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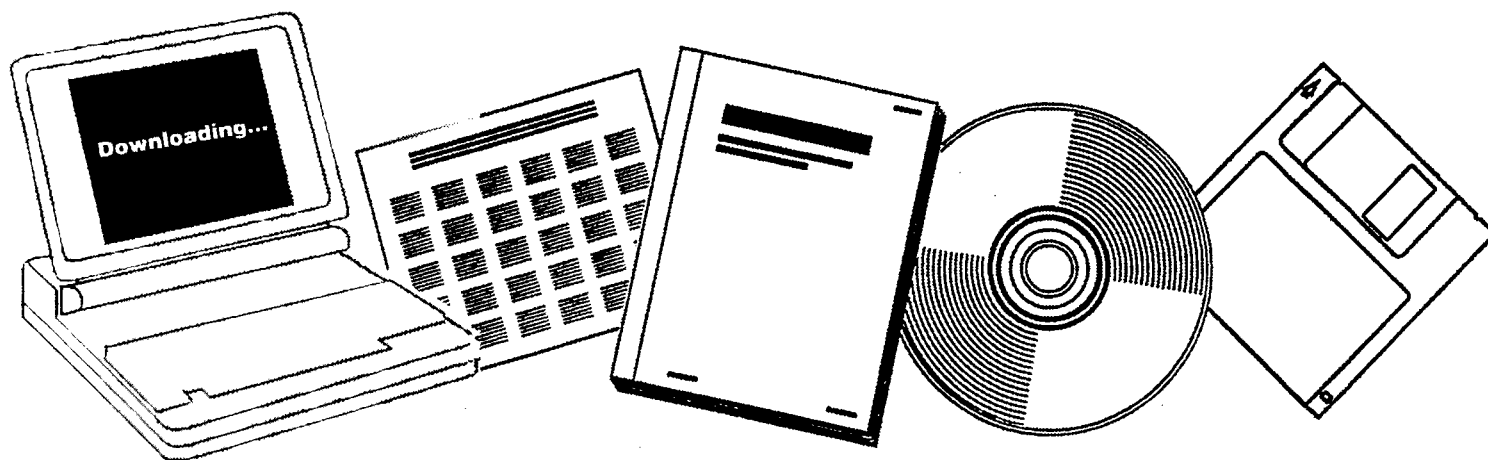
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**EXXON CATALYTIC COAL GASIFICATION PROCESS:  
PREDEVELOPMENT PROGRAM. QUARTERLY  
TECHNICAL PROGRESS REPORT,  
OCTOBER--DECEMBER 31, 1976**

**EXXON RESEARCH AND ENGINEERING CO.,  
BAYTOWN, TEX**

**FEB 1977**



U.S. Department of Commerce  
**National Technical Information Service**

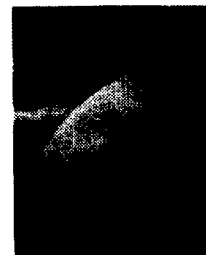
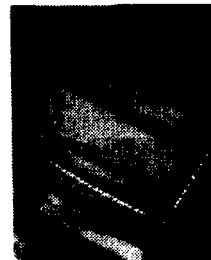
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EXXON CATALYTIC COAL GASIFICATION PROCESS -  
PREDEVELOPMENT PROGRAM

Quarterly Technical Progress Report  
For the Period  
October 1 - December 31, 1976

T. Kalina - Project Manager

Published - February, 1977

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PREPARED FOR THE  
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

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Baytown, Texas 77520

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## 1. FLUID BED GASIFIER STUDIES (Reporting Category 1)

### 1.1 FBG Start-up

During the third quarter of 1976, the existing Fluid Bed Gasifier (FBG) was recommissioned for use in the Predevelopment Program, and some changes were made to improve overall data quality, unit operability, and safety. The unit can feed up to 25 lbs/hr of coal on a continuous basis and has the capability for catalyst impregnation on coal, coal feeding, gasification, and catalyst recovery from ash/char residue. On-line computer facilities are available for continuous data acquisition and reduction. The maximum operating pressure is 100 psig. Construction was about 90 percent complete by the end of the third quarter.

Unit construction was completed early in the month of October, and the effort thereafter was concentrated on pressure testing, instrument and computer tie-in, and instrument checkout. Following these activities, the unit heater systems and steam generation systems were started up. At the same time operations of the coal impregnation system began, and a substantial inventory of catalyzed coal was produced.

In late November, just prior to the introduction of coal into the primary gasifier, a final pressure test of the system revealed a previously undetected leak in one of the two downstream fines filter vessels. Examination of the 304 SS vessels showed that cracking was present in the vicinity of the vessel welds. Metallurgical analysis of the vessels is not yet complete. However, there are strong indications that the cause of the leaks was chloride stress cracking. The FBG filter vessels were structurally sound at the time of the unit shutdown in December, 1975. Between that time and the start of recommissioning, the unit was kept under a nitrogen blanket. Since a liquid phase is necessary for chloride stress cracking to occur, it is concluded that condensation must have occurred during the recommissioning when the vessels were open to the atmosphere. Apparently there was sufficient residual chloride from previous operations with Illinois coal to cause this problem.

The damaged vessels were replaced with 304 SS filter vessels from the secondary gas handling system which is not scheduled to be operated during the initial period. New vessels made of carbon steel, which is not subject to chloride stress cracking, were subsequently constructed for the secondary system.

During November, work was also completed on updating the data acquisition system for the recommissioned Fluid Bed Gasifier. This work included interfacing the on-line computer with unit instrumentation added during the recommissioning, and revising the on-line material balance computer program. Also, checkout was completed of the three new process profile schematics on video display in the control room. One video display program covers the coal feed system; the second, the primary gasifier; and the third, the secondary gasifier. All provide the operator with a snapshot of the critical unit temperatures, pressures, flow rates, etc. to aid in guidance of unit operations.

## 1.2 FBG Baseline Operations

During December, FBG operations were begun under baseline conditions. Initial operations were exceptionally smooth, even though major modifications have been made to the unit. The initial run lasted for six days during which coal was fed 70 percent of the time. The run was terminated to open the bottom of the gasifier when some symptoms of bridging were observed in the bottom section. No bridge was found. The gasifier was clean except for traces of gray ash-like material adhering loosely to the wall near the bottom and a thin ring of agglomerated metallic material that was found lying in the bottom cone. Chemical analyses of the ring are underway. The ring may have been formed during the previous thermal gasification operations.

In subsequent runs, it was determined that the bridging symptoms seem to correlate with the buildup of high ash, high density solids at the bottom of the fluidized bed. A bulk specific gravity of 0.75 was measured for the bottom drawoff material compared with a typical average gravity of 0.45 to 0.55 for the bed. It appears that this behavior can be corrected by increasing the rate of char draw-off from the bottom of the gasifier.

To date continuous periods of coal feeding have been limited to a maximum of about two days as a result of a number of minor problems. These consisted mostly of leaks in high temperature fittings and valves and plugging in the synthesis gas preheater due to carbon deposition. It now appears that the carbon was forming from CO via the Boudard reaction ( $2\text{CO} \rightarrow \text{C} + \text{CO}_2$ ) which apparently was being catalyzed by the metal walls of the heater. Initially, the preheater coil outlet temperature was set at 1000°F. Since carbon deposition had not been experienced during previous FBG operations with a syngas preheat temperature of 700°F, the outlet temperature was reduced to this level. No further plugging has occurred.

Initial operating data obtained during December are shown in Table I. The baseline operating conditions include a gasifier bed temperature of 1300°F, a unit pressure of 100 psig, a coal feed rate of 10 pounds per hour, a steam feed rate of 12.5 pounds per hour, and a catalyst loading of 10 wt.% potassium carbonate. The overall material balances close within  $\pm 5$  percent, but the oxygen and hydrogen elemental balances do not agree as well. It was found subsequently that during this period, synthesis gas was leaking into the vent system through a faulty by-pass valve causing the material balance error.

Steam conversions calculated by oxygen balance vary between 38 and 41 percent. This is very close to kinetic model predictions for the specified feed rates. Although higher steam conversions are calculated from measurements of the condensate collected from the product gas, these numbers are more likely to be in error. This is because of the possibility of water loss through pumps and through entrainment from the gas scrubber system.

The product gas compositions measured by the on-line gas chromatograph all show close approaches to gas phase methanation equilibrium. The methane equilibrium temperature is obtained by calculating the ratio  $K = \frac{(P_{\text{H}_2\text{O}})(P_{\text{CH}_4})}{(P_{\text{CO}})(P_{\text{H}_2})^3}$ . Published data on the equilibrium constant for the methanation

Table I

SUMMARY OF MATERIAL BALANCE DATA FROM FBG OPERATIONS

Material Balance Period Time, Hours	1 14	2 17	3 4
<u>Conditions</u>			
Temperature, °F	1330	1330	1330
Pressure, psia	115	114	115
<u>Input, Lbs/Hr<sup>(1)</sup></u>			
Coal + Catalyst	10.0	8.5	10.0
Steam	11.1	12.4	11.6
Synthesis Gas	9.1	7.4	6.3
Total	30.2	28.3	27.9
<u>Output, Lbs/Hr<sup>(1)</sup></u>			
Product Gas (Dry)	19.4	18.6	17.1
Water	5.5	5.4	6.3
Char	1.6	1.6	1.1
Total	26.5	25.6	24.5
<u>Accumulation, Lbs/Hr</u>	2.1	0.0	4.4
<u>Material Balance<sup>(1)</sup></u>			
Overall	95	94	103
Oxygen	92	85	95
Hydrogen	81	81	90
<u>Steam Conversion</u>			
By Water Balance	52	57	47
By Oxygen Balance	40	38	41
<u>Syngas Output/Input, Mol/Mol</u>	0.72	0.76	0.94
<u>Carbon Conversion (By Solids Analysis)</u>	73	85	
<u>Product Gas Composition (Dry Basis)<sup>(1)</sup></u>			
H <sub>2</sub>	64.3	67.3	60.9
CO	10.7	10.0	13.3
CO <sub>2</sub>	9.1	6.8	10.3
CH <sub>4</sub>	15.6	15.6	15.1
H <sub>2</sub> S	0.3	0.3	0.4
	100.0	100.0	100.0
Methane Equilibrium Temp., °F	1360	1365	1345
<u>T<sub>equilibrium</sub> - T<sub>actual</sub>, °F</u>	30	35	15

(1) Excluding N<sub>2</sub> from feeder blowby



reaction as a function of temperature are then used to determine the temperature corresponding with the calculated ratio. The difference between this methane equilibrium temperature and the actual temperature is a measure of the approach to equilibrium. For the three material balance periods shown, the approach to equilibrium varied between 15 and 35°F.

## BENCH-SCALE STUDIES (Reporting Category 2)

### 2.1 Fixed-Bed Gasification Program

Recent fixed-bed gasification experiments have focused on the use of  $\text{Na}_2\text{CO}_3$  and mixed  $\text{Na}_2\text{CO}_3/\text{K}_2\text{CO}_3$  catalysts. Previous data on mixed catalyst were very limited. The incentive for the use of  $\text{Na}_2\text{CO}_3$  is that its cost is 20-30 percent of the cost for  $\text{K}_2\text{CO}_3$ .

Carbon gasification rate data were obtained for catalyst loadings of 15 wt.%  $\text{Na}_2\text{CO}_3$  and 5 wt.%  $\text{Na}_2\text{CO}_3/5$  wt.%  $\text{K}_2\text{CO}_3$ . These data are compared in Figure 1 with correlation lines for  $\text{K}_2\text{CO}_3$  catalyst from multiple runs made prior to the start of the ERDA program. Some check runs were also made with 10 wt.%  $\text{K}_2\text{CO}_3$ . The moles of carbon gasified per mol of steam fed is plotted on the ordinate and the relative steam residence time on the abscissa. For all runs the temperature was 1300°F and the pressure, 500 psig. Steam rates varied between 3 and 24 gm/hr.

The data from individual runs on the 5%  $\text{K}_2\text{CO}_3/5\%$   $\text{Na}_2\text{CO}_3$  mixed catalyst form a continuous curve relating carbon converted/steam fed to steam residence time, over a wide range of initial steam rates. This is similar to the data for  $\text{K}_2\text{CO}_3$  catalyst except that the curve has been displaced along the abscissa. This displacement is a measure of the reduced activity for the mixed catalyst. The data for the pure  $\text{Na}_2\text{CO}_3$  catalyst on the other hand form discrete curves for each steam rate. Thus, these initial runs suggest that the  $\text{Na}_2\text{CO}_3$  catalyst does not maintain activity as well as the run proceeds.

