TULAMEEN COAL PROJECT

Report on 1977 Field Work

(Report to Accompany Application to Extend Terms of Licence - Coal Licences Nos. 69, 70, 71, 125, 126, 145, 146, 147, 154, 158, 159, 3663, 3664, 3665)

N.T.S. 92-H-7, 10
Lat.: 49°, 30'
Long.: 120°, 45'

Field Work carried out in period
May 9 - October 7, 1977

By:
T. J. Adamson
CYPRUS ANVIL MINING CORPORATION
March, 1978

VOLUME I

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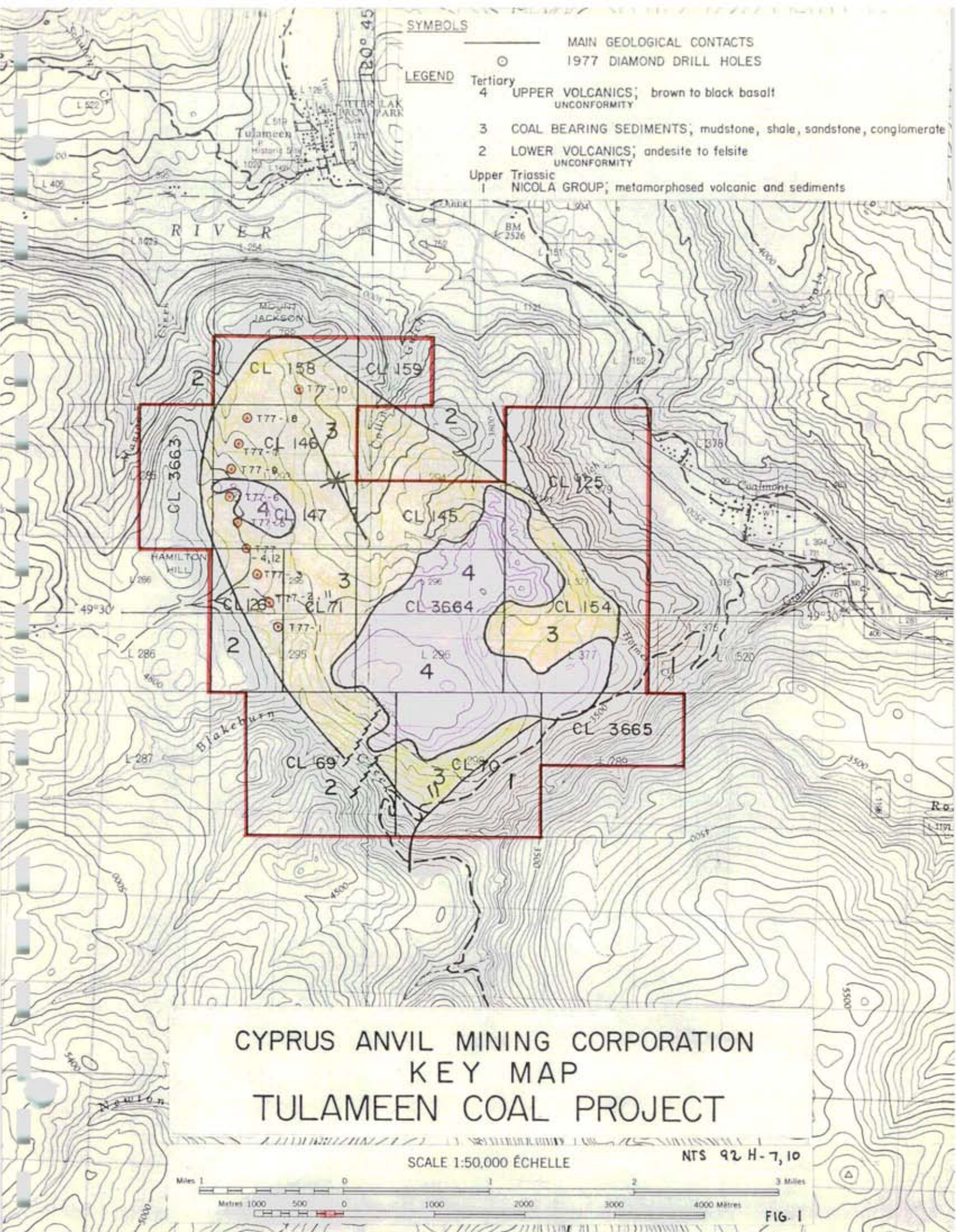
SYMBOLS
MAIN GEOLOGICAL CONTACTS
1977 DIAMOND DRILL HOLES
LEGEND
Tertiary
4 UPPER VOLCANICS; brown to black basalt
UNCONFORMITY
3 COAL BEARING SEDIMENTS; mudstone, shale, sandstone, conglomerate
2 LOWER VOLCANICS; andesite to felsite
UNCONFORMITY
Upper Triassic
1 NICOLA GROUP; metamorphosed volcanic and sediments
CL 158
CL 159
CL 146
CL 147
CL 145
CL 125
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CL 3664
CL 154
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T77-10
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T77-3
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T77-1
Tulameen
RIVER
MOUNT JACKSON
HAMILTON HILL
Coalmont
Blakeburn
Granite Creek
Otter Lake Provincial Park
120° 45
49° 30
CYPRUS ANVIL MINING CORPORATION
KEY MAP
TULAMEEN COAL PROJECT
SCALE 1:50,000 ÉCHELLE
NTS 92 H-7, 10
Miles 1 0 1 2 3 Miles
Metres 1000 500 0 1000 2000 3000 4000 Metres
FIG. 1

LIST OF APPENDICES

INTRODUCTION

During 1977, Cyprus Anvil Mining Corporation carried out a field exploration program within the Tulameen Coalfield. Work carried out during the program included the following:

- topographic control survey,
- new aerial photography,
- preparation of base maps and orthophotos,
- geological mapping,
- bulldozer and backhoe trenching,
- diamond drilling,
- electrologging of drill holes,
- bulk sampling,
- extensive analyses and testing of bulk and core samples,
- geophysical resistivity and I.P. Survey.

The above work has proven a substantial tonnage of good-quality, surface minable thermal coal. It will be necessary to clean this coal in a preparation plant to produce a marketable product. A preliminary proposed pit plan has been prepared.

The work proposed during 1978 on this project will attempt to define additional reserves and will develop operating costs, capital costs, and coal quality and marketing data that will allow us to proceed to a definitive evaluation of the economic viability of the project.

LOCATION AND ACCESS (see Figure 1 - Key Map)

The Tulameen Coalfield is located in southwestern B.C. on the flank of the Cascade Mountains, about 170 air kilometres E.N.E. of Vancouver, and 48 km north of the U.S. border. The property is centered south of the town of Tulameen and west of the town of Coalmont.

There is good gravel road access to the property from Coalmont, a distance of about 11 km. A narrow paved road connects Coalmont with Princeton, a distance of about 20 km to the southeast.

A branch line of the Canadian Pacific Railway runs from Princeton, through Coalmont and Tulameen, to the main line at Spences Bridge. The rail distance from Coalmont to Vancouver is 420 km.

LAND STATUS

Coal licences covering most of the Tulameen Basin are held by Imperial Metals and Power Ltd. and Mullins Strip Mine Ltd. Cyprus Anvil Mining Corporation is the present operator of these licences, through an option agreement entered into with Imperial Metals and Power Ltd. By making a production commitment, these licences can be acquired by Cyprus Anvil, with a royalty interest retained by the present licence holders. This option agreement was forwarded for consideration of the Minister of Mines in compliance with Section 9 of the Coal Act and was subsequently filed and recorded as an endorsement on each licence document.

Tulameen Coal Project Coal Licences - Operator: Cyprus Anvil Mining Corporation (see Figure 1)

Imperial Metals & Power Ltd.	- Coal Licence No.	145 - 320 acres
		146 - 320 acres
		147 - 320 acres
		154 - 640 acres
		158 - 320 acres
		159 - 160 acres
		3663 - 320 acres
		3664 - 640 acres
		3665 - 320 acres
Mullins Strip Mine Ltd.	- Coal Licence No.	69 - 640 acres
		70 - 640 acres
		71 - 320 acres
		125 - 640 acres
		126 - 320 acres

During 1977, field work was carried out under Reclamation Permit No. 115, issued August 9, 1977, for a period of three years, pursuant to Section 8 of the Coal Mines Regulation Act.

DIAMOND DRILLING

Twelve diamond drill holes, totalling 1,479.1 m, were drilled in the period July 13, 1977 to September 22, 1977. The drilling was contracted by Shepherd Enterprises Ltd. (a member of the Tonto Group of companies). All core was HQ size and was recovered using a triple tube core barrel.

Drill holes are numbered T-77-1 through T-77-12 and their locations are plotted on Figures 2 and 3 (1:5,000), 4 and 5 (1:2,000). Drill core is stored in a shed rented by Cyprus Anvil in the town of Coalmont, B.C.

Drill hole data is tablulated below:

Hole No.	Bearing	Dip	Commenced	Completed	Ultimate Depth	Elect. Logged	Core Rec. Main Seam (3b 7) %	Core Rec. Lower Seam (3b 2) %
T-77- 1	235°	-60°	July 19/77	July 21/77	82.6m	Yes	96	-
T-77- 2	235	-47	July 13/77	July 18/77	92.5	Yes	94	-
T-77- 3	250	-45	July 27/77	July 28/77	160.0	Yes	98	98
T-77- 4	255	-48	July 29/77	Aug. 3/77	123.1	Yes	96	98
T-77- 5	255	-45	Aug. 4/77	Aug. 8/77	119.8	Yes	97	95
T-77- 6	-	-90	Aug. 9/77	Aug. 14/77	107.3	Yes	97	95
T-77- 7	-	-90	Aug. 17/77	Aug. 20/77	126.8	Yes	85	90
T-77- 8	-	-90	Aug. 21/77	Aug. 27/77	93.6	No	84	-
T-77- 9	-	-90	Aug. 28/77	Aug. 31/77	111.9	No	97	98
T-77-10	-	-90	Sept. 1/77	Sept.12/77	131.4	No	92	98
T-77-11	-	-90	Sept.14/77	Sept.17/77	163.7	No	98	99
T-77-12	-	-90	Sept.18/77	Sept.22/77	166.4	No	97	99

Lithologic logs of all drill holes are included in Appendix 4.

DRILL HOLE ELECTROLOGGING

Diamond drill holes T-77-1 through T-77-7 were electrologged, under contract by B.P.B. Instruments (Canada) Ltd. For each of these holes, a gamma ray log, neutron-neutron log, and long spacing density logs were run over the entire lengths of the hole at a general scale of 1:120. Also, for each coal interval

a detail gamma ray log, long spacing density log, and high resolution density log were run at a scale of 1:24.

From the above suite of electrologs, the different lithologic units present could be very easily identified and correlated. The gamma ray - neutron log combination was most useful in the identification of sandstone, shales, mudstones, etc. Coal intervals could be positively identified by the gamma ray - density logs combination and from these detail logs, very accurate coal interval thickness determinations could be made. The detail logs were also useful in determining the nature of any section of unrecovered coal within the coal seam interval.

For each hole, there is excellent correlation between the electrologs and written core lithology logs and, for each of the seven holes electrologged, definite correlation can be made, from hole to hole, of coal seams and overlying and underlying strata.

Because of the presence of a number of swelling clay sections in the sequence drilled, holes would not stay "open" for even a short period after drilling. For this reason, all electrologging had to be done through the drill stem immediately on the completion of each hole. It was necessary to keep the electrologging contractor on stand-by at all times during the drilling. The subsequent electrologging cost, on a footage basis, was extremely high.

In view of the fact that all holes were being cored, with good core recovery, and the good correlation between electrologs and written core lithology logs, permission was obtained from the Department of Mines to dispense with electrologging drill holes T-77-8 through 12. Sufficient electrolog and corresponding core lithology data has been obtained in holes T-77-1 through 7 that in subsequent drill programs using, perhaps, a non-coring technique plus

electrologging, we will have a high degree of confidence in our electrolog interpretations.

General scale and detail scale electrologs for diamond drill holes T-77-1 through T-77-7 are found in Appendices 5 through 8 (Figures 6 - 19).

GEOLOGY (see Geology Map, Figures 2 - 5, and Cross Sections, Figures 20 - 24)

The Tulameen basin consists of an elongate, oval-shaped synclinally folded sequence of Tertiary sediments and volcanics which rest unconformably on a basement of Upper Triassic Nicola Group metamorphosed volcanics and sediments.

The 1977 regional mapping of the area generally confirmed earlier work by W. S. Shaw (G.S.C. Paper 52-19).

Throughout much of the Tulameen basin, there is very little natural exposure of bedrock, especially in the sedimentary sequence which includes the coal seams. Geological mapping is based on natural exposures, drill cores, exposures in old bulldozer trenches that were cleaned out, and exposures in new backhoe trenches that were dug along access roads.

The primary objective of the 1977 program was to prove coal reserves surface minable at low stripping ratios. For this reason, work was concentrated (all trenching, drilling, most mapping) along the western margin of the basin. In this area, dips are moderate (25 - 45^{o}E) and, for a considerable strike distance, the topographic slope tends to fall off to the east, resulting in a reasonable surface mining situation. Mapping is very sketchy and incomplete along the eastern margin of the basin because of a lack of bedrock exposure. A large number of old bulldozer trenches exist in this area, but most are extensively slumped. Geological data available suggests

that coal seams exist in the sedimentary sequence along the entire eastern margin of the basin but that dips are steep to the west and dip into the topographic slope rather than in the same direction as the topographic slope, as is the case along the western margin. The potential of proving significant surface minable reserves along the eastern margin of the basin is thought to be low.

TABLE OF GEOLOGIC FORMATIONS

TERTIARY

4 UPPER VOLCANICS

Brown to black, fine-grained basalt.

Unconformity.

3 COAL - BEARING TERTIARY SEDIMENTS

3c UPPER SANDSTONES (600 m)

3c2 Granule conglomerate, coarse sandstone, minor shale, mudstone.

3c1 Transitional unit; interbedded sandstone, mudstone, minor thin coal.

3b COAL MEMBER: Shales, mudstone, tuffs, coal. (130 m)

3b10 Blocky breaking mudstone and shales.

3b9 Finely laminated, fissile shales.

3b8 Interbedded thin dirty coal, bentonite, shales, mudstones.

3b7 Main coal seam (including interbedded volcanic horizons).

3b6 Light grey, medium-grained sandstone; white muddy matrix.

3b5 Dark-grey, massive, blocky breaking mudstone.

3b4 Distinctive color banded, light to dark grey, interbedded shales, mudstones, muddy sandstone.

3b3 Mudstone, medium brownish grey to dary grey, massive to medium laminated.

3b2 Lower coal seam.

3b1 Interbedded fragmental bentonitic tuff, thin coal seams, coaly bentonitic mudstone.

3a LOWER SANDSTONE: Coarse to fine sandstone, interbedded with mudstone and shale (100 - 150 m).

2 LOWER VOLCANIC:

Massive to porphyritic or fragmental; andesitic to felsitic.

Unconformity.

UPPER TRIASSIC

1 NICOLA GROUP:

Highly metamorphosed volcanic and sediments.

Nicola Group (unit 1) rocks are exposed along the extreme south and eastern sections of the mapped area. The Nicola Group consists mostly of a varied assemblage of metamorphosed, highly fractured, quartz and ca bonate veined volcanic rocks varying from porphyritic and non-porphyritic dacite to basalt. Also present are minor argillite, tuffs, limestone, and chlorite and sericite schist.

Unit 2, the Lower Volcanics, are the oldest Tertiary rocks in the area and they unconformably overlie the Nicola volcanics. This unit consists of a wide variety of generally light coloured, massive to porphyritic and/or fragmental andesite to felsites. This is a very resistant outcrop forming unit. Best exposures are on Hamilton Hill and Jackson Mtn. along the western and northern margin of the basin. Total thickness of this unit, in Collins Gulch, is reported to be about 500 m.

Unit 3 includes the Tertiary sedimentary strata. Unit 3 can be further broken down into a lower sandstone unit (3a); unit 3b, the coal-bearing member consisting of shales, mudstone tuffs, flows, and coal; and an upper sandstone horizon (3c).

Unit 3a is a recessive, poorly exposed, poorly cemented, often arkosic, coarse to fine-grained sandstone, interbedded with minor thin mudstones and shales. The thickness of this unit in the western and northern basin is in the order of 100 - 150 m.

Unit 3b, the coal member, is about 130 m thick along the western margin of the basin. This unit appears to conformably overlie unit 3a along the western and northern portions of the basin but, to the east and south, it progressively overlaps unit 3a and unit 2 to lie directly on the Upper Triassic Nicola Group basement. Using drill cores and electrologs, unit 3b

has been further broken down into a number of sub-units (3b1-10). These units are readily identifiable in core and logs and have been correlated between all holes in the area drilled. Unit 3b is a very recessive weathering unit with very few natural exposures. In weathered surface exposures (outcrop, road cuts, shallow cat and backhoe trenches), it is very difficult to differentiate between the various unit 3b shale and mudstone sub-units.

Unit 3b1 consists mainly of tuffs, tuffaceous mudstones and thin, dirty coal seams (coal with numerous interbeds of mudstone and bentonitic clay). Many bentonitic tuff horizons contain abundant (up to 25%) irregular, angular felsitic fragments of up to 5 cm diameter.

Unit 3b2, the Lower Coal Seam, ranges in thickness, in drill hole intersections, from 7 to 7.6 m. This seam is very dirty, with numerous interbeds of coaly mudstone, light grey, soft bentonite, and light brown bentonitic mudstone. The raw coal ash of the Lower Coal Seam is in the order of 52% (a.d.b.). This seam is of no present economic interest.

Unit 3b3 consists of massive to coarsely laminated, medium brownish grey to dark grey mudstones. Unit 3b3 is gradational with overlying unit 3b4, which is made up of distinctively colour-banded, light grey to brownish to black, medium-bedded shales, mudstones and muddy sandstones.

Unit 3b5 is a dark grey to black, coarsely laminated to massive, blocky breaking mudstone.

Unit 3b6, directly underlying the Main Coal Seam, is a thin, persistent bed of light grey, medium to fine-grained, poorly consolidated sandstone with a white clayey matrix. Thin organic "streaks" are seen along bedding planes.

Main Coal Seam

Unit 3b7 is the Main Coal Seam. This seam was intersected in all twelve diamond drill holes. Drilling was carried out along the western margin of the basin, extending from the northern limit of the old underground workings (Mine No. 5), northwards to the extreme northern limit of the basin. The Main Coal Seam, as a whole, consists of beds, up to 1 m thick, of clean to dirty coal (grading to coaly mudstone, some white speckled (ankerite?)), with numerous discrete, thin, waste interbeds. The percentage of discrete waste partings relative to the percentage of coal within the 3b7 interval increases progressively from south to north in the drilling area, as is noted below:

Hole No.	% Coal	% Waste Partings
T-77- 1 - 5	88 - 82	12 - 18
T-77- 6	71	29
T-77- 9	66	34
T-77- 7	58	42
T-77- 8	47	53
T-77-10	41	59

Within the strike trace of the coal seam bounded by sections through drill holes T-77-1 and T-77-5, the waste partings within the coal interval consist primarily of mudstone, coaly mudstone, soft clayey bentonite, and gritty bentonitic mudstone, with a very few thin scattered beds of dark brown to black, very fine-grained, siliceous, slightly fragmental rock of probably a volcanic origin. Within the strike interval bounded by Sections 1 and 5, a thick (up to 1 m) seam of soft, light grey to cream coloured bentonite ("main" bentonite seam), occurring near the top of the coal interval, seen in core and in surface exposures, is continuous throughout the entire strike distance. All other waste interbeds appear to be very lensy and discontinuous. From hole T-77-6 and continuing north through hole T-77-10, there is a rapid progressive increase in the percentage of

waste interbeds of volcanic origin (see core logs, Appendix 4). Few interbeds exceed 50 cm thick, with most in the order of 5 - 20 cm thick. The volcanic interbeds include a wide variety of lithologies, including multi-coloured tuffs, welded tuffs?, light grey to black siliceous, very fine-grained, often pyritic, cherty to "stoney" rock; black, very fine-grained, slightly vesicular flows, etc. In a few examples, coal immediately adjacent to the above apparently volcanic interbeds appears to have been burnt or sintered, but in most cases contacts are sharp, clean and unaltered.

The average raw coal ash of the 3b7 interval intersected in holes T-77-1 through T-77-5 is in the order of 38%. The raw coal ash of holes T-77-6 through T-77-10 will range from 50% to 70%+.

The strike extent of coal reserves which have the possible potential to be economically exploited by surface mining has, as a south limit, the north margin of the old No. 5 underground mine just to the south of Section 1 (this also corresponds to the southern limit of topography favourable to surface mining) and runs to the north, to just north of Section 5 to the point where there is a rapid increase in raw coal ash percentage. The coal seam dip in this zone ranges from 28^{o} in the south to 45^{o} to the north, with seam thickness ranging from 15 m to 21 m.

Individual coal beds are well-banded. In hand specimens, bands of vitrain and clairain predominate (approximately 90% of total), with minor durain and fusain. Nodules of bright clear amber are widely scattered throughout the coal. The coal has well-developed bedding and butt cleat. Ankerite is occasionally seen as thin interbeds (less than 1 cm thick), as white speckling in dirty coal, and as a thin coating on butt cleat surfaces.

The Main Coal Seam is overlain by unit 3b8. This is a thin unit of

interbedded dirty coal, coaly mudstone, and white to yellowish soft bentonite beds.

Unit 3b9 is a thick (approximately 30 m), homogeneous interval of very thinly bedded, fissile, "paper" shales. Overall colour is medium to dark greyish brown but individual thin laminae range from black to very light grey in colour. These fissile shales are gradational with the overlying unit 3b10, which consists of blocky breaking, medium to dark grey, massive to medium-laminated mudstones, with a few thin light grey sandy lenses.

The unit 3b coal-bearing sediments are conformably overlain by the Upper Sandstones (unit 3c). Unit 3c has been further divided into a lower, thin (3 - 6 m) transitional unit (3c1) consisting of interbedded fine to coarse-grained sandstones, mudstones and thin coal and coaly mudstone. Unit 3c2 is a very thick interval (600 m) of granule conglomerates and coarse sandstones with minor thin interbeds of shale and mudstone. The conglomerates and sandstones are generally light grey in colour, with a white muddy matrix.

The Upper Volcanic rocks (unit 4) unconformably overlie the unit 3 sediments. Unit 4 is made up of dark brown to black, fine-grained, primarily massive basalt. A few exposures are vesicular and amygdaloidal. Some pillow structure was noted. The basalts form a nearly flat-lying sheet in the order of 100 m thick which occupies most of the southeastern half of the basin. The limits of this sheet are generally well-defined by cliffs. A small, thin, erosional remnant of this basalt sheet occurs along the northwestern margin of the basin, overlying the unit 3b coal-bearing member between drill holes T-77-6 and T-77-9.

The Tertiary sediments are folded into an assymetric, northwest trending

synclinal structure. In the area of the old underground mines along the southwest margin of the basin, the beds dip between 20 and 25° to the northeast. To the north of this area, between Sections 1 and 5 in the area of potential economic reserves, dips increase from 25° to 45°. The beds tend to flatten to about 20° around the northern nose of the syncline and then steepen to 55 to 80° to the southwest around most of the eastern margin of the basin. The structure around the southeastern margin of the basin, because of the almost total lack of unit 3 rocks exposed, is unclear. There may be sharp flexures in the areas of Blakeburn and the Hayes-Vitoni Prospects, with the unit 3 rocks curving around the southeastern margin, closing the syncline. An alternate interpretation would continue the northwest strike of the southwest and northeast limits of the syncline, with the coal horizon pinching out against the basement rocks near Blakeburn and the Hayes-Vitoni Prospects.

A major northeast trending fault zone exists between the No. 3 and No. 4 underground mines. This fault zone is noted in descriptions of the old underground workings and can be seen by the surface offset of unit 3b horizons. A similar major northeast fault zone has been described as forming the southeast limit of the No. 3 underground mine. No surface evidence of this zone has been seen. No faulting of significance was seen involving unit 3b between Section 1 and Section 5. To the north of Section 5, numerous small scale faults and drag folds were encountered, although no major displacements are indicated.

PHYSICAL WORK

Bulk sampling, trenching, road building and drill site preparation was carried out using a D-7 bulldozer, a D-6 bulldozer, and a small backhoe. The location of all new physical work and its location with respect to coal

licence boundaries is shown on Figure 25. A Reclamation Report regarding Reclamation Permit No. 115, reporting on physical work done and a description of reclamation for the calendar year 1977 was submitted to the Senior Reclamation Inspector, Victoria on January 6, 1978.

Bulk samples Nos. 1 and 2 (10 tonnes each) were collected from Trench No. 5. This was a pre-existing bulldozer trench. The trench was deepened with a bulldozer during the course of bulk sampling, but with no increase in original disturbed area. Bulk samples Nos. 3A and 3B were also collected from an enlarged pre-existing bulldozer trench (Trench No. 3), causing a new disturbed area of 25 m by 70 m (1,750 m^2).

Twelve diamond drill sites were cleared for a total disturbed area of 7,500 m^2.

New roads were built using a D-6 bulldozer. New roads provided access to drill sites. All timber of commercial size along new road locations was recovered. Details of new road locations are as follows:

New Roads (1977 field season)	Length	Area Disturbed
Access to DDH T-77-1	170 m	850 m^2
Access to DDH T-77-2	40	200
Access to DDH T-77-3	70	350
Access to DDH T-77-4, T-77-12	110	550
Access to DDH T-77-5	100	500
Access to DDH T-77-6	40	200
Access to DDH T-77-7	220	1,100
Access to DDH T-77-8	220	1,100
Access to DDH T-77-9 and trenching access	300	1,500
Access to DDH T-77-11	30	150
Access to unused drill site	270	1,350
	1,570 m	7,850 m^2

To aid in geological mapping, a number of trenches were dug using a small backhoe (trench width $\pm$1 m, slope 0 - 10^o). Most trenches are along new access roads with area disturbed included in road work above. A number of

pre-existing bulldozer trenches were cleaned out without increasing the original disturbed area. Details of new trenches are as follows:

New Trenches	Length	Area Disturbed
TR-CC - Trench along road through DDH T-77-9 (area disturbed included in roads above).	150 m	-
TR-DD - Trench along existing road north of Trench TR-CC (backfilled).	120	120 m^2
TR-GG - Trench along road to DDH T-77-7 (backfilled) (area disturbed included in road work).	100	-
TR-HH - Trench along road to DDH T-77-8 (backfilled) (area disturbed included in road work).	120	-
TR-II - Trench along pre-existing road north of DDH T-77-10.	333	332 m^2
	822 m	452 m^2

not in reclaimed area

Total area disturbed by all 1977 physical work is 1.76 hectares.

COAL ANALYSIS AND TESTING

Drill core analyses and washability testing were carried out by Cyclone Engineering Ltd. on Main Seam (unit 3b7) coal samples from drill holes T-77-1 through T-77-6 and on Lower Seam (unit 3b2) coal samples from drill holes T-77-3 through T-77-6. Because of the obvious very high raw ash content of Main Seam coal intersected in DDH T-77-7 to DDH T-77-10, no detailed analyses of these intersections were warranted.

For each core intersection (3b2, 3b7), analytical samples of all core recovered, in 2 - 4 m components, were collected through the entire coal interval.

Each seam component was air dried, weighed and subjected to a proximate and B.T.U. analysis. Each component was composited into a representative

seam sample. A proximate, Sulphur, B.T.U., H.G.I. and Equilibrium Moisture analysis was made on each seam composite head sample. Density determinations, on an air dried basis, were made on a number of head samples. Head samples were screened into 3/4" x 1/4", 1/4" x 28 mesh, 28 x 100 mesh and 100 x 0 mesh fractions. A float-sink analysis was made on 3/4" x 1/4", 1/4" x 28 mesh, and 28 x 100 mesh fractions. On some samples, froth flotation tests were run on 28 x 0 mesh and 100 x 0 mesh fractions. A representative core analysis flow chart and the results of all core analyses are included in Appendix 12.

The raw ash (a.d.b.) of the Main Coal Seam intersected in holes T-77-1 through T-77-5 ranges from 36.54% to 41.17% for an average of 38.8%. Raw coal B.T.U. (a.d.b.) from the Main Seam intersected in holes T-77-1 through T-77-5 ranges from 6,640 B.T.U./lb. to 7,540 B.T.U./lb. for an average of 7,149 B.T.U./lb. From the density determinations made on the seam head samples, coal density at this average ash content of 38.8% would be 1.64. This density figure was used in all coal reserve calculations.

The raw coal ash percentage (a.d.b.) for the Lower Seam (3b2) intersected in holes T-77-3 through T-77-6 ranges from 46.72% to 52.08% for an average of 50.2%.

Earlier work by other parties, based on trench samples analyses within the DDH T-77-1 through DDH T-77-5 Main Seam coal interval, suggested a very variable rank for this coal. Based on our current work, and determined, as is shown following, by A.S.T.M. designation D388-66, all coal intervals intersected are ranked as High Volatile C Bituminous.

Method

1. All a.d.b. analysis converted to an equilibrium moisture basis.

$$\text{i.e. ash, S, B.T.U.}_{\text{E.M.}} = \text{ash, S, B.T.U.}_{\text{a.d.b.}} \times \frac{100 - M_{\text{E.M.}}}{100 - M_{\text{a.d.b.}}}$$

2. Calculate Moist, Mineral Matter Free B.T.U.

$$\text{Moist Mineral Matter Free B.T.U.} = \frac{\text{B.T.U.}}{100-(1.1A+0.1S)} \times 100$$

Where E.M. = equilibrium moisture basis
a.d.b. = air dry basis
A = ash percentage
S = sulphur percentage

	Equilibrium Moisture Basis				Moist. MM Free B.T.U./lb.	Rank
	Ash	E.M.	S	B.T.U./lb.		
T-77-1 (M.S.)	37.31	7.3	.40	7,076	12,010	HvCb
T-77-2 (M.S.)	36.23	7.4	.43	7,311	12,163	HvCb
T-77-3 (M.S.)	35.81	8.0	.41	7,389	12,362	HvCb
T-77-4 (M.S.)	40.57	7.8	.40	6,742	12,185	HvCb
T-77-5 (M.S.)	40.35	8.3	.41	6,507	11,707	HvCb
T-77-3 (L.S.)	45.52	7.2	.64	6,201	12,435	HvCb
T-77-4 (L.S.)	49.40	7.9	.57	5,451	11,964	HvCb
T-77-5 (L.S.)	50.57	7.3	.61	5,538	12,498	HvCb
T-77-6 (L.S.)	51.03	6.1	.76	5,459	12,466	HvCb

By year end, bulk sample analysis and washability testing had been carried out on Bulk Sample No. 1 (Cyclone Engineering Sales Ltd.) and Bulk Sample No. 3B (Birtley Engineering Ltd.). A representative analytical flow chart for these samples, and all analytical data for both samples, is included in Appendix 13.

To be marketable as either a thermal power plant fuel or as a rotary kiln fuel, the clean coal product would have to have, as a minimum specification, a heating value of 10,000 B.T.U./lb. on an as-received basis. From an examination of the washability characteristics of the Tulameen coal, and of probable error curves of various types of coal cleaning equipment, it

is thought that a simple coal preparation plant, incorporating a BATAC Jig for the 4" x 28m fraction, compound water cyclones for the 28 x 100m fraction, and discarding the high ash 100 x 0 fraction, could produce a 10,000 B.T.U. product at 12% total moisture, at an overall recovery of 54%. The clean coal product would have the following specifications:

Proximate Analysis (As Received)

Total Moisture	12.0%
Ash	14.5%
Volatile Matter	30.2%
Fixed Carbon	43.3%
	100.0%

Sulphur	0.60%
Calorific Value	10,000 B.T.U./lb.

Ultimate Analysis (As Received)

Ash	13.80%
Carbon	62.73%
Hydrogen	4.90%
Nitrogen	1.36%
Sulphur	0.63%
Oxygen	16.57%

Ash Fusion Temperatures

	Oxidizing Atmosphere	Reducing Atmosphere
Initial Deformation	2400°F	2260°F
Softening (Spherical)	2580°F	2480°F
Fluid	2800°F	2760°F

Mineral Ash Analysis

SiO_2	69.51
Al_2O_3	13.54
Fe_2O_3	6.55
CaO	1.17
MgO	0.44
Na_2O	0.67
K_2O	0.64
TiO_2	0.04
P_2O_5	0.17
SO_3	0.51

Hardgrove Grindability Index - 55-60

Bulk Density - 50 lbs./cu.ft.

ASTM Classification by Rank

High Volatile Bituminous C

With the limited information available to date, it is felt that this coal will have excellent ignition characteristics and will present no slagging or fouling problems in a power plant. The alkalies in the ash are relatively low and the silica to iron ratio is high with few impurities such as titanium, phosphorous and sulphur, so the coal will also be very suitable as a rotary kiln fuel in cement plants.

GEOPHYSICAL SURVEYS (Survey Specifications outlined in Appendix 14). Between May 30th and June 1st, Peter E. Walcott & Associates Limited carried out test Resistivity and Induced Polarization Surveys over three trenches, in which the Main Coal Seam (unit 3b7) was exposed, in an effort to determine which method, if any, could be used to trace the seam beneath overburden cover.

The surveys were carried out using a portable 250 watt transmitter and Newmont type I.P. receiver with 15 metre collinear and parallel dipoles.

The results are shown on line profiles labelled Lines 1, 2 and 3, May Survey (Figures 26, 27, 28). Survey lines are shown on Figures 2, 4 and 5.

As can be seen from the profiles, no I.P. response was obtained over the coal seam. The small I.P. high observed to the east of the coal seam on Lines 1 and 2 was not seen on Line 3.

However, a definite resistivity high was observed on the collinear dipole-dipole (D.D.) survey on Line 1. This was repeated over the trench on

Line 2 (a = 15 m, n = 1) and further enhanced using the parallel dipole method (side looking dipole-dipole, S.L.D.D.). An even stronger response was obtained using the second separation S.L.D.D. on Line 3.

Accordingly, it was felt that the coal seam could possibly be traced using the S.L.D.D. method of surveying on lines 30 metres apart with dipole lengths of 15 metres.

Between July 11th and 16th, an attempt was made to put this into practice with eight further resistivity profiles being carried out (see profiles, Figures 29 through 35).

Profiles 1 to 4, widely-spaced, were done first, as suggested, and again the method appeared to work as can be seen from the profiles and the geological map (Figures 2 and 4) with the location of the main resistivity high corresponding to that of the coal seam.

Four further profiles, 5 to 8, were then undertaken. Although resistivity highs were still obtained over and around the location of the coal seam, other features, sometimes more dominant, were also observed. These appeared to be due to an increase in volcanics in the geological sequence.

It is therefore the writer's opinion that, for the method to be successfully employed, profiling would have to be carried out over a closely-spaced line grid, in order to trace the seam from one line to the next. The economics of the method versus those of trenching then become the governing factor.

COAL RESERVE CALCULATIONS AND PRELIMINARY PIT DESIGN

Theoretical raw coal tonnage reserves and strip ratios were calculated for main seam (3b7) surface minable coal with a limit to the south of a line

parallel to Section 1 and 70 m south of Section 1 and limited to the north by a line parallel to Section 5 and located midway between Section 5 and Section 6.

Reserve-strip ratio graphs were calculated for Section 1 through Section 5. For each section, in 20 m depth increments, a calculation was made of recoverable tonnes of coal, volume of waste, and stripping ratio (m^3 waste/ recoverable tonne coal) per metre of strike length. The following assumptions were made: raw coal density 1.64, pit footwall would be the floor of the main seam, pit hanging wall would be at 50^{o} (see Appendix 17). On Figures 20 to 24, for Sections 1 to 5, stripping ratio and recoverable tonnes/m of strike length were plotted against pit depth.

From the above graphs, for any given stripping ratio, total theoretical recoverable tonnes can be calculated. Reserves at 2.0:1, 2.5:1 and 3.0:1 are summarized in the table following.

RESERVE SUMMARY

RECOVERABLE RAW TONNES COAL

Section	Strike Length (m)	Strip Ratio (m^3 Waste/Recoverable Raw Tonne Coal)					
		2.0:1		2.5:1		3.0:1	
		Tonnes/m	Tonnes / m x strike	Tonnes/m	Tonnes / m x strike	Tonnes/m	Tonnes / m x strike
1	255	4,140	1,055,700	4,870	1,241,850	5,620	1,433,100
2	345	5,200	1,794,000	6,750	2,328,750	8,530	2,942,850
3	304	6,480	1,969,920	7,930	2,410,720	9,350	2,842,400
4	295	3,100	914,500	4,050	1,194,750	5,310	1,566,450
5	304	5,540	1,684,160	6,790	2,064,160	8,050	2,447,200
	1,503		7,418,280		9,240,230		11,232,000

A preliminary mining study, based on the use of conventional scrapers, with tractors for ripping and push loading, has been carried out. The preliminary proposed pit design is shown in Figure 36. This proposed pit would extract 10,000,000 tonnes of raw coal at an overall stripping ratio (m^3/raw tonnes) of 2.82:1. This mining operation is proposed at a production level of 800,000 tonnes of raw coal per year. Depending on final clean coal specifications and preparation plant design, this level of mine production would yield between 430,000 and 500,000 tonnes of product coal per year. The proposed pit at this production level would result in a mine life of 12.5 years.

CONCLUSION

Work to date has proven substantial reserves of good quality surface minable thermal coal. The proposed 1978 work program will develop operating cost, capital cost and additional coal quality data that will allow us to proceed to a definitive evaluation of the economic viability of the project.

Respectfully submitted

T. J. Adamson

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APPENDIX 1

Statement of Qualifications

(as required by Regulations under the Coal Act, 1974, Part II, Sec. 9 (2))

I, Thomas J. Adamson, geologist, with business address 330 - 355 Burrard Street, Vancouver, B.C. and residential address at 3842 - West 23rd Avenue, Vancouver, B.C., hereby state that:

(1) I graduated from the University of British Columbia in 1967 with a B.Sc., majoring in geology.

(2) From 1967 to the present, I have been actively engaged as a geologist on mineral and coal exploration programs in British Columbia and the Yukon Territory.

(3) From 1972 to the present, I have been employed by Cyprus Anvil Mining Corporation of Vancouver, B.C.

(4) I personally participated in and supervised all 1977 field work on the Tulameen Coal Project and have interpreted all data resulting from this work.

