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FUEL RESEARCH INSTITUTE OF SOUTH AFRICA.

TECHNICAL MEMORANDUM NO. 20 OF 1962.

A REPORT ON THE RESULTS OBTAINED FROM WASHING KOORNFONTEIN PEAS IN THE DREWBOY WASHER.

BY:

S.F.STREICHER.

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KOORNFONTEIN PEAS IN THE DREWBOY WASHER.

INTRODUCTION:

This work was done at the request of the Assistant Consulting Development Engineer, Anglo American Corporation.

About 300 tons of Koornfontein pre-washed peas were screened and the $+\frac{3}{8}$ " material was washed in the Drewboy washer at s.g. 1.375.

THE COAL:

Nine truck loads of Koornfontein peas were despatched to the Fuel Research Institute's pilot plant and arrived on the 4th. October, 1962.

THE TEST:

The coal was washed in the pilot plant on the 8th, 9th and 10th of October. As requested the treatment was exactly the same as for Springbok peas described in Technical Memorandum No. 12 of 1962, except that no test was done on $\frac{1}{8}$ " undersize material.

TREATMENT OF SAMPLES:

Samples taken were analysed in the same way as described in Technical Memorandum No. 12, but no ash determinations were carried out on separate specific gravity fractions.

The screen analysis of the raw coal sample is reported in Table 1, and the float and sink analyses of the raw coal, washed coal and discard samples are reported in Table 2.

Results obtained from the chemical analysis of samples of washery products are reported in Table 3.

WEIGHT BALANCE.

A.	Raw Coal	(S.A.R. wei	ghts)			323	tons.
	corrected	for moisture	content	of	sample	314.7	tons.
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B. Products leaving the plant

(air-dry weights)

(i)	Washery discard		118.7	tons.
(ii)	$-\frac{3}{8}$ " material screened out		23.1	77
(iii)	$-\frac{1}{4}$ " from pre-wet screen	· 12	13.2	11
(iv)	Slurry		2.9	79
(v)	Washed coal (by difference)		156.8	₽₽
		TOTAL:	314.7	11

Weights of washed coal received as reported by Highveld were:

Truck No.		Weight (lb.)
152835		69900
126151		70320
136816		65140
118447		70720
118167		41720
	TOTAL:	317800 i.e. 158.9 tons.

If allowance is made for l-2% moisture in the coal when weighed, this figure corresponds with the indirect determination derived from the weight balance.

YIELD OF WASHED COAL:

Using the three different methods described in the report on the Springbok test, the following values are arrived at:-

(i)	Weight balance	56.9	%
(ii)	Ash balance	57.4	%
(iii)	From float and sink analysis of products	56.8	%

For evaluation of results the yield figure obtained from the weight balance was used.

A summary of plant performance data are given in Table 4.

(SIGNED) S. F. STREICHER.

TECHNICAL OFFICER.

PRETORIA: 8/11/62.

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TABLE 1.

SCREEN ANALYSIS OF A RAW COAL SAMPLE.

SIZE	YIELD		
ROUND HOLES	lb.	FRACT.	
+3 -3	359.25 32.25	91.76 8.24	
TOTAL:	391.50	100.00	

TABLE 2.

FLOAT AND SINK ANALYSIS OF RAW COAL, WASHED COAL
AND DISCARD.

S. G.	RAW C	COAL	WASHED COAL		DISCARD		5
	YIF	YIELD YIELD		YIELD		DIST	
INTERVAL	Fract.	Cum.	Fract.	Cum.	Fract.	Cum.	FACTOR
F. 1.30 1.30-1.32 1.32-1.34 1.34-1.36 1.36-1.38 1.38-1.40 1.40-1.42 1.42-1.44 1.42-1.44 1.44-1.46 1.46-1.48 1.48-1.50 S. 1.50	2.05 8.89 15.43 18.26 11.82 10.93 6.45 4.69 3.61 4.30 4.00 9.57	2.05 10.94 26.37 44.63 56.45 67.38 78.52 82.13 86.43 90.43	4.73 14.85 27.19 28.21 14.48 5.94 1.83 0.97 0.66 0.48 0.31 0.35	4.73 19.58 46.77 74.98 89.46 95.40 97.23 98.20 98.86 99.34 99.65	0.05 0.29 0.99 3.65 10.21 16.05 11.22 9.12 8.75 8.57 8.02 23.08	0.05 0.34 1.33 4.98 15.19 31.24 42.46 51.58 60.33 68.90 76.92	99.3 97.3 91.1 65.2 32.8 17.7 12.3 9.2 6.8 4.9
TOTAL:	100.00	100.00	100.00	100.00	100.00	100.00	

TABLE 3.

ANALYSIS OF WASHED PRODUCT AND DISCARD.
(air-dry basis).

	PRODUCT	DISCARD	Γ
Moisture %	2.9	2.3	
Ash %	7.7	17.8	
Volatile Matter %	31.7	26.5	
Fixed Carbon %	51.7	53.4	
Sulphur %	0.68	1.38	
Phosphorus %	0.186	0.165	
Swelling Number	$1\frac{1}{2} - 2$	1	

TABLE 4.
PLANT PERFORMANCE DATA.

Raw Coal Ash %	12.0
Washed Coal Ash %	7.7
Discard Ash %	17.8
Yield % (i) Weight Balance	56.9
(ii) Ash Balance	57.4
(iii) I. S. O.	56.8
Cut Point	1.377
Misplaced Material %	6.7
Probable Error	0.016
Near Gravity Material %) (+0.1 S.G.)	85.5