification of Steeply Dipping Beds Phase II Report: Results of Rawlins Test No. I. Prepared for The Division of Oil, Gas and In Situ Technology Department of Energy SAN131108-54 UC-90c (November, 1980).

17. Comparison Results

A summary of results for each of the thirteen UCG Data Base tests is presented in Table 17.1. The table presents overall material and energy balance results on a char and no char basis. As a guide, Table 17.2 presents the char sensitivity for each experiment based on the overall average gas composition. Note in some instances the char to coal ratio based on a single overall gas composition does not equal the integral average char ratio.

Three figures are presented. Figure 17.1 highlights the total coal production for each experiment on a gram atom and volume basis. Figure 17.2 shows the char/coal ratio for each experiment versus total coal production. And Figure 17.3 highlights the energy utilization of each experiment. In Figure 3 the product heat of combustion per mole of injected oxygen is shown versus total coal production.

Process parameters, material and energy balance results for each experiment on a daily average basis are presented in Appendix III.

TABLE 17.1 UCG DATA BASE COMPARISON RESULTS

	HA1	HA2.1A	HA2.1B	HA2.2	HA2.3	HA3	HA4.A	HA4.B	HCI	HCII	HCIII	METC	GULF
PROCESS PARAMETERS													
Duration (days)	356	48	38	46	62	60	131	152	11	72	57	123	37
Total Injection (Mmols)	382	89	41	157	290	197	423	136	12	220	188	41	90
Total Production (Mmols)	554	124	92	273	531	307	582	206	23	317	473	66	160
Mole Fraction - N2	.54	.52	.50	.48	.52	.52	.59	.52	.55	.56	.10	.57	.48
Mole Fraction - H2	.16	.18	.18	.18	.15	.14	.12	.17	.17	.14	.33	.09	.14
Mole Fraction - CH4	.04	.03	.04	.05	.04	.04	.03	.04	.02	.02	.05	.10	.04
Mole Fraction - CO	.06	.15	.14	.16	.13	.15	.09	.10	.09	.08	.11	.11	.18
Mole Fraction - CO2	.18	.12	.14	.12	.14	.14	.16	.16	.16	.18	.40	.11	.14
H_2O/Dry gas - Ratio	.26	.19	.13	.08	.23	.13	.31	.09	.44	.36	1.1	.04	.22
BALANCE RESULTS WITHOUT CHAR													
O2/Coal - Ratio	.49	.43	.41	.38	.44	.41	.56	.44	.52	.50	.54	.46	.36
H_2O/Coal - Ratio	.41	.29	.34	.40	.28	.19	.19	.36	.31	.24	.33	.56	.22
Total Coal Consumed (Mmols)	130	34	27	87	139	92	127	60	5	73	129	21	60
Total Water influx (Mmols)	151	25	16	43	119	48	145	31	7	58	157	14	23
Total Coal Energy (TJ)	57	16	13	41	66	44	55	26	2	32	56	10	26
% Combustible Gas	85	80	83	93	80	77	73	87	72	70	72	105	79
% Combustible Tar	0	5	3	0	0	0	0	1	9	6	1	0	11
% Heat Loss	-3	3	3	-2	5	10	2	-3	-7	6	4	-11	-2
% Gas Sensible heat	8	6	6	6	7	8	12	11	10	7	9	4	8
% Net Steam	9	5	4	2	7	4	11	3	16	10	13	1	3
% Char + Ash Sensible Heat	1	1	1	1	1	1	1	1	0	0	0	0	0
BALANCE RESULTS WITH CHAR													
O2/Coal - Ratio	.37	.30	.30	.22	.35	.47	.42	.34	.32	.44	.52	.16	.29
Char/Coal - Ratio	.26	.30	.28	.41	.21	-.15	.25	.24	.37	.12	.04	.04	.20
H_2O/Coal - Ratio	.20	.07	.12	.06	.13	.28	.04	.18	.05	.16	.33	.0	.22
Total Coal Consumed (Mmols)	174	48	37	147	175	80	169	78	7	83	134	60	75
Total Water Influx (Mmols)	126	17	10	10	99	52	122	21	4	51	224	0	27
Total Coal Energy (TJ)	76	23	18	70	84	38	74	34	3	36	58	27	32
% Combustible Gas	63	56	60	55	64	88	55	66	45	62	69	38	63
% Combustible Tar	0	3	2	0	0	0	0	8	6	5	1	0	9
% Heat Loss	-2	5	5	2	6	11	2	-2	-5	6	4	0	-3
% Gas Sensible Heat	2	2	2	4	6	10	9	8	6	6	8	2	6
% Net Steam	7	4	3	1	5	4	8	2	10	9	13	0	3
% Char + Ash Sensible Heat	2	2	2	3	2	1	2	2	2	1	0	3	1
% Char Combustion Energy	24	26	24	35	18	-13	23	22	36	12	4	53	19
Product Heat of Combustion per mole O2 injected (kJ/mol)	761	884	957	1175	872	880	570	855	606	611	583	1039	940

TABLE 17.2 UCG DATA BASE CHAR SENSITIVITY

	HA1	HA2.1A	HA2.1B	HA2.2	HA2.3	HA3	HA4.A	HA4.B	HCI	HCII	HCIII	METC	GULF
OVERALL STOICHIOMETRIC COEFFICIENTS													
O_2 coefficient	.386	.301	.296	.225	.362	.592	.469	.341	.311	.466	.353	.165	.350
H_2O coefficient	.234	.070	.122	.046	.143	.433	.087	.182	.065	.197	.042	-.025	.259
Char coefficient	.213	.306	.280	.411	.184	-.417	.166	.229	.377	.063	.318	.642	-.037
OVERALL CHAR DERIVATIVES													
AR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N_2	5.38	4.01	4.02	2.45	5.73	15.09	6.96	4.42	5.27	10.75	6.86	0.73	11.70
O_2	-19.98	-14.90	-14.93	-9.11	-21.29	-56.05	-25.84	-16.43	-19.58	-39.92	-24.83	-2.72	-43.47
H_2	9.99	7.45	7.47	4.55	10.64	28.03	12.92	8.21	9.79	19.96	12.41	1.36	21.73
CH_4	16.10	11.95	12.07	7.02	17.62	49.89	21.35	13.37	15.92	34.50	20.51	1.53	38.85
CO	-13.86	-10.40	-10.33	-6.64	-14.31	-34.19	-17.41	-11.27	-13.46	-25.38	-16.73	-2.54	-26.34
CO_2	-23.85	-17.86	-17.80	-11.19	-24.95	-62.21	-30.34	-19.49	-23.25	-45.34	-29.15	-3.90	-48.08
C_2H_4	12.23	9.00	9.21	4.94	13.95	43.73	16.86	10.31	12.25	29.09	16.19	0.35	34.24
C_2H_6	22.22	16.45	16.67	9.49	24.59	71.75	29.78	18.53	22.04	49.05	28.60	1.71	55.98
C_6	-23.24	-17.72	-17.18	-12.52	-22.01	-36.98	-26.95	-18.35	-22.00	-32.51	-25.92	-7.10	-27.67
H_{10}	49.94	37.26	37.33	22.77	53.21	140.13	64.61	41.07	48.96	99.81	62.07	6.79	108.66
H_2S	9.99	7.45	7.47	4.55	10.64	28.03	12.92	8.21	9.79	19.96	12.41	1.36	21.73
TAR	10.09	6.95	7.83	1.72	14.88	70.65	17.72	9.44	17.68	54.54	25.36	-2.52	88.57
H_2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H in Char	0.32	0.44	0.42	0.50	0.31	-1.23	0.28	0.36	0.61	0.15	0.56	0.39	-0.13
O in Char	-0.63	-0.89	-0.84	-1.01	-0.63	2.46	-0.56	-0.71	-1.22	-0.31	-1.13	-0.78	0.26
H in Coal	-1.48	-1.45	-1.50	-1.23	-1.70	-2.95	-1.68	-1.55	-1.62	-2.44	-1.78	-0.61	-3.49
O in Coal	2.97	2.89	3.00	2.45	3.40	5.91	3.37	3.11	3.25	4.88	3.55	1.22	6.98

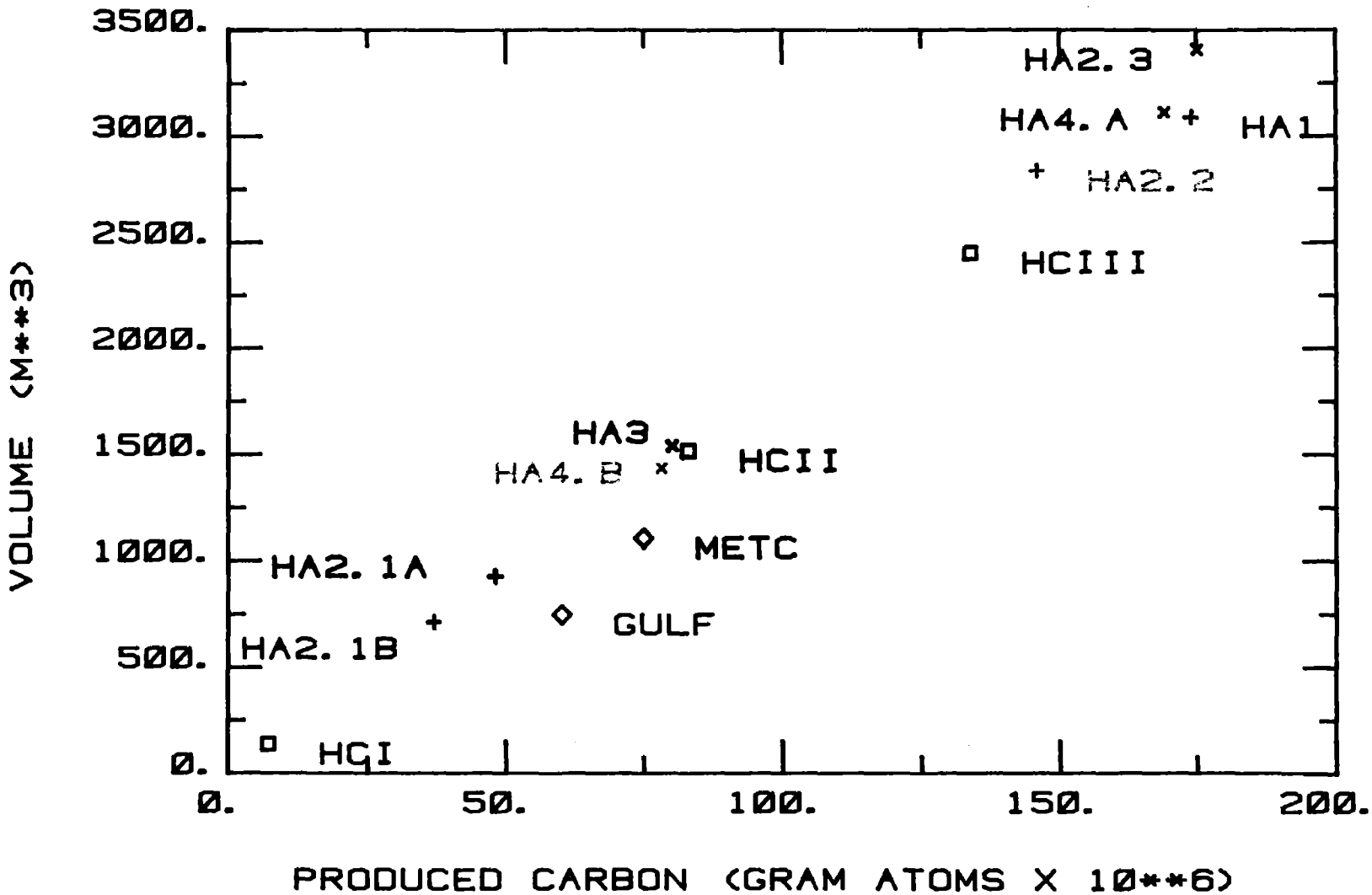


Figure 17.1 Total Coal Consumption (Including Modified Char) for Thirteen UCG Data Base Tests

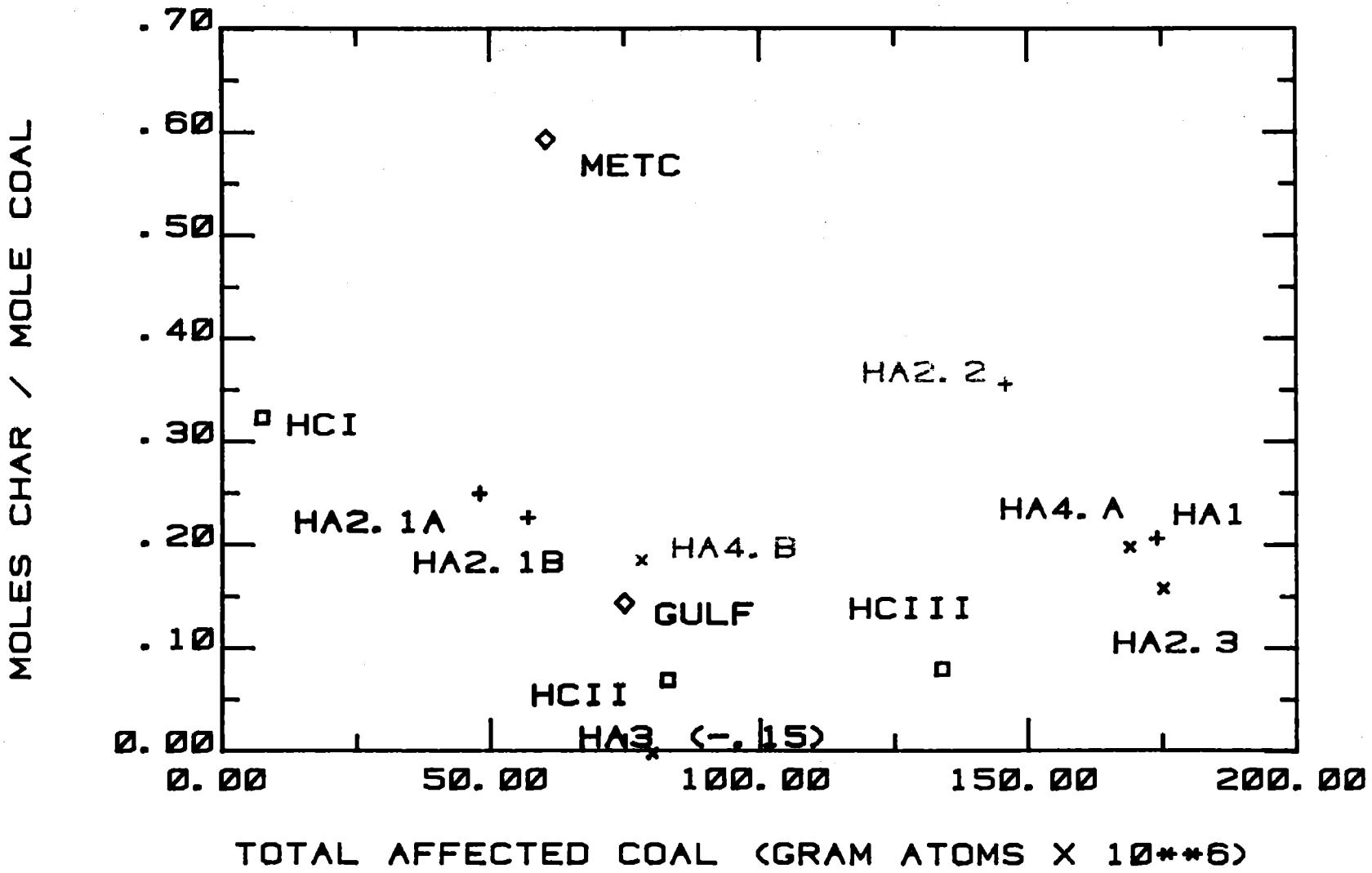


Figure 17.2 Char to Coal Ratio for Thirteen UCG Data Base Tests

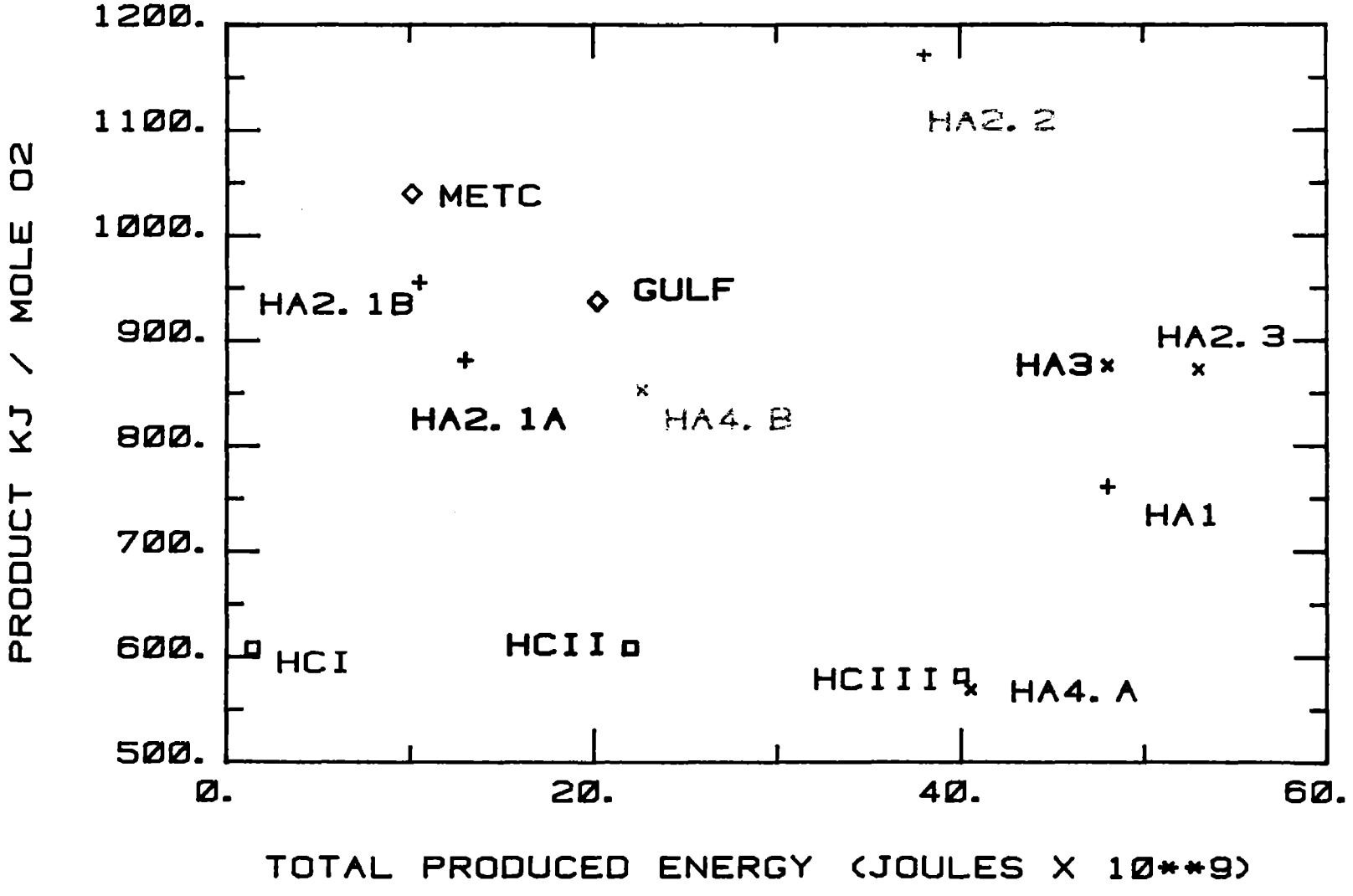


Figure 17.3 Product Heat of Combustion per Mole Injected Oxygen for Thirteen UCG Data Base Tests

APPENDIX I

FORMAT OF STANDARD HISTORY FILES

The raw and reduced data files which make up the UCG Data Base are stored on a HP - 1000 minicomputer in "standard history" format. The files contain integer, ASCII and floating point information in user specified fixed length records. The file structure is shown schematically in Figure A.1.

The first or header record is defined as follows:

HEADER RECORD

Word 1	Word 2	Word 3	. . . . .	Word L

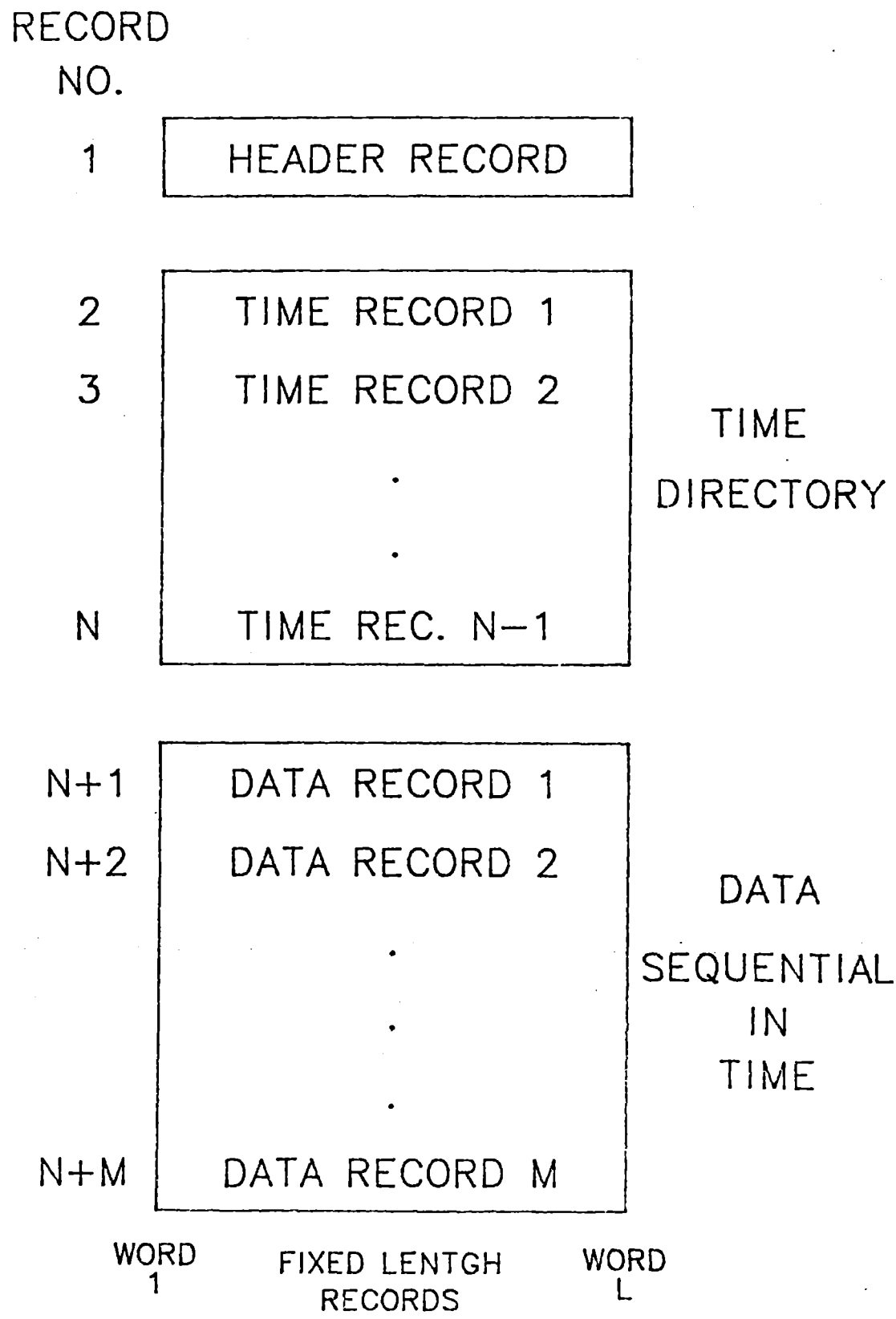
Where:

Word 1	Equals the number of data records currently in the file (M)
Word 2	Equals the record number of the first data entry (N+1)
Word 3	Equals the number of words per record. (L) (Items per record equals L/2)
Words 5-L	Optional comments

Record 2 through N are the time directory records. Each record contains floating point (2 words each) times associated with each data record. The first time corresponds to the first data entry, the second time to the second data entry, etc. The times must be monotonically increasing. The number of times per record is dependent on the user defined length and is fixed at creation at L/2. The maximum number of data entries in the file is limited by the maximum number of time directory records set aside at creation.

TABLE A.1

STANDARD HISTORY FILE FORMAT



The data records begin at record N+1. In each data record, the first two words are reserved for the floating point time. This time is repeated in the time directory. The remainder of the record contains data, with the contents or location of data within the record defined by the user. The contents of standard history files !EXP and !RED are described in the main body of this report. In the descriptions the word "item" is ment to stand for two consective words in the file. This is done since the majority of data within the files are in floating point (two word representation) format.

APPENDIX II

MATERIAL AND ENERGY BALANCE CONVENSIONS

The contents of the !RED reduced data file are calculated based on raw process data contained in file !EXP. A description of each item in !RED is given in the main body of this report. Detailes of the calculations are discussed below.

In !RED, item 1 is the time associated with all of the data in that record. It is the time for the differential data (items 4 - 100) and it is the end time for the integral data (items 104 - 200). Item 2 is the integral data start time. Items 4 - 23 are process gas compositions, with items 24 & 25 being the tar and water to dry gas ratios. The insitu water ratio (item 27) is calculated by eliminating any product cooling water injection. Items 30-43, the well geometry, are set to the default values.

The material balance parameters are calculated by solving the overall stiochiometric equation shown in Equation (1).

$$CH_aO_b + A_1O_2 + A_2H_2O \text{ --- } A_3H_2 + A_4CH_4 + A_5CO + A_6CO_2 + A_7C_2H_4 + A_8C_2H_6 + A_9C_6 + A_{10}H_{10} + \underset{\text{(Tar)}}{A_{11}C_cH_dO_e} + \underset{\text{(Char)}}{A_{12}CH_fO_g} \quad (1)$$

In Equation (1) the subscripts (a-g) are defined for each particular coal type in Appendix III. The 12 stoichiometric coefficients are solved using the following 12 equations:

Atomic balances for carbon, hygrogen and oxygen	3 equations
Molar ratio of product species (i.e. H_2/CO_2 ratio)	8 equations
Char equation - choose one	1 equation

A) Assume no insitu char accumulation, $A_{12} = 0$.

B) Molar ratio of consumed oxygen to product gas based on an oxygen tracer in the product.
(i.e. for air O_2/product = (0.21/0.78) * N_2/product)

The coal consumption rate (item 44) is calculated via Equation (1) assuming no char accumulation. This is equivalent to counting carbon atoms in the product gas. The char rate (item 45) is zero. The ash and water from the coal (items 46 & 48) are propotional to the coal rate based on the coal analysis. The water consumed in the reaction (item 49) is the calculated from Eq. (1). The insitu water influx rate is calculated using Equation (2).

$$\text{Influx} = \text{Water produced} - \text{Water injected (all wells)} - \text{Water from coal} + \text{Water consumed in reaction} \quad (2)$$

Where:

Water produced is calculated from the wet gas composition

Water injected accounts for all surface injection, including steam injection

Water from coal is calculated from the coal rate based on coal analysis

Water consumed in reaction is calculated based on Eq. (1).

Gas recovery (item 50) is calculated via Equation (3) or Equation (4) depending on the availability of a suitable inert tracer.

$$\text{Recovery \%} = \text{Inert tracer produced} / \text{Inert tracer injected} \times 100. \quad (3)$$

$$\text{Recovery \%} = (O_2 \text{ produced} - O_2 \text{ from coal}) / O_2 \text{ injected} \times 100. \quad (4)$$

Using the recovery, the rate of gas loss assuming the lost gas is product is calculated by Equation (5). (Although this item is calculated, material and energy balance results assume that injection gas rather than production gas is lost)

$$\text{Gas loss} = (\text{Product rate} - \text{cooling water}) \times (100 - \text{Recovery}) / 100 \quad (5)$$

The gas leak parameter (item 52) is then calculated by dividing the product gas loss rate by the average system pressure.

The material and energy balance calculational flags are given in item 53 - 55. The char flag (item 55) is always off. The resultant stoichiometric coefficients from the overall reaction (Eq. (1)) are given in items 60 - 62. Items 63 and 64 are the result of an alternate stoichiometric balance in which char is allowed. However, if an oxygen tracer is not available, these items are set to zero.

The energy balance parameters are calculated using the coal rate (item 44) and thus are based on the assumption of no net char accumulation. Item 72 is the rate of energy release from the consumed coal. The molar coal heat of combustion is given in Appendix III for each coal type. Items 73 - 80 are calculated and then divided by the coal heat of combustion (item 72).

Item 73 is the produced tar heat of combustion. Item 74 is the dry, tar free product heat of combustion. Item 76 is the sensible heat of the product (including steam). Item 77 is the latent heat of vaporization of the produced steam with the injected steam and cooling water removed. Item 80 is the heat of vaporization of any injected cooling water. Item 78 is the sensible heat associated with accumulated char and ash underground. Item 79 is the char heat of combustion. The insitu heat loss (item 75) is then calculated using Equation 6. In the equation the gas loss is assumed to be injected gas.

Energy loss rate = Enthalpy in rate - Enthalpy out rate (6)

Terms for Enthalpy in:	Coal	@ T-coal
	Coal ash	"
	Coal H_2O (liquid)	"
	H_2O (liq) influx	"
	H_2O (liq) injected	"
	Injected gas (X recovery)	@ T-injection
Terms for Enthalpy out:	Product gas	@ T-product
	Char	@ T-accumulation
	Ash	"

(See Appendix III for temperatures T-coal and T-accumulation)

Items 81 - 83 are product gas heats of combustion on various bases. Item 84 is the dry, tar free product heat of combustion (item 81) divided by the oxygen injection rate corrected for gas loss.

The stoichiometric ratio (item 85) is calculated from the overall stoichiometric equation and the water gas shift temperature (item 86) is calculated based on the product gas composition using the insitu water to dry gas ratio (item 27). Items 90 - 99 are differential operating parameters at the time specified in item 1.

Beginning with item 104 are process integrals. The integration time period is specified by items 1 and 2. Items 104 - 137 are integral injected and produced species, with Items 144 - 149 being integral material balance results. The integral gas recovery (item 150) is flow weighted using the differential and integral injected oxygen rate. Four volumes are reported (items 151 - 154). Since no char accumulation is allowed, the material balance and carbon count results are identical. Item 164 is the integral char accumulation based on item 64. Items 172 - 180 are integrals of items 72 - 80. Items 181 - 185 are not integrals of items 81 - 85 but rather are recalculated based on total produced species. Items 190 - 193 are integral process parameters. Items 194 & 196 are flow weighted averages using the differential and integral injection rates. Items 195 & 197 are also averaged based on production rates.

Total coal consumed including char can simply be calculated by adding total coal and char produced, !RED items 144 and 164, respectively. The overall stiochiometry, material and energy balance terms can then be recalculated, as above using this new coal total.

APPENDIX III

DAILY AVERAGED SUMMARY TABLES

Process, material and energy balance results for each experiment in the UCG Data Base are presented on a daily averaged basis. The information is contained in five tables for each experiment. The contents of each table are described below.

TABLE 1 OPERATING PARAMETERS

ITEM	DESCRIPTION	UNITS
1	Time	Days
2	Injection rate	Moles/sec
3	Production rate	Moles/sec
4	Injection temperature	Celsius
5	Production temperature	Celsius
6	Injection pressure	kPa
7	Production pressure	kPa
8	Steam injection rate	Moles/sec
9	Product cooling water injection rate	Moles/sec
10	Oxygen injection concentration	Mole fraction
11	Steam injection concentration	Mole fraction

TABLE 2 PRODUCT GAS ANALYSIS 1

ITEM	DESCRIPTION	UNITS
1	Time	Days
2	Argon	Mole fraction
3	Nitrogen	Mole fraction
4	Oxygen	Mole fraction
5	Hydrogen	Mole fraction
6	Methane	Mole fraction
7	Carbon monoxide	Mole fraction
8	Carbon dioxide	Mole fraction
9	Ethane	Mole fraction

TABLE 3 PRODUCT GAS ANALYSIS 2

ITEM	DESCRIPTION	UNITS
1	Time	Days
2	Ethylene	Mole fraction
3	C_6 (composite)	Mole fraction
4	H_{10} (composite)	Mole fraction
5	Hydrogen sulfide	Mole fraction
6	Tar to dry gas ratio	Mole fraction
7	H_2O to dry gas ratio	Mole fraction

TABLE 4 MATERIAL BALANCE PARAMETERS

ITEM	DESCRIPTION	UNITS
1	Time	Days
2	Coal consumption rate	Moles/sec
3	Ash accumulation rate	Moles/sec
4	Water influx rate	Moles/sec
5	Water from consumed coal	Moles/sec
6	Water consumed in reaction	Moles/sec
7	O_2/coal ratio in overall reaction	None
8	H_2O/coal ratio in overall reaction	None
9	Char accumulation rate - alternate material balance.	Moles/sec
10	Char/coal ratio in overall reaction - alternate material balance	None
11	Gas recovery	Percent

TABLE 5 ENERGY BALANCE PARAMETERS

ITEM	DESCRIPTION	UNITS
1	Time	Days
2	Energy from consumed coal	Moles/sec
	Items 3 - 9 are calculated and then ratiod to item 2	
3	Product heat of combustion, dry no tar	Fraction
4	Produced tar heat of combustion	Fraction
5	Product sensible heat	Fraction
6	Produced steam (without cooling H_2O)	Fraction
7	Produced cooling water (latent heat)	Fraction
8	Sensible heat of char and ash	Fraction
9	Heat loss underground	Fraction
10	Product heat of combustion, dry no tar	kJ/mole
11	Product heat of combustion per mole of injected oxygen per recovery	kJ/mole

UNDERGROUND COAL GASIFICATION

DATA BASE

LARIMIE ENERGY TECHNOLOGY CENTER

HANNA I

DAILY AVERAGE RESULTS

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  HANNA I COAL ANALYSIS

                                                                    KG/M**3   KJ/MOL
COAL H/C  COAL O/C  COAL S/C  COAL N/C  WT F H2O  WT F ASH  DENSITY  HT COMB
.9683     0.1684     0.005    0.022     .0951     .2376      1363.    438.

CHAR H/C  CHAR O/C  CHAR S/C  CHAR N/C
.1018     0.0003    0.        0.

 TAR H/C   TAR O/C   TAR S/C   TAR N/C      C/MOLECULE
 1.00      0.        0.        0.            9.

  COAL       ASH&CHAR  --  TEMPERATURES (K)
   300.       1000.