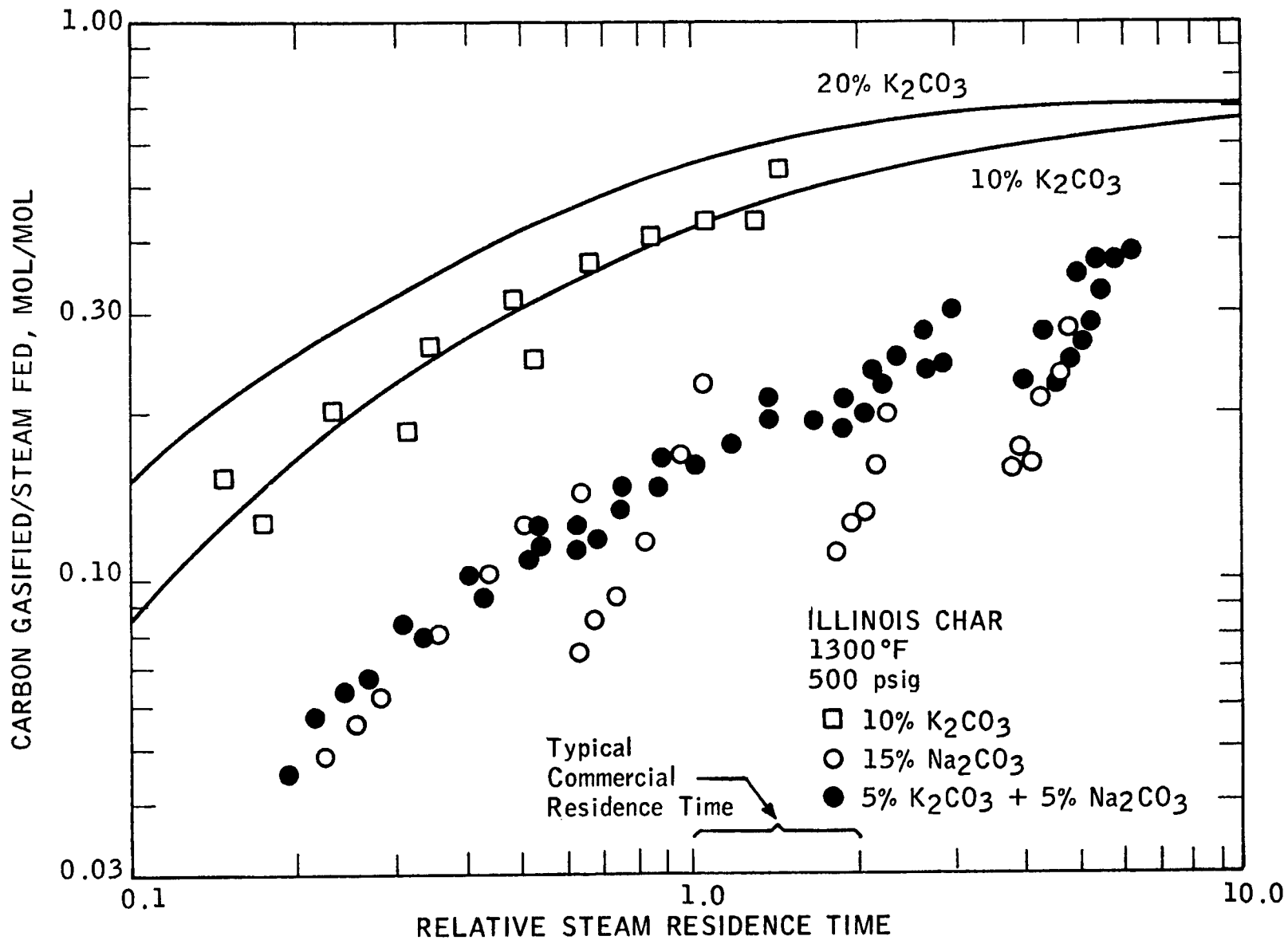
Based upon the data obtained, the 5% Na/5% K mixed catalyst has about 20-25 percent of the activity of the 10%  $\text{K}_2\text{CO}_3$ . This is a larger decrease than one would expect even if the sodium had no activity. One possible explanation is that the more active potassium is being selectively tied up with the aluminum compounds in the coal to form the insoluble  $\text{KAlSiO}_4$ . About 4 percent on coal of the catalyst usually is tied up as aluminosilicates. Analyses of the char residue for water soluble and insoluble potassium and sodium are currently in progress.

While the gasification rate for the 5%  $\text{K}_2\text{CO}_3/5\%$   $\text{Na}_2\text{CO}_3$  catalyst is relatively low, the methane content of the gas produced corresponds with gas phase methane equilibrium over the range of steam rates investigated. This is shown in Figure 2 which is a plot of the measured percent methane in the product gas versus the measured steam conversion. The solid curve represents the predicted methane content for the case of equilibrium in the gas phase.

To check the effect of gasification on particle size distribution in the fixed bed, dry sieve analyses were obtained before and after four gasification runs. The data are shown in Figure 3. The four runs produced essentially the same size distribution. The initial particle size of the feed char is nominally -30 +200 mesh on the Tyler scale. After gasification, there is only a small decrease in particle size; the percent less than 100 mesh increases

FIGURE 1

GASIFICATION RATES IN FIXED BED TESTS



## ALL WHEAT

MARKETING YEAR 06/01 - 05/31

OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	:OUTSTANDING SALES:		ACCUMULATED EXPORTS:		OUTSTANDING SALES	
	:THIS WEEK:	YR AGO:	:THIS WEEK:	YR AGO	:SECOND YR:	THIRD YR
EUROPEAN UNION - 25	217.3	334.8	233.7	367.9	0.0	0.0
BELGIUM	0.0	11.0	11.1	24.7	0.0	0.0
FINLAND	0.0	0.0	0.0	2.2	0.0	0.0
GERMANY	0.0	12.0	0.0	12.3	0.0	0.0
ITALY	136.4	175.2	118.7	187.9	0.0	0.0
NETHLDS	3.7	0.0	9.4	10.4	0.0	0.0
PORTUGL	0.0	20.0	7.9	36.7	0.0	0.0
SPAIN	75.0	98.0	64.6	49.7	0.0	0.0
SWEDEN	0.0	2.0	0.0	6.0	0.0	0.0
U KING	2.2	16.6	22.0	38.2	0.0	0.0
OTHER EUROPE	0.0	0.0	17.7	60.5	0.0	0.0
ICELAND	0.0	0.0	0.0	0.4	0.0	0.0
SWITZLD	0.0	0.0	0.0	33.4	0.0	0.0
TURKEY	0.0	0.0	17.7	26.7	0.0	0.0
JAPAN	652.4	695.1	682.2	706.8	0.0	0.0
TAIWAN	53.7	134.0	173.3	215.8	0.0	0.0
CHINA	1031.9	5.0	882.8	75.7	0.0	0.0
OTHER ASIA AND OCEANIA:	1180.2	724.2	1451.1	953.3	0.0	0.0
BURMA	0.6	1.0	0.0	0.0	0.0	0.0
HG KONG	0.7	1.7	1.3	1.8	0.0	0.0
INDNSIA	0.0	60.0	78.4	14.1	0.0	0.0
IRAQ	0.0	0.0	159.6	0.0	0.0	0.0
ISRAEL	124.7	63.6	189.6	75.1	0.0	0.0
JORDAN	0.0	0.0	50.5	0.0	0.0	0.0
KOR REP	341.2	219.9	305.1	324.8	0.0	0.0
MALAYSA	0.0	40.0	18.7	4.6	0.0	0.0
PAKISTN	234.0	0.0	0.0	0.0	0.0	0.0
PHIL	258.5	264.0	384.3	270.9	0.0	0.0
SINGAPR	0.0	12.0	13.3	11.6	0.0	0.0
THAILND	91.0	32.0	127.3	138.2	0.0	0.0
U AR EM	0.0	0.0	9.0	10.7	0.0	0.0
VIETNAM	0.0	0.0	19.8	0.0	0.0	0.0
YEMEN	129.5	30.0	94.4	101.4	0.0	0.0
AFRICA	814.3	1400.6	1318.4	1358.2	0.0	0.0
ALGERIA	36.0	0.0	104.5	0.0	0.0	0.0
ANGOLA	0.0	0.0	42.5	6.0	0.0	0.0
CAMROON	0.0	0.0	10.8	0.0	0.0	0.0
CO BRAZ	0.0	0.0	0.0	2.6	0.0	0.0
CONGO DR	0.0	0.0	0.0	16.7	0.0	0.0
EGYPT	377.0	672.8	377.6	566.2	0.0	0.0
GUIN-BIS	0.0	0.0	12.1	0.0	0.0	0.0
LIBYA	0.0	0.0	34.6	0.0	0.0	0.0
MALI	0.0	0.0	6.0	0.0	0.0	0.0
MOROCCO	0.0	0.0	0.0	89.0	0.0	0.0
MOZAMBEQ	0.0	0.0	8.4	32.3	0.0	0.0
NIGERIA	385.3	672.8	615.1	556.1	0.0	0.0
REP SAF	16.0	55.0	75.4	28.3	0.0	0.0
SENEGAL	0.0	0.0	0.1	0.0	0.0	0.0
SIER LN	0.0	0.0	8.9	12.9	0.0	0.0
SUDAN	0.0	0.0	22.5	0.0	0.0	0.0
TUNISIA	0.0	0.0	0.0	48.1	0.0	0.0
WESTERN HEMISPHERE	1073.9	1129.6	1780.0	2616.9	0.0	0.0
EAREADO	23.3	13.8	7.7	5.8	0.0	0.0
BELIZE	6.2	2.3	7.3	4.9	0.0	0.0

ALL WHEAT MARKETING YEAR 06/01 - 05/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	:OUTSTANDING SALES:ACCUMULATED EXPORTS:				OUTSTANDING SALES	
	:THIS WEEK:	YR AGO:	:THIS WEEK:	YR AGO	:SECOND YR:	THIRD YR
BOLIVIA	: 0.0	0.0	9.5	26.8	0.0	0.0
BRAZIL	: 0.0	44.0	52.4	374.2	0.0	0.0
C RICA	: 54.5	18.0	36.3	38.7	0.0	0.0
CANADA	: 0.0	0.0	0.5	1.2	0.0	0.0
CHILE	: 0.0	6.0	0.0	162.1	0.0	0.0
COLOMB	: 43.0	163.8	176.4	301.5	0.0	0.0
CUBA	: 80.0	175.0	116.1	59.8	0.0	0.0
DOM REP	: 45.5	52.6	80.2	39.8	0.0	0.0
ECUADOR	: 0.0	17.0	26.4	15.3	0.0	0.0
GUATMAL	: 55.5	78.0	85.0	73.7	0.0	0.0
GUYANA	: 0.0	0.0	5.9	10.5	0.0	0.0
HAITI	: 0.0	0.0	16.0	30.7	0.0	0.0
HONDURA	: 11.2	13.6	33.7	42.6	0.0	0.0
JAMAICA	: 140.2	4.9	45.7	35.3	0.0	0.0
LW WW I	: 20.4	11.7	4.9	8.7	0.0	0.0
MEXICO	: 469.2	339.1	570.2	650.2	0.0	0.0
N ANTIL	: 0.0	4.5	0.0	0.0	0.0	0.0
NICARAG	: 5.5	4.5	10.5	31.4	0.0	0.0
PANAMA	: 9.7	31.9	14.1	28.8	0.0	0.0
PERU	: 54.5	40.3	316.7	296.3	0.0	0.0
SALVADR	: 16.5	0.0	73.1	36.0	0.0	0.0
SURINAM	: 0.0	0.0	0.0	2.9	0.0	0.0
TRINID	: 11.9	16.5	29.7	33.9	0.0	0.0
URUGUAY	: 0.0	0.0	0.0	26.3	0.0	0.0
VENEZ	: 26.6	92.1	61.6	279.5	0.0	0.0
TOTAL KNOWN	: 5023.6	4423.1	6539.2	6355.1	0.0	0.0
TOTAL UNKNOWN	: 763.5	662.1	0.0	0.0	0.0	0.0
TOTAL KNOWN & UNKNOWN	: 5787.1	5085.2	6539.2	6355.1	0.0	0.0
EXPORTS FOR OWN ACCT	: -	-	100.6	124.4	-	-
OPTIONAL ORIGIN	: 0.0	18.0	-	-	0.0	0.0

WHEAT PRODUCTS MARKETING YEAR 06/01 - 05/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	:OUTSTANDING SALES:ACCUMULATED EXPORTS:				OUTSTANDING SALES	
	:THIS WEEK:	YR AGO:	:THIS WEEK:	YR AGO	:SECOND YR:	THIRD YR
EUROPEAN UNION - 25	: 0.1	0.1	0.1	0.1	0.0	0.0
NETHLDS	: 0.1	0.1	0.1	0.1	0.0	0.0
OTHER EUROPE	: *	0.0	*	*	0.0	0.0
ICELAND	: *	0.0	*	*	0.0	0.0
JAPAN	: 0.0	0.0	*	*	0.0	0.0
TAIWAN	: *	0.0	0.0	*	0.0	0.0
OTHER ASIA AND OCEANIA:	0.0	0.0	0.6	0.3	0.0	0.0
AUSTRAL	: 0.0	0.0	0.0	*	0.0	0.0
GUAM	: 0.0	0.0	*	*	0.0	0.0
MARSHALL	: 0.0	0.0	0.3	0.2	0.0	0.0
MICRONES	: 0.0	0.0	*	0.0	0.0	0.0
NMARIANA	: 0.0	0.0	0.1	0.0	0.0	0.0

