

DRESSER INDUSTRIES INC.

FIRESIDE PROJECT

PROJECT COST ESTIMATE

LIARD, M. D.

94 M / 11 W ± 14

50° 46 N 127° 14 W

March 1981

Prepared by
C. A. McLeish
R. Baran, C.S.T.

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT

9052

NO. _____



Telephone: (416) 792-2700
Telex: 06-97762

CANADIAN MINE SERVICES LTD.

1595 CLARK BOULEVARD, BRAMPTON, ONTARIO L6T 4C1

March 18, 1981

Mr. L. B. Bryan
Vice President, Project Development
Magcobar Mineral Division
Dresser Industries Inc.
P. O. Box 650A
Houston, Texas 77005
U.S.A.

Dear Mr. Bryan:

Enclosed herein please find our report entitled

Dresser Industries Inc.
Fireside Project
Project Cost Estimate

The report was prepared in accordance with your instructions included in your purchase order.

We would like to express our appreciation to your Mr. J. S. Carter whose information was very helpful for the completion of the report.

We thank you for having the opportunity to work on this most interesting project and will be pleased to discuss this report or answer any questions you may have, at your convenience.

Yours very truly,

CANADIAN MINE SERVICES LTD.

J. I. Tatak, P.Eng.
Vice President, Engineering
Canadian Based Subsidiaries

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DRESSER INDUSTRIES INC.
FIRESIDE PROJECT

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DRESSER INDUSTRIES INC.
FIRESIDE PROJECT

1.0 INTRODUCTION

Dresser Industries Inc. has engaged Canadian Mine Services to study available deposits to establish mineable reserves of open pit barite and suitable access to those reserves.

Cost estimates are to be developed to build a new access road from the Alaska Highway to the Moose deposit and to mine by open pit as detailed in the Terms of Reference.

DRESSER INDUSTRIES INC.
FIRESIDE PROJECT

2.0 TERMS OF REFERENCE

Dresser Industries Inc. have established the following terms of reference:

1. Develop cost to build a new access road for truck haulage of approximately 4 miles from mile 551 near Alaska Highway to the Moose deposit.
2. Develop the cost of an open pit, starting in the south end of the Moose deposit, beginning June 1, 1981.
 - a) Cost per ton of mining barite including cost of thin overburden removal and waste removal of the walls.
 - b) Cost per ton barite to haul to stockpile at the Alaska Highway mile 551.
 - c) Cost to crush ore to minus 4 inch.
3. Minimum specific gravity of acceptable barite is 4.22.
4. Develop cost for the mining rates:
 - a) 30,000 tons per year increasing by 10% per annum.
5. Establish mineable reserves of 4.22 S.G. barite ore.
 - a) Determine reserves to a final pit ratio of 5 cubic metres waste to one metric ton ore. Cut off grade equals 4.22 run of mine basis.
 - b) Determine waste removed by year.
 - c) Determine life of mine.
 - d) Tabulate ore production, waste production, ore/waste ratio, grade, volumes and production costs by year, for the first 20 years of production. Illustrate the extraction areas on the mine plan for the first 10 years by year showing area, volume and grade by year of ore and waste.
6. Develop mine volumes in metric units and cost data in Canadian dollars.

DRESSER INDUSTRIES INC.
FIRESIDE PROJECT

2.0 TERMS OF REFERENCE (CONT'D)

7. Supply ten copies of report and summary to Dresser.
Supply Dresser with mylar transparencies of all plans, sections, and layouts used to construct the report and summary.
8. Canadian Mine Service agrees to furnish Dresser Industries the final report and drawings six weeks from the date of the purchase order.

DRESSER INDUSTRIES INC.
FIRESIDE PROJECT

2.1 STUDY PARAMETERS AND ASSUMPTIONS

1. Metric units are used for all engineering calculations.
2. Costs are expressed in Canadian dollars
3. In all cases in which capital and operating cost data are indexed, index multipliers are shown.
4. Start-up target date is June 1, 1981
5. Assume clean mining without intentional dilution.
6. Assume all mining and processing is conducted in accordance with Canadian and Provincial statutes and in accordance with industry standards.
7. Assume that the operation will be under the management and direction of Dresser Industries Inc. Standard approximation or experience are used for estimating the cost of supervision, maintenance and parts.
8. Assume that work force to be non-union.
9. Assume that performance levels of equipment and labor to be equal to local standards for operations with similar conditions.

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3.0 SUMMARY

Road access and open pit mining of the Fireside barite deposit in Northern British Columbia has been studied briefly. Time and cost schedules were developed to provide a new access road and subsequent open pit mining of barite for stockpiling near the Alaska highway.

3.1 ACCESS ROAD AND PRE-PRODUCTION SITES

A tentative access road has been picked using the route drawn by photo interpreters except for the Alaska highway exit, which is considered too far West. Costs were developed for the shorter four-mile route advancing from the Moose pit site out to the highway to utilize as much overburden and waste from the pit as possible. All work was scheduled in the four month period of good weather from June 1st to September 30th.

3.2 PRE-PRODUCTION COST SUMMARY

1. Preparation & mobilization	\$ 34,326.
2. Build road	368,412.
3. Site preparation	35,436.
4. Camp costs	97,200.
5. Administration & supervision labour	101,828.
	<hr/>
TOTAL	637,202.
Contingencies 15%	95,580.
	<hr/>
TOTAL PRE-PRODUCTION COST	\$732,782.