T. J. ADAMSON

COALFIELD	TYPE	MINING METHOD	RESERVES metric tonnes		RESOURCES metric tonnes	UPDATE & COMMENTS
Southeast -Elk Valley -Crowsnest -Flathead	Medium Volatile Bituminous	Open Pit & Underground	Metallurgical Thermal	1030×10^6 165×10^6	21500×10^6 3800×10^6	July, 1981
Peace River (Northeast)	Medium Volatile Bituminous to Low Volatile Bituminous	Open Pit & Underground	Metallurgical Thermal	470×10^6 105×10^6	6900×10^6 1200×10^6	December, 1981
Groundhog	Low Volatile Bituminous to Semi Anthracite	Open Pit & Underground	Thermal		3900×10^6	December, 1983
Telkwa	High Volatile B Bituminous	Open Pit & Underground	Thermal		88×10^6	June, 1983
Bowron River	High Volatile B Bituminous	Underground	Thermal		20×10^6	August, 1982
Merritt	High Volatile B Bituminous	Underground	Thermal		18×10^6	September, 1982
Hat Creek	Lignite to Sub Bituminous B	Open Pit	Thermal	925×10^6	1720×10^6	December, 1980 -reserves only in No.1 Deposit
Similkameen	Lignite to High Volatile C Bituminous	Open Pit & Underground	Thermal	15×10^6	21×10^6	August, 1981
Comox	High Volatile A Bituminous	Open Pit & Underground	Thermal	30×10^6	154×10^6	August, 1981
Nanaimo	High Volatile B Bituminous	Underground	?		7×10^6	September, 1983
			Total Metallurgical Total Thermal	1500×10^6 1240×10^6	28400×10^6 10900×10^6	

200

APPENDIX 4

Lithologic Logs

Diamond Drill Holes T-77-1 through T-77-12

DIAMOND DRILL LOG

TULAMEEN PROJECT

Hole No. T-77-1

Bearing: 235°
Dip: -60°
Commenced: July 19, 1977
Completed: July 21, 1977
Ultimate Depth: 271' (82.6m)
Electrologged: Yes

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
0 - 15	0.0 - 4.6	0		
15 - 24	4.6 - 7.3	90	$3c_2$	Conglomeratic s.s.; med. gr.; some limonitic; poor recovery; C.A. @ 16', 45°?
24 - 42	7.3 - 12.8	95%	$3c_1$	24-35 - dark grey massive mudstone; C.A. @ 35', 7°. 35-42 - very light grey, finely to coarsely laminated, gritty m.s. to med. gr. muddy s.s. at depth; white clay matrix; some sections abundant plant debris, abrupt contact with underlying mudstone and shales; C.A. @ 40', 10°. N.B. Correlation: hole 1, 42' = hole 2, 95'.
42 - 73	12.8 - 22.3	95+	$3b_{10}$	Blocky breaking mudstones; massive to med. laminated; minor thin sandy lenses; gradational contact with shales below; C.A. @ 47' - 2°. C.A. @ 66' - 5°. C.A. @ 74' - 8°.
73 - 174	22.3 - 53.0	98+	$3b_9$	Finely laminated fissile shales; at 168', 2" light grey m.s. bed. C.A. @ 81', 6°. C.A. @ 95', 5°. C.A. @ 104', 5°. C.A. @ 116', 5°. C.A. @ 123', 3°. C.A. @ 130', 2°. C.A. @ 141', 0°. C.A. @ 151', 5°. C.A. @ 162', 5°. C.A. @ 164', 5°. C.A. @ 165', 18°.

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
				C.A. @ 168', 5^{0}. C.A. @ 171', 3^{0}. C.A. @ 173', 0^{0}.
174 - 181	53.0 - 55.2	98	$3b_8$	174-176 - thin dirty coal and poorly consolidated brown coaly m.s. 176-181 - interbedded thin dirty coal, light grey bentonite, bentonitic (ashy) coaly m.s. (bentonite about 75% of interval).
181 - 232	55.2 - 70.7	Overall recovery in coal seam: 96	$3b_7$	Main coal seam. 181.0-182.0 - dirty coal. 182.0-183.0 - med. clean coal. 183.0-184.0 - hard bentonitic bed. 184.0-189.5 - clean coal. 189.5-190.5 - soft, light grey bentonite; "main" bentonite seam. 190.5-191.5 - dirty coal. 191.5-193.5 - clean coal. 193.5-194.5 - light brown coaly m.s. 194.5-203.5 - mostly clean coal. - at 197.5 - 6" white speckled ashy coal. - at 199.5 - 1" soft light brown bentonite. 203.5-207.5 - ashy coal; distinct white speckled (bentonitic?) horizons. - at 206.0 - 3" soft light brown bentonite. 207.5-217.0 - mostly clean coal, some sections white speckled; discrete dirt partings. - at 210.0 - 3" light brown coaly bentonitic m.s. - at 213.0 - 4" light brown coaly bentonitic m.s. - at 215.0 - 5" light brown coaly bentonitic m.s.
		226.5-227.5 - 0 (coaly m.s.) 231.5-232.0 - 0 (coal)		217.0-232.0 - clean coal. - 225.0-226.0 - dark brown coaly mudstone. C.A. 181-232; variable 0-4^{0}; average 2^{0}.
232 - 234	70.7 - 71.3	100	$3b_6$	Very light grey, med. laminated, fine to med. grained s.s. or sandy m.s., whitish muddy matrix; C.A. - 0^{0}.
234 - 271	71.3 - 82.6	98	$3b_5$	Medium to dark grey m.s.; numerous leaf fossils near top; med. laminated to massive. C.A. @ 256', 4^{0}. C.A. @ 268', 2^{0}.

DIAMOND DRILL LOG

TULAMEEN PROJECT

Hole No. T-77-2

Bearing: 235°
Dip: -47°
Commenced: July 13, 1977
Completed: July 18, 1977
Ultimate Depth: 303' (92.5m)
Electrologged: Yes

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
0.0 - 10.0	0.0 - 3.0	0		Overburden.
10.0 - 76.0	3.0 - 23.2	10-43 - 0% 43-76 - 98%	$3c_2$	Conglomeratic s.s.; soft, weathered, uncoreable to 43'; f.g. to m.g. sand, pebbles to ¼"; white clayey matrix; some sections have minor carbonaceous material in thin irregular lenses along bedding; bedding generally indistinct. 61-63 - interbedded thin dirty coal and coaly m.s. 63-65 - dark grey carbonaceous m.s. 65-69 - light brownish grey massive m.s.; random plant fragments; 2" coal at 67'.
76.0 - 95.0	23.2 - 29.0	98%	$3c_1$	76-82 - f.g. to slightly gritty, finely to med. laminated m.s., very light grey; bentonitic (swells when wet). 82-88 - massive blocky med. to dark grey m.s. 88-95 - light grey gritty m.s., coarsely laminated, grading to a med. grained muddy s.s. at 95'; scattered small plant fragments along bedding planes; sharp contact with underlying mudstones.
95.0 - 116.0	29.0 - 35.4	98%+	$3b_{10}$	Blocky breaking mudstone, medium grey, massive to coarsely laminated. 114-116 - gritty m.s. C.A. @ 100' - 5°.
116.0 - 217.5	35.4 - 66.3	100%	3_9	Shales; very thinly bedded and fissile, very homogeneous, overall colour medium to dark greyish brown, but individual thin beds black to white. 170-171 - light grey gritty m.s. at 217.5- 3" clean coal. C.A. @ 148' - 8°. C.A. @ 194' - 7°. C.A. @ 211' - 5°.

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
217.5 - 226.0	66.3 - 68.9	98%+	$3b_8$	217.5-220.5 - thin coal and poorly consolidated coaly m.s.; m.s. light to dark brown, speckled (white bentonitic ash) with coaly streaks throughout. (Coal approx. 20% of interval). 220.5-226.0 - interbedded light grey, white weathering bentonite beds (containing randomly oriented organic debris), dark grey coaly ashy m.s., and thin dirty coal (bentonite approx. 70% of interval). 220.5-221.0 - bentonite. 221.5-222.5 - bentonite. 223.0-224.0 - bentonite. 224.5-226.0 - bentonite and thin white speckled m.s.
226.0 - 292.0	68.9 - 89.0	Overall rec. in main coal seam: 94%	$3b_7$	226.0-227.0 - clean coal. 227.0-229.0 - interbedded clean coal and thin, hard, light brown bentonite? beds. 229.0-246.0 - mostly clean massive blocky coal. at 229.8 - 1" bentonite. 232.5-234.5 - soft light brown bentonite. "Main" bentonite seam. at 241.8 - ½" bentonite. at 244.5 - 5" light brown bentonitic m.s. 246.0-249.0 - medium clean coal, thin white speckled ashy layers. 249.0-250.5 - clean coal. 250.5-251.0 - dirty coal. 251.0-257.0 - clean coal. 257.0-258.0 - white speckled m.s. 258.0-258.5 - clean coal. 258.5-261.0 - interbedded clean coal and medium brown m.s. 261.0-263.0 - dirty coal with white ash and brown m.s. interbeds. 263.0-265.5 - clean coal. 265.5-267.0 - dirty coal. 267.0-272.0 - clean coal with minor discrete bentonite beds, each approx. 1" thick, at 268', 270.5', 270.7', 271.5'. 272.0-279.5 - clean coal with thin m.s. and bentonite interbeds. at 274 - 6" light grey, white speckled bentonitic m.s. at 275.5 - 6" light grey, white speckled bentonitic m.s. at 276.5 - 5" light grey, white speckled bentonitic m.s. at 279.5 - interbedded m.s. and coal. 279.5-286.5 - clean coal. 286.5-287.5 - dark brown coaly m.s. 287.5-289.0 - medium clean coal; scattered white speckled horizons. 289.0-292.0 - clean coal.
		251-257 - 66% (2' coal lost)		
		261-265 - 80%		

TULAMEEN PROJECT - Hole No. T-77-2

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
292.0 - 294.0	89.0 - 89.6	98%+	$3b_6$	Very light grey, f.g. s.s., muddy matrix. C.A. - 5^0.
294.0 - 303.5	89.6 - 92.5	98%+	$3b_5$	Blocky breaking m.s., med. grey-brown; coarsely laminated to massive; abundant leaf fossils, C.A. approx. 50.

DIAMOND DRILL LOG

TULAMEEN PROJECT

Hole No. T-77-3

Bearing: 250°
Dip: -45°
Commenced: July 22, 1977
Completed: July 28, 1977
Ultimate depth: 525' (160m)
Electrologged: Yes

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
0.0 - 15.0	0.0- 4.6	0		Overburden.
15.0 - 46.0	4.6- 14.5	98%	$3c_2$	Conglomerate, conglomeratic s.s., (white muddy cement), minor m.s., coal. 15-18.0 - gritty m.s. at 18' - 2" coaly m.s. 38-39.5 - coal and coaly m.s. C.A. @ 21' - 20°? C.A. @ 34' - 22°? C.A. @ 45' - 10°?
46.0 - 62.0	14.5- 18.9	98%	$3c_1$	Transitional unit. 46-52 - massive medium-dark grey m.s. 52-62 - light grey, fine to coarsely laminated gritty m.s. grading to medium grained s.s. with muddy matrix at 62'; sharp contact with m.s. below; C.A. @ 55' - 6°. NOTE: Correlation Hole 1 - 42' Hole 2 - 95' Hole 3 - 62'
62.0 - 94.0	18.9- 28.7	98%	$3b_{10}$	Medium to dark grey massive blocky m.s., some thin gritty sections; gradational into shales below. C.A. @ 85' - 8°. C.A. @ 93' - 5°.
94.0 - 176.5	28.7- 53.8	98%	$3b_9$	Light to dark grey fissile shales. - at 155.5 - 1" sandy bentonitic bed. - at 158.0 - 1" sandy bentonitic bed. - at 158.5 - 2" sandy bentonitic bed. - at 164.0 - 4" light brown soft bentonite. - at 171.0 - ½" sandy bentonitic bed.

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
				C.A. @ 109' - 6° C.A. @ 114' - 6°. C.A. @ 135' - 5°. C.A. @ 145' - 5°. C.A. @ 155' - 4°. C.A. @ 165' - 6°. C.A. @ 175' - 6°.
176.5 - 185.5	53.8- 56.5	98%	$3b_8$	176.5-180 - interbedded thin dirty coal, coaly m.s., bentonite. 176.5-177.5 - coal and coaly m.s. 177.5-178.5 - bentonite bed. 178.5-180.0 - white speckled dirty coal. C.A. - 3°. 180.0-185.5 - bentonite beds, thin interbeds coaly m.s.
185.5 - 254.0	56.5- 77.4	Overall rec. in main seam: 98%	$3b_7$	Main coal seam. 185.5-186.5 - clean coal. 186.5-187.5 - hard gritty bentonite, thin coal lenses. 187.5-192.0 - hard clean coal. 192.0-193.5 - dirty coal, white speckled. 193.5-195.0 - soft light grey, yellowish weathering bentonite. C.A. - 6°. 195.0-205.5 - medium clean coal. 205.5-207.0 - interbedded m.s. and dirty coal. 207.0-211.0 - medium clean coal. 211.0-218.0 - hard clean coal. 218.0-218.5 - coaly m.s. 218.5-219.0 - clean coal. 219.0-220.5 - brown m.s. C.A. - 5°. 220.5-222.5 - clean coal. 222.5-230.0 - medium clean to dirty coal. 224.0-224.5 - white speckled ashy coal. 225.5-226.5 - coaly m.s. 230.0-232.0 - dirty coal, white speckled. at 230.5 - 3" hard white gritty m.s. bed. 232.0-237.0 - medium to clean coal. at 235.0 - 3" soft white bentonite.

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
				237.0-240.0 - dirty speckled ashy coal with thin hard interbeds of light brown to white bentonitic m.s. at 237.0 - 2" m.s. at 238.0-238.5 - 6" m.s. at 240.0 - 2" m.s. 240.0-254.0 - mostly clean hard coal; a few minor thin speckled ashy horizons.
254.0 - 257.0	77.4- 78.3		$3b_6$	Light grey muddy s.s.
257.0 - 280.0	78.3- 85.3	85%	$3b_5$	Blocky, massive, dark grey m.s.; core very broken; leaf fossils. 263.0-264.5 - scattered thin bentonitic s.s. seams (swell when wet). C.A. @ 267.5, 7^0. C.A. @ 275.0, 4^0.
280.0 - 306.5	85.3- 93.4	98%+	$3b_4$	Medium to coarsely laminated, color banded, light to dark grey to brown; shales, m.s., gritty m.s., fine-grained muddy s.s. 300.0-300.5 - slump breccia. at 297.5 - 2" bentonitic (swelling) m.s. bed. at 302.0 - 3" bentonitic (swelling) m.s. bed. at 303.0 - 2" bentonitic (swelling) m.s. bed. at 306.5 - 3" bentonitic (swelling) m.s. bed. C.A. @ 299 - 5^0. C.A. @ 306 - 4^0.
306.5 - 335.5	93.4-102.3	85%+	$3b_3$	Gradational with above; dark grey shales and m.s., mostly blocky breaking; core very broken, some sections very poor recovery; scattered thin grey to brown soft mud seams. 317-318 - medium grey soft clay. C.A. @ 318' - 3^0. C.A. @ 335' - 4^0.
335.5 - 359.5	102.3-109.6	Overall rec. in coal seam: 98%	$3b_2$	Lower coal seam. 335.5-343.5 - medium clean coal. at 337.5 - 2" gritty swelling m.s. bed. at 341.5 - 3" coaly brown m.s. at 343.0 - 3" light brown coaly m.s. C.A. @ 340 - 1^0. C.A. @ 345 - 1^0. C.A. @ 352 - 4^0.

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
				343.5-359.5 - medium to clean coal with discrete thin dirt interbeds. at 344 - 1" white bentonite with carb. fragments. 344.8-346.0 - light brown hard coaly m.s. at 348 - 4" light grey gritty m.s. at 352 - 1" white soft bentonite. at 354 - 2" light brown coaly m.s. at 358 - 4" medium brown, white speckled m.s.
359.5 - 490.0	109.6-149.4	98%+	$3b_1$	Tuffs, tuffaceous m.s., thin coal seams. 359.5-371.0 - medium grey, soft, bentonitic m.s. (swells when wet); thin dirty coal interbeds. 361.0-362.5 - coal and coaly m.s. 369.0-370.0 - coaly m.s. and coal. 371.0-379.5 - fragmental bentonitic tuff; gritty; swelling; angular felsitic fragments to ¼" make up 5% of some sections. 379.5-380.0 - coaly m.s. 380.0-382.0 - light grey soft, f.g. bentonitic m.s. 382.0-385.0 - soft, poorly consolidated, bentonitic tuff, slightly fragmented, C.A. - 0^{o}. 385.0-389.5 - coal; clean to dirty (white speckled), C.A. approx. 3^{o}. 389.5-393.5 - clean light grey clay. 393.5-394.5 - clean coal, C.A. approx. 5^{o}. 394.5-398.5 - soft, clean, med. grey, slightly gritty bentonitic m.s. 398.5-401.0 - interbedded thin dirty coal, clay, brecciated m.s. 401.0-419.0 - fragmental bentonitic tuff; poorly consolidated, medium grey; gritty, swells when wet; contains angular, soft, grey to black sed. rock fragments (1/16" - 1/4") to 10% of total. 413.0-419.0 - as above, but more consolidated - large (3") irregular felsitic fragments make up 25%. 419.0-420.0 - coaly m.s. 420.0-422.5 - light brown, soft, gritty micaceous tuff. 422.5-426.5 - interbedded dirty coal and thin bentonite beds. 426.5-431.0 - light grey, very-fine-grained, hard siliceous felsite (may be very-fine-grained s.s.). 431.0-440.0 - coal; coal itself appears quite clean but with abundant discrete m.s. and bentonite interbeds; C.A. approx. 5^{o}. at 432.5 - 2" medium brown gritty bentonite at 434.0 - 2" light grey clay (bentonite?). at 436.0 - 2" hard white ashy bed. at 439.0 - 2" hard light brown gritty m.s.

TULAMEEN PROJECT - Hole No. T-77-3

INTERVAL Feet	INTERVAL Metres	CORE REC.: %	UNIT	DESCRIPTION
				440.0-442.5 - light brown bentonitic m.s.; organic debris along bedding. 442.5-450.0 - thin dirty coal and coaly bentonitic m.s. 448.5-449.0 - white coarse-grained s.s.; white muddy matrix. 450.0-470.0 - fragmental bentonitic tuff; similar to 401-419'; most fragments white to grey felsite, to 2" diameter, up to 15% of volume; small coaly fragments throughout. 470.0-476.0 - interbedded thin dirty coal, coaly m.s., fragmental tuff; coal about 20% of interval; C.A. approx. 2°. 476.0-479.0 - very-fine-grained light grey s.s., white muddy matrix; small coaly fragments throughout. 479.0-490.0 - Coal Horizon, interbedded thin clean coal (to 3" thick), dirty coal (predominant) and coaly m.s., and thin white bentonite.
490.0 - 525.0	149.4-160.0	98%+	3a	Lower Sandstone Unit. Light grey, medium-fine grained arkosic s.s., white muddy matrix; abundant thin organic material along bedding planes. C.A. approx. 0 - 3°. 497.0-498.0 - gritty coaly m.s.

DIAMOND DRILL LOG

TULAMEEN PROJECT

Hole No. T-77-4

Bearing: 255°
Dip: -48°
Commenced: July 29, 1977
Completed: August 3, 1977
Ultimate Depth: 404' (123.1m)
Electrologged: Yes

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
0.0 - 10.0	0.0- 3.04	0		Overburden.
10.0 - 112.0	3.04- 34.1	90%	$3c_2$	Upper sandstone unit. 10- 44 - interbedded medium-fine grained slightly conglomeratic s.s., muddy matrix, and med.-grey gritty m.s.; C.A. @ 26' - 0°. 26-27 - coaly m.s. 43-44 - coaly m.s. 44- 59 - coarse-grained conglomeratic s.s., white muddy matrix. 59- 78 - muddy, fine-grained s.s. to med. grey gritty bentonitic m.s.; massive to med. laminated, C.A. variable 0 - 5°. 78-112 - coarse-grained to fine-grained white s.s.; white muddy matrix; C.A. @ 92' - 5°. 95.5- 96.5 - coaly m.s. 102.0-103.0 - coaly m.s. 105.0-107.0 - coal and coaly m.s.; C.A. 3°.
112.0 - 124.0	34.1- 37.8		$3c_1$	112-116 - massive medium-grey m.s. 116-124 - very light grey, mostly fine-grained, finely laminated muddy s.s.; lower 2' progressively cleaner and coarser grained; sharp contact with underlying m.s. N.B. Correlation Hole 1: 42' Hole 2: 95' Hole 3: 62' Hole 4: 124'
124.0 - 145.0	37.8- 44.2		$3b_{10}$	Medium to dark grey, mostly massive, blocky breaking m.s.; C.A. @ 135' - 5°.
145.0 - 225.0	44.2- 68.6		$3b_9$	Fissile thinly bedded shales, brownish grey to dark grey; gradational with overlying mudstones.

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
				C.A. @ 145' - 5°. C.A. @ 178' - 4°. C.A. @ 191' - 4°. C.A. @ 207' - 2°. C.A. @ 220' - 3°. C.A. @ 225' - 3°.
225.0 - 232.5	68.6- 70.9		$3b_8$	Interbedded thin dirty coal, coaly m.s., and white to yellowish bentonite beds; coal about 35% of interval.
232.5 - 280.5	70.9- 85.5	Overall rec. in main seam: 96% 273-280.5 - 85%	$3b_7$	Main coal seam. 232.5-234.0 - clean coal. 234.0-235.0 - dirty white speckled coal with thin hard white ash beds. 235.0-236.0 - clean coal. 236.0-237.0 - dirty coal. 237.0-240.0 - clean coal; 2" m.s. at 239'. C.A. @ 232-240 - 0-2°. 240.0-241.0 - main bentonite seam. 241.0-252.5 - clean coal; C.A. @ 250' - 5°. 252.5-254.5 - interbedded coal, m.s., bentonite. C.A. variable 0 - 15°. 254.5-262.0 - medium to clean coal; thin dirty sections are brownish and white speckled, C.A.0-2°. 262.0-263.0 - medium brown, gritty, white speckled m.s. 263.0-267.0 - medium to clean coal. 267.0-268.0 - same as 262-263, C.A. - 3°. 268.0-271.0 - clean coal. 271.0-273.0 - thin interbeds of dirty white speckled coal and hard white siliceous tuff. 273.0-280.5 - clean coal, core very broken.
280.5 - 283.0	85.5 - 86.3	98%+	$3b_6$	Light grey, muddy matrix, medium grained s.s., minor thin organic material along bedding planes.
283.0 - 298.0	86.3- 90.8	98%+	$3b_5$	Dark grey, coarsely laminated, blocky breaking m.s.; C.A. 2°.
298.0 - 333.0	90.8-101.5	98%+	$3b_4$	Light grey to brownish to black, distinctly color banded, interbedded m.s., gritty mudstones mudstones; and muddy s.s.; C.A. 2 - 3°.
333.0 - 355.0	101.5-108.2	98%+	$3b_3$	Massive to coarsely laminated, med. grey mudstones; gradational with above.

TULAMEEN PROJECT - Hole No. T-77-4

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
355.0 - 380.0	108.2-115.8	Overall rec. in lower seam: 98%	$3b_2$	Lower Coal Seam. C.A. 0 - 2°. 355.0-356.0 - clean coal. 356.0-357.0 - white speckled ashy dirty coal. 357.0-357.5 - clean coal. 357.5-358.0 - coaly bentonitic m.s. 358.0-359.5 - clean coal. 359.5-360.0 - light brown, white speckled m.s. 360.0-361.5 - clean coal. 361.5-364.0 - interbedded clean coal (approx. 20%), light brown coaly m.s., light grey, white speckled coaly m.s. 364.0-365.5 - clean coal. 365.5-366.5 - light brown coaly m.s. 366.5-371.0 - medium to clean coal. at 370.5 - 2" soft light yellowish grey bentonite. 371.0-372.0 - soft, white, yellowish weathering bentonite. 372.0-373.0 - clean coal. 373.0-373.5 - light brown coaly m.s. 373.5-380.0 - mostly medium clean coal, a few thin clean sections. at 378.5 - 4" light brown coaly m.s.
380.0 - 404.0	115.8-123.1	98%+	$3b_1$	Tuffs; minor m.s. and coal. 380-390 - interbedded coal (10%), coaly m.s., and bentonitic s.s. 394-404 - fragmental bentonitic tuff; felsite fragments to 1" diameter make up about 15%.

DIAMOND DRILL LOG

TULAMEEN PROJECT

Hole No. T-77-5

Bearing: 255°
Dip: -45°
Commenced: August 4, 1977
Completed: August 8, 1977
Ultimate Depth: 393' (119.8m)
Electrologged: Yes

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
0.0 - 23.0	0.0- 7.0	0		Overburden.
23.0 - 116.0	7.0- 35.4	80%	$3c_2$	Upper s.s. unit.
116.0 - 136.5	35.4- 41.6	95%	$3c_1$	116.0-126.0 - interbedded medium brown coaly m.s. (thin coal streaks and lenses parallel to bedding), thin dirty coal, and light grey, coarse-grained muddy s.s., C.A. 0°. 126.0-127.0 - coal. 127.0-136.5 - light grey, medium to finely laminated, fine-grained, cross-bedded s.s. with white muddy matrix; increasing grain size with depth. NOTE: Correlation Hole 1: 42.0' Hole 2: 95.0' Hole 3: 62.0' Hole 4: 124.0' Hole 5: 136.5'
136.5 - 154.0	41.6- 46.9	98%+	$3b_{10}$	Dark grey, massive to coarsely laminated, blocky breaking m.s. C.A. 0 - 2°.
154.0 - 216.0	46.9- 65.8	98%	$3b_9$	Finely laminated fissile shales. C.A. @ 156' - 3°. C.A. @ 166' - 5°. C.A. @ 169' - 7°. C.A. @ 191' - 4°. C.A. @ 198' - 5°. C.A. @ 212' - 3°.
216.0 - 226.5	65.8- 69.0		$3b_8$	Interbedded coal, coaly m.s. and bentonite. 217.0-218.0 - light grey, brownish weathering, soft, clean bentonite. 218.0-220.0 - clean to dirty (white speckled) coal.

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
				220.0-221.0 - light grey, yellowish weathering, gritty bentonite. 221.0-222.0 - thin dirty coal and bentonitic beds. 222.0-226.5 - mostly bentonite beds, minor m.s. C.A. 0 - 2°.
226.5 - 293.5	69.0- 89.5	Overall rec. in main seam: 97%	3b7	Main Coal Seam. 226.5-241.0 - clean coal; C.A. 0 - 2°. at 230-231 - interbedded coal and coaly m.s. at 232 - 1" hard, light grey ash. at 235-242 - bedding very contorted, C.A. variable to 25°.
		33%		241.0-242.0 - main bentonite seam. Only 4" soft grey bentonite recovered. HRD log suggests bentonite approx. 1' thick.
				242.0-251.0 - Clean coal; minor resin nodules to ½", C.A. 2 - 4°. at 243 - 6" coaly m.s.
				251.0-251.5 - sandy, coaly m.s.
				251.5-261.0 - medium clean coal; slightly white speckled throughout; C.A. 0°. at 252.5 - 2" light brown coaly m.s. at 254.0 - 1" hard white ash. at 260.0 - 2" brown coaly m.s.
				261.0-262.5 - light grey, brown weathering, fine-grained, soft, bentonitic m.s.
				262.5-265.5 - Clean coal; C.A. 3°.
				265.5-272.0 - interbedded clean coal and distinct dirt band. 265.5-266.0 - coal and soft bentonitic s.s. 266.5-267.5 - medium brown coaly m.s. at 269.0 - 3" hard, medium brown siliceous volcanic. at 270.0 - 4" hard, medium brown, very fine-grained, siliceous volcanic. at 271.5 - 6" soft light brown bentonitic m.s.
				272.0-293.5 - clean coal to white speckled ashy coal with scattered distinct dirt bands. at 275.0 - 1" medium brown m.s. at 275.5 - 2" light grey gritty bentonite. at 277.0 - 4" brown coaly m.s. at 278.5 - 4" hard light brown, massive, siliceous volcanic? at 279.0 - 1" hard white volcanic? at 282.0 - 4" hard light brown massive volcanic? at 284.0 - 4" very dirty coal. at 288.5 - 1" brown m.s.

TULAMEEN PROJECT - Hole No. T-77-5

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
293.5 - 296.0	89.5- 90.2	98%+	$3b_6$	Light grey, distinctly bedded muddy s.s.
296.0 - 309.0	90.2- 94.2	98%+	$3b_5$	Dark brownish grey, mostly massive blocky breaking m.s.; C.A. 0 - 3^{o}!
309.0 - 343.0	94.2-104.5	98%+	$3b_4$	Very light grey to dark grey, distinctly color banded, interbedded m.s., gritty m.s. fine-grained s.s.; C.A. approx. 4^{o}.
343.0 - 362.0	104.5-110.3	98%	$3b_3$	Blocky breaking, coarsely laminated m.s.; gradational with above, more uniformly medium-grey coloured.
362.0 - 385.0	110.3-117.3	Overall rec. in lower seam: 95%	$3b_2$	Lower Coal Seam. C.A. approx. 3^{o}. 362.0-363.0 - clean coal. 363.0-369.0 - medium clean coal. 367.5-368.0 - yellowish bentonitic m.s. 369.0-370.0 - light grey, yellowish weathering coaly, bentonitic m.s. 370.0-376.0 - thinly interbedded clean to dirty coal. 376.0-378.0 - soft light grey yellowish weathering bentonite (80%), dirty coal (20%). 378.0-379.0 - clean coal. 379.0-379.5 - coaly m.s. 379.5-380.5 - medium clean coal. 380.5-381.0 - coaly m.s. 381.0-385.0 - medium clean coal.
385.0 - 393.0	117.3-119.8	98%	$3b_1$	Light brownish grey, soft, gritty bentonitic m.s. or tuff; scattered coaly fragments. 386.5-387.0 - dirty coal.

DIAMOND DRILL LOG

TULAMEEN PROJECT

Hole No. T-77-6

Bearing:
Dip: -90°
Commenced: August 9, 1977
Completed: August 14, 1977
Ultimate depth: 352' (107.3m)
Electrologged: Yes

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
0.0 - 18.0	0.0- 5.5	0		Overburden.
18.0 - 26.0	5.5- 7.9	40%	$3c_2$?	Very poor recovery, muddy s.s. and clay seams?; electrolog suggests mostly s.s. or cong. 0 - 26'.
26.0 - 51.0	7.9- 15.5	60%	$3c_1$	Very poor recovery; m.s., clay seams, minor s.s.; C.A. @ 50' - 37°.
51.0 - 85.0	15.5- 25.9	70%	$3b_{10}$	Blocky breaking dark grey m.s.; poor recovery, core very broken; very gradational contact with underlying shales. C.A. @ 72' - 32°. C.A. @ 81' - 30°.
85.0 - 159.0	25.9- 48.5	95%+	$3b_9$	Finely laminated light to dark grey fissile shales. C.A. @ 96' - 36°. C.A. @ 103' - 44°. C.A. @ 100' - 40°. C.A. @ 110' - 44°. C.A. @ 120' - 60°. C.A. @ 128' - 50°. C.A. @ 140' - 60°. C.A. @ 145' - 45°. C.A. @ 149' - 40°. C.A. @ 153' - 43°.
159.0 - 164.0	48.5- 50.0	90%	$3b_8$	Interbedded coal, m.s. and bentonite. 159.0-160.0 - very broken dirty coal. 160.0-161.5 - dirty coal and coaly m.s. 161.5-162.5 - light grey soft bentonite; light yellowish brown weathering. 162.5-164.0 - grey to black coaly m.s.

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
164.0 - 223.0	50.0- 68.0	Overall rec. in coal seam: 96% 165-170: 70%	$3b_7$	Main Coal Seam. 164.0-170.0 - medium clean to dirty coal; C.A. 43°. 170.0-172.0 - bentonitic m.s., small coaly fragments. 172.0-174.5 - medium clean coal; C.A. 45°. 174.5-175.5 - medium brown coaly m.s. 175.5-182.0 - medium clean coal; C.A. 45°. 182.0-187.0 - interbedded hard siliceous, medium brown fragmental volcanic, soft light brown tuffaceous rock with coaly fragments, and thin dirty coal. 187.0-190.0 - medium clean coal; C.A. 45°. 190.0-192.0 - light to medium brown, fine-grained hard siliceous, slightly fragmental volcanic (welded tuff??). 192.0-192.5 - clean coal; C.A. 30°. 192.5-194.5 - light brown coaly m.s. and dirty coal; C.A. @ 193' - 38°. 194.5-205.0 - medium clean coal with thin interbeds of light brown m.s. and tuffaceous m.s. at 195' - 2" m.s. at 199' - 3" m.s. at 201' - 6" m.s. at 203' - 4" m.s. at 205' - 4" light brown bentonitic m.s. C.A. @ 197' - 38°. C.A. @ 205' - 35°. 205.0-223.0 - medium to clean coal with scattered interbeds of siliceous white "ash" (to ½"); thin white speckled dirty coal layers; and brownish fine-grained siliceous to granular fragmented volcanic horizons and irregular fragments (flows and/or tuffs). at 208.0' - 1" medium brown, very fine-grained siliceous volcanic. at 209.5' - 1½" medium brown, very fine-grained siliceous volcanic. 211.0-215.0 - thinly interbedded coal and fine-grained to medium-grained granular volcanic beds, flows, and fragments; coal approx. 50%. 215.0-217.5 - as above, but volcanic material 75%, coal 25%. 217.5-223.0 - mostly clean coal.
223.0 - 226.0	68.0- 68.9	98%+	$3b_6$	Light grey medium-grained to fine-grained muddy matrix s.s. Same as below main coal seam in other holes.
226.0 - 242.0	68.9- 73.7	98%+	$3b_5$	Dark grey to brownish grey, blocky breaking, massive to coarsely laminated m.s. C.A. @ 237' - 35°. at 231' - two 2" beds light grey, muddy, medium-grained s.s.

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
242.0 - 300.0	73.7- 91.4	98%+	$3b_4$	Interbedded fine-grained to medium-grained s.s., light tan to dark grey m.s., and gritty m.s.; medium to coarsely laminated, minor tuff. 242-247 - medium to finely laminated bentonitic s.s. 247-256 - medium grey, fine-grained gritty m.s. 256-260 - bentonitic s.s.; same as 242-247. 263-265 - dark brown fragmented tuff; felsitic fragments to ½" diameter make up 25% of total. 267-290 - distinctive color-banded section of mudstone, gritty m.s. and s.s. C.A. @ 247 - 30°. C.A. @ 254 - 28°. C.A. @ 264 - 28°. C.A. @ 273 - 32°. C.A. @ 280 - 31°. C.A. @ 292 - 30°. C.A. @ 300 - 30°.
300.0 - 320.0	91.4- 97.5	98%+	$3b_3$	Blocky breaking m.s., medium brownish-grey to dark grey, scattered light grey gritty m.s. beds to ½" thick, numerous leaf fossils in lower section.
320.0 - 342.0	97.5-104.2	Overall rec. in lower coal seam: 95%	$3b_2$	Lower Coal Seam. 320.0-320.5 - medium clean coal. 320.5-321.0 - dirty coal and medium brown coaly m.s. 321.0-324.0 - medium clean coal, C.A. 18°. 324.0-325.0 - dirty coal and white speckled coaly m.s. 325.0-326.0 - clean coal; C.A. approx. 18°. 326.0-327.0 - medium brown gritty m.s. *327.0-328.0 - clean coal. 328.5-329.5 - medium clean coal. 329.5-330.0 - dark brown m.s. 330.0-332.0 - medium clean, white speckled coal; C.A. approx. 18°. 332.0-332.5 - light brown, white speckled coaly m.s., irregular coal streaks and fragments. 332.5-335.0 - clean coal, C.A. 18°. 335.0-336.0 - soft light grey, yellowish weathering bentonite. 336.0-342.0 - medium clean coal; C.A. @ 340' - 18°. at 339' - 3" hard brown fine-grained siliceous volcanic. at 341' - 4" white speckled medium-brown coaly m.s. *328.0-328.5 - light brown white speckled coaly m.s.

TULAMEEN PROJECT - Hole No. T-77-6

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
342.0 - 352.0	104.2-107.3	98%	$3b_1$	342-344 - soft, swelling, brownish-grey bentonitic m.s. 344-345 - black coaly m.s. 345-352 - light brownish grey, very swelling when wet, slightly fragmental bentonitic tuff.

DIAMOND DRILL LOG

TULAMEEN PROJECT

Hole No. T-77-7

Bearing:
Dip: -90°
Commenced: August 15, 1977
Completed: August 20, 1977
Ultimate depth: 416' (126.8m)
Electrologged: Yes

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
0.0 - 20.0	0.0- 6.1	0		Overburden.
20.0 - 58.0	6.1- 17.7	96%	$3c_2$	Coarse s.s., conglomeratic s.s., minor m.s.
58.0 - 93.0	17.7- 28.3	58-62: 90% 62-74: 25% 74-82: 90% 82-92: 50% 92-93:100%	$3c_1$	Transitional Unit. 58-70 - light grey gritty, bentonitic m.s. 70-92 - medium to dark brownish grey, crumbly, finely blocky breaking m.s.; more gritty with depth. 92-93 - coarse-grained, muddy matrix s.s. C.A. @ 86' - 25°.
93.0 - 106.0	28.3- 32.3	95%	$3b_{10}$	Blocky breaking, dark brownish grey m.s. C.A. @ 104' - 28°.
106.0 - 150.0	32.3- 45.7	98%	$3b_9$	Fissile, finely laminated medium-grey to dark brownish-grey shales. C.A. @ 114' - 30°. C.A. @ 130' - 25°. C.A. @ 140' - 28°.
150.0 - 164.0	45.7- 50.0	90%	$3b_8$	Interbedded coal, bentonite, m.s., minor fine-grained dark, siliceous volcanic. 150.0-151.0 - thinly interbedded dark grey m.s. (50%) and coal. 151.0-152.0 - soft, light grey, tan weathering bentonite. 152.0-155.0 - thinly interbedded, dirty coal, dark grey m.s. and bentonite. 155.0-157.0 - bentonite - same as 151-152. 157.0-159.5 - light grey to yellowish, tan to yellowish weathering bentonitic m.s., minor black m.s. 159.5-160.0 - black, massive fine-grained volcanic; pyrite in fractures. 160.0-162.0 - same as 157-159.5. 162.0-162.5 - dirty coal. 162.5-164.0 - same as 157-159.5.

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
164.0 - 292.5	50.0- 89.2	Overall rec. in main coal seam: 85%	$3b_7$	Main Coal Seam. N.B. - numerous volcanic tuffs, welded tuffs, and/or flow interbeds throughout.
		160-170: 90%		164.0-165.0 - dirty coal; C.A. 20^0.
		170-172: 50%		165.0-165.5 - massive, fine-grained, hard, dark grey, pyritic volcanic.
		172-174.5: 60%		165.5-170.0 - interbedded dirty coal (50%) and coaly m.s.
		174.5-179.5: 90%		170.0-172.0 - black, fine-grained, cherty volcanic.
		179.5-202.0: 98%+		172.0-174.0 - dirty coal.
				174.0-174.5 - medium brown to black, fine-grained, siliceous volcanic; "flow banded" or "welded tuff" texture.
				174.5-180.0 - medium clean coal. at 177' - 3" black massive volcanic.
				180.0-181.0 - dirty coal and coaly m.s.
				181.0-182.0 - clean coal.
				182.0-183.0 - medium brown to black very fine-grained banded volcanic.
				183.0-185.5 - dirty coal (10%) and bentonitic coaly m.s.
				185.5-189.0 - medium clean coal; C.A. @ 186' - 20^0.
				189.0-190.5 - brown to black, very fine-grained volcanic, "flow banded" or "welded tuff" texture.
				190.5-195.0 - medium clean to "white speckled" dirty coal. at 191.5' - 3" medium brown fine-grained stoney volcanic. C.A. @ 193' - 20^0.
				195.0-198.0 - dirty coal (50%) thinly interbedded with brown to black, fine-grained siliceous welded tuffs.
		202-207: 80%		198.0-205.0 - medium to dirty coal (60%) and coaly m.s.
				205.0-206.0 - black, massive, hard, fine-grained volcanic.
				206.0-207.0 - medium clean coal.
		207-212: 98%+		207.0-209.0 - very fine-grained, black to brown welded tuff (or flow?).
				209.0-210.0 - dirty coal.
				210.0-210.5 - very fine-grained black massive volcanic.
				210.5-211.5 - dirty coal.
				211.5-212.0 - dark brown, "white speckled" bentonitic m.s.
		212-217: 80%		212.0-226.0 - interbedded, fine-grained, brown to black, banded flows or welded tuffs (50%), medium to dirty coal (40%), and grey bentonitic mudstone (10%). C.A. @ 219 - 20^0.
		217-221: 60%		
		221-226: 75%		
		226-231: 98%+		226.0-235.0 - medium clean to dirty "white speckled" coal. C.A. @ 230 - 18^0. at 229 - 3" bentonitic m.s. at 231 - 6" bentonitic m.s. at 234 - 6" bentonitic m.s.
		231-236: 90%		

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
		236-242: 25% 242-246: 75% 246-247: 50% 247-249: 50% 249-252: 33% 252-256.5: 66% 256.5-292.5: 98%+		235.0-242.0 - brown to black, fine-grained volcanic; very broken and very poor recovery. 242.0-246.0 - medium clean coal, very minor thin brown volcanic. 246.0-246.5 - volcanic?, coarse, granular, black, irregular contacts. 246.5-249.0 - thinly interbedded coal (50%) and fine-grained brown to black stoney volcanic (probably welded tuffs?). 249.0-254.0 - as above, but coal (30%), volcanics (70%). 254.0-256.5 - dirty coal. 256.5-260.0 - same as 246.5-249, but coal (40%), volcanics (60%). 260.0-265.0 - medium clean coal; C.A. @ 265 - 13°. at 263.5 - 2" m.s. at 264.0 - 2" m.s. 265.0-266.0 - dark grey welded tuffs. 266.0-270.5 - medium clean coal. 266.5-267.5 - m.s. and tuff. at 269 - 8" bentonitic light grey m.s. 270.5-271.5 - light brown, stoney, banded, welded tuff? 271.5-278.0 - medium clean coal (80%), thin volcanics (20%). C.A. @ 277 - 18°. 278.0-285.0 - brown to black, fine-grained, banded siliceous welded tuffs (70%), coal (30%). 285.0-292.5 - medium clean coal. at 286 - 4" fine-grained massive medium-grey volcanic. at 287 - 2" dark brown volc. at 288 - 2" black volc. C.A. @ 287 - 15°. C.A. @ 291 - 5°.
292.5 - 294.0	89.2- 89.6	98%	$3b_6$	Light grey, medium-grained, muddy matrix s.s.
294.0 - 315.0	89.6- 96.0	98%+	$3b_5$	Medium to dark grey, blocky breaking, medium laminated m.s. C.A. @ 298 - 4°. at 299 - 3" medium-grained poorly-consolidated s.s. C.A. @ 305 - 2°. C.A. @ 311 - 5°.