  1   NUMBER OF POINTS ON OXYGEN TRACER TYPE CURVE
999.     2   TIME,TRACER FLAG (ZERO=NONE,ONE=ARGON,TWO=NITROGEN)

  1   NUMBER OF POINTS ON GAS LOSS TRACER TYPE CURVE
 999.   2  TIME,TRACER FLAG (SAME AS OXYGEN TRACER)

  1   NUMBER OF POINTS ON CHAR FLAG CURVE
 999.   0  TIME,TRACER FLAG (0=NO CHAR , 1=WITH CHAR)
```

UCG DB - HA1 - OPERATING PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	INJ RATE kg/s IRED1 90	PRD RATE kg/s IRED1 91	INJ TEMP C IRED1 94	PRD TEMP C IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM kg/s IRED1 92	COOLING kg/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
90.000	4.108	2.522	10.00	150.0	1513.	1513.	0.000	0.000	.2100	0.000
91.000	3.650	2.346	10.00	150.0	1575.	1575.	0.000	0.000	.2100	0.000
92.000	2.848	2.033	10.00	150.0	1680.	1680.	0.000	0.000	.2100	0.000
93.000	2.360	2.046	10.00	150.0	1760.	1760.	0.000	0.000	.2100	0.000
94.000	2.631	2.514	10.00	150.0	1788.	1788.	0.000	0.000	.2100	0.000
95.000	3.684	3.578	10.00	150.0	1784.	1784.	0.000	0.000	.2100	0.000
96.000	4.588	3.636	10.00	150.0	1806.	1806.	0.000	0.000	.2100	0.000
97.000	4.961	2.530	10.00	150.0	2329.	2329.	0.000	0.000	.2100	0.000
98.000	4.375	1.842	10.00	150.0	3211.	3211.	0.000	0.000	.2100	0.000
99.000	2.816	1.573	10.00	150.0	3411.	3411.	0.000	0.000	.2100	0.000
100.000	3.446	1.533	10.00	150.0	2968.	2968.	0.000	0.000	.2100	0.000
101.000	5.782	1.226	10.00	150.0	2071.	2071.	0.000	0.000	.2100	0.000
102.000	9.195	.8399	10.00	150.0	1265.	1265.	0.000	0.000	.2100	0.000
103.000	12.62	.7239	10.00	150.0	1177.	1177.	0.000	0.000	.2100	0.000
104.000	13.55	.7216	10.00	150.0	1290.	1290.	0.000	0.000	.2100	0.000
105.000	13.69	.7076	10.00	150.0	1322.	1322.	0.000	0.000	.2100	0.000
106.000	13.76	.6409	10.00	150.0	1350.	1350.	0.000	0.000	.2100	0.000
107.000	13.72	.6489	10.00	150.0	1411.	1411.	0.000	0.000	.2100	0.000
108.000	13.15	.9007	10.00	150.0	1521.	1521.	0.000	0.000	.2100	0.000
109.000	12.38	1.050	10.00	150.0	1653.	1653.	0.000	0.000	.2100	0.000
110.000	12.12	1.123	10.00	150.0	1756.	1756.	0.000	0.000	.2100	0.000
111.000	12.11	1.199	10.00	150.0	1812.	1812.	0.000	0.000	.2100	0.000
112.000	12.02	1.158	10.00	150.0	1843.	1843.	0.000	0.000	.2100	0.000
113.000	11.79	1.153	10.00	150.0	1856.	1856.	0.000	0.000	.2100	0.000
114.000	11.82	1.302	10.00	150.0	1857.	1857.	0.000	0.000	.2100	0.000
115.000	12.01	1.756	10.00	150.0	1844.	1844.	0.000	0.000	.2100	0.000
116.000	12.05	2.084	10.00	150.0	1828.	1828.	0.000	0.000	.2100	0.000
117.000	12.23	2.158	10.00	150.0	1827.	1827.	0.000	0.000	.2100	0.000
118.000	12.44	2.205	10.00	150.0	1829.	1829.	0.000	0.000	.2100	0.000
119.000	12.61	2.202	10.00	150.0	1825.	1825.	0.000	0.000	.2100	0.000
120.000	12.78	2.199	10.00	150.0	1818.	1818.	0.000	0.000	.2100	0.000
121.000	12.76	2.083	10.00	150.0	1809.	1809.	0.000	0.000	.2100	0.000
122.000	12.51	1.852	10.00	150.0	1771.	1771.	0.000	0.000	.2100	0.000
123.000	12.19	1.754	10.00	150.0	1693.	1693.	0.000	0.000	.2100	0.000
124.000	11.82	1.864	10.00	150.0	1693.	1693.	0.000	0.000	.2100	0.000
125.000	11.45	1.979	10.00	150.0	1778.	1778.	0.000	0.000	.2100	0.000
126.000	11.23	2.015	10.00	150.0	1817.	1817.	0.000	0.000	.2100	0.000
127.000	11.22	1.951	10.00	150.0	1807.	1807.	0.000	0.000	.2100	0.000

TIME (D)	INJ RATE mo/s IRED1 90	PRD RATE mo/s IRED1 91	INJ TEMP c IRED1 94	PRD c IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM mo/s IRED1 92	COOLING mo/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
128.000	11.28	1.872	10.00	150.0	1782.	1782.	0.000	0.000	.2100	0.000
129.000	11.31	1.832	10.00	150.0	1753.	1753.	0.000	0.000	.2100	0.000
130.000	11.47	1.486	10.00	150.0	1718.	1718.	0.000	0.000	.2100	0.000
131.000	11.86	1.157	10.00	150.0	1703.	1703.	0.000	0.000	.2100	0.000
132.000	12.28	1.116	10.00	150.0	1708.	1708.	0.000	0.000	.2100	0.000
133.000	12.44	1.097	10.00	150.0	1709.	1709.	0.000	0.000	.2100	0.000
134.000	12.17	1.132	10.00	150.0	1703.	1703.	0.000	0.000	.2100	0.000
135.000	10.84	1.180	10.00	150.0	1744.	1744.	0.000	0.000	.2100	0.000
136.000	7.824	1.337	10.00	150.0	1833.	1833.	0.000	0.000	.2100	0.000
137.000	5.850	1.207	10.00	150.0	1812.	1812.	0.000	0.000	.2100	0.000
138.000	5.760	.9152	10.00	150.0	1719.	1719.	0.000	0.000	.2100	0.000
139.000	5.207	.8368	10.00	150.0	1684.	1684.	0.000	0.000	.2100	0.000
140.000	4.615	.6969	10.00	150.0	1627.	1627.	0.000	0.000	.2100	0.000
141.000	4.554	.6453	10.00	150.0	1566.	1566.	0.000	0.000	.2100	0.000
142.000	4.534	.7189	10.00	150.0	1552.	1552.	0.000	0.000	.2100	0.000
143.000	4.455	.7650	10.00	150.0	1550.	1550.	0.000	0.000	.2100	0.000
144.000	4.417	.7622	10.00	150.0	1543.	1543.	0.000	0.000	.2100	0.000
145.000	4.414	.7594	10.00	150.0	1539.	1539.	0.000	0.000	.2100	0.000
146.000	4.411	.7626	10.00	150.0	1538.	1538.	0.000	0.000	.2100	0.000
147.000	4.524	.8405	10.00	150.0	1543.	1543.	0.000	0.000	.2100	0.000
148.000	4.757	.9522	10.00	150.0	1555.	1555.	0.000	0.000	.2100	0.000
149.000	5.006	1.083	10.00	150.0	1590.	1590.	0.000	0.000	.2100	0.000
150.000	4.823	1.874	10.00	150.0	1621.	1621.	0.000	0.000	.2100	0.000
151.000	4.377	3.711	10.00	150.0	1621.	1621.	0.000	0.000	.2100	0.000
152.000	4.242	4.659	10.00	150.0	1598.	1598.	0.000	0.000	.2100	0.000
153.000	4.239	4.277	10.00	150.0	1623.	1623.	0.000	0.000	.2100	0.000
154.000	4.364	4.058	10.00	150.0	1664.	1664.	0.000	0.000	.2100	0.000
155.000	4.513	3.792	10.00	150.0	1716.	1716.	0.000	0.000	.2100	0.000
156.000	4.571	3.290	10.00	150.0	1868.	1868.	0.000	0.000	.2100	0.000
157.000	4.643	2.941	10.00	150.0	1927.	1927.	0.000	0.000	.2100	0.000
158.000	4.783	3.024	10.00	150.0	1902.	1902.	0.000	0.000	.2100	0.000
159.000	4.967	2.983	10.00	150.0	1945.	1945.	0.000	0.000	.2100	0.000
160.000	5.112	2.752	10.00	150.0	1998.	1998.	0.000	0.000	.2100	0.000
161.000	5.228	2.596	10.00	150.0	1989.	1989.	0.000	0.000	.2100	0.000
162.000	5.280	2.500	10.00	150.0	1948.	1948.	0.000	0.000	.2100	0.000
163.000	5.277	3.070	10.00	150.0	1948.	1948.	0.000	0.000	.2100	0.000
164.000	5.275	4.475	10.00	150.0	1966.	1966.	0.000	0.000	.2100	0.000
165.000	5.189	5.652	10.00	150.0	1987.	1987.	0.000	0.000	.2100	0.000
166.000	5.034	5.941	10.00	150.0	2029.	2029.	0.000	0.000	.2100	0.000
167.000	5.100	5.920	10.00	150.0	2105.	2105.	0.000	0.000	.2100	0.000
168.000	5.103	5.965	10.00	150.0	2186.	2186.	0.000	0.000	.2100	0.000
169.000	4.911	6.019	10.00	150.0	2240.	2240.	0.000	0.000	.2100	0.000
170.000	4.854	5.981	10.00	150.0	2269.	2269.	0.000	0.000	.2100	0.000
171.000	4.895	6.172	10.00	150.0	2296.	2296.	0.000	0.000	.2100	0.000
172.000	4.887	6.436	10.00	150.0	2156.	2156.	0.000	0.000	.2100	0.000
173.000	4.850	6.562	10.00	150.0	1844.	1844.	0.000	0.000	.2100	0.000
174.000	4.634	7.209	10.00	150.0	1664.	1664.	0.000	0.000	.2100	0.000

TIME (D)	INJ RATE mo/s IRED1 90	PRD RATE mo/s IRED1 91	INJ TEMP c IRED1 94	PRD TEMP c IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM mo/s IRED1 92	COOLING mo/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
175.000	4.458	6.734	10.00	150.0	1589.	1589.	0.000	0.000	.2100	0.000
176.000	4.633	7.090	10.00	150.0	1601.	1601.	0.000	0.000	.2100	0.000
177.000	4.769	6.754	10.00	150.0	1737.	1737.	0.000	0.000	.2100	0.000
178.000	4.779	4.606	10.00	150.0	1808.	1808.	0.000	0.000	.2100	0.000
179.000	4.850	3.700	10.00	150.0	1704.	1704.	0.000	0.000	.2100	0.000
180.000	4.923	3.214	10.00	150.0	1395.	1395.	0.000	0.000	.2100	0.000
181.000	4.923	3.454	10.00	150.0	1191.	1191.	0.000	0.000	.2100	0.000
182.000	4.966	3.678	10.00	150.0	1216.	1216.	0.000	0.000	.2100	0.000
183.000	5.064	3.450	10.00	150.0	1243.	1243.	0.000	0.000	.2100	0.000
184.000	5.155	3.108	10.00	150.0	1213.	1213.	0.000	0.000	.2100	0.000
185.000	5.315	3.027	10.00	150.0	1159.	1159.	0.000	0.000	.2100	0.000
186.000	5.780	3.082	10.00	150.0	1191.	1191.	0.000	0.000	.2100	0.000
187.000	7.032	3.050	10.00	150.0	1316.	1316.	0.000	0.000	.2100	0.000
188.000	8.516	2.871	10.00	150.0	1412.	1412.	0.000	0.000	.2100	0.000
189.000	8.917	2.618	10.00	150.0	1379.	1379.	0.000	0.000	.2100	0.000
190.000	8.258	2.558	10.00	150.0	1286.	1286.	0.000	0.000	.2100	0.000
191.000	7.753	2.440	10.00	150.0	1238.	1238.	0.000	0.000	.2100	0.000
192.000	7.934	2.214	10.00	150.0	1223.	1223.	0.000	0.000	.2100	0.000
193.000	8.774	2.106	10.00	150.0	1221.	1221.	0.000	0.000	.2100	0.000
194.000	9.555	1.924	10.00	150.0	1214.	1214.	0.000	0.000	.2100	0.000
195.000	9.825	1.993	10.00	150.0	1191.	1191.	0.000	0.000	.2100	0.000
196.000	9.725	2.370	10.00	150.0	1161.	1161.	0.000	0.000	.2100	0.000
197.000	9.114	2.591	10.00	150.0	1119.	1119.	0.000	0.000	.2100	0.000
198.000	8.738	2.675	10.00	150.0	1105.	1105.	0.000	0.000	.2100	0.000
199.000	8.790	3.043	10.00	150.0	1156.	1156.	0.000	0.000	.2100	0.000
200.000	8.876	3.832	10.00	150.0	1247.	1247.	0.000	0.000	.2100	0.000
201.000	8.949	4.307	10.00	150.0	1310.	1310.	0.000	0.000	.2100	0.000
202.000	8.907	4.357	10.00	150.0	1337.	1337.	0.000	0.000	.2100	0.000
203.000	8.792	4.393	10.00	150.0	1365.	1365.	0.000	0.000	.2100	0.000
204.000	8.706	4.402	10.00	150.0	1417.	1417.	0.000	0.000	.2100	0.000
205.000	8.663	4.399	10.00	150.0	1492.	1492.	0.000	0.000	.2100	0.000
206.000	8.660	4.424	10.00	150.0	1547.	1547.	0.000	0.000	.2100	0.000
207.000	8.657	4.488	10.00	150.0	1575.	1575.	0.000	0.000	.2100	0.000
208.000	8.620	4.534	10.00	150.0	1590.	1590.	0.000	0.000	.2100	0.000
209.000	8.576	4.541	10.00	150.0	1576.	1576.	0.000	0.000	.2100	0.000
210.000	8.764	4.483	10.00	150.0	1576.	1576.	0.000	0.000	.2100	0.000
211.000	8.969	4.362	10.00	150.0	1495.	1495.	0.000	0.000	.2100	0.000
212.000	9.030	4.033	10.00	150.0	1342.	1342.	0.000	0.000	.2100	0.000
213.000	7.956	3.607	10.00	150.0	1260.	1260.	0.000	0.000	.2100	0.000
214.000	7.769	3.329	10.00	150.0	1207.	1207.	0.000	0.000	.2100	0.000
215.000	9.002	3.487	10.00	150.0	1174.	1174.	0.000	0.000	.2100	0.000
216.000	9.311	2.816	10.00	150.0	1150.	1150.	0.000	0.000	.2100	0.000
217.000	9.534	2.658	10.00	150.0	1062.	1062.	0.000	0.000	.2100	0.000
218.000	9.772	4.436	10.00	150.0	980.5	980.5	0.000	0.000	.2100	0.000
219.000	9.687	5.427	10.00	150.0	985.2	985.2	0.000	0.000	.2100	0.000
220.000	9.565	5.496	10.00	150.0	1007.	1007.	0.000	0.000	.2100	0.000
221.000	10.12	5.762	10.00	150.0	1030.	1030.	0.000	0.000	.2100	0.000

TIME (D)	INJ RATE mo/s IRED1 90	PRD RATE mo/s IRED1 91	INJ TEMP c IRED1 94	PRD TEMP c IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM mo/s IRED1 92	COOLING mo/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
222.000	11.61	6.074	10.00	150.0	1068.	1068.	0.000	0.000	.2100	0.000
223.000	12.77	6.514	10.00	150.0	1115.	1115.	0.000	0.000	.2100	0.000
224.000	13.17	7.609	10.00	150.0	1141.	1141.	0.000	0.000	.2100	0.000
225.000	14.46	8.644	10.00	150.0	1143.	1143.	0.000	0.000	.2100	0.000
226.000	15.45	9.059	10.00	150.0	1130.	1130.	0.000	0.000	.2100	0.000
227.000	15.53	9.047	10.00	150.0	1112.	1112.	0.000	0.000	.2100	0.000
228.000	16.73	8.873	10.00	150.0	1105.	1105.	0.000	0.000	.2100	0.000
229.000	17.05	8.895	10.00	150.0	1111.	1111.	0.000	0.000	.2100	0.000
230.000	16.07	8.778	10.00	150.0	1124.	1124.	0.000	0.000	.2100	0.000
231.000	15.33	8.228	10.00	150.0	1125.	1125.	0.000	0.000	.2100	0.000
232.000	14.53	7.770	10.00	150.0	1115.	1115.	0.000	0.000	.2100	0.000
233.000	13.79	6.992	10.00	150.0	1111.	1111.	0.000	0.000	.2100	0.000
234.000	12.18	4.713	10.00	150.0	1116.	1116.	0.000	0.000	.2100	0.000
235.000	11.91	2.630	10.00	150.0	1122.	1122.	0.000	0.000	.2100	0.000
236.000	14.70	1.530	10.00	150.0	1127.	1127.	0.000	0.000	.2100	0.000
237.000	16.74	.9811	10.00	150.0	1129.	1129.	0.000	0.000	.2100	0.000
238.000	16.24	1.034	10.00	150.0	1130.	1130.	0.000	0.000	.2100	0.000
239.000	15.29	2.968	10.00	150.0	1130.	1130.	0.000	0.000	.2100	0.000
240.000	13.49	8.877	10.00	150.0	1119.	1119.	0.000	0.000	.2100	0.000
241.000	11.21	12.96	10.00	150.0	1253.	1253.	0.000	0.000	.2100	0.000
242.000	10.47	12.16	10.00	150.0	1451.	1451.	0.000	0.000	.2100	0.000
243.000	10.50	11.02	10.00	150.0	1463.	1463.	0.000	0.000	.2100	0.000
244.000	11.23	9.965	10.00	150.0	1351.	1351.	0.000	0.000	.2100	0.000
245,000	11.96	9.547	10.00	150.0	1226.	1226.	0.000	0.000	.2100	0.000
246.000	12.02	10.60	10.00	150.0	1148.	1148.	0.000	0.000	.2100	0.000
247.000	13.21	15.42	10.00	150.0	1119.	1119.	0.000	0.000	.2100	0.000
248.000	14.54	18.15	10.00	150.0	1134.	1134.	0.000	0.000	.2100	0.000
249.000	14.27	12.36	10.00	150.0	1155.	1155.	0.000	0.000	.2100	0.000
250.000	16.20	10.89	10.00	150.0	1147.	1147.	0.000	0.000	.2100	0.000
251.000	16.60	13.85	10.00	150.0	1051.	1051.	0.000	0.000	.2100	0.000
252.000	13.47	13.37	10.00	150.0	913.7	913.7	0.000	0.000	.2100	0.000
253.000	12.83	19.55	10.00	150.0	823.6	823.6	0.000	0.000	.2100	0.000
254.000	14.89	25.40	10.00	150.0	755.7	755.7	0.000	0.000	.2100	0.000
255.000	17.20	25.94	10.00	150.0	718.7	718.7	0.000	0.000	.2100	0.000
256.000	17.73	27.03	10.00	150.0	702.6	702.6	0.000	0.000	.2100	0.000
257.000	17.57	26.21	10.00	150.0	701.5	701.5	0.000	0.000	.2100	0.000
258.000	17.29	25.76	10.00	150.0	700.3	700.3	0.000	0.000	.2100	0.000
259.000	16.96	27.23	10.00	150.0	699.0	699.0	0.000	0.000	.2100	0.000
260.000	17.51	28.54	10.00	150.0	709.6	709.6	0.000	0.000	.2100	0.000
261.000	18.08	20.79	10.00	150.0	687.0	687.0	0.000	0.000	.2100	0.000
262.000	15.81	9.810	10.00	150.0	648.5	648.5	0.000	0.000	.2100	0.000
263.000	11.74	10.68	10.00	150.0	869.0	869.0	0.000	0.000	.2100	0.000
264.000	9.790	15.33	10.00	150.0	1204.	1204.	0.000	0.000	.2100	0.000
265.000	9.772	16.95	10.00	150.0	1402.	1402.	0.000	0.000	.2100	0.000
266.000	9.870	18.96	10.00	150.0	1581.	1581.	0.000	0.000	.2100	0.000
267.000	9.825	19.69	10.00	150.0	1661.	1661.	0.000	0.000	.2100	0.000
268.000	10.26	19.69	10.00	150.0	1629.	1629.	0.000	0.000	.2100	0.000
269.000	11.14	20.37	10.00	150.0	1401.	1401.	0.000	0.000	.2100	0.000

TIME (D)	!RED1 90	[illegible] RATE !RED1 91	INJ TEMP c !RED1 94	PRD TEMP c !RED1 95	INJ PRES kPa !RED1 96	PRD PRES kPa !RED1 97	STEAM mo/s !RED1 92	COOLING mo/s !RED1 93	INJ 02 frac !RED1 6	INJ H20 frac !RED1 7
% FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
270.000	11.55	22.68	10.00	150.0	993.8	993.8	0.000	0.000	.2100	0.000
271.000	11.61	25.34	10.00	150.0	678.8	678.8	0.000	0.000	.2100	0.000
272.000	11.69	25.47	10.00	150.0	502.0	502.0	0.000	0.000	.2100	0.000
273.000	12.19	24.62	10.00	150.0	414.5	414.5	0.000	0.000	.2100	0.000
274.000	13.14	25.53	10.00	150.0	381.3	381.3	0.000	0.000	.2100	0.000
275.000	13.82	27.73	10.00	150.0	365.4	365.4	0.000	0.000	.2100	0.000
276.000	14.60	29.76	10.00	150.0	371.0	371.0	0.000	0.000	.2100	0.000
277.000	15.36	30.95	10.00	150.0	405.1	405.1	0.000	0.000	.2100	0.000
278.000	15.64	31.02	10.00	175.0	419.2	419.2	0.000	0.000	.2100	0.000
279.000	14.82	30.45	10.00	200.6	380.5	380.5	0.000	0.000	.2100	0.000
280.000	13.99	31.17	10.00	201.7	349.2	349.2	0.000	0.000	.2100	0.000
281.000	14.57	33.65	10.00	202.8	357.6	357.6	0.000	0.000	.2100	0.000
282.000	15.57	33.99	10.00	203.9	364.9	364.9	0.000	0.000	.2100	0.000
283.000	16.21	32.35	10.00	205.1	359.7	359.7	0.000	0.000	.2100	0.000
284.000	16.32	31.59	10.00	206.2	359.1	359.1	0.000	0.000	.2100	0.000
285.000	15.91	31.70	10.00	207.3	359.0	359.0	0.000	0.000	.2100	0.000
286.000	15.54	32.27	10.00	208.4	358.5	358.5	0.000	0.000	.2100	0.000
287.000	15.44	32.46	10.00	209.6	353.4	353.4	0.000	0.000	.2100	0.000
288.000	15.41	32.00	10.00	210.7	347.0	347.0	0.000	0.000	.2100	0.000
289.000	15.41	31.76	10.00	211.8	345.2	345.2	0.000	0.000	.2100	0.000
290.000	15.40	31.93	10.00	212.9	343.4	343.4	0.000	0.000	.2100	0.000
291.000	15.34	30.97	10.00	214.0	334.7	334.7	0.000	0.000	.2100	0.000
292.000	14.95	29.69	10.00	215.2	318.5	318.5	0.000	0.000	.2100	0.000
293.000	14.54	30.02	10.00	216.3	307.1	307.1	0.000	0.000	.2100	0.000
294.000	14.46	30.55	10.00	217.4	308.0	308.0	0.000	0.000	.2100	0.000
295.000	14.55	31.05	10.00	218.5	314.4	314.4	0.000	0.000	.2100	0.000
296.000	14.59	31.71	10.00	219.7	317.8	317.8	0.000	0.000	.2100	0.000
297.000	14.60	31.71	10.00	220.8	321.4	321.4	0.000	0.000	.2100	0.000
298.000	14.95	31.71	10.00	221.9	333.1	333.1	0.000	0.000	.2100	0.000
299.000	15.60	31.73	10.00	223.0	348.6	348.6	0.000	0.000	.2100	0.000
300.000	15.71	31.97	10.00	224.2	352.4	352.4	0.000	0.000	.2100	0.000
301.000	15.22	31.60	10.00	225.3	346.1	346.1	0.000	0.000	.2100	0.000
302.000	14.21	29.33	10.00	226.4	343.3	343.3	0.000	0.000	.2100	0.000
303.000	13.85	28.53	10.00	227.5	343.2	343.2	0.000	0.000	.2100	0.000
304.000	15.07	29.33	10.00	228.7	343.0	343.0	0.000	0.000	.2100	0.000
305.000	16.18	27.61	10.00	229.8	348.2	348.2	0.000	0.000	.2100	0.000
306.000	15.37	23.00	10.00	230.9	337.2	337.2	0.000	0.000	.2100	0.000
307.000	9.618	16.70	10.00	232.0	283.8	283.8	0.000	0.000	.2100	0.000
308.000	4.362	12.67	10.00	233.1	210.3	210.3	0.000	0.000	.2100	0.000
309.000	4.988	13.49	10.00	234.3	171.5	171.5	0.000	0.000	.2100	0.000
310.000	6.203	17.47	10.00	235.4	185.2	185.2	0.000	0.000	.2100	0.000
311.000	9.817	22.55	10.00	236.5	219.4	219.4	0.000	0.000	.2100	0.000
312.000	14.52	26.77	10.00	237.6	253.2	253.2	0.000	0.000	.2100	0.000
313.000	15.17	27.23	10.00	238.8	270.3	270.3	0.000	0.000	.2100	0.000
314.000	13.94	25.15	10.00	239.9	268.9	268.9	0.000	0.000	.2100	0.000
315.000	12.99	25.48	10.00	241.0	266.6	266.6	0.000	0.000	.2100	0.000
316.000	13.79	29.06	10.00	242.1	273.9	273.9	0.000	0.000	.2100	0.000

TIME (D)	INJ RATE kg/s IRED1 90	PRD RATE kg/s IRED1 91	INJ TEMP C IRED1 94	PRD TEMP C IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM kg/s IRED1 92	COOLING kg/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
317.000	15.84	32.94	10.00	243.3	296.1	296.1	0.000	0.000	.2100	0.000
318.000	17.34	34.26	10.00	244.4	326.3	326.3	0.000	0.000	.2100	0.000
319.000	17.53	33.40	10.00	245.5	340.9	340.9	0.000	0.000	.2100	0.000
320.000	17.26	33.38	10.00	246.6	341.6	341.6	0.000	0.000	.2100	0.000
321.000	17.04	34.32	10.00	247.8	354.6	354.6	0.000	0.000	.2100	0.000
322.000	16.92	37.39	10.00	248.9	367.8	367.8	0.000	0.000	.2100	0.000
323.000	18.49	40.09	10.00	250.0	374.2	374.2	0.000	0.000	.2100	0.000
324.000	20.24	38.59	10.00	251.1	373.5	373.5	0.000	0.000	.2100	0.000
325.000	19.05	34.66	10.00	252.2	353.3	353.3	0.000	0.000	.2100	0.000
326.000	16.52	30.02	10.00	253.4	328.6	328.6	0.000	0.000	.2100	0.000
327.000	14.22	28.92	10.00	254.5	327.1	327.1	0.000	0.000	.2100	0.000
328.000	14.47	30.82	10.00	255.6	344.5	344.5	0.000	0.000	.2100	0.000
329.000	17.23	31.20	10.00	256.7	348.4	348.4	0.000	0.000	.2100	0.000
330.000	18.70	32.72	10.00	257.9	343.9	343.9	0.000	0.000	.2100	0.000
331.000	19.08	34.67	10.00	259.0	347.6	347.6	0.000	0.000	.2100	0.000
332.000	19.45	35.03	10.00	260.1	345.9	345.9	0.000	0.000	.2100	0.000
333.000	19.80	35.72	10.00	261.2	346.0	346.0	0.000	0.000	.2100	0.000
334.000	20.16	36.19	10.00	262.4	353.0	353.0	0.000	0.000	.2100	0.000
335.000	20.32	34.69	10.00	263.5	359.5	359.5	0.000	0.000	.2100	0.000
336.000	20.24	29.09	10.00	264.6	334.2	334.2	0.000	0.000	.2100	0.000
337.000	15.96	23.23	10.00	265.7	283.6	283.6	0.000	0.000	.2100	0.000
338.000	12.05	21.26	10.00	266.9	261.4	261.4	0.000	0.000	.2100	0.000
339.000	13.24	21.45	10.00	268.0	261.7	261.7	0.000	0.000	.2100	0.000
340.000	13.82	23.37	10.00	269.1	280.0	280.0	0.000	0.000	.2100	0.000
341.000	14.82	26.49	10.00	270.2	341.4	341.4	0.000	0.000	.2100	0.000
342.000	16.96	28.89	10.00	271.3	415.3	415.3	0.000	0.000	.2100	0.000
343.000	17.85	30.90	10.00	272.5	467.0	467.0	0.000	0.000	.2100	0.000
344.000	18.04	32.87	10.00	273.6	502.1	502.1	0.000	0.000	.2100	0.000
345.000	17.83	33.76	10.00	274.7	518.6	518.6	0.000	0.000	.2100	0.000
346.000	17.27	33.47	10.00	275.8	532.8	532.8	0.000	0.000	.2100	0.000
347.000	17.04	33.13	10.00	277.0	540.0	540.0	0.000	0.000	.2100	0.000
348.000	17.13	33.09	10.00	278.1	546.1	546.1	0.000	0.000	.2100	0.000
349.000	17.20	33.09	10.00	279.2	557.3	557.3	0.000	0.000	.2100	0.000
350.000	17.13	33.09	10.00	280.3	560.6	560.6	0.000	0.000	.2100	0.000
351.000	17.07	33.09	10.00	281.5	560.6	560.6	0.000	0.000	.2100	0.000
352.000	17.25	33.09	10.00	282.6	560.6	560.6	0.000	0.000	.2100	0.000
353.000	17.57	33.09	10.00	283.7	560.6	560.6	0.000	0.000	.2100	0.000
354.000	17.82	33.09	10.00	284.8	560.6	560.6	0.000	0.000	.2100	0.000
355.000	17.91	33.09	10.00	286.0	560.6	560.6	0.000	0.000	.2100	0.000
356.000	18.02	33.09	10.00	287.1	560.6	560.6	0.000	0.000	.2100	0.000
357.000	18.21	33.09	10.00	288.2	560.6	560.6	0.000	0.000	.2100	0.000
358.000	18.01	33.09	10.00	289.3	560.6	560.6	0.000	0.000	.2100	0.000
359.000	17.81	33.09	10.00	290.4	560.6	560.6	0.000	0.000	.2100	0.000
360.000	18.01	33.09	10.00	291.6	560.6	560.6	0.000	0.000	.2100	0.000
361.000	17.78	33.08	10.00	292.7	560.6	560.6	0.000	0.000	.2100	0.000
362.000	16.73	33.75	10.00	293.8	560.6	560.6	0.000	0.000	.2100	0.000
363.000	16.23	31.40	10.00	294.9	560.6	560.6	0.000	0.000	.2100	0.000

TIME (D)	INJ RATE kg/s IRED1 90	PRD RATE kg/s IRED1 91	INJ TEMP C IRED1 94	PRD TEMP C IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM kg/s IRED1 92	COOLING kg/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
364.000	14.42	27.26	10.00	296.1	560.6	560.6	0.000	0.000	.2100	0.000
365.000	10.90	22.60	10.00	297.2	560.6	560.6	0.000	0.000	.2100	0.000
366.000	9.642	19.21	10.00	298.3	560.6	560.6	0.000	0.000	.2100	0.000
367.000	10.92	20.17	10.00	299.4	560.6	560.6	0.000	0.000	.2100	0.000
368.000	12.41	19.91	10.00	300.6	560.6	560.6	0.000	0.000	.2100	0.000
369.000	12.86	19.25	10.00	301.7	560.6	560.6	0.000	0.000	.2100	0.000
370.000	13.07	21.00	10.00	302.8	560.6	560.6	0.000	0.000	.2100	0.000
371.000	13.67	23.56	10.00	303.9	560.6	560.6	0.000	0.000	.2100	0.000
372.000	14.16	24.48	10.00	305.1	560.6	560.6	0.000	0.000	.2100	0.000
373.000	14.11	23.02	10.00	306.2	560.6	560.6	0.000	0.000	.2100	0.000
374.000	13.88	21.21	10.00	307.3	560.6	560.6	0.000	0.000	.2100	0.000
375.000	13.71	20.52	10.00	308.4	560.6	560.6	0.000	0.000	.2100	0.000
376.000	13.46	20.09	10.00	309.6	560.6	560.6	0.000	0.000	.2100	0.000
377.000	13.05	19.38	10.00	310.7	560.6	560.6	0.000	0.000	.2100	0.000
378.000	12.93	19.75	10.00	311.8	560.6	560.6	0.000	0.000	.2100	0.000
379.000	13.52	20.13	10.00	312.9	560.6	560.6	0.000	0.000	.2100	0.000
380.000	13.87	19.85	10.00	314.0	560.6	560.6	0.000	0.000	.2100	0.000
381.000	12.43	20.77	10.00	315.2	560.6	560.6	0.000	0.000	.2100	0.000
382.000	11.11	21.70	10.00	316.3	560.6	560.6	0.000	0.000	.2100	0.000
383.000	12.06	21.74	10.00	317.4	560.6	560.6	0.000	0.000	.2100	0.000
384.000	12.87	18.86	10.00	318.5	560.6	560.6	0.000	0.000	.2100	0.000
385.000	11.65	15.47	10.00	319.7	560.6	560.6	0.000	0.000	.2100	0.000
386.000	9.659	14.31	10.00	320.8	560.6	560.6	0.000	0.000	.2100	0.000
387.000	8.282	11.83	10.00	321.9	560.6	560.6	0.000	0.000	.2100	0.000
388.000	7.162	11.77	10.00	323.0	560.6	560.6	0.000	0.000	.2100	0.000
389.000	7.260	13.53	10.00	324.2	560.6	560.6	0.000	0.000	.2100	0.000
390.000	8.126	13.28	10.00	325.3	560.6	560.6	0.000	0.000	.2100	0.000
391.000	8.039	17.06	10.00	326.4	560.6	560.6	0.000	0.000	.2100	0.000
392.000	9.572	22.62	10.00	327.5	560.6	560.6	0.000	0.000	.2100	0.000
393.000	13.16	25.28	10.00	328.7	560.6	560.6	0.000	0.000	.2100	0.000
394.000	15.79	26.94	10.00	329.8	560.6	560.6	0.000	0.000	.2100	0.000
395.000	17.10	27.94	10.00	330.9	560.6	560.6	0.000	0.000	.2100	0.000
396.000	17.71	28.28	10.00	332.0	560.6	560.6	0.000	0.000	.2100	0.000
397.000	16.47	27.53	10.00	333.1	560.6	560.6	0.000	0.000	.2100	0.000
398.000	13.42	25.73	10.00	334.3	560.6	560.6	0.000	0.000	.2100	0.000
399.000	11.28	29.23	10.00	335.4	560.6	560.6	0.000	0.000	.2100	0.000
400.000	12.59	36.62	10.00	336.5	560.6	560.6	0.000	0.000	.2100	0.000
401.000	16.70	39.06	10.00	337.6	560.6	560.6	0.000	0.000	.2100	0.000
402.000	18.14	37.02	10.00	338.8	560.6	560.6	0.000	0.000	.2100	0.000
403.000	17.06	35.61	10.00	339.9	560.6	560.6	0.000	0.000	.2100	0.000
404.000	17.38	35.51	10.00	341.0	560.6	560.6	0.000	0.000	.2100	0.000
405.000	17.50	35.24	10.00	342.1	560.6	560.6	0.000	0.000	.2100	0.000
406.000	17.64	38.26	10.00	343.3	560.6	560.6	0.000	0.000	.2100	0.000
407.000	18.65	41.83	10.00	344.4	560.6	560.6	0.000	0.000	.2100	0.000
408.000	20.25	48.34	10.00	345.5	560.6	560.6	0.000	0.000	.2100	0.000
409.000	22.58	54.24	10.00	346.6	560.6	560.6	0.000	0.000	.2100	0.000
410.000	25.11	54.22	10.00	347.8	560.6	560.6	0.000	0.000	.2100	0.000

TIME (D)	INJ RATE mo/s !RED1 90	PRD RATE mo/s !RED1 91	INJ TEMP c !RED1 94	PRD TEMP c !RED1 95	INJ PRES kPa !RED1 96	PRD PRES kPa !RED1 97	STEAM mo/s !RED1 92	COOLING mo/s !RED1 93	INJ O2 frac !RED1 6	INJ H2O frac !RED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
411.000	27.11	50.52	10.00	348.9	560.6	560.6	0.000	0.000	.2100	0.000
412.000	25.11	44.11	10.00	350.0	560.6	560.6	0.000	0.000	.2100	0.000
413.000	16.04	34.65	10.00	351.1	560.6	560.6	0.000	0.000	.2100	0.000
414.000	6.899	22.47	10.00	352.2	560.6	560.6	0.000	0.000	.2100	0.000
415.000	2.459	15.56	10.00	353.4	560.6	560.6	0.000	0.000	.2100	0.000
416.000	.5344	11.68	10.00	354.5	560.6	560.6	0.000	0.000	.2100	0.000
417.000	.1548	18.99	10.00	355.6	560.6	560.6	0.000	0.000	.2100	0.000
418.000	.9791	36.70	10.00	356.7	560.6	560.6	0.000	0.000	.2100	0.000
419.000	8.648	52.73	10.00	357.9	560.6	560.6	0.000	0.000	.2100	0.000
420.000	22.52	60.87	10.00	359.0	560.6	560.6	0.000	0.000	.2100	0.000
421.000	28.96	59.99	10.00	360.1	560.6	560.6	0.000	0.000	.2100	0.000
422.000	28.41	59.88	10.00	361.2	560.6	560.6	0.000	0.000	.2100	0.000
423.000	28.44	59.95	10.00	362.4	560.6	560.6	0.000	0.000	.2100	0.000
424.000	28.25	59.25	10.00	363.5	560.6	560.6	0.000	0.000	.2100	0.000
425.000	27.36	52.21	10.00	364.6	560.6	560.6	0.000	0.000	.2100	0.000
426.000	24.35	44.21	10.00	365.7	560.6	560.6	0.000	0.000	.2100	0.000
427.000	21.89	39.44	10.00	366.9	560.6	560.6	0.000	0.000	.2100	0.000
428.000	20.95	35.62	10.00	368.0	560.6	560.6	0.000	0.000	.2100	0.000
429.000	19.04	35.32	10.00	369.1	560.6	560.6	0.000	0.000	.2100	0.000
430.000	19.63	35.27	10.00	370.2	560.6	560.6	0.000	0.000	.2100	0.000
431.000	22.43	42.18	10.00	371.3	560.6	560.6	0.000	0.000	.2100	0.000
432.000	24.23	51.65	10.00	372.5	560.6	560.6	0.000	0.000	.2100	0.000
433.000	27.86	51.25	10.00	373.6	560.6	560.6	0.000	0.000	.2100	0.000
434.000	32.61	45.06	10.00	374.7	560.6	560.6	0.000	0.000	.2100	0.000
435.000	20.63	34.17	10.00	375.8	560.6	560.6	0.000	0.000	.2100	0.000
436.000	4.563	18.91	10.00	377.0	560.6	560.6	0.000	0.000	.2100	0.000
437.000	1.896	13.01	10.00	378.1	560.6	560.6	0.000	0.000	.2100	0.000
438.000	.9950	25.14	10.00	379.2	560.6	560.6	0.000	0.000	.2100	0.000
439.000	7.060	36.04	10.00	380.3	560.6	560.6	0.000	0.000	.2100	0.000
440.000	17.41	38.20	10.00	381.5	560.6	560.6	0.000	0.000	.2100	0.000
441.000	21.18	40.91	10.00	382.6	560.6	560.6	0.000	0.000	.2100	0.000
442.000	21.19	41.61	10.00	383.7	560.6	560.6	0.000	0.000	.2100	0.000
443.000	21.30	37.91	10.00	384.8	560.6	560.6	0.000	0.000	.2100	0.000
444.000	20.92	26.98	10.00	386.0	560.6	560.6	0.000	0.000	.2100	0.000
445.000	15.64	15.52	10.00	387.1	560.6	560.6	0.000	0.000	.2100	0.000
446.000	10.06	9.245	10.00	388.2	560.6	560.6	0.000	0.000	.2100	0.000
447.000	9.353	5.855	10.00	389.3	560.6	560.6	0.000	0.000	.2100	0.000
448.000	9.353	3.958	10.00	390.4	560.6	560.6	0.000	0.000	.2100	0.000
449.000	9.353	3.405	10.00	391.6	560.6	560.6	0.000	0.000	.2100	0.000
450.000	9.353	3.061	10.00	392.7	560.6	560.6	0.000	0.000	.2100	0.000
451.000	9.353	2.388	10.00	393.8	560.6	560.6	0.000	0.000	.2100	0.000
452.000	9.353	1.891	10.00	394.9	560.6	560.6	0.000	0.000	.2100	0.000
453.000	9.353	1.529	10.00	396.1	560.6	560.6	0.000	0.000	.2100	0.000
454.000	9.353	1.591	10.00	397.2	560.6	560.6	0.000	0.000	.2100	0.000
455.000	9.353	1.596	10.00	398.3	560.6	560.6	0.000	0.000	.2100	0.000
456.000	9.353	1.596	10.00	398.3	560.6	560.6	0.000	0.000	.2100	0.000

UCG DB - HA1 - PRODUCT GAS ANALYSIS 1

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	ARGON molf !RED1 10	NITROGEN molf !RED1 11	OXYGEN molf !RED1 12	HYDROGEN molf !RED1 13	METHANE molf !RED1 14	CO molf !RED1 15	CO2 molf !RED1 16	ETHANE molf !RED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
90.000	0.000	.5017	5.9970E-03	.1609	.1269	4.4978E-02	.1469	1.0995E-02
91.000	0.000	.4967	6.2473E-03	.1561	.1333	4.4605E-02	.1501	1.1370E-02
92.000	0.000	.4865	6.7479E-03	.1463	.1461	4.3861E-02	.1563	1.2121E-02
93.000	0.000	.4763	7.2487E-03	.1366	.1588	4.3117E-02	.1626	1.2873E-02
94.000	0.000	.4661	7.7495E-03	.1269	.1716	4.2372E-02	.1689	1.3624E-02
95.000	0.000	.4710	8.2004E-03	.1179	.1730	3.8502E-02	.1739	1.4301E-02
96.000	0.000	.4911	8.6013E-03	.1097	.1630	3.1505E-02	.1777	1.4902E-02
97.000	0.000	.5111	9.0023E-03	.1015	.1530	2.4506E-02	.1815	1.5504E-02
98.000	0.000	.5312	9.4033E-03	9.3332E-02	.1430	1.7506E-02	.1854	1.6106E-02
99.000	0.000	.5512	9.8044E-03	8.5138E-02	.1331	1.0505E-02	.1892	1.6708E-02
100.000	0.000	.5755	1.0106E-02	8.1745E-02	.1178	6.3034E-03	.1889	1.5609E-02
101.000	0.000	.6040	1.0307E-02	8.3154E-02	9.7163E-02	4.9032E-03	.1845	1.2808E-02
102.000	0.000	.6325	1.0508E-02	8.4563E-02	7.6557E-02	3.5026E-03	.1801	1.0007E-02
103.000	0.000	.6610	1.0709E-02	8.5973E-02	5.5947E-02	2.1018E-03	.1757	7.2061E-03
104.000	0.000	.6895	1.0910E-02	8.7383E-02	3.5333E-02	7.0063E-04	.1714	4.4041E-03
105.000	0.000	.6973	1.0911E-02	8.9094E-02	2.9231E-02	9.0099E-04	.1692	3.2034E-03
106.000	0.000	.6846	1.0712E-02	9.1105E-02	3.7643E-02	2.7032E-03	.1692	3.6042E-03
107.000	0.000	.6718	1.0513E-02	9.3116E-02	4.6058E-02	4.5057E-03	.1692	4.0050E-03
108.000	0.000	.6591	1.0314E-02	9.5128E-02	5.4474E-02	6.3086E-03	.1692	4.4060E-03
109.000	0.000	.6463	1.0115E-02	9.7141E-02	6.2891E-02	8.1118E-03	.1692	4.8070E-03
110.000	0.000	.6518	1.3920E-02	9.3035E-02	6.2791E-02	8.6125E-03	.1637	4.7068E-03
111.000	0.000	.6756	2.1729E-02	8.2812E-02	5.4173E-02	7.8106E-03	.1527	4.1056E-03
112.000	0.000	.6994	2.9537E-02	7.2591E-02	4.5557E-02	7.0088E-03	.1417	3.5044E-03
113.000	0.000	.7231	3.7343E-02	6.2372E-02	3.6943E-02	6.2072E-03	.1307	2.9034E-03
114.000	0.000	.7469	4.5147E-02	5.2155E-02	2.8330E-02	5.4057E-03	.1196	2.3024E-03
115.000	0.000	.7582	5.0451E-02	4.6374E-02	2.4271E-02	4.7542E-03	.1137	2.0851E-03
116.000	0.000	.7572	5.3283E-02	4.5028E-02	2.4765E-02	4.2527E-03	.1128	2.2514E-03
117.000	0.000	.7562	5.6104E-02	4.3683E-02	2.5259E-02	3.7514E-03	.1120	2.4176E-03
118.000	0.000	.7552	5.8924E-02	4.2339E-02	2.5753E-02	3.2504E-03	.1111	2.5836E-03
119.000	0.000	.7542	6.1742E-02	4.0995E-02	2.6247E-02	2.7497E-03	.1102	2.7496E-03
120.000	0.000	.7531	6.4559E-02	3.9652E-02	2.6740E-02	2.2492E-03	.1094	2.9156E-03
121.000	0.000	.7569	6.7716E-02	3.6982E-02	2.5612E-02	1.8741E-03	.1066	2.8736E-03
122.000	0.000	.7654	7.1214E-02	3.2984E-02	2.2864E-02	1.6242E-03	.1018	2.6237E-03
123.000	0.000	.7739	7.4713E-02	2.8986E-02	2.0115E-02	1.3743E-03	9.7076E-02	2.3738E-03
124.000	0.000	.7824	7.8211E-02	2.4988E-02	1.7366E-02	1.1244E-03	9.2329E-02	2.1239E-03
125.000	0.000	.7800	7.3457E-02	2.3986E-02	1.7989E-02	9.9940E-04	9.9439E-02	2.2986E-03
126.000	0.000	.7669	6.0452E-02	2.5979E-02	2.1982E-02	9.9920E-04	.1184	2.8977E-03
127.000	0.000	.7537	4.7453E-02	2.7972E-02	2.5974E-02	9.9900E-04	.1374	3.4965E-03

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TIME (D)	ARGON mol/ IRED1 10	NITROGEN mol/ IRED1 11	OXYGEN mol/ IRED1 12	HYD. _N mol/ IRED1 13	METHANE mol/ IRED1 14	CO mol/ IRED1 15	CO2 mol/ IRED1 16	ETHANE mol/ IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
128.000	0.000	.7406	3.4459E-02	2.9964E-02	2.9964E-02	9.9880E-04	.1563	4.0951E-03
129.000	0.000	.7275	2.1471E-02	3.1955E-02	3.3952E-02	9.9860E-04	.1753	4.6934E-03
130.000	0.000	.7224	1.5581E-02	3.2959E-02	3.5755E-02	9.9875E-04	.1831	4.8939E-03
131.000	0.000	.7254	1.6788E-02	3.2975E-02	3.5373E-02	9.9925E-04	.1798	4.6965E-03
132.000	0.000	.7283	1.7996E-02	3.2992E-02	3.4991E-02	9.9975E-04	.1765	4.4988E-03
133.000	0.000	.7313	1.9205E-02	3.3008E-02	3.4609E-02	1.0002E-03	.1731	4.3011E-03
134.000	0.000	.7343	2.0415E-02	3.3025E-02	3.4226E-02	1.0008E-03	.1698	4.1031E-03
135.000	0.000	.7325	2.0416E-02	3.4027E-02	3.5028E-02	9.0074E-04	.1700	4.1033E-03
136.000	0.000	.7260	1.9208E-02	3.6014E-02	3.7015E-02	7.0030E-04	.1738	4.3017E-03
137.000	0.000	.7195	1.8000E-02	3.8000E-02	3.9000E-02	5.0002E-04	.1775	4.5000E-03
138.000	0.000	.7130	1.6793E-02	3.9984E-02	4.0983E-02	2.9990E-04	.1812	4.6981E-03
139.000	0.000	.7065	1.5588E-02	4.1966E-02	4.2965E-02	9.9940E-05	.1850	4.8961E-03
140.000	0.000	.7071	1.4685E-02	4.1359E-02	4.2657E-02	0.000	.1863	4.8951E-03
141.000	0.000	.7147	1.4086E-02	3.8162E-02	4.0060E-02	0.000	.1853	4.6953E-03
142.000	0.000	.7223	1.3487E-02	3.4965E-02	3.7463E-02	0.000	.1843	4.4955E-03
143.000	0.000	.7299	1.2887E-02	3.1768E-02	3.4865E-02	0.000	.1833	4.2957E-03
144.000	0.000	.7375	1.2288E-02	2.8571E-02	3.2268E-02	0.000	.1823	4.0959E-03
145.000	0.000	.7443	2.3338E-02	2.5763E-02	2.9188E-02	0.000	.1708	3.7395E-03
146.000	0.000	.7505	4.6042E-02	2.3342E-02	2.5626E-02	0.000	.1489	3.2264E-03
147.000	0.000	.7567	6.8758E-02	2.0919E-02	2.2062E-02	0.000	.1269	2.7131E-03
148.000	0.000	.7628	9.1483E-02	1.8496E-02	1.8496E-02	0.000	.1050	2.1995E-03
149.000	0.000	.7690	.1142	1.6072E-02	1.4929E-02	0.000	8.3001E-02	1.6857E-03
150.000	0.000	.7752	.1370	1.3646E-02	1.1360E-02	0.000	6.1014E-02	1.1717E-03
151.000	0.000	.7814	.1597	1.1220E-02	7.7893E-03	0.000	3.9018E-02	6.5743E-04
152.000	0.000	.7512	.1509	2.2625E-02	2.0374E-02	6.3739E-03	4.5503E-02	2.2248E-03
153.000	0.000	.6846	.1106	4.7843E-02	4.9092E-02	1.9112E-02	8.0448E-02	5.8710E-03
154.000	0.000	.6182	7.0289E-02	7.3022E-02	7.7765E-02	3.1830E-02	.1153	9.5116E-03
155.000	0.000	.5518	3.0069E-02	9.8163E-02	.1064	4.4528E-02	.1502	1.3147E-02
156.000	0.000	.5177	1.0175E-02	.1103	.1208	5.0078E-02	.1693	1.4964E-02
157.000	0.000	.5158	1.0576E-02	.1095	.1210	4.8489E-02	.1727	1.4966E-02
158.000	0.000	.5139	1.0976E-02	.1088	.1212	4.6899E-02	.1761	1.4968E-02
159.000	0.000	.5120	1.1377E-02	.1080	.1215	4.5309E-02	.1795	1.4970E-02
160.000	0.000	.5100	1.1778E-02	.1072	.1217	4.3718E-02	.1830	1.4972E-02
161.000	0.000	.5099	1.1975E-02	.1036	.1231	4.0517E-02	.1877	1.5069E-02
162.000	0.000	.5117	1.1969E-02	9.7150E-02	.1259	3.5709E-02	.1938	1.5261E-02
163.000	0.000	.5134	1.1963E-02	9.0720E-02	.1286	3.0905E-02	.1999	1.5452E-02
164.000	0.000	.5151	1.1957E-02	8.4296E-02	.1313	2.6106E-02	.2060	1.5643E-02
165.000	0.000	.5169	1.1951E-02	7.7878E-02	.1340	2.1312E-02	.2120	1.5834E-02
166.000	0.000	.5202	1.0959E-02	7.4328E-02	.1328	1.9031E-02	.2172	1.5742E-02
167.000	0.000	.5252	8.9800E-03	7.3641E-02	.1276	1.9259E-02	.2215	1.5367E-02
168.000	0.000	.5302	6.9947E-03	7.2952E-02	.1224	1.9487E-02	.2259	1.4990E-02
169.000	0.000	.5352	5.0035E-03	7.2261E-02	.1172	1.9717E-02	.2302	1.4612E-02
170.000	0.000	.5402	3.0063E-03	7.1568E-02	.1120	1.9947E-02	.2346	1.4233E-02
171.000	0.000	.5508	3.0064E-03	7.0668E-02	.1023	2.4154E-02	.2320	1.3032E-02
172.000	0.000	.5670	5.0038E-03	6.9564E-02	8.8386E-02	3.2326E-02	.2224	1.1011E-02
173.000	0.000	.5832	6.9954E-03	6.8463E-02	7.4464E-02	4.0475E-02	.2129	8.9958E-03
174.000	0.000	.5993	8.9812E-03	6.7365E-02	6.0583E-02	4.8599E-02	.2034	6.9867E-03

TIME (D)	ARGON mol f !RED1 10	NITROGEN mol f !RED1 11	OXYGEN mol f !RED1 12	HYDROGEN mol f !RED1 13	METHANE mol f !RED1 14	CO mol f !RED1 15	CO2 mol f !RED1 16	ETHANE mol f !RED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
175.000	0.000	.6154	1.0961E-02	6.6270E-02	4.6743E-02	5.6700E-02	.1939	4.9834E-03
176.000	0.000	.6099	1.1946E-02	6.9021E-02	4.8113E-02	5.6496E-02	.1941	4.5625E-03
177.000	0.000	.5830	1.1939E-02	7.5610E-02	6.4664E-02	4.8004E-02	.2039	5.7204E-03
178.000	0.000	.5561	1.1931E-02	8.2190E-02	8.1194E-02	3.9523E-02	.2138	6.8767E-03
179.000	0.000	.5293	1.1923E-02	8.8763E-02	9.7704E-02	3.1052E-02	.2236	8.0316E-03
180.000	0.000	.5025	1.1916E-02	9.5327E-02	.1142	2.2592E-02	.2334	9.1851E-03
181.000	0.000	.4757	1.1909E-02	.1019	.1307	1.4143E-02	.2431	1.0337E-02
182.000	0.000	.4736	1.1322E-02	.1080	.1303	9.0809E-03	.2453	1.0950E-02
183.000	0.000	.4965	1.0147E-02	.1138	.1129	7.3897E-03	.2397	1.1026E-02
184.000	0.000	.5196	8.9563E-03	.1196	9.5231E-02	5.6749E-03	.2340	1.1104E-02
185.000	0.000	.5431	7.7487E-03	.1255	7.7350E-02	3.9359E-03	.2283	1.1182E-02
186.000	0.000	.5718	7.7377E-03	.1211	6.3650E-02	3.6646E-03	.2205	1.0388E-02
187.000	0.000	.6055	8.9274E-03	.1062	5.4289E-02	4.8690E-03	.2105	8.7270E-03
188.000	0.000	.6389	1.0109E-02	9.1506E-02	4.4996E-02	6.0647E-03	.2007	7.0783E-03
189.000	0.000	.6721	1.1281E-02	7.6875E-02	3.5770E-02	7.2520E-03	.1909	5.4412E-03
190.000	0.000	.7050	1.2446E-02	6.2348E-02	2.6608E-02	8.4307E-03	.1812	3.8158E-03
191.000	0.000	.7199	1.3023E-02	5.4897E-02	2.1839E-02	1.0318E-02	.1771	2.8050E-03
192.000	0.000	.7167	1.3017E-02	5.4471E-02	2.1428E-02	1.2917E-02	.1786	2.4032E-03
193.000	0.000	.7136	1.3011E-02	5.4046E-02	2.1018E-02	1.5513E-02	.1802	2.0017E-03
194.000	0.000	.7105	1.3005E-02	5.3621E-02	2.0608E-02	1.8107E-02	.1817	1.6007E-03
195.000	0.000	.7074	1.2999E-02	5.3196E-02	2.0199E-02	2.0698E-02	.1832	1.2000E-03
196.000	0.000	.7030	1.2796E-02	5.4484E-02	1.9394E-02	2.5492E-02	.1825	9.9970E-04
197.000	0.000	.6974	1.2396E-02	5.7483E-02	1.8195E-02	3.2490E-02	.1797	9.9970E-04
198.000	0.000	.6918	1.1996E-02	6.0482E-02	1.6995E-02	3.9488E-02	.1769	9.9970E-04
199.000	0.000	.6862	1.1597E-02	6.3481E-02	1.5795E-02	4.6486E-02	.1741	9.9970E-04
200.000	0.000	.6806	1.1197E-02	6.6480E-02	1.4596E-02	5.3484E-02	.1713	9.9970E-04
201.000	0.000	.6755	1.0799E-02	6.9493E-02	1.4899E-02	5.5894E-02	.1710	1.0999E-03
202.000	0.000	.6710	1.0403E-02	7.2522E-02	1.6705E-02	5.3716E-02	.1731	1.3004E-03
203.000	0.000	.6665	1.0007E-02	7.5553E-02	1.8513E-02	5.1536E-02	.1751	1.5011E-03
204.000	0.000	.6619	9.6105E-03	7.8587E-02	2.0323E-02	4.9354E-02	.1772	1.7019E-03
205.000	0.000	.6574	9.2138E-03	8.1623E-02	2.2133E-02	4.7171E-02	.1793	1.9029E-03
206.000	0.000	.6511	9.3066E-03	8.2541E-02	2.6919E-02	4.3238E-02	.1836	1.8612E-03
207.000	0.000	.6430	9.8398E-03	8.1338E-02	3.4687E-02	3.7550E-02	.1901	1.5765E-03
208.000	0.000	.6350	1.0474E-02	8.0133E-02	4.2472E-02	3.1851E-02	.1966	1.2912E-03
209.000	0.000	.6269	1.1060E-02	7.8926E-02	5.0274E-02	2.6140E-02	.2031	1.0054E-03
210.000	0.000	.6188	1.1647E-02	7.7716E-02	5.8091E-02	2.0416E-02	.2096	7.1885E-04
211.000	0.000	.6107	1.2235E-02	7.6503E-02	6.5926E-02	1.4680E-02	.2162	4.3174E-04
212.000	0.000	.6025	1.2824E-02	7.5288E-02	7.3777E-02	8.9322E-03	.2228	1.4402E-04
213.000	0.000	.5908	1.2726E-02	7.8745E-02	8.0133E-02	6.6773E-03	.2258	1.0068E-03
214.000	0.000	.5756	1.1942E-02	8.6858E-02	8.4974E-02	7.9187E-03	.2253	3.0158E-03
215.000	0.000	.5605	1.1162E-02	9.4932E-02	8.9792E-02	9.1544E-03	.2247	5.0153E-03
216.000	0.000	.5454	1.0385E-02	.1030	9.4588E-02	1.0384E-02	.2242	7.0056E-03
217.000	0.000	.5428	1.0399E-02	.1059	9.4787E-02	1.1298E-02	.2221	7.7989E-03
218.000	0.000	.5527	1.1200E-02	.1037	9.0398E-02	1.1900E-02	.2183	7.3998E-03
219.000	0.000	.5626	1.2001E-02	.1015	8.6008E-02	1.2501E-02	.2145	7.0007E-03
220.000	0.000	.5724	1.2803E-02	9.9322E-02	8.1618E-02	1.3103E-02	.2107	6.6014E-03
221.000	0.000	.5823	1.3605E-02	9.7133E-02	7.7226E-02	1.3705E-02	.2070	6.2021E-03

TIME (D)	ARGON mol/ IRED1 10	NITROGEN mol/ IRED1 11	OXYGEN mol/ IRED1 12	HYDROGEN mol/ IRED1 13	METHANE mol/ IRED1 14	CO mol/ IRED1 15	CO2 mol/ IRED1 16	ETHANE mol/ IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
222.000	0.000	.5945	1.3607E-02	9.4250E-02	7.0537E-02	1.4408E-02	.2045	5.7030E-03
223.000	0.000	.6091	1.2810E-02	9.0671E-02	6.1548E-02	1.5212E-02	.2034	5.1040E-03
224.000	0.000	.6237	1.2013E-02	8.7091E-02	5.2555E-02	1.6017E-02	.2022	4.5047E-03
225.000	0.000	.6382	1.1215E-02	8.3509E-02	4.3556E-02	1.6822E-02	.2011	3.9051E-03
226.000	0.000	.6528	1.0416E-02	7.9925E-02	3.4554E-02	1.7628E-02	.1999	3.3052E-03
227.000	0.000	.6540	9.9188E-03	7.8048E-02	3.1460E-02	1.8134E-02	.2041	3.0057E-03
228.000	0.000	.6419	9.7223E-03	7.7879E-02	3.4279E-02	1.8342E-02	.2136	3.0069E-03
229.000	0.000	.6297	9.5257E-03	7.7710E-02	3.7100E-02	1.8550E-02	.2231	3.0081E-03
230.000	0.000	.6175	9.3289E-03	7.7540E-02	3.9924E-02	1.8758E-02	.2326	3.0093E-03
231.000	0.000	.6053	9.1319E-03	7.7371E-02	4.2750E-02	1.8966E-02	.2421	3.0105E-03
232.000	0.000	.5968	8.9478E-03	7.9359E-02	4.5240E-02	2.1784E-02	.2436	2.9269E-03
233.000	0.000	.5919	8.7767E-03	8.3503E-02	4.7394E-02	2.7207E-02	.2370	2.7584E-03
234.000	0.000	.5871	8.6057E-03	8.7644E-02	4.9545E-02	3.2626E-02	.2303	2.5901E-03
235.000	0.000	.5822	8.4349E-03	9.1781E-02	5.1694E-02	3.8040E-02	.2237	2.4219E-03
236.000	0.000	.5774	8.2642E-03	9.5914E-02	5.3842E-02	4.3449E-02	.2171	2.2539E-03
237.000	0.000	.5725	8.0936E-03	.1000	5.5988E-02	4.8853E-02	.2105	2.0860E-03
238.000	0.000	.5677	7.9233E-03	.1042	5.8131E-02	5.4253E-02	.2039	1.9183E-03
239.000	0.000	.5628	7.7530E-03	.1083	6.0273E-02	5.9648E-02	.1973	1.7507E-03
240.000	0.000	.5580	7.5829E-03	.1124	6.2413E-02	6.5038E-02	.1907	1.5833E-03
241.000	0.000	.5532	7.4130E-03	.1165	6.4551E-02	7.0423E-02	.1842	1.4160E-03
242.000	0.000	.5484	7.2432E-03	.1206	6.6687E-02	7.5803E-02	.1776	1.2488E-03
243.000	0.000	.5435	7.0736E-03	.1247	6.8822E-02	8.1179E-02	.1710	1.0819E-03
244.000	0.000	.5543	7.3657E-03	.1226	6.3792E-02	8.1520E-02	.1673	8.7385E-04
245.000	0.000	.5806	8.1200E-03	.1142	5.1591E-02	7.6826E-02	.1664	6.2457E-04
246.000	0.000	.6070	8.8753E-03	.1058	3.9374E-02	7.2126E-02	.1655	3.7497E-04
247.000	0.000	.6334	9.6316E-03	9.7314E-02	2.7141E-02	6.7420E-02	.1646	1.2504E-04
248.000	0.000	.6407	1.0410E-02	9.5195E-02	2.1922E-02	6.7267E-02	.1645	0.000
249.000	0.000	.6289	1.1211E-02	9.9399E-02	2.3724E-02	7.1672E-02	.1651	0.000
250.000	0.000	.6171	1.2012E-02	.1036	2.5526E-02	7.6076E-02	.1657	0.000
251.000	0.000	.6053	1.2813E-02	.1078	2.7327E-02	8.0480E-02	.1663	0.000
252.000	0.000	.5935	1.3614E-02	.1120	2.9129E-02	8.4885E-02	.1669	0.000
253.000	0.000	.5979	1.3712E-02	.1077	2.8726E-02	8.4076E-02	.1677	2.0016E-04
254.000	0.000	.6186	1.3109E-02	9.4867E-02	2.6118E-02	7.8055E-02	.1686	6.0040E-04
255.000	0.000	.6393	1.2506E-02	8.2042E-02	2.3512E-02	7.2036E-02	.1696	1.0005E-03
256.000	0.000	.6600	1.1904E-02	6.9221E-02	2.0906E-02	6.6020E-02	.1706	1.4004E-03
257.000	0.000	.6807	1.1301E-02	5.6406E-02	1.8302E-02	6.0006E-02	.1715	1.8002E-03
258.000	0.000	.6725	1.1402E-02	5.6012E-02	2.0805E-02	5.7312E-02	.1801	1.8003E-03
259.000	0.000	.6356	1.2207E-02	6.8042E-02	2.8418E-02	5.7935E-02	.1964	1.4008E-03
260.000	0.000	.5986	1.3013E-02	8.0081E-02	3.6037E-02	5.8559E-02	.2127	1.0010E-03
261.000	0.000	.5616	1.3819E-02	9.2130E-02	4.3662E-02	5.9183E-02	.2290	6.0080E-04
262.000	0.000	.5245	1.4626E-02	.1042	5.1293E-02	5.9808E-02	.2453	2.0032E-04
263.000	0.000	.5154	1.4125E-02	.1095	5.4897E-02	5.8304E-02	.2468	8.0123E-04
264.000	0.000	.5342	1.2316E-02	.1080	5.4471E-02	5.4672E-02	.2335	2.4030E-03
265.000	0.000	.5530	1.0509E-02	.1066	5.4046E-02	5.1044E-02	.2202	4.0032E-03
266.000	0.000	.5717	8.7036E-03	.1051	5.3621E-02	4.7419E-02	.2069	5.6020E-03
267.000	0.000	.5905	6.8997E-03	.1037	5.3196E-02	4.3797E-02	.1936	7.1993E-03
268.000	0.000	.5921	6.1648E-03	.1115	5.1068E-02	4.5653E-02	.1845	7.7477E-03
269.000	0.000	.5766	6.4981E-03	.1285	4.7236E-02	5.2984E-02	.1797	7.2478E-03

TIME (D)	ARGON molf IRED1 10	NITROGEN molf IRED1 11	OXYGEN molf IRED1 12	HYDROGEN molf IRED1 13	METHANE molf IRED1 14	CO molf IRED1 15	CO2 molf IRED1 16	ETHANE molf IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
270.000	0.000	.5611	6.8313E-03	.1455	4.3404E-02	6.0315E-02	.1749	6.7480E-03
271.000	0.000	.5456	7.1645E-03	.1625	3.9571E-02	6.7646E-02	.1700	6.2481E-03
272.000	0.000	.5301	7.4978E-03	.1794	3.5739E-02	7.4978E-02	.1652	5.7483E-03
273.000	0.000	.5146	7.8310E-03	.1964	3.1907E-02	8.2309E-02	.1604	5.2484E-03
274.000	0.000	.5058	7.9973E-03	.2004	3.2489E-02	8.6721E-02	.1598	5.2482E-03
275.000	0.000	.5038	7.9967E-03	.1914	3.7484E-02	8.8214E-02	.1636	5.7476E-03
276.000	0.000	.5018	7.9961E-03	.1824	4.2479E-02	8.9706E-02	.1673	6.2469E-03
277.000	0.000	.4997	7.9955E-03	.1734	4.7473E-02	9.1199E-02	.1710	6.7462E-03
278.000	0.000	.4960	8.0951E-03	.1727	4.9470E-02	9.1045E-02	.1732	6.8959E-03
279.000	0.000	.4906	8.2950E-03	.1803	4.8471E-02	8.9246E-02	.1738	6.6960E-03
280.000	0.000	.4852	8.4949E-03	.1879	4.7472E-02	8.7448E-02	.1744	6.4961E-03
281.000	0.000	.4798	8.6948E-03	.1955	4.6472E-02	8.5649E-02	.1750	6.2962E-03
282.000	0.000	.4744	8.8947E-03	.2031	4.5473E-02	8.3850E-02	.1756	6.0963E-03
283.000	0.000	.4695	8.9934E-03	.2092	4.5567E-02	8.1241E-02	.1767	6.0955E-03
284.000	0.000	.4649	8.9911E-03	.2140	4.6754E-02	7.7823E-02	.1782	6.2938E-03
285.000	0.000	.4604	8.9888E-03	.2187	4.7940E-02	7.4407E-02	.1798	6.4919E-03
286.000	0.000	.4559	8.9864E-03	.2235	4.9126E-02	7.0993E-02	.1813	6.6899E-03
287.000	0.000	.4514	8.9841E-03	.2282	5.0311E-02	6.7581E-02	.1829	6.8878E-03
288.000	0.000	.4540	8.7853E-03	.2273	5.0416E-02	6.4692E-02	.1842	6.7886E-03
289.000	0.000	.4638	8.3898E-03	.2208	4.9440E-02	6.2324E-02	.1853	6.3922E-03
290.000	0.000	.4736	7.9940E-03	.2143	4.8464E-02	5.9955E-02	.1864	5.9955E-03
291.000	0.000	.4835	7.5978E-03	.2078	4.7486E-02	5.7583E-02	.1874	5.5983E-03
292.000	0.000	.4933	7.2012E-03	.2013	4.6508E-02	5.5209E-02	.1885	5.2008E-03
293.000	0.000	.4991	7.0021E-03	.1964	4.6014E-02	5.4716E-02	.1892	5.0015E-03
294.000	0.000	.5010	7.0007E-03	.1929	4.6005E-02	5.6106E-02	.1893	5.0005E-03
295.000	0.000	.5029	6.9993E-03	.1895	4.5995E-02	5.7494E-02	.1895	4.9995E-03
296.000	0.000	.5048	6.9979E-03	.1860	4.5986E-02	5.8882E-02	.1896	4.9985E-03
297.000	0.000	.5067	6.9965E-03	.1826	4.5977E-02	6.0270E-02	.1898	4.9975E-03
298.000	0.000	.5082	7.0667E-03	.1809	4.5612E-02	6.1030E-02	.1897	4.9253E-03
299.000	0.000	.5091	7.2084E-03	.1811	4.4892E-02	6.1164E-02	.1892	4.7818E-03
300.000	0.000	.5100	7.3501E-03	.1812	4.4172E-02	6.1298E-02	.1887	4.6384E-03
301.000	0.000	.5109	7.4918E-03	.1813	4.3452E-02	6.1432E-02	.1883	4.4951E-03
302.000	0.000	.5119	7.6334E-03	.1814	4.2733E-02	6.1566E-02	.1878	4.3517E-03
303.000	0.000	.5128	7.7749E-03	.1815	4.2013E-02	6.1700E-02	.1874	4.2085E-03
304.000	0.000	.5137	7.9165E-03	.1817	4.1294E-02	6.1834E-02	.1869	4.0652E-03
305.000	0.000	.4917	7.6153E-03	.1896	4.5444E-02	5.9674E-02	.1986	4.4945E-03
306.000	0.000	.4469	6.8708E-03	.2055	5.4470E-02	5.5217E-02	.2225	5.4969E-03
307.000	0.000	.4019	6.1254E-03	.2214	6.3507E-02	5.0754E-02	.2464	6.5007E-03
308.000	0.000	.3569	5.3790E-03	.2373	7.2557E-02	4.6285E-02	.2703	7.5059E-03
309.000	0.000	.3529	5.3051E-03	.2382	7.2971E-02	4.6845E-02	.2726	7.5073E-03
310.000	0.000	.3901	5.9040E-03	.2242	6.4745E-02	5.2435E-02	.2531	6.5045E-03
311.000	0.000	.4272	6.5026E-03	.2101	5.6523E-02	5.8023E-02	.2336	5.5023E-03
312.000	0.000	.4643	7.1008E-03	.1960	4.8306E-02	6.3607E-02	.2141	4.5006E-03
313.000	0.000	.5013	7.6987E-03	.1820	4.0094E-02	6.9189E-02	.1947	3.4995E-03
314.000	0.000	.5213	7.9974E-03	.1724	3.6788E-02	7.1177E-02	.1857	3.0990E-03
315.000	0.000	.5243	7.9969E-03	.1674	3.8385E-02	6.9573E-02	.1873	3.2987E-03
316.000	0.000	.5273	7.9964E-03	.1624	3.9982E-02	6.7969E-02	.1889	3.4984E-03

TIME (D)	ARGON mol/ IRED1 10	NITROGEN mol/ IRED1 11	OXYGEN mol/ IRED1 12	HYDROGEN mol/ IRED1 13	METHANE mol/ IRED1 14	CO mol/ IRED1 15	CO2 mol/ IRED1 16	ETHANE mol/ IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
317.000	0.000	.5302	7.9959E-03	.1574	4.1579E-02	6.6366E-02	.1905	3.6981E-03
318.000	0.000	.5332	7.9954E-03	.1524	4.3175E-02	6.4763E-02	.1921	3.8978E-03
319.000	0.000	.5346	7.9952E-03	.1509	4.4074E-02	6.3662E-02	.1922	3.9976E-03
320.000	0.000	.5344	7.9952E-03	.1529	4.4273E-02	6.3062E-02	.1908	3.9976E-03
321.000	0.000	.5342	7.9952E-03	.1549	4.4473E-02	6.2463E-02	.1894	3.9976E-03
322.000	0.000	.5340	7.9952E-03	.1569	4.4673E-02	6.1863E-02	.1880	3.9976E-03
323.000	0.000	.5338	7.9952E-03	.1589	4.4873E-02	6.1263E-02	.1866	3.9976E-03
324.000	0.000	.5344	7.9944E-03	.1597	4.4869E-02	5.9259E-02	.1872	3.9972E-03
325.000	0.000	.5359	7.9928E-03	.1593	4.4660E-02	5.5850E-02	.1897	3.9964E-03
326.000	0.000	.5374	7.9912E-03	.1588	4.4451E-02	5.2442E-02	.1923	3.9956E-03
327.000	0.000	.5389	7.9896E-03	.1584	4.4242E-02	4.9036E-02	.1948	3.9948E-03
328.000	0.000	.5404	7.9880E-03	.1580	4.4034E-02	4.5632E-02	.1974	3.9940E-03
329.000	0.000	.5404	8.0706E-03	.1584	4.3598E-02	4.4430E-02	.1987	3.9105E-03
330.000	0.000	.5389	8.2374E-03	.1598	4.2935E-02	4.5431E-02	.1987	3.7443E-03
331.000	0.000	.5375	8.4043E-03	.1611	4.2271E-02	4.6432E-02	.1987	3.5781E-03
332.000	0.000	.5360	8.5711E-03	.1624	4.1607E-02	4.7432E-02	.1987	3.4118E-03
333.000	0.000	.5345	8.7380E-03	.1638	4.0944E-02	4.8433E-02	.1987	3.2455E-03
334.000	0.000	.5330	8.9049E-03	.1651	4.0280E-02	4.9435E-02	.1987	3.0793E-03
335.000	0.000	.5349	8.9894E-03	.1639	3.9828E-02	4.8818E-02	.1993	2.9965E-03
336.000	0.000	.5400	8.9917E-03	.1602	3.9588E-02	4.6582E-02	.2003	2.9972E-03
337.000	0.000	.5451	8.9939E-03	.1565	3.9348E-02	4.4345E-02	.2014	2.9980E-03
338.000	0.000	.5503	8.9962E-03	.1528	3.9108E-02	4.2107E-02	.2024	2.9987E-03
339.000	0.000	.5459	8.8973E-03	.1566	3.9688E-02	4.4187E-02	.2004	2.9991E-03
340.000	0.000	.5321	8.6974E-03	.1677	4.1088E-02	5.0585E-02	.1954	2.9991E-03
341.000	0.000	.5183	8.4975E-03	.1789	4.2487E-02	5.6983E-02	.1904	2.9991E-03
342.000	0.000	.5045	8.2975E-03	.1901	4.3887E-02	6.3381E-02	.1854	2.9991E-03
343.000	0.000	.4908	8.0976E-03	.2013	4.5286E-02	6.9779E-02	.1804	2.9991E-03
344.000	0.000	.4869	7.8992E-03	.2046	4.5395E-02	7.2893E-02	.1781	2.9997E-03
345.000	0.000	.4928	7.7023E-03	.1999	4.4213E-02	7.2722E-02	.1784	3.0009E-03
346.000	0.000	.4988	7.5052E-03	.1951	4.3030E-02	7.2551E-02	.1786	3.0021E-03
347.000	0.000	.5049	7.3080E-03	.1904	4.1846E-02	7.2380E-02	.1789	3.0033E-03
348.000	0.000	.5109	7.1106E-03	.1857	4.0661E-02	7.2208E-02	.1792	3.0045E-03
349.000	1.4633E-03	.5167	7.0295E-03	.1817	4.0224E-02	7.2156E-02	.1765	2.9303E-03
350.000	4.3878E-03	.5224	7.0647E-03	.1786	4.0534E-02	7.2222E-02	.1708	2.7809E-03
351.000	6.3251E-03	.5279	7.0201E-03	.1760	4.0349E-02	7.0407E-02	.1682	2.6578E-03
352.000	6.8482E-03	.5342	6.8600E-03	.1729	3.9445E-02	6.7268E-02	.1689	2.5725E-03
353.000	6.9646E-03	.5432	6.6403E-03	.1670	3.8182E-02	6.5454E-02	.1689	2.4901E-03
354.000	7.0922E-03	.5532	6.4079E-03	.1604	3.6845E-02	6.3957E-02	.1687	2.4030E-03
355.000	7.1542E-03	.5580	6.2477E-03	.1583	3.5925E-02	6.0399E-02	.1706	2.3429E-03
356.000	7.1619E-03	.5586	6.1492E-03	.1600	3.5358E-02	5.5229E-02	.1742	2.3060E-03
357.000	7.1775E-03	.5598	6.0639E-03	.1606	3.4867E-02	5.1622E-02	.1766	2.2740E-03
358.000	7.2219E-03	.5633	6.0268E-03	.1572	3.4654E-02	5.3742E-02	.1746	2.2600E-03
359.000	7.2954E-03	.5690	5.9837E-03	.1511	3.4406E-02	5.8334E-02	.1706	2.2439E-03
360.000	7.3972E-03	.5770	5.7943E-03	.1459	3.3317E-02	5.6906E-02	.1706	2.1728E-03
361.000	7.5043E-03	.5853	5.5387E-03	.1418	3.1848E-02	5.2024E-02	.1729	2.0770E-03
362.000	7.5641E-03	.5900	5.4055E-03	.1393	3.1082E-02	4.9867E-02	.1738	2.0271E-03
363.000	7.0187E-03	.5475	6.4508E-03	.1664	3.7092E-02	5.9344E-02	.1727	2.4190E-03

TIME (D)	ARGON mol/f IRED1 10	NITROGEN mol/f IRED1 11	OXYGEN mol/f IRED1 12	HYDROGEN mol/f IRED1 13	METHANE mol/f IRED1 14	CO mol/f IRED1 15	CO2 mol/f IRED1 16	ETHANE mol/f IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
364.000	6.3049E-03	.4918	7.8183E-03	.2019	4.4955E-02	7.1726E-02	.1713	2.9319E-03
365.000	6.8953E-03	.5378	6.6917E-03	.1725	3.8477E-02	6.1752E-02	.1723	2.5094E-03
366.000	7.9941E-03	.6235	4.5896E-03	.1178	2.6390E-02	4.2886E-02	.1744	1.7211E-03
367.000	8.5191E-03	.6645	3.5833E-03	9.1671E-02	2.0604E-02	3.3754E-02	.1755	1.3437E-03
368.000	8.7871E-03	.6854	3.0690E-03	7.8366E-02	1.7647E-02	2.9061E-02	.1760	1.1509E-03
369.000	8.9183E-03	.6956	2.8175E-03	7.1850E-02	1.6201E-02	2.6775E-02	.1763	1.0566E-03
370.000	8.6281E-03	.6730	3.3776E-03	8.6176E-02	1.9421E-02	3.2054E-02	.1755	1.2666E-03
371.000	8.3059E-03	.6479	4.0002E-03	.1021	2.3001E-02	3.7959E-02	.1747	1.5001E-03
372.000	8.3108E-03	.6482	3.9934E-03	.1018	2.2962E-02	3.8029E-02	.1746	1.4975E-03
373.000	8.3950E-03	.6548	3.8326E-03	9.7554E-02	2.2038E-02	3.6605E-02	.1747	1.4372E-03
374.000	8.6143E-03	.6719	3.4101E-03	8.6717E-02	1.9608E-02	3.2652E-02	.1753	1.2788E-03
375.000	8.8441E-03	.6898	2.9673E-03	7.5348E-02	1.7062E-02	2.8522E-02	.1758	1.1127E-03
376.000	9.0183E-03	.7034	2.6328E-03	6.6710E-02	1.5139E-02	2.5454E-02	.1762	9.8730E-04
377.000	8.9736E-03	.6999	2.7219E-03	6.8848E-02	1.5651E-02	2.6434E-02	.1760	1.0207E-03
378.000	8.7348E-03	.6813	3.1856E-03	8.0573E-02	1.8317E-02	3.0941E-02	.1752	1.1946E-03
379.000	8.7981E-03	.6863	3.0636E-03	7.7439E-02	1.7616E-02	2.9806E-02	.1754	1.1488E-03
380.000	8.8598E-03	.6911	2.9456E-03	7.4366E-02	1.6937E-02	2.8751E-02	.1755	1.1046E-03
381.000	8.4959E-03	.6627	3.6517E-03	9.2239E-02	2.0997E-02	3.5595E-02	.1744	1.3694E-03
382.000	8.2496E-03	.6435	4.1301E-03	.1043	2.3748E-02	4.0258E-02	.1736	1.5488E-03
383.000	8.2644E-03	.6446	4.1035E-03	.1035	2.3595E-02	4.0103E-02	.1736	1.5388E-03
384.000	8.1299E-03	.6341	4.3651E-03	.1101	2.5099E-02	4.2673E-02	.1731	1.6369E-03
385.000	7.6751E-03	.5987	5.2453E-03	.1325	3.0161E-02	5.1098E-02	.1718	1.9670E-03
386.000	7.4711E-03	.5827	5.6419E-03	.1425	3.2441E-02	5.4977E-02	.1712	2.1157E-03
387.000	7.6662E-03	.5980	5.2664E-03	.1329	3.0282E-02	5.1495E-02	.1716	1.9749E-03
388.000	7.7360E-03	.6034	5.1320E-03	.1294	2.9509E-02	5.0248E-02	.1718	1.9245E-03
389.000	7.5042E-03	.5853	5.5763E-03	.1409	3.2064E-02	5.4269E-02	.1713	2.0911E-03
390.000	7.2264E-03	.5637	6.1059E-03	.1548	3.5109E-02	5.8931E-02	.1709	2.2897E-03
391.000	7.2302E-03	.5640	6.0928E-03	.1548	3.5034E-02	5.8524E-02	.1711	2.2848E-03
392.000	7.2458E-03	.5652	6.0579E-03	.1541	3.4833E-02	5.7949E-02	.1714	2.2717E-03
393.000	7.1092E-03	.5545	6.3168E-03	.1610	3.6321E-02	6.0148E-02	.1712	2.3688E-03
394.000	6.7986E-03	.5303	6.9062E-03	.1765	3.9711E-02	6.5194E-02	.1708	2.5898E-03
395.000	6.1238E-03	.4777	8.1911E-03	.2103	4.7099E-02	7.6421E-02	.1698	3.0716E-03
396.000	5.5093E-03	.4297	9.3600E-03	.2410	5.3820E-02	8.6569E-02	.1689	3.5100E-03
397.000	5.2683E-03	.4109	9.8110E-03	.2533	5.6413E-02	9.0104E-02	.1689	3.6791E-03
398.000	5.3459E-03	.4170	9.6543E-03	.2496	5.5512E-02	8.8278E-02	.1694	3.6204E-03
399.000	5.6266E-03	.4389	9.1118E-03	.2358	5.2393E-02	8.3128E-02	.1702	3.4169E-03
400.000	5.8984E-03	.4601	8.5848E-03	.2224	4.9362E-02	7.8032E-02	.1710	3.2193E-03
401.000	5.6707E-03	.4423	9.0111E-03	.2340	5.1814E-02	8.1389E-02	.1710	3.3792E-03
402.000	5.1244E-03	.3997	1.0047E-02	.2614	5.7773E-02	9.0240E-02	.1703	3.7670E-03
403.000	5.1117E-03	.3987	1.0067E-02	.2622	5.7884E-02	9.0167E-02	.1705	3.7751E-03
404.000	5.4668E-03	.4264	9.3848E-03	.2446	5.3963E-02	8.3898E-02	.1713	3.5193E-03
405.000	5.7201E-03	.4462	8.8958E-03	.2320	5.1151E-02	7.9284E-02	.1720	3.3359E-03
406.000	5.8645E-03	.4574	8.6143E-03	.2250	4.9532E-02	7.6492E-02	.1724	3.2304E-03
407.000	6.0663E-03	.4732	8.2248E-03	.2150	4.7293E-02	7.2819E-02	.1730	3.0843E-03
408.000	6.1995E-03	.4836	7.9652E-03	.2085	4.5800E-02	7.0241E-02	.1734	2.9869E-03
409.000	6.2112E-03	.4845	7.9351E-03	.2081	4.5627E-02	6.9579E-02	.1738	2.9757E-03
410.000	6.1057E-03	.4762	8.1272E-03	.2136	4.6731E-02	7.0809E-02	.1740	3.0477E-03

TIME (D)	ARGON molf IRED1 10	NITROGEN molf IRED1 11	OXYGEN molf IRED1 12	HYDROGEN molf IRED1 13	METHANE molf IRED1 14	CO molf IRED1 15	CO2 molf IRED1 16	ETHANE molf IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
411.000	5.8656E-03	.4575	8.5758E-03	.2258	4.9311E-02	7.4289E-02	.1740	3.2159E-03
412.000	5.9294E-03	.4625	8.4513E-03	.2227	4.8595E-02	7.3044E-02	.1742	3.1692E-03
413.000	6.1601E-03	.4805	8.0109E-03	.2112	4.6062E-02	6.9129E-02	.1746	3.0041E-03
414.000	6.1273E-03	.4779	8.0681E-03	.2130	4.6392E-02	6.9371E-02	.1748	3.0255E-03
415.000	6.0008E-03	.4681	8.3033E-03	.2194	4.7744E-02	7.1123E-02	.1749	3.1137E-03
416.000	5.8742E-03	.4582	8.5384E-03	.2259	4.9096E-02	7.2874E-02	.1749	3.2019E-03
417.000	5.7476E-03	.4483	8.7735E-03	.2324	5.0448E-02	7.4625E-02	.1750	3.2901E-03
418.000	5.6210E-03	.4384	9.0087E-03	.2389	5.1800E-02	7.6377E-02	.1750	3.3783E-03
419.000	5.9808E-03	.4665	8.3252E-03	.2208	4.7870E-02	7.0495E-02	.1755	3.1220E-03
420.000	6.8684E-03	.5357	6.6454E-03	.1762	3.8211E-02	5.6345E-02	.1764	2.4920E-03
421.000	7.1830E-03	.5603	6.0504E-03	.1604	3.4790E-02	5.1356E-02	.1767	2.2689E-03
422.000	7.0084E-03	.5467	6.3811E-03	.1691	3.6691E-02	5.4145E-02	.1765	2.3929E-03
423.000	6.9203E-03	.5398	6.5476E-03	.1736	3.7649E-02	5.5541E-02	.1765	2.4554E-03
424.000	6.8514E-03	.5344	6.6780E-03	.1770	3.8398E-02	5.6639E-02	.1764	2.5042E-03
425.000	6.9367E-03	.5411	6.5163E-03	.1728	3.7469E-02	5.5263E-02	.1765	2.4436E-03
426.000	7.0801E-03	.5522	6.2450E-03	.1655	3.5909E-02	5.2984E-02	.1766	2.3419E-03
427.000	7.0583E-03	.5505	6.2868E-03	.1666	3.6149E-02	5.3364E-02	.1766	2.3576E-03
428.000	6.8832E-03	.5369	6.6180E-03	.1754	3.8054E-02	5.6147E-02	.1764	2.4818E-03
429.000	6.5987E-03	.5147	7.1560E-03	.1898	4.1147E-02	6.0651E-02	.1761	2.6835E-03
430.000	6.5687E-03	.5124	7.2124E-03	.1913	4.1471E-02	6.1109E-02	.1761	2.7047E-03
431.000	6.7676E-03	.5279	6.8359E-03	.1813	3.9306E-02	5.7933E-02	.1763	2.5635E-03
432.000	6.7700E-03	.5281	6.8314E-03	.1812	3.9281E-02	5.7894E-02	.1763	2.5618E-03
433.000	6.7036E-03	.5229	6.9568E-03	.1845	4.0001E-02	5.8937E-02	.1763	2.6088E-03
434,000	6.6414E-03	.5180	7.0742E-03	.1876	4.0676E-02	5.9910E-02	.1762	2.6528E-03
435.000	6.6868E-03	.5216	6.9883E-03	.1854	4.0182E-02	5.9188E-02	.1763	2.6206E-03
436.000	6.8547E-03	.5347	6.6707E-03	.1769	3.8357E-02	5.6522E-02	.1764	2.5015E-03
437.000	7.0225E-03	.5478	6.3532E-03	.1685	3.6531E-02	5.3855E-02	.1766	2.3824E-03
438.000	7.1904E-03	.5609	6.0357E-03	.1600	3.4705E-02	5.1188E-02	.1768	2.2634E-03
439.000	7.3583E-03	.5739	5.7181E-03	.1516	3.2879E-02	4.8522E-02	.1769	2.1443E-03
440.000	7.4424E-03	.5805	5.5594E-03	.1473	3.1966E-02	4.7213E-02	.1770	2.0848E-03
441.000	7.1723E-03	.5594	6.0715E-03	.1609	3.4911E-02	5.1571E-02	.1767	2.2768E-03
442.000	6.8387E-03	.5334	6.7028E-03	.1777	3.8541E-02	5.6884E-02	.1763	2.5135E-03
443.000	6.7737E-03	.5284	6.8252E-03	.1809	3.9245E-02	5.7890E-02	.1763	2.5594E-03
444.000	6.7703E-03	.5281	6.8317E-03	.1811	3.9282E-02	5.7942E-02	.1763	2.5619E-03
445.000	6.7668E-03	.5278	6.8382E-03	.1813	3.9320E-02	5.7993E-02	.1763	2.5643E-03
446.000	6.7633E-03	.5275	6.8447E-03	.1815	3.9357E-02	5.8044E-02	.1763	2.5668E-03
447.000	6.7598E-03	.5273	6.8513E-03	.1817	3.9395E-02	5.8096E-02	.1763	2.5692E-03
448.000	6.7563E-03	.5270	6.8578E-03	.1818	3.9432E-02	5.8147E-02	.1763	2.5717E-03
449.000	6.7529E-03	.5267	6.8643E-03	.1820	3.9470E-02	5.8199E-02	.1763	2.5741E-03
450.000	6.7494E-03	.5265	6.8708E-03	.1822	3.9507E-02	5.8250E-02	.1763	2.5766E-03
451.000	6.7459E-03	.5262	6.8773E-03	.1824	3.9545E-02	5.8301E-02	.1763	2.5790E-03
452.000	6.7424E-03	.5259	6.8838E-03	.1825	3.9582E-02	5.8353E-02	.1763	2.5814E-03
453.000	6.7390E-03	.5256	6.8904E-03	.1827	3.9619E-02	5.8404E-02	.1763	2.5839E-03
454.000	6.7355E-03	.5254	6.8969E-03	.1829	3.9657E-02	5.8455E-02	.1763	2.5863E-03
455.000	6.7320E-03	.5251	6.9034E-03	.1831	3.9694E-02	5.8507E-02	.1763	2.5888E-03
456.000	6.7320E-03	.5251	6.9034E-03	.1831	3.9694E-02	5.8507E-02	.1763	2.5888E-03

UCG DB - HA1 - PRODUCT GAS ANALYSIS 2

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	C2H4 molf !RED1 17	C6 molf !RED1 19	H10 molf !RED1 20	H2S molf !RED1 21	TAR/DRY !RED1 24	H2O/DRY !RED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
90.000	0.000	4.9975E-04	9.9950E-04	0.000	0.000	0.000
91.000	0.000	5.6226E-04	1.1245E-03	0.000	0.000	0.000
92.000	0.000	6.8729E-04	1.3746E-03	0.000	0.000	0.000
93.000	0.000	8.1235E-04	1.6247E-03	0.000	0.000	0.000
94.000	0.000	9.3745E-04	1.8749E-03	0.000	0.000	0.000
95.000	0.000	1.0501E-03	2.1001E-03	0.000	0.000	0.000
96.000	0.000	1.1502E-03	2.3004E-03	0.000	0.000	0.000
97.000	0.000	1.2503E-03	2.5006E-03	0.000	0.000	0.000
98.000	0.000	1.3505E-03	2.7010E-03	0.000	0.000	0.000
99.000	0.000	1.4507E-03	2.9013E-03	0.000	0.000	0.000
100.000	0.000	1.3507E-03	2.7015E-03	0.000	0.000	0.000
101.000	0.000	1.0507E-03	2.1014E-03	0.000	0.000	0.000
102.000	0.000	7.5056E-04	1.5011E-03	0.000	0.000	0.000
103.000	0.000	4.5038E-04	9.0075E-04	0.000	0.000	0.000
104.000	0.000	1.5014E-04	3.0027E-04	0.000	0.000	0.000
105.000	0.000	5.0055E-05	1.0011E-04	0.000	0.000	0.000
106.000	0.000	1.5018E-04	3.0035E-04	0.000	0.000	0.000
107.000	0.000	2.5032E-04	5.0063E-04	0.000	0.000	0.000
108.000	0.000	3.5048E-04	7.0095E-04	0.000	0.000	0.000
109.000	0.000	4.5066E-04	9.0131E-04	0.000	0.000	0.000
110.000	0.000	4.5066E-04	9.0131E-04	0.000	0.000	0.000
111.000	0.000	3.5048E-04	7.0095E-04	0.000	0.000	0.000
112.000	0.000	2.5032E-04	5.0063E-04	0.000	0.000	0.000
113.000	0.000	1.5018E-04	3.0035E-04	0.000	0.000	0.000
114.000	0.000	5.0055E-05	1.0011E-04	0.000	0.000	0.000
115.000	0.000	4.1698E-05	8.3396E-05	0.000	0.000	0.000
116.000	0.000	1.2507E-04	2.5015E-04	0.000	0.000	0.000
117.000	0.000	2.0841E-04	4.1681E-04	0.000	0.000	0.000
118.000	0.000	2.9170E-04	5.8340E-04	0.000	0.000	0.000
119.000	0.000	3.7495E-04	7.4990E-04	0.000	0.000	0.000
120.000	0.000	4.5816E-04	9.1631E-04	0.000	0.000	0.000
121.000	0.000	4.9975E-04	9.9950E-04	0.000	0.000	0.000
122.000	0.000	4.9975E-04	9.9950E-04	0.000	0.000	0.000
123.000	0.000	4.9975E-04	9.9950E-04	0.000	0.000	0.000
124.000	0.000	4.9975E-04	9.9950E-04	0.000	0.000	0.000
125.000	0.000	5.9963E-04	1.1993E-03	0.000	0.000	0.000
126.000	0.000	7.9935E-04	1.5987E-03	0.000	0.000	0.000
127.000	0.000	9.9899E-04	1.9980E-03	0.000	0.000	0.000

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TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2S molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
128.000	0.000	1.1986E-03	2.3971E-03	0.000	0.000	0.000
129.000	0.000	1.3980E-03	2.7961E-03	0.000	0.000	0.000
130.000	0.000	1.4482E-03	2.8964E-03	0.000	0.000	0.000
131.000	0.000	1.3490E-03	2.6980E-03	0.000	0.000	0.000
132.000	0.000	1.2497E-03	2.4994E-03	0.000	0.000	0.000
133.000	0.000	1.1503E-03	2.3006E-03	0.000	0.000	0.000
134.000	0.000	1.0508E-03	2.1016E-03	0.000	0.000	0.000
135.000	0.000	1.0008E-03	2.0016E-03	0.000	0.000	0.000
136.000	0.000	1.0004E-03	2.0008E-03	0.000	0.000	0.000
137.000	0.000	1.0000E-03	2.0000E-03	0.000	0.000	0.000
138.000	0.000	9.9960E-04	1.9992E-03	0.000	0.000	0.000
139.000	0.000	9.9920E-04	1.9984E-03	0.000	0.000	0.000
140.000	0.000	9.9900E-04	1.9980E-03	0.000	0.000	0.000
141.000	0.000	9.9900E-04	1.9980E-03	0.000	0.000	0.000
142.000	0.000	9.9900E-04	1.9980E-03	0.000	0.000	0.000
143.000	0.000	9.9900E-04	1.9980E-03	0.000	0.000	0.000
144.000	0.000	9.9900E-04	1.9980E-03	0.000	0.000	0.000
145.000	0.000	9.2774E-04	1.8555E-03	0.000	0.000	0.000
146.000	0.000	7.8519E-04	1.5704E-03	0.000	0.000	0.000
147.000	0.000	6.4257E-04	1.2851E-03	0.000	0.000	0.000
148.000	0.000	4.9989E-04	9.9978E-04	0.000	0.000	0.000
149.000	0.000	3.5714E-04	7.1429E-04	0.000	0.000	0.000
150.000	0.000	2.1433E-04	4.2867E-04	0.000	0.000	0.000
151.000	0.000	7.1455E-05	1.4291E-04	0.000	0.000	0.000
152.000	0.000	3.1245E-04	4.9991E-04	0.000	0.000	0.000
153.000	0.000	9.3685E-04	1.4990E-03	0.000	0.000	0.000
154.000	0.000	1.5603E-03	2.4965E-03	0.000	0.000	0.000
155.000	0.000	2.1828E-03	3.4924E-03	0.000	0.000	0.000
156.000	0.000	2.5438E-03	4.0701E-03	0.000	0.000	0.000
157.000	0.000	2.6439E-03	4.2303E-03	0.000	0.000	0.000
158.000	0.000	2.7441E-03	4.3906E-03	0.000	0.000	0.000
159.000	0.000	2.8443E-03	4.5509E-03	0.000	0.000	0.000
160.000	0.000	2.9445E-03	4.7112E-03	0.000	0.000	0.000
161.000	0.000	3.0936E-03	4.9498E-03	0.000	0.000	0.000
162.000	0.000	3.2915E-03	5.2664E-03	0.000	0.000	0.000
163.000	0.000	3.4892E-03	5.5827E-03	0.000	0.000	0.000
164.000	0.000	3.6866E-03	5.8986E-03	0.000	0.000	0.000
165.000	0.000	3.8839E-03	6.2142E-03	0.000	0.000	0.000
166.000	0.000	3.7362E-03	5.9779E-03	0.000	0.000	0.000
167.000	0.000	3.2428E-03	5.1885E-03	0.000	0.000	0.000
168.000	0.000	2.7480E-03	4.3968E-03	0.000	0.000	0.000
169.000	0.000	2.2517E-03	3.6028E-03	0.000	0.000	0.000
170.000	0.000	1.7539E-03	2.8063E-03	0.000	0.000	0.000
171.000	0.000	1.5536E-03	2.4858E-03	0.000	0.000	0.000
172.000	0.000	1.6515E-03	2.6423E-03	0.000	0.000	0.000
173.000	0.000	1.7490E-03	2.7984E-03	0.000	0.000	0.000
174.000	0.000	1.8463E-03	2.9540E-03	0.000	0.000	0.000

TIME (D)	C2H4 molf !RED1 17	C6 molf !RED1 19	H10 molf !RED1 20	H2S molf !RED1 21	TAR/DRY !RED1 24	H2O/DRY !RED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
175.000	0.000	1.9432E-03	3.1092E-03	0.000	0.000	0.000
176.000	0.000	2.2398E-03	3.5837E-03	0.000	0.000	0.000
177.000	0.000	2.7358E-03	4.3773E-03	0.000	0.000	0.000
178.000	0.000	3.2312E-03	5.1700E-03	0.000	0.000	0.000
179.000	0.000	3.7260E-03	5.9616E-03	0.000	0.000	0.000
180.000	0.000	4.2202E-03	6.7523E-03	0.000	0.000	0.000
181.000	0.000	4.7137E-03	7.5419E-03	0.000	0.000	0.000
182.000	0.000	4.4156E-03	7.0649E-03	0.000	0.000	0.000
183.000	0.000	3.3185E-03	5.3096E-03	0.000	0.000	0.000
184.000	0.000	2.2061E-03	3.5298E-03	0.000	0.000	0.000
185.000	0.000	1.0780E-03	1.7249E-03	0.000	0.000	0.000
186.000	0.000	4.5831E-04	7.3329E-04	0.000	0.000	0.000
187.000	0.000	3.5520E-04	5.6832E-04	0.000	0.000	0.000
188.000	0.000	2.5283E-04	4.0453E-04	0.000	0.000	0.000
189.000	0.000	1.5119E-04	2.4191E-04	0.000	0.000	0.000
190.000	0.000	5.0279E-05	8.0446E-05	0.000	0.000	0.000
191.000	0.000	5.0077E-05	8.0123E-05	0.000	0.000	0.000
192.000	0.000	1.5019E-04	2.4030E-04	0.000	0.000	0.000
193.000	0.000	2.5020E-04	4.0032E-04	0.000	0.000	0.000
194.000	0.000	3.5013E-04	5.6020E-04	0.000	0.000	0.000
195.000	0.000	4.4996E-04	7.1993E-04	0.000	0.000	0.000
196.000	0.000	4.9985E-04	7.9976E-04	0.000	0.000	0.000
197.000	0.000	4.9985E-04	7.9976E-04	0.000	0.000	0.000
198.000	0.000	4.9985E-04	7.9976E-04	0.000	0.000	0.000
199.000	0.000	4.9985E-04	7.9976E-04	0.000	0.000	0.000
200.000	0.000	4.9985E-04	7.9976E-04	0.000	0.000	0.000
201.000	0.000	4.9995E-04	7.9992E-04	0.000	0.000	0.000
202.000	0.000	5.0015E-04	8.0024E-04	0.000	0.000	0.000
203.000	0.000	5.0035E-04	8.0056E-04	0.000	0.000	0.000
204.000	0.000	5.0055E-04	8.0088E-04	0.000	0.000	0.000
205.000	0.000	5.0075E-04	8.0120E-04	0.000	0.000	0.000
206.000	0.000	5.7274E-04	9.1639E-04	0.000	0.000	0.000
207.000	0.000	7.1668E-04	1.1467E-03	0.000	0.000	0.000
208.000	0.000	8.6092E-04	1.3775E-03	0.000	0.000	0.000
209.000	0.000	1.0055E-03	1.6087E-03	0.000	0.000	0.000
210.000	0.000	1.1503E-03	1.8405E-03	0.000	0.000	0.000
211.000	0.000	1.2955E-03	2.0728E-03	0.000	0.000	0.000
212.000	0.000	1.4410E-03	2.3055E-03	0.000	0.000	.1038
213.000	0.000	1.5749E-03	2.5199E-03	0.000	0.000	.1770
214.000	0.000	1.6970E-03	2.7151E-03	0.000	0.000	.1316
215.000	0.000	1.8184E-03	2.9095E-03	0.000	0.000	.1391
216.000	0.000	1.9393E-03	3.1029E-03	0.000	0.000	.1837
217.000	0.000	1.8997E-03	3.0396E-03	0.000	0.000	.2284
218.000	0.000	1.7000E-03	2.7199E-03	0.000	0.000	.2730
219.000	0.000	1.5001E-03	2.4002E-03	0.000	0.000	.2856
220.000	0.000	1.3003E-03	2.0804E-03	0.000	0.000	.2658
221.000	0.000	1.1004E-03	1.7606E-03	0.000	0.000	.2830

TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2S molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
222.000	0.000	9.5050E-04	1.5208E-03	0.000	0.000	.3176
223.000	0.000	8.5067E-04	1.3611E-03	0.000	0.000	.3580
224.000	0.000	7.5078E-04	1.2013E-03	0.000	0.000	.3566
225.000	0.000	6.5085E-04	1.0414E-03	0.000	0.000	.3287
226.000	0.000	5.5086E-04	8.8137E-04	0.000	0.000	.3096
227.000	0.000	5.0095E-04	8.0152E-04	0.000	0.000	.2821
228.000	0.000	5.0115E-04	8.0184E-04	0.000	0.000	.2796
229.000	0.000	5.0135E-04	8.0217E-04	0.000	0.000	.2616
230.000	0.000	5.0155E-04	8.0249E-04	0.000	0.000	.2622
231.000	0.000	5.0176E-04	8.0281E-04	0.000	0.000	.2753
232.000	0.000	5.2265E-04	8.3624E-04	0.000	0.000	.2821
233.000	0.000	5.6421E-04	9.0273E-04	0.000	0.000	.3050
234.000	0.000	6.0573E-04	9.6918E-04	0.000	0.000	.3278
235.000	0.000	6.4722E-04	1.0356E-03	0.000	0.000	.3507
236.000	0.000	6.8867E-04	1.1019E-03	0.000	0.000	.3951
237.000	0.000	7.3009E-04	1.1681E-03	0.000	0.000	.4611
238.000	0.000	7.7147E-04	1.2343E-03	0.000	0.000	.4378
239.000	0.000	8.1281E-04	1.3005E-03	0.000	0.000	.3772
240.000	0.000	8.5412E-04	1.3666E-03	0.000	0.000	.3688
241.000	0.000	8.9538E-04	1.4326E-03	0.000	0.000	.3605
242.000	0.000	9.3662E-04	1.4986E-03	0.000	0.000	.3750
243.000	0.000	9.7781E-04	1.5645E-03	0.000	0.000	.4125
244.000	0.000	8.7385E-04	1.3982E-03	0.000	0.000	.3381
245.000	0.000	6.2457E-04	9.9931E-04	0.000	0.000	.2372
246.000	0.000	3.7497E-04	5.9995E-04	0.000	0.000	.2217
247.000	0.000	1.2504E-04	2.0007E-04	0.000	0.000	.2147
248.000	0.000	0.000	0.000	0.000	0.000	.2162
249.000	0.000	0.000	0.000	0.000	0.000	.2177
250.000	0.000	0.000	0.000	0.000	0.000	.2192
251.000	0.000	0.000	0.000	0.000	0.000	.2207
252.000	0.000	0.000	0.000	0.000	0.000	.2222
253.000	0.000	0.000	0.000	0.000	0.000	.2237
254.000	0.000	0.000	0.000	0.000	0.000	.2251
255.000	0.000	0.000	0.000	0.000	0.000	.2266
256.000	0.000	0.000	0.000	0.000	0.000	.2922
257.000	0.000	0.000	0.000	0.000	0.000	.3151
258.000	0.000	0.000	0.000	0.000	0.000	.2440
259.000	0.000	0.000	0.000	0.000	0.000	.1940
260.000	0.000	0.000	0.000	0.000	0.000	.1585
261.000	0.000	0.000	0.000	0.000	0.000	.1578
262.000	0.000	0.000	0.000	0.000	0.000	.1856
263.000	0.000	5.0077E-05	8.0123E-05	0.000	0.000	.2135
264.000	0.000	1.5019E-04	2.4030E-04	0.000	0.000	.2413
265.000	0.000	2.5020E-04	4.0032E-04	0.000	0.000	.2546
266.000	0.000	3.5012E-04	5.6020E-04	0.000	0.000	.2406
267.000	0.000	4.4996E-04	7.1993E-04	0.000	0.000	.2342
268.000	0.000	4.9985E-04	7.9976E-04	0.000	0.000	.2591
269.000	0.000	4.9985E-04	7.9976E-04	0.000	0.000	.2730

TIME (D)	C2H4 molf !RED1 17	C6 molf !RED1 19	H10 molf !RED1 20	H2S molf !RED1 21	TAR/DRY !RED1 24	H2O/DRY !RED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
270.000	0.000	4.9985E-04	7.9976E-04	0.000	0.000	.2918
271.000	0.000	4.9985E-04	7.9976E-04	0.000	0.000	.2405
272.000	0.000	4.9985E-04	7.9976E-04	0.000	0.000	.1342
273.000	0.000	4.9985E-04	7.9976E-04	0.000	0.000	.1152
274.000	0.000	5.6231E-04	8.9969E-04	0.000	0.000	.1553
275.000	0.000	6.8721E-04	1.0995E-03	0.000	0.000	.2108
276.000	0.000	8.1210E-04	1.2994E-03	0.000	0.000	.2580
277.000	0.000	9.3697E-04	1.4992E-03	0.000	0.000	.2671
278.000	0.000	9.9940E-04	1.5990E-03	0.000	0.000	.2608
279.000	0.000	9.9940E-04	1.5990E-03	0.000	0.000	.2678
280.000	0.000	9.9940E-04	1.5990E-03	0.000	0.000	.2938
281.000	0.000	9.9940E-04	1.5990E-03	0.000	0.000	.2677
282.000	0.000	9.9940E-04	1.5990E-03	0.000	0.000	.2357
283.000	0.000	1.0492E-03	1.6788E-03	0.000	0.000	.2458
284.000	0.000	1.1489E-03	1.8382E-03	0.000	0.000	.2505
285.000	0.000	1.2484E-03	1.9975E-03	0.000	0.000	.2611
286.000	0.000	1.3480E-03	2.1567E-03	0.000	0.000	.2642
287.000	0.000	1.4474E-03	2.3159E-03	0.000	0.000	.2768
288.000	0.000	1.4476E-03	2.3161E-03	0.000	0.000	.2789
289.000	0.000	1.3484E-03	2.1574E-03	0.000	0.000	.2454
290.000	0.000	1.2491E-03	1.9985E-03	0.000	0.000	.2434
291.000	0.000	1.1497E-03	1.8394E-03	0.000	0.000	.2665
292,000	0.000	1.0502E-03	1.6803E-03	0.000	0.000	.2662
293.000	0.000	1.0003E-03	1.6005E-03	0.000	0.000	.2712
294.000	0.000	1.0001E-03	1.6002E-03	0.000	0.000	.2687
295.000	0.000	9.9990E-04	1.5998E-03	0.000	0.000	.2888
296.000	0.000	9.9970E-04	1.5995E-03	0.000	0.000	.2992
297.000	0.000	9.9950E-04	1.5992E-03	0.000	0.000	.2683
298.000	0.000	9.9933E-04	1.5989E-03	0.000	0.000	.2423
299.000	0.000	9.9919E-04	1.5987E-03	0.000	0.000	.2287
300.000	0.000	9.9904E-04	1.5985E-03	0.000	0.000	.2717
301.000	0.000	9.9890E-04	1.5982E-03	0.000	0.000	.3981
302.000	0.000	9.9876E-04	1.5980E-03	0.000	0.000	.3287
303.000	0.000	9.9862E-04	1.5978E-03	0.000	0.000	.2142