WHEAT PRODUCTS MARKETING YEAR 06/01 - 05/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES: ACCUMULATED EXPORTS: OUTSTANDING SALES					
	: THIS WEEK:	YR AGO:	: THIS WEEK:	YR AGO	: SECOND YR:	THIRD YR
S ARAB	: 0.0	0.0	: 0.1	0.0	: 0.0	0.0
AFRICA	: 0.0	0.0	: *	0.0	: 0.0	0.0
TOGO	: 0.0	0.0	: *	0.0	: 0.0	0.0
WESTERN HEMISPHERE	: 14.3	23.0	: 22.8	7.3	: 0.0	0.0
BAHAMAS	: 0.0	0.0	: 0.6	0.0	: 0.0	0.0
BERMUDA	: 0.0	*	: 0.0	0.1	: 0.0	0.0
CANADA	: 1.6	0.1	: 1.1	0.4	: 0.0	0.0
CAYMAN	: 0.0	0.0	: *	0.0	: 0.0	0.0
COLOMB	: 0.0	0.0	: 0.3	0.2	: 0.0	0.0
CUBA	: 10.0	20.0	: 9.9	0.0	: 0.0	0.0
DOM REP	: 0.2	*	: 0.5	*	: 0.0	0.0
F W IND	: 0.0	0.0	: *	0.0	: 0.0	0.0
HAITI	: 0.0	0.0	: 2.9	0.0	: 0.0	0.0
MEXICO	: 2.3	2.5	: 7.0	6.4	: 0.0	0.0
N ANTIL	: 0.0	0.0	: 0.1	0.0	: 0.0	0.0
PANAMA	: 0.0	0.0	: 0.2	0.0	: 0.0	0.0
TRINID	: 0.2	0.3	: 0.1	0.1	: 0.0	0.0
VIRGIN I	: *	0.0	: 0.1	0.1	: 0.0	0.0
TOTAL KNOWN	: 14.5	23.1	: 23.6	7.7	: 0.0	0.0
TOTAL UNKNOWN	: 0.0	0.0	: 0.0	0.0	: 0.0	0.0
TOTAL KNOWN & UNKNOWN	: 14.5	23.1	: 23.6	7.7	: 0.0	0.0
EXPORTS FOR OWN ACCT	: -	-	: 0.0	0.0	: -	-
OPTIONAL ORIGIN	: 0.0	0.0	: -	-	: 0.0	0.0

BARLEY - UNMILLED MARKETING YEAR 06/01 - 05/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES: ACCUMULATED EXPORTS: OUTSTANDING SALES					
	: THIS WEEK:	YR AGO:	: THIS WEEK:	YR AGO	: SECOND YR:	THIRD YR
EUROPEAN UNION - 25	: 0.0	0.0	: 6.0	0.0	: 0.0	0.0
IRELAND	: 0.0	0.0	: 1.8	0.0	: 0.0	0.0
U KING	: 0.0	0.0	: 4.2	0.0	: 0.0	0.0
JAPAN	: 10.5	14.2	: 30.5	40.8	: 0.0	0.0
WESTERN HEMISPHERE	: 0.5	23.4	: 3.8	3.1	: 0.0	0.0
CANADA	: 0.5	17.0	: 3.8	3.1	: 0.0	0.0
MEXICO	: 0.0	6.4	: 0.0	0.0	: 0.0	0.0
TOTAL KNOWN	: 10.9	37.6	: 40.2	43.8	: 0.0	0.0
TOTAL UNKNOWN	: 0.0	55.0	: 0.0	0.0	: 0.0	0.0
TOTAL KNOWN & UNKNOWN	: 10.9	92.6	: 40.2	43.8	: 0.0	0.0
EXPORTS FOR OWN ACCT	: -	-	: 0.0	0.0	: -	-
OPTIONAL ORIGIN	: 0.0	0.0	: -	-	: 0.0	0.0

CORN - UNMILLED MARKETING YEAR 09/01 - 08/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	: THIS WEEK: YR AGO:		THIS WEEK: YR AGO		: SECOND YR: THIRD YR	
	: THIS WEEK:	: YR AGO:	: THIS WEEK:	: YR AGO	: SECOND YR:	: THIRD YR
EUROPEAN UNION - 25	0.0	0.0	123.4	29.4	0.0	0.0
CYPRUS	0.0	0.0	102.5	0.0	0.0	0.0
ITALY	0.0	0.0	5.1	0.0	0.0	0.0
MALTA	0.0	0.0	15.0	29.4	0.0	0.0
SPAIN	0.0	0.0	0.8	0.0	0.0	0.0
OTHER EUROPE	0.0	0.0	722.0	983.7	0.0	0.0
AZORES	0.0	0.0	5.9	0.0	0.0	0.0
BULGAR	0.0	0.0	*	0.0	0.0	0.0
ICELAND	0.0	0.0	7.3	10.8	0.0	0.0
TURKEY	0.0	0.0	708.7	972.9	0.0	0.0
FORMER SOVIET UNION-12:	0.0	0.0	48.9	11.7	0.0	0.0
RUSSIA	0.0	0.0	48.9	11.7	0.0	0.0
JAPAN	760.6	526.9	15271.6	15138.0	1666.2	0.0
TAIWAN	314.1	280.0	4643.9	4306.9	192.9	0.0
OTHER ASIA AND OCEANIA:	293.0	66.7	6925.7	1353.3	200.5	0.0
AUSTRAL	0.0	0.0	0.0	48.4	0.0	0.0
BAHRAIN	0.0	0.0	6.0	0.0	0.0	0.0
HG KONG	0.0	0.0	2.1	0.0	0.0	0.0
INDNSIA	120.0	65.0	223.9	0.0	0.0	0.0
IRAN	0.0	0.0	121.1	0.0	0.0	0.0
IRAQ	0.0	0.0	32.0	0.0	0.0	0.0
ISRAEL	22.0	0.0	1067.4	229.9	35.5	0.0
JORDAN	0.0	0.0	195.1	27.5	0.0	0.0
KOR REP	116.0	1.7	3604.5	263.3	165.0	0.0
LEBANON	0.0	0.0	272.1	117.2	0.0	0.0
MALAYSA	0.0	0.0	188.2	9.9	0.0	0.0
OMAN	0.0	0.0	22.2	0.0	0.0	0.0
S ARAB	0.0	0.0	399.3	210.4	0.0	0.0
SYRIA	35.0	0.0	753.6	446.8	0.0	0.0
YEMEN	0.0	0.0	38.2	0.0	0.0	0.0
AFRICA	54.8	159.1	6160.7	3954.9	369.6	0.0
ALGERIA	0.0	9.6	1383.9	917.5	15.0	0.0
C IVOIRE	0.0	0.0	0.0	1.7	0.0	0.0
CAMROON	0.0	0.0	5.5	4.7	0.0	0.0
EGYPT	54.8	149.4	3300.6	2745.4	300.0	0.0
GHANA	0.0	0.0	0.0	4.5	0.0	0.0
GUIN-BIS	0.0	0.0	5.7	4.9	0.0	0.0
LIBYA	0.0	0.0	30.7	0.0	0.0	0.0
MOROCCO	0.0	0.0	748.9	105.2	8.0	0.0
MOZAMBQ	0.0	0.0	7.4	5.9	0.0	0.0
NIGERIA	0.0	0.0	0.8	0.0	0.0	0.0
REP SAF	0.0	0.0	60.0	23.1	0.0	0.0
TUNISIA	0.0	0.0	617.3	142.2	46.6	0.0
WESTERN HEMISPHERE	374.7	564.9	13808.0	13867.8	1375.4	0.0
BARBADO	0.0	0.0	35.3	31.1	0.0	0.0
BRAZIL	0.0	0.0	0.0	7.4	0.0	0.0
C RICA	0.0	0.0	507.5	539.0	40.7	0.0
CANADA	91.5	81.5	1232.2	2872.2	68.9	0.0
CHILE	0.0	0.0	9.4	0.0	0.0	0.0
COLOMB	0.0	76.8	1867.2	1614.5	69.4	0.0
CUBA	3.8	15.0	494.0	287.4	166.1	0.0
DOM REP	0.0	83.4	839.3	987.9	72.5	0.0
ECUADOR	0.0	0.0	372.0	187.0	0.0	0.0
GUATMAL	39.3	90.4	499.8	382.9	146.0	0.0

CORN - UNMILLED MARKETING YEAR 09/01 - 08/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES: ACCUMULATED EXPORTS: OUTSTANDING SALES					
	THIS WEEK:	YR AGO:	THIS WEEK:	YR AGO	SECOND YR:	THIRD YR
GUYANA	0.0	0.0	0.0	5.9	0.0	0.0
HONDURA	0.0	4.0	233.3	179.5	0.0	0.0
JAMAICA	8.4	0.0	252.0	240.2	2.0	0.0
LW WW I	0.0	0.0	6.1	8.0	0.8	0.0
MEXICO	169.6	146.7	5815.2	5023.7	646.5	0.0
N ANTIL	0.0	0.0	0.0	4.6	0.0	0.0
NICARAG	12.4	6.7	78.1	71.5	0.0	0.0
PANAMA	0.0	0.0	269.8	272.8	35.0	0.0
PERU	0.0	0.0	131.6	42.3	0.0	0.0
SALVADR	6.3	11.6	439.2	373.6	0.0	0.0
SURINAM	0.0	0.0	16.5	17.9	0.0	0.0
TRINID	13.5	0.0	84.6	113.0	0.0	0.0
VENEZ	30.0	48.9	625.0	605.2	127.5	0.0
TOTAL KNOWN	1797.2	1597.7	47704.2	39645.7	3804.6	0.0
TOTAL UNKNOWN	379.9	301.9	0.0	0.0	1144.0	0.0
TOTAL KNOWN & UNKNOWN	2177.1	1899.6	47704.2	39645.7	4948.6	0.0
EXPORTS FOR OWN ACCT	-	-	41.1	10.0	-	-
OPTIONAL ORIGIN	0.0	0.0	-	-	0.0	0.0

RYE - UNMILLED MARKETING YEAR 06/01 - 05/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES: ACCUMULATED EXPORTS: OUTSTANDING SALES					
	THIS WEEK:	YR AGO:	THIS WEEK:	YR AGO	SECOND YR:	THIRD YR
OTHER ASIA AND OCEANIA:	0.0	0.0	0.0	*	0.0	0.0
AUSTRAL	0.0	0.0	0.0	*	0.0	0.0
TOTAL KNOWN	0.0	0.0	0.0	*	0.0	0.0
TOTAL UNKNOWN	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL KNOWN & UNKNOWN	0.0	0.0	0.0	*	0.0	0.0
EXPORTS FOR OWN ACCT	-	-	0.0	0.0	-	-
OPTIONAL ORIGIN	0.0	0.0	-	-	0.0	0.0

OATS - UNMILLED MARKETING YEAR 06/01 - 05/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES: ACCUMULATED EXPORTS: OUTSTANDING SALES					
	THIS WEEK:	YR AGO:	THIS WEEK:	YR AGO	SECOND YR:	THIRD YR
WESTERN HEMISPHERE	0.0	0.1	0.0	1.3	0.0	0.0
CANADA	0.0	0.1	0.0	1.3	0.0	0.0



OATS - UNMILLED MARKETING YEAR 06/01 - 05/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES		ACCUMULATED EXPORTS		OUTSTANDING SALES	
	THIS WEEK	YR AGO	THIS WEEK	YR AGO	SECOND YR	THIRD YR
TOTAL KNOWN	0.0	0.1	0.0	1.3	0.0	0.0
TOTAL UNKNOWN	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL KNOWN & UNKNOWN	0.0	0.1	0.0	1.3	0.0	0.0
EXPORTS FOR OWN ACCT	-	-	0.0	0.0	-	-
OPTIONAL ORIGIN	0.0	0.0	-	-	0.0	0.0

