cw/ch

N.U.M Lodge
Secretary.

NATIONAL COAL BOARD

Method Study Branch

DIVISION West Midlands

AREA 1.

COLLIERY Chatterley Whitfield

SUBJECT

Face Delay Study. 3[6] South Moss.

STUDY COMMENCED 8/2/66

FIELD WORK COMPLETED 10/2/66

REPORT ISSUED 25/3/66

Report No. 310/3/66

cw/P/11

NATIONAL COAL BOARD

West Midlands Division — No. 1 (North Staffs.) Area

Report on Face Delay Study on 3's South Moss Chatterley/Whitfield

Reference 310/3/66

1. INTRODUCTION

1.1. This report details the results of a Delay Study carried out on 3's South Moss Face at Chatterley Whitfield with the agreement of the Colliery N.U.M. Secretary.

1.2. The Study commenced at the beginning of Tuesday dayshift, 8th February, and finished at the end of Thursday noonshift 10th February, 1966.

2. INFORMATION

APPENDIX 1. gives the analysis, shift by shift, over study period of Machine Running, Ancillary and Delay times and causes.

APPENDIX 2. gives a summary of delays.

APPENDIX 3. gives a graphical representation over the six shifts of study.

3. SYSTEM OF WORK

3.1. 3's South Moss is a solid stowed prop free front installation with a 125 h.p. Trepan shearer. Diameter of disc 48 ins.

3.2. The face is supported by hydraulic Dowty props and Groetschel Link Bars with 7'6" box section girders to support the stowing race. In addition there are eighty-nine hydraulic Fletcher chocks to which are attached the stowing sheets and pipes.

3.3. The total face length is 188 yds. of which 167 yds. is machine cut and loaded. The average gradient along the face is 1 in 7.

3.4. The machine cycle commences when the Trepan shearer starts cutting from the return gate stable. When the machine has completed its cutting run, the plough (which has been transported down the face on the conveyor before the cutting run is started) is attached to the Trepan wheel end of the machine.

During the flitting run the face conveyor and the supports are moved forward. When the machine reaches a point ten pans deepside of the top stable it starts to backshear towards the stable. The cycle is completed when the conveyor and supports have been moved over and the machine is ready to start cutting again.

3.5. The face is manned to produce coal on the day and noon shifts but some drawing is carried out on the night shift. Stowing is carried out on all three shifts.

4. COMMENTS

4.1. During the period of observation it was understood that one trepanning run and up to 16 pans of flitting were completed on each of the nightshifts as shown in Appendix 3 in graphical presentation. It was stated that the reason for this was to assist coal clearance and to keep timberers fully employed from the commencement of the dayshift. The dayshift complete this shear and one further cycle. The afternoon shift commence the trepanning run from the top stable and complete one production cycle. This third cycle was completed by approximately 7.10 p.m. on two of the observed shifts. No further production would have been possible because of the limitation imposed by stowing

contd.....

4.2. Summary of stoppages at the Moss Loading Point.

CAUSE	Tues. 8th Feb.				Wed. 9th Feb.				Thurs. 10th Feb.			
	Day	Occs	Aft.	Occs	Day	Occs	Aft	Occs	Day	Occs	Aft.	Occs
Waiting for empties	18.1	1	14.0	2	48.5	7	67.0	7	37.0	4	114.0	9
Waiting for empties and blocked out with loads					27.5	1						
Blocked out with loads					11.0	1						
Loaded car derailed							16.0	1	22.0	1		
T O T A L	18.1		14.0		87.0		83.0		59.0		114.0	
Lumps fast in chute at L.P.									0.25	1	2.0	2
Material trolley passing under L.P.	0.4	1										

During the six shifts observed, the face stood for a total of approximately 4 hours (248.15 mins.) waiting for empties and stoppages caused by derailed mine cars in the crut and at the loading point. , The total delay at the loading point for the same causes was approximately 6¼ hours (375.10 mins.) The difference between these times is accounted for by coincident delays at the coal face and stoppages of the intermediate conveyors.

In order to overcome the effect of the delays noted above, the installation of a 100 ton Cowlishaw Walker Bunker in the main level to the face is now nearing completion. This should obviate restrictions caused through outbye delays but careful organisation and control are considered essential to get the ultimate service from it and possibly alleviate existing problems for the North face.

4.3. During the 6 shifts of studies messages were received both at the face and at the loading point of stoppages and the reasons given were:-

(1) No. 2 Dip Belt stalling.

(2) No. 2 Dip Belt receiving mechanical attention.

There were numerous occasions also when the belts stopped for periods of ½ min. - 1 min. and no reasons were given.

A follow up study of the conveyor system revealed that on peak loading the No. 2 Dip Belt fitted with a 60 h.p. drive was operating on approximately 10% overload and after a stoppage was inclined to stall.

Following discussion with Mechanisation Branch it is understood that the following proposals are to be carried out on the dip conveyor system.

(a) Interim measure - completion by end of March

Full use to be made of the existing 120 h.p. conveyor by inbye extension of the conveyor and the second dip conveyor to be shortened and provided with a 40 h.p. motor.

(b) Final proposal - completion after Easter - depending on delivery of equipment.

Replacement of two dip conveyors by one conveyor powered by two 100 h.p. motors.

contd.....

4.4. The total delay time during the 6 shift study period waiting for timberers was 378 mins. - some $6\frac{1}{4}$ hours or 19% of study period. Of this delay time some $3\frac{1}{2}$ hours was recorded on the day shifts following the machine work carried out during the night shifts when no timberers were present. Of the remaining time, it is estimated that $1\frac{1}{2}$ hours was directly attributable to absenteeism in the face team.

Following installation in the near future of the Cowlishaw Walker 100 ton Conveyor bunker which should alleviate 'clearance' difficulties outlined in 4.2 above it is considered that coal production should be confined as far as possible, to the recognised production shifts leaving the night shift exclusively for completion of stowing and thus reducing some of the $3\frac{1}{2}$ hours waiting for timberers.

5. SUMMARY

5.1. Because of the 'clearance' limitations existing at time of study, three shift coal production was practiced. Following implementation of proposals outlined above i.e. Installation of 100 tons Conveyor Bunker and re-organisation of conveyor system it may be possible to produce coal during the recognised production shifts leaving the night shift for stowing and machine maintenance, this should also eliminate the majority of delays recorded to waiting for timberers.

After the proposals to improve haulage clearance have been implemented it is intended to carry out further face delay studies to measure the effect of such improvements.

Area Method Study Department

March, 1966

Distribution

Agent/Manager 2.
No. 1 Group Manager.
Area Industrial Relations Officer.
Area Mechanisation Engineer
D.A.P.M. (Operations) 3.
Area Production Manager.3
Divisional Method Study Engineer.
National Union of Mineworkers Colliery Lodge Secretary.

APPENDIX. I

NATIONAL COAL BOARD

NO. 1 (NORTH STAFFS.) AREA

WEST MIDLANDS DIVISION

Colliery: Chatterley Whitfield

Face: 3's South Moss

Machined Face Length: 500 FT

Type of Machine: Trepan Shearer

Date: Tuesday 8th February, 1966.
Day Shift.

Clock Time	MACHINE RUNNING TIME			ANCILLARY TIME		DELAY TIME	
	DESCRIPTION	TIME IN MINS.	M/C spd FT/MIN.	DESCRIPTION	TIME IN MINS.	DESCRIPTION	TIME IN MINS.
7.20	Arrive at machine					Wait for empties	5.0
7.25	Start flitting back					Face conveyors stopped - cause not identified	0.2
						Level belt stopped - cause not identified	0.4
						Waiting for timberers to advance supports over face conveyor which has been pushed over to enable M/C to backshear into stable	51.0
	Time to flit 390 ft.	18.4	21.23				
8.35	Start to backshear						
8.41	M/C enters top stable	6.0					
		24.4					51.6
				Remove plough etc.	16.0	Wait for face conveyor to be moved over and supports advanced	28.00
						Fire top stable	3.00
					16.0		31.00
9.28	Start Trepanning					Water off	1.1
						Face conveyor stopped - cause not identified (2)	4.3
						Gate conveyor stopped - cause not identified (2)	3.1
						Gate conveyor stalling (4)	1.1
10.48	Finish Trepanning					(Snapping time 20 mins)	
	Time to Trepan 490 ft.	50.4	9.72				9.6
				Attach plough and oil up	15.0		
11.03	Start flitting back					Face conveyor stopped - cause not identified (2)	1.4
						Wait for empties	21.0
12.00	M/C enters top stable					Fire - top stable	8.5
	Time to flit / backshear 500 ft	26.1	19.16				30.9
						Waiting for timberers to advance face conveyor and supports	74.0

APPENDIX. I

NATIONAL COAL BOARD

WEST MIDLANDS DIVISION — NO. 1 (NORTH STAFFS.) AREA

Colliery: Chatterley/Whitfield — Face: 3's South Moss

Machined Face Length: 500 FT. — Type of Machine: Trepan/shearer — Date: Tuesday 8th February, 1966. Noon Shift

Clock Time	Machine Running Time			Ancillary Time		Delay Time	
	Description	Time in Mins.	Speed Ft./Min.	Description	Time in Mins.	Description	Time in Mins.
14.45	Arrive at machine			Remove plough, change picks	16.0	Wait for face conveyor and supports to be advanced.	38.0
						Face conveyor chain fast	3.2
					16.0		41.2
15.43	Start Trepanning					Face conveyor stopped - cause not identified (2)	7.85
						Tight spill plates	0.55
						Bretby cable carrier fast	0.60
						Setting supports in stable	0.84
17.14	Finish Trepanning					Firing in bottom stable	19.40
	Time to Trepan 490 ft.	61.76	7.93				29.24
				Attach plough. Remove outer picks	14.0		
17.28	Start flitting back					Face conveyor stopped - cause not identified (6)	5.52
						Gate conveyor stopped " " "	3.80
	Time taken to flit 450 ft.	24.04	18.72			Dip belt stalling (2)	1.09
	Time taken to backshear	9.00		Remove plough	3.30	(Snapping time 27.25 mins.)	7.25
18.42	Finish flit/backshear				3.30		17.66
		33.04					
				Change picks in Trepan head & disc	20.0		
19.02	Machine ready to Trepan					Waiting for stowing	98.0

APPENDIX-1.