304.000	0.000	9.9847E-04	1.5976E-03	0.000	0.000	.2606
305.000	0.000	1.0612E-03	1.6979E-03	0.000	0.000	.4771
306.000	0.000	1.1868E-03	1.8989E-03	0.000	0.000	.5889
307.000	0.000	1.3126E-03	2.1002E-03	0.000	0.000	.5379
308.000	0.000	1.4386E-03	2.3018E-03	0.000	0.000	.4213
309.000	0.000	1.4014E-03	2.2422E-03	0.000	0.000	.2418
310.000	0.000	1.2008E-03	1.9213E-03	0.000	0.000	.1416
311.000	0.000	1.0004E-03	1.6007E-03	0.000	0.000	8.4158E-02
312.000	0.000	8.0011E-04	1.2802E-03	0.000	0.000	.1940
313.000	0.000	5.9992E-04	9.5987E-04	0.000	0.000	.3184
314.000	0.000	5.4982E-04	8.7971E-04	0.000	0.000	.2903
315.000	0.000	6.4974E-04	1.0396E-03	0.000	0.000	.1389
316.000	0.000	7.4966E-04	1.1995E-03	0.000	0.000	9.8473E-02

TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2S molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
317.000	0.000	8.4957E-04	1.3593E-03	0.000	0.000	.2018
318.000	0.000	9.4946E-04	1.5191E-03	0.000	0.000	.2781
319.000	0.000	9.9940E-04	1.5990E-03	0.000	0.000	.2639
320.000	0.000	9.9940E-04	1.5990E-03	0.000	0.000	.2379
321.000	0.000	9.9940E-04	1.5990E-03	0.000	0.000	.2559
322.000	0.000	9.9940E-04	1.5990E-03	0.000	0.000	.2686
323.000	0.000	9.9940E-04	1.5990E-03	0.000	0.000	.2641
324.000	0.000	9.9930E-04	1.5989E-03	0.000	0.000	.2674
325.000	0.000	9.9910E-04	1.5986E-03	0.000	0.000	.3149
326.000	0.000	9.9890E-04	1.5982E-03	0.000	0.000	.3129
327.000	0.000	9.9870E-04	1.5979E-03	0.000	0.000	.2771
328.000	0.000	9.9850E-04	1.5976E-03	0.000	0.000	.2648
329.000	0.000	9.5683E-04	1.5309E-03	0.000	0.000	.2608
330.000	0.000	8.7367E-04	1.3979E-03	0.000	0.000	.2663
331.000	0.000	7.9050E-04	1.2648E-03	0.000	0.000	.2549
332.000	0.000	7.0732E-04	1.1317E-03	0.000	0.000	.2485
333.000	0.000	6.2414E-04	9.9863E-04	0.000	0.000	.2498
334.000	0.000	5.4095E-04	8.6552E-04	0.000	0.000	.2530
335.000	0.000	4.9941E-04	7.9906E-04	0.000	0.000	.2436
336.000	0.000	4.9954E-04	7.9926E-04	0.000	0.000	.2475
337.000	0.000	4.9966E-04	7.9946E-04	0.000	0.000	.2601
338.000	0.000	4.9979E-04	7.9966E-04	0.000	0.000	.2509
339.000	0.000	4.9985E-04	7.9976E-04	0.000	0.000	.2428
340,000	0.000	4.9985E-04	7.9976E-04	0.000	0.000	.2774
341.000	0.000	4.9985E-04	7.9976E-04	0.000	0.000	.2922
342.000	0.000	4.9985E-04	7.9976E-04	0.000	0.000	.2702
343.000	0.000	4.9985E-04	7.9976E-04	0.000	0.000	.2802
344.000	0.000	4.9995E-04	7.9992E-04	0.000	0.000	.2924
345.000	0.000	5.0015E-04	8.0024E-04	0.000	0.000	.2521
346.000	0.000	5.0035E-04	8.0056E-04	0.000	0.000	.2142
347.000	0.000	5.0055E-04	8.0088E-04	0.000	0.000	.2301
348.000	0.000	5.0075E-04	8.0120E-04	0.000	0.000	.2340
349.000	0.000	4.8839E-04	7.8143E-04	0.000	0.000	.2218
350.000	0.000	4.6349E-04	7.4158E-04	0.000	0.000	.2266
351.000	0.000	4.4296E-04	7.0874E-04	0.000	0.000	.2479
352.000	0.000	4.2875E-04	6.8600E-04	0.000	0.000	.2645
353.000	0.000	4.1502E-04	6.6403E-04	0.000	0.000	.2551
354.000	0.000	4.0049E-04	6.4079E-04	0.000	0.000	.2438
355.000	0.000	3.9048E-04	6.2478E-04	0.000	0.000	.2467
356.000	0.000	3.8432E-04	6.1492E-04	0.000	0.000	.3497
357.000	0.000	3.7899E-04	6.0639E-04	0.000	0.000	.3818
358.000	0.000	3.7667E-04	6.0268E-04	0.000	0.000	.3053
359.000	0.000	3.7398E-04	5.9837E-04	0.000	0.000	.2602
360.000	0.000	3.6214E-04	5.7942E-04	0.000	0.000	.2573
361.000	0.000	3.4617E-04	5.5387E-04	0.000	0.000	.2898
362.000	0.000	3.3785E-04	5.4055E-04	0.000	0.000	.2887
363.000	0.000	4.0317E-04	6.4508E-04	0.000	0.000	.2876

TIME (D)	C2H4 molf !RED1 17	C6 molf !RED1 19	H10 molf !RED1 20	H2S molf !RED1 21	TAR/DRY !RED1 24	H2O/DRY !RED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
364.000	0.000	4.8864E-04	7.8183E-04	0.000	0.000	.2865
365.000	0.000	4.1823E-04	6.6917E-04	0.000	0.000	.2854
366.000	0.000	2.8685E-04	4.5896E-04	0.000	0.000	.2844
367.000	0.000	2.2395E-04	3.5833E-04	0.000	0.000	.2833
368.000	0.000	1.9182E-04	3.0690E-04	0.000	0.000	.2822
369.000	0.000	1.7610E-04	2.8176E-04	0.000	0.000	.2811
370.000	0.000	2.1110E-04	3.3776E-04	0.000	0.000	.2800
371.000	0.000	2.5001E-04	4.0002E-04	0.000	0.000	.2790
372.000	0.000	2.4959E-04	3.9934E-04	0.000	0.000	.2779
373.000	0.000	2.3954E-04	3.8326E-04	0.000	0.000	.2768
374.000	0.000	2.1313E-04	3.4101E-04	0.000	0.000	.2757
375.000	0.000	1.8545E-04	2.9673E-04	0.000	0.000	.2746
376.000	0.000	1.6455E-04	2.6328E-04	0.000	0.000	.2735
377.000	0.000	1.7012E-04	2.7219E-04	0.000	0.000	.2725
378.000	0.000	1.9910E-04	3.1856E-04	0.000	0.000	.2714
379.000	0.000	1.9147E-04	3.0636E-04	0.000	0.000	.2703
380.000	0.000	1.8410E-04	2.9456E-04	0.000	0.000	.2692
381.000	0.000	2.2823E-04	3.6517E-04	0.000	0.000	.2681
382.000	0.000	2.5813E-04	4.1301E-04	0.000	0.000	.2671
383.000	0.000	2.5647E-04	4.1035E-04	0.000	0.000	.2660
384.000	0.000	2.7282E-04	4.3650E-04	0.000	0.000	.2649
385.000	0.000	3.2783E-04	5.2453E-04	0.000	0.000	.2638
386.000	0.000	3.5262E-04	5.6419E-04	0.000	0.000	.2627
387.000	0.000	3.2915E-04	5.2664E-04	0.000	0.000	.2616
388.000	0.000	3.2075E-04	5.1320E-04	0.000	0.000	.2622
389.000	0.000	3.4852E-04	5.5763E-04	0.000	0.000	.2644
390.000	0.000	3.8161E-04	6.1058E-04	0.000	0.000	.2667
391.000	0.000	3.8080E-04	6.0928E-04	0.000	0.000	.2689
392.000	0.000	3.7861E-04	6.0579E-04	0.000	0.000	.2711
393.000	0.000	3.9479E-04	6.3168E-04	0.000	0.000	.2734
394.000	0.000	4.3164E-04	6.9062E-04	0.000	0.000	.2756
395.000	0.000	5.1194E-04	8.1911E-04	0.000	0.000	.2778
396.000	0.000	5.8500E-04	9.3600E-04	0.000	0.000	.2801
397.000	0.000	6.1319E-04	9.8110E-04	0.000	0.000	.2823
398.000	0.000	6.0340E-04	9.6543E-04	0.000	0.000	.2845
399.000	0.000	5.6949E-04	9.1118E-04	0.000	0.000	.2867
400.000	0.000	5.3655E-04	8.5848E-04	0.000	0.000	.2890
401.000	0.000	5.6319E-04	9.0111E-04	0.000	0.000	.2912
402.000	0.000	6.2797E-04	1.0047E-03	0.000	0.000	.2934
403.000	0.000	6.2918E-04	1.0067E-03	0.000	0.000	.2957
404.000	0.000	5.8655E-04	9.3848E-04	0.000	0.000	.2979
405.000	0.000	5.5599E-04	8.8958E-04	0.000	0.000	.3001
406.000	0.000	5.3840E-04	8.6143E-04	0.000	0.000	.3024
407.000	0.000	5.1405E-04	8.2248E-04	0.000	0.000	.3046
408.000	0.000	4.9783E-04	7.9652E-04	0.000	0.000	.3068
409.000	0.000	4.9595E-04	7.9351E-04	0.000	0.000	.3090
410.000	0.000	5.0795E-04	8.1272E-04	0.000	0.000	.3113

TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2S molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
411.000	0.000	5.3599E-04	8.5758E-04	0.000	0.000	.3135
412.000	0.000	5.2821E-04	8.4513E-04	0.000	0.000	.3157
413.000	0.000	5.0068E-04	8.0109E-04	0.000	0.000	.3180
414.000	0.000	5.0426E-04	8.0681E-04	0.000	0.000	.3202
415.000	0.000	5.1895E-04	8.3033E-04	0.000	0.000	.3224
416.000	0.000	5.3365E-04	8.5384E-04	0.000	0.000	.3247
417.000	0.000	5.4834E-04	8.7736E-04	0.000	0.000	.3269
418.000	0.000	5.6304E-04	9.0087E-04	0.000	0.000	.3280
419.000	0.000	5.2032E-04	8.3252E-04	0.000	0.000	.3280
420.000	0.000	4.1534E-04	6.6454E-04	0.000	0.000	.3280
421.000	0.000	3.7815E-04	6.0504E-04	0.000	0.000	.3280
422.000	0.000	3.9881E-04	6.3811E-04	0.000	0.000	.3280
423.000	0.000	4.0923E-04	6.5476E-04	0.000	0.000	.3280
424.000	0.000	4.1737E-04	6.6780E-04	0.000	0.000	.3280
425.000	0.000	4.0727E-04	6.5163E-04	0.000	0.000	.3280
426.000	0.000	3.9031E-04	6.2450E-04	0.000	0.000	.3280
427.000	0.000	3.9293E-04	6.2868E-04	0.000	0.000	.3280
428.000	0.000	4.1363E-04	6.6180E-04	0.000	0.000	.3280
429.000	0.000	4.4725E-04	7.1560E-04	0.000	0.000	.3280
430.000	0.000	4.5078E-04	7.2124E-04	0.000	0.000	.3280
431.000	0.000	4.2724E-04	6.8359E-04	0.000	0.000	.3280
432.000	0.000	4.2696E-04	6.8314E-04	0.000	0.000	.3280
433.000	0.000	4.3479E-04	6.9567E-04	0.000	0.000	.3280
434.000	0.000	4.4213E-04	7.0742E-04	0.000	0.000	.3280
435.000	0.000	4.3676E-04	6.9883E-04	0.000	0.000	.3280
436.000	0.000	4.1692E-04	6.6707E-04	0.000	0.000	.3280
437.000	0.000	3.9707E-04	6.3532E-04	0.000	0.000	.3280
438.000	0.000	3.7723E-04	6.0357E-04	0.000	0.000	.3280
439.000	0.000	3.5738E-04	5.7181E-04	0.000	0.000	.3280
440.000	0.000	3.4746E-04	5.5594E-04	0.000	0.000	.3280
441.000	0.000	3.7947E-04	6.0715E-04	0.000	0.000	.3280
442.000	0.000	4.1892E-04	6.7028E-04	0.000	0.000	.3280
443.000	0.000	4.2657E-04	6.8252E-04	0.000	0.000	.3280
444.000	0.000	4.2698E-04	6.8317E-04	0.000	0.000	.3280
445.000	0.000	4.2739E-04	6.8382E-04	0.000	0.000	.3280
446.000	0.000	4.2780E-04	6.8447E-04	0.000	0.000	.3280
447.000	0.000	4.2820E-04	6.8513E-04	0.000	0.000	.3280
448.000	0.000	4.2861E-04	6.8578E-04	0.000	0.000	.3280
449.000	0.000	4.2902E-04	6.8643E-04	0.000	0.000	.3280
450.000	0.000	4.2942E-04	6.8708E-04	0.000	0.000	.3280
451.000	0.000	4.2983E-04	6.8773E-04	0.000	0.000	.3280
452.000	0.000	4.3024E-04	6.8838E-04	0.000	0.000	.3280
453.000	0.000	4.3064E-04	6.8903E-04	0.000	0.000	.3280
454.000	0.000	4.3105E-04	6.8969E-04	0.000	0.000	.3280
455.000	0.000	4.3146E-04	6.9034E-04	0.000	0.000	.3280
456.000	0.000	4.3146E-04	6.9034E-04	0.000	0.000	.3280

1

UCG DB - HA1 - MATERIAL BALANCES

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL RT mo/s !RED1 44	ASH RATE mo/s !RED1 46	H2O INFX mo/s !RED1 47	H2O COAL mo/s !RED1 48	-H2O RXN mo/s !RED1 49	O2 per COAL !RED1 60	H2O per COAL !RED1 61	CHAR RT mo/s !RED1 64	CHAR per COAL !RED1 63	RECOVORY % !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
90.000	.8671	6.5527E-02	.6113	.1107	.7220	9.6192E-03	.8327	2.507	.7430	39.49
91.000	.8291	6.2655E-02	.5761	.1059	.6820	9.3301E-03	.8221	2.310	.7353	41.17
92.000	.7604	5.7463E-02	.5130	9.7110E-02	.6101	8.7827E-03	.8020	1.960	.7200	44.80
93.000	.8101	6.1222E-02	.5309	.1035	.6344	8.2922E-03	.7839	1.927	.7046	53.29
94.000	1.049	7.9241E-02	.6698	.1339	.8037	7.8502E-03	.7677	2.315	.6892	57.41
95.000	1.499	.1133	.9238	.1915	1.115	2.1735E-02	.7465	3.160	.6787	58.33
96.000	1.491	.1127	.8854	.1904	1.076	5.0721E-02	.7186	3.076	.6729	50.36
97.000	1.008	7.6192E-02	.5689	.1288	.6976	8.1371E-02	.6892	2.020	.6664	33.43
98.000	.7129	5.3878E-02	.3799	9.1051E-02	.4710	.1138	.6581	1.384	.6593	28.74
99.000	.5896	4.4558E-02	.2934	7.5300E-02	.3687	.1483	.6250	1.103	.6514	43.81
100.000	.5408	4.0873E-02	.2491	6.9073E-02	.3181	.1973	.5867	.9955	.6480	40.42
101.000	.3949	2.9843E-02	.1653	5.0434E-02	.2157	.2669	.5393	.7313	.6496	17.16
102.000	.2411	1.8220E-02	8.6601E-02	3.0792E-02	.1174	.3532	.4805	.4503	.6515	8.270
103.000	.1816	1.3726E-02	5.1010E-02	2.3196E-02	7.4206E-02	.4630	.4057	.3430	.6539	4.876
104.000	.1567	1.1843E-02	2.8841E-02	2.0014E-02	4.8854E-02	.6076	.3072	.3000	.6570	4.706
105.000	.1457	1.1012E-02	2.2285E-02	1.8609E-02	4.0895E-02	.6526	.2803	.2854	.6620	4.623
106,000	.1392	1.0519E-02	2.8804E-02	1.7776E-02	4.6580E-02	.5810	.3362	.2797	.6679	4.093
107.000	.1491	1.1271E-02	3.9017E-02	1.9048E-02	5.8066E-02	.5167	.3864	.3074	.6730	4.073
108.000	.2181	1.6483E-02	6.7419E-02	2.7856E-02	9.5276E-02	.4586	.4318	.4592	.6775	5.832
109.000	.2651	2.0031E-02	9.1434E-02	3.3851E-02	.1253	.4059	.4730	.5670	.6815	7.030
110.000	.2765	2.0893E-02	9.5608E-02	3.5309E-02	.1309	.4156	.4745	.6188	.6906	7.756
111.000	.2701	2.0414E-02	8.3386E-02	3.4498E-02	.1179	.4926	.4347	.6469	.7059	8.569
112.000	.2348	1.7746E-02	6.1013E-02	2.9990E-02	9.1003E-02	.5866	.3860	.6108	.7225	8.642
113.000	.2081	1.5725E-02	4.1534E-02	2.6574E-02	6.8109E-02	.7041	.3252	.5941	.7409	9.064
114.000	.2044	1.5445E-02	2.3982E-02	2.6101E-02	5.0082E-02	.8549	.2471	.6544	.7611	10.55
115.000	.2583	1.9521E-02	2.0457E-02	3.2989E-02	5.3447E-02	.9444	.2063	.8616	.7697	14.21
116.000	.3065	2.3163E-02	2.6192E-02	3.9145E-02	6.5337E-02	.9529	.2131	1.001	.7656	16.79
117.000	.3173	2.3978E-02	2.9283E-02	4.0522E-02	6.9805E-02	.9614	.2199	1.012	.7614	17.10
118.000	.3242	2.4497E-02	3.2097E-02	4.1399E-02	7.3496E-02	.9699	.2267	1.010	.7570	17.15
119.000	.3237	2.4460E-02	3.4250E-02	4.1336E-02	7.5586E-02	.9785	.2335	.9838	.7524	16.89
120.000	.3232	2.4423E-02	3.6397E-02	4.1274E-02	7.7671E-02	.9870	.2403	.9578	.7477	16.61
121.000	.2979	2.2510E-02	3.0387E-02	3.8042E-02	6.8429E-02	1.029	.2284	.8941	.7504	15.82
122.000	.2496	1.8865E-02	1.7424E-02	3.1881E-02	4.9305E-02	1.111	.1959	.7928	.7609	14.51
123.000	.2214	1.6733E-02	7.0540E-03	2.8279E-02	3.5332E-02	1.203	.1591	.7486	.7717	14.28
124.000	.2197	1.6606E-02	-2.389E-03	2.8064E-02	2.5675E-02	1.308	.1172	.7936	.7829	15.84
125.000	.2509	1.8959E-02	-9.163E-03	3.2039E-02	2.2877E-02	1.251	9.1550E-02	.7914	.7589	17.28
126.000	.3064	2.3153E-02	-1.282E-02	3.9127E-02	2.6302E-02	1.060	8.6057E-02	.7053	.6966	17.63
127.000	.3450	2.6070E-02	-1.573E-02	4.4057E-02	2.8326E-02	.9240	8.2165E-02	.5880	.6279	16.82

TIME (D)	COAL RT mo/s IRED1 44	ASH RATE mo/s IRED1 46	H2O INFX mo/s IRED1 47	H2O COAL mo/s IRED1 48	-H2O RXN mo/s IRED1 49	O2 per COAL IRED1 60	H2O per COAL IRED1 61	CHAR RT mo/s IRED1 64	CHAR per COAL IRED1 63	RECOVERY % IRED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
128.000	.3795	2.8677E-02	-1.842E-02	4.8462E-02	3.0046E-02	.8228	7.9260E-02	.4691	.5517	15.76
129.000	.4172	3.1527E-02	-2.117E-02	5.3279E-02	3.2112E-02	.7443	7.7009E-02	.3686	.4669	15.11
130.000	.3549	2.6823E-02	-1.818E-02	4.5330E-02	2.7151E-02	.7132	7.6627E-02	.2722	.4369	12.04
131.000	.2703	2.0428E-02	-1.348E-02	3.4522E-02	2.1045E-02	.7204	7.7875E-02	.2354	.4655	9.074
132.000	.2555	1.9309E-02	-1.241E-02	3.2631E-02	2.0225E-02	.7278	7.9176E-02	.2479	.4925	8.486
133.000	.2461	1.8597E-02	-1.161E-02	3.1427E-02	1.9815E-02	.7355	8.0532E-02	.2644	.5178	8.271
134.000	.2484	1.8776E-02	-1.137E-02	3.1730E-02	2.0363E-02	.7436	8.1947E-02	.2942	.5417	8.764
135.000	.2598	1.9632E-02	-9.795E-03	3.3178E-02	2.3383E-02	.7380	8.9843E-02	.3091	.5434	10.33
136.000	.3027	2.2876E-02	-6.985E-03	3.8660E-02	3.1675E-02	.7191	.1038	.3309	.5233	17.36
137.000	.2792	2.1101E-02	-3.364E-03	3.5660E-02	3.2296E-02	.7011	.1171	.2849	.5026	19.02
138.000	.2177	1.6451E-02	4.1149E-04	2.7802E-02	2.8214E-02	.6840	.1296	.2021	.4811	14.52
139.000	.2038	1.5404E-02	2.7559E-03	2.6031E-02	2.8787E-02	.6678	.1416	.1736	.4590	14.59
140.000	.1707	1.2902E-02	1.3638E-03	2.1804E-02	2.3168E-02	.6700	.1341	.1389	.4487	13.66
141.000	.1553	1.1737E-02	-3.283E-03	1.9835E-02	1.6553E-02	.6905	.1070	.1274	.4507	12.98
142.000	.1701	1.2856E-02	-8.423E-03	2.1726E-02	1.3303E-02	.7118	7.9021E-02	.1407	.4527	14.70
143.000	.1781	1.3456E-02	-1.380E-02	2.2741E-02	8.9406E-03	.7337	5.0058E-02	.1485	.4548	16.07
144.000	.1744	1.3177E-02	-1.874E-02	2.2269E-02	3.5300E-03	.7564	2.0084E-02	.1467	.4569	16.32
145.000	.1618	1.2230E-02	-1.955E-02	2.0668E-02	1.1173E-03	.8275	7.0500E-03	.1426	.4689	16.42
146.000	.1415	1.0697E-02	-1.638E-02	1.8077E-02	1.6964E-03	.9654	1.2183E-02	.1372	.4928	16.63
147.000	.1320	9.9784E-03	-1.434E-02	1.6863E-02	2.5264E-03	1.152	1.9131E-02	.1445	.5219	18.00
148.000	.1241	9.3776E-03	-1.229E-02	1.5848E-02	3.5603E-03	1.419	2.9076E-02	.1564	.5581	19.57
149.000	.1108	8.3702E-03	-9.264E-03	1.4145E-02	4.8814E-03	1.835	4.4529E-02	.1693	.6041	21.30
150.000	.1328	1.0038E-02	-6.907E-03	1.6963E-02	1.0056E-02	2.573	7.2017E-02	.2763	.6648	39.78
151.000	.1645	1.2433E-02	1.6036E-03	2.1011E-02	2.2615E-02	4.299	.1362	.5192	.7486	85.91
152.000	.3578	2.7038E-02	.1097	4.5694E-02	.1554	3.419	.3473	.9195	.7399	106.0
153.000	.7017	5.3028E-02	.2932	8.9615E-02	.3828	.9433	.5395	1.379	.6656	88.75
154.000	1.027	7.7593E-02	.4643	.1311	.5954	.4463	.5781	1.825	.6411	73.91
155.000	1.281	9.6798E-02	.5996	.1636	.7632	.2226	.5954	2.166	.6286	59.71
156.000	1.267	9.5778E-02	.5969	.1619	.7587	.1472	.5984	2.054	.6179	47.81
157.000	1.141	8.6217E-02	.5300	.1457	.6757	.1545	.5922	1.752	.6053	41.90
158.000	1.181	8.9287E-02	.5414	.1509	.6923	.1617	.5861	1.712	.5920	41.61
159.000	1.173	8.8634E-02	.5308	.1498	.6805	.1688	.5801	1.610	.5780	39.47
160.000	1.090	8.2356E-02	.4865	.1392	.6256	.1758	.5741	1.406	.5632	35.22
161.000	1.038	7.8458E-02	.4545	.1326	.5871	.1829	.5653	1.257	.5471	32.48
162.000	1.014	7.6657E-02	.4320	.1295	.5616	.1902	.5538	1.142	.5297	31.06
163.000	1.264	9.5530E-02	.5231	.1614	.6846	.1972	.5426	1.315	.5115	38.31
164.000	1.868	.1411	.7524	.2385	.9910	.2041	.5317	1.798	.4923	56.06
165.000	2.388	.1805	.9386	.3050	1.244	.2108	.5211	2.133	.4722	72.28
166.000	2.513	.1899	.9405	.3209	1.261	.2269	.5019	1.978	.4394	78.74
167.000	2.478	.1873	.8574	.3165	1.174	.2527	.4736	1.592	.3897	78.21
168.000	2.471	.1867	.7828	.3156	1.098	.2792	.4446	1.218	.3287	79.53
169.000	2.467	.1864	.7086	.3150	1.024	.3063	.4149	.8430	.2520	84.10
170.000	2.425	.1833	.6231	.3097	.9328	.3341	.3845	.4523	.1528	85.32
171.000	2.429	.1836	.5276	.3102	.8378	.3707	.3453	.1118	4.1631E-02	89.06
172.000	2.413	.1824	.4057	.3082	.7140	.4179	.2953	-.1871	-9.115E-02	95.77
173.000	2.337	.1766	.2638	.2985	.5622	.4699	.2402	-.5060	-.2889	101.2
174.000	2.429	.1835	.1212	.3102	.4314	.5276	.1792	-.9104	-.6161	120.4

TIME (D)	COAL RT mo/s !RED1 44	ASH RATE mo/s !RED1 46	H2O INFX mo/s !RED1 47	H2O COAL mo/s !RED1 48	-H2O RXN mo/s !RED1 49	O2 per COAL !RED1 60	H2O per COAL !RED1 61	CHAR RT mo/s !RED1 64	CHAR per COAL !RED1 63	RECOVORY % !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
175.000	2.158	.1631	-2.161E-02	.2756	.2540	.5918	.1112	-1.134	-1.271	119.1
176.000	2.294	.1734	2.4689E-02	.2930	.3177	.5824	.1267	-1.161	-1.232	118.7
177.000	2.307	.1743	.1960	.2946	.4906	.5014	.2226	-.8263	-.5393	106.5
178.000	1.688	.1276	.2975	.2156	.5131	.4307	.3064	-.2976	-.2178	68.87
179.000	1.440	.1088	.3584	.1839	.5424	.3685	.3800	-4.532E-02	-3.034E-02	52.07
180.000	1.330	.1005	.4236	.1699	.5935	.3134	.4454	.1427	9.2812E-02	42.06
181.000	1.512	.1143	.5727	.1931	.7658	.2641	.5038	.3439	.1801	42.71
182.000	1.593	.1204	.6320	.2034	.8355	.2572	.5242	.4550	.2224	44.97
183.000	1.390	.1050	.5305	.1775	.7080	.2929	.5086	.4231	.2339	43.33
184.000	1.154	8.7175E-02	.4191	.1473	.5664	.3352	.4902	.3778	.2473	40.14
185.000	1.024	7.7363E-02	.3486	.1307	.4794	.3862	.4679	.3644	.2627	39.66
186.000	.9594	7.2503E-02	.2858	.1225	.4083	.4429	.4245	.3808	.2844	39.16
187.000	.8826	6.6698E-02	.2042	.1127	.3170	.5047	.3574	.3994	.3119	34.15
188.000	.7693	5.8138E-02	.1200	9.8250E-02	.2182	.5762	.2798	.3967	.3413	27.75
189.000	.6443	4.8691E-02	4.2173E-02	8.2286E-02	.1245	.6598	.1891	.3810	.3725	25.27
190.000	.5728	4.3290E-02	-2.549E-02	7.3159E-02	4.7673E-02	.7589	8.1443E-02	.3914	.4059	28.17
191.000	.5248	3.9663E-02	-5.892E-02	6.7029E-02	8.1066E-03	.8159	1.4985E-02	.3388	.3883	29.05
192.000	.4841	3.6585E-02	-6.203E-02	6.1828E-02	-1.986E-04	.8220	-5.704E-04	.2217	.3106	25.68
193.000	.4679	3.5363E-02	-6.703E-02	5.9762E-02	-7.265E-03	.8279	-1.562E-02	.1306	.2139	22.12
194.000	.4339	3.2792E-02	-6.832E-02	5.5417E-02	-1.290E-02	.8336	-3.019E-02	4.8238E-02	9.0244E-02	18.37
195.000	.4572	3.4551E-02	-7.900E-02	5.8389E-02	-2.061E-02	.8391	-4.430E-02	-3.222E-02	-7.348E-02	18.37
196.000	.5510	4.1642E-02	-9.950E-02	7.0374E-02	-2.913E-02	.8375	-5.274E-02	-9.744E-02	-.2130	22.00
197.000	.6101	4.6109E-02	-.1119	7.7921E-02	-3.400E-02	.8288	-5.569E-02	-.1443	-.3104	25.48
198,000	.6379	4.8208E-02	-.1188	8.1470E-02	-3.737E-02	.8204	-5.856E-02	-.1888	-.4217	27.15
199.000	.7353	5.5568E-02	-.1391	9.3907E-02	-4.524E-02	.8121	-6.137E-02	-.2625	-.5501	30.43
200.000	.9372	7.0829E-02	-.1799	.1197	-6.023E-02	.8041	-6.410E-02	-.3879	-.6999	37.63
201.000	1.064	8.0393E-02	-.1917	.1359	-5.584E-02	.7913	-5.262E-02	-.4401	-.7094	41.68
202.000	1.085	8.2022E-02	-.1680	.1386	-2.935E-02	.7738	-2.717E-02	-.3964	-.5782	42.09
203.000	1.103	8.3389E-02	-.1432	.1409	-2.258E-03	.7565	-2.128E-03	-.3504	-.4674	42.69
204.000	1.115	8.4262E-02	-.1172	.1424	2.5163E-02	.7395	2.2521E-02	-.3017	-.3726	42.91
205.000	1.124	8.4908E-02	-9.088E-02	.1435	5.2614E-02	.7228	4.6783E-02	-.2521	-.2905	42.80
206.000	1.154	8.7219E-02	-5.771E-02	.1474	8.9688E-02	.6994	7.7291E-02	-.2369	-.2581	42.64
207.000	1.211	9.1495E-02	-1.720E-02	.1546	.1374	.6702	.1131	-.2571	-.2694	42.73
208.000	1.263	9.5477E-02	2.4286E-02	.1614	.1856	.6428	.1466	-.2766	-.2802	42.82
209.000	1.306	9.8672E-02	6.6231E-02	.1668	.2330	.6170	.1782	-.2940	-.2905	42.55
210.000	1.329	.1004	.1067	.1697	.2764	.5927	.2079	-.3070	-.3004	40.62
211.000	1.332	.1007	.1442	.1701	.3143	.5698	.2360	-.3151	-.3098	38.08
212.000	1.164	8.7930E-02	.4784	.1486	.3032	.5481	.2625	-.2809	-.3189	31.79
213.000	.9922	7.4986E-02	.7159	.1267	.2988	.5117	.3012	-.1549	-.1978	29.63
214.000	.9832	7.4301E-02	.6077	.1256	.3451	.4617	.3512	1.4498E-02	8.4453E-03	28.48
215.000	1.055	7.9701E-02	.7161	.1347	.4214	.4148	.3979	.1910	.1455	24.38
216.000	.8455	6.3896E-02	.6807	.1080	.3675	.3708	.4418	.2544	.2433	18.08
217.000	.7618	5.7573E-02	.7541	9.7296E-02	.3463	.3582	.4564	.3082	.2874	15.66
218.000	1.196	9.0422E-02	1.339	.1528	.5279	.3759	.4425	.4960	.2925	25.21
219.000	1.418	.1072	1.631	.1811	.6070	.3946	.4279	.6017	.2979	31.44
220.000	1.417	.1071	1.557	.1810	.5846	.4145	.4125	.6176	.3035	33.33
221.000	1.423	.1075	1.654	.1817	.5635	.4355	.3961	.6370	.3093	33.18

TIME (D)	COAL RT mo/s IRED1 44	ASH RATE mo/s IRED1 46	H2O INFX mo/s IRED1 47	H2O COAL mo/s IRED1 48	-H2O RXN mo/s IRED1 49	O2 per COAL IRED1 60	H2O per COAL IRED1 61	CHAR RT mo/s IRED1 64	CHAR per COAL IRED1 63	RECOVERY % IRED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
222.000	1.413	.1068	1.798	.1804	.5139	.4692	.3636	.5677	.2856	30.39
223.000	1.416	.1070	1.983	.1808	.4440	.5166	.3138	.4139	.2250	29.32
224.000	1.596	.1206	2.188	.2038	.4101	.5677	.2600	.2692	.1468	34.15
225.000	1.776	.1342	2.271	.2268	.3581	.6231	.2018	8.4883E-02	4.2096E-02	36.92
226.000	1.812	.1370	2.155	.2315	.2503	.6832	.1386	-.1650	-.1057	37.53
227.000	1.853	.1400	1.943	.2366	.1892	.7140	.1021	-.6047	-.5744	38.13
228.000	1.909	.1442	1.877	.2437	.1818	.7129	9.5312E-02	-.4557	-.4779	34.25
229.000	2.030	.1534	1.764	.2593	.1806	.7119	8.9085E-02	0.000	0.000	33.46
230.000	2.088	.1578	1.728	.2667	.1742	.7110	8.3375E-02	0.000	0.000	34.26
231.000	2.016	.1524	1.678	.2575	.1577	.7102	7.8119E-02	0.000	0.000	32.64
232.000	1.937	.1464	1.631	.2474	.1697	.6962	8.7783E-02	0.000	0.000	31.92
233.000	1.718	.1299	1.600	.2195	.1903	.6690	.1121	0.000	0.000	29.46
234.000	1.143	8.6408E-02	1.158	.1460	.1511	.6421	.1362	0.000	0.000	21.49
235.000	.6282	4.7477E-02	.6982	8.0234E-02	9.9087E-02	.6153	.1602	0.000	0.000	12.52
236.000	.3575	2.7015E-02	.4415	4.5655E-02	6.4126E-02	.5887	.1840	0.000	0.000	5.958
237.000	.2175	1.6437E-02	.3271	2.7778E-02	4.5188E-02	.5623	.2077	-6.230E-02	-.6685	2.945
238.000	.2341	1.7695E-02	.3372	2.9904E-02	5.4348E-02	.5360	.2313	-.1142	-1.022	3.245
239.000	.7038	5.3191E-02	.9035	8.9891E-02	.1846	.5099	.2547	-.2006	-.5263	10.28
240.000	2.122	.1603	2.713	.2710	.6009	.4839	.2780	-.3044	-.2291	36.61
241.000	3.118	.2356	3.974	.3982	.9390	.4581	.3011	-7.033E-02	-3.040E-02	60.52
242.000	2.907	.2197	3.876	.3712	.9391	.4324	.3241	.3630	.1120	59.48
243.000	2.568	.1941	3.776	.3280	.8898	.4069	.3469	.7247	.2191	51.83
244.000	2.379	.1798	3.001	.3039	.7827	.4265	.3278	.7456	.2363	47.21
245,000	2.311	.1746	2.139	.2951	.6060	.4953	.2626	.4698	.1675	48.07
246.000	2.423	.1831	2.062	.3095	.4523	.5741	.1881	.1905	7.1481E-02	56.24
247.000	3.267	.2469	2.608	.4173	.2985	.6650	.1021	-.2567	-7.195E-02	77.05
248.000	3.781	.2858	2.983	.4829	.2396	.7059	6.3887E-02	-.7176	-.2457	84.48
249.000	2.631	.1989	2.074	.3361	.2024	.6904	7.9548E-02	-.7485	-.4429	56.95
250.000	2.395	.1810	1.885	.3059	.2310	.6758	9.4410E-02	-1.008	-.6981	42.78
251.000	3.109	.2350	2.444	.3971	.3378	.6618	.1085	-1.574	-1.042	53.75
252.000	3.072	.2322	2.413	.3924	.3742	.6485	.1220	-.8725	-.6203	62.05
253.000	4.467	.3376	3.444	.5705	.4387	.6584	.1057	0.000	0.000	94.78
254.000	5.683	.4295	4.283	.7258	.3415	.6921	5.9015E-02	-1.706	-.8480	111.8
255.000	5.645	.4266	4.123	.7210	5.0404E-02	.7274	9.9114E-03	-3.526	-1.665	100.7
256.000	5.466	.4131	5.134	.6981	-.2177	.7646	-4.176E-02	-3.367	-1.602	100.0
257.000	5.053	.3818	5.142	.6453	-.4857	.8038	-9.621E-02	-3.063	-1.540	99.05
258.000	5.432	.4105	3.856	.6938	-.4880	.8030	-9.216E-02	-1.515	-.7542	103.3
259.000	6.540	.4942	3.364	.8352	-.1983	.7646	-3.327E-02	0.000	0.000	109.5
260.000	7.623	.5761	3.063	.9736	.1349	.7321	1.6592E-02	0.000	0.000	108.1
261.000	5.926	.4479	2.305	.7569	.3108	.7042	5.9345E-02	0.000	0.000	72.81
262.000	2.930	.2215	1.394	.3743	.2665	.6800	9.6412E-02	0.000	0.000	34.53
263.000	3.150	.2381	1.943	.4023	.4273	.6523	.1298	0.000	0.000	53.84
264.000	4.301	.3250	3.136	.5492	.7019	.6182	.1632	0.000	0.000	86.52
265.000	4.516	.3413	3.766	.5768	.9043	.5813	.1993	0.000	0.000	97.99
266.000	4.907	.3708	4.215	.6267	1.174	.5413	.2385	-.4398	-.1046	113.8
267.000	4.910	.3710	4.484	.6270	1.376	.4978	.2810	.6591	5.3853E-02	122.9
268.000	4.688	.3543	4.949	.5987	1.497	.4684	.3194	2.239	.3233	116.0
269.000	4.759	.3596	5.437	.6077	1.677	.4549	.3520	2.407	.3357	106.3

TIME (D)	COAL RT mo/s !RED1 44	ASH RATE mo/s !RED1 46	H2O INFX mo/s !RED1 47	H2O COAL mo/s !RED1 48	-H2O RXN mo/s !RED1 49	O2 per COAL !RED1 60	H2O per COAL !RED1 61	CHAR RT mo/s !RED1 64	CHAR per COAL !RED1 63	RECOVORY % !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
270.000	5.174	.3911	6.479	.6609	1.998	.4412	.3852	2.766	.3479	109.2
271.000	6.010	.4542	6.557	.7676	2.527	.4272	.4189	3.387	.3599	123.4
272.000	6.522	.4929	5.135	.8330	2.955	.4130	.4531	3.856	.3715	130.6
273.000	6.361	.4807	4.828	.8124	3.101	.3986	.4879	3.947	.3830	120.0
274.000	6.473	.4892	5.792	.8267	3.177	.3912	.4914	3.590	.3564	109.1
275.000	6.980	.5275	7.184	.8915	3.239	.3911	.4645	2.825	.2876	106.9
276.000	7.496	.5665	8.443	.9573	3.292	.3909	.4396	1.996	.2095	104.2
277.000	8.035	.6073	8.838	1.026	3.344	.3908	.4165	1.106	.1201	101.9
278.000	8.206	.6201	8.783	1.048	3.416	.3877	.4164	.7843	8.7202E-02	100.1
279.000	7.949	.6008	8.900	1.015	3.485	.3817	.4386	1.047	.1164	102.1
280.000	7.906	.5975	9.721	1.010	3.647	.3755	.4611	1.337	.1442	107.1
281.000	8.670	.6552	10.12	1.107	4.204	.3693	.4840	1.800	.1708	112.2
282.000	8.895	.6722	9.840	1.136	4.507	.3629	.5072	2.164	.1961	107.8
283.000	8.360	.6318	9.760	1.068	4.444	.3528	.5317	2.505	.2302	96.47
284.000	8.141	.6153	9.818	1.040	4.534	.3389	.5571	3.035	.2713	92.27
285.000	8.109	.6129	10.25	1.036	4.724	.3251	.5824	3.624	.3082	93.31
286.000	8.243	.6229	10.70	1.053	5.009	.3112	.6077	4.284	.3415	95.98
287.000	8.219	.6211	11.19	1.050	5.201	.2975	.6329	4.865	.3716	95.33
288.000	8.045	.6080	11.07	1.027	5.115	.2987	.6356	4.945	.3806	94.51
289.000	8.111	.6129	10.20	1.036	4.992	.3152	.6157	4.750	.3694	98.52
290.000	8.073	.6101	10.02	1.031	4.808	.3320	.5953	4.497	.3575	101.2
291.000	7.597	.5741	9.913	.9702	4.366	.3493	.5744	4.005	.3449	98.77
292.000	7.199	.5440	9.306	.9194	3.982	.3670	.5529	3.572	.3315	99.21
293.000	7.223	.5458	9.338	.9224	3.855	.3796	.5339	3.250	.3104	104.0
294.000	7.402	.5594	9.354	.9454	3.830	.3869	.5175	2.898	.2811	107.0
295.000	7.444	.5626	9.740	.9508	3.732	.3941	.5013	2.479	.2495	106.8
296.000	7.579	.5727	10.01	.9679	3.677	.4013	.4853	2.082	.2154	108.3
297.000	7.802	.5896	9.369	.9964	3.661	.4083	.4694	1.696	.1784	111.2
298.000	7.967	.6021	8.835	1.017	3.671	.4134	.4607	1.495	.1580	111.2
299.000	8.027	.6066	8.567	1.025	3.685	.4165	.4591	1.479	.1556	108.1
300.000	7.789	.5886	9.374	.9947	3.564	.4197	.4575	1.409	.1532	104.7
301.000	6.997	.5288	11.19	.8936	3.190	.4229	.4559	1.242	.1507	97.62
302.000	6.816	.5151	9.340	.8706	3.096	.4261	.4542	1.185	.1482	103.2
303.000	7.178	.5425	7.366	.9167	3.249	.4293	.4526	1.224	.1457	111.6
304.000	7.078	.5349	8.349	.9040	3.192	.4326	.4509	1.182	.1431	102.0
305.000	6.076	.4592	10.41	.7760	2.802	.4242	.4632	-.1371	-.1204	75.94
306.000	5.034	.3804	10.39	.6429	2.451	.4059	.4872	-.7145	-.1913	53.73
307.000	4.132	.3122	7.333	.5277	2.089	.3906	.5073	0.000	0.000	67.10
308.000	3.711	.2804	5.171	.4739	1.948	.3776	.5243	0.000	0.000	95.37
309.000	4.510	.3408	4.372	.5759	2.342	.3802	.5206	0.000	0.000	101.0
310.000	6.024	.4552	4.140	.7693	2.972	.3984	.4957	0.000	0.000	126.4
311.000	7.553	.5708	4.352	.9646	3.523	.4192	.4674	0.000	0.000	127.6
312.000	7.630	.5766	6.679	.9744	3.325	.4431	.4349	-1.601	-.3960	92.30
313.000	6.529	.4934	8.308	.8338	2.607	.4708	.3971	-2.086	-.4961	87.46
314.000	5.913	.4468	7.091	.7552	2.202	.4859	.3724	-1.027	-.2101	93.90
315.000	6.909	.5222	4.522	.8824	2.510	.4864	.3639	-1.298	-.2300	117.1
316.000	8.147	.6157	4.500	1.041	2.894	.4869	.3554	-1.632	-.2502	129.8

TIME (D)	COAL RT mo/s IRED1 44	ASH RATE mo/s IRED1 46	H20 INFX mo/s IRED1 47	H20 [illegible] mo/s IRED1 48	-H20 RXN mo/s IRED1 49	02 per COAL IRED1 60	H20 per COAL IRED1 61	CHAR RT mo/s IRED1 64	CHAR per COAL IRED1 63	RECOVORY % IRED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
317.000	8.524	.6442	7.401	1.089	2.959	.4873	.3471	-1.816	-.2708	118.2
318.000	8.405	.6352	9.222	1.073	2.849	.4878	.3389	-1.897	-.2917	105.8
319.000	8.296	.6269	8.738	1.060	2.830	.4844	.3411	-1.617	-.2450	103.3
320.000	8.416	.6360	8.317	1.075	2.976	.4769	.3535	-1.012	-.1392	107.0
321.000	8.479	.6408	9.015	1.083	3.104	.4695	.3661	-.3840	-4.902E-02	109.8
322.000	9.091	.6870	10.20	1.161	3.448	.4619	.3788	.3057	2.8722E-02	119.2
323.000	9.726	.7351	10.94	1.242	3.810	.4542	.3917	1.052	9.6462E-02	118.1
324.000	9.300	.7028	10.65	1.188	3.704	.4530	.3983	1.290	.1215	103.2
325.000	8.044	.6079	10.40	1.027	3.206	.4582	.3986	.9818	.1080	95.17
326.000	6.922	.5231	9.061	.8841	2.761	.4635	.3989	.7219	9.4064E-02	95.40
327.000	6.840	.5169	8.134	.8736	2.730	.4688	.3992	.5897	7.9558E-02	111.1
328.000	7.339	.5547	8.435	.9374	2.932	.4741	.3994	.5039	6.4478E-02	117.4
329.000	7.433	.5618	8.461	.9493	2.961	.4792	.3984	.3046	3.8573E-02	100.3
330.000	7.750	.5857	8.948	.9897	3.068	.4839	.3959	-2.184E-03	6.0475E-04	95.47
331.000	8.268	.6249	9.239	1.056	3.254	.4886	.3935	-.3198	-4.063E-02	99.76
332.000	8.384	.6336	9.179	1.071	3.279	.4933	.3911	-.6592	-8.557E-02	99.14
333.000	8.528	.6445	9.365	1.089	3.314	.4980	.3887	-1.010	-.1347	98.91
334.000	8.602	.6501	9.529	1.099	3.322	.5028	.3862	-1.363	-.1888	97.90
335.000	8.281	.6258	8.895	1.058	3.149	.5094	.3800	-1.523	-.2257	94.10
336.000	6.903	.5216	7.415	.8816	2.559	.5180	.3700	-1.345	-.2434	79.77
337.000	5.423	.4098	6.056	.6926	1.954	.5266	.3599	-1.122	-.2617	84.88
338.000	4.973	.3758	5.369	.6352	1.739	.5353	.3497	-1.090	-.2808	99.53
339.000	5.063	.3826	5.392	.6466	1.847	.5226	.3644	-.8152	-.2002	91.70
340.000	5.413	.4091	6.595	.6913	2.190	.4888	.4037	-.1853	-4.299E-02	90.32
341.000	6.136	.4637	7.908	.7836	2.722	.4556	.4422	.5511	7.5684E-02	92.22
342.000	6.863	.5186	8.565	.8765	3.299	.4230	.4800	1.426	.1685	86.78
343.000	7.348	.5553	9.634	.9384	3.803	.3910	.5171	2.390	.2430	85.02
344.000	7.766	.5869	10.52	.9919	4.080	.3814	.5257	2.800	.2651	88.02
345.000	8.211	.6206	9.874	1.049	4.152	.3938	.5060	2.616	.2418	95.73
346.000	8.358	.6317	8.901	1.067	4.064	.4062	.4861	2.317	.2166	102.1
347.000	8.138	.6150	8.947	1.039	3.795	.4188	.4661	1.909	.1896	102.3
348.000	8.073	.6101	8.841	1.031	3.600	.4315	.4460	1.544	.1603	102.5
349.000	8.061	.6092	8.519	1.029	3.542	.4338	.4394	2.041	.1989	104.3
350.000	7.876	.5952	8.624	1.006	3.518	.4255	.4467	3.339	.2957	105.5
351.000	7.610	.5751	9.027	.9719	3.430	.4238	.4507	4.101	.3502	105.1
352.000	7.413	.5602	9.266	.9467	3.291	.4329	.4439	4.185	.3609	103.9
353.000	7.383	.5580	8.907	.9429	3.125	.4480	.4233	4.140	.3593	104.5
354.000	7.361	.5563	8.486	.9401	2.940	.4645	.3993	4.097	.3576	105.9
355.000	7.271	.5495	8.478	.9286	2.858	.4750	.3931	4.028	.3565	106.0
356.000	6.699	.5063	10.27	.8556	2.689	.4803	.4018	3.703	.3559	98.02
357.000	6.478	.4895	10.89	.8273	2.628	.4854	.4057	3.572	.3554	94.59
358.000	6.840	.5169	9.543	.8735	2.678	.4891	.3917	3.765	.3550	101.7
359.000	7.097	.5363	8.502	.9063	2.597	.4945	.3663	3.896	.3544	107.6
360.000	7.041	.5321	8.295	.8993	2.440	.5089	.3462	3.841	.3529	108.2
361.000	6.746	.5098	8.806	.8615	2.236	.5275	.3315	3.648	.3510	108.3
362.000	6.832	.5163	8.887	.8726	2.199	.5375	.3219	3.677	.3499	118.8
363.000	6.703	.5066	8.938	.8561	2.779	.4636	.4185	3.728	.3576	106.5

TIME (D)	COAL RT mo/s !RED1 44	ASH RATE mo/s !RED1 46	H2O INFX mo/s !RED1 47	H2O COAL mo/s !RED1 48	-H2O RXN mo/s !RED1 49	O2 per COAL !RED1 60	H2O per COAL !RED1 61	CHAR RT mo/s !RED1 64	CHAR per COAL !RED1 63	RECOVORY % !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
364.000	6.284	.4749	8.669	.8026	3.400	.3694	.5417	3.648	.3673	93.77
365.000	4.983	.3766	6.703	.6364	2.318	.4500	.4355	2.820	.3589	110.6
366.000	3.720	.2812	4.636	.4751	.8578	.6080	.2281	1.938	.3422	124.0
367.000	3.673	.2776	4.378	.4691	.3941	.6998	.1081	1.826	.3321	123.2
368.000	3.514	.2656	4.080	.4488	.1468	.7519	4.0098E-02	1.703	.3262	110.2
369.000	3.342	.2526	3.814	.4269	1.6387E-02	.7787	5.0651E-03	1.596	.3232	104.3
370.000	3.797	.2869	4.437	.4849	.3286	.7223	7.7953E-02	1.873	.3295	108.0
371.000	4.423	.3342	5.278	.5649	.7055	.6591	.1596	2.245	.3367	111.9
372.000	4.599	.3475	5.463	.5873	.7271	.6598	.1581	2.334	.3366	112.4
373.000	4.287	.3239	5.039	.5475	.5957	.6752	.1378	2.159	.3349	107.2
374.000	3.848	.2908	4.420	.4915	.3278	.7170	8.3553E-02	1.898	.3302	103.2
375.000	3.619	.2735	4.048	.4622	8.8503E-02	.7628	2.4121E-02	1.743	.3250	103.9
376.000	3.468	.2621	3.794	.4429	-7.947E-02	.7994	-2.359E-02	1.638	.3208	105.7
377.000	3.367	.2545	3.680	.4300	-3.969E-02	.7898	-1.180E-02	1.598	.3219	104.8
378.000	3.545	.2679	3.953	.4528	.1897	.7400	5.2047E-02	1.728	.3276	104.9
379.000	3.586	.2710	3.956	.4580	.1312	.7533	3.4810E-02	1.737	.3261	103.2
380.000	3.511	.2653	3.830	.4484	6.8110E-02	.7654	1.8873E-02	1.688	.3247	99.86
381.000	3.855	.2913	4.341	.4924	.4422	.6942	.1102	1.926	.3327	113.2
382.000	4.148	.3135	4.749	.5298	.7062	.6474	.1702	2.118	.3380	127.1
383.000	4.154	.3140	4.730	.5306	.6922	.6499	.1666	2.118	.3377	118.4
384.000	3.654	.2762	4.185	.4667	.7017	.6266	.1964	1.882	.3403	94.28
385.000	3.166	.2393	3.747	.4044	.9227	.5531	.2912	1.692	.3482	80.91
386.000	3.004	.2270	3.599	.3837	1.004	.5204	.3331	1.631	.3517	88.13
387,000	2.436	.1841	2.868	.3111	.7247	.5500	.2945	1.305	.3486	86.24
388.000	2.399	.1813	2.813	.3064	.6744	.5608	.2805	1.277	.3474	102.8
389.000	2.824	.2134	3.392	.3606	.9238	.5260	.3262	1.529	.3511	112.1
390.000	2.850	.2153	3.515	.3639	1.083	.4853	.3802	1.571	.3554	93.32
391.000	3.644	.2754	4.528	.4653	1.375	.4862	.3802	2.006	.3553	122.0
392.000	4.824	.3645	6.037	.6161	1.827	.4886	.3779	2.656	.3551	137.7
393.000	5.458	.4125	6.936	.6971	2.205	.4698	.4032	3.032	.3570	108.9
394.000	5.990	.4527	7.806	.7651	2.750	.4292	.4574	3.389	.3612	91.20
395.000	6.619	.5002	8.984	.8453	3.755	.3495	.5634	3.881	.3693	78.39
396.000	7.066	.5340	9.702	.9024	4.617	.2821	.6532	4.258	.3760	68.76
397.000	7.010	.5297	9.974	.8952	4.808	.2582	.6861	4.266	.3783	68.93
398.000	6.495	.4909	9.273	.8296	4.404	.2662	.6769	3.942	.3776	80.83
399.000	7.161	.5412	10.17	.9146	4.568	.2947	.6404	4.289	.3748	114.6
400.000	8.744	.6608	12.36	1.117	5.266	.3238	.6034	5.175	.3719	134.0
401.000	9.505	.7183	13.64	1.214	6.047	.3008	.6349	5.685	.3741	106.0
402.000	9.429	.7126	13.87	1.204	6.675	.2456	.7086	5.767	.3796	80.89
403.000	9.065	.6850	13.41	1.158	6.445	.2445	.7108	5.549	.3797	82.39
404.000	8.749	.6612	12.86	1.117	5.831	.2794	.6656	5.280	.3763	86.02
405.000	8.466	.6398	12.41	1.081	5.354	.3054	.6324	5.052	.3737	88.64
406.000	9.048	.6838	13.27	1.156	5.537	.3211	.6127	5.362	.3722	97.64
407.000	9.693	.7325	14.19	1.238	5.659	.3437	.5839	5.690	.3699	104.3
408.000	11.04	.8341	16.18	1.410	6.232	.3589	.5648	6.437	.3684	112.9
409.000	12.34	.9329	18.19	1.576	6.962	.3605	.5640	7.195	.3682	114.3
410.000	12.43	.9396	18.51	1.588	7.223	.3489	.5809	7.283	.3694	100.9

TIME (D)	COAL RT mo/s !RED1 44	ASH RATE mo/s !RED1 46	H2O INFX mo/s !RED1 47	H2O COAL mo/s !RED1 48	-H2O RXN mo/s !RED1 49	O2 per COAL !RED1 60	H2O per COAL !RED1 61	CHAR RT mo/s !RED1 64	CHAR per COAL !RED1 63	RECOVORY % !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
411.000	11.81	.8924	17.82	1.508	7.271	.3225	.6169	6.993	.3720	83.67
412.000	10.25	.7746	15.53	1.309	6.255	.3298	.6078	6.058	.3713	79.68
413.000	7.864	.5943	11.88	1.004	4.524	.3554	.5744	4.595	.3687	110.6
414.000	5.094	.3850	7.738	.6506	2.942	.3519	.5799	2.978	.3691	163.1
415.000	3.563	.2693	5.470	.4551	2.133	.3378	.5994	2.097	.3705	468.6
416.000	2.700	.2040	4.181	.3448	1.665	.3240	.6185	1.597	.3719	1304.
417.000	4.447	.3360	6.971	.5679	2.855	.3105	.6372	2.652	.3732	7514.
418.000	8.670	.6552	13.66	1.107	5.700	.2973	.6554	5.195	.3745	7083.
419.000	11.97	.9045	18.61	1.529	7.118	.3379	.6020	7.028	.3705	595.6
420.000	12.76	.9646	19.30	1.630	5.895	.4463	.4581	7.172	.3594	151.9
421.000	12.18	.9204	18.19	1.555	4.927	.4866	.4046	6.712	.3553	112.0
422.000	12.38	.9356	18.62	1.581	5.410	.4622	.4370	6.899	.3578	111.2
423.000	12.50	.9449	18.87	1.597	5.659	.4504	.4526	7.005	.3591	109.9
424.000	12.44	.9405	18.83	1.589	5.784	.4412	.4648	7.000	.3600	108.2
425.000	10.89	.8227	16.43	1.390	4.920	.4527	.4497	6.097	.3588	99.26
426.000	9.075	.6858	13.61	1.159	3.850	.4720	.4240	5.035	.3568	97.49
427.000	8.108	.6127	12.17	1.035	3.459	.4690	.4278	4.502	.3571	95.77
428.000	7.457	.5636	11.27	.9524	3.424	.4455	.4590	4.187	.3596	88.19
429.000	7.605	.5747	11.61	.9712	3.860	.4093	.5072	4.339	.3633	92.33
430.000	7.616	.5756	11.64	.9727	3.904	.4054	.5124	4.353	.3637	89.36
431.000	8.927	.6746	13.55	1.140	4.268	.4304	.4793	5.044	.3611	95.42
432.000	10.94	.8268	16.60	1.397	5.244	.4307	.4789	6.184	.3611	108.6
433.000	10.92	.8254	16.62	1.395	5.352	.4222	.4903	6.196	.3620	94.52
434.000	9.660	.7300	14.73	1.234	4.833	.4143	.5008	5.499	.3628	69.65
435.000	7.309	.5524	11.14	.9335	3.628	.4201	.4930	4.155	.3622	129.2
436.000	3.983	.3010	6.034	.5087	1.872	.4418	.4642	2.245	.3599	227.2
437.000	2.684	.2028	4.033	.3427	1.162	.4642	.4344	1.493	.3576	396.6
438.000	5.082	.3840	7.577	.6490	2.018	.4875	.4036	2.793	.3552	2069.
439.000	7.184	.5429	10.65	.9175	2.670	.5115	.3716	3.914	.3527	1875.
440.000	7.548	.5704	11.15	.9640	2.682	.5237	.3553	4.089	.3514	127.8
441.000	8.322	.6289	12.44	1.063	3.395	.4858	.4055	4.592	.3554	104.2
442.000	8.752	.6614	13.25	1.118	4.086	.4396	.4668	4.927	.3602	101.1
443.000	8.024	.6064	12.17	1.025	3.837	.4311	.4782	4.534	.3611	90.80
444.000	5.713	.4318	8.669	.7296	2.735	.4307	.4788	3.229	.3611	65.43
445.000	3.287	.2484	4.988	.4197	1.575	.4302	.4794	1.858	.3611	51.36
446.000	1.959	.1480	2.973	.2502	.9402	.4298	.4800	1.108	.3612	46.30
447.000	1.241	9.3792E-02	1.884	.1585	.5964	.4293	.4806	.7019	.3612	31.87
448.000	.8393	6.3425E-02	1.274	.1072	.4038	.4289	.4812	.4747	.3613	21.53
449.000	.7222	5.4579E-02	1.097	9.2236E-02	.3480	.4284	.4818	.4086	.3613	18.51
450.000	.6494	4.9078E-02	.9863	8.2940E-02	.3133	.4280	.4824	.3675	.3614	16.63
451.000	.5069	3.8311E-02	.7700	6.4744E-02	.2448	.4275	.4830	.2869	.3614	12.97
452.000	.4015	3.0340E-02	.6099	5.1273E-02	.1941	.4271	.4836	.2273	.3615	10.26
453.000	.3247	2.4537E-02	.4933	4.1467E-02	.1572	.4266	.4842	.1838	.3615	8.293
454.000	.3382	2.5555E-02	.5138	4.3187E-02	.1640	.4262	.4848	.1915	.3616	8.630
455.000	.3393	2.5640E-02	.5156	4.3331E-02	.1647	.4258	.4854	.1922	.3616	8.652
456.000	.3393	2.5640E-02	.5156	4.3331E-02	.1647	.4258	.4854	.1922	.3616	8.652

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UCG DB - HA1 - ENERGY PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/02 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
90.000	379.8	1.271	0.000	2.8564E-02	0.000	0.000	8.9488E-03	-.3117	191.4	1417.
91.000	363.1	1.267	0.000	2.7831E-02	0.000	0.000	8.9488E-03	-.3071	196.5	1470.
92.000	333.0	1.260	0.000	2.6443E-02	0.000	0.000	8.9488E-03	-.2982	206.7	1579.
93.000	354.8	1.253	0.000	2.5199E-02	0.000	0.000	8.9488E-03	-.2903	216.9	1692.
94.000	459.3	1.247	0.000	2.4079E-02	0.000	0.000	8.9488E-03	-.2831	227.0	1810.
95.000	656.8	1.229	0.000	2.3897E-02	0.000	0.000	8.9488E-03	-.2647	226.2	1786.
96.000	653.1	1.197	0.000	2.4616E-02	0.000	0.000	8.9488E-03	-.2339	214.5	1624.
97.000	441.6	1.164	0.000	2.5377E-02	0.000	0.000	8.9488E-03	-.2013	202.7	1474.
98.000	312.3	1.128	0.000	2.6183E-02	0.000	0.000	8.9488E-03	-.1668	190.9	1336.
99.000	258.2	1.091	0.000	2.7037E-02	0.000	0.000	8.9488E-03	-.1301	179.2	1208.
100.000	236.9	1.043	0.000	2.8760E-02	0.000	0.000	8.9488E-03	-8.407E-02	161.2	1043.
101.000	173.0	.9798	0.000	3.1611E-02	0.000	0.000	8.9488E-03	-2.363E-02	137.0	844.4
102.000	105.6	.9014	0.000	3.5146E-02	0.000	0.000	8.9488E-03	5.1297E-02	112.7	663.9
103.000	79.55	.8015	0.000	3.9647E-02	0.000	0.000	8.9488E-03	.1467	88.50	499.0
104.000	68.64	.6699	0.000	4.5572E-02	0.000	0.000	8.9488E-03	.2723	64.26	347.7
105.000	63.82	.6306	0.000	4.7650E-02	0.000	0.000	8.9488E-03	.3095	57.00	303.8
106,000	60.96	.6988	0.000	4.5160E-02	0.000	0.000	8.9488E-03	.2438	66.70	362.2
107.000	65.33	.7601	0.000	4.2923E-02	0.000	0.000	8.9488E-03	.1847	76.41	422.7
108.000	95.53	.8155	0.000	4.0902E-02	0.000	0.000	8.9488E-03	.1314	86.12	485.6
109.000	116.1	.8657	0.000	3.9067E-02	0.000	0.000	8.9488E-03	8.3004E-02	95.83	551.0
110.000	121.1	.8723	0.000	3.9928E-02	0.000	0.000	8.9488E-03	7.5574E-02	94.55	539.6
111.000	118.3	.8339	0.000	4.3759E-02	0.000	0.000	8.9488E-03	.1101	82.29	453.1
112.000	102.9	.7871	0.000	4.8437E-02	0.000	0.000	8.9488E-03	.1523	70.02	372.6
113.000	91.14	.7286	0.000	5.4279E-02	0.000	0.000	8.9488E-03	.2049	57.76	297.3
114.000	89.51	.6535	0.000	6.1783E-02	0.000	0.000	8.9488E-03	.2725	45.50	226.8
115.000	113.1	.6156	0.000	6.6046E-02	0.000	0.000	8.9488E-03	.3061	39.67	194.3
116.000	134.2	.6250	0.000	6.6085E-02	0.000	0.000	8.9488E-03	.2967	40.27	197.5
117.000	139.0	.6344	0.000	6.6124E-02	0.000	0.000	8.9488E-03	.2873	40.86	200.7
118.000	142.0	.6438	0.000	6.6163E-02	0.000	0.000	8.9488E-03	.2778	41.45	203.9
119.000	141.8	.6531	0.000	6.6202E-02	0.000	0.000	8.9488E-03	.2684	42.05	207.1
120.000	141.6	.6625	0.000	6.6241E-02	0.000	0.000	8.9488E-03	.2590	42.64	210.3
121.000	130.5	.6537	0.000	6.8191E-02	0.000	0.000	8.9488E-03	.2659	40.91	200.8
122.000	109.3	.6250	0.000	7.2296E-02	0.000	0.000	8.9488E-03	.2905	36.86	178.9
123.000	96.98	.5925	0.000	7.6939E-02	0.000	0.000	8.9488E-03	.3183	32.81	157.5
124.000	96.24	.5555	0.000	8.2233E-02	0.000	0.000	8.9488E-03	.3501	28.76	136.6
125.000	109.9	.5367	0.000	7.7533E-02	0.000	0.000	8.9488E-03	.3735	29.77	141.9
126.000	134.2	.5383	0.000	6.4802E-02	0.000	0.000	8.9488E-03	.3846	35.84	173.7
127.000	151.1	.5395	0.000	5.5781E-02	0.000	0.000	8.9488E-03	.3924	41.90	206.6

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TIME (D)	COAL kJ /mol IRED1 72	PRODUCT frac IRED1 74	TAR frac IRED1 73	SENS HT frac IRED1 76	STEAM frac IRED1 77	COOLING frac IRED1 80	SEN HT INSU IRED1 78	LOSS frac IRED1 75	HC kJ /mol IRED1 81	HC/02 kJ /mol IRED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
128.000	166.2	.5404	0.000	4.9050E-02	0.000	0.000	8.9488E-03	.3983	47.97	240.7
129.000	182.7	.5411	0.000	4.3832E-02	0.000	0.000	8.9488E-03	.4028	54.03	276.0
130.000	155.5	.5412	0.000	4.1915E-02	0.000	0.000	8.9488E-03	.4046	56.49	290.4
131.000	118.4	.5408	0.000	4.2699E-02	0.000	0.000	8.9488E-03	.4042	55.34	283.4
132.000	111.9	.5405	0.000	4.3517E-02	0.000	0.000	8.9488E-03	.4037	54.20	276.4
133.000	107.8	.5401	0.000	4.4370E-02	0.000	0.000	8.9488E-03	.4032	53.05	269.5
134.000	108.8	.5397	0.000	4.5260E-02	0.000	0.000	8.9488E-03	.4027	51.90	262.6
135.000	113.8	.5456	0.000	4.5128E-02	0.000	0.000	8.9488E-03	.3970	52.62	266.9
136.000	132.6	.5575	0.000	4.3986E-02	0.000	0.000	8.9488E-03	.3863	55.21	282.5
137.000	122.3	.5687	0.000	4.2903E-02	0.000	0.000	8.9488E-03	.3761	57.80	298.4
138.000	95.35	.5794	0.000	4.1874E-02	0.000	0.000	8.9488E-03	.3665	60.38	314.6
139.000	89.28	.5896	0.000	4.0896E-02	0.000	0.000	8.9488E-03	.3573	62.96	331.0
140.000	74.78	.5828	0.000	4.0750E-02	0.000	0.000	8.9488E-03	.3642	62.48	328.3
141.000	68.03	.5589	0.000	4.1422E-02	0.000	0.000	8.9488E-03	.3874	58.95	306.4
142.000	74.51	.5342	0.000	4.2116E-02	0.000	0.000	8.9488E-03	.4114	55.41	285.0
143.000	77.99	.5087	0.000	4.2835E-02	0.000	0.000	8.9488E-03	.4362	51.87	264.0
144.000	76.37	.4822	0.000	4.3579E-02	0.000	0.000	8.9488E-03	.4619	48.33	243.5
145.000	70.88	.4702	0.000	4.6793E-02	0.000	0.000	8.9488E-03	.4707	43.87	219.0
146.000	62.00	.4733	0.000	5.3371E-02	0.000	0.000	8.9488E-03	.4610	38.49	190.5
147.000	57.83	.4776	0.000	6.2273E-02	0.000	0.000	8.9488E-03	.4478	33.10	162.5
148.000	54.35	.4838	0.000	7.5016E-02	0.000	0.000	8.9488E-03	.4289	27.71	135.0
149.000	48.51	.4934	0.000	9.4818E-02	0.000	0.000	8.9488E-03	.3995	22.32	107.9
150.000	58.18	.5104	0.000	.1300	0.000	0.000	8.9488E-03	.3473	16.93	81.15
151.000	72.06	.5502	0.000	.2123	0.000	0.000	8.9488E-03	.2252	11.53	54.85
152.000	156.7	.7909	0.000	.1750	0.000	0.000	8.9488E-03	2.1891E-02	31.28	159.9
153.000	307.3	1.038	0.000	6.2424E-02	0.000	0.000	8.9488E-03	-.1126	76.15	420.0
154.000	449.7	1.088	0.000	3.9822E-02	0.000	0.000	8.9488E-03	-.1396	120.9	736.0
155.000	561.0	1.110	0.000	2.9643E-02	0.000	0.000	8.9488E-03	-.1517	165.7	1128.
156.000	555.1	1.114	0.000	2.5978E-02	0.000	0.000	8.9488E-03	-.1520	188.0	1349.
157.000	499.7	1.106	0.000	2.5832E-02	0.000	0.000	8.9488E-03	-.1441	188.0	1354.
158.000	517.5	1.098	0.000	2.5688E-02	0.000	0.000	8.9488E-03	-.1363	187.9	1358.
159.000	513.7	1.091	0.000	2.5546E-02	0.000	0.000	8.9488E-03	-.1286	187.9	1363.
160.000	477.3	1.083	0.000	2.5405E-02	0.000	0.000	8.9488E-03	-.1210	187.9	1368.
161.000	454.7	1.073	0.000	2.5207E-02	0.000	0.000	8.9488E-03	-.1108	188.1	1370.
162.000	444.3	1.061	0.000	2.4954E-02	0.000	0.000	8.9488E-03	-9.810E-02	188.5	1368.
163.000	553.7	1.049	0.000	2.4708E-02	0.000	0.000	8.9488E-03	-8.577E-02	188.9	1367.
164.000	818.1	1.037	0.000	2.4469E-02	0.000	0.000	8.9488E-03	-7.379E-02	189.3	1365.
165.000	1046.	1.026	0.000	2.4236E-02	0.000	0.000	8.9488E-03	-6.214E-02	189.7	1364.
166.000	1101.	1.005	0.000	2.4225E-02	0.000	0.000	8.9488E-03	-4.133E-02	186.2	1329.
167.000	1085.	.9742	0.000	2.4434E-02	0.000	0.000	8.9488E-03	-1.083E-02	178.6	1263.
168.000	1082.	.9427	0.000	2.4649E-02	0.000	0.000	8.9488E-03	2.0405E-02	171.1	1199.
169.000	1080.	.9105	0.000	2.4868E-02	0.000	0.000	8.9488E-03	5.2403E-02	163.5	1135.
170.000	1062.	.8775	0.000	2.5093E-02	0.000	0.000	8.9488E-03	8.5192E-02	155.8	1072.
171.000	1064.	.8427	0.000	2.5749E-02	0.000	0.000	8.9488E-03	.1193	145.4	981.7
172.000	1057.	.8049	0.000	2.6888E-02	0.000	0.000	8.9488E-03	.1560	132.3	867.4
173.000	1024.	.7631	0.000	2.8143E-02	0.000	0.000	8.9488E-03	.1964	119.2	759.8
174.000	1064.	.7169	0.000	2.9533E-02	0.000	0.000	8.9488E-03	.2413	106.1	658.4

TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/02 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
175.000	945.1	.6654	0.000	3.1081E-02	0.000	0.000	8.9488E-03	.2912	93.08	562.5
176.000	1005.	.6786	0.000	3.0887E-02	0.000	0.000	8.9488E-03	.2782	95.71	584.3
177.000	1010.	.7541	0.000	2.8997E-02	0.000	0.000	8.9488E-03	.2047	114.0	727.7
178.000	739.5	.8199	0.000	2.7348E-02	0.000	0.000	8.9488E-03	.1405	132.2	884.7
179.000	630.8	.8778	0.000	2.5896E-02	0.000	0.000	8.9488E-03	8.4035E-02	150.4	1058.
180.000	582.6	.9292	0.000	2.4608E-02	0.000	0.000	8.9488E-03	3.3956E-02	168.5	1249.
181.000	662.3	.9751	0.000	2.3459E-02	0.000	0.000	8.9488E-03	-1.077E-02	186.7	1461.
182.000	697.7	.9817	0.000	2.3672E-02	0.000	0.000	8.9488E-03	-1.761E-02	186.3	1463.
183.000	608.7	.9489	0.000	2.5319E-02	0.000	0.000	8.9488E-03	1.3509E-02	167.2	1253.
184.000	505.2	.9101	0.000	2.7274E-02	0.000	0.000	8.9488E-03	5.0425E-02	147.8	1058.
185.000	448.4	.8632	0.000	2.9630E-02	0.000	0.000	8.9488E-03	9.4933E-02	128.1	878.2
186.000	420.2	.8100	0.000	3.2019E-02	0.000	0.000	8.9488E-03	.1458	110.6	720.3
187.000	386.6	.7508	0.000	3.4374E-02	0.000	0.000	8.9488E-03	.2025	95.29	586.3
188.000	337.0	.6824	0.000	3.7099E-02	0.000	0.000	8.9488E-03	.2682	80.11	467.2
189.000	282.2	.6024	0.000	4.0285E-02	0.000	0.000	8.9488E-03	.3450	65.04	360.7
190.000	250.9	.5075	0.000	4.4063E-02	0.000	0.000	8.9488E-03	.4361	50.07	264.9
191.000	229.9	.4526	0.000	4.5745E-02	0.000	0.000	8.9488E-03	.4893	42.65	220.1
192.000	212.0	.4461	0.000	4.5008E-02	0.000	0.000	8.9488E-03	.4966	42.72	221.4
193.000	205.0	.4398	0.000	4.4296E-02	0.000	0.000	8.9488E-03	.5036	42.79	222.7
194.000	190.1	.4336	0.000	4.3606E-02	0.000	0.000	8.9488E-03	.5104	42.86	224.1
195.000	200.2	.4277	0.000	4.2939E-02	0.000	0.000	8.9488E-03	.5170	42.93	225.4
196.000	241.3	.4307	0.000	4.2295E-02	0.000	0.000	8.9488E-03	.5146	43.85	231.7
197.000	267.2	.4424	0.000	4.1672E-02	0.000	0.000	8.9488E-03	.5036	45.62	243.0
198.000	279.4	.4538	0.000	4.1065E-02	0.000	0.000	8.9488E-03	.4928	47.39	254.5
199.000	322.1	.4649	0.000	4.0473E-02	0.000	0.000	8.9488E-03	.4823	49.16	266.1
200.000	410.5	.4757	0.000	3.9896E-02	0.000	0.000	8.9488E-03	.4721	50.93	278.0
201.000	465.9	.4890	0.000	3.9456E-02	0.000	0.000	8.9488E-03	.4592	52.90	290.9
202.000	475.4	.5048	0.000	3.9148E-02	0.000	0.000	8.9488E-03	.4437	55.07	304.9
203.000	483.3	.5203	0.000	3.8845E-02	0.000	0.000	8.9488E-03	.4285	57.25	319.1
204.000	488.4	.5356	0.000	3.8547E-02	0.000	0.000	8.9488E-03	.4135	59.42	333.5
205.000	492.1	.5506	0.000	3.8254E-02	0.000	0.000	8.9488E-03	.3988	61.60	348.1
206.000	505.5	.5710	0.000	3.7533E-02	0.000	0.000	8.9488E-03	.3792	65.27	372.4
207.000	530.3	.5959	0.000	3.6418E-02	0.000	0.000	8.9488E-03	.3554	70.43	406.9
208.000	553.4	.6193	0.000	3.5372E-02	0.000	0.000	8.9488E-03	.3330	75.60	442.4
209.000	571.9	.6413	0.000	3.4389E-02	0.000	0.000	8.9488E-03	.3120	80.79	478.8
210.000	582.1	.6620	0.000	3.3463E-02	0.000	0.000	8.9488E-03	.2923	85.99	516.3
211.000	583.5	.6815	0.000	3.2589E-02	0.000	0.000	8.9488E-03	.2736	91.20	554.8
212.000	509.6	.7000	0.000	3.4869E-02	3.2633E-02	0.000	8.9488E-03	.2202	96.41	594.5
213.000	434.6	.7349	0.000	3.6119E-02	5.4950E-02	0.000	8.9488E-03	.1618	104.4	656.7
214.000	430.6	.7851	0.000	3.3740E-02	3.9570E-02	0.000	8.9488E-03	.1294	115.0	742.8
215.000	461.9	.8320	0.000	3.2962E-02	4.0402E-02	0.000	8.9488E-03	8.2372E-02	125.6	833.3
216.000	370.3	.8761	0.000	3.3249E-02	5.1858E-02	0.000	8.9488E-03	2.6599E-02	136.2	928.2
217.000	333.7	.8905	0.000	3.4424E-02	6.4592E-02	0.000	8.9488E-03	-1.714E-03	138.5	948.2
218.000	524.1	.8762	0.000	3.6549E-02	7.9335E-02	0.000	8.9488E-03	-4.361E-03	132.7	891.7
219.000	621.2	.8612	0.000	3.7875E-02	8.5237E-02	0.000	8.9488E-03	3.4463E-03	126.8	837.2
220.000	620.8	.8453	0.000	3.8341E-02	8.1625E-02	0.000	8.9488E-03	2.2512E-02	120.9	784.6
221.000	623.1	.8284	0.000	3.9971E-02	8.9736E-02	0.000	8.9488E-03	2.9656E-02	115.0	733.8

TIME (D)	COAL kJ /mol IRED1 72	PRODUCT frac IRED1 74	TAR frac IRED1 73	SENS HT frac IRED1 76	STEAM frac IRED1 77	COOLING frac IRED1 80	SEN HT INSU IRED1 78	LOSS frac IRED1 75	HC kJ /mol IRED1 81	HC/02 kJ /mol IRED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
222.000	618.8	.7962	0.000	4.2331E-02	.1040	0.000	8.9488E-03	4.5172E-02	107.0	668.8
223.000	620.0	.7475	0.000	4.5192E-02	.1218	0.000	8.9488E-03	7.3195E-02	96.79	590.7
224.000	698.9	.6950	0.000	4.6813E-02	.1256	0.000	8.9488E-03	.1203	86.61	516.2
225.000	777.8	.6381	0.000	4.7715E-02	.1208	0.000	8.9488E-03	.1811	76.42	445.1
226.000	793.8	.5764	0.000	4.8961E-02	.1184	0.000	8.9488E-03	.2440	66.22	377.1
227.000	811.5	.5422	0.000	4.7865E-02	.1078	0.000	8.9488E-03	.2898	62.38	354.4
228.000	835.9	.5385	0.000	4.5663E-02	.1020	0.000	8.9488E-03	.3016	64.91	375.7
229.000	889.3	.5350	0.000	4.3147E-02	9.1338E-02	0.000	8.9488E-03	.3182	67.43	397.9
230.000	914.6	.5319	0.000	4.1401E-02	8.7485E-02	0.000	8.9488E-03	.3269	69.96	420.9
231.000	883.2	.5290	0.000	4.0212E-02	8.8332E-02	0.000	8.9488E-03	.3302	72.49	444.9
232.000	848.4	.5431	0.000	3.9548E-02	8.8541E-02	0.000	8.9488E-03	.3165	76.03	473.3
233.000	752.7	.5741	0.000	4.0058E-02	9.5455E-02	0.000	8.9488E-03	.2780	80.59	505.8
234.000	500.8	.6050	0.000	4.0566E-02	.1023	0.000	8.9488E-03	.2398	85.15	538.8
235.000	275.2	.6356	0.000	4.1071E-02	.1092	0.000	8.9488E-03	.2018	89.70	572.3
236.000	156.6	.6661	0.000	4.2210E-02	.1227	0.000	8.9488E-03	.1567	94.25	606.4
237.000	95.27	.6963	0.000	4.3979E-02	.1428	0.000	8.9488E-03	.1046	98.79	641.0
238.000	102.6	.7264	0.000	4.3117E-02	.1352	0.000	8.9488E-03	8.2961E-02	103.3	676.2
239.000	308.3	.7563	0.000	4.1163E-02	.1162	0.000	8.9488E-03	7.4064E-02	107.9	711.9
240.000	929.2	.7860	0.000	4.0747E-02	.1133	0.000	8.9488E-03	4.7651E-02	112.4	748.2
241.000	1366.	.8155	0.000	4.0335E-02	.1105	0.000	8.9488E-03	2.1403E-02	116.9	785.2
242.000	1273.	.8449	0.000	4.0590E-02	.1146	0.000	8.9488E-03	-1.234E-02	121.5	822.7
243.000	1125.	.8740	0.000	4.1510E-02	.1257	0.000	8.9488E-03	-5.355E-02	126.0	860.9
244.000	1042.	.8576	0.000	4.0420E-02	.1053	0.000	8.9488E-03	-1.562E-02	120.2	807.1
245,000	1012.	.7914	0.000	3.9925E-02	7.9363E-02	0.000	8.9488E-03	7.6987E-02	104.1	667.3
246.000	1061.	.7158	0.000	4.2190E-02	7.9435E-02	0.000	8.9488E-03	.1503	87.96	539.5
247.000	1431.	.6284	0.000	4.5128E-02	8.2924E-02	0.000	8.9488E-03	.2312	71.81	422.3
248.000	1656.	.5918	0.000	4.6244E-02	8.5519E-02	0.000	8.9488E-03	.2641	65.76	381.4
249.000	1153.	.6119	0.000	4.5051E-02	8.3856E-02	0.000	8.9488E-03	.2469	69.82	412.5
250.000	1049.	.6309	0.000	4.3918E-02	8.2277E-02	0.000	8.9488E-03	.2306	73.87	444.8
251.000	1362.	.6490	0.000	4.2842E-02	8.0777E-02	0.000	8.9488E-03	.2151	77.92	478.3
252.000	1346.	.6662	0.000	4.1818E-02	7.9350E-02	0.000	8.9488E-03	.2003	81.97	513.2
253.000	1956.	.6538	0.000	4.1908E-02	7.9895E-02	0.000	8.9488E-03	.2120	80.46	500.4
254.000	2489.	.6113	0.000	4.3116E-02	8.2441E-02	0.000	8.9488E-03	.2508	73.40	441.1
255.000	2473.	.5666	0.000	4.4386E-02	8.5116E-02	0.000	8.9488E-03	.2916	66.33	385.8
256.000	2394.	.5196	0.000	4.8103E-02	.1129	0.000	8.9488E-03	.3070	59.27	333.9
257.000	2213.	.4700	0.000	5.0328E-02	.1245	0.000	8.9488E-03	.3428	52.21	285.2
258.000	2379.	.4660	0.000	4.6349E-02	9.4151E-02	0.000	8.9488E-03	.3811	53.56	296.8
259.000	2864.	.5056	0.000	4.0841E-02	6.8563E-02	0.000	8.9488E-03	.3727	63.33	371.2
260.000	3339.	.5390	0.000	3.6633E-02	5.1670E-02	0.000	8.9488E-03	.3603	73.11	455.0
261.000	2596.	.5677	0.000	3.3999E-02	4.7428E-02	0.000	8.9488E-03	.3385	82.89	549.9
262.000	1284.	.5926	0.000	3.2510E-02	5.2103E-02	0.000	8.9488E-03	.3104	92.69	658.4
263.000	1380.	.6194	0.000	3.2805E-02	5.9248E-02	0.000	8.9488E-03	.2762	98.15	707.5
264.000	1884.	.6509	0.000	3.4861E-02	6.9582E-02	0.000	8.9488E-03	.2323	99.27	690.4
265.000	1978.	.6850	0.000	3.6659E-02	7.6307E-02	0.000	8.9488E-03	.1897	100.4	674.5
266.000	2149.	.7219	0.000	3.7795E-02	7.5065E-02	0.000	8.9488E-03	.1529	101.5	659.7
267.000	2150.	.7621	0.000	3.9292E-02	7.6453E-02	0.000	8.9488E-03	.1099	102.6	645.8
268.000	2053.	.7966	0.000	4.1022E-02	8.6743E-02	0.000	8.9488E-03	6.3401E-02	104.6	656.2
269.000	2084.	.8239	0.000	4.1612E-02	9.2082E-02	0.000	8.9488E-03	3.0187E-02	107.3	691.6

TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/02 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
270.000	2266.	.8516	0.000	4.2373E-02	9.9208E-02	0.000	8.9488E-03	-5.417E-03	110.1	728.8
271.000	2632.	.8797	0.000	4.0850E-02	8.2318E-02	0.000	8.9488E-03	-1.516E-02	112.8	768.2
272.000	2857.	.9084	0.000	3.7507E-02	4.6293E-02	0.000	8.9488E-03	-4.406E-03	115.5	809.9
273.000	2786.	.9374	0.000	3.7009E-02	4.0145E-02	0.000	8.9488E-03	-2.684E-02	118.3	854.0
274.000	2835.	.9469	0.000	3.7665E-02	5.3016E-02	0.000	8.9488E-03	-4.982E-02	121.5	891.9
275.000	3057.	.9369	0.000	3.8028E-02	6.9203E-02	0.000	8.9488E-03	-5.639E-02	125.1	922.3
276.000	3283.	.9277	0.000	3.8120E-02	8.1594E-02	0.000	8.9488E-03	-5.965E-02	128.7	953.0
277.000	3519.	.9191	0.000	3.7106E-02	8.1542E-02	0.000	8.9488E-03	-5.003E-02	132.4	983.8
278.000	3594.	.9202	0.000	4.3669E-02	7.8431E-02	0.000	8.9488E-03	-5.452E-02	134.4	1007.
279.000	3482.	.9306	0.000	5.1644E-02	8.1170E-02	0.000	8.9488E-03	-7.563E-02	134.9	1021.
280.000	3463.	.9411	0.000	5.3435E-02	8.9784E-02	0.000	8.9488E-03	-9.660E-02	135.3	1036.
281.000	3797.	.9519	0.000	5.3043E-02	8.2398E-02	0.000	8.9488E-03	-9.956E-02	135.8	1051.
282.000	3896.	.9628	0.000	5.2416E-02	7.3206E-02	0.000	8.9488E-03	-.1006	136.2	1067.
283.000	3662.	.9756	0.000	5.3362E-02	7.6567E-02	0.000	8.9488E-03	-.1178	137.6	1089.
284.000	3566.	.9902	0.000	5.3898E-02	7.7966E-02	0.000	8.9488E-03	-.1343	139.8	1117.
285.000	3552.	1.005	0.000	5.4689E-02	8.1186E-02	0.000	8.9488E-03	-.1529	142.0	1145.
286.000	3610.	1.019	0.000	5.5157E-02	8.2056E-02	0.000	8.9488E-03	-.1688	144.2	1175.
287.000	3600.	1.034	0.000	5.6050E-02	8.5900E-02	0.000	8.9488E-03	-.1881	146.4	1204.
288.000	3524.	1.031	0.000	5.6808E-02	8.6998E-02	0.000	8.9488E-03	-.1872	145.2	1189.
289.000	3552.	1.011	0.000	5.6284E-02	7.7378E-02	0.000	8.9488E-03	-.1569	140.8	1128.
290.000	3536.	.9904	0.000	5.7219E-02	7.7731E-02	0.000	8.9488E-03	-.1375	136.3	1069.
291.000	3327.	.9692	0.000	5.9328E-02	8.6056E-02	0.000	8.9488E-03	-.1268	131.9	1013.
292,000	3153.	.9475	0.000	6.0391E-02	8.7006E-02	0.000	8.9488E-03	-.1071	127.4	959.5
293.000	3164.	.9319	0.000	6.1210E-02	8.8938E-02	0.000	8.9488E-03	-9.434E-02	124.9	929.1
294.000	3242.	.9228	0.000	6.1152E-02	8.7666E-02	0.000	8.9488E-03	-8.389E-02	124.3	921.2
295.000	3261.	.9138	0.000	6.2198E-02	9.3740E-02	0.000	8.9488E-03	-8.198E-02	123.7	913.2
296.000	3319.	.9049	0.000	6.2771E-02	9.6677E-02	0.000	8.9488E-03	-7.655E-02	123.1	905.4
297.000	3417.	.8960	0.000	6.1332E-02	8.6260E-02	0.000	8.9488E-03	-5.585E-02	122.5	897.6
298.000	3489.	.8906	0.000	6.0387E-02	7.7866E-02	0.000	8.9488E-03	-4.111E-02	121.8	890.0
299.000	3516.	.8886	0.000	6.0299E-02	7.3812E-02	0.000	8.9488E-03	-3.494E-02	121.0	882.6
300.000	3411.	.8865	0.000	6.3043E-02	8.8099E-02	0.000	8.9488E-03	-4.993E-02	120.2	875.2
301.000	3065.	.8845	0.000	7.0045E-02	.1296	0.000	8.9488E-03	-9.641E-02	119.4	867.8
302.000	2986.	.8824	0.000	6.7124E-02	.1074	0.000	8.9488E-03	-6.914E-02	118.6	860.5
303.000	3144.	.8803	0.000	6.1916E-02	7.0364E-02	0.000	8.9488E-03	-2.484E-02	117.8	853.2
304.000	3100.	.8782	0.000	6.4916E-02	8.5932E-02	0.000	8.9488E-03	-4.129E-02	117.0	845.9
305.000	2661.	.8821	0.000	7.2917E-02	.1472	0.000	8.9488E-03	-.1144	123.3	935.7
306.000	2205.	.8911	0.000	7.2906E-02	.1702	0.000	8.9488E-03	-.1465	136.8	1142.
307.000	1810.	.8987	0.000	6.5265E-02	.1412	0.000	8.9488E-03	-.1174	150.2	1396.
308.000	1625.	.9051	0.000	5.6691E-02	.1040	0.000	8.9488E-03	-7.808E-02	163.7	1715.
309.000	1975.	.9020	0.000	4.9308E-02	5.8249E-02	0.000	8.9488E-03	-2.183E-02	164.3	1737.
310.000	2638.	.8890	0.000	4.8161E-02	3.5746E-02	0.000	8.9488E-03	1.4819E-02	152.1	1454.
311.000	3308.	.8742	0.000	4.8993E-02	2.3370E-02	0.000	8.9488E-03	4.1164E-02	139.9	1221.
312.000	3342.	.8572	0.000	5.8027E-02	5.8299E-02	0.000	8.9488E-03	1.4206E-02	127.6	1025.
313.000	2859.	.8374	0.000	6.9109E-02	.1022	0.000	8.9488E-03	-2.102E-02	115.4	858.1
314.000	2590.	.8244	0.000	7.0159E-02	9.6136E-02	0.000	8.9488E-03	-2.998E-03	109.5	780.0
315.000	3026.	.8197	0.000	6.1710E-02	4.5672E-02	0.000	8.9488E-03	6.0664E-02	109.8	777.7
316.000	3568.	.8150	0.000	5.9400E-02	3.1971E-02	0.000	8.9488E-03	8.1343E-02	110.1	775.4

TIME (D)	COAL kJ /mol IRED1 72	PRODUCT frac IRED1 74	TAR frac IRED1 73	SENS HT frac IRED1 76	STEAM frac IRED1 77	COOLING frac IRED1 80	SEN HT INSU IRED1 78	LOSS frac IRED1 75	HC kJ /mol IRED1 81	HC/02 kJ /mol IRED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
317.000	3733.	.8104	0.000	6.4983E-02	6.5006E-02	0.000	8.9487E-03	4.7315E-02	110.4	773.2
318.000	3681.	.8059	0.000	6.9073E-02	8.8963E-02	0.000	8.9488E-03	2.3783E-02	110.7	770.9
319.000	3634.	.8081	0.000	6.8603E-02	8.4303E-02	0.000	8.9488E-03	2.6729E-02	111.1	772.0
320.000	3686.	.8170	0.000	6.7897E-02	7.6449E-02	0.000	8.9488E-03	2.6395E-02	111.7	776.3
321.000	3714.	.8260	0.000	6.9631E-02	8.2743E-02	0.000	8.9488E-03	9.3690E-03	112.3	780.6
322.000	3982.	.8351	0.000	7.1081E-02	8.7316E-02	0.000	8.9488E-03	-5.756E-03	112.8	784.9
323.000	4260.	.8443	0.000	7.1577E-02	8.6355E-02	0.000	8.9488E-03	-1.450E-02	113.4	789.2
324.000	4073.	.8456	0.000	7.2487E-02	8.7868E-02	0.000	8.9488E-03	-1.825E-02	113.1	785.9
325.000	3523.	.8390	0.000	7.5942E-02	.1039	0.000	8.9488E-03	-3.107E-02	111.8	774.8
326.000	3032.	.8323	0.000	7.6506E-02	.1035	0.000	8.9488E-03	-2.461E-02	110.5	763.9
327.000	2996.	.8256	0.000	7.5095E-02	9.2000E-02	0.000	8.9488E-03	-4.971E-03	109.2	753.0
328.000	3215.	.8188	0.000	7.5050E-02	8.8233E-02	0.000	8.9488E-03	5.6030E-03	108.0	742.1
329.000	3256.	.8140	0.000	7.5378E-02	8.7133E-02	0.000	8.9488E-03	1.1226E-02	107.1	735.8
330.000	3394.	.8111	0.000	7.6141E-02	8.9089E-02	0.000	8.9488E-03	1.1429E-02	106.5	734.0
331.000	3622.	.8081	0.000	7.5885E-02	8.5424E-02	0.000	8.9488E-03	1.8282E-02	105.9	732.2
332.000	3672.	.8052	0.000	7.5927E-02	8.3414E-02	0.000	8.9488E-03	2.3193E-02	105.4	730.3
333.000	3735.	.8022	0.000	7.6440E-02	8.3975E-02	0.000	8.9488E-03	2.5070E-02	104.8	728.5
334.000	3768.	.7993	0.000	7.7074E-02	8.5185E-02	0.000	8.9488E-03	2.6189E-02	104.3	726.6
335.000	3627.	.7924	0.000	7.7098E-02	8.2304E-02	0.000	8.9488E-03	3.5946E-02	103.0	715.6
336.000	3023.	.7815	0.000	7.8135E-02	8.4018E-02	0.000	8.9488E-03	4.4083E-02	101.1	695.7
337.000	2375.	.7705	0.000	7.9738E-02	8.8717E-02	0.000	8.9488E-03	4.8779E-02	99.24	676.2
338.000	2178.	.7594	0.000	7.9957E-02	8.6006E-02	0.000	8.9488E-03	6.2383E-02	97.33	657.0
339.000	2217.	.7744	0.000	7.9570E-02	8.3046E-02	0.000	8.9488E-03	5.0661E-02	99.51	677.4
340.000	2371.	.8154	0.000	8.1262E-02	9.3904E-02	0.000	8.9488E-03	-2.806E-03	105.8	738.6
341.000	2688.	.8555	0.000	8.1690E-02	9.8087E-02	0.000	8.9488E-03	-4.757E-02	112.0	803.1
342.000	3006.	.8949	0.000	7.9750E-02	8.9850E-02	0.000	8.9488E-03	-7.680E-02	118.3	871.2
343.000	3218.	.9336	0.000	7.9867E-02	9.2276E-02	0.000	8.9488E-03	-.1180	124.5	943.1
344.000	3402.	.9453	0.000	8.0723E-02	9.6051E-02	0.000	8.9488E-03	-.1343	126.4	964.7
345.000	3597.	.9303	0.000	7.8785E-02	8.3079E-02	0.000	8.9488E-03	-.1044	124.0	934.5
346.000	3661.	.9152	0.000	7.6988E-02	7.0868E-02	0.000	8.9488E-03	-7.529E-02	121.5	905.1
347.000	3565.	.8999	0.000	7.8667E-02	7.6397E-02	0.000	8.9488E-03	-6.725E-02	119.1	876.3
348.000	3536.	.8846	0.000	7.9568E-02	7.7958E-02	0.000	8.9488E-03	-5.434E-02	116.6	848.1
349.000	3531.	.8817	0.000	7.9956E-02	7.4748E-02	0.000	8.9488E-03	-4.866E-02	114.9	826.3
350.000	3449.	.8916	0.000	8.2059E-02	7.7885E-02	0.000	8.9488E-03	-6.380E-02	114.0	810.6
351.000	3333.	.8935	0.000	8.5264E-02	8.6698E-02	0.000	8.9488E-03	-7.772E-02	112.3	790.2
352.000	3247.	.8825	0.000	8.7929E-02	9.3663E-02	0.000	8.9488E-03	-7.636E-02	109.5	761.5
353.000	3234.	.8641	0.000	8.8657E-02	9.1363E-02	0.000	8.9488E-03	-5.638E-02	106.0	724.9
354.000	3224.	.8439	0.000	8.9292E-02	8.8384E-02	0.000	8.9488E-03	-3.388E-02	102.3	686.9
355.000	3184.	.8312	0.000	9.0850E-02	9.0357E-02	0.000	8.9488E-03	-2.468E-02	99.73	663.8
356.000	2934.	.8248	0.000	9.9937E-02	.1293	0.000	8.9488E-03	-6.632E-02	98.16	652.6
357.000	2837.	.8188	0.000	.1035	.1418	0.000	8.9488E-03	-7.636E-02	96.79	642.2
358.000	2996.	.8141	0.000	9.8054E-02	.1135	0.000	8.9488E-03	-3.795E-02	96.20	634.3
359.000	3108.	.8075	0.000	9.4798E-02	9.6636E-02	0.000	8.9488E-03	-1.119E-02	95.52	623.5
360.000	3084.	.7899	0.000	9.6012E-02	9.6681E-02	0.000	8.9488E-03	5.1384E-03	92.49	595.6
361.000	2955.	.7674	0.000	.1006	.1105	0.000	8.9488E-03	9.2508E-03	88.41	561.1
362.000	2992.	.7551	0.000	.1018	.1110	0.000	8.9488E-03	1.9778E-02	86.29	543.2
363.000	2936.	.8452	0.000	9.6689E-02	.1047	0.000	8.9488E-03	-5.883E-02	103.0	712.4

TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/02 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
364.000	2753.	.9598	0.000	9.0071E-02	9.6867E-02	0.000	8.9488E-03	-.1590	124.8	944.0
365.000	2182.	.8617	0.000	9.6328E-02	.1028	0.000	8.9488E-03	-7.314E-02	106.8	763.5
366.000	1630.	.6693	0.000	.1084	.1148	0.000	8.9488E-03	9.5195E-02	73.26	440.1
367.000	1609.	.5576	0.000	.1156	.1216	0.000	8.9488E-03	.1929	57.20	320.4
368.000	1539.	.4942	0.000	.1198	.1252	0.000	8.9488E-03	.2485	48.99	265.7
369.000	1464.	.4616	0.000	.1222	.1268	0.000	8.9488E-03	.2771	44.98	240.2
370.000	1663.	.5302	0.000	.1184	.1219	0.000	8.9488E-03	.2172	53.92	300.1
371.000	1937.	.6071	0.000	.1139	.1165	0.000	8.9488E-03	.1501	63.85	366.1
372.000	2014.	.6063	0.000	.1143	.1161	0.000	8.9488E-03	.1509	63.74	365.2
373.000	1878.	.5876	0.000	.1159	.1168	0.000	8.9488E-03	.1674	61.18	347.2
374.000	1685.	.5366	0.000	.1194	.1196	0.000	8.9488E-03	.2120	54.43	301.4
375.000	1585.	.4809	0.000	.1233	.1226	0.000	8.9488E-03	.2608	47.37	255.2
376.000	1519.	.4364	0.000	.1265	.1249	0.000	8.9488E-03	.2999	42.03	222.1
377.000	1475.	.4481	0.000	.1262	.1236	0.000	8.9488E-03	.2898	43.45	230.9
378.000	1553.	.5087	0.000	.1227	.1194	0.000	8.9488E-03	.2370	50.85	277.5
379.000	1571.	.4925	0.000	.1241	.1199	0.000	8.9488E-03	.2512	48.90	265.4
380.000	1538.	.4778	0.000	.1254	.1203	0.000	8.9488E-03	.2642	47.02	253.0
381.000	1689.	.5643	0.000	.1202	.1145	0.000	8.9488E-03	.1886	58.29	328.3
382.000	1817.	.6213	0.000	.1169	.1106	0.000	8.9488E-03	.1389	65.93	380.6
383.000	1820.	.6183	0.000	.1174	.1103	0.000	8.9488E-03	.1417	65.50	377.4
384.000	1601.	.6467	0.000	.1159	.1081	0.000	8.9488E-03	.1170	69.68	408.7
385.000	1387.	.7361	0.000	.1105	.1023	0.000	8.9488E-03	3.8855E-02	83.73	522.7
386.000	1316.	.7759	0.000	.1082	9.9479E-02	0.000	8.9488E-03	4.1642E-03	90.06	574.4
387.000	1067.	.7399	0.000	.1108	.1012	0.000	8.9488E-03	3.5736E-02	84.07	522.4
388.000	1051.	.7268	0.000	.1122	.1022	0.000	8.9488E-03	4.6498E-02	81.92	504.3
389.000	1237.	.7691	0.000	.1101	.1005	0.000	8.9488E-03	8.0237E-03	89.01	566.5
390.000	1248.	.8187	0.000	.1074	9.8420E-02	0.000	8.9488E-03	-3.680E-02	97.47	642.4
391.000	1596.	.8176	0.000	.1082	9.9340E-02	0.000	8.9488E-03	-3.741E-02	97.26	640.7
392.000	2113.	.8147	0.000	.1090	.1004	0.000	8.9488E-03	-3.633E-02	96.70	635.6
393.000	2391.	.8376	0.000	.1081	9.9785E-02	0.000	8.9488E-03	-5.777E-02	100.8	675.7
394.000	2624.	.8870	0.000	.1054	9.7544E-02	0.000	8.9488E-03	-.1022	110.2	774.7
395.000	2899.	.9841	0.000	9.9489E-02	9.2252E-02	0.000	8.9488E-03	-.1881	130.8	1030.
396.000	3095.	1.066	0.000	9.4524E-02	8.7836E-02	0.000	8.9488E-03	-.2607	149.4	1294.
397.000	3070.	1.095	0.000	9.3133E-02	8.6731E-02	0.000	8.9488E-03	-.2873	156.6	1416.
398.000	2845.	1.085	0.000	9.4371E-02	8.8084E-02	0.000	8.9488E-03	-.2802	154.1	1375.
399.000	3137.	1.051	0.000	9.7323E-02	9.1050E-02	0.000	8.9488E-03	-.2514	145.4	1232.
400.000	3830.	1.015	0.000	.1004	9.4115E-02	0.000	8.9488E-03	-.2221	137.0	1108.
401.000	4163.	1.043	0.000	9.9016E-02	9.3023E-02	0.000	8.9488E-03	-.2476	143.8	1219.
402.000	4130.	1.111	0.000	9.4892E-02	8.9308E-02	0.000	8.9488E-03	-.3070	160.4	1494.
403.000	3970.	1.112	0.000	9.5356E-02	8.9929E-02	0.000	8.9488E-03	-.3094	160.7	1500.
404.000	3832.	1.069	0.000	9.8921E-02	9.3496E-02	0.000	8.9488E-03	-.2741	149.8	1308.
405.000	3708.	1.038	0.000	.1018	9.6371E-02	0.000	8.9488E-03	-.2481	142.0	1182.
406.000	3963.	1.019	0.000	.1037	9.8423E-02	0.000	8.9488E-03	-.2330	137.5	1117.
407.000	4245.	.9912	0.000	.1063	.1011	0.000	8.9488E-03	-.2108	131.3	1032.
408.000	4834.	.9727	0.000	.1082	.1031	0.000	8.9488E-03	-.1963	127.1	976.6
409.000	5407.	.9707	0.000	.1090	.1040	0.000	8.9488E-03	-.1960	126.7	971.1
410.000	5446.	.9849	0.000	.1086	.1038	0.000	8.9488E-03	-.2096	129.7	1012.

TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/O2 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
411.000	5172.	1.017	0.000	.1069	.1024	0.000	8.9488E-03	-.2385	136.9	1113.
412.000	4490.	1.008	0.000	.1082	.1037	0.000	8.9488E-03	-.2322	134.9	1086.
413.000	3444.	.9769	0.000	.1111	.1067	0.000	8.9488E-03	-.2069	127.9	988.6
414.000	2231.	.9812	0.000	.1114	.1072	0.000	8.9488E-03	-.2120	128.8	1001.
415.000	1561.	.9984	0.000	.1107	.1067	0.000	8.9488E-03	-.2281	132.5	1052.
416.000	1183.	1.015	0.000	.1101	.1062	0.000	8.9488E-03	-.2437	136.3	1105.
417.000	1948.	1.032	0.000	.1094	.1058	0.000	8.9488E-03	-.2591	140.0	1161.
418.000	3798.	1.048	0.000	.1087	.1050	0.000	8.9488E-03	-.2736	143.8	1219.
419.000	5243.	.9983	0.000	.1129	.1087	0.000	8.9488E-03	-.2321	132.9	1071.
420.000	5590.	.8663	0.000	.1234	.1184	0.000	8.9488E-03	-.1203	106.1	745.4
421.000	5334.	.8173	0.000	.1275	.1220	0.000	8.9488E-03	-7.906E-02	96.58	641.2
422.000	5422.	.8470	0.000	.1257	.1198	0.000	8.9488E-03	-.1048	101.9	692.1
423.000	5477.	.8613	0.000	.1250	.1188	0.000	8.9488E-03	-.1174	104.5	719.4
424.000	5451.	.8725	0.000	.1246	.1179	0.000	8.9488E-03	-.1273	106.6	740.9
425.000	4768.	.8586	0.000	.1261	.1190	0.000	8.9488E-03	-.1159	104.0	714.4
426.000	3975.	.8350	0.000	.1284	.1207	0.000	8.9488E-03	-9.635E-02	99.69	670.6
427.000	3551.	.8386	0.000	.1285	.1204	0.000	8.9488E-03	-9.986E-02	100.4	677.3
428.000	3266.	.8672	0.000	.1267	.1183	0.000	8.9488E-03	-.1245	105.6	731.3
429.000	3331.	.9114	0.000	.1237	.1151	0.000	8.9488E-03	-.1624	114.2	826.1
430.000	3336.	.9161	0.000	.1237	.1147	0.000	8.9488E-03	-.1668	115.1	835.9
431.000	3910.	.8857	0.000	.1266	.1170	0.000	8.9488E-03	-.1415	109.1	767.9
432.000	4792.	.8853	0.000	.1270	.1170	0.000	8.9488E-03	-.1416	109.0	767.1
433.000	4784.	.8957	0.000	.1266	.1162	0.000	8.9488E-03	-.1508	111.0	788.9
434.000	4231.	.9053	0.000	.1263	.1155	0.000	8.9488E-03	-.1594	112.9	809.7
435.000	3201.	.8982	0.000	.1273	.1161	0.000	8.9488E-03	-.1538	111.6	794.7
436.000	1745.	.8718	0.000	.1298	.1180	0.000	8.9488E-03	-.1319	106.5	740.0
437.000	1175.	.8445	0.000	.1324	.1200	0.000	8.9488E-03	-.1092	101.4	688.0
438.000	2226.	.8162	0.000	.1352	.1221	0.000	8.9488E-03	-8.575E-02	96.34	638.3
439.000	3147.	.7869	0.000	.1380	.1243	0.000	8.9488E-03	-6.147E-02	91.28	591.0
440.000	3306.	.7720	0.000	.1396	.1254	0.000	8.9488E-03	-4.932E-02	88.74	567.8
441.000	3645.	.8182	0.000	.1363	.1220	0.000	8.9488E-03	-8.877E-02	96.92	646.4
442.000	3833.	.8745	0.000	.1322	.1178	0.000	8.9488E-03	-.1367	107.0	745.2
443.000	3515.	.8848	0.000	.1318	.1170	0.000	8.9488E-03	-.1459	108.9	765.9
444.000	2502.	.8854	0.000	.1321	.1170	0.000	8.9488E-03	-.1468	109.1	767.0
445.000	1440.	.8859	0.000	.1325	.1170	0.000	8.9488E-03	-.1476	109.2	768.1
446.000	858.0	.8865	0.000	.1329	.1169	0.000	8.9488E-03	-.1485	109.3	769.3
447.000	543.6	.8870	0.000	.1333	.1169	0.000	8.9488E-03	-.1494	109.4	770.4
448.000	367.6	.8875	0.000	.1337	.1168	0.000	8.9488E-03	-.1503	109.5	771.5
449.000	316.3	.8881	0.000	.1341	.1168	0.000	8.9488E-03	-.1512	109.6	772.7
450.000	284.4	.8886	0.000	.1344	.1168	0.000	8.9488E-03	-.1521	109.7	773.8
451.000	222.0	.8892	0.000	.1348	.1167	0.000	8.9488E-03	-.1530	109.8	774.9
452.000	175.8	.8897	0.000	.1352	.1167	0.000	8.9488E-03	-.1539	109.9	776.1
453.000	142.2	.8903	0.000	.1356	.1166	0.000	8.9488E-03	-.1547	110.0	777.2
454.000	148.1	.8908	0.000	.1360	.1166	0.000	8.9488E-03	-.1556	110.1	778.3
455.000	148.6	.8913	0.000	.1364	.1166	0.000	8.9488E-03	-.1565	110.2	779.5
456.000	148.6	.8913	0.000	.1364	.1166	0.000	8.9488E-03	-.1565	110.2	779.5

UNDERGROUND COAL GASIFICATION

DATA BASE

LARIMIE ENERGY TECHNOLOGY CENTER

HANNA II PHASE IA

DAILY AVERAGE RESULTS

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  HANNA II COAL ANALYSIS
                                                                    KG/M**3   KJ/MOLE
COAL H/C  COAL O/C  COAL S/C  COAL N/C  WT F H2O  WT F ASH  DENSITY   HT COMB
.965      0.192      0.006    0.022     .0862     .2892     1363.     476.

CHAR H/C  CHAR O/C  CHAR S/C  CHAR N/C
.1018     0.0003    0.        0.

 TAR H/C   TAR O/C   TAR S/C   TAR N/C      C/MOLECULE
 1.00      0.        0.        0.            9.

  COAL      ASH&CHAR  --  TEMPERATURES (K)
   300.      1000.

  1   NUMBER OF POINTS ON OXYGEN TRACER TYPE CURVE
999.     2   TIME,TRACER FLAG (ZERO=NONE,ONE=ARGON,TWO=NITROGEN)

  1   NUMBER OF POINTS ON GAS LOSS TRACER TYPE CURVE
 999.   2  TIME,TRACER FLAG (SAME AS OXYGEN TRACER)