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
315.0 - 353.0	96.0-107.6	98%+	$3b_4$	Color banded, light grey to medium-grey, interbedded fine-grained s.s., gritty m.s., m.s. C.A. @ 327 - 8^{o}. C.A. @ 312 - 4^{o}. C.A. @ 332 - 8^{o}. C.A. @ 338 - 8^{o}. C.A. @ 352 - 8^{o}.
353.0 - 370.5	107.6-112.9	98%+	$3b_3$	Medium to dark grey, medium laminated blocky m.s.; abundant leaf fossils; scattered thin (to 2") beds of light grey soft gritty bentonitic m.s. C.A. @ 358 - 13^{o}. C.A. @ 365 - 12^{o}. C.A. @ 369 - 10^{o}. 369.5-370.5 - medium-brown, "white speckled" coaly m.s.
370.5 - 396.0	112.9-120.7	Overall rec. in lower seam: 90%	$3b_2$	Lower Coal Seam. 370.5-372.5 - clean coal. 372.5-374.0 - dirty coal to coaly m.s. 374.0-375.5 - medium clean coal. 375.5-378.0 - black, white speckled coaly m.s. to light brown m.s. 378.0-379.0 - medium clean coal. 379.0-380.5 - medium-brown gritty m.s.? 380.5-382.0 - medium clean coal. 382.0-382.5 - medium brown m.s. 382.5-384.5 - dirty to medium clean coal. C.A. approx. 15^{o}. 384.5-385.0 - soft, medium brown, speckled coaly m.s. 385.0-386.5 - medium clean coal. 386.5-388.0 - coaly m.s. 388.0-389.0 - clean coal, C.A. 17^{o}. 389.0-389.5 - mudstone. 389.5-394.0 - medium clean coal, abundant small amber nodules to 1/8" diameter; scattered thin m.s. beds. 394.0-396.0 - very dirty coal to coaly m.s.; white speckled.

TULAMEEN PROJECT - Hole No. T-77-7

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
396.0 - 416.0	120.7-126.8		$3b_4$	Mostly gritty fragmental tuff; minor clean bentonite, m.s., thin coal near top. 396-399 - soft clean light-grey to light-brown clay (bentonite?), scattered organic fragments. 399-401 - coaly m.s. 401-402 - soft light-brown clayey m.s. 402-404 - brown coaly m.s. 404-407 - medium clean coal; C.A. - 11^{o}. 407-408 - brown to black, very coaly m.s., abundant amber nodules to 1/8" diameter. 408-416 - soft clean light-grey clay at top, grading into medium-grey gritty, slightly fragmental, bentonitic tuff.

DIAMOND DRILL LOG

TULAMEEN PROJECT

Hole No. T-77-8

Bearing:
Dip: -90°
Commenced: August 21, 1977
Completed: August 27, 1977
Ultimate depth: 307' (93.6m)
Electrologged: No

INTERVAL Feet	INTERVAL Metres	CORE REC.	UNIT	DESCRIPTION
0.0 - 40.0	0.0 - 12.2	0		Overburden.
40.0 - 40.5	12.2 - 12.3	40-61 - 69%		Light brown soft m.s.
40.5 - 60.5	12.3 - 18.4		$3b_9$?	Medium to dark brown fissile shales, a few scattered thin (to 2") beds light brown bentonitic m.s. C.A. @ 43 - 20°. C.A. @ 52 - 24°.
60.5 - 61.0	18.4 - 18.6			Volcanic; very dark grey, very fine-grained, hard, slightly banded (welded tuff?); very fractured with irregular thin quartz veinlets.
61.0 - 70.0	18.6 - 21.3	98%	$3b_6$	Interbedded thin dirty coal (20%) and soft light grey to tan bentonitic m.s.; m.s. has small irregular organic fragments throughout. at 69' - 4" very fine-grained, black, slightly fragmental volcanic.
70.0 - 209.0	21.3 - 63.7	70-82 - 60%		Thin beds of varied volcanic predominate; light to dark grey and brown to black, massive to fragmented to banded (flow banding and/or welded tuff texture); most very hard and cherty, some dull, "stoney", some soft, granular, tuffaceous; some sections very fractured and quartz-veined; remnant blocks of coaly material and shale scattered throughout; minor thin beds m.s., shale, coal.
		82-137 - 97%		at 84 - 4" "burnt"? coaly m.s. C.A. 25°. 85-86 - thinly interbedded (beds 1/16 - 1/2" thick) coal, light brown tuff, black cherty volcanic. 88-90 - thinly bedded coal and shale. at 90 - 1/2" soft tan finely laminated tuff. at 92 - 6" "burnt" coaly shale, C.A. 40°?

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
				104.5-106.5 - coaly m.s., burnt?
				112.0-114.0 - light brown, fragmented, siliceous stoney tuff?, thin wispy coaly fragments throughout.
				at 115 - 1" clean bright coal.
				at 118 - 1" soft light brown bentonite.
				118.0-119.0 - volc. breccia; brown to black very fine-grained volc. fragments to 1/4" (50% of interval) in a very fine-grained black volc. matrix.
				120.0-121.0 - burnt looking thinly interbedded coal, shale, whitish tuff.
				at 122 - 2" burnt looking dirty coal; C.A. 28°.
		137-142 - 60%		C.A. @ 140 - 35°.
		142-158 - 68%		at 176 - 3" coal-tuff interbeds.
		158-163 - 99%		176.0-180.0 - interbedded thin coal, tuff, fragmented tuff, black fine-grained siliceous volc. (some with disseminated pyrite).
		163-166 - 30%		
		166-172 - 66%		at 185.5 - 1/2" pyrite horizon in very fine-grained black siliceous volcanic.
		172-181 - 90%		at 188.0 - 1/4" pyrite horizon in very fine-grained black siliceous volcanic.
		181-203 - 35%		at 190.0 - 4" clean coal, C.A. approx. 30°.
				at 200.0 - C.A. 25°.
209.0 - 292.5	63.7 - 89.2	209-292.5 - 84%	3b	Main Coal Seam.
				209.0-211.5 - dirty coal.
				211.5-212.5 - very fine-grained siliceous, black volcanic.
				212.5-214.0 - interbedded coal (50%) (beds 1"-3") and volcanic.
				214.0-214.5 - flow banded?, fine-grained siliceous volcanic.
				214.5-215.0 - dirty coal, C.A. approx. 15°.
				215.0-221.0 - massive volcanics?, black to brownish grey, very fine-grained, cherty.
				221.0-222.0 - medium clean coal.
				222.0-225.0 - brecciated massive, very fine-grained dark grey, siliceous volcanic?, thin quartz veinlet fracture fillings.
				225.0-232.5 - coal (40%), black fine-grained siliceous rock (60%), very contorted.
				232.5-243.0 - medium clean (50%) to dirty (50%) coal. A few scattered, thin volcanic horizons; C.A. @ 235 - 13°.
				at 236.0 - 4" volcanic.
				at 239.5 - 6" volcanic.
				at 241.0 - 2" volcanic.
				243.0-244.0 - dark fine-grained siliceous volcanic.
				244.0-244.5 - bentonitic m.s.
				244.5-245.5 - dirty coal.

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
				245.5-246.0 - bentonitic m.s. 246.0-251.5 - a variety of thin dark colored, fine-grained welded tuffs and/or flows, minor thin (to 2") coal beds. C.A. @ 248 - 13°. 251.5-252.5 - dirty coal (50%) and bentonitic m.s. 252.5-253.0 - light brown, "stoney", fragmental volcanic. 253.0-253.5 - dirty coal. 253.5-254.0 - very fine-grained, black, hard, slightly banded volcanic? 254.0-265.0 - coal interbedded with tuffs and/or flows; individual beds 1-3" thick; coal approx. 60%, core angle variable 5°- 15°. 257.0-257.5 - gritty bentonitic m.s. 265.0-283.0 - thinly interbedded coal and fine-grained siliceous volcanics (beds 1 - 6" thick); coal about 40% of interval. C.A. @ 269 - 18°. C.A. 270-280 - very convoluted and variable. C.A. @ 282 - 10°. 283.0-284.5 - medium clean coal. 284.5-287.0 - thinly interbedded coal (40%) and fine-grained dark volcanics. C.A. approx. 15°. 287.0-288.0 - massive, dark grey, fine-grained siliceous volcanic. 288.0-289.5 - medium clean coal, C.A. 15°. 289.5-292.5 - interbedded coal (50%) and fine-grained volcanic flows/beds, individual horizons 1/2" - 6", C.A. approx. 10°.
292.5 - 296.0	89.2 - 90.2	98%+	$3b_6$	Light grey, medium-grained, medium to finely laminated s.s., white muddy matrix.
296.0 - 307.0	90.2 - 93.6	98%+	$3b_5$	Medium to dark grey m.s., massive to medium laminated, blocky to slightly fissile, scattered thin (⅛" - 4") light grey s.s. and gritty m.s. interbeds.

DIAMOND DRILL LOG

TULAMEEN PROJECT

Hole No. T-77-9

Bearing:
Dip: -90°
Commenced: August 28, 1977
Completed: August 31, 1977
Ultimate Depth: 367' (111.9m)
Electrologged: No

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
0.0 - 36.0	0.0- 11.0	0		Overburden.
36.0 - 51.0	11.0- 15.5	80%	$3c_2$	Sandstone, conglomerate, minor coal, m.s. 36-42 - grey m.s. to black coaly m.s. at 38 - 3" clean coal. 42-51 - light grey s.s., white muddy matrix, fine-grained and thinly laminated at 42', grading to coarse-grained massive at 51'. C.A. 30°.
51.0 - 76.5	15.5- 23.3	90%	$3c_1$	51.0-57.0 - medium grey gritty m.s. 57.0-59.0 - fine-grained to medium-grained muddy matrix s.s. 59.0-74.0 - fine-grained, medium grey, gritty m.s. 74.0-76.5 - very fine-grained, medium grey, medium laminated muddy s.s., sharp contact at 76.5' with underlying m.s., C.A. approx. 30°.
76.5 - 124.0	23.3- 37.8	98%+	$3b_{10}$	Blocky breaking medium to dark grey m.s. 110.0-110.5 - light grey fragmented tuff? C.A. @ 89 - 30°. C.A. @ 94 - 30°. C.A. @ 114 - 30°. C.A. @ 124 - 25°.
124.0 - 185.0	37.8- 56.4	98%+	$3b_9$	Medium to dark grey fissile shales. C.A. @ 132 - 28°. C.A. @ 137 - 28°. C.A. @ 142 - 45°. C.A. @ 151 - 45°. C.A. @ 157 - 45°. C.A. @ 162 - 55°.

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
				C.A. @ 167 - 40°. C.A. @ 173 - 38°. C.A. @ 177 - 32°. C.A. @ 182 - 32°.
185.0 - 187.5	56.4- 57.2	98%	$3b_8$	Thinly interbedded dirty coal, soft white bentonite, fine-grained, black, fractured, quartz-veined volcanic, coal approx. 30%.
187.5 - 257.0	57.2- 78.3	97%	$3b_7$	Main Coal Seam. 187.5-188.0 - clean coal. 188.0-188.5 - soft dark brown coaly m.s. 188.5-197.0 - dirty coal, minor thin medium clean coal; some dirty coal grading into soft blackish brown coaly m.s., C.A. approx. 27°. 197.0-198.5 - light greyish-brown, gritty, coaly, bentonitic (?) m.s. 198.5-202.0 - medium clean coal, C.A. approx. 25°. at 200 - 3" medium brown m.s. 202.0-203.0 - gritty, bentonitic, coaly m.s. 203.0-212.0 - medium clean to dirty (brownish cast) coal. C.A. 30°. at 205 - 3" m.s. at 208 - 1" m.s. at 209.5 - 4" light brownish grey, slightly vesicular, fine-grained black volc. at 211.5 - 3" soft dark brown m.s. 212.0-214.0 - light brownish grey, soft, clay (bentonite?). 214.0-219.0 - dirty coal (50%) to coaly brown m.s. at 216.5 - 4" dark grey fine-grained volc. 219.0-227.5 - dirty coal (20%) thinly interbedded with grey to brown fine-grained volc. horizons (50%) and m.s. C.A. 30°. 227.5-231.0 - medium clean coal, C.A. 30°. 231.0-235.0 - very fine-grained grey to brownish siliceous volc. flows/beds (50%), gritty bentonitic m.s. (30%), dirty coal (20%). 235.0-236.5 - medium clean coal, C.A. approx. 30°. 236.5-237.0 - light grey, fine-grained, bentonitic m.s. 237.0-237.5 - coal. 237.5-238.0 - m.s. 238.0-239.5 - dirty coal to coaly m.s.

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
				239.5-240.0 - light brownish grey, siliceous, very-fine grained volc. 240.0-243.0 - medium clean coal, C.A. 20°. at 241 - 3" fine-grained dark grey volc. 243.0-244.5 - fine-grained dark grey massive flow? 244.5-247.0 - dirty coal. 247.0-256.0 - medium clean coal, C.A. approx. 25°. at 254 - 3" bentonitic m.s. 256.0-256.5 - volc. 256.5-257.0 - coal.
257.0 - 259.0	78.3- 78.9	98%+	$3b_6$	Light grey, fine-grained, muddy s.s.; scattered small irregular coal fragments.
259.0 - 276.0	78.9- 84.1	98%+	$3b_5$	Medium to dark grey, massive to coaly laminated, blocky breaking to slightly fissile m.s. at 266 - 4" coarse-grained s.s. C.A. @ 262 - 30°. C.A. @ 274 - 28°.
276.0 - 321.0	84.1- 97.8	98%+	$3b_4$	Light to medium grey, distinctly color banded shales, m.s., fine-grained s.s. Same as other holes. C.A. @ 282 - 32°. C.A. @ 292 - 33°. C.A. @ 304 - 33°. C.A. @ 316 - 33°.
321.0 - 335.0	97.8-102.1	98%+	$3b_3$	Medium grey to brownish grey m.s., massive to obscurely laminated, abundant leaf fossils and organic fragments. C.A. approx. 25°.
335.0 - 364.0	102.1-110.9	98%	$3b_2$	Lower Coal Seam. 335.0-336.0 - medium clean coal. 336.0-336.5 - gritty m.s. 336.5-338.5 - dirty coal. 338.5-339.0 - gritty bentonitic m.s. 339.0-339.5 - medium clean coal. 339.5-340.5 - light grey, gritty, "white speckled" m.s. 340.5-342.0 - dirty coal, C.A. 25°. 342.0-343.0 - bentonitic coaly m.s.

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
				343.0-344.0 - clean coal, C.A. approx. 29°. 344.0-345.5 - soft medium-brown m.s. 345.5-347.5 - dirty coal, C.A. 30°. 347.5-348.0 - medium-brown, medium-grained muddy s.s. 348.0-353.5 - dirty coal, brownish cast, white speckled, C.A. 30°. 353.5-355.0 - white soft, clean clayey bentonite. 355.0-357.0 - medium clean coal. 357.0-357.5 - brown m.s. 357.5-364.0 - dirty coal, minor scattered thin m.s., C.A. 30°. at 357.5 - 2" medium-brown siliceous, very fine-grained volcanic.
364.0 - 367.0	110.9-111.9	98%+	$3b_1$	Medium-grey, soft, gritty, bentonitic, slightly fragmental tuffaceous m.s.

DIAMOND DRILL LOG

TULAMEEN PROJECT

Hole No. T-77-10

Bearing:
Dip: -90°
Commenced: September 1, 1977
Completed: September 12, 1977
Ultimate depth: 431'
Electrologged: No

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
0.0 - 17.0	0.0- 5.2	0	0	Overburden.
17.0 - 56.0	5.2- 17.1	80%	$3c_1$	Interbedded s.s., m.s., minor thin coal. 17-22 - fine-grained, light grey massive s.s., soft muddy matrix. 22-42 - brown to grey, soft, gritty, swelling m.s. at 30 - 3" coaly m.s. 42-45 - light grey, soft, not gritty, clayey m.s. 45-56 - soft, poorly consolidated, muddy fine-grained to medium-grained s.s.; medium laminated, increasingly coarser grained with depth; sharp contact at 56' with underlying m.s.
56.0 - 97.0	17.1- 29.6	80% overall. 57-68 - 40%	$3b_{10}$	Dark grey m.s.; mostly massive and blocky breaking, C.A. approx. 15°.
97.0 - 170.5	29.6- 52.0	95%	$3b_9$	Fissile shales but not as uniformly finely laminated and fissile as in other holes; scattered thin bentonitic m.s. and gritty bentonitic m.s. beds. C.A. @ 98 - 20°. C.A. @ 104-116 - very variable, contorted, 0-90°. C.A. @ 117 - 40°. C.A. @ 121 - 38°. C.A. @ 129 - 40°. C.A. @ 139 - 45°. C.A. @ 148 - 38°. C.A. @ 160 - 35°.
170.5 - 181.5	52.0- 55.3	96%	$3b_8$	170.5-180.0 - interbedded soft white bentonite (80%) and dirty coal, coaly m.s. 180.0-181.5 - hard, siliceous, dark grey, very fine-grained, slightly fragmental volc. (welded tuff?).

TULAMEEN PROJECT - Hole No. T-77-10

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
181.5 - 292.0	55.3- 89.0	Overall rec. in main seam: 92%	$3b_7$	Main Coal Seam.
				181.5-183.5 - dirty coal; C.A. @ 183 - 30°.
				183.5-186.0 - dark brown coaly m.s.
				186.0-194.5 - dirty coal (50%) with interbeds of m.s., coaly m.s. and light grey bentonitic m.s.
				194.5-197.0 - main bentonite seam; soft, clean, light grey and yellowish brown weathering.
				197.0-197.5 - coaly m.s.
				197.5-198.5 - black, very fine-grained siliceous volcanic.
				198.5-201.0 - coaly m.s.
				201.0-202.5 - medium clean coal.
				202.5-203.0 - light brown hard massive m.s. (maybe welded tuff??).
				203.0-204.5 - dirty coal.
				204.5-205.0 - soft shaly m.s.
				205.0-206.0 - clean coal.
				206.0-207.0 - dark grey, very fine-grained, massive slightly pyritic volcanic.
				207.0-208.0 - dirty coal.
				208.0-209.0 - soft, light grey, coaly bentonitic m.s.
				209.0-211.0 - dirty coal.
		211-215 - 60%		211.0-215.0 - dark grey massive volc. interbedded with coal (50%); poor recovery (approx. 60%), core very broken.
				215.0-216.0 - soft, brownish grey bentonitic m.s.
				216.0-217.5 - very broken, medium brown, siliceous, fine-grained massive volcanic (flow or welded tuff??).
		217.5-224 - 80%		217.5-224.0 - thinly interbedded (most beds a few inches thick), coal (50%), fine-grained massive, siliceous volcanics (30%); m.s. (20%).
		224-226 - 50%		224.0-226.0 - medium brown fragmental volcanic.
				226.0-226.5 - coal.
		226.5-231.5 - 60%		226.5-231.5 - soft white bentonitic m.s., small coaly fragments throughout; a few thin ½" coaly beds.
				231.5-232.5 - cherty, medium-brown fragmental volcanic.
		232.5-240 - 60%		232.5-240.0 - very broken, interbedded, poorly recovered coal, m.s., volcanics.
				240.0-243.0 - dirty coal, C.A. @ 241 - 30°.
				243.0-252.0 - interbedded dirty coal (30%) and a variety of volcanics, most beds a few inches thick; minor brown to grey m.s.
				252.0-254.0 - black massive very fine-grained volcanic to medium-brown fragmental tuffaceous rock.

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
				254.0-255.5 - medium clean coal; scattered thin (1/16") fractures filled with pyrite. 255.5-292.0 - interbedded coal (20%), volcanic flow and/or welded tuff 80%, no individual coal beds greater than 1' thick; wide variety of volcanics, black to grey to light brown, all fine-grained, siliceous, massive to banded and fragmental. C.A. @ 287 - 20°.
292.0 - 294.0	89.0- 89.6	98%	$3b_6$	Light grey, medium-bedded, fine-grained to medium-grained s.s. C.A. @ 293 - 20°.
294.0 - 332.0	89.6-101.2	98%+	$3b_5$	Medium to dark grey, massive to obscurely medium laminated, blocky breaking m.s. C.A. @ 305 - 18°. C.A. @ 323 - 20°.
332.0 - 359.0	101.2-109.4	98%+	$3b_4$	Distinctly color-banded, light to dark grey interbedded shale, m.s., s.s. C.A. @ 337 - 20°. C.A. @ 350 - 20°.
359.0 - 385.0	109.4-117.3	98%+	$3b_3$	Dark brownish-grey m.s., obscurely coarsely laminated, slightly fissile to blocky breaking scattered thin minor light-grey sandy beds, abundant leaf fossils in m.s. C.A. approx. 20°.
385.0 - 423.0	117.3-128.9	98%	$3b_2$	Lower Coal Seam. 385.0-386.0 - clean coal. 386.0-387.0 - white speckled coaly m.s. 387.0-390.0 - medium-clean coal, C.A. 20°. 390.0-391.0 - white speckled coaly m.s. 391.0-392.0 - medium clean coal. 392.0-393.0 - thinly interbedded, soft grey clayey m.s., hard grey m.s., hard white bentonitic? m.s. 393.0-394.5 - dirty coal. 394.5-395.5 - medium-grey, white speckled, soft, swelling (bentonitic?) m.s. 395.5-399.0 - medium clean to dirty coal, C.A. 20°. 399.0-400.0 - "white speckled", dark brownish grey coaly m.s. 400.0-401.0 - dirty coal. 401.0-402.0 - grey clayey coaly m.s. 402.0-403.0 - soft, white, clayey m.s., small coaly fragments throughout. 403.0-405.0 - dirty coal. 405.0-406.5 - interbedded coal and flow banded, hard, siliceous, fine-grained dark horizons, sometimes slightly fragmental.

TULAMEEN PROJECT - Hole No. T-77-10

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
				406.0-410.0 - medium clean coal, C.A. 20°. 410.0-412.5 - coaly m.s., hard, "white speckled" to soft, clayey. 412.5-415.0 - clean coal. 415.0-417.0 - dark brown coaly m.s. 417.0-421.0 - light grey, gritty, slightly coaly m.s. 421.0-423.0 - dirty coal.
423.0 - 433.0	128.9-132.0	98%+	$3b_I$	Medium-brownish grey, soft, gritty, fragmental, bentonitic (swelling) tuff or tuffaceous m.s.

DIAMOND DRILL LOG

TULAMEEN PROJECT

Hole No. T-77-11

Bearing:
Dip: -90°
Commenced: September 14, 1977
Completed: September 17, 1977
Ultimate depth: 537' (163.7m)
Electrologged: No

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
0.0 - 7.0	0.0- 2.1	0		Overburden.
7.0 - 140.5	2.1- 42.8	80%	$3c_2$	Conglomeratic s.s., medium to coarse-grained s.s., all with white muddy matrix, minor m.s., thin dirty coal.
140.5 - 181.0	42.8- 55.2	95%	$3c_1$	Interbedded thin dirty coal, m.s., and fine-grained s.s.; bottom few feet of interval grading to coarse-grained s.s., abrupt contact at 181' with underlying m.s. C.A. @ 172 - 30°.
181.0 - 202.0	55.2- 61.6	98%+	$3b_{10}$	Dark grey, massive to coarsely laminated, blocky breaking m.s.; gradational into underlying shales; C.A. @ 192' - 28°.
202.0 - 314.0	61.6- 95.7	98%+	$3b_9$	Grey to dark brownish fissile shales. C.A. @ 221 - 29°. C.A. @ 235 - 29°. C.A. @ 247 - 27°. C.A. @ 273 - 28°. C.A. @ 290 - 32°. C.A. @ 303 - 29°.
314.0 - 323.5	95.7- 98.6	95%	$3b_8$	Interbedded soft light coloured bentonite, bentonitic m.s., and thin coal.
323.5 - 398.0	98.6-121.3	98%	$3b_7$	Main Coal Seam. 334.0-336.5 - bentonite. C.A. @ 325 - 30°. C.A. @ 342 - 25°. C.A. @ 352 - 29°.

TULAMEEN PROJECT - Hole No. T-77-11

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
				C.A. @ 370 - 25°. C.A. @ 384 - 30°. C.A. @ 388 - 28°.
398.0 - 401.0	121.3-122.2	98%+	$3b_6$	Very light grey, medium-grained muddy matrix s.s.
401.0 - 435.0	122.2-132.6	98%+	$3b_5$	Dark grey blocky breaking m.s.; abundant leaf fossils. C.A. @ 417 - 29°. C.A. @ 430 - 29°.
435.0 - 462.0	132.6-140.8	98%+	$3b_4$	Distinctly color banded, interbedded light to dark grey shales, m.s., fine-grained s.s. C.A. @ 440 - 26°. C.A. @ 460 - 25°.
462.0 - 487.5	140.8-148.6	98%+	$3b_3$	Dark grey shale to m.s., gradational with above; scattered leaf fossils. C.A. @ 467 - 26°. C.A. @ 480 - 26°.
487.5 - 517.0	148.6-157.6	99%	$3b_2$	Lower Coal Seam. C.A. approx. 25%.
517.0 - 537.0	157.6-163.7	98%	$3b_1$	Medium-grey, gritty, fragmental tuff; minor coal, bentonite and m.s. near top. 517-520 - soft white bentonite. 520-522 - coal. 522-524 - coaly m.s. 524-537 - medium-grey, swelling fragmental tuff.

DIAMOND DRILL LOG

TULAMEEN PROJECT

Hole No. T-77-12

Bearing:
Dip: 90°
Commenced: September 18, 1977
Completed: September 22, 1977
Ultimate depth: 546' (166.4m)
Electrologged: No

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
0.0 - 144.0	0.0- 43.9	80%	$3c_2$	Conglomerate, medium to coarse-grained s.s., minor m.s., thin dirty coal.
144.0 - 184.0	43.9- 56.1	95%	$3c_1$	Thin dirty coal, m.s.; fine-grained to coarse-grained s.s.; sharp contact at 184' between coarse-grained s.s. and underlying m.s.
184.0 - 207.0	56.1- 63.1	98%	$3b_{10}$	Dark grey blocky breaking, medium laminated m.s.
207.0 - 318.0	63.1- 97.0	98%	$3b_9$	Grey to dark brownish grey fissile shales. C.A. @ 216 - 40°. C.A. @ 250 - 40°. C.A. @ 273 - 36°. C.A. @ 290 - 37°. C.A. @ 310 - 37°.
318.0 - 327.5	97.0- 99.8	95%	$3b_8$	Thinly interbedded bentonite, coal, and m.s.
327.5 - 408.0	99.8-124.4	97%	$3b_7$	Main Coal Seam. 336.5-341.0 - main bentonite bed. C.A. @ 382 - 38°. C.A. @ 400 - 39°.
408.0 - 411.0	124.4-125.3	98%	$3b_6$	Light grey, medium grained s.s.
411.0 - 431.0	125.3-131.4	98%+	$3b_5$	Dark grey blocky breaking m.s.

TULAMEEN PROJECT - Hole No. T-77-12

INTERVAL Feet	INTERVAL Metres	CORE REC. %	UNIT	DESCRIPTION
431.0 - 471.0	131.4-143.6	98%+	$3b_4$	Color banded, light to dark grey shales, m.s., fine-grained s.s. C.A. @ 440 - 35°. C.A. @ 450 - 37°. C.A. @ 470 - 35°.
471.0 - 499.5	143.6-152.2	98%+	$3b_3$	Dark grey m.s. and shale; gradational with above.
499.5 - 527.0	152.2-160.6	99%	$3b_2$	Lower Coal Seam. C.A. @ 507 - 39°.
527.0 - 546.0	160.6-166.4	98%	$3b_1$	Grey tuffaceous m.s., swells when wet, scattered thin coaly horizons.

APPENDICES 5, 6, 7, 8

Figures 6 through 19

Electrologs

SEE VOLUME II

App. 12

APPENDIX 12

Core Analyses Data

CYCLONE ENGINEERING SALES LTD.

SEPARATION OF BULK MATERIALS

Manufacturing, Engineering, Testing Services

9751 - 51 Avenue
Edmonton, Alberta T6E 4Z5
Telephone: (403) 436-1385
Cable Address:
Cyclone, Edmonton
Telex: 037-3793

Ref: S1-232

October 31, 1977

Cyprus Anvil Mining Corp.
330, 355 Burrard Street
Vancouver, B. C.

Attention: Mr. T. J. Adamson

Dear Sir:

This is to confirm the values of Specific Gravity determinations performed on the following head samples.

Sample	Sp. Gr.
T-77-1 Main Seam	1.63
T-77-2 Main Seam	1.61
T-77-6 Main Seam	1.77

I trust this is satisfactory.

Yours truly,

CYCLONE ENGINEERING SALES LTD.

Per: _____
B. Y. H. Wong

BYHW/ejr

CYCLONE ENGINEERING SALES LTD.

SEPARATION OF BULK MATERIALS

Manufacturing, Engineering, Testing Services

9751 - 51 Avenue
Edmonton, Alberta T6E 4Z5
Telephone: (403) 436-1385
Cable Address:
Cyclone, Edmonton
Telex: 037-3793

Ref: S1-232

October 13, 1977

Cyprus Anvil Mining Corporation
330, 355 Burrard Street
Vancouver, B. C.

Attention: Mr. T. J. Adamson

Dear Sir:

This is to confirm all the Equilibrium Moisture Determinations on the Tulameen Drill Core Samples.

Main Seam Samples		Lower Seam Samples	
No. 1	7.3		
No. 2	7.4		
No. 3	8.0	No. 3L	7.2
No. 4	7.8	No. 4L	7.9
No. 5	8.3	No. 5L	7.3
No. 6	7.4	No. 6L	6.1

Yours truly,

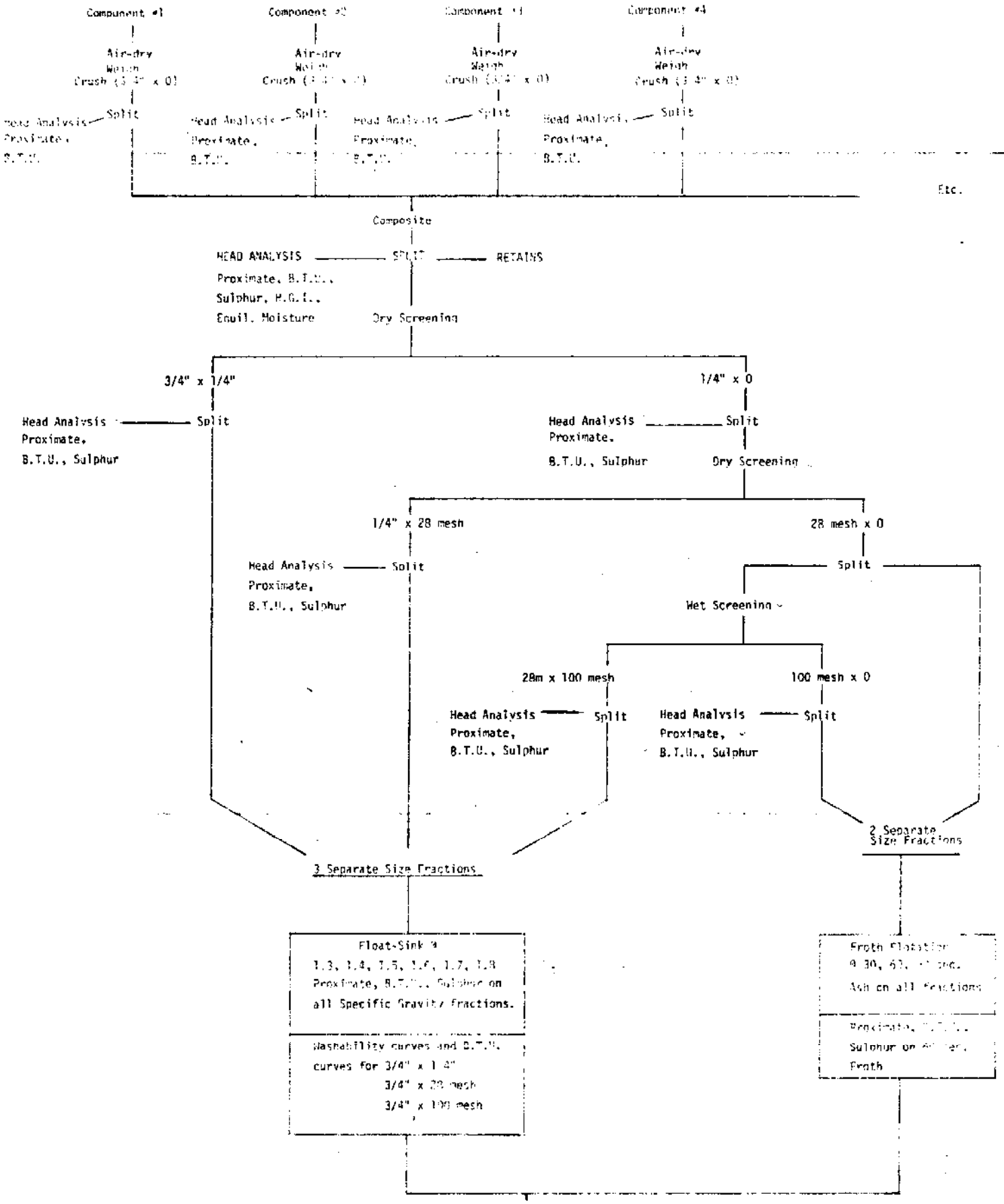
CYCLONE ENGINEERING SALES LTD.

Per: B. Y. H. Wong

B. Y. H. Wong

BYHW/ejr

CORE ANALYSIS



CYPRUS ANVIL MINING CORPORATION

Analytical Report
for
Core Testing

PROJECT: Tulameen

DRILL HOLE #: T-77-1

AREA:

SEAM: Main

DATE SAMPLED:

LAB COMPOSITE #: T-77-1

DATE ANALYSED:

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:
HOLE NO.: T-77-1
SEAM: Main

TABLE 1 COMPONENTS AND ANALYSIS (a.d.b.)

		Ash%	R.M.%	V.M.%	F.C.%	B.T.U./lb.
Number:	1	44.42	4.80	26.69	24.09	6,550
Footage:	55.17 - 58.37m					
Weight:	28.5 lbs.					
Number:	2	43.16	5.85	26.00	24.99	6,750
Footage:	59.37 - 62.03					
Weight:	36.0 lbs.					
Number:	3	47.22	5.13	23.72	23.93	5,920
Footage:	62.03 - 66.14					
Weight:	38.5					
Number:	4	22.42	7.60	29.31	40.67	9,520
Footage:	66.14 - 68.98					
Weight:	24.5 lbs.					
Number:	5	32.81	5.50	26.24	35.45	8,170
Footage:	68.88 - 70.71					
Weight:	10.0 lbs.					

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:

HOLE NO.: T-77-1

SEAM: Main

TABLE 2

ANALYSIS OF COMPOSITE HEAD SAMPLE (a.d.b.)