NATIONAL COAL BOARD

West Midlands Division

No. 1 (North Staffs.) Area

Colliery:- Chatterley Whitfield

Face: 3's S. Moss

Machined Face Length: 500 FEET

Type of Machine Trepan Shearer

Date: Wednesday 9th February, 1966
Day Shift

Clock Time	Machine Running Time			Ancillary Time		Delay Time	
	Description	Time in Mins	M/c speed ft/min.	Description	Time in Mins	Description	Time in Mins
7.16	Arrive at machine (16's chock on Flitting run)					Wait for conveyors to start running	2.0
7.18	Start Flitting						
7.36	Waiting to backshear into stable					Wait for timberers to advance face conveyor and supports to enable machine to backshear into the stable	19.5
	Time taken to Flit 375ft	18.0	20.83				
	Time Taken to backshear	8.5					
8.04	Finish Flit/Backshear						
		26.5					19.5
				Remove plough etc.	18.0	Wait for face conveyor and supports to be advanced	62.0
9.24	Start Trepanning					Waiting for empties:- Trouble with surface rams	35.0
						" " " " " pit bottom drop cages	5.0
						" " " "	9.5
						Face conveyor stopped - cause not identified	0.6
						Level belt stopped " " " (7)	8.3
						Lump fast at face conveyor delivery (2)	3.7
						Firing in Return gate stable	2.1
						" " Main gate "	3.5
	Time taken to Trepan 490ft	57.6	8.50			Face conveyor reversed - cause could not be identified	9.7
11.59	FINISH TREPANNING					(Snapping 20 mins)	
		57.6					77.4
				Attach plough	10.0		
12.09	Start Flitting Back					Wait for empties - load off in crut	32.2
	Time taken to Flit 450ft	23.9	18.83			" " "	6.0
	" " " Backshear	3.0				Level belt stopped - cause not identified	0.6
13.15	Finish Flit/Backshear					Face conveyor stopped " " "	0.3
		26.9					39.1

APPENDIX. I

NATIONAL COAL BOARD

NO. 1 (NORTH STAFFS.) AREA

WEST MIDLANDS DIVISION

Colliery: Chatterley Whitfield

Face: 3's S. Moss

Machined Face Length: 600FT

Type of Machine: Trepan Shearer

Date: Wednesday, 9th February, 1966.

NOON SHIFT

Clock Time	Machine Running Time			Ancillary Time		Delay Time	
	Description	Time in Mins.	M/c Speed ft/min.	Description	Time in Mins.	Description	Time in Mins.
14.45	Arrive at machine in Return gate			Remove plough. Repick Trepan head	19.0	Wait for face conveyor and supports to be advanced	23.0
15.27	Start Trepanning					Speaking on face 'phone	3.42
						Cleaning coal from cable carrier	0.90
						Stopped by stowing operations	1.05
	Time taken to trepan (490 ft)	62.97	7.78			Face conveyor stopped - cause not identified	2.60
16.40	Finish Trepanning			Take plough off face conveyor	2.45	Gate conveyor stopped - cause not identified	0.66
		62.97			2.45		8.63
				Attach plough. Remove outerpicks	9.0		
16.49	Start Flitting Back					Speaking on face 'phone	0.15
						Face conveyor stopped - cause not identified (7)	15.56
						Gate conveyor stopped - cause not identified (3)	8.05
						Gate conveyor tripped out	9.85
						Waiting for empties (5)	45.50
	Time taken to flit 445 ft.	22.78	19.53			Load off at loading point	10.15
	Time taken to backshear	8.50				Dip belt stalling (3)	3.46
19.13	Finish flit/backshear					(Snapping 20 mins.)	
		31.28					92.72
				Remove plough. Repick Trepan wheel	8.0		
19.21	Start Trepanning					Face conveyor stopped - cause not identified	1.60
	Time taken to Trepan 290 ft.	47.90	6.04			Waiting for empties	29.50
20.40	Trepan-shearer @ 42's pan						
		47.90					31.10

APPENDIX. I

NATIONAL COAL BOARD

WEST MIDLANDS DIVISION

NO. 1 (NORTH STAFFS.) AREA

Colliery: Chatterley Whitfield

Face: 3's South Moss.

Machined Face Length: 500FT

Type of Machine: Trepan Shearer

Date: Thursday 10th February, 1966. Days.

Clock Time	MACHINE RUNNING TIME DECRIPTION	TIME IN MINS	M/C spd FT/MINS.	ANCILLARY TIME DESCRIPTION	TIME IN MINS.	DELAY TIME DESCRIPTION	TIME IN MINS
7.08	Arrive at machine (14's pan on flitting run)						
7.29	Machine at 90's pan ready to backshear					Wait for timberers to advance supports over face conveyor which has been pushed over, to enable M/C to backshear into stable	11.0
	Time taken to flit 380 ft.	21.0	18.09				
	Time taken to backshear	15.0					
7.55	Finish flit / backshear						
		36.0					11.0
				Remove plough, repick Trepanwheel	12.0	Wait for face conveyor to be moved over and supports advanced	40.0
8.47	Start Trepanning					Plough fast whilst being transported to bottom stable on face conveyor	2.7
						Replacing peg in cable carrier	1.5
						Getting supports into main stable	0.5
						Gate conveyor standing - cause not identified	0.8
						Belt standing - fitters working on conveyors	13.5
						Belt standing - getting spill plates into N. Moss	1.5
	Time taken to Trepan 490 ft.	63.1	7.77	Remove plough	4.8	Face conveyors stopped - not identified	0.6
10.36	Finish Trepanning					(Snapping 20 mins.)	
		63.1			4.8		21.1
				Attach plough, Remove outer picks	14.0		
10.50	Start to flit back					Wait for empties - shunting materials into Ten Feet	14.0
						Wait for empties	2.3
	Time taken to flit 450 ft.	25.5	17.70			Cable out of cable carrier	3.0
	Time taken to backshear	4.0				Firing in top stable	5.0
11.44	Finish flit / backshear					Face conveyor stopped - cause not identified	0.2
		29.5					24.5
				Remove plough. Repick Trepanwheel	15.0	Wait for face conveyor to be moved over and supports advanced	11.0
12.10	Start Trepanning			Remove plough off face conveyor at bottom stable	2.5	Waiting for empties	23.0
						Face conveyor stopped - cause not identified	2.7
	Time taken to Trepan 200 ft.	26.4	7.58			Put materials on conveyor	0.4
13.05	Finish Trepanning 60's pan						
		26.4			2.5		26.1

APPENDIX. /.

NATIONAL COAL BOARD

NO. 1 (NORTH STAFFS.) AREA

WEST MIDLANDS DIVISION

COLLIERY: Chatterley/Whitfield

FACE: 3's South Moss

Machined Face Length: 500 FEET

Type of Machine: Trepan/Shearer

Date: Thursday 10th February, 1966. Noon Shift.

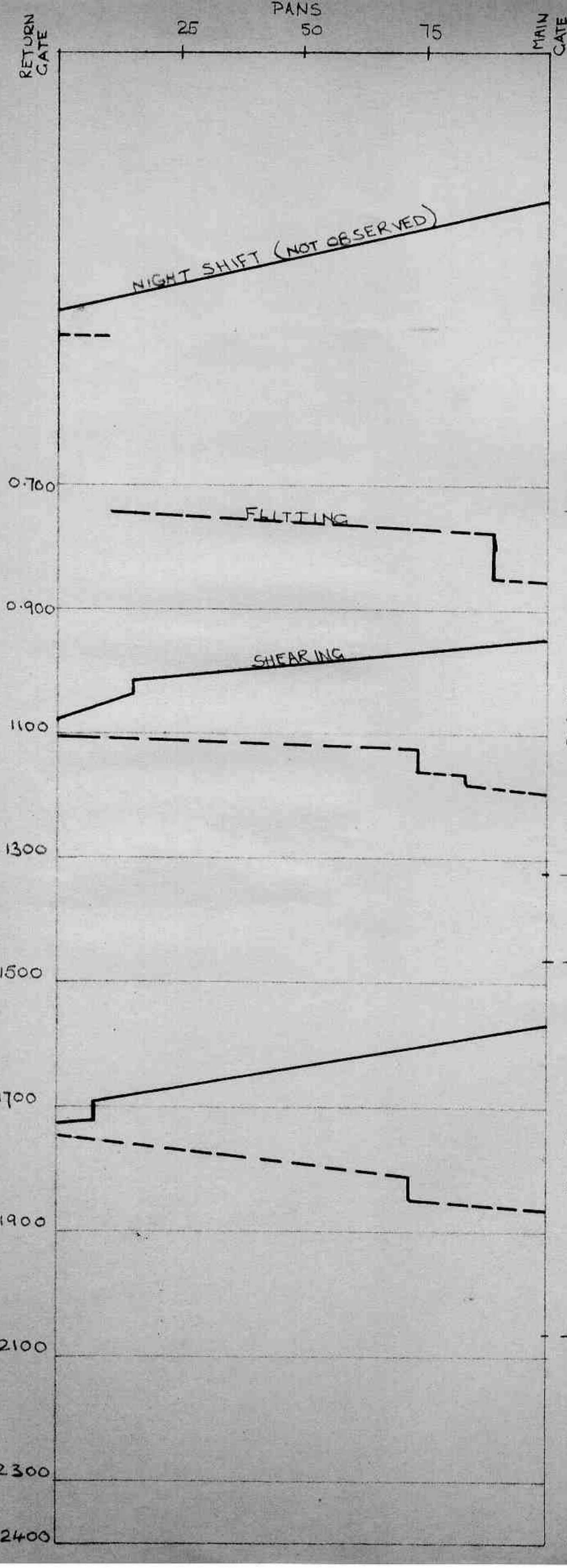
Clock Time	Machine Running Time			Ancillary Time		Delay Time	
	Deacription	Time in Mins.	M/c Speed P/Min.	Description	Time in Mins.	Description	Time in Mins.
14.47	Start Trepanning 60's Pan					Waiting for empties	23.3
	Time taken to Trepan 290 ft.	35.4	8.19			Face conveyor stopped - cause not identified	0.6
15.55	Finish Trepanning					Blockage in loading chute	8.7
		35.4					32.6
				Attach plough. Remove outer picks	7.0		
4.02	Start Flitting back					Waiting for empties	22.5
	Time taken to flit 450 ft.	23.6	19.07			Face conveyor stopped - cause not identified (6)	6.3
	Time taken to backshear	7.4				Setting supports in stable	6.2
5.04	Start to backshear					Coal in cable carrier	0.3
5.26	Finish flit/backshear					Firing in top stable (4)	17.7
		31.0					53.0
				Remove plough. Repick Trepan Wheel	15.0	Wait for stowing	162.0
						(Snapping 20 mins.)	
							162.0

APPENDIX II

Summary of Delays

(during 6 shifts - 33½ hours of observation)

CAUSE	DURATION	% of observation time	No of Occasions
Waiting for timberers	6hrs.18 mins	18.8%	14
Waiting for stowing	4hrs.21 mins	13.0%	5
Waiting for empties	2hrs.46 mins	11.8%	14
" - trouble with pit bottom drop cage	5 mins		1
" - trouble with surface rams	35.00 mins		1
" - loaded car derailed in crut	32.20 mins		1
Face conveyor stopped - cause not identified (majority of delays probably caused by dip belt stalling)	50.31 mins	3.8%	34
Gate conveyor stopped - cause not identified (majority of delays probably caused by dip belt stalling)	25.71 mins		22
Loaded car derailed at loading point	10.15 mins		1
Face conveyor stopped - chain fast	3.16 mins		1
Dip conveyor stalling	4.55		7
Gate conveyor stalling	1.10		4
Wait for conveyor to start	2.00		1
Face conveyor reversed-cause not identified	9.70		1
Fitter working on gate conveyor	13.50		1
Gate conveyor tripped out	9.35		1
Firing in top stable	36.30		7
Firing in bottom stable	22.90		2
Setting supports in stables	7.54		3
Coal blockage in loading chute	8.70		1
Lump fast at bottom of face	3.70		2
Speaking on face phone	3.57		2
Water off	1.10		1
Getting material into Ten Feet Shunt	14.00		1
Getting material into N.Moss	1.50		1
Replace pin in Bretby carrier	1.50		1
Cable out of Bretby carrier	3.00		1
Bretby cable carrier fast in spill plates	2.20		1
Remove coal from Bretby cable carrier	1.20		2
Putting materials on face conveyor	0.40		1
Excess snapping time	7.25		1
Plough fast whilst being transported to bottom stable	2.70		1



APPENDIX 3.