 1   NUMBER OF POINTS ON CHAR FLAG CURVE
999.      0   TIME,TRACER FLAG   (0=DO NOT USE CHAR, 1=USE CHAR)
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UCG DB - HA2.1A - OPERATING PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	INJ RATE mo/s !RED1 90	PRD RATE mo/s !RED1 91	INJ TEMP c !RED1 94	PRD TEMP c !RED1 95	INJ PRES kPa !RED1 96	PRD PRES kPa !RED1 97	STEAM mo/s !RED1 92	COOLING mo/s !RED1 93	INJ O2 frac !RED1 6	INJ H2O frac !RED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
145.000	1.151	3.2276E-02	8.206	12.34	1941.	1941.	0.000	0.000	.2100	0.000
146.000	1.059	.6001	11.74	13.42	1930.	1930.	0.000	0.000	.2100	0.000
147.000	1.141	1.197	13.27	15.90	1920.	1920.	0.000	0.000	.2100	0.000
148.000	1.279	1.836	3.542	11.44	1867.	1867.	0.000	0.000	.2100	0.000
149.000	1.336	2.093	10.66	30.24	1839.	1839.	0.000	0.000	.2100	0.000
150.000	1.432	2.196	10.72	36.24	1813.	1813.	0.000	0.000	.2100	0.000
151.000	1.487	2.385	11.36	39.91	1801.	1801.	0.000	0.000	.2100	0.000
152.000	1.546	2.530	14.06	45.26	1795.	1795.	0.000	0.000	.2100	0.000
153.000	1.592	2.594	17.49	45.17	1792.	1792.	0.000	0.000	.2100	0.000
154.000	1.721	3.261	15.56	51.98	1754.	1754.	0.000	0.000	.2100	0.000
155.000	11.10	20.12	16.13	98.34	1020.	1020.	0.000	0.000	.2100	0.000
156.000	19.10	35.63	20.29	199.3	432.6	432.6	0.000	0.000	.2100	0.000
157.000	19.03	34.52	22.15	233.4	324.0	324.0	0.000	0.000	.2100	0.000
158.000	19.01	34.61	18.53	240.3	304.4	304.4	0.000	0.000	.2100	0.000
159.000	19.24	35.00	15.81	231.1	294.5	294.5	0.000	0.000	.2100	0.000
160.000	20.32	36.15	13.24	251.4	298.2	298.2	0.000	0.000	.2100	0.000
161.000	22.70	38.55	14.37	262.8	314.8	314.8	0.000	0.000	.2100	0.000
162.000	23.09	40.34	16.64	252.9	314.0	314.0	0.000	0.000	.2100	0.000
163.000	22.79	39.14	24.38	263.7	309.7	309.7	0.000	0.000	.2100	0.000
164.000	22.40	38.44	22.42	248.2	300.9	300.9	0.000	0.000	.2100	0.000
165.000	22.56	38.74	20.15	263.8	299.9	299.9	0.000	0.000	.2100	0.000
166.000	22.72	38.55	21.21	234.4	292.5	292.5	0.000	0.000	.2100	0.000
167.000	22.51	39.13	18.09	233.3	287.1	287.1	0.000	0.000	.2100	0.000
168.000	22.37	38.85	12.95	242.7	286.7	286.7	0.000	0.000	.2100	0.000
169.000	22.77	40.50	14.09	238.7	291.5	291.5	0.000	0.000	.2100	0.000
170.000	22.44	39.60	16.48	237.9	281.1	281.1	0.000	0.000	.2100	0.000
171.000	22.85	39.98	18.08	244.2	284.6	284.6	0.000	0.000	.2100	0.000
172.000	23.49	40.68	16.07	241.4	285.9	285.9	0.000	0.000	.2100	0.000
173.000	23.85	41.42	20.19	257.0	293.9	293.9	0.000	0.000	.2100	0.000
174.000	26.26	37.41	23.01	275.6	277.6	277.6	0.000	0.000	.2100	0.000
175.000	30.47	39.96	26.53	282.4	279.1	279.1	0.000	0.000	.2100	0.000
176.000	28.60	40.32	20.72	271.8	262.7	262.7	0.000	0.000	.2100	0.000
177.000	27.74	42.06	18.99	271.7	266.0	266.0	0.000	0.000	.2100	0.000
178.000	28.74	39.61	24.37	280.6	251.5	251.5	0.000	0.000	.2100	0.000
179.000	30.98	37.98	27.20	292.1	248.5	248.5	0.000	0.000	.2100	0.000
180.000	28.97	35.08	27.11	282.1	230.6	230.6	0.000	0.000	.2100	0.000
181.000	28.71	31.88	28.08	280.2	208.9	208.9	0.000	0.000	.2100	0.000
182.000	28.61	31.31	29.65	281.4	208.4	208.4	0.000	0.000	.2100	0.000

TIME (D)	INJ RATE kg/s IRED1 90	PRD RATE kg/s IRED1 91	INJ TEMP C IRED1 94	PRD TEMP C IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM kg/s IRED1 92	COOLING kg/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
183.000	29.79	32.83	28.03	288.4	224.2	224.2	0.000	0.000	.2100	0.000
184.000	33.92	39.84	30.33	304.5	254.7	254.7	0.000	0.000	.2100	0.000
185.000	33.30	37.45	30.88	303.0	242.2	242.2	0.000	0.000	.2100	0.000
186.000	32.80	36.18	27.36	307.2	242.3	242.3	0.000	0.000	.2100	0.000
187.000	31.94	35.42	26.39	304.2	240.9	240.9	0.000	0.000	.2100	0.000
188.000	31.92	35.41	26.20	304.2	240.9	240.9	0.000	0.000	.2100	0.000
189.000	32.07	35.49	28.74	306.2	240.9	240.9	0.000	0.000	.2100	0.000
190.000	32.23	36.97	30.34	311.4	241.8	241.8	0.000	0.000	.2100	0.000
191.000	31.82	36.85	31.26	307.1	236.6	236.6	0.000	0.000	.2100	0.000
192.000	32.79	32.13	28.27	293.1	234.8	234.8	0.000	0.000	.2100	0.000
193.000	32.79	32.13	28.27	293.1	234.8	234.8	0.000	0.000	.2100	0.000

UCG DB - HA2.1A - PRODUCT GAS ANALYSIS 1

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	ARGON molf !RED1 10	NITROGEN molf !RED1 11	OXYGEN molf !RED1 12	HYDROGEN molf !RED1 13	METHANE molf !RED1 14	CO molf !RED1 15	CO2 molf !RED1 16	ETHANE molf !RED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
145.000	0.000	.4998	0.000	.1891	4.5090E-02	.1232	.1428	0.000
146.000	0.000	.4998	0.000	.1891	4.5090E-02	.1232	.1428	0.000
147.000	0.000	.4998	0.000	.1891	4.5090E-02	.1232	.1428	0.000
148.000	0.000	.4998	0.000	.1891	4.5090E-02	.1232	.1428	0.000
149.000	0.000	.4998	0.000	.1891	4.5090E-02	.1232	.1428	0.000
150.000	0.000	.4998	0.000	.1891	4.5090E-02	.1232	.1428	0.000
151.000	0.000	.4998	0.000	.1891	4.5090E-02	.1232	.1428	0.000
152.000	0.000	.4998	0.000	.1891	4.5090E-02	.1232	.1428	0.000
153.000	0.000	.4998	0.000	.1891	4.5090E-02	.1232	.1428	0.000
154.000	0.000	.4998	0.000	.1891	4.5088E-02	.1233	.1428	0.000
155.000	0.000	.4759	0.000	.2059	4.2274E-02	.1520	.1239	0.000
156.000	0.000	.4579	0.000	.2215	4.0519E-02	.1688	.1113	0.000
157.000	0.000	.4709	0.000	.2158	4.1024E-02	.1639	.1084	0.000
158.000	0.000	.4856	0.000	.1968	4.1176E-02	.1661	.1104	0.000
159.000	0.000	.4965	0.000	.1848	4.2601E-02	.1600	.1160	0.000
160.000	0.000	.4914	0.000	.1852	4.3428E-02	.1572	.1227	0.000
161.000	0.000	.4825	0.000	.1969	4.1278E-02	.1608	.1186	0.000
162.000	0.000	.4892	0.000	.1987	3.9710E-02	.1570	.1153	0.000
163.000	0.000	.4933	0.000	.1836	3.9029E-02	.1681	.1159	0.000
164.000	0.000	.4962	0.000	.1833	3.8030E-02	.1686	.1139	0.000
165.000	0.000	.5042	0.000	.1822	3.7726E-02	.1623	.1136	0.000
166.000	0.000	.5171	0.000	.1779	3.6902E-02	.1562	.1118	0.000
167.000	0.000	.5199	0.000	.1729	3.7907E-02	.1513	.1180	0.000
168.000	0.000	.5113	0.000	.1707	3.9918E-02	.1469	.1313	0.000
169.000	0.000	.5067	0.000	.1737	4.1818E-02	.1400	.1378	0.000
170.000	0.000	.5073	0.000	.1805	4.3759E-02	.1402	.1283	0.000
171.000	0.000	.5063	0.000	.1832	4.3285E-02	.1456	.1216	0.000
172.000	0.000	.5040	0.000	.1836	4.3540E-02	.1492	.1197	0.000
173.000	0.000	.5041	0.000	.1830	4.3015E-02	.1496	.1203	0.000
174.000	0.000	.5077	0.000	.1826	3.9736E-02	.1490	.1210	0.000
175.000	0.000	.5120	0.000	.1818	3.6677E-02	.1488	.1208	0.000
176.000	0.000	.5174	0.000	.1767	3.4785E-02	.1501	.1211	0.000
177.000	0.000	.5203	0.000	.1705	3.2725E-02	.1531	.1235	0.000
178.000	0.000	.5239	0.000	.1639	2.9622E-02	.1528	.1298	0.000
179.000	0.000	.5238	0.000	.1668	2.5717E-02	.1557	.1279	0.000
180.000	0.000	.5125	0.000	.1790	2.4686E-02	.1691	.1148	0.000
181.000	0.000	.5328	0.000	.1593	2.2692E-02	.1641	.1211	0.000
182.000	0.000	.5523	0.000	.1569	2.0313E-02	.1508	.1197	0.000

TIME (D)	ARGON molf IRED1 10	NITROGEN molf IRED1 11	OXYGEN molf IRED1 12	HYDROGEN molf IRED1 13	METHANE molf IRED1 14	CO molf IRED1 15	CO2 molf IRED1 16	ETHANE molf IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
183.000	0.000	.5477	0.000	.1655	1.9933E-02	.1517	.1152	0.000
184.000	0.000	.5469	0.000	.1618	2.1238E-02	.1481	.1220	0.000
185.000	0.000	.5432	0.000	.1577	2.1233E-02	.1446	.1332	0.000
186.000	0.000	.5476	0.000	.1567	2.0245E-02	.1356	.1399	0.000
187.000	0.000	.5558	0.000	.1544	2.0092E-02	.1262	.1434	0.000
188.000	0.000	.5555	0.000	.1516	2.1097E-02	.1232	.1486	0.000
189.000	0.000	.5510	0.000	.1500	2.1051E-02	.1312	.1467	0.000
190.000	0.000	.5627	0.000	.1484	2.1218E-02	.1304	.1373	0.000
191.000	5.9282E-05	.5601	0.000	.1474	2.2576E-02	.1346	.1353	0.000
192.000	2.3713E-03	.4627	0.000	.2012	4.0771E-02	.1632	.1298	0.000
193.000	2.3713E-03	.4627	0.000	.2012	4.0771E-02	.1632	.1298	0.000

UCG DB - HA2.1A - PRODUCT GAS ANALYSIS 2

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	C2H4 molf !RED1 17	C6 molf !RED1 19	H10 molf !RED1 20	H2S molf !RED1 21	TAR/DRY !RED1 24	H2O/DRY !RED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
145.000	0.000	0.000	0.000	0.000	0.000	0.000
146.000	0.000	0.000	0.000	0.000	0.000	0.000
147.000	0.000	0.000	0.000	0.000	0.000	0.000
148.000	0.000	0.000	0.000	0.000	0.000	0.000
149.000	0.000	0.000	0.000	0.000	0.000	0.000
150.000	0.000	0.000	0.000	0.000	0.000	0.000
151.000	0.000	0.000	0.000	0.000	0.000	0.000
152.000	0.000	0.000	0.000	0.000	0.000	0.000
153.000	0.000	0.000	0.000	0.000	0.000	0.000
154.000	0.000	0.000	0.000	0.000	0.000	0.000
155.000	0.000	0.000	0.000	0.000	5.7972E-04	.1932
156.000	0.000	0.000	0.000	0.000	9.0000E-04	.3000
157.000	0.000	0.000	0.000	0.000	9.0000E-04	.3000
158.000	0.000	0.000	0.000	0.000	9.0000E-04	.3000
159.000	0.000	0.000	0.000	0.000	9.0000E-04	.3000
160.000	0.000	0.000	0.000	0.000	9.0000E-04	.3000
161.000	0.000	0.000	0.000	0.000	9.0000E-04	.3000
162.000	0.000	0.000	0.000	0.000	9.0000E-04	.3000
163.000	0.000	0.000	0.000	0.000	9.0000E-04	.3000
164.000	0.000	0.000	0.000	0.000	9.0000E-04	.3000
165.000	0.000	0.000	0.000	0.000	9.0000E-04	.3000
166.000	0.000	0.000	0.000	0.000	9.0000E-04	.3000
167.000	0.000	0.000	0.000	0.000	9.0000E-04	.3000
168.000	0.000	0.000	0.000	0.000	9.0000E-04	.3000
169.000	0.000	0.000	0.000	0.000	9.0000E-04	.3000
170.000	0.000	0.000	0.000	0.000	9.0000E-04	.3000
171.000	0.000	0.000	0.000	0.000	9.0000E-04	.3000
172.000	0.000	0.000	0.000	0.000	9.0000E-04	.3000
173.000	0.000	0.000	0.000	0.000	9.1375E-04	.2975
174.000	0.000	0.000	0.000	0.000	1.9588E-03	.1075
175.000	0.000	0.000	0.000	0.000	2.0000E-03	.1000
176.000	0.000	0.000	0.000	0.000	2.0000E-03	.1000
177.000	0.000	0.000	0.000	0.000	2.0000E-03	.1000
178.000	0.000	0.000	0.000	0.000	2.0000E-03	.1000
179.000	0.000	0.000	0.000	0.000	2.0000E-03	.1000
180.000	0.000	0.000	0.000	0.000	2.0000E-03	.1000
181.000	0.000	0.000	0.000	0.000	2.0000E-03	.1000
182.000	0.000	0.000	0.000	0.000	2.0000E-03	.1000

1

TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2S molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
183.000	0.000	0.000	0.000	0.000	2.0000E-03	.1000
184.000	0.000	0.000	0.000	0.000	2.0000E-03	.1000
185.000	0.000	0.000	0.000	0.000	2.0000E-03	.1000
186.000	0.000	0.000	0.000	0.000	2.0000E-03	.1000
187.000	0.000	0.000	0.000	0.000	2.0000E-03	.1000
188.000	0.000	0.000	0.000	0.000	2.0000E-03	.1000
189.000	0.000	0.000	0.000	0.000	2.0000E-03	.1000
190.000	0.000	0.000	0.000	0.000	2.0000E-03	.1000
191.000	0.000	0.000	0.000	0.000	2.0000E-03	.1000
192.000	0.000	0.000	0.000	0.000	1.9875E-03	.1003
193.000	0.000	0.000	0.000	0.000	1.9875E-03	.1003

UCG DB - HA2.1A - MATERIAL BALANCES

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL RT mo/s !RED1 44	ASH RATE mo/s !RED1 46	H2O INFX mo/s !RED1 47	H2O COAL mo/s !RED1 48	-H2O RXN mo/s !RED1 49	O2 per COAL !RED1 60	H2O per COAL !RED1 61	CHAR RT mo/s !RED1 64	CHAR per COAL !RED1 63	RECOVORY % !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
145.000	1.0042E-02	1.0117E-03	2.8949E-03	1.2732E-03	4.1681E-03	.3535	.4151	6.6167E-03	.3972	1.664
146.000	.1867	1.8811E-02	5.3827E-02	2.3674E-02	7.7501E-02	.3535	.4151	.1230	.3972	39.48
147.000	.3724	3.7519E-02	.1074	4.7217E-02	.1546	.3535	.4151	.2454	.3972	67.70
148.000	.5712	5.7551E-02	.1647	7.2427E-02	.2371	.3535	.4151	.3764	.3972	92.26
149.000	.6512	6.5607E-02	.1877	8.2565E-02	.2703	.3535	.4151	.4291	.3972	100.4
150.000	.6833	6.8843E-02	.1970	8.6638E-02	.2836	.3535	.4151	.4502	.3972	98.35
151.000	.7421	7.4769E-02	.2139	9.4097E-02	.3080	.3535	.4151	.4890	.3972	102.8
152.000	.7872	7.9312E-02	.2269	9.9813E-02	.3268	.3535	.4151	.5187	.3972	104.9
153.000	.8071	8.1310E-02	.2327	.1023	.3350	.3535	.4151	.5318	.3972	104.5
154.000	1.014	.1022	.2925	.1286	.4211	.3534	.4151	.6686	.3972	120.2
155.000	5.231	.5270	5.647	.6632	2.220	.3107	.4237	3.751	.4170	99.17
156.000	9.001	.9068	11.13	1.141	4.053	.2742	.4502	7.582	.4557	84.18
157.000	8.528	.8592	10.77	1.081	3.895	.2678	.4568	9.005	.5135	84.22
158.000	8.663	.8728	10.24	1.098	3.356	.3043	.3870	7.026	.4463	87.11
159.000	8.789	.8854	10.09	1.114	3.133	.3257	.3564	6.116	.4100	89.03
160.000	9.212	.9281	10.40	1.168	3.228	.3361	.3505	4.825	.3418	86.44
161.000	9.732	.9805	11.36	1.234	3.709	.3191	.3802	6.240	.3825	80.68
162.000	9.930	1.000	12.00	1.259	3.959	.3099	.3991	8.381	.4558	84.24
163.000	9.964	1.004	10.95	1.263	3.190	.3478	.3200	4.429	.3073	83.51
164.000	9.709	.9782	10.73	1.231	3.097	.3475	.3190	4.775	.3294	83.90
165.000	9.582	.9654	10.89	1.215	3.170	.3439	.3309	6.226	.3934	85.35
166.000	9.278	.9348	10.82	1.176	3.102	.3436	.3344	7.826	.4573	86.48
167.000	9.484	.9555	10.85	1.203	3.029	.3584	.3194	6.763	.4148	89.05
168.000	9.746	.9819	10.63	1.236	2.904	.3827	.2979	3.160	.2450	87.67
169.000	10.20	1.028	11.26	1.294	3.212	.3806	.3150	3.021	.2262	88.83
170.000	9.751	.9824	11.47	1.236	3.576	.3397	.3669	7.022	.4153	88.24
171.000	9.792	.9865	11.67	1.242	3.689	.3257	.3769	8.323	.4596	87.27
172.000	10.02	1.010	11.86	1.271	3.753	.3229	.3746	8.385	.4555	86.01
173.000	10.24	1.032	11.96	1.299	3.772	.3274	.3682	8.129	.4420	86.47
174.000	11.04	1.112	6.034	1.399	3.809	.3287	.3451	8.184	.4258	86.44
175.000	11.76	1.185	6.039	1.491	3.903	.3401	.3319	8.333	.4147	78.17
176.000	11.85	1.194	5.777	1.503	3.621	.3567	.3054	7.245	.3785	85.08
177.000	12.49	1.259	5.553	1.584	3.319	.3822	.2658	4.756	.2734	92.21
178.000	11.87	1.196	4.713	1.505	2.624	.4181	.2206	.9389	6.6506E-02	85.11
179.000	11.28	1.137	4.404	1.431	2.388	.4268	.2117	.3811	3.2426E-02	75.52
180.000	10.40	1.048	4.399	1.319	2.535	.3922	.2443	2.562	.1967	72.62
181.000	9.429	.9500	3.330	1.196	1.632	.4408	.1732	-5.644E-02	-4.519E-02	68.92
182.000	8.776	.8842	3.356	1.113	1.628	.4423	.1869	2.798	.2163	70.30

1

TIME (D)	COAL RT mo/s !RED1 44	ASH RATE mo/s !RED1 46	H2O INFX mo/s !RED1 47	H2O COAL mo/s !RED1 48	-H2O RXN mo/s !RED1 49	O2 per COAL !RED1 60	H2O per COAL !RED1 61	CHAR RT mo/s !RED1 64	CHAR per COAL !RED1 63	RECOVORY % !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
183.000	9.090	.9158	3.826	1.152	1.999	.4204	.2207	4.721	.3426	70.23
184.000	11.18	1.127	4.511	1.418	2.314	.4344	.2068	3.882	.2567	74.76
185.000	10.77	1.085	3.944	1.366	1.912	.4634	.1774	-.1824	-3.430E-02	71.08
186.000	10.30	1.038	3.777	1.306	1.800	.4787	.1748	-.7588	-8.246E-02	70.29
187.000	9.893	.9967	3.732	1.254	1.772	.4856	.1791	4.5520E-02	4.0162E-03	71.70
188.000	9.990	1.006	3.644	1.267	1.697	.4951	.1699	-1.176	-.1348	71.69
189.000	10.21	1.028	3.476	1.294	1.550	.4979	.1519	-2.543	-.3355	71.01
190.000	10.29	1.037	3.786	1.305	1.736	.4794	.1687	1.247	7.8865E-02	75.26
191.000	10.38	1.046	3.758	1.316	1.731	.4737	.1662	1.073	8.4708E-02	75.50
192.000	10.25	1.033	5.177	1.300	3.557	.3316	.3471	1.940	.1590	52.64
193.000	10.25	1.033	5.177	1.300	3.557	.3316	.3471	1.940	.1590	52.64

UCG DB - HA2.1A - ENERGY PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/02 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
145.000	4.780	.2179	0.000	-8.105E-05	0.000	0.000	2.7444E-03	2.8539E-02	129.1	239.8
146.000	88.88	.8715	0.000	-8.832E-04	0.000	0.000	1.0978E-02	.1147	129.1	959.2
147.000	177.3	.8715	0.000	-5.650E-04	0.000	0.000	1.0978E-02	.1144	129.1	959.2
148.000	271.9	.8715	0.000	-2.662E-04	0.000	0.000	1.0978E-02	.1141	129.1	959.2
149.000	310.0	.8715	0.000	2.7043E-03	0.000	0.000	1.0978E-02	.1111	129.1	959.2
150.000	325.3	.8715	0.000	3.9330E-03	0.000	0.000	1.0978E-02	.1099	129.1	959.2
151.000	353.3	.8715	0.000	4.6094E-03	0.000	0.000	1.0978E-02	.1092	129.1	959.2
152.000	374.7	.8715	0.000	5.3799E-03	0.000	0.000	1.0978E-02	.1085	129.1	959.2
153.000	384.2	.8715	0.000	4.9318E-03	0.000	0.000	1.0978E-02	.1089	129.1	959.2
154.000	482.9	.8716	0.000	6.5849E-03	0.000	0.000	1.0978E-02	.1072	129.1	959.3
155.000	2490.	.9060	1.7861E-02	1.9413E-02	5.4350E-02	0.000	1.0978E-02	-1.230E-02	139.5	1090.
156.000	4284.	.9405	2.7682E-02	4.6369E-02	8.4248E-02	0.000	1.0978E-02	-.1135	147.1	1193.
157.000	4059.	.9451	2.8306E-02	5.6697E-02	8.6148E-02	0.000	1.0978E-02	-.1309	144.6	1141.
158.000	4124.	.9024	2.7933E-02	5.8326E-02	8.5011E-02	0.000	1.0978E-02	-8.835E-02	139.9	1070.
159.000	4183.	.8748	2.7846E-02	5.6082E-02	8.4748E-02	0.000	1.0978E-02	-5.813E-02	136.1	1018.
160.000	4385.	.8626	2.7449E-02	6.1225E-02	8.3539E-02	0.000	1.0978E-02	-4.944E-02	136.1	1029.
161.000	4633.	.8856	2.7683E-02	6.4652E-02	8.4252E-02	0.000	1.0978E-02	-7.680E-02	138.5	1067.
162.000	4726.	.8964	2.8419E-02	6.3173E-02	8.6491E-02	0.000	1.0978E-02	-8.910E-02	136.6	1037.
163.000	4743.	.8553	2.7475E-02	6.3206E-02	8.3617E-02	0.000	1.0978E-02	-4.430E-02	134.8	1015.
164.000	4622.	.8565	2.7687E-02	5.9559E-02	8.4263E-02	0.000	1.0978E-02	-4.265E-02	134.0	1003.
165.000	4561.	.8592	2.8281E-02	6.5521E-02	8.6071E-02	0.000	1.0978E-02	-5.376E-02	131.6	969.4
166.000	4416.	.8583	2.9060E-02	5.8628E-02	8.8441E-02	0.000	1.0978E-02	-4.914E-02	127.9	918.9
167.000	4515.	.8397	2.8857E-02	5.8432E-02	8.7825E-02	0.000	1.0978E-02	-2.945E-02	126.0	900.3
168.000	4639.	.8108	2.7896E-02	5.9978E-02	8.4898E-02	0.000	1.0978E-02	1.7621E-03	125.9	914.6
169.000	4857.	.8109	2.7761E-02	5.8566E-02	8.4489E-02	0.000	1.0978E-02	3.6359E-03	126.5	927.2
170.000	4641.	.8542	2.8403E-02	5.9258E-02	8.6443E-02	0.000	1.0978E-02	-4.296E-02	130.2	953.6
171.000	4661.	.8711	2.8556E-02	6.1071E-02	8.6908E-02	0.000	1.0978E-02	-6.230E-02	132.1	969.2
172.000	4771.	.8747	2.8385E-02	6.0119E-02	8.6387E-02	0.000	1.0978E-02	-6.422E-02	133.4	983.5
173.000	4877.	.8697	2.8760E-02	6.3791E-02	8.5515E-02	0.000	1.0978E-02	-6.246E-02	132.9	979.6
174.000	5253.	.8326	6.0486E-02	5.7202E-02	3.0329E-02	0.000	1.0978E-02	4.7036E-03	129.7	949.1
175.000	5598.	.8208	6.2348E-02	5.8432E-02	2.8462E-02	0.000	1.0978E-02	1.5255E-02	126.7	919.3
176.000	5642.	.8038	6.2409E-02	5.6678E-02	2.8490E-02	0.000	1.0978E-02	3.3960E-02	123.9	889.9
177.000	5947.	.7779	6.1778E-02	5.6301E-02	2.8202E-02	0.000	1.0978E-02	6.1187E-02	121.2	865.1
178.000	5649.	.7410	6.1229E-02	5.7275E-02	2.7952E-02	0.000	1.0978E-02	9.7826E-02	116.5	825.8
179.000	5371.	.7358	6.1761E-02	5.9980E-02	2.8195E-02	0.000	1.0978E-02	9.9612E-02	114.6	813.0
180.000	4950.	.7784	6.1913E-02	5.7508E-02	2.8264E-02	0.000	1.0978E-02	5.9227E-02	121.0	877.0
181.000	4488.	.7230	6.2039E-02	5.7139E-02	2.8321E-02	0.000	1.0978E-02	.1148	112.2	783.3
182.000	4178.	.7188	6.5497E-02	6.0261E-02	2.9900E-02	0.000	1.0978E-02	.1108	105.6	710.2

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TIME (D)	COAL kJ /mol IRED1 72	PRODUCT frac IRED1 74	TAR frac IRED1 73	SENS ...I frac IRED1 76	STEAM frac IRED1 77	COOLING frac IRED1 80	SEN HT INSU IRED1 78	LOSS frac IRED1 75	HC kJ /mol IRED1 81	HC/02 kJ /mol IRED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
183.000	4327.	.7441	6.6330E-02	6.2964E-02	3.0280E-02	0.000	1.0978E-02	8.1589E-02	108.0	732.2
184.000	5323.	.7270	6.5357E-02	6.5883E-02	2.9836E-02	0.000	1.0978E-02	9.7199E-02	107.1	727.1
185.000	5128.	.6953	6.3772E-02	6.4138E-02	2.9113E-02	0.000	1.0978E-02	.1330	104.9	717.5
186.000	4904.	.6775	6.4456E-02	6.6437E-02	2.9425E-02	0.000	1.0978E-02	.1474	101.2	686.5
187.000	4709.	.6673	6.5690E-02	6.7173E-02	2.9988E-02	0.000	1.0978E-02	.1552	97.76	653.3
188.000	4755.	.6554	6.5031E-02	6.6681E-02	2.9687E-02	0.000	1.0978E-02	.1685	97.00	648.6
189.000	4859.	.6544	6.3788E-02	6.5534E-02	2.9120E-02	0.000	1.0978E-02	.1725	98.74	665.5
190.000	4898.	.6722	6.5905E-02	6.8527E-02	3.0086E-02	0.000	1.0978E-02	.1486	98.19	648.3
191.000	4942.	.6783	6.5160E-02	6.6561E-02	2.9746E-02	0.000	1.0978E-02	.1456	100.3	667.4
192.000	4880.	.8364	5.7137E-02	5.6317E-02	2.6333E-02	0.000	1.0978E-02	9.1405E-03	140.0	1124.
193.000	4880.	.8364	5.7137E-02	5.6317E-02	2.6333E-02	0.000	1.0978E-02	9.1405E-03	140.0	1124.

UNDERGROUND COAL GASIFICATION

DATA BASE

LARIMIE ENERGY TECHNOLOGY CENTER

HANNA II PHASE IB

DAILY AVERAGE RESULTS

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  HANNA II COAL ANALYSIS

                                                                    KG/M**3   KJ/MOLE
COAL H/C  COAL O/C  COAL S/C  COAL N/C  WT F H2O  WT F ASH  DENSITY   HT COMB
.965      0.192      0.006    0.022     .0862     .2892      1363.     476.

CHAR H/C  CHAR O/C  CHAR S/C  CHAR N/C
.1018     0.0003    0.        0.

 TAR H/C   TAR O/C   TAR S/C   TAR N/C      C/MOLECULE
 1.00      0.        0.        0.            9.

  COAL      ASH&CHAR  --  TEMPERATURES (K)
   300.      1000.

  1   NUMBER OF POINTS ON OXYGEN TRACER TYPE CURVE
999.     2   TIME,TRACER FLAG (ZERO=NONE,ONE=ARGON,TWO=NITROGEN)

  1   NUMBER OF POINTS ON GAS LOSS TRACER TYPE CURVE
 999.   2  TIME,TRACER FLAG (SAME AS OXYGEN TRACER)

 1   NUMBER OF POINTS ON CHAR FLAG CURVE
999.      0   TIME,TRACER FLAG   (0=DO NOT USE CHAR, 1=USE CHAR)
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UCG DB - HA2.1B - OPERATING PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	INJ RATE mo/s IRED1 90	PRD RATE mo/s IRED1 91	INJ TEMP c IRED1 94	PRD TEMP c IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM mo/s IRED1 92	COOLING mo/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
203.000	17.81	39.86	40.00	304.9	637.2	637.2	0.000	0.000	.2100	0.000
204.000	19.79	44.87	40.00	304.9	502.2	502.2	0.000	0.000	.2100	0.000
205.000	18.43	43.40	40.00	304.9	303.5	303.5	0.000	0.000	.2100	0.000
206.000	13.59	32.59	40.00	304.9	223.3	223.3	0.000	0.000	.2100	0.000
207.000	12.07	28.13	40.00	304.9	206.2	206.2	0.000	0.000	.2100	0.000
208.000	12.04	27.93	40.00	304.9	204.9	204.9	0.000	0.000	.2100	0.000
209.000	12.00	27.81	40.00	304.9	203.7	203.7	0.000	0.000	.2100	0.000
210.000	15.77	36.47	40.00	304.9	234.9	234.9	0.000	0.000	.2100	0.000
211.000	15.44	37.84	40.00	304.9	240.7	240.7	0.000	0.000	.2100	0.000
212.000	8.995	23.17	40.00	304.9	194.7	194.7	0.000	0.000	.2100	0.000
213.000	6.677	15.80	40.00	304.9	173.5	173.5	0.000	0.000	.2100	0.000
214.000	6.484	14.98	40.00	304.9	169.3	169.3	0.000	0.000	.2100	0.000
215.000	5.532	12.81	40.00	304.9	153.7	153.7	0.000	0.000	.2100	0.000
216.000	4.797	11.39	40.00	304.9	142.8	142.8	0.000	0.000	.2100	0.000
217.000	4.822	11.32	40.00	304.9	146.2	146.2	0.000	0.000	.2100	0.000
218.000	5.143	11.74	40.00	304.9	150.9	150.9	0.000	0.000	.2100	0.000
219.000	6.999	13.28	40.00	304.9	169.3	169.3	0.000	0.000	.2100	0.000
220.000	8.557	15.41	40.00	304.9	184.1	184.1	0.000	0.000	.2100	0.000
221.000	8.581	17.48	40.00	304.9	182.7	182.7	0.000	0.000	.2100	0.000
222.000	8.575	18.56	40.00	304.9	181.4	181.4	0.000	0.000	.2100	0.000
223.000	8.535	18.45	40.00	304.9	174.8	174.8	0.000	0.000	.2100	0.000
224.000	8.493	18.28	40.00	304.9	166.8	166.8	0.000	0.000	.2100	0.000
225.000	9.847	25.73	40.00	304.9	170.5	170.5	0.000	0.000	.2100	0.000
226.000	15.67	38.97	40.00	304.9	213.4	213.4	0.000	0.000	.2100	0.000
227.000	18.53	40.70	40.00	304.9	247.9	247.9	0.000	0.000	.2100	0.000
228.000	12.62	27.92	40.00	304.9	206.7	206.7	0.000	0.000	.2100	0.000
229.000	8.345	19.21	40.00	304.9	168.5	168.5	0.000	0.000	.2100	0.000
230.000	8.430	19.24	40.00	304.9	169.3	169.3	0.000	0.000	.2100	0.000
231.000	8.515	19.27	40.00	304.9	170.1	170.1	0.000	0.000	.2100	0.000
232.000	11.36	25.47	40.00	304.9	183.1	183.1	0.000	0.000	.2100	0.000
233.000	17.57	40.01	40.00	304.9	226.0	226.0	0.000	0.000	.2100	0.000
234.000	21.13	48.42	40.00	304.9	256.7	256.7	0.000	0.000	.2100	0.000
235.000	19.60	44.79	40.00	304.9	242.0	242.0	0.000	0.000	.2100	0.000
236.000	18.31	42.09	40.00	304.9	228.6	228.6	0.000	0.000	.2100	0.000
237.000	19.78	44.13	40.00	304.9	232.4	232.4	0.000	0.000	.2100	0.000
238.000	20.70	44.80	40.00	304.9	234.9	234.9	0.000	0.000	.2100	0.000
239.000	20.30	44.11	40.00	304.9	235.7	235.7	0.000	0.000	.2100	0.000
240.000	14.04	31.73	40.00	304.9	236.4	236.4	0.000	0.000	.2100	0.000

	TIME (D)	INJ RATE mo/s	PRD RATE mo/s	INJ TEMP c	PRD TEMP c	INJ PRES kPa	PRD PRES kPa	STEAM mo/s	COOLING mo/s	INJ O2 frac	INJ H2O frac
		!RED1 90	!RED1 91	!RED1 94	!RED1 95	!RED1 96	!RED1 97	!RED1 92	!RED1 93	!RED1 6	!RED1 7
	* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	241.000	14.04	31.73	40.00	304.9	236.4	236.4	0.000	0.000	.2100	0.000

UCG DB - HA2.1B - PRODUCT GAS ANALYSIS 1

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	ARGON molf !RED1 10	NITROGEN molf !RED1 11	OXYGEN molf !RED1 12	HYDROGEN molf !RED1 13	METHANE molf !RED1 14	CO molf !RED1 15	CO2 molf !RED1 16	ETHANE molf !RED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
203.000	4.8717E-03	.3800	1.2735E-08	.2508	5.7337E-02	.1825	.1246	0.000
204.000	5.3547E-03	.4177	7.3930E-09	.2275	5.2508E-02	.1692	.1277	0.000
205.000	5.9139E-03	.4613	1.0256E-09	.2007	4.6912E-02	.1539	.1314	0.000
206.000	6.0164E-03	.4693	0.000	.1958	4.5871E-02	.1509	.1322	0.000
207.000	6.0822E-03	.4744	0.000	.1927	4.5194E-02	.1488	.1328	0.000
208.000	6.1611E-03	.4806	0.000	.1890	4.4386E-02	.1464	.1334	0.000
209.000	6.1060E-03	.4763	5.2875E-09	.1917	4.4936E-02	.1479	.1331	0.000
210.000	5.8363E-03	.4552	7.6602E-09	.2046	4.7646E-02	.1555	.1312	0.000
211.000	5.8971E-03	.4600	8.9824E-09	.2016	4.7057E-02	.1540	.1315	0.000
212.000	6.2134E-03	.4846	7.8164E-09	.1863	4.3905E-02	.1455	.1334	0.000
213.000	6.3657E-03	.4965	1.2067E-09	.1791	4.2362E-02	.1411	.1346	0.000
214.000	6.5616E-03	.5118	0.000	.1699	4.0353E-02	.1351	.1363	0.000
215.000	6.7862E-03	.5293	2.3028E-09	.1594	3.8049E-02	.1282	.1383	0.000
216.000	6.8978E-03	.5380	4.3596E-09	.1541	3.6906E-02	.1248	.1392	0.000
217.000	6.9320E-03	.5407	2.0569E-09	.1526	3.6550E-02	.1237	.1396	0.000
218.000	6.8821E-03	.5368	0.000	.1549	3.7066E-02	.1253	.1391	0.000
219.000	6.7005E-03	.5226	0.000	.1633	3.8946E-02	.1311	.1374	0.000
220,000	6.5807E-03	.5133	0.000	.1689	4.0173E-02	.1347	.1363	0.000
221.000	6.5273E-03	.5091	0.000	.1716	4.0693E-02	.1360	.1361	0.000
222.000	6.4549E-03	.5035	0.000	.1751	4.1413E-02	.1379	.1357	0.000
223.000	6.4749E-03	.5050	0.000	.1741	4.1223E-02	.1375	.1357	0.000
224.000	6.5075E-03	.5076	0.000	.1724	4.0908E-02	.1367	.1358	0.000
225.000	6.4436E-03	.5026	0.000	.1755	4.1549E-02	.1385	.1354	0.000
226.000	6.2054E-03	.4840	0.000	.1870	4.3932E-02	.1451	.1338	0.000
227.000	5.9408E-03	.4634	0.000	.1996	4.6602E-02	.1526	.1319	0.000
228.000	6.1366E-03	.4787	0.000	.1901	4.4661E-02	.1475	.1330	0.000
229.000	6.4331E-03	.5018	0.000	.1758	4.1689E-02	.1392	.1350	0.000
230.000	6.4120E-03	.5001	0.000	.1768	4.1902E-02	.1398	.1349	0.000
231.000	6.3444E-03	.4949	0.000	.1801	4.2576E-02	.1417	.1344	0.000
232.000	6.3346E-03	.4941	0.000	.1807	4.2650E-02	.1416	.1346	0.000
233.000	6.4308E-03	.5016	0.000	.1762	4.1665E-02	.1387	.1354	0.000
234.000	6.6987E-03	.5225	0.000	.1634	3.8961E-02	.1311	.1374	0.000
235.000	6.9495E-03	.5421	0.000	.1515	3.6416E-02	.1237	.1393	0.000
236.000	7.0253E-03	.5480	0.000	.1480	3.5632E-02	.1213	.1400	0.000
237.000	7.0043E-03	.5463	0.000	.1490	3.5834E-02	.1218	.1400	0.000
238.000	6.9516E-03	.5422	0.000	.1516	3.6359E-02	.1232	.1396	0.000
239.000	6.8988E-03	.5381	0.000	.1541	3.6885E-02	.1246	.1393	0.000
240.000	6.8528E-03	.5345	0.000	.1564	3.7343E-02	.1259	.1390	0.000

TIME (D)	ARGON molf IRED1 10	NITROGEN molf IRED1 11	OXYGEN molf IRED1 12	HYDROGEN molf IRED1 13	METHANE molf IRED1 14	CO molf IRED1 15	CO2 molf IRED1 16	ETHANE molf IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
241.000	6.8528E-03	.5345	0.000	.1564	3.7343E-02	.1259	.1390	0.000

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UCG DB - HA2.1B - PRODUCT GAS ANALYSIS 2

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2S molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
203.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
204.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
205.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
206.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
207.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
208.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
209.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
210.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
211.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
212.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
213.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
214.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
215.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
216.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
217.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
218.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
219.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
220,000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
221.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
222.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
223.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
224.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
225.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
226.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
227.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
228.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
229.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
230.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
231.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
232.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
233.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
234.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
235.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
236.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
237.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
238.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
239.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250
240.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250

TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2S molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
241.000	0.000	0.000	0.000	0.000	1.0000E-03	.1250

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UCG DB - HA2.1B - MATERIAL BALANCES

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL RT mo/s !RED1 44	ASH RATE mo/s !RED1 46	H2O INFX mo/s !RED1 47	H2O COAL mo/s !RED1 48	-H2O RXN mo/s !RED1 49	O2 per COAL !RED1 60	H2O per COAL !RED1 61	CHAR RT mo/s !RED1 64	CHAR per COAL !RED1 63	RECOVORY % !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
203.000	13.22	1.332	9.470	1.676	6.720	.2277	.5085	5.101	.2785	96.86
204.000	14.22	1.432	9.605	1.803	6.426	.2691	.4557	5.495	.2787	107.8
205.000	13.16	1.326	8.353	1.669	5.203	.3177	.3939	5.095	.2790	124.5
206.000	9.784	.9858	6.118	1.241	3.740	.3275	.3818	3.788	.2791	127.8
207.000	8.387	.8450	5.197	1.063	3.138	.3340	.3741	3.248	.2792	125.8
208.000	8.265	.8327	5.066	1.048	3.014	.3418	.3646	3.202	.2792	126.9
209.000	8.274	.8336	5.113	1.049	3.074	.3365	.3715	3.204	.2792	125.7
210.000	11.16	1.125	7.200	1.415	4.566	.3108	.4038	4.319	.2790	119.9
211.000	11.53	1.161	7.373	1.461	4.633	.3166	.3958	4.460	.2790	131.4
212.000	6.845	.6897	4.171	.8679	2.467	.3468	.3571	2.652	.2792	139.8
213.000	4.590	.4624	2.724	.5820	1.551	.3623	.3379	1.779	.2793	133.8
214.000	4.271	.4303	2.462	.5415	1.340	.3833	.3127	1.657	.2795	134.5
215.000	3.572	.3599	1.986	.4529	1.016	.4081	.2828	1.387	.2796	140.2
216.000	3.135	.3159	1.706	.3975	.8388	.4208	.2675	1.218	.2797	145.5
217.000	3.106	.3129	1.680	.3938	.8164	.4248	.2628	1.206	.2798	144.6
218.000	3.236	.3261	1.767	.4103	.8741	.4190	.2696	1.257	.2797	139.7
219.000	3.734	.3762	2.103	.4734	1.103	.3984	.2940	1.449	.2796	116.8
220,000	4.382	.4415	2.514	.5556	1.359	.3851	.3100	1.700	.2795	105.2
221.000	4.997	.5034	2.896	.6335	1.589	.3795	.3176	1.938	.2795	118.0
222.000	5.341	.5381	3.132	.6772	1.749	.3719	.3274	2.071	.2794	124.1
223.000	5.299	.5339	3.096	.6719	1.720	.3739	.3245	2.055	.2794	124.3
224.000	5.235	.5274	3.040	.6637	1.674	.3773	.3199	2.030	.2794	124.4
225.000	7.422	.7478	4.365	.9410	2.451	.3706	.3284	2.878	.2794	146.1
226.000	11.52	1.160	7.045	1.460	4.179	.3466	.3588	4.461	.2792	143.4
227.000	12.29	1.238	7.761	1.558	4.800	.3204	.3915	4.756	.2791	115.8
228.000	8.350	.8412	5.193	1.059	3.152	.3399	.3663	3.233	.2792	122.1
229.000	5.544	.5586	3.254	.7030	1.824	.3692	.3290	2.150	.2794	131.5
230.000	5.564	.5605	3.276	.7054	1.846	.3671	.3318	2.157	.2794	130.0
231.000	5.607	.5649	3.338	.7109	1.910	.3601	.3407	2.173	.2793	127.5
232.000	7.414	.7470	4.425	.9400	2.538	.3592	.3425	2.874	.2793	126.2
233.000	11.52	1.161	6.759	1.461	3.778	.3694	.3302	4.467	.2794	129.7
234.000	13.61	1.371	7.657	1.725	4.006	.3984	.2940	5.280	.2796	136.3
235.000	12.28	1.237	6.610	1.557	3.195	.4266	.2593	4.769	.2798	141.1
236.000	11.44	1.152	6.067	1.450	2.845	.4355	.2488	4.444	.2798	143.4
237.000	12.02	1.211	6.405	1.524	3.030	.4331	.2520	4.669	.2798	139.0
238.000	12.26	1.236	6.605	1.555	3.187	.4270	.2598	4.764	.2798	133.6
239.000	12.14	1.223	6.605	1.539	3.248	.4210	.2676	4.714	.2797	133.1
240.000	8.765	.8831	4.806	1.111	2.395	.4158	.2743	3.404	.2797	141.1

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	COAL RT mo/s	ASH RATE mo/s	H2O INFX mo/s	H2O COAL mo/s	-H2O RXN mo/s	O2 per COAL	H2O per COAL	CHAR RT mo/s	CHAR per COAL	RECOVERY %
TIME (D)	IRED1 44	IRED1 46	IRED1 47	IRED1 48	IRED1 49	IRED1 60	IRED1 61	IRED1 64	IRED1 63	IRED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
241.000 1	8.765	.8831	4.806	1.111	2.395	.4158	.2743	3.404	.2797	141.1

UCG DB - HA2.1B - ENERGY PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/O2 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
203.000	6291.	.9812	2.7077E-02	5.5837E-02	3.0902E-02	0.000	1.0978E-02	-.1096	174.4	1704.
204.000	6768.	.9340	2.8252E-02	5.8109E-02	3.2244E-02	0.000	1.0978E-02	-6.722E-02	159.7	1444.
205.000	6266.	.8785	2.9635E-02	6.0782E-02	3.3821E-02	0.000	1.0978E-02	-1.741E-02	142.7	1149.
206.000	4657.	.8673	2.9918E-02	6.1333E-02	3.4144E-02	0.000	1.0978E-02	-7.374E-03	139.5	1104.
207.000	3992.	.8599	3.0107E-02	6.1703E-02	3.4361E-02	0.000	1.0978E-02	-7.462E-04	137.4	1076.
208.000	3934.	.8509	3.0336E-02	6.2150E-02	3.4622E-02	0.000	1.0978E-02	7.2811E-03	135.0	1043.
209.000	3938.	.8571	3.0184E-02	6.1856E-02	3.4448E-02	0.000	1.0978E-02	1.7946E-03	136.7	1066.
210.000	5314.	.8863	2.9451E-02	6.0436E-02	3.3612E-02	0.000	1.0978E-02	-2.449E-02	144.9	1185.
211.000	5486.	.8797	2.9611E-02	6.0742E-02	3.3795E-02	0.000	1.0978E-02	-1.850E-02	143.1	1160.
212.000	3258.	.8452	3.0466E-02	6.2392E-02	3.4770E-02	0.000	1.0978E-02	1.2454E-02	133.5	1024.
213.000	2185.	.8275	3.0913E-02	6.3262E-02	3.5281E-02	0.000	1.0978E-02	2.8349E-02	128.8	964.0
214.000	2033.	.8036	3.1523E-02	6.4452E-02	3.5977E-02	0.000	1.0978E-02	4.9752E-02	122.7	891.4
215.000	1700.	.7752	3.2248E-02	6.5866E-02	3.6804E-02	0.000	1.0978E-02	7.5165E-02	115.7	812.4
216.000	1492.	.7608	3.2617E-02	6.6586E-02	3.7225E-02	0.000	1.0978E-02	8.8119E-02	112.2	774.8
217.000	1478.	.7562	3.2736E-02	6.6819E-02	3.7361E-02	0.000	1.0978E-02	9.2232E-02	111.2	763.6
218.000	1540.	.7628	3.2566E-02	6.6487E-02	3.7167E-02	0.000	1.0978E-02	8.6335E-02	112.7	780.2
219.000	1777.	.7864	3.1959E-02	6.5297E-02	3.6473E-02	0.000	1.0978E-02	6.5222E-02	118.4	842.3
220.000	2086.	.8016	3.1571E-02	6.4542E-02	3.6032E-02	0.000	1.0978E-02	5.1614E-02	122.2	884.0
221.000	2378.	.8079	3.1417E-02	6.4246E-02	3.5855E-02	0.000	1.0978E-02	4.5870E-02	123.8	902.9
222.000	2542.	.8166	3.1202E-02	6.3832E-02	3.5610E-02	0.000	1.0978E-02	3.8073E-02	125.9	929.1
223.000	2523.	.8143	3.1257E-02	6.3936E-02	3.5673E-02	0.000	1.0978E-02	4.0182E-02	125.4	922.1
224.000	2492.	.8105	3.1348E-02	6.4111E-02	3.5777E-02	0.000	1.0978E-02	4.3619E-02	124.4	910.4
225.000	3533.	.8181	3.1158E-02	6.3741E-02	3.5559E-02	0.000	1.0978E-02	3.6749E-02	126.4	933.9
226.000	5481.	.8455	3.0475E-02	6.2422E-02	3.4781E-02	0.000	1.0978E-02	1.2178E-02	133.6	1028.
227.000	5848.	.8754	2.9724E-02	6.0964E-02	3.3924E-02	0.000	1.0978E-02	-1.463E-02	141.7	1136.
228.000	3974.	.8532	3.0272E-02	6.2020E-02	3.4549E-02	0.000	1.0978E-02	5.3189E-03	135.8	1059.
229.000	2639.	.8196	3.1110E-02	6.3641E-02	3.5505E-02	0.000	1.0978E-02	3.5434E-02	126.8	938.5
230.000	2648.	.8221	3.1047E-02	6.3520E-02	3.5433E-02	0.000	1.0978E-02	3.3198E-02	127.4	946.5
231.000	2669.	.8301	3.0849E-02	6.3138E-02	3.5208E-02	0.000	1.0978E-02	2.6050E-02	129.5	971.8
232.000	3529.	.8311	3.0832E-02	6.3109E-02	3.5188E-02	0.000	1.0978E-02	2.5145E-02	129.7	975.0
233.000	5484.	.8195	3.1127E-02	6.3683E-02	3.5524E-02	0.000	1.0978E-02	3.5505E-02	126.7	938.7
234.000	6477.	.7863	3.1961E-02	6.5302E-02	3.6476E-02	0.000	1.0978E-02	6.5264E-02	118.5	843.9
235.000	5844.	.7542	3.2774E-02	6.6883E-02	3.7404E-02	0.000	1.0978E-02	9.4095E-02	110.7	759.1
236.000	5444.	.7440	3.3036E-02	6.7397E-02	3.7703E-02	0.000	1.0978E-02	.1032	108.4	734.5
237.000	5720.	.7467	3.2971E-02	6.7272E-02	3.7629E-02	0.000	1.0978E-02	.1008	109.0	740.9
238.000	5038.	.7536	3.2798E-02	6.6937E-02	3.7431E-02	0.000	1.0978E-02	9.4516E-02	110.6	757.5
239.000	5777.	.7605	3.2626E-02	6.6606E-02	3.7235E-02	0.000	1.0978E-02	8.8317E-02	112.2	774.3
240.000	4172.	.7665	3.2478E-02	6.6320E-02	3.7066E-02	0.000	1.0978E-02	8.2964E-02	113.6	789.2

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TIME (D)	COAL kJ /mol IRED1 72	PRODUCT frac IRED1 74	TAR frac IRED1 73	SENS HT frac IRED1 76	STEAM frac IRED1 77	COOLING frac IRED1 80	SEN HT INSU IRED1 78	LOSS frac IRED1 75	HC kJ /mol IRED1 81	HC/02 kJ /mol IRED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
241.000	4172.	.7665	3.2478E-02	6.6320E-02	3.7066E-02	0.000	1.0978E-02	8.2964E-02	113.6	789.2

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UNDERGROUND COAL GASIFICATION

DATA BASE

LARIMIE ENERGY TECHNOLOGY CENTER

HANNA II PHASE II

DAILY AVERAGE RESULTS

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  HANNA II COAL ANALYSIS

                                                                    KG/M**3   KJ/MOLE
COAL H/C  COAL O/C  COAL S/C  COAL N/C  WT F H2O  WT F ASH  DENSITY   HT COMB
.965      0.192      0.006    0.022     .0862     .2892      1363.     476.

CHAR H/C  CHAR O/C  CHAR S/C  CHAR N/C
.1018     0.0003    0.        0.

 TAR H/C   TAR O/C   TAR S/C   TAR N/C      C/MOLECULE
 1.00      0.        0.        0.            9.

  COAL      ASH&CHAR  --  TEMPERATURES (K)
   300.      1000.

  1   NUMBER OF POINTS ON OXYGEN TRACER TYPE CURVE
999.     2   TIME,TRACER FLAG (ZERO=NONE,ONE=ARGON,TWO=NITROGEN)

  1   NUMBER OF POINTS ON GAS LOSS TRACER TYPE CURVE
 999.   2  TIME,TRACER FLAG (SAME AS OXYGEN TRACER)

 1   NUMBER OF POINTS ON CHAR FLAG CURVE
999.      0   TIME,TRACER FLAG   (0=DO NOT USE CHAR, 1=USE CHAR)
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UCG DB - HA2.2 - OPERATING PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	INJ RATE mo/s IRED1 90	PRD RATE mo/s IRED1 91	INJ TEMP c IRED1 94	PRD TEMP c IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM mo/s IRED1 92	COOLING mo/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
106.000	2.449	5.381	40.00	324.6	405.5	92.08	0.000	0.000	.2100	0.000
107.000	2.202	4.889	40.00	324.6	311.5	93.37	0.000	0.000	.2100	0.000
108.000	2.030	4.272	40.00	324.6	278.8	90.96	0.000	0.000	.2100	0.000
109.000	1.359	2.552	40.00	324.6	247.3	89.01	0.000	0.000	.2100	0.000
110.000	.9554	1.758	40.00	324.6	278.3	91.34	0.000	0.000	.2100	0.000
111.000	1.271	2.349	40.00	324.6	266.4	90.65	0.000	0.000	.2100	0.000
112.000	1.834	3.472	40.00	324.6	241.6	90.32	0.000	0.000	.2100	0.000
113.000	4.745	9.680	40.00	324.6	476.7	104.4	0.000	0.000	.2100	0.000
114.000	11.13	20.87	40.00	324.6	787.8	142.2	0.000	0.000	.2100	0.000
115.000	17.24	31.02	39.60	325.3	938.6	190.8	0.000	0.000	.2100	0.000
116.000	19.52	36.96	29.06	337.9	984.8	215.3	0.000	0.000	.2100	0.000
117.000	22.39	40.88	29.33	365.2	971.1	236.9	0.000	0.000	.2100	0.000
118.000	19.83	37.21	25.38	342.6	848.7	219.6	0.000	0.000	.2100	0.000
119.000	27.27	50.27	31.87	343.1	1156.	292.8	0.000	0.000	.2100	0.000
120.000	15.00	44.26	25.84	303.2	746.4	214.2	0.000	0.000	.2100	0.000
121.000	18.42	31.56	20.92	218.9	459.5	154.9	0.000	0.000	.2100	0.000
122.000	10.62	33.74	21.99	170.5	427.1	151.5	0.000	0.000	.2100	0.000
123.000	21.41	46.17	31.72	254.7	712.5	229.0	0.000	0.000	.2100	0.000
124.000	22.82	56.92	32.07	346.8	696.8	236.1	0.000	0.000	.2100	0.000
125.000	27.95	53.44	28.38	311.6	365.2	268.1	0.000	0.000	.2100	0.000
126.000	33.18	59.69	35.24	289.5	386.1	234.5	0.000	0.000	.2100	0.000
127.000	33.70	61.10	31.41	296.1	348.5	179.4	0.000	0.000	.2100	0.000
128.000	40.33	71.79	36.68	300.6	398.9	207.0	0.000	0.000	.2100	0.000
129.000	49.52	88.14	46.31	334.8	482.1	245.5	0.000	0.000	.2100	0.000
130.000	50.04	89.48	43.51	325.1	483.9	242.5	0.000	0.000	.2100	0.000
131.000	49.85	87.61	49.33	386.2	489.8	247.6	0.000	0.000	.2100	0.000
132.000	49.46	88.88	41.15	289.4	460.3	230.3	0.000	0.000	.2100	0.000
133.000	54.83	92.83	41.83	269.9	471.5	233.8	0.000	0.000	.2100	0.000
134.000	69.08	113.6	52.49	308.2	650.5	344.3	0.000	0.000	.2100	0.000
135.000	69.76	116.3	53.75	371.2	696.9	380.2	0.000	0.000	.2100	0.000
136.000	69.71	113.2	42.77	342.4	690.5	386.2	0.000	0.000	.2100	0.000
137.000	69.21	113.1	48.47	324.4	713.3	452.1	0.000	0.000	.2100	0.000
138.000	68.29	115.9	54.87	318.9	741.6	516.1	0.000	0.000	.2100	0.000
139.000	69.61	111.5	56.13	331.4	710.1	414.8	0.000	0.000	.2100	0.000
140.000	69.92	118.2	55.53	309.3	683.5	394.9	0.000	0.000	.2100	0.000
141.000	69.52	113.6	52.69	319.9	671.3	386.8	0.000	0.000	.2100	0.000
142.000	70.50	117.7	52.20	322.4	675.7	391.2	0.000	0.000	.2100	0.000
143.000	69.89	114.7	48.44	309.3	659.9	381.9	0.000	0.000	.2100	0.000

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TIME (D)	INJ RATE kg/s IRED1 90	PRD RATE kg/s IRED1 91	INJ TEMP C IRED1 94	PRD TEMP C IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM kg/s IRED1 92	COOLING kg/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
144.000	69.35	111.7	47.79	308.8	651.1	374.7	0.000	0.000	.2100	0.000
145.000	68.85	109.1	49.38	320.6	635.9	369.7	0.000	0.000	.2100	0.000
146.000	70.15	112.6	48.66	344.8	666.2	382.0	0.000	0.000	.2100	0.000
147.000	68.98	109.3	53.17	362.7	650.7	371.6	0.000	0.000	.2100	0.000
148.000	69.47	110.5	56.08	355.3	655.7	373.6	0.000	0.000	.2100	0.000
149.000	69.38	111.4	57.64	365.5	666.2	379.7	0.000	0.000	.2100	0.000
150.000	68.93	109.4	55.94	362.9	663.3	363.8	0.000	0.000	.2100	0.000
151.000	68.93	109.4	55.94	362.9	663.3	363.8	0.000	0.000	.2100	0.000

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UCG DB - HA2.2 - PRODUCT GAS ANALYSIS 1

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	ARGON molf !RED1 10	NITROGEN molf !RED1 11	OXYGEN molf !RED1 12	HYDROGEN molf !RED1 13	METHANE molf !RED1 14	CO molf !RED1 15	CO2 molf !RED1 16	ETHANE molf !RED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
106.000	4.8578E-03	.4597	1.9128E-03	.2197	3.9404E-02	.1145	.1466	4.9565E-03
107.000	5.1445E-03	.4633	2.1552E-03	.2188	3.8766E-02	.1165	.1451	4.4053E-03
108.000	5.1597E-03	.4650	2.4585E-03	.2209	4.1040E-02	.1052	.1533	4.7956E-03
109.000	5.3626E-03	.4826	2.6864E-03	.2133	3.9154E-02	8.4339E-02	.1670	4.4405E-03
110.000	5.6450E-03	.5042	2.0391E-03	.2004	3.7801E-02	6.7567E-02	.1771	3.8958E-03
111.000	5.5432E-03	.5028	1.6636E-03	.1955	3.8550E-02	9.1720E-02	.1591	3.8071E-03
112.000	5.2933E-03	.4880	2.2061E-03	.1975	4.1079E-02	.1261	.1343	4.1359E-03
113.000	5.0430E-03	.4679	2.4396E-03	.1955	5.8206E-02	.1290	.1346	5.5754E-03
114.000	4.8053E-03	.4522	2.0846E-03	.1965	6.8421E-02	.1277	.1401	6.6025E-03
115.000	5.0581E-03	.4524	3.4264E-03	.1984	6.3921E-02	.1330	.1353	6.7533E-03
116.000	5.3693E-03	.4570	5.6682E-03	.1950	6.3240E-02	.1347	.1310	6.9579E-03
117.000	5.0081E-03	.4583	1.2345E-03	.1859	6.1100E-02	.1470	.1335	6.5644E-03
118.000	4.9515E-03	.4685	9.3499E-04	.2246	4.5182E-02	.1425	.1069	5.0357E-03
119.000	4.8995E-03	.4534	1.1796E-03	.1908	6.9472E-02	.1309	.1409	6.8593E-03
120.000	1.2798E-02	.3701	2.1829E-03	.2802	7.3003E-02	9.2143E-02	.1613	6.6760E-03
121.000	4.6407E-03	.3875	5.0384E-03	.2730	5.9843E-02	.1084	.1523	7.3656E-03
122.000	4.6418E-03	.4191	2.1092E-03	.2498	5.0409E-02	.1203	.1466	5.9607E-03
123.000	5.3543E-03	.4699	2.0802E-03	.1892	5.2302E-02	.1431	.1322	4.9589E-03
124.000	4.6622E-03	.4291	3.8111E-03	.2234	5.7803E-02	.1563	.1177	5.5083E-03
125.000	5.3707E-03	.4956	1.3074E-03	.1671	3.8700E-02	.1844	.1021	4.3382E-03
126.000	4.9542E-03	.4765	9.9932E-04	.1816	4.1861E-02	.1867	.1019	4.5216E-03
127.000	5.2444E-03	.4723	1.8639E-03	.1878	4.2468E-02	.1859	9.9016E-02	4.4737E-03
128.000	5.2916E-03	.4757	1.6824E-03	.1797	4.6037E-02	.1871	9.8650E-02	4.6402E-03
129.000	5.4089E-03	.4757	2.3430E-03	.1773	4.5807E-02	.1904	9.7727E-02	4.6418E-03
130.000	5.4124E-03	.4749	2.8116E-03	.1756	5.1454E-02	.1827	.1016	4.9389E-03
131.000	5.4744E-03	.4827	2.0271E-03	.1746	4.6147E-02	.1820	.1021	4.5512E-03
132.000	5.1811E-03	.4826	1.3839E-03	.1715	4.8955E-02	.1873	9.7631E-02	5.0641E-03
133.000	5.2576E-03	.4840	2.1325E-03	.1638	5.5783E-02	.1825	.1002	5.9392E-03
134.000	5.5275E-03	.4861	3.0681E-03	.1618	5.4857E-02	.1779	.1040	5.9835E-03
135.000	5.3364E-03	.4734	1.9585E-03	.1715	5.5387E-02	.1773	.1088	5.5353E-03
136.000	5.5585E-03	.4812	3.0028E-03	.1690	5.2880E-02	.1710	.1112	5.4184E-03
137.000	5.6007E-03	.4897	2.5900E-03	.1616	5.3963E-02	.1652	.1153	5.3180E-03
138.000	5.3759E-03	.4817	8.9053E-04	.1711	5.6821E-02	.1629	.1164	4.0789E-03
139.000	5.3813E-03	.4788	0.000	.1812	6.1446E-02	.1455	.1246	2.0102E-03
140.000	5.1707E-03	.4737	0.000	.1646	6.6206E-02	.1550	.1290	5.2914E-03
141.000	4.7701E-03	.4725	3.6291E-04	.1692	6.5200E-02	.1577	.1265	3.3121E-03
142.000	4.4640E-03	.4945	9.3774E-04	.1486	6.0382E-02	.1584	.1227	9.9374E-03
143.000	5.2470E-03	.4865	2.1955E-04	.1673	5.7924E-02	.1493	.1296	3.6267E-03

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TIME (D)	ARGON molf !RED1 10	NITROGEN molf !RED1 11	OXYGEN molf !RED1 12	HYD_N molf !RED1 13	METHANE molf !RED1 14	CO molf !RED1 15	CO2 molf !RED1 16	ETHANE molf !RED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
144.000	5.1233E-03	.4936	0.000	.1724	5.8508E-02	.1385	.1306	8.6836E-04
145.000	5.1680E-03	.5124	5.7498E-05	.1772	5.9354E-02	.1036	.1415	2.8553E-04
146.000	5.6043E-03	.5154	2.1519E-03	.1411	6.4773E-02	.1319	.1335	5.0819E-03
147.000	5.9049E-03	.5282	1.6924E-03	.1390	4.7312E-02	.1379	.1360	3.9529E-03
148.000	5.6942E-03	.5313	0.000	.1389	4.8988E-02	.1277	.1432	3.7207E-03
149.000	5.6350E-03	.5439	8.5032E-05	.1355	4.6136E-02	.1108	.1534	3.9369E-03
150.000	5.9319E-03	.5432	1.0394E-03	.1320	4.5801E-02	.1137	.1534	4.0970E-03
151.000	5.9319E-03	.5432	1.0394E-03	.1320	4.5801E-02	.1137	.1534	4.0970E-03

UCG DB - HA2.2 - PRODUCT GAS ANALYSIS 2

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2S molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
106.000	0.000	3.2424E-03	5.1879E-03	0.000	0.000	.2952
107.000	0.000	2.2363E-03	3.5781E-03	0.000	0.000	.3184
108.000	0.000	8.1574E-04	1.3052E-03	0.000	0.000	.2532
109.000	0.000	4.2728E-04	6.8365E-04	0.000	0.000	.1618
110.000	0.000	4.9978E-04	7.9965E-04	0.000	0.000	.1892
111.000	0.000	5.0120E-04	8.0192E-04	0.000	0.000	.1906
112.000	0.000	5.5308E-04	8.8493E-04	0.000	0.000	.1801
113.000	0.000	6.7427E-04	1.0788E-03	0.000	0.000	.2271
114.000	0.000	6.4987E-04	1.0398E-03	0.000	0.000	8.8156E-02
115.000	0.000	6.4479E-04	1.0272E-03	0.000	0.000	4.3397E-02
116.000	0.000	5.2453E-04	6.2944E-04	0.000	0.000	.1095
117.000	0.000	6.0284E-04	7.2341E-04	0.000	0.000	7.3262E-02
118.000	0.000	6.2803E-04	7.5664E-04	0.000	0.000	.1326
119.000	0.000	6.6282E-04	7.9538E-04	0.000	0.000	7.1990E-02
120.000	0.000	7.0864E-04	8.5299E-04	0.000	0.000	1.064
121.000	0.000	8.5161E-04	1.0297E-03	0.000	0.000	1.182
122.000	0.000	4.5745E-04	5.5729E-04	0.000	0.000	1.748
123.000	0.000	3.9253E-04	4.7104E-04	0.000	0.000	.8164
124.000	0.000	7.7543E-04	9.3052E-04	0.000	0.000	.5824
125.000	0.000	5.1075E-04	6.1290E-04	0.000	0.000	.4572
126.000	0.000	4.4284E-04	5.3141E-04	0.000	0.000	9.9245E-02
127.000	0.000	4.0886E-04	5.0938E-04	0.000	0.000	9.8275E-02
128.000	0.000	5.2853E-04	6.4146E-04	0.000	0.000	9.1948E-02
129.000	0.000	2.8305E-04	3.3966E-04	0.000	0.000	8.5532E-02
130.000	0.000	3.0032E-04	3.6038E-04	0.000	0.000	8.8730E-02
131.000	0.000	1.6888E-04	2.0266E-04	0.000	0.000	8.7486E-02
132.000	0.000	1.8840E-04	2.2608E-04	0.000	0.000	.1119
133.000	0.000	2.0782E-04	2.4939E-04	0.000	0.000	6.0953E-02
134.000	0.000	3.8713E-04	4.6456E-04	0.000	0.000	2.5970E-02
135.000	0.000	4.0497E-04	4.8597E-04	0.000	0.000	1.2789E-02
136.000	0.000	3.4976E-04	4.1971E-04	0.000	0.000	7.7303E-03
137.000	0.000	3.2453E-04	3.8944E-04	0.000	0.000	4.6739E-02
138.000	0.000	3.4032E-04	4.1738E-04	0.000	0.000	6.1573E-02
139.000	0.000	4.9894E-04	6.6098E-04	0.000	0.000	2.3534E-02
140.000	0.000	4.2902E-04	5.7298E-04	0.000	0.000	2.6386E-02
141.000	0.000	2.3320E-04	2.8346E-04	0.000	0.000	7.1660E-03
142.000	0.000	1.3804E-05	1.6564E-05	0.000	0.000	5.8501E-02
143.000	0.000	1.1093E-04	1.4661E-04	0.000	0.000	2.4467E-02

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TIME (D)	C2H4 molf !RED1 17	C6 molf !RED1 19	H10 molf !RED1 20	H2S molf !RED1 21	TAR/DRY !RED1 24	H2O/DRY !RED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
144.000	0.000	2.0335E-04	2.6276E-04	0.000	0.000	1.9710E-02
145.000	0.000	1.1880E-04	1.5529E-04	0.000	0.000	5.8863E-02
146.000	0.000	2.0828E-04	2.5195E-04	0.000	0.000	6.7065E-02
147.000	0.000	4.8820E-05	6.0210E-05	0.000	0.000	7.2911E-02
148.000	0.000	2.2782E-04	3.0778E-04	0.000	0.000	8.3415E-02
149.000	0.000	2.4536E-04	3.3045E-04	0.000	0.000	.1190
150.000	0.000	3.0500E-04	3.8026E-04	0.000	0.000	.1063
151.000	0.000	3.0500E-04	3.8026E-04	0.000	0.000	.1063

UCG DB - HA2.2 - MATERIAL BALANCES

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL RT mo/s !RED1 44	ASH RATE mo/s !RED1 46	H2O INFX mo/s !RED1 47	H2O COAL mo/s !RED1 48	-H2O RXN mo/s !RED1 49	O2 per COAL !RED1 60	H2O per COAL !RED1 61	CHAR RT mo/s !RED1 64	CHAR per COAL !RED1 63	RECOVORY % !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
106.000	1.372	.1382	1.801	.1739	.7501	.2548	.5460	1.379	.5008	100.0
107.000	1.196	.1205	1.666	.1517	.6370	.2748	.5325	1.115	.4824	100.0
108.000	1.070	.1078	1.317	.1357	.5873	.2933	.5486	.9414	.4676	100.0
109.000	.6636	6.6856E-02	.6286	8.4138E-02	.3577	.3362	.5389	.5210	.4397	100.0
110.000	.4334	4.3669E-02	.4467	5.4957E-02	.2219	.3739	.5124	.3222	.4262	100.0
111.000	.5923	5.9672E-02	.5834	7.5097E-02	.2827	.3542	.4774	.4799	.4472	100.0
112.000	.9224	9.2927E-02	.8482	.1169	.4302	.3094	.4644	.8540	.4791	100.0
113.000	2.674	.2694	2.783	.3390	1.362	.2478	.5086	2.807	.5123	100.0
114.000	6.778	.6829	4.425	.8594	3.605	.2211	.5319	6.978	.5074	100.0
115.000	10.39	1.047	5.411	1.318	5.438	.2294	.5234	10.31	.4977	100.0
116.000	11.56	1.165	8.096	1.466	5.994	.2353	.5168	11.72	.4911	100.0
117.000	13.65	1.375	7.080	1.731	6.036	.2641	.4421	9.165	.3929	100.0
118.000	10.63	1.071	8.651	1.348	6.133	.1456	.6650	17.26	.5728	99.98
119.000	16.84	1.696	9.735	2.135	8.500	.2300	.5044	15.48	.4781	100.0
120.000	11.59	1.168	17.06	1.469	7.907	9.4627E-02	.8498	15.44	.5888	235.1
121.000	8.379	.8442	10.58	1.062	4.584	.1505	.7541	7.968	.5173	127.5
122,000	6.015	.6060	17.90	.7627	2.645	.2136	.6423	4.282	.4485	100.0
123.000	12.11	1.220	14.64	1.536	4.969	.2945	.4338	8.089	.3834	99.56
124.000	14.35	1.446	22.88	1.820	8.564	.2056	.5495	18.01	.4219	96.30
125.000	14.96	1.508	11.88	1.897	4.222	.3397	.2915	7.202	.2910	100.0
126.000	18.57	1.871	9.347	2.355	6.321	.3073	.3405	10.51	.3588	100.0
127.000	18.86	1.900	10.03	2.391	6.975	.2913	.3698	13.22	.4104	100.0
128.000	22.70	2.287	10.94	2.878	7.938	.2888	.3568	15.37	.4065	100.0
129.000	28.01	2.822	12.97	3.552	9.594	.2990	.3424	16.90	.3752	100.0
130.000	28.56	2.877	14.14	3.621	10.49	.2839	.3671	20.02	.4096	100.0
131.000	27.43	2.764	13.02	3.478	9.463	.3051	.3445	17.58	.3875	100.0
132.000	27.59	2.780	14.97	3.499	9.535	.2897	.3452	20.02	.4178	100.0
133.000	30.95	3.118	11.92	3.924	10.92	.2772	.3549	24.03	.4379	99.65
134.000	38.89	3.918	11.48	4.931	13.56	.2880	.3488	27.47	.4128	99.93
135.000	40.76	4.106	11.22	5.168	14.93	.2827	.3663	25.94	.3858	99.88
136.000	39.09	3.938	10.02	4.957	14.10	.2979	.3598	24.36	.3802	99.36
137.000	37.47	3.775	13.39	4.751	12.97	.3089	.3456	22.27	.3687	97.94
138.000	37.86	3.815	16.23	4.801	14.43	.2874	.3810	27.52	.4199	98.82
139.000	36.90	3.718	14.27	4.679	16.31	.2641	.4464	35.30	.4797	96.00
140.000	41.84	4.215	13.90	5.305	16.17	.2791	.3866	25.08	.3740	100.0
141.000	40.33	4.063	11.30	5.113	15.61	.2854	.3887	23.45	.3529	98.31
142.000	40.18	4.048	15.29	5.094	13.91	.2927	.3471	25.49	.3812	100.0
143.000	38.60	3.889	12.23	4.895	14.39	.3107	.3729	22.32	.3624	99.93

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TIME (D)	COAL RT mo/s ------- !RED1 44	ASH RATE mo/s ------- !RED1 46	H2O INFX mo/s ------- !RED1 47	H2O COAL mo/s ------- !RED1 48	-H2O RXN mo/s ------- !RED1 49	O2 per COAL ------- !RED1 60	H2O per COAL ------- !RED1 61	CHAR RT mo/s ------- !RED1 64	CHAR per COAL ------- !RED1 63	RECOVERY % ------- !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
144.000	36.23	3.650	12.23	4.593	14.67	.3060	.4051	29.00	.4415	99.99
145.000	31.51	3.175	17.57	3.995	15.41	.2902	.4936	41.68	.5601	98.09
146.000	36.13	3.640	15.48	4.581	13.03	.3235	.3499	27.92	.3695	99.39
147.000	33.56	3.381	12.01	4.255	8.845	.3996	.2636	8.976	.2091	100.0
148.000	33.52	3.377	13.53	4.250	9.286	.3954	.2770	11.15	.2488	100.0
149.000	31.81	3.205	16.46	4.034	8.655	.4214	.2721	9.702	.2323	100.0
150.000	31.98	3.222	14.49	4.054	8.119	.4315	.2538	5.706	.1468	100.0
151.000	31.98	3.222	14.49	4.054	8.119	.4315	.2538	5.706	.1468	100.0

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UCG DB - HA2.2 - ENERGY PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/02 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
106.000	652.8	.9714	0.000	8.0188E-02	8.2603E-02	0.000	1.0978E-02	-.1488	152.5	1233.
107.000	569.5	.9568	0.000	8.3087E-02	9.1063E-02	0.000	1.0978E-02	-.1455	146.9	1178.
108.000	509.5	.9403	0.000	8.0614E-02	7.4392E-02	0.000	1.0978E-02	-.1099	140.6	1123.
109.000	315.9	.8944	0.000	7.7321E-02	4.9460E-02	0.000	1.0978E-02	-3.583E-02	128.5	989.5
110.000	206.3	.8481	0.000	8.1793E-02	5.9563E-02	0.000	1.0978E-02	-4.115E-03	118.4	872.0
111.000	281.9	.8705	0.000	7.9599E-02	5.8634E-02	0.000	1.0978E-02	-2.342E-02	124.3	918.6
112.000	439.0	.9234	0.000	7.5099E-02	5.3071E-02	0.000	1.0978E-02	-6.623E-02	137.6	1048.
113.000	1273.	.9719	0.000	7.3511E-02	6.2233E-02	0.000	1.0978E-02	-.1223	155.9	1238.
114.000	3226.	.9897	0.000	6.2039E-02	2.3031E-02	0.000	1.0978E-02	-8.942E-02	166.4	1367.
115.000	4947.	.9895	0.000	5.9868E-02	1.1446E-02	0.000	1.0978E-02	-7.548E-02	164.7	1352.
116.000	5502.	.9907	0.000	6.8663E-02	2.9289E-02	0.000	1.0978E-02	-.1032	163.1	1327.
117.000	6498.	.9480	0.000	6.9787E-02	1.8872E-02	0.000	1.0978E-02	-5.135E-02	161.7	1312.
118.000	5061.	1.113	0.000	8.8927E-02	5.3944E-02	0.000	1.0978E-02	-.2703	155.1	1243.
119.000	8015.	.9757	0.000	6.4938E-02	1.8477E-02	0.000	1.0978E-02	-7.374E-02	166.7	1366.
120.000	5516.	1.133	0.000	.1051	.2764	0.000	1.0978E-02	-.5289	184.4	2127.
121.000	3989.	1.091	0.000	7.5841E-02	.3311	0.000	1.0978E-02	-.5128	176.8	1919.
122.000	2863.	1.023	0.000	7.7140E-02	.4948	0.000	1.0978E-02	-.6101	161.4	1496.
123.000	5766.	.9290	0.000	7.4460E-02	.2336	0.000	1.0978E-02	-.2516	150.4	1194.
124.000	6832.	1.031	0.000	.1035	.1627	0.000	1.0978E-02	-.3121	171.2	1605.
125.000	7123.	.8923	0.000	8.9843E-02	.1311	0.000	1.0978E-02	-.1279	143.2	1076.
126.000	8841.	.9261	0.000	5.5490E-02	2.6802E-02	0.000	1.0978E-02	-2.308E-02	150.8	1176.
127.000	8976.	.9470	0.000	5.7848E-02	2.6783E-02	0.000	1.0978E-02	-4.625E-02	152.7	1201.
128.000	1.0806E+04	.9436	0.000	5.7098E-02	2.4667E-02	0.000	1.0978E-02	-4.003E-02	154.6	1208.
129.000	1.3334E+04	.9361	0.000	6.3041E-02	2.2895E-02	0.000	1.0978E-02	-3.667E-02	153.7	1200.
130.000	1.3593E+04	.9470	0.000	6.1256E-02	2.3602E-02	0.000	1.0978E-02	-4.652E-02	156.6	1225.
131.000	1.3058E+04	.9273	0.000	7.5448E-02	2.3754E-02	0.000	1.0978E-02	-4.115E-02	150.3	1157.
132.000	1.3134E+04	.9387	0.000	5.5192E-02	2.9961E-02	0.000	1.0978E-02	-3.856E-02	154.2	1187.
133.000	1.4730E+04	.9453	0.000	4.7287E-02	1.6122E-02	0.000	1.0978E-02	-2.338E-02	158.2	1214.
134.000	1.8513E+04	.9353	0.000	5.2466E-02	6.8657E-03	0.000	1.0978E-02	-9.325E-03	156.3	1194.
135.000	1.9400E+04	.9392	0.000	6.3902E-02	3.3201E-03	0.000	1.0978E-02	-2.112E-02	158.7	1245.
136.000	1.8608E+04	.9273	0.000	5.9948E-02	2.0419E-03	0.000	1.0978E-02	-3.919E-03	153.6	1187.
137.000	1.7836E+04	.9114	0.000	5.8311E-02	1.2444E-02	0.000	1.0978E-02	3.2278E-03	150.5	1142.
138.000	1.8022E+04	.9299	0.000	5.7494E-02	1.6341E-02	0.000	1.0978E-02	-1.835E-02	153.3	1182.
139.000	1.7565E+04	.9501	0.000	5.9328E-02	6.4325E-03	0.000	1.0978E-02	-3.045E-02	152.8	1186.
140.000	1.9914E+04	.9243	0.000	5.1403E-02	6.7005E-03	0.000	1.0978E-02	2.9153E-03	159.9	1254.
141.000	1.9196E+04	.9242	0.000	5.3340E-02	1.7788E-03	0.000	1.0978E-02	6.0094E-03	157.1	1235.
142.000	1.9124E+04	.9108	0.000	5.6543E-02	1.4941E-02	0.000	1.0978E-02	3.0988E-03	156.6	1176.
143.000	1.8375E+04	.9006	0.000	5.4389E-02	6.5067E-03	0.000	1.0978E-02	2.3868E-02	147.8	1128.

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TIME (D)	COAL kJ /mol IRED1 72	PRODUCT frac IRED1 74	TAR frac IRED1 73	SE fr IRED1 76	STEAM frac IRED1 77	COOLING frac IRED1 80	SEN HT INSU IRED1 78	LOSS frac IRED1 75	HC /mol IRED1 81	HC/O2 kJ /mol IRED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
144.000	1.7243E+04	.9073	0.000	5.6204E-02	5.5243E-03	0.000	1.0978E-02	1.6325E-02	142.7	1074.
145.000	1.4999E+04	.9200	0.000	6.6476E-02	1.7944E-02	0.000	1.0978E-02	-1.909E-02	133.8	971.2
146.000	1.7197E+04	.8791	0.000	6.5992E-02	1.8595E-02	0.000	1.0978E-02	2.1697E-02	144.1	1047.
147.000	1.5974E+04	.8114	0.000	7.1496E-02	2.0439E-02	0.000	1.0978E-02	8.2013E-02	127.2	894.8
148.000	1.5957E+04	.8066	0.000	7.0591E-02	2.3472E-02	0.000	1.0978E-02	8.4628E-02	126.2	882.6
149.000	1.5144E+04	.7774	0.000	7.7772E-02	3.4381E-02	0.000	1.0978E-02	9.5750E-02	118.3	808.0
150.000	1.5221E+04	.7694	0.000	7.5619E-02	3.0379E-02	0.000	1.0978E-02	.1099	118.3	809.2
151.000	1.5221E+04	.7694	0.000	7.5619E-02	3.0379E-02	0.000	1.0978E-02	.1099	118.3	809.2

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UNDERGROUND COAL GASIFICATION

DATA BASE

LARIMIE ENERGY TECHNOLOGY CENTER

HANNA II PHASE III

DAILY AVERAGE RESULTS

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  HANNA II COAL ANALYSIS
                                                                    KG/M**3   KJ/MOLE
COAL H/C  COAL O/C  COAL S/C  COAL N/C  WT F H2O  WT F ASH  DENSITY   HT COMB
.965      0.192      0.006    0.022     .0862     .2892      1363.     476.

CHAR H/C  CHAR O/C  CHAR S/C  CHAR N/C
.1018     0.0003    0.        0.

 TAR H/C   TAR O/C   TAR S/C   TAR N/C      C/MOLECULE
 1.00      0.        0.        0.            9.

  COAL      ASH&CHAR  --  TEMPERATURES (K)
   300.      1000.

  1   NUMBER OF POINTS ON OXYGEN TRACER TYPE CURVE
999.     2   TIME,TRACER FLAG (ZERO=NONE,ONE=ARGON,TWO=NITROGEN)

  1   NUMBER OF POINTS ON GAS LOSS TRACER TYPE CURVE
 999.   2  TIME,TRACER FLAG (SAME AS OXYGEN TRACER)

 1   NUMBER OF POINTS ON CHAR FLAG CURVE
999.      0   TIME,TRACER FLAG   (0=DO NOT USE CHAR, 1=USE CHAR)
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UCG DB - HA2.3 - OPERATING PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	INJ RATE mo/s IRED1 90	PRD RATE mo/s IRED1 91	INJ TEMP c IRED1 94	PRD TEMP c IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM mo/s IRED1 92	COOLING mo/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
152.000	13.13	32.88	40.00	46.60	252.3	171.6	0.000	0.000	.2100	1.000
153.000	1.3834E-02	1.3834E-02	40.00	52.24	168.9	168.9	0.000	0.000	.2100	1.000
154.000	1.3834E-02	1.3834E-02	40.00	115.8	168.9	168.9	0.000	0.000	.2100	1.000
155.000	7.0032E-02	.1350	40.00	200.4	168.7	168.1	0.000	0.000	.2100	1.000
156.000	2.316	4.996	40.00	231.4	160.4	133.5	0.000	0.000	.2100	1.000
157.000	4.403	10.19	40.00	236.4	150.1	94.38	0.000	0.000	.2100	1.000
158.000	3.186	9.973	40.00	241.4	154.1	91.44	0.000	0.000	.2100	1.000
159.000	2.549	9.680	40.00	249.9	179.4	94.59	0.000	0.000	.2100	1.000
160.000	2.702	10.08	40.00	260.3	184.8	99.67	0.000	0.000	.2100	1.000
161.000	2.742	9.818	40.00	262.7	171.5	101.1	0.000	0.000	.2100	1.000
162.000	7.851	14.55	40.00	261.8	210.6	106.8	0.000	0.000	.2100	1.000
163.000	24.27	37.46	40.00	251.9	426.4	131.2	0.000	0.000	.2100	1.000
164.000	32.49	54.86	40.00	237.6	526.9	140.5	0.000	0.000	.2100	1.000
165.000	24.48	48.61	40.00	233.9	396.0	161.3	0.000	0.000	.2100	1.000
166.000	22.92	48.22	40.00	235.3	365.9	184.6	0.000	0.000	.2100	1.000
167.000	27.82	60.05	40.00	239.6	368.9	162.1	0.000	0.000	.2100	1.000
168.000	37.63	81.97	39.87	241.8	330.2	139.3	0.000	0.000	.2100	1.000
169.000	46.26	98.95	38.70	274.1	306.8	158.6	0.000	0.000	.2100	1.000
170.000	50.99	104.1	39.43	280.9	277.7	170.3	0.000	0.000	.2100	1.000
171.000	49.25	100.2	35.18	273.8	237.3	199.2	0.000	0.000	.2100	1.000
172.000	41.88	84.30	37.52	252.4	285.6	125.8	0.000	0.000	.2100	1.000
173.000	44.18	89.11	47.81	259.5	412.3	141.3	0.000	0.000	.2100	1.000
174.000	44.15	96.58	40.00	192.1	424.5	144.1	0.000	0.000	.2100	1.000
175.000	48.96	88.41	41.13	206.4	465.1	167.7	0.000	0.000	.2100	1.000
176.000	49.67	89.82	45.01	221.4	480.1	165.9	0.000	0.000	.2100	1.000
177.000	49.86	94.38	44.53	214.9	480.2	165.1	0.000	0.000	.2100	1.000
178.000	49.19	97.63	47.48	220.0	484.0	180.1	0.000	0.000	.2100	1.000
179.000	48.72	94.67	48.58	225.1	528.1	279.9	0.000	0.000	.2100	1.000
180.000	48.65	97.65	52.62	235.6	611.3	429.3	0.000	0.000	.2100	1.000
181.000	45.58	94.96	50.20	234.0	514.4	343.7	0.000	0.000	.2100	1.000
182.000	55.79	106.8	52.42	241.4	500.5	157.5	0.000	0.000	.2100	1.000
183.000	68.34	125.2	53.10	272.1	609.7	197.2	0.000	0.000	.2100	1.000
184.000	69.07	128.0	51.41	279.9	617.0	205.0	0.000	0.000	.2100	1.000
185.000	69.27	125.3	57.17	290.5	678.4	354.0	0.000	0.000	.2100	1.000
186.000	70.26	132.7	60.92	306.4	718.1	419.7	0.000	0.000	.2100	1.000
187.000	69.48	129.8	61.50	319.6	718.4	431.2	0.000	0.000	.2100	1.000
188.000	69.95	130.1	60.87	328.2	730.5	450.1	0.000	0.000	.2100	1.000
189.000	77.29	141.6	60.73	333.1	779.1	444.6	0.000	0.000	.2100	1.000
190.000	89.32	164.9	65.98	338.8	863.5	431.5	0.000	0.000	.2100	1.000

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TIME (D)	INJ RATE kg/s IRED1 90	PRD RATE kg/s IRED1 91	INJ TEMP C IRED1 94	PRD TEMP C IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM kg/s IRED1 92	COOLING kg/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
191.000	89.11	166.2	67.80	346.0	865.8	426.5	0.000	0.000	.2100	0.000
192.000	89.73	164.6	68.60	350.1	871.1	437.4	0.000	0.000	.2100	0.000
193.000	86.81	156.9	68.11	346.1	894.6	533.3	0.000	0.000	.2100	0.000
194.000	85.31	149.2	65.49	340.2	934.9	644.5	0.000	0.000	.2100	0.000
195.000	82.36	145.3	62.58	340.7	911.6	638.9	0.000	0.000	.2100	0.000
196.000	85.14	155.5	62.84	326.6	856.0	477.8	0.000	0.000	.2100	0.000
197.000	83.49	146.5	61.66	313.3	760.1	307.0	0.000	0.000	.2100	0.000
198.000	83.16	146.1	63.27	311.7	756.9	303.3	0.000	0.000	.2100	0.000
199.000	83.07	144.3	66.35	311.0	759.5	309.0	0.000	0.000	.2100	0.000
200.000	86.67	146.3	62.15	310.8	791.7	307.1	0.000	0.000	.2100	0.000
201.000	88.69	149.3	63.33	317.5	814.3	317.7	0.000	0.000	.2100	0.000
202.000	88.95	146.6	62.60	324.5	829.4	355.0	0.000	0.000	.2100	0.000
203.000	87.70	146.1	64.59	330.4	861.3	475.8	0.000	0.000	.2100	0.000
204.000	87.88	148.6	64.96	346.5	853.6	450.0	0.000	0.000	.2100	0.000
205.000	89.01	148.4	67.49	357.9	860.6	434.0	0.000	0.000	.2100	0.000
206.000	87.88	149.1	64.45	360.0	848.3	430.2	0.000	0.000	.2100	0.000
207.000	87.69	144.9	61.80	361.8	849.3	429.1	0.000	0.000	.2100	0.000
208.000	85.84	137.4	64.10	363.9	844.0	438.1	0.000	0.000	.2100	0.000
209.000	85.39	138.7	65.48	372.3	834.4	417.0	0.000	0.000	.2100	0.000
210.000	83.78	135.6	64.81	374.5	817.5	403.9	0.000	0.000	.2100	0.000
211.000	84.76	137.2	66.08	390.1	832.4	419.7	0.000	0.000	.2100	0.000
212.000	76.69	134.8	66.29	391.1	809.1	411.5	0.000	0.000	.2100	0.000
213.000	76.69	134.8	66.29	391.1	809.1	411.5	0.000	0.000	.2100	0.000

UCG DB - HA2.3 - PRODUCT GAS ANALYSIS 1

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	ARGON molf !RED1 10	NITROGEN molf !RED1 11	OXYGEN molf !RED1 12	HYDROGEN molf !RED1 13	METHANE molf !RED1 14	CO molf !RED1 15	CO2 molf !RED1 16	ETHANE molf !RED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
152.000	3.8417E-03	.3481	2.3303E-03	.3387	4.1994E-02	.1280	.1340	2.6838E-03
153.000	3.9215E-03	.3534	3.1501E-03	.3379	3.9893E-02	.1049	.1534	2.8437E-03
154.000	4.0014E-03	.3587	3.9699E-03	.3371	3.7791E-02	8.1759E-02	.1728	3.0035E-03
155.000	4.0812E-03	.3639	4.7895E-03	.3364	3.5690E-02	5.8661E-02	.1921	3.1634E-03
156.000	4.1650E-03	.3697	5.5639E-03	.3351	3.3543E-02	3.5874E-02	.2113	3.3187E-03
157.000	4.4099E-03	.3932	4.5648E-03	.3153	2.9593E-02	2.5411E-02	.2227	3.2890E-03
158.000	4.8367E-03	.4250	3.2311E-03	.2905	2.5796E-02	2.4342E-02	.2217	2.8925E-03
159.000	4.4102E-03	.4657	2.5478E-03	.2590	2.6070E-02	3.0491E-02	.2079	2.6479E-03
160.000	4.7254E-03	.4939	2.5200E-03	.2368	2.4176E-02	3.7247E-02	.1970	2.5028E-03
161.000	5.5767E-03	.4828	7.1303E-03	.2394	2.0655E-02	3.8696E-02	.1962	2.5531E-03
162.000	5.0496E-03	.5020	6.7243E-03	.2138	2.0352E-02	6.2951E-02	.1782	2.8556E-03
163.000	5.3506E-03	.5643	2.2478E-03	.1538	2.3674E-02	7.8781E-02	.1663	3.2529E-03
164.000	5.2745E-03	.6017	2.1741E-03	.1092	2.4732E-02	8.7048E-02	.1656	3.3917E-03
165.000	2.2430E-03	.5331	3.0915E-03	.1443	3.3922E-02	.1481	.1286	5.0408E-03
166.000	6.8692E-05	.4581	2.7591E-03	.1915	4.5053E-02	.1928	9.9369E-02	6.6959E-03
167.000	8.5533E-04	.4515	1.2463E-03	.2035	4.8565E-02	.1704	.1133	6.7408E-03
168.000	3.0952E-03	.4434	1.2057E-03	.2215	5.0764E-02	.1417	.1294	6.6023E-03
169.000	4.5870E-03	.4395	1.1422E-03	.2335	5.1368E-02	.1296	.1339	6.4467E-03
170.000	4.6526E-03	.4438	9.5641E-04	.2398	5.9589E-02	9.7315E-02	.1472	6.5690E-03
171.000	5.2253E-03	.4658	1.2788E-03	.2125	6.4780E-02	6.8842E-02	.1729	8.6259E-03
172.000	5.3173E-03	.4945	1.1928E-03	.1888	4.5525E-02	.1010	.1544	9.2947E-03
173.000	4.6155E-03	.4433	1.5144E-03	.2188	5.2215E-02	.1401	.1327	6.7663E-03
174.000	4.5931E-03	.4405	8.7715E-04	.2177	5.6422E-02	.1542	.1184	7.3389E-03
175.000	5.2844E-03	.4748	1.1313E-03	.1701	5.0676E-02	.2055	8.3090E-02	9.2537E-03
176.000	5.0854E-03	.4838	1.7017E-03	.1667	4.6263E-02	.1882	.1011	6.4582E-03
177.000	5.4747E-03	.4948	1.5997E-03	.1613	4.1422E-02	.1889	9.7304E-02	9.1617E-03
178.000	5.3532E-03	.4816	1.9245E-03	.1876	3.9707E-02	.1844	9.2921E-02	6.4319E-03
179.000	5.3129E-03	.4709	2.1100E-03	.1970	4.6292E-02	.1642	.1091	5.0220E-03
180.000	5.2619E-03	.4565	2.8778E-03	.2071	5.4972E-02	.1485	.1191	5.6505E-03
181.000	5.2000E-03	.4562	2.2230E-03	.2056	5.1067E-02	.1601	.1141	5.4415E-03
182.000	5.3507E-03	.4906	7.0835E-04	.1762	3.6250E-02	.1829	.1015	6.4349E-03
183.000	5.4357E-03	.4894	1.2024E-03	.1790	3.8699E-02	.1737	.1075	4.9886E-03
184.000	5.4100E-03	.4898	1.3172E-03	.1826	4.0341E-02	.1630	.1129	4.6113E-03
185.000	5.3832E-03	.4855	1.5168E-03	.1835	4.8811E-02	.1508	.1195	5.0180E-03
186.000	5.2462E-03	.4777	1.2788E-03	.1886	5.2239E-02	.1433	.1253	6.2522E-03
187.000	5.3119E-03	.4827	1.3964E-03	.1794	4.9764E-02	.1387	.1317	1.1028E-02
188.000	5.2340E-03	.4904	8.9637E-04	.1642	5.2698E-02	.1392	.1410	6.4421E-03
189.000	5.6227E-03	.5003	2.0425E-03	.1550	4.6767E-02	.1438	.1413	4.9683E-03
190.000	5.5857E-03	.4950	1.5646E-03	.1554	4.7849E-02	.1537	.1357	5.0904E-03

TIME (D)	ARGON mol/ IRED1 10	NITROGEN mol/ IRED1 11	OXYGEN mol/ IRED1 12	HY mol/ IRED1 13	METHANE mol/ IRED1 14	CO mol/ IRED1 15	CO2 mol/ IRED1 16	ETHANE mol/ IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
191.000	5.5741E-03	.4906	1.6781E-03	.1577	5.0908E-02	.1489	.1393	5.2611E-03
192.000	5.7982E-03	.5148	1.5894E-03	.1469	4.3708E-02	.1376	.1452	4.4408E-03
193.000	5.8910E-03	.5246	1.4478E-03	.1393	4.4007E-02	.1294	.1511	4.2491E-03
194.000	5.8939E-03	.5320	1.7756E-03	.1322	4.4476E-02	.1221	.1556	5.9615E-03
195.000	6.1727E-03	.5425	1.7777E-03	.1325	4.0655E-02	.1122	.1593	4.9554E-03
196.000	6.3583E-03	.5626	2.3815E-03	.1229	3.3533E-02	.1041	.1640	4.1796E-03
197.000	6.3692E-03	.5678	1.4170E-03	.1174	3.1906E-02	.1103	.1611	3.7687E-03
198.000	6.2757E-03	.5717	9.4813E-04	.1171	3.2033E-02	.1115	.1569	3.5827E-03
199.000	6.4620E-03	.5861	9.9229E-04	.1093	2.9391E-02	.1075	.1578	2.5287E-03
200.000	6.6735E-03	.5944	1.6736E-03	.1042	2.7975E-02	.1062	.1565	2.3748E-03
201.000	6.5979E-03	.5939	1.3685E-03	.1026	2.9985E-02	.1091	.1540	2.4596E-03
202.000	6.7522E-03	.5994	1.6001E-03	9.8833E-02	2.8068E-02	.1063	.1567	2.3849E-03
203.000	6.7790E-03	.5933	2.8496E-03	.1014	2.9916E-02	.1077	.1559	2.1393E-03
204.000	6.5733E-03	.5904	2.8006E-03	.1050	2.8327E-02	.1128	.1519	2.1348E-03
205.000	6.6787E-03	.6026	1.2159E-03	9.7400E-02	2.4053E-02	.1088	.1575	1.8379E-03
206.000	6.7838E-03	.6019	8.7697E-04	9.7258E-02	2.4806E-02	.1021	.1644	1.8603E-03
207.000	6.7416E-03	.6140	6.1170E-04	9.0220E-02	2.2803E-02	9.6154E-02	.1678	1.6257E-03
208.000	6.7508E-03	.6121	1.0796E-03	8.9270E-02	2.2184E-02	.1036	.1634	1.6617E-03
209.000	6.8187E-03	.6135	1.0804E-03	9.1723E-02	2.1163E-02	.1057	.1585	1.5266E-03
210.000	6.9111E-03	.6131	1.3096E-03	9.1322E-02	2.0125E-02	.1094	.1564	1.4206E-03
211.000	6.7571E-03	.6049	8.4837E-04	9.4207E-02	2.0647E-02	.1157	.1555	1.4914E-03
212.000	6.7222E-03	.5926	1.4009E-03	9.8756E-02	2.3184E-02	.1194	.1563	1.6562E-03
213.000	6.7222E-03	.5926	1.4009E-03	9.8756E-02	2.3184E-02	.1194	.1563	1.6562E-03

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UCG DB - HA2.3 - PRODUCT GAS ANALYSIS 2

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	C2H4 molf !RED1 17	C6 molf !RED1 19	H10 molf !RED1 20	H2S molf !RED1 21	TAR/DRY !RED1 24	H2O/DRY !RED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
152.000	0.000	1.5249E-04	2.4398E-04	0.000	0.000	.1144
153.000	0.000	2.5247E-04	4.0395E-04	0.000	0.000	0.000
154.000	0.000	3.5244E-04	5.6391E-04	0.000	0.000	0.000
155.000	0.000	4.5241E-04	7.2385E-04	0.000	0.000	4.3100E-04
156.000	0.000	5.5112E-04	8.8179E-04	0.000	0.000	2.0728E-02
157.000	0.000	6.0169E-04	9.6270E-04	0.000	0.000	.1702
158.000	0.000	6.6971E-04	1.0715E-03	0.000	0.000	.7083
159.000	0.000	4.7279E-04	7.5647E-04	0.000	0.000	1.267
160.000	0.000	4.3326E-04	6.9321E-04	0.000	0.000	1.361
161.000	0.000	2.7072E-03	4.3316E-03	0.000	0.000	1.264
162.000	0.000	3.1132E-03	4.9811E-03	0.000	0.000	.2038
163.000	0.000	8.8572E-04	1.4172E-03	0.000	0.000	.1158
164.000	0.000	3.3254E-04	5.3207E-04	0.000	0.000	.3033
165.000	0.000	6.4415E-04	1.0306E-03	0.000	0.000	.3570
166.000	0.000	1.4020E-03	2.2432E-03	0.000	0.000	.2352
167.000	0.000	1.5098E-03	2.4156E-03	0.000	0.000	.2493
168.000	0.000	9.4855E-04	1.5177E-03	0.000	0.000	.2384
169,000	0.000	4.1755E-07	6.2633E-07	0.000	0.000	.2037
170.000	0.000	2.9204E-05	4.3805E-05	0.000	0.000	.1630
171.000	0.000	1.3182E-05	1.9774E-05	0.000	0.000	.2189
172.000	0.000	5.0049E-06	6.0059E-06	0.000	0.000	.3350
173.000	0.000	0.000	0.000	0.000	0.000	.1459
174.000	0.000	4.3451E-06	6.2168E-06	0.000	0.000	.2423
175.000	0.000	6.8445E-05	9.1135E-05	0.000	0.000	9.8882E-02
176.000	0.000	2.9918E-04	3.5901E-04	0.000	0.000	.1222
177.000	0.000	0.000	0.000	0.000	0.000	.2008
178.000	0.000	0.000	0.000	0.000	0.000	.2261
