Table 2-4
EECP Blended Feedstock Data

	Blend 1		*Blend 2*	
Data Items	Weight %		Weight %	
Anthracite Culm	95		95	
Limestone	5		2.5	
CFB Fly Ash	0		2.5	
	Ash Fusion Fluid Temperature °F	Difference, Measured - Estimated	Ash Fusion Fluid Temperature °F	Difference, Measured - Estimated
Measured	2,471	Measured	2,696	Measured
Direct WR $AFFT_1$	2,478	+ 7	2,607	- 89
Indirect WR $AFFT_2$	2,514	+43	2,773	+ 77
Average $AFFT_1$ and $AFFT_2$	2,496	+25	2,690	- 6

The three correlations (direct, indirect and average) are each within the inherent accuracy of the ASTM D-1857 test.

2.1.3 Conclusion

Winegartner and Rhodes (WR) correlation was found to be quite satisfactory in estimating coal ash fusion temperature, based on the two set of coal data analyzed and some of the preliminary measurements made by WMPI as part of the Phase I EECP Design Basis activities. It can be a useful tool in guiding the EECP program in estimating the coal ash fusion temperature and the amount of fluxing materials may be required for satisfactory gasification operation. Additional data will be added to the evaluation as more ash composition and fusion temperature measurements are contemplated as part of the Phase II RD&T program.

Table 2-5 summarizes the results of the data analyzed.

Table 2-5
Summary of Correlation Assessment
Feedstock Average and Standard Deviations

Data Sources	Data Points	Direct WR $AFFT_1$	Indirect WR $AFFT_2$	Average of $AFFT_1$ and $AFFT_2$ $AFFT_{avg}$
		Average Deviations, Degree F		
US DOE Coal Data Book	60	-186	-36	-111

Nexant Data	30	-63	+83	+10
WMPI Data	13	-108	+76	-16
All Data Points (103)		-140	+14	-63
		Standard Deviation, Degree F		
US DOE Coal Data	60	214	185	168
Nexant Data	30	130	325	195
WMPI Data	13	175	226	162
All Data Points (103)		187	236	173

The WR $AFFT_2$ correlations have the smallest average deviations, but they are the least accurate based on standard deviations. The average, $AFFT_{avg}$, deviations are somewhat better than the $AFFT_1$ values, but the difference is too small to justify the more complicated calculation. Thus, the simpler direct WR $AFFT_1$ correlation is recommended be used for estimating ash fluid temperatures. Also, as a design margin, 150^{o} F should be added to the WR $AFFT_1$ estimates to compensate for the correlation's tendency to under-estimate the ash fluid temperatures.

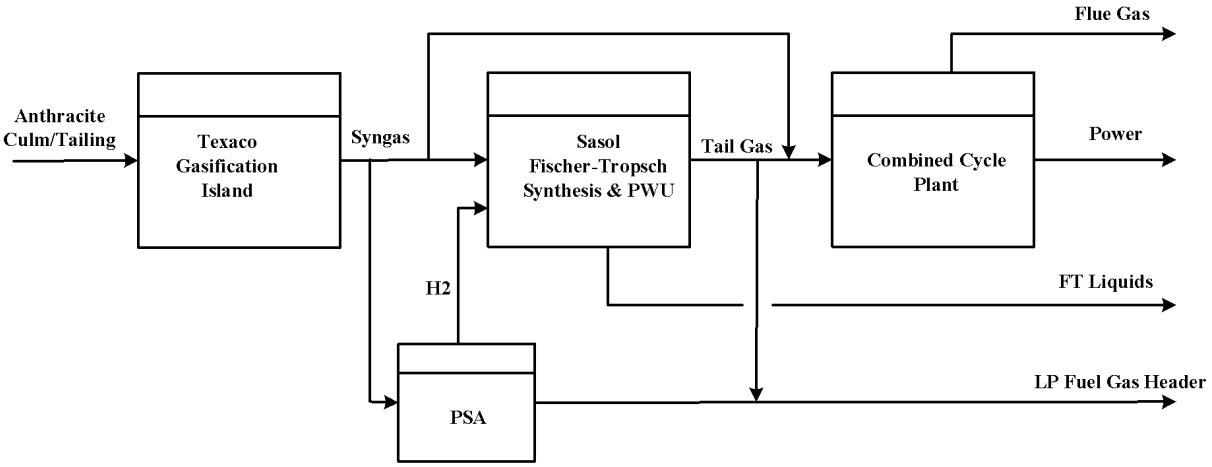
2.2 Preliminary EECP Plant Balances

Preliminary heat, material and utility balances were carried out, based on process performance estimates and utility demands from Texaco and Sasol for the gasification and FT synthesis section respectively, with an objective to establish an integrated process/utility model for future optimization trade-off analysis, and to provide preliminary emission data needed for Phase I Task 7(Preliminary Environmental Assessment) planning.

2.2.1 EECP Configuration

Figure 2-13 shows the overall WMPI EECP block flow configuration.

Figure 2-13 Overall EECP Process Configuration



This Base Case, stand-alone, EECP plant consists of two main process sections: Texaco Gasification, and Sasol FT Synthesis and product work up (PWU). It is designed to use anthracite culm of 20% ash as the primary feed. The design has the operation flexibility of feeding in 25% petroleum coke as feed.

The Texaco gasification section consists of air separation unit; coal storage, receiving and conveying; anthracite culm beneficiation facility; coal slurry preparation; gasification; sour water-gas-shift; syngas cooling; Rectisol acid gas removal; sulfur recovery and tail gas treating; and CO2 product treating and handling.

The Sasol FT synthesis and PWU section consists of syngas polishing; FT synthesis; pressure swing absorption (PSA) for hydrogen recovery and product workup and recovery.

Block flow diagrams depicting the Texaco coal gasification section and the Sasol FT synthesis section are shown in more detail in Figure 2-14 and 2-15 respectively. More

detailed process descriptions and material balances will be provided at as part of the overall feasibility study package at a later day.

Figure 2-14 EECP Block Flow Diagram – Gasification Section