RECORDED DELAYS (MINS)

COAL CLEARANCE	STOWING	TIMBERING	OTHERS
		51·6	
			31·0
			9·6
-	-	-	-
21·0			9·9
		74·0	
		38·0	3·2
			29·2
-	-	-	-
			7·7
	98·0		

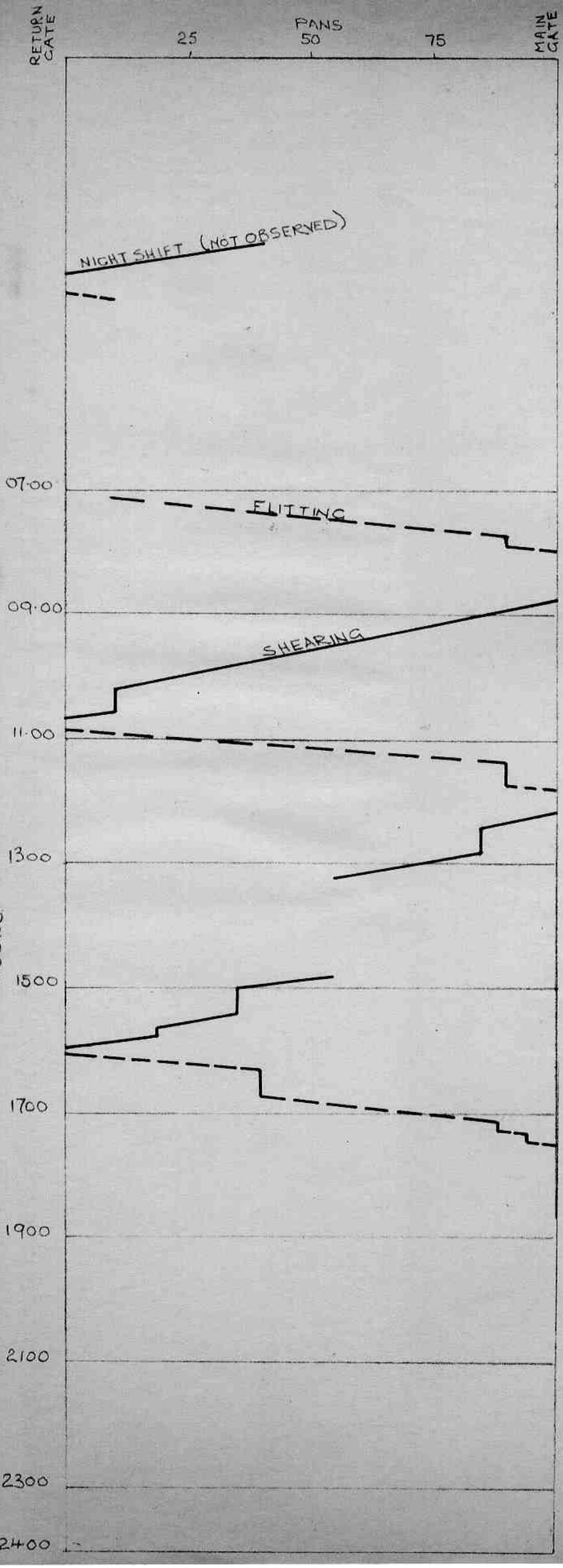
TUESDAY 8/2/66

APPENDIX 3

RECORDED DELAYS (MINS)

COAL CLEARANCE	STOWING	TIMBERING	OTHERS
		19.5	2.0
		62.0	
49.5			27.9
38.2			0.9
		23.0	
	1.05		7.58
45.5			47.2
29.5			1.60

WEDNESDAY 9/2/66



APPENDIX 3.

RECORDED DELAYS (MINS)			
COAL CLEARANCE	STOWING	TIMBERING	OTHERS
		11·0	
		40·0	
			21·1
-	-	-	-
16·3			8·2
		11·0	
23·0			3·1
-	-	-	-
23·3			9·3
-	-	-	-
22·5			30·5
	162·0		

THURSDAY 10/2/66

NATIONAL COAL BOARD — STAFFORDSHIRE AREA

DUST SUPPRESSION DEPARTMENT

CHATTERLEY WHITFIELD COLLIERY - 1's SOUTH HARDMINE

INTRODUCTION:

An earlier report on 1's South Hardmine face, 1973/TR/11 showed that the automatically steered shearer on the face had reduced dust produced by the shearing operation. However, the situation at the sampling position in the return airway had not improved over the shift due to an increase in the output produced.

Investigations were carried out to determine the build up of airborne dust around the district so that remedial action could then be taken.

SAMPLING:

Sampling was carried out using the M.R.D.E. Gravimetric Dust Sampler type 113A. Six instruments were set up around the district and samples were taken over full shifts so that readings and differences were truly comparable.

Sampling Points:

Station 1 - 70m outbye the face intake.
Station 2 - 5m in from the face in the advanced heading.
Station 3 - at No.10 chock along the face.
Station 4 - at No.150 chock along the face.
Station 5 - at the return gate in the chock track.
Station 6 - 70m outbye the face in the return roadway.

Results:

DATE	DUST CONCENTRATIONS Mg/m^3					
	ST 1	ST 2	ST 3	ST 4	ST 5	ST 6
22/10/73	5·1	6·8	5·2	8·4	10·6	12·7
23/10/73	3·3	4·5	5·4	14·6	13·7	12·3
24/10/73	3·6	8·8	6·9	11·4	9·4	10·6
25/10/73	4·1	7·0	6·1	12·5	13·4	13·3
26/10/73	4·4	5·5	5·2	10·7	15·0	14·9
AVERAGE	4·1	6·5	5·8	11·5	12·4	12·8

The average dust concentration at the 70 metre mark in the intake is 4·1 mg/m^3.

The two headings in front of the face at the intake end, contribute about 3 mg/m^3 of dust so that the air starting up the face has a dust load of 6·7 mg/m^3.

The main shearer which is automatically steered and the other operations along that length of face contribute about 5 mg/m^3.

There is a further pick up of about 1 to 2 mg/m^3 from the main machine finishing point out to the 70 metre point in the return airway.

RECOMMENDATIONS:

Action should be taken to reduce the intake pollution from 4·1 mg/m^3 to 2 mg/m^3. The methods are outlined in a document already in the hands of the Colliery Dust Suppression Officer.

The ventilation system for the two advanced headings has no filter system and immediate improvement can be obtained by placing a Joy Microdyne free standing filter over the stage loader adjacent to the face. There should be at least 8 to 10,000 c.f.m. of air filtered to improve the face intake to below 3 mg/m^3.

The shearer should have a new drum with wider pick spacing and the facility for a hollow shaft ventilator.

All rippings should be bored wet and the dirt piles must be regularly wetted.

A significant improvement would result if the air quantity could be increased by at least 50%.

Distribution:

Acting Colliery General Manager (4).

Copy:

W.R. Monks, Esq., Production Manager.
T.E. Smales, Esq., Mining Engineer (Special Duties) (4).

November, 1973.

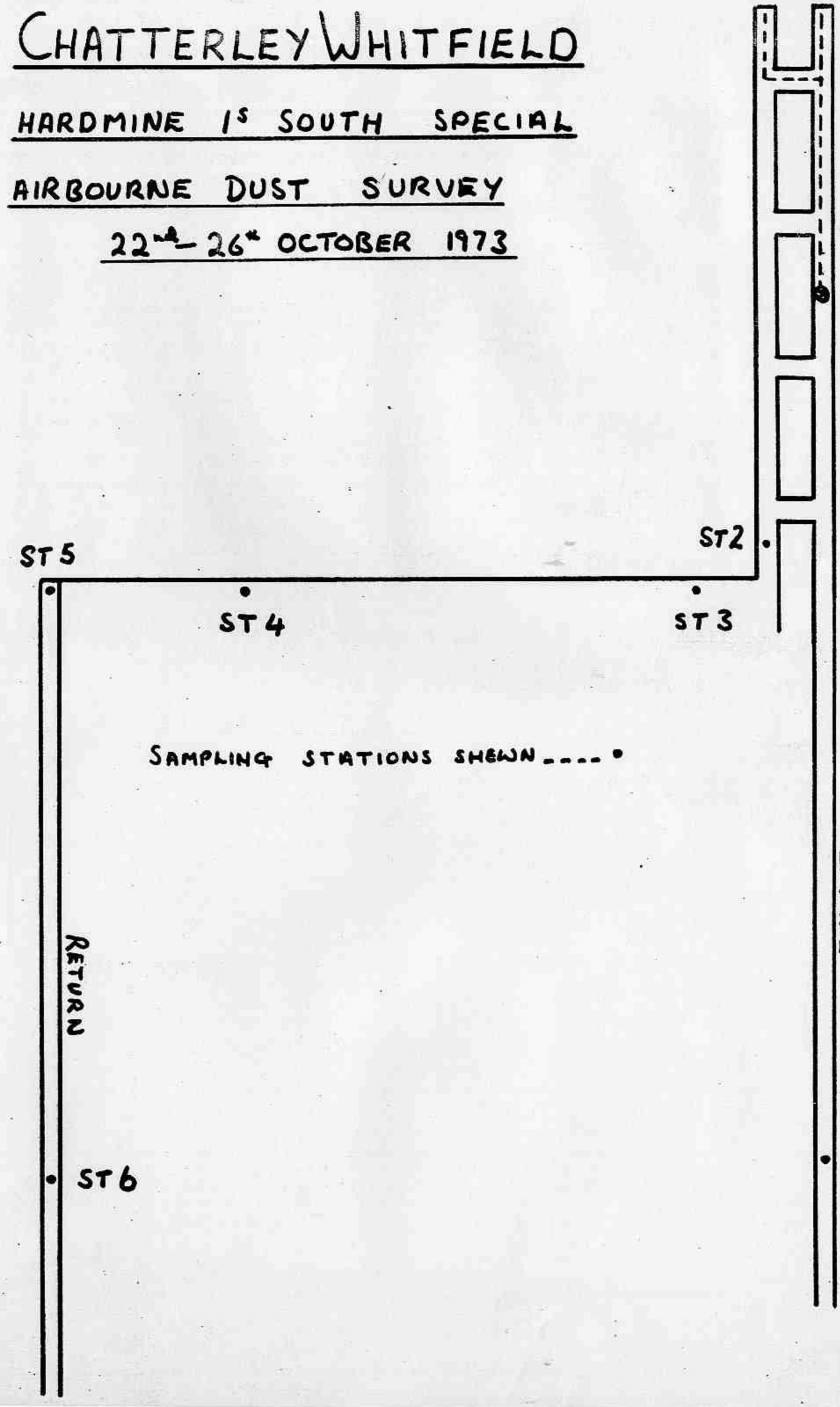
/RD.