		EM	a.d.b.
Ash %	38.07	37.31	46.24
R.M.%	5.43		
V.M.%	25.03		
F.C.%	31.47		
S. %	0.41	.40	
B.T.U./lb	7,220	7,076	7,632
H.G.I.	46		
Equilibrium Moisture		7.3	

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:

HOLE NO.: T-77-1

SEAM: Main

TABLE 3 SIZE CONSIST OF COMPOSITE HEAD SAMPLE

Size	Wt% Fractional	Cumulative
3/4" x ¼"	53.55	53.55
¼" x 28m	38.71	92.26
28m x 100m	3.92	96.18
100m x 0	3.82	100.00
TOTAL	100.00	

COMPOSITE NO.:
HOLE NO.: T-77-1
SEAM: Main

TABLE 4 ANALYSIS OF SIZE FRACTIONS

(a)

	3/4" x 1/4"	1/4" x 0	Total
Ash%	41.17	32.56	37.17
R.M.%	5.24	5.69	5.41
V.M.%	23.76	26.35	24.96
F.C.%	29.83	35.40	32.46
S. %	0.37	0.42	0.39
B.T.U./lb.	6,660	7,930	7,250

(b)

	1/4" x 28m	28m x 100m	100m x 0	Reconstituted 1/4" x 0
Ash%	34.41	20.70	44.15	34.08
R.M.%	5.68	1.81	2.63	5.10
V.M.%	25.39	31.14	25.23	25.86
F.C.%	34.52	46.35	27.99	34.96
S.%	0.45	0.60	0.30	0.45
B.T.U./lb.	7,750	10,200	6,630	7,860

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:

HOLE NO.: T-77-1

SEAM: Main

TABLE 5. FLOAT-SINK AND ANALYSIS OF SIZE FRACTIONS

(Fractional Basis)

(a) 3/4" x 1/4"

Sp.Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb.
- 1.30	3.24	4.09	6.86	35.92	53.13		12,300
1.30 - 1.40	24.10	8.27	6.41	32.93	52.39		11,650
1.40 - 1.50	12.08	21.83	6.04	30.15	41.98		9,740
1.50 - 1.60	9.25	34.11	5.49	28.96	31.44		8,200
1.60 - 1.70	7.04	43.74	4.82	26.37	25.07		6,710
1.70 - 1.80	6.26	55.06	4.10	22.70	18.14		5,060
+ 1.80	38.03	75.93	3.95	18.23	1.89		1,690
TOTAL	100.00	43.32	5.10	25.63	25.95		6,570

(b) 1/4" x 28m

Sp. Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb
- 1.30	3.82	2.32	4.72	37.94	55.02		12,870
1.30 - 1.40	43.67	6.81	4.53	35.32	53.34		12,000
1.40 - 1.50	6.62	22.26	4.54	30.27	42.93		9,880
1.50 - 1.60	5.73	30.88	4.45	26.92	37.75		8,540
1.60 - 1.70	4.44	39.62	3.08	23.47	33.83		7,170
1.70 - 1.80	3.18	46.86	3.05	22.88	27.21		6,280
+ 1.80	32.54	75.52	3.49	14.67	6.32		1,920
TOTAL	100.00	34.13	4.08	26.96	34.83		8,020

TABLE 5. (cont'd)

(c) 28m x 100 mesh

Sp. Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb
- 1.30	7.24	1.80	4.36	35.46	58.38		13,010
1.30 - 1.40	56.63	3.93	4.98	33.99	57.10		12,430
1.40 - 1.50	8.65	13.33	5.10	29.52	52.05		11,020
1.50 - 1.60	4.61	18.00	5.51	28.97	47.52		10,300
1.60 - 1.70	2.92	34.97	5.00	26.12	33.91		7,930
1.70 - 1.80	2.45	48.31	4.27	21.60	25.82		5,980
+ 1.80	17.50	72.83	2.62	18.41	6.14		2,020
TOTAL	100.00	19.29	4.54	30.22	45.95		10,140

COMPOSITE NO.:
HOLE: T-77-1
SEAM: Main

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS

(a) 3/4" x 1/4"

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	3.24	4.09	12,300	3.24	4.09	12,300	100.00	43.32	6,570
1.30 - 1.40	24.10	8.27	11,650	27.34	7.77	11,730	96.76	44.63	6,380
1.40 - 1.50	12.08	21.83	9,740	39.42	12.08	11,120	72.66	56.69	4,630
1.50 - 1.60	9.25	34.11	8,200	48.67	16.27	10,560	60.58	63.65	3,620
1.60 - 1.70	7.04	43.74	6,710	55.71	19.74	10,080	51.33	68.97	2,790
1.70 - 1.80	6.26	55.06	5,060	61.97	23.31	9,570	44.29	72.98	2,170
+ 1.80	38.03	75.93	1,690	100.00	43.32	6,570	38.03	75.93	1,690
TOTAL	100.00	43.32	6,570						

COMPOSITE NO:
HOLE: T-77-1
SEAM: Main

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS continued

(b) 3/4" x 28m (Reconstituted data)

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	3.48	3.28	12,560	3.48	3.28	12,560	100.00	39.46	7,180
1.30 - 1.40	32.31	7.44	11,850	35.79	7.04	11,920	96.52	40.77	6,990
1.40 - 1.50	9.79	21.95	9,780	45.58	10.24	11,460	64.21	57.54	4,540
1.50 - 1.60	7.78	33.11	8,300	53.36	13.57	11,000	54.42	63.94	3,600
1.60 - 1.70	5.95	42.45	6,850	59.31	16.47	10,580	46.64	69.08	2,810
1.70 - 1.80	4.96	52.86	5,390	64.27	19.28	10,180	40.69	72.98	2,220
+ 1.80	35.73	75.77	1,780	100.00	39.46	7,180	35.73	75.77	1,780
TOTAL	100.00	39.46	7,180						

COMPOSITE NO.
HOLE: T-77-1
SEAM: Main

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS continued

(c) 3/4" x 100 mesh (Reconstituted data)

	Fractional			Cumulative Floats			Cumulative Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	3.64	3.16	12,600	3.64	3.16	12,600	100.00	38.63	7,300
1.30 - 1.40	33.30	7.20	11,890	36.94	6.80	11,960	96.36	39.97	7,100
1.40 - 1.50	9.74	21.64	9,820	46.68	9.90	11,510	63.06	57.28	4,570
1.50 - 1.60	7.65	32.73	8,350	54.33	13.11	11,070	53.32	63.79	3,610
1.60 - 1.70	5.83	42.30	6,870	60.16	15.94	10,660	45.67	69.00	2,810
1.70 - 1.80	4.86	52.70	5,400	65.02	18.69	10,270	39.84	72.90	2,220
+ 1.80	34.98	75.71	1,780	100.00	38.63	7,300	34.98	75.71	1,780
TOTAL	100.00	38.63	7,300						

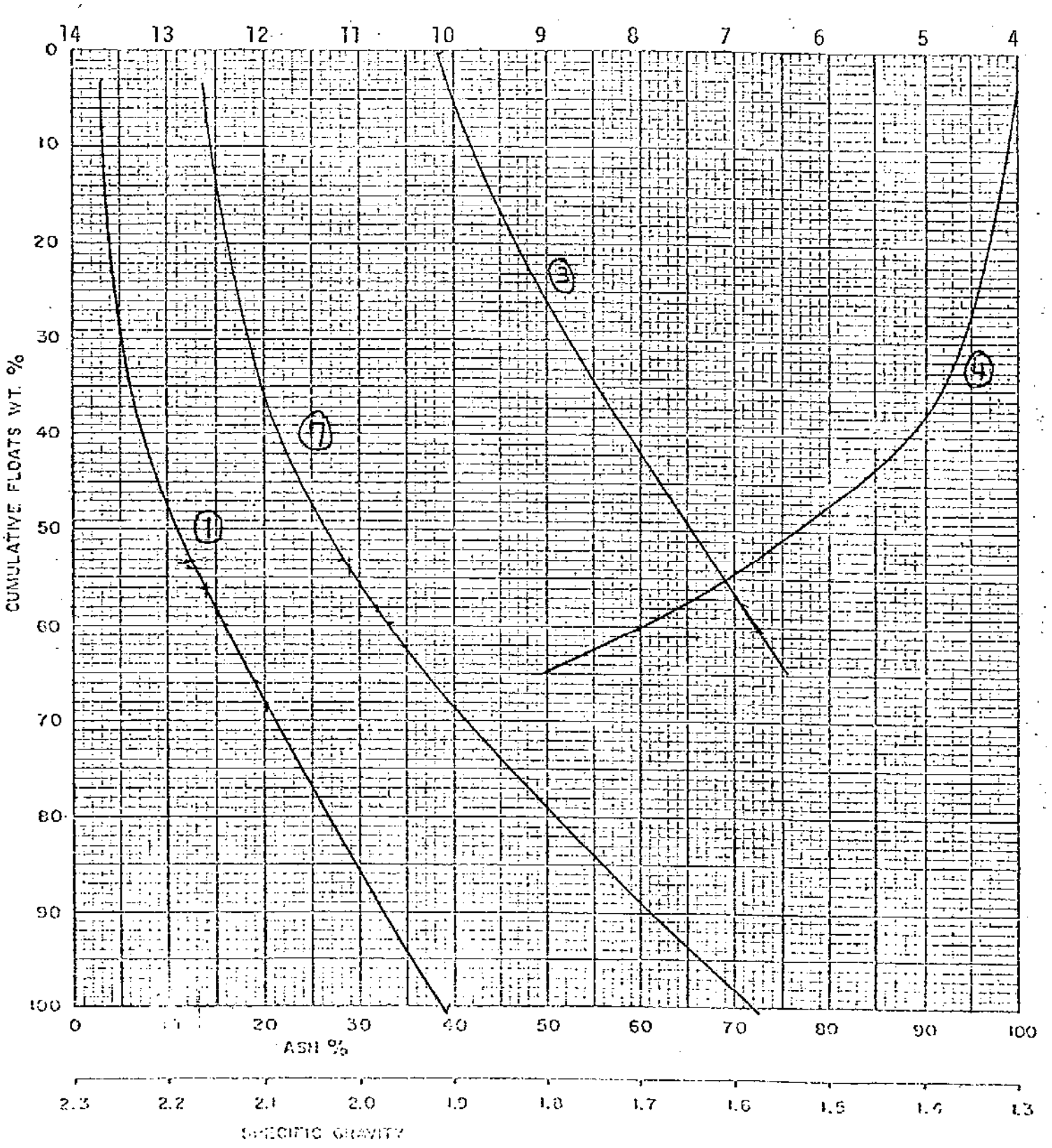
COMPANY CYPRUS ANVIL MINING CORPORATION

SAMPLE T-77-1

Size 3/4" x 100m

WASHABILITY CURVES

3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU



DATE

CYCLONE ENGINEERING SALES LTD.
EDMONTON ALBERTA CANADA

COMPANY CYPRUS ANVIL MINING CORPORATION

SAMPLE T-77-1

Size $3\frac{1}{4}$" x 28m.

WASHABILITY CURVES

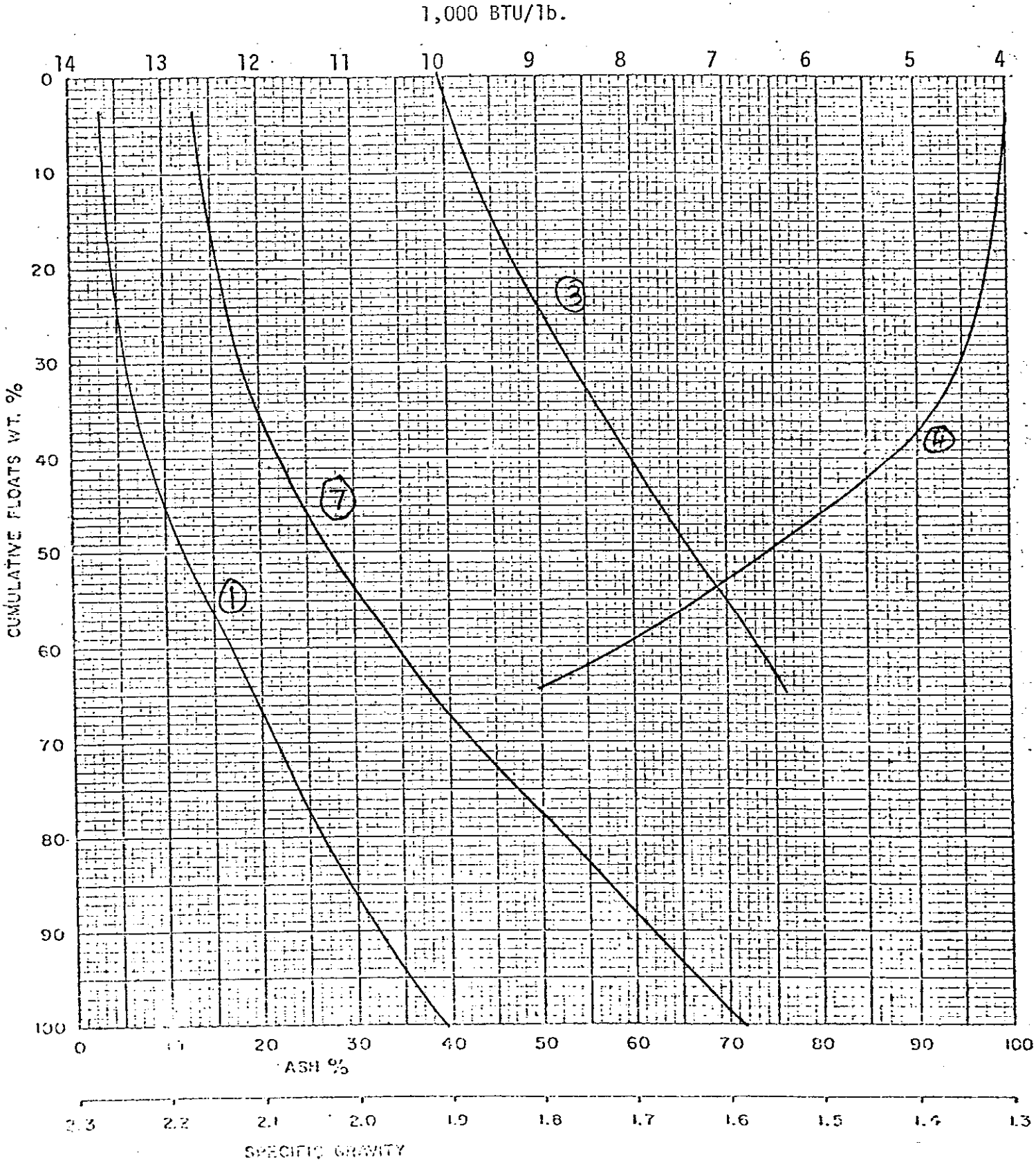
3 - SINKS

4 - SPECIFIC GRAVITY

5 - ELEMENTARY ASH

6 - NEAR GRAVITY MATERIAL

7 - BTU



DATE

CYCLONE ENGINEERING SALES LTD.
EDMONTON ALBERTA CANADA

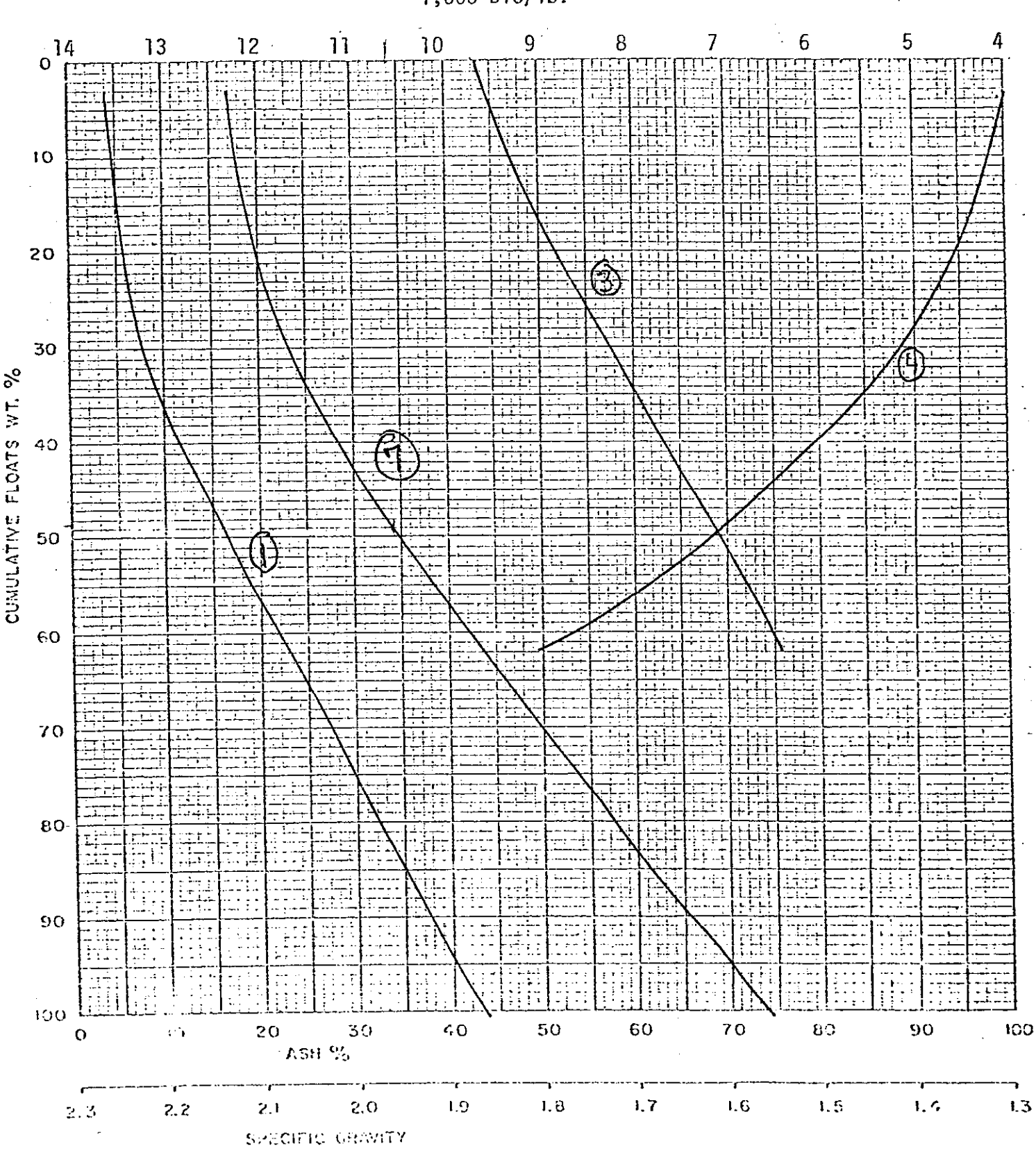
COMPANY CYPRUS ANVIL MINING CORPORATION.

SAMPLE T-77-1

Size 3/4" x 1/4"

WASHABILITY CURVES

2 - [illegible]
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU



DATE

CYCLONE ENGINEERING SALES LTD.
EDMONTON ALBERTA CANADA

CYPRUS ANVIL MINING CORPORATION

Analytical Report
for
Core Testing

PROJECT: Tulameen

DRILL HOLE #: T-77-2

AREA:

SEAM:

DATE SAMPLED:

LAB COMPOSITE #: (T-77-2)

DATE ANALYSED:

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:
HOLE NO.: T-77-2
SEAM:

TABLE 1 COMPONENTS AND ANALYSIS (a.d.b.)

	Ash%	R.M.%	V.M.%	F.C.%	B.T.U./lb.
Number: 1 Footage: —— Weight:	46.75	5.93	20.32	27.00	6,050
Number: 2 Footage: Weight:	28.56	6.52	29.07	35.85	8,420
Number: 3 Footage: Weight:	23.84	6.58	29.58	40.00	9,240
Number: 4 Footage: Weight:	46.33	5.71	27.08	20.88	5,650
Number: 5 Footage: Weight:	44.60	6.16	22.07	27.17	6,280
Number: 6 Footage: Weight:	31.41	6.24	28.48	33.87	7,840
Number: 7 Footage: Weight:	43.43	6.76	26.08	23.73	6,020

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:

HOLE NO.: T-77-2

SEAM:

TABLE 2

ANALYSIS OF COMPOSITE HEAD SAMPLE (a.d.b.)

		EM	db
Ash %	36.97	36.73	39.06
R.M.%	5.39		
V.M.%	27.54		
F.C.%	30.10		
S. %	0.44	.43	
B.T.U./lb	7,460	7311	7885
H.G.I.	50		

Equilibrium Moisture 7.4

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:

HOLE NO.: T-77-2

SEAM:

TABLE 3

SIZE CONSIST OF COMPOSITE HEAD SAMPLE

Size	Wt% Fractional	Cumulative
3/4" x ¼"	50.53	50.53
¼" x 28m	40.52	91.05
28m x 100m	4.05	95.10
100m x 0	4.90	100.00
TOTAL	100.00	

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:

HOLE NO.: T-77-2

SEAM:

TABLE 4 ANALYSIS OF SIZE FRACTIONS

(a)

	3/4" x 1/4"	1/4" x 0	Total
Ash%	39.71	35.00	37.38
R.M.%	5.39	4.80	5.10
V.M.%	26.16	27.54	26.84
F.C.%	28.74	32.66	30.68
S. %	0.39	0.46	0.43
B.T.U./lb.	7,040	7,750	7,390

(b)

	1/4" x 28m	28m x 100m	100m x 0	Reconstitute 1/4" x 0
Ash%	34.34	27.12	45.74	34.88
R.M.%	5.16	2.64	1.95	4.64
V.M.%	27.59	29.25	23.70	27.34
F.C.%	32.91	40.99	28.61	33.14
S.%	0.43	0.56	0.38	0.44
B.T.U./lb.	7,910	8,870	6,600	7,860

COMPOSITE NO.:

HOLE NO.: T-77-2

SEAM:

TABLE 5. FLOAT-SINK AND ANALYSIS OF SIZE FRACTIONS
(Fractional Basis)

(a) 3/4" x 1/4"

Sp.Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb
- 1.30	1.36	2.64	7.27	36.27	53.82	0.49	12,480
1.30 - 1.40	25.14	8.07	7.45	35.64	48.84	0.58	11,640
1.40 - 1.50	14.08	20.48	6.48	29.30	43.74	0.45	9,880
1.50 - 1.60	10.96	32.42	5.81	27.16	34.61	0.46	8,290
1.60 - 1.70	7.82	42.76	4.63	22.51	30.10	0.44	6,900
1.70 - 1.80	6.00	52.77	4.36	20.86	22.01	0.23	5,680
+ 1.80	34.64	73.01	4.07	19.18	3.74	0.13	1,690
TOTAL	100.00	40.30	5.55	26.21	27.94	0.36	6,860

(b) 1/4" x 28m

Sp. Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb
- 1.30	1.51	2.60	4.65	36.55	56.20	0.53	13,170
1.30 - 1.40	42.83	6.75	4.64	35.23	53.38	0.53	12,120
1.40 - 1.50	7.63	21.94	4.51	33.21	40.34	0.51	9,820
1.50 - 1.60	6.48	31.93	3.40	28.92	35.75	0.52	8,590
1.60 - 1.70	5.09	39.64	3.01	24.33	33.02	0.55	7,380
1.70 - 1.80	3.52	47.96	3.17	21.49	27.38	0.56	6,250
+ 1.80	32.94	75.08	3.27	16.31	5.34	0.19	1,680
TOTAL	100.00	35.11	3.96	27.36	33.57	0.42	7,840

TABLE 5. (cont'd)

(c) 28m x 100 mesh

Sp. Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb
- 1.30	18.49	1.92	5.25	35.70	57.13	0.50	12,510
1.30 - 1.40	18.94	5.21	3.09	34.47	57.23	0.66	12,160
1.40 - 1.50	14.06	16.40	5.10	33.69	44.81	0.54	10,450
1.50 - 1.60	10.86	21.09	3.09	32.95	42.87	0.50	10,130
1.60 - 1.70	14.01	39.41	3.34	32.01	25.24	0.61	7,030
1.70 - 1.80	1.69	45.84	3.08	24.15	26.93	0.60	6,600
+ 1.80	21.95	73.08	1.72	18.81	6.39	0.38	1,550
TOTAL	100.00	28.28	3.51	30.47	37.74	0.53	8,620

COMPOSITE NO.:

HOLE: T-77-2

SEAM:

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS

(a) 3/4" x 1/4"

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	1.36	2.64	12,480	1.36	2.64	12,480	100.00	40.30	6,860
1.30 - 1.40	25.14	8.07	11,640	26.50	7.79	11,680	98.64	40.82	6,790
1.40 - 1.50	14.08	20.48	9,880	40.58	12.19	11,050	73.50	52.02	5,130
1.50 - 1.60	10.96	32.42	8,290	51.54	16.49	10,460	59.42	59.50	4,000
1.60 - 1.70	7.82	42.76	6,900	59.36	19.95	9,990	48.46	65.62	3,030
1.70 - 1.80	6.00	52.77	5,680	65.36	22.96	9,590	40.64	70.02	2,280
+ 1.80	34.64	73.01	1,690	100.00	40.30	6,860	34.64	73.01	1,690
TOTAL	100.00	40.30	6,860						

COMPOSITE NO:

HOLE: T-77-2

SEAM:

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS continued

(b) 3/4" x 28m (Reconstituted data)

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	1.42	2.62	12,810	1.42	2.62	12,810	100.00	38.00	7,300
1.30 - 1.40	33.01	7.31	11,920	34.43	7.12	11,960	98.58	38.51	7,220
1.40 - 1.50	11.21	20.92	9,860	45.64	10.51	11,440	65.57	54.21	4,850
1.50 - 1.60	8.96	32.26	8,390	54.60	14.08	10,940	54.36	61.08	3,820
1.60 - 1.70	6.61	41.69	7,060	61.21	17.06	10,520	45.40	66.76	2,920
1.70 - 1.80	4.90	51.23	5,860	66.11	19.59	10,170	38.79	71.04	2,220
+ 1.80	33.89	73.90	1,690	100.00	38.00	7,300	33.89	73.90	1,690
TOTAL	100.00	38.00							

COMPOSITE NO.

HOLE: T-77-2

SEAM:

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS continued

(c) 3/4" x 100 mesh (Reconstituted data)

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	2.15	2.36	12,700	2.15	2.36	12,700	100.00	37.46	7,350
1.30 - 1.40	32.41	7.26	11,930	34.56	6.96	11,980	97.85	38.24	7,240
1.40 - 1.50	11.33	19.90	9,890	45.89	10.15	11,460	65.44	53.58	4,920
1.50 - 1.60	9.04	31.69	8,480	54.93	13.70	10,970	54.11	60.63	3,880
1.60 - 1.70	6.93	41.49	7,060	61.86	16.81	10,530	45.07	66.43	2,960
1.70 - 1.80	4.76	50.50	5,870	66.62	19.22	10,200	38.14	70.96	2,220
+ 1.80	33.38	73.88	1,690	100.00	37.46	7,350	33.38	73.88	1,690
TOTAL	100.00	37.46	7,350						

COMPOSITE NO:
HOLE: T-77-6
SEAM: Main

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS continued

(b) 3/4" x 28m (Reconstituted data)

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	-	-	-	-	-	-	-	-	-
1.30 - 1.40	21.10	6.09	11,870	21.10	6.09	11,870	100.00	50.04	5,510
1.40 - 1.50	10.60	19.75	10,050	31.70	10.66	11,260	78.90	61.80	3,810
1.50 - 1.60	7.01	30.10	8,620	38.71	14.18	10,780	68.30	68.33	2,850
1.60 - 1.70	5.21	41.38	7,100	43.92	17.41	10,350	61.29	72.70	2,190
1.70 - 1.80	3.46	48.04	6,270	47.38	19.64	10,050	56.08	75.61	1,730
+ 1.80	52.62	77.42	1,430	100.00	50.04	5,510	52.62	77.42	1,430
TOTAL	100.00	50.04	5,510						

COMPOSITE NO.
HOLE: T-77-6
SEAM: Main

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS continued

(c) 3/4" x 100 mesh (Reconstituted data)

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	-	-	-	-	-	-	-	-	-
1.30 - 1.40	22.19	5.90	11,910	22.19	5.90	11,910	100.00	49.33	5,630
1.40 - 1.50	10.46	19.68	10,070	32.65	10.31	11,320	77.81	61.72	4,830
1.50 - 1.60	6.97	29.81	8,660	39.62	13.74	10,850	67.35	68.25	2,870
1.60 - 1.70	5.12	41.19	7,130	44.74	16.89	10,430	60.38	72.68	2,200
1.70 - 1.80	3.42	47.89	6,290	48.16	19.09	10,130	55.26	75.60	1,740
+ 1.80	51.84	77.43	1,440	100.00	49.33	5,630	51.84	77.43	1,440
TOTAL	100.00	49.33	5,630						

COMPOSITE:

HOLE: T-77-2

SEAM:

TABLE 7 CONTINUOUS FROTH FLOTATION TEST

Test Conditions:

Wt. % Solids in Pulp	10
Reagents	MIBC/Kerosene (Collector/Frother)
Reagent Composition	3/1
Reagent Consumption	1.05 lb./ton
Conditioning Time	

a. 28 mesh x 0

Time, Seconds	Wt.%	Ash%	Cumulative Wt.%	Cumulative Ash %
30	14.17	22.18	14.17	22.18
30 - 60	4.17	31.40	18.34	24.28
60 - 90	2.96	35.27	21.30	25.80
Tails	78.70	40.04	100.00	37.01
TOTAL	100.00	37.01		

Proximate Analysis of Froth for 1 min. Flotation:

Ash %	24.65
RM %	3.51
VM %	25.96
FC %	45.88
S %	0.40
BTU/lb.	9,610

COMPOSITE:

HOLE NO: T-77-2

SEAM:

TABLE 7

b. 100 mesh x 0

Time, Seconds	Wt.%	Ash%	Cumulative Wt.%	Cumulative Ash %
30	18.16	19.01	18.16	19.01
30 - 60	5.85	40.75	24.01	24.31
60 - 90	3.37	47.13	27.38	27.12
Tails	72.62	52.83	100.00	45.79
TOTAL	100.00	45.79		

Proximate Analysis of Froth for 1 min. Flotation:

Ash %	23.31
RM %	3.41
VM %	25.75
FC %	47.53
S %	0.64
BTU/lb.	9,850

COMPOSITE:

HOLE: T-77-2

SEAM:

TABLE 8 CLEAN COAL COMPOSITE CALCULATIONS

A. +1/4" Floats at S.G. 1.4, 1.5, 1.6, 1.7 plus 100% of raw 1/4" x 0

COMPOSITION + 1/4: at 1.4: 21.30% at 1.5: 29.30% at 1.6: 34.49% at 1.7: 37.74%

1/4" x 0 raw: 78.70% 70.70 65.51% 62.26

TOTAL YIELD	62.86 %	69.97 %	75.51 %	79.46 %
PROXIMATE ANALYSIS				
Ash	29.20 %	28.32 %	28.61 %	29.32 %
RM	5.36 %	5.48 %	5.50 %	5.46 %
VM	29.27 %	29.27 %	29.12 %	28.79 %
FC	36.17 %	36.93 %	36.77 %	36.43 %
S	0.49 %	0.48 %	0.48 %	0.48 %
BTU/lb.	8,590	8,720	8,680	8,600

COMPANY CYPRUS ANVIL MINING CORPORATION

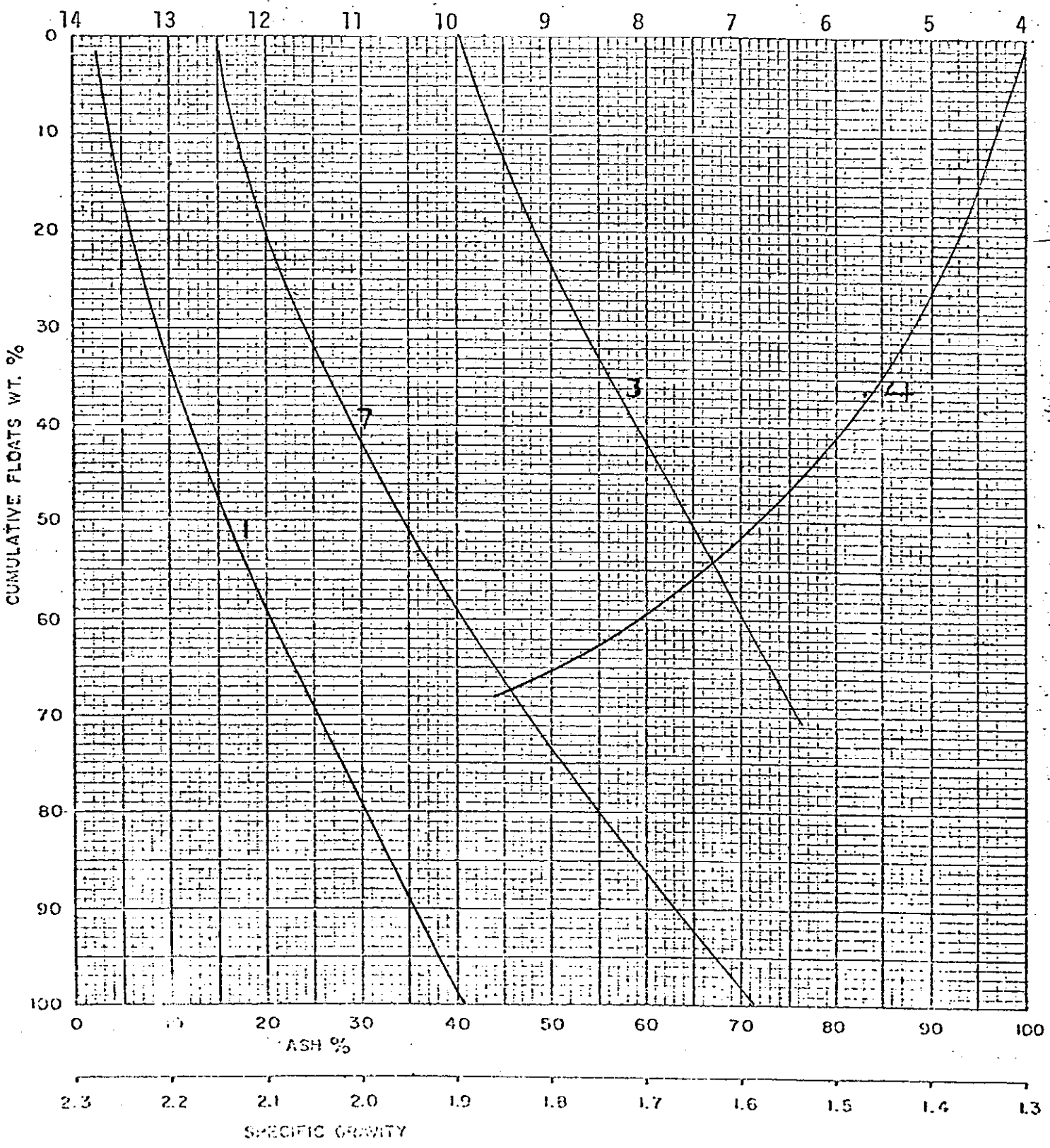
SAMPLE T-77-2

Size 3/4" x 1/4"

1 - FLOATS
2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU

WASHABILITY CURVES

1,000 BTU/lb.



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CYCLONE ENGINEERING SALES LTD.

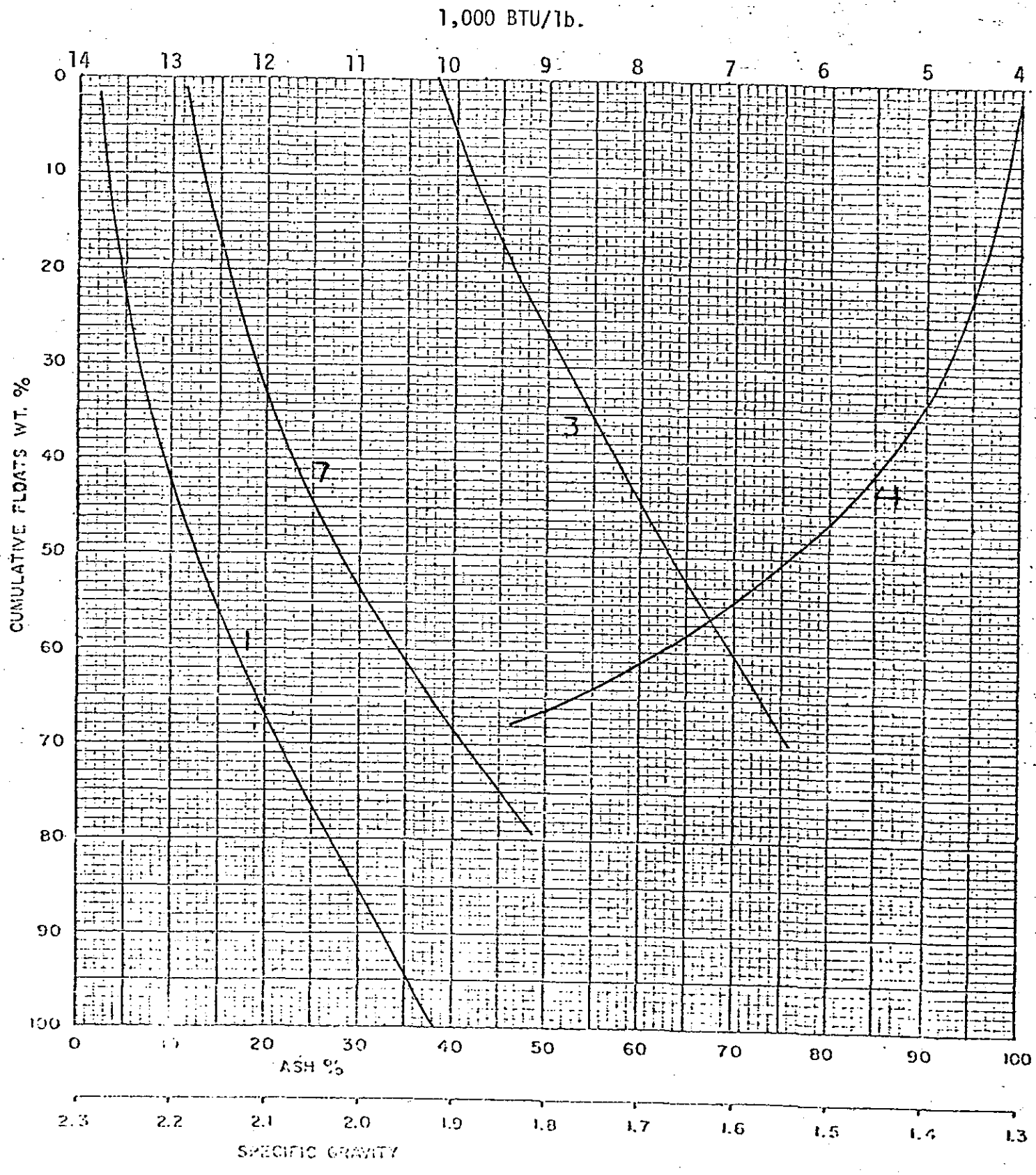
COMPANY CYPRUS ANVIL MINING CORPORATION

SAMPLE T-77-2

Size 3/4" x 28m

1 - FLOATS
2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU

WASHABILITY CURVES



DATE

CYCLONE ENGINEERING SALES LTD

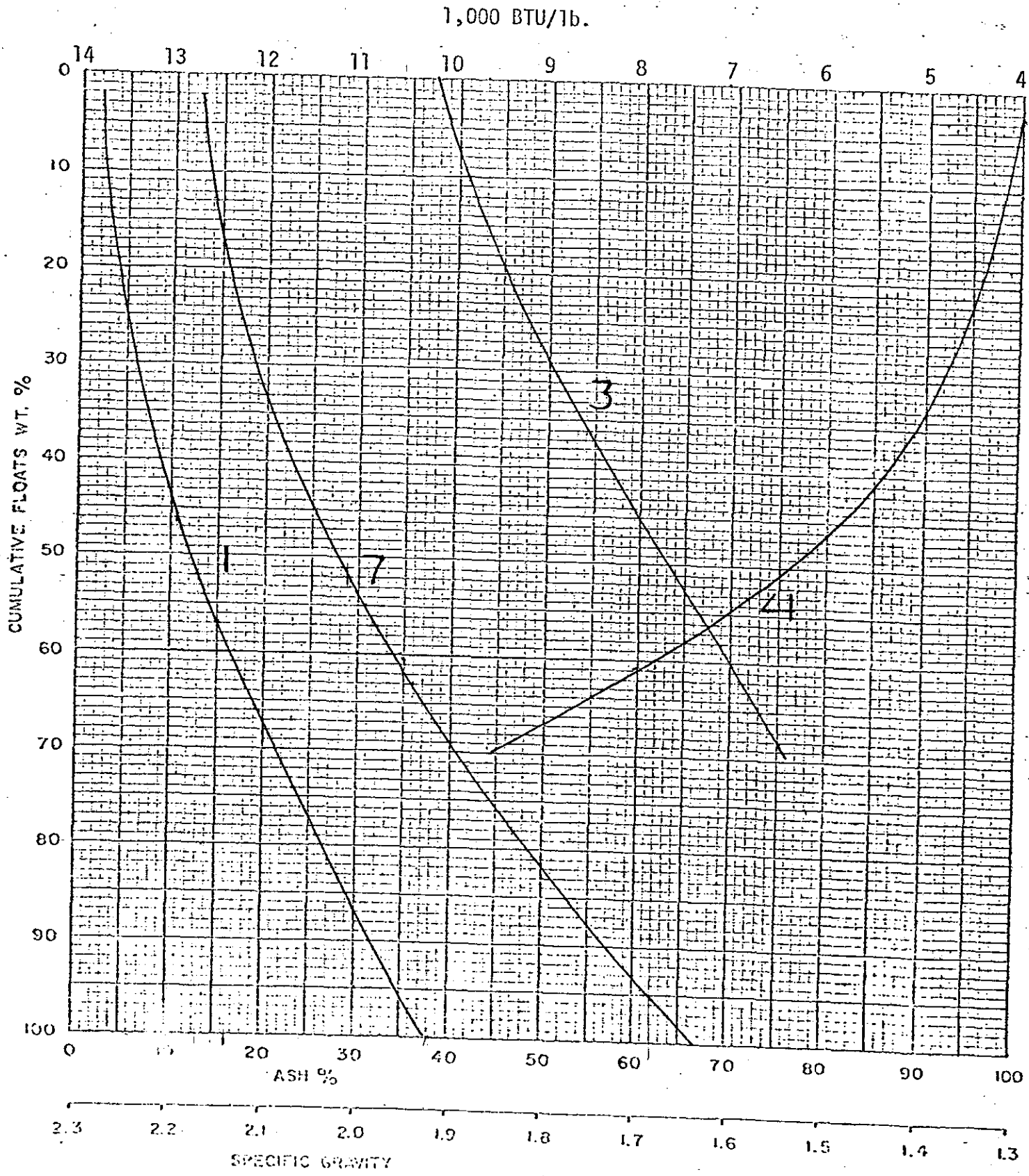
COMPANY CYPRUS ANVIL MINING CORPORATION

SAMPLE T-77-2

Size 3/4" x 100m

WASHABILITY CURVES

2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU



DATE

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:
HOLE NO.: T-77-3
SEAM: Main

TABLE 1 COMPONENTS AND ANALYSIS (a.d.b.)