179.000	0.000	0.000	0.000	0.000	0.000	.1802
180.000	0.000	0.000	0.000	0.000	0.000	.1764
181.000	0.000	0.000	0.000	0.000	0.000	.2972
182.000	0.000	0.000	0.000	0.000	0.000	.2139
183.000	0.000	0.000	0.000	0.000	0.000	.1501
184.000	0.000	0.000	0.000	0.000	0.000	.1635
185.000	0.000	0.000	0.000	0.000	0.000	.1293
186.000	0.000	0.000	0.000	0.000	0.000	.1569
187.000	0.000	0.000	0.000	0.000	0.000	.1561
188.000	0.000	0.000	0.000	0.000	0.000	.1695
189.000	0.000	7.5148E-05	9.0177E-05	0.000	0.000	.1763
190.000	0.000	9.1810E-05	1.3020E-04	0.000	0.000	.1717

TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2 molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
191.000	0.000	0.000	0.000	0.000	0.000	.1734
192.000	0.000	0.000	0.000	0.000	0.000	.2110
193.000	0.000	0.000	0.000	0.000	0.000	.2163
194.000	0.000	0.000	0.000	0.000	0.000	.1936
195.000	0.000	0.000	0.000	0.000	0.000	.2277
196.000	0.000	0.000	0.000	0.000	0.000	.3172
197.000	0.000	0.000	0.000	0.000	0.000	.2779
198.000	0.000	0.000	0.000	0.000	0.000	.2883
199.000	0.000	0.000	0.000	0.000	0.000	.3056
200.000	0.000	0.000	0.000	0.000	0.000	.2867
201.000	0.000	0.000	0.000	0.000	0.000	.2821
202.000	0.000	3.9374E-06	9.7249E-06	0.000	0.000	.2732
203.000	0.000	0.000	0.000	0.000	0.000	.2667
204.000	0.000	0.000	0.000	0.000	0.000	.2802
205.000	0.000	0.000	0.000	0.000	0.000	.2887
206.000	0.000	0.000	0.000	0.000	0.000	.3098
207.000	0.000	0.000	0.000	0.000	0.000	.3017
208.000	0.000	0.000	0.000	0.000	0.000	.2569
209.000	0.000	0.000	0.000	0.000	0.000	.2780
210.000	0.000	0.000	0.000	0.000	0.000	.2738
211.000	0.000	1.5001E-05	1.8001E-05	0.000	0.000	.2561
212.000	0.000	0.000	0.000	0.000	0.000	.3441
213.000	0.000	0.000	0.000	0.000	0.000	.3441

UCG DB - HA2.3 - MATERIAL BALANCES

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL RT mo/s !RED1 44	ASH RATE mo/s !RED1 46	H2O INFX mo/s !RED1 47	H2O COAL mo/s !RED1 48	-H2O RXN mo/s !RED1 49	O2 per COAL !RED1 60	H2O per COAL !RED1 61	CHAR RT mo/s !RED1 64	CHAR per COAL !RED1 63	RECOVERY % !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
152.000	9.133	.9201	10.60	1.158	8.308	9.4714E-02	.9099	15.84	.6336	98.63
153.000	4.2237E-03	4.2553E-04	3.3506E-03	5.3553E-04	3.8861E-03	.1283	.9201	6.4552E-03	.6044	45.31
154.000	4.1560E-03	4.1871E-04	3.3407E-03	5.2695E-04	3.8676E-03	.1630	.9306	5.4887E-03	.5690	45.98
155.000	3.8735E-02	3.9025E-03	3.3998E-02	4.9113E-03	3.6849E-02	.1989	.9415	3.5359E-02	.5250	47.98
156.000	1.419	.1429	1.281	.1799	1.346	.2366	.9504	1.241	.4679	100.0
157.000	2.517	.2536	3.320	.3191	2.189	.3030	.8691	1.360	.3503	100.0
158.000	1.648	.1660	5.203	.2090	1.290	.3547	.7822	.7068	.3006	100.0
159.000	1.164	.1173	6.080	.1476	.8169	.3810	.7018	.7663	.3970	100.0
160.000	1.135	.1144	6.380	.1439	.7160	.4086	.6307	.8641	.4322	100.0
161.000	1.226	.1235	6.015	.1555	.7757	.3896	.6373	.8153	.4000	100.0
162.000	3.465	.3491	3.768	.4393	1.784	.3985	.5248	2.112	.3823	100.0
163.000	9.411	.9482	5.491	1.193	2.759	.4979	.2945	3.377	.2617	100.0
164.000	12.04	1.213	12.64	1.527	1.402	.5845	.1166	-1.806	-.1790	100.0
165.000	11.63	1.172	14.03	1.475	2.719	.4217	.2330	2.042	.1447	100.0
166.000	14.01	1.412	12.87	1.777	5.459	.2624	.3892	9.495	.4034	100.0
167.000	17.05	1.717	17.60	2.161	7.785	.2390	.4560	14.76	.4634	100.0
168.000	22.55	2.272	25.23	2.859	12.31	.2222	.5461	24.12	.5168	100.0
169,000	26.97	2.717	29.70	3.420	16.41	.2127	.6021	34.04	.5461	100.0
170.000	28.46	2.867	31.04	3.608	20.21	.1679	.7121	49.11	.6277	100.0
171.000	26.74	2.694	31.78	3.390	17.50	.2218	.6535	37.15	.5786	100.0
172.000	21.36	2.152	25.44	2.708	10.38	.3103	.4808	19.63	.4510	100.0
173.000	26.32	2.652	22.04	3.337	14.03	.2412	.5325	24.48	.4777	100.0
174.000	26.85	2.705	29.58	3.405	14.46	.2038	.5455	31.59	.5397	100.0
175.000	28.83	2.905	14.51	3.655	10.24	.2491	.3541	26.03	.4684	100.0
176.000	28.08	2.829	15.07	3.561	8.952	.3068	.3185	15.12	.2693	100.0
177.000	27.21	2.742	20.52	3.450	8.259	.3116	.3030	16.69	.3742	100.0
178.000	26.30	2.650	24.77	3.335	10.15	.2786	.3855	25.23	.4852	100.0
179.000	26.42	2.662	22.86	3.350	11.67	.2697	.4417	25.32	.4884	99.28
180.000	27.77	2.798	25.38	3.521	14.41	.2328	.5179	31.44	.5279	100.0
181.000	25.93	2.613	26.56	3.288	12.15	.2480	.4808	24.74	.4882	100.0
182.000	29.52	2.974	23.95	3.743	9.389	.3243	.3209	17.61	.3719	100.0
183.000	35.94	3.621	23.98	4.557	12.23	.3269	.3400	21.73	.3756	100.0
184.000	35.81	3.607	26.64	4.540	13.21	.3209	.3689	25.16	.4099	100.0
185.000	36.51	3.679	25.05	4.629	15.25	.2923	.4170	31.94	.4655	99.61
186.000	38.25	3.853	30.47	4.849	17.33	.2721	.4531	36.30	.4863	100.0
187.000	38.42	3.870	29.15	4.871	16.52	.2807	.4304	31.75	.4426	100.0
188.000	38.48	3.877	27.53	4.880	13.58	.3391	.3531	13.66	.2469	100.0
189.000	41.22	4.153	27.73	5.226	11.86	.3887	.2885	1.847	3.4329E-02	100.0
190.000	48.98	4.934	31.90	6.210	13.96	.3768	.2850	2.523	4.4156E-02	100.0

TIME (D)	COAL RT mo/s IRED1 44	ASH RATE mo/s IRED1 46	H2O INFX mo/s IRED1 47	H2O COAL mo/s IRED1 48	-H2O RXN mo/s IRED1 49	O2 per COAL IRED1 60	H2O per COAL IRED1 61	CHAR RT mo/s IRED1 64	CHAR per COAL IRED1 63	RECOVERY % IRED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
191.000	49.55	4.992	33.36	6.282	15.10	.3679	.3046	4.085	6.9106E-02	100.0
192.000	45.64	4.598	34.53	5.786	11.70	.4193	.2554	-2.071	-5.988E-02	100.0
193.000	42.94	4.326	32.73	5.445	10.20	.4375	.2380	-4.901	-.1449	99.90
194.000	41.80	4.212	28.59	5.300	9.741	.4413	.2329	-4.359	-.1259	100.0
195.000	38.15	3.844	30.70	4.837	8.682	.4648	.2272	-3.526	-.1198	100.0
196.000	36.60	3.687	39.09	4.640	6.261	.5233	.1708	-10.49	-.4232	100.0
197.000	35.65	3.592	32.21	4.520	4.882	.5359	.1368	-13.05	-.5941	100.0
198.000	34.91	3.517	33.16	4.426	4.939	.5279	.1412	-7.961	-.2988	100.0
199.000	33.15	3.339	32.91	4.203	3.435	.5613	.1035	-9.615	-.4126	100.0
200.000	33.59	3.385	31.08	4.259	2.798	.5775	8.3484E-02	-10.02	-.4268	100.0
201.000	34.71	3.497	31.48	4.401	3.053	.5645	8.7825E-02	-8.053	-.3122	100.0
202.000	34.03	3.428	29.46	4.314	2.225	.5860	6.5575E-02	-11.41	-.5255	99.43
203.000	34.34	3.459	29.16	4.353	2.769	.5777	8.0629E-02	-11.82	-.5298	100.0
204.000	34.51	3.477	31.01	4.376	2.861	.5727	8.2887E-02	-10.92	-.4718	100.0
205.000	33.87	3.412	29.98	4.294	1.055	.6133	3.1108E-02	-16.16	-.9963	100.0
206.000	33.59	3.384	32.12	4.259	1.151	.6201	3.4174E-02	-13.02	-.8864	100.0
207.000	32.29	3.254	29.52	4.095	9.0615E-02	.6492	2.6909E-03	-11.93	-.9048	100.0
208.000	32.00	3.224	23.71	4.058	-.2791	.6476	-8.512E-03	-10.91	-.8749	100.0
209.000	31.33	3.156	26.13	3.972	-5.328E-02	.6417	-1.995E-03	-16.89	-1.269	100.0
210.000	30.76	3.099	24.76	3.900	-.3818	.6459	-1.243E-02	-13.46	-1.060	100.0
211.000	32.25	3.249	23.57	4.089	-.2332	.6341	-7.715E-03	-6.989	-.5588	100.0
212.000	31.02	3.125	28.49	3.932	.3978	.6169	1.3396E-02	-2.210	-.2021	116.0
213.000	31.02	3.125	28.49	3.932	.3978	.6169	1.3396E-02	-2.210	-.2021	116.0

UCG DB - HA2.3 - ENERGY PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/02 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
152.000	4347.	1.187	0.000	3.4201E-03	3.4035E-02	0.000	1.0978E-02	-.2390	175.3	1870.
153.000	2.010	1.151	0.000	4.1751E-03	0.000	0.000	1.0978E-02	-.1702	167.3	1759.
154.000	1.978	1.115	0.000	1.8217E-02	0.000	0.000	1.0978E-02	-.1475	159.4	1651.
155.000	18.44	1.077	0.000	3.8159E-02	1.3681E-04	0.000	1.0978E-02	-.1297	151.5	1546.
156.000	675.3	1.037	0.000	4.7551E-02	6.5914E-03	0.000	1.0978E-02	-.1054	143.4	1442.
157.000	1198.	.9594	0.000	5.7215E-02	5.4660E-02	0.000	1.0978E-02	-8.589E-02	131.5	1243.
158.000	784.5	.8983	0.000	8.9480E-02	.2323	0.000	1.0978E-02	-.2347	120.4	1053.
159.000	554.0	.8641	0.000	.1289	.4291	0.000	1.0978E-02	-.4367	112.1	894.3
160.000	540.3	.8339	0.000	.1442	.4723	0.000	1.0978E-02	-.4650	105.6	794.1
161.000	583.6	.8641	0.000	.1347	.4216	0.000	1.0978E-02	-.4350	113.9	876.0
162.000	1649.	.8484	0.000	6.6306E-02	6.5798E-02	0.000	1.0978E-02	4.8432E-03	115.4	854.8
163.000	4480.	.7216	0.000	5.8396E-02	3.8061E-02	0.000	1.0978E-02	.1673	96.38	634.6
164.000	5732.	.6209	0.000	6.3182E-02	9.7812E-02	0.000	1.0978E-02	.2034	84.66	523.5
165.000	5537.	.8027	0.000	5.7101E-02	.1016	0.000	1.0978E-02	2.3912E-02	124.1	866.3
166.000	6671.	.9722	0.000	4.7045E-02	6.0470E-02	0.000	1.0978E-02	-9.440E-02	166.1	1347.
167.000	8114.	.9883	0.000	4.9561E-02	6.4870E-02	0.000	1.0978E-02	-.1173	166.9	1373.
168.000	1.0733E+04	1.006	0.000	5.1856E-02	6.4585E-02	0.000	1.0978E-02	-.1371	163.1	1367.
169,000	1.2838E+04	1.020	0.000	6.0634E-02	5.7436E-02	0.000	1.0978E-02	-.1531	159.2	1347.
170.000	1.3545E+04	1.056	0.000	6.2404E-02	4.7544E-02	0.000	1.0978E-02	-.1809	159.5	1337.
171.000	1.2729E+04	.9818	0.000	6.3640E-02	6.2653E-02	0.000	1.0978E-02	-.1227	151.4	1208.
172.000	1.0167E+04	.9025	0.000	6.4403E-02	9.9793E-02	0.000	1.0978E-02	-8.136E-02	137.6	1045.
173.000	1.2529E+04	.9882	0.000	5.1206E-02	3.9834E-02	0.000	1.0978E-02	-9.386E-02	159.2	1335.
174.000	1.2781E+04	1.024	0.000	3.7584E-02	6.5033E-02	0.000	1.0978E-02	-.1412	167.5	1413.
175.000	1.3723E+04	.9771	0.000	3.4858E-02	2.5470E-02	0.000	1.0978E-02	-5.209E-02	166.6	1305.
176.000	1.3368E+04	.9202	0.000	3.9444E-02	3.2323E-02	0.000	1.0978E-02	-6.612E-03	153.4	1179.
177.000	1.2953E+04	.9156	0.000	4.1559E-02	5.3724E-02	0.000	1.0978E-02	-2.551E-02	150.7	1133.
178.000	1.2520E+04	.9627	0.000	4.5421E-02	6.3430E-02	0.000	1.0978E-02	-8.620E-02	151.2	1167.
179.000	1.2575E+04	.9676	0.000	4.4982E-02	5.0494E-02	0.000	1.0978E-02	-7.769E-02	151.8	1198.
180.000	1.3219E+04	1.000	0.000	4.6720E-02	4.8829E-02	0.000	1.0978E-02	-.1105	159.0	1295.
181.000	1.2345E+04	.9873	0.000	5.1167E-02	8.0897E-02	0.000	1.0978E-02	-.1340	158.1	1300.
182.000	1.4052E+04	.9096	0.000	4.9106E-02	5.9194E-02	0.000	1.0978E-02	-3.258E-02	144.4	1094.
183.000	1.7108E+04	.9077	0.000	5.4122E-02	4.1984E-02	0.000	1.0978E-02	-1.851E-02	142.6	1082.
184.000	1.7043E+04	.9129	0.000	5.7854E-02	4.6359E-02	0.000	1.0978E-02	-3.175E-02	141.4	1073.
185.000	1.7380E+04	.9343	0.000	5.7548E-02	3.6228E-02	0.000	1.0978E-02	-4.268E-02	146.4	1121.
186.000	1.8205E+04	.9500	0.000	6.2276E-02	4.3430E-02	0.000	1.0978E-02	-7.035E-02	150.7	1172.
187.000	1.8286E+04	.9339	0.000	6.4169E-02	4.2041E-02	0.000	1.0978E-02	-5.471E-02	152.0	1170.
188.000	1.8319E+04	.8706	0.000	6.6427E-02	4.5315E-02	0.000	1.0978E-02	2.9533E-03	143.3	1086.
189.000	1.9620E+04	.8267	0.000	6.8421E-02	4.7572E-02	0.000	1.0978E-02	4.2647E-02	134.7	1000.
190.000	2.3313E+04	.8383	0.000	6.7752E-02	4.5545E-02	0.000	1.0978E-02	3.3682E-02	138.8	1042.

TIME (D)	COAL kJ /mol IRED1 72	PRODUCT frac IRED1 74	TAR frac IRED1 73	SENS ... frac IRED1 76	STEAM frac IRED1 77	COOLING frac IRED1 80	SEN HT INSU IRED1 78	LOSS frac IRED1 75	HC kJ /mol IRED1 81	HC/02 kJ /mol IRED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
191.000	2.3585E+04	.8455	0.000	6.9270E-02	4.5766E-02	0.000	1.0978E-02	2.4762E-02	140.7	1066.
192.000	2.1723E+04	.7937	0.000	7.5501E-02	5.8155E-02	0.000	1.0978E-02	5.7997E-02	126.8	916.1
193.000	2.0440E+04	.7709	0.000	7.5488E-02	5.9971E-02	0.000	1.0978E-02	7.8930E-02	122.2	865.8
194.000	1.9898E+04	.7623	0.000	7.2636E-02	5.3569E-02	0.000	1.0978E-02	9.6775E-02	121.2	846.7
195.000	1.8161E+04	.7404	0.000	7.8071E-02	6.5317E-02	0.000	1.0978E-02	.1015	113.5	777.8
196.000	1.7420E+04	.6843	0.000	8.3109E-02	9.4518E-02	0.000	1.0978E-02	.1234	101.0	666.9
197.000	1.6970E+04	.6694	0.000	7.6060E-02	8.2506E-02	0.000	1.0978E-02	.1573	99.05	648.1
198.000	1.6616E+04	.6769	0.000	7.6722E-02	8.6569E-02	0.000	1.0978E-02	.1452	99.11	644.2
199.000	1.5777E+04	.6432	0.000	7.8944E-02	9.4143E-02	0.000	1.0978E-02	.1690	91.78	581.8
200.000	1.5991E+04	.6288	0.000	7.9183E-02	8.9526E-02	0.000	1.0978E-02	.1878	88.43	552.7
201.000	1.6524E+04	.6397	0.000	8.0093E-02	8.7375E-02	0.000	1.0978E-02	.1781	90.75	567.7
202.000	1.6196E+04	.6181	0.000	8.2450E-02	8.5425E-02	0.000	1.0978E-02	.1993	87.04	539.5
203.000	1.6344E+04	.6309	0.000	8.2851E-02	8.2682E-02	0.000	1.0978E-02	.1888	89.44	560.1
204.000	1.6428E+04	.6394	0.000	8.8785E-02	8.6996E-02	0.000	1.0978E-02	.1701	90.49	569.3
205.000	1.6121E+04	.5924	0.000	9.3556E-02	9.0631E-02	0.000	1.0978E-02	.2087	82.91	511.3
206.000	1.5990E+04	.5816	0.000	9.6357E-02	9.6897E-02	0.000	1.0978E-02	.2104	81.68	504.2
207.000	1.5372E+04	.5494	0.000	9.8273E-02	9.6015E-02	0.000	1.0978E-02	.2416	75.84	458.8
208.000	1.5234E+04	.5544	0.000	9.3831E-02	8.1134E-02	0.000	1.0978E-02	.2559	77.18	468.5
209.000	1.4911E+04	.5632	0.000	9.9195E-02	8.9021E-02	0.000	1.0978E-02	.2338	77.35	468.5
210.000	1.4643E+04	.5614	0.000	9.9418E-02	8.7525E-02	0.000	1.0978E-02	.2370	77.20	468.2
211.000	1.5351E+04	.5730	0.000	.1005	8.0260E-02	0.000	1.0978E-02	.2315	80.44	494.3
212.000	1.4763E+04	.5919	0.000	.1066	.1055	0.000	1.0978E-02	.1813	85.23	536.4
213.000	1.4763E+04	.5919	0.000	.1066	.1055	0.000	1.0978E-02	.1813	85.23	536.4

UNDERGROUND COAL GASIFICATION

DATA BASE

LARIMIE ENERGY TECHNOLOGY CENTER

HANNA III

DAILY AVERAGE RESULTS

UCG DB - HA3 - OPERATING PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	INJ RATE mo/s !RED1 90	PRD RATE mo/s !RED1 91	INJ TEMP c !RED1 94	PRD TEMP c !RED1 95	INJ PRES kPa !RED1 96	PRD PRES kPa !RED1 97	STEAM mo/s !RED1 92	COOLING mo/s !RED1 93	INJ O2 frac !RED1 6	INJ H2O frac !RED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
162.000	.8723	.3460	21.32	17.87	1220.	288.5	0.000	0.000	.2100	0.000
163.000	1.546	.8866	20.67	15.62	1097.	302.3	0.000	0.000	.2100	0.000
164.000	1.666	1.448	20.04	17.77	1082.	317.9	0.000	0.000	.2100	0.000
165.000	1.664	2.238	25.04	24.46	1035.	235.6	0.000	0.000	.2100	0.000
166.000	1.500	2.106	25.20	24.13	955.1	237.0	0.000	0.000	.2100	0.000
167.000	1.714	2.616	25.60	24.06	1005.	238.7	0.000	0.000	.2100	0.000
168.000	1.848	2.806	23.37	21.64	1016.	241.1	0.000	0.000	.2100	0.000
169.000	1.863	2.798	22.20	20.54	1001.	243.0	0.000	0.000	.2100	0.000
170.000	1.935	3.061	22.34	20.62	995.3	245.2	0.000	0.000	.2100	0.000
171.000	1.997	3.266	23.67	20.92	982.5	244.8	0.000	0.000	.2100	0.000
172.000	2.024	3.388	20.24	17.30	912.0	245.4	0.000	0.000	.2100	0.000
173.000	4.781	8.838	25.41	53.35	421.2	217.8	0.000	0.000	.2100	0.000
174.000	28.25	44.97	53.07	366.2	421.6	193.9	0.000	0.000	.2100	0.000
175.000	39.93	67.42	56.73	432.2	405.0	248.9	0.000	0.000	.2100	0.000
176.000	40.14	65.83	54.12	434.8	388.8	251.6	0.000	0.000	.2100	0.000
177.000	40.78	66.30	54.05	432.9	379.4	240.6	0.000	0.000	.2100	0.000
178.000	30.83	51.89	46.87	433.3	319.3	179.6	0.000	0.000	.2100	0.000
179.000	12.31	29.18	40.94	213.7	240.2	197.4	0.000	0.000	.2100	0.000
180.000	15.05	25.14	40.79	227.9	284.0	218.3	0.000	0.000	.2100	0.000
181.000	25.87	51.35	48.26	330.7	290.0	203.8	0.000	0.000	.2100	0.000
182.000	33.67	66.41	50.67	365.2	283.1	183.7	0.000	0.000	.2100	0.000
183.000	34.06	67.26	47.02	362.2	275.2	181.7	0.000	0.000	.2100	0.000
184.000	37.14	63.79	52.51	353.5	274.5	179.7	0.000	0.000	.2100	0.000
185.000	39.80	75.64	50.91	370.2	320.5	190.2	0.000	0.000	.2100	0.000
186.000	39.78	78.90	51.65	266.7	317.5	186.4	0.000	0.000	.2100	0.000
187.000	43.91	79.33	59.05	315.8	338.7	204.8	0.000	0.000	.2100	0.000
188.000	53.16	94.05	57.20	350.2	383.6	252.5	0.000	0.000	.2100	0.000
189.000	55.72	96.18	59.52	431.0	388.0	265.7	0.000	0.000	.2100	0.000
190.000	56.29	94.51	64.32	422.5	369.3	268.2	0.000	0.000	.2100	0.000
191.000	59.69	100.3	62.76	445.5	388.2	288.7	0.000	0.000	.2100	0.000
192.000	59.63	110.3	62.31	393.1	448.6	311.7	0.000	0.000	.2100	0.000
193.000	59.62	106.0	67.32	308.2	390.2	281.4	0.000	0.000	.2100	0.000
194.000	59.44	109.5	63.71	222.6	369.5	276.9	0.000	0.000	.2100	0.000
195.000	59.65	104.6	64.95	303.1	351.5	268.2	0.000	0.000	.2100	0.000
196.000	63.00	102.3	69.64	381.6	387.9	292.5	0.000	0.000	.2100	0.000
197.000	69.64	112.9	70.40	432.1	448.4	334.1	0.000	0.000	.2100	0.000
198.000	69.54	108.8	70.94	439.2	453.7	335.3	0.000	0.000	.2100	0.000
199.000	69.58	109.4	69.35	451.3	442.7	328.5	0.000	0.000	.2100	0.000
200.000	68.76	109.3	66.49	407.8	425.1	320.5	0.000	0.000	.2100	0.000

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  HANNA III COAL ANALYSIS

                                                                    KG/M**3   KJ/MOLE
COAL H/C  COAL O/C  COAL S/C  COAL N/C  WT F H2O  WT F ASH  DENSITY   HT COMB
.965      0.192      0.006    0.022     .0862     .2892     1363.     476.

CHAR H/C  CHAR O/C  CHAR S/C  CHAR N/C
.1018     0.0003    0.        0.

 TAR H/C   TAR O/C   TAR S/C   TAR N/C      C/MOLECULE
 1.00      0.        0.        0.           9.

  COAL      ASH&CHAR  --  TEMPERATURES (K)
   300.      1000.

  1   NUMBER OF POINTS ON OXYGEN TRACER TYPE CURVE
999.     2   TIME,TRACER FLAG (ZERO=NONE,ONE=ARGON,TWO=NITROGEN)

  1   NUMBER OF POINTS ON GAS LOSS TRACER TYPE CURVE
 999.   2  TIME,TRACER FLAG (SAME AS OXYGEN TRACER)

 1   NUMBER OF POINTS ON CHAR FLAG CURVE
999.      0   TIME,TRACER FLAG   (0=DO NOT USE CHAR, 1=USE CHAR)
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UCG DB - HA3 - PRODUCT GAS ANALYSIS 1

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	ARGON molf IRED1 10	NITROGEN molf IRED1 11	OXYGEN molf IRED1 12	HYDROGEN molf IRED1 13	METHANE molf IRED1 14	CO molf IRED1 15	CO2 molf IRED1 16	ETHANE molf IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
162.000	6.4992E-03	.5560	4.6514E-03	.1166	7.6766E-02	4.6007E-02	.1771	9.0423E-03
163.000	7.1873E-03	.6369	4.8607E-03	8.7705E-02	3.0921E-02	4.3837E-02	.1799	3.6630E-03
164.000	6.9542E-03	.6553	1.8692E-02	7.7665E-02	3.1510E-02	3.9190E-02	.1610	3.8870E-03
165.000	6.5965E-03	.6138	4.4913E-03	9.8807E-02	3.1854E-02	5.4622E-02	.1783	4.0371E-03
166.000	6.7630E-03	.6313	4.1774E-03	8.6764E-02	3.0146E-02	5.0043E-02	.1779	3.9327E-03
167.000	6.5695E-03	.6189	4.1630E-03	9.3056E-02	3.4207E-02	5.5050E-02	.1740	4.3968E-03
168.000	6.8484E-03	.6218	3.8000E-03	9.3084E-02	3.4291E-02	5.0310E-02	.1757	4.6376E-03
169.000	6.7059E-03	.6162	1.7913E-03	9.9393E-02	3.6664E-02	5.0100E-02	.1774	4.6342E-03
170.000	6.7297E-03	.6146	5.9349E-04	.1004	3.6817E-02	5.1738E-02	.1781	4.8574E-03
171.000	6.4671E-03	.5920	4.7438E-03	.1079	4.2928E-02	5.4913E-02	.1802	5.5048E-03
172.000	6.2460E-03	.5715	8.8739E-05	.1259	4.3613E-02	5.8861E-02	.1836	5.3134E-03
173.000	4.8303E-03	.4536	1.3716E-05	.1792	5.6397E-02	.1558	.1387	5.6550E-03
174.000	4.9662E-03	.4657	1.7502E-05	.1900	3.8668E-02	.1642	.1297	3.6527E-03
175.000	4.9965E-03	.4617	8.7514E-06	.1955	3.9630E-02	.1637	.1282	3.5681E-03
176.000	4.9878E-03	.4593	6.2497E-06	.1907	4.3079E-02	.1619	.1327	3.6712E-03
177.000	5.0858E-03	.4684	2.1234E-05	.1732	4.8082E-02	.1606	.1352	3.9375E-03
178.000	3.8980E-03	.3680	0.000	.2599	5.9081E-02	.1568	.1408	4.6066E-03
179.000	5.1760E-03	.4752	0.000	.1596	5.5774E-02	.1448	.1449	4.8828E-03
180.000	5.3433E-03	.4904	2.2492E-05	.1457	5.3308E-02	.1521	.1393	5.4188E-03
181.000	5.3185E-03	.4895	1.2493E-06	.1552	4.7036E-02	.1656	.1280	4.2246E-03
182.000	5.1379E-03	.4711	8.7391E-06	.1651	5.2482E-02	.1599	.1330	4.4604E-03
183.000	5.1742E-03	.4787	6.2479E-06	.1611	5.0159E-02	.1523	.1404	4.4153E-03
184.000	5.3627E-03	.4923	1.2483E-06	.1533	3.3763E-02	.1726	.1338	3.3947E-03
185.000	5.0498E-03	.4638	2.1241E-05	.1713	3.9201E-02	.1703	.1410	4.2972E-03
186.000	5.2006E-03	.4769	9.9982E-06	.1657	3.0810E-02	.1797	.1363	2.9168E-03
187.000	5.4499E-03	.4937	0.000	.1533	2.7784E-02	.1843	.1307	2.6705E-03
188.000	5.5208E-03	.5014	0.000	.1457	3.1946E-02	.1716	.1375	3.3648E-03
189.000	5.6089E-03	.4978	0.000	.1450	3.3976E-02	.1823	.1288	3.4388E-03
190.000	5.7005E-03	.5135	2.2509E-05	.1301	3.9730E-02	.1704	.1334	3.9311E-03
191.000	5.8302E-03	.5317	0.000	.1192	4.4616E-02	.1395	.1516	3.9090E-03
192.000	5.3970E-03	.4971	0.000	.1489	4.6892E-02	.1535	.1416	3.7049E-03
193.000	5.6821E-03	.5185	1.0000E-05	.1302	4.2256E-02	.1522	.1452	3.7018E-03
194.000	5.7562E-03	.5259	0.000	.1233	4.4629E-02	.1456	.1494	3.6589E-03
195.000	6.0954E-03	.5440	4.9996E-06	.1184	3.7142E-02	.1443	.1460	2.8670E-03
196.000	6.1951E-03	.5463	4.9996E-06	.1261	3.7983E-02	.1400	.1394	2.8882E-03
197.000	6.0272E-03	.5357	0.000	.1354	3.9768E-02	.1358	.1421	2.9967E-03
198.000	6.2146E-03	.5504	6.5021E-05	.1308	3.2350E-02	.1314	.1450	2.5121E-03
199.000	6.2602E-03	.5537	0.000	.1281	2.9923E-02	.1349	.1440	2.3585E-03
200.000	6.1777E-03	.5535	0.000	.1251	3.0212E-02	.1425	.1390	2.2917E-03

TIME (D)	INJ RATE mo/s IRED1 90	PRD RATE mo/s IRED1 91	INJ TEMP c IRED1 94	PRD c IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM mo/s IRED1 92	COOLING mo/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
201.000	69.61	111.0	66.04	425.1	427.4	326.3	0.000	0.000	.2100	0.000
202.000	74.35	115.2	66.30	440.9	455.9	339.1	0.000	0.000	.2100	0.000
203.000	82.37	124.3	66.93	458.6	545.5	375.9	0.000	0.000	.2100	0.000
204.000	89.15	151.5	69.68	462.6	551.0	417.0	0.000	0.000	.2100	0.000
205.000	89.10	147.7	65.71	469.8	541.1	409.0	0.000	0.000	.2100	0.000
206.000	89.50	138.0	67.86	477.9	583.5	455.1	0.000	0.000	.2100	0.000
207.000	85.46	126.9	67.54	469.8	565.2	449.2	0.000	0.000	.2100	0.000
208.000	89.41	136.4	69.43	491.5	593.9	448.6	0.000	0.000	.2100	0.000
209.000	85.29	120.9	68.95	477.9	695.5	570.6	0.000	0.000	.2100	0.000
210.000	89.14	94.31	68.87	550.4	621.2	461.9	0.000	0.000	.2100	0.000
211.000	89.53	47.07	22.56	363.1	212.9	264.3	0.000	0.000	.2100	0.000
212.000	89.53	47.07	22.56	363.1	212.9	264.3	0.000	0.000	.2100	0.000

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UCG DB - HA3 - PRODUCT GAS ANALYSIS 2

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2S molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
162.000	1.2828E-03	2.5991E-03	3.4243E-03	0.000	0.000	0.000
163.000	1.2768E-03	1.6142E-03	2.0738E-03	0.000	0.000	0.000
164.000	1.5310E-03	1.8859E-03	2.4344E-03	0.000	0.000	5.1578E-02
165.000	1.9970E-03	2.3577E-03	3.1418E-03	0.000	0.000	6.5520E-02
166.000	2.1823E-03	2.8897E-03	3.9469E-03	0.000	0.000	.1370
167.000	2.1025E-03	3.2063E-03	4.3803E-03	0.000	0.000	.2122
168.000	1.8257E-03	3.2995E-03	4.3874E-03	0.000	0.000	.2095
169.000	1.6428E-03	2.3479E-03	3.1734E-03	0.000	0.000	.1863
170.000	1.7824E-03	1.9684E-03	2.4820E-03	0.000	0.000	.2464
171.000	1.8295E-03	3.5371E-03	4.6952E-03	0.000	0.000	.2410
172.000	1.5680E-03	1.4680E-03	1.7589E-03	0.000	0.000	.2254
173.000	1.5054E-03	1.8949E-03	2.3620E-03	0.000	0.000	.1405
174.000	1.2013E-03	8.7420E-04	1.0587E-03	0.000	0.000	1.6168E-02
175.000	1.2383E-03	6.5170E-04	8.2578E-04	0.000	0.000	9.0232E-03
176.000	1.1648E-03	9.9421E-04	1.3306E-03	0.000	0.000	5.2388E-03
177.000	1.4050E-03	1.7415E-03	2.2814E-03	0.000	0.000	2.7506E-04
178.000	2.0244E-03	2.1177E-03	2.6309E-03	0.000	0.000	4.0352E-02
179.000	3.8949E-03	2.5740E-03	3.2157E-03	0.000	0.000	.5105
180.000	2.5854E-03	2.6712E-03	3.1905E-03	0.000	0.000	8.4273E-02
181.000	2.1098E-03	1.3958E-03	1.6160E-03	0.000	0.000	.2297
182.000	1.8469E-03	2.9308E-03	3.9678E-03	0.000	0.000	.1961
183.000	1.6514E-03	2.7035E-03	3.3358E-03	0.000	0.000	.2141
184.000	1.2795E-03	1.8387E-03	2.3214E-03	0.000	0.000	8.3962E-02
185.000	1.4291E-03	1.5641E-03	1.9061E-03	0.000	0.000	.1259
186.000	9.4436E-04	6.4460E-04	8.7487E-04	0.000	0.000	.2115
187.000	9.1950E-04	4.8680E-04	5.9953E-04	0.000	0.000	.1459
188.000	1.1777E-03	8.0477E-04	1.0356E-03	0.000	0.000	.1373
189.000	1.1306E-03	8.3147E-04	1.1051E-03	0.000	0.000	.1015
190.000	1.1201E-03	9.4467E-04	1.1795E-03	0.000	0.000	.1056
191.000	1.4608E-03	9.5753E-04	1.2338E-03	0.000	0.000	.1450
192.000	1.5064E-03	5.9766E-04	8.6083E-04	0.000	0.000	.1794
193.000	1.0814E-03	4.8640E-04	7.1032E-04	0.000	0.000	.1829
194.000	8.5580E-04	4.0485E-04	5.4933E-04	0.000	0.000	.2423
195.000	5.8891E-04	2.3015E-04	3.3032E-04	0.000	0.000	.2228
196.000	5.7313E-04	2.5822E-04	3.2511E-04	0.000	0.000	.1390
197.000	5.2758E-04	6.9980E-04	9.5776E-04	0.000	0.000	.1132
198.000	4.5015E-04	3.3594E-04	4.7940E-04	0.000	0.000	.1066
199.000	4.0393E-04	1.6194E-04	2.2460E-04	0.000	0.000	.1157
200.000	4.3009E-04	2.9900E-04	4.1681E-04	0.000	0.000	.1306

TIME (D)	ARGON mol/ IRED1 10	NITROGEN mol/ IRED1 11	OXYGEN mol/ IRED1 12	HYDROGEN mol/ IRED1 13	METHANE mol/ IRED1 14	CO mol/ IRED1 15	CO2 mol/ IRED1 16	ETHANE mol/ IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
201.000	6.2719E-03	.5550	7.5032E-06	.1216	2.9566E-02	.1575	.1265	2.2169E-03
202.000	6.6789E-03	.5352	1.0877E-04	.1269	2.9489E-02	.1671	.1310	2.3405E-03
203.000	6.4238E-03	.5591	0.000	.1185	3.0992E-02	.1516	.1299	2.3492E-03
204.000	6.4147E-03	.5597	0.000	.1229	3.3922E-02	.1343	.1393	2.3787E-03
205.000	6.3925E-03	.5640	5.0018E-06	.1203	3.0093E-02	.1387	.1376	2.0233E-03
206.000	6.3248E-03	.5583	0.000	.1184	2.9314E-02	.1520	.1333	1.8403E-03
207.000	5.9015E-03	.5333	0.000	.1377	2.3968E-02	.1400	.1567	1.6058E-03
208.000	6.3068E-03	.5749	1.2005E-04	.1052	2.0328E-02	.1497	.1420	1.1628E-03
209.000	6.9021E-03	.6115	1.1103E-03	8.6690E-02	2.0413E-02	.1339	.1382	1.1968E-03
210.000	6.7975E-03	.6077	4.2017E-04	8.8637E-02	1.8462E-02	.1294	.1470	1.1534E-03
211.000	6.1404E-05	1.3603E-02	0.000	.5523	4.0298E-02	.1733	.2188	1.3964E-03
212.000	6.1404E-05	1.3603E-02	0.000	.5523	4.0298E-02	.1733	.2188	1.3964E-03

UCG DB - HA3 - MATERIAL BALANCES

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL RT mo/s IRED1 44	ASH RATE mo/s IRED1 46	H2O INFX mo/s IRED1 47	H2O COAL mo/s IRED1 48	-H2O RXN mo/s IRED1 49	O2 per COAL IRED1 60	H2O per COAL IRED1 61	CHAR RT mo/s IRED1 64	CHAR per COAL IRED1 63	RECOVORY % IRED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
162.000	.1052	1.0594E-02	2.2347E-02	1.3332E-02	3.5679E-02	.2947	.4496	.1089	.5403	19.36
163.000	.2432	2.4497E-02	5.8695E-03	3.0830E-02	3.6699E-02	.5830	.1497	8.8223E-02	.2480	46.84
164.000	.3329	3.3544E-02	.1141	4.2214E-02	6.0221E-02	.6672	.1877	.3076	.3952	68.75
165.000	.6167	6.2134E-02	.1652	7.8195E-02	.1170	.5348	.1839	.1804	.2135	99.61
166.000	.5329	5.3689E-02	.2675	6.7567E-02	8.2003E-02	.5471	.1538	.1956	.2593	100.0
167.000	.6399	6.4474E-02	.5001	8.1139E-02	.1270	.5018	.1968	.3307	.3370	100.0
168.000	.6794	6.8450E-02	.5403	8.6143E-02	.1385	.5005	.2040	.4003	.3687	100.0
169.000	.6858	6.9089E-02	.5070	8.6948E-02	.1545	.4934	.2255	.4389	.3763	100.0
170.000	.7172	7.2257E-02	.6700	9.0934E-02	.1575	.4961	.2185	.4274	.3721	100.0
171.000	.8262	8.3234E-02	.7560	.1047	.2264	.4290	.2738	.5441	.3958	100.0
172.000	.8543	8.6065E-02	.7694	.1083	.2555	.4457	.2981	.3795	.3040	100.0
173.000	3.134	.3157	1.406	.3974	1.057	.3044	.3552	1.688	.1149	94.39
174.000	15.41	1.552	3.913	1.953	5.158	.3447	.3393	2.416	9.6907E-02	91.39
175.000	23.06	2.323	6.073	2.923	8.390	.3308	.3641	5.631	.1894	99.03
176.000	23.14	2.331	5.698	2.934	8.280	.3299	.3578	3.873	.1339	96.11
177.000	24.19	2.437	4.879	3.067	7.926	.3311	.3269	3.022	9.4344E-02	97.55
178.000	19.16	1.930	6.127	2.429	7.740	.1901	.5763	5.821	.2637	82.86
179.000	7.500	.7557	10.70	.9510	2.463	.3112	.3342	1.852	.1676	100.0
180.000	8.716	.8781	3.387	1.105	2.493	.3325	.2864	1.308	.1236	96.88
181.000	14.70	1.481	12.84	1.864	4.049	.3495	.2751	2.160	9.0626E-02	98.54
182.000	20.90	2.106	15.11	2.650	6.998	.3036	.3348	5.949	.2175	99.83
183.000	20.61	2.076	15.55	2.613	6.410	.3319	.3112	2.599	.1003	100.0
184.000	21.18	2.134	6.480	2.686	4.173	.4160	.1973	-6.336	-.5427	100.0
185.000	24.98	2.516	11.80	3.167	6.495	.3844	.2573	-8.298	-.5560	100.0
186.000	23.33	2.350	15.39	2.958	4.532	.4382	.1937	-7.445	-.7594	100.0
187.000	24.47	2.465	10.47	3.102	3.540	.4627	.1457	-2.583	-.2532	100.0
188.000	29.36	2.957	12.26	3.722	4.618	.4543	.1576	-11.69	-.9767	100.0
189.000	31.36	3.160	9.931	3.977	5.047	.4359	.1609	-14.36	-.9960	100.0
190.000	30.74	3.097	9.893	3.897	4.812	.4347	.1561	-12.67	-.7371	100.0
191.000	30.85	3.108	13.97	3.911	5.203	.4481	.1686	-10.71	-.6374	100.0
192.000	33.34	3.359	20.88	4.228	8.399	.3922	.2506	-4.340	-.1630	100.0
193.000	31.60	3.183	17.87	4.006	5.545	.4451	.1748	-12.74	-.7606	100.0
194.000	30.95	3.119	22.57	3.925	5.164	.4535	.1668	-12.94	-.7374	100.0
195.000	28.72	2.894	19.04	3.641	3.614	.4907	.1259	-4.562	-.2972	100.0
196.000	29.29	2.951	13.72	3.714	5.048	.4604	.1726	-2.199	-8.808E-02	100.0
197.000	33.35	3.360	14.46	4.229	7.224	.4343	.2164	1.184	1.8036E-02	100.0
198.000	31.14	3.137	11.85	3.948	5.290	.4851	.1688	-4.342	-.1870	99.72
199.000	30.90	3.114	11.82	3.918	4.407	.5034	.1424	-7.841	-.3549	100.0
200.000	30.93	3.116	12.56	3.922	4.051	.4987	.1287	-4.309	-.1801	99.80

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TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2 molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
201.000	4.3389E-04	3.7613E-04	5.1537E-04	0.000	0.000	.1348
202.000	5.4261E-04	2.8024E-04	3.7929E-04	0.000	0.000	.1015
203.000	5.3260E-04	2.5586E-04	3.4304E-04	0.000	0.000	8.2048E-02
204.000	4.5088E-04	3.0176E-04	4.0343E-04	0.000	0.000	.2191
205.000	3.8640E-04	1.9153E-04	2.6035E-04	1.0009E-05	0.000	.1992
206.000	3.2880E-04	9.0623E-05	1.2925E-04	0.000	0.000	.1035
207.000	2.2934E-04	3.0715E-04	3.8646E-04	0.000	0.000	.1002
208.000	2.9008E-04	0.000	0.000	0.000	0.000	.1242
209.000	8.4183E-05	1.8755E-06	2.2506E-06	0.000	0.000	.1328
210.000	3.7268E-04	7.5010E-06	9.0012E-06	0.000	0.000	4.3408E-02
211.000	3.0211E-04	1.8754E-06	2.2505E-06	0.000	0.000	0.000
212.000	3.0211E-04	1.8754E-06	2.2505E-06	0.000	0.000	0.000

UCG DB - HA3 - ENERGY PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/02 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
162.000	50.05	.5290	0.000	-4.597E-04	0.000	0.000	6.8610E-03	8.7288E-02	141.2	598.3
163.000	115.7	.6051	0.000	-1.545E-03	0.000	0.000	1.0978E-02	.3817	79.02	461.2
164.000	158.5	.6534	0.000	-1.353E-03	3.0634E-02	0.000	1.0978E-02	.3027	77.18	442.8
165.000	293.6	.6544	0.000	-2.874E-04	2.1384E-02	0.000	1.0978E-02	.3098	90.84	551.8
166.000	253.7	.6355	0.000	-4.246E-04	4.3856E-02	0.000	1.0978E-02	.3064	87.00	512.0
167.000	304.6	.6807	0.000	-5.233E-04	6.6329E-02	0.000	1.0978E-02	.2389	95.75	574.9
168.000	323.4	.6788	0.000	-6.747E-04	6.6072E-02	0.000	1.0978E-02	.2411	94.69	565.7
169.000	326.4	.6828	0.000	-9.395E-04	5.9337E-02	0.000	1.0978E-02	.2441	94.46	569.5
170.000	341.4	.6772	0.000	-9.971E-04	7.8075E-02	0.000	1.0978E-02	.2311	94.07	569.1
171.000	393.2	.7375	0.000	-1.138E-03	7.0919E-02	0.000	1.0978E-02	.1780	110.2	692.2
172.000	406.6	.7327	0.000	-1.631E-03	6.7332E-02	0.000	1.0978E-02	.1869	107.7	701.6
173.000	1492.	.9023	0.000	4.9478E-03	3.5948E-02	0.000	1.0978E-02	4.2124E-02	164.0	1479.
174.000	7333.	.8815	0.000	6.4682E-02	4.1919E-03	0.000	1.0978E-02	3.4919E-02	146.0	1167.
175.000	1.0975E+04	.8975	0.000	7.8062E-02	2.4119E-03	0.000	1.0978E-02	7.3436E-03	147.4	1187.
176.000	1.1013E+04	.8927	0.000	7.7198E-02	1.3970E-03	0.000	1.0978E-02	1.4008E-02	150.2	1214.
177.000	1.1515E+04	.8804	0.000	7.4559E-02	7.0008E-05	0.000	1.0978E-02	3.0287E-02	153.0	1213.
178.000	9119.	1.035	0.000	7.5964E-02	9.0387E-03	0.000	1.0978E-02	-.1344	189.7	8103.
179.000	3570.	.8851	0.000	4.7283E-02	.1233	0.000	1.0978E-02	-7.033E-02	159.6	1260.
180.000	4149.	.8625	0.000	3.7666E-02	2.0479E-02	0.000	1.0978E-02	6.4726E-02	154.7	1172.
181.000	6997.	.8594	0.000	6.9494E-02	5.8455E-02	0.000	1.0978E-02	-2.068E-03	148.1	1127.
182.000	9949.	.8996	0.000	7.3114E-02	4.7982E-02	0.000	1.0978E-02	-3.538E-02	160.8	1268.
183.000	9810.	.8699	0.000	7.4798E-02	5.3274E-02	0.000	1.0978E-02	-1.263E-02	153.7	1193.
184.000	1.0083E+04	.7991	0.000	6.4514E-02	2.1672E-02	0.000	1.0978E-02	.1000	137.2	1036.
185.000	1.1889E+04	.8308	0.000	6.9574E-02	3.1302E-02	0.000	1.0978E-02	5.3627E-02	147.0	1184.
186.000	1.1103E+04	.7866	0.000	5.2084E-02	5.4421E-02	0.000	1.0978E-02	9.2145E-02	134.2	1046.
187.000	1.1646E+04	.7626	0.000	5.9841E-02	3.8163E-02	0.000	1.0978E-02	.1247	128.1	964.4
188.000	1.3973E+04	.7623	0.000	6.7375E-02	3.5697E-02	0.000	1.0978E-02	.1199	128.8	954.4
189.000	1.4929E+04	.7818	0.000	8.1828E-02	2.6088E-02	0.000	1.0978E-02	9.5610E-02	133.7	997.5
190.000	1.4632E+04	.7730	0.000	8.0222E-02	2.7206E-02	0.000	1.0978E-02	.1049	132.3	958.2
191.000	1.4682E+04	.7475	0.000	9.1578E-02	3.8041E-02	0.000	1.0978E-02	.1082	125.3	875.8
192.000	1.5872E+04	.8152	0.000	7.9958E-02	4.6619E-02	0.000	1.0978E-02	4.3551E-02	138.2	1035.
193.000	1.5040E+04	.7592	0.000	5.9858E-02	4.8003E-02	0.000	1.0978E-02	.1182	127.3	912.8
194.000	1.4735E+04	.7466	0.000	4.2804E-02	6.3762E-02	0.000	1.0978E-02	.1322	124.8	881.3
195.000	1.3671E+04	.7140	0.000	6.3429E-02	6.0960E-02	0.000	1.0978E-02	.1469	114.0	779.2
196.000	1.3944E+04	.7466	0.000	7.9549E-02	3.9393E-02	0.000	1.0978E-02	.1197	115.8	787.5
197.000	1.5876E+04	.7721	0.000	8.9676E-02	3.1748E-02	0.000	1.0978E-02	9.1783E-02	120.9	838.3
198.000	1.4822E+04	.7253	0.000	9.3608E-02	3.1092E-02	0.000	1.0978E-02	.1353	109.3	738.7
199.000	1.4710E+04	.7088	0.000	9.7941E-02	3.3877E-02	0.000	1.0978E-02	.1447	106.4	713.7
200.000	1.4724E+04	.7136	0.000	8.7668E-02	3.8329E-02	0.000	1.0978E-02	.1457	108.4	732.1

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TIME (D)	COAL RT mo/s IRED1 44	ASH RATE mo/s IRED1 46	H2O INFX mo/s IRED1 47	H2 mo/ IRED1 48	-H2O RXN mo/s IRED1 49	O2 per COAL IRED1 60	H2O per COAL IRED1 61	CHAR RT mo/s IRED1 64	CHAR pe COAL IRED1 63	ECOVORY Z IRED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
201.000	31.41	3.165	12.72	3.983	3.511	.4872	.1119	-5.724	-.2519	100.0
202.000	35.37	3.564	9.447	4.485	3.589	.4931	.1032	-5.962	-.2172	96.51
203.000	36.75	3.703	8.856	4.660	4.126	.4909	.1128	-6.267	-.2299	100.0
204.000	39.15	3.945	28.29	4.964	6.078	.4821	.1548	-1.137	-5.705E-02	100.0
205.000	38.50	3.879	24.27	4.881	4.680	.5059	.1214	-6.318	-.2289	100.0
206.000	39.94	4.024	11.60	5.065	3.732	.5121	9.3726E-02	-9.133	-.3947	100.0
207.000	36.85	3.712	10.84	4.672	3.762	.5445	.1142	4.303	-2.931E-02	92.05
208.000	38.23	3.852	10.01	4.847	-.2360	.5959	-6.069E-03	-5.854	-.3460	100.0
209.000	31.37	3.161	9.252	3.978	-1.268	.6230	-3.791E-02	-5.115	-.3251	97.57
210.000	26.57	2.677	.2299	3.369	-1.265	.6414	-5.132E-02	-7.529	-.6651	78.45
211.000	21.42	2.158	15.97	2.716	18.68	9.9281E-02	1.012	-2.403	3.1988E-02	1.423
212.000	21.42	2.158	15.97	2.716	18.68	9.9281E-02	1.012	-2.403	3.1988E-02	1.423

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UNDERGROUND COAL GASIFICATION

DATA BASE

LARIMIE ENERGY TECHNOLOGY CENTER

HANNA IV-A

DAILY AVERAGE RESULTS

TIME (D)	COAL kJ /mol IRED1 72	PRODUCT frac IRED1 74	TAR frac IRED1 73	SENS frac IRED1 76	STEAM frac IRED1 77	COOLING frac IRED1 80	SEN HT INSU frac IRED1 78	LOSS frac IRED1 75	HC kJ /mol IRED1 81	HC/O2 kJ /mol IRED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
201.000	1.4952E+04	.7281	0.000	9.1150E-02	3.8771E-02	0.000	1.0978E-02	.1272	111.3	744.7
202.000	1.6838E+04	.7242	0.000	8.9908E-02	2.9462E-02	0.000	1.0978E-02	.1417	115.4	844.8
203.000	1.7494E+04	.7216	0.000	9.4899E-02	2.3673E-02	0.000	1.0978E-02	.1451	109.8	730.2
204.000	1.8637E+04	.7263	0.000	.1115	6.4352E-02	0.000	1.0978E-02	8.3127E-02	108.9	723.6
205.000	1.8325E+04	.7057	0.000	.1127	5.8845E-02	0.000	1.0978E-02	.1081	104.9	691.4
206.000	1.9014E+04	.7020	0.000	.1018	2.9895E-02	0.000	1.0978E-02	.1516	106.7	710.0
207.000	1.7540E+04	.6732	0.000	.1019	3.1075E-02	0.000	1.0978E-02	.1790	104.4	919.8
208.000	1.8198E+04	.6191	0.000	.1085	3.6329E-02	0.000	1.0978E-02	.2214	92.77	600.0
209.000	1.4934E+04	.5889	0.000	.1130	4.2407E-02	0.000	1.0978E-02	.2410	82.84	504.8
210.000	1.2647E+04	.5670	0.000	.1210	1.3703E-02	0.000	1.0978E-02	.2835	80.75	535.6
211.000	1.0196E+04	1.201	0.000	5.3534E-02	0.000	0.000	1.0978E-02	-.2694	245.4	3.9054E+04
212.000	1.0196E+04	1.201	0.000	5.3534E-02	0.000	0.000	1.0978E-02	-.2694	245.4	3.9054E+04

UNDERGROUND COAL GASIFICATION

DATA BASE

LARIMIE ENERGY TECHNOLOGY CENTER

HANNA IV-A

DAILY AVERAGE RESULTS

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  HANNA IV COAL ANALYSIS
                                                                    KG/M**3   KJ/MOLE
COAL H/C  COAL O/C  COAL S/C  COAL N/C  WT F H2O  WT F ASH  DENSITY   HT COMB
.939      0.171      0.006    0.021     .0855     .2748     1363.     437.

CHAR H/C  CHAR O/C  CHAR S/C  CHAR N/C
.1018     0.0003    0.        0.

 TAR H/C   TAR O/C   TAR S/C   TAR N/C      C/MOLECULE
 1.00      0.        0.        0.            9.

  COAL       ASH&CHAR  --  TEMPERATURES (K)
   300.       1000.

  1    NUMBER OF POINTS ON OXYGEN TRACER TYPE CURVE
999.     2    TIME,TRACER FLAG (ZERO=NONE,ONE=ARGON,TWO=NITROGEN)

  1    NUMBER OF POINTS ON GAS LOSS TRACER TYPE CURVE
 999.    2  TIME,TRACER FLAG (SAME AS OXYGEN TRACER)

  1    NUMBER OF POINTS ON CHAR FLAG CURVE
 999.    0  TIME,TRACER FLAG (0=NO CHAR, 1=WITH CHAR)
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UCG DB - HA4.A - OPERATING PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	INJ RATE mo/s !RED1 90	PRD RATE mo/s !RED1 91	INJ TEMP c !RED1 94	PRD TEMP c !RED1 95	INJ PRES kPa !RED1 96	PRD PRES kPa !RED1 97	STEAM mo/s !RED1 92	COOLING mo/s !RED1 93	INJ O2 frac !RED1 6	INJ H2O frac !RED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
24.000	7.500	.9000	40.00	10.60	1298.	1298.	0.000	0.000	.2100	0.000
25.000	7.900	0.000	40.00	-.6000	1501.	1501.	0.000	0.000	.2100	0.000
26.000	7.800	.8000	40.00	-.6000	1498.	1498.	0.000	0.000	.2100	0.000
27.000	8.300	.9000	40.00	10.60	1527.	1527.	0.000	0.000	.2100	0.000
28.000	9.200	1.000	40.00	8.900	1571.	1571.	0.000	0.000	.2100	0.000
29.000	9.300	1.000	40.00	11.10	1608.	1608.	0.000	0.000	.2100	0.000
30.000	8.900	1.000	40.00	9.400	1570.	1570.	0.000	0.000	.2100	0.000
31.000	9.000	1.000	40.00	8.900	1580.	1580.	0.000	0.000	.2100	0.000
32.000	9.000	1.100	40.00	7.200	1569.	1569.	0.000	0.000	.2100	0.000
33.000	9.000	1.100	40.00	7.200	1563.	1563.	0.000	0.000	.2100	0.000
34.000	8.900	1.100	40.00	7.800	1555.	1555.	0.000	0.000	.2100	0.000
35.000	9.100	1.000	40.00	9.400	1571.	1571.	0.000	0.000	.2100	0.000
36.000	9.100	1.100	40.00	11.70	1562.	1562.	0.000	0.000	.2100	0.000
37.000	9.100	1.200	40.00	7.200	1558.	1558.	0.000	0.000	.2100	0.000
38.000	9.000	1.200	40.00	7.800	1549.	1549.	0.000	0.000	.2100	0.000
39.000	9.100	1.300	40.00	10.60	1542.	1542.	0.000	0.000	.2100	0.000
40.000	9.200	1.400	40.00	10.60	1538.	1538.	0.000	0.000	.2100	0.000
41.000	9.000	1.200	40.00	12.80	1537.	1537.	0.000	0.000	.2100	0.000
42.000	9.100	1.200	40.00	0.000	1556.	1556.	0.000	0.000	.2100	0.000
43.000	9.200	1.300	40.00	0.000	1556.	1556.	0.000	0.000	.2100	0.000
44.000	9.300	1.200	40.00	3.300	1564.	1564.	0.000	0.000	.2100	0.000
45.000	9.100	1.200	40.00	5.000	1553.	1553.	0.000	0.000	.2100	0.000
46.000	9.000	1.200	40.00	3.900	1545.	1545.	0.000	0.000	.2100	0.000
47.000	8.600	1.100	40.00	1.700	1524.	1524.	0.000	0.000	.2100	0.000
48.000	9.600	1.000	40.00	-1.700	1517.	1517.	0.000	0.000	.2100	0.000
49.000	9.400	1.100	40.00	.6000	1544.	1544.	0.000	0.000	.2100	0.000
50.000	9.200	1.700	40.00	2.800	1524.	1524.	0.000	0.000	.2100	0.000
51.000	9.000	1.700	40.00	6.100	1504.	1504.	0.000	0.000	.2100	0.000
52.000	9.100	1.700	40.00	10.00	1511.	1511.	0.000	0.000	.2100	0.000
53.000	9.200	1.600	40.00	9.400	1511.	1511.	0.000	0.000	.2100	0.000
54.000	9.100	1.600	40.00	8.900	1511.	1511.	0.000	0.000	.2100	0.000
55.000	9.300	1.700	40.00	9.400	1511.	1511.	0.000	0.000	.2100	0.000
56.000	9.100	1.500	40.00	11.70	1511.	1511.	0.000	0.000	.2100	0.000
57.000	9.100	1.600	40.00	10.60	1511.	1511.	0.000	0.000	.2100	0.000
58.000	9.000	1.400	40.00	13.30	1517.	1517.	0.000	0.000	.2100	0.000
59.000	9.100	1.500	40.00	6.700	1503.	1503.	0.000	0.000	.2100	0.000
60.000	8.900	1.300	40.00	11.10	1509.	1509.	0.000	0.000	.2100	0.000
61.000	9.200	1.500	40.00	-5.600	1538.	1538.	0.000	0.000	.2100	0.000

1

TIME (D)	INJ RATE mo/s IRED1 90	PRD RATE mo/s IRED1 91	INJ TEMP c IRED1 94	P IP IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM mo/s IRED1 92	COOLING mo/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
62.000	9.100	1.700	40.00	-3.300	1524.	1524.	0.000	0.000	.2100	0.000
63.000	9.000	1.500	40.00	7.200	1517.	1517.	0.000	0.000	.2100	0.000
64.000	9.200	1.400	40.00	4.400	1517.	1517.	0.000	0.000	.2100	0.000
65.000	9.200	1.400	40.00	1.100	1558.	1558.	0.000	0.000	.2100	0.000
66.000	9.100	1.200	40.00	2.800	1628.	1628.	0.000	0.000	.2100	0.000
67.000	9.100	1.200	40.00	11.10	1642.	1642.	0.000	0.000	.2100	0.000
68.000	9.300	1.200	40.00	12.80	1662.	1662.	0.000	0.000	.2100	0.000
69.000	9.200	1.300	40.00	10.00	1696.	1696.	0.000	0.000	.2100	0.000
70.000	9.200	1.400	40.00	9.400	1717.	1717.	0.000	0.000	.2100	0.000
71.000	8.700	1.200	40.00	11.70	1482.	1482.	0.000	0.000	.2100	0.000
72.000	9.300	1.300	40.00	2.200	1751.	1751.	0.000	0.000	.2100	0.000
73.000	9.100	1.300	40.00	1.700	1786.	1786.	0.000	0.000	.2100	0.000
74.000	11.10	.8000	40.00	-3.300	1938.	1938.	0.000	0.000	.2100	0.000
75.000	15.90	6.700	40.00	2.200	2939.	2939.	0.000	0.000	.2100	0.000
76.000	17.40	10.60	40.00	31.10	3180.	3180.	0.000	0.000	.2100	0.000
77.000	16.60	23.60	40.00	46.10	3041.	3041.	0.000	0.000	.2100	0.000
78.000	26.70	61.60	40.00	96.70	1345.	1345.	0.000	0.000	.2100	0.000
79.000	28.80	50.90	40.00	160.6	952.2	952.2	0.000	0.000	.2100	0.000
80.000	28.50	38.20	40.00	307.2	917.7	917.7	0.000	0.000	.2100	0.000
81.000	28.80	52.00	40.00	209.4	730.9	730.9	0.000	0.000	.2100	0.000
82.000	46.40	81.30	40.00	364.4	599.9	599.9	0.000	0.000	.2100	0.000
83.000	59.40	87.60	40.00	421.1	641.9	641.9	0.000	0.000	.2100	0.000
84.000	36.70	58.60	40.00	441.1	457.1	457.1	0.000	0.000	.2100	0.000
85.000	0.000	0.000	40.00	66.70	136.5	136.5	0.000	0.000	.2100	0.000
86.000	0.000	0.000	40.00	4.400	108.9	108.9	0.000	0.000	.2100	0.000
87.000	0.000	0.000	40.00	12.20	81.36	81.36	0.000	0.000	.2100	0.000
88.000	0.000	0.000	40.00	15.60	81.07	81.07	0.000	0.000	.2100	0.000
89.000	0.000	0.000	40.00	19.40	80.77	80.77	0.000	0.000	.2100	0.000
90.000	0.000	0.000	40.00	17.80	80.47	80.47	0.000	0.000	.2100	0.000
91.000	0.000	0.000	40.00	10.60	80.18	80.18	0.000	0.000	.2100	0.000
92.000	0.000	0.000	40.00	10.00	79.88	79.88	0.000	0.000	.2100	0.000
93.000	0.000	0.000	40.00	7.200	79.59	79.59	0.000	0.000	.2100	0.000
94.000	0.000	0.000	40.00	7.200	79.29	79.29	0.000	0.000	.2100	0.000
95.000	0.000	0.000	40.00	7.200	124.1	124.1	0.000	0.000	.2100	0.000
96.000	0.000	0.000	40.00	11.10	800.5	800.5	0.000	0.000	.2100	0.000
97.000	0.000	0.000	40.00	72.20	2055.	2055.	0.000	0.000	.2100	0.000
98.000	0.000	0.000	40.00	11.70	1351.	1351.	0.000	0.000	.2100	0.000
99.000	0.000	0.000	40.00	3.900	1069.	1069.	0.000	0.000	.2100	0.000
100.000	6.400	7.000	40.00	8.900	724.7	724.7	0.000	0.000	.2100	0.000
101.000	11.40	5.000	40.00	244.4	1558.	1558.	0.000	0.000	.2100	0.000
102.000	7.100	1.200	40.00	7.200	1620.	1620.	0.000	0.000	.2100	0.000
103.000	18.20	1.200	40.00	213.9	1125.	1125.	0.000	0.000	.2100	0.000
104.000	11.50	2.000	40.00	455.6	876.4	876.4	0.000	0.000	.2100	0.000
105.000	8.800	1.200	40.00	175.0	731.6	731.6	0.000	0.000	.2100	0.000
106.000	7.300	4.000	40.00	532.2	628.1	628.1	0.000	0.000	.2100	0.000
107.000	4.900	4.400	40.00	40.00	504.0	504.0	0.000	0.000	.2100	0.000
108.000	25.90	23.40	40.00	9.400	476.4	476.4	0.000	0.000	.2100	0.000
109.000	28.60	45.80	40.00	60.00	759.1	759.1	0.000	0.000	.2100	0.000

TIME (D)	INJ RATE mo/s IRED1 90	PRD RATE mo/s IRED1 91	INJ TEMP c IRED1 94	PRD TEMP c IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM mo/s IRED1 92	COOLING mo/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
110.000	34.70	58.00	40.00	41.10	793.6	793.6	0.000	0.000	.2100	0.000
111.000	53.30	80.00	40.00	93.90	820.5	820.5	0.000	0.000	.2100	0.000
112.000	62.20	104.8	40.00	89.40	751.6	751.6	0.000	0.000	.2100	0.000
113.000	71.00	177.6	40.00	101.7	717.8	717.8	0.000	0.000	.2100	0.000
114.000	78.60	158.4	40.00	143.9	621.2	621.2	0.000	0.000	.2100	0.000
115.000	79.70	145.6	40.00	200.0	559.2	559.2	0.000	0.000	.2100	0.000
116.000	77.60	139.6	40.00	220.0	448.9	448.9	0.000	0.000	.2100	0.000
117.000	79.70	143.9	40.00	252.8	435.1	435.1	0.000	0.000	.2100	0.000
118.000	82.30	155.3	40.00	255.0	407.5	407.5	0.000	0.000	.2100	0.000
119.000	83.70	156.6	40.00	260.0	359.2	359.2	0.000	0.000	.2100	0.000
120.000	84.70	143.7	40.00	288.3	335.8	335.8	0.000	0.000	.2100	0.000
121.000	95.30	138.9	40.00	337.2	379.9	379.9	0.000	0.000	.2100	0.000
122.000	119.7	172.8	40.00	342.2	476.4	476.4	0.000	0.000	.2100	0.000
123.000	119.7	175.4	40.00	401.1	483.3	483.3	0.000	0.000	.2100	0.000
124.000	119.5	169.4	40.00	461.7	510.2	510.2	0.000	0.000	.2100	0.000
125.000	119.5	174.6	40.00	442.2	503.3	503.3	0.000	0.000	.2100	0.000
126.000	119.5	173.4	40.00	428.9	517.1	517.1	0.000	0.000	.2100	0.000
127.000	119.1	181.5	40.00	417.8	655.0	655.0	0.000	0.000	.2100	0.000
128.000	117.9	180.0	40.00	472.8	668.8	668.8	0.000	0.000	.2100	0.000
129.000	131.3	211.0	40.00	450.6	682.6	682.6	0.000	0.000	.2100	0.000
130.000	121.6	195.3	40.00	485.0	627.4	627.4	0.000	0.000	.2100	0.000
131.000	99.60	147.3	40.00	448.9	627.8	627.8	0.000	0.000	.2100	0.000
132.000	99.60	144.4	40.00	506.1	628.1	628.1	0.000	0.000	.2100	0.000
133.000	89.60	135.7	40.00	498.3	559.2	559.2	0.000	0.000	.2100	0.000
134.000	79.70	118.3	40.00	471.7	517.8	517.8	0.000	0.000	.2100	0.000
135.000	79.70	115.8	40.00	460.0	517.1	517.1	0.000	0.000	.2100	0.000
136.000	79.70	114.7	40.00	458.9	530.9	530.9	0.000	0.000	.2100	0.000
137.000	76.70	110.1	40.00	448.9	530.9	530.9	0.000	0.000	.2100	0.000
138.000	78.50	109.0	40.00	442.8	537.8	537.8	0.000	0.000	.2100	0.000
139.000	79.30	108.5	40.00	444.4	539.2	539.2	0.000	0.000	.2100	0.000
140.000	79.70	116.7	40.00	449.4	518.5	518.5	0.000	0.000	.2100	0.000
141.000	79.70	124.0	40.00	441.7	518.5	518.5	0.000	0.000	.2100	0.000
142.000	79.70	116.7	40.00	436.1	517.8	517.8	0.000	0.000	.2100	0.000
143.000	79.70	115.0	40.00	463.3	531.6	531.6	0.000	0.000	.2100	0.000
144.000	79.90	106.9	40.00	479.4	538.5	538.5	0.000	0.000	.2100	0.000
145.000	79.70	108.1	40.00	479.4	545.4	545.4	0.000	0.000	.2100	0.000
146.000	79.70	107.6	40.00	490.6	538.5	538.5	0.000	0.000	.2100	0.000
147.000	79.70	105.8	40.00	488.3	545.4	545.4	0.000	0.000	.2100	0.000
148.000	79.70	106.9	40.00	493.9	552.3	552.3	0.000	0.000	.2100	0.000
149.000	79.70	108.3	40.00	500.0	559.2	559.2	0.000	0.000	.2100	0.000
150.000	79.70	102.8	40.00	502.2	559.2	559.2	0.000	0.000	.2100	0.000
155.000	79.70	109.2	40.00	500.0	566.1	566.1	0.000	0.000	.2100	0.000

UCB DB - HA4.A - PRODUCT GAS ANALYSIS 1

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	ARGON molf !RED1 10	NITROGEN molf !RED1 11	OXYGEN molf !RED1 12	HYDROGEN molf !RED1 13	METHANE molf !RED1 14	CO molf !RED1 15	CO2 molf !RED1 16	ETHANE molf !RED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
24.000	1.1403E-02	.8202	.1642	0.000	2.0006E-04	0.000	3.9012E-03	0.000
25.000	1.0203E-02	.7844	8.2226E-02	2.8509E-02	1.2304E-02	1.7206E-02	6.2920E-02	1.4004E-03
26.000	9.4098E-03	.7089	4.0842E-02	7.1374E-02	2.8229E-02	3.3935E-02	.1022	3.6037E-03
27.000	8.9023E-03	.6788	3.9110E-02	8.2621E-02	3.4809E-02	3.3209E-02	.1149	4.7012E-03
28.000	8.7021E-03	.6625	3.6909E-02	9.3823E-02	3.3608E-02	3.8209E-02	.1194	4.4011E-03
29.000	8.7012E-03	.6634	3.2004E-02	9.9214E-02	3.3305E-02	3.5405E-02	.1221	4.3006E-03
30.000	9.0022E-03	.6793	3.9309E-02	8.7721E-02	3.3508E-02	2.3606E-02	.1212	4.3010E-03
31.000	9.0001E-03	.6778	4.2000E-02	8.7901E-02	3.5200E-02	2.4200E-02	.1170	4.6000E-03
32.000	1.0505E-02	.6824	4.5221E-02	8.6040E-02	3.3215E-02	2.3611E-02	.1129	4.1019E-03
33.000	8.8059E-03	.6934	4.3529E-02	8.3756E-02	3.0721E-02	2.5317E-02	.1092	3.7025E-03
34.000	9.2026E-03	.6993	4.3612E-02	7.8422E-02	2.9208E-02	2.1806E-02	.1137	3.5010E-03
35.000	9.0014E-03	.6893	3.4905E-02	8.5813E-02	3.2205E-02	2.1803E-02	.1216	3.9006E-03
36.000	8.7030E-03	.6781	2.7410E-02	9.1032E-02	3.3212E-02	2.3908E-02	.1312	4.3015E-03
37.000	8.5020E-03	.6589	2.2405E-02	.1077	3.4908E-02	2.5006E-02	.1359	4.2010E-03
38.000	8.5012E-03	.6613	2.1903E-02	.1082	3.2805E-02	2.6004E-02	.1350	4.1006E-03
39.000	8.0003E-03	.6433	1.4701E-02	.1187	3.5301E-02	3.2401E-02	.1412	4.2002E-03
40.000	7.9800E-03	.6404	1.3267E-02	.1217	3.9002E-02	2.7132E-02	.1438	4.6882E-03
41.000	8.1028E-03	.6505	1.1504E-02	.1115	3.9413E-02	2.4308E-02	.1479	4.6016E-03
42.000	8.3028E-03	.6545	1.0504E-02	.1026	3.9513E-02	2.4708E-02	.1529	4.7016E-03
43.000	7.9021E-03	.6466	1.0103E-02	.1167	3.7210E-02	2.7507E-02	.1475	4.4012E-03
44.000	7.8958E-03	.6574	7.4960E-03	.1068	3.5981E-02	2.3987E-02	.1540	4.3977E-03
45.000	8.1023E-03	.6619	7.1020E-03	.1033	3.5210E-02	2.3106E-02	.1547	4.5013E-03
46.000	8.3033E-03	.6753	7.5030E-03	9.0536E-02	3.6214E-02	2.2609E-02	.1535	4.1016E-03
47.000	8.5051E-03	.6855	8.3050E-03	8.3150E-02	3.5922E-02	2.2313E-02	.1506	3.8023E-03
48.000	8.7052E-03	.6903	8.8053E-03	7.9748E-02	3.5521E-02	2.3314E-02	.1479	3.7022E-03
49.000	8.2039E-03	.6915	1.1305E-02	7.9437E-02	3.7217E-02	2.4011E-02	.1425	3.8018E-03
50.000	8.3033E-03	.6963	1.1705E-02	8.8836E-02	3.3914E-02	3.5314E-02	.1200	3.5014E-03
51.000	7.9049E-03	.6625	1.1807E-02	.1034	3.2320E-02	3.8624E-02	.1382	3.2020E-03
52.000	8.2046E-03	.6705	1.7510E-02	9.1851E-02	2.8016E-02	3.2718E-02	.1386	2.9018E-03
53.000	1.1403E-02	.6563	1.6204E-02	9.7924E-02	3.2108E-02	2.7407E-02	.1534	3.3008E-03
54.000	8.6010E-03	.6793	1.4802E-02	8.8411E-02	2.8903E-02	2.4603E-02	.1466	3.2004E-03
55.000	8.4022E-03	.6921	1.3504E-02	8.4922E-02	2.9408E-02	2.1706E-02	.1453	3.0009E-03
56.000	8.4026E-03	.7025	1.3404E-02	7.8824E-02	2.9509E-02	1.9206E-02	.1434	3.1010E-03
57.000	8.7044E-03	.7160	1.7209E-02	7.0835E-02	2.4912E-02	2.1711E-02	.1364	2.8009E-03
58.000	8.7034E-03	.7180	1.2705E-02	7.1728E-02	2.4710E-02	2.4410E-02	.1359	2.5010E-03
59.000	8.7034E-03	.7147	1.3605E-02	6.7926E-02	2.2613E-02	2.4910E-02	.1333	2.6010E-03
60.000	8.7037E-03	.7158	1.4806E-02	6.9830E-02	2.5511E-02	2.6011E-02	.1353	2.6011E-03
61.000	8.3030E-03	.7189	1.4505E-02	6.7324E-02	2.6209E-02	2.3208E-02	.1372	2.8010E-03

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TIME (D)	ARGON mol/ IRED1 10	NITROGEN mol/ IRED1 11	OXYGEN mol/ IRED1 12	HYDROGEN mol/ IRED1 13	METHANE mol/ IRED1 14	CO mol/ IRED1 15	CO2 mol/ IRED1 16	ETHANE mol/ IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
62.000	8.5034E-03	.7060	1.2505E-02	7.1829E-02	2.7811E-02	2.7011E-02	.1416	3.0012E-03
63.000	8.4025E-03	.7114	1.4904E-02	6.9221E-02	2.7208E-02	2.3407E-02	.1408	3.0009E-03
64.000	8.4048E-03	.7161	1.1607E-02	6.6638E-02	2.6315E-02	2.1912E-02	.1445	2.9017E-03
65.000	8.2034E-03	.6978	8.9036E-03	8.2034E-02	3.2213E-02	2.9212E-02	.1370	3.1013E-03
66.000	8.2025E-03	.6934	7.5023E-03	9.1028E-02	3.5711E-02	2.2207E-02	.1383	2.7008E-03
67.000	8.1024E-03	.6954	6.3019E-03	8.3225E-02	3.6211E-02	1.9906E-02	.1468	3.0009E-03
68.000	8.3352E-03	.7039	9.2729E-03	7.9392E-02	3.1674E-02	1.8754E-02	.1452	2.5005E-03
69.000	8.5015E-03	.7009	1.1502E-02	7.7414E-02	3.2406E-02	1.7703E-02	.1479	2.6005E-03
70.000	8.5030E-03	.7039	1.3805E-02	7.8527E-02	2.9710E-02	1.4805E-02	.1476	2.5009E-03
71.000	8.6029E-03	.7079	1.5805E-02	7.8827E-02	2.4808E-02	1.2504E-02	.1485	1.8006E-03
72.000	8.7037E-03	.7222	1.0504E-02	7.2230E-02	2.2910E-02	1.0404E-02	.1506	2.0008E-03
73.000	8.6033E-03	.7257	1.1704E-02	6.8726E-02	2.1208E-02	9.1035E-03	.1525	2.0008E-03
74.000	8.7033E-03	.7342	1.5606E-02	6.4024E-02	1.9107E-02	7.8030E-03	.1483	1.8007E-03
75.000	5.6009E-03	.5093	7.8012E-03	.1257	.1347	6.5010E-02	.1371	1.1302E-02
76.000	5.2689E-03	.5445	3.2353E-03	9.3453E-02	.1375	4.1042E-02	.1536	1.1000E-02
77.000	5.7004E-03	.5058	1.3001E-03	.1182	.1214	4.8603E-02	.1864	9.9007E-03
78.000	6.3505E-03	.4945	1.9845E-04	.1747	4.5942E-02	.1014	.1724	3.6714E-03
79.000	5.9027E-03	.5198	1.0005E-04	.1741	3.7917E-02	.1127	.1470	2.2010E-03
80.000	6.4018E-03	.5743	0.000	.1492	2.8808E-02	7.6221E-02	.1630	1.8005E-03
81.000	6.2017E-03	.5451	1.0003E-04	.1722	2.3006E-02	8.9925E-02	.1618	1.2003E-03
82.000	6.9145E-03	.6063	0.000	.1231	9.0189E-03	.1179	.1363	4.0084E-04
83.000	7.6017E-03	.6575	0.000	8.3719E-02	1.0602E-02	.1064	.1331	6.0014E-04
84.000	7.3025E-03	.6327	0.000	.1132	1.6606E-02	7.7726E-02	.1514	6.0020E-04
85.000	1.0000E-02	.7800	.2100	0.000	0.000	0.000	0.000	0.000
86.000	1.0000E-02	.7800	.2100	0.000	0.000	0.000	0.000	0.000
87.000	1.0000E-02	.7800	.2100	0.000	0.000	0.000	0.000	0.000
88.000	1.0000E-02	.7800	.2100	0.000	0.000	0.000	0.000	0.000
89.000	1.0000E-02	.7800	.2100	0.000	0.000	0.000	0.000	0.000
90.000	1.0000E-02	.7800	.2100	0.000	0.000	0.000	0.000	0.000
91.000	1.0000E-02	.7800	.2100	0.000	0.000	0.000	0.000	0.000
92.000	1.0000E-02	.7800	.2100	0.000	0.000	0.000	0.000	0.000
93.000	1.0000E-02	.7800	.2100	0.000	0.000	0.000	0.000	0.000
94.000	1.0000E-02	.7800	.2100	0.000	0.000	0.000	0.000	0.000
95.000	1.0000E-02	.7800	.2100	0.000	0.000	0.000	0.000	0.000
96.000	1.0000E-02	.7800	.2100	0.000	0.000	0.000	0.000	0.000
97.000	1.0000E-02	.7800	.2100	0.000	0.000	0.000	0.000	0.000
98.000	1.0000E-02	.7800	.2100	0.000	0.000	0.000	0.000	0.000
99.000	1.0000E-02	.7800	.2100	0.000	0.000	0.000	0.000	0.000
100.000	1.0000E-02	.7800	.2100	0.000	0.000	0.000	0.000	0.000
101.000	1.0000E-02	.7800	.2100	0.000	0.000	0.000	0.000	0.000
102.000	1.0903E-02	.6850	.1867	4.0007E-02	1.5003E-02	3.2908E-02	2.7606E-02	1.3003E-03
103.000	8.7937E-03	.6713	1.3390E-02	.1043	2.1584E-02	7.0949E-02	.1070	1.4989E-03
104.000	6.0008E-03	.5250	1.0001E-04	.1858	4.4106E-02	8.7011E-02	.1464	3.5005E-03
105.000	5.5014E-03	.4881	1.0003E-04	.2066	6.0316E-02	7.1619E-02	.1594	5.4014E-03
106.000	5.7025E-03	.4983	8.0034E-04	.1972	5.6424E-02	8.0435E-02	.1529	5.4023E-03
107.000	5.7029E-03	.5020	6.0030E-04	.2107	3.9520E-02	8.7344E-02	.1486	3.1016E-03
108.000	5.2009E-03	.4848	1.1902E-02	.1948	4.5608E-02	.1553	9.5817E-02	3.7007E-03
109.000	5.1992E-03	.4671	2.8996E-03	.2112	5.7591E-02	.1247	.1234	4.6993E-03

TIME (D)	ARGON molf IRED1 10	NITROGEN molf IRED1 11	OXYGEN molf IRED1 12	HYD molf IRED1 13	METHANE molf IRED1 14	CO molf IRED1 15	CO2 molf IRED1 16	ETHANE molf IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
110.000	4.9029E-03	.4591	7.0042E-04	.1964	7.0242E-02	.1182	.1436	4.9029E-03
111.000	5.3019E-03	.4670	1.8006E-03	.1905	6.9125E-02	.1209	.1377	5.5020E-03
112.000	5.2026E-03	.4625	8.0040E-04	.1910	6.5533E-02	.1316	.1357	5.8029E-03
113.000	5.4131E-03	.4815	2.0049E-04	.1769	5.6036E-02	.1436	.1292	4.9119E-03
114.000	5.2999E-03	.4907	0.000	.1871	4.1800E-02	.1521	.1179	3.5000E-03
115.000	5.9030E-03	.5199	0.000	.1708	3.5018E-02	.1444	.1213	2.0010E-03
116.000	6.1832E-03	.5425	4.1221E-04	.1812	2.4630E-02	.1180	.1250	1.5458E-03
117.000	5.4019E-03	.5064	1.0004E-04	.1862	2.8610E-02	.1491	.1209	2.2008E-03
118.000	6.0035E-03	.5222	0.000	.1794	2.7716E-02	.1230	.1385	2.2013E-03
119.000	5.7011E-03	.5027	0.000	.1944	2.5705E-02	.1365	.1316	2.2004E-03
120.000	5.9669E-03	.5265	0.000	.1819	2.3569E-02	.1281	.1325	9.9449E-04
121.000	1.6007E-02	.5506	0.000	.1537	2.4711E-02	9.2742E-02	.1600	1.3006E-03
122.000	6.6028E-03	.5765	0.000	.1391	2.8512E-02	.1029	.1437	1.6007E-03
123.000	6.4021E-03	.5540	0.000	.1497	3.1010E-02	.1229	.1331	1.7006E-03
124.000	6.6030E-03	.5759	0.000	.1297	2.7112E-02	.1315	.1271	1.5007E-03
125.000	6.6024E-03	.5785	0.000	.1291	2.8710E-02	.1207	.1336	1.9007E-03
126.000	6.8027E-03	.5716	0.000	.1170	2.3709E-02	9.3537E-02	.1843	2.4010E-03
127.000	6.6026E-03	.5866	1.0004E-04	.1041	2.5410E-02	7.9232E-02	.1951	2.5010E-03
128.000	6.6033E-03	.5872	1.0005E-04	.1031	2.2411E-02	.1042	.1746	1.7008E-03
129.000	7.5028E-03	.6356	1.0004E-04	7.3328E-02	2.1408E-02	8.5232E-02	.1748	1.5006E-03
130.000	8.8033E-03	.6679	4.1016E-03	5.9923E-02	1.9207E-02	6.7626E-02	.1711	9.0034E-04
131.000	7.6030E-03	.6725	0.000	6.0424E-02	2.1208E-02	6.5726E-02	.1707	1.5006E-03
132.000	8.0024E-03	.6883	0.000	5.2216E-02	2.0906E-02	5.4516E-02	.1743	1.5005E-03
133.000	9.9050E-03	.6601	9.4047E-03	6.6833E-02	2.1111E-02	5.4027E-02	.1766	1.6008E-03
134.000	8.3042E-03	.6899	1.8009E-03	5.3427E-02	1.8109E-02	4.8824E-02	.1778	1.3007E-03
135.000	8.4042E-03	.6976	8.0040E-04	5.3127E-02	1.8109E-02	4.1921E-02	.1783	1.3007E-03
136.000	8.2992E-03	.7043	3.9996E-04	4.9995E-02	1.9098E-02	3.6796E-02	.1792	1.4999E-03
137.000	8.0032E-03	.6727	3.0012E-04	5.9324E-02	2.2409E-02	3.5814E-02	.1993	1.8007E-03
138.000	8.4040E-03	.6930	0.000	5.3625E-02	2.1510E-02	3.3516E-02	.1878	1.8008E-03
139.000	8.4031E-03	.6985	0.000	5.2720E-02	2.1308E-02	3.2812E-02	.1844	1.7006E-03
140.000	1.1593E-02	.6763	9.0725E-04	6.2096E-02	2.3387E-02	3.9818E-02	.1840	1.6129E-03
141.000	1.3508E-02	.6677	1.9011E-03	6.5937E-02	2.4614E-02	4.3024E-02	.1814	1.7010E-03
142.000	8.1021E-03	.6755	4.0010E-04	6.6117E-02	2.3006E-02	4.8413E-02	.1766	1.5004E-03
143.000	8.2041E-03	.6762	3.0015E-04	6.7334E-02	2.3812E-02	5.1326E-02	.1713	1.4007E-03
144.000	8.1023E-03	.6732	0.000	6.6819E-02	2.5707E-02	4.9614E-02	.1745	1.7005E-03
145.000	8.2033E-03	.6688	0.000	6.8527E-02	2.5810E-02	5.1921E-02	.1749	1.7007E-03
146.000	8.1024E-03	.6634	0.000	7.0921E-02	2.7208E-02	5.4916E-02	.1735	1.8005E-03
147.000	8.0032E-03	.6538	0.000	7.2129E-02	2.8411E-02	5.6723E-02	.1789	1.9008E-03
148.000	7.8031E-03	.6369	0.000	8.3333E-02	3.2313E-02	6.4026E-02	.1735	2.0008E-03
149.000	7.8023E-03	.6414	0.000	8.0824E-02	3.2510E-02	6.3619E-02	.1716	2.0006E-03
150.000	7.8031E-03	.6510	0.000	7.4530E-02	3.0812E-02	6.0524E-02	.1732	1.9008E-03
155.000	7.8039E-03	.6423	0.000	7.8039E-02	3.2116E-02	6.3332E-02	.1742	2.0010E-03

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UCG DB - HA4.A - PRODUCT GAS ANALYSIS 2

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	C2H4 molf !RED1 17	C6 molf !RED1 19	H10 molf !RED1 20	H2S molf !RED1 21	TAR/DRY !RED1 24	H2O/DRY !RED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
24.000	0.000	0.000	0.000	0.000	0.000	0.000
25.000	4.0013E-04	2.0006E-04	2.8009E-04	0.000	0.000	0.000
26.000	0.000	6.0062E-04	8.6090E-04	0.000	0.000	2.7844E-03
27.000	7.0018E-04	9.0023E-04	1.3403E-03	0.000	0.000	4.1766E-03
28.000	5.0012E-04	8.0019E-04	1.1603E-03	0.000	0.000	5.5688E-03
29.000	3.0004E-04	5.0007E-04	7.6011E-04	0.000	0.000	6.9610E-03
30.000	3.0007E-04	7.0017E-04	1.0603E-03	0.000	0.000	8.3532E-03
31.000	4.0000E-04	7.5001E-04	1.1400E-03	0.000	0.000	9.7454E-03
32.000	3.0014E-04	7.0032E-04	1.0405E-03	0.000	0.000	1.1138E-02
33.000	3.0020E-04	5.5037E-04	7.8052E-04	0.000	0.000	1.2530E-02
34.000	2.0006E-04	4.0011E-04	6.2017E-04	0.000	0.000	1.3922E-02
35.000	3.0005E-04	4.5007E-04	7.0010E-04	0.000	0.000	1.5314E-02
36.000	4.0014E-04	6.5023E-04	1.0003E-03	0.000	0.000	1.6706E-02
37.000	6.0014E-04	7.5017E-04	1.1203E-03	0.000	0.000	1.8099E-02
38.000	4.0006E-04	7.0010E-04	1.0601E-03	0.000	0.000	1.9491E-02
39.000	4.0002E-04	7.0003E-04	1.0600E-03	0.000	0.000	2.0883E-02
40.000	3.9900E-04	6.4837E-04	9.5760E-04	0.000	0.000	2.2275E-02
41.000	4.0014E-04	7.0024E-04	1.0604E-03	0.000	0.000	2.3667E-02
42.000	5.0017E-04	7.0024E-04	1.0604E-03	0.000	0.000	2.5060E-02
43.000	4.0011E-04	6.5018E-04	9.8026E-04	0.000	0.000	2.6452E-02
44.000	3.9979E-04	6.4966E-04	9.7948E-04	0.000	0.000	2.7844E-02
45.000	5.0014E-04	6.0017E-04	9.2026E-04	0.000	0.000	2.9236E-02
46.000	5.0020E-04	6.0024E-04	9.0036E-04	0.000	0.000	3.0628E-02
47.000	4.0024E-04	6.0036E-04	9.0054E-04	0.000	0.000	3.2021E-02
48.000	5.0030E-04	6.0036E-04	9.0054E-04	0.000	0.000	3.3413E-02
49.000	4.0019E-04	6.5031E-04	9.8046E-04	0.000	0.000	3.4805E-02
50.000	6.0024E-04	6.0024E-04	9.0036E-04	0.000	0.000	3.6197E-02
51.000	6.0037E-04	6.0037E-04	8.8055E-04	0.000	0.000	3.7589E-02
52.000	5.0028E-04	5.0028E-04	7.4041E-04	0.000	0.000	3.8982E-02
53.000	6.0015E-04	5.5014E-04	8.0020E-04	0.000	0.000	4.0374E-02
54.000	4.0005E-04	2.3003E-03	2.8803E-03	0.000	0.000	4.1766E-02
55.000	4.0010E-04	5.0013E-04	7.4019E-04	0.000	0.000	4.3158E-02
56.000	5.0016E-04	4.5014E-04	6.4020E-04	0.000	0.000	4.4550E-02
57.000	5.0025E-04	4.0020E-04	6.0030E-04	0.000	0.000	4.5942E-02
58.000	6.0023E-04	3.5014E-04	4.6018E-04	0.000	0.000	4.7335E-02
59.000	6.0023E-04	4.5018E-04	6.6026E-04	0.000	0.000	4.8727E-02
60.000	6.0026E-04	3.5015E-04	5.2022E-04	0.000	0.000	5.0119E-02
61.000	6.0022E-04	4.0014E-04	5.4019E-04	0.000	0.000	5.1511E-02

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TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2S molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
62.000	6.0024E-04	5.0020E-04	7.0028E-04	0.000	0.000	5.2903E-02
63.000	6.0018E-04	4.0012E-04	6.0018E-04	0.000	0.000	5.4296E-02
64.000	5.0029E-04	4.5026E-04	6.8039E-04	0.000	0.000	5.5688E-02
65.000	5.0020E-04	4.5018E-04	6.4026E-04	0.000	0.000	5.7080E-02
66.000	0.000	3.5011E-04	5.4017E-04	0.000	0.000	5.8472E-02
67.000	0.000	4.0012E-04	6.0018E-04	0.000	0.000	5.9864E-02
68.000	0.000	3.6466E-04	5.6262E-04	0.000	0.000	6.1257E-02
69.000	0.000	4.0007E-04	6.2011E-04	0.000	0.000	6.2649E-02
70.000	0.000	2.5009E-04	4.0014E-04	0.000	0.000	6.4041E-02
71.000	5.0017E-04	3.0010E-04	4.6016E-04	0.000	0.000	6.5433E-02
72.000	0.000	2.0008E-04	2.8012E-04	0.000	0.000	6.6825E-02
73.000	0.000	2.0008E-04	3.2012E-04	0.000	0.000	6.8218E-02
74.000	0.000	2.0008E-04	3.2012E-04	0.000	0.000	6.9610E-02
75.000	1.0002E-04	1.3002E-03	2.0403E-03	0.000	0.000	7.1002E-02
76.000	7.3949E-03	1.1555E-03	1.7378E-03	0.000	0.000	7.2394E-02
77.000	1.0001E-04	1.0501E-03	1.4801E-03	0.000	0.000	7.3786E-02
78.000	9.9226E-05	2.9768E-04	3.9690E-04	0.000	0.000	7.5179E-02
79.000	0.000	1.5007E-04	2.0009E-04	0.000	0.000	7.6571E-02
80.000	0.000	1.0003E-04	1.2003E-04	0.000	0.000	7.7963E-02
81.000	2.0006E-04	1.0003E-04	1.2003E-04	0.000	0.000	7.9355E-02
82.000	1.0021E-04	0.000	0.000	0.000	0.000	8.0747E-02
83.000	1.0002E-04	1.5003E-04	2.2005E-04	0.000	0.000	8.2140E-02
84.000	2.0007E-04	1.0003E-04	1.6005E-04	0.000	0.000	8.3532E-02
85.000	0.000	0.000	0.000	0.000	0.000	0.000
86.000	0.000	0.000	0.000	0.000	0.000	0.000
87.000	0.000	0.000	0.000	0.000	0.000	0.000
88.000	0.000	0.000	0.000	0.000	0.000	0.000
89.000	0.000	0.000	0.000	0.000	0.000	0.000
90.000	0.000	0.000	0.000	0.000	0.000	0.000
91.000	0.000	0.000	0.000	0.000	0.000	0.000
92.000	0.000	0.000	0.000	0.000	0.000	0.000
93.000	0.000	0.000	0.000	0.000	0.000	0.000
94.000	0.000	0.000	0.000	0.000	0.000	0.000
95.000	0.000	0.000	0.000	0.000	0.000	0.000
96.000	0.000	0.000	0.000	0.000	0.000	0.000
97.000	0.000	0.000	0.000	0.000	0.000	0.000
98.000	0.000	0.000	0.000	0.000	0.000	0.000
99.000	0.000	0.000	0.000	0.000	0.000	0.000
100.000	0.000	0.000	0.000	0.000	0.000	.1058
101.000	0.000	0.000	0.000	0.000	0.000	.1072
102.000	2.0005E-04	1.5003E-04	2.2005E-04	0.000	0.000	.1086
103.000	3.9971E-04	2.9978E-04	4.1970E-04	0.000	0.000	.1100
104.000	7.0009E-04	5.5007E-04	8.2011E-04	0.000	0.000	.1114
105.000	7.0018E-04	9.0023E-04	1.3403E-03	0.000	0.000	.1128
106.000	1.0004E-03	7.5032E-04	1.1205E-03	0.000	0.000	.1142
107.000	8.0040E-04	7.0035E-04	1.0005E-03	0.000	0.000	.1156
108.000	1.1002E-03	7.0013E-04	1.0202E-03	0.000	0.000	.1169
109.000	6.9989E-04	1.0498E-03	1.4998E-03	0.000	0.000	.1183

TIME (D)	C2H4 molf !RED1 17	C6 molf !RED1 19	H10 molf !RED1 20	H2S molf !RED1 21	TAR/DRY !RED1 24	H2O/DRY !RED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
110.000	5.0030E-04	6.0036E-04	9.0054E-04	0.000	0.000	.1197
111.000	4.0014E-04	7.0025E-04	1.0404E-03	0.000	0.000	.1211
112.000	4.0020E-04	6.0030E-04	9.0045E-04	0.000	0.000	.1225
113.000	7.0170E-04	6.0146E-04	8.8213E-04	0.000	0.000	.1239
114.000	4.9999E-04	4.5000E-04	6.5999E-04	0.000	0.000	.1253
115.000	3.0015E-04	2.0010E-04	3.0015E-04	0.000	0.000	.1267
116.000	2.0611E-04	1.5458E-04	2.2672E-04	0.000	0.000	.1281
117.000	4.0014E-04	3.0011E-04	4.4016E-04	0.000	0.000	.1295
118.000	4.0024E-04	2.5015E-04	3.6021E-04	0.000	0.000	.1309
119.000	5.0009E-04	2.5005E-04	3.6007E-04	0.000	0.000	.1375
120.000	2.9835E-04	9.9449E-05	1.3923E-04	0.000	0.000	.1095
121.000	6.0027E-04	1.5007E-04	2.0009E-04	0.000	0.000	.1259
122.000	6.0025E-04	2.0008E-04	2.8012E-04	0.000	0.000	.1272
123.000	7.0023E-04	1.5005E-04	2.2007E-04	0.000	0.000	8.9140E-02
124.000	5.0023E-04	1.0005E-04	1.4006E-04	0.000	0.000	7.8389E-02
125.000	5.0018E-04	1.0004E-04	1.4005E-04	0.000	0.000	.1004
126.000	6.0024E-04	0.000	0.000	0.000	0.000	.1132
127.000	3.0012E-04	0.000	0.000	0.000	0.000	9.6201E-02
128.000	2.0010E-04	0.000	0.000	0.000	0.000	6.2475E-02
129.000	3.0011E-04	1.0004E-04	1.2005E-04	0.000	0.000	.1149
130.000	3.0011E-04	1.0004E-04	1.2005E-04	0.000	0.000	.5067
131.000	3.0012E-04	5.0020E-05	6.0023E-05	0.000	0.000	.5509
132.000	3.0009E-04	0.000	0.000	0.000	0.000	.6147
133.000	4.0020E-04	0.000	0.000	0.000	0.000	.4975
134.000	5.0025E-04	0.000	0.000	0.000	0.000	.6385
135.000	4.0020E-04	0.000	0.000	0.000	0.000	.5404
136.000	3.9996E-04	0.000	0.000	0.000	0.000	.4412
137.000	4.0016E-04	0.000	0.000	0.000	0.000	.7343
138.000	2.0009E-04	5.0024E-05	8.0038E-05	0.000	0.000	.8603
139.000	1.0004E-04	5.0019E-05	8.0030E-05	0.000	0.000	.9486
140.000	2.0161E-04	5.0403E-05	6.0483E-05	0.000	0.000	.6712
141.000	0.000	1.0006E-04	1.4008E-04	0.000	0.000	1.110
142.000	1.0003E-04	1.0003E-04	1.4004E-04	0.000	0.000	1.154
143.000	1.0005E-04	0.000	0.000	0.000	0.000	.7930
144.000	3.0009E-04	5.0015E-05	6.0017E-05	0.000	0.000	.3564
145.000	2.0008E-04	0.000	0.000	0.000	0.000	.8277
146.000	2.0006E-04	0.000	0.000	0.000	0.000	.8007
147.000	2.0008E-04	0.000	0.000	0.000	0.000	.2417
148.000	2.0008E-04	0.000	0.000	0.000	0.000	.5765
149.000	3.0009E-04	0.000	0.000	0.000	0.000	.9545
150.000	3.0012E-04	0.000	0.000	0.000	0.000	.7099
155.000	2.0010E-04	0.000	0.000	0.000	0.000	.7099

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UCG DB - HA4.A - MATERIAL BALANCES

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL RT mo/s IRED1 44	ASH RATE mo/s IRED1 46	H2O INFX mo/s IRED1 47	H2O COAL mo/s IRED1 48	-H2O RXN mo/s IRED1 49	O2 per COAL IRED1 60	H2O per COAL IRED1 61	CHAR RT mo/s IRED1 64	CHAR per COAL IRED1 63	RECOVORY % IRED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
24.000	3.6911E-03	3.3717E-04	-1.816E-03	4.4294E-04	-1.373E-03	41.10	-.3719	.3796	.9904	12.62
25.000	0.000	0.000	0.000	0.000	0.000	1.424	.1426	0.000	.8577	0.000
26.000	.1398	1.2766E-02	3.3876E-02	1.6771E-02	4.8426E-02	.6547	.3465	.4903	.7782	9.296
27.000	.1785	1.6305E-02	5.4870E-02	2.1419E-02	7.2546E-02	.5681	.4064	.5033	.7382	9.397
28.000	.2047	1.8700E-02	6.4902E-02	2.4565E-02	8.3930E-02	.5618	.4100	.5031	.7108	9.180
29.000	.2016	1.8418E-02	6.9914E-02	2.4195E-02	8.7197E-02	.5446	.4325	.5452	.7300	9.082
30.000	.1902	1.7370E-02	6.8290E-02	2.2819E-02	8.2825E-02	.5955	.4356	.5496	.7429	9.704
31.000	.1891	1.7270E-02	7.5079E-02	2.2687E-02	8.8115E-02	.5777	.4661	.5768	.7531	9.562
32.000	.1987	1.8154E-02	8.0529E-02	2.3849E-02	9.2262E-02	.6123	.4642	.6308	.7604	10.58
33.000	.1918	1.7517E-02	7.5265E-02	2.3012E-02	8.4665E-02	.6305	.4415	.6606	.7750	10.73
34.000	.1894	1.7298E-02	6.7120E-02	2.2724E-02	7.4740E-02	.6811	.3947	.6074	.7623	10.93
35.000	.1839	1.6800E-02	7.0188E-02	2.2070E-02	7.7174E-02	.6013	.4196	.5824	.7600	9.565
36.000	.2182	1.9931E-02	8.0044E-02	2.6183E-02	8.8152E-02	.5585	.4040	.6105	.7367	10.34
37.000	.2475	2.2605E-02	.1076	2.9695E-02	.1160	.4939	.4686	.7007	.7390	10.94
38.000	.2437	2.2260E-02	.1056	2.9243E-02	.1119	.5058	.4590	.6964	.7408	11.09
39.000	.2831	2.5859E-02	.1246	3.3971E-02	.1320	.4556	.4662	.7389	.7230	11.54
40.000	.3068	2.8027E-02	.1500	3.6819E-02	.1563	.4215	.5096	.8616	.7374	12.22
41.000	.2647	2.4177E-02	.1182	3.1760E-02	.1222	.4432	.4618	.7100	.7284	10.86
42.000	.2712	2.4775E-02	.1060	3.2546E-02	.1092	.4716	.4027	.6325	.6999	10.79
43.000	.2859	2.6119E-02	.1310	3.4311E-02	.1318	.4432	.4609	.7563	.7257	11.41
44.000	.2656	2.4260E-02	.1068	3.1870E-02	.1061	.4775	.3996	.6440	.7080	10.58
45.000	.2643	2.4140E-02	.1032	3.1713E-02	.1008	.4888	.3813	.6340	.7058	10.87
46.000	.2621	2.3940E-02	9.1645E-02	3.1450E-02	8.7433E-02	.5130	.3336	.6230	.7039	11.20
47.000	.2354	2.1501E-02	7.8387E-02	2.8246E-02	7.2503E-02	.5305	.3080	.5796	.7112	10.89
48.000	.2117	1.9334E-02	6.9547E-02	2.5399E-02	6.2614E-02	.5363	.2958	.5352	.7166	8.921
49.000	.2296	2.0974E-02	8.3395E-02	2.7553E-02	7.3951E-02	.5209	.3221	.6317	.7334	10.03
50.000	.3299	3.0135E-02	.1485	3.9588E-02	.1287	.4624	.3902	1.250	.7913	15.92
51.000	.3610	3.2977E-02	.1490	4.3321E-02	.1307	.5019	.3620	.8960	.7128	15.46
52.000	.3422	3.1255E-02	.1260	4.1060E-02	.1033	.5882	.3018	.7875	.6971	15.64
53.000	.3446	3.1476E-02	.1315	4.1350E-02	.1108	.5720	.3216	.6020	.6360	14.06
54.000	.3396	3.1023E-02	.1266	4.0755E-02	.1032	.5482	.3039	.7641	.6923	14.70
55.000	.3361	3.0704E-02	.1284	4.0335E-02	9.8440E-02	.5908	.2929	.8477	.7161	15.55
56.000	.2902	2.6506E-02	.1103	3.4820E-02	8.1105E-02	.5985	.2795	.7902	.7314	14.21
57.000	.2937	2.6829E-02	.1007	3.5244E-02	6.5662E-02	.6592	.2236	.8170	.7356	15.43
58.000	.2584	2.3600E-02	8.7623E-02	3.1003E-02	5.5352E-02	.6392	.2142	.7524	.7444	13.67
59.000	.2859	2.6115E-02	.1092	3.4307E-02	7.3824E-02	.5824	.2582	.8770	.7542	14.40
60.000	.2418	2.2083E-02	8.3507E-02	2.9011E-02	5.0473E-02	.6452	.2088	.6665	.7338	12.76
61.000	.2794	2.5524E-02	9.7136E-02	3.3530E-02	5.7184E-02	.6462	.2047	.7707	.7339	14.29

TIME (D)	COAL RT mo/s !RED1 44	ASH RATE mo/s !RED1 46	H2O INFX mo/s !RED1 47	H2O COAL mo/s !RED1 48	-H2O RXN mo/s !RED1 49	O2 per COAL !RED1 60	H2O per COAL !RED1 61	CHAR RT mo/s !RED1 64	CHAR per COAL !RED1 63	RECOVERY % !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
62.000	.3335	3.0468E-02	.1167	4.0026E-02	7.1310E-02	.6187	.2138	.8109	.7085	16.06
63.000	.2861	2.6131E-02	.1033	3.4327E-02	6.0386E-02	.6418	.2111	.7174	.7149	14.42
64.000	.2682	2.4496E-02	9.1315E-02	3.2180E-02	4.9645E-02	.6480	.1851	.6608	.7113	13.23
65.000	.2759	2.5198E-02	.1248	3.3103E-02	8.2346E-02	.5357	.2985	.8152	.7472	12.88
66.000	.2310	2.1102E-02	.1265	2.7721E-02	8.7961E-02	.4944	.3808	.7862	.7729	11.08
67.000	.2393	2.1860E-02	.1165	2.8717E-02	7.7461E-02	.5243	.3237	.6979	.7447	11.09
68.000	.2294	2.0953E-02	.1071	2.7526E-02	6.5371E-02	.5799	.2850	.6557	.7408	10.97
69.000	.2516	2.2980E-02	.1157	3.0188E-02	6.9219E-02	.5953	.2751	.6544	.7223	11.95
70.000	.2613	2.3866E-02	.1243	3.1352E-02	7.1344E-02	.6278	.2731	.6884	.7249	12.91
71.000	.2164	1.9771E-02	.1006	2.5973E-02	5.2852E-02	.6797	.2442	.5451	.7158	11.75
72.000	.2304	2.1047E-02	9.8479E-02	2.7649E-02	4.4697E-02	.6969	.1940	.6162	.7278	12.13
73.000	.2288	2.0896E-02	9.2677E-02	2.7451E-02	3.7109E-02	.7309	.1622	.5692	.7133	12.44
74.000	.1346	1.2296E-02	5.4420E-02	1.6153E-02	1.8509E-02	.7779	.1375	.3479	.7210	6.342
75.000	2.299	.2100	1.838	.2759	1.670	3.4117E-02	.7265	6.288	.7323	25.69
76.000	3.716	.3394	2.726	.4459	2.456	5.5815E-02	.6611	10.02	.7294	39.66
77.000	8.412	.7684	5.418	1.009	4.805	.1828	.5713	11.74	.5826	85.86
78.000	18.85	1.722	9.226	2.262	7.181	.4026	.3809	.3180	1.6588E-02	136.0
79.000	14.32	1.308	7.355	1.718	5.453	.3957	.3808	7.676	.3490	109.4
80.000	9.649	.8814	4.618	1.158	3.013	.4972	.3123	5.502	.3632	91.54
81.000	13.40	1.224	6.660	1.608	4.445	.4925	.3317	3.790	.2204	116.9
82.000	19.88	1.816	5.075	2.385	1.387	.6185	6.9749E-02	-.1354	-6.859E-03	126.0
83.000	20.44	1.867	3.347	2.452	-.8503	.6734	-4.161E-02	4.569	.1827	114.9
84.000	13.41	1.225	4.697	1.609	1.788	.6151	.1334	7.793	.3676	119.5
85.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0
86.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0
87.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0
88.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0
89.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0
90.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0
91.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0
92.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0
93.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0