CHATTERLEY WHITFIELD

HARDMINE 1ˢ SOUTH SPECIAL

AIRBOURNE DUST SURVEY

22ⁿᵈ – 26ᵗʰ OCTOBER 1973



SAMPLING STATIONS SHEWN ---- •

Additional Information. No 1 S.H. Mine

Main Loader shrouded 28-1-1974.
Fabric Screen erected 28.4-1974.
Hollow shaft ventilator on Secondary Shearer 14-5-1974.
Initial Trials with prototype Chock Ventura started
30-5.1974 & continued on 4s N.H. Mine.
Fan Filter Unit installed in Intake, outbye
bord face. 28-4-1975 (see appended sample survey)
Ceased production 26-7-1974.

No 1 Sth. Hard Mine

Fan Filter - Routine Samples

Date	Site	mg/m³	Fabric	Remarks	Routine Samples
29-4-74	10ˣ Outbye	12·3	Kencoll 10	Litre Vol. 260 (104 mins)	
29·4·74	10ˣ Inbye	6·6	Kencoll 10	Litre Vol. 256 (102 min)	
				Fan energised at 11·00 AM	
30·4·74	10ˣ outbye	5·3	Kencoll 10		
30-4-74	10ˣ Inbye	3·3	Kencoll 10		
1·5·74	10ˣ Outbye	9·2	Kencoll 10		Adv Hd 4·1
1·5·74	10ˣ Inbye	5·2	Kencoll 10	Classified as Intake sample (9)	Return 7·5
2·5·74	10ˣ Outbye	5·9	Kencoll 10	Kencoll torn.	Adv. Hd. 5·7
2·5·74	10ˣ Inbye	4·1	Kencoll 10	Classified as Intake sample (pos 9)	Return 28·5
3·5·74	10ˣ outbye	9·3	Bondina		Adv. Hd. 4·7
3·5·74	10ˣ Inbye	1·9	Bondina	Classified as Intake sample (pos. 9)	Return 19·1
	Average of 5		fan/filter	samples. OUTBYE 8·5 INBYE 4·2	
				50 % Improvement	
6·5·74	10ˣ Outbye	18·4	Bondina		Adv Hd. 4·4
6·5·74	10ˣ Inbye	0·9	Bondina	Classified as Intake sample (pos. 9)	Return 19·7
7·5·74	10ˣ Outbye	4·8	Bondina		Adv Hd. 4·4
7·5·74	10ˣ Inbye	2·2	Bondina	Classified as Intake samples (pos 9)	Return 19·7
	Average of 5 Routine Samples: Intake 2·8 Return : 19·1 mg/m³.				
8·5·74	10ˣ Outbye	2·4	Bondina	2 Shears done. ~~No shearing changing gearhead~~	
8·5·74	10ˣ Inbye	0·1	Bondina		
9·5·74	10ˣ Outbye	5·3	Bondina	No shearing changing gearhead	
9·5·74	10ˣ Inbye	1·4	Bondina		
10·5·74	10ˣ Outbye	2·9	Bondina		83% Improvement
10·5·74	10ˣ Inbye	1·0	Bondina		
		Average of 5		Fan/Filter Samples: Outbye 6·8 Inbye: 1·1	
13·5·74	10ˣ outbye	4·3	Bondina		
13·5·74	10ˣ Inbye	2·3	Bondina		
14·5·74	10ˣ Outbye	3·8	Bondina	Bondina changed	
14·5·74	10ˣ Inbye	2·2	Bondina	— — —	

No 1 S. HARD MINE

FAN/FILTER & ROUTINE mg/m³

DATE	SITE	mg/m³	FABRIC	REMARKS	ROUTINE mg/m³
15·5·74	10ˣ o/Bye Fan	1·1	Bondina		
15·5·74	10ˣ Inlye "	1·1		Faulty Instrument	
16·5·74	10ˣ o/Bye Fan	4·5	Bondina		Return Int
16·5·74	10ˣ Inlye "	1·1			20·8 0·5
17·5·74	10ˣ o/Bye Fan	3·3	Bondina		Ret Int
17·5·74	10ˣ Inlye "	0·9			13·9 0·9
		Av. of 5.	Samples	o/Bye 3·4 : Inlye 1·5	
20·5·74	10ˣ o/Bye Fan	2·9	Bondina	Moving Unit inlye	Ret
20·5·74	10ˣ Inlye "	2·6			24·3
21·5·74	10ˣ o/Bye Fan	7·7	Kencoll 10	Changing filter cage & fabric	Ret
21·5·74	10ˣ Inlye "	4·2			14·6
22·5·74	10ˣ o/Bye Fan	2·9	Kencoll 10		Ret.
22·5·74	10ˣ Inlye "	0·6			20·1
					Av of 5 18·7
23·5·74	10ˣ o/Bye Fan	7·8	Kencoll 10		
23·5·74	10ˣ Inlye Fan	2·6			
24·5·74	10ˣ o/Bye Fan	5·0	Kencoll 10.		
24·5·74	10ˣ I/Bye "	1·8			
		Av of 5	Samples	o/Bye 5·3 : Inlye 2·4	
28·5·74	10ˣ o/Bye Fan	8·2	Kencoll 10		
	10ˣ Inlye Fan	2·8			
29·5·74	10ˣ o/Bye Fan	5·5	Kencoll 10.	Sampling ceased	
	10ˣ Inlye Fan	2·8			

AREA DUST SUPPRESSION REPORT

1's SOUTH HARDMINE CHATTERLEY-WHITFIELD

Introduction

At the request of Area Management, a survey was carried out on 1's South Hardmine district at Chatterley-Whitfield Colliery, by members of Area Dust Suppression Department and Area Ventilation Department.

Description of District

1's South Hardmine is an advancing face **220** yards in length. The face is worked by two A.B.125 Shearers taking a 48 inch extraction. The main machine, which cuts from main gate to tail gate, is equipped with nucleonic steering. Dust suppression is by pick face flushing and external sprays utilising the water from the motor and oil coolers. The Tail Gate machine uses barrel release sprays for dust suppression.

The face is supported on Gullick five leg chocks with supplementary supports in the return pack hole area.

The Tail Gate rip is a conventional ripping barrel, fired and packed by a slusher packer.

The Main Gate end is worked by two advanced headings. The Main Advanced heading is on 14' x 10' Arches; it is fired down and loaded out by an Eimco shovel. The face advanced heading is 12' x 6' square set on girders; it is fired and loaded out by a B.D.12 gathering arm loader. system finished

Details of the conveyor system are shown on the attached plan.

Air Quantities

The total amount of air reaching the Hardmine seam, measured on the day of the survey, was 40,700 c.f.m. This quantity splits almost equally between the three Hardmine Districts.

At the outbye end of 1's South intake 11,600 c.f.m. was measured. Leakage through the splits reduces this quantity to approximately 8,500 c.f.m. at the inbye end of the intake.

Auxiliary Ventilation System

The two intake advanced headings are force ventilated by a 20" fan blowing air through 24" flexiduct. The fan is passing 6,000 c.f.m. of air.

The main advanced heading is ventilated by 3,000 c.f.m. and the face advanced heading by 1,800 c.f.m., the comparitively low quantity in the face advanced heading being due to an excessive amount of leakage at the "Tee" piece in the duct system; this has since been rectified.

Temperatures

The temperature of the air in the main intake to the Hardmine seam is 75° F.D.B., 71° F.W.B. with an effective temperature of 59°F. At the intake end of the face the readings were 85° F.D.B., 82° F.W.B. effective temperature 79°F. The temperatures at the return end of the face were 88° F.D.B., 87° F.W.B. effective temperature 84°F.

In the headings the temperatures were:-

Main Advanced Heading 84° F.D.B., 81° F.W.B. effective temperature 80°F.
Face Advanced Heading 86° F.D.B., 82° F.W.B. effective temperature 83°F.

Conveyor System

The following shortcomings which are likely to increase dust production were noted:-

1/. Hardmine Trunk Belt; bottom strand ploughs at the "Tripper" and at the hopper end were badly worn and require replacing.

2/. The belt requires a bottom belt spray which would be most effective sighted 10 yards outbye of the "Tripper". CORRECTED

3/. H.M.P.80 chain; this conveyor requires an effective chute at the delivery end.

4/. Hardmine 2's N gate belt; the delivery end of this conveyor requires an effective chute and cowl. SCREEN FITTED.

5/. Roadway consolidation of travelling roads.

Face Equipment

1/. Face advanced heading; the heading was being bored and loaded out without any water at all being used. A wet boring attachment and a suitable clamping hose were available but were not being used.

2/. Main Power Loader; Two sprays were missing from the disc, and deprived the remaining spray of pressure, resulting in most of the other sprays becoming blocked up.

3/. Return Rip; the rip was being bored and loaded dry, again a clamping hose and wet boring attachment were available but were not being used.

4/. The water ranges in both gates were a considerable distance behind the face, 120 yards behind on the main gate and 50 yards behind on the return gate.

5/. Waste flushing gives clouds of dirt and chock shields must be improved in design.

Comments and Conclusions

1/. Maintenance and renewal of equipment must be carried out in a systematic manner. The position has improved particularly with regards to maintenance of the p.f.f. sprays on the power loader.

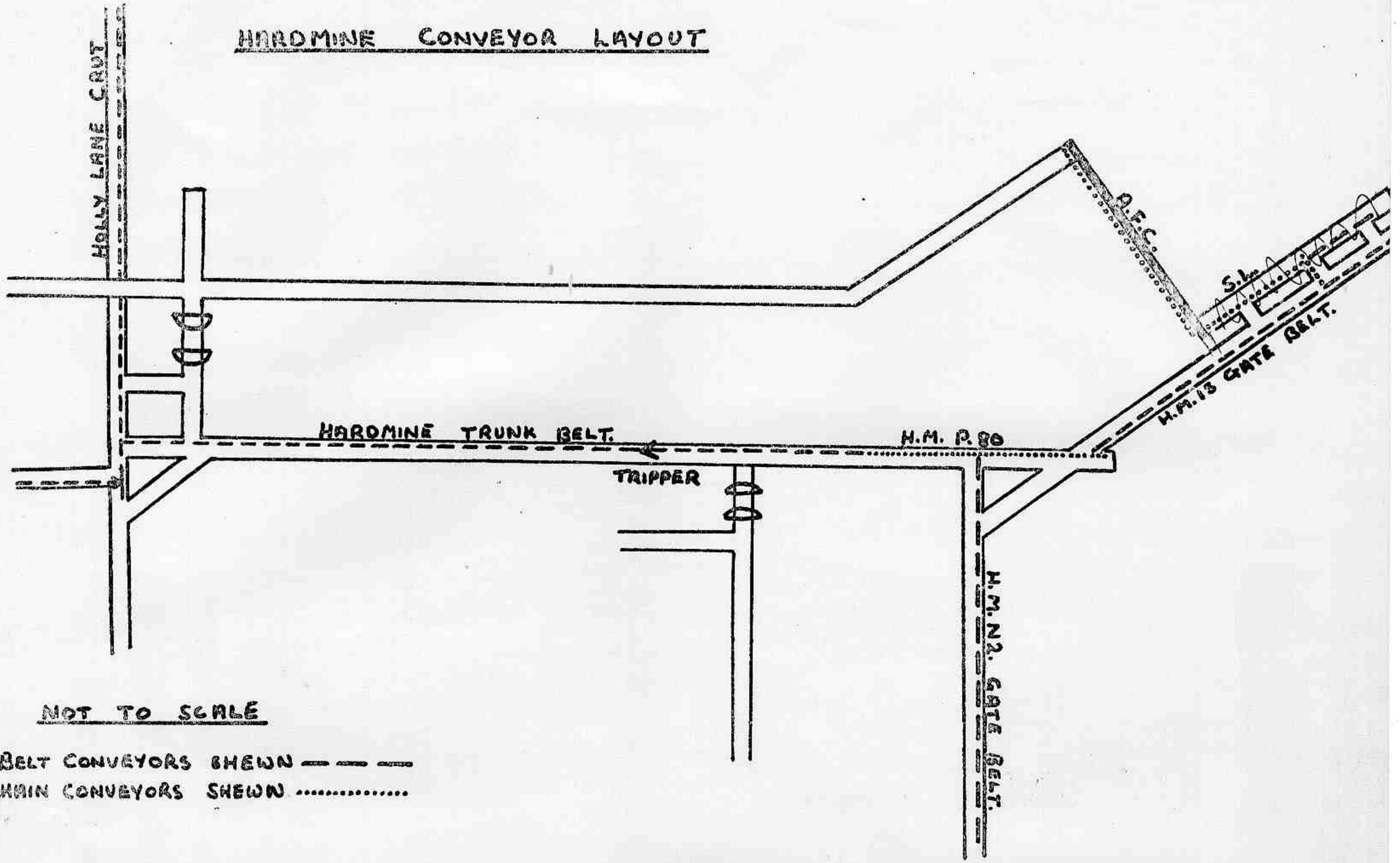
2/. The equipment provided for the purposes of dust suppression must be used at all times, and district officials must ensure that this is done.