	Ash%	R.M.%	V.M.%	F.C.%	B.T.U./lb.
Number: 1 Footage: 56.54 - 59.44 Weight: 28.0 lbs.	42.91	6.35	23.31	27.43	6,700
Number: 2 Footage: 59.44 - 64.31 Weight: 38.0 lbs.	35.12	6.49	25.76	32.63	7,600
Number: 3 Footage: 64.31 - 66.45 Weight: 17.0 lbs.	20.61	6.63	31.79	40.97	10,000
Number: 4 Footage: 66.45 - 70.71 Weight: 39.50 lbs.	46.55	6.31	21.54	25.60	6,040
Number: 5. Footage: 70.71 - 73.15 Weight: 23.50 lbs.	42.89	4.62	24.25	28.24	6,720
Number: 6 Footage: 73.15 - 77.42 Weight: 32.50 lbs.	27.29	6.10	29.51	37.10	8,920

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:
HOLE NO.: T-77-3
SEAM: Main

TABLE 2

ANALYSIS OF COMPOSITE HEAD SAMPLE (a.d.b.)

Ash %	36.54	35.81	38.73
R.M.%	5.80		
V.M.%	26.83		
F.C.%	30.83		
S. %	0.42	.41	
B.T.U./lb	7,540	7389	7992
H.G.I.	47		
Equilibrium Moisture		8.0	

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:
HOLE NO.: T-77-3
SEAM: Main

TABLE 3

SIZE CONSIST OF COMPOSITE HEAD SAMPLE

Size	Wt% Fractional	Cumulative
3/4" x ¼"	51.53	51.53
¼" x 28m	40.31	91.84
28m x 100m	3.75	95.59
100m x 0	4.41	100.00
TOTAL	100.00	

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:

HOLE NO.: T-77-3

SEAM: Main

TABLE 4 ANALYSIS OF SIZE FRACTIONS

(a)

	3/4" x 1/4"	1/4" x 0	Total
Ash%	40.75	32.54	36.77
R.M.%	5.37	5.89	5.62
V.M.%	26.15	25.23	25.70
F.C.%	27.73	36.34	31.91
S. %	0.44	0.40	0.42
B.T.U./lb.	7,050	7,930	7,480

(b)

	1/4" x 28m	28m x 100m	100m x 0	Reconstituted 1/4" x 0
Ash%	33.81	21.71	50.71	34.41
R.M.%	6.06	2.36	4.16	5.60
V.M.%	28.03	30.09	21.60	27.60
F.C.%	32.10	45.84	23.53	32.39
S.%	0.37	0.52	0.37	0.38
B.T.U./lb.	7,940	10,000	5,590	7,930

COMPOSITE NO.:
HOLE NO.: T-77-3
SEAM: Main

TABLE 5. FLOAT-SINK AND ANALYSIS OF SIZE FRACTIONS
(Fractional Basis)

(a) 3/4" x 1/4"

Sp.Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb
- 1.30	2.98	3.37	6.44	37.95	52.24		12,430
1.30 - 1.40	- 30.04	8.35	6.24	34.83	50.58		11,600
1.40 - 1.50	12.14	23.12	5.71	29.13	42.04		9,690
1.50 - 1.60	8.18	34.39	5.07	25.88	34.66		8,120
1.60 - 1.70	5.96	43.36	4.57	22.91	29.16		6,770
1.70 - 1.80	5.29	55.17	3.73	18.91	22.19		5,190
+ 1.80	35.41	77.05	3.94	14.35	4.66		1,860
TOTAL	100.00	41.01	5.04	24.69	29.26		7,030

(b) 1/4" x 28m

Sp. Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb
- 1.30	3.26	2.18	5.48	37.85	55.49		12,720
1.30 - 1.40	43.26	4.86	6.04	36.51	52.59		12,150
1.40 - 1.50	9.10	20.14	5.04	31.11	43.71		9,920
1.50 - 1.60	4.00	30.06	4.50	29.22	36.22		8,720
1.60 - 1.70	4.27	38.53	4.17	26.32	30.98		7,410
1.70 - 1.80	2.67	46.12	4.14	24.96	24.78		6,390
+ 1.80	33.44	74.79	4.24	15.11	5.86		1,870
TOTAL	100.00	33.10	5.13	27.86	33.91		8,030

TABLE 5. (cont'd)

(c) 28m x 100 mesh

Sp. Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb
- 1.30	12.22	2.19	5.67	35.89	56.25		12,450
1.30 - 1.40	31.13	5.39	5.32	33.52	55.77		11,900
1.40 - 1.50	21.29	12.64	5.37	30.52	51.47		10,920
1.50 - 1.60	6.21	13.85	5.20	31.61	49.34		10,810
1.60 - 1.70	9.29	16.80	5.12	31.70	49.31		10,640
1.70 - 1.80	1.64	44.55	3.79	24.85	26.81		6,590
+ 1.80	18.22	76.62	2.43	14.72	6.73		2,270
TOTAL	100.00	21.75	4.80	29.31	44.42		9,730

COMPOSITE NO.:

HOLE:: T-77-3

SEAM: Main

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS

(a) 3/4" x 1/4"

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	2.98	3.37	12,430	2.98	3.37	12,430	100.00	41.01	7,03
1.30 - 1.40	30.04	8.35	11,600	33.02	7.90	11,670	97.02	42.17	6,87
1.40 - 1.50	12.14	23.12	9,690	45.16	11.99	11,140	66.98	57.34	4,74
1.50 - 1.60	8.18	34.39	8,120	53.34	15.42	10,680	54.84	64.91	3,65
1.60 - 1.70	5.96	43.36	6,770	59.30	18.23	10,290	46.66	70.36	2,86
1.70 - 1.80	5.29	55.17	5,190	64.59	21.26	9,870	40.70	74.21	2,29
+ 1.80	35.41	77.05	1,860	100.00	41.01	7,030	35.41	77.05	1,86
TOTAL	100.00	41.01	7,030						

COMPOSITE NO:
HOLE: T-77-3
SEAM: Main

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS continued

(b) 3/4" x 28m (Reconstituted data)

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	3.10	2.82	12,560	3.10	2.82	12,560	100.00	37.54	7,470
1.30 - 1.40	35.85	6.50	11,890	38.95	6.21	11,940	96.90	38.65	7,310
1.40 - 1.50	10.81	22.02	9,780	49.76	9.64	11,470	61.05	57.53	4,620
1.50 - 1.60	6.34	33.19	8,290	56.10	12.30	11,110	50.24	65.17	3,510
1.60 - 1.70	5.21	41.63	7,000	61.31	14.80	10,760	43.90	69.79	2,820
1.70 - 1.80	4.14	52.61	5,530	65.45	17.19	10,430	38.69	73.58	2,250
+ 1.80	34.55	76.09	1,860	100.00	37.54	7,470	34.55	76.09	1,860
TOTAL	100.00	37.54	7,470						

COMPOSITE NO.

HOLE: T-77-3

SEAM: Main

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS continued

(c) 3/4" x 100 mesh (Reconstituted data)

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	3.46	2.73	12,540	3.46	2.73	12,540	100.00	36.93	7,560
1.30 - 1.40	35.66	6.46	11,890	39.12	6.13	11,950	96.54	38.15	7,380
1.40 - 1.50	11.22	21.32	9,870	50.34	9.52	11,480	60.88	56.71	4,740
1.50 - 1.60	6.33	32.46	8,390	56.67	12.08	11,140	49.66	64.71	3,580
1.60 - 1.70	5.37	39.97	7,240	62.04	14.49	10,800	43.33	69.42	2,870
1.70 - 1.80	4.04	52.49	5,550	66.08	16.82	10,480	37.96	73.59	2,260
+ 1.80	33.92	76.10	1,870	100.00	36.93	7,560	33.92	76.10	1,870
TOTAL	100.00	36.93	7,560						

COMPANY CYPRUS ANVIL MINING CORPORATION

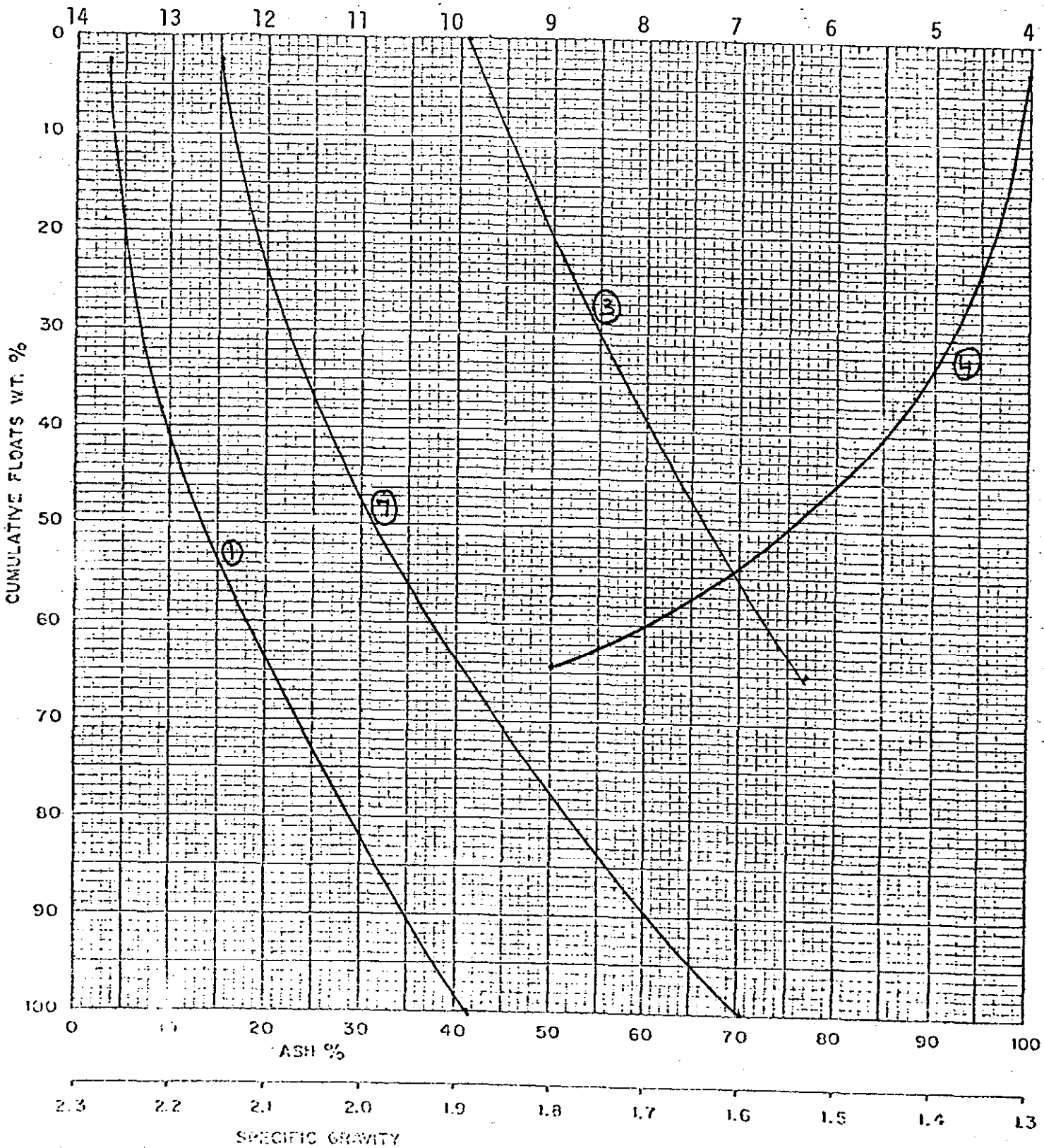
SAMPLE T 77-3

Size 3 1/4" x 1/4"

WASHABILITY CURVES

2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU

1,000 BTU/lb.



DATE

CYCLONE ENGINEERING SALES LTD.

COMPANY CYPRUS ANVIL MINING CORPORATION

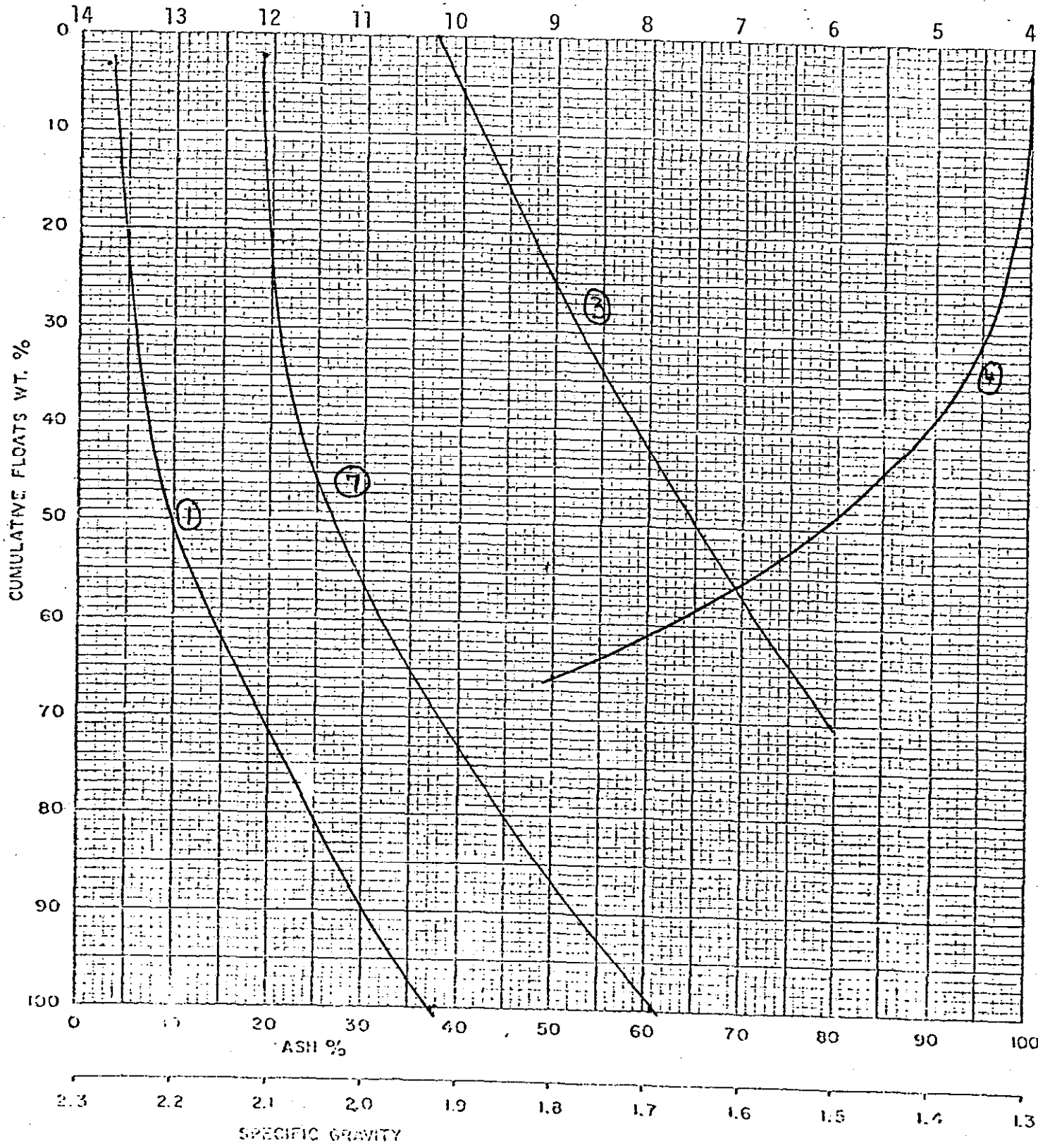
SAMPLE T-77-3

Size 3/4" x 28m.

WASHABILITY CURVES

2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU

1,000 BTU/lb.



DATE

CYCLONE ENGINEERING SALES LTD.
EDMONTON ALBERTA CANADA

COMPANY CYPRUS ANVIL MINING CORPORATION

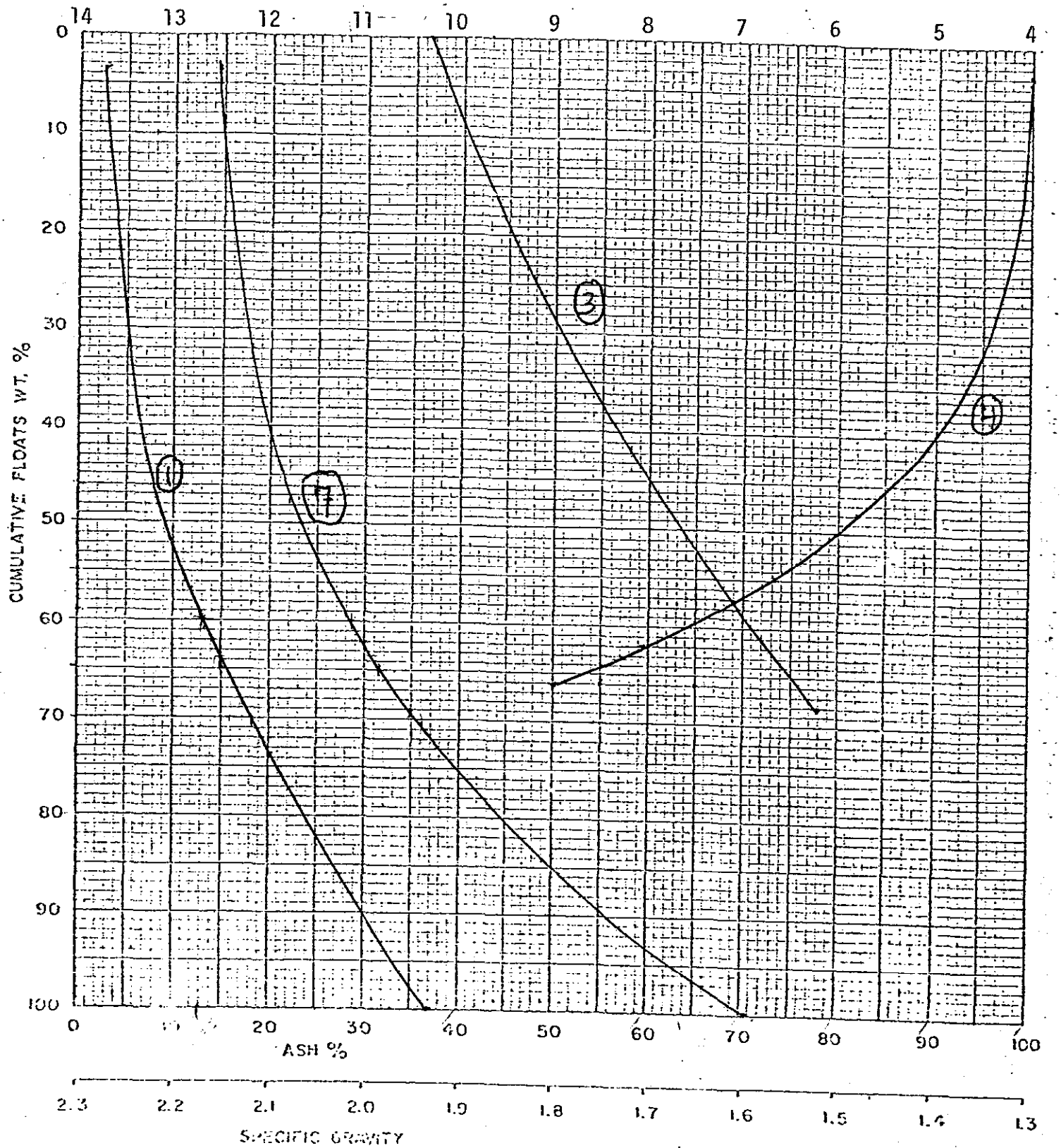
SAMPLE T-77-3

Size 3/4" x 100m

WASHABILITY CURVES

2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU

1,000 BTU/lb.



DATE

CYCLONE ENGINEERING SALES LTD.
EDMONTON ALBERTA CANADA

CYCLONE ENGINEERING SALES LTD.

SEPARATION OF BULK MATERIALS

Manufacturing, Engineering, Testing Services

9751 - 51 Avenue
Edmonton, Alberta T6E 4Z5
Telephone: (403) 436-1385

Cable Address:
Cyclone, Edmonton
Telex: 037-3793

Ref: S1-232

October 11, 1977

Mr. Tom Adamson
Cyprus Anvil Mining Corp.
330, 335 Burrard Street
Vancouver, B. C.
V6C 2G8

Dear Sir:

This is to confirm my conversation with Mr. G. Simpson in connection with the size consist data on your samples #4 and #5 from the main seam.

These two samples were actually crushed to a top size of 3/8". The analytical data are therefore for the coal of 3/8" x 0. Judging from the hardness of the coal, these two samples should have similar size consist with slightly higher fines when compared with the other samples from the main seam, if they had been reduced to a top size of 3/4".

I deeply apologize for the wrong treatment of these two samples.

Yours truly,

CYCLONE ENGINEERING SALES LTD.

Per: _____
B. Y. H. Wong

BYHW/ejr

CYPRUS ANVIL MINING CORPORATION

Analytical Report
for
Core Testing

PROJECT: Tulameen

DRILL HOLE #: T77-4

AREA:

SEAM: Main

DATE SAMPLED:

LAB COMPOSITE #: T-77-4

DATE ANALYSED:

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:

HOLE NO.: T-77-A

SEAM: MAIN

TABLE 1 COMPONENTS AND ANALYSIS (a.d.b.)

		Ash%	R.M.%	V.M.%	F.C.%	B.T.U./lb.
Number: 1 Footage: 2.59m Weight: 22 lbs.		43.68	4.95	21.43	29.94	6,670
Number: 2 Footage: 3.50m Weight: 30 1/2 lbs.		32.04	8.25	24.64	35.07	8,140
Number: 3 Footage: 2.9m Weight: 25 lbs.		38.74	6.70	23.84	30.72	7,510
Number: 4 Footage: 3.35m Weight: 31 lbs.		46.68	6.57	20.95	25.80	5,760
Number: 5 Footage: 2.29m Weight: 16 lbs.		33.35	5.36	26.48	34.81	8,120

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:
HOLE NO.: T-77-4
SEAM: Main

TABLE 2

ANALYSIS OF COMPOSITE HEAD SAMPLE (a.d.b.)

Ash %	41.14
R.M.%	6.02
V.M.%	25.41
F.C.%	27.43
S. %	0.41
B.T.U./lb	6,880
H.G.I.	59
Equilibrium Moisture	7.8

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:
HOLE NO.: T-77-4
SEAM: Main

TABLE 3

SIZE CONSIST OF COMPOSITE HEAD SAMPLE

Size	Wt% Fractional	Cumulative
3/4" x ¼"	15.56	15.56
¼" x 28m	65.18	80.74
28m x 100m	7.26	88.00
100m x 0	12.00	100.00
TOTAL	100.00	

N.B. - ACTUALLY CRUSHED TO 3/8" TOP SIZE BY MISTAKE SAME FOR T77-5

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:

HOLE NO.: T-77-4

SEAM: Main

TABLE 4 ANALYSIS OF SIZE FRACTIONS

(a)

	3/4" x 1/4"	1/4" x 0	Total
Ash%	48.47	38.54	40.08
R.M.%	5.14	6.48	6.27
V.M.%	22.10	25.54	25.00
F.C.%	24.29	29.44	28.65
S. %	0.32	0.42	0.40
B.T.U./lb.	6,020	7,200	7,020

(b)

	1/4" x 28m	28m x 100m	100m x 0	Reconstituted 1/4" x 0
Ash%	40.91	24.17	40.65	39.43
R.M.%	5.99	2.12	2.79	5.20
V.M.%	24.03	30.54	26.01	24.87
F.C.%	29.07	43.17	30.55	30.50
S.%	0.46	0.48	0.32	0.44
B.T.U./lb.	6,880	9,820	7,390	7,200

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:
HOLE NO.: T-77-4
SEAM: Main

TABLE 5. FLOAT-SINK AND ANALYSIS OF SIZE FRACTIONS
(Fractional Basis)

(a) 3/4" x 1/4"

Sp.Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb.
- 1.30	--	--	--	--	--	--	--
1.30 - 1.40	17.97	8.04	7.85	33.87	50.24		11,490
1.40 - 1.50	11.62	22.73	6.62	28.85	41.80		9,600
1.50 - 1.60	8.45	33.66	5.74	25.94	34.66		8,060
1.60 - 1.70	8.95	42.59	5.17	22.19	30.05		6,750
1.70 - 1.80	7.37	51.57	5.21	20.46	22.76		5,460
+ 1.80	45.74	76.02	3.51	14.34	6.13		2,150
TOTAL	100.00	49.31	5.11	21.65	23.93	--	5,840

(b) 1/4" x 28m

Sp. Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb
- 1.30	--	--	--	--	--	--	--
1.30 - 1.40	31.67	5.88	6.74	33.19	54.19		12,000
1.40 - 1.50	9.66	21.55	5.61	30.53	42.31		9,890
1.50 - 1.60	5.87	31.58	5.26	27.29	35.87		8,480
1.60 - 1.70	4.93	39.89	5.38	23.35	31.38		7,160
1.70 - 1.80	4.52	46.43	5.73	21.17	26.67		6,420
+ 1.80	43.35	73.23	4.27	17.96	4.54		2,300
TOTAL	100.00	41.61	5.36	24.96	28.07	--	6,890

TABLE 5. (cont'd)

(c) 28m x 100 mesh

Sp. Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb
- 1.30	--	--	--	--	--	--	--
1.30 - 1.40	60.19	3.12	4.72	34.10	58.06		12,540
1.40 - 1.50	4.39	11.50	5.61	33.73	49.16		11,160
1.50 - 1.60	6.52	15.63	4.95	32.19	47.23		10,680
1.60 - 1.70	4.82	30.00	5.10	29.76	35.14		8,510
1.70 - 1.80	2.35	45.08	4.42	22.69	27.81		6,140
+ 1.80	21.73	75.69	3.00	13.99	7.32		2,290
TOTAL	100.00	22.35	4.41	29.11	44.13	--	9,730

COMPOSITE NO.:

HOLE: T-77-4

SEAM: Main

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS

(a) 3/4" x 1/4"

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	--	--	--	--	--	--	--	--	--
1.30 - 1.40	17.87	8.04	11,490	17.87	8.04	11,490	100.00	49.31	5,840
1.40 - 1.50	11.62	22.73	9,600	29.49	13.83	10,750	82.13	58.29	4,610
1.50 - 1.60	8.45	33.66	8,060	37.94	18.25	10,150	70.51	64.14	3,790
1.60 - 1.70	8.95	42.59	6,750	46.89	22.89	9,500	62.06	68.30	3,210
1.70 - 1.80	7.37	51.57	5,460	54.26	26.79	8,950	53.11	72.63	2,610
+ 1.80	45.74	76.02	2,150	100.00	49.31	5,840	45.74	76.02	2,150
TOTAL	100.00	49.31	5,840						

COMPOSITE NO:

HOLE: T-77-4

SEAM: Main

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS continued

(b) 3/4" x 28m (Reconstituted data)

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	--	--	--	--	--	--	--	--	--
1.30 - 1.40	29.0	6.14	11,930	29.0	6.14	11,930	100.00	43.09	6,680
1.40 - 1.50	10.04	21.81	9,830	39.04	10.17	11,390	71.00	58.19	4,530
1.50 - 1.60	6.37	32.11	8,370	45.41	13.25	10,970	60.96	64.18	3,660
1.60 - 1.70	5.71	40.71	7,040	51.12	16.32	10,530	54.59	67.92	3,110
1.70 - 1.80	5.07	47.87	6,150	56.19	19.16	10,130	48.88	71.10	2,650
+ 1.80	43.81	73.79	2,250	100.00	43.09	6,680	43.81	73.79	2,250
TOTAL	100.00	43.09	6,680						

COMPOSITE NO.

HOLE: T-77-4

SEAM: Main

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS continued

(c) 3/4" x 100 mesh (Reconstituted data)

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	--	--	--	--	--	--	--	--	--
1.30 - 1.40	31.58	5.66	12,030	31.58	5.66	12,030	100.00	41.38	6,940
1.40 - 1.50	9.57	21.42	9,880	41.15	9.33	11,530	68.42	57.87	4,590
1.50 - 1.60	6.38	30.72	8,570	47.53	12.20	11,130	58.85	63.79	3,720
1.60 - 1.70	5.64	39.95	7,140	53.17	15.14	10,710	52.47	67.82	3,140
1.70 - 1.80	4.84	47.76	6,150	58.01	17.86	10,330	46.83	71.17	2,650
+ 1.80	41.99	73.87	2,250	100.00	41.38	6,940	41.99	73.87	2,250
TOTAL	100.00	41.38	6,940						

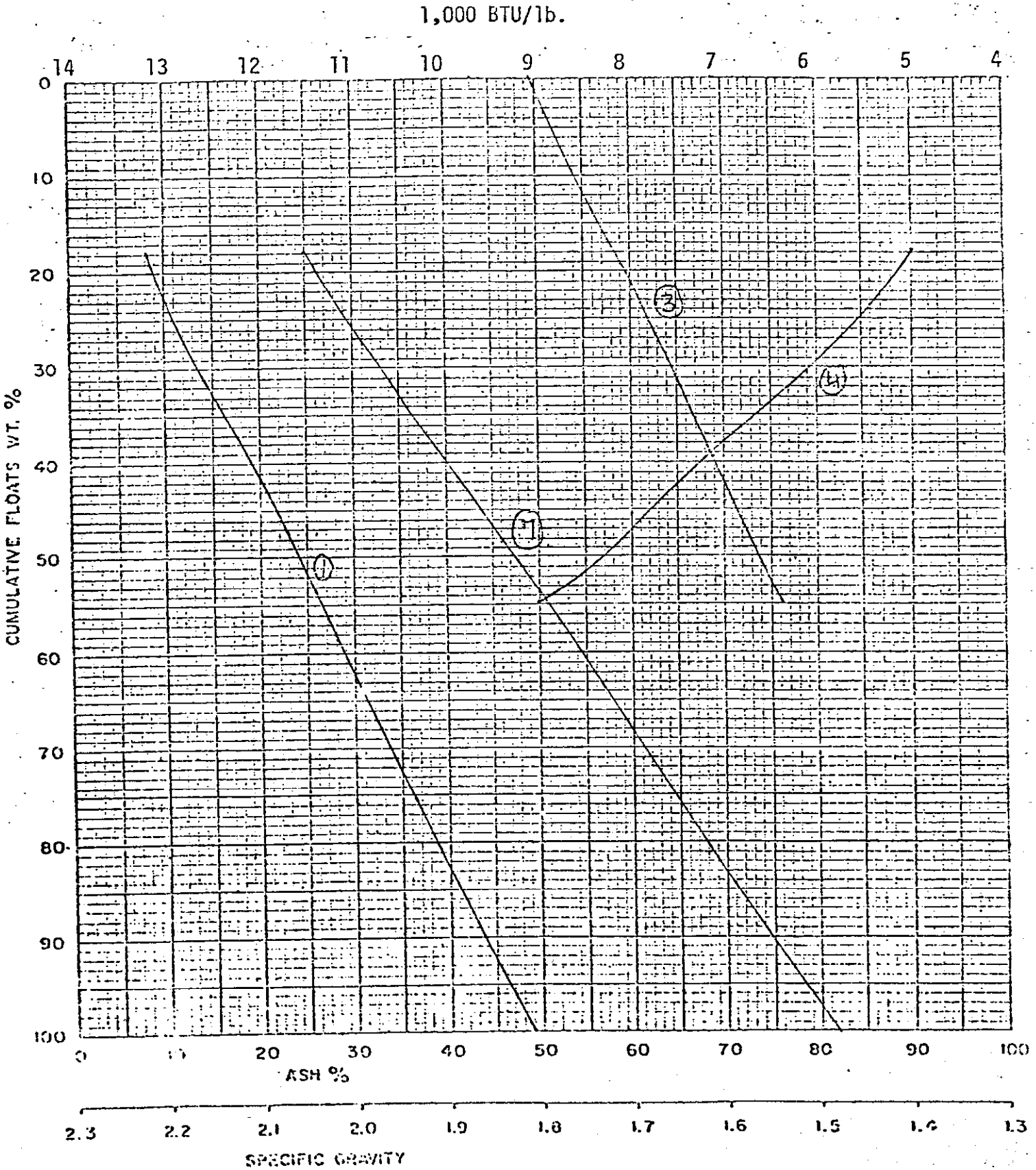
COMPANY CYPRUS ANVIL MINING CORPORATION

SAMPLE T 77-4 MAIN SEAM

Size 3/4" x 1/4"

WASHABILITY CURVES

2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU



DATE

CYCLONE ENGINEERING SALES LTD.

COMPANY CYPRUS ANVIL MINING CORPORATION

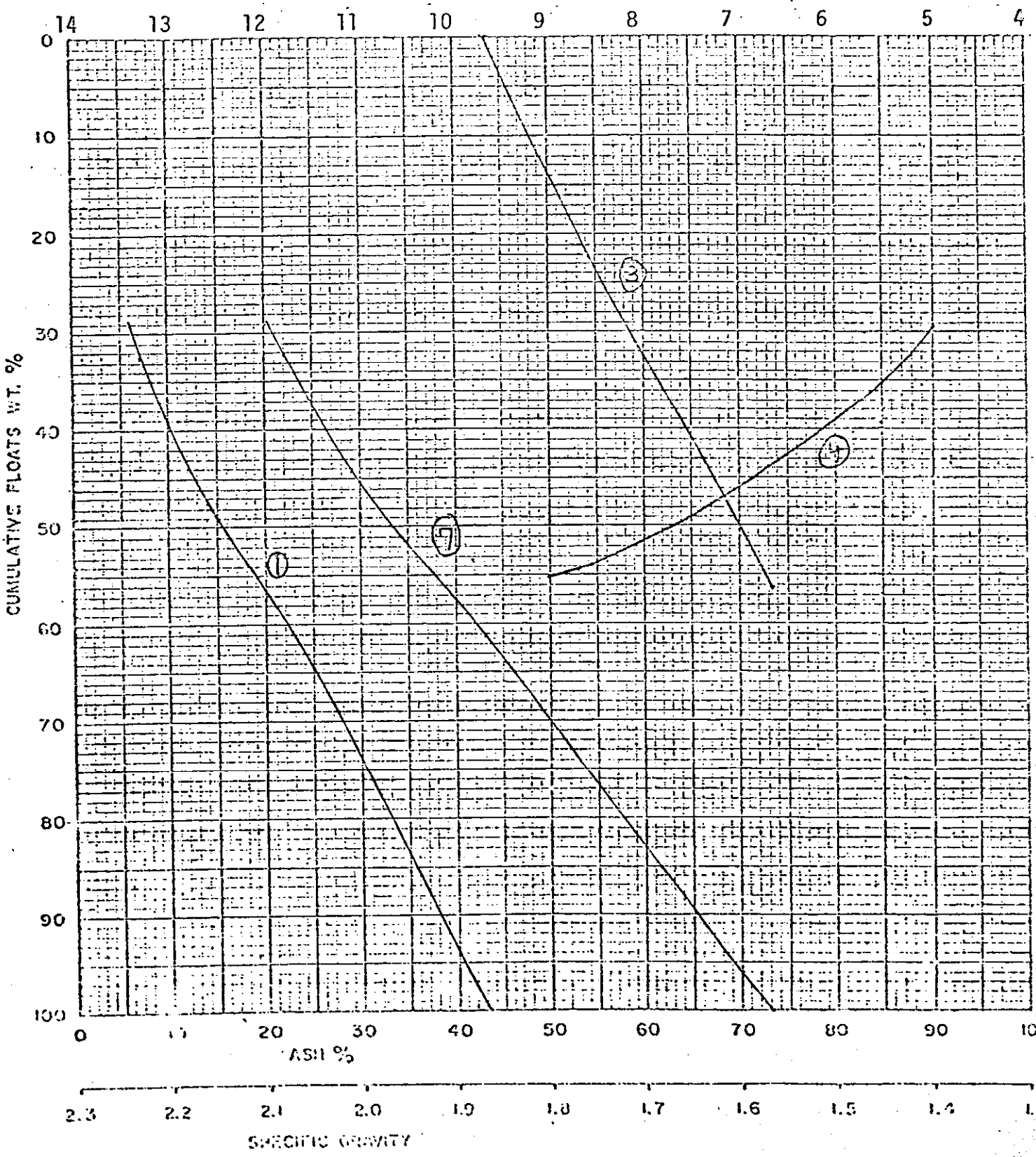
SAMPLE T 77 - 4 MAIN SEAM

Size 3/4" x 28m.

WASHABILITY CURVES

2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU

1,000 BTU/lb.



DATE

CYCLONE ENGINEERING SALES LTD.

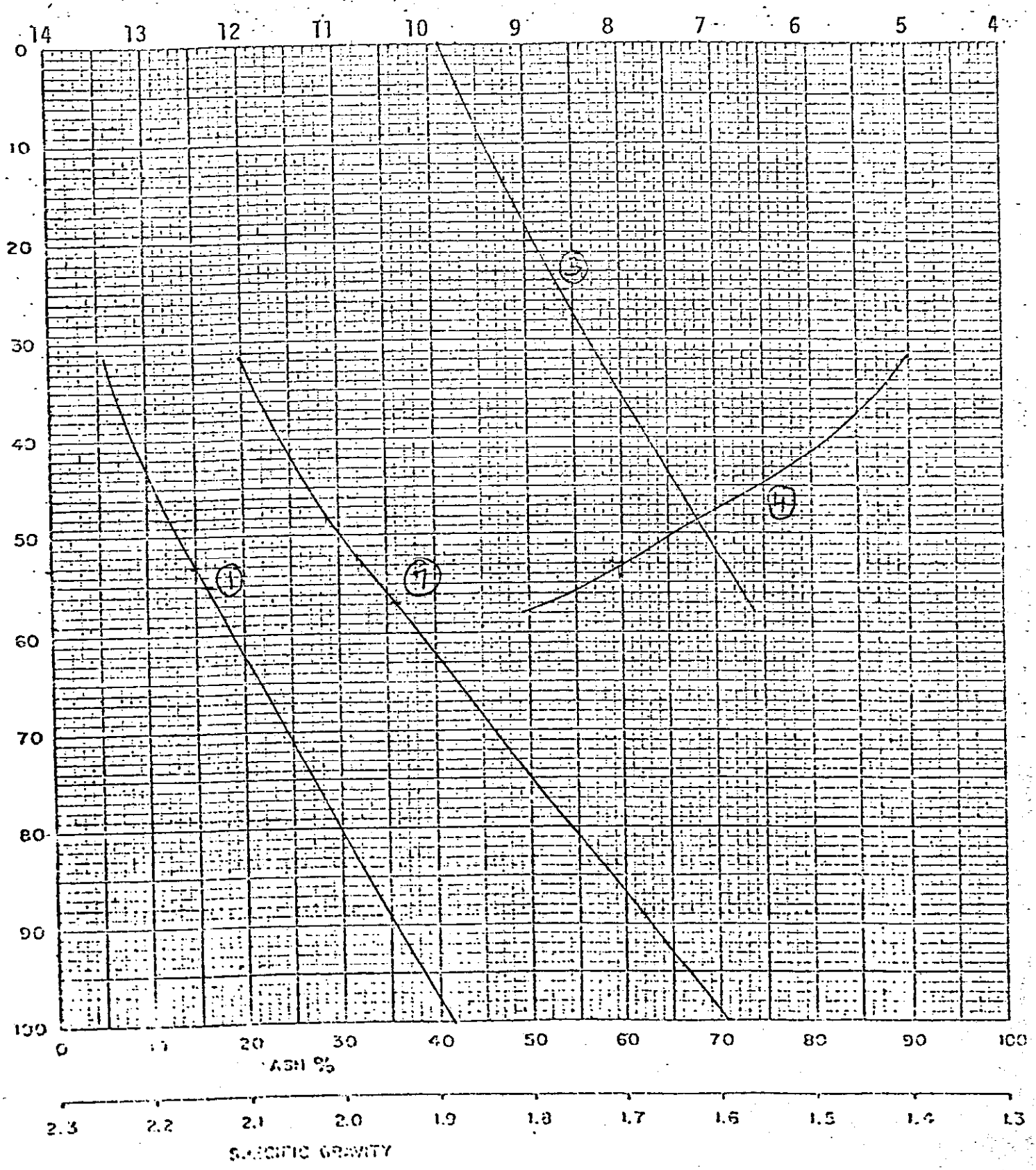
COMPANY CYPRUS ANVIL MINING CORPORATION

SAMPLE T 77-4 MAIN SEAM.