94.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0
95.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0
96.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0
97.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0
98.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0
99.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0
100.000	0.000	0.000	.6698	0.000	0.000	0.000	0.000	0.000	0.000	98.91
101.000	0.000	0.000	.4841	0.000	0.000	0.000	0.000	0.000	0.000	39.61
102.000	8.5967E-02	7.8528E-03	.1485	1.0316E-02	4.1275E-02	2.581	.4801	9.000	0.000	13.39
103.000	.2218	2.0260E-02	.1556	2.6615E-02	6.3319E-02	.5316	.2855	.6252	.7381	5.112
104.000	.5205	4.7547E-02	.4155	6.2461E-02	.2776	.3049	.5333	.7718	.5972	10.53
105.000	.3332	3.0437E-02	.3042	3.9985E-02	.2226	.2127	.6681	.5716	.6317	7.669
106.000	1.102	.1007	.9586	.1323	.6810	.2371	.6178	1.778	.6173	31.42
107.000	1.134	.1036	.9930	.1361	.6733	.2885	.5938	1.662	.5944	51.80
108.000	6.506	.5943	4.993	.7807	3.324	.2560	.5109	8.622	.5699	50.27
109.000	13.22	1.207	11.36	1.586	8.101	.1925	.6129	21.03	.6140	85.76

TIME (D)	COAL RT mo/s !RED1 44	ASH RATE mo/s !RED1 46	H2O INFX mo/s !RED1 47	H2O COAL mo/s !RED1 48	-H2O RXN mo/s !RED1 49	O2 per COAL !RED1 60	H2O per COAL !RED1 61	CHAR RT mo/s !RED1 64	CHAR per COAL !RED1 63	RECOVORY % !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
110.000	17.94	1.639	14.12	2.153	10.07	.2209	.5614	19.67	.5230	87.86
111.000	24.53	2.241	19.24	2.944	13.54	.2202	.5520	28.78	.5398	80.15
112.000	32.56	2.974	24.43	3.908	16.90	.2349	.5190	32.09	.4964	89.01
113.000	54.32	4.962	36.47	6.518	23.41	.2844	.4311	40.62	.4279	137.4
114.000	45.40	4.147	31.06	5.448	18.87	.3080	.4158	37.22	.4505	112.7
115.000	39.60	3.618	25.19	4.752	13.57	.3744	.3428	26.31	.3992	108.1
116.000	33.67	3.075	25.28	4.040	13.47	.3922	.4002	39.27	.5384	110.9
117.000	38.94	3.557	25.77	4.672	13.95	.3753	.3583	22.25	.3636	103.8
118.000	40.63	3.712	27.53	4.876	14.44	.4127	.3553	20.48	.3352	111.7
119.000	41.41	3.782	29.66	4.969	15.70	.3895	.3792	20.20	.3279	106.0
120.000	37.21	3.399	22.46	4.466	12.75	.4272	.3425	19.86	.3480	103.2
121.000	34.81	3.179	20.82	4.177	9.467	.5099	.2720	4.378	.1117	91.39
122.000	43.04	3.931	25.32	5.164	10.99	.4819	.2554	24.66	.3643	94.67
123.000	47.15	4.307	21.89	5.658	13.19	.4393	.2797	26.66	.3612	95.55
124.000	45.59	4.165	15.30	5.471	8.455	.4860	.1854	17.72	.2798	97.05
125.000	45.78	4.182	19.72	5.493	9.285	.4856	.2028	20.04	.3045	98.48
126.000	47.90	4.376	16.32	5.748	4.437	.6195	9.2634E-02	0.000	0.000	95.53
127.000	50.55	4.618	13.13	6.066	3.264	.6512	6.4576E-02	0.000	0.000	104.6
128.000	51.66	4.719	6.113	6.200	1.728	.6414	3.3453E-02	0.000	0.000	108.2
129.000	54.05	4.937	12.95	6.486	-2.318	.6974	-4.288E-02	0.000	0.000	117.5
130.000	33.82	3.089	58.99	4.058	-2.625	.7543	-7.763E-02	-17.77	-1.107	91.27
131.000	24.84	2.269	47.96	2.980	-1.380	.7206	-5.558E-02	-5.663	-.2953	82.21
132.000	22.65	2.069	50.48	2.718	-1.769	.7492	-7.811E-02	-3.199	-.1645	79.23
133.000	23.17	2.117	41.81	2.781	-.4900	.7580	-2.114E-02	-11.78	-1.035	85.59
134.000	17.93	1.638	42.36	2.152	-1.591	.7804	-8.876E-02	-4.681	-.3533	80.13
135.000	18.17	1.660	36.98	2.181	-1.461	.7823	-8.043E-02	-.7731	-4.444E-02	84.36
136.000	19.01	1.737	31.34	2.281	-1.485	.7824	-7.812E-02	1.759	8.4706E-02	90.17
137.000	16.63	1.519	43.82	1.995	-.8012	.7690	-4.819E-02	-10.40	-1.669	71.38
138.000	14.48	1.323	47.90	1.737	-.7718	.7689	-5.331E-02	-1.617	-.1257	66.32
139.000	13.50	1.233	50.49	1.620	-.7108	.7691	-5.266E-02	.7252	5.0990E-02	62.88
140.000	17.53	1.602	44.52	2.104	-.2430	.7370	-1.386E-02	-1.676	-.1057	75.97
141.000	14.87	1.358	63.58	1.784	.1272	.7196	8.5544E-03	-1.109	-8.058E-02	63.12
142.000	13.65	1.247	60.84	1.638	-3.903E-02	.7150	-2.860E-03	.7785	5.3967E-02	58.87
143.000	16.00	1.461	49.08	1.920	.1446	.7008	9.0400E-03	3.761	.1904	69.77
144.000	20.02	1.829	26.07	2.403	.3900	.6890	1.9476E-02	3.933	.1641	85.13
145.000	15.17	1.385	47.45	1.820	.3117	.6875	2.0551E-02	1.803	.1063	63.63
146.000	15.51	1.417	46.54	1.861	.5538	.6706	3.5702E-02	2.181	.1233	63.77
147.000	22.85	2.088	18.63	2.742	.7780	.6701	3.4043E-02	-2.559	-.1261	89.61
148.000	18.59	1.699	38.60	2.231	1.737	.6171	9.3433E-02	1.222	6.1670E-02	69.47
149.000	15.09	1.378	52.44	1.810	1.364	.6162	9.0382E-02	2.193	.1269	57.17
150.000	16.17	1.477	41.71	1.940	.9743	.6409	6.0262E-02	1.417	8.0580E-02	62.96
155.000	17.50	1.599	44.51	2.100	1.278	.6292	7.3034E-02	.2663	1.4989E-02	65.99

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UCG DB - HA4.A - ENERGY PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/02 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
24.000	1.613	9.9383E-02	0.000	-.4843	0.000	0.000	1.0841E-02	1.371	.1781	.8066
25.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	27.56	0.000
26.000	61.07	.8270	0.000	-1.528E-02	1.5979E-03	0.000	1.0841E-02	.1719	63.31	331.7
27.000	78.00	.8758	0.000	-9.472E-03	2.1084E-03	0.000	1.0841E-02	.1168	76.22	417.1
28.000	89.46	.8731	0.000	-9.660E-03	2.7197E-03	0.000	1.0841E-02	.1191	78.54	440.3
29.000	88.11	.8718	0.000	-9.054E-03	3.4469E-03	0.000	1.0841E-02	.1190	77.35	433.1
30.000	83.10	.8565	0.000	-1.031E-02	4.3797E-03	0.000	1.0841E-02	.1346	71.77	392.5
31.000	82.62	.8910	0.000	-1.053E-02	5.1322E-03	0.000	1.0841E-02	9.9648E-02	74.33	407.3
32.000	86.85	.8855	0.000	-1.167E-02	6.1292E-03	0.000	1.0841E-02	.1053	70.69	384.8
33.000	83.80	.8683	0.000	-1.215E-02	7.1362E-03	0.000	1.0841E-02	.1219	66.98	358.8
34.000	82.75	.8141	0.000	-1.210E-02	8.0186E-03	0.000	1.0841E-02	.1752	62.10	329.8
35.000	80.37	.8317	0.000	-1.068E-02	8.2452E-03	0.000	1.0841E-02	.1559	67.87	365.7
36.000	95.35	.8225	0.000	-9.062E-03	8.3283E-03	0.000	1.0841E-02	.1634	72.49	397.0
37.000	108.1	.8675	0.000	-1.013E-02	8.6666E-03	0.000	1.0841E-02	.1191	79.59	448.7
38.000	106.5	.8567	0.000	-1.009E-02	9.4648E-03	0.000	1.0841E-02	.1291	77.51	435.3
39.000	123.7	.8718	0.000	-8.437E-03	9.4439E-03	0.000	1.0841E-02	.1124	84.70	489.9
40.000	134.1	.8973	0.000	-8.374E-03	9.9957E-03	0.000	1.0841E-02	8.6243E-02	87.85	509.6
41.000	115.7	.8579	0.000	-7.678E-03	1.0539E-02	0.000	1.0841E-02	.1244	84.65	483.3
42.000	118.5	.8159	0.000	-1.146E-02	1.0874E-02	0.000	1.0841E-02	.1699	82.60	468.7
43.000	124.9	.8569	0.000	-1.171E-02	1.1779E-02	0.000	1.0841E-02	.1283	84.54	485.6
44.000	116.1	.8009	0.000	-1.067E-02	1.2306E-02	0.000	1.0841E-02	.1827	79.61	449.8
45.000	115.5	.7853	0.000	-1.020E-02	1.2967E-02	0.000	1.0841E-02	.1972	77.78	436.5
46.000	114.5	.7546	0.000	-1.069E-02	1.3680E-02	0.000	1.0841E-02	.2276	74.23	408.3
47.000	102.9	.7374	0.000	-1.167E-02	1.4577E-02	0.000	1.0841E-02	.2449	71.16	385.6
48.000	92.50	.7334	0.000	-1.292E-02	1.5357E-02	0.000	1.0841E-02	.2493	70.10	377.2
49.000	100.3	.7623	0.000	-1.233E-02	1.6199E-02	0.000	1.0841E-02	.2190	71.96	386.5
50.000	144.2	.8477	0.000	-1.244E-02	1.8098E-02	0.000	1.0841E-02	.1318	74.49	397.4
51.000	157.8	.8066	0.000	-1.016E-02	1.7151E-02	0.000	1.0841E-02	.1716	77.67	435.4
52.000	149.5	.7424	0.000	-9.447E-03	1.8741E-02	0.000	1.0841E-02	.2335	67.84	371.4
53.000	150.6	.7423	0.000	-8.935E-03	1.8116E-02	0.000	1.0841E-02	.2337	72.68	411.3
54.000	148.4	.7522	0.000	-9.360E-03	1.8989E-02	0.000	1.0841E-02	.2233	72.69	397.4
55.000	146.9	.7101	0.000	-9.900E-03	2.1037E-02	0.000	1.0841E-02	.2640	64.00	343.5
56.000	126.8	.6986	0.000	-9.342E-03	2.2166E-02	0.000	1.0841E-02	.2738	61.68	326.1
57.000	128.3	.6601	0.000	-1.031E-02	2.4057E-02	0.000	1.0841E-02	.3113	55.38	287.3
58.000	112.9	.6581	0.000	-9.250E-03	2.4622E-02	0.000	1.0841E-02	.3117	55.58	287.5
59.000	124.9	.7137	0.000	-1.134E-02	2.4509E-02	0.000	1.0841E-02	.2583	62.34	324.0
60.000	105.6	.6615	0.000	-9.977E-03	2.5802E-02	0.000	1.0841E-02	.3079	56.45	292.9
61.000	122.1	.6544	0.000	-1.617E-02	2.6439E-02	0.000	1.0841E-02	.3205	56.01	289.4

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TIME (D)	COAL kJ /mol IRED1 72	PRODUCT frac IRED1 74	TAR frac IRED1 73	SENS nf frac IRED1 76	STEAM frac IRED1 77	COOLING frac IRED1 80	SEN HT INSU IRED1 78	LOSS frac IRED1 75	HC kJ /mol IRED1 81	HC/02 kJ /mol IRED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
62.000	145.8	.6709	0.000	-1.449E-02	2.5746E-02	0.000	1.0841E-02	.3031	60.56	318.6
63.000	125.0	.6589	0.000	-1.112E-02	2.7149E-02	0.000	1.0841E-02	.3102	57.90	302.3
64.000	117.2	.6322	0.000	-1.212E-02	2.7686E-02	0.000	1.0841E-02	.3373	55.87	289.8
65.000	120.5	.7453	0.000	-1.283E-02	2.7551E-02	0.000	1.0841E-02	.2251	67.84	361.1
66.000	101.0	.7845	0.000	-1.250E-02	2.8850E-02	0.000	1.0841E-02	.1844	69.85	374.2
67.000	104.6	.7370	0.000	-9.198E-03	2.8474E-02	0.000	1.0841E-02	.2289	68.08	363.6
68.000	100.2	.6961	0.000	-9.009E-03	3.0358E-02	0.000	1.0841E-02	.2678	61.70	325.6
69.000	109.9	.6878	0.000	-9.891E-03	3.0629E-02	0.000	1.0841E-02	.2766	61.81	327.5
70.000	114.2	.6697	0.000	-1.049E-02	3.2424E-02	0.000	1.0841E-02	.2936	58.11	306.6
71.000	94.58	.6310	0.000	-9.976E-03	3.4233E-02	0.000	1.0841E-02	.3299	52.99	278.0
72.000	100.7	.5803	0.000	-1.395E-02	3.5531E-02	0.000	1.0841E-02	.3833	47.95	246.6
73.000	99.97	.5493	0.000	-1.426E-02	3.6486E-02	0.000	1.0841E-02	.4136	45.12	230.9
74.000	58.82	.5242	0.000	-1.700E-02	3.8886E-02	0.000	1.0841E-02	.4391	41.23	208.6
75.000	1005.	1.232	0.000	-6.695E-03	1.9426E-02	0.000	1.0841E-02	-.2594	197.8	1443.
76.000	1624.	1.177	0.000	-7.479E-04	1.9360E-02	0.000	1.0841E-02	-.2106	193.4	1319.
77.000	3676.	1.050	0.000	2.4546E-03	1.9382E-02	0.000	1.0841E-02	-8.677E-02	175.6	1290.
78.000	8238.	.8807	0.000	1.4704E-02	2.2970E-02	0.000	1.0841E-02	6.6769E-02	126.6	951.1
79.000	6257.	.9026	0.000	3.2232E-02	2.5420E-02	0.000	1.0841E-02	2.4942E-02	119.4	853.4
80.000	4216.	.7823	0.000	7.9489E-02	2.8787E-02	0.000	1.0841E-02	9.4607E-02	93.08	602.0
81.000	5857.	.8038	0.000	4.9059E-02	2.8679E-02	0.000	1.0841E-02	.1036	97.71	665.9
82.000	8687.	.6698	0.000	9.8082E-02	3.0720E-02	0.000	1.0841E-02	.1865	77.35	473.9
83.000	8931.	.5910	0.000	.1214	3.2710E-02	0.000	1.0841E-02	.2399	65.21	368.4
84.000	5859.	.6537	0.000	.1320	3.3878E-02	0.000	1.0841E-02	.1655	70.81	415.7
85.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
86.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
87.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
88.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
89.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
90.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
91.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
92.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
93.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
94.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
95.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
96.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
97.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
98.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
99.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
100.000	0.000	0.000	0.000	-6.083E-17	2.9426E-16	0.000	0.000	-2.334E-16	0.000	0.000
101.000	0.000	0.000	0.000	3.0936E-16	2.1268E-16	0.000	0.000	-5.220E-16	0.000	0.000
102.000	37.57	1.068	0.000	-2.821E-02	.1375	0.000	1.0841E-02	-.1920	37.06	201.0
103.000	96.92	.8173	0.000	6.8571E-02	5.3897E-02	0.000	1.0841E-02	4.5377E-02	73.27	405.4
104.000	227.5	.9955	0.000	.1233	3.8713E-02	0.000	1.0841E-02	-.1724	125.8	890.3
105.000	145.6	1.084	0.000	3.7408E-02	3.6692E-02	0.000	1.0841E-02	-.1725	146.3	1113.
106.000	481.7	1.062	0.000	.1412	3.7381E-02	0.000	1.0841E-02	-.2550	142.4	1062.
107.000	495.4	1.027	0.000	1.6464E-03	4.0415E-02	0.000	1.0841E-02	-8.434E-02	129.1	955.0
108.000	2843.	1.109	0.000	-6.126E-03	3.7858E-02	0.000	1.0841E-02	-.1560	150.6	1154.
109.000	5776.	1.132	0.000	6.5273E-03	3.6861E-02	0.000	1.0841E-02	-.1903	159.7	1270.

TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/O2 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
110.000	7841.	1.077	0.000	1.7855E-03	3.4748E-02	0.000	1.0841E-02	-.1286	163.1	1319.
111.000	1.0721E+04	1.081	0.000	1.4200E-02	3.5416E-02	0.000	1.0841E-02	-.1452	162.4	1292.
112.000	1.4230E+04	1.065	0.000	1.2956E-02	3.5315E-02	0.000	1.0841E-02	-.1285	162.4	1304.
113.000	2.3736E+04	1.014	0.000	1.5953E-02	3.6240E-02	0.000	1.0841E-02	-8.124E-02	152.3	1175.
114.000	1.9838E+04	1.006	0.000	2.7513E-02	3.9060E-02	0.000	1.0841E-02	-8.781E-02	141.8	1074.
115.000	1.7306E+04	.9353	0.000	4.3913E-02	4.1562E-02	0.000	1.0841E-02	-3.568E-02	125.3	895.0
116.000	1.4713E+04	.9292	0.000	5.5410E-02	4.7330E-02	0.000	1.0841E-02	-4.675E-02	110.5	756.4
117.000	1.7015E+04	.9446	0.000	5.8658E-02	4.2592E-02	0.000	1.0841E-02	-6.070E-02	126.2	925.3
118.000	1.7756E+04	.8958	0.000	6.1567E-02	4.4467E-02	0.000	1.0841E-02	-1.665E-02	115.8	823.8
119.000	1.8095E+04	.9305	0.000	6.2273E-02	4.5951E-02	0.000	1.0841E-02	-5.360E-02	122.3	903.6
120.000	1.6262E+04	.8890	0.000	7.1351E-02	3.8302E-02	0.000	1.0841E-02	-1.349E-02	111.6	787.4
121.000	1.5210E+04	.7759	0.000	8.9439E-02	4.4853E-02	0.000	1.0841E-02	7.4923E-02	95.66	645.3
122.000	1.8806E+04	.8025	0.000	9.1359E-02	4.5543E-02	0.000	1.0841E-02	4.5711E-02	98.45	634.2
123.000	2.0606E+04	.8557	0.000	.1012	3.0607E-02	0.000	1.0841E-02	-2.343E-03	109.5	734.1
124.000	1.9924E+04	.8032	0.000	.1180	2.7153E-02	0.000	1.0841E-02	3.6743E-02	101.9	657.0
125.000	2.0005E+04	.7990	0.000	.1160	3.4980E-02	0.000	1.0841E-02	3.5107E-02	100.7	646.8
126.000	2.0933E+04	.6372	0.000	.1084	3.7002E-02	0.000	1.0841E-02	.2026	85.63	556.4
127.000	2.2092E+04	.5931	0.000	.1046	3.1676E-02	0.000	1.0841E-02	.2557	79.14	501.1
128.000	2.2577E+04	.6140	0.000	.1155	2.0596E-02	0.000	1.0841E-02	.2350	81.82	517.5
129.000	2.3620E+04	.5392	0.000	.1228	4.0461E-02	0.000	1.0841E-02	.2826	67.29	393.2
130.000	1.4779E+04	.4875	0.000	.2021	.1952	0.000	1.0841E-02	.1002	55.58	309.1
131.000	1.0854E+04	.5050	0.000	.1905	.2118	0.000	1.0841E-02	7.7762E-02	57.71	318.8
132,000	9898.	.4674	0.000	.2357	.2440	0.000	1.0841E-02	3.8016E-02	51.73	279.1
133.000	1.0127E+04	.5033	0.000	.2118	.1956	0.000	1.0841E-02	7.4323E-02	56.25	316.5
134.000	7835.	.4418	0.000	.2252	.2585	0.000	1.0841E-02	5.9557E-02	47.95	258.1
135.000	7941.	.4332	0.000	.2104	.2248	0.000	1.0841E-02	.1166	45.77	243.7
136.000	8308.	.4274	0.000	.1978	.1857	0.000	1.0841E-02	.1742	44.61	235.3
137.000	7266.	.4405	0.000	.2158	.2819	0.000	1.0841E-02	4.6849E-02	50.42	278.4
138.000	6327.	.4378	0.000	.2417	.3500	0.000	1.0841E-02	-4.441E-02	47.28	253.4
139.000	5898.	.4375	0.000	.2595	.3934	0.000	1.0841E-02	-.1054	46.34	246.4
140.000	7663.	.4815	0.000	.2158	.2687	0.000	1.0841E-02	1.9021E-02	52.84	290.2
141.000	6498.	.5065	0.000	.2684	.4410	0.000	1.0841E-02	-.2308	56.01	311.6
142.000	5964.	.5086	0.000	.2713	.4606	0.000	1.0841E-02	-.2554	55.98	307.8
143.000	6991.	.5257	0.000	.2417	.3196	0.000	1.0841E-02	-.1019	57.30	314.7
144.000	8751.	.5341	0.000	.1836	.1410	0.000	1.0841E-02	.1264	59.30	327.2
145.000	6627.	.5372	0.000	.2500	.3245	0.000	1.0841E-02	-.1267	60.20	334.3
146.000	6778.	.5565	0.000	.2497	.3101	0.000	1.0841E-02	-.1312	63.13	353.4
147.000	9987.	.5564	0.000	.1620	9.0585E-02	0.000	1.0841E-02	.1761	65.21	370.5
148.000	8126.	.6185	0.000	.2074	.2113	0.000	1.0841E-02	-5.207E-02	74.11	432.2
149.000	6593.	.6185	0.000	.2656	.3524	0.000	1.0841E-02	-.2515	73.59	426.2
150.000	7065.	.5893	0.000	.2347	.2654	0.000	1.0841E-02	-.1043	69.25	395.1
155.000	7648.	.6031	0.000	.2294	.2604	0.000	1.0841E-02	-.1078	72.23	417.7

UNDERGROUND COAL GASIFICATION

DATA BASE

LARIMIE ENERGY TECHNOLOGY CENTER

HANNA IV-B

DAILY AVERAGE RESULTS

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  HANNA IV COAL ANALYSIS

                                                                    KG/M**3   KJ/MOLE
COAL H/C  COAL O/C  COAL S/C  COAL N/C  WT F H2O  WT F ASH         DENSITY   HT COMB
.939      0.171      0.006     0.021     .0855     .2748            1363.     437.

CHAR H/C  CHAR O/C  CHAR S/C  CHAR N/C
.1018     0.0003    0.        0.

 TAR H/C   TAR O/C   TAR S/C   TAR N/C       C/MOLECULE
 1.00      0.        0.        0.             9.

  COAL      ASH&CHAR  --  TEMPERATURES (K)
   300.      1000.

  1    NUMBER OF POINTS ON OXYGEN TRACER TYPE CURVE
999.     2    TIME,TRACER FLAG (ZERO=NONE,ONE=ARGON,TWO=NITROGEN)

  1    NUMBER OF POINTS ON GAS LOSS TRACER TYPE CURVE
 999.    2  TIME,TRACER FLAG (SAME AS OXYGEN TRACER)

  1    NUMBER OF POINTS ON CHAR FLAG CURVE
 999.    0  TIME,TRACER FLAG (0=NO CHAR, 1=WITH CHAR)
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UCG DB - HA4.B - OPERATING PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	INJ RATE mo/s !RED1 90	PRD RATE mo/s !RED1 91	INJ TEMP c !RED1 94	PRD TEMP c !RED1 95	INJ PRES kPa !RED1 96	PRD PRES kPa !RED1 97	STEAM mo/s !RED1 92	COOLING mo/s !RED1 93	INJ O2 frac !RED1 6	INJ H2O frac !RED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
110.000	10.38	1.793	45.88	37.51	2511.	301.7	0.000	0.000	.2100	0.000
111.000	8.515	1.761	45.90	37.90	2337.	418.5	0.000	0.000	.2100	0.000
112.000	7.091	1.900	41.63	48.65	2159.	468.4	0.000	0.000	.2100	0.000
113.000	7.022	2.006	39.70	48.47	2097.	430.2	0.000	0.000	.2100	0.000
114.000	7.349	2.044	36.26	43.64	2115.	464.6	0.000	0.000	.2100	0.000
115.000	7.186	1.949	34.86	49.17	2234.	401.4	0.000	0.000	.2100	0.000
116.000	7.892	2.018	39.02	54.44	2099.	476.1	0.000	0.000	.2100	0.000
117.000	7.321	2.000	46.78	54.58	2206.	597.8	0.000	0.000	.2100	0.000
118.000	8.190	2.024	49.05	57.64	2375.	831.0	0.000	0.000	.2100	0.000
119.000	8.530	1.975	50.37	66.22	2374.	987.1	0.000	0.000	.2100	0.000
120.000	8.227	1.927	42.42	79.30	2388.	1050.	0.000	0.000	.2100	0.000
121.000	5.525	1.664	32.16	75.69	2494.	371.6	0.000	0.000	.2100	0.000
122.000	5.846	.9941	31.25	56.94	2856.	119.5	0.000	0.000	.2100	0.000
123.000	5.476	1.037	37.07	51.27	2838.	105.6	0.000	0.000	.2100	0.000
124.000	5.443	.9805	34.77	43.06	2850.	102.6	0.000	0.000	.2100	0.000
125.000	5.150	.8945	28.16	37.64	2852.	107.0	0.000	0.000	.2100	0.000
126.000	5.034	.7925	28.34	35.69	2863.	113.7	0.000	0.000	.2100	0.000
127.000	4.795	.8217	34.95	42.64	2869.	113.8	0.000	0.000	.2100	0.000
128.000	4.560	.8870	26.55	48.89	2928.	110.1	0.000	0.000	.2100	0.000
129.000	4.580	.9314	24.42	48.78	2926.	101.0	0.000	0.000	.2100	0.000
130.000	4.396	.9171	34.72	47.10	2915.	106.2	0.000	0.000	.2100	0.000
131.000	4.715	.8142	29.28	43.10	2879.	102.1	0.000	0.000	.2100	0.000
132.000	4.522	.7244	27.15	40.56	2883.	102.4	0.000	0.000	.2100	0.000
133.000	4.570	.7180	31.42	40.44	2890.	101.8	0.000	0.000	.2100	0.000
134.000	4.195	.6727	36.91	39.17	2894.	111.0	0.000	0.000	.2100	0.000
135.000	3.411	.6155	37.75	39.28	2889.	96.43	0.000	0.000	.2100	0.000
136.000	2.855	.7074	33.54	40.28	2926.	111.6	0.000	0.000	.2100	0.000
137.000	2.825	.8202	34.32	37.78	2886.	118.4	0.000	0.000	.2100	0.000
138.000	2.897	.8743	31.57	37.78	2854.	119.3	0.000	0.000	.2100	0.000
139.000	2.883	.9153	35.39	38.17	2855.	120.4	0.000	0.000	.2100	0.000
140.000	2.820	.9044	26.54	43.53	2857.	118.6	0.000	0.000	.2100	0.000
141.000	4.046	.9327	37.87	45.65	2862.	120.1	0.000	0.000	.2100	0.000
142.000	4.280	.9780	35.48	40.18	2865.	144.5	0.000	0.000	.2100	0.000
143.000	4.197	.8353	36.88	35.31	2876.	313.1	0.000	0.000	.2100	0.000
144.000	4.313	.8923	36.29	39.63	2875.	177.1	0.000	0.000	.2100	0.000
145.000	4.691	.8848	34.94	44.25	2836.	122.8	0.000	0.000	.2100	0.000
146.000	3.926	.6299	32.10	37.57	2446.	112.2	0.000	0.000	.2100	0.000
147.000	4.482	.7522	32.28	35.00	2887.	122.7	0.000	0.000	.2100	0.000

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TIME (D)	INJ RATE mo/s IRED1 90	PRD RATE mo/s IRED1 91	INJ TEMP c IRED1 94	PRD TEMP c IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM mo/s IRED1 92	COOLING mo/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
148.000	6.490	.8079	88.49	35.00	4100.	120.2	0.000	0.000	.2100	0.000
149.000	4.883	.8600	27.29	35.20	2935.	120.7	0.000	0.000	.2100	0.000
150.000	4.906	.9098	27.31	37.89	2920.	121.5	0.000	0.000	.2100	0.000
151.000	4.481	.8792	31.09	39.37	2882.	120.5	0.000	0.000	.2100	0.000
152.000	4.311	.8360	32.45	41.94	2889.	121.2	0.000	0.000	.2100	0.000
153.000	4.541	.8828	35.94	41.83	2883.	122.6	0.000	0.000	.2100	0.000
154.000	4.685	.9435	37.71	40.56	3011.	125.6	0.000	0.000	.2100	0.000
155.000	5.250	1.107	45.75	40.32	3112.	128.2	0.000	0.000	.2100	0.000
156.000	5.339	1.092	40.27	37.68	3130.	128.2	0.000	0.000	.2100	0.000
157.000	5.462	.9483	38.63	36.04	3123.	224.6	0.000	0.000	.2100	0.000
158.000	5.429	1.045	38.63	32.42	3109.	125.6	0.000	0.000	.2100	0.000
159.000	5.992	1.131	31.09	36.54	3126.	128.9	0.000	0.000	.2100	0.000
160.000	5.741	1.160	43.20	43.33	3142.	126.9	0.000	0.000	.2100	0.000
161.000	5.836	1.305	44.12	43.13	3166.	135.2	0.000	0.000	.2100	0.000
162.000	3.110	.8287	20.44	40.32	1666.	144.9	0.000	0.000	.2100	0.000
163.000	2.122	.1987	13.91	37.48	2104.	172.8	0.000	0.000	.2100	0.000
164.000	3.006	.4406	24.93	33.41	2839.	371.8	0.000	0.000	.2100	0.000
165.000	3.050	.3240	26.44	30.95	2902.	505.1	0.000	0.000	.2100	0.000
166.000	3.568	.8411	36.05	32.42	2905.	522.8	0.000	0.000	.2100	0.000
167.000	3.146	.7097	27.21	34.70	2941.	376.1	0.000	0.000	.2100	0.000
168.000	3.954	.6831	31.81	29.91	3043.	112.2	0.000	0.000	.2100	0.000
169.000	4.186	.8657	32.48	19.44	3092.	131.9	0.000	0.000	.2100	0.000
170.000	4.184	1.015	28.69	16.13	3120.	114.5	0.000	0.000	.2100	0.000
171.000	4.099	1.028	36.26	23.10	3157.	106.9	0.000	0.000	.2100	0.000
172.000	4.163	1.098	41.69	31.73	3162.	108.9	0.000	0.000	.2100	0.000
173.000	5.325	1.198	42.51	44.49	3151.	136.9	0.000	0.000	.2100	0.000
174.000	3.971	1.763	41.81	57.83	3114.	215.4	0.000	0.000	.2100	0.000
175.000	1.611	1.802	37.51	62.78	2923.	227.2	0.000	0.000	.2100	0.000
176.000	3.699	1.620	39.21	62.58	2761.	266.7	0.000	0.000	.2100	0.000
177.000	3.887	2.654	37.73	59.88	2617.	286.1	0.000	0.000	.2100	0.000
178.000	2.889	2.699	25.16	58.31	2093.	211.9	0.000	0.000	.2100	0.000
179.000	3.367	2.500	31.48	54.07	2475.	205.4	0.000	0.000	.2100	0.000
180.000	3.111	2.878	39.06	50.16	2799.	219.3	0.000	0.000	.2100	0.000
181.000	2.727	1.524	24.59	48.69	2733.	178.2	0.000	0.000	.2100	0.000
182.000	3.068	1.332	28.66	46.23	2812.	166.3	0.000	0.000	.2100	0.000
183.000	3.691	1.764	33.24	47.60	2920.	197.2	0.000	0.000	.2100	0.000
184.000	2.962	1.142	28.29	48.49	2837.	173.4	0.000	0.000	.2100	0.000
185.000	2.669	.3870	17.09	42.94	2772.	144.9	0.000	0.000	.2100	0.000
186.000	2.551	.3555	17.48	39.75	2767.	164.9	0.000	0.000	.2100	0.000
187.000	7.517	.9863	25.96	66.42	2564.	327.9	0.000	0.000	.2100	0.000
188.000	3.507	2.137	12.01	80.71	2048.	439.1	0.000	0.000	.2100	0.000
189.000	5.217	1.512	24.41	70.12	2622.	266.6	0.000	0.000	.2100	0.000
190.000	5.172	.9201	29.90	56.83	2725.	243.4	0.000	0.000	.2100	0.000
191.000	4.828	.8331	25.95	53.06	2527.	348.6	0.000	0.000	.2100	0.000
192.000	4.781	1.544	30.16	69.13	2232.	536.0	0.000	0.000	.2100	0.000
193.000	2.191	6.101	-.8024	77.06	552.0	539.9	0.000	0.000	.2100	0.000
194.000	.3234	3.976	-9.159	30.99	88.46	268.9	0.000	0.000	.2100	0.000

TIME (D)	INJ RATE mo/s !RED1 90	PRD RATE mo/s !RED1 91	INJ TEMP c !RED1 94	PRD TEMP c !RED1 95	INJ PRES kPa !RED1 96	PRD PRES kPa !RED1 97	STEAM mo/s !RED1 92	COOLING mo/s !RED1 93	INJ O2 frac !RED1 6	INJ H2O frac !RED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
195.000	.3234	3.976	-9.159	30.99	88.46	268.9	0.000	0.000	.2100	0.000
196.000	.3234	3.976	-9.159	30.99	88.46	268.9	0.000	0.000	.2100	0.000
197.000	.3234	3.976	-9.159	30.99	88.46	268.9	0.000	0.000	.2100	0.000
198.000	.3234	3.976	-9.159	30.99	88.46	268.9	0.000	0.000	.2100	0.000
199.000	.3234	3.976	-9.159	30.99	88.46	268.9	0.000	0.000	.2100	0.000
200.000	.3234	3.976	-9.159	30.99	88.46	268.9	0.000	0.000	.2100	0.000
201.000	.3234	3.976	-9.159	30.99	88.46	268.9	0.000	0.000	.2100	0.000
202.000	.3234	3.976	-9.159	30.99	88.46	268.9	0.000	0.000	.2100	0.000
203.000	.3234	3.976	-9.159	30.99	88.46	268.9	0.000	0.000	.2100	0.000
204.000	.3234	3.976	-9.159	30.99	88.46	268.9	0.000	0.000	.2100	0.000
205.000	.3234	3.976	-9.159	30.99	88.46	268.9	0.000	0.000	.2100	0.000
206.000	.3234	3.976	-9.159	30.99	88.46	268.9	0.000	0.000	.2100	0.000
207.000	.3234	3.976	-9.159	30.99	88.46	268.9	0.000	0.000	.2100	0.000
208.000	.3234	3.976	-9.159	30.99	88.46	268.9	0.000	0.000	.2100	0.000
209.000	7.140	13.94	-.9008	344.7	548.7	152.7	0.000	0.000	.2100	0.000
210.000	11.95	25.57	-2.173	454.4	818.0	130.3	0.000	0.000	.2100	0.000
211.000	22.16	43.35	3.338	454.4	838.0	139.2	0.000	0.000	.2100	0.000
212.000	42.07	59.47	9.102	454.4	699.3	199.1	0.000	0.000	.2100	0.000
213.000	69.06	106.5	17.40	454.4	747.8	202.4	0.000	0.000	.2100	0.000
214.000	86.96	193.4	22.18	454.4	622.0	260.6	0.000	0.000	.2100	0.000
215.000	113.2	187.0	23.99	454.4	622.5	303.1	0.000	0.000	.2100	0.000
216.000	55.27	97.21	7.608	235.0	400.3	309.8	0.000	0.000	.2100	0.000
217.000	55.27	97.21	7.608	235.0	400.3	309.8	0.000	0.000	.2100	0.000
218.000	55.27	97.21	7.608	235.0	400.3	309.8	0.000	0.000	.2100	0.000
219.000	55.27	97.21	7.608	235.0	400.3	309.8	0.000	0.000	.2100	0.000
220.000	55.27	97.21	7.608	235.0	400.3	309.8	0.000	0.000	.2100	0.000
221.000	55.27	97.21	7.608	235.0	400.3	309.8	0.000	0.000	.2100	0.000
222.000	55.27	97.21	7.608	235.0	400.3	309.8	0.000	0.000	.2100	0.000
223.000	55.27	97.21	7.608	235.0	400.3	309.8	0.000	0.000	.2100	0.000
224.000	55.27	97.21	7.608	235.0	400.3	309.8	0.000	0.000	.2100	0.000
225.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
226.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
227.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
228.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
229.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
230.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
231.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
232.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
233.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
234.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
235.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
236.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
237.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
238.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
239.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
240.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
241.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000

TIME (D)	INJ RATE kg/s IRED1 90	PRD RATE kg/s IRED1 91	INJ TEMP C IRED1 94	PRD TEMP C IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM kg/s IRED1 92	COOLING kg/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
242.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
243.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
244.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
245.000	6.572	14.57	-7.130	235.0	300.5	163.6	0.000	0.000	.2100	0.000
246.000	13.23	28.38	-8.441	454.3	515.8	239.0	0.000	0.000	.2100	0.000
247.000	16.62	34.86	-8.209	454.3	502.5	336.3	0.000	0.000	.2100	0.000
248.000	18.67	39.73	-5.179	454.3	452.2	399.3	0.000	0.000	.2100	0.000
249.000	20.33	42.60	1.164	454.3	486.6	436.8	0.000	0.000	.2100	0.000
250.000	25.05	49.31	3.501	454.3	541.5	482.7	0.000	0.000	.2100	0.000
251.000	31.18	61.05	5.998	454.3	571.5	519.3	0.000	0.000	.2100	0.000
252.000	32.93	63.00	5.910	454.3	576.1	525.6	0.000	0.000	.2100	0.000
253.000	38.45	64.69	4.753	454.3	570.5	508.5	0.000	0.000	.2100	0.000
254.000	40.30	69.98	4.534	454.3	565.7	501.1	0.000	0.000	.2100	0.000
255.000	44.72	75.21	4.390	454.3	571.4	498.0	0.000	0.000	.2100	0.000
256.000	50.57	83.92	6.767	454.3	598.7	512.7	0.000	0.000	.2100	0.000
257.000	61.17	97.10	6.466	454.3	660.1	555.2	0.000	0.000	.2100	0.000
258.000	61.14	99.97	-.8718	454.3	674.4	569.4	0.000	0.000	.2100	0.000
259.000	52.28	88.46	-1.235	454.3	719.0	640.2	0.000	0.000	.2100	0.000
260.000	23.06	45.20	2.029	454.3	750.3	353.8	0.000	0.000	.2100	0.000
261.000	18.50	48.38	1.374	454.3	769.1	519.6	0.000	0.000	.2100	0.000
262.000	18.50	48.38	1.374	454.3	769.1	519.6	0.000	0.000	.2100	0.000

UCG DB - HA4.B - PRODUCT GAS ANALYSIS 1

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	ARGON molf !RED1 10	NITROGEN molf !RED1 11	OXYGEN molf !RED1 12	HYDROGEN molf !RED1 13	METHANE molf !RED1 14	CO molf !RED1 15	CO2 molf !RED1 16	ETHANE molf !RED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
110.000	7.7523E-03	.7254	0.000	6.2419E-02	1.0428E-02	5.8893E-02	.1342	7.5026E-05
111.000	6.6969E-03	.6136	2.1912E-03	.1268	3.3013E-02	7.5025E-02	.1376	2.7487E-03
112.000	6.3169E-03	.5610	6.5487E-06	.1541	4.7313E-02	7.0776E-02	.1527	4.8228E-03
113.000	6.2630E-03	.5579	0.000	.1629	4.6229E-02	6.0885E-02	.1588	4.6667E-03
114.000	6.1039E-03	.5579	3.0541E-05	.1556	4.4627E-02	4.6988E-02	.1798	4.9681E-03
115.000	6.2465E-03	.5824	1.0024E-03	.1460	4.4457E-02	3.8139E-02	.1721	5.0013E-03
116.000	7.8861E-03	.6015	7.0423E-04	.1357	4.0044E-02	3.6026E-02	.1697	4.5680E-03
117.000	6.4453E-03	.6024	2.7263E-04	.1328	4.1866E-02	3.8664E-02	.1698	4.5281E-03
118.000	6.7789E-03	.6091	1.0999E-04	.1207	4.8707E-02	3.3065E-02	.1728	5.4616E-03
119.000	6.5806E-03	.6122	1.9046E-05	.1173	4.6446E-02	3.1300E-02	.1776	5.4958E-03
120.000	6.7951E-03	.5871	4.1788E-03	.1185	5.7343E-02	4.5637E-02	.1704	6.5164E-03
121.000	6.4303E-03	.5337	4.8163E-03	.1759	4.6574E-02	4.1152E-02	.1834	5.2449E-03
122.000	8.0346E-03	.6641	5.2650E-03	.1071	2.1248E-02	3.8946E-02	.1513	2.2581E-03
123.000	8.2223E-03	.6355	1.0772E-02	.1164	2.7739E-02	4.0807E-02	.1553	2.9321E-03
124.000	7.4899E-03	.6069	6.8323E-03	.1331	2.9751E-02	3.6440E-02	.1742	3.0167E-03
125.000	6.2928E-03	.5974	3.8134E-03	.1400	2.6724E-02	4.4775E-02	.1763	2.9582E-03
126.000	7.5618E-03	.6318	5.0059E-03	.1204	2.6836E-02	3.3138E-02	.1703	2.9132E-03
127.000	8.2502E-03	.6479	6.0996E-03	.1124	2.9916E-02	2.4138E-02	.1648	3.6081E-03
128.000	7.5445E-03	.6295	5.8655E-03	.1218	2.9195E-02	3.7969E-02	.1623	3.2293E-03
129.000	7.8932E-03	.6387	2.2484E-02	.1100	2.7848E-02	4.1005E-02	.1454	3.0980E-03
130.000	7.3543E-03	.6267	5.4653E-03	.1231	3.1516E-02	4.2068E-02	.1576	3.4482E-03
131.000	7.4046E-03	.6386	4.6462E-03	.1132	3.2672E-02	3.8955E-02	.1581	3.6002E-03
132.000	7.3231E-03	.6488	5.5184E-03	.1085	3.0488E-02	3.0886E-02	.1624	3.4474E-03
133.000	7.4970E-03	.6627	6.0239E-03	9.9787E-02	2.6527E-02	3.2591E-02	.1595	3.0317E-03
134.000	1.1776E-02	.6194	6.9728E-02	9.0222E-02	2.3794E-02	3.1544E-02	.1470	2.5781E-03
135.000	7.9494E-03	.6606	6.3262E-03	9.4359E-02	2.5532E-02	3.4542E-02	.1602	2.7422E-03
136.000	7.9975E-03	.6397	8.4881E-03	.1063	2.9063E-02	4.5893E-02	.1564	3.3702E-03
137.000	7.6871E-03	.6161	7.3479E-03	.1167	3.4475E-02	5.9133E-02	.1530	3.4041E-03
138.000	6.1997E-03	.5794	3.7116E-03	.1472	3.7316E-02	6.1566E-02	.1594	3.2111E-03
139.000	6.1117E-03	.5754	3.6399E-03	.1471	4.1434E-02	5.8630E-02	.1619	3.9346E-03
140.000	6.4210E-03	.5851	3.8592E-03	.1357	4.2264E-02	5.2409E-02	.1680	4.0728E-03
141.000	6.2783E-03	.5750	3.4277E-03	.1414	4.6253E-02	4.9983E-02	.1715	4.2946E-03
142.000	6.2247E-03	.5122	3.6303E-03	.1253	3.9973E-02	4.6245E-02	.2609	3.7430E-03
143.000	5.2412E-03	.4993	2.3419E-03	9.3810E-02	3.8581E-02	3.0689E-02	.3254	3.3820E-03
144.000	6.5929E-03	.5888	6.5137E-03	.1039	2.9829E-02	3.5579E-02	.2241	2.9797E-03
145.000	7.4780E-03	.6100	1.0133E-02	.1105	3.0775E-02	4.3489E-02	.1819	3.4483E-03
146.000	7.0557E-03	.6232	1.0462E-02	.1108	3.1855E-02	3.2862E-02	.1788	3.3059E-03
147.000	7.5293E-03	.6519	1.2633E-02	9.2657E-02	2.1250E-02	3.0778E-02	.1798	2.1923E-03

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TIME (D)	ARGON mol/f IRED1 10	NITROGEN mol/f IRED1 11	OXYGEN mol/f IRED1 12	HYDROGEN mol/f IRED1 13	METHANE mol/f IRED1 14	CO mol/f IRED1 15	CO2 mol/f IRED1 16	ETHANE mol/f IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
148.000	6.9234E-03	.6210	1.1893E-02	.1077	3.1280E-02	4.0449E-02	.1756	2.9464E-03
149.000	6.8689E-03	.6063	1.1323E-02	.1179	3.7219E-02	4.4406E-02	.1709	3.1756E-03
150.000	6.2966E-03	.5797	8.3199E-03	.1355	4.8854E-02	4.5196E-02	.1691	4.5756E-03
151.000	6.6618E-03	.6007	6.6886E-03	.1233	4.4795E-02	4.6688E-02	.1654	4.0578E-03
152.000	7.0013E-03	.6074	7.7229E-03	.1204	4.2569E-02	4.3255E-02	.1663	3.8114E-03
153.000	7.2513E-03	.6275	7.9242E-03	.1093	3.8396E-02	3.6598E-02	.1678	3.5256E-03
154.000	7.7648E-03	.6259	1.2286E-02	.1082	3.6079E-02	3.9228E-02	.1658	3.2627E-03
155.000	7.2296E-03	.5920	1.3622E-02	.1228	4.7269E-02	4.7319E-02	.1633	4.1711E-03
156.000	7.2724E-03	.5758	1.1687E-02	.1339	5.1450E-02	4.6113E-02	.1671	4.5934E-03
157.000	8.6346E-03	.5888	5.1488E-02	.1141	4.7735E-02	3.9188E-02	.1435	4.3172E-03
158.000	9.1171E-03	.5817	1.5719E-02	.1223	4.2066E-02	6.6858E-02	.1557	3.7547E-03
159.000	7.0191E-03	.5796	1.6463E-02	.1343	3.9001E-02	6.4395E-02	.1547	3.2335E-03
160.000	6.9925E-03	.5637	1.8528E-02	.1428	3.9237E-02	6.5617E-02	.1577	3.7793E-03
161.000	6.6192E-03	.5177	1.9085E-02	.1393	4.3345E-02	7.0712E-02	.1974	4.1222E-03
162.000	5.9593E-03	.4463	1.8450E-02	.2080	8.4561E-02	4.0785E-02	.1819	7.5963E-03
163.000	8.9703E-03	.5790	4.8569E-02	.1380	6.3026E-02	5.5548E-03	.1437	6.9927E-03
164.000	1.0110E-02	.6662	.1115	4.9271E-02	3.2277E-02	1.1447E-02	.1140	3.5127E-03
165.000	9.0426E-03	.6081	.1351	6.1976E-02	4.1334E-02	3.1200E-02	.1064	4.5878E-03
166.000	8.7067E-03	.6640	9.7230E-02	7.2023E-02	2.4940E-02	2.5838E-02	.1026	2.6805E-03
167.000	8.9297E-03	.6595	3.7420E-02	8.0496E-02	3.2540E-02	1.8910E-02	.1572	3.2875E-03
168.000	8.6071E-03	.7234	6.7731E-03	5.7816E-02	1.3142E-02	1.2717E-02	.1759	1.2046E-03
169.000	8.4456E-03	.6826	2.0636E-02	8.1051E-02	2.4724E-02	2.0054E-02	.1596	2.1900E-03
170.000	8.4110E-03	.6554	2.7967E-02	9.5597E-02	2.6796E-02	3.3590E-02	.1489	2.5758E-03
171.000	7.7582E-03	.6350	1.2653E-02	.1100	2.7653E-02	4.0194E-02	.1635	2.4866E-03
172.000	7.9611E-03	.6116	2.7906E-02	.1104	3.1122E-02	4.7630E-02	.1572	3.1921E-03
173.000	7.7021E-03	.6167	1.9049E-02	.1120	3.5509E-02	3.8790E-02	.1656	3.3175E-03
174.000	7.4914E-03	.5911	2.9385E-02	.1236	4.4372E-02	4.2772E-02	.1556	4.0444E-03
175.000	6.5380E-03	.5959	6.1822E-03	.1238	5.0957E-02	2.3798E-02	.1836	5.8254E-03
176.000	6.2959E-03	.5770	3.5905E-03	.1411	4.4926E-02	4.4153E-02	.1749	5.0032E-03
177.000	5.8077E-03	.5200	3.7912E-03	.1765	4.7933E-02	5.3227E-02	.1846	4.9745E-03
178.000	5.0356E-03	.4719	0.000	.2048	5.1098E-02	7.9994E-02	.1789	5.4302E-03
179.000	5.4971E-03	.5099	0.000	.1718	4.5014E-02	7.9696E-02	.1808	4.9507E-03
180.000	5.6908E-03	.5239	3.2258E-03	.1602	4.3023E-02	.1022	.1546	3.7567E-03
181.000	5.6239E-03	.5188	2.1428E-05	.1754	4.6499E-02	6.0781E-02	.1867	4.5666E-03
182.000	5.2962E-03	.4873	1.0835E-04	.1807	5.2249E-02	8.9245E-02	.1768	4.8334E-03
183.000	4.7770E-03	.4323	3.6720E-03	.2025	9.0343E-02	9.6460E-02	.1590	7.4975E-03
184.000	4.3754E-03	.4053	1.1426E-03	.2280	9.9214E-02	6.4238E-02	.1836	9.8786E-03
185.000	6.5143E-03	.5760	3.1781E-04	.1463	4.7025E-02	7.8150E-03	.2062	6.2657E-03
186.000	7.9718E-03	.6923	3.3749E-04	7.7766E-02	1.9556E-02	2.8669E-03	.1946	2.8544E-03
187.000	8.6839E-03	.6411	.1166	6.2920E-02	3.0777E-02	2.7052E-03	.1311	4.3385E-03
188.000	4.7627E-03	.3645	5.2746E-02	.2099	9.5311E-02	6.2299E-03	.2473	1.3041E-02
189.000	5.4158E-03	.5733	5.0625E-03	.1300	4.3445E-02	8.7973E-03	.2247	5.5661E-03
190.000	4.8173E-03	.6348	0.000	.1224	2.1785E-02	1.5406E-02	.1974	1.8755E-03
191.000	5.5053E-03	.5248	0.000	.1930	3.2302E-02	5.7978E-02	.1823	3.1214E-03
192.000	5.0107E-03	.4728	0.000	.1992	6.2583E-02	7.2016E-02	.1802	5.6927E-03
193.000	4.8676E-03	.4599	0.000	.1939	6.7488E-02	7.2508E-02	.1916	6.7743E-03
194.000	3.7588E-03	.5326	4.7680E-02	.1463	4.9582E-02	7.9184E-02	.1341	4.7220E-03

TIME (D)	ARGON mol/f IRED1 10	NITROGEN mol/f IRED1 11	OXYGEN mol/f IRED1 12	HYDROGEN mol/f IRED1 13	METHANE mol/f IRED1 14	CO mol/f IRED1 15	CO2 mol/f IRED1 16	ETHANE mol/f IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
195.000	3.7588E-03	.5326	4.7680E-02	.1463	4.9582E-02	7.9184E-02	.1341	4.7220E-03
196.000	3.7588E-03	.5326	4.7680E-02	.1463	4.9582E-02	7.9184E-02	.1341	4.7220E-03
197.000	3.7588E-03	.5326	4.7680E-02	.1463	4.9582E-02	7.9184E-02	.1341	4.7220E-03
198.000	3.7588E-03	.5326	4.7680E-02	.1463	4.9582E-02	7.9184E-02	.1341	4.7220E-03
199.000	3.7588E-03	.5326	4.7680E-02	.1463	4.9582E-02	7.9184E-02	.1341	4.7220E-03
200.000	3.7588E-03	.5326	4.7680E-02	.1463	4.9582E-02	7.9184E-02	.1341	4.7220E-03
201.000	3.7588E-03	.5326	4.7680E-02	.1463	4.9582E-02	7.9184E-02	.1341	4.7220E-03
202.000	3.7588E-03	.5326	4.7680E-02	.1463	4.9582E-02	7.9184E-02	.1341	4.7220E-03
203.000	3.7588E-03	.5326	4.7680E-02	.1463	4.9582E-02	7.9184E-02	.1341	4.7220E-03
204.000	3.7588E-03	.5326	4.7680E-02	.1463	4.9582E-02	7.9184E-02	.1341	4.7220E-03
205.000	3.7588E-03	.5326	4.7680E-02	.1463	4.9582E-02	7.9184E-02	.1341	4.7220E-03
206.000	3.7588E-03	.5326	4.7680E-02	.1463	4.9582E-02	7.9184E-02	.1341	4.7220E-03
207.000	3.7588E-03	.5326	4.7680E-02	.1463	4.9582E-02	7.9184E-02	.1341	4.7220E-03
208.000	3.7588E-03	.5326	4.7680E-02	.1463	4.9582E-02	7.9184E-02	.1341	4.7220E-03
209.000	5.9571E-03	.5775	2.4167E-02	.1164	3.2867E-02	.1322	.1073	2.5302E-03
210.000	5.2565E-03	.4584	2.4999E-04	.1858	7.7368E-02	.1115	.1508	7.1670E-03
211.000	5.1831E-03	.4447	0.000	.2016	7.5697E-02	.1065	.1563	7.3122E-03
212.000	5.8911E-03	.4739	1.1139E-03	.1806	6.3529E-02	.1068	.1583	6.2016E-03
213.000	6.0329E-03	.5069	0.000	.1697	4.8594E-02	.1152	.1465	4.6246E-03
214.000	6.0137E-03	.5068	0.000	.1773	4.2251E-02	.1143	.1470	3.9025E-03
215.000	6.0771E-03	.5201	0.000	.1751	3.8268E-02	.1012	.1548	3.0097E-03
216.000	9.5383E-03	.5047	0.000	.1712	3.7282E-02	.1098	.1563	5.5919E-03
217.000	9.5383E-03	.5047	0.000	.1712	3.7282E-02	.1098	.1563	5.5919E-03
218.000	9.5383E-03	.5047	0.000	.1712	3.7282E-02	.1098	.1563	5.5919E-03
219.000	9.5383E-03	.5047	0.000	.1712	3.7282E-02	.1098	.1563	5.5919E-03
220.000	9.5383E-03	.5047	0.000	.1712	3.7282E-02	.1098	.1563	5.5919E-03
221.000	9.5383E-03	.5047	0.000	.1712	3.7282E-02	.1098	.1563	5.5919E-03
222.000	9.5383E-03	.5047	0.000	.1712	3.7282E-02	.1098	.1563	5.5919E-03
223.000	9.5383E-03	.5047	0.000	.1712	3.7282E-02	.1098	.1563	5.5919E-03
224.000	9.5383E-03	.5047	0.000	.1712	3.7282E-02	.1098	.1563	5.5919E-03
225.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
226.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
227.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
228.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
229.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
230.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
231.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
232.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
233.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
234.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
235.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
236.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
237.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
238.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
239.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
240.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
241.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03

TIME (D)	ARGON molf IRED1 10	NITROGEN molf IRED1 11	OXYGEN molf IRED1 12	HYDROGEN molf IRED1 13	METHANE molf IRED1 14	CO molf IRED1 15	CO2 molf IRED1 16	ETHANE molf IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
242.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
243.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
244.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
245.000	8.7376E-03	.4715	0.000	.1880	3.7666E-02	.1264	.1561	5.8417E-03
246.000	4.5636E-03	.4708	0.000	.2093	4.1422E-02	9.6148E-02	.1734	3.1507E-03
247.000	4.9324E-03	.4614	0.000	.2074	4.2006E-02	9.3422E-02	.1843	3.6011E-03
248.000	5.0903E-03	.4842	0.000	.2069	3.9866E-02	9.0931E-02	.1673	3.6650E-03
249.000	5.2928E-03	.4880	0.000	.1967	4.4202E-02	9.4240E-02	.1664	3.6217E-03
250.000	5.3331E-03	.5120	3.5459E-04	.1789	4.1582E-02	9.7375E-02	.1595	3.5020E-03
251.000	5.2736E-03	.4949	0.000	.1853	4.2764E-02	.1261	.1411	3.1835E-03
252.000	5.2946E-03	.5053	0.000	.1830	4.0820E-02	.1120	.1498	3.0295E-03
253.000	5.5513E-03	.5121	0.000	.1715	3.6959E-02	.1258	.1438	2.9578E-03
254.000	5.9822E-03	.5490	0.000	.1450	3.5406E-02	9.1756E-02	.1645	2.6794E-03
255.000	5.8899E-03	.5707	0.000	.1326	3.2355E-02	9.9125E-02	.1559	2.6543E-03
256.000	5.8815E-03	.5451	7.5012E-05	.1426	3.2996E-02	.1334	.1365	2.5457E-03
257.000	6.3070E-03	.5731	0.000	.1295	3.4383E-02	9.7768E-02	.1555	2.5483E-03
258.000	6.3269E-03	.5727	0.000	.1296	3.1575E-02	9.0820E-02	.1657	2.2057E-03
259.000	6.4118E-03	.5812	0.000	.1208	3.5292E-02	8.0188E-02	.1735	1.9956E-03
260.000	7.6656E-03	.6688	5.6921E-03	8.1567E-02	2.5974E-02	3.2960E-02	.1753	1.5555E-03
261.000	6.4584E-03	.5880	0.000	.1187	2.9400E-02	4.0997E-02	.2128	1.7976E-03
262.000	6.4584E-03	.5880	0.000	.1187	2.9400E-02	4.0997E-02	.2128	1.7976E-03

UCG DB - HA4.B - PRODUCT GAS ANALYSIS 2

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	C2H4 molf !RED1 17	C6 molf !RED1 19	H10 molf !RED1 20	H2S molf !RED1 21	TAR/DRY !RED1 24	H2O/DRY !RED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
110.000	9.0027E-04	0.000	0.000	0.000	2.4569E-04	3.0438E-02
111.000	1.1306E-03	4.9404E-04	7.2692E-04	0.000	2.4696E-04	3.0596E-02
112.000	8.1670E-04	8.5201E-04	1.2641E-03	0.000	2.4929E-04	3.0884E-02
113.000	5.9755E-04	7.3069E-04	1.1048E-03	0.000	2.5156E-04	3.1165E-02
114.000	4.8876E-04	1.3917E-03	2.1138E-03	0.000	2.5366E-04	3.1426E-02
115.000	7.1228E-04	1.5662E-03	2.3309E-03	0.000	2.5577E-04	3.1687E-02
116.000	6.8365E-04	1.2539E-03	1.8630E-03	0.000	2.5798E-04	3.1961E-02
117.000	6.6010E-04	1.0572E-03	1.5747E-03	0.000	2.6019E-04	3.2235E-02
118.000	5.8990E-04	1.0790E-03	1.6227E-03	0.000	2.6241E-04	3.2510E-02
119.000	5.3816E-04	9.9292E-04	1.5034E-03	0.000	2.6468E-04	3.2791E-02
120.000	5.8147E-04	1.1636E-03	1.7649E-03	0.000	2.6689E-04	3.3065E-02
121.000	4.8129E-04	9.4165E-04	1.4230E-03	0.000	2.6905E-04	3.3333E-02
122.000	6.2015E-04	4.6572E-04	6.8114E-04	0.000	2.7127E-04	3.3607E-02
123.000	6.3940E-04	6.8014E-04	9.9823E-04	0.000	2.7354E-04	3.3888E-02
124.000	4.3131E-04	7.3943E-04	1.0921E-03	0.000	2.7581E-04	3.4170E-02
125.000	4.3511E-04	4.7053E-04	7.1142E-04	0.000	2.7802E-04	3.4444E-02
126.000	6.4262E-04	5.6013E-04	8.3869E-04	0.000	2.8024E-04	3.4718E-02
127.000	1.0464E-03	7.2843E-04	1.0761E-03	0.000	2.8245E-04	3.4993E-02
128.000	1.0002E-03	6.2334E-04	9.2233E-04	0.000	2.8472E-04	3.5274E-02
129.000	1.8459E-03	6.7776E-04	9.9138E-04	0.000	2.8693E-04	3.5548E-02
130.000	8.9361E-04	7.4597E-04	1.0994E-03	0.000	2.8915E-04	3.5822E-02
131.000	8.7922E-04	7.9308E-04	1.1675E-03	0.000	2.9131E-04	3.6090E-02
132.000	8.6211E-04	7.5992E-04	1.1211E-03	0.000	2.9358E-04	3.6371E-02
133.000	9.0639E-04	6.0218E-04	8.8514E-04	0.000	2.9584E-04	3.6652E-02
134.000	2.1908E-03	7.1018E-04	1.0652E-03	0.000	2.9806E-04	3.6926E-02
135.000	6.1620E-03	6.4386E-04	9.3808E-04	0.000	3.0027E-04	3.7201E-02
136.000	8.6316E-04	7.8313E-04	1.1586E-03	0.000	3.0238E-04	3.7461E-02
137.000	6.3940E-04	6.1825E-04	9.2263E-04	0.000	3.0464E-04	3.7742E-02
138.000	7.2349E-04	4.6408E-04	7.2596E-04	0.000	3.0686E-04	3.8016E-02
139.000	4.2864E-04	5.7598E-04	8.8299E-04	0.000	3.0907E-04	3.8291E-02
140.000	4.2864E-04	6.5724E-04	9.9586E-04	0.000	3.1140E-04	3.8579E-02
141.000	5.2509E-04	5.4384E-04	8.3514E-04	0.000	3.1356E-04	3.8846E-02
142.000	3.7391E-04	5.4996E-04	8.6517E-04	0.000	3.1577E-04	3.9120E-02
143.000	1.7380E-04	4.3259E-04	6.7139E-04	0.000	3.1809E-04	3.9408E-02
144.000	3.3547E-04	5.3411E-04	8.0055E-04	0.000	3.2020E-04	3.9669E-02
145.000	4.5286E-04	7.3731E-04	1.1249E-03	0.000	3.2241E-04	3.9943E-02
146.000	4.9514E-04	4.5825E-04	7.0194E-04	0.000	3.2474E-04	4.0231E-02
147.000	4.7514E-04	3.1780E-04	4.7638E-04	0.000	3.2684E-04	4.0492E-02

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TIME (D)	C2H4 mol/ IRED1 17	C6 mol/ IRED1 19	H10 mol/ IRED1 20	H2S mol/ IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
148.000	5.2863E-04	6.9253E-04	1.0432E-03	0.000	3.2900E-04	4.0759E-02
149.000	4.2866E-04	5.9880E-04	9.2712E-04	0.000	3.3132E-04	4.1047E-02
150.000	4.5631E-04	7.4731E-04	1.1401E-03	0.000	3.3348E-04	4.1315E-02
151.000	3.2684E-04	5.1675E-04	8.1513E-04	0.000	3.3564E-04	4.1582E-02
152.000	2.3933E-04	4.9236E-04	7.7229E-04	0.000	3.3796E-04	4.1870E-02
153.000	2.3337E-04	5.6190E-04	8.5806E-04	0.000	3.4012E-04	4.2137E-02
154.000	3.3051E-04	4.8217E-04	7.3678E-04	0.000	3.4239E-04	4.2419E-02
155.000	3.4168E-04	7.7292E-04	1.1558E-03	0.000	3.4466E-04	4.2700E-02
156.000	3.2861E-04	6.8817E-04	1.0408E-03	0.000	3.4682E-04	4.2967E-02
157.000	4.5008E-04	7.3514E-04	1.0993E-03	0.000	3.4898E-04	4.3235E-02
158.000	1.9363E-03	3.3492E-04	5.1944E-04	0.000	3.5114E-04	4.3502E-02
159.000	2.4938E-04	4.1356E-04	6.4920E-04	0.000	3.5335E-04	4.3776E-02
160.000	3.1970E-04	5.2299E-04	7.9975E-04	0.000	3.5556E-04	4.4051E-02
161.000	4.0722E-04	4.8043E-04	7.4298E-04	0.000	3.5789E-04	4.4339E-02
162.000	2.5464E-03	1.6235E-03	2.3501E-03	0.000	3.2996E-04	4.0878E-02
163.000	7.7980E-04	2.1544E-03	3.2497E-03	0.000	2.3312E-04	2.8881E-02
164.000	3.3218E-04	5.4823E-04	8.4896E-04	0.000	3.6453E-04	4.5161E-02
165.000	4.2500E-04	7.2155E-04	1.0950E-03	0.000	3.6669E-04	4.5429E-02
166.000	2.1697E-04	6.9918E-04	9.9211E-04	0.000	3.6885E-04	4.5696E-02
167.000	1.6788E-04	6.0318E-04	9.3129E-04	0.000	3.7117E-04	4.5984E-02
168.000	6.2522E-05	1.7434E-04	2.7172E-04	0.000	3.7333E-04	4.6252E-02
169.000	1.8757E-04	1.9325E-04	3.0033E-04	0.000	3.7554E-04	4.6526E-02
170.000	2.4174E-04	2.1464E-04	3.3843E-04	0.000	3.7776E-04	4.6800E-02
171.000	2.9296E-04	1.8399E-04	2.8117E-04	0.000	3.7992E-04	4.7068E-02
172.000	2.9281E-04	1.0580E-03	1.6213E-03	0.000	3.8224E-04	4.7356E-02
173.000	3.1260E-04	3.9799E-04	6.0510E-04	0.000	3.8440E-04	4.7623E-02
174.000	3.3825E-04	5.3136E-04	8.1275E-04	0.000	3.8667E-04	4.7904E-02
175.000	5.9173E-04	1.1275E-03	1.6935E-03	0.000	3.8894E-04	4.8185E-02
176.000	5.8568E-04	9.8472E-04	1.4777E-03	0.000	3.9110E-04	4.8453E-02
177.000	4.2912E-04	1.0831E-03	1.6455E-03	0.000	3.9326E-04	4.8720E-02
178.000	7.3749E-04	8.5889E-04	1.2899E-03	0.000	3.9541E-04	4.8987E-02
179.000	6.8922E-04	6.4548E-04	9.9027E-04	0.000	3.9779E-04	4.9282E-02
180.000	2.4339E-03	3.8545E-04	6.1006E-04	0.000	4.0001E-04	4.9557E-02
181.000	2.1431E-04	5.0720E-04	8.0867E-04	0.000	4.0217E-04	4.9824E-02
182.000	1.8212E-03	6.3815E-04	9.9744E-04	0.000	4.0432E-04	5.0091E-02
183.000	7.3329E-04	1.0679E-03	1.6804E-03	0.000	4.0643E-04	5.0352E-02
184.000	5.4802E-04	1.4468E-03	2.2388E-03	0.000	4.0870E-04	5.0633E-02
185.000	2.6240E-04	1.2903E-03	1.9739E-03	0.000	4.1102E-04	5.0921E-02
186.000	7.1674E-04	3.7920E-04	6.0672E-04	0.000	4.1318E-04	5.1189E-02
187.000	8.2713E-05	6.7251E-04	1.0247E-03	0.000	4.1578E-04	5.1511E-02
188.000	4.8603E-04	2.2689E-03	3.4032E-03	0.000	4.1800E-04	5.1785E-02
189.000	3.5702E-04	1.3879E-03	1.9450E-03	0.000	4.1977E-04	5.2005E-02
190.000	1.2003E-03	1.3128E-04	2.1005E-04	0.000	4.2209E-04	5.2292E-02
191.000	1.6669E-04	3.5839E-04	5.6675E-04	0.000	4.2425E-04	5.2560E-02
192.000	3.4999E-04	8.7855E-04	1.3553E-03	0.000	4.2641E-04	5.2827E-02
193.000	3.4638E-04	1.0320E-03	1.5866E-03	0.000	4.2873E-04	5.3115E-02
194.000	2.5049E-04	7.1612E-04	1.0906E-03	0.000	2.1728E-04	2.6918E-02

TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2S molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
195.000	2.5049E-04	7.1612E-04	1.0906E-03	0.000	2.1728E-04	2.6918E-02
196.000	2.5049E-04	7.1612E-04	1.0906E-03	0.000	2.1728E-04	2.6918E-02
197.000	2.5049E-04	7.1612E-04	1.0906E-03	0.000	2.1728E-04	2.6918E-02
198.000	2.5049E-04	7.1612E-04	1.0906E-03	0.000	2.1728E-04	2.6918E-02
199.000	2.5049E-04	7.1612E-04	1.0906E-03	0.000	2.1728E-04	2.6918E-02
200.000	2.5049E-04	7.1612E-04	1.0906E-03	0.000	2.1728E-04	2.6918E-02
201.000	2.5049E-04	7.1612E-04	1.0906E-03	0.000	2.1728E-04	2.6918E-02
202.000	2.5049E-04	7.1612E-04	1.0906E-03	0.000	2.1728E-04	2.6918E-02
203.000	2.5049E-04	7.1612E-04	1.0906E-03	0.000	2.1728E-04	2.6918E-02
204.000	2.5049E-04	7.1612E-04	1.0906E-03	0.000	2.1728E-04	2.6918E-02
205.000	2.5049E-04	7.1612E-04	1.0906E-03	0.000	2.1728E-04	2.6918E-02
206.000	2.5049E-04	7.1612E-04	1.0906E-03	0.000	2.1728E-04	2.6918E-02
207.000	2.5049E-04	7.1612E-04	1.0906E-03	0.000	2.1728E-04	2.6918E-02
208.000	2.5049E-04	7.1612E-04	1.0906E-03	0.000	2.1728E-04	2.6918E-02
209.000	3.2688E-04	2.9496E-04	4.2157E-04	0.000	3.4838E-04	4.3160E-02
210.000	6.2849E-04	1.1534E-03	1.6591E-03	0.000	4.6648E-04	5.7792E-02
211.000	6.2080E-04	8.4991E-04	1.2174E-03	0.000	4.7689E-04	5.8450E-02
212.000	5.6768E-04	1.2552E-03	1.8615E-03	0.000	7.1343E-04	7.4102E-02
213.000	5.8745E-04	7.2805E-04	1.0841E-03	0.000	5.8649E-04	7.7681E-02
214.000	6.8125E-04	7.1686E-04	1.0447E-03	0.000	8.5807E-04	.1000
215.000	4.9306E-04	3.3742E-04	5.0102E-04	0.000	3.8007E-04	8.7970E-02
216.000	1.5006E-04	2.3558E-03	3.1689E-03	0.000	1.1586E-04	4.1831E-02
217.000	1.5006E-04	2.3558E-03	3.1689E-03	0.000	1.1586E-04	4.1831E-02
218.000	1.5006E-04	2.3558E-03	3.1689E-03	0.000	1.1586E-04	4.1831E-02
219.000	1.5006E-04	2.3558E-03	3.1689E-03	0.000	1.1586E-04	4.1831E-02
220.000	1.5006E-04	2.3558E-03	3.1689E-03	0.000	1.1586E-04	4.1831E-02
221.000	1.5006E-04	2.3558E-03	3.1689E-03	0.000	1.1586E-04	4.1831E-02
222.000	1.5006E-04	2.3558E-03	3.1689E-03	0.000	1.1586E-04	4.1831E-02
223.000	1.5006E-04	2.3558E-03	3.1689E-03	0.000	1.1586E-04	4.1831E-02
224.000	1.5006E-04	2.3558E-03	3.1689E-03	0.000	1.1586E-04	4.1831E-02
225.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
226.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
227.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
228.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
229.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
230.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
231.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
232.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
233.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
234.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
235.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
236.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
237.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
238.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
239.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
240.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
241.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02

TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2S molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
242.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
243.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
244.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
245.000	3.2507E-04	2.3120E-03	3.1088E-03	0.000	1.1586E-04	4.1831E-02
246.000	5.3763E-04	3.2507E-04	4.8511E-04	0.000	2.3173E-04	8.3663E-02
247.000	6.4254E-04	9.2934E-04	1.3421E-03	0.000	2.1232E-04	8.3836E-02
248.000	4.6794E-04	6.3940E-04	9.2945E-04	0.000	1.5867E-04	8.7418E-02
249.000	3.7929E-04	4.7720E-04	7.2685E-04	0.000	2.1334E-04	8.3221E-02
250.000	2.6938E-04	4.1657E-04	6.3469E-04	1.3641E-05	2.2512E-04	6.3636E-02
251.000	2.5205E-04	4.3175E-04	6.6914E-04	0.000	1.7366E-04	5.5787E-02
252.000	2.0363E-04	2.2150E-04	3.5440E-04	0.000	1.8329E-04	5.3358E-02
253.000	3.5364E-04	3.8160E-04	5.8294E-04	0.000	1.4806E-04	5.4691E-02
254.000	2.7168E-03	1.2023E-03	1.8058E-03	0.000	9.6112E-05	6.1833E-02
255.000	2.4318E-04	2.3349E-04	3.6683E-04	0.000	1.1594E-04	5.6958E-02
256.000	2.0505E-04	2.9383E-04	4.4712E-04	0.000	1.1666E-04	5.2600E-02
257.000	1.6005E-04	2.8887E-04	4.2266E-04	0.000	1.4854E-04	6.9118E-02
258.000	1.2253E-04	3.6133E-04	5.3812E-04	0.000	2.3040E-04	.1152
259.000	2.7502E-05	2.4254E-04	3.6657E-04	0.000	1.5967E-04	.1285
260.000	6.7518E-05	1.4625E-04	2.2001E-04	0.000	3.1606E-04	.2256
261.000	1.4737E-04	6.6012E-04	9.9405E-04	0.000	1.7401E-04	.3439
262.000	1.4737E-04	6.6012E-04	9.9405E-04	0.000	1.7401E-04	.3439

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UCG DB - HA4.B - MATERIAL BALANCES

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL RT mo/s IRED1 44	ASH RATE mo/s IRED1 46	H2O INFX mo/s IRED1 47	H2O COAL mo/s IRED1 48	-H2O RXN mo/s IRED1 49	O2 per COAL IRED1 60	H2O per COAL IRED1 61	CHAR RT mo/s IRED1 64	CHAR per COAL IRED1 63	RECOVORY % IRED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
110.000	.3612	3.2994E-02	-9.678E-03	4.3344E-02	-1.928E-02	.7293	-5.371E-02	.6160	.6299	15.58
111.000	.4410	4.0281E-02	.1461	5.2916E-02	.1467	.4458	.3183	.7333	.6248	15.82
112.000	.5335	4.8736E-02	.2441	6.4023E-02	.2512	.3287	.4717	.8300	.6081	18.77
113.000	.5506	5.0295E-02	.2753	6.6072E-02	.2807	.3282	.5097	.8999	.6200	19.84
114.000	.5806	5.3032E-02	.2600	6.9667E-02	.2674	.3782	.4607	.6296	.5164	19.31
115.000	.5244	4.7901E-02	.2486	6.2927E-02	.2516	.3654	.4815	.8402	.6126	19.63
116.000	.5204	4.7534E-02	.2277	6.2444E-02	.2277	.4039	.4375	.8584	.6218	19.22
117.000	.5218	4.7661E-02	.2206	6.2612E-02	.2208	.4061	.4232	.8257	.6123	20.54
118.000	.5400	4.9328E-02	.2255	6.4801E-02	.2266	.3924	.4194	.8843	.6200	18.69
119.000	.5273	4.8167E-02	.2041	6.3276E-02	.2046	.4214	.3881	.7499	.5871	17.62
120.000	.5565	5.0833E-02	.2303	6.6778E-02	.2355	.3926	.4049	.7268	.5259	18.46
121.000	.4797	4.3822E-02	.2764	5.7568E-02	.2803	.3792	.5257	.5398	.4834	19.21
122.000	.2150	1.9637E-02	6.3179E-02	2.5797E-02	5.6657E-02	.5785	.2568	.3888	.6434	14.07
123.000	.2381	2.1752E-02	8.2299E-02	2.8575E-02	7.6891E-02	.5387	.3229	.3502	.5936	14.94
124.000	.2407	2.1984E-02	8.8727E-02	2.8880E-02	8.5221E-02	.5208	.3545	.2384	.4084	13.56
125.000	.2254	2.0593E-02	7.7335E-02	2.7053E-02	7.4616E-02	.5292	.3316	.1626	.3301	12.85
126.000	.1863	1.7022E-02	6.2000E-02	2.2361E-02	5.7778E-02	.5486	.3096	.2261	.5417	12.33
127.000	.1867	1.7054E-02	7.0108E-02	2.2404E-02	6.4736E-02	.5200	.3459	.3344	.6413	13.82
128.000	.2092	1.9109E-02	7.6324E-02	2.5103E-02	7.1212E-02	.5106	.3404	.3096	.5964	15.30
129.000	.2077	1.8975E-02	7.6036E-02	2.4927E-02	6.8999E-02	.6073	.3341	.3025	.5926	16.12
130.000	.2186	1.9973E-02	8.4372E-02	2.6238E-02	7.8904E-02	.4796	.3611	.3591	.6205	16.18
131.000	.1934	1.7671E-02	6.9903E-02	2.3214E-02	6.4767E-02	.4877	.3358	.3290	.6302	13.72
132.000	.1675	1.5297E-02	5.8260E-02	2.0095E-02	5.2938E-02	.5217	.3166	.2795	.6257	12.90
133.000	.1612	1.4722E-02	4.7884E-02	1.9340E-02	4.1849E-02	.5662	.2587	.2608	.6171	12.99
134.000	.1429	1.3055E-02	4.2028E-02	1.7150E-02	3.5230E-02	1.170	.2448	.2101	.6669	12.51
135.000	.1454	1.3280E-02	3.8677E-02	1.7445E-02	3.4056E-02	.5505	.2328	.2087	.5872	15.06
136.000	.1691	1.5451E-02	5.1426E-02	2.0297E-02	4.6184E-02	.5402	.2717	.2131	.5571	19.54
137.000	.2066	1.8875E-02	6.9352E-02	2.4796E-02	6.4325E-02	.4889	.3068	.2468	.5425	22.09
138.000	.2288	2.0902E-02	9.7496E-02	2.7459E-02	9.2943E-02	.4252	.4060	.2749	.5455	21.60
139.000	.2441	2.2295E-02	.1089	2.9289E-02	.1044	.4044	.4275	.3055	.5552	22.55
140.000	.2424	2.2144E-02	9.9384E-02	2.9090E-02	9.4889E-02	.4302	.3915	.2650	.5209	23.17
141.000	.2544	2.3240E-02	.1124	3.0531E-02	.1081	.4076	.4246	.2850	.5269	17.16
142.000	.3635	3.3201E-02	2.4163E-02	4.3616E-02	3.0969E-02	.5756	.2239	.1168	.6634	13.94
143.000	.3304	3.0181E-02	-1.381E-02	3.9648E-02	-5.818E-03	.7143	5.2641E-02	3.5366E-02	.7359	12.33
144.000	.2623	2.3964E-02	3.1548E-02	3.1481E-02	2.8995E-02	.6723	.1259	-1.726E-02	.1289	14.92
145.000	.2310	2.1102E-02	5.9377E-02	2.7722E-02	5.3122E-02	.5873	.2316	3.0105E-02	8.4090E-02	14.17
146.000	.1571	1.4351E-02	4.6813E-02	1.8852E-02	4.1323E-02	.5854	.2659	7.8236E-02	.3532	14.55
147.000	.1756	1.6044E-02	3.1983E-02	2.1076E-02	2.3793E-02	.7056	.1356	2.1528E-02	3.3614E-02	13.42

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TIME (D)	COAL RT mo/s !RED1 44	ASH RATE mo/s !RED1 46	H2O INFX mo/s !RED1 47	H2O COAL mo/s !RED1 48	-H2O RXN mo/s !RED1 49	O2 per COAL !RED1 60	H2O per COAL !RED1 61	CHAR RT mo/s !RED1 64	CHAR per COAL !RED1 63	RECOVORY % !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
148.000	.2029	1.8533E-02	5.7126E-02	2.4346E-02	4.9842E-02	.5868	.2451	8.7119E-02	.2993	12.06
149.000	.2199	2.0090E-02	7.7309E-02	2.6392E-02	6.9801E-02	.5251	.3147	.1597	.4003	13.16
150.000	.2452	2.2394E-02	.1143	2.9419E-02	.1077	.4079	.4393	.2937	.5440	13.25
151.000	.2296	2.0970E-02	9.5489E-02	2.7548E-02	8.7952E-02	.4437	.3805	.2824	.5503	14.51
152.000	.2137	1.9518E-02	8.6475E-02	2.5641E-02	7.8531E-02	.4660	.3673	.2556	.5447	14.52
153.000	.2176	1.9881E-02	7.9436E-02	2.6117E-02	6.9871E-02	.5104	.3205	.2595	.5431	14.99
154.000	.2307	2.1069E-02	8.1036E-02	2.7678E-02	7.0324E-02	.5423	.3003	.2255	.4947	15.41
155.000	.2916	2.6638E-02	.1259	3.4994E-02	.1155	.4467	.3964	.3144	.5181	15.36
156.000	.2950	2.6947E-02	.1412	3.5400E-02	.1317	.4079	.4460	.3391	.5345	14.51
157.000	.2390	2.1835E-02	.1170	2.8685E-02	.1064	.6261	.4850	.2100	.3667	12.55
158.000	.2815	2.5716E-02	.1037	3.3782E-02	9.3941E-02	.4773	.3330	.1831	.3912	13.77
159.000	.2933	2.6796E-02	.1208	3.5202E-02	.1086	.4808	.3701	.2264	.4346	13.45
160.000	.3077	2.8104E-02	.1327	3.6920E-02	.1207	.4706	.3937	.2343	.4200	14.00
161.000	.4097	3.7426E-02	.1217	4.9166E-02	.1155	.5443	.2814	4.3283E-02	7.2289E-02	14.15
162.000	.2481	2.2663E-02	.1502	2.9772E-02	.1447	.2029	.7319	.2643	.5581	19.72
163.000	3.0473E-02	2.7836E-03	1.7075E-02	3.6568E-03	1.2190E-02	.5085	.6471	8.7361E-02	.6962	6.465
164.000	8.2812E-02	7.5646E-03	3.7414E-02	9.9375E-03	2.8313E-02	1.438	.2356	2.1572E-02	.2773	12.50
165.000	6.8246E-02	6.2341E-03	3.4035E-02	8.1896E-03	2.8155E-02	1.328	.3600	9.4177E-03	.4477	7.806
166.000	.1643	1.5011E-02	7.4218E-02	1.9720E-02	5.7161E-02	1.457	.3286	.3174	.8499	17.87
167.000	.1670	1.5257E-02	6.7056E-02	2.0043E-02	5.5925E-02	.8849	.2255	.1728	.3239	17.25
168.000	.1360	1.2423E-02	9.8792E-03	1.6320E-02	-3.993E-03	.8374	-3.405E-02	.1093	.4282	15.54
169.000	.1767	1.6137E-02	5.1362E-02	2.1198E-02	3.4084E-02	.7409	.1865	.2146	.5089	17.71
170.000	.2123	1.9392E-02	7.5388E-02	2.5475E-02	5.5490E-02	.7404	.2616	.2343	.4097	19.50
171.000	.2371	2.1658E-02	7.9703E-02	2.8452E-02	6.1953E-02	.5966	.2614	.2120	.4695	19.68
172.000	.2646	2.4174E-02	9.5221E-02	3.1757E-02	7.7370E-02	.6206	.2908	.1480	.3302	20.14
173.000	.2860	2.6127E-02	.1097	3.4322E-02	8.9528E-02	.5707	.3152	.2151	.4272	16.90
174.000	.4426	4.0429E-02	.2175	5.3111E-02	.1900	.5529	.4235	.4510	.4410	44.00
175.000	.4835	4.4166E-02	.2349	5.8020E-02	.2102	.4147	.4337	.6103	.5575	73.08
176.000	.4360	3.9823E-02	.2083	5.2315E-02	.1858	.4067	.4289	.5062	.5313	30.91
177.000	.7762	7.0906E-02	.4179	9.3148E-02	.3877	.3666	.5017	.5424	.4172	44.98
178.000	.8497	7.7615E-02	.4810	.1020	.4569	.3082	.5362	.5312	.3765	54.37
179.000	.7871	7.1900E-02	.3599	9.4454E-02	.3369	.4075	.3909	.2678	-5.510E-02	46.06
180.000	.8703	7.9501E-02	.3191	.1044	.2878	.3891	.3654	.3262	.1806	59.46
181.000	.4499	4.1097E-02	.2252	5.3988E-02	.2069	.3845	.4600	.2388	.3442	35.41
182.000	.4253	3.8851E-02	.1877	5.1038E-02	.1752	.3481	.4397	.2015	.2781	25.98
183.000	.6278	5.7346E-02	.4189	7.5334E-02	.4097	.1616	.6419	.7997	.5468	25.68
184.000	.4094	3.7398E-02	.2831	4.9130E-02	.2772	.1052	.7609	.5367	.5858	19.26
185.000	.1063	9.7130E-03	5.9066E-02	1.2760E-02	5.3083E-02	.4293	.4589	.1155	.4988	10.07
186.000	7.7764E-02	7.1036E-03	1.5808E-02	9.3318E-03	7.8339E-03	.7170	.1021	5.8434E-02	.4243	11.79
187.000	.2474	2.2595E-02	.1854	2.9683E-02	.1666	8.679	.1152	1.9829E-02	.4667	21.27
188.000	.7579	6.9230E-02	.5562	9.0946E-02	.5421	.3559	.7081	-.1757	-.5136	33.87
189.000	.4377	3.9987E-02	.1785	5.2530E-02	.1563	.5619	.3023	9.6413E-02	2.3402E-02	19.88
190.000	.2133	1.9487E-02	6.8177E-02	2.5599E-02	4.8091E-02	.6258	.2499	.1164	.3402	13.59
191.000	.2287	2.0888E-02	.1263	2.7440E-02	.1121	.4200	.4809	.1515	.3983	10.92
192.000	.4991	4.5590E-02	.3053	5.9891E-02	.2878	.2721	.5740	.4216	.4599	19.17
193.000	2.055	.1877	1.173	.2466	1.111	.2842	.5425	1.088	.2943	277.3
194.000	1.363	.1245	.8192	.1636	.7817	.5495	.4453	.9769	9.6186E-02	386.8

TIME (D)	COAL RT mo/s !RED1 44	ASH RATE mo/s !RED1 46	H2O INFX mo/s !RED1 47	H2O COAL mo/s !RED1 48	-H2O RXN mo/s !RED1 49	O2 per COAL !RED1 60	H2O per COAL !RED1 61	CHAR RT mo/s !RED1 64	CHAR per COAL !RED1 63	RECOVORY % !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
195.000	1.363	.1245	.8192	.1636	.7817	.5495	.4453	.9769	9.6186E-02	386.8
196.000	1.363	.1245	.8192	.1636	.7817	.5495	.4453	.9769	9.6186E-02	386.8
197.000	1.363	.1245	.8192	.1636	.7817	.5495	.4453	.9769	9.6186E-02	386.8
198.000	1.363	.1245	.8192	.1636	.7817	.5495	.4453	.9769	9.6186E-02	386.8
199.000	1.363	.1245	.8192	.1636	.7817	.5495	.4453	.9769	9.6186E-02	386.8
200.000	1.363	.1245	.8192	.1636	.7817	.5495	.4453	.9769	9.6186E-02	386.8
201.000	1.363	.1245	.8192	.1636	.7817	.5495	.4453	.9769	9.6186E-02	386.8
202.000	1.363	.1245	.8192	.1636	.7817	.5495	.4453	.9769	9.6186E-02	386.8
203.000	1.363	.1245	.8192	.1636	.7817	.5495	.4453	.9769	9.6186E-02	386.8
204.000	1.363	.1245	.8192	.1636	.7817	.5495	.4453	.9769	9.6186E-02	386.8
205.000	1.363	.1245	.8192	.1636	.7817	.5495	.4453	.9769	9.6186E-02	386.8
206.000	1.363	.1245	.8192	.1636	.7817	.5495	.4453	.9769	9.6186E-02	386.8
207.000	1.363	.1245	.8192	.1636	.7817	.5495	.4453	.9769	9.6186E-02	386.8
208.000	1.363	.1245	.8192	.1636	.7817	.5495	.4453	.9769	9.6186E-02	386.8
209.000	4.145	.3786	1.108	.4974	.8474	.5471	.2062	2.021	.1735	124.3
210.000	8.923	.8151	5.410	1.071	5.084	.2058	.5482	10.30	.5028	116.7
211.000	14.85	1.357	9.269	1.783	8.653	.1973	.5868	15.73	.5151	107.7
212.000	19.75	1.804	11.26	2.370	9.546	.2697	.4851	13.90	.4077	83.36
213.000	32.50	2.969	17.53	3.900	13.32	.3291	.4074	22.49	.4041	91.31
214.000	56.98	5.205	33.78	6.838	22.84	.3417	.4042	36.11	.3886	132.6
215.000	52.19	4.767	28.90	6.262	19.87	.3873	.3954	28.56	.3600	99.75
216.000	26.40	2.411	13.35	3.168	9.014	.3735	.3719	11.61	.2715	107.7
217.000	26.40	2.411	13.35	3.168	9.014	.3735	.3719	11.61	.2715	107.7
218.000	26.40	2.411	13.35	3.168	9.014	.3735	.3719	11.61	.2715	107.7
219.000	26.40	2.411	13.35	3.168	9.014	.3735	.3719	11.61	.2715	107.7
220.000	26.40	2.411	13.35	3.168	9.014	.3735	.3719	11.61	.2715	107.7
221.000	26.40	2.411	13.35	3.168	9.014	.3735	.3719	11.61	.2715	107.7
222.000	26.40	2.411	13.35	3.168	9.014	.3735	.3719	11.61	.2715	107.7
223.000	26.40	2.411	13.35	3.168	9.014	.3735	.3719	11.61	.2715	107.7
224.000	26.40	2.411	13.35	3.168	9.014	.3735	.3719	11.61	.2715	107.7
225.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
226.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
227.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
228.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
229.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
230.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
231.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
232.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
233.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
234.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
235.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
236.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
237.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
238.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
239.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
240.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
241.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0

TIME (D)	COAL RT mo/s IRED1 44	ASH RATE mo/s IRED1 46	H2O INFX mo/s IRED1 47	H2O COAL mo/s IRED1 48	-H2O RXN mo/s IRED1 49	O2 per COAL IRED1 60	H2O per COAL IRED1 61	CHAR RT mo/s IRED1 64	CHAR per COAL IRED1 63	RECOVERY % IRED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
242.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
243.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
244.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
245.000	4.425	.4042	2.220	.5310	1.626	.3542	.3850	-.5325	5.0398E-02	114.0
246.000	8.442	.7711	5.222	1.013	4.045	.3609	.4809	2.139	.1709	119.5
247.000	10.73	.9801	6.349	1.288	4.939	.3708	.4609	4.004	.2211	114.4
248.000	11.38	1.040	7.583	1.366	5.757	.3450	.5051	6.771	.3682	121.4
249.000	12.50	1.142	7.736	1.500	5.978	.3472	.4791	6.660	.3424	121.0
250.000	14.39	1.315	7.318	1.727	6.101	.3745	.4234	8.030	.3525	121.7
251.000	18.58	1.697	8.734	2.229	7.740	.3414	.4186	10.96	.3715	117.5
252.000	18.67	1.705	8.772	2.240	7.819	.3649	.4185	10.73	.3531	117.5
253.000	19.42	1.774	7.712	2.330	6.684	.3949	.3450	6.431	.2460	104.8
254.000	20.45	1.868	7.761	2.453	6.139	.4435	.2994	5.763	.1453	115.1
255.000	21.05	1.923	6.492	2.526	4.969	.4927	.2339	4.678	.1768	116.4
256.000	24.82	2.267	7.059	2.978	5.854	.4501	.2354	4.412	.1283	110.2
257.000	26.84	2.452	9.410	3.221	6.339	.4869	.2361	7.598	.2110	109.3
258.000	26.62	2.432	12.87	3.194	5.731	.5180	.2149	.3007	4.3111E-03	107.6
259.000	23.27	2.125	11.73	2.792	4.673	.5347	.2050	-1.098	-.1456	114.2
260.000	9.133	.8343	8.093	1.096	1.070	.6795	.1188	4.107	.2453	152.0
261.000	10.40	.9504	12.11	1.249	1.604	.6378	.1569	-.3799	-5.520E-02	188.5
262.000	10.40	.9504	12.11	1.249	1.604	.6378	.1569	-.3799	-5.520E-02	188.5

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UCG DB - HA4.B - ENERGY PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL kJ /mol IRED1 72	PRODUCT frac IRED1 74	TAR frac IRED1 73	SENS HT frac IRED1 76	STEAM frac IRED1 77	COOLING frac IRED1 80	SEN HT INSU IRED1 78	LOSS frac IRED1 75	HC kJ /mol IRED1 81	HC/02 kJ /mol IRED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
110.000	157.8	.4976	1.3029E-02	-1.992E-03	1.4738E-02	0.000	1.0841E-02	.4617	45.18	231.6
111.000	192.7	.8247	1.0632E-02	-7.992E-04	1.2026E-02	0.000	1.0841E-02	.1386	94.87	590.1
112.000	233.1	.9376	9.4915E-03	3.0772E-03	1.0736E-02	0.000	1.0841E-02	2.4312E-02	118.6	785.1
113.000	240.6	.9398	9.7883E-03	3.4328E-03	1.1072E-02	0.000	1.0841E-02	2.1138E-02	116.3	774.3
114.000	253.7	.8751	9.5394E-03	2.7043E-03	1.0790E-02	0.000	1.0841E-02	8.7009E-02	112.0	746.2
115.000	229.2	.8871	1.0142E-02	4.4673E-03	1.1472E-02	0.000	1.0841E-02	7.1990E-02	107.7	687.2
116.000	227.4	.8438	1.0677E-02	5.2638E-03	1.2078E-02	0.000	1.0841E-02	.1133	98.15	606.3
117.000	228.0	.8387	1.0638E-02	3.7809E-03	1.2033E-02	0.000	1.0841E-02	.1201	98.73	608.8
118.000	236.0	.8409	1.0488E-02	4.0716E-03	1.1864E-02	0.000	1.0841E-02	.1179	101.3	617.6
119.000	230.4	.8082	1.0570E-02	6.1167E-03	1.1956E-02	0.000	1.0841E-02	.1483	97.41	591.2
120.000	243.2	.8586	1.0137E-02	1.0989E-02	1.1466E-02	0.000	1.0841E-02	9.3950E-02	113.9	763.2
121.000	209.6	.9022	1.0425E-02	1.1793E-02	1.1792E-02	0.000	1.0841E-02	4.9025E-02	116.3	850.5
122.000	93.94	.6855	1.3478E-02	8.6182E-03	1.5245E-02	0.000	1.0841E-02	.2623	66.94	377.2
123.000	104.1	.7510	1.2689E-02	5.1826E-03	1.4353E-02	0.000	1.0841E-02	.2019	77.91	455.4
124.000	105.2	.7513	1.1966E-02	3.0354E-03	1.3535E-02	0.000	1.0841E-02	.2053	83.35	510.5
125.000	98.52	.7367	1.1829E-02	2.7863E-03	1.3380E-02	0.000	1.0841E-02	.2204	83.77	523.0
126.000	81.43	.7104	1.2697E-02	2.3523E-03	1.4361E-02	0.000	1.0841E-02	.2453	75.57	445.2
127.000	81.59	.7377	1.3231E-02	3.0195E-03	1.4966E-02	0.000	1.0841E-02	.2162	75.82	435.0
128.000	91.42	.7561	1.2842E-02	6.6120E-03	1.4526E-02	0.000	1.0841E-02	.1951	80.70	476.3
129.000	90.78	.7805	1.4338E-02	7.8904E-03	1.6218E-02	0.000	1.0841E-02	.1663	78.19	457.8
130.000	95.55	.7876	1.2900E-02	4.2953E-03	1.4592E-02	0.000	1.0841E-02	.1657	85.00	504.0
131.000	84.54	.7684	1.3044E-02	4.3192E-03	1.4755E-02	0.000	1.0841E-02	.1846	82.73	482.2
132.000	73.18	.7326	1.3497E-02	4.1159E-03	1.5267E-02	0.000	1.0841E-02	.2196	76.75	439.8
133.000	70.43	.6878	1.3997E-02	3.1413E-03	1.5833E-02	0.000	1.0841E-02	.2644	69.96	392.4
134.000	62.45	.6867	1.6240E-02	1.9491E-03	1.8369E-02	0.000	1.0841E-02	.2618	66.09	392.1
135.000	63.53	.7017	1.3541E-02	1.2069E-03	1.5316E-02	0.000	1.0841E-02	.2534	75.20	423.7
136.000	73.92	.7294	1.3504E-02	2.5080E-03	1.5275E-02	0.000	1.0841E-02	.2244	79.10	461.5
137.000	90.30	.7846	1.2863E-02	1.5652E-03	1.4550E-02	0.000	1.0841E-02	.1716	89.67	542.1
138.000	100.0	.8489	1.2434E-02	2.0803E-03	1.4065E-02	0.000	1.0841E-02	.1077	100.8	646.4
139.000	106.7	.8659	1.2290E-02	1.4895E-03	1.3902E-02	0.000	1.0841E-02	9.1637E-02	104.8	676.6
140.000	105.9	.8307	1.2316E-02	4.4638E-03	1.3931E-02	0.000	1.0841E-02	.1237	101.1	641.7
141.000	111.2	.8522	1.2184E-02	2.9964E-03	1.3781E-02	0.000	1.0841E-02	.1040	105.6	682.3
142.000	158.8	.6624	1.0517E-02	1.7590E-03	1.1896E-02	0.000	1.0841E-02	.2986	93.31	695.8
143.000	144.4	.4945	9.5786E-03	5.5948E-04	1.0835E-02	0.000	1.0841E-02	.4696	77.28	593.9
144.000	114.6	.5630	1.1737E-02	1.6365E-03	1.3276E-02	0.000	1.0841E-02	.3954	73.75	465.3
145.000	101.0	.6784	1.3095E-02	3.1936E-03	1.4812E-02	0.000	1.0841E-02	.2756	80.52	490.9
146.000	68.65	.6819	1.4005E-02	1.9632E-03	1.5841E-02	0.000	1.0841E-02	.2715	77.19	466.1
147.000	76.75	.5629	1.4885E-02	1.2079E-03	1.6837E-02	0.000	1.0841E-02	.3893	59.58	340.3

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TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/O2 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
148.000	88.66	.6863	1.3864E-02	-1.004E-02	1.5682E-02	0.000	1.0841E-02	.2793	78.44	469.4
149.000	96.11	.7524	1.3706E-02	2.2125E-03	1.5504E-02	0.000	1.0841E-02	.2013	87.60	537.4
150.000	107.1	.8644	1.3093E-02	2.8119E-03	1.4810E-02	0.000	1.0841E-02	9.0093E-02	106.1	680.3
151.000	100.3	.8193	1.3606E-02	2.6008E-03	1.5391E-02	0.000	1.0841E-02	.1342	97.43	603.8
152.000	93.37	.7992	1.3983E-02	3.1050E-03	1.5816E-02	0.000	1.0841E-02	.1530	93.03	569.2
153.000	95.11	.7486	1.4602E-02	2.4098E-03	1.6516E-02	0.000	1.0841E-02	.2030	84.08	498.4
154.000	100.8	.7350	1.4843E-02	1.7291E-03	1.6789E-02	0.000	1.0841E-02	.2168	81.82	487.1
155.000	127.4	.8406	1.3819E-02	1.5695E-04	1.5631E-02	0.000	1.0841E-02	.1149	100.9	633.1
156.000	128.9	.8750	1.3556E-02	5.1242E-04	1.5333E-02	0.000	1.0841E-02	8.0729E-02	107.8	695.3
157.000	104.5	.9193	1.6749E-02	3.5117E-04	1.8946E-02	0.000	1.0841E-02	2.9793E-02	96.75	613.7
158.000	123.0	.8243	1.3767E-02	-6.047E-04	1.5573E-02	0.000	1.0841E-02	.1321	101.4	648.2
159.000	128.2	.8329	1.4375E-02	1.8499E-03	1.6260E-02	0.000	1.0841E-02	.1198	98.56	631.8
160.000	134.4	.8514	1.4150E-02	1.5540E-03	1.6006E-02	0.000	1.0841E-02	.1021	103.0	679.2
161.000	179.0	.7558	1.2101E-02	1.3956E-03	1.3688E-02	0.000	1.0841E-02	.2022	107.5	773.4
162.000	108.4	1.003	1.0966E-02	2.5651E-03	1.2404E-02	0.000	9.9379E-03	-.1263	168.6	1367.
163.000	13.32	.5321	1.5699E-02	3.0363E-03	1.7758E-02	0.000	6.9695E-03	6.4730E-02	118.5	215.1
164.000	36.19	.6642	2.7578E-02	4.1514E-03	3.1194E-02	0.000	1.0841E-02	.2580	54.42	332.1
165.000	29.82	.8304	2.4290E-02	1.8464E-03	2.7476E-02	0.000	1.0841E-02	.1011	74.25	491.2
166.000	71.81	.7609	3.0561E-02	-6.382E-04	3.4569E-02	0.000	1.0841E-02	.1597	57.54	351.7
167.000	72.99	.6367	2.1341E-02	3.0076E-03	2.4140E-02	0.000	1.0841E-02	.3000	65.35	406.5
168.000	59.43	.3789	1.9712E-02	-4.037E-04	2.2297E-02	0.000	1.0841E-02	.5645	34.56	177.8
169.000	77.20	.5905	1.9839E-02	-4.087E-03	2.2441E-02	0.000	1.0841E-02	.3564	55.39	303.6
170.000	92.77	.6855	2.0225E-02	-4.525E-03	2.2878E-02	0.000	1.0841E-02	.2611	66.00	376.2