3/. It is recommended that the headings should be put on exhausting ventilation discharging through a Joy Microlyne dust collector, or dry dust filter. This would prevent the heading polluting the air entering the face. The necessary equipment is available at the colliery.

(P. Johnson)
Ass. Area Dust Suppression Engineer.

CHATTERLEY WHITFIELD

HARDMINE CONVEYOR LAYOUT



NOT TO SCALE

BELT CONVEYORS SHEWN — — —
CHAIN CONVEYORS SHEWN .....

Area Dust Suppression Department.

Report on the Automatically Steered Shearer at
Chatterley-Whitfield Colliery on 1s South Hardmine Face.

1973/TR/11.

INTRODUCTION.

Dust conditions on Hardmine faces at Chatterley-Whitfield Colliery have been unapproved in the past and the reason given for the adverse condition has been given as the necessity to cut floor dirt.

By the introduction of an automatically steered machine it was expected that dirt would not be sheared in either roof or floor and that airborne dust would be reduced.

Sampling Procedure.

The face started work using two A.M. 16/150 shearers both equipped with P.F.F. drums and manually steered. During the period that they were working, samples of airborne dust were taken to compare the machine length and the statutory sampling positions with later results. The machine cutting the major part of the face was changed for an automatically steered machine and samples again were taken.

Five sampling positions were set up as follows:-

Station	1.	Intake 70 metres from the face.
"	2.	Face advanced heading 5 metres from the face.
"	3.	On the face at No.10 chock.
"	4.	On the face at No.150 chock.
"	5.	Return 70 metres from the face.

The samples taken at Stations 1, 2 and 5 were over the full shift and give a comparison of the effect on the whole district. Samples taken at Stations 3 and 4 were taken only during the time that the machine was shearing to measure the effect of improved horizon control on the dust conditions produced.

Results. Tables 1, 2 and 3.

Comments on the Results.

(1) Output increased from 3,224 tons per week when the machine was manually steered to 4,322 tons per week when automatically steered.

(2) A fault had travelled up the face during the initial tests and the results at the 70 metre position in the return are affected by shearing through dirt.

(3) The intake to the face, 5 metres from the face line, was 5·8 mg/m^3 in the first trial and 5·2 mg/m^3 in the second trial. The trials show a pick up of 1-2 mg/m^3 from the two advanced heads.

(4) Each of the trials had a week when sampling results were very high. The condition was due to the jets being missing on the drums and water pressure as a result was probably down.

If these two weeks are removed, the results over the machine length show that when manually steered the dust concentration was 29·5 mg/m^3 and when automatically steered 26·6 mg/m^3.

/The effect.....

The effect of this reduction over a full shift which is normally about 3 to 4 times the shearing time would be low and probably not show significantly on the return instrument.

(5) The condition at the return sampling point showed a distinct improvement during the period that the automatically steered machine was in use, dust concentration being reduced from 15·2 mg/m^3 to 14·1 mg/m^3. The problem of assessing this improvement must be balanced against an improvement due to the fault running off the face and a deterioration due to increased output.

Conclusions.

The automatically steered AM 16/150 shearer on 1s South Hardmine produced less dust over the machine length than the manually steered machine.

The dust concentration at the intake end of the face is between 5 and 6 mg/m^3 and must be reduced.

The dust concentration at the 70 metre return position was reduced from 15·2 mg/m^3 to 14·1 mg/m^3.

Further Action.

The air to and from the headings must be filtered and a Joy Microdyne or a dry type filter should be installed.

The use of dozer doors on the main machine would make shrouding better and tend to hold the dust in one spot. Venturi extraction may be placed on the face side of the shearer.

Full shift samples must be taken at each of the five positions already sampled so that the true build up of dust around the district can be obtained.

The probable figure of dust concentration over the shift based on dispersal and fall out are.

No.1 Position	70m	from the face	4·2 mg/m^3
No.2 Position	5m	from the face	5·5 mg/m^3
No.3 Position	10	chock	6·0 mg/m^3
No.4 Position	150	chock	11·0 mg/m^3
No.5 Position	70m	in the return	14·0 mg/m^3

Full shift sampling is proceeding and follow-up will take place.

P. Johnson.

(P. Johnson)
Assistant Area Dust Suppression Engineer.

Distribution.

Colliery Manager, Chatterley-Whitfield Colliery,
Area Dust Suppression Engineer.
Area Chief Mining Engineer.
D.C.M.E. (Planning & Surveying).
Production Manager.

TABLE 1.

RESULTS PREVIOUS TO AUTOMATIC STEERING BEING INSTALLED.

DATE	DUST CONCENTRATIONS Mg/m^3					ACTIVITY						
	ST1	ST2	ST3	ST4	ST5	A	B	C	D	E	F	G
16/7/73	5·6	4·6	16·3	15·3	23·2	2	1	1	2	-	-	-
17/7/73	3·6	5·0	9·0	39·2	15·3	1	2	1	1	-	-	3
18/7/73	4·3	6·7	10·4	45·2	21·2	2	1	1	1	2	10	-
19/7/73	6·0	4·9	4·9	9·3	15·4	1	1	1	1½	-	-	-
20/7/73	4·2	5·4	9·5	34·0	13·4	2	1	1	1	28	10	4
25/7/73	1·7	7·4	10·5	22·0	16·4	2	1	1	3	40	-	-
26/7/73	2·5	6·4	8·1	25·3	10·0	2	1	1	1	28	10	-
27/7/73	4·9	5·0	8·6	41·4	11·8	1	1	1	1	10	5	-
30/7/73	4·4	9·0	10·4	22·0	14·7	1½	1	1	2	10	5	-
31/7/73	4·1	5·5	5·6	36·9	9·5	1	1	1	2	11	-	-
1/8/73	4·6	6·9	8·4	32·7	16·0	1	1	1	1	10	4	4
2/8/73	3·2	2·9	6·8	14·1	15·6	2	1	1	2	20	-	-
3/8/73	4·1	5·7	6·3	45·1	17·7	1	2	2	2	24	-	5
7/8/73	5·1	8·5	8·8	38·2	18·9	2	1	1	2	10	-	3
8/8/73	4·4	5·7	9·2	42·2	17·6	2	1	1	1	12	-	4
9/8/73	4·6	6·1	8·2	74·3	9·4	1	-	-	-	-	-	-
10/8/73	2·4	3·5	7·9	57·2	12·8	1	-	-	-	20	-	-
AVERAGE	4·1	5·8	8·8	35·0	15·2	1·5	1·0	0·94	1·38	13·3	2·5	1·4

ST1 Intake 70m from face
ST2 Face Advanced heading 5m from face.
ST3 10s Chock on face - sample during shearing only.
ST4 150s Chock on face - sample during shearing only.
ST5 Return 70m from face.

ACTIVITY.

A. Shears taken Main Shearer.
B. Flits taken Main Shearer.
C. Caves.
D. Cuts taken. Top Shearer.
E. Shots fired in Advanced Headings.
F. Shots fired in fault area.
G. Shots fired on Top Rip.

TABLE 2.

RESULTS AFTER INSTALLATION OF AUTOMATIC STEERING.

DATE	DUST CONCENTRATIONS Mg/m³					ACTIVITY						
	ST1	ST2	ST3	ST4	ST5	A	B	C	D	E	F	G
4/ 9/73	5•2	5•2	6•6	I.F.	18•8	2	1	1	2	29	2	Y
5/ 9/73	3•5	3•7	9•7	48•5	12•5	1½	2	2	2	-	-	Y
6/ 9/73	4•0	3•5	6•8	52•8	21•1	2½	1½	1½	3	10	6	Y
7/ 9/73	4•1	4•3	7•8	38•9	17•0	2½	2	2	2	-	-	Y
10/ 9/73	6•2	5•6	5•6	21•3	8•0	1½	1	1	3	-	4	Y
11/ 9/73	5•5	6•0	6•8	24•4	12•4	2	2	2	2	32	-	Y
12/ 9/73	3•6	5•4	5•7	28•2	11•8	2	1	1	2	-	-	Y
13/ 9/73	5•2	6•5	6•8	23•4	12•3	2	2	2	3	11	-	Y
14/ 9/73	4•4	3•2	I.F.	22•7	13•1	2	3	3	2	10	-	Y
17/ 9/73	3•9	4•2	7•7	29•5	14•8	2	2	2	3	-	5	Y
18/ 9/73	2•8	4•5	6•7	26•5	15•1	2	2	2	2	27	-	Y
19/ 9/73	2•9	7•7	8•5	32•2	12•8	2½	2	2	3	20	-	Y
20/ 9/73	3•4	8•7	10•7	34•2	14•3	2	2	2	2	18	-	Y
21/ 9/73	3•7	3•6	4•2	23•3	13•7	2	2	2	2	20	-	Y
AVERAGES	4•2	5•2	7•2	31•2	14•1	2	1•8	1•8	2•4	12•7	1•3	

ST 1 Intake 70m from face.
ST 2 Face advanced heading 5m from face.
ST 3 10s Chock on face - sample during shearing only.
ST 4 150s Chock on face - sample during shearing only.
ST 5 Return 70m from face.

ACTIVITY.

A Shears taken Main Shearer.
B Flits taken Main Shearer.
C Caves.
D Cuts taken Top Shearer.
E Shots fired in Advanced Headings.
F Shots fired on Return Rip.
G Nucleonic Steering in use Y - Yes N - No.

TABLE 3.

AVERAGE DUST CONCENTRATIONS COMPARED WITH SALEABLE OUTPUT.