GRAIN SORGHUMS - UNMILLED MARKETING YEAR 09/01 - 08/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES		ACCUMULATED EXPORTS		OUTSTANDING SALES	
	THIS WEEK	YR AGO	THIS WEEK	YR AGO	SECOND YR	THIRD YR
EUROPEAN UNION - 25	0.0	0.0	857.4	182.1	0.0	0.0
IRELAND	0.0	0.0	15.3	0.0	0.0	0.0
ITALY	0.0	0.0	441.9	0.0	0.0	0.0
PORTUGL	0.0	0.0	58.3	0.0	0.0	0.0
SPAIN	0.0	0.0	338.7	182.1	0.0	0.0
U KING	0.0	0.0	3.3	0.0	0.0	0.0
JAPAN	48.1	62.4	819.0	1053.7	192.0	0.0
OTHER ASIA AND OCEANIA:	*	16.0	131.5	24.3	0.0	0.0
ISRAEL	0.0	16.0	131.5	24.2	0.0	0.0
KOR REP	*	0.0	0.1	*	0.0	0.0
AFRICA	0.0	0.0	16.6	55.6	0.0	0.0
ERITREA	0.0	0.0	0.0	33.0	0.0	0.0
REP SAF	0.0	0.0	16.6	22.6	0.0	0.0
WESTERN HEMISPHERE	164.7	158.2	2871.6	3424.4	449.5	0.0
CANADA	*	0.0	0.0	0.0	0.0	0.0
MEXICO	164.7	158.2	2871.6	3424.4	449.5	0.0
TOTAL KNOWN	212.8	236.7	4696.2	4740.1	641.5	0.0
TOTAL UNKNOWN	0.0	50.0	0.0	0.0	8.1	0.0
TOTAL KNOWN & UNKNOWN	212.8	286.7	4696.2	4740.1	649.7	0.0
EXPORTS FOR OWN ACCT	-	-	0.0	0.0	-	-
OPTIONAL ORIGIN	0.0	9.0	-	-	0.0	0.0

SOYBEANS MARKETING YEAR 09/01 - 08/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	: THIS WEEK:		: YR AGO:		: SECOND YR: THIRD YR	
	: THIS WEEK:	: YR AGO:	: THIS WEEK:	: YR AGO:	: SECOND YR:	: THIRD YR
EUROPEAN UNION - 25	: 3.0	45.0	3493.4	5689.2	495.0	0.0
BELGIUM	: 0.0	0.0	196.9	612.0	0.0	0.0
DENMARK	: 0.0	0.0	98.3	119.3	0.0	0.0
FINLAND	: 0.0	0.0	42.6	25.6	0.0	0.0
FRANCE	: 0.0	0.0	54.7	120.7	60.0	0.0
GERMANY	: 0.0	45.0	924.2	1429.6	300.0	0.0
GREECE	: 0.0	0.0	60.4	163.7	0.0	0.0
IRELAND	: 3.0	0.0	2.6	6.9	0.0	0.0
ITALY	: 0.0	0.0	23.7	299.2	0.0	0.0
NETHLDS	: 0.0	0.0	920.1	829.7	135.0	0.0
PORTUGL	: 0.0	0.0	158.3	527.5	0.0	0.0
SPAIN	: 0.0	0.0	938.8	1427.3	0.0	0.0
U KING	: 0.0	0.0	72.8	127.8	0.0	0.0
OTHER EUROPE	: 15.0	35.0	267.8	382.3	0.0	0.0
ROMANIA	: 0.0	0.0	0.0	21.3	0.0	0.0
TURKEY	: 15.0	35.0	267.8	361.0	0.0	0.0
JAPAN	: 24.1	203.3	3262.5	3537.5	381.9	0.0
TAIWAN	: 21.0	34.0	1363.7	1628.7	22.1	0.0
CHINA	: 0.0	0.0	8229.0	7680.9	2253.0	0.0
OTHER ASIA AND OCEANIA:	122.5	115.9	3225.6	4468.4	343.5	0.0
AUSTRAL	: 0.0	0.0	8.2	70.4	0.0	0.0
HG KONG	: 0.0	0.0	0.1	0.0	0.0	0.0
INDNSIA	: 60.0	69.9	959.2	1257.2	60.0	0.0
IRAN	: 0.0	0.0	55.0	132.5	0.0	0.0
ISRAEL	: 0.0	0.0	190.6	375.4	13.5	0.0
KOR REP	: 1.5	40.0	1066.3	1188.9	150.0	0.0
LEBANON	: 0.0	0.0	69.6	45.9	0.0	0.0
MALAYSA	: 0.0	0.0	214.9	235.9	0.0	0.0
PAKISTN	: 0.0	0.0	0.0	42.3	0.0	0.0
PHIL	: 61.0	6.0	179.4	206.0	0.0	0.0
S LANKA	: 0.0	0.0	0.1	0.6	0.0	0.0
SINGAPP	: 0.0	0.0	0.1	0.1	0.0	0.0
SYRIA	: 0.0	0.0	38.4	30.1	0.0	0.0
THAILND	: 0.0	0.0	443.8	829.3	120.0	0.0
U AR EM	: 0.0	0.0	0.0	53.8	0.0	0.0
AFRICA	: 0.0	0.0	202.1	328.8	110.0	0.0
EGYPT	: 0.0	0.0	71.0	50.1	60.0	0.0
MOROCCO	: 0.0	0.0	131.0	275.1	50.0	0.0
NIGERIA	: 0.0	0.0	0.0	3.6	0.0	0.0
WESTERN HEMISPHERE	: 124.2	156.7	4063.6	5191.7	302.3	0.0
BARBADO	: 0.0	*	22.6	22.6	4.0	0.0
C RICA	: 0.0	0.0	166.4	215.6	20.2	0.0
CANADA	: 8.2	14.9	439.3	545.2	3.8	0.0
COLOMB	: 0.0	1.1	119.6	180.3	5.2	0.0
CUBA	: 20.0	0.0	118.8	94.6	0.0	0.0
GUATMAL	: 0.0	12.7	9.2	7.1	21.9	0.0
MEXICO	: 88.4	128.1	3117.4	4043.2	247.3	0.0
NICARAG	: 0.0	0.0	0.0	2.8	0.0	0.0
SALVADR	: 0.0	0.0	1.8	0.0	0.0	0.0
TRINID	: 7.5	0.0	60.5	80.4	0.0	0.0
VENEZ	: 0.0	0.0	8.0	0.0	0.0	0.0

SOYBEANS MARKETING YEAR 09/01 - 08/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	: THIS WEEK:		YR AGO:		SECOND YR:	THIRD YR
	THIS WEEK:	YR AGO:	THIS WEEK:	YR AGO:	SECOND YR:	THIRD YR
TOTAL KNOWN	309.8	589.9	24107.8	28907.5	3907.8	0.0
TOTAL UNKNOWN	0.0	9.3	0.0	0.0	1449.0	0.0
TOTAL KNOWN & UNKNOWN	309.8	599.2	24107.8	28907.5	5356.8	0.0
EXPORTS FOR OWN ACCT	-	-	46.8	*	-	-
OPTIONAL ORIGIN	0.0	0.0	-	-	60.0	0.0

SOYBEAN CAKE AND MEAL MARKETING YEAR 10/01 - 09/30  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	: THIS WEEK:		YR AGO:		SECOND YR:	THIRD YR
	THIS WEEK:	YR AGO:	THIS WEEK:	YR AGO:	SECOND YR:	THIRD YR
EUROPEAN UNION - 25	16.0	4.5	15.3	64.6	0.0	0.0
BELGIUM	0.0	0.0	0.0	1.0	0.0	0.0
DENMARK	0.0	0.0	2.0	2.0	0.0	0.0
GREECE	0.0	0.0	0.0	7.4	0.0	0.0
HUNGARY	0.0	4.5	4.2	6.6	0.0	0.0
IRELAND	8.0	0.0	0.0	17.1	0.0	0.0
NETHLD	0.0	0.0	9.2	13.5	0.0	0.0
U KING	8.0	0.0	0.0	17.0	0.0	0.0
OTHER EUROPE	0.0	25.0	157.2	173.0	0.0	0.0
TURKEY	0.0	25.0	157.2	173.0	0.0	0.0
FORMER SOVIET UNION-12	0.0	0.0	27.0	47.7	0.0	0.0
RUSSIA	0.0	0.0	27.0	47.7	0.0	0.0
JAPAN	20.8	33.1	134.3	213.7	8.0	0.0
OTHER ASIA AND OCEANIA:	1.5	166.9	665.6	1488.2	81.0	0.0
AUSTRAL	0.0	55.0	224.0	293.8	70.0	0.0
INDNSIA	0.0	88.9	94.9	542.1	0.0	0.0
ISRAEL	0.0	7.0	28.1	39.2	0.0	0.0
JORDAN	0.0	0.0	0.0	6.6	0.0	0.0
KOR REP	*	0.0	0.1	99.6	0.0	0.0
N ZEAL	0.0	11.0	60.8	66.5	11.0	0.0
PHIL	*	0.0	223.1	252.5	0.0	0.0
S ARAB	1.5	5.0	34.5	91.0	0.0	0.0
THAILND	0.0	0.0	0.0	96.8	0.0	0.0
AFRICA	0.0	14.0	246.2	259.2	24.0	0.0
ALGERIA	0.0	0.0	195.6	198.7	0.0	0.0
CAMROON	0.0	0.0	0.0	1.0	0.0	0.0
EGYPT	0.0	7.0	14.5	31.1	0.0	0.0
GHANA	0.0	0.0	0.0	6.3	0.0	0.0
TUNISIA	0.0	7.0	36.1	22.0	24.0	0.0
WESTERN HEMISPHERE	129.6	290.7	2518.1	2900.9	609.1	51.3
BELIZE	0.0	0.5	3.2	3.5	0.0	0.0
CANADA	42.8	60.9	798.3	954.8	471.9	51.3
COLOMB	0.0	7.0	107.6	61.2	3.0	0.0
CUBA	0.0	30.0	121.6	149.3	0.0	0.0
DOM REP	0.0	99.1	188.4	327.2	10.0	0.0
ECUADOR	0.0	0.0	0.0	30.1	0.0	0.0

SOYBEAN CAKE AND MEAL

MARKETING YEAR 10/01 - 09/30

OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES: ACCUMULATED EXPORTS: OUTSTANDING SALES					
	THIS WEEK:	YR AGO:	THIS WEEK:	YR AGO:	SECOND YR:	THIRD YR
GUATMAL	9.4	27.5	137.6	152.2	15.0	0.0
HONDURA	0.0	0.0	77.3	96.4	0.0	0.0
JAMAICA	4.3	5.3	91.6	86.3	2.6	0.0
LW WW I	0.3	0.3	0.7	1.3	0.0	0.0
MEXICO	69.8	31.6	650.5	525.8	100.4	0.0
N ANTIL	0.0	0.4	0.0	1.1	0.0	0.0
NICARAG	1.8	1.6	26.6	41.2	0.0	0.0
PANAMA	0.0	5.3	83.7	131.0	6.2	0.0
PERU	0.0	0.0	29.0	14.4	0.0	0.0
SALVADR	1.2	5.7	91.5	120.5	0.0	0.0
SURINAM	0.0	0.0	7.5	6.3	0.0	0.0
VENEZ	0.0	15.6	103.1	198.3	0.0	0.0
TOTAL KNOWN	167.9	534.2	3763.8	5147.3	722.1	51.3
TOTAL UNKNOWN	0.0	114.3	0.0	0.0	0.0	0.0
TOTAL KNOWN & UNKNOWN	167.9	648.5	3763.8	5147.3	722.1	51.3
EXPORTS FOR OWN ACCT	-	-	0.0	0.0	-	-
OPTIONAL ORIGIN	0.0	0.0	-	-	0.0	0.0

SOYBEAN OIL

MARKETING YEAR 10/01 - 09/30

OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES: ACCUMULATED EXPORTS: OUTSTANDING SALES					
	THIS WEEK:	YR AGO:	THIS WEEK:	YR AGO:	SECOND YR:	THIRD YR
EUROPEAN UNION - 25	0.0	0.0	0.2	0.1	0.0	0.0
CYPRUS	0.0	0.0	0.2	0.1	0.0	0.0
GERMANY	0.0	0.0	0.0	*	0.0	0.0
U KING	0.0	0.0	0.0	*	0.0	0.0
OTHER EUROPE	0.0	0.0	*	16.5	0.0	0.0
ICELAND	0.0	0.0	*	0.0	0.0	0.0
TURKEY	0.0	0.0	0.0	16.5	0.0	0.0
JAPAN	0.0	1.0	2.4	3.0	0.0	0.0
TAIWAN	0.0	0.0	0.0	10.0	0.0	0.0
CHINA	0.0	0.0	0.1	99.0	0.0	0.0
INDIA	0.0	0.0	0.0	0.3	0.0	0.0
OTHER ASIA AND OCEANIA:	0.4	0.7	9.2	62.3	3.6	0.0
AM SAMOA	0.0	0.0	0.0	*	0.0	0.0
AUSTRAL	0.1	*	0.5	0.1	0.0	0.0
BAHRAIN	0.0	0.0	0.2	0.1	0.0	0.0
GUAM	0.0	0.0	0.0	*	0.0	0.0
HG KONG	*	*	1.4	1.0	0.0	0.0
INDNSIA	0.0	*	0.4	0.2	0.0	0.0
ISRAEL	0.0	0.0	0.5	0.4	0.0	0.0
JORDAN	0.0	0.0	0.1	9.6	0.0	0.0
KOR REP	0.0	0.0	0.9	41.0	0.0	0.0
KUWAIT	*	*	1.2	4.7	0.0	0.0
LEBANON	*	*	0.3	0.3	0.0	0.0