Size 3/4" X 100m

WASHABILITY CURVES

2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU



CYPRUS ANVIL MINING CORPORATION

Analytical Report
for
Core Testing

PROJECT: Tulameen

DRILL HOLE #: T-77-5

AREA:

SEAM: Main

DATE SAMPLED:

LAB COMPOSITE #: T-77-5

DATE ANALYSED: October 5, 1977

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:
HOLE NO.: T-77-5
SEAM: Main

TABLE 1 COMPONENTS AND ANALYSIS (a.d.b.)

	Ash%	R.M.%	V.M.%	F.C.%	B.T.U./lb.
Number: 1 Footage: 2.59m Weight: 18 lbs.	32.50	6.10	29.33	32.07	8,010
Number: 2 Footage: 2.13m Weight: 19 lbs.	56.34	3.05	31.10	9.51	4,680
Number: 3 Footage: 2.74m Weight: 21 lbs.	31.49	7.70	26.16	34.65	8,020
Number: 4 Footage: 3.51m Weight: 30 lbs.	39.20	8.11	24.54	28.15	6,890
Number: 5 Footage: 2.90m Weight: 28 1/2 lbs.	48.21	6.97	24.52	20.30	5,410
Number: 6 Footage: 3.04m Weight: 31 lbs.	45.95	6.62	22.30	25.13	6,110
Number: 7 Footage: 3.51m Weight: 28 lbs.	32.67	6.47	29.24	31.62	8,020

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:

HOLE NO.: T-77-5

SEAM: Main

TABLE 2

ANALYSIS OF COMPOSITE HEAD SAMPLE (a.d.b.)

Ash %	41.17	40.35
R.M.%	6.41	
V.M.%	24.81	
F.C.%	27.61	
S. %	0.42	.41
B.T.U./lb	6,640	6507
H.G.I.	62	
Equilibrium Moisture	8.3	

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:
HOLE NO.: T-77-5
SEAM: Main

TABLE 3

SIZE CONSIST OF COMPOSITE HEAD SAMPLE

Size	Wt% Fractional	Cumulative
3/4" x ¼"	28.27	28.27
¼" x 28m	56.55	84.82
28m x 100m	6.88	91.70
100m x 0	8.30	100.00
TOTAL	100.00	

COMPOSITE NO.:
HOLE NO.: T-77-5
SEAM: Main

TABLE 4 ANALYSIS OF SIZE FRACTIONS

(a)

	3/4" x 1/4"	1/4" x 0	Total
Ash%	44.90	37.35	39.48
R.M.%	5.85	6.73	6.48
V.M.%	23.99	26.03	25.45
F.C.%	25.26	29.89	28.59
S. %	0.37	0.42	0.41
B.T.U./lb.	6,300	7,070	6,850

(b)

	1/4" x 28m	28m x 100m	100m x 0	Reconstituted 1/4" x 0
Ash%	38.61	27.76	40.37	37.77
R.M.%	6.80	2.32	2.61	5.89
V.M.%	25.95	29.78	27.56	26.50
F.C.%	28.64	40.14	29.46	29.84
S.%	0.40	0.54	0.32	0.40
B.T.U./lb.	6,930	9,080	7,270	7,170

COMPOSITE NO.:

HOLE NO.: T-77-5

SEAM: Main

TABLE 5. FLOAT-SINK AND ANALYSIS OF SIZE FRACTIONS

(Fractional Basis)

(a) 3/4" x 1/4"

Sp.Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb.
- 1.30	--	--	--	--	--	--	--
1.30 - 1.40	22.02	7.65	8.14	35.20	49.01	--	11,460
1.40 - 1.50	10.85	20.02	6.77	32.44	40.77	--	9,680
1.50 - 1.60	8.94	29.87	6.37	30.89	32.87	--	8,320
1.60 - 1.70	7.73	40.74	5.85	23.89	29.52	--	6,840
1.70 - 1.80	5.88	49.13	4.89	22.01	23.97	--	5,590
+ 1.80	44.58	73.39	4.50	18.16	3.95	--	1,860
TOTAL	100.00	45.28	5.84	25.27	23.61	--	6,000

(b) 1/4" x 28m

Sp. Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb
- 1.30	--	--	--	--	--	--	--
1.30 - 1.40	35.77	5.18	7.72	34.63	52.47	--	11,790
1.40 - 1.50	7.97	20.16	5.41	32.62	41.81	--	9,990
1.50 - 1.60	6.45	30.05	5.31	27.31	37.33	--	8,600
1.60 - 1.70	4.06	38.30	5.47	24.72	31.51	--	7,230
1.70 - 1.80	3.48	46.17	5.92	21.95	25.96	--	6,100
+ 1.80	42.27	73.78	4.62	17.41	4.19	--	2,180
TOTAL	100.00	39.75	5.92	25.87	28.46	--	6,700

TABLE 5. (cont'd)

(c) 28m x 100 mesh

Sp. Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb
- 1.30	--	--	--	--	--	--	--
1.30 - 1.40	38.56	5.78	5.81	34.23	54.81	--	11,820
1.40 - 1.50	15.78	10.01	5.64	32.95	51.40	--	11,310
1.50 - 1.60	14.25	11.15	5.24	32.58	51.03	--	11,040
1.60 - 1.70	3.21	19.11	5.07	30.95	44.87	--	9,990
1.70 - 1.80	1.77	40.29	3.96	27.31	28.44	--	7,170
+ 1.80	26.43	76.24	1.85	19.58	2.33	--	1,920
TOTAL	100.00	28.87	4.60	29.85	36.68	--	8,870

COMPOSITE NO.:

HOLE:: T-77-5

SEAM: Main

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS

(a) 3/4" x 1/4"

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb
- 1.30	--	--	--	--	--	--	--	--	--
1.30 - 1.40	22.02	7.65	11,460	22.02	7.65	11,460	100.00	45.28	6,000
1.40 - 1.50	10.85	20.02	9,680	32.87	11.73	10,870	77.98	55.91	4,460
1.50 - 1.60	8.94	29.87	8,320	41.81	15.61	10,330	67.13	61.71	3,620
1.60 - 1.70	7.73	40.74	6,840	49.54	19.53	9,780	58.19	66.60	2,900
1.70 - 1.80	5.88	49.13	5,590	55.42	22.67	9,340	50.46	70.56	2,290
+ 1.80	44.58	73.39	1,860	100.00	45.28	6,000	44.58	73.39	1,860
TOTAL	100.00	45.28	6,000						

COMPOSITE NO:
HOLE: T-77-5
SEAM: Main

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS continued

(b) 3/4" x 28m (Reconstituted data)

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	--	--	--	--	--	--	--	--	--
1.30 - 1.40	31.19	5.76	11,710	31.19	5.76	11,710	100.00	41.57	6,660
1.40 - 1.50	8.93	20.10	9,860	40.12	8.95	11,300	68.81	57.81	4,380
1.50 - 1.60	7.28	30.00	8,480	47.40	12.18	10,860	59.88	63.43	3,560
1.60 - 1.70	5.29	39.49	7,040	52.69	14.93	10,480	52.60	68.06	2,880
1.70 - 1.80	4.28	47.53	5,860	56.97	17.37	10,130	47.31	71.25	2,410
+ 1.80	43.03	73.61	2,070	100.00	41.57	6,660	43.03	73.61	2,070
TOTAL	100.00	41.57	6,660						

COMPOSITE NO.

HOLE: T-77-5

SEAM: Main

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS continued

(c) 3/4" x 100 mesh (Reconstituted data)

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb
- 1.30	--	--	--	--	--	--	--	--	--
1.30 - 1.40	31.74	5.76	11,720	31.74	5.76	11,720	100.00	40.47	6,790
1.40 - 1.50	9.45	18.83	10,040	41.19	8.76	11,330	68.26	56.60	4,500
1.50 - 1.60	7.81	27.42	8,830	49.00	11.73	10,930	58.81	62.67	3,600
1.60 - 1.70	5.13	38.54	7,180	54.13	14.27	10,580	51.00	68.07	2,800
1.70 - 1.80	4.09	47.30	4,930	58.22	16.59	10,180	45.87	71.37	2,310
+ 1.80	41.78	73.73	2,060	100.00	40.47	6,790	41.78	73.73	2,060
TOTAL	100.00	40.47	6,790						

COMPOSITE:

HOLE: T-77-5

SEAM: Main

TABLE 7 CONTINUOUS FROTH FLOTATION TEST

Test Conditions:

Wt. % Solids in Pulp	10
Reagents	MIBC/Kerosene (Collector/Frother)
Reagent Composition	3/1
Reagent Consumption	1.05 lb./ton
Conditioning Time	

a. 28 mesh x 0

Time, Seconds	Wt.%	Ash%	Cumulative Wt.%	Cumulative Ash %
30	24.85	19.44	24.85	19.44
30 - 60	5.37	28.21	30.22	21.00
60 - 90	5.55	30.48	35.77	22.47
Tails	64.23	37.52	100.00	32.14
TOTAL	100.00	32.14		

Proximate Analysis of Froth for 1 min. Flotation:

Ash %	21.40
RM %	5.93
VM %	30.00
FC %	42.67
S %	0.45
BTU/lb.	9,740

COMPOSITE:

HOLE NO: T-77-5

SEAM: Main

TABLE 7

b. 100 mesh x 0

Time, Seconds	Wt.%	Ash%	Cumulative Wt.%	Cumulative Ash %
30	13.65	12.40	13.65	12.40
30 - 60	4.48	14.81	18.13	13.00
60 - 90	1.43	30.35	19.56	14.26
Tails	80.44	44.50	100.00	38.59
TOTAL	100.00	38.59		

Proximate Analysis of Froth for 1 min. Flotation:

Ash %	13.04
RM %	4.44
VM %	32.10
FC %	50.42
S %	0.49
BTU/lb.	10,950

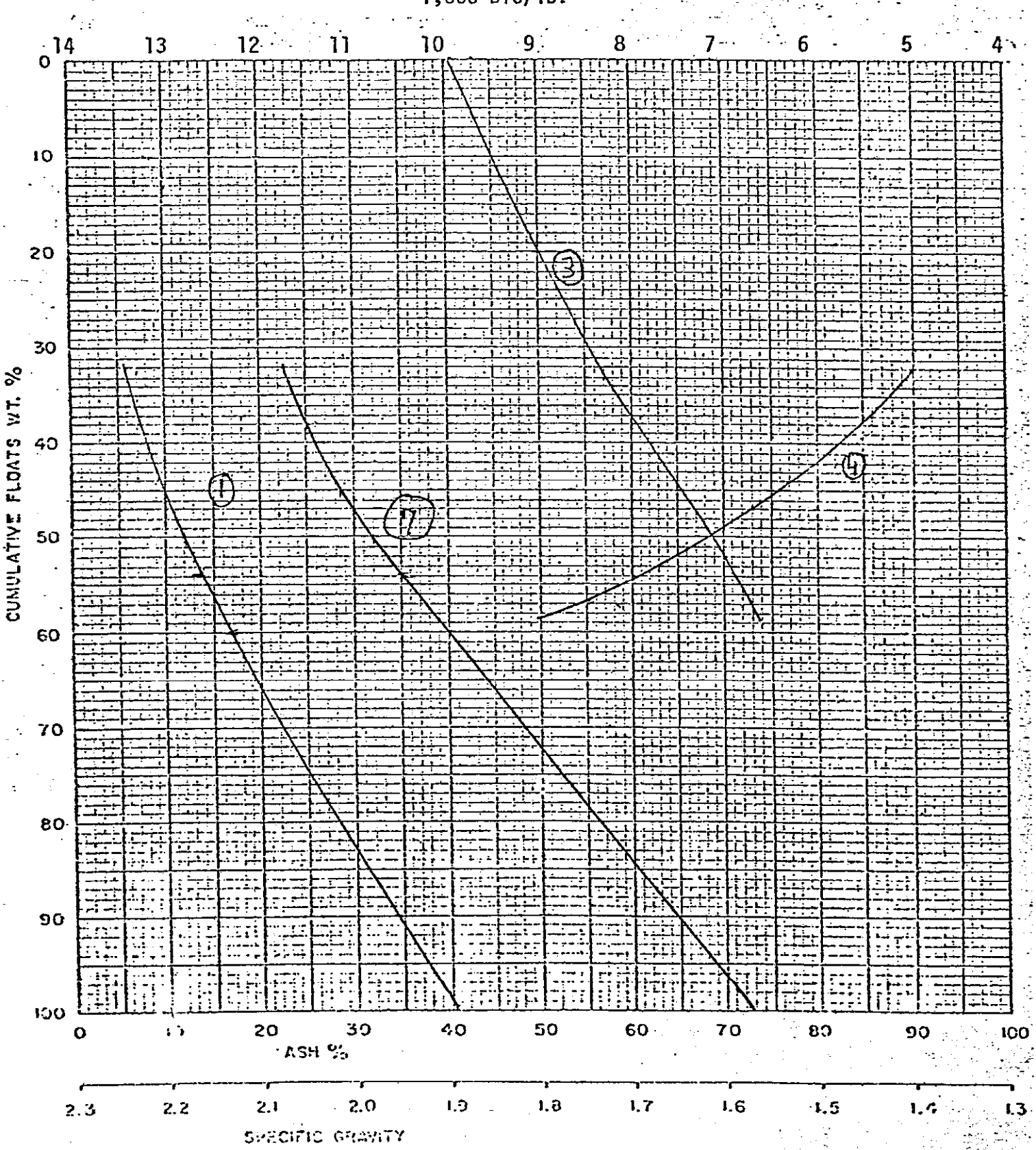
COMPANY CYPRUS ANVIL MINING CORPORATION

SAMPLE T-77-5

Size 3/4" x 100m

WASHABILITY CURVES

2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU



DATE

CYCLONE ENGINEERING SALES LTD.

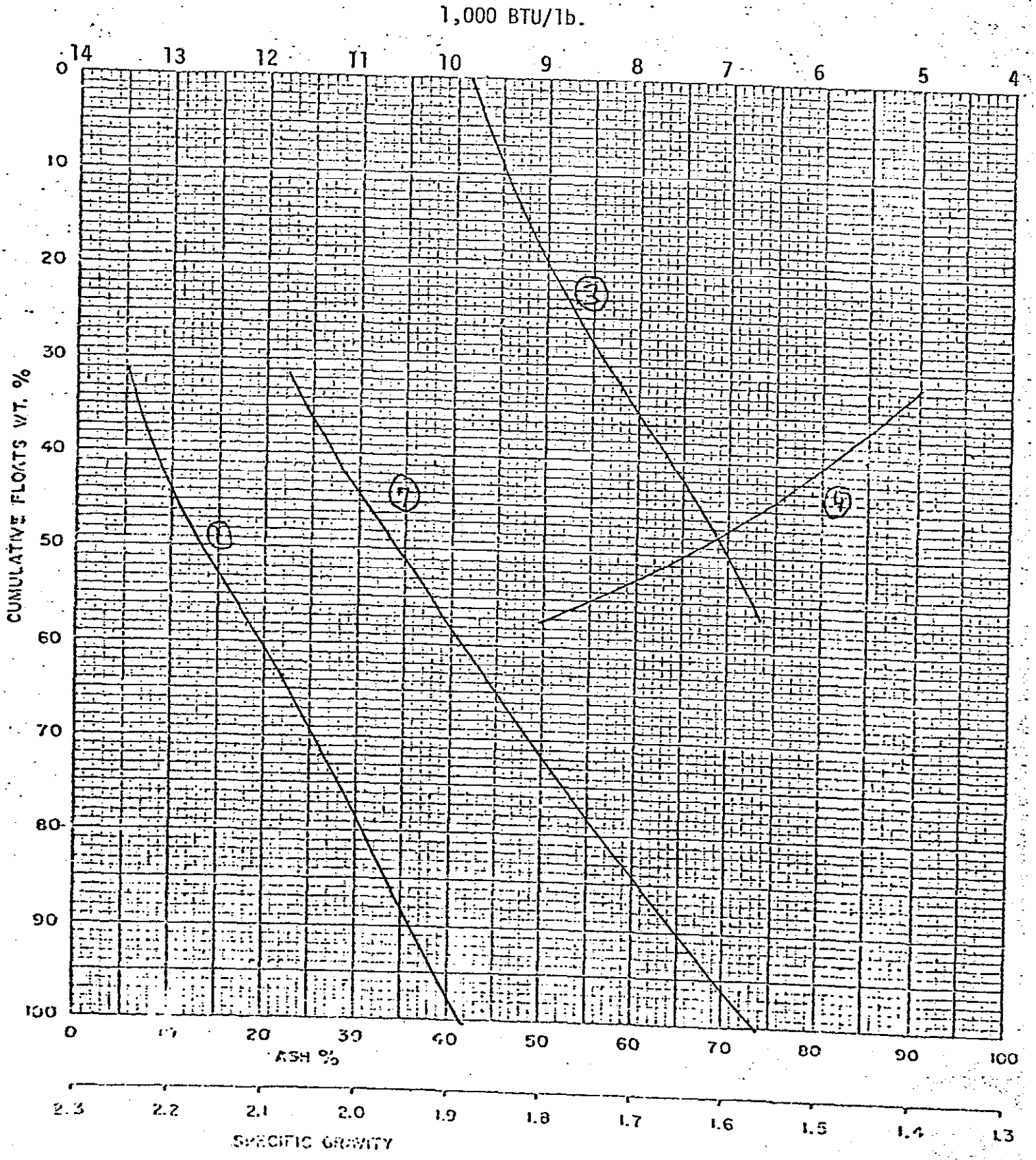
COMPANY CYPRUS ANVIL MINING CORPORATION

SAMPLE T-77-5 MAIN SEAM

Size 3/4" X 28m

WASHABILITY CURVES

2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU



DATE

CYCLONE ENGINEERING SALES LTD.

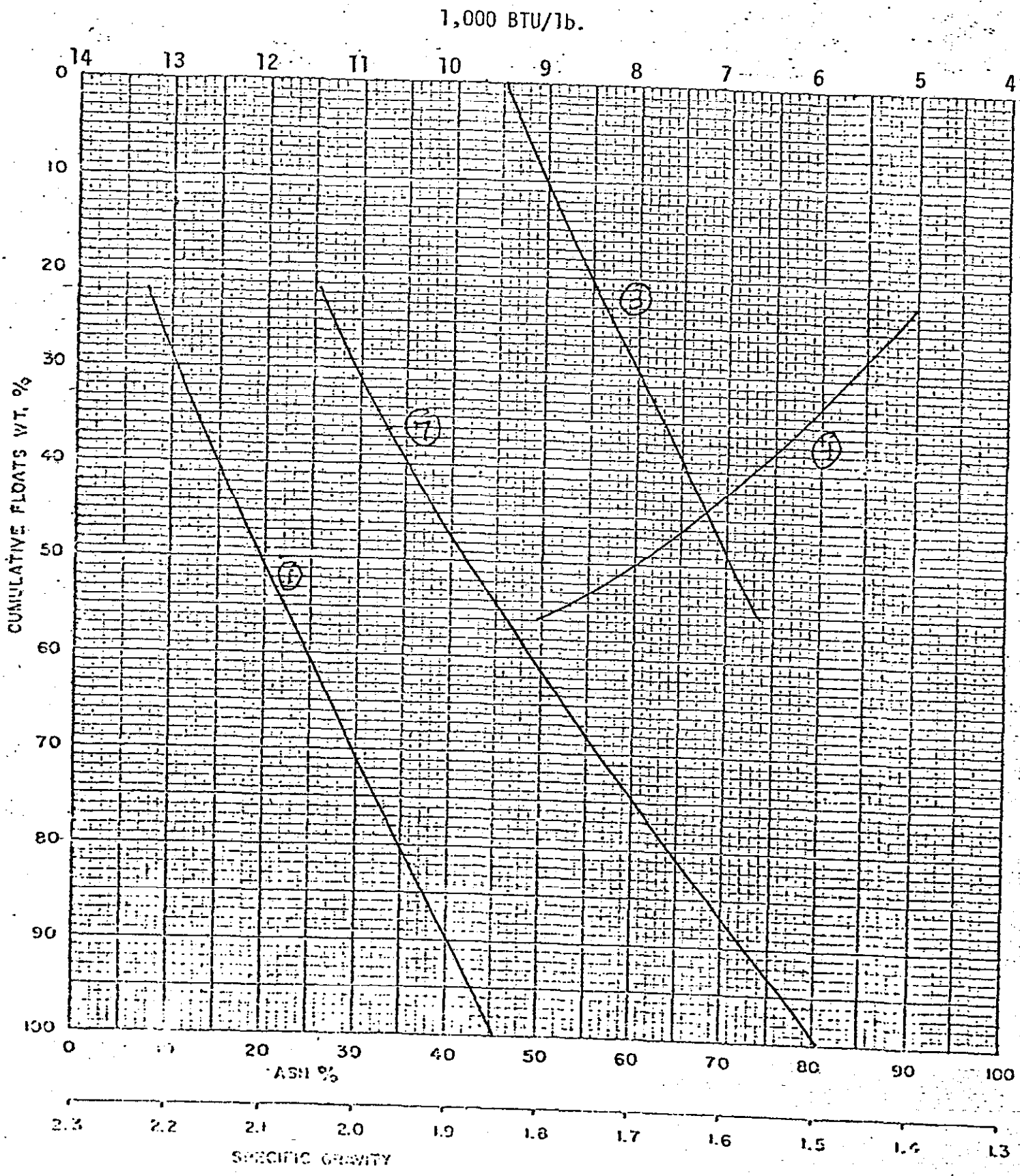
COMPANY CYPRUS ANVIL MINING CORPORATION

SAMPLE T-77-5 MAIN SEAM

Size 3/4" x 1/4"

WASHABILITY CURVES

2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU



DATE

CYCLONE ENGINEERING SALES LTD.
EDMONTON, ALBERTA, CANADA

CYPRUS ANVIL MINING CORPORATION

Analytical Report
for
Core Testing

PROJECT: Tulameen

DRILL HOLE #: T-77-6

AREA:

SEAM: Main

DATE SAMPLED:

LAB COMPOSITE #: T-77-6

DATE ANALYSED: October 15, 1977

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.: T-77-6
HOLE NO.: T-77-6
SEAM: Main

TABLE 1 COMPONENTS AND ANALYSIS (a.d.b.)

		Ash%	R.M.%	V.M.%	F.C.%	B.T.U./lb.
Number:	1	53.02	8.53	18.47	19.98	4,740
Footage:						
Weight:	9.19 kg.					
Number:	2	42.43	6.66	25.90	25.01	6,320
Footage:						
Weight:	8.21 kg.					
Number:	3	66.86	4.34	18.65	10.15	2,580
Footage:						
Weight:	20.51 kg.					
Number:	4	42.69	7.19	21.80	28.32	6,050
Footage:						
Weight:	15.41 kg.					
Number:	5	39.17	5.35	26.93	28.55	7,010
Footage:						
Weight:	12.69 kg.					
Number:	6	32.01	5.94	27.84	34.21	8,410
Footage:						
Weight:	11.63 kg.					

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:

HOLE NO.: T-77-6

SEAM: Main

TABLE 2 ANALYSIS OF COMPOSITE HEAD SAMPLE (a.d.b.)

Ash %	49.17
R.M.%	5.85
V.M.%	23.56
F.C.%	21.42
S. %	0.55
B.T.U./lb	5,420
H.G.I.	61
Equilibrium Moisture	7.40

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:

HOLE NO.: T-77-6

SEAM: Main

TABLE 3

SIZE CONSIST OF COMPOSITE HEAD SAMPLE

Size	Wt% Fractional	Cumulative
3/4" x ¼"	40.41	40.41
¼" x 28m	51.30	91.71
28m x 100m	3.42	95.13
100m x 0	4.87	100.00
TOTAL	100.00	

COMPOSITE NO.:

HOLE NO.: T-77-6

SEAM: Main

TABLE 4 ANALYSIS OF SIZE FRACTIONS

(a)

	3/4" x 1/4"	1/4" x 0	Total
Ash%	56.38	44.93	49.56
R.M.%	4.65	4.93	4.82
V.M.%	21.98	24.94	23.74
F.C.%	16.99	25.20	21.88
S. %	0.49	0.57	0.54
B.T.U./lb.	4,620	6,200	5,560

(b)

	1/4" x 28m	28m x 100m	100m x 0	Reconstituted 1/4" x 0
Ash%	45.02	29.83	48.96	44.47
R.M.%	6.00	2.50	2.80	5.54
V.M.%	25.49	27.36	21.63	25.34
F.C.%	23.49	39.31	26.61	24.65
S.%	0.60	0.60	0.45	0.59
B.T.U./lb.	6,050	8,710	6,200	6,210

COMPOSITE NO.:
HOLE NO.: T-77-6
SEAM: Main

TABLE 5. FLOAT-SINK AND ANALYSIS OF SIZE FRACTIONS
(Fractional Basis)

(a) 3/4" x 1/4"

Sp.Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb.
- 1.30	-	-	-	-	-	-	-
1.30 - 1.40	12.74	8.33	5.10	34.26	52.31	-	11,680
1.40 - 1.50	10.79	21.07	4.90	32.90	41.13	-	9,870
1.50 - 1.60	7.92	32.50	4.55	27.07	35.88	-	8,330
1.60 - 1.70	6.07	43.46	3.83	24.23	28.48	-	6,930
1.70 - 1.80	3.76	49.77	3.61	20.89	25.73	-	6,040
+ 1.80	58.72	77.16	2.66	14.58	5.60	-	1,450
TOTAL	100.00	55.73	3.47	20.88	19.92	-	4,710

(b) 1/4" x 28m

Sp. Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb
- 1.30	-	-	-	-	-	-	-
1.30 - 1.40	27.68	5.28	5.20	35.40	54.12	-	11,940
1.40 - 1.50	10.46	18.68	4.80	32.52	44.00	-	10,190
1.50 - 1.60	6.29	27.72	4.60	27.41	40.27	-	8,900
1.60 - 1.70	4.53	39.17	4.58	23.94	32.31	-	7,280
1.70 - 1.80	3.22	46.45	2.93	23.00	27.62	-	6,480
+ 1.80	47.82	77.68	2.62	16.76	4.94	-	1,400
TOTAL	100.00	45.58	3.79	24.76	25.87	-	6,140

HOLE NO.: T-77-6

SEAM: Main

TABLE 5. (cont'd)

(c) 28m x 100 mesh

Sp. Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb
- 1.30	-	-	-	-	-	-	-
1.30 - 1.40	51.33	3.80	3.35	32.35	60.50	-	12,320
1.40 - 1.50	6.77	16.64	3.26	31.94	48.16	-	10,760
1.50 - 1.60	5.74	20.39	3.33	30.70	45.58	-	9,910
1.60 - 1.70	2.85	31.51	3.22	27.42	37.85	-	8,440
1.70 - 1.80	2.33	41.50	3.36	25.05	30.09	-	6,960
+ 1.80	30.98	77.95	1.03	15.12	5.90	-	1,780
TOTAL	100.00	30.26	2.62	26.58	40.54	-	8,580

COMPOSITE NO.:

HOLE: T-77-6

SEAM: Main

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS

(a) 3/4" x 1/4"

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	-	-	-	-	-	-	-	-	-
1.30 - 1.40	12.74	8.33	11,680	12.74	8.33	11,680	100.00	55.73	4,710
1.40 - 1.50	10.79	21.07	9,870	23.53	14.17	10,850	87.26	62.65	3,690
1.50 - 1.60	7.92	32.50	8,330	31.45	18.79	10,220	76.47	68.51	2,820
1.60 - 1.70	6.07	43.46	6,930	37.52	22.78	9,680	68.55	72.67	2,190
1.70 - 1.80	3.76	49.77	6,040	41.28	25.24	9,350	62.48	75.51	1,730
+ 1.80	58.72	77.16	1,450	100.00	55.73	4,710	58.72	77.16	1,450
TOTAL	100.00	55.73	4,710						

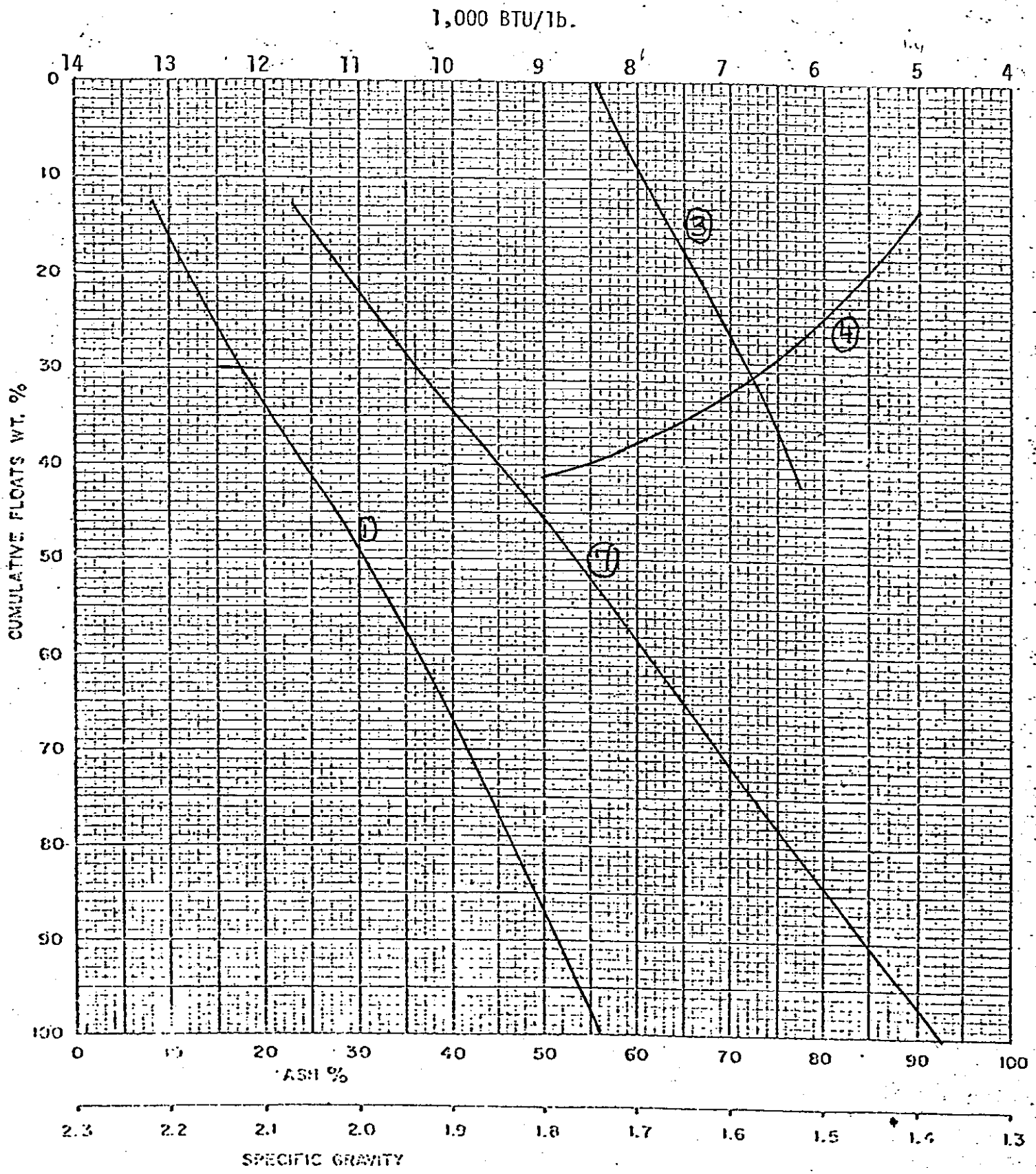
COMPANY Cyprus Anvil Mining Corporation

SAMPLE T-77-6 Main

Size 3/4" x 1/4"

WASHABILITY CURVES

2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU



DATE Oct.15/77

CYCLONE ENGINEERING SALES LTD.

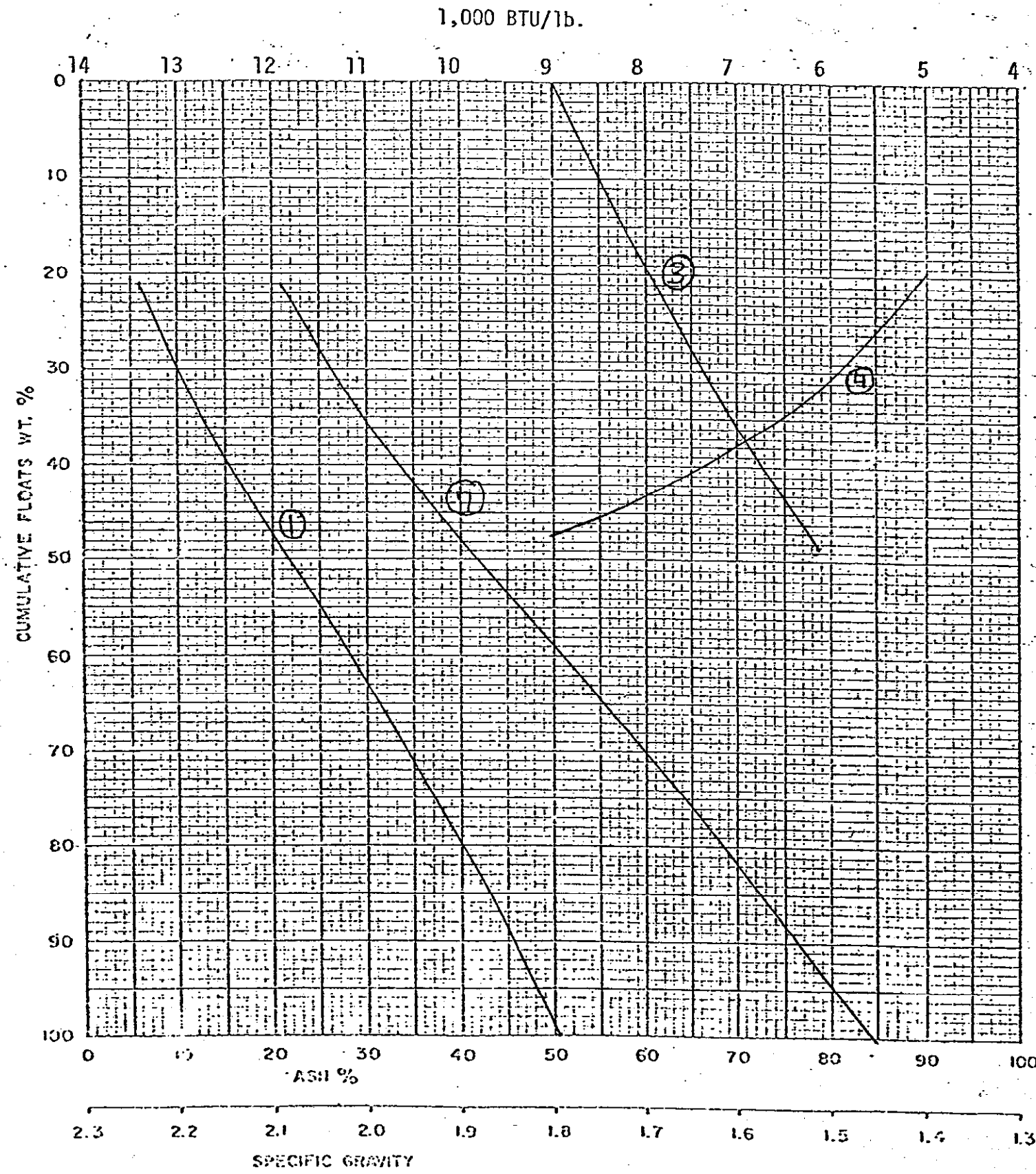
COMPANY Cyprus Anvil Mining Corporation

SAMPLE T-77-6 Main

Size 3/4"x 28 mesh

WASHABILITY CURVES

2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU



DATE Oct. 15/77

CYCLONE ENGINEERING SALES LTD.

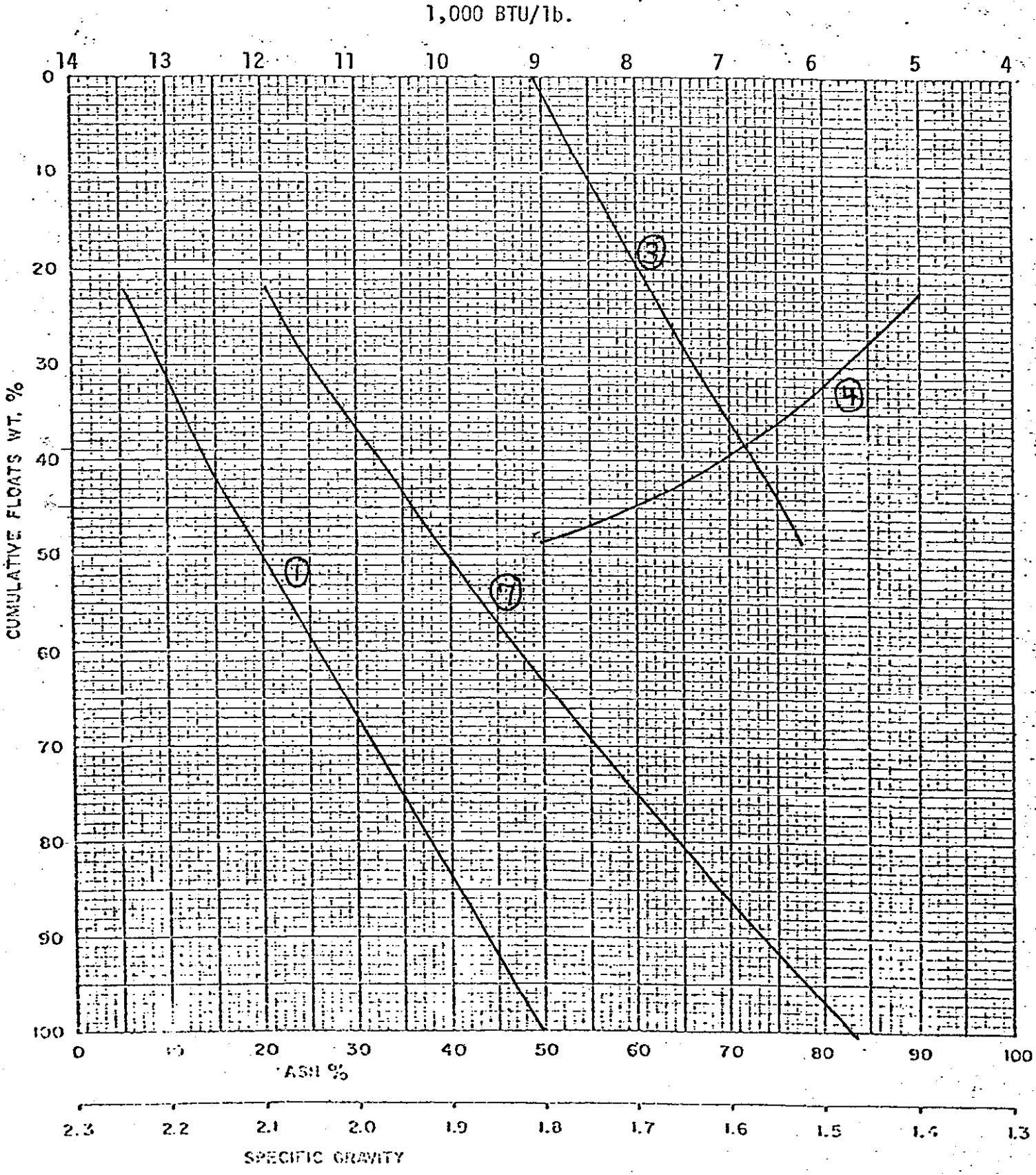
COMPANY Cyprus Anvil Mining Corporation

SAMPLE T-77-6 Main

Size 3/4" x 100 Mesh

2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU

WASHABILITY CURVES



DATE Oct.15/77

CYCLONE ENGINEERING SALES LTD.