171.000	103.6	.6874	1.7329E-02	-3.238E-03	1.9601E-02	0.000	1.0841E-02	.2641	72.54	424.4
172.000	115.6	.7411	1.7083E-02	-1.678E-03	1.9323E-02	0.000	1.0841E-02	.2093	82.78	511.1
173.000	125.0	.7424	1.6887E-02	2.0601E-03	1.9102E-02	0.000	1.0841E-02	.2047	81.95	494.3
174.000	193.4	.8486	1.7325E-02	6.6666E-03	1.9597E-02	0.000	1.0841E-02	9.2899E-02	96.04	388.3
175.000	211.3	.8305	1.5235E-02	8.5980E-03	1.7233E-02	0.000	1.0841E-02	.1134	102.3	236.7
176.000	190.5	.8472	1.5189E-02	7.3141E-03	1.7181E-02	0.000	1.0841E-02	9.8338E-02	105.7	688.3
177.000	339.2	.9039	1.4153E-02	6.5067E-03	1.6009E-02	0.000	1.0841E-02	4.4644E-02	121.3	870.1
178.000	371.3	.9665	1.3176E-02	7.3721E-03	1.4904E-02	0.000	1.0841E-02	-1.679E-02	139.9	1104.
179.000	344.0	.8510	1.3672E-02	5.6579E-03	1.5465E-02	0.000	1.0841E-02	9.9318E-02	123.3	946.9
180.000	380.3	.8892	1.3063E-02	3.6949E-03	1.5681E-02	0.000	1.0841E-02	6.2746E-02	124.0	888.3
181.000	196.6	.8734	1.4276E-02	5.6030E-03	1.6148E-02	0.000	1.0841E-02	7.5697E-02	118.4	848.7
182.000	185.9	.9176	1.3186E-02	3.9733E-03	1.4915E-02	0.000	1.0841E-02	3.5448E-02	136.4	1071.
183.000	274.3	1.119	1.2076E-02	3.6491E-03	1.3660E-02	0.000	1.0841E-02	-.1628	183.1	1650.
184.000	178.9	1.165	1.1858E-02	4.0859E-03	1.3413E-02	0.000	1.0841E-02	-.2087	194.2	1872.
185.000	46.47	.7946	1.6065E-02	5.9916E-03	1.8172E-02	0.000	1.0841E-02	.1503	101.7	697.7
186.000	33.98	.4725	1.9786E-02	6.6348E-03	2.2380E-02	0.000	1.0841E-02	.4639	47.61	256.1
187.000	108.1	.4676	.1435	3.7018E-02	.1623	0.000	1.0841E-02	.1743	55.98	416.5
188.000	331.2	1.047	1.2063E-02	1.2344E-02	1.3645E-02	0.000	1.0841E-02	-.1003	177.5	1873.
189.000	191.3	.6707	1.6615E-02	1.1576E-02	1.8793E-02	0.000	1.0841E-02	.2674	93.33	729.6
190.000	93.22	.5951	1.8961E-02	8.4381E-03	2.1448E-02	0.000	1.0841E-02	.3412	63.94	377.4
191.000	99.93	.8520	1.6524E-02	7.0281E-03	1.8691E-02	0.000	1.0841E-02	9.0930E-02	107.0	768.9
192.000	218.1	.9950	1.4020E-02	9.1541E-03	1.5858E-02	0.000	1.0841E-02	-4.885E-02	146.3	1155.
193.000	898.0	.9752	1.3319E-02	1.3935E-02	1.5065E-02	0.000	1.0841E-02	-3.235E-02	151.6	1230.
194.000	595.6	.5164	6.6238E-03	4.0614E-03	7.4924E-03	0.000	5.4753E-03	-3.707E-02	119.2	678.2

TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/02 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
195.000	595.6	.5164	6.6238E-03	4.0614E-03	7.4924E-03	0.000	5.4753E-03	-3.707E-02	119.2	678.2
196.000	595.6	.5164	6.6238E-03	4.0614E-03	7.4924E-03	0.000	5.4753E-03	-3.707E-02	119.2	678.2
197.000	595.6	.5164	6.6238E-03	4.0614E-03	7.4924E-03	0.000	5.4753E-03	-3.707E-02	119.2	678.2
198.000	595.6	.5164	6.6238E-03	4.0614E-03	7.4924E-03	0.000	5.4753E-03	-3.707E-02	119.2	678.2
199.000	595.6	.5164	6.6238E-03	4.0614E-03	7.4924E-03	0.000	5.4753E-03	-3.707E-02	119.2	678.2
200.000	595.6	.5164	6.6238E-03	4.0614E-03	7.4924E-03	0.000	5.4753E-03	-3.707E-02	119.2	678.2
201.000	595.6	.5164	6.6238E-03	4.0614E-03	7.4924E-03	0.000	5.4753E-03	-3.707E-02	119.2	678.2
202.000	595.6	.5164	6.6238E-03	4.0614E-03	7.4924E-03	0.000	5.4753E-03	-3.707E-02	119.2	678.2
203.000	595.6	.5164	6.6238E-03	4.0614E-03	7.4924E-03	0.000	5.4753E-03	-3.707E-02	119.2	678.2
204.000	595.6	.5164	6.6238E-03	4.0614E-03	7.4924E-03	0.000	5.4753E-03	-3.707E-02	119.2	678.2
205.000	595.6	.5164	6.6238E-03	4.0614E-03	7.4924E-03	0.000	5.4753E-03	-3.707E-02	119.2	678.2
206.000	595.6	.5164	6.6238E-03	4.0614E-03	7.4924E-03	0.000	5.4753E-03	-3.707E-02	119.2	678.2
207.000	595.6	.5164	6.6238E-03	4.0614E-03	7.4924E-03	0.000	5.4753E-03	-3.707E-02	119.2	678.2
208.000	595.6	.5164	6.6238E-03	4.0614E-03	7.4924E-03	0.000	5.4753E-03	-3.707E-02	119.2	678.2
209.000	1811.	.6212	1.2454E-02	8.4782E-02	1.4087E-02	0.000	8.1310E-03	6.3602E-03	105.6	602.7
210.000	3899.	1.063	1.4040E-02	9.9581E-02	1.5881E-02	0.000	1.0841E-02	-.2071	170.5	1394.
211.000	6491.	1.076	1.4452E-02	9.9557E-02	1.6171E-02	0.000	1.0841E-02	-.2208	171.0	1431.
212.000	8629.	.9916	2.2129E-02	.1025	2.0971E-02	0.000	1.0841E-02	-.1520	154.3	1210.
213.000	1.4201E+04	.9378	1.9546E-02	.1080	2.3641E-02	0.000	1.0841E-02	-.1038	135.6	997.9
214.000	2.4902E+04	.9202	2.9057E-02	.1114	3.1043E-02	0.000	1.0841E-02	-.1066	130.8	962.3
215.000	2.2805E+04	.8902	1.3552E-02	.1158	2.8902E-02	0.000	1.0841E-02	-6.331E-02	119.6	862.1
216.000	1.1536E+04	.4053	4.3347E-03	6.0477E-02	1.4289E-02	0.000	5.4207E-03	8.1221E-03	131.8	349.3
217.000	1.1536E+04	.4053	4.3347E-03	6.0477E-02	1.4289E-02	0.000	5.4207E-03	8.1221E-03	131.8	349.3
218.000	1.1536E+04	.4053	4.3347E-03	6.0477E-02	1.4289E-02	0.000	5.4207E-03	8.1221E-03	131.8	349.3
219.000	1.1536E+04	.4053	4.3347E-03	6.0477E-02	1.4289E-02	0.000	5.4207E-03	8.1221E-03	131.8	349.3
220.000	1.1536E+04	.4053	4.3347E-03	6.0477E-02	1.4289E-02	0.000	5.4207E-03	8.1221E-03	131.8	349.3
221.000	1.1536E+04	.4053	4.3347E-03	6.0477E-02	1.4289E-02	0.000	5.4207E-03	8.1221E-03	131.8	349.3
222.000	1.1536E+04	.4053	4.3347E-03	6.0477E-02	1.4289E-02	0.000	5.4207E-03	8.1221E-03	131.8	349.3
223.000	1.1536E+04	.4053	4.3347E-03	6.0477E-02	1.4289E-02	0.000	5.4207E-03	8.1221E-03	131.8	349.3
224.000	1.1536E+04	.4053	4.3347E-03	6.0477E-02	1.4289E-02	0.000	5.4207E-03	8.1221E-03	131.8	349.3
225.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
226.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
227.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
228.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
229.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
230.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
231.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
232.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
233.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
234.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
235.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
236.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
237.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
238.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
239.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
240.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
241.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6

TIME (D)	COAL kJ /mol IRED1 72	PRODUCT frac IRED1 74	TAR frac IRED1 73	SENS nf frac IRED1 76	STEAM frac IRED1 77	COOLING frac IRED1 80	SEN HT INSU IRED1 78	LOSS frac IRED1 75	HC kJ /mol IRED1 81	HC/02 kJ /mol IRED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
242.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
243.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
244.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
245.000	1934.	.4342	3.8754E-03	5.5879E-02	1.2775E-02	0.000	5.4207E-03	-1.418E-02	142.1	475.6
246.000	3689.	.9305	7.9188E-03	.1144	2.6103E-02	0.000	1.0841E-02	-9.372E-02	131.0	1035.
247.000	4689.	.9144	6.9531E-03	.1110	2.5206E-02	0.000	1.0841E-02	-7.238E-02	133.6	1079.
248.000	4975.	.9500	5.6115E-03	.1183	2.8212E-02	0.000	1.0841E-02	-.1169	129.5	995.3
249.000	5461.	.9403	7.3942E-03	.1149	2.6350E-02	0.000	1.0841E-02	-.1038	130.5	994.0
250.000	6290.	.9090	7.9840E-03	.1147	2.0595E-02	0.000	1.0841E-02	-6.718E-02	123.4	897.1
251.000	8118.	.9547	5.9582E-03	.1090	1.7478E-02	0.000	1.0841E-02	-.1019	133.9	1007.
252.000	8159.	.9270	6.4736E-03	.1121	1.7207E-02	0.000	1.0841E-02	-7.763E-02	126.4	930.7
253.000	8485.	.8964	5.1500E-03	.1103	1.7372E-02	0.000	1.0841E-02	-4.411E-02	124.3	908.3
254.000	8935.	.8255	3.4210E-03	.1153	2.0056E-02	0.000	1.0841E-02	2.0814E-02	112.2	760.1
255.000	9198.	.7757	4.3236E-03	.1191	1.9376E-02	0.000	1.0841E-02	6.6613E-02	100.3	654.1
256.000	1.0846E+04	.8339	4.1281E-03	.1113	1.6998E-02	0.000	1.0841E-02	1.8859E-02	113.4	773.5
257.000	1.1730E+04	.7779	5.5368E-03	.1201	2.3530E-02	0.000	1.0841E-02	5.8041E-02	100.7	653.9
258.000	1.1633E+04	.7397	8.5287E-03	.1267	3.8988E-02	0.000	1.0841E-02	7.1255E-02	96.03	623.1
259.000	1.0168E+04	.7163	5.9443E-03	.1297	4.3885E-02	0.000	1.0841E-02	8.9299E-02	92.84	597.3
260.000	3991.	.5632	1.4187E-02	.1751	9.5736E-02	0.000	1.0841E-02	.1368	58.92	329.0
261.000	4547.	.5894	6.9791E-03	.1585	.1129	0.000	1.0841E-02	.1173	77.59	538.3
262.000	4547.	.5894	6.9791E-03	.1585	.1129	0.000	1.0841E-02	.1173	77.59	538.3

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UNDERGROUND COAL GASIFICATION

DATA BASE

LAWRENCE LIVERMORE NATIONAL LABOATORY

HOE CREEK I

DAILY AVERAGE RESULTS

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  HOE CREEK COAL ANALYSIS
                                                                  KG/M**3   KJ/MOLE
COAL H/C  COAL O/C  COAL S/C  COAL N/C  WT F H2O  WT F ASH  DENSITY   HT COMB
.903      0.193      .003      .017      .3011     .0405     1350.     433.

CHAR H/C  CHAR O/C  CHAR S/C  CHAR N/C
.1330     0.        0.        0.

 TAR H/C   TAR O/C   TAR S/C   TAR N/C      C/MOLECULE
 1.15      0.        0.        0.            9.

  COAL      ASH&CHAR  --  TEMPERATURES (K)
   300.      1000.

  1   NUMBER OF POINTS ON OXYGEN TRACER TYPE CURVE
999.     2   TIME,TRACER FLAG (ZERO=NONE,ONE=ARGON,TWO=NITROGEN)

  1   NUMBER OF POINTS ON GAS LOSS TRACER TYPE CURVE
 999.   2  TIME,TRACER FLAG (SAME AS OXYGEN TRACER)

 1   NUMBER OF POINTS ON CHAR FLAG CURVE
999.      0   TIME,TRACER FLAG   (0=DO NOT USE CHAR, 1=USE CHAR)
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UCG DB - HCI - OPERATING PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	INJ RATE kg/s IRED1 90	PRD RATE kg/s IRED1 91	INJ TEMP C IRED1 94	PRD TEMP C IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM kg/s IRED1 92	COOLING kg/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
289.000	3.662	4.851	10.66	9.524	516.9	87.23	0.000	0.000	.2100	0.000
290.000	6.500	11.23	16.71	26.81	476.2	104.0	0.000	0.000	.2100	0.000
291.000	8.392	16.89	20.17	93.42	217.1	109.9	0.000	0.000	.2100	0.000
292.000	11.70	20.98	23.90	192.4	194.0	122.7	0.000	0.000	.2100	0.000
293.000	15.37	29.15	35.48	279.9	202.3	123.3	0.000	0.000	.2100	0.000
294.000	14.69	28.17	38.12	269.9	208.7	163.5	0.000	0.000	.2100	0.000
295.000	17.62	32.04	42.02	307.1	222.3	184.4	0.000	0.000	.2100	0.000
296.000	15.36	30.33	45.59	376.1	199.5	169.5	0.000	0.000	.2100	0.000
297.000	15.46	33.58	37.57	416.5	218.8	181.1	0.000	0.000	.2100	0.000
298.000	12.71	24.89	37.24	330.6	190.4	135.0	0.000	0.000	.2100	0.000
299.000	12.97	22.66	37.41	233.7	186.1	115.2	0.000	0.000	.2100	0.000
300.000	12.97	22.66	37.41	233.7	186.1	115.2	0.000	0.000	.2100	0.000

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UCG DB - HCI - PRODUCT GAS ANALYSIS 1

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	ARGON molf !RED1 10	NITROGEN molf !RED1 11	OXYGEN molf !RED1 12	HYDROGEN molf !RED1 13	METHANE molf !RED1 14	CO molf !RED1 15	CO2 molf !RED1 16	ETHANE molf !RED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
289.000	6.4374E-03	.5021	0.000	.1923	2.4619E-02	.1355	.1375	1.5196E-03
290.000	5.9930E-03	.4675	0.000	.2213	4.1659E-02	9.3790E-02	.1671	2.7601E-03
291.000	6.5199E-03	.5085	0.000	.1981	2.3304E-02	.1270	.1352	1.2342E-03
292.000	6.9352E-03	.5409	0.000	.1793	1.4978E-02	.1039	.1532	7.1708E-04
293.000	7.1290E-03	.5561	0.000	.1705	1.5578E-02	6.9991E-02	.1799	8.0628E-04
294.000	6.5256E-03	.5090	0.000	.2101	1.8572E-02	8.7467E-02	.1673	1.0169E-03
295.000	6.7665E-03	.5278	0.000	.1939	1.7685E-02	9.1791E-02	.1612	8.7906E-04
296.000	6.6790E-03	.5210	0.000	.1971	1.6946E-02	.1049	.1525	9.6215E-04
297.000	7.0517E-03	.5500	0.000	.1804	1.1760E-02	9.1135E-02	.1591	4.6849E-04
298.000	8.0313E-03	.6264	0.000	.1206	6.6112E-03	7.9377E-02	.1590	0.000
299.000	9.2640E-03	.7226	0.000	5.3638E-02	2.8295E-03	4.6126E-02	.1656	0.000
300.000	9.2640E-03	.7226	0.000	5.3638E-02	2.8295E-03	4.6126E-02	.1656	0.000

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UCG DB - HCI - PRODUCT GAS ANALYSIS 2

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	C2H4 molf !RED1 17	C6 molf !RED1 19	H10 molf !RED1 20	H2S molf !RED1 21	TAR/DRY !RED1 24	H2O/DRY !RED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
289.000	0.000	0.000	0.000	0.000	6.4785E-07	1.8774E-02
290.000	0.000	0.000	0.000	0.000	1.4455E-05	8.4476E-02
291.000	0.000	0.000	0.000	0.000	8.5178E-05	.2807
292.000	0.000	0.000	0.000	0.000	1.5803E-04	.3406
293.000	0.000	0.000	0.000	0.000	3.8446E-04	.4120
294.000	0.000	0.000	0.000	0.000	2.2182E-03	.4440
295.000	0.000	0.000	0.000	0.000	2.6908E-03	.2565
296.000	0.000	0.000	0.000	0.000	3.2972E-03	.4128
297.000	0.000	0.000	0.000	0.000	3.5050E-03	.4910
298.000	0.000	0.000	0.000	0.000	6.2656E-03	.7880
299.000	0.000	0.000	0.000	0.000	4.5077E-03	.8692
300.000	0.000	0.000	0.000	0.000	4.5077E-03	.8692

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UCG DB - HCI - MATERIAL BALANCES

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL RT mo/s IRED1 44	ASH RATE mo/s IRED1 46	H2O INFX mo/s IRED1 47	H2O COAL mo/s IRED1 48	-H2O RXN mo/s IRED1 49	O2 per COAL IRED1 60	H2O per COAL IRED1 61	CHAR RT mo/s IRED1 64	CHAR per COAL IRED1 63	RECOVORY % IRED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
289.000	1.428	1.8865E-02	2.9704E-02	.5922	.5298	.4021	.3683	.7347	.2460	84.56
290.000	3.072	4.0594E-02	1.746	1.274	1.755	.3155	.5644	3.084	.4297	86.74
291.000	3.826	5.0554E-02	3.703	1.587	1.591	.3873	.4100	3.523	.4734	101.7
292.000	4.307	5.6913E-02	4.942	1.787	1.381	.4916	.3183	1.706	.2802	92.52
293.000	5.586	7.3802E-02	7.914	2.317	1.733	.5442	.3087	.6093	6.7050E-02	95.73
294.000	5.758	7.6078E-02	8.742	2.388	2.503	.4006	.4349	3.790	.3820	86.66
295.000	7.507	9.9192E-02	6.250	3.114	2.768	.4135	.3778	5.084	.4049	97.81
296.000	6.655	8.7934E-02	8.176	2.760	2.453	.3895	.3693	4.834	.4201	94.76
297.000	6.719	8.8781E-02	10.27	2.787	2.188	.4511	.2996	4.038	.3751	101.6
298.000	4.198	5.5469E-02	9.488	1.741	.4207	.5147	9.9063E-02	1.936	.3100	89.40
299.000	3.139	4.1479E-02	8.672	1.302	-.4076	.7280	-.1381	1.752	.3307	87.34
300.000	3.139	4.1479E-02	8.672	1.302	-.4076	.7280	-.1381	1.752	.3307	87.34

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UCG DB - HCI - ENERGY PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/O2 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
289.000	618.2	.9037	2.5103E-05	-1.817E-03	6.3552E-03	0.000	1.5827E-03	8.8100E-02	117.6	872.7
290.000	1330.	.9833	5.4206E-04	1.6892E-03	2.7818E-02	0.000	1.5827E-03	-1.692E-02	131.2	1050.
291.000	1657.	.9212	3.4338E-03	2.2426E-02	9.8887E-02	0.000	1.5827E-03	-4.949E-02	115.3	843.9
292.000	1865.	.7960	6.6861E-03	6.1185E-02	.1262	0.000	1.5827E-03	6.3205E-03	95.11	660.8
293.000	2419.	.7127	1.6208E-02	9.8246E-02	.1544	0.000	1.5827E-03	1.4829E-02	83.68	562.7
294.000	2493.	.8051	8.6649E-02	8.8496E-02	.1523	0.000	1.5827E-03	-.1361	102.9	751.6
295.000	3251.	.7686	.1031	8.7689E-02	8.7609E-02	0.000	1.5827E-03	-5.052E-02	98.51	697.2
296.000	2882.	.7758	.1231	.1218	.1362	0.000	1.5827E-03	-.1605	102.6	731.9
297.000	2909.	.6851	.1389	.1533	.1713	0.000	1.5827E-03	-.1522	88.57	623.4
298.000	1818.	.4798	.2395	.1385	.2651	0.000	1.5827E-03	-.1265	62.81	374.4
299.000	1359.	.2794	.1834	.1178	.3579	0.000	1.5827E-03	5.7872E-02	30.90	159.8
300.000	1359.	.2794	.1834	.1178	.3579	0.000	1.5827E-03	5.7872E-02	30.90	159.8

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UNDERGROUND COAL GASIFICATION

DATA BASE

LAWRENCE LIVERMORE NATIONAL LABOATORY

HOE CREEK II

DAILY AVERAGE RESULTS

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  HOE CREEK COAL ANALYSIS
                                                                  KG/M**3   KJ/MOLE
COAL H/C  COAL O/C  COAL S/C  COAL N/C  WT F H2O  WT F ASH  DENSITY   HT COMB
.903      0.193      .003     .017      .3011     .0405     1350.     433.

CHAR H/C  CHAR O/C  CHAR S/C  CHAR N/C
.1330     0.        0.        0.

 TAR H/C   TAR O/C   TAR S/C   TAR N/C      C/MOLECULE
 1.15      0.        0.        0.            9.

  COAL       ASH&CHAR  --  TEMPERATURES (K)
   300.       1000.

  4   NUMBER OF POINTS ON OXYGEN TRACER TYPE CURVE
314.652  2
314.653  0   NO TRACER DURING OXYGEN BURN
316.526  0
999.     2   TIME,TRACER FLAG (ZERO=NONE,ONE=ARGON,TWO=NITROGEN)

  4   NUMBER OF POINTS ON GAS LOSS TRACER TYPE CURVE
314.652  2
314.653  0   NO TRACER DURING OXYGEN BURN
316.526  0
999.     2  TIME,TRACER FLAG (SAME AS OXYGEN TRACER)

 1   NUMBER OF POINTS ON CHAR FLAG CURVE
999.      0   TIME,TRACER FLAG   (0=DO NOT USE CHAR, 1=USE CHAR)
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UCG DB - HCII - OPERATING PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	INJ RATE mo/s !RED1 90	PRD RATE mo/s !RED1 91	INJ TEMP c !RED1 94	PRD TEMP c !RED1 95	INJ PRES kPa !RED1 96	PRD PRES kPa !RED1 97	STEAM mo/s !RED1 92	COOLING mo/s !RED1 93	INJ O2 frac !RED1 6	INJ H2O frac !RED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
287.000	7.074	2.011	26.55	46.37	485.1	294.6	0.000	5.9183E-12	.2100	0.000
288.000	3.636	2.459	23.14	73.43	375.5	305.7	0.000	5.9183E-12	.2100	0.000
289.000	4.882	2.549	31.35	62.82	432.5	337.6	0.000	5.9183E-12	.2100	0.000
290.000	8.586	2.783	35.21	60.89	536.2	363.0	0.000	5.9183E-12	.2100	0.000
291.000	9.202	2.719	42.49	58.85	580.9	367.2	0.000	5.9183E-12	.2100	0.000
292.000	8.745	2.390	43.54	40.33	570.1	317.7	0.000	5.9183E-12	.2100	0.000
293.000	9.112	2.120	42.12	43.85	573.7	270.9	0.000	5.9183E-12	.2100	0.000
294.000	10.11	1.713	31.81	33.54	593.4	237.7	0.000	5.9183E-12	.2100	0.000
295.000	11.08	1.454	33.96	31.00	597.7	299.1	0.000	5.9183E-12	.2100	0.000
296.000	9.635	1.661	39.16	37.92	576.2	320.7	0.000	5.9183E-12	.2100	0.000
297.000	9.331	1.722	36.49	36.99	564.2	343.3	0.000	5.9183E-12	.2100	0.000
298.000	7.103	1.724	31.43	39.26	479.7	367.5	0.000	5.9183E-12	.2100	0.000
299.000	1.952	1.087	15.53	36.21	301.0	271.3	0.000	5.9183E-12	.2100	0.000
300.000	1.602	.9727	11.50	29.55	291.9	272.3	0.000	5.9183E-12	.2100	0.000
301.000	11.15	24.38	36.05	83.24	309.5	272.1	0.000	5.9183E-12	.2100	0.000
302.000	25.24	62.21	58.98	180.7	201.0	189.7	0.000	5.9183E-12	.2100	0.000
303,000	30.13	72.35	67.43	232.2	207.0	197.8	0.000	5.9183E-12	.2100	0.000
304.000	29.66	66.04	64.84	327.3	252.6	244.5	0.000	5.9183E-12	.2100	0.000
305.000	33.22	79.30	53.22	250.8	249.1	237.7	0.000	5.9183E-12	.2100	0.000
306.000	24.94	53.17	33.48	155.0	285.6	275.3	0.000	5.9183E-12	.2100	0.000
307.000	52.75	99.74	38.25	213.8	291.4	276.8	0.000	.5677	.2100	0.000
308.000	58.90	101.6	68.63	307.6	367.6	333.5	0.000	4.120	.2100	0.000
309.000	23.16	23.38	56.30	234.7	516.6	499.6	0.000	6.0477E-03	.2100	0.000
310.000	24.49	23.45	60.71	106.7	448.0	432.3	0.000	6.0477E-03	.2100	0.000
311.000	27.54	21.42	58.46	0.000	432.1	417.9	0.000	6.0477E-03	.2100	0.000
312.000	30.21	29.26	51.11	47.60	392.2	338.3	0.000	6.0477E-03	.2100	0.000
313.000	30.91	38.10	59.44	184.0	343.1	331.3	0.000	6.0477E-03	.2100	0.000
314.000	27.27	33.18	65.06	199.3	332.1	323.9	0.000	6.0477E-03	.1855	.1165
315.000	18.39	45.51	39.80	142.4	331.9	322.0	0.000	.2354	.3875	.1145
316.000	21.26	51.67	66.44	110.7	322.8	316.9	0.000	12.31	.4947	9.1072E-02
317.000	34.37	60.73	66.76	155.6	330.6	314.4	0.000	8.541	.2100	1.2138E-04
318.000	35.86	64.93	63.37	172.8	343.3	305.2	0.000	4.735	.2099	5.3054E-04
319.000	37.69	70.07	59.38	82.95	344.2	316.8	0.000	10.43	.2100	0.000
320.000	43.66	70.70	63.35	157.2	335.1	304.1	0.000	3.957	.2100	0.000
321.000	43.60	67.09	63.66	203.2	326.2	288.9	0.000	5.1511E-03	.2100	0.000
322.000	44.43	71.51	63.22	136.9	331.9	291.6	0.000	5.1511E-03	.2100	0.000
323.000	45.81	65.46	54.14	12.20	329.7	271.3	0.000	5.1511E-03	.2100	0.000
324.000	47.07	74.05	53.26	17.03	318.3	253.1	0.000	5.1511E-03	.2100	0.000

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TIME (D)	INJ RATE kg/s IRED1 90	PRD RATE kg/s IRED1 91	INJ TEMP C IRED1 94	PRD TEMP C IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM kg/s IRED1 92	COOLING kg/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
325.000	46.55	74.26	67.69	243.6	325.9	272.6	0.000	5.1511E-03	.2100	0.000
326.000	46.57	73.33	67.98	297.3	321.2	319.2	0.000	5.1511E-03	.2100	0.000
327.000	45.06	70.27	68.28	309.7	321.2	317.6	0.000	5.1511E-03	.2100	0.000
328.000	44.71	65.15	68.85	297.1	327.5	323.1	0.000	5.1511E-03	.2100	0.000
329.000	46.24	64.84	70.43	307.9	323.4	317.3	0.000	5.1511E-03	.2100	0.000
330.000	46.36	67.23	66.84	315.0	312.0	307.2	0.000	.6554	.2100	0.000
331.000	45.75	64.54	68.03	327.7	311.2	307.5	0.000	1.507	.2100	0.000
332.000	45.67	65.75	69.20	320.1	317.8	313.4	0.000	3.442	.2100	0.000
333.000	46.06	62.66	65.14	262.6	331.7	326.3	0.000	3.485	.2100	0.000
334.000	45.72	57.92	66.04	318.9	335.9	331.1	0.000	1.967	.2100	0.000
335.000	45.98	57.90	67.42	283.2	326.0	322.8	0.000	1.951	.2100	0.000
336.000	45.71	54.53	71.08	294.2	321.6	318.9	0.000	.6949	.2100	0.000
337.000	45.14	51.62	71.04	270.5	319.6	316.6	0.000	.3633	.2100	0.000
338.000	44.77	45.60	65.32	239.9	341.2	338.3	0.000	.4783	.2100	0.000
339.000	45.38	50.09	61.67	256.0	335.7	313.6	0.000	.6360	.2100	0.000
340.000	43.87	52.93	63.30	259.4	321.3	318.1	0.000	1.459	.2100	0.000
341.000	45.66	65.10	64.61	258.7	294.1	294.0	0.000	3.165	.2100	0.000
342.000	47.32	72.62	61.29	223.4	274.0	198.6	0.000	3.238	.2100	0.000
343.000	48.58	71.62	70.96	237.4	252.9	153.6	0.000	3.114	.2100	0.000
344.000	39.55	53.20	70.89	239.6	254.0	214.2	0.000	3.114	.2100	0.000
345.000	46.42	59.58	66.21	258.8	262.1	257.5	0.000	3.114	.2100	0.000
346.000	47.73	61.66	62.61	292.3	268.7	263.7	0.000	3.114	.2100	0.000
347.000	44.29	60.69	68.92	308.1	268.6	264.1	0.000	3.114	.2100	0.000
348,000	43.93	59.32	69.83	301.8	268.1	256.2	0.000	3.114	.2100	0.000
349.000	44.09	48.63	65.97	301.6	303.3	302.9	0.000	3.114	.2100	0.000
350.000	61.44	76.74	60.06	273.6	299.3	297.4	0.000	2.178	.2100	0.000
351.000	70.16	86.71	62.11	327.5	312.8	308.7	0.000	3.326	.2100	0.000
352.000	65.93	108.9	63.60	337.2	244.8	239.7	0.000	6.469	.2100	0.000
353.000	46.75	60.27	65.06	325.7	270.7	265.4	0.000	5.955	.2100	0.000
354.000	47.29	66.16	62.94	329.8	257.3	225.1	0.000	.2001	.2100	0.000
355.000	47.05	73.06	67.98	323.5	233.5	228.5	0.000	1.679	.2100	0.000
356.000	47.51	73.34	69.43	322.6	233.0	229.5	0.000	4.593	.2100	0.000
357.000	48.07	71.16	65.81	336.5	234.2	230.0	0.000	2.687	.2100	0.000
358.000	46.27	73.43	61.29	278.9	230.3	229.2	0.000	6.191	.2100	0.000
359.000	46.27	73.43	61.29	278.9	230.3	229.2	0.000	6.191	.2100	0.000

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UCG DB - HCII - PRODUCT GAS ANALYSIS 1

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	ARGON molf !RED1 10	NITROGEN molf !RED1 11	OXYGEN molf !RED1 12	HYDROGEN molf !RED1 13	METHANE molf !RED1 14	CO molf !RED1 15	CO2 molf !RED1 16	ETHANE molf !RED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
287.000	9.0939E-03	.7093	2.7082E-02	6.3718E-02	8.7462E-03	3.7280E-02	.1428	2.5517E-04
288.000	8.4323E-03	.6577	4.8915E-03	.1016	1.7057E-02	4.1469E-02	.1651	1.3361E-03
289.000	7.6942E-03	.6001	5.0209E-03	.1385	2.2009E-02	5.3801E-02	.1644	1.6840E-03
290.000	8.3799E-03	.6536	9.2252E-03	9.2519E-02	3.0029E-02	2.8406E-02	.1668	1.7614E-03
291.000	8.1477E-03	.6355	5.4293E-04	9.8795E-02	3.7752E-02	3.2638E-02	.1760	1.7094E-03
292.000	8.1964E-03	.6393	7.7148E-04	.1056	1.8028E-02	3.3384E-02	.1820	3.5805E-03
293.000	7.9249E-03	.6181	0.000	.1166	2.1504E-02	4.0401E-02	.1831	2.0147E-03
294.000	7.7958E-03	.6081	3.6627E-04	.1261	2.4038E-02	4.4510E-02	.1783	1.7378E-03
295.000	8.0877E-03	.6308	5.7193E-05	.1136	1.8880E-02	3.6715E-02	.1816	1.3378E-03
296.000	8.0419E-03	.6273	7.1682E-03	.1151	1.8037E-02	3.5101E-02	.1770	1.8196E-03
297.000	8.0048E-03	.6244	0.000	.1186	1.9173E-02	3.6831E-02	.1836	1.5933E-03
298.000	7.4815E-03	.5836	7.3142E-03	.1390	2.3745E-02	4.4526E-02	.1796	2.3380E-03
299.000	7.5979E-03	.5926	2.0150E-04	.1413	2.1515E-02	4.3389E-02	.1795	2.1008E-03
300.000	6.6255E-03	.5168	0.000	.1799	2.9770E-02	7.1968E-02	.1790	2.6222E-03
301.000	5.9474E-03	.4639	0.000	.2050	3.6893E-02	.1179	.1531	2.6838E-03
302.000	6.4735E-03	.5049	0.000	.1859	2.0304E-02	.1340	.1412	6.8016E-04
303,000	6.6991E-03	.5225	0.000	.1720	1.8621E-02	.1287	.1413	1.2181E-03
304.000	6.6497E-03	.5187	0.000	.1716	2.3598E-02	.1162	.1500	1.3831E-03
305.000	6.6430E-03	.5182	0.000	.1679	2.7425E-02	.1146	.1511	1.6266E-03
306.000	7.5261E-03	.5870	0.000	.1253	2.4019E-02	8.4614E-02	.1613	1.1842E-03
307.000	8.1722E-03	.6374	0.000	9.1258E-02	1.2009E-02	7.9132E-02	.1624	1.1894E-03
308.000	8.9705E-03	.6997	0.000	6.6895E-02	1.2618E-02	3.6022E-02	.1718	6.1638E-04
309.000	8.8245E-03	.6883	1.0174E-04	6.3720E-02	1.4629E-02	1.7701E-02	.2013	9.3211E-04
310.000	9.4024E-03	.7334	0.000	4.1279E-02	1.3209E-02	5.4927E-03	.1931	8.8083E-04
311.000	8.2601E-03	.6443	0.000	8.7290E-02	9.4014E-03	5.7898E-02	.1901	4.6971E-04
312.000	6.7544E-03	.5268	0.000	.1585	2.3265E-02	.1191	.1613	1.2394E-03
313.000	6.9690E-03	.5436	0.000	.1561	1.7648E-02	9.1811E-02	.1779	1.2242E-03
314.000	5.1954E-03	.4052	0.000	.1648	3.2428E-02	6.8810E-02	.3173	1.4573E-03
315.000	9.4197E-06	7.3474E-04	0.000	.3709	6.1599E-02	.2255	.3309	2.6945E-03
316.000	3.5545E-03	.2773	2.0932E-04	.2385	3.8634E-02	.1346	.3024	9.1829E-04
317.000	6.4339E-03	.5018	0.000	.1728	3.6833E-02	9.6551E-02	.1780	1.2440E-03
318.000	6.3130E-03	.4924	0.000	.1798	3.7967E-02	9.5190E-02	.1788	2.0940E-03
319.000	6.3274E-03	.4935	0.000	.1807	3.6806E-02	8.7714E-02	.1840	2.5189E-03
320.000	6.5537E-03	.5112	0.000	.1660	3.7259E-02	9.0637E-02	.1770	2.3060E-03
321.000	6.6199E-03	.5163	0.000	.1664	3.3770E-02	8.6941E-02	.1802	1.9859E-03
322.000	6.6612E-03	.5196	0.000	.1623	3.4539E-02	8.1472E-02	.1849	2.1021E-03
323.000	6.4573E-03	.5037	0.000	.1690	3.8710E-02	8.7261E-02	.1821	2.8488E-03
324.000	6.4972E-03	.5068	0.000	.1677	3.6278E-02	8.2296E-02	.1895	2.7514E-03

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TIME (D)	ARGON mol/ IRED1 10	NITROGEN mol/ IRED1 11	OXYGEN mol/ IRED1 12	HYDROGEN mol/ IRED1 13	METHANE mol/ IRED1 14	CO mol/ IRED1 15	CO2 mol/ IRED1 16	ETHANE mol/ IRED1 18
# FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
325.000	6.9056E-03	.5386	0.000	.1479	3.0721E-02	8.1006E-02	.1838	2.6505E-03
326.000	6.8734E-03	.5361	0.000	.1461	3.4282E-02	7.4548E-02	.1877	2.7279E-03
327.000	6.8637E-03	.5354	0.000	.1465	3.5083E-02	6.7497E-02	.1938	2.8608E-03
328.000	6.9951E-03	.5456	0.000	.1410	3.4883E-02	6.1028E-02	.1958	2.8043E-03
329.000	7.0402E-03	.5491	0.000	.1404	3.2873E-02	5.9491E-02	.1974	2.6044E-03
330.000	7.0835E-03	.5525	0.000	.1402	3.3442E-02	5.4295E-02	.2006	2.3469E-03
331.000	7.2949E-03	.5690	0.000	.1313	3.0161E-02	4.2021E-02	.2097	1.9117E-03
332.000	7.3159E-03	.5706	0.000	.1298	2.9193E-02	4.4267E-02	.2070	2.1936E-03
333.000	7.3593E-03	.5740	0.000	.1267	2.8874E-02	4.7424E-02	.2043	2.1206E-03
334.000	7.1006E-03	.5538	0.000	.1406	2.8245E-02	6.2967E-02	.1966	2.0102E-03
335.000	7.3338E-03	.5720	0.000	.1333	2.2493E-02	5.7982E-02	.1982	1.5619E-03
336.000	7.1479E-03	.5575	0.000	.1439	2.1561E-02	6.3947E-02	.1979	1.4151E-03
337.000	7.0543E-03	.5502	0.000	.1498	2.4505E-02	5.5530E-02	.2042	1.9246E-03
338.000	7.0868E-03	.5528	0.000	.1454	2.5457E-02	5.7289E-02	.2041	1.7891E-03
339.000	7.0063E-03	.5465	0.000	.1491	2.4611E-02	6.0895E-02	.2054	1.5889E-03
340.000	6.9355E-03	.5410	0.000	.1522	2.2915E-02	7.0313E-02	.2001	1.3536E-03
341.000	7.0860E-03	.5527	0.000	.1472	1.7852E-02	7.8360E-02	.1924	7.5249E-04
342.000	7.0234E-03	.5478	0.000	.1484	1.6654E-02	8.2626E-02	.1936	7.4498E-04
343.000	7.2898E-03	.5686	0.000	.1368	1.4513E-02	8.7643E-02	.1809	7.0383E-04
344.000	7.2307E-03	.5640	0.000	.1418	1.5272E-02	8.2993E-02	.1836	7.1751E-04
345.000	7.4374E-03	.5801	0.000	.1352	1.0558E-02	8.2835E-02	.1797	7.0094E-04
346.000	7.3253E-03	.5714	0.000	.1383	1.1104E-02	8.9760E-02	.1783	7.0296E-04
347.000	7.4064E-03	.5777	0.000	.1406	1.2866E-02	8.3491E-02	.1740	6.9485E-04
348.000	7.4993E-03	.5849	0.000	.1357	1.6040E-02	8.1982E-02	.1700	7.0548E-04
349.000	7.5422E-03	.5883	0.000	.1332	1.5911E-02	9.1557E-02	.1599	7.1714E-04
350.000	7.8169E-03	.6097	0.000	.1203	1.4363E-02	8.6635E-02	.1583	6.6315E-04
351.000	8.1552E-03	.6361	0.000	.1009	1.5058E-02	6.5709E-02	.1711	7.2688E-04
352.000	8.3680E-03	.6527	0.000	9.3472E-02	1.3474E-02	4.9542E-02	.1798	6.5396E-04
353.000	8.0915E-03	.6311	0.000	.1063	1.4798E-02	5.9995E-02	.1768	6.9103E-04
354.000	8.0618E-03	.6288	0.000	.1090	1.4713E-02	6.1245E-02	.1751	6.8470E-04
355.000	7.9540E-03	.6204	0.000	.1155	1.5488E-02	6.5030E-02	.1719	7.3736E-04
356.000	8.0904E-03	.6311	0.000	.1105	1.4576E-02	5.7743E-02	.1746	6.5100E-04
357.000	8.2403E-03	.6427	0.000	.1031	1.3474E-02	5.2388E-02	.1768	6.5215E-04
358.000	8.2422E-03	.6429	0.000	.1021	1.2923E-02	5.0426E-02	.1807	5.7135E-04
359.000	8.2422E-03	.6429	0.000	.1021	1.2923E-02	5.0426E-02	.1807	5.7135E-04

UCG DB - HCII - PRODUCT GAS ANALYSIS 2

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	C2H4 molf !RED1 17	C6 molf !RED1 19	H10 molf !RED1 20	H2S molf !RED1 21	TAR/DRY !RED1 24	H2O/DRY !RED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
287.000	1.6732E-03	2.2822E-05	2.7387E-05	0.000	0.000	.2744
288.000	1.8811E-03	2.4020E-04	3.0928E-04	0.000	0.000	.4358
289.000	1.0235E-03	2.3320E-03	3.3399E-03	0.000	0.000	.3581
290.000	1.0770E-03	3.3498E-03	4.8052E-03	0.000	0.000	.4041
291.000	1.1105E-03	3.2018E-03	4.5938E-03	0.000	0.000	.4877
292.000	1.0315E-03	3.3064E-03	4.7454E-03	0.000	0.000	.3989
293.000	1.5149E-03	3.5993E-03	5.1629E-03	0.000	0.000	.3705
294.000	1.0482E-03	3.3306E-03	4.7628E-03	0.000	0.000	.2207
295.000	8.7538E-04	3.2642E-03	4.6671E-03	0.000	0.000	.1992
296.000	1.2258E-03	3.7818E-03	5.4175E-03	0.000	0.000	.2751
297.000	1.0246E-03	2.7654E-03	3.9654E-03	0.000	0.000	.1312
298.000	1.1949E-03	4.6492E-03	6.6768E-03	0.000	0.000	2.2277E-02
299.000	1.1715E-03	4.3469E-03	6.2338E-03	0.000	0.000	2.4416E-02
300.000	1.3484E-03	4.9266E-03	7.0634E-03	0.000	0.000	1.6049E-02
301.000	1.5701E-03	5.3244E-03	7.6222E-03	0.000	3.2201E-04	.2479
302.000	1.6800E-03	1.9753E-03	2.8357E-03	0.000	1.5703E-03	.5701
303.000	2.2617E-03	2.7305E-03	3.9566E-03	0.000	1.3487E-03	.4808
304.000	2.6070E-03	3.7978E-03	5.4310E-03	0.000	2.0889E-03	.3618
305.000	2.9933E-03	3.9150E-03	5.5969E-03	0.000	2.7282E-03	.4409
306.000	2.1567E-03	2.7689E-03	4.0783E-03	0.000	5.8222E-03	.5264
307.000	1.8729E-03	2.6738E-03	3.8456E-03	0.000	6.3773E-03	.5364
308.000	1.4554E-03	7.7953E-04	1.1131E-03	0.000	3.3761E-03	.3711
309.000	4.0590E-04	1.6745E-03	2.4021E-03	0.000	3.1861E-03	.4823
310.000	3.1853E-04	1.2049E-03	1.7282E-03	0.000	3.1638E-03	.5414
311.000	1.7272E-04	8.5426E-04	1.2301E-03	0.000	3.5369E-03	.5861
312.000	2.4905E-04	1.1576E-03	1.6656E-03	0.000	1.5935E-03	.2385
313.000	3.2062E-04	1.8147E-03	2.6138E-03	0.000	1.5168E-03	.2519
314.000	3.3239E-04	1.8101E-03	2.6089E-03	0.000	8.8351E-03	.4160
315.000	3.9051E-04	2.9899E-03	4.3046E-03	0.000	7.0446E-03	.6184
316.000	2.0897E-04	1.5379E-03	2.2160E-03	0.000	1.7555E-03	1.125
317.000	4.7168E-04	2.3969E-03	3.4466E-03	0.000	7.4038E-04	.4434
318.000	5.8091E-04	2.8202E-03	4.0623E-03	0.000	9.7304E-04	.3244
319.000	5.1657E-04	3.2194E-03	4.6500E-03	0.000	1.6924E-03	.5047
320.000	7.0537E-04	3.3927E-03	4.8971E-03	0.000	1.0326E-03	.3373
321.000	3.2547E-04	3.0255E-03	4.3670E-03	0.000	9.5992E-04	.3279
322.000	4.1315E-04	3.2738E-03	4.7231E-03	0.000	1.1616E-03	.4320
323.000	1.0112E-03	3.6397E-03	5.2406E-03	0.000	8.2836E-04	.3136
324.000	8.6495E-04	2.9744E-03	4.2872E-03	0.000	6.4468E-04	.2278

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TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2S molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
325.000	8.5653E-04	3.0990E-03	4.4541E-03	0.000	9.4152E-04	.2990
326.000	1.2055E-03	4.2979E-03	6.1767E-03	0.000	1.5495E-03	.4212
327.000	1.0702E-03	4.4841E-03	6.4503E-03	0.000	1.6163E-03	.3901
328.000	9.0105E-04	4.5275E-03	6.5185E-03	0.000	1.4240E-03	.3436
329.000	6.7947E-04	4.2333E-03	6.0997E-03	0.000	1.6589E-03	.4003
330.000	6.9138E-04	3.6142E-03	5.2054E-03	0.000	1.8657E-03	.4502
331.000	5.2680E-04	3.3335E-03	4.8080E-03	0.000	1.8293E-03	.4415
332.000	6.1855E-04	3.6730E-03	5.2962E-03	0.000	1.8589E-03	.4442
333.000	5.8553E-04	3.5162E-03	5.0721E-03	0.000	1.7773E-03	.4194
334.000	5.4587E-04	3.3010E-03	4.7606E-03	0.000	1.4119E-03	.3332
335.000	6.2427E-04	2.6484E-03	3.8154E-03	0.000	1.3121E-03	.3096
336.000	4.9349E-04	2.4953E-03	3.5963E-03	0.000	1.1670E-03	.2754
337.000	4.3050E-04	2.6038E-03	3.7571E-03	0.000	8.0413E-04	.2652
338.000	3.1802E-04	2.3572E-03	3.4058E-03	0.000	7.6387E-04	.2579
339.000	2.7102E-04	1.8659E-03	2.6958E-03	0.000	4.4886E-04	.2722
340.000	2.7967E-04	2.0304E-03	2.9297E-03	0.000	1.4478E-03	.3077
341.000	2.3175E-04	1.4168E-03	2.0441E-03	0.000	1.7613E-03	.4024
342.000	2.0405E-04	1.1975E-03	1.7250E-03	0.000	4.8727E-04	.3960
343.000	2.1303E-04	1.3639E-03	1.9629E-03	0.000	3.6361E-04	.3541
344.000	2.0552E-04	1.7089E-03	2.4593E-03	0.000	4.4088E-04	.3251
345.000	2.0276E-04	1.3218E-03	1.9016E-03	0.000	4.2259E-04	.2392
346.000	2.3354E-04	1.2140E-03	1.7451E-03	0.000	3.8831E-04	.2186
347.000	2.2399E-04	1.2083E-03	1.7393E-03	0.000	6.4831E-04	.2648
348.000	3.1107E-04	1.1544E-03	1.6604E-03	0.000	4.3969E-04	.2452
349.000	3.7534E-04	1.0365E-03	1.4880E-03	0.000	3.1970E-04	.1880
350.000	3.0152E-04	7.8220E-04	1.1217E-03	0.000	5.1794E-04	.2515
351.000	3.0856E-04	7.9624E-04	1.1420E-03	0.000	9.5411E-04	.2729
352.000	4.0051E-04	6.4241E-04	9.1707E-04	0.000	2.1815E-03	.4599
353.000	3.3460E-04	7.5386E-04	1.0807E-03	0.000	2.9311E-03	.2540
354.000	3.4396E-04	8.3537E-04	1.1974E-03	0.000	8.5601E-04	.2765
355.000	3.9208E-04	1.0706E-03	1.5351E-03	0.000	5.7638E-04	.3012
356.000	3.8588E-04	9.7809E-04	1.4043E-03	0.000	5.2270E-04	.2852
357.000	4.1431E-04	8.9099E-04	1.2791E-03	0.000	3.6185E-04	.2892
358.000	3.8491E-04	7.2343E-04	1.0374E-03	0.000	3.5288E-04	.3334
359.000	3.8491E-04	7.2343E-04	1.0374E-03	0.000	3.5288E-04	.3334

UCG DB - HCII - MATERIAL BALANCES

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL RT lb/s !RED1 44	ASH RATE lb/s !RED1 46	H2O INFX lb/s !RED1 47	H2O COAL lb/s !RED1 48	-H2O RXN lb/s !RED1 49	O2 per COAL !RED1 60	H2O per COAL !RED1 61	CHAR RT lb/s !RED1 64	CHAR per COAL !RED1 63	RECOVORY % !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
287.000	.3037	4.0133E-03	.3100	.1260	-3.096E-03	.9917	-6.018E-02	.3278	.5240	25.30
288.000	.3978	5.2560E-03	.6532	.1650	7.1706E-02	.6424	.1738	.4971	.5501	39.34
289.000	.4859	6.4206E-03	.6452	.2015	.1644	.4936	.3391	.6330	.5593	34.89
290.000	.4961	6.5554E-03	.7613	.2058	.1402	.5241	.2791	.9089	.6433	18.68
291.000	.4962	6.5564E-03	.8581	.2058	.1584	.4663	.2996	.9007	.6100	15.81
292.000	.4502	5.9489E-03	.6108	.1867	.1053	.5507	.2264	.4826	.5185	15.84
293.000	.4264	5.6338E-03	.5087	.1768	.1121	.5178	.2586	.3941	.4827	13.59
294.000	.3900	5.1533E-03	.2883	.1618	.1270	.4950	.2982	.4210	.5253	10.91
295.000	.3115	4.1157E-03	.2229	.1292	7.6858E-02	.5518	.2384	.3451	.5027	9.042
296.000	.3443	4.5496E-03	.3101	.1428	9.2257E-02	.5610	.2671	.3561	.5115	10.87
297.000	.4022	5.3139E-03	.1244	.1668	.1013	.5519	.2504	.3929	.4869	13.26
298.000	.4789	6.3275E-03	-1.141E-03	.1986	.1620	.4756	.3538	.4744	.4721	19.31
299.000	.2946	3.8926E-03	1.0368E-02	.1222	.1066	.4534	.3560	.3850	.5527	43.89
300.000	.3047	4.0260E-03	2.4579E-02	.1264	.1356	.3588	.4432	.2569	.4530	39.73
301.000	6.296	8.3192E-02	6.992	2.611	2.817	.2669	.4862	5.102	.4767	79.61
302.000	12.84	.1696	21.22	5.325	4.080	.3803	.3252	5.113	.2805	101.6
303.000	15.83	.2091	21.66	6.564	4.781	.3876	.3016	7.794	.3173	108.6
304.000	16.48	.2178	16.05	6.836	5.491	.3524	.3319	10.53	.3820	108.8
305.000	19.21	.2538	22.46	7.966	6.347	.3316	.3347	12.99	.4093	109.0
306.000	12.40	.1638	15.95	5.141	3.190	.3885	.2129	10.43	.4171	100.4
307.000	22.22	.2936	23.52	9.217	2.057	.4752	7.3887E-02	8.883	.2922	99.85
308.000	19.46	.2571	15.64	8.071	.3698	.6346	6.0998E-03	18.41	.4914	110.2
309.000	4.083	5.3950E-02	5.196	1.694	-.1619	.6751	-1.338E-02	4.180	.5031	57.91
310.000	3.824	5.0530E-02	6.393	1.586	-.1893	.7243	-7.165E-02	2.949	.3950	58.85
311.000	4.349	5.7459E-02	6.118	1.804	.3912	.6793	-4.495E-02	-1.030	-.1840	37.89
312.000	7.644	.1010	4.161	3.170	1.695	.4640	.2318	-1.509	-.4352	52.28
313.000	9.583	.1266	5.918	3.975	2.264	.4960	.2362	-3.132	-.5273	68.59
314.000	9.921	.1311	.9507	4.115	2.170	.4775	.1791	5.0907E-02	-3.926E-02	105.4
315.000	19.45	.2570	12.02	8.069	6.683	.3645	.3469	0.000	0.000	142.6
316.000	11.92	.1575	10.65	4.943	2.582	.5445	.1995	-.2919	.1149	84.43
317.000	14.15	.1870	9.179	5.870	5.076	.3977	.3591	.6271	4.1914E-02	78.91
318.000	16.82	.2223	10.66	6.977	6.545	.3687	.3898	3.175	.1536	86.40
319.000	16.28	.2151	12.59	6.753	6.388	.3597	.3932	3.496	.1760	79.15
320.000	17.99	.2377	13.02	7.462	6.603	.3730	.3668	5.834	.2432	79.24
321.000	16.77	.2216	15.52	6.956	5.924	.3996	.3536	3.247	.1228	76.91
322.000	16.76	.2214	20.44	6.950	5.810	.4017	.3465	2.587	.1265	74.89
323.000	17.43	.2303	14.40	7.228	6.696	.3670	.3814	4.579	.2097	70.88
324.000	20.44	.2700	12.59	8.477	7.343	.4043	.3597	-.2655	-3.846E-02	83.26

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TIME (D)	COAL RT mo/s IRED1 44	ASH RATE mo/s IRED1 46	H2O INFX mo/s IRED1 47	H2O mo/s IRED1 48	-H2O RXN mo/s IRED1 49	O2 per COAL IRED1 60	H2O per COAL IRED1 61	CHAR RT mo/s IRED1 64	CHAR per COAL IRED1 63	RECOVERY % IRED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
325.000	18.91	.2499	14.67	7.843	5.622	.4377	.2939	.7613	4.1430E-03	85.00
326.000	17.74	.2344	19.95	7.359	5.609	.3994	.3159	3.735	.1682	76.16
327.000	17.45	.2306	18.13	7.239	5.652	.4002	.3235	3.099	.1487	76.89
328.000	16.42	.2170	15.06	6.812	5.225	.4120	.3179	3.643	.1737	75.74
329.000	15.57	.2057	16.80	6.456	4.736	.4261	.3042	2.121	.1175	70.40
330.000	15.41	.2036	18.47	6.392	4.672	.4364	.3030	1.729	9.2187E-02	70.75
331.000	14.45	.1909	16.09	5.994	3.844	.4844	.2659	-1.553	-.1332	71.28
332.000	14.78	.1952	14.51	6.129	3.885	.4778	.2625	-.7064	-5.608E-02	72.81
333.000	14.24	.1882	12.68	5.907	3.565	.4850	.2491	-.8795	-8.012E-02	70.39
334.000	14.11	.1864	10.44	5.852	3.811	.4699	.2702	-1.603	-.1479	67.48
335.000	13.72	.1813	9.108	5.691	3.076	.5226	.2242	-3.818	-.4263	70.47
336.000	13.36	.1765	8.734	5.541	3.213	.5188	.2399	-5.354	-.6818	66.79
337.000	12.72	.1681	8.733	5.276	3.574	.5070	.2810	-4.208	-.5010	63.75
338.000	11.30	.1493	7.194	4.687	2.987	.5174	.2639	-4.716	-.7697	57.25
339.000	12.19	.1610	8.202	5.054	3.142	.5364	.2566	-4.780	-.9413	60.63
340.000	12.99	.1717	8.810	5.388	3.210	.5111	.2470	-5.475	-.9342	64.82
341.000	14.54	.1921	12.49	6.029	2.928	.5395	.1995	-2.131	-.3139	71.45
342.000	15.93	.2105	13.70	6.607	2.969	.5772	.1863	0.000	0.000	77.26
343.000	15.68	.2071	11.55	6.502	2.446	.5841	.1556	-2.017	-.3065	79.64
344.000	11.84	.1564	6.915	4.910	2.037	.5698	.1816	-4.460	-.7379	73.69
345.000	13.78	.1820	4.646	5.714	1.975	.6035	.1431	-5.439	-.9173	77.00
346.000	14.75	.1949	3.926	6.119	2.112	.5965	.1437	-3.667	-.5688	77.90
347.000	13.69	.1809	6.399	5.678	2.501	.5684	.1827	.1003	-2.289E-02	80.18
348,000	13.38	.1768	5.662	5.549	2.625	.5581	.1929	.2616	1.8621E-02	81.27
349.000	11.41	.1507	1.949	4.730	2.095	.5500	.1835	2.204	.1548	70.00
350.000	16.37	.2164	8.582	6.791	2.052	.5800	.1378	5.425	.2127	77.45
351.000	18.03	.2382	8.793	7.478	1.350	.6246	8.5993E-02	4.996	.1638	78.38
352.000	19.93	.2633	21.65	8.265	1.419	.6335	6.4598E-02	3.806	.1044	94.70
353.000	13.66	.1805	1.984	5.666	1.505	.5768	.1077	2.982	.1665	83.32
354.000	13.76	.1818	9.991	5.707	1.681	.6179	.1193	2.958	.1552	88.37
355.000	14.96	.1976	11.21	6.204	2.242	.5962	.1499	4.833	.2414	94.96
356.000	14.81	.1957	7.497	6.144	1.990	.6205	.1342	5.293	.2579	97.21
357.000	13.99	.1848	8.725	5.802	1.472	.6520	.1053	4.503	.2414	94.63
358.000	13.97	.1846	7.552	5.795	1.256	.6706	9.0521E-02	1.781	.1001	98.36
359.000	13.97	.1846	7.552	5.795	1.256	.6706	9.0521E-02	1.781	.1001	98.36

UCG DB - HCII - ENERGY PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/O2 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
287.000	131.5	.4236	0.000	8.0667E-03	.1436	2.2190E-12	1.5827E-03	.4210	39.40	216.4
288.000	172.2	.6134	0.000	2.1975E-02	.1918	1.6215E-12	1.5827E-03	.1692	61.67	350.3
289.000	210.4	.7805	0.000	1.2773E-02	.1401	1.3743E-12	1.5827E-03	6.3038E-02	88.37	557.9
290.000	214.8	.7304	0.000	1.2187E-02	.1629	1.3583E-12	1.5827E-03	9.1018E-02	79.70	454.4
291.000	214.9	.7538	0.000	9.7377E-03	.1821	1.4410E-12	1.5827E-03	5.0763E-02	88.91	521.3
292.000	194.9	.6746	0.000	1.9171E-03	.1543	1.7182E-12	1.5827E-03	.1657	76.76	446.7
293.000	184.6	.7117	0.000	3.3861E-03	.1374	1.5508E-12	1.5827E-03	.1440	84.47	508.6
294.000	168.9	.7435	0.000	1.1717E-03	8.2308E-02	2.0747E-12	1.5827E-03	.1695	88.34	547.5
295.000	134.9	.6772	0.000	4.2244E-04	7.6158E-02	2.5318E-12	1.5827E-03	.2427	76.83	452.9
296.000	149.1	.7091	0.000	1.3257E-03	.1089	2.1864E-12	1.5827E-03	.1771	79.50	473.5
297.000	174.1	.6798	0.000	1.0447E-03	5.1922E-02	1.9397E-12	1.5827E-03	.2637	77.07	458.6
298.000	207.4	.7989	0.000	2.4044E-03	8.0159E-03	1.5742E-12	1.5827E-03	.1871	98.54	643.9
299.000	127.6	.7919	0.000	4.5674E-03	9.0091E-03	2.0949E-12	1.5827E-03	.1909	95.19	600.7
300.000	131.9	.9059	0.000	2.7746E-03	5.1404E-03	1.9832E-12	1.5827E-03	8.2640E-02	125.2	905.9
301.000	2726.	1.007	1.0819E-02	1.6836E-02	7.1329E-02	7.0410E-13	1.5827E-03	-.1098	153.8	1245.
302.000	5559.	.8533	5.6015E-02	5.1277E-02	.1774	4.8059E-14	1.5827E-03	-.1416	121.0	897.6
303,000	6852.	.8470	4.7947E-02	6.4652E-02	.1504	3.8017E-14	1.5827E-03	-.1136	118.9	845.5
304.000	7137.	.8490	7.0067E-02	8.8007E-02	.1094	3.6774E-14	1.5827E-03	-.1201	124.9	896.3
305.000	8316.	.8440	8.9799E-02	6.6334E-02	.1274	3.3024E-14	1.5827E-03	-.1311	128.2	921.4
306.000	5367.	.6462	.1970	4.1021E-02	.1557	7.0147E-14	1.5827E-03	-4.346E-02	97.95	638.4
307.000	9622.	.5209	.2189	6.3564E-02	.1597	1.9012E-03	1.5827E-03	3.1404E-02	75.03	439.9
308.000	8426.	.4110	.1501	.1052	.1217	2.4077E-02	1.5827E-03	.1844	46.87	251.5
309.000	1768.	.3648	.1385	8.2522E-02	.1812	3.0438E-04	1.5827E-03	.2290	45.38	264.8
310.000	1656.	.2919	.1468	2.8667E-02	.2204	1.7459E-04	1.5827E-03	.3084	32.05	164.7
311.000	1883.	.3756	.1446	-1.747E-02	.2113	2.0346E-04	1.5827E-03	.2822	54.31	373.8
312.000	3310.	.7479	5.6102E-02	2.9618E-03	7.3808E-02	9.0287E-05	1.5827E-03	.1156	106.9	759.2
313.000	4150.	.7066	5.5654E-02	4.1781E-02	8.1076E-02	6.4314E-05	1.5827E-03	.1112	96.39	658.9
314.000	4296.	.5437	.1968	2.8327E-02	-3.406E-02	7.0431E-05	1.5827E-03	.2615	105.9	563.5
315.000	8423.	.7968	.1092	2.0200E-02	6.9142E-02	1.2767E-03	1.5827E-03	-2.086E-05	242.1	970.1
316.000	5160.	.6549	4.4875E-02	3.0599E-02	.1097	.1373	1.5827E-03	1.8952E-02	148.9	775.2
317.000	6129.	.8411	2.5436E-02	3.6196E-02	7.1889E-02	6.1808E-02	1.5827E-03	-3.996E-02	122.3	905.5
318.000	7283.	.8634	3.2760E-02	3.7692E-02	6.8567E-02	2.7308E-02	1.5827E-03	-3.329E-02	128.2	967.5
319.000	7050.	.8440	5.6049E-02	1.4397E-02	8.1195E-02	6.5529E-02	1.5827E-03	-6.471E-02	127.6	961.7
320.000	7790.	.8497	3.4996E-02	3.3762E-02	7.8970E-02	2.1415E-02	1.5827E-03	-2.244E-02	125.3	910.9
321.000	7262.	.8253	3.3414E-02	4.8483E-02	.1002	3.1190E-05	1.5827E-03	-1.094E-02	118.7	853.8
322.000	7255.	.8110	3.9956E-02	2.9946E-02	.1304	3.1292E-05	1.5827E-03	-1.489E-02	118.0	843.7
323.000	7546.	.8619	2.7754E-02	-7.564E-03	9.2210E-02	3.2952E-05	1.5827E-03	2.2114E-02	128.8	950.5
324.000	8850.	.8289	2.1985E-02	-6.002E-03	6.8176E-02	2.5681E-05	1.5827E-03	8.3365E-02	121.7	892.2

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TIME (D)	COAL kJ /mol IRED1 72	PRODUCT frac IRED1 74	TAR frac IRED1 73	SENS HT frac IRED1 76	STEAM frac IRED1 77	COOLING frac IRED1 80	SEN HT INSU IRED1 78	LOSS frac IRED1 75	HC kJ /mol IRED1 81	HC/O2 kJ /mol IRED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
325.000	8188.	.7766	3.3253E-02	6.1489E-02	9.2509E-02	2.7853E-05	1.5827E-03	3.2537E-02	111.1	769.0
326.000	7683.	.7890	5.2036E-02	8.1686E-02	.1243	2.9486E-05	1.5827E-03	-5.061E-02	117.6	814.9
327.000	7558.	.7829	5.3982E-02	8.3628E-02	.1143	3.0032E-05	1.5827E-03	-3.849E-02	117.2	813.8
328.000	7111.	.7730	4.8554E-02	7.7856E-02	.1028	3.1931E-05	1.5827E-03	-5.886E-03	113.5	773.1
329.000	6740.	.7496	5.6932E-02	8.5533E-02	.1206	3.3585E-05	1.5827E-03	-1.623E-02	109.3	739.1
330.000	6673.	.7296	6.4812E-02	9.2738E-02	.1329	4.3584E-03	1.5827E-03	-2.809E-02	105.2	707.7
331.000	6257.	.6728	6.5420E-02	9.9233E-02	.1280	1.0591E-02	1.5827E-03	2.0343E-02	94.18	614.9
332.000	6398.	.6787	6.6134E-02	9.6048E-02	.1151	2.3636E-02	1.5827E-03	1.6801E-02	95.53	622.3
333.000	6167.	.6744	6.3647E-02	7.4832E-02	.1070	2.4829E-02	1.5827E-03	5.1724E-02	94.45	612.7
334.000	6110.	.7161	5.0167E-02	8.7411E-02	8.9731E-02	1.4179E-02	1.5827E-03	3.8832E-02	101.1	680.1
335.000	5942.	.6620	4.8814E-02	7.6761E-02	8.6709E-02	1.4400E-02	1.5827E-03	.1077	89.11	579.0
336.000	5785.	.6787	4.3170E-02	7.6979E-02	8.4137E-02	5.2805E-03	1.5827E-03	.1081	91.95	613.6
337.000	5508.	.7039	2.9805E-02	6.9057E-02	8.3416E-02	2.9042E-03	1.5827E-03	.1073	95.04	641.6
338.000	4893.	.6934	2.8263E-02	5.9613E-02	7.9458E-02	4.3704E-03	1.5827E-03	.1313	93.72	629.8
339.000	5277.	.6899	1.6742E-02	6.6417E-02	8.3790E-02	5.3363E-03	1.5827E-03	.1342	92.58	629.4
340.000	5625.	.6815	5.1822E-02	6.7108E-02	8.5617E-02	1.1465E-02	1.5827E-03	9.8839E-02	94.95	652.8
341.000	6294.	.6436	6.3727E-02	7.2955E-02	.1075	2.2374E-02	1.5827E-03	8.6197E-02	87.66	589.6
342.000	6898.	.6569	1.8365E-02	6.2361E-02	.1103	2.0794E-02	1.5827E-03	.1276	87.16	591.3
343.000	6788.	.6544	1.4158E-02	6.5091E-02	.1011	2.0169E-02	1.5827E-03	.1415	84.01	549.6
344.000	5126.	.6655	1.7104E-02	6.4353E-02	8.1899E-02	2.8847E-02	1.5827E-03	.1387	86.29	574.5
345.000	5966.	.6321	1.7040E-02	6.8329E-02	6.1743E-02	2.2946E-02	1.5827E-03	.1942	78.48	502.8
346.000	6389.	.6440	1.5380E-02	7.7388E-02	5.4496E-02	2.1507E-02	1.5827E-03	.1836	81.40	530.2
347.000	5927.	.6621	2.6405E-02	8.7117E-02	7.1312E-02	2.3125E-02	1.5827E-03	.1264	81.82	527.3
348.000	5793.	.6798	1.8098E-02	8.4215E-02	6.4410E-02	2.4172E-02	1.5827E-03	.1257	82.71	525.5
349.000	4938.	.6975	1.3263E-02	8.0572E-02	4.0752E-02	2.7724E-02	1.5827E-03	.1365	84.19	531.8
350.000	7090.	.6512	2.2286E-02	7.9030E-02	8.0295E-02	1.4283E-02	1.5827E-03	.1493	76.48	468.7
351.000	7807.	.5652	4.1413E-02	.1018	8.4186E-02	1.9825E-02	1.5827E-03	.1839	65.80	388.6
352.000	8628.	.4890	9.4184E-02	.1224	.1381	3.6096E-02	1.5827E-03	.1165	57.04	327.8
353.000	5916.	.5299	.1185	9.3491E-02	4.5042E-02	4.5364E-02	1.5827E-03	.1640	65.29	384.5
354.000	5958.	.5800	3.6736E-02	.1033	.1039	1.6731E-03	1.5827E-03	.1708	66.70	394.0
355.000	6477.	.6197	2.5036E-02	.1015	.1033	1.1504E-02	1.5827E-03	.1353	71.46	427.9
356.000	6414.	.5924	2.3210E-02	.1019	7.9836E-02	3.1433E-02	1.5827E-03	.1677	66.62	392.3
357.000	6057.	.5621	1.6504E-02	.1112	9.6367E-02	1.9417E-02	1.5827E-03	.1908	61.68	356.4
358.000	6050.	.5416	1.6101E-02	9.2917E-02	8.8367E-02	4.5208E-02	1.5827E-03	.2121	59.46	343.8
359.000	6050.	.5416	1.6101E-02	9.2917E-02	8.8367E-02	4.5208E-02	1.5827E-03	.2121	59.46	343.8

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UNDERGROUND COAL GASIFICATION

DATA BASE

LAWRENCE LIVERMORE NATIONAL LABORATORY

HOE CREEK III

DAILY AVERAGE RESULTS

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  HOE CREEK COAL ANALYSIS

                                                                    KG/M**3   KJ/MOLE
COAL H/C  COAL O/C  COAL S/C  COAL N/C  WT F H2O  WT F ASH  DENSITY   HT COMB
.903      0.193      .003     .017      .3011     .0405      1350.     433.

CHAR H/C  CHAR O/C  CHAR S/C  CHAR N/C
.1330     0.        0.        0.

 TAR H/C   TAR O/C   TAR S/C   TAR N/C      C/MOLECULE
 1.15      0.        0.        0.            9.

  COAL       ASH&CHAR  --  TEMPERATURES (K)
   300.       1000.

  3   NUMBER OF POINTS ON OXYGEN TRACER TYPE CURVE
236.401  2
236.402  0   NO TRACER DURING OXYGEN BURN
999.     0   TIME,TRACER FLAG (ZERO=NONE,ONE=ARGON,TWO=NITROGEN)

  3   NUMBER OF POINTS ON GAS LOSS TRACER TYPE CURVE
236.401  2
236.402  0   NO TRACER DURING OXYGEN BURN
999.     0   TIME,TRACER FLAG (SAME AS OXYGEN TRACER)

 1   NUMBER OF POINTS ON CHAR FLAG CURVE
999.      0   TIME,TRACER FLAG   (0=DO NOT USE CHAR, 1=USE CHAR)
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UCG DB - HCIII - OPERATING PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	INJ RATE kg/s !RED1 90	PRD RATE kg/s !RED1 91	INJ TEMP C !RED1 94	PRD TEMP C !RED1 95	INJ PRES kPa !RED1 96	PRD PRES kPa !RED1 97	STEAM kg/s !RED1 92	COOLING kg/s !RED1 93	INJ O2 frac !RED1 6	INJ H2O frac !RED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
226.000	4.052	2.798	3.330	48.28	0.000	0.000	0.000	1.652	.2100	0.000
227.000	4.039	3.393	15.88	74.25	285.7	202.7	0.000	.8423	.2100	0.000
228.000	4.251	6.595	27.03	109.3	382.7	287.8	0.000	2.728	.2471	0.000
229.000	8.240	16.74	17.86	173.2	312.3	283.9	0.000	2.020	.2366	0.000
230.000	28.30	61.59	40.99	307.5	258.5	250.5	0.000	7.877	.2100	0.000
231.000	39.64	93.36	46.53	215.5	237.0	221.8	0.000	13.51	.2100	0.000
232.000	52.82	128.7	50.72	267.8	256.8	241.2	0.000	16.22	.2100	0.000
233.000	44.54	105.5	46.80	319.2	315.0	308.9	0.000	8.130	.2100	0.000
234.000	32.90	69.12	45.50	325.4	346.9	348.0	0.000	.2407	.2100	0.000
235.000	28.61	64.06	46.66	314.9	338.3	341.9	0.000	.6280	.2100	0.000
236.000	30.82	67.99	103.1	274.4	320.2	317.9	0.000	1.145	.2012	.4592
237.000	40.76	95.69	138.8	291.6	284.9	278.3	0.000	.1522	.2684	.7311
238.000	41.59	120.5	119.8	330.8	283.7	278.8	0.000	1.861	.3848	.5567
239.000	37.88	157.7	110.9	323.6	305.2	298.8	0.000	2.832	.5351	.4634
240.000	34.34	119.1	102.1	284.3	350.7	346.1	0.000	.9076	.5954	.3848
241.000	42.30	138.2	114.3	235.9	353.3	343.1	0.000	.1510	.4820	.5092
242.000	36.96	151.7	103.1	123.7	358.9	342.1	0.000	.1568	.5515	.4484
243.000	46.08	145.7	114.5	179.2	368.7	342.9	0.000	.1540	.4868	.5087
244.000	40.59	112.2	111.4	317.8	366.5	341.4	0.000	1.540	.4903	.4969
245.000	40.91	101.8	112.2	310.1	362.0	343.3	0.000	1.471	.4940	.4980
246.000	42.41	88.82	100.6	338.3	354.8	341.7	0.000	.1566	.4631	.4498
247.000	37.02	80.33	92.68	346.8	362.7	341.8	0.000	2.405	.5620	.3905
248.000	37.79	82.40	105.5	329.5	378.3	344.9	0.000	6.880	.5287	.4443
249.000	43.33	96.28	113.4	256.5	365.9	346.3	0.000	7.615	.4629	.5303
250.000	37.10	83.55	110.6	280.5	351.1	335.9	0.000	4.905	.4856	.4789
251.000	30.52	66.63	112.7	316.6	342.7	49.70	0.000	.9584	.4984	.5009
252.000	32.43	55.57	110.8	366.7	350.6	50.85	0.000	9.9017E-02	.4941	.4944
253.000	38.08	72.31	90.16	366.8	311.1	45.12	0.000	1.2171E-02	.4345	.4055
254.000	40.29	75.49	113.4	378.1	320.4	46.47	0.000	8.0036E-02	.4946	.5047
255.000	38.77	78.56	107.8	376.5	314.5	45.61	0.000	0.000	.5330	.4663
256.000	40.31	92.16	110.3	390.4	304.1	44.11	0.000	1.212	.5014	.4912
257.000	39.96	98.13	110.7	379.1	286.2	41.50	0.000	2.510	.5020	.4973
258.000	41.17	97.32	110.0	369.4	281.9	40.88	0.000	2.658	.4959	.4888
259.000	40.25	103.2	110.2	372.2	275.6	39.97	0.000	2.742	.4742	.4912
260.000	41.45	91.23	110.5	375.7	282.6	40.99	0.000	1.902	.4474	.4861
261.000	44.63	109.3	107.6	378.2	289.9	42.04	0.000	3.723	.4643	.4501
262.000	52.12	112.9	119.7	367.4	289.3	41.96	0.000	3.306	.3978	.5458
263.000	49.12	116.6	118.6	365.4	293.6	42.59	0.000	1.292	.4188	.5809

TIME (D)	INJ RATE kg/s IRED1 90	PRD RATE kg/s IRED1 91	INJ TEMP C IRED1 94	PRD TEMP C IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM kg/s IRED1 92	COOLING kg/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
264.000	46.66	120.7	111.5	368.6	287.6	41.72	0.000	.7111	.4405	.5592
265.000	42.26	117.0	109.4	373.7	279.2	40.49	0.000	0.000	.4911	.4687
266.000	39.61	102.4	113.2	359.2	271.7	39.41	0.000	0.000	.5062	.4935
267.000	39.80	105.7	115.2	373.3	265.7	38.53	0.000	.1042	.4992	.5005
268.000	39.21	105.5	115.0	380.9	264.0	38.29	0.000	.1659	.5004	.4993
269.000	39.52	101.1	112.2	375.3	272.5	39.53	0.000	7.1295E-02	.5091	.4906
270.000	39.93	115.0	114.0	375.7	272.5	39.52	0.000	.3961	.5006	.4991
271.000	40.49	110.5	115.6	360.5	264.6	38.37	0.000	.9234	.4571	.5021
272.000	48.37	116.3	104.0	374.2	273.0	39.59	0.000	.7004	.4481	.4094
273.000	51.77	134.8	98.66	380.8	270.0	39.16	0.000	1.142	.4546	.3781
274.000	45.25	104.9	108.2	391.8	265.9	38.56	0.000	.2477	.4604	.4502
275.000	45.45	124.5	102.5	400.6	252.8	36.67	0.000	3.599	.4521	.4372
276.000	39.28	100.1	112.9	361.3	251.6	36.49	0.000	3.692	.5040	.4956
277.000	40.39	110.9	111.8	360.5	257.4	37.33	0.000	4.460	.5047	.4846
278.000	39.51	105.2	114.6	369.5	259.0	37.56	0.000	4.347	.4975	.5021
279.000	39.52	98.35	113.8	358.7	263.0	38.14	0.000	4.220	.5038	.4959
280.000	39.59	97.40	114.6	350.2	261.3	37.90	0.000	4.071	.4993	.5004
281.000	39.33	97.90	111.1	355.9	259.9	37.69	0.000	4.063	.5080	.4917
282.000	39.72	99.53	113.6	348.4	254.6	36.93	0.000	2.709	.5045	.4951
283.000	39.72	99.53	113.6	348.4	254.6	36.93	0.000	2.709	.5045	.4951

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UCG DB - HCIII - PRODUCT GAS ANALYSIS 1

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	ARGON molf !RED1 10	NITROGEN molf !RED1 11	OXYGEN molf !RED1 12	HYDROGEN molf !RED1 13	METHANE molf !RED1 14	CO molf !RED1 15	CO2 molf !RED1 16	ETHANE molf !RED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
226.000	9.7193E-03	.7581	.1627	0.000	1.2480E-02	1.0399E-02	4.6555E-02	6.9789E-06
227.000	9.7614E-03	.7614	.1409	1.6535E-02	3.8178E-04	1.6123E-02	5.3823E-02	7.3295E-05
228.000	7.3695E-03	.5748	2.4545E-02	.1253	9.5063E-03	.1129	.1440	2.4705E-04
229.000	6.3291E-03	.4937	3.6926E-03	.1783	2.2424E-02	.1274	.1642	1.7104E-03
230.000	6.7542E-03	.5268	4.6512E-05	.1676	2.1736E-02	.1420	.1301	1.5829E-03
231.000	6.6469E-03	.5185	8.8414E-05	.1793	2.2106E-02	.1404	.1285	1.3484E-03
232.000	6.7183E-03	.5240	0.000	.1723	2.4952E-02	.1371	.1305	1.3466E-03
233.000	7.5135E-03	.5861	0.000	.1232	2.6710E-02	9.2604E-02	.1584	1.9015E-03
234.000	8.3416E-03	.6506	1.7430E-03	6.9240E-02	2.2044E-02	7.0488E-02	.1732	1.9024E-03
235.000	8.2241E-03	.6415	1.7469E-04	8.3875E-02	2.7144E-02	6.5588E-02	.1689	1.9028E-03
236.000	3.7056E-03	.2890	5.8079E-06	.2757	3.6668E-02	.1237	.2648	2.0284E-03
237.000	8.1036E-05	6.3208E-03	4.9608E-06	.3892	3.1272E-02	.1821	.3851	1.8058E-03
238.000	9.1698E-04	7.1524E-02	4.3706E-06	.3595	3.1157E-02	.1640	.3661	1.6380E-03
239.000	9.7276E-05	7.5875E-03	0.000	.3730	4.3666E-02	.1775	.3883	1.9761E-03
240.000	1.7344E-04	1.3528E-02	0.000	.3218	6.4516E-02	.1778	.4101	2.4526E-03
241.000	1.9645E-04	1.5323E-02	0.000	.3368	6.1399E-02	.1691	.4058	3.5353E-03
242.000	1.2826E-04	1.0004E-02	8.2748E-05	.3318	7.3452E-02	.1504	.4198	3.7699E-03
243.000	2.1603E-04	1.6851E-02	1.8563E-03	.2882	6.6184E-02	.1443	.4701	3.6051E-03
244.000	2.0982E-04	1.6366E-02	0.000	.4081	5.5313E-02	.1838	.3256	3.3107E-03
245.000	1.2017E-04	9.3730E-03	0.000	.4272	3.4058E-02	.2185	.3039	1.7773E-03
246.000	1.2470E-03	9.7265E-02	0.000	.2880	3.3158E-02	7.5983E-02	.4926	1.8435E-03
247.000	8.9669E-04	6.9942E-02	0.000	.2906	4.2624E-02	5.1890E-02	.5319	2.6371E-03
248.000	3.6677E-04	2.8608E-02	0.000	.3444	6.3571E-02	6.4391E-02	.4868	3.6768E-03
249.000	9.3090E-05	7.2610E-03	0.000	.3864	6.0190E-02	8.1632E-02	.4500	4.2585E-03
250.000	3.9464E-04	3.0782E-02	0.000	.3529	4.9391E-02	6.6023E-02	.4863	3.6835E-03
251.000	9.1959E-05	7.1728E-03	0.000	.3870	6.6426E-02	6.7137E-02	.4554	4.5020E-03
252.000	1.8606E-04	1.4512E-02	0.000	.3819	7.1420E-02	8.8004E-02	.4301	4.2785E-03
253.000	1.3259E-03	.1034	3.6404E-05	.3495	4.8577E-02	8.2220E-02	.4049	2.6097E-03
254.000	9.2663E-05	7.2278E-03	0.000	.3763	4.5996E-02	7.7482E-02	.4824	2.4304E-03
255.000	9.2154E-05	7.1880E-03	0.000	.3692	4.3755E-02	7.0307E-02	.4997	2.0637E-03
256.000	2.4081E-04	1.8783E-02	0.000	.3782	5.0411E-02	8.8931E-02	.4549	2.2218E-03
257.000	8.5564E-05	6.6740E-03	0.000	.3846	4.7670E-02	.1034	.4496	1.8996E-03
258.000	9.0933E-05	7.0928E-03	0.000	.3680	4.7219E-02	.1024	.4661	1.6587E-03
259.000	9.0907E-05	7.0908E-03	0.000	.3589	4.5796E-02	9.0945E-02	.4875	1.5885E-03
260.000	8.9707E-05	6.9971E-03	0.000	.3587	5.0192E-02	8.7788E-02	.4869	1.8075E-03
261.000	8.7619E-05	6.8343E-03	3.8175E-05	.3812	5.2552E-02	.1060	.4446	2.0891E-03
262.000	9.1224E-05	7.1155E-03	0.000	.3813	5.1440E-02	9.7216E-02	.4537	2.1985E-03
263.000	8.2311E-05	6.4203E-03	0.000	.3749	5.6208E-02	8.4783E-02	.4671	2.8251E-03

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TIME (D)	ARGON molf IRED1 10	NITROGEN molf IRED1 11	OXYGEN molf IRED1 12	HYDROGEN molf IRED1 13	METHANE molf IRED1 14	CO molf IRED1 15	CO2 molf IRED1 16	ETHANE molf IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
264.000	8.5108E-05	6.6384E-03	0.000	.3555	7.0512E-02	7.1510E-02	.4788	5.5074E-03
265.000	4.0129E-04	3.1301E-02	0.000	.3552	5.9260E-02	9.7218E-02	.4446	3.7901E-03
266.000	8.9823E-05	7.0062E-03	0.000	.3825	5.1467E-02	.1149	.4343	2.7909E-03
267.000	9.0191E-05	7.0349E-03	0.000	.3863	4.5542E-02	.1177	.4351	2.1880E-03
268.000	8.1827E-05	6.3825E-03	0.000	.3957	4.4901E-02	.1020	.4426	1.9634E-03
269.000	7.5753E-05	5.9088E-03	0.000	.3855	4.7363E-02	9.1360E-02	.4615	1.7481E-03
270.000	6.8716E-05	5.3599E-03	0.000	.3848	4.7208E-02	8.1612E-02	.4718	1.6631E-03
271.000	1.6232E-04	1.2661E-02	0.000	.3756	4.3658E-02	7.5109E-02	.4840	1.5414E-03
272.000	2.4336E-04	1.8982E-02	0.000	.3609	5.3203E-02	7.8001E-02	.4801	1.9018E-03
273.000	4.3361E-04	3.3821E-02	0.000	.3606	5.2068E-02	7.8342E-02	.4664	1.9070E-03
274.000	3.2740E-04	2.5537E-02	0.000	.3527	5.5035E-02	8.1112E-02	.4770	1.7886E-03
275.000	6.9599E-04	5.4287E-02	0.000	.3514	4.8150E-02	8.0861E-02	.4566	1.5842E-03
276.000	4.5425E-05	3.5431E-03	0.000	.3689	5.4869E-02	.1003	.4643	1.6952E-03
277.000	1.4576E-04	1.1369E-02	0.000	.3767	5.3679E-02	.1089	.4415	1.4272E-03
278.000	2.8446E-05	2.2188E-03	0.000	.3863	5.0515E-02	.1097	.4441	1.3059E-03
279.000	3.0948E-05	2.4139E-03	0.000	.3729	5.0251E-02	.1076	.4600	1.1965E-03
280.000	4.7652E-05	3.7168E-03	0.000	.3762	5.3537E-02	.1130	.4463	1.2294E-03
281.000	7.2695E-05	5.6702E-03	0.000	.3692	4.6565E-02	.1096	.4612	1.1998E-03
282.000	7.1143E-05	5.5492E-03	0.000	.3611	4.0104E-02	.1058	.4784	1.2286E-03
283.000	7.1143E-05	5.5492E-03	0.000	.3611	4.0104E-02	.1058	.4784	1.2286E-03

UCG DB - HCIII - PRODUCT GAS ANALYSIS 2

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	C2H4 molf !RED1 17	C6 molf !RED1 19	H10 molf !RED1 20	H2S molf !RED1 21	TAR/DRY !RED1 24	H2O/DRY !RED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
226.000	7.6768E-05	0.000	0.000	0.000	5.9848E-05	.1280
227.000	2.0057E-05	9.6809E-04	1.9386E-05	0.000	4.2319E-05	.1433
228.000	7.6701E-04	5.4676E-04	3.6692E-05	0.000	1.8947E-05	.1638
229.000	1.6030E-03	3.7686E-04	3.1105E-04	0.000	1.1991E-04	.2868
230.000	2.4707E-03	4.7998E-04	4.2765E-04	0.000	4.5769E-05	.4534
231.000	2.6246E-03	2.6149E-04	2.6016E-04	0.000	1.8573E-04	.4509
232.000	2.2535E-03	3.8961E-04	3.6114E-04	0.000	5.1428E-04	.4392
233.000	2.7674E-03	4.0870E-04	3.5602E-04	1.4885E-04	5.6576E-04	.6360
234.000	1.4309E-03	4.0354E-04	2.6867E-04	2.8668E-04	2.5158E-04	.7272
235.000	1.2965E-03	6.4033E-04	5.2239E-04	2.3118E-04	4.5530E-04	.6055
236.000	1.3127E-03	5.7293E-04	5.1243E-04	1.8868E-03	5.0904E-04	.8558
237.000	1.0489E-03	3.9914E-04	3.3012E-04	2.3310E-03	3.7301E-04	1.284
238.000	6.3422E-04	4.5567E-04	3.7968E-04	3.6181E-03	5.1021E-04	1.182
239.000	9.6239E-04	5.2237E-04	4.3430E-04	5.9513E-03	3.4889E-04	1.219
240.000	1.8945E-03	8.0703E-04	7.1854E-04	6.2073E-03	3.6545E-04	1.236
241.000	1.8804E-03	1.1343E-03	9.9200E-04	3.8063E-03	2.0338E-03	1.629
242.000	2.0972E-03	1.1289E-03	9.5614E-04	6.4045E-03	1.9279E-03	1.608
243.000	7.7441E-04	1.2795E-03	1.0021E-03	5.7241E-03	1.0217E-03	1.632
244.000	7.0710E-04	8.6176E-04	6.6445E-04	5.0999E-03	1.3657E-04	.8735
245.000	3.0011E-04	3.4899E-04	2.4149E-04	4.1368E-03	1.0370E-04	.5856
246.000	2.5429E-04	5.0962E-04	3.5414E-04	8.8246E-03	4.0861E-04	1.151
247.000	4.3823E-04	6.6009E-04	4.5693E-04	7.9210E-03	5.7012E-04	1.611
248.000	4.1010E-04	6.2048E-04	4.1025E-04	6.7524E-03	1.0038E-03	1.409
249.000	3.8911E-04	6.4829E-04	3.9338E-04	8.6689E-03	3.7151E-04	1.334
250.000	3.8110E-04	6.8798E-04	4.3972E-04	9.0662E-03	8.0903E-04	1.808
251.000	3.8277E-04	9.2059E-04	5.5492E-04	1.0458E-02	3.0884E-04	1.392
252.000	3.0283E-04	9.7142E-04	5.9172E-04	7.7311E-03	2.8316E-04	.9830
253.000	2.2332E-04	5.8649E-04	3.6678E-04	6.1955E-03	1.9566E-04	.8125
254.000	1.9093E-04	5.0319E-04	3.0823E-04	7.0665E-03	1.4776E-04	.9688
255.000	1.3867E-04	4.5687E-04	2.8236E-04	6.8470E-03	2.6978E-04	1.048
256.000	1.3609E-04	5.2558E-04	3.3064E-04	5.3165E-03	3.9728E-04	.8412
257.000	9.4518E-05	4.4044E-04	2.6674E-04	5.2265E-03	2.3298E-04	.9153
258.000	7.4901E-05	3.5922E-04	2.1590E-04	6.8038E-03	5.2450E-04	.9765
259.000	1.0931E-04	3.4448E-04	2.0432E-04	7.4530E-03	4.4872E-04	1.338
260.000	1.9458E-04	3.7574E-04	2.2139E-04	6.6692E-03	5.0654E-04	1.252
261.000	3.2188E-04	4.0008E-04	2.3738E-04	5.6028E-03	4.2210E-04	.9373
262.000	3.3476E-04	4.4247E-04	2.6790E-04	5.8221E-03	4.2219E-04	1.148
263.000	5.6756E-04	6.3929E-04	4.1493E-04	6.0837E-03	8.3799E-04	1.483

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TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2S molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
264.000	1.5439E-03	1.4475E-03	1.0193E-03	7.4964E-03	1.1770E-03	1.559
265.000	8.3269E-04	1.1012E-03	7.7361E-04	5.5213E-03	3.9290E-04	1.118
266.000	6.2252E-04	7.1599E-04	4.9347E-04	5.0491E-03	7.4725E-04	1.021
267.000	3.7741E-04	4.6545E-04	2.8810E-04	4.9323E-03	6.7760E-04	.9450
268.000	3.6380E-04	3.6135E-04	2.1029E-04	5.4488E-03	8.2401E-04	.8974
269.000	3.5823E-04	2.8266E-04	1.5180E-04	5.8222E-03	8.6396E-04	1.083
270.000	4.7958E-04	2.6732E-04	1.5037E-04	6.6149E-03	6.2597E-04	1.428
271.000	6.0143E-04	2.2850E-04	1.3290E-04	6.2304E-03	8.9731E-04	1.665
272.000	8.1666E-04	2.4282E-04	1.2557E-04	5.5488E-03	1.0571E-03	1.255
273.000	7.4344E-04	3.5464E-04	2.2631E-04	5.1056E-03	4.7089E-04	1.210
274.000	7.1255E-04	3.5233E-04	2.3022E-04	5.2211E-03	8.8253E-04	1.373
275.000	7.9584E-04	2.2074E-04	1.2884E-04	5.3677E-03	8.1028E-04	1.486
276.000	7.5823E-04	2.1255E-04	1.1209E-04	5.1862E-03	6.8931E-04	1.116
277.000	6.6709E-04	1.5774E-04	6.7259E-05	5.4134E-03	5.0995E-04	1.093
278.000	5.5272E-04	1.5087E-04	6.3824E-05	5.0455E-03	5.0319E-04	1.178
279.000	3.3074E-04	1.6299E-04	7.1178E-05	5.0019E-03	7.2814E-04	1.331
280.000	3.2885E-04	1.8715E-04	9.4779E-05	5.3969E-03	8.4794E-04	1.335
281.000	1.3003E-04	2.3050E-04	1.3477E-04	5.9853E-03	7.1585E-04	1.490
282.000	1.0101E-04	2.7807E-04	1.7927E-04	7.1462E-03	9.0160E-04	1.563
283.000	1.0101E-04	2.7807E-04	1.7927E-04	7.1462E-03	9.0160E-04	1.563

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UCG DB - HCIII - MATERIAL BALANCES

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL RT mo/s IRED1 44	ASH RATE mo/s IRED1 46	H2O INFX mo/s IRED1 47	H2O COAL mo/s IRED1 48	-H2O RXN mo/s IRED1 49	O2 per COAL IRED1 60	H2O per COAL IRED1 61	CHAR RT mo/s IRED1 64	CHAR per COAL IRED1 63	RECOVORY % IRED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
226.000	.1787	2.3608E-03	-1.427	7.4105E-02	-1.925E-02	21.49	-.2658	.1110	.6517	59.66
227.000	.2447	3.2338E-03	-.5661	.1015	-4.915E-02	4.649	-.3320	.3201	.6897	71.62
228.000	1.705	2.2528E-02	-2.321	.7072	.1779	.9562	2.0214E-02	.1608	.1330	97.78
229.000	4.102	5.4203E-02	1.363	1.701	1.139	.4825	.2704	.4324	8.5459E-02	102.9
230.000	12.56	.1660	10.61	5.211	3.568	.4225	.2798	6.544	.2828	99.96
231.000	19.45	.2569	13.77	8.066	6.352	.3981	.3265	12.95	.3991	108.0
232.000	27.44	.3625	20.33	11.38	8.619	.3949	.3154	18.58	.4037	114.0
233.000	19.40	.2564	27.94	8.048	4.154	.4983	.2015	8.719	.2629	109.3
234.000	11.12	.1470	24.23	4.614	7.1951E-02	.6630	-1.018E-03	-.8456	-.1118	101.1
235.000	10.99	.1452	19.84	4.558	1.141	.5828	.1008	7.672	.1575	115.6
236.000	15.56	.2056	10.34	6.453	5.718	.4703	.3350	6.971	.2169	126.3
237.000	25.78	.3406	14.10	10.69	7.477	.5264	.3139	0.000	0.000	121.8
238.000	32.74	.4326	34.86	13.58	11.03	.5340	.3000	0.000	0.000	105.5
239.000	46.54	.6150	55.85	19.30	17.81	.4979	.3355	0.000	0.000	106.1
240.000	35.21	.4652	48.49	14.60	9.616	.5133	.2661	0.000	0.000	88.87
241.000	35.73	.4721	61.45	14.82	10.28	.4908	.2843	0.000	0.000	86.14
242,000	39.80	.5259	72.67	16.51	12.30	.4783	.3078	0.000	0.000	93.77
243.000	39.74	.5250	56.00	16.48	7.965	.5723	.1977	0.000	0.000	101.8
244.000	34.70	.4585	39.46	14.39	16.65	.3845	.4799	0.000	0.000	66.94
245.000	36.30	.4796	22.18	15.06	16.36	.4116	.4490	0.000	0.000	73.48
246.000	25.52	.3372	23.72	10.58	4.153	.6898	.1586	0.000	0.000	89.69
247.000	19.62	.2592	32.22	8.138	3.294	.6879	.1704	0.000	0.000	66.97
248.000	21.82	.2884	28.61	9.052	7.568	.5520	.3348	0.000	0.000	61.56
249.000	25.14	.3321	33.10	10.43	10.71	.4979	.4248	0.000	0.000	62.66
250.000	18.59	.2457	35.85	7.713	5.864	.5804	.3188	0.000	0.000	60.28
251.000	16.92	.2236	30.16	7.017	7.630	.4821	.4535	0.000	0.000	53.86
252.000	17.36	.2294	19.26	7.200	7.660	.4571	.4549	0.000	0.000	49.42
253.000	21.88	.2890	21.48	9.073	8.726	.5173	.4014	0.000	0.000	71.08
254.000	23.63	.3122	21.15	9.800	7.989	.5815	.3374	0.000	0.000	68.92
255.000	23.93	.3162	23.92	9.925	7.332	.6080	.3071	0.000	0.000	72.32
256.000	30.27	.4000	23.18	12.56	11.13	.5448	.3662	0.000	0.000	81.26
257.000	31.18	.4120	25.79	12.93	11.20	.5468	.3585	0.000	0.000	85.13
258.000	30.80	.4069	24.83	12.77	9.633	.5735	.3125	0.000	0.000	86.49
259.000	28.22	.3729	34.78	11.71	7.853	.6017	.2853	0.000	0.000	88.93
260.000	26.05	.3442	28.84	10.80	7.649	.5902	.2965	0.000	0.000	82.03
261.000	34.62	.4574	29.71	14.36	12.71	.5305	.3664	0.000	0.000	88.50
262.000	32.31	.4269	30.66	13.40	11.75	.5394	.3646	0.000	0.000	85.80
263.000	29.53	.3902	43.24	12.25	10.76	.5359	.3623	0.000	0.000	79.24

TIME (D)	COAL RT ao/s IRED1 44	ASH RATE ao/s IRED1 46	H20 INFX ao/s IRED1 47	H2[illegible] ao/s IRED1 48	-H20 RXN ao/s IRED1 49	02 per COAL IRED1 60	H20 per COAL IRED1 61	CHAR RT ao/s IRED1 64	CHAR per COAL IRED1 63	RECOVORY % IRED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
264.000	30.96	.4091	49.23	12.84	11.39	.5072	.3659	0.000	0.000	79.13
265.000	34.23	.4522	42.59	14.20	12.23	.5212	.3529	0.000	0.000	85.50
266.000	31.51	.4164	34.19	13.07	11.59	.5149	.3673	0.000	0.000	80.77
267.000	33.35	.4406	31.27	13.83	11.89	.5320	.3564	0.000	0.000	89.38
268.000	33.54	.4432	30.88	13.91	12.82	.5302	.3818	0.000	0.000	90.64
269.000	29.75	.3931	35.06	12.34	10.68	.5504	.3585	0.000	0.000	81.43
270.000	29.04	.3837	49.22	12.05	10.40	.5618	.3584	0.000	0.000	81.52
271.000	25.72	.3398	45.12	10.67	8.412	.5857	.3277	0.000	0.000	99.39
272.000	32.61	.4309	43.58	13.53	10.62	.5688	.3235	0.000	0.000	85.75
273.000	37.52	.4958	51.49	15.56	12.71	.5652	.3384	0.000	0.000	90.06
274.000	27.34	.3613	42.13	11.34	8.320	.5716	.3128	0.000	0.000	77.29
275.000	30.08	.3975	50.92	12.48	9.616	.5719	.3233	0.000	0.000	85.18
276.000	30.35	.4010	29.28	12.59	10.04	.5521	.3312	0.000	0.000	84.51
277.000	32.43	.4285	35.21	13.45	11.67	.5315	.3600	0.000	0.000	84.74
278.000	29.73	.3929	34.82	12.33	10.82	.5348	.3641	0.000	0.000	80.93
279.000	26.54	.3507	34.83	11.01	8.593	.5590	.3240	0.000	0.000	74.53
280.000	26.11	.3450	35.67	10.83	9.027	.5356	.3455	0.000	0.000	70.71
281.000	24.70	.3264	38.14	10.25	7.595	.5714	.3078	0.000	0.000	70.67
282.000	24.72	.3266	39.67	10.25	6.621	.6040	.2678	0.000	0.000	74.55
283.000	24.72	.3266	39.67	10.25	6.621	.6040	.2678	0.000	0.000	74.55

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UCG DB - HCIII - ENERGY PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL kJ /mol IRED1 72	PRODUCT frac IRED1 74	TAR frac IRED1 73	SENS HT frac IRED1 76	STEAM frac IRED1 77	COOLING frac IRED1 80	SEN HT INSU IRED1 78	LOSS frac IRED1 75	HC kJ /mol IRED1 81	HC/02 kJ /mol IRED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
226.000	77.36	.1977	7.5752E-02	2.6509E-02	-36.79	38.07	1.5827E-03	-.5813	14.17	77.04
227.000	106.0	.2398	1.0787E-02	8.1416E-02	-.3855	.7047	1.5827E-03	.3451	11.92	61.85
228.000	738.2	.6114	1.1316E-03	2.8237E-02	-.1580	.2400	1.5827E-03	.2736	78.95	444.1
229.000	1776.	.8060	4.4803E-03	4.5783E-02	4.2602E-02	4.9439E-02	1.5827E-03	4.8070E-02	113.2	748.6
230.000	5441.	.8710	1.7397E-03	9.9829E-02	9.7813E-02	5.3490E-02	1.5827E-03	-.1275	115.1	811.7
231.000	8420.	.8974	7.0847E-03	6.4173E-02	8.0837E-02	7.0572E-02	1.5827E-03	-.1237	117.4	841.3
232.000	1.1881E+04	.8805	1.9201E-02	8.1687E-02	8.5469E-02	5.9776E-02	1.5827E-03	-.1302	116.9	829.0
233.000	8402.	.7324	2.1699E-02	.1214	.1806	3.9441E-02	1.5827E-03	-9.881E-02	93.55	595.9
234.000	4816.	.5477	1.0475E-02	.1401	.2644	2.1470E-03	1.5827E-03	3.2322E-02	65.78	376.9
235.000	4759.	.6213	1.8927E-02	.1250	.2166	5.7053E-03	1.5827E-03	9.4202E-03	73.78	428.0
236.000	6737.	.7809	1.7792E-02	7.8972E-02	9.7772E-02	8.0446E-03	1.5827E-03	1.5383E-02	154.5	702.7
237.000	1.1161E+04	.7507	7.1678E-03	6.1752E-02	6.3054E-02	6.7739E-04	1.5827E-03	.1157	197.6	637.9
238.000	1.4175E+04	.7353	1.1145E-02	8.5033E-02	.1290	4.7663E-03	1.5827E-03	3.5367E-02	183.9	623.9
239.000	2.0153E+04	.7816	6.4111E-03	7.8321E-02	.1453	5.7347E-03	1.5827E-03	-1.461E-02	205.3	767.0
240.000	1.5246E+04	.7430	6.3422E-03	6.5437E-02	.1533	2.5375E-03	1.5827E-03	3.2108E-02	212.5	674.0
241.000	1.5471E+04	.7341	3.4205E-02	5.9628E-02	.1916	4.4152E-04	1.5827E-03	-1.961E-02	213.0	661.2
242.000	1.7233E+04	.7455	3.2476E-02	2.3960E-02	.1990	4.0540E-04	1.5827E-03	1.5782E-03	219.1	677.7
243.000	1.7205E+04	.6543	1.6439E-02	3.5086E-02	.1687	3.9982E-04	1.5827E-03	.1271	196.3	551.6
244.000	1.5026E+04	.9166	2.7062E-03	7.0363E-02	.1088	4.5909E-03	1.5827E-03	-.1006	229.8	1044.
245.000	1.5718E+04	.9061	2.1236E-03	5.7504E-02	5.9057E-02	3.9779E-03	1.5827E-03	-2.732E-02	220.9	970.4
246.000	1.1049E+04	.5407	7.7418E-03	8.2983E-02	.1251	6.4479E-04	1.5827E-03	.2491	143.2	351.0
247.000	8495.	.5304	1.0122E-02	.1024	.1920	1.3344E-02	1.5827E-03	.1567	147.0	336.5
248.000	9449.	.6769	1.7762E-02	8.8827E-02	.1452	3.1779E-02	1.5827E-03	4.3313E-02	185.3	545.1
249.000	1.0884E+04	.7641	7.0075E-03	6.4346E-02	.1331	3.1232E-02	1.5827E-03	6.4617E-03	201.2	668.8
250.000	8052.	.6578	1.4726E-02	8.6037E-02	.2119	2.5111E-02	1.5827E-03	1.0759E-02	177.0	492.6
251.000	7326.	.7806	5.8568E-03	8.7309E-02	.1776	5.7776E-03	1.5827E-03	-4.894E-02	205.0	711.2
252.000	7516.	.8067	5.3608E-03	8.6132E-02	.1175	3.6423E-04	1.5827E-03	-1.088E-02	212.1	773.8
253.000	9472.	.7474	3.9929E-03	9.2164E-02	.1133	5.1839E-05	1.5827E-03	4.7321E-02	176.1	631.0
254.000	1.0231E+04	.6758	2.7497E-03	8.5795E-02	9.8953E-02	3.3891E-04	1.5827E-03	.1406	180.0	504.3
255.000	1.0362E+04	.6412	4.9528E-03	8.8467E-02	.1132	0.000	1.5827E-03	.1560	173.0	456.9
256.000	1.3108E+04	.7114	7.5113E-03	8.5106E-02	8.3029E-02	3.6619E-03	1.5827E-03	.1117	186.4	566.3
257.000	1.3502E+04	.7164	4.4181E-03	8.4810E-02	8.9264E-02	8.2112E-03	1.5827E-03	9.9180E-02	189.0	567.8
258.000	1.3335E+04	.6783	9.7030E-03	8.2381E-02	9.2209E-02	8.5866E-03	1.5827E-03	.1327	183.8	513.1
259.000	1.2221E+04	.6457	8.1400E-03	9.7447E-02	.1410	9.5198E-03	1.5827E-03	.1026	177.0	466.9
260.000	1.1279E+04	.6543	9.1808E-03	9.4344E-02	.1275	6.8239E-03	1.5827E-03	.1114	180.1	480.7
261.000	1.4989E+04	.7291	7.8982E-03	8.4908E-02	9.1781E-02	1.0893E-02	1.5827E-03	7.8064E-02	193.8	595.8
262.000	1.3991E+04	.7182	7.9178E-03	8.8557E-02	.1014	1.0342E-02	1.5827E-03	7.6499E-02	190.8	579.2
263.000	1.2786E+04	.7077	1.5432E-02	.1015	.1566	4.4188E-03	1.5827E-03	1.7407E-02	191.8	573.0