SOYBEAN OIL MARKETING YEAR 10/01 - 09/30  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES		ACCUMULATED EXPORTS		OUTSTANDING SALES	
	THIS WEEK	YR AGO	THIS WEEK	YR AGO	SECOND YR	THIRD YR
NMARIANA	0.0	0.0	*	0.1	0.0	0.0
OMAN	0.0	0.0	0.1	0.1	0.0	0.0
PALAU	0.0	0.0	*	0.1	0.0	0.0
PHIL	0.0	*	0.1	*	0.0	0.0
QATAR	0.0	0.0	0.4	0.3	0.0	0.0
S ARAB	0.3	0.6	1.3	0.9	3.6	0.0
SINGAPR	0.0	0.0	0.6	0.4	0.0	0.0
THAILND	0.0	0.0	0.1	0.1	0.0	0.0
U AR EM	0.0	0.0	1.1	0.6	0.0	0.0
YEMEN	0.0	0.0	0.0	2.4	0.0	0.0
AFRICA	15.0	1.0	0.6	105.6	0.0	0.0
ALGERIA	0.0	0.0	0.0	21.5	0.0	0.0
EGYPT	0.0	1.0	0.6	54.6	0.0	0.0
MOROCCO	15.0	0.0	0.0	26.5	0.0	0.0
SENEGAL	0.0	0.0	0.0	3.0	0.0	0.0
WESTERN HEMISPHERE	17.7	60.1	198.1	369.3	51.5	0.0
BAHAMAS	0.0	0.0	0.4	0.3	0.0	0.0
BARBADO	0.0	*	0.7	0.1	0.0	0.0
C RICA	0.0	0.0	1.4	0.6	0.0	0.0
CANADA	3.6	31.2	50.3	58.5	0.5	0.0
COLOMB	0.0	0.0	0.6	1.7	0.0	0.0
CUBA	0.0	8.0	39.9	59.7	0.0	0.0
DOM REP	0.4	0.1	0.3	15.1	0.0	0.0
GUATMAL	0.0	1.0	4.3	15.6	0.0	0.0
HAITI	0.0	0.0	*	0.4	0.0	0.0
HONDURA	0.0	0.0	0.3	0.7	0.0	0.0
JAMAICA	2.5	2.0	11.9	16.6	0.0	0.0
MEXICO	10.6	14.8	74.2	163.0	51.0	0.0
N ANTIL	0.0	0.0	*	0.0	0.0	0.0
NICARAG	0.7	0.0	3.0	18.3	0.0	0.0
PANAMA	0.0	2.5	3.0	5.8	0.0	0.0
SALVADR	0.0	0.5	3.0	13.1	0.0	0.0
TRINID	0.0	0.0	4.9	0.0	0.0	0.0
TOTAL KNOWN	33.2	62.8	210.5	666.1	55.1	0.0
TOTAL UNKNOWN	3.0	0.0	0.0	0.0	0.0	0.0
TOTAL KNOWN & UNKNOWN	36.2	62.8	210.5	666.1	55.1	0.0
EXPORTS FOR OWN ACCT	-	-	0.0	0.0	-	-
OPTIONAL ORIGIN	0.0	0.0	-	-	0.0	0.0

LINSEED OIL MARKETING YEAR 06/01 - 05/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES		ACCUMULATED EXPORTS		OUTSTANDING SALES	
	THIS WEEK	YR AGO	THIS WEEK	YR AGO	SECOND YR	THIRD YR
EUROPEAN UNION - 25	0.0	3.0	2.5	3.0	0.0	0.0
NETHLDS	0.0	3.0	2.5	3.0	0.0	0.0
JAPAN	0.0	0.0	*	0.0	0.0	0.0
CHINA	0.0	0.0	1.0	0.0	0.0	0.0

LINSEED OIL MARKETING YEAR 06/01 - 05/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	: THIS WEEK: YR AGO:		THIS WEEK: YR AGO		SECOND YR:	THIRD YR
	OUTSTANDING SALES:	ACCUMULATED EXPORTS:	OUTSTANDING SALES			
WESTERN HEMISPHERE	0.3	0.6	0.3	0.3	0.0	0.0
CANADA	0.1	0.2	0.1	0.1	0.0	0.0
MEXICO	0.1	0.4	0.2	0.2	0.0	0.0
TOTAL KNOWN	0.3	3.6	3.9	3.3	0.0	0.0
TOTAL UNKNOWN	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL KNOWN & UNKNOWN	0.3	3.6	3.9	3.3	0.0	0.0
EXPORTS FOR OWN ACCT	-	-	0.0	0.0	-	-
OPTIONAL ORIGIN	0.0	0.0	-	-	0.0	0.0

SUNFLOWERSEED OIL MARKETING YEAR 10/01 - 09/30  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	: THIS WEEK: YR AGO:		THIS WEEK: YR AGO		SECOND YR:	THIRD YR
	OUTSTANDING SALES:	ACCUMULATED EXPORTS:	OUTSTANDING SALES			
EUROPEAN UNION - 25	0.0	0.0	2.5	0.0	0.0	0.0
SPAIN	0.0	0.0	2.5	0.0	0.0	0.0
JAPAN	0.0	2.6	4.1	7.3	0.0	0.0
TAIWAN	0.0	0.0	0.5	4.5	0.0	0.0
OTHER ASIA AND OCEANIA:	*	*	2.4	4.8	0.0	0.0
IRAQ	0.0	0.0	*	0.0	0.0	0.0
JORDAN	0.0	0.0	2.0	1.0	0.0	0.0
KUWAIT	0.0	0.0	*	0.0	0.0	0.0
LEBANON	*	*	0.3	0.2	0.0	0.0
S ARAB	0.0	0.0	0.0	3.6	0.0	0.0
AFRICA	0.0	0.0	12.1	3.0	0.0	0.0
ALGERIA	0.0	0.0	12.1	0.0	0.0	0.0
EGYPT	0.0	0.0	0.0	3.0	0.0	0.0
WESTERN HEMISPHERE	3.3	5.5	85.7	31.1	3.1	0.0
C RICA	0.0	0.6	2.1	3.6	0.0	0.0
CANADA	1.7	1.5	11.4	12.4	2.6	0.0
GUATMAL	0.0	0.2	0.5	1.9	0.0	0.0
MEXICO	1.6	3.2	70.2	12.9	0.5	0.0
N ANTIL	0.0	0.0	*	0.0	0.0	0.0
NICARAG	0.0	0.0	1.2	0.0	0.0	0.0
SALVADR	0.0	0.0	0.3	0.3	0.0	0.0
TOTAL KNOWN	3.3	8.1	107.3	50.7	3.1	0.0
TOTAL UNKNOWN	0.0	0.5	0.0	0.0	0.0	0.0
TOTAL KNOWN & UNKNOWN	3.3	8.5	107.3	50.7	3.1	0.0
EXPORTS FOR OWN ACCT	-	-	0.0	0.0	-	-
OPTIONAL ORIGIN	0.0	0.0	-	-	0.0	0.0

COTTONSEED MARKETING YEAR 08/01 - 07/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES		ACCUMULATED EXPORTS		OUTSTANDING SALES	
	THIS WEEK	YR AGO	THIS WEEK	YR AGO	SECOND YR	THIRD YR
JAPAN	0.1	15.2	0.0	0.0	0.0	0.0
TAIWAN	0.0	0.0	0.1	0.0	0.0	0.0
OTHER ASIA AND OCEANIA:	20.7	13.1	1.0	1.5	0.0	0.0
KOR REP	20.7	13.1	1.0	1.5	0.0	0.0
WESTERN HEMISPHERE	9.7	1.4	7.9	1.6	0.0	0.0
MEXICO	9.7	1.4	7.9	1.6	0.0	0.0
TOTAL KNOWN	30.5	29.6	9.0	3.1	0.0	0.0
TOTAL UNKNOWN	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL KNOWN & UNKNOWN	30.5	29.6	9.0	3.1	0.0	0.0
EXPORTS FOR OWN ACCT	-	-	0.0	0.0	-	-
OPTIONAL ORIGIN	0.0	0.0	-	-	0.0	0.0

COTTONSEED CAKE AND MEAL MARKETING YEAR 10/01 - 09/30  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES		ACCUMULATED EXPORTS		OUTSTANDING SALES	
	THIS WEEK	YR AGO	THIS WEEK	YR AGO	SECOND YR	THIRD YR
WESTERN HEMISPHERE	7.8	10.4	103.4	88.4	0.0	0.0
MEXICO	7.8	10.4	103.4	88.4	0.0	0.0
TOTAL KNOWN	7.8	10.4	103.4	88.4	0.0	0.0
TOTAL UNKNOWN	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL KNOWN & UNKNOWN	7.8	10.4	103.4	88.4	0.0	0.0
EXPORTS FOR OWN ACCT	-	-	0.0	0.0	-	-
OPTIONAL ORIGIN	0.0	0.0	-	-	0.0	0.0

COTTONSEED OIL MARKETING YEAR 10/01 - 09/30  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES		ACCUMULATED EXPORTS		OUTSTANDING SALES	
	THIS WEEK	YR AGO	THIS WEEK	YR AGO	SECOND YR	THIRD YR
EUROPEAN UNION - 25	0.0	0.0	0.1	*	0.0	0.0
GREECE	0.0	0.0	0.1	0.0	0.0	0.0
U KING	0.0	0.0	*	*	0.0	0.0
JAPAN	1.1	4.5	5.0	0.6	0.0	0.0
CHINA	0.0	0.0	0.1	0.0	0.0	0.0

COTTONSEED OIL MARKETING YEAR 10/01 - 09/30  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	:OUTSTANDING SALES:ACCUMULATED EXPORTS: OUTSTANDING SALES					
	:THIS WEEK:	YR AGO:	:THIS WEEK:	YR AGO	:SECOND YR:	THIRD YR
OTHER ASIA AND OCEANIA:	0.0	0.0	*	*	0.0	0.0
LEBANON	0.0	0.0	*	*	0.0	0.0
WESTERN HEMISPHERE	0.9	0.4	2.9	5.1	0.0	0.0
CANADA	0.7	0.2	1.5	1.5	0.0	0.0
COLOMB	0.0	0.0	*	*	0.0	0.0
MEXICO	0.3	0.2	1.3	3.2	0.0	0.0
SALVADR	0.0	0.0	0.0	0.4	0.0	0.0
TOTAL KNOWN	2.0	4.9	8.0	5.7	0.0	0.0
TOTAL UNKNOWN	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL KNOWN & UNKNOWN	2.0	4.9	8.0	5.7	0.0	0.0
EXPORTS FOR OWN ACCT	-	-	0.0	0.0	-	-
OPTIONAL ORIGIN	0.0	0.0	-	-	0.0	0.0

COTTON - AMERICAN PIMA - RAW, EXTRA LONG STAPLE MARKETING YEAR 08/01 - 07/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 RUNNING BALES AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	:OUTSTANDING SALES:ACCUMULATED EXPORTS: OUTSTANDING SALES					
	:THIS WEEK:	YR AGO:	:THIS WEEK:	YR AGO	:SECOND YR:	THIRD YR
EUROPEAN UNION - 25	10.2	27.9	0.3	0.7	0.0	0.0
AUSTRIA	2.1	0.0	0.0	0.0	0.0	0.0
BELGIUM	2.1	6.5	0.0	0.0	0.0	0.0
GERMANY	0.4	15.2	0.0	0.0	0.0	0.0
ITALY	5.5	6.1	0.3	0.5	0.0	0.0
PORTUGL	0.0	0.0	0.0	0.3	0.0	0.0
OTHER EUROPE	4.0	10.8	0.0	0.0	0.0	0.0
SWITZLD	4.0	10.8	0.0	0.0	0.0	0.0
JAPAN	23.2	16.2	3.3	3.3	0.0	0.0
TAIWAN	0.7	0.0	0.0	0.0	0.0	0.0
CHINA	1.4	0.3	0.9	0.1	0.0	0.0
INDIA	0.9	13.5	1.9	1.1	0.0	0.0
OTHER ASIA AND OCEANIA:	21.3	11.8	15.3	10.6	0.0	0.0
BANGLADH	0.3	0.2	1.3	2.0	0.0	0.0
INDNSIA	4.8	1.3	3.1	1.7	0.0	0.0
KOR REP	4.1	1.4	1.1	0.0	0.0	0.0
MALAYSA	0.3	0.0	0.1	0.0	0.0	0.0
PAKISTN	7.8	7.9	4.3	6.1	0.0	0.0
THAILND	4.0	1.1	0.6	0.8	0.0	0.0
U AR EM	0.0	0.0	4.3	0.0	0.0	0.0
VIETNAM	0.0	0.0	0.5	0.0	0.0	0.0
WESTERN HEMISPHERE	9.0	6.9	3.0	1.0	0.0	0.0
BRACIL	0.0	0.9	0.3	0.2	0.0	0.0
CANADA	*	0.0	2.7	0.0	0.0	0.0
CHILE	0.0	0.0	*	0.0	0.0	0.0
GUATMAL	0.3	0.0	0.0	0.0	0.0	0.0