Week Ending	AVERAGE DUST CONCENTRATION mg/m^3					SALEABLE OUTPUT		AUTOMATIC STEERING USED
	ST1	ST2	ST3	ST4	ST5	PER WEEK	PER DAY	
21/7/73	4•7	5•3	9•0	28•6	17•7	3432	686	No
28/7/73	3•0	6•3	9•1	29•6	12•7	3412	682	No
4/8/73	4•1	6•0	7•5	30•2	14•7	3131	626	No
11/8/73	4•1	5•9	8•5	53•0	14•7	2921	584	No
4 WEEK AVERAGE	4•1	5•8	8•8	35•0	15•2	3224	645	No
8/9/73	4•2	4•2	7•7	46•7	17•3	4024	805	Yes
15/9/73	5•0	5•3	6•2	24•0	11•5	4337	867	Yes
22/9/73	3•3	5•7	7•6	29•1	14•1	4606	921	Yes
3 WEEK AVERAGE	4•2	5•2	7•2	31•2	14•1	4322	864	Yes

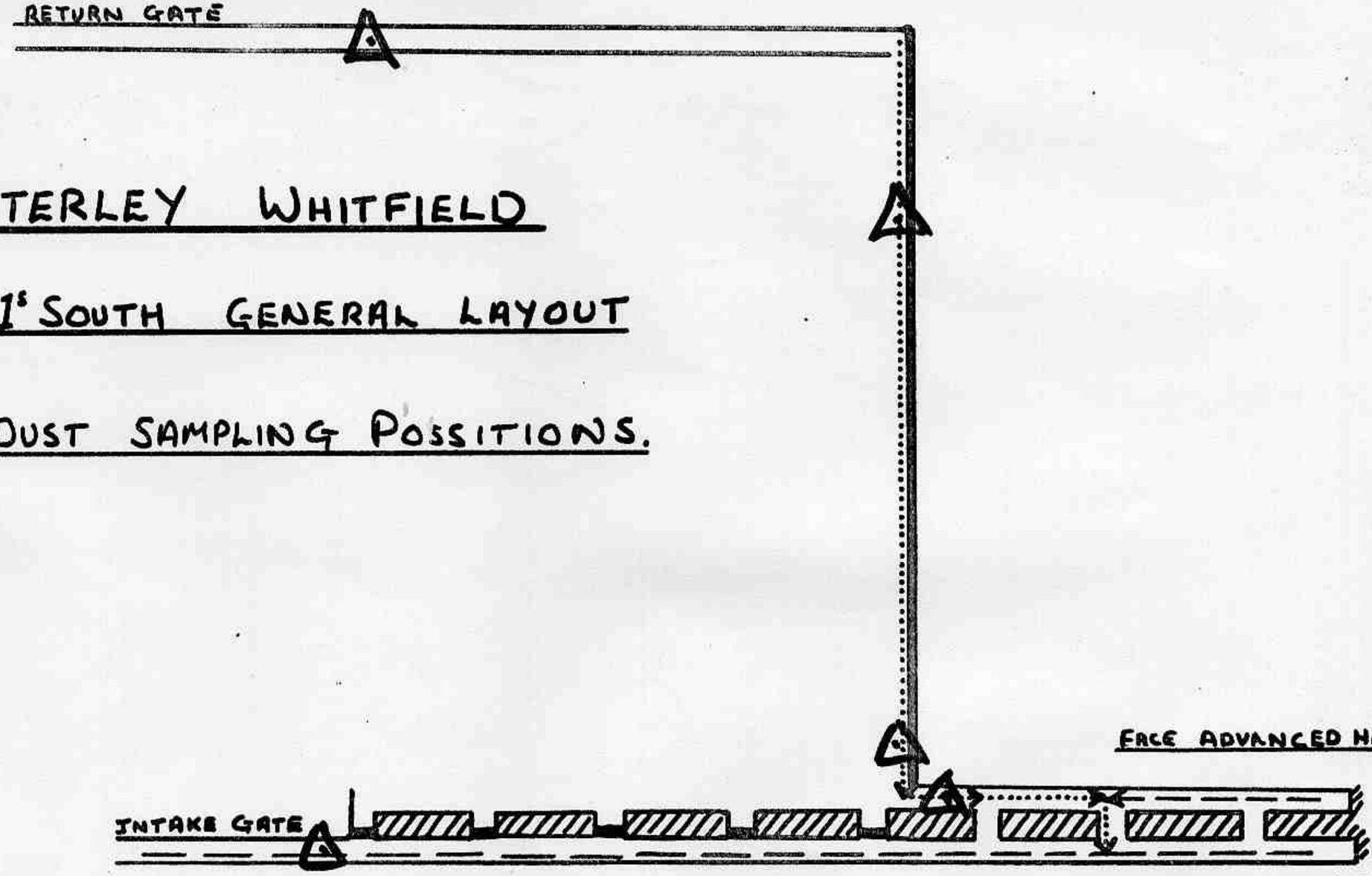
ST1 Intake 70 metres from face.
ST2 Face advanced heading, 5 metres from face.
ST3 On face, 10s Chock - samples during shearing only.
ST4 On face, 150s Chock - samples during shearing only.
ST5 Return 70 metres from face.

NOTE: Line marked 4 week average, refers to the previous 4 weeks when the automatic steering was not in use; and the line marked 3 week average refers to the previous 3 weeks when the automatic steering was in use.

CHATTERLEY WHITFIELD

HARDMINE 1ˢ SOUTH GENERAL LAYOUT

SHOWING DUST SAMPLING POSSITIONS.



NOT TO SCALE

SAMPLING POSSITIONS SHEWN △

BELT CONVEYORS SHEWN — — —

CHAIN CONVEYORS SHEWN .....

CONVEYOR TRANSFER POINTS SHEWN →

NATIONAL COAL BOARD

WESTERN AREA

METHOD STUDY BRANCH

REPORT NO.

Day Shift Night Shift

Colliery:- CHATTERLEY WHITFIELD Study from..8.1.75.....to.9.1.75..

Seam:- Facilities reviewed during Study... Period.

District:- HARDMINE DEVELOPMENT Study and Report by
W. Tasker.
M. Clowry.
R. Brown.

Drivage:- WOLSTANTON CONNECTION

D. MURFIN
.....
Method Study Team Leader

Date:- 27TH JANUARY, 1975.

CONTENTS

Distribution

COLLIERY AGENT MANAGER.
DEPUTY MANAGER.
DEVELOPMENT UNDERMANAGER.
COLLIERY MECHANICAL ENGINEER.
COLLIERY ELECTRICAL ENGINEER.
OPERATIONS ENGINEER MECHANICAL (NO. 3 PROD. CENTRE).
OPERATIONS ENGINEER ELECTRICAL (NO. 3 PROD. CENTRE).
NO. 3 PRODUCTION MANAGER.

For information

N. U. M. SECRETARY

WESTERN AREA — DETAILS OF SHIFT OPERATIONS, PERFORMANCES, & OBSERVED DELAYS

COLLIERY CHATTERLEY WHITFIELD — DRIVAGE WOLSTANTON COUNTOUR

	DAY	WED	WED.	WED.	THURS.	THURS.	THURS.	TOTAL FOR SHIFTS STUDIED.	
	SHIFT	DAY	NOON	NIGHT	DAY	NOON	NIGHT		
	DATE.	8-1-75	8-1-75	8-1-75	9-1-75	9-1-75	9-1-75		
NO. OF DRIVAGE FACEMEN DEPLOYED		4	3	4	4	3	4		
NO. OF "BACK-UP" MEN DEPLOYED			+2 & Repair						
DRIVAGE OPERATIONS.		MINS.	MINS.	MINS.	MINS.	MINS.	MINS.	MINS.	% OF TOTAL TIME
PREPARE TO BORE	DRILL RIG		17 00			17 00		34·00	0·42
BORING AND ASSIST	DRILL RIG		169 68			154·28		323 96	4·05
ASIDE BORING TACKLE	DRILL RIG		6 00					6 00	0·07
PREPARE TO BORE	HAND HELD ROTARY					2·00		2 00	0·02
BORING AND ASSIST	HAND HELD ROTARY					44 56		44 56	0·55
ASIDE BORING TACKLE	HAND HELD ROTARY					29 00		29 00	0·36
CHANGE STEM AND ASSIST STEEL			119·00			111 00		230 00	2 87
OUTWAY & FIRE			54 00			48 00		102 00	1 27
EXAMINE HEADING		11 00			6 00			17 00	0 21
LOAD OUT		62 00	20 00	63·00	19·00	88 00	18 00	270 00	3 38
ASSIST LOAD OUT / CABLEMAN		124·00	41 00	65·00	28 00	103 00	27 00	398 00	4 98
OPERATE CONVEYORS - 5 LOADER BELT		62·00	24 00	73·00	21·00	81 00	18 00	279 00	3 49
				68·00			21 00	89 00	1 11
OBTAIN MATERIALS		77 00			375 00		134 00	586·00	7 33
SETTING ARCH		315 00			593·00	1070	313 00	1231 70	15 42
COVERING IN AND BACK BEWING		320 00			418 00		200 00	938 00	11 74
PREPARE FOR MOVE IN			33 00					23·00	0 41
MOVE IN EXTEND BELT (HOUSEKEEP)			657 00					637 70	7 97
TINY CABLES			36·00			4 00		40 00	0 50
EXTEND AIR TUBE						44 00		44 00	0·55
TOTAL TIME ON DRIVAGE OPS.		971·00	1156 68	269·00	1470 00	736·34	731 00	5334·02	66 78

WORK COMPLETED DURING EACH SHIFT.