CYPRUS ANVIL MINING CORPORATION

Analytical Report
for
Core Testing

PROJECT: Tulameen

DRILL HOLE #: T-77-3

AREA:

SEAM: Lower Seam

DATE SAMPLED:

LAB COMPOSITE #: T-77-3L

DATE ANALYSED: August 31, 1977

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:

HOLE NO.: T-77-3

SEAM: Lower Seam

TABLE 1 COMPONENTS AND ANALYSIS (a.d.b.)

	Ash%	R.M.%	V.M.%	F.C.%	B.T.U./lb.
Number: 1	42.89	5.94	19.68	31.49	6,690 *
Footage: 102.26m - 104.70m					
Weight: 23.5 lbs.					
Number: 2	49.05	4.26	18.85	27.84	6,160 *
Footage: 104.70 - 107.14m					
Weight: 32 lbs.					
Number: 3	47.39	4.78	21.21	26.62	6,430 *
Footage: 107.14 - 109.56					
Weight: 16 lbs.					
Number:					
Footage:					
Weight:					
Number:					
Footage:					
Weight:					

* Revised values.

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:

HOLE NO.: T-77-3

SEAM: Lower

TABLE 2

ANALYSIS OF COMPOSITE HEAD SAMPLE (a.d.b.)

Ash %	46.72
R.M.%	4.84
V.M.%	19.98
F.C.%	28.46
S. %	0.66
B.T.U./lb	6,360 *
H.G.I.	49
Equilibrium Moisture	

* Revised value.

CYCLONE ENGINEERING SALES LTD.

CYPRUS ANVIL MINING CORPORATION

Analytical Report
for
Core Testing

PROJECT: Tulameen

DRILL HOLE #: T-77-4

AREA:

SEAM: Lower

DATE SAMPLED:

LAB COMPOSITE #: T-77-4L

DATE ANALYSED: October 15, 1977

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.: T-77-4L
HOLE NO.: T-77-4
SEAM: Lower

TABLE 1 COMPONENTS AND ANALYSIS (a.d.b.)

		Ash%	R.M.%	V.M.%	F.C.%	B.T.U./lb.
Number:	1	48.88	5.30	17.28	28.54	5,720
Footage:						
Weight:	10.05 kg.					
Number:	2	57.50	5.38	14.84	22.28	4,550
Footage:						
Weight:	12.40 kg.					
Number:	3	44.44	5.71	21.15	28.70	6,540
Footage:						
Weight:	10.03 kg.					
Number:						
Footage:						
Weight:						
Number:						
Footage:						
Weight:						

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.: T-77-4L

HOLE NO.: T-77-4

SEAM: Lower

TABLE 2

ANALYSIS OF COMPOSITE HEAD SAMPLE (a.d.b.)

Ash %	50.97
R.M.%	5.43
V.M.%	17.93
F.C.%	25.67
S. %	0.59
B.T.U./lb	5,620
H.G.I.	50
Equilibrium Moisture	7.90

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.: T-77-4L
HOLE NO.: T-77-4
SEAM: Lower

TABLE 3 SIZE CONSIST OF COMPOSITE HEAD SAMPLE

Size	Wt% Fractional	Cumulative
3/4" x ¼"	58.26	58.26
¼" x 28m	34.22	92.48
28m x 100m	3.76	96.24
100m x 0	3.76	100.00
TOTAL	100.00	

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.: T-77-4L
HOLE NO.: T-77-4
SEAM: Lower

TABLE 4 ANALYSIS OF SIZE FRACTIONS

(a)

	3/4" x 1/4"	1/4" x 0	Total
Ash%	57.42	44.20	51.90
R.M.%	4.94	5.61	5.22
V.M.%	17.06	21.39	18.86
F.C.%	20.58	28.80	24.02
S. %	0.54	0.67	0.59
B.T.U./lb.	4,760	6,540	5,500

(b)

	1/4" x 28m	28m x 100m	100m x 0	Reconstituted 1/4" x 0
Ash%	44.69	27.20	54.99	44.00
R.M.%	5.67	5.07	1.85	5.27
V.M.%	20.47	26.62	19.80	20.96
F.C.%	29.17	41.11	23.36	29.77
S.%	0.72	0.78	0.56	0.71
B.T.U./lb.	6,530	9,110	5,200	6,640

COMPOSITE NO.: T-77-4L
HOLE NO.: T-77-4
SEAM: Lower

TABLE 5. FLOAT-SINK AND ANALYSIS OF SIZE FRACTIONS
(Fractional Basis)

(a) 3/4" x 1/4"

Sp.Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb.
- 1.30	-	-	-	-	-	-	-
1.30 - 1.40	15.25	9.75	5.35	32.95	51.95	-	11,690
1.40 - 1.50	9.39	22.34	4.83	28.31	44.52	-	9,830
1.50 - 1.60	7.02	32.93	4.15	25.95	36.97	-	8,460
1.60 - 1.70	6.43	44.04	3.74	22.01	30.21	-	6,760
1.70 - 1.80	4.82	53.88	3.28	19.19	23.65	-	5,510
+ 1.80	57.09	80.12	3.67	9.68	6.53	-	1,500
TOTAL	100.00	57.07	4.05	17.37	21.51	-	4,860

(b) 1/4" x 28m

Sp. Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb
- 1.30	-	-	-	-	-	-	-
1.30 - 1.40	32.68	6.08	6.05	32.48	55.39	-	12,050
1.40 - 1.50	7.75	19.58	5.25	28.65	46.52	-	10,090
1.50 - 1.60	4.53	29.99	4.50	26.38	39.13	-	8,860
1.60 - 1.70	4.31	38.73	4.78	23.09	33.40	-	7,290
1.70 - 1.80	2.63	46.44	4.61	22.16	26.79	-	6,280
+ 1.80	48.10	76.47	5.43	10.86	7.24	-	1,800
TOTAL	100.00	44.54	5.53	20.83	29.10	-	6,470

COMPOSITE NO.: T-77-4L
HOLE: T-77-4
SEAM: Lower

TABLE 5. (cont'd)

(c) 28m x 100 mesh

Sp. Gr.	Wt.%	Ash%	R.M.%	V.M.%	F.C.%	S.%	B.T.U./lb
- 1.30	-	-	-	-	-	-	-
1.30 - 1.40	49.61	4.33	4.59	33.01	58.07	-	12,320
1.40 - 1.50	9.03	12.60	4.52	31.64	51.24	-	11,150
1.50 - 1.60	6.51	16.58	4.62	30.96	47.84	-	10,600
1.60 - 1.70	4.56	32.09	4.58	26.11	37.22	-	8,360
1.70 - 1.80	1.84	43.62	4.97	23.55	27.86	-	6,690
+ 1.80	28.45	76.36	1.89	14.31	7.44	-	2,350
TOTAL	100.00	28.36	3.82	26.94	40.88	-	8,980

COMPOSITE NO.: T-77-4L

HOLE:: T-77-4

SEAM: Lower

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS

(a) 3/4" x 1/4"

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	-	-	-	-	-	-	-	-	-
1.30 - 1.40	15.25	9.75	11,690	15.25	9.75	11,690	100.00	57.07	4,860
1.40 - 1.50	9.39	22.34	9,830	24.64	14.55	10,980	84.75	65.58	3,630
1.50 - 1.60	7.02	32.93	8,460	31.66	18.62	10,420	75.36	70.97	2,850
1.60 - 1.70	6.43	44.04	6,760	38.09	22.91	9,800	68.34	74.87	2,280
1.70 - 1.80	4.82	53.88	5,510	42.91	26.39	9,320	61.91	78.08	1,810
+ 1.80	57.09	80.12	1,500	100.00	57.07	4,860	57.09	80.12	1,500
TOTAL	100.00	57.07	4,860						

COMPOSITE NO: T-77-4L

HOLE: T-77-4

SEAM: Lower

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS continued

(b) 3/4" x 28m (Reconstituted data)

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	-	-	-	-	-	-	-	-	-
1.30 - 1.40	21.70	7.71	11,890	21.70	7.71	11,890	100.00	52.43	5,450
1.40 - 1.50	8.79	21.44	9,910	30.49	11.67	11,320	78.30	64.82	3,670
1.50 - 1.60	6.10	32.12	8,570	36.59	15.08	10,860	69.51	70.31	2,880
1.60 - 1.70	5.64	42.54	6,910	42.23	18.75	10,330	63.41	73.98	2,330
1.70 - 1.80	4.01	52.08	5,700	46.24	21.64	9,930	57.77	77.05	1,880
+ 1.80	53.76	78.91	1,600	100.00	52.43	5,450	53.76	78.91	1,600
TOTAL	100.00	52.43	5,450						

COMPOSITE NO. T-77-4L
HOLE: T-77-4
SEAM: Lower

TABLE 6 WASHABILITY AND B.T.U. DATA FOR SIZE FRACTIONS continued

(c) 3/4" x 100 mesh (Reconstituted data)

	Fractional			Cumulative					
				Floats			Sinks		
	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.	Wt.%	Ash%	BTU/lb.
- 1.30	-	-	-	-	-	-	-	-	-
1.30 - 1.40	22.79	7.42	11,930	22.79	7.42	11,930	100.00	51.49	5,590
1.40 - 1.50	8.80	21.09	9,960	31.59	11.23	11,380	77.21	64.49	3,720
1.50 - 1.60	6.12	31.46	8,660	37.71	14.51	10,940	68.41	70.08	2,920
1.60 - 1.70	5.60	42.20	6,960	43.31	18.09	10,430	62.29	73.87	2,360
1.70 - 1.80	3.92	51.93	5,720	47.23	20.90	10,030	56.69	77.00	1,900
+ 1.80	52.77	78.86	1,620	100.00	51.49	5,590	52.77	78.86	1,620
TOTAL	100.00	51.49	5,590						

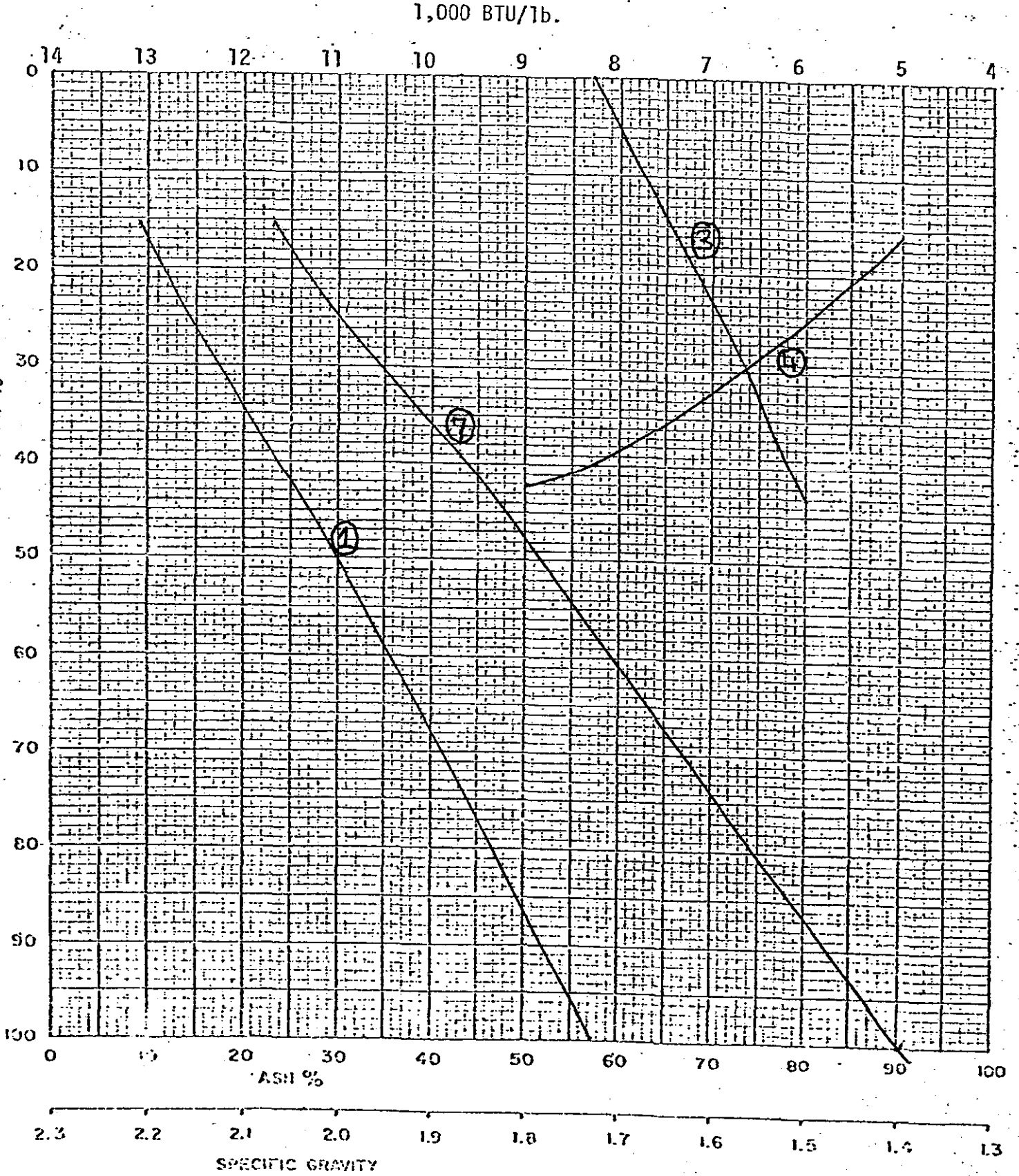
COMPANY Cyprus Anvil Mining Corporation

SAMPLE T-77-4 Lower

Size 3/4" x 1/4"

2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU

WASHABILITY CURVES



DATE Oct.15/77

CYCLONE EFFICIENCY CURVE

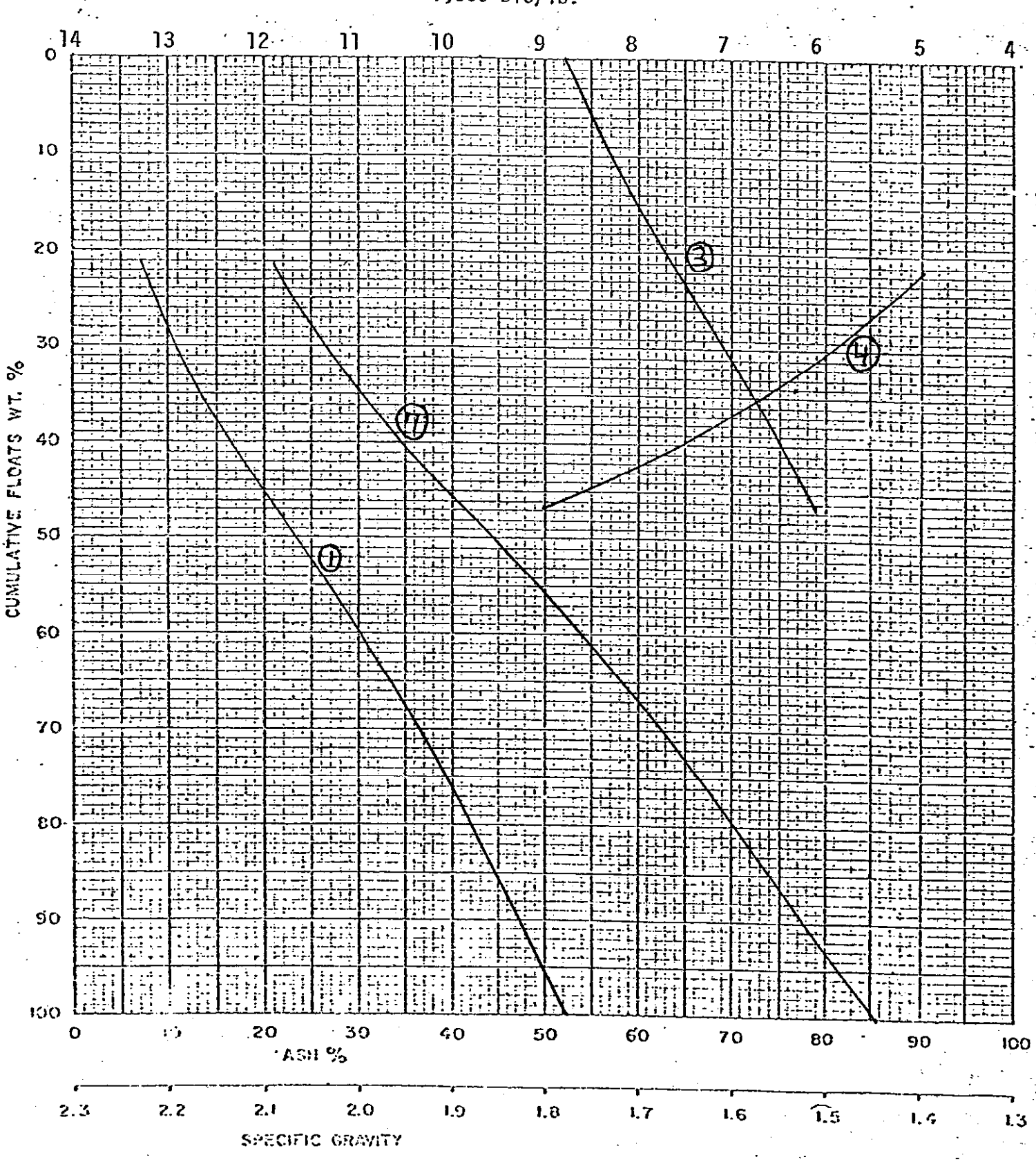
COMPANY Cyprus Anvil Mining Corporation

SAMPLE T-77-4 Lower

Size 3/4" x 28 Mesh

WASHABILITY CURVES

2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU



DATE Oct.15/77

CYCLONE ENGINEERING SALES LTD.

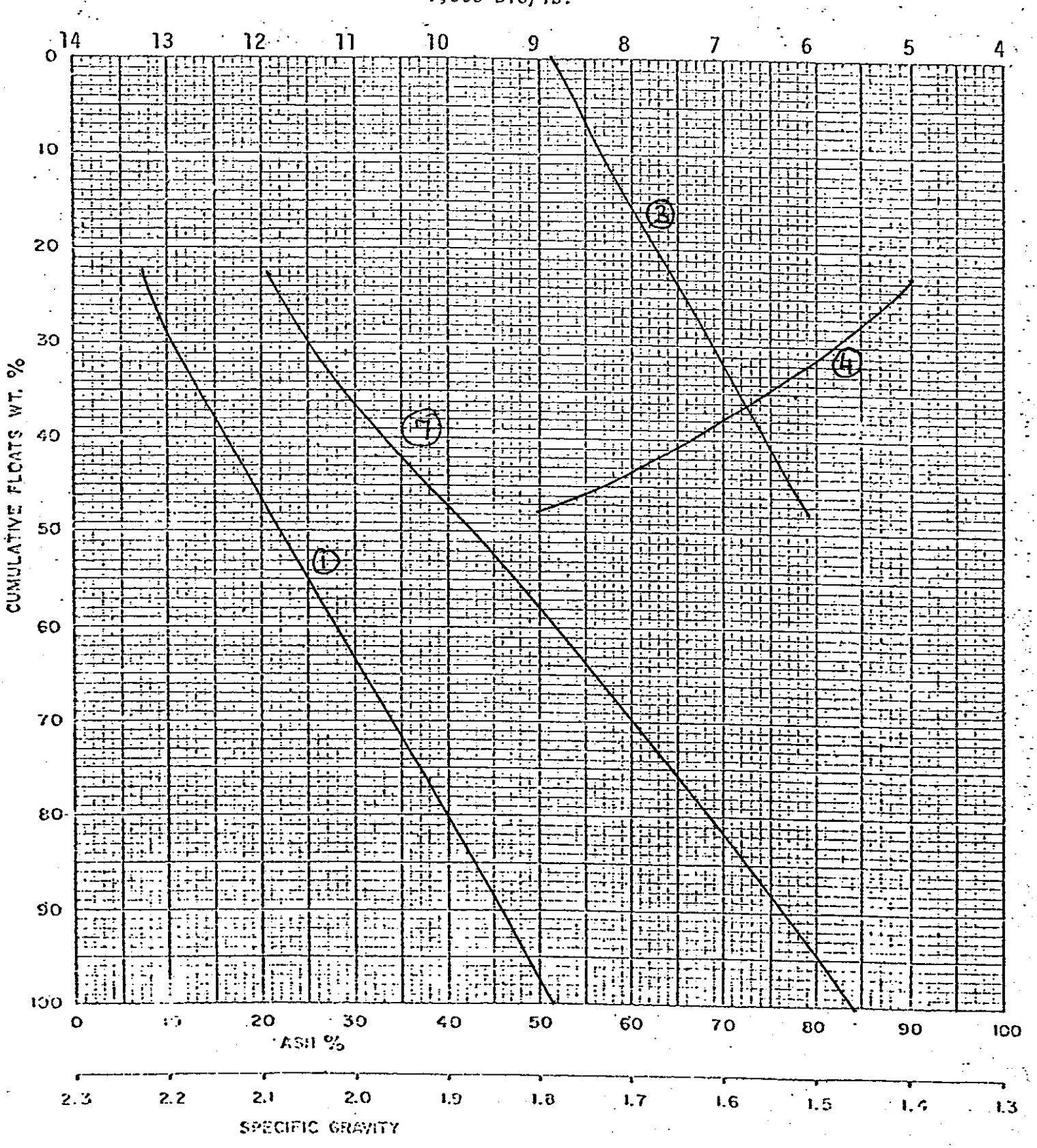
COMPANY Cyprus Anvil Mining Corporation

SAMPLE T-77-4 Lower

Size 3/4" x 100 Mesh

2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL
7 - BTU

WASHABILITY CURVES



DATE Oct.15/77

CYCLONE ENGINEERING SALES LTD.

CYPRUS ANVIL MINING CORPORATION. S1-232

RESULTS OF FROTH-FLOTATION TEST
ON LOWER SEAM SAMPLE (4L)
FROM TULAMEEN DRILL CORE

1. 28m x 0 Size Fraction

	Fractional		Cumulative	
Time (Sec.)	Wt. %	Ash %	Wt. %	Ash %
- 30	29.24	24.04	29.24	24.04
30 - 60	6.82	42.26	36.06	27.49
60 - 90	4.57	43.53	40.63	29.29
Tails	59.37	48.27	100.00	40.56
TOTAL	100.00	40.56		

2. 100m x 0 Size Fractions

	Fractional		Cumulative	
Time (Sec.)	Wt. %	Ash %	Wt. %	Ash %
- 30	32.82	34.99	32.82	34.99
30 - 60	11.75	57.18	44.57	40.84
60 - 90	8.95	62.69	53.52	44.49
Tails	46.48	63.45	100.00	53.30
TOTAL	100.00	53.30		

CYCLONE ENGINEERING SALES LTD.
EDMONTON, ALBERTA, CANADA.

CYPRUS ANVIL MINING CORPORATION. S1-232

RESULTS OF FROTH-FLOTATION TEST ON LOWER SEAM SAMPLE (4L) FROM TULAMEEN DRILL CORE

1. 28m x 0 Size Fraction

	Fractional		Cumulative	
Time (Sec.)	Wt. %	Ash %	Wt. %	Ash %
- 30	29.24	24.04	29.24	24.04
30 - 60	6.82	42.26	36.06	27.49
60 - 90	4.57	43.53	40.63	29.29
Tails	59.37	48.27	100.00	40.56
TOTAL	100.00	40.56		

2. 100m x 0 Size Fractions

	Fractional		Cumulative	
Time (Sec.)	Wt. %	Ash %	Wt. %	Ash %
- 30	32.82	34.99	32.82	34.99
30 - 60	11.75	57.18	44.57	40.84
60 - 90	8.95	62.69	53.52	44.49
Tails	46.48	63.45	100.00	53.30
TOTAL	100.00	53.30		

CYCLONE ENGINEERING SALES LTD.
EDMONTON, ALBERTA, CANADA.

CYPRUS ANVIL MINING CORPORATION

Analytical Report
for
Core Testing

PROJECT: Tulameen

DRILL HOLE #: T-77-5

AREA:

SEAM: Lower

DATE SAMPLED:

LAB COMPOSITE #: T-77-5L

DATE ANALYSED:

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:
HOLE NO.: T-77-5L
SEAM: Lower

TABLE 1 COMPONENTS AND ANALYSIS (a.d.b.)

		Ash%	R.M.%	V.M.%	F.C.%	B.T.U./lb.
Number:	1	52.15	6.76	18.30	24.44	5,330
Footage:						
Weight:	10.75 Kg.					
Number:	2	53.07	6.24	17.55	23.14	5,200
Footage:						
Weight:	10.45 Kg.					
Number:	3	47.92	5.73	21.47	24.88	6,100
Footage:						
Weight:	10.92 Kg.					
Number:						
Footage:						
Weight:						
Number:						
Footage:						
Weight:						

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:

HOLE NO.: T-77-5L

SEAM: Lower

TABLE 2

ANALYSIS OF COMPOSITE HEAD SAMPLE (a.d.b.)

Ash %	51.13	50.57
R.M.%	6.23	
V.M.%	19.02	
F.C.%	23.62	
S. %	0.62	.61
B.T.U./lb	5,600	5538
H.G.I.	58	
Equilibrium Moisture		7.3

CYCLONE ENGINEERING SALES LTD.

CYPRUS ANVIL MINING CORPORATION

Analytical Report
for
Core Testing

PROJECT: Tulameen

DRILL HOLE #: T-77-6

AREA:

SEAM: Lower

DATE SAMPLED:

LAB COMPOSITE #: T-77-6L

DATE ANALYSED:

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:

HOLE NO.: T-77-6L

SEAM: Lower

TABLE 1 COMPONENTS AND ANALYSIS (a.d.b.)

		Ash%	R.M.%	V.M.%	F.C.%	B.T.U./lb.
Number:	1	55.81	6.26	17.31	20.62	4,770
Footage:						
Weight:	15.625					
Number:	2	47.06	4.99	21.68	26.27	6,210
Footage:						
Weight:	15.355					
Number:						
Footage:						
Weight:						
Number:						
Footage:						
Weight:						
Number:						
Footage:						
Weight:						

CYCLONE ENGINEERING SALES LTD.

COMPOSITE NO.:

HOLE NO.: T-77-6L

SEAM: Lower

TABLE 2

ANALYSIS OF COMPOSITE HEAD SAMPLE (a.d.b.)

Ash %	52.08	51.03
R.M.%	4.92	
V.M.%	19.46	
F.C.%	23.54	
S. %	0.78	.76
B.T.U./lb	5,570	5459
H.G.I.	50	
Equilibrium Moisture	6.1	

CYCLONE ENGINEERING SALES LTD.

App. 13

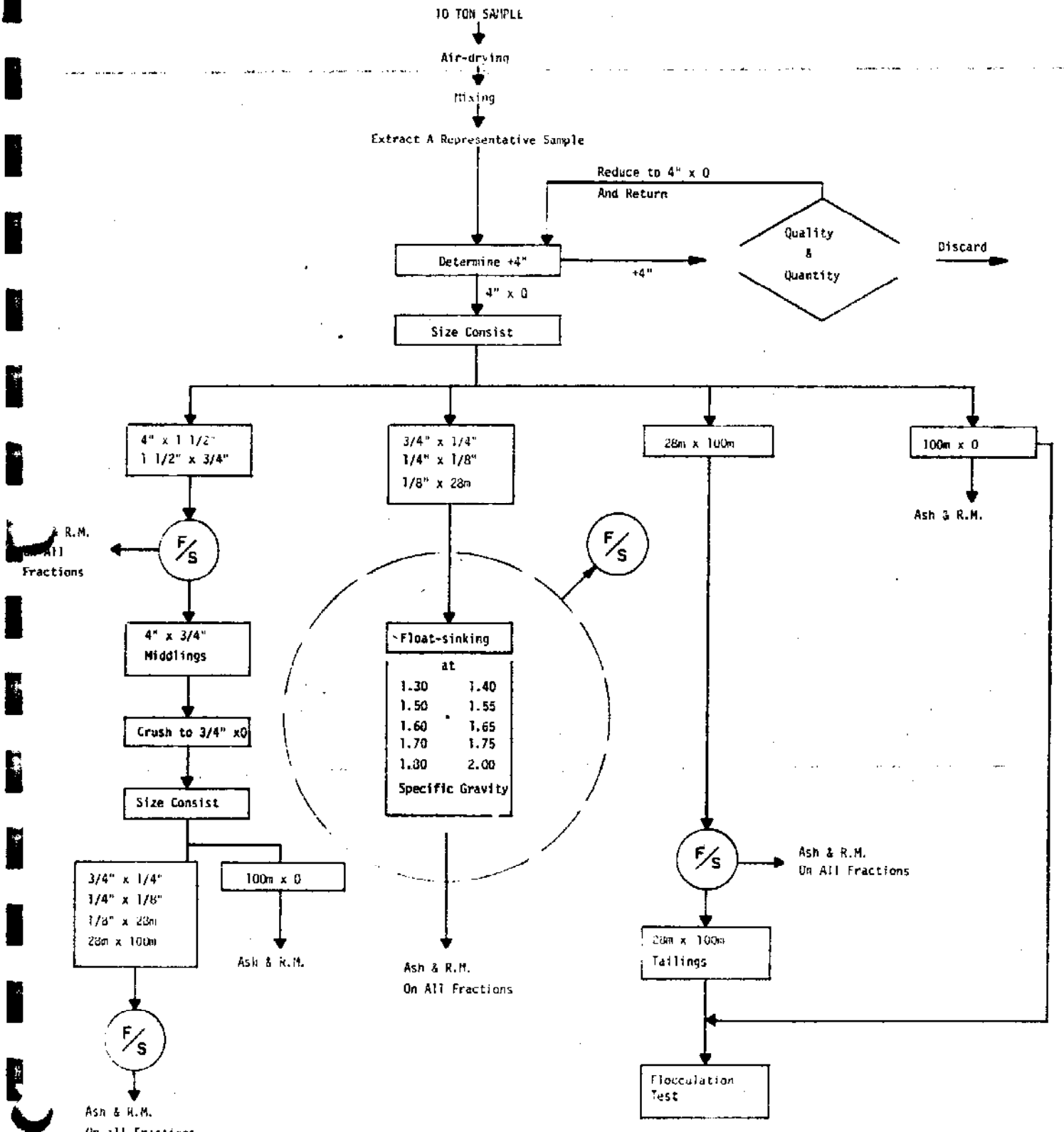
APPENDIX 13

Bulk Sample Analyses Data

CYPRUS ANVIL MINING CORPORATION

BULK SAMPLE ANALYSIS - TULAMEEN PROJECT

SAMPLE NO. 3B



Composite Clean Coal Analyses

- Proximate
- S
- B.T.U.
- H.G.I.
- Ash Fusion Temp.
- Mineral Analyses of Ash
- Ultimate Analyses

BULK SAMPLE NO. 1

CYPRUS ANVIL MINING CORPORATION SI-232

TULAMEEN PROJECT

Date: July 26, 1977

TABLE 1: ANALYSES OF HEAD SAMPLES

	Air-Dry Basis	Dry Basis
PROXIMATE ANALYSIS:		
Ash %	33.83	36.04
R.M. %	5.99	--
V.M. %	27.15	28.88
F.C. %	32.98	35.08
CALORIFIC VALUE (BTU/lb.):	7,730	8,220
SULPHUR %	0.54	0.57

HARDGROVE GRINDABILITY INDEX: 50

SIZING TO 1 1/2" MAXIMUM:

OVERSIZE: 47.6%

CYCLONE ENGINEERING SALES LTD.
EDMONTON, ALBERTA, CANADA.

CYPRUS ANVIL MINING CORPORATION

S1-232

TULAMEEN PROJECT

TABLE 2a: SIZE CONSIST BY DRY SCREENING

Size	Weight %
1 1/2" x 3/4"	34.70
3/4" x 1/4"	31.62
1/4" x 28m	23.26
28m x 100m	6.62
100m x 0	3.80
Total	100.00

TABLE 2b: SIZE CONSIST BY WET SCREENING

Size	Wt. %	Wt. % of Total
28m x 60 m	39.79	4.15
60m x 100m	13.36	1.39
100m x 200m	15.73	1.64
200m x 325m	8.03	0.84
325m x 0	23.09	2.40
Total	100.00	10.42

TABLE 3: ANALYSES OF SIZE FRACTIONS

Size	Ash %	R.M. %	V.M. %	F.C. %	BTU/lb.	S. %
1 1/2" x 3/4"	39.56	5.54	25.95	28.95	7,080	0.50
3/4" x 1/4"	34.48	6.24	27.96	31.32	7,750	0.54
1/4" x 28m	28.65	6.46	26.82	38.07	8,350	0.51
28m x 100m	30.32	6.18	27.02	36.48	8,180	0.54
100m x 0	44.69	4.73	22.61	27.97	6,080	0.47
Total	35.00	5.99	26.73	32.28	7,620	0.52

CYPRUS ANVIL MINING CORPORATION S1-232

TULAMEEN PROJECT

TABLE 4a: FLOAT-SINK AND FRACTIONAL ANALYSES OF SIZE FRACTION 1 1/2" x 3/4"

Sp. Gr.	Wt. %	Ash %	R.M. %	V.M. %	F.C. %	BTU/lb.
- 1.30						
1.30 - 1.35	7.38	5.04	8.21	35.71	51.04	11,640
1.35 - 1.40	14.29	10.51	7.85	33.25	48.39	11,150
1.40 - 1.45	10.09	17.86	7.49	31.21	43.44	9,990
1.45 - 1.50	7.94	22.84	7.15	29.52	40.49	9,250
1.50 - 1.55	6.57	28.37	6.66	28.30	36.67	8,610
1.55 - 1.60	4.10	33.67	6.51	25.34	34.48	7,860
1.60 - 1.65	4.46	38.41	5.63	22.98	32.98	7,340
1.65 - 1.70	4.05	45.68	5.50	21.37	27.45	6,240
1.70 - 1.80	7.98	55.27	5.37	19.45	19.91	5,360
1.80 - 2.00	15.21	64.84	4.51	14.63	16.02	3,690
+ 2.00	17.93	77.09	1.48	21.40	0.03	1,620
Total	100.00	40.39	5.61	25.28	28.72	6,940

CYCLONE ENGINEERING SALES LTD.
EDMONTON, ALBERTA, CANADA

CYPRUS ANVIL MINING CORPORATION S1-232

TULAMEEN PROJECT

TABLE 4b: FLOAT-SINK AND FRACTIONAL ANALYSES OF SIZE FRACTION 3/4" x 1/4"

Sp. Gr.	Wt. %	Ash %	R.M. %	V.M. %	F.C. %	BTU/lb.
- 1.30	1.11	3.01	7.60	37.29	52.10	12,270
1.30 - 1.35	24.21	4.13	7.97	36.48	51.42	11,860
1.35 - 1.40	14.38	10.42	7.76	33.35	48.47	10,920
1.40 - 1.45	7.14	17.07	6.73	33.24	42.96	10,210
1.45 - 1.50	5.78	22.03	6.42	30.31	41.24	9,580
1.50 - 1.55	4.68	28.66	6.22	28.69	36.43	8,570
1.55 - 1.60	3.14	34.93	5.82	26.44	32.81	7,830
1.60 - 1.65	2.93	38.81	5.57	25.53	30.09	7,070
1.65 - 1.70	2.22	44.17	4.99	22.95	27.89	6,550
1.70 - 1.80	5.30	53.36	5.03	19.81	21.80	4,930
1.80 - 2.00	13.93	67.38	5.90	14.09	12.63	3,350
+ 2.00	15.18	79.33	2.24	17.08	1.35	1,630
Total	100.00	33.84	6.16	27.20	32.80	7,840

CYCLONE ENGINEERING SALES LTD.
EDMONTON, ALBERTA, CANADA.

TABLE 4c: FLOAT-SINK AND FRACTIONAL ANALYSES OF SIZE FRACTION 1/4" x 28 MESH

Sp. Gr.	Wt. %	Ash %	R.M. %	V.M. %	F.C. %	BTU/lb.
- 1.30	26.63	2.25	6.46	35.16	56.13	12,160
1.30 - 1.35	17.32	4.34	6.29	34.52	54.85	11,900
1.35 - 1.40	5.98	10.59	6.02	34.16	49.23	10,990
1.40 - 1.45	5.78	16.10	5.79	32.94	45.17	10,330
1.45 - 1.50	3.93	23.15	5.47	30.83	40.55	9,280
1.50 - 1.55	1.05	25.43	5.49	29.40	39.68	9,010
1.55 - 1.60	2.22	30.34	5.26	27.75	36.65	8,250
1.60 - 1.65	2.01	33.50	5.24	27.61	33.65	7,900
1.65 - 1.70	1.40	38.07	5.41	24.64	31.88	7,210
1.70 - 1.80	5.27	46.27	5.20	22.85	25.68	5,950
1.80 - 2.00	7.50	61.43	4.45	16.26	17.86	3,990
+ 2.00	20.91	77.89	4.14	13.35	4.62	1,940
Total	100.00	29.30	5.55	27.54	37.61	8,470

CYPRUS ANVIL MINING CORPORATION
EDMONTON, ALBERTA, CANADA.