COTTON - AMERICAN PIMA - RAW, EXTRA LONG STAPLE      MARKETING YEAR 08/01 - 07/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 RUNNING BALES      AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES		ACCUMULATED EXPORTS		OUTSTANDING SALES	
	THIS WEEK	YR AGO	THIS WEEK	YR AGO	SECOND YR	THIRD YR
MEXICO	0.0	0.3	0.0	0.0	0.0	0.0
PERU	8.7	5.7	0.0	0.8	0.0	0.0
TOTAL KNOWN	70.6	87.5	24.9	16.8	0.0	0.0
TOTAL UNKNOWN	0.0	2.6	0.0	0.0	0.0	0.0
TOTAL KNOWN & UNKNOWN	70.6	90.0	24.9	16.8	0.0	0.0
EXPORTS FOR OWN ACCT	-	-	0.0	0.0	-	-
OPTIONAL ORIGIN	0.0	0.0	-	-	0.0	0.0

ALL UPLAND COTTON      MARKETING YEAR 08/01 - 07/31  
 OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
 1000 RUNNING BALES      AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES		ACCUMULATED EXPORTS		OUTSTANDING SALES	
	THIS WEEK	YR AGO	THIS WEEK	YR AGO	SECOND YR	THIRD YR
EUROPEAN UNION - 25	119.8	49.2	57.3	12.4	10.8	0.0
AUSTRIA	2.0	0.0	1.0	0.0	0.0	0.0
BELGIUM	28.7	0.0	46.3	4.6	0.0	0.0
ESTONIA	5.3	4.2	0.5	1.0	0.0	0.0
FRANCE	0.0	0.0	0.0	0.3	0.0	0.0
GERMANY	1.8	0.9	0.3	0.0	0.0	0.0
IRELAND	37.3	11.7	1.4	3.7	7.5	0.0
ITALY	42.4	28.4	7.0	1.0	3.3	0.0
PORTUGL	1.3	0.3	0.0	1.1	0.0	0.0
SLOVENIA	1.1	1.3	0.7	0.3	0.0	0.0
SWEDEN	0.0	2.5	0.0	0.4	0.0	0.0
OTHER EUROPE	294.0	100.3	113.5	156.1	0.4	0.0
SWITZLD	0.0	2.3	0.0	0.0	0.0	0.0
TURKEY	294.0	98.1	113.5	156.1	0.4	0.0
JAPAN	156.8	90.7	12.1	19.5	0.0	0.0
TAIWAN	51.5	46.4	42.1	29.0	0.0	0.0
CHINA	130.0	50.7	56.4	58.4	0.0	0.0
INDIA	32.4	55.9	58.4	81.2	0.0	0.0
OTHER ASIA AND OCEANIA	1707.2	596.5	272.9	219.6	9.9	0.0
BAHRAIN	5.5	4.0	0.0	2.8	0.0	0.0
BANGLADH	30.2	26.6	27.6	28.1	0.0	0.0
CAMBODIA	0.0	0.4	0.0	0.4	0.0	0.0
HG KONG	66.9	*	24.8	5.8	0.0	0.0
INDNSIA	564.2	264.2	64.6	67.2	6.2	0.0
KOR REP	362.4	163.5	20.0	57.1	2.7	0.0
MALAYSA	1.3	0.7	1.5	0.5	0.0	0.0
PAKISTN	239.7	16.7	72.9	10.5	0.0	0.0
PHIL	62.8	19.5	4.5	3.6	1.0	0.0
S LANKA	4.2	4.7	0.7	0.6	0.0	0.0
SINGAPR	0.0	0.0	0.0	2.0	0.0	0.0
THAILND	333.6	91.5	42.8	30.9	0.0	0.0
U AR EM	2.6	0.0	3.3	0.0	0.0	0.0
VIETNAM	33.8	4.7	10.3	10.1	0.0	0.0

## ALL UPLAND COTTON

MARKETING YEAR 08/01 - 07/31

OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
1000 RUNNING BALES AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES: ACCUMULATED EXPORTS: OUTSTANDING SALES					
	: THIS WEEK:	YR AGO:	: THIS WEEK:	YR AGO	: SECOND YR:	THIRD YR
AFRICA	: 2.2	0.0	0.0	0.0	0.0	0.0
MAURIT	: 2.2	0.0	0.0	0.0	0.0	0.0
WESTERN HEMISPHERE	: 1728.8	1357.4	122.3	216.9	136.3	0.0
BRAZIL	: 32.8	26.8	2.1	13.1	0.0	0.0
CANADA	: 262.1	319.4	16.3	20.1	3.1	0.0
CHILE	: 2.1	0.0	0.0	4.5	0.0	0.0
COLOMB	: 25.1	59.3	2.0	10.2	0.0	0.0
CUBA	: 3.9	1.1	0.0	0.3	0.0	0.0
ECUADOR	: 25.7	18.0	8.5	5.8	0.0	0.0
GUATMAL	: 51.0	9.4	4.5	11.0	6.4	0.0
HONDURA	: 2.0	0.4	0.0	0.2	0.0	0.0
MEXICO	: 1213.6	832.0	76.9	132.8	110.4	0.0
PERU	: 20.4	9.8	7.9	4.4	0.0	0.0
SALVADR	: 67.7	46.7	4.1	11.5	16.4	0.0
VENEZ	: 22.4	34.4	0.0	2.9	0.0	0.0
TOTAL KNOWN	: 4222.7	2347.1	735.0	793.0	157.3	0.0
TOTAL UNKNOWN	: 19.1	44.0	0.0	0.0	0.0	0.0
TOTAL KNOWN & UNKNOWN	: 4241.8	2391.1	735.0	793.0	157.3	0.0
EXPORTS FOR OWN ACCT	: -	-	0.0	0.0	-	-
OPTIONAL ORIGIN	: 0.0	0.0	-	-	0.0	0.0

## LONG GRAIN, ROUGH

MARKETING YEAR 08/01 - 07/31

OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	OUTSTANDING SALES: ACCUMULATED EXPORTS: OUTSTANDING SALES					
	: THIS WEEK:	YR AGO:	: THIS WEEK:	YR AGO	: SECOND YR:	THIRD YR
EUROPEAN UNION - 25	: 10.0	0.0	0.0	0.0	0.0	0.0
SPAIN	: 10.0	0.0	0.0	0.0	0.0	0.0
WESTERN HEMISPHERE	: 118.0	118.9	84.6	168.8	0.0	0.0
BRAZIL	: 0.0	0.0	0.0	61.8	0.0	0.0
GUATMAL	: 0.4	0.0	0.0	0.0	0.0	0.0
HONDURA	: 1.4	3.0	1.0	12.0	0.0	0.0
JAMAICA	: 17.5	16.8	3.4	5.3	0.0	0.0
MEXICO	: 69.7	87.2	43.7	40.1	0.0	0.0
NICARAG	: 18.0	10.5	30.7	7.5	0.0	0.0
SALVADR	: 11.1	1.4	5.8	3.4	0.0	0.0
VENEZ	: 0.0	0.0	0.0	38.8	0.0	0.0
TOTAL KNOWN	: 128.0	118.9	84.6	168.8	0.0	0.0
TOTAL UNKNOWN	: 0.0	11.0	0.0	0.0	0.0	0.0
TOTAL KNOWN & UNKNOWN	: 128.0	129.9	84.6	168.8	0.0	0.0
EXPORTS FOR OWN ACCT	: -	-	0.0	0.0	-	-
OPTIONAL ORIGIN	: 0.0	0.0	-	-	0.0	0.0

## ALL RICE

MARKETING YEAR 08/01 - 07/31

OUTSTANDING EXPORT SALES AND EXPORTS BY COUNTRY, REGION AND MARKETING YEAR  
1000 METRIC TONS AS OF AUGUST 26, 2004

DESTINATION	CURRENT MARKETING YEAR				NEXT MARKETING YEAR	
	:OUTSTANDING SALES:		ACCUMULATED EXPORTS:		OUTSTANDING SALES	
	:THIS WEEK:	YR AGO:	:THIS WEEK:	YR AGO	:SECOND YR:	THIRD YR
EUROPEAN UNION - 25	45.6	35.8	13.2	26.5	0.0	0.0
AUSTRIA	0.0	*	0.0	0.0	0.0	0.0
BELGIUM	4.7	3.8	*	4.4	0.0	0.0
CYPRUS	0.5	0.0	0.0	0.0	0.0	0.0
DENMARK	0.0	0.0	*	0.0	0.0	0.0
FINLAND	0.2	0.1	0.0	0.1	0.0	0.0
FRANCE	3.5	1.9	1.6	2.0	0.0	0.0
GERMANY	13.6	10.6	2.5	8.5	0.0	0.0
ITALY	0.0	0.0	*	0.0	0.0	0.0
MALTA	0.2	0.2	*	*	0.0	0.0
NETHLD	1.5	5.4	0.4	0.4	0.0	0.0
POLAND	0.0	0.2	0.0	0.0	0.0	0.0
SPAIN	10.0	0.9	0.0	0.1	0.0	0.0
SWEDEN	0.4	1.0	0.5	0.1	0.0	0.0
U KING	11.0	11.8	8.2	10.8	0.0	0.0
OTHER EUROPE	9.3	4.5	0.3	4.1	0.0	0.0
GIBRALT	*	*	0.0	0.0	0.0	0.0
ICELAND	0.1	0.1	*	*	0.0	0.0
NORWAY	1.1	0.7	0.1	0.2	0.0	0.0
SWITZLD	8.0	3.6	0.1	4.0	0.0	0.0
TURKEY	0.0	*	0.0	0.0	0.0	0.0
FORMER SOVIET UNION-12:	0.3	0.1	0.1	0.2	0.0	0.0
RUSSIA	0.3	0.1	0.1	0.2	0.0	0.0
JAPAN	0.2	3.1	0.6	1.1	0.0	0.0
TAIWAN	10.0	36.1	4.5	4.5	0.0	0.0
OTHER ASIA AND OCEANIA:	41.9	18.1	12.6	6.0	0.0	0.0
AM SAMOA	0.3	*	*	*	0.0	0.0
AUSTRAL	0.1	*	*	0.1	0.0	0.0
BAHRAIN	0.0	0.0	0.0	*	0.0	0.0
BR P IS	0.1	0.0	0.0	0.0	0.0	0.0
FR P IS	0.1	*	0.0	0.0	0.0	0.0
GUAM	0.2	0.3	0.2	0.4	0.0	0.0
HG KONG	0.6	0.1	*	0.3	0.0	0.0
INDNSIA	*	0.1	0.1	*	0.0	0.0
ISRAEL	6.2	0.3	0.1	0.1	0.0	0.0
JORDAN	12.5	0.6	1.7	0.0	0.0	0.0
KOR REP	15.0	0.0	0.0	*	0.0	0.0
KUWAIT	0.0	0.1	*	*	0.0	0.0
LEBANON	1.3	1.0	0.2	0.1	0.0	0.0
MACAU	0.0	0.0	*	0.0	0.0	0.0
MALAYSA	0.0	0.0	*	*	0.0	0.0
MARSHALL	*	*	*	0.1	0.0	0.0
MICRONES	1.0	*	0.3	0.9	0.0	0.0
N ZEAL	0.0	*	0.0	0.0	0.0	0.0
NMARIANA	0.2	0.1	0.1	0.2	0.0	0.0
PAKISTN	0.0	0.0	0.0	*	0.0	0.0
PALAU	0.2	*	*	0.1	0.0	0.0
S ARAB	0.3	13.1	8.2	2.0	0.0	0.0
S LANKA	*	0.0	0.0	0.0	0.0	0.0
SINGAPR	0.6	*	0.1	*	0.0	0.0
SYRIA	0.0	1.0	0.0	0.0	0.0	0.0
U AR EM	1.3	0.5	0.1	*	0.0	0.0
W SAMOA	2.1	0.0	1.1	0.3	0.0	0.0
YEMEN	0.0	0.6	0.3	1.1	0.0	0.0
AFRICA	7.8	27.1	10.0	12.0	0.0	0.0