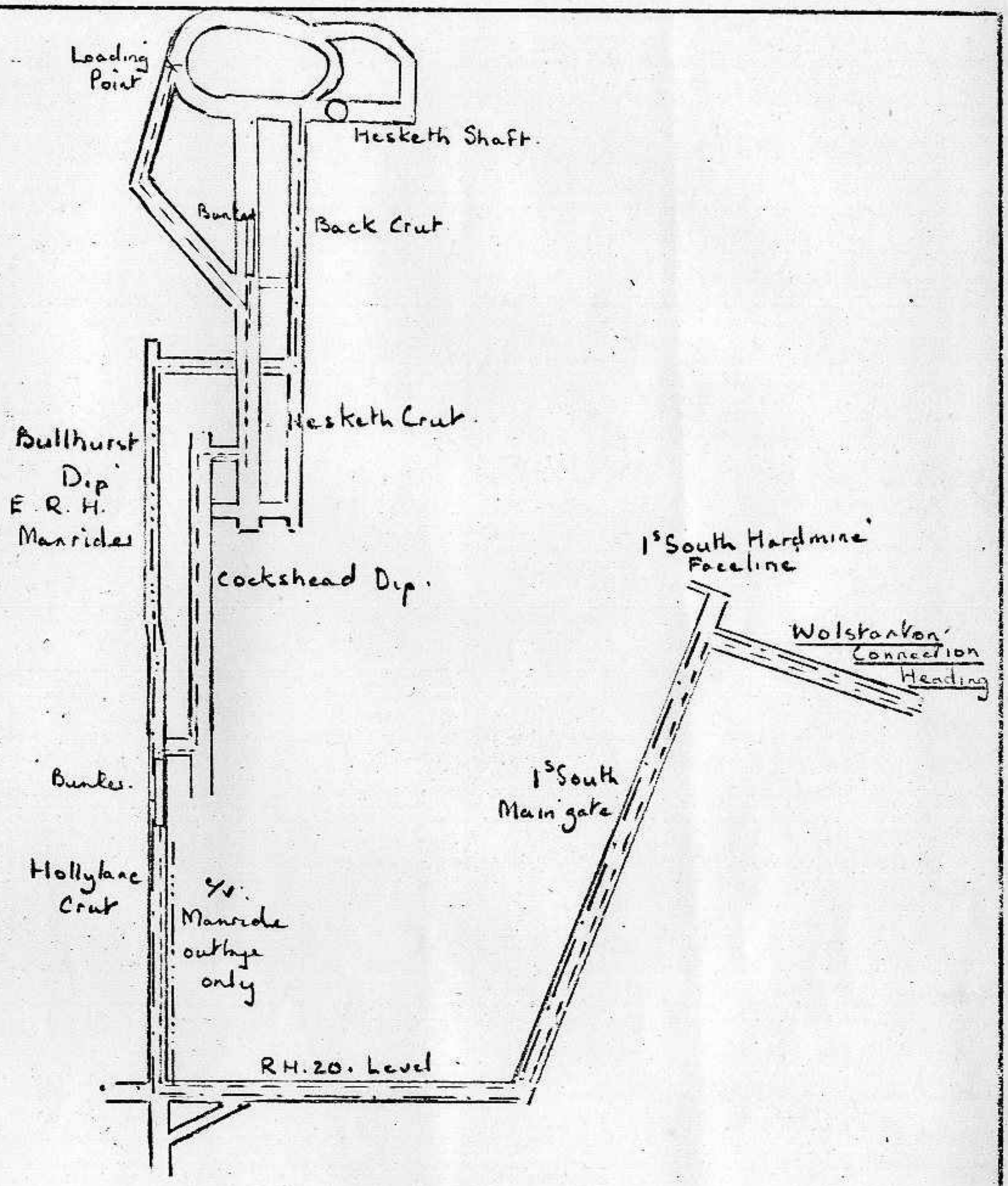
Set 2nd Arch	Completed	Loaded 3/3	Load out	Moved in	loaded out	
Cover and	Belt Ext.	dressing	3/3 dressing	Power Pack	Bored + Fired	
pack over	Clean Gulley 2 Men		Set and	Cleaned up	5 prop holes	
Load out	Bored + Fired		cover over	Bored + Fired	Cleaned and	
3/3 dressing	39 holes		3 Arches	39 holes	reinvade and	
prepare to	Prepare to			Load out	set and	
move in and	Load out			3/3 Dressing	covered two	
outhead F/V					arches.	

EL. NO.	DELAYS.	OCC.	MINS.	OCC.	MINS.	OCC.	MINS.	OCC.	MINS.	OCC.	MINS.	OCC.	MINS.	OCC.	MINS.	
	(OPERATIONAL DELAYS DENOTED *)															
1	CONVEYOR STANDS UNKNOWN	5	160 00	1	15·00	2	68 00			1	9 00			9	252·00	3·16
2	SURVEYORS PUT LINE ON							1	28·00					1	28 00	0·35
3	ROOF BREAKING UP							3	97 00					3	97 00	0·59
4	CENTRALISER DAMAGED UP							1	52 00					1	52 00	0·65
5	WAIT CONVEYORS START OF SHIFT							1	24 00					1	29 00	0·30
6	REPAIR CONVEYOR JOINTS							1	36·00					1	33 00	0·41
7	REPLACE COVER TINS					1	3 00							1	1 00	0·04
8	ELECTRICAL FAULT HOLEY LANE GULLY F/E					1	64 00							1	64 00	0·80
9	HEADING F/E FAST DUCT BOOM BELT					1	28 00							1	28 00	0·35
10	ALIGN HEADING F/E					1	28·00							1	29 00	0 35
11	CHANGE OVER CENTRALISER					1	16·00							1	16 00	0·20
12	DIRT IN RH20 BELT TRIPPER					1	260·00							1	260·00	3·26
13	ELECTRICAL FAULT 30" SCRAPER (RH2a)					1	420·00							1	420 00	5·26
14	BURST EMGO HOSE & REPAIR									1	9 00	1	15 00	2	24 00	0 30
15	OBTAIN OIL FOR EMGO											1	17 00	1	17 00	0·21
16	NO POWER IN HAULAGE ENGINE											1	45 00	1	45 00	0·56
17	RH 20 F/E CABLE FAULT.											1	220·00	1	220 00	2·75
18	DRILL & FIRE BOLT HOLES											1	92 00	1	92 00	1·15
19	CHANGE CABLES OVER			1	14 00									1	14 00	0·17
20	NH CUTTERS CHANGING BITS			2	15 50					2	11 66			4	27 16	0·34
21	POWER SEE POWER PACK			1	19 10					1	10 74			2	29 84	0·37
22	FITTER EXAMINE LEAKING HOSE			1	4 00									1	4 00	0·05
23	NO POWER DURING PREPARE TO MOVE	1	447·00											1	447 00	5·59
24	CLEAN ROUND BOX LNS.									1	45 00			1	45 00	0·56
25	BURNING HOLES IN DRILL BOOM.									1	5 80			1	5 80	0 07
26	PUT OIL IN POWER PACK									1	5 90			1	5·90	0 07
27	ASSIST FITTER REPAIR BOOM CHAIN									1	83 00			1	83·00	1·04
28	BOOM TRACKS NOT GRIPPING									1	15 00			1	15 00	0·19
	NON PRODUCTIVE		4·00		50·00				2·00						56·00	0·70
	TOTAL DELAY TIME.		611·00		117·60		887 00		186·00		195 10		389 00		2385·70	29 87
	MEAL BREAK.		72·00		-		80·00		32·00		-		80 00		264·00	3·31
	TOTAL OBSERVED TIME.		1654·00		1271 28		1236·60		1688 00		931·44		1200·00		7983·72	100%

WESTERN AREA. MINERAL, MATERIALS TRANSPORT & MANRIDING SYSTEMS. 2

COLLIERY CHATTERLEY WHITFIELD DRIVAGE WOLSTANTON CONNECTION DATE JANUARY, 1975

SKETCH PLAN.



KEY.

Conveyor System	- - - -
Travelling Route	— · — ·
Manriding	— · · · —
Materials route	

COMMENTS ON TRANSPORT SYSTEM.

Due to the low conditions and back ripping currently being carried out along 1's S Main Gate, the materials supply to the heading is disrupted and difficult.

WESTERN AREA. DRIVAGE SPECIFICATIONS. DATE JANUARY, 1975. 3.

COLLIERY CHATTERLEY WHITFIELD DRIVAGE HOLSTANTON CONNECTION

ITEM	DETAILS.	REMARKS.
PURPOSE OF DRIVAGE	To connect to Holstanton Colliery.	
STARTING DATE	October, 1974.	
PLANNED LENGTH OF DRIVAGE	750 yds.	
YARDS DRIVEN TO DATE	80 yds.	
NAME OF ~~CONTRACTOR~~/N.C.B.	N.C.B.	
STRATA:- IMMEDIATE ROOF	Soft grey shale - over laid grey mudstone	
SECTION WORKED	Hardmine Seam.	
IMMEDIATE FLOOR	Soft Fireclay.	
EXCAVATED HEIGHT	13 feet.	
EXCAVATED WIDTH	17 feet.	
EXCAVATED AREA	190 sq. feet.	
FINISHED ROADWAY SIZE	16 x 11' Arched.	
GRADIENT- ADVANCING TO DIP/~~RISE~~	1 in 5 Dipping.	
LOSS GRADIENT	Level	
CONDITIONS	Main Good	
EQUIPMENT:- DRILLING		
LOADING	Imco 625 Side Tipping Loader.	
BRIDGE CONVEYOR	65 H.P. Stage Loader 24½" x 7½" Pans.	
DRIVAGE CONVEYOR	36" Belt Conveyors - Av. 30" Belt Width.	
SUPPLIES TRANSPORT	No. 2 Size Direct Rope Haulage.	
SYSTEM OF VENTILATION	Exhausting Fan.	
METHOD OF DUST SUPPRESSION	Spray Dirt Pile - Water Spray on S/Loader.	
COMP. AIR PRESSURE	-	
METHOD OF EXTENSION	-	
DRIVAGE PROFILE	Arched.	
SUPPORTS:- SIZE	16' x 11' (6" x 5" Sec. Gresford Arch).	
CENTRES	3ft.	
STRUTS	Heavy Duty Tubular - 9 per Arch.	
STILTS	None - Arches set on 18" x 5" Conc.Blocks.	
COVERING	Corrugated Sheets - 14-16 bins/arch.	
BORING PATTERN	Double Wedge Pattern.	
NO. OF HOLES PER BLOWING	36-40	
DEPTH OF HOLES	Average 7ft.	
NO. OF HOLES PER CYCLE	36-40	
NO OF BLOWINGS PER CYCLE	One	
ADVANCE PER CYCLE:- PLANNED	2 Arches - 6ft.	
ACTUAL.	2 Arches - 6ft.	
TYPE OF EXPLOSIVES	P 4/5 Carrick Detonators.	
WEIGHT OF EXPLOSIVE/CYCLE	60-70 lbs.	
TYPE OF STEMMING	Coneplug - Sand Stemming.	
SYSTEM OF FIRING	Full round.	
DISTANCE FROM PIT BOTTOM	3990 yds.	
MANRIDING FACILITIES	1240 yds. Endless Manrider - Both Ways.	
BORING TIME PER SHIFT	450 yds. Holly Lane Crut c/v Outbye Only 315 Mins.	

WESTERN AREA. DEVELOPMENT STUDY FOLLOW-UP & ACTION NOTES.