TABLE 4d: FLOAT-SINK AND FRACTIONAL ANALYSES OF SIZE FRACTION 28 MESH x 100 MESH

Sp. Gr.	Wt. %	Ash %	R.M. %	V.M. %	F.C. %	BTU/lb
- 1.30	22.79	1.37	6.32	35.69	56.62	12,280
1.30 - 1.35	17.64	3.47	6.38	34.62	55.53	11,810
1.35 - 1.40	4.62	8.36	6.24	34.11	51.29	11,210
1.40 - 1.45	6.85	13.19	5.85	33.91	47.05	10,630
1.45 - 1.50	3.38	17.82	5.55	32.37	44.26	9,920
1.50 - 1.55	2.16	20.74	5.43	31.04	42.79	9,520
1.55 - 1.60	2.07	25.90	5.36	30.17	38.57	8,740
1.60 - 1.65	1.74	29.85	4.93	28.36	36.86	8,230
1.65 - 1.70	1.61	33.74	4.54	27.80	33.92	7,670
1.70 - 1.80	4.17	41.99	4.89	24.98	28.14	6,490
1.80 - 2.00	4.17	51.70	4.33	20.51	23.46	4,690
+ 2.00	28.80	78.03	3.35	13.61	5.01	2,490
Total	100.00	31.24	5.18	27.29	36.29	8,300

CYPRUS ANVIL MINING CORPORATION

SI-232

TULAMEEN PROJECT

TABLE 5a: FLOAT-SINK AND CUMULATIVE ANALYSES OF SIZE FRACTION 1 1/2" x 3/4"

Sp. Gr.	Wt. %	Ash %	R.M. %	V.M. %	F.C. %	BTU/lb.
- 1.30						
- 1.35	7.38	5.04	8.21	35.71	51.04	11,640
- 1.40	21.67	8.65	7.97	34.09	49.29	11,320
- 1.45	31.76	11.57	7.82	33.17	47.44	10,900
- 1.50	39.70	13.83	7.69	32.44	46.04	10,570
- 1.55	46.27	15.89	7.54	31.85	44.72	10,290
- 1.60	50.37	17.34	7.46	31.32	43.88	10,090
- 1.65	54.83	19.05	7.31	30.65	42.99	9,870
- 1.70	58.88	20.88	7.18	30.01	41.93	9,620
- 1.80	66.86	24.99	6.97	28.75	39.29	9,110
- 2.00	82.07	32.37	6.51	26.13	34.99	8,110

TABLE 5b: FLOAT-SINK AND CUMULULATIVE ANALYSES OF SIZE FRACTION 3/4" x 1/4"

Sp. Gr.	Wt. %	Ash %	R.M. %	V.M. %	F.C. %	BTU/lb.
- 1.30	1.11	3.01	7.60	37.29	52.10	12,270
- 1.35	25.32	4.08	7.95	36.52	51.45	11,880
- 1.40	39.70	6.38	7.88	35.37	50.37	11,530
- 1.45	46.84	8.01	7.71	35.04	49.24	11,330
- 1.50	52.62	9.55	7.57	34.52	48.36	11,140
- 1.55	57.30	11.11	7.46	34.05	47.38	10,930
- 1.60	60.44	12.35	7.37	33.65	46.63	10,770
- 1.65	63.37	13.57	7.29	33.28	45.86	10,600
- 1.70	65.59	14.61	7.21	32.93	45.25	10,460
- 1.80	70.89	17.50	7.05	31.95	43.50	10,050
- 2.00	84.82	25.69	6.86	29.01	38.44	8,950

CYPRUS ANVIL MINING CORPORATION

S1-232

TULAMEEN PROJECT

TABLE 5c: FLOAT-SINK AND CUMULATIVE ANALYSES OF SIZE FRACTION 1/4" x 28 MESH

Sp. Gr.	Wt. %	Ash %	R.M. %	V.M. %	F.C. %	BTU/lb.
- 1.30	26.63	2.25	6.46	35.16	56.13	12,160
- 1.35	43.95	3.07	6.39	34.91	55.63	12,060
- 1.40	49.93	3.97	6.35	34.82	54.86	11,930
- 1.45	55.71	5.23	6.29	34.62	53.86	11,760
- 1.50	59.64	6.41	6.24	34.37	52.98	11,600
- 1.55	60.69	6.74	6.22	34.29	52.75	11,560
- 1.60	62.91	7.57	6.19	34.06	52.18	11,440
- 1.65	64.92	8.38	6.16	33.86	51.60	11,330
- 1.70	66.32	9.00	6.14	33.66	51.20	11,240
- 1.80	71.59	11.75	6.07	32.87	49.31	10,850
- 2.00	79.09	16.46	5.92	31.29	46.33	10,200

TABLE 5d: FLOAT-SINK AND CUMULATIVE ANALYSES OF SIZE FRACTION 28 MESH x 100 MESH

Sp. Gr.	Wt. %	Ash %	R.M. %	V.M. %	F.C. %	BTU/lb.
- 1.30	22.79	1.37	6.32	35.69	56.62	12,280
- 1.35	40.43	2.29	6.35	35.22	56.14	12,070
- 1.40	45.05	2.91	6.34	35.11	55.64	11,990
- 1.45	51.90	4.27	6.27	34.95	54.51	11,810
- 1.50	55.28	5.09	6.23	34.79	53.89	11,690
- 1.55	57.44	5.68	6.20	34.65	53.47	11,610
- 1.60	59.51	6.39	6.17	34.50	52.94	11,510
- 1.65	61.25	7.05	6.13	34.32	52.50	11,420
- 1.70	62.86	7.74	6.09	34.15	52.02	11,320
- 1.80	67.03	9.87	6.02	33.58	50.53	11,020
- 2.00	71.20	12.32	5.92	32.82	48.94	10,650

CYPRUS ANVIL MINING CORPORATION S1-232

TULAMEEN PROJECT

TABLE 6a: WASHABILITY FOR SIZE FRACTION 1 1/2" x 3/4"

	Fractional		Cumulative			
			Floats		Sinks	
Sp. Gr.	Wt. %	Ash %	Wt. %	Ash %	Wt. %	Ash %
- 1.30	--	--	--	--	--	--
1.30 - 1.35	7.38	5.04	7.38	5.04	100.00	40.39
1.35 - 1.40	14.29	10.51	21.67	8.65	92.62	43.21
1.40 - 1.45	10.09	17.86	31.76	11.57	78.33	49.17
1.45 - 1.50	7.94	22.84	39.70	13.83	68.24	53.80
1.50 - 1.55	6.57	28.37	46.27	15.89	60.30	57.88
1.55 - 1.60	4.10	33.67	50.37	17.34	53.73	61.49
1.60 - 1.65	4.46	38.41	54.83	19.05	49.63	63.79
1.65 - 1.70	4.05	45.68	58.88	20.88	45.17	66.29
1.70 - 1.80	7.98	55.27	66.86	24.99	41.12	68.32
1.80 - 2.00	15.21	64.84	82.07	32.37	33.14	71.47
+ 2.00	17.93	77.09	100.00	40.39	17.93	77.09
Total	100.00	40.39				

CYCLONE ENGINEERING SALES LTD.
EDMONTON, ALBERTA, CANADA

CYPRUS ANVIL MINING CORPORATION S1-232

TULAMEEN PROJECT

TABLE 6b: WASHABILITY FOR SIZE FRACTION 3/4" x 1/4"

	Fractional		Cumulative Floats		Cumulative Sinks	
Sp. Gr.	Wt. %	Ash %	Wt. %	Ash %	Wt. %	Ash %
- 1.30	1.11	3.01	1.11	3.01	100.00	33.84
1.30 - 1.35	24.21	4.13	25.32	4.08	98.89	34.18
1.35 - 1.40	14.38	10.42	39.70	6.38	74.68	43.92
1.40 - 1.45	7.14	17.07	46.84	8.01	60.30	51.91
1.45 - 1.50	5.78	22.03	52.62	9.55	53.16	56.59
1.50 - 1.55	4.68	28.66	57.30	11.11	47.38	60.81
1.55 - 1.60	3.14	34.93	60.44	12.35	42.70	64.33
1.60 - 1.65	2.93	38.81	63.37	13.57	39.56	66.67
1.65 - 1.70	2.22	44.17	65.59	14.61	36.63	68.90
1.70 - 1.80	5.30	53.36	70.89	17.50	34.41	70.49
1.80 - 2.00	13.93	67.38	84.82	25.69	29.11	73.61
+ 2.00	15.18	79.33	100.00	33.84	15.18	79.33
Total	100.00	33.84				

CYCLONE ENGINEERING SALES LTD.
EDMONTON, ALBERTA, CANADA.

CYPRUS ANVIL MINING CORPORATION S1-232

TULAMEEN PROJECT

TABLE 6c: WASHABILITY FOR SIZE FRACTION 1/4" x 28 MESH

	Fractional		Cumulative Floats		Cumulative Sinks	
Sp. Gr.	Wt. %	Ash %	Wt. %	Ash %	Wt. %	Ash %
- 1.30	26.63	2.25	26.63	2.25	100.00	29.30
1.30 - 1.35	17.32	4.34	43.95	3.07	73.37	39.12
1.35 - 1.40	5.98	10.59	49.93	3.97	56.05	49.87
1.40 - 1.45	5.78	16.10	55.71	5.23	50.07	54.56
1.45 - 1.50	3.93	23.15	59.64	6.41	44.29	59.58
1.50 - 1.55	1.05	25.43	60.69	6.74	40.36	63.13
1.55 - 1.60	2.22	30.34	62.91	7.57	39.31	64.14
1.60 - 1.65	2.01	33.50	64.92	8.38	37.09	66.16
1.65 - 1.70	1.40	38.07	66.32	9.00	35.08	68.03
1.70 - 1.80	5.27	46.27	71.59	11.75	33.68	69.28
1.80 - 2.00	7.50	61.43	79.09	16.46	28.41	73.54
+ 2.00	20.91	77.89	100.00	29.30	20.91	77.89
Total	100.00	29.30				

CYCLONE ENGINEERING SALES LTD.
EDMONTON, ALBERTA, CANADA.

CYPRUS ANVIL MINING CORPORATION S1-232

TULAMEEN PROJECT

TABLE 6d: WASHABILITY FOR SIZE FRACTION 28 MESH x 100 MESH

	Fractional		Cumulative			
			Floats		Sinks	
Sp. Gr.	Wt. %	Ash %	Wt. %	Ash %	Wt. %	Ash %
- 1.30	22.79	1.37	22.79	1.37	100.00	31.24
1.30 - 1.35	17.64	3.47	40.43	2.29	77.21	40.06
1.35 - 1.40	4.62	8.36	45.05	2.91	59.57	50.90
1.40 - 1.45	6.85	13.19	51.90	4.27	54.95	54.47
1.45 - 1.50	3.38	17.82	55.28	5.09	48.10	60.35
1.50 - 1.55	2.16	20.74	57.44	5.68	44.72	63.56
1.55 - 1.60	2.07	25.90	59.51	6.39	42.56	65.74
1.60 - 1.65	1.74	29.85	61.25	7.05	40.49	67.78
1.65 - 1.70	1.61	33.74	62.86	7.74	38.75	69.48
1.70 - 1.80	4.17	41.99	67.03	9.87	37.14	71.03
1.80 - 2.00	4.17	51.70	71.20	12.32	32.97	74.70
+ 2.00	28.80	78.03	100.00	31.24	28.80	78.03
Total	100.00	31.24				

CYCLONE ENGINEERING SALES LTD.
EDMONTON, ALBERTA, CANADA.

CYPRUS ANVIL MINING CORPORATION S1-232

TULAMEEN PROJECT

TABLE 6e: WASHABILITY FOR SIZE FRACTION 1 1/2" x 100 MESH
(Reconstituted)

	Fractional		Cumulative			
			Floats		Sinks	
Sp. Gr.	Wt. %	Ash %	Wt. %	Ash %	Wt. %	Ash %
- 1.30	8.37	2.12	8.37	2.12	100.00	34.93
1.30 - 1.35	16.02	4.29	24.39	3.55	91.63	37.92
1.35 - 1.40	11.64	10.43	36.03	5.77	75.61	45.05
1.40 - 1.45	7.86	17.02	43.89	7.78	63.97	51.35
1.45 - 1.50	5.95	22.42	49.84	9.53	56.11	56.16
1.50 - 1.55	4.31	28.04	54.15	11.00	50.16	60.16
1.55 - 1.60	3.19	33.17	57.34	12.24	45.85	63.18
1.60 - 1.65	3.18	37.43	60.52	13.56	42.66	65.42
1.65 - 1.70	2.64	43.78	63.16	14.82	39.48	67.68
1.70 - 1.80	6.18	52.27	69.34	18.16	36.84	69.39
1.80 - 2.00	12.17	64.95	81.51	25.15	30.66	72.84
+ 2.00	18.49	78.03	100.00	34.93	18.49	78.04
Total	100.00	34.93				

CYCLONE ENGINEERING SALES LTD.
EDMONTON, ALBERTA, CANADA.

CYPRUS ANVIL MINING CORPORATION S1-232

TULAMEEN PROJECT

TABLE 7: FROTH-FLOTATION AND ANALYSES OF FINE SIZE FRACTIONS

Test Conditions:

Reagent	Fuel Oil & MIBC
Reagent Composition	4:1
Reagent Consumption	1.13 lb./ton
Solids % of Pulp	10

7a: SIZE FRACTION 28 MESH x 0

Time (sec.)	Wt. %	Ash %	R.M. %	V.M. %	F.C. %	BTU/lb.
30	9.42	34.39	4.44	27.11	34.06	7,770
30 - 60	--	--	--	--	--	--
60 - 90	--	--	--	--	--	--
Tailings	90.58	36.96	4.40	26.43	32.21	7,350
Total	100.00	36.72	4.40	26.49	32.39	7,390

7b: SIZE FRACTION 100 MESH x 0

Time (sec.)	Wt. %	Ash %	R.M. %	V.M. %	F.C. %	BTU/lb.
30	8.19	39.31	4.38	25.50	30.81	7,150
30 - 60	--	--	--	--	--	--
60 - 90	--	--	--	--	--	--
Tailings	91.81	46.46	4.30	21.96	27.28	6,070
Total	100.00	45.87	4.31	22.25	27.56	6,160

CYCLONE ENGINEERING SALES LTD.
EDMONTON, ALBERTA, CANADA.

CYPRUS ANVIL MINING CORPORATION S1-232

TULAMEEN PROJECT

TABLE 8: ANALYSES OF RECONSTITUTED CLEAN COAL PRODUCT

COMPOSITION:

Size	Yield	Cut (a)	Process
1 1/2" x 100m	60.52	1.65	Float
100m x 0	--	--	Froth
Total	58.22		

	Air-Dry Basis	Dry Basis
PROXIMATE ANALYSIS:		
Ash %	13.65	14.47
R.M. %	5.66	--
V.M. %	31.82	33.73
F.C. %	48.87	51.80
CALORIFIC VALUE (BTU/lb.)	10,720 5956	11,363

HARDGROVE GRINDABILITY INDEX: 57

CYCLONE ENGINEERING SALES LTD.
EDMONTON, ALBERTA, CANADA.

TABLE 8: ANALYSES OF RECONSTITUTED CLEAN COAL PRODUCT continued

ULTIMATE ANALYSIS:

Ash %	13.65
Carbon %	62.27
Hydrogen %	4.93
Oxygen %	17.23
Nitrogen %	1.30
Sulphur %	0.62

MINERAL ANALYSIS OF ASH:

SiO_2 %	69.51
Al_2O_3 %	13.54
Fe_2O_3 %	6.55
CaO %	1.17
MgO %	0.44
Na_2O %	0.67
K_2O %	0.64
TiO_2 %	0.04
P_2O_5 %	0.17
SO_3 %	0.51

ASH FUSHION TEMPERATURES:

	Oxidizing Atmosphere	Reducing Atmosphere
Initial Deformation	2400° F.	2260° F.
Softening (Spherical)	2580° F.	2480° F.
Softening (Hemispherical)	2660° F.	2580° F.
Fluid	2800° F.	2760° F.

CYCLONE ENGINEERING SALES LTD.
EDMONTON, ALBERTA, CANADA.

FIGURE

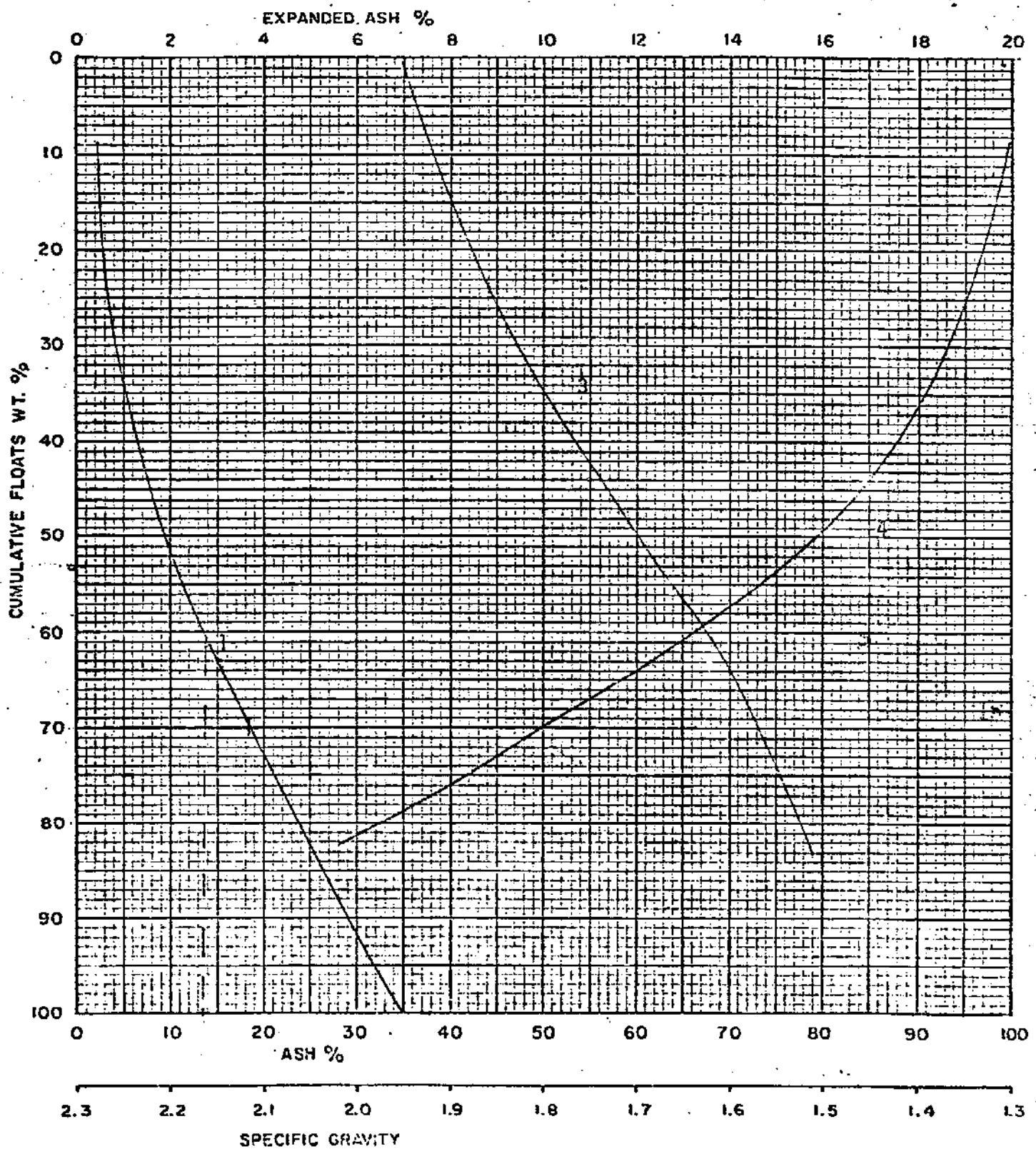
COMPANY CYPRUS ANVIL MINING CORPORATION

SAMPLE TULAMEEN BULK #1

Size 1 1/2" x 100 Mesh

WASHABILITY CURVES

1 - FLOATS
2 - EXPANDED FLOATS
3 - SINKS
4 - SPECIFIC GRAVITY
5 - ELEMENTARY ASH
6 - NEAR GRAVITY MATERIAL



DATE

CYCLONE ENGINEERING SALES LTD.
EDMONTON, ALBERTA, CANADA

BULK SAMPLE NO. 3B

Birtley Coal & Minerals Testing

A DIVISION OF GREAT WEST STEEL INDUSTRIES LTD.

February 24, 1978

Mr. T. Adamson
Cyprus Anvil Mining Corporation
330 - 355 Burrard Street
Vancouver, B.C.
V6C 2G8

Dear Tom:

Enclosed is a summary of the results to date of analyses performed on samples from your Tulameen project.

Yours truly,

BIRTLEY COAL & MINERALS TESTING

Frank J. Horvat

Frank J. Horvat
Manager

cas
Encl.

505 - 50th Avenue S.E., P.O. Box 5488, Station "A", Calgary, Alberta T2H 1X9 Telephone (403) 253-8273

BULK SAMPLE NO. 3B

CLIENT: CYPRUS ANVIL MINING CORPORATION

PROJECT: TULAMEEN PROJECT

LAB. NO.: 239

December 15, 1977

SIZE AND RAW ANALYSIS						
				CUMULATIVE		
SIZE FRACTION	WT.%	RM.%	ASH%	WT.%	ASH%	REMARKS
4" x 1 1/2"	26.0	7.5	33.0	26.0	33.0	air dried basis
	26.1		35.7	26.1	35.7	dry basis
1 1/2" x 3/4"	14.2	7.5	33.3	40.2	33.1	a.d.b.
	14.3		36.0	40.4	35.8	d.b.
3/4" x 1/4"	17.6	8.9	30.1	57.8	32.2	a.d.b.
	17.4		33.0	57.8	35.0	d.b.
1/4" x 1/8"	10.3	7.5	27.8	68.1	31.5	a.d.b.
	10.4		30.1	68.2	34.2	d.b.
1/4" x 28M	23.7	8.5	28.1	91.8	30.6	a.d.b.
	23.6		30.7	91.8	33.3	d.b.
28M x 100M	6.0	8.5	37.0	97.8	31.0	a.d.b.
	6.0		40.4	97.8	33.7	d.b.
100M x 0	2.2	8.0	45.1	100.0	31.3	a.d.b.
	2.2		49.0	100.0	34.1	d.b.
HEAD RAW	100.0	8.0	32.2			a.d.b.
	100.0		35.0			d.b.

+4" Rock = 4.3%, discarded

+4" Coal = 13.9%, crushed to -4" and included in above size analysis.

TOTAL +4" = 18.2%

Head Raw analysis does include +4" rock.

CLIENT: CYPRUS ANVIL MINING CORPORATION

PROJECT: TULAMEEN PROJECT

LAB. NO.: 239

December 15, 1977

SINK-FLOAT ANALYSES

S.G. FRACTION	4" x 1 1/2" (WT.%= 26.0) WT.%	RM.%	ASH%	CUMULATIVE WT.%	CUMULATIVE ASH%	1 1/2" x 3/4" (WT.%= 14.2) WT.%	RM.%	ASH%	CUMULATIVE WT.%	CUMULATIVE ASH%	REMARKS
-1.30	nil					nil					a.d.b.
	nil					nil					d.b.
1.30-1.40	18.4	8.7	10.5	18.4	10.5	25.0	9.3	9.6	25.0	9.6	a.d.b.
	18.1		11.5	18.1	11.5	24.4		10.6	24.4	10.6	d.b.
1.40-1.50	25.3	7.9	20.8	43.7	16.5	25.7	8.6	21.4	50.7	15.6	a.d.b.
	25.0		22.6	43.1	17.9	25.4		23.4	49.8	17.1	d.b.
1.50-1.55	6.4	5.3	29.8	50.1	18.2	6.5	6.9	29.9	57.2	17.2	a.d.b.
	6.5		31.5	49.6	19.7	6.5		32.1	56.3	18.9	d.b.
1.55-1.60	11.1	6.9	34.1	61.2	21.1	6.2	7.0	34.7	63.4	18.9	a.d.b.
	11.1		36.6	60.7	22.8	6.2		37.3	62.5	20.7	d.b.
1.60-1.65	10.1	6.0	39.9	71.3	23.7	4.6	7.0	39.5	68.0	20.3	a.d.b.
	10.2		42.4	70.9	25.6	4.6		42.5	67.1	22.2	d.b.
1.65-1.70	4.4	6.3	42.8	75.7	24.8	5.4	6.1	44.7	73.4	22.1	a.d.b.
	4.4		45.7	75.3	26.8	5.5		47.6	72.6	24.1	d.b.
1.70-1.75	3.3	5.5	48.5	79.0	25.8	3.2	5.2	48.2	76.6	23.2	a.d.b.
	3.3		51.3	78.6	27.8	3.3		50.8	75.9	25.3	d.b.
1.75-1.80	5.7	5.3	53.0	84.7	27.7	3.7	4.9	56.5	80.3	24.7	a.d.b.
	5.8		56.0	84.4	29.8	3.8		59.4	79.7	26.9	d.b.
1.80-2.00	7.8	5.4	59.5	92.5	30.3	8.9	5.7	64.3	89.2	28.7	a.d.b.
	7.9		62.9	92.3	32.6	9.1		68.2	88.8	31.1	d.b.
+ 2.00	7.5	3.0	70.2	100.0	33.3	10.8	2.8	72.9	100.0	33.5	a.d.b.
	7.7		72.4	100.0	35.7	11.2		75.0	100.0	36.0	d.b.

CLIENT: CYPRUS ANVIL MINING CORPORATION

PROJECT: TULAMEEN PROJECT

LAB. NO.: 289 - LIBERATION TESTS

December 21, 1977

SINK-FLOAT ANALYSES

FRACTION	1/8" x 28M (WT.% = 25.3)					28M x 100M (WT.% = 7.6)					REMARKS
	WT.%	RM.%	ASH%	CUMULATIVE WT.%	CUMULATIVE ASH%	WT.%	RM.%	ASH%	CUMULATIVE WT.%	CUMULATIVE ASH%	
-1.30	1.1	1.6	3.0	1.1	3.0	0.8	1.3	2.0	0.8	2.0	a.d.b.
	1.1		3.0	1.1	3.0	0.8		2.0	0.8	2.0	d.b.
1.30-1.40	24.5	1.7	4.4	25.6	4.3	39.1	2.6	2.6	39.9	2.7	a.d.b.
	24.5		4.5	25.6	4.4	39.1		2.7	39.9	2.7	d.b.
1.40-1.50	7.9	1.8	16.5	33.5	7.2	7.8	2.9	10.6	47.7	3.9	a.d.b.
	7.9		16.8	33.5	7.4	7.8		10.9	47.7	4.0	d.b.
1.50-1.55	4.8	2.2	24.5	38.3	9.4	5.4	2.9	17.6	53.1	5.3	a.d.b.
	4.8		25.1	38.3	9.6	5.4		18.1	53.1	5.5	d.b.
1.55-1.60	3.7	2.2	29.4	42.0	11.1	3.5	2.0	23.2	56.6	6.4	a.d.b.
	3.7		30.1	42.0	11.4	3.5		23.7	56.6	6.6	d.b.
1.60-1.65	4.2	2.5	32.8	46.2	13.1	3.3	2.3	28.7	59.9	7.6	a.d.b.
	4.2		33.6	46.2	13.4	3.3		29.4	59.9	7.8	d.b.
1.65-1.70	6.3	2.5	38.9	52.5	16.2	2.1	2.2	33.4	62.0	8.5	a.d.b.
	6.3		39.9	52.5	16.6	2.1		34.2	62.0	8.7	d.b.
1.70-1.75	7.7	2.2	45.2	60.2	19.9	2.8	2.3	38.1	64.8	9.8	a.d.b.
	7.7		46.2	60.2	20.4	2.8		39.0	64.8	10.0	d.b.
1.75-1.80	6.1	1.9	49.9	66.3	22.7	4.2	1.9	43.8	69.0	11.9	a.d.b.
	6.1		50.9	66.3	23.2	4.2		44.6	69.0	12.1	d.b.
1.80-2.00	18.7	2.4	58.1	85.0	30.5	11.4	2.5	53.5	80.4	17.8	a.d.b.
	18.7		59.5	85.0	31.2	11.4		54.9	80.4	18.2	d.b.
+ 2.00	15.0	1.3	74.3	100.0	37.0	19.6	1.4	75.4	100.0	29.1	a.d.b.
	15.0		75.3	100.0	37.8	19.6		76.5	100.0	29.6	d.b.

CLIENT: CYPRUS ANVIL MINING CORPORATION

PROJECT: TULAMEEN PROJECT

LAB. NO.: 239

December 15, 1977

SINK-FLOAT ANALYSES

S.G. FRACTION	3/4" x 1/4" (WT.%=17.6) WT.%	RM.%	ASH%	CUMULATIVE WT.%	CUMULATIVE ASH%	1/4" x 1/8" (WT.%=10.3) WT.%	RM.%	ASH%	CUMULATIVE WT.%	CUMULATIVE ASH%	REMARKS
-1.30	14.1	5.3	5.0	14.1	5.0	4.1	3.4	4.4	4.1	4.4	a.d.b.
	13.9		5.3	13.9	5.3	4.0		4.6	4.0	4.6	d.b.
1.30-1.40	19.4	5.3	10.9	33.5	8.4	38.7	4.7	7.9	42.8	7.6	a.d.b.
	19.1		11.5	33.0	8.9	38.4		8.3	42.4	8.0	d.b.
1.40-1.50	21.8	4.6	21.5	55.3	13.6	14.6	3.3	19.9	57.4	10.7	a.d.b.
	21.7		22.5	54.7	14.3	14.6		20.6	57.0	11.2	d.b.
1.50-1.55	5.7	3.6	30.9	61.0	15.2	7.1	3.3	27.5	64.5	12.6	a.d.b.
	5.7		32.1	60.4	16.0	7.1		28.4	64.1	13.1	d.b.
1.55-1.60	6.9	3.2	37.7	67.9	17.5	4.5	3.4	34.7	69.0	14.0	a.d.b.
	7.0		38.9	67.4	18.4	4.5		35.9	68.6	14.6	d.b.
1.60-1.65	5.6	3.3	40.7	73.5	19.2	3.6	3.6	39.3	72.6	15.3	a.d.b.
	5.7		42.1	73.1	20.2	3.6		40.8	72.2	15.9	d.b.
1.65-1.70	1.1	3.0	44.8	74.6	19.6	2.7	3.4	43.7	75.3	16.3	a.d.b.
	1.1		46.2	74.2	20.6	2.9		45.2	75.1	17.0	d.b.
1.70-1.75	2.4	3.2	51.6	77.0	20.6	1.9	3.3	47.9	77.2	17.0	a.d.b.
	2.4		53.3	76.6	21.6	1.9		49.5	77.0	17.8	d.b.
1.75-1.80	2.9	2.6	58.2	79.9	22.0	2.4	3.2	51.2	79.6	18.1	a.d.b.
	2.8		59.8	79.4	23.0	2.4		52.9	79.4	18.9	d.b.
1.80-2.00	8.8	2.7	68.1	88.7	26.6	6.8	3.0	61.5	86.4	21.5	a.d.b.
	8.9		70.0	88.3	27.7	6.9		63.4	86.3	22.5	d.b.
+ 2.00	11.3	1.6	75.9	100.0	32.1	13.6	3.4	76.6	100.0	29.0	a.d.b.
	11.7		77.1	100.0	33.5	13.7		79.3	100.0	30.2	d.b.

Firtley Engineering

Subsidiary of Great West Steel Industries

CLIENT: CYPRUS ANVIL MINING CORPORATION

PROJECT: TULAMEEN PROJECT

LAB. NO.: 239

December 15, 1977

SINK-FLOAT ANALYSIS

S.G. FRACTION	1/8" x 28M (WT.%=23.7)					28M x 100M (WT.%=6.0)					REMARKS
				CUMULATIVE					CUMULATIVE		
	WT.%	RM.%	ASH%	WT.%	ASH%	WT.%	RM.%	ASH%	WT.%	ASH%	
-1.30	6.4	4.3	4.9	6.4	4.9	0.4	2.5	5.6	0.4	5.6	a.d.b.
	6.4		5.1	6.4	5.1	0.4		5.7	0.4	5.7	d.b.
1.30-1.40	30.1	3.9	6.7	36.5	6.4	11.9	3.2	7.6	12.3	7.5	a.d.b.
	30.2		7.0	36.6	6.7	12.1		7.9	12.5	7.8	d.b.
1.40-1.50	17.6	3.8	17.0	54.1	9.8	18.7	3.4	13.1	31.0	10.9	a.d.b.
	17.7		17.7	54.3	10.3	18.9		13.6	31.4	11.3	d.b.
1.50-1.55	6.2	3.6	24.1	60.3	11.3	6.6	4.0	19.0	37.6	12.3	a.d.b.
	6.3		25.0	60.6	11.8	6.6		19.8	38.0	12.8	d.b.
1.55-1.60	3.6	4.1	30.3	63.9	12.4	6.5	4.3	25.4	44.1	14.2	a.d.b.
	3.5		31.6	64.1	12.9	6.5		26.5	44.5	14.8	d.b.
1.60-1.65	3.6	4.2	34.9	67.5	13.6	4.5	4.4	30.0	48.6	15.7	a.d.b.
	3.6		36.4	67.7	14.1	4.5		31.4	49.0	16.3	d.b.
1.65-1.70	3.0	3.8	40.4	70.5	14.7	3.8	5.0	32.9	52.4	16.9	a.d.b.
	3.0		42.0	70.7	15.3	3.8		34.6	52.8	17.6	d.b.
1.70-1.75	3.0	4.2	43.2	73.5	15.9	3.6	4.9	38.1	56.0	18.3	a.d.b.
	3.0		45.1	73.7	16.5	3.6		40.1	56.4	19.1	d.b.
1.75-1.80	3.0	4.0	47.0	76.5	17.1	3.8	4.9	42.5	59.8	19.8	a.d.b.
	3.0		49.0	76.7	17.8	3.8		44.7	60.2	20.7	d.b.
1.80-2.00	8.8	4.7	56.5	85.3	21.2	15.5	4.7	54.5	75.3	27.0	a.d.b.
	8.8		59.3	85.4	22.0	15.4		57.2	75.6	28.1	d.b.
+ 2.00	14.7	4.4	74.9	100.0	29.1	24.7	5.4	72.3	100.0	38.2	a.d.b.
	14.6		78.3	100.0	30.2	24.4		76.4	100.0	39.9	d.b.

CLIENT: CYPRUS ANVIL MINING CORPORATION

PROJECT: TULAMEEN PROJECT

LAB. NO.: 289 - LIBERATION TESTS December 21, 1977

COMPOSITE 4" x 3/4" SINK AT 1.55: FLOAT AT 1.80 CRUSHED TO PASS 3/4".

SIZE & RAW ANALYSIS						
				CUMULATIVE		
FRACTION	WT.%	RM.%	ASH%	WT.%	ASH%	REMARKS
3/4"x1/4"	45.7	6.0	46.2	45.7	46.2	a.d.b.
	45.7		49.1	45.7	49.1	d.b.
1/4"x1/8"	16.1	5.7	45.4	61.8	46.0	a.d.b.
	16.1		47.6	61.8	48.7	d.b.
1/8"x28M	25.3	5.8	35.6	87.1	43.0	a.d.b.
	25.3		37.8	87.1	45.5	d.b.
28Mx100M	7.6	6.0	28.0	94.7	41.8	a.d.b.
	7.6		29.8	94.7	44.3	d.b.
100Mx0	5.3	6.9	32.5	100.0	41.3	a.d.b.
	5.3		34.9	100.0	43.8	d.b.

CLIENT: CYPRUS ANVIL MINING CORPORATION

PROJECT: TULAMEEN PROJECT

LAB. NO.: 289 - LIBERATION TESTS

December 21, 1977

SINK-FLOAT ANALYSES

FRACTION	3/4" x 1/4" (WT.% = 45.7) WT.%	RM.%	ASH%	CUMULATIVE WT.%	CUMULATIVE ASH%	1/4" x 1/8" (WT.% = 16.1) WT.%	RM.%	ASH%	CUMULATIVE WT.%	CUMULATIVE ASH%	REMARKS
-1.30	--	--	--	--	--	0.1	1.4	6.2	0.1	6.2	a.d.b.
						0.1		6.3	0.1	6.3	d.b.
1.30-1.40	0.7	3.2	8.2	0.7	8.2	4.6	2.6	8.3	4.7	8.3	a.d.b.
	0.7		8.5	0.7	8.5	4.5		8.5	4.6	8.5	d.b.
1.40-1.50	3.6	1.8	20.5	4.3	18.5	6.5	2.6	19.0	11.2	14.5	a.d.b.
	3.6		20.9	4.3	18.9	6.5		19.5	11.1	14.9	d.b.
1.50-1.55	6.1	2.2	28.3	10.4	24.2	7.0	2.6	27.4	18.2	19.5	a.d.b.
	6.1		28.9	10.4	24.8	6.9		28.1	18.0	20.0	d.b.
1.55-1.60	11.9	2.4	35.2	22.3	30.1	6.5	2.5	32.8	24.7	23.0	a.d.b.
	11.9		36.1	22.3	30.8	6.5		33.6	24.5	23.6	d.b.
1.60-1.65	8.5	2.3	39.3	30.8	32.6	8.5	2.3	36.8	33.2	26.5	a.d.b.
	8.5		40.2	30.8	33.4	8.6		37.7	33.1	27.3	d.b.
1.65-1.70	12.4	2.8	42.8	43.2	35.6	10.1	2.6	41.7	43.3	30.1	a.d.b.
	12.3		44.0	43.1	36.4	10.1		42.8	43.2	30.9	d.b.
1.70-1.75	9.4	1.7	47.5	52.6	37.7	9.4	2.2	46.8	52.7	33.0	a.d.b.
	9.4		48.3	52.5	38.6	9.4		47.9	52.6	33.9	d.b.
1.75-1.80	15.3	1.7	51.1	67.9	40.7	9.6	2.0	50.7	62.3	35.8	a.d.b.
	15.4		52.0	67.9	41.6	9.6		51.7	62.2	36.7	d.b.
1.80-2.00	23.6	2.1	60.2	91.5	45.7	25.5	2.5	59.3	87.8	42.6	a.d.b.
	23.6		61.5	91.5	46.7	25.4		60.8	87.6	43.7	d.b.
+ 2.00	8.5	1.4	73.8	100.0	48.1	12.2	1.2	74.8	100.0	46.5	a.d.b.
	8.5		74.8	100.0	49.1	12.4		75.7	100.0	47.6	d.b.

CLIENT: CYPRUS ANVIL MINING CORPORATION

PROJECT: TULAMEEN PROJECT

LAB. NO.: 239 - COMPOSITE CLEAN COAL (4" x 100M/-1.55)

YIELD = 54.8% of 4" x 100M							
MOISTURE	ASH%	VM.%	FC.%	S%	B.T.U.	H.G.I.	CALC. FACTORS
5.5	14.7	31.2	48.6	0.58	10738	61	a.d.b.
	15.6	33.0	51.4	0.61	11363	--	d.b.

ASH FUSION TEMPS. (°F)				
ATMOSPHERE	I.D.T.	S.T.	H.T.	F.T.
OXIDIZING	2540	2650+		
REDUCING	2440	2620	2650	2650+

MINERAL ANALYSIS OF ASH										
SiO_2	Al_2O_3	TiO_2	Fe_2O_3	CaO	MgO	Na_2O	K_2O	P_2O_5	SO_3	Undeter.
71.50	18.78	1.27	3.57	0.14	0.54	0.47	2.17	0.27	0.29	-1.00

ULTIMATE ANALYSIS						
H20%	C%	H%	N%	S%	ASH%	O%
5.54	61.71	4.75	0.90	0.58	14.72	17.34

APPENDIX 14

App. 14

Geophysical Survey Specifications

APPENDIX 14

Geophysical Survey Specifications

1st Survey

Transmitter

A 250 watt, battery operated, portable unit manufactured by Crone Geophysics Ltd. Cycling rate is 2 seconds ON - 2 seconds OFF with the pulses reversing continuously in polarity.

Receiver

A Newmont designed, pulse-type I.P. receiver manufactured by Crone Geophysics Ltd. It samples the decay curve between .45 - .90 seconds (M) and .90 - 1.35 seconds (N) for 3 current cycles and stores them after adjustment to the 33M1 standard. The primary Voltage Vp is also obtainable from .0005 to 60 volts $\pm$5%.

2nd Survey

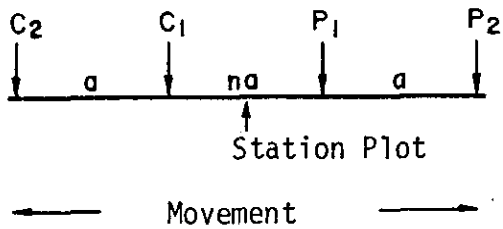
Transmitter

The same as on the first survey.

Receiver

A sensitive S.P. meter manufactured by Apex Parametrics Ltd.

Collinear Dipole-Dipole (D.D.)



a = Dipole length.

n = Separation, usually an integer.

Parallel Dipole-Dipole (S.L.D.D.)