FIGURE 2  
APPROACH TO METHANE EQUILIBRIUM IN FIXED BED GASIFICATION TESTS

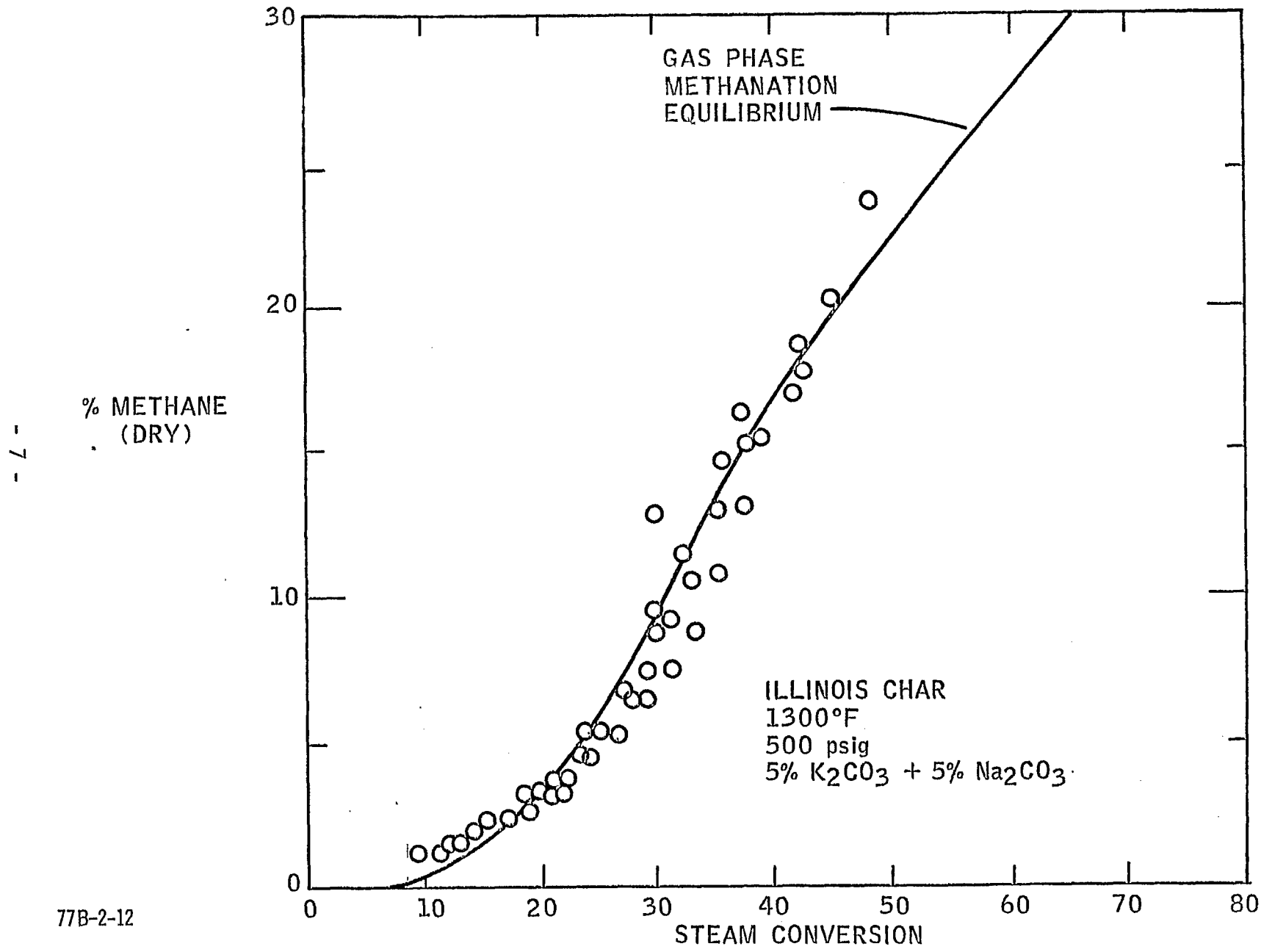
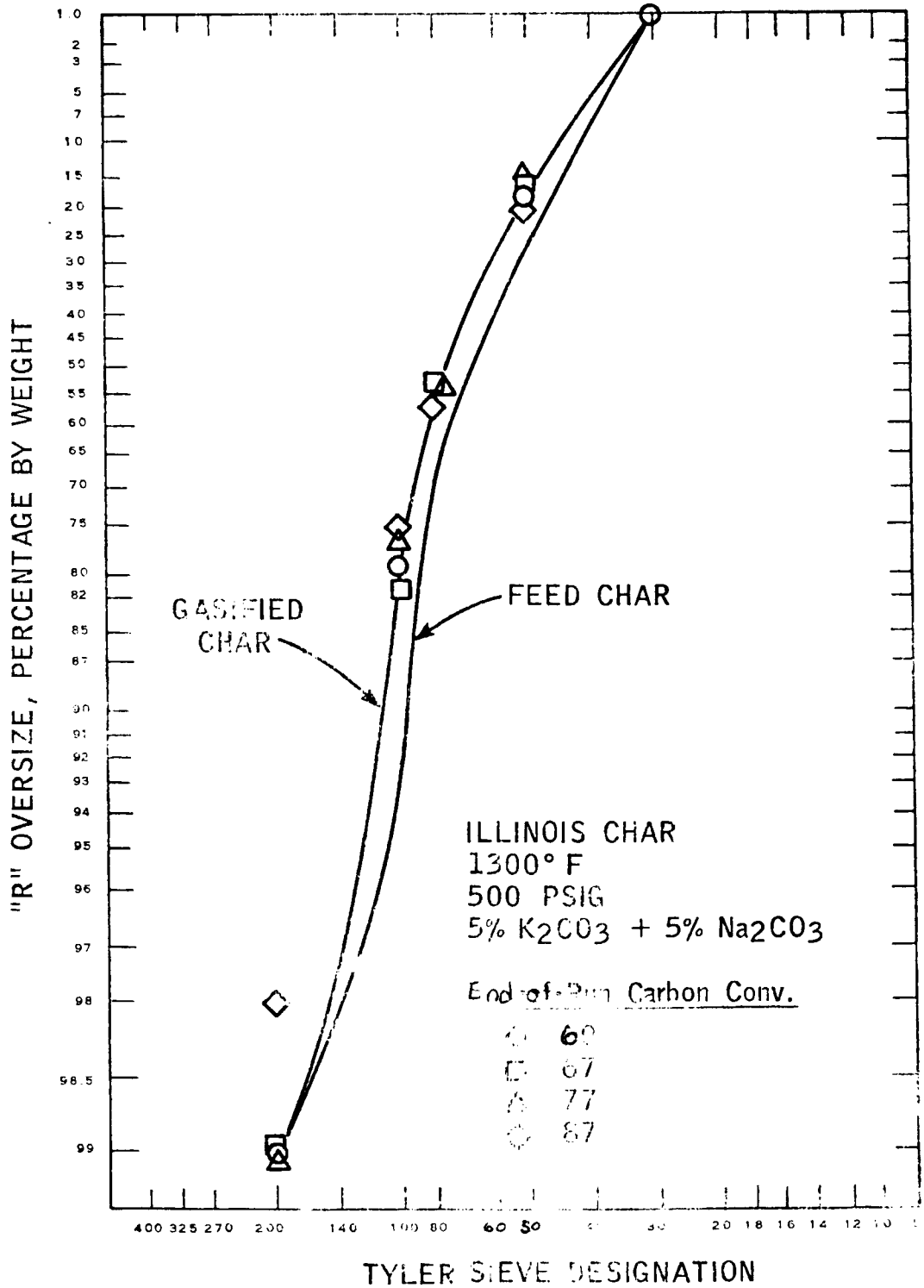


FIGURE 3

PARTICLE SIZE DISTRIBUTION IN FIXED BED GASIFICATION TESTS



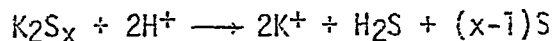
from 10-wt.% to 20 wt.% of the total. This is not surprising since all evidence indicates that gasification occurs within the particles at active sites rather than on the external surface.

Additional fixed-bed runs are planned with Na<sub>2</sub>CO<sub>3</sub> and with higher loadings of mixed catalyst.

## 2.2 Catalyst Recovery

In October, program work began on the recovery of water-soluble catalyst from gasifier ash/char residue. Previous Exxon-funded studies had shown that while K<sub>2</sub>CO<sub>3</sub> was the major component in the leachate produced by water washing the residue, potassium-sulfur compounds are also present. Current program work is aimed at determining the mechanism for the formation of these sulfur compounds, their reactivity, and their ultimate disposition in a recycle catalyst system. The chemistry of potassium thiosulfate (K<sub>2</sub>S<sub>2</sub>O<sub>3</sub>) formation has been given particular attention because it was the major sulfur form in the leachate.

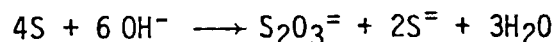
To help in understanding the origin of the sulfur compounds in solution, chemical analyses were performed on the char prior to leaching. These analyses showed the presence of sulfate, sulfite, and pyritic and non-pyritic sulfides. Organic sulfur which cannot be measured directly was taken as the difference between the sum of these and the total sulfur. However, the level of organic sulfur was high relative to the ungasified organic material suggesting that some sulfur species were not being accounted for. Since polysulfide is a sulfur form which would not be picked up by the existing analytical procedure, a technique was developed to determine whether polysulfide is a major constituent of the char. This technique involves char leaching with a pH 4-5 buffered solution. Under this condition, K<sub>2</sub>S<sub>x</sub> is decomposed while any K<sub>2</sub>S<sub>2</sub>O<sub>3</sub> present is not affected.



The sulfur is then extracted by subsequent carbon disulfide leaching. Using this technique, the complete sulfur analysis was determined for two char samples. One char was produced during operations of the Fluid Bed Gasifier (FBG) prior to the start of the current contract. The second was produced in the small Continuous Gasification Unit (CGU) during the third quarter of 1976.

	FBG Char	CGU Char
Total sulfur, Wt.% on Char	3.63	1.58
Sulfur Distribution, Wt.% of Total		
Pyritic	1.1	2.5
Sulfate	13.3	6.9
Sulfide	41.3	38.6
Sulfite	0.5	0.6
Polysulfide	33.9	18.4
Organic (by difference)	9.9	33.0
	100.0	100.0

As can be seen, polysulfides account for a significant portion of total sulfur analyzed. This finding is important because literature data as well as brief lab experiments indicate that in a basic solution, polysulfide sulfur can be converted to thiosulfate by reactions of the following type:



Sulfide sulfur, on the other hand, cannot be converted to thiosulfate unless air is present, and brief leaching experiments performed under an inert atmosphere showed no reduction in  $K_2S_2O_3$  levels.

To study the pH dependence of thiosulfate formation, leaching experiments were conducted on the two char samples using buffered solutions of different acid strengths. In all cases, 75 grams of char were leached in 500 ml  $H_2O$ . The data confirm the strong pH dependence of the thiosulfate level in solution and lend weight to the conclusion that polysulfide sulfur is an important source of thiosulfate found in the recovered catalyst solution.

	Thiosulfate Level, ppm			
	pH 4.8	pH 5.8	pH 7.0	pH 11.0
FBG Char	290	1320	1690	2030
CGU Char	307	361	428	711

At this time it is not known whether potassium thiosulfate is an active catalyst. However, if it is desirable to prevent or suppress the formation of thiosulfate, one approach may be to carry out the water extraction under high pressure  $CO_2$  to reduce the solution pH. Some brief Soxhlet leaching tests performed under atmospheric pressure with  $CO_2$  bubbling show some reduction in thiosulfate levels, although the data scatter considerably.

<u>Sparging Gas</u>	<u>% of Original Sulfur on Char as Thiosulfate in Solution</u>
Air	33
$N_2$	33, 42
$CO_2$	25, 15

As a result of these findings, leaching experiments have been carried out in a tubing bomb under  $CO_2$  pressures up to 380 psi and temperatures up to  $100^\circ C$ . The solutions produced are currently being analyzed to determine whether a reduction has been achieved in thiosulfate levels.

### 3: ENGINEERING RESEARCH AND DEVELOPMENT (Reporting Category 3)

#### 3.1 Evaluation of the Incentive for Secondary Gasification

During the fourth quarter of 1976, an engineering screening study was carried out to determine whether there is an economic incentive for adding a secondary gasification step to the Exxon Catalytic Coal Gasification Process. The objective of secondary gasification is to raise overall process efficiency by increasing carbon conversion above that attainable in a single fluidized bed. The gas cost with secondary gasification was estimated to be only 0.8 percent less than the "Base Case" gas cost. This small economic credit does not appear to offset the development risks due to greater system complexity and the potential for added technical problems. However, this conclusion could change if it were not practical to obtain high carbon conversions in a single reaction step or if coal or catalyst costs increase significantly. The basis assumptions, results, and economic sensitivities for the secondary gasification case are discussed below.

A schematic reactor system flow plan with secondary gasification is shown in Figure 4. The primary stage of the gasifier gasifies 90 percent of the feed carbon as in the current Catalytic Gasification "Base Case," and the secondary stage gasifies enough additional carbon so that the overall carbon conversion is 95 percent. The secondary gasifier operates at a slightly lower pressure than the primary gasifier and receives as feed all of the entrained solids which can be captured from the primary effluent gas by an overhead cyclone and all of the char withdrawn from the primary gasifier. The secondary gasifier is fed a portion of the preheated steam/recycle mixture and operates at a relatively low gas velocity to minimize fines entrainment. The coal injection gas supplies a second source of recycle gas for the primary gasifier. Since the steam and recycle mixture is split on the basis of the steam required for each gasifier, the two gasifiers are not individually in recycle gas balance. (Recycle gas balance is achieved when  $CO + H_2$  in equals  $CO + H_2$  out.) Recycle gas balance could have been achieved by heating the steam and recycle streams separately and blending the appropriate mixture for each gasifier. Since this would have increased the complexity and cost of the preheat furnace, it was judged that this simpler scheme would be better.