COLLIERY CHATTERLEY WHITFIELD DRIVAGE WOLSTANTON CONNECTION DATE OF STUDY

EL. NO.	CAUSE OF DELAY	NO. OF OCCS.	DELAY TIME (MINS)	COMMENTS & RECOMMENDATIONS.	ACTION NOTES.
	DURING DRILLING.				
20	NO COTTERL - CHANGING BITS	4	27.16	OBTAINING WIRE TO SECURE BITS	
21	POWER OFF POWER PACK	2	29.84	TRIPPING ON THERMAL OVERLOAD	
22	FITTER EXAMING LEAKING HOSE	1	4 00	HOSE LEAK ON BOOM LIFTING RAM.	
25	SCREW LOOSE IN DRILL BOOM	1	5 80		
26	PUT OIL IN POWER PACK	1	5 90	LOSS OF OIL DUE TO LEAKS ON MACHINE	
27	ASSIST FITTER REPAIR BOOM CHAIN	1	83.00		
28	BOOM TRACKS NOT GRIPPING	1	15 00	UNABLE TO TRACK BACK	
	DURING SHOTFIRING.				
7.	REPLACE COVER TINS	1	3 00	NOT PACKED SECURELY OVER	
	DURING LOADING.				
1	CONVEYOR STANDS UNKNOWN	9	252.00	OUTBYE STANDS	
4	CENTRALISER DOUBLED UP	1	52.00	ONLY IMPROVISED CONVEYOR BELTING	
5	WAIT CONVEYOR START	1	24 00	DELAY AFTER 30" SCRAPER ELECTRIC FAULT	
6	REPAIR CONVEYOR JOINTS	1	33.00	BAD JOINTS IN HEADING CONVEYOR BELT	
8	ELECTRICAL FALILT HOLLY LANE C/U	1	64 00	GATE HAD TO BE RESET AFTER MANRIDING	
9	HEADING CONVEYOR FAST	1	28 00	DIRT ON BOTTOM BELT	
10	ALIGN HEADING CONVEYOR	1	28 00	TO PREVENT SPILLAGE	
11	CHANGE CENTRALISER OVER	1	16 00	AS ABOVE.	
12	DIRT IN RH 20 BELT TRIPPER	1	260 00		
13	ELECTRICAL FAULT 30" SCRAPER	1	420 00	FAULT ON PANELS (RH 20 Scraper)	
14	BURST EIMCO HOSE	2	24 00		
15	OBTAIN OIL FOR EIMCO	1	17 00		
17.	RH20 C/U CABLE FAULT	1	220 00	FAULT ON K.F.S switchgear	
24	CLEAN ROUND BOX END	1	45 00	RESULT OF SPILLAGE	
	DURING EXTENSIONS.				
19	CHANGE CABLES OVER	1	14 00	EXTRA CABLES REQUIRED	
23	NO POWER DURING PREPARE TO MOVE	1	447 00	FAULT ON SIGNALS DELAYED CLEAN UP	
	DURING SUPPORTS SETTING				
18	DRILL AND FIRE POP HOLES	1	92 00	ELIMINATED WITH CORRECT PLACING OF HOLES	
2	SURVEYORS PUT CENTRE LINE ON	1	28 00		
3	ROOF BREAKING UP	3	47 00	NO PACKING OVER WITH EXTRA GROUND OPEN	
16	NO POWER IN HAULAGE ENGINE	1	45 00		
	TOTAL DELAY TIME OVER STUDY PERIOD		2385.70	(INCLUDING 56.00 MINS NON PRODUCTIVE)	

COMMENTS & RECOMMENDATIONS.

EQUIPMENT & SUPPLIES.
EQUIPMENT IN GOOD CONDITION - SPARE CABLES ETC REQUIRED TO COVER HEADING ADVANCE

MATERIALS SUPPLY - HAND TO MOUTH DUE TO DISTANCE FROM SHAFT AND POOR CONDITION OF PARTS OF 1st SOUTH MAINGATE WHICH IS UNDER REPAIR

CONVEYORS.
328 MINS WERE LOST DUE TO CONVEYOR STANDS DURING LOADING OUT OPERATIONS. THIS IS EQUIVALENT TO ONE SHIFTS HEADING TIME

RAILS. RAILS ARE LAID FOR 48 YDS - 32 yds FROM FACE OF HEADING.

HAULAGES.
SIZE 2 DIRECT ROPE PITCHERS HAULAGE INSTALLED

CLEARANCE
NO SEPARATE BUNKERAGE - DEBRIS CONVEYED TO COAL SYSTEM.

MANPOWER.

DAYS	NOONS	NIGHTS
4	3	4

OTHER ITEMS.

SUMMARY (1)

STANDARD PERFORMANCE

Available Time ..... 313 MINS

Time at Standard per Cycle ..... 481·04 MINS

Number of Cycles at Standard per Shift = $\frac{313}{481 \cdot 04}$ = 0·65

Planned Shifts per Day 3

STANDARD ADVANCE (Yards)	Per Cycle	Per Shift	Per Day	Per Week
	2	1·30	3·90	19·50

STANDARD MANPOWER

FACE TEAM	Shift:	1	2	3	4	Total 24 Hours
	Start Time:	6.30 a.m	2.15 p.m	10.45p.m		
		4	4	4		12
	TOTAL	4	4	4		12

STANDARD ADVANCE PER MANSHIFT (FACE TEAM) 0·325 Yards

SERVICES	Shift:	1	2	3	4	Total 24 Hours
	Start Time					
	TOTAL					

REMARKS

FORM B – DETERMINATION OF MACHINE AVAILABLE TIME

1. SHIFT MAXIMUM TIME

– 7¼ hrs. + 1 Winding Time

= 435 mins. + 30 mins = 465 mins.

2. AGREED MANRIDER DEPARTURE TIMES

Shift 1	Shift 2	Shift 3

Depart Pit Bottom Station

Depart Inbye Station

3. SHIFT TIME REALISABLE

	Mins.	Mins.	Mins.
Ride Shaft	4	4	4
Walk to Manrider	7	8	7
Load Manrider	6	2	7
Manrider Departure to Manrider) Arrival at Pit Bottom)	421	421	421
Walk to Pit Bottom	7	7	7
Wait to Ride Shaft	5	8	4
Ride Shaft	4	4	4
Total Time Realisable	454	454	454
4. UNREALISED TIME PER SHIFT (1–3)	11	11	11

5. MACHINE AVAILABLE TIME PER SHIFT

(a) Manrider Depart Pit Bottom to Manrider Arrive Pit Bottom.	421	421	421
Less:			
Travel Inbye on Manrider	8	7	7
Walk Inbye (to mid point of face life)	30	30	31
Prepare for work	5	5	5
Meal Time	20	20	20
Prepare to Travel Out	5	5	5
Walk to Manrider	31	34	33
Travel Outbye on Manrider	8	7	7
(b) Total to be deducted.	107	108	108
Machine available time (a–b)	314	313	313

Mean Machine available time – 313 MINS.

COMMENTS ON DELAYS

Conveyors General

The general condition of the conveyor system inbye of the R.H. 20 dip is not good with badly worn belting and poor joints being the main problem. 1's South Main Gate has been subject to severe crushing and is under repair at several places. This creates problems in materials supply, communications and continuous running of the conveyors. Delays directly attributable to the conveying system including both mechanical and electrical problems accounted for 328 mins. or approximately 1 shift out of the total of 6 shifts studied.

Management are aware of the condition of the development conveyors and are attempting to bring the system to a reasonable state of repair.

Conveyor Stands Unknown 252 man mins. - 11 min./shift average.

The high total in this category was due to lack of adequate communications. A telephone was installed on the first day of study and the situation was improved. Discussion with the Electrical Engineer revealed that the tannoy system in 1's S. Main Gate is not suitable for the heading. It is intended to install a D.A.C.S. system of tannoy communications.

Centraliser Trouble 68 man mins. - 3 min./shift average.

The heading c/v centraliser was improvised from conveyor belting and is only a temporary measure, prior to the installation of a beam type stage loader which should eliminate the problem.

Dirt in R.H. 20 Tripper 260 man. mins. - 12 mins./shift average.

Dirt build up in the R.H. 20 belt tripper caused the conveyor to stall. A delay ensued while the dirt was cleaned out.

Heading Conveyor Trouble 89 man mins. - 4 mins./shift average.

Delays due to mis-alignment of conveyor and repairing joints.

Clean up & Extend Conveyor

The absence of the beam stage loader which it is planned to install, resulted in difficulties in A.S.L. move in which extended the operational time. The early installation of this equipment would ensure a methodical system which would be of immediate benefit.

Signal Problem on Crut Conveyor 447 man min. - 20 min./shift average.

This occurred at the end of the dayshift when the team stayed over to clean up, move in the A.S.L. and extend the conveyor. A signal problem occurred at No. 1 box which in the absence of an electrician was difficult to locate, with the resulting delay.

The fault was eventually rectified by the operator with no apparent electrical failure.

Discussion with the Electrical Engineer revealed that the problem could have been caused by the pull wire being operated and not re-set.

Electrical Faults

1. Electrical fault on Holly Lane Conveyor (16 min 1 occ) caused by the manriding gate being activated. Delay ensued while electrician. went to site and reset the trip.

2. Fault on R.H. 20 Conveyor (55 mins 1occ).

   Fault on K.F.G. box.

3. Fault on panels R.H. 20 Scraper (111 min. 1 occ).

The delay time stated is the time that the heading was directly affected. When possible o erations in the heading continued off-cycle which obscured the total delay time.

Miscellaneous Delays

Bore & Fire Pop Holes 23 min 1 occ.

Could be eliminated with correct hole placing.

No Cotters to Secure Bits 9 min 2 occ.

No cutters were available and time was lost searching for wire.

Changing Cables 15 min 2 occ.

Due to the lack of spare cables and the stage loader cable being too short to accommodate a move in, cables had to be interchanged to allow individual machines to operate as required. Spare cables were being sent in and the Electrical Engineer confirms that the switches have been re-located in the heading.

Repair Boom Slew Chain 28 min 1 occ. (Average 5 min./shift).

The connecting link on the boom slew chain broke during traversing. Previous breakages had occurred prior to the study both on the chain and on the connecting pin to the rams. This is the subject of an investigation by the Mechanical Engineers.

It is worthy of note that if the chain breaks when side holes are being bored a safety hazard exists to any workman at the side of the boom.

General Comments

Leak to the Ram/Hose at the Back of the Boom

This results in the boom not manoeuvring correctly and requires manual assistance to lift.

Tracks not Holding

The machine was observed to run down the gradient during positioning of the boom thus creating difficulties when positioning for boring. A block

had to be used to scotch the tracks.

Securing Screws to the Drill Clamp

The Allen screws securing the drill clamp work loose on vibration and no Allen key is available for tightening.

Boring

During the study it was observed that all the holes were bored dry. An additional hose is required to allow wet boring to be carried out. It is understood that wet boring has been practised in the heading buttrouble was experienced with drills clogging up.

During the study period an opportunity to study boring by hand presented itself when the chain on the drill boom broke. Comparisons can, therefore, be made for boring in coal with the two systems.

It must be stated, however, that weak strata conditions existed at the time of study due to slips in the face of the heading.

Comparison Table

	Distance Bored	Time (mins)	Penetration Rate ft./mins.
Boring in Coal with Drill Boom	282 ft.	35·76	7·89
Boring in Coal with Drill Boom including Re-position	282 ft.	71·72	3·93
Boring in Coal with Hand Held Machine	73 ft.	9·90	7·37
Boring in Coal with Hand Held Machine inc. Stomp etc.	73 ft.	14·18	5·15

It can be seen from the table that the overall mean boring penetration rate is higher with hand held machines. Further tests in dirt should be made before any conclusions can be drawn but it would appear that excluding environmental considerations strata hardness may be a governing factor in the introduction of single drill booms in headings of this type.

Tripping on Thermal Overload 10 min. 2 occ.

The drill boom tripped out on thermal overload on each occasion when boring was carried out. This problem has been under investigation by the engineers since the machine was introduced, and the current situation is that the Colliery are now awaiting some different valves from Dimco, which may alleviate the problem.

Pressure Trouble

On occasions it was observed that there appeared to be a pressure problem with the machine as the operators had to wait for pressure build up.

On discussing this with a mechanic, it is considered that this may be a result of a valve sticking in the pump.

Cable Handling

The method of cable handling and control is by a pulley system in the roof of the gate with the Eimco cable being manually pulled back and then being allowed to run free during traversing for loading. It is considered that a suitable catenary wire system would ease the manual aspect of this operation.

Performance

Under the existing conditions the standard performance of the heading is calculated at 19·5 yards per week. The 16' x 11'; 6" x 5" heavy section arches obviously increase the work load in Arch Setting which affects the Standard Performance. Assistance in lifting the arches is facilitated by the drill boom although as previously stated during initial lifting manual assistance has to be provided.

Work is being pursued at Boltons to modify the feature in design which allows breakages in the boom slew chain.