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TIME (D)	COAL kJ /mol IRED1 72	PRODUCT frac IRED1 74	TAR frac IRED1 73	SENS HT frac IRED1 76	STEAM frac IRED1 77	COOLING frac IRED1 80	SEN HT INSU IRED1 78	LOSS frac IRED1 75	HC kJ /mol IRED1 81	HC/02 kJ /mol IRED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
264.000	1.3408E+04	.7210	2.0735E-02	.1031	.1675	2.2954E-03	1.5827E-03	-1.034E-02	204.2	628.9
265.000	1.4820E+04	.7294	7.4090E-03	9.1724E-02	.1322	0.000	1.5827E-03	4.1779E-02	195.5	610.7
266.000	1.3646E+04	.7394	1.3963E-02	8.2868E-02	.1165	0.000	1.5827E-03	4.9235E-02	198.0	622.6
267.000	1.4439E+04	.7258	1.2767E-02	8.3732E-02	.1021	3.1527E-04	1.5827E-03	7.7216E-02	192.4	591.0
268.000	1.4523E+04	.7258	1.5729E-02	8.5120E-02	9.6791E-02	4.8305E-04	1.5827E-03	7.8661E-02	189.7	593.3
269.000	1.2883E+04	.6981	1.6257E-02	9.1010E-02	.1249	2.2930E-04	1.5827E-03	7.2480E-02	185.5	549.4
270.000	1.2575E+04	.6901	1.1734E-02	.1074	.1786	1.3746E-03	1.5827E-03	1.4637E-02	182.9	532.8
271.000	1.1135E+04	.6554	1.6793E-02	.1075	.1823	3.5098E-03	1.5827E-03	3.7832E-02	174.9	485.1
272.000	1.4122E+04	.6646	1.9260E-02	9.6315E-02	.1479	2.0130E-03	1.5827E-03	7.2387E-02	180.5	506.3
273.000	1.6247E+04	.6817	8.9258E-03	9.9949E-02	.1509	3.0439E-03	1.5827E-03	5.7677E-02	179.6	522.5
274.000	1.1839E+04	.6631	1.6151E-02	.1081	.1648	7.9127E-04	1.5827E-03	4.9164E-02	180.6	507.4
275.000	1.3026E+04	.6685	1.5530E-02	.1221	.1825	1.3197E-02	1.5827E-03	6.8459E-04	173.5	507.7
276.000	1.3140E+04	.6943	1.2560E-02	8.5675E-02	.1113	1.2505E-02	1.5827E-03	8.5731E-02	190.0	544.7
277.000	1.4043E+04	.7260	9.5879E-03	8.6792E-02	.1151	1.3968E-02	1.5827E-03	5.1011E-02	192.9	591.6
278.000	1.2875E+04	.7248	9.4743E-03	9.3074E-02	.1252	1.4915E-02	1.5827E-03	3.4644E-02	192.5	587.1
279.000	1.1492E+04	.6893	1.3428E-02	9.4191E-02	.1430	1.6288E-02	1.5827E-03	4.5658E-02	187.4	536.5
280.000	1.1307E+04	.7140	1.5685E-02	9.2237E-02	.1466	1.5765E-02	1.5827E-03	1.8052E-02	193.1	577.4
281.000	1.0697E+04	.6776	1.3125E-02	.1002	.1680	1.6663E-02	1.5827E-03	2.7396E-02	184.1	515.4
282.000	1.0702E+04	.6378	1.6358E-02	9.8695E-02	.1779	1.1020E-02	1.5827E-03	6.2352E-02	175.8	457.6
283.000	1.0702E+04	.6378	1.6358E-02	9.8695E-02	.1779	1.1020E-02	1.5827E-03	6.2352E-02	175.8	457.6

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UNDERGROUND COAL GASIFICATION

DATA BASE

MORGANTOWN ENERGY TECHNOLOGY CENTER

PRICETOWN I

DAILY AVERAGE RESULTS

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  PRICETOWN COAL ANALYSIS
                                                                    KG/M**3  KJ/MOLE
COAL H/C  COAL O/C  COAL S/C  COAL N/C  WT F H2O  WT F ASH  DENSITY  HT COMB
.797      0.055     .022      .013      .0136     .1103     1340.    455.

CHAR H/C  CHAR O/C  CHAR S/C  CHAR N/C
.100      0.00      0.        0.

 TAR H/C   TAR O/C   TAR S/C   TAR N/C      C/MOLECULE
 1.33      0.        0.        0.            9.

  COAL      ASH&CHAR  --  TEMPERATURES (K)
   300.      1000.

  1   NUMBER OF POINTS ON OXYGEN TRACER TYPE CURVE
999.     2   TIME,TRACER FLAG (ZERO=NONE,ONE=ARGON,TWO=NITROGEN)

  1   NUMBER OF POINTS ON GAS LOSS TRACER TYPE CURVE
 999.   2  TIME,TRACER FLAG (SAME AS OXYGEN TRACER)

 1   NUMBER OF POINTS ON CHAR FLAG CURVE
999.      0   TIME,TRACER FLAG   (0=DO NOT USE CHAR, 1=USE CHAR)
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UCG DB - METC - OPERATING PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	INJ RATE kg/s !RED1 90	PRD RATE kg/s !RED1 91	INJ TEMP C !RED1 94	PRD TEMP C !RED1 95	INJ PRES kPa !RED1 96	PRD PRES kPa !RED1 97	STEAM kg/s !RED1 92	COOLING kg/s !RED1 93	INJ O2 frac !RED1 6	INJ H2O frac !RED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
160.000	.6700	.1321	10.00	22.41	5971.	105.5	0.000	0.000	.2100	0.000
161.000	.6500	.3432	10.00	15.55	5862.	588.5	0.000	0.000	.2100	0.000
162.000	.7140	.2713	10.51	20.94	5874.	754.4	0.000	0.000	.2100	0.000
163.000	.6509	.4284	10.00	22.30	5789.	749.2	0.000	0.000	.2100	0.000
164.000	.6715	.7824	10.00	17.57	5822.	766.7	0.000	0.000	.2100	0.000
165.000	.6824	.8549	10.00	23.74	5435.	663.9	0.000	0.000	.2100	0.000
166.000	1.035	1.875	10.00	59.44	4358.	749.5	0.000	0.000	.2100	0.000
167.000	.7890	.8844	10.00	70.85	3205.	790.8	0.000	0.000	.2100	0.000
168.000	.8969	.9342	10.00	74.47	3329.	897.3	0.000	0.000	.2100	0.000
169.000	1.087	1.378	10.00	67.03	3850.	1014.	0.000	0.000	.2100	0.000
170.000	1.042	1.261	10.00	64.58	4534.	1313.	0.000	0.000	.2100	0.000
171.000	.8358	.9540	10.00	63.09	4635.	1329.	0.000	0.000	.2100	0.000
172.000	.9340	.8864	10.00	72.05	4208.	1142.	0.000	0.000	.2100	0.000
173.000	.5385	.5166	10.00	78.45	4839.	1265.	0.000	0.000	.2100	0.000
174.000	.5489	.8524	10.00	80.05	4731.	1107.	0.000	0.000	.2100	0.000
175.000	.3758	.5052	10.00	79.39	4735.	1199.	0.000	0.000	.2100	0.000
176.000	.5987	.9199	10.00	68.01	4213.	977.1	0.000	0.000	.2100	0.000
177.000	.5426	.9238	10.00	60.52	3840.	757.1	0.000	0.000	.2100	0.000
178.000	.5033	.8571	10.07	65.72	3215.	665.8	0.000	0.000	.2100	0.000
179.000	.5232	.9014	10.00	69.39	3064.	713.6	0.000	0.000	.2100	0.000
180.000	.5792	1.025	10.00	61.83	2927.	681.5	0.000	0.000	.2100	0.000
181.000	.5679	.9462	10.59	54.89	3189.	610.1	0.000	0.000	.2100	0.000
182.000	.5591	1.072	10.00	54.69	3278.	727.9	0.000	0.000	.2100	0.000
183.000	.5586	1.090	10.00	55.70	3097.	776.2	0.000	0.000	.2100	0.000
184.000	.4663	.9504	10.00	58.67	2942.	773.0	0.000	0.000	.2100	0.000
185.000	.3300	.6866	10.00	69.56	2801.	778.9	0.000	0.000	.2100	0.000
186.000	.3301	.6444	10.00	72.22	2684.	788.1	0.000	0.000	.2100	0.000
187.000	.3301	.6021	10.00	72.07	2565.	788.0	0.000	0.000	.2100	0.000
188.000	.4811	.8577	10.00	59.70	2463.	788.0	0.000	0.000	.2100	0.000
189.000	.6447	1.111	10.00	54.52	2374.	610.0	0.000	0.000	.2100	0.000
190.000	.4989	.5407	10.00	83.48	3541.	817.8	0.000	0.000	.2100	0.000
191.000	.3367	.1106	10.00	89.10	5901.	791.6	0.000	0.000	.2100	0.000
192.000	.2443	.2523	10.00	87.39	5901.	788.9	0.000	0.000	.2100	0.000
193.000	.2386	.3167	10.00	80.95	5633.	751.2	0.000	0.000	.2100	0.000
194.000	.2913	.3741	10.00	61.77	5935.	606.8	0.000	0.000	.2100	0.000
195.000	.3282	.4257	10.00	72.56	5871.	675.7	0.000	0.000	.2100	0.000
196.000	.4278	.5623	10.00	83.04	5868.	795.6	0.000	0.000	.2100	0.000
197.000	.3497	.5946	10.00	83.48	5817.	835.4	0.000	0.000	.2100	0.000

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TIME (D)	INJ RATE mo/s IRED1 90	PRD RATE mo/s IRED1 91	INJ TEMP c IRED1 94	PRD TEMP c IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM mo/s IRED1 92	COOLING mo/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
198.000	.2705	.5895	10.00	83.05	5354.	1125.	0.000	0.000	.2100	0.000
199.000	.2303	.4406	10.00	88.59	4951.	1133.	0.000	0.000	.2100	0.000
200.000	.2174	.4335	10.00	87.27	4892.	1134.	0.000	0.000	.2100	0.000
201.000	.2364	.4659	10.00	75.83	4594.	1078.	0.000	0.000	.2100	0.000
202.000	.2155	.4270	10.00	88.51	4429.	1078.	0.000	0.000	.2100	0.000
203.000	.2409	.4631	10.00	95.01	4473.	1135.	0.000	0.000	.2100	0.000
204.000	.2813	.6918	10.00	81.62	3478.	1135.	0.000	0.000	.2100	0.000
205.000	.2201	.5099	10.00	76.44	2548.	1078.	0.000	0.000	.2100	0.000
206.000	.2718	.5126	10.00	77.48	2650.	1012.	0.000	0.000	.2100	0.000
207.000	.2934	.6020	10.00	73.04	2767.	951.0	0.000	0.000	.2100	0.000
208.000	.4249	1.037	10.00	72.07	2457.	1069.	0.000	0.000	.2100	0.000
209.000	.6973	1.263	10.00	71.08	2354.	1138.	0.000	0.000	.2100	0.000
210.000	.4967	.8539	10.00	68.58	3686.	1071.	0.000	0.000	.2100	0.000
211.000	.2833	.6740	10.00	77.63	2093.	1138.	0.000	0.000	.2100	0.000
212.000	.4025	.3779	10.00	42.22	1761.	530.7	0.000	0.000	.2100	0.000
213.000	.2458	.3437	10.00	83.87	1505.	1063.	0.000	0.000	.2100	0.000
214.000	.2403	.3291	10.00	90.24	1595.	1134.	0.000	0.000	.2100	0.000
215.000	.2432	.4494	10.00	89.98	1529.	916.7	0.000	0.000	.2100	0.000
216.000	.2499	.2891	10.00	90.98	2805.	1137.	0.000	0.000	.2100	0.000
217.000	.5303	.6526	10.00	88.17	1768.	1137.	0.000	0.000	.2100	0.000
218.000	.5699	.7869	10.00	76.12	1887.	1137.	0.000	0.000	.2100	0.000
219.000	.7309	1.119	10.14	56.05	1960.	1133.	0.000	0.000	.2100	0.000
220.000	.7342	1.112	10.00	62.95	1200.	799.1	0.000	0.000	.2100	0.000
221.000	1.230	1.964	10.00	44.29	1949.	1108.	0.000	0.000	.2100	0.000
222.000	.7484	1.274	10.00	54.38	2095.	1140.	0.000	0.000	.2100	0.000
223.000	.5737	.7351	10.00	79.65	2143.	1212.	0.000	0.000	.2100	0.000
224.000	.7292	1.030	10.00	66.87	1911.	1307.	0.000	0.000	.2100	0.000
225.000	.6872	1.130	10.00	66.87	2141.	1076.	0.000	0.000	.2100	0.000
226.000	.6061	.8506	10.00	75.47	2507.	1108.	0.000	0.000	.2100	0.000
227.000	.5170	.9652	10.00	69.64	2193.	1130.	0.000	0.000	.2100	0.000
228.000	.9173	1.226	10.00	69.81	1386.	1136.	0.000	0.000	.2100	0.000
229.000	1.320	2.175	10.00	45.85	2734.	810.2	0.000	0.000	.2100	0.000
230.000	1.513	2.549	14.84	44.63	2881.	439.4	0.000	0.000	.2100	0.000
231.000	1.278	2.116	28.82	46.40	1990.	468.9	0.000	0.000	.2100	0.000
232.000	1.338	1.923	14.72	50.35	2600.	479.4	0.000	0.000	.2100	0.000
233.000	2.367	3.468	51.41	46.07	2110.	446.3	0.000	0.000	.2100	0.000
234.000	3.330	5.903	123.5	31.47	1881.	393.1	0.000	0.000	.2100	0.000
235.000	4.818	8.297	136.7	59.27	2163.	439.6	0.000	0.000	.2100	0.000
236.000	4.840	8.542	142.8	65.87	2164.	440.3	0.000	0.000	.2100	0.000
237.000	4.740	8.135	131.8	66.93	2162.	440.4	0.000	0.000	.2100	0.000
238.000	4.336	7.351	169.3	67.50	2164.	450.9	0.000	0.000	.2100	0.000
239.000	3.435	6.302	83.68	69.84	2224.	759.4	0.000	0.000	.2100	0.000
240.000	1.339	3.051	172.2	39.62	2237.	1326.	0.000	0.000	.2100	0.000
241.000	2.812	3.868	115.7	40.92	1871.	638.4	0.000	0.000	.2100	0.000
242.000	3.792	5.313	143.9	39.43	2171.	405.4	0.000	0.000	.2100	0.000
243.000	3.829	5.646	112.0	46.40	2139.	376.0	0.000	0.000	.2100	0.000
244.000	1.898	5.639	72.61	56.49	2177.	436.3	0.000	0.000	.2100	0.000

TIME (D)	INJ RATE kg/s IRED1 90	PRD RATE kg/s IRED1 91	INJ TEMP C IRED1 94	PRD TEMP C IRED1 95	INJ PRES kPa IRED1 96	PRD PRES kPa IRED1 97	STEAM kg/s IRED1 92	COOLING kg/s IRED1 93	INJ O2 frac IRED1 6	INJ H2O frac IRED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
245.000	3.406	5.913	79.24	56.54	2203.	212.1	0.000	0.000	.2100	0.000
246.000	3.418	5.782	98.68	55.34	2232.	169.9	0.000	0.000	.2100	0.000
247.000	3.353	5.738	70.93	53.70	2236.	170.8	0.000	0.000	.2100	0.000
248.000	3.764	6.689	164.1	42.14	2213.	197.7	0.000	0.000	.2100	0.000
249.000	3.339	5.969	175.9	36.54	2240.	176.2	0.000	0.000	.2100	0.000
250.000	3.779	6.780	61.91	59.88	2238.	166.1	0.000	0.000	.2100	0.000
251.000	3.595	6.833	123.1	65.42	2238.	165.7	0.000	0.000	.2100	0.000
252.000	3.617	6.484	174.2	55.90	2213.	166.0	0.000	0.000	.2100	0.000
253.000	3.544	6.088	115.6	43.39	2130.	149.4	0.000	0.000	.2100	0.000
254.000	3.082	6.354	114.3	53.44	2232.	164.1	0.000	0.000	.2100	0.000
255.000	2.972	5.821	43.71	54.75	2240.	165.7	0.000	0.000	.2100	0.000
256.000	4.768	7.034	66.89	43.86	2248.	158.1	0.000	0.000	.2100	0.000
257.000	4.704	7.007	79.77	44.41	2244.	166.3	0.000	0.000	.2100	0.000
258.000	4.478	6.448	37.53	46.22	2245.	166.1	0.000	0.000	.2100	0.000
259.000	4.160	6.324	56.97	46.02	2244.	166.1	0.000	0.000	.2100	0.000
260.000	3.910	5.650	27.21	41.53	2240.	167.4	0.000	0.000	.2100	0.000
261.000	4.681	6.466	40.11	49.58	2239.	169.9	0.000	0.000	.2100	0.000
262.000	4.329	5.919	39.40	49.08	2240.	169.8	0.000	0.000	.2100	0.000
263.000	4.199	6.479	61.18	52.16	2780.	204.7	0.000	0.000	.2100	0.000
264.000	4.882	7.208	88.91	43.42	2238.	167.9	0.000	0.000	.2100	0.000
265.000	3.877	6.886	68.35	58.71	2242.	289.8	0.000	0.000	.2100	0.000
266.000	9.776	20.56	80.55	80.47	2011.	399.4	0.000	0.000	.2100	0.000
267.000	22.93	44.85	12.30	175.2	2172.	455.2	0.000	0.000	.2100	0.000
268.000	22.49	43.30	31.79	242.6	2147.	615.9	0.000	0.000	.2100	0.000
269.000	25.49	39.48	56.22	339.8	2131.	618.6	0.000	0.000	.2100	0.000
270.000	26.10	40.59	54.88	365.1	2181.	618.6	0.000	0.000	.2100	0.000
271.000	25.80	39.98	50.14	371.8	2177.	738.9	0.000	0.000	.2100	0.000
272.000	25.78	41.36	54.31	386.4	2174.	607.8	0.000	0.000	.2100	0.000
273.000	24.90	40.14	50.42	393.2	2017.	617.3	0.000	0.000	.2100	0.000
274.000	21.16	32.07	46.17	350.6	1740.	318.9	0.000	0.000	.2100	0.000
275.000	25.69	40.64	55.29	403.2	2168.	101.6	0.000	0.000	.2100	0.000
276.000	21.97	36.32	53.34	401.2	1918.	105.4	0.000	0.000	.2100	0.000
277.000	23.61	37.73	54.52	405.9	2088.	101.6	0.000	0.000	.2100	0.000
278.000	10.75	21.73	28.75	322.4	2203.	101.6	0.000	0.000	.2100	0.000
279.000	4.235	7.416	10.00	127.2	2106.	101.3	0.000	0.000	.2100	0.000
280.000	3.711	5.012	10.00	87.92	2784.	101.6	0.000	0.000	.2100	0.000
281.000	4.617	3.342	10.00	86.16	2918.	101.6	0.000	0.000	.2100	0.000
282.000	7.203	2.771	10.00	76.26	3709.	103.3	0.000	0.000	.2100	0.000
283.000	7.203	2.771	10.00	76.26	3709.	103.3	0.000	0.000	.2100	0.000

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UCG DB - METC - PRODUCT GAS ANALYSIS 1

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	ARGON molf IRED1 10	NITROGEN molf IRED1 11	OXYGEN molf IRED1 12	HYDROGEN molf IRED1 13	METHANE molf IRED1 14	CO molf IRED1 15	CO2 molf IRED1 16	ETHANE molf IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
160.000	1.3245E-02	.5920	0.000	.1022	.1119	7.4484E-02	.1001	3.2136E-03
161.000	6.9336E-03	.6250	0.000	8.9840E-02	.1127	4.5159E-02	9.8816E-02	9.3663E-03
162.000	5.8114E-03	.6108	0.000	.1041	.1198	2.1683E-02	.1103	1.1399E-02
163.000	7.6139E-03	.6084	0.000	9.5271E-02	.1215	1.2337E-02	.1222	1.2982E-02
164.000	6.9762E-03	.5505	0.000	8.9985E-02	.1655	2.7681E-02	.1147	1.8303E-02
165.000	7.3358E-03	.4851	0.000	9.8915E-02	.2078	3.9254E-02	.1240	1.5314E-02
166.000	5.4214E-02	.5179	0.000	.1077	.1464	6.5183E-02	7.9571E-02	1.0913E-02
167.000	.1269	.5546	0.000	7.8586E-02	.1002	5.9037E-02	6.3476E-02	5.4965E-03
168.000	.1304	.5812	0.000	7.6758E-02	5.9248E-02	6.8114E-02	7.0388E-02	4.3533E-03
169.000	5.8519E-03	.4809	0.000	9.7921E-02	.1928	7.5433E-02	.1248	8.8035E-03
170.000	4.9688E-03	.4071	0.000	7.5941E-02	.2820	4.4934E-02	.1476	1.4712E-02
171.000	4.3778E-02	.3768	0.000	8.5724E-02	.2987	3.5635E-02	.1246	1.2016E-02
172.000	9.6908E-03	.6515	0.000	4.2979E-02	7.2046E-02	7.2193E-02	.1366	4.6992E-03
173.000	6.3954E-03	.5232	0.000	.1090	.1536	5.0839E-02	.1393	6.3416E-03
174.000	6.7673E-02	.5622	0.000	7.2696E-02	.1316	3.2235E-02	.1181	6.9377E-03
175.000	3.8419E-02	.4270	0.000	.1260	.2088	3.7426E-02	.1438	9.5322E-03
176.000	4.3496E-02	.5951	0.000	8.7127E-02	8.7372E-02	5.4516E-02	.1183	5.5610E-03
177.000	5.6698E-03	.4508	0.000	.1633	.1478	.1278	8.6654E-02	7.2427E-03
178.000	2.1393E-02	.4494	0.000	.1265	.1963	9.2087E-02	9.1016E-02	1.0642E-02
179.000	5.7003E-03	.4628	0.000	.1122	.2051	8.4658E-02	.1021	1.1148E-02
180.000	5.3354E-03	.4294	0.000	.1143	.2301	8.7532E-02	.1061	1.0796E-02
181.000	5.4729E-03	.4348	0.000	.1037	.2306	7.9003E-02	.1185	1.0806E-02
182.000	5.2931E-03	.4191	0.000	.1020	.2492	7.6622E-02	.1211	9.8066E-03
183.000	5.1153E-03	.4136	0.000	9.8791E-02	.2492	7.6036E-02	.1278	1.0606E-02
184.000	5.0099E-03	.3930	0.000	.1007	.2714	7.0173E-02	.1288	1.1368E-02
185.000	4.9805E-03	.3936	0.000	9.6820E-02	.2946	4.4015E-02	.1273	1.3649E-02
186.000	5.9383E-03	.4824	0.000	7.7872E-02	.2172	4.2055E-02	.1415	1.1093E-02
187.000	6.5824E-03	.5219	0.000	7.6615E-02	.1781	4.7118E-02	.1421	9.4283E-03
188.000	6.9239E-03	.5521	0.000	7.6623E-02	.1323	6.5892E-02	.1425	7.8796E-03
189.000	6.8485E-02	.5988	0.000	8.9911E-02	8.6026E-02	4.2329E-02	.1045	3.6936E-03
190.000	.1305	.6830	0.000	3.6518E-02	8.4667E-02	8.3198E-03	4.9097E-02	4.8503E-03
191.000	7.4386E-03	.6138	0.000	5.8798E-02	.2032	4.5862E-03	8.5319E-02	1.9399E-02
192.000	7.9144E-03	.6123	0.000	5.3946E-02	.1559	2.2373E-02	.1107	1.9838E-02
193.000	7.6917E-03	.5797	0.000	6.9529E-02	.1554	3.0097E-02	.1155	1.8015E-02
194.000	6.9357E-03	.5395	0.000	8.4586E-02	.1845	3.8840E-02	.1130	1.3684E-02
195.000	6.7857E-03	.5400	0.000	7.5938E-02	.1903	2.6891E-02	.1171	1.7797E-02
196.000	6.2344E-03	.4989	0.000	8.5403E-02	.2136	3.0706E-02	.1231	1.7438E-02
197.000	7.2496E-03	.4932	0.000	7.5639E-02	.2299	2.0298E-02	.1300	1.8557E-02

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TIME (D)	ARGON molf IRED1 10	NITROGEN molf IRED1 11	OXYGEN molf IRED1 12	HYDROGEN molf IRED1 13	METHANE molf IRED1 14	CO molf IRED1 15	CO2 molf IRED1 16	ETHANE molf IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
198.000	6.6678E-03	.5453	0.000	6.1952E-02	.2030	1.2450E-02	.1320	1.6504E-02
199.000	5.9356E-03	.4762	0.000	7.9587E-02	.2253	1.7343E-02	.1427	2.3568E-02
200.000	5.9747E-03	.4764	0.000	7.9897E-02	.2287	1.6808E-02	.1394	2.3694E-02
201.000	5.9747E-03	.4764	0.000	7.9897E-02	.2287	1.6808E-02	.1394	2.3694E-02
202.000	6.0674E-03	.4784	0.000	7.8610E-02	.2291	1.5714E-02	.1397	2.3863E-02
203.000	5.8481E-03	.4552	0.000	8.8588E-02	.2427	1.9709E-02	.1360	2.3880E-02
204.000	5.6160E-03	.4323	0.000	.1101	.2319	5.1193E-02	.1245	1.9014E-02
205.000	4.7901E-03	.3717	0.000	.1193	.2678	5.8788E-02	.1422	1.4305E-02
206.000	5.5417E-03	.4438	0.000	9.7805E-02	.2438	4.2843E-02	.1491	8.3082E-03
207.000	5.6830E-03	.4530	0.000	9.4747E-02	.2402	4.2871E-02	.1430	9.2039E-03
208.000	5.3656E-03	.4345	0.000	.1019	.2310	6.2508E-02	.1322	1.1617E-02
209.000	5.9965E-03	.4818	0.000	9.2929E-02	.1817	8.7646E-02	.1258	8.5237E-03
210.000	6.7371E-02	.5177	0.000	8.8351E-02	.1713	4.4750E-02	8.2116E-02	1.1115E-02
211.000	1.1222E-02	.5373	0.000	9.8103E-02	.1559	2.3182E-02	.1473	1.2829E-02
212.000	6.1458E-03	.5067	0.000	9.2415E-02	.1886	5.1237E-03	.1627	2.0491E-02
213.000	8.5748E-03	.7134	0.000	2.6485E-02	5.4227E-02	5.4754E-03	.1841	3.0346E-03
214.000	8.7906E-03	.7291	0.000	2.6777E-02	2.8360E-02	1.6044E-02	.1845	1.7882E-03
215.000	1.5323E-02	.6795	0.000	4.7521E-02	4.3005E-02	2.7072E-02	.1806	1.4980E-03
216.000	.1089	.6953	0.000	3.6800E-02	5.4511E-02	6.3788E-03	9.4503E-02	1.7008E-03
217.000	8.5328E-03	.7049	0.000	3.0398E-02	2.6716E-02	4.2783E-02	.1824	1.0343E-03
218.000	1.1075E-02	.6012	0.000	8.6807E-02	9.4514E-02	6.1955E-02	.1366	1.7754E-03
219.000	7.1242E-03	.5832	0.000	.1175	5.0869E-02	7.9198E-02	.1501	2.2441E-03
220.000	7.3233E-03	.6053	0.000	.1028	5.0944E-02	8.7359E-02	.1338	2.4837E-03
221.000	6.9287E-03	.5445	0.000	.1324	9.2105E-02	8.7310E-02	.1186	4.9347E-03
222.000	7.8824E-03	.4993	0.000	.1362	.1352	7.0802E-02	.1331	4.5111E-03
223.000	9.1914E-03	.6791	0.000	4.2210E-02	8.2065E-02	1.0798E-02	.1646	4.8108E-03
224.000	8.8979E-03	.6464	0.000	5.8872E-02	4.1438E-02	4.9560E-02	.1806	3.2538E-03
225.000	7.0195E-03	.5750	0.000	9.0305E-02	9.0424E-02	6.2205E-02	.1571	4.9696E-03
226.000	7.0612E-03	.5809	0.000	9.3503E-02	.1001	3.5674E-02	.1580	6.9427E-03
227.000	5.8492E-03	.5060	0.000	.1081	.1511	4.7047E-02	.1543	7.5114E-03
228.000	7.7868E-03	.6406	0.000	6.3001E-02	5.4428E-02	5.1502E-02	.1635	4.2813E-03
229.000	5.4622E-03	.4503	0.000	8.7532E-02	.2398	6.0055E-02	.1262	9.5307E-03
230.000	6.2917E-03	.5187	0.000	8.3048E-02	.1406	7.0832E-02	.1502	9.6265E-03
231.000	6.3462E-03	.5229	0.000	9.7269E-02	.1201	.1014	.1282	6.7241E-03
232.000	5.8149E-03	.4830	0.000	9.4089E-02	.1803	7.2076E-02	.1331	8.7027E-03
233.000	6.2944E-03	.5167	0.000	8.8977E-02	.1415	9.3404E-02	.1289	6.5471E-03
234.000	5.5477E-03	.4655	0.000	.1056	.1762	.1146	.1085	7.7759E-03
235.000	5.6154E-03	.4540	0.000	.1111	.1878	.1050	.1121	9.0072E-03
236.000	5.5216E-03	.4497	0.000	.1168	.1846	.1006	.1165	9.5865E-03
237.000	5.5838E-03	.4581	0.000	.1186	.1755	9.7352E-02	.1194	8.6962E-03
238.000	5.5423E-03	.4551	0.000	.1216	.1752	9.7363E-02	.1211	8.4289E-03
239.000	6.3727E-03	.5280	0.000	.1024	.1303	8.4709E-02	.1380	3.3024E-03
240.000	6.3727E-03	.5280	0.000	.1024	.1303	8.4709E-02	.1380	3.3024E-03
241.000	6.3903E-03	.5295	0.000	.1020	.1292	8.4468E-02	.1383	3.3003E-03
242.000	6.6833E-03	.5441	0.000	9.7072E-02	.1272	7.1889E-02	.1429	3.3087E-03
243.000	6.6031E-03	.5350	0.000	9.9552E-02	.1372	7.0052E-02	.1413	3.3350E-03
244.000	6.6031E-03	.5350	0.000	9.9552E-02	.1372	7.0052E-02	.1413	3.3350E-03

TIME (D)	ARGON mol/f IRED1 10	NITROGEN mol/f IRED1 11	OXYGEN mol/f IRED1 12	HYDROGEN mol/f IRED1 13	METHANE mol/f IRED1 14	CO mol/f IRED1 15	CO2 mol/f IRED1 16	ETHANE mol/f IRED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
245.000	6.6031E-03	.5350	0.000	9.9552E-02	.1372	7.0052E-02	.1413	3.3350E-03
246.000	6.6031E-03	.5350	0.000	9.9552E-02	.1372	7.0052E-02	.1413	3.3350E-03
247.000	6.6031E-03	.5350	0.000	9.9552E-02	.1372	7.0052E-02	.1413	3.3350E-03
248.000	6.6031E-03	.5350	0.000	9.9552E-02	.1372	7.0052E-02	.1413	3.3350E-03
249.000	6.6031E-03	.5350	0.000	9.9552E-02	.1372	7.0052E-02	.1413	3.3350E-03
250.000	6.6031E-03	.5350	0.000	9.9552E-02	.1372	7.0052E-02	.1413	3.3350E-03
251.000	6.6031E-03	.5350	0.000	9.9552E-02	.1372	7.0052E-02	.1413	3.3350E-03
252.000	6.6031E-03	.5350	0.000	9.9552E-02	.1372	7.0052E-02	.1413	3.3350E-03
253.000	6.6031E-03	.5350	0.000	9.9552E-02	.1372	7.0052E-02	.1413	3.3350E-03
254.000	6.6031E-03	.5350	0.000	9.9552E-02	.1372	7.0052E-02	.1413	3.3350E-03
255.000	6.2923E-03	.5092	0.000	.1027	.1569	6.8417E-02	.1389	4.9639E-03
256.000	6.6021E-03	.5309	0.000	9.3214E-02	.1350	7.5425E-02	.1338	6.5970E-03
257.000	6.3619E-03	.5154	0.000	.1014	.1365	8.3692E-02	.1319	6.5133E-03
258.000	6.2506E-03	.5066	0.000	.1022	.1458	8.0090E-02	.1344	6.4733E-03
259.000	6.1312E-03	.4953	0.000	.1045	.1429	8.4489E-02	.1433	6.1291E-03
260.000	6.1818E-03	.4991	0.000	.1033	.1404	8.3232E-02	.1446	6.1181E-03
261.000	6.1450E-03	.5008	0.000	.1048	.1361	8.1203E-02	.1470	6.2509E-03
262.000	5.9811E-03	.4886	0.000	.1071	.1382	7.7455E-02	.1577	6.5777E-03
263.000	6.9520E-03	.4957	0.000	.1082	.1447	6.9192E-02	.1478	6.7863E-03
264.000	6.3456E-03	.5161	0.000	9.6333E-02	.1258	9.5331E-02	.1347	5.9516E-03
265.000	6.1108E-03	.4937	0.000	.1040	.1702	6.5108E-02	.1317	7.0843E-03
266.000	6.8401E-03	.6034	0.000	7.3045E-02	7.4898E-02	.1178	9.8648E-02	3.0442E-03
267.000	7.2438E-03	.6007	0.000	9.3626E-02	4.3863E-02	.1767	6.2397E-02	5.8602E-04
268.000	7.1006E-03	.5800	0.000	8.9072E-02	4.8892E-02	.1783	8.0243E-02	6.1570E-04
269.000	7.4212E-03	.6058	0.000	6.3857E-02	4.2092E-02	.1706	9.3975E-02	6.2290E-04
270.000	7.2964E-03	.5951	0.000	6.7927E-02	4.3533E-02	.1923	8.8482E-02	2.1078E-04
271.000	7.3275E-03	.5976	0.000	7.5664E-02	3.3157E-02	.1933	8.5744E-02	8.3059E-05
272.000	7.3700E-03	.5823	0.000	9.7381E-02	2.7195E-02	.1803	9.7146E-02	0.000
273.000	7.1087E-03	.5765	0.000	.1073	2.9778E-02	.1666	.1054	1.3287E-04
274.000	7.0938E-03	.5815	0.000	9.1714E-02	.1330	7.5880E-02	.1029	1.8107E-03
275.000	7.0893E-03	.5862	0.000	9.5039E-02	.1490	3.5753E-02	.1222	3.7055E-04
276.000	7.4538E-03	.6235	0.000	8.5455E-02	.1253	1.8152E-02	.1364	1.4395E-03
277.000	7.4538E-03	.6235	0.000	8.5455E-02	.1253	1.8152E-02	.1364	1.4395E-03
278.000	7.4236E-03	.6210	0.000	8.5109E-02	.1248	1.8078E-02	.1358	3.0066E-03
279.000	7.2745E-03	.6085	0.000	8.3400E-02	.1222	1.7715E-02	.1331	1.0715E-02
280.000	7.2745E-03	.6085	0.000	8.3400E-02	.1222	1.7715E-02	.1331	1.0715E-02
281.000	7.3242E-03	.6127	0.000	8.3969E-02	.1231	1.7836E-02	.1340	8.4864E-03
282.000	7.5277E-03	.6293	0.000	8.3147E-02	.1183	1.7432E-02	.1346	4.7194E-03
283.000	7.5277E-03	.6293	0.000	8.3147E-02	.1183	1.7432E-02	.1346	4.7194E-03

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UCG DB - METC - PRODUCT GAS ANALYSIS 2

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2S molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
160.000	0.000	4.6409E-04	7.4255E-04	1.6291E-03	0.000	1.1230E-02
161.000	0.000	1.8012E-03	2.8751E-03	7.5304E-03	0.000	7.1583E-03
162.000	0.000	1.9548E-03	3.1253E-03	1.0958E-02	0.000	6.7299E-03
163.000	0.000	2.3099E-03	3.6927E-03	1.3687E-02	0.000	6.7442E-03
164.000	0.000	2.6136E-03	4.1815E-03	1.9499E-02	0.000	2.4850E-03
165.000	0.000	2.1192E-03	3.3822E-03	1.6800E-02	0.000	1.4471E-03
166.000	0.000	1.4484E-03	2.3124E-03	1.4402E-02	0.000	9.7055E-03
167.000	0.000	5.7038E-04	9.1261E-04	1.0169E-02	0.000	2.6023E-02
168.000	0.000	3.2931E-04	5.2690E-04	8.7377E-03	0.000	1.3955E-02
169.000	0.000	5.8498E-04	9.3597E-04	1.1960E-02	0.000	1.3582E-02
170.000	0.000	1.0972E-03	1.7555E-03	1.9857E-02	0.000	9.5334E-03
171.000	0.000	1.0257E-03	1.6411E-03	2.0114E-02	0.000	9.3411E-03
172.000	0.000	7.0558E-04	1.1289E-03	8.4239E-03	0.000	1.8269E-02
173.000	0.000	3.9778E-04	6.3645E-04	1.0225E-02	0.000	1.9052E-02
174.000	0.000	3.8004E-04	6.0807E-04	7.6178E-03	0.000	1.1512E-02
175.000	0.000	2.4934E-04	3.9895E-04	8.4174E-03	0.000	8.2731E-03
176.000	0.000	6.6349E-04	1.0584E-03	6.8462E-03	0.000	5.6533E-03
177.000	0.000	6.1252E-04	9.8003E-04	9.1283E-03	0.000	1.3212E-03
178.000	0.000	8.4439E-04	1.3510E-03	1.0463E-02	0.000	2.3749E-03
179.000	0.000	9.0179E-04	1.4428E-03	1.3917E-02	0.000	7.0233E-04
180.000	0.000	2.2114E-03	3.5367E-03	1.0663E-02	0.000	1.0142E-03
181.000	0.000	8.1685E-04	1.3070E-03	1.5051E-02	0.000	1.5638E-03
182.000	0.000	8.2516E-04	1.3203E-03	1.4753E-02	0.000	8.8842E-03
183.000	0.000	9.0569E-04	1.4491E-03	1.6391E-02	0.000	2.3482E-03
184.000	0.000	9.9684E-04	1.5949E-03	1.6885E-02	0.000	1.2793E-03
185.000	0.000	1.2167E-03	1.9467E-03	2.1848E-02	0.000	6.1360E-04
186.000	0.000	1.1270E-03	1.8031E-03	1.8934E-02	0.000	2.6941E-04
187.000	0.000	9.3636E-04	1.4982E-03	1.5736E-02	0.000	4.4603E-04
188.000	0.000	9.2988E-04	1.4878E-03	1.3350E-02	0.000	8.9062E-03
189.000	0.000	3.3210E-04	5.3136E-04	5.3898E-03	0.000	5.8451E-03
190.000	0.000	7.6334E-04	1.2213E-03	1.0600E-03	0.000	1.7359E-02
191.000	0.000	5.3628E-04	8.5805E-04	6.0465E-03	0.000	4.5050E-03
192.000	0.000	2.2472E-03	3.5955E-03	1.1211E-02	0.000	1.3662E-03
193.000	0.000	3.4731E-03	5.5569E-03	1.5127E-02	0.000	1.3012E-03
194.000	0.000	2.6050E-03	4.1680E-03	1.2173E-02	0.000	9.5557E-04
195.000	0.000	2.7055E-03	4.3289E-03	1.8122E-02	0.000	4.5401E-04
196.000	0.000	2.4766E-03	3.9626E-03	1.8136E-02	0.000	2.4435E-03
197.000	0.000	2.5554E-03	4.0887E-03	1.8505E-02	0.000	6.3376E-04

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TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2S molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
198.000	0.000	2.2260E-03	3.5617E-03	1.6340E-02	0.000	3.2034E-03
199.000	0.000	2.8569E-03	4.5711E-03	2.1984E-02	0.000	2.2976E-03
200.000	0.000	2.8183E-03	4.5092E-03	2.1839E-02	0.000	1.8336E-03
201.000	0.000	2.8183E-03	4.5092E-03	2.1839E-02	0.000	1.8336E-03
202.000	0.000	2.7831E-03	4.4530E-03	2.1310E-02	0.000	1.0543E-03
203.000	0.000	2.7777E-03	4.4443E-03	2.0778E-02	0.000	0.000
204.000	0.000	2.1348E-03	3.4157E-03	1.9844E-02	0.000	1.7000E-05
205.000	0.000	1.2117E-03	1.9387E-03	1.7892E-02	0.000	1.1021E-05
206.000	0.000	5.2814E-04	8.4503E-04	7.3838E-03	0.000	0.000
207.000	0.000	6.1664E-04	9.8663E-04	9.7535E-03	0.000	0.000
208.000	0.000	1.1968E-03	1.9120E-03	1.7704E-02	0.000	0.000
209.000	0.000	7.9792E-04	1.2767E-03	1.3588E-02	0.000	0.000
210.000	0.000	4.9854E-04	7.9766E-04	1.5986E-02	0.000	0.000
211.000	0.000	8.4855E-04	1.3577E-03	1.1989E-02	0.000	0.000
212.000	0.000	1.4720E-03	2.3552E-03	1.4095E-02	0.000	0.000
213.000	0.000	3.9637E-04	6.3419E-04	3.6338E-03	0.000	0.000
214.000	0.000	3.9642E-04	6.2577E-04	3.5929E-03	0.000	0.000
215.000	0.000	5.3085E-04	8.2911E-04	4.0943E-03	0.000	0.000
216.000	0.000	2.3252E-04	3.7204E-04	1.2897E-03	0.000	0.000
217.000	0.000	2.7974E-04	4.3959E-04	2.4741E-03	0.000	0.000
218.000	0.000	6.7502E-04	1.0287E-03	4.3665E-03	0.000	0.000
219.000	0.000	1.0608E-03	1.6191E-03	7.0239E-03	0.000	0.000
220.000	0.000	5.2699E-04	8.1817E-04	8.7006E-03	0.000	0.000
221.000	0.000	2.2226E-04	3.5562E-04	1.2702E-02	0.000	0.000
222.000	0.000	2.1221E-04	3.3826E-04	1.2508E-02	0.000	0.000
223.000	0.000	1.6254E-04	2.6006E-04	6.8010E-03	0.000	0.000
224.000	0.000	4.7610E-04	7.6053E-04	9.7568E-03	0.000	2.0880E-05
225.000	0.000	5.7479E-04	9.1753E-04	1.1447E-02	0.000	1.1384E-03
226.000	0.000	8.4335E-04	1.3423E-03	1.5663E-02	0.000	1.6472E-03
227.000	0.000	8.7768E-04	1.3987E-03	1.7834E-02	0.000	1.9128E-03
228.000	0.000	5.9721E-04	9.5553E-04	1.3375E-02	0.000	1.1607E-03
229.000	0.000	5.0138E-04	8.0197E-04	1.9875E-02	0.000	1.4681E-03
230.000	0.000	8.0712E-04	1.2913E-03	1.8616E-02	0.000	3.0874E-03
231.000	0.000	5.4961E-04	8.7938E-04	1.5633E-02	0.000	2.9828E-03
232.000	0.000	7.7359E-04	1.2377E-03	2.0858E-02	0.000	4.2546E-03
233.000	0.000	5.7619E-04	9.2190E-04	1.6229E-02	0.000	3.7655E-03
234.000	0.000	3.8708E-04	6.1931E-04	1.5236E-02	0.000	1.0073E-02
235.000	0.000	6.2979E-05	1.0076E-04	1.5204E-02	0.000	2.2326E-02
236.000	0.000	5.1339E-05	8.2143E-05	1.6451E-02	0.000	2.8445E-02
237.000	0.000	1.4765E-04	2.3214E-04	1.6378E-02	0.000	3.3126E-02
238.000	0.000	3.1945E-05	5.1112E-05	1.5667E-02	0.000	3.2108E-02
239.000	0.000	1.6434E-05	2.6294E-05	6.7980E-03	0.000	2.1217E-02
240.000	0.000	1.6434E-05	2.6294E-05	6.7980E-03	0.000	2.1217E-02
241.000	0.000	1.6423E-05	2.6277E-05	6.7936E-03	0.000	2.0920E-02
242.000	0.000	1.6465E-05	2.6344E-05	6.8110E-03	0.000	2.9639E-02
243.000	0.000	1.6596E-05	2.6553E-05	6.8651E-03	0.000	3.5100E-02
244.000	0.000	1.6596E-05	2.6553E-05	6.8651E-03	0.000	3.5100E-02

TIME (D)	C2H4 molf IRED1 17	C6 molf IRED1 19	H10 molf IRED1 20	H2S molf IRED1 21	TAR/DRY IRED1 24	H2O/DRY IRED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
245.000	0.000	1.6596E-05	2.6553E-05	6.8651E-03	0.000	3.5100E-02
246.000	0.000	1.6596E-05	2.6553E-05	6.8651E-03	0.000	3.5100E-02
247.000	0.000	1.6596E-05	2.6553E-05	6.8651E-03	0.000	3.5100E-02
248.000	0.000	1.6596E-05	2.6553E-05	6.8651E-03	0.000	3.5100E-02
249.000	0.000	1.6596E-05	2.6553E-05	6.8651E-03	0.000	3.5100E-02
250.000	0.000	1.6596E-05	2.6553E-05	6.8651E-03	0.000	3.5100E-02
251.000	0.000	1.6596E-05	2.6553E-05	6.8651E-03	0.000	3.5100E-02
252.000	0.000	1.6596E-05	2.6553E-05	6.8651E-03	0.000	3.5100E-02
253.000	0.000	1.6596E-05	2.6553E-05	6.8651E-03	0.000	3.5100E-02
254.000	0.000	1.6596E-05	2.6553E-05	6.8651E-03	0.000	3.5100E-02
255.000	0.000	9.6370E-05	1.5419E-04	1.2391E-02	0.000	4.7579E-02
256.000	0.000	1.9543E-04	3.1268E-04	1.7975E-02	0.000	4.2969E-02
257.000	0.000	1.9294E-04	3.0871E-04	1.7747E-02	0.000	3.3866E-02
258.000	0.000	1.9176E-04	3.0682E-04	1.7638E-02	0.000	3.7838E-02
259.000	0.000	1.8156E-04	2.9050E-04	1.6700E-02	0.000	3.8578E-02
260.000	0.000	1.8124E-04	2.8998E-04	1.6670E-02	0.000	3.9579E-02
261.000	0.000	2.1283E-04	3.4053E-04	1.7119E-02	0.000	4.2776E-02
262.000	0.000	3.4631E-04	5.5410E-04	1.7539E-02	0.000	4.4196E-02
263.000	0.000	3.8154E-04	6.1047E-04	1.9741E-02	0.000	5.0184E-02
264.000	0.000	2.4500E-04	3.9199E-04	1.8792E-02	0.000	3.2668E-02
265.000	0.000	3.0662E-04	4.9024E-04	2.1192E-02	0.000	5.1763E-02
266.000	0.000	2.5112E-03	4.0179E-03	1.5722E-02	0.000	.1363
267.000	0.000	4.6099E-03	7.3759E-03	2.8677E-03	0.000	.1172
268.000	0.000	4.8636E-03	7.7818E-03	3.0520E-03	0.000	3.1577E-02
269.000	0.000	4.7796E-03	7.6474E-03	3.1265E-03	0.000	2.4428E-02
270.000	0.000	4.2425E-05	6.7881E-05	5.0462E-03	0.000	4.5153E-02
271.000	0.000	9.3451E-05	1.4334E-04	6.8571E-03	0.000	7.1794E-02
272.000	0.000	1.0089E-05	1.6143E-05	8.2961E-03	0.000	3.3305E-02
273.000	0.000	2.3023E-05	3.6836E-05	7.1923E-03	0.000	2.0247E-02
274.000	0.000	2.5987E-05	4.1579E-05	6.0237E-03	0.000	4.5471E-03
275.000	0.000	6.7329E-05	1.0773E-04	4.1131E-03	0.000	7.7401E-03
276.000	0.000	1.9823E-04	3.1716E-04	1.8501E-03	0.000	2.2130E-02
277.000	0.000	1.9823E-04	3.1716E-04	1.8501E-03	0.000	2.2130E-02
278.000	0.000	2.2469E-04	3.5951E-04	4.2456E-03	0.000	2.2040E-02
279.000	0.000	3.6780E-04	5.8849E-04	1.6092E-02	0.000	2.1597E-02
280.000	0.000	3.6780E-04	5.8849E-04	1.6092E-02	0.000	2.1597E-02
281.000	0.000	4.0257E-04	6.4411E-04	1.1597E-02	0.000	2.1745E-02
282.000	0.000	3.7780E-04	6.0447E-04	3.9011E-03	0.000	2.4358E-02
283.000	0.000	3.7780E-04	6.0447E-04	3.9011E-03	0.000	2.4358E-02

UCG DB - METC - MATERIAL BALANCES

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL RT mo/s IRED1 44	ASH RATE mo/s IRED1 46	H2O INFX mo/s IRED1 47	H2O COAL mo/s IRED1 48	-H2O RXN mo/s IRED1 49	O2 per COAL IRED1 60	H2O per COAL IRED1 61	CHAR RT mo/s IRED1 64	CHAR per COAL IRED1 63	RECOVORY % IRED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
160.000	3.4833E-02	8.4034E-04	2.7470E-02	4.3748E-04	2.6321E-02	.1206	.7028	.1321	.7705	15.98
161.000	9.9126E-02	2.3914E-03	8.9216E-02	1.2449E-03	8.8162E-02	-3.250E-02	.8682	.4248	.8112	42.99
162.000	7.9929E-02	1.9283E-03	8.2141E-02	1.0038E-03	8.1787E-02	-6.856E-02	.9923	.3688	.8258	30.29
163.000	.1411	3.4033E-03	.1435	1.7717E-03	.1440	-2.276E-02	.9444	.5880	.8165	51.41
164.000	.2817	6.7954E-03	.2900	3.5377E-03	.2916	-.1880	1.035	1.152	.8034	82.37
165.000	.3549	8.5611E-03	.3603	4.4569E-03	.3632	-.1985	1.035	1.203	.7770	70.82
166.000	.5800	1.3993E-02	.5725	7.2846E-03	.5629	-.1932	1.026	2.389	.8045	119.3
167.000	.2480	5.9837E-03	.2469	3.1151E-03	.2260	-.1163	1.042	.9978	.8384	74.85
168.000	.2239	5.4006E-03	.1401	2.8115E-03	.1309	5.1298E-02	.7956	.6812	.7159	72.32
169.000	.5600	1.3509E-02	.4978	7.0329E-03	.4862	-6.094E-02	.8607	1.462	.7134	77.38
170.000	.6378	1.5386E-02	.6396	8.0102E-03	.6357	-.1902	.9947	1.769	.7334	63.11
171.000	.4623	1.1153E-02	.5096	5.8061E-03	.5070	-.3098	1.139	1.544	.7729	59.04
172.000	.2558	6.1708E-03	.1004	3.2125E-03	8.8530E-02	.3950	.3313	.3853	.2084	79.73
173.000	.1752	4.2274E-03	.1439	2.2008E-03	.1359	3.7712E-02	.8100	.4318	.7051	76.77
174.000	.2179	5.2574E-03	.1626	2.7370E-03	.1558	6.0278E-02	.7713	.7645	.7321	121.4
175.000	.1801	4.3445E-03	.1359	2.2618E-03	.1352	-4.796E-02	.9083	.3709	.6761	72.09
176.000	.2606	6.2866E-03	.1545	3.2728E-03	.1528	.2171	.6399	.5803	.5326	114.9
177.000	.3508	8.4624E-03	.3122	4.4055E-03	.3153	-8.004E-02	.8991	.9558	.7299	98.03
178.000	.3534	8.5259E-03	.3441	4.4386E-03	.3470	-.1912	1.003	1.124	.7673	274.6
179.000	.3769	9.0936E-03	.3621	4.7341E-03	.3662	-.1697	.9745	1.197	.7613	102.0
180.000	.4698	1.1335E-02	.4585	5.9009E-03	.4634	-.1939	.9866	1.428	.7523	97.34
181.000	.4294	1.0360E-02	.4095	5.3933E-03	.4135	-.1613	.9627	1.226	.7402	92.82
182.000	.5018	1.2105E-02	.4959	6.3021E-03	.4931	-.1807	.9825	1.434	.7409	102.0
183.000	.5216	1.2584E-02	.4980	6.5513E-03	.5020	-.1628	.9620	1.405	.7287	103.2
184.000	.4702	1.1344E-02	.4638	5.9059E-03	.4685	-.1994	1.004	1.310	.7359	104.4
185.000	.3437	8.2920E-03	.3302	4.3168E-03	.3841	-.2862	1.115	1.170	.7728	104.8
186.000	.2770	6.6825E-03	.2563	3.4789E-03	.2596	-.1163	.9349	.7931	.7399	120.6
187.000	.2359	5.6917E-03	.1951	2.9631E-03	.1978	-2.250E-02	.8366	.6147	.7223	121.9
188.000	.3045	7.3465E-03	.1995	3.8246E-03	.1940	.1280	.6614	.5591	.6465	127.8
189.000	.2878	6.9422E-03	.2273	3.6141E-03	.2235	5.5463E-02	.8076	.9617	.7611	127.9
190.000	5.6613E-02	1.3658E-03	6.4911E-02	7.1102E-04	6.0657E-02	-.1267	.9649	.7930	.9057	104.2
191.000	3.4993E-02	8.4420E-04	3.9763E-02	4.3949E-04	3.9728E-02	-.3264	1.155	.2019	.8515	30.40
192.000	8.8365E-02	2.1318E-03	8.1464E-02	1.1098E-03	8.2255E-02	-.1331	.9268	.3612	.8083	82.60
193.000	.1131	2.7280E-03	.1046	1.4202E-03	.1056	-.1295	.9345	.4352	.7941	100.1
194.000	.1418	3.4198E-03	.1394	1.7803E-03	.1408	-.1728	.9910	.5394	.7913	88.94
195.000	.1645	3.9689E-03	.1668	2.0662E-03	.1686	-.2016	1.025	.6467	.7976	90.12
196.000	.2340	5.6440E-03	.2435	2.9383E-03	.2451	-.2195	1.047	.8640	.7863	93.67
197.000	.2569	6.1982E-03	.2688	3.2268E-03	.2717	-.2328	1.058	.9458	.7859	112.8

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TIME (D)	COAL RT mo/s !RED1 44	ASH RATE mo/s !RED1 46	H2O INFX mo/s !RED1 47	H2O COAL mo/s !RED1 48	-H2O RXN mo/s !RED1 49	O2 per COAL !RED1 60	H2O per COAL !RED1 61	CHAR RT mo/s !RED1 64	CHAR per COAL !RED1 63	RECOVERY % !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
198.000	.2325	5.6080E-03	.2305	2.9195E-03	.2316	-.1787	1.003	.8528	.7876	149.9
199.000	.1978	4.7715E-03	.2030	2.4840E-03	.2044	-.2097	1.038	.6609	.7705	116.6
200.000	.1944	4.6886E-03	.2033	2.4409E-03	.2050	-.2257	1.055	.6770	.7770	124.1
201.000	.2089	5.0389E-03	.2185	2.6233E-03	.2203	-.2257	1.055	.7276	.7770	122.9
202.000	.1916	4.6219E-03	.2001	2.4062E-03	.2020	-.2257	1.054	.6693	.7774	123.0
203.000	.2143	5.1693E-03	.2303	2.6911E-03	.2330	-.2567	1.089	.7603	.7802	112.4
204.000	.3167	7.6393E-03	.3239	3.9770E-03	.3279	-.2271	1.056	.9949	.7651	131.0
205.000	.2562	6.1810E-03	.2645	3.2178E-03	.2677	-.2068	1.039	.7159	.7335	110.3
206.000	.2336	5.6357E-03	.2224	2.9339E-03	.2253	-.1366	.9668	.6315	.7306	120.7
207.000	.2675	6.4528E-03	.2540	3.3593E-03	.2573	-.1485	.9772	.7535	.7407	122.4
208.000	.4717	1.1380E-02	.4506	5.9242E-03	.4565	-.1551	.9728	1.315	.7354	135.6
209.000	.5264	1.2699E-02	.4163	6.6113E-03	.4229	-2.217E-02	.8038	1.197	.6940	111.5
210.000	.2975	7.1766E-03	.3055	3.7361E-03	.3092	-.2939	1.160	1.207	.8207	169.0
211.000	.2321	5.5987E-03	.1935	2.9147E-03	.1964	4.0879E-02	.8202	.6584	.7206	163.3
212.000	.1554	3.7496E-03	.1539	1.9520E-03	.1559	-.1012	.9662	.4875	.7472	87.07
213.000	8.7798E-02	2.1181E-03	1.8603E-02	1.1027E-03	1.9705E-02	.6894	.1164	9.3678E-02	.3628	128.6
214.000	7.7306E-02	1.8650E-03	-3.078E-04	9.7091E-04	6.6314E-04	.7889	7.5214E-03	2.5154E-02	.2209	128.2
215.000	.1163	2.8055E-03	2.1275E-02	1.4605E-03	2.2736E-02	.6470	.1680	6.6808E-02	.2229	168.9
216.000	6.0767E-02	1.4660E-03	3.3105E-02	7.6319E-04	3.3868E-02	.2608	.6155	.2359	.8103	107.2
217.000	.1725	4.1614E-03	-1.068E-02	2.1664E-03	-8.517E-03	.7931	-3.963E-02	-4.760E-02	-.3851	108.9
218.000	.2351	5.6721E-03	.1139	2.9529E-03	.1168	.2597	.5523	.3867	.4534	105.1
219.000	.3280	7.9129E-03	.1359	4.1194E-03	.1401	.4103	.4318	.2808	.4436	114.5
220.000	.3140	7.5753E-03	.1330	3.9437E-03	.1369	.4103	.3968	.4115	.5328	200.3
221.000	.6053	1.4602E-02	.4183	7.6018E-03	.4259	.1393	.7175	1.369	.6912	114.1
222.000	.4398	1.0609E-02	.3370	5.5231E-03	.3425	4.1027E-02	.8337	.9490	.6925	109.5
223.000	.1911	4.6106E-03	6.0001E-02	2.4003E-03	6.2401E-02	.4088	.4222	.2902	.5629	109.8
224.000	.2896	6.9876E-03	5.2519E-02	3.6377E-03	5.6133E-02	.6127	.1852	2.5929E-02	-1.515E-02	116.9
225.000	.3570	8.6130E-03	.1731	4.4839E-03	.1764	.3166	.5039	.4231	.5073	124.6
226.000	.2625	6.3326E-03	.1642	3.2968E-03	.1662	.2147	.6583	.4970	.6543	107.5
227.000	.3545	8.5533E-03	.2757	4.4529E-03	.2785	7.1354E-02	.7905	.7308	.6750	116.8
228.000	.3520	8.4926E-03	.1059	4.4213E-03	.1092	.4883	.3185	.2763	.4086	108.5
229.000	.9748	2.3517E-02	.9623	1.2243E-02	.9717	-.1657	.9785	2.979	.7472	94.40
230.000	.9849	2.3761E-02	.6802	1.2370E-02	.6846	.1296	.6653	1.718	.5968	111.3
231.000	.7753	1.8703E-02	.4890	9.7367E-03	.4926	.1504	.6256	1.274	.6093	102.1
232.000	.7530	1.8166E-02	.5751	9.4575E-03	.5761	-2.639E-02	.8360	1.605	.6923	90.27
233.000	1.320	3.1842E-02	.9138	1.6577E-02	.9141	9.1688E-02	.6853	2.474	.6512	96.25
234.000	2.460	5.9347E-02	2.043	3.0896E-02	2.009	-2.630E-02	.7952	5.664	.6883	106.5
235.000	3.435	8.2875E-02	3.066	4.3145E-02	2.928	-6.484E-02	.8523	8.281	.7066	98.10
236.000	3.498	8.4397E-02	3.214	4.3937E-02	3.021	-6.330E-02	.8637	8.358	.7050	98.87
237.000	3.230	7.7931E-02	2.975	4.0571E-02	2.754	-4.396E-02	.8518	7.592	.7013	97.55
238.000	2.925	7.0557E-02	2.682	3.6732E-02	2.490	-3.867E-02	.8500	6.740	.6968	95.81
239.000	2.220	5.3550E-02	1.562	2.7878E-02	1.459	.1452	.6574	3.782	.6301	124.8
240.000	1.075	2.5923E-02	.7563	1.3496E-02	.7065	.1452	.6574	1.831	.6301	154.3
241.000	1.358	3.2752E-02	.9465	1.7051E-02	.8847	.1497	.6527	2.290	.6277	102.1
242.000	1.801	4.3459E-02	1.326	2.2625E-02	1.193	.1592	.6547	3.266	.6350	94.83
243.000	1.938	4.6753E-02	1.528	2.4340E-02	1.361	.1176	.7020	3.801	.6623	103.5
244.000	1.936	4.6702E-02	1.526	2.4313E-02	1.359	.1176	.7020	3.796	.6623	230.6

TIME (D)	COAL RT mo/s IRED1 44	ASH RATE mo/s IRED1 46	H2O INFX mo/s IRED1 47	H2O COAL mo/s IRED1 48	-H2O RXN mo/s IRED1 49	O2 per COAL IRED1 60	H2O per COAL IRED1 61	CHAR RT mo/s IRED1 64	CHAR per COAL IRED1 63	RECOVORY % IRED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
245.000	2.030	4.8964E-02	1.600	2.5491E-02	1.425	.1176	.7020	3.980	.6623	115.4
246.000	1.985	4.7885E-02	1.565	2.4929E-02	1.393	.1176	.7020	3.893	.6623	112.1
247.000	1.970	4.7523E-02	1.553	2.4740E-02	1.383	.1176	.7020	3.863	.6623	113.4
248.000	2.296	5.5397E-02	1.810	2.8840E-02	1.612	.1176	.7020	4.503	.6623	120.4
249.000	2.049	4.9432E-02	1.615	2.5734E-02	1.438	.1176	.7020	4.018	.6623	121.4
250.000	2.328	5.6150E-02	1.835	2.9232E-02	1.634	.1176	.7020	4.565	.6623	118.9
251.000	2.346	5.6588E-02	1.849	2.9460E-02	1.647	.1176	.7020	4.600	.6623	126.0
252.000	2.226	5.3700E-02	1.755	2.7956E-02	1.563	.1176	.7020	4.365	.6623	118.9
253.000	2.090	5.0415E-02	1.647	2.6246E-02	1.467	.1176	.7020	4.098	.6623	113.8
254.000	2.181	5.2617E-02	1.719	2.7393E-02	1.531	.1176	.7020	4.277	.6623	145.4
255.000	2.078	5.0121E-02	1.862	2.6093E-02	1.627	4.4083E-02	.7839	4.576	.6862	143.4
256.000	2.389	5.7642E-02	1.923	3.0009E-02	1.680	9.5044E-02	.7163	4.943	.6721	98.13
257.000	2.480	5.9832E-02	2.004	3.1148E-02	1.806	8.2706E-02	.7288	5.011	.6687	95.26
258.000	2.326	5.6117E-02	1.966	2.9214E-02	1.760	6.0105E-02	.7566	4.824	.6739	90.17
259.000	2.339	5.6421E-02	1.873	2.9373E-02	1.667	9.9453E-02	.7127	3.953	.6280	93.06
260.000	2.073	5.0015E-02	1.648	2.6038E-02	1.459	.1087	.7037	3.441	.6241	85.61
261.000	2.345	5.6563E-02	1.872	2.9447E-02	1.637	.1196	.6982	3.794	.6166	85.07
262.000	2.201	5.3110E-02	1.745	2.7649E-02	1.522	.1323	.6912	3.098	.5826	82.04
263.000	2.279	5.4973E-02	1.974	2.8619E-02	1.691	8.2874E-02	.7554	4.250	.6512	96.24
264.000	2.523	6.0878E-02	1.715	3.1693E-02	1.526	.1560	.6315	3.706	.5892	97.74
265.000	2.455	5.9229E-02	2.400	3.0834E-02	2.110	-2.173E-02	.8610	6.407	.7198	111.1
266.000	5.520	.1332	5.144	6.9324E-02	2.369	.2514	.4522	10.63	.6492	324.2
267.000	12.58	.3036	8.455	.1580	4.009	.2994	.3145	18.85	.6003	134.9
268.000	14.18	.3421	5.177	.1781	4.030	.3318	.2841	12.60	.4704	140.3
269.000	12.97	.3130	2.980	.1629	2.204	.4203	.1697	5.697	.3010	117.3
270.000	12.62	.3046	2.814	.1586	1.226	.4922	9.6890E-02	8.5806E-02	1.0079E-03	113.6
271.000	11.67	.2816	3.454	.1466	.9381	.5154	8.0366E-02	-8.296E-02	-1.069E-02	110.8
272.000	12.20	.2944	2.726	.1533	1.554	.5235	.1272	-.7898	-.1329	115.9
273.000	11.90	.2871	2.770	.1495	2.129	.5092	.1774	.5124	-6.915E-02	117.3
274.000	10.01	.2416	7.003	.1258	6.953	4.9672E-02	.7527	27.73	.6161	126.8
275.000	12.45	.3002	11.38	.1563	11.23	-1.022E-02	.8830	45.53	.6623	117.9
276.000	10.09	.2434	8.855	.1267	8.196	7.8702E-02	.8124	35.24	.7775	129.7
277.000	10.48	.2528	9.198	.1316	8.513	7.8702E-02	.8124	36.61	.7775	125.2
278.000	6.056	.1461	5.346	7.6057E-02	4.953	6.7354E-02	.8237	21.25	.7790	207.6
279.000	2.154	5.1957E-02	2.023	2.7049E-02	1.893	1.1375E-02	.8792	7.937	.7866	135.2
280.000	1.456	3.5117E-02	1.367	1.8282E-02	1.280	1.1375E-02	.8792	5.364	.7866	103.3
281.000	.9638	2.3251E-02	.8909	1.2105E-02	.8319	2.8272E-02	.8599	3.505	.7838	56.42
282.000	.7778	1.8765E-02	.6963	9.7690E-03	.6403	8.0125E-02	.8057	2.775	.7817	40.04
283.000	.7778	1.8765E-02	.6963	9.7690E-03	.6403	8.0125E-02	.8057	2.775	.7817	40.04

UCG DB - METC - ENERGY PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/O2 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
160.000	15.85	1.119	0.000	2.0893E-03	4.7267E-03	0.000	2.7499E-03	-.1386	158.0	1164.
161.000	45.10	1.263	0.000	4.2427E-04	2.5498E-03	0.000	2.7499E-03	-.2665	165.7	994.8
162.000	36.37	1.307	0.000	2.2329E-03	3.5454E-03	0.000	2.7499E-03	-.3047	175.3	1097.
163.000	64.19	1.260	0.000	2.4224E-03	4.1580E-03	0.000	2.7499E-03	-.2526	177.2	1134.
164.000	128.2	1.416	0.000	2.8447E-04	6.7323E-04	0.000	2.7499E-03	-.3989	232.2	1568.
165.000	161.5	1.417	0.000	1.0633E-03	3.3994E-04	0.000	2.7499E-03	-.4090	267.2	2053.
166.000	263.9	1.445	0.000	1.1046E-02	3.9734E-03	0.000	2.7499E-03	-.4471	211.2	1595.
167.000	112.9	1.411	0.000	.1085	4.2774E-02	0.000	2.7499E-03	-.5374	145.2	1092.
168.000	101.9	1.241	0.000	2.3965E-02	8.7108E-03	0.000	2.7499E-03	-.2531	107.1	701.3
169.000	254.8	1.286	0.000	8.7357E-03	3.4415E-03	0.000	2.7499E-03	-.2966	244.1	1966.
170.000	290.2	1.394	0.000	6.5255E-03	1.7961E-03	0.000	2.7499E-03	-.3940	324.5	2998.
171.000	210.3	1.514	0.000	6.4731E-03	1.8761E-03	0.000	2.7499E-03	-.5128	335.2	2812.
172.000	116.4	.8339	0.000	1.3855E-02	6.1212E-03	0.000	2.7499E-03	.1479	112.1	650.6
173.000	79.73	1.192	0.000	1.2486E-02	5.4199E-03	0.000	2.7499E-03	-.2084	199.7	1567.
174.000	99.16	1.154	0.000	1.7101E-02	4.4346E-03	0.000	2.7499E-03	-.1767	163.8	1480.
175.000	81.94	1.262	0.000	1.2679E-02	2.1736E-03	0.000	2.7499E-03	-.2805	253.2	4799.
176,000	118.6	1.029	0.000	5.4573E-02	1.3445E-02	0.000	2.7499E-03	-9.288E-02	133.6	994.1
177.000	159.6	1.347	0.000	7.7495E-03	3.3724E-04	0.000	2.7499E-03	-.3569	233.6	1935.
178.000	160.8	1.426	0.000	8.2285E-03	7.1029E-04	0.000	2.7499E-03	-.4353	263.3	2188.
179.000	171.5	1.402	0.000	8.6950E-03	1.6266E-04	0.000	2.7499E-03	-.4056	267.9	2186.
180.000	213.8	1.414	0.000	6.6795E-03	2.1457E-04	0.000	2.7499E-03	-.4225	295.0	2566.
181.000	195.4	1.384	0.000	5.6292E-03	3.3101E-04	0.000	2.7499E-03	-.3852	286.3	2477.
182.000	228.3	1.398	0.000	5.4379E-03	1.8578E-03	0.000	2.7499E-03	-.4021	300.0	2673.
183.000	237.3	1.381	0.000	5.4608E-03	4.6790E-04	0.000	2.7499E-03	-.3816	301.5	2718.
184.000	214.0	1.414	0.000	5.6476E-03	2.5118E-04	0.000	2.7499E-03	-.4146	321.9	3095.
185.000	156.4	1.498	0.000	7.2967E-03	1.1829E-04	0.000	2.7499E-03	-.4936	341.5	3259.
186.000	126.0	1.332	0.000	9.0734E-03	6.0026E-05	0.000	2.7499E-03	-.3288	260.6	2012.
187.000	107.3	1.242	0.000	9.9708E-03	1.1077E-04	0.000	2.7499E-03	-.2427	221.5	1580.
188.000	138.6	1.103	0.000	8.4119E-03	2.4270E-03	0.000	2.7499E-03	-.1066	182.3	1233.
189.000	130.9	1.172	0.000	2.8581E-02	2.9333E-03	0.000	2.7499E-03	-.2065	124.6	882.6
190.000	25.76	1.319	0.000	5.6676E-02	9.1818E-03	0.000	2.7499E-03	-.3931	99.76	628.2
191.000	15.92	1.507	0.000	1.6194E-02	1.2867E-03	0.000	2.7499E-03	-.5278	235.1	1532.
192.000	40.21	1.331	0.000	1.5302E-02	4.1815E-04	0.000	2.7499E-03	-.3423	207.8	1294.
193.000	51.45	1.344	0.000	1.3012E-02	3.5008E-04	0.000	2.7499E-03	-.3464	218.9	1404.
194.000	64.50	1.385	0.000	8.6690E-03	2.4482E-04	0.000	2.7499E-03	-.3894	239.3	1657.
195.000	74.86	1.416	0.000	1.0291E-02	1.1515E-04	0.000	2.7499E-03	-.4125	248.8	1717.
196.000	106.4	1.432	0.000	1.1366E-02	5.6001E-04	0.000	2.7499E-03	-.4327	271.8	2032.
197.000	116.9	1.437	0.000	1.1050E-02	1.4059E-04	0.000	2.7499E-03	-.4374	282.9	2131.

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TIME (D)	COAL kJ /mol IRED1 72	PRODUCT frac IRED1 74	TAR frac IRED1 73	SEN frac IRED1 76	STEAM frac IRED1 77	COOLING frac IRED1 80	SEN HT INSU IRED1 78	LOSS frac IRED1 75	HC kJ /mol IRED1 81	HC/02 kJ /mol IRED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
198.000	105.8	1.379	0.000	1.2230E-02	8.0144E-04	0.000	2.7499E-03	-.3815	246.9	1694.
199.000	89.99	1.418	0.000	1.1528E-02	4.9306E-04	0.000	2.7499E-03	-.4154	290.1	2264.
200.000	88.43	1.434	0.000	1.1320E-02	3.9416E-04	0.000	2.7499E-03	-.4307	293.0	2285.
201.000	95.04	1.434	0.000	9.4460E-03	3.9416E-04	0.000	2.7499E-03	-.4288	293.0	2285.
202.000	87.17	1.432	0.000	1.1533E-02	2.2664E-04	0.000	2.7499E-03	-.4300	292.6	2273.
203.000	97.49	1.464	0.000	1.2187E-02	0.000	0.000	2.7499E-03	-.4636	308.4	2524.
204.000	144.1	1.449	0.000	1.0055E-02	3.8077E-06	0.000	2.7499E-03	-.4477	302.8	2688.
205.000	116.6	1.424	0.000	8.1933E-03	2.1916E-06	0.000	2.7499E-03	-.4256	327.0	3293.
206.000	106.3	1.335	0.000	9.3417E-03	0.000	0.000	2.7499E-03	-.3503	276.6	2321.
207.000	121.7	1.350	0.000	8.8619E-03	0.000	0.000	2.7499E-03	-.3619	275.7	2270.
208.000	214.6	1.377	0.000	8.4068E-03	0.000	0.000	2.7499E-03	-.3767	286.0	2452.
209.000	239.5	1.252	0.000	9.0255E-03	0.000	0.000	2.7499E-03	-.2563	237.7	1838.
210.000	135.4	1.537	0.000	1.2268E-02	0.000	0.000	2.7499E-03	-.5263	219.0	1658.
211.000	105.6	1.178	0.000	1.2994E-02	0.000	0.000	2.7499E-03	-.1862	203.9	1718.
212.000	70.72	1.116	0.000	4.5114E-03	0.000	0.000	2.3374E-03	-.2659	242.3	1571.
213.000	39.95	.4979	0.000	2.0167E-02	0.000	0.000	2.7499E-03	.4738	65.95	400.8
214.000	35.17	.4109	0.000	2.2739E-02	0.000	0.000	2.7499E-03	.5593	44.02	224.8
215.000	52.91	.5656	0.000	2.6505E-02	0.000	0.000	2.7499E-03	.4014	66.52	367.1
216.000	27.65	.9414	0.000	4.2914E-02	0.000	0.000	2.7499E-03	4.1251E-03	65.28	355.6
217.000	78.49	.4150	0.000	2.0288E-02	0.000	0.000	2.7499E-03	.5539	48.83	260.2
218.000	107.0	.9699	0.000	1.4252E-02	0.000	0.000	2.7499E-03	8.2373E-03	134.7	896.1
219.000	149.2	.8547	0.000	9.5986E-03	0.000	0.000	2.7499E-03	.1341	113.4	726.8
220.000	142.9	.8602	0.000	1.1326E-02	0.000	0.000	2.7499E-03	.1317	110.6	593.5
221.000	275.4	1.138	0.000	6.2551E-03	0.000	0.000	2.7499E-03	-.1342	160.4	1102.
222.000	200.1	1.214	0.000	7.3702E-03	0.000	0.000	2.7499E-03	-.2150	194.3	1499.
223.000	86.96	.7918	0.000	1.7229E-02	0.000	0.000	2.7499E-03	.1905	100.2	571.2
224.000	131.8	.6251	0.000	1.2925E-02	6.8167E-06	0.000	2.7499E-03	.3676	80.44	466.8
225.000	162.4	.9273	0.000	1.1120E-02	3.3522E-04	0.000	2.7499E-03	6.7200E-02	140.7	967.2
226.000	119.4	1.030	0.000	1.3550E-02	4.9486E-04	0.000	2.7499E-03	-2.876E-02	149.4	987.2
227.000	161.3	1.169	0.000	1.0366E-02	4.9653E-04	0.000	2.7499E-03	-.1663	204.4	1738.
228.000	160.2	.7592	0.000	1.3690E-02	4.0669E-04	0.000	2.7499E-03	.2407	97.92	573.9
229.000	443.5	1.387	0.000	4.3981E-03	3.1461E-04	0.000	2.7499E-03	-.3798	283.8	2385.
230.000	448.1	1.112	0.000	4.5233E-03	7.7561E-04	0.000	2.7499E-03	-.1025	198.1	1458.
231.000	352.7	1.105	0.000	2.8653E-03	7.8428E-04	0.000	2.7499E-03	-9.781E-02	185.2	1100.
232.000	342.6	1.266	0.000	5.0975E-03	1.0147E-03	0.000	2.7499E-03	-.2559	236.6	1539.
233.000	600.6	1.154	0.000	7.2292E-04	9.4926E-04	0.000	2.7499E-03	-.1447	199.7	1438.
234.000	1119.	1.205	0.000	-7.431E-03	2.3209E-03	0.000	2.6124E-03	-.2429	241.9	1838.
235.000	1563.	1.306	0.000	-4.247E-03	5.0926E-03	0.000	2.7499E-03	-.3005	251.6	2059.
236.000	1592.	1.308	0.000	-3.569E-03	6.5215E-03	0.000	2.7499E-03	-.3023	250.7	2071.
237.000	1470.	1.291	0.000	-2.645E-03	7.7955E-03	0.000	2.7499E-03	-.2870	241.1	1956.
238.000	1331.	1.285	0.000	-5.837E-03	7.5477E-03	0.000	2.7499E-03	-.2792	240.4	1972.
239.000	1010.	1.089	0.000	1.5219E-03	5.6951E-03	0.000	2.7499E-03	-.1012	178.3	1254.
240.000	488.9	1.089	0.000	-1.513E-02	5.6951E-03	0.000	2.7499E-03	-8.455E-02	178.3	1254.
241.000	617.7	1.085	0.000	-8.025E-03	5.6236E-03	0.000	2.7499E-03	-8.711E-02	177.1	1244.
242.000	819.7	1.071	0.000	-1.258E-02	8.1135E-03	0.000	2.7499E-03	-7.118E-02	170.4	1168.
243.000	881.8	1.111	0.000	-6.665E-03	9.5382E-03	0.000	2.7499E-03	-.1182	179.6	1247.
244.000	880.8	1.111	0.000	3.0844E-04	9.5382E-03	0.000	2.7499E-03	-.1251	179.6	1247.

TIME (D)	COAL /mol IRED1 72	PRODUCT frac IRED1 74	TAR frac IRED1 73	SENS HT frac IRED1 76	STEAM frac IRED1 77	COOLING frac IRED1 80	SEN HT INSU IRED1 78	LOSS frac IRED1 75	HC kJ /mol IRED1 81	HC/02 kJ /mol IRED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
245.000	923.5	1.111	0.000	-4.975E-04	9.5382E-03	0.000	2.7499E-03	-.1243	179.6	1247.
246.000	903.1	1.111	0.000	-3.178E-03	9.5382E-03	0.000	2.7499E-03	-.1216	179.6	1247.
247.000	896.3	1.111	0.000	-4.439E-05	9.5382E-03	0.000	2.7499E-03	-.1248	179.6	1247.
248.000	1045.	1.111	0.000	-1.404E-02	9.5382E-03	0.000	2.7499E-03	-.1108	179.6	1247.
249.000	932.3	1.111	0.000	-1.666E-02	9.5382E-03	0.000	2.7499E-03	-.1082	179.6	1247.
250.000	1059.	1.111	0.000	2.3083E-03	9.5382E-03	0.000	2.7499E-03	-.1271	179.6	1247.
251.000	1067.	1.111	0.000	-4.228E-03	9.5382E-03	0.000	2.7499E-03	-.1206	179.6	1247.
252.000	1013.	1.111	0.000	-1.261E-02	9.5382E-03	0.000	2.7499E-03	-.1122	179.6	1247.
253.000	950.9	1.111	0.000	-7.734E-03	9.5382E-03	0.000	2.7499E-03	-.1171	179.6	1247.
254.000	992.4	1.111	0.000	-5.609E-03	9.5382E-03	0.000	2.7499E-03	-.1192	179.6	1247.
255.000	945.3	1.190	0.000	3.4712E-03	1.2138E-02	0.000	2.7499E-03	-.2014	203.5	1496.
256.000	1087.	1.156	0.000	-1.569E-03	1.1375E-02	0.000	2.7499E-03	-.1494	189.5	1343.
257.000	1128.	1.171	0.000	-2.743E-03	8.9130E-03	0.000	2.7499E-03	-.1621	195.2	1408.
258.000	1058.	1.189	0.000	2.5178E-03	9.7590E-03	0.000	2.7499E-03	-.1877	202.6	1485.
259.000	1064.	1.149	0.000	3.5397E-04	9.7061E-03	0.000	2.7499E-03	-.1474	200.8	1507.
260.000	943.3	1.139	0.000	2.7174E-03	1.0018E-02	0.000	2.7499E-03	-.1406	197.8	1472.
261.000	1067.	1.130	0.000	2.8843E-03	1.0924E-02	0.000	2.7499E-03	-.1317	194.5	1444.
262.000	1002.	1.116	0.000	2.8405E-03	1.1009E-02	0.000	2.7499E-03	-.1169	197.2	1504.
263.000	1037.	1.169	0.000	9.7555E-04	1.2922E-02	0.000	2.7499E-03	-.1657	202.7	1590.
264.000	1148.	1.103	0.000	-4.021E-03	8.4716E-03	0.000	2.7499E-03	-9.107E-02	187.5	1395.
265.000	1117.	1.270	0.000	2.2016E-03	1.3126E-02	0.000	2.7499E-03	-.2659	224.1	1758.
266.000	2512.	1.022	0.000	5.5580E-03	4.3487E-02	0.000	2.7499E-03	-5.532E-02	145.8	903.3
267.000	5726.	.9781	0.000	3.8525E-02	3.7083E-02	0.000	2.7499E-03	-6.476E-02	139.0	864.3
268.000	6453.	.9362	0.000	4.5363E-02	9.0234E-03	0.000	2.7499E-03	-1.706E-03	143.9	921.7
269.000	5903.	.8367	0.000	6.3584E-02	7.0048E-03	0.000	2.7499E-03	8.1717E-02	128.2	785.9
270.000	5744.	.7841	0.000	7.1768E-02	1.3506E-02	0.000	2.7499E-03	.1237	115.9	723.7
271.000	5312.	.7743	0.000	7.8616E-02	2.2081E-02	0.000	2.7499E-03	.1222	110.2	685.1
272.000	5552.	.7776	0.000	8.0588E-02	1.0642E-02	0.000	2.7499E-03	.1318	107.8	688.2
273.000	5416.	.7888	0.000	8.2756E-02	6.5094E-03	0.000	2.7499E-03	.1205	108.7	702.1
274.000	4557.	1.185	0.000	7.2434E-02	1.4809E-03	0.000	2.7499E-03	-.2638	172.4	1117.
275.000	5663.	1.225	0.000	8.7683E-02	2.5844E-03	0.000	2.7499E-03	-.3238	173.2	1105.
276.000	4590.	1.125	0.000	9.5433E-02	7.5277E-03	0.000	2.7499E-03	-.2403	145.3	865.3
277.000	4768.	1.125	0.000	9.6573E-02	7.5277E-03	0.000	2.7499E-03	-.2414	145.3	865.3
278.000	2755.	1.141	0.000	7.7474E-02	7.4436E-03	0.000	2.7499E-03	-.2336	148.6	889.3
279.000	979.9	1.223	0.000	2.7282E-02	7.0288E-03	0.000	2.7499E-03	-.2388	165.1	1008.
280.000	662.3	1.223	0.000	1.7466E-02	7.0288E-03	0.000	2.7499E-03	-.2290	165.1	1008.
281.000	438.5	1.196	0.000	1.7158E-02	7.1352E-03	0.000	2.7499E-03	-.2116	160.2	971.5
282.000	353.9	1.128	0.000	1.5362E-02	8.5835E-03	0.000	2.7499E-03	-.1595	145.3	862.8
283.000	353.9	1.128	0.000	1.5362E-02	8.5835E-03	0.000	2.7499E-03	-.1595	145.3	862.8

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UNDERGROUND COAL GASIFICATION

DATA BASE

GULF RESEARCH AND DEVELOPMENT COMPANY

RAWLINS I

DAILY AVERAGE RESULTS

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RAWLINS COAL ANALYSIS
                                                                    KG/M**3   KJ/MOLE
COAL H/C  COAL O/C  COAL S/C  COAL N/C  WT F H2O  WT F ASH  DENSITY   HT COMB
.825      .195      0.0011    0.010     .1462     .0507     1350.     425.

CHAR H/C  CHAR O/C  CHAR S/C  CHAR N/C    HC - KJ/MOL
.17       0.016     0.0016    0.0065

 TAR H/C   TAR O/C   TAR S/C   TAR N/C   C/MOLECULE    HC
1.33       0.000     0.000     0.000     9.000

  COAL     ASH&CHAR ---  TEMPERATURES (K)
  300.     1000.

 2   NUMBER OF POINTS ON OXYGEN TRACER TYPE CURVE
333.5      2   TIME,TRACER FLAG   (0=NONE, 1=ARGON, 2=NITROGEN)
999.0      0   TIME,TRACER FLAG   (0=NONE, 1=ARGON, 2=NITROGEN)

 2   NUMBER OF POINTS ON GAS LOSS TRACER TYPE CURVE
333.5      2   TIME,TRACER FLAG   (0=NONE, 1=ARGON, 2=NITROGEN)
999.0      0   TIME,TRACER FLAG   (0=NONE, 1=ARGON, 2=NITROGEN)

 1   NUMBER OF POINTS ON CHAR FLAG CURVE
999.0      0   TIME,TRACER FLAG   (0=DO NOT USE CHAR, 1=USE CHAR)
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UCG DB - GULF - OPERATING PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	INJ RATE mo/s !RED1 90	PRD RATE mo/s !RED1 91	INJ TEMP c !RED1 94	PRD TEMP c !RED1 95	INJ PRES kPa !RED1 96	PRD PRES kPa !RED1 97	STEAM mo/s !RED1 92	COOLING mo/s !RED1 93	INJ O2 frac !RED1 6	INJ H2O frac !RED1 7
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
302.000	2.153	.4527	20.00	55.00	1244.	2085.	0.000	0.000	.2100	0.000
303.000	2.545	1.930	20.00	55.15	630.6	2104.	0.000	.4379	.2100	0.000
304.000	3.491	6.428	20.00	122.2	372.2	1397.	0.000	.2223	.2100	0.000
305.000	8.634	17.67	20.00	234.1	291.0	281.9	0.000	0.000	.2100	0.000
306.000	26.55	63.86	20.00	295.3	501.3	468.2	0.000	0.000	.2100	0.000
307.000	30.43	77.64	20.00	305.1	558.6	519.9	0.000	0.000	.2100	0.000
308.000	30.62	74.94	20.00	309.5	589.1	526.7	0.000	0.000	.2100	0.000
309.000	30.29	79.06	20.00	289.8	592.3	531.5	0.000	0.000	.2100	0.000
310.000	30.02	72.46	20.00	282.5	609.9	534.5	0.000	0.000	.2100	0.000
311.000	29.61	73.98	20.00	282.8	622.8	529.9	0.000	0.000	.2100	0.000
312.000	29.52	73.60	20.00	294.8	616.6	515.4	0.000	7.0151E-02	.2100	0.000
313.000	30.95	74.65	20.00	286.4	617.9	503.2	0.000	0.000	.2100	0.000
314.000	35.57	80.76	20.00	242.1	644.8	514.5	0.000	0.000	.2100	0.000
315.000	41.68	89.68	20.00	228.2	710.2	566.0	0.000	0.000	.2100	0.000
316.000	41.63	93.30	20.00	257.1	693.4	544.2	0.000	0.000	.2100	0.000
317.000	41.13	90.75	20.00	338.4	682.1	533.8	0.000	0.000	.2100	0.000
318.000	39.18	87.69	20.00	371.6	688.0	541.1	0.000	.2153	.2100	0.000
319.000	20.89	36.89	20.00	336.1	592.8	483.1	0.000	.1929	.2100	0.000
320.000	20.09	30.83	20.00	283.9	601.2	493.8	0.000	.1468	.2100	0.000
321.000	37.00	60.78	20.00	340.6	744.2	610.0	0.000	.2610	.2100	0.000
322.000	39.30	66.62	20.00	462.9	754.2	605.8	0.000	.5639	.2100	0.000
323.000	31.16	25.98	20.00	477.4	680.5	544.0	0.000	3.291	.2100	0.000
324.000	39.78	88.57	20.00	475.3	781.2	633.8	0.000	4.832	.2100	0.000
325.000	40.38	92.03	20.00	484.2	773.5	600.9	0.000	8.273	.2100	0.000
326.000	40.29	88.84	20.00	451.2	768.9	520.7	0.000	9.280	.2100	0.000
327.000	39.99	82.59	20.00	399.1	765.7	564.8	0.000	8.913	.2100	0.000
328.000	37.18	65.27	20.00	365.0	760.4	628.7	0.000	7.320	.2100	0.000
329.000	32.39	49.83	20.00	366.4	674.4	557.0	0.000	5.187	.2100	0.000
330.000	23.70	35.41	20.00	420.0	604.0	363.0	0.000	3.044	.2100	0.000
331.000	28.42	45.57	20.00	420.0	631.8	14.12	0.000	3.652	.1995	0.000
332.000	25.11	37.52	20.00	420.0	489.0	10.88	0.000	6.662	.1628	0.000
333.000	6.1247E-02	23.59	20.00	421.4	164.7	18.14	0.000	3.033	.5250	0.000
334.000	25.71	33.03	51.14	473.8	210.6	24.14	0.000	4.056	.4154	.3892
335.000	21.45	35.90	56.50	425.3	193.5	25.79	0.000	5.678	.4740	.4563
336.000	19.17	26.29	48.31	435.8	207.7	28.46	0.000	4.915	.5692	.3539
337.000	20.86	23.10	52.13	466.8	270.4	31.83	0.000	12.58	.5973	.4017
338.000	23.66	21.78	44.72	437.5	243.8	30.12	0.000	10.40	.6217	.3091
339.000	23.66	21.78	44.72	437.5	243.8	30.12	0.000	10.40	.6217	.3091

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UCG DB - GULF - PRODUCT GAS ANALYSIS 1

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	ARGON molf !RED1 10	NITROGEN molf !RED1 11	OXYGEN molf !RED1 12	HYDROGEN molf !RED1 13	METHANE molf !RED1 14	CO molf !RED1 15	CO2 molf !RED1 16	ETHANE molf !RED1 18
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
302.000	1.8516E-02	.3747	0.000	.1562	3.0665E-02	.1016	.1464	1.2295E-02
303.000	1.0906E-02	.4131	0.000	.1560	3.4152E-02	.1381	.1236	9.1172E-03
304.000	5.8513E-03	.4724	0.000	.1697	3.8916E-02	.1787	9.8696E-02	3.3073E-03
305.000	7.1408E-03	.4625	0.000	.2137	3.7411E-02	.1581	.1135	2.8278E-03
306.000	7.2963E-03	.4711	0.000	.1702	4.1627E-02	.2207	8.3985E-02	2.2989E-03
307.000	7.5142E-03	.4534	0.000	.1789	4.2352E-02	.2414	7.2254E-02	2.0874E-03
308.000	7.4525E-03	.4700	0.000	.1475	4.2933E-02	.2617	6.6166E-02	2.0334E-03
309.000	7.0307E-03	.4407	0.000	.1847	4.3668E-02	.2487	7.0829E-02	2.2487E-03
310.000	7.1333E-03	.4391	0.000	.1759	4.6563E-02	.2429	8.3781E-02	2.5516E-03
311.000	7.0975E-03	.4440	0.000	.1713	4.4738E-02	.2365	9.2008E-02	2.5557E-03
312.000	7.0498E-03	.4531	0.000	.1713	4.5320E-02	.2198	9.8393E-02	2.6463E-03
313.000	7.2452E-03	.4809	0.000	.1427	4.7960E-02	.2031	.1126	2.7561E-03
314.000	7.6336E-03	.5203	0.000	.1126	4.8945E-02	.1671	.1372	2.7494E-03
315.000	7.7246E-03	.5112	0.000	.1105	5.2385E-02	.1805	.1310	3.1465E-03
316.000	7.8368E-03	.5113	0.000	.1021	5.4898E-02	.1745	.1429	3.6396E-03
317.000	7.9130E-03	.5164	0.000	.1051	4.8483E-02	.1802	.1377	2.6029E-03
318.000	8.1195E-03	.5225	0.000	.1081	4.6544E-02	.1559	.1555	2.0240E-03
319.000	7.8721E-03	.5317	0.000	.1163	4.2764E-02	.1133	.1828	2.1402E-03
320.000	7.7658E-03	.5359	0.000	.1095	4.4342E-02	.1085	.1898	2.3580E-03
321.000	8.2570E-03	.5568	0.000	.1054	4.3865E-02	.1106	.1718	1.8296E-03
322.000	7.7736E-03	.5353	0.000	.1147	4.4604E-02	.1189	.1746	2.4955E-03
323.000	8.2352E-03	.5182	0.000	.1193	4.7014E-02	.1266	.1771	2.1450E-03
324.000	9.3585E-03	.5150	0.000	.1124	4.7623E-02	.1301	.1803	3.0081E-03
325.000	1.0764E-02	.5119	0.000	.1137	5.0941E-02	.1340	.1742	2.6951E-03
326.000	1.1117E-02	.5205	0.000	.1120	4.6533E-02	.1371	.1696	1.9571E-03
327.000	1.0754E-02	.5307	0.000	.1103	4.2835E-02	.1357	.1676	1.5469E-03
328.000	1.0436E-02	.5306	0.000	.1112	4.2868E-02	.1325	.1703	1.3288E-03
329.000	1.0197E-02	.5308	0.000	.1029	4.1802E-02	.1445	.1682	1.1667E-03
330.000	9.7338E-03	.5163	0.000	.1089	4.3202E-02	.1474	.1716	1.3771E-03
331.000	8.8031E-03	.5494	0.000	.1065	3.8120E-02	.1317	.1641	1.0411E-03
332.000	8.9650E-03	.4969	0.000	.1427	4.0638E-02	.1396	.1696	9.6202E-04
333.000	9.4892E-03	.5379	0.000	.1044	3.8769E-02	.1419	.1668	6.5608E-04
334.000	6.7843E-03	.4999	0.000	.1452	2.3849E-02	.1609	.1627	3.6044E-04
335.000	3.3015E-03	7.1186E-02	0.000	.2920	1.7091E-02	.3002	.3151	9.0284E-04
336.000	3.8619E-03	7.1613E-02	0.000	.2709	2.5286E-02	.3376	.2890	1.4527E-03
337.000	3.4188E-03	1.4530E-02	0.000	.3650	3.0230E-02	.3333	.2514	1.8554E-03
338.000	6.5656E-03	7.3122E-02	0.000	.3102	3.2185E-02	.2526	.3230	1.8381E-03
339.000	6.5656E-03	7.3122E-02	0.000	.3102	3.2185E-02	.2526	.3230	1.8381E-03

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UCG DB - GULF - PRODUCT GAS ANALYSIS 2

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	C2H4 molf !RED1 17	C6 molf !RED1 19	H10 molf !RED1 20	H2S molf !RED1 21	TAR/DRY !RED1 24	H2O/DRY !RED1 25
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000
302.000	1.3020E-02	6.0419E-02	7.4901E-02	1.1208E-02	0.000	.1527
303.000	9.9252E-03	4.3297E-02	5.3879E-02	7.9052E-03	0.000	.1865
304.000	4.2368E-03	1.1545E-02	1.4751E-02	1.8593E-03	0.000	.2385
305.000	2.7004E-03	8.2544E-04	1.2150E-03	0.000	0.000	.1842
306.000	1.8084E-03	3.9591E-04	5.3180E-04	0.000	1.1602E-03	.1201
307.000	1.1012E-03	4.1446E-04	5.7928E-04	0.000	1.7955E-03	9.4190E-02
308.000	1.4734E-03	3.2351E-04	4.4644E-04	0.000	2.4733E-03	3.4247E-02
309.000	1.1480E-03	3.8248E-04	5.3974E-04	0.000	3.0785E-03	.1066
310.000	1.0777E-03	4.5071E-04	6.4484E-04	0.000	6.0547E-03	.1901
311.000	5.8042E-04	4.8645E-04	7.0121E-04	0.000	3.6418E-03	.1449
312.000	1.2337E-03	4.5759E-04	6.5384E-04	0.000	6.5472E-03	.2015
313.000	1.3417E-03	5.8535E-04	8.4206E-04	0.000	1.3046E-02	.1434
314.000	1.4646E-03	8.3610E-04	1.2103E-03	0.000	9.7119E-03	.2732
315.000	1.1735E-03	9.3389E-04	1.3688E-03	0.000	4.3446E-03	.1904
316.000	8.1218E-04	8.3976E-04	1.2400E-03	0.000	4.6864E-03	.2148
317.000	4.8978E-04	4.7124E-04	6.9452E-04	0.000	4.2727E-03	.1570
318.000	2.7307E-04	4.3738E-04	6.3589E-04	0.000	1.9036E-03	.1570
319,000	2.0971E-04	1.2253E-03	1.7309E-03	0.000	2.7432E-03	.1591
320.000	1.0799E-04	7.3027E-04	1.1005E-03	0.000	7.2816E-03	.2486
321.000	1.8172E-05	5.6787E-04	8.7933E-04	0.000	5.7821E-03	.2095
322.000	6.6363E-06	5.8481E-04	9.0708E-04	0.000	1.4543E-03	7.0149E-02
323.000	0.000	5.9510E-04	9.3754E-04	0.000	8.3275E-03	.1429
324.000	5.2766E-05	8.2413E-04	1.2623E-03	0.000	7.3097E-03	.2889
325.000	0.000	6.9841E-04	1.1175E-03	0.000	2.7084E-03	.2553
326.000	9.9974E-06	4.1600E-04	6.6095E-04	0.000	1.0872E-03	.2845
327.000	0.000	2.1228E-04	3.3965E-04	0.000	8.7169E-04	.3890
328.000	3.1249E-06	2.8373E-04	4.5397E-04	0.000	6.7779E-04	.2826
329.000	7.2560E-06	1.6575E-04	2.6520E-04	0.000	4.5605E-04	.3300
330.000	0.000	5.6880E-04	9.0509E-04	0.000	1.9263E-04	.2141
331.000	0.000	1.2753E-04	2.0404E-04	0.000	9.8359E-05	.1352
332.000	8.1052E-05	1.9577E-04	3.1323E-04	0.000	0.000	.5436
333.000	1.9771E-05	7.3856E-05	1.1817E-04	0.000	0.000	.9902
334.000	5.6307E-06	9.7613E-05	1.2743E-04	0.000	0.000	.8158
335.000	0.000	7.0844E-05	1.1335E-04	0.000	0.000	1.219
336.000	0.000	9.3404E-05	1.4945E-04	0.000	0.000	.8656
337.000	8.0000E-06	9.8570E-05	1.5771E-04	0.000	0.000	.5341
338.000	1.0999E-05	1.6165E-04	2.5864E-04	0.000	0.000	.2400
339.000	1.0999E-05	1.6165E-04	2.5864E-04	0.000	0.000	.2400

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UCG DB - GULF - MATERIAL BALANCES

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL RT mo/s !RED1 44	ASH RATE mo/s !RED1 46	H2O INFX mo/s !RED1 47	H2O COAL mo/s !RED1 48	-H2O RXN mo/s !RED1 49	O2 per COAL !RED1 60	H2O per COAL !RED1 61	CHAR RT mo/s !RED1 64	CHAR per COAL !RED1 63	RECOVORY % !RED1 50
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
302.000	.2717	3.6381E-03	.1652	4.4295E-02	.1496	-8.769E-02	.5505	.8545	.7587	8.764
303.000	.9257	1.2395E-02	.1888	.1509	.4644	-2.550E-02	.5096	2.638	.7408	38.67
304.000	1.922	2.5732E-02	1.541	.3133	.8320	.1589	.4391	4.074	.6825	87.43
305.000	4.902	6.5646E-02	4.210	.7993	2.267	.2301	.5295	8.717	.6622	104.6
306.000	21.19	.2837	10.12	3.454	7.105	.2665	.3324	23.69	.5084	129.9
307.000	27.00	.3616	11.34	4.402	9.088	.2387	.3410	29.02	.4909	135.4
308.000	29.06	.3891	4.504	4.737	6.764	.2764	.2335	15.08	.3236	142.3
309.000	28.46	.3811	12.87	4.640	9.920	.2027	.3754	30.68	.3749	132.8
310.000	26.74	.3580	14.86	4.359	8.428	.2146	.3154	20.06	.4252	114.9
311.000	26.79	.3587	12.83	4.368	7.993	.2602	.2979	10.08	.2623	123.9
312.000	26.40	.3535	16.08	4.304	8.286	.2279	.3149	19.49	.4090	120.0
313.000	31.79	.4257	12.36	5.184	8.343	.2132	.2696	24.31	.4023	128.6
314.000	28.60	.3830	18.82	4.663	6.248	.2859	.2166	11.53	.2173	118.6
315.000	31.41	.4206	15.77	5.120	6.672	.3293	.2090	1.421	-.1332	118.0
316.000	32.94	.4410	17.38	5.370	6.408	.3461	.1896	-6.356	-.3781	120.3
317.000	32.37	.4334	12.37	5.277	5.405	.3702	.1678	-9.990	-.5131	125.8
318.000	28.80	.3857	11.94	4.696	4.935	.4285	.1702	-7.177	-.5588	129.0
319.000	11.82	.1583	5.727	1.927	2.741	.4335	.2121	3.932	7.0602E-02	99.55
320.000	10.38	.1390	6.173	1.692	1.997	.3915	.1971	-.5328	-.1334	83.55
321.000	19.31	.2585	10.61	3.148	3.912	.3937	.2037	1.978	-4.725E-02	97.26
322.000	22.39	.2998	4.872	3.650	4.727	.4473	.2121	-5.275	-.4758	108.9
323.000	9.956	.1333	1.187	1.623	2.010	.3517	.2231	-1.478	-.3178	41.59
324.000	29.97	.4014	15.83	4.887	6.033	.3749	.2008	-1.264	-4.311E-02	115.2
325.000	28.83	.3860	11.66	4.700	6.107	.4104	.2119	-.7443	-6.383E-02	119.1
326.000	25.61	.3429	10.79	4.175	4.746	.4549	.1849	0.000	0.000	114.7
327.000	21.30	.2853	14.26	3.473	3.551	.4762	.1667	-.5271	-5.272E-02	101.1
328.000	18.08	.2421	7.051	2.948	3.008	.4821	.1694	0.000	0.000	92.38
329.000	13.56	.1816	6.583	2.211	1.648	.5046	.1243	0.000	0.000	78.99
330.000	10.81	.1447	2.974	1.762	1.545	.4952	.1411	0.000	0.000	81.34
331.000	13.42	.1798	1.444	2.189	2.077	.5111	.1451	-2.251	-.2172	96.90
332.000	9.090	.1217	4.839	1.482	2.191	.4616	.2359	-.4576	.2402	79.74
333.000	4.451	5.9600E-02	7.238	.7256	.3809	.5269	.1124	0.000	.5590	2299.
334.000	6.337	8.4857E-02	-8.877E-02	1.033	.8759	.5257	.1421	0.000	0.000	334.2
335.000	10.25	.1372	7.232	1.671	1.202	.5764	.1188	0.000	0.000	62.56
336.000	8.931	.1196	3.742	1.456	.9490	.5471	.1057	0.000	0.000	51.59
337.000	9.099	.1218	-6.374	1.483	1.623	.4230	.3102	0.000	0.000	39.55
338.000	11.07	.1482	-9.921	1.804	2.065	.5301	.2124	0.000	0.000	41.64
339.000	11.07	.1482	-9.921	1.804	2.065	.5301	.2124	0.000	0.000	41.64

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UCG DB - GULF - ENERGY PARAMETERS

(TSTART,TEND,DT 0.000,999.000, 0.000)

TIME (D)	COAL kJ /mol !RED1 72	PRODUCT frac !RED1 74	TAR frac !RED1 73	SENS HT frac !RED1 76	STEAM frac !RED1 77	COOLING frac !RED1 80	SEN HT INSU !RED1 78	LOSS frac !RED1 75	HC kJ /mol !RED1 81	HC/02 kJ /mol !RED1 84
* FACTOR	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
302.000	115.5	1.307	0.000	4.3697E-03	2.2814E-02	0.000	1.6341E-03	-.3248	384.2	3808.
303.000	393.4	1.261	0.000	5.0925E-03	-4.257E-02	7.5571E-02	1.6341E-03	-.2918	318.7	2888.
304.000	816.7	1.125	0.000	2.4361E-02	3.9844E-02	2.2860E-02	1.6341E-03	-.2113	192.3	1520.
305.000	2084.	1.089	0.000	5.7489E-02	5.8678E-02	0.000	1.6341E-03	-.2072	150.9	1326.
306.000	9005.	.9989	3.7635E-02	6.2259E-02	3.4293E-02	0.000	1.6341E-03	-.1354	155.9	1232.
307.000	1.1476E+04	1.014	5.7203E-02	6.0563E-02	2.5683E-02	0.000	1.6341E-03	-.1598	163.7	1345.
308.000	1.2350E+04	.9441	7.4150E-02	5.4967E-02	8.8001E-03	0.000	1.6341E-03	-8.443E-02	161.0	1274.
309.000	1.2096E+04	1.015	9.4474E-02	5.5932E-02	2.7881E-02	0.000	1.6341E-03	-.1958	168.8	1484.
310.000	1.1362E+04	.9047	.1680	5.3967E-02	4.3609E-02	0.000	1.6341E-03	-.1726	167.9	1422.
311.000	1.1386E+04	.9221	.1074	5.4370E-02	3.6039E-02	0.000	1.6341E-03	-.1222	162.6	1362.
312.000	1.1219E+04	.8692	.1820	5.8582E-02	4.7973E-02	2.5225E-04	1.6341E-03	-.1603	159.3	1306.
313.000	1.3513E+04	.7418	.2972	5.0225E-02	3.2032E-02	0.000	1.6341E-03	-.1237	149.6	1161.
314.000	1.2156E+04	.6972	.2506	4.9003E-02	6.2726E-02	0.000	1.6341E-03	-6.190E-02	133.0	950.5
315.000	1.3348E+04	.7895	.1259	4.5128E-02	4.7350E-02	0.000	1.6341E-03	-1.024E-02	139.9	1018.
316.000	1.3998E+04	.7575	.1324	5.1838E-02	5.2251E-02	0.000	1.6341E-03	3.6650E-03	137.9	1006.
317.000	1.3757E+04	.7463	.1249	6.9242E-02	3.9427E-02	0.000	1.6341E-03	1.7703E-02	131.0	943.3
318.000	1.2242E+04	.7501	6.1379E-02	8.2738E-02	4.1884E-02	7.4109E-04	1.6341E-03	6.0730E-02	121.9	868.6
319.000	5024.	.7047	8.9954E-02	7.6349E-02	4.1907E-02	1.9788E-03	1.6341E-03	8.2738E-02	112.2	790.8
320.000	4411.	.6154	.2083	6.2244E-02	5.8933E-02	1.1199E-03	1.6341E-03	5.1572E-02	108.5	752.6
321.000	8205.	.6502	.1774	7.9369E-02	5.3294E-02	1.3902E-03	1.6341E-03	3.5955E-02	105.8	706.5
322.000	9514.	.7366	4.9832E-02	.1042	1.7318E-02	2.8489E-03	1.6341E-03	8.6813E-02	112.6	782.1
323.000	4231.	.6487	.2238	9.9583E-02	-1.823	1.855	1.6341E-03	-7.203E-03	117.8	848.4
324.000	1.2739E+04	.6583	.1889	.1131	5.4379E-02	1.7207E-02	1.6341E-03	-3.416E-02	119.7	863.8
325.000	1.2252E+04	.7370	8.4531E-02	.1195	3.7377E-02	2.9851E-02	1.6341E-03	-1.060E-02	123.1	893.4
326.000	1.0882E+04	.7461	3.6093E-02	.1186	4.2094E-02	3.7656E-02	1.6341E-03	1.7101E-02	117.2	836.5
327.000	9054.	.7317	2.9967E-02	.1151	6.8933E-02	4.3279E-02	1.6341E-03	8.6844E-03	111.4	780.2
328.000	7684.	.7320	2.3328E-02	9.6358E-02	3.7043E-02	4.5143E-02	1.6341E-03	6.3745E-02	110.8	776.5
329.000	5764.	.7161	1.5629E-02	9.8624E-02	5.5132E-02	3.9361E-02	1.6341E-03	7.2790E-02	110.1	771.5
330.000	4593.	.7364	6.4982E-03	.1026	2.9207E-02	3.0645E-02	1.6341E-03	9.2304E-02	116.0	838.2
331.000	5705.	.7256	3.3444E-03	.1040	1.2542E-02	2.8603E-02	1.6341E-03	.1235	103.9	667.2
332.000	3863.	.7944	0.000	.1364	3.5292E-02	.1191	1.6341E-03	-8.766E-02	119.0	637.1
333.000	1892.	.7114	0.000	.1793	.1951	9.3888E-02	1.6341E-03	-.1824	105.9	274.4
334.000	2693.	.7367	0.000	.1800	-9.730E-03	6.6065E-02	1.6341E-03	2.4420E-02	109.2	612.8
335.000	4356.	.6951	0.000	.1123	7.6379E-02	5.8910E-02	1.6341E-03	5.4906E-02	185.4	520.7
336.000	3796.	.7250	0.000	9.8511E-02	-5.848E-02	.1680	1.6341E-03	6.4512E-02	198.2	584.9
337.000	3867.	.8860	0.000	8.7510E-02	-3.924	3.979	1.6341E-03	-3.019E-02	228.9	1046.
338.000	4703.	.7401	0.000	6.7687E-02	-.1394	.1504	1.6341E-03	.1788	192.4	597.9
339.000	4703.	.7401	0.000	6.7687E-02	-.1394	.1504	1.6341E-03	.1788	192.4	597.9