The process basis and some results of the material and energy balances are presented in Table II. The key process basis items are unchanged from the Base Case except where indicated in the table. The material balance was calculated assuming shift, methanation, and steam-graphite equilibrium in each gasifier. The assumption of steam-graphite equilibrium results in feed steam conversions of 43 percent in the primary and 54 percent in the secondary which appear reasonable based upon the kinetic data obtained to date. The temperature in the primary gasifier was fixed at 1300°F and the secondary gasifier temperature was determined by a trial-and-error material and energy balance. The secondary temperature was found to be essentially the same as that for the primary gasifier, 1300°F. Also, the steam/recycle preheat furnace coil outlet temperature was calculated to be almost identical to the Base Case value of 1540°F.



FIGURE 4

EXXON CATALYTIC GASIFICATION PROCESS WITH SECONDARY GASIFICATION

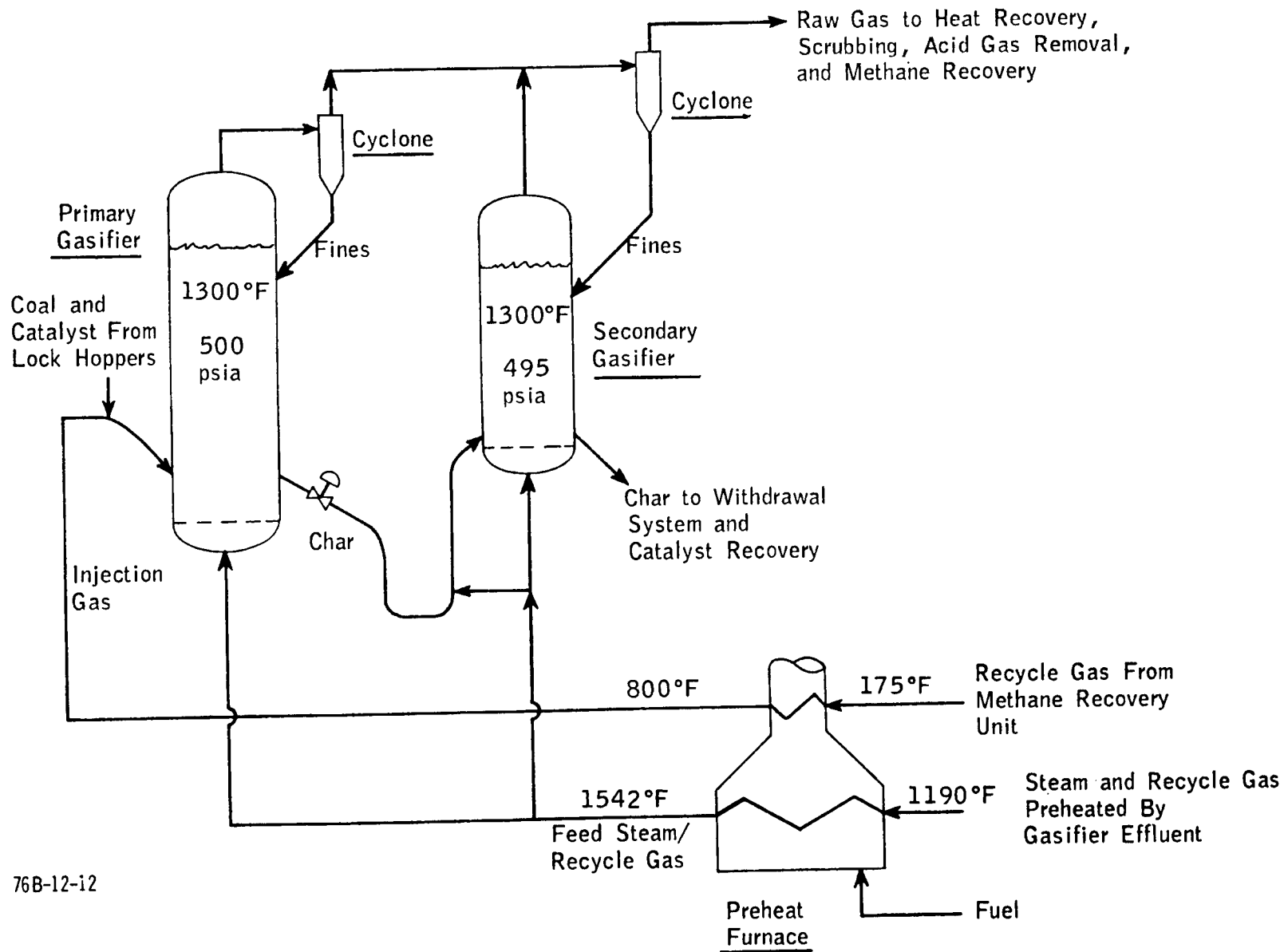


Table II

INCENTIVE FOR SECONDARY GASIFICATION  
SUMMARY OF PROCESS BASIS AND HEAT AND MATERIAL BALANCE(1)

	<u>Base Case</u>	<u>Secondary Gasification Incentive Case</u>
Reactor System	"Primary" Gasifier Only	Primary and Secondary Gasifiers (Figure 1)
Feed Carbon Conversion:		
Primary Gasifier	90%	90%
Overall	90%	95%
Conditions:		
Primary Gasifier	1300°F/500 psia	1300°F/500 psia
Secondary Gasifier	--	1300°F/495 psia
Secondary Gasifier Sizing Basis:		
Superficial Outlet Velocity	--	22.5% of Primary
Volumetric Gasification Rate	--	50% of Primary
Preheat Furnace Coil Outlet Temperature	1540°F	1542°F
Key Stream Rates:(2)		
Coal Feed to Gasifiers	14,490 ST/SD	13,835 ST/SD
Coal to Boiler Fuel	1,860 ST/SD	1,925 ST/SD
Coal to Dryer Fuel	650 ST/SD	620 ST/SD
Total Coal	17,000 ST/SD	16,380 ST/SD
Total Gasifier Steam Rate	84,164 moles/hr	85,633 moles/hr
Total Recycle Rate	51,292 moles/hr	51,605 moles/hr
Split of Preheated Steam/Recycle	All to Primary	94.0/6.0% to Primary/Secondary
By-Product Rates:		
Ammonia	239 ST/SD	234 ST/SD
Sulfur	400 LT/SD	403 LT/SD
Sulfuric Acid	177 ST/SD	179 ST/SD
Utilities Requirements:		
Electric Power	159 MW	157 MW
Raw Water	5,500 GPM	5,500 GPM
Overall Thermal Efficiency(3)	67.1%	69.5%

Notes:

- (1) For plant sized to produce 257 GBtu/SD SNG.
- (2) All coal rates are for Illinois coal as received from coal cleaning. Higher heating value is 10,620 Btu/lb.
- (3) Thermal efficiency includes purchased electric power (evaluated at a power plant heat rate of 8,950 Btu/KWH) and by-products.

Stream rates are presented in Table II for the Base Case and the Secondary Gasification Incentive Case for plants producing 257 GBtu/SD net SNG product. Steam and recycle rates are up slightly, but the gasifier coal rate is down about 5 percent because of the higher overall carbon conversion. This increase in gas production per unit of coal increased the overall process thermal efficiency from 67.1 percent to 69.5 percent. These thermal efficiencies take into account all energy losses including those in the power plant supplying the purchased electrical power. In sizing the secondary gasifier, the outlet gas velocity was assumed to be 22.5 percent of the Base Case primary velocity and the volumetric carbon gasification rate was assumed to be 50 percent of the rate in the primary.

A breakdown of the relative investment for the Secondary Gasification Incentive Case as compared to the Base Case is presented in Table III. The total plant investment with secondary gasification has increased by 1.0 percent over the Base Case investment. The addition of the secondary gasifier increased the investment for gasifier vessels by about 20 percent. Reductions in the investments for other areas of the plant offset about half the added investment in the gasifier area. The reduced coal rate decreased the investment for the coal feed and catalyst handling areas. The lower coal rate and higher overall carbon conversion reduced the spent solids rate to the catalyst recovery area to 84 percent of the Base Case rate. This resulted in investment savings in the char withdrawal, catalyst recovery, and waste treating areas.

A breakdown of the relative gas cost for the Secondary Gasification Incentive Case as compared to the Base Case is shown in Table IV. The total gas cost with secondary gasification is 0.8 percent less than the Base Case gas cost. Savings in coal and catalyst are partially offset by increased capital charges associated with the net added investment. Thus, based on these results, there appears to be only a marginal incentive for adding a secondary gasification step at this stage in the development.

This conclusion is dependent on the validity of the basis assumptions, which will become clearer as the development proceeds. If conversion of 90 percent of the feed carbon in a single reactor is not practically obtainable--such as with a relatively friable coal feed which would produce excessive fines--or if coal cost or catalyst cost increases significantly, then there would be increased incentive to develop secondary gasification. The incentive would also be larger if the disposal of char containing nearly 50% carbon becomes an economic or environmental problem. For example, if a significant charge per ton is added for solid waste disposal, the savings shown for secondary gasification could increase from the present 0.8 percent to about 1.5-2.5 percent, depending on the assumptions made. Another area of uncertainty is gasification rate. If the volumetric carbon gasification rate in the secondary gasifier is equal to the rate in the primary, rather than 50 percent of that rate, then the Secondary Gasification Case would save an additional 0.5 percent relative to the Base Case.

There may be benefits in catalyst recovery performance due to the reduced carbon content of the residual solids from secondary gasification. The present study takes credit only for the reduced weight of char/ash solids

Table III

INCENTIVE FOR SECONDARY GASIFICATION  
INVESTMENT BREAKDOWN

Basis: Base Case Total Investment = 100

	<u>Base Case</u>	<u>Secondary Gasification Incentive Case</u>
<u>Coal Prep. and Materials Handling</u>		
Coal Handling	5.3	5.2
Char/Ash Handling	1.1	1.1
Catalyst Handling	1.2	1.2
Coal Drying/Catalyst Addition	<u>3.7</u>	<u>3.6</u>
Subtotal	11.3	11.1
<u>Onsites</u>		
Reactor System	17.4	19.1
Preheat Furnace	5.6	5.6
Product Gas Cooling/Scrubbing	9.7	9.7
NH <sub>3</sub> /H <sub>2</sub> S Recovery	2.7	2.6
Acid Gas Removal/Sulfur Recovery	14.2	14.2
Methane Recovery/Refrigeration	8.6	8.6
Catalyst Recovery	1.9	1.5
Common Facilities	<u>4.4</u>	<u>4.4</u>
Subtotal	64.5	65.7
<u>Offsites</u>		
Waste Treating	2.9	2.8
By-product Handling	0.7	0.7
Miscellaneous Offsites	<u>4.7</u>	<u>4.7</u>
Subtotal	8.3	8.2
<u>Utilities</u>		
Raw Water/CW/BFW Treating	2.0	2.0
Steam Generation	7.2	7.3
Flue Gas Desulfurization	3.4	3.4
Electric Power Distribution	2.9	2.9
Miscellaneous Utilities	<u>0.4</u>	<u>0.4</u>
Subtotal	15.9	16.0
TOTAL	100.0	101.0

Table IV  
INCENTIVE FOR SECONDARY GASIFICATION  
SUMMARY OF RELATIVE GAS COSTS

Basis: Base Case Total Gas Cost = 100

	<u>Base Case</u>	<u>Secondary Gasification Incentive Case</u>
● Coal	26.1	25.2
● Gasification Catalyst	6.3	5.9
● By-products		
- Ammonia	(3.2)	(3.2)
- Sulfur	(1.9)	(1.9)
- Sulfuric Acid	<u>(0.6)</u>	<u>(0.6)</u>
Subtotal	(5.7)	(5.7)
● Operating Costs		
- Electric Power	7.9	7.8
- Raw Water	0.1	0.1
- Labor and Related Costs	5.6	5.6
- Investment-Related Costs	9.3	9.4
- Other Catalysts and Chemicals	<u>0.6</u>	<u>0.6</u>
Subtotal	23.5	23.5
● Capital Charges <sup>(1)</sup>	<u>49.8</u>	<u>50.3</u>
TOTAL GAS COST	<u>100.0</u>	<u>99.2</u>

Note: Capital charges based on 100% equity financing with 10% DCF return.

to be washed. If catalyst recovery can be operated with more concentrated slurries of char/ash solids after those solids are processed in a secondary gasifier, the gas cost savings for secondary gasification might increase from 0.8 percent to about 2 percent. If two or more of these revised assumptions prove to be applicable, the potential gas cost savings for secondary gasification could increase to 3 percent or more. Thus, the secondary gasification alternative should be held in reserve pending further definition of the catalytic gasification process performance in the base configuration.

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