DRESSER INDUSTRIES INC.
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3.3 BARITE PRODUCTION

Barite mining schedules and costs were developed using the following assumptions.

1. Annual production will commence at 27,223 tonnes and increase 2,722 tonnes per year.
2. Annual production can be obtained during the four month summer season.
3. Mining will start in the Moose deposit and continue to a depth of 25 metres which is the bottom of presently indicated barite.
4. The West Bear deposit and the Moose north extension will each yield one year's production by surface mining.
5. Inflation was assumed at 12% per year with gradual decrease to 6.5% in 1989.

On the basis of these assumptions the three pits will probably yield nine years production totalling 343,000 tonnes of barite with a specific gravity between 4.22 and 4.25 and an average waste to barite ratio of 1.42 m³ to 1 tonne barite. Future exploration work could outline extra tonnage for both open pit and underground mining.

3.4 OPERATION COSTS

Annual operating costs include operating and administration for the full season except for the Year 1981 in which waste removal and camp costs for three months are included in pre-production costs.

The following table illustrates production and cost of barite delivered to the Alaska highway for the nine years required to exhaust presently indicated barite reserves.

DRESSER INDUSTRIES INC.
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COST SUMMARY

Canadian Dollars Per Tonne Barite

YEAR	BARITE TONNES MINED	COST PER TONNE BARITE				TOTAL
		MINING	CRUSHING	HAUL TO STOCKPILE	CAMP & ADMIN.	
1981	27,223	2.95	1.54	2.91	2.95	10.35
1982	29,946	21.03	1.72	2.96	10.45	36.16
1983	32,666	21.61	1.91	3.28	10.60	37.40
1984	35,389	22.19	2.09	3.59	10.74	38.61
1985	38,111	22.73	2.27	3.91	10.86	39.77
1986	40,833	23.50	2.46	4.23	10.95	41.14
1987	43,553	23.81	2.64	4.54	11.04	42.03
1988	46,283	24.28	2.83	4.86	11.11	43.08
1989	49,007	20.33	3.01	5.18	11.18	39.70
TOTAL 9 YEARS	343,011					

Note: Overburden stripping in Year 1 included in road building in Preproduction cost.

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4.0 GENERAL PROCEDURE

Available data on the Fireside Project were examined for the general area, road location, storage sites, camp sites, and mining areas. Typical diamond drill cores of the barite and both walls of the Moose deposit were examined at the Rosalind storage sheds. Diamond drill logs were read and several barite intersections checked for specific gravity. The property was not visited.

During the investigation, it appeared that the road and mining schedule should be planned for the four month period of favourable weather for June 1st through September, 1981. This would require the crew and equipment to work 12 hour shifts, six days per week. This schedule is not desirable, but it is possible with a non-union crew.

Other alternatives are:

1. Shorter hours with larger crew and more equipment requiring a larger camp.
2. Double shifting with larger crew and the same equipment. A calculation was made using ten hour shifts. This did not provide enough time to complete the required work.
3. Extend the work period to five or six months.

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4.1 ACCESS ROAD, STOCKPILE AND CAMP

Examination of the air photos and the 1,000 scale contour maps indicates that the general route suggested by the Dresser staff is satisfactory. A recently revised 1,000 scale photo mosaic and contour map has been supplied by the Orthoshop. A preferred route and alternate routes have been sketched by the photo interpreter. The preferred road exit from the Alaska Highway is shown approximately 800 metres west of any previously chosen site. This would involve 800 metres of extra road building and 800 metres uphill haul to the stockpile site. For reasons of economy, this new western site has not been used in calculating length of the road which generally follows the preferred route.

Two mineral reserves in the vicinity of the Alaska Highway may influence the choice of a storage site. The first of these reserves established by Order in Council 365, dated February 3, 1970, requires a release for mining or other activity below the 2,200 foot (616 metre) contour which crosses the highway 500 metres west of Oregon Lake. This reserve may be avoided by siting the access road exit and stockpile area 1,000 metres west of Oregon Lake at approximately mile 551.

The second mineral reserve established by Order in Council 992, dated March 17, 1977, reserves a 1,500 metre Yukon pipeline corridor along the Alaska Highway. This corridor extends 800 metres north and 600 metres south of Oregon Lake. Discussion with the Gold Commissioner of B.C., February 25, 1981, indicates that the access road would be subject to normal permit conditions, but a stockpile site within the pipeline reserve would be subject to more restrictions because the final pipeline route is not established.

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4.1 ACCESS ROAD, STOCKPILE AND CAMP (CONT'D)

Either of two alternate sites may be developed. The first is a small plateau, 2,100 metres northeast of Oregon Lake, at elevation 2,300 foot (646 metre), the second in an area 500 - 600 metres south of the Moose barite pit site at elevation 2,300 foot (646 metres).

(APPENDIX I - FIGURES 2 & 3)

Both alternate sites would require up-grading the access road to permit transport by highway trucks and also would require snow-plowing for winter hauling. Subject to pipeline reserve, all three sites are suitable for any further processing plant.

If one of the alternate off highway sites is chosen, an effort should be made to use the existing highway exit approximately 1,000 metres east of Oregon Lake. This would shorten the road by about 500 metres and eliminate the construction of a new exit from the Highway.

(APPENDIX I - FIGURE 3)

4.1.1 ROAD CONSTRUCTION PROCEDURE

To meet a road construction and mining schedule in the first year, both these operations must proceed together. As much of the pit overburden and waste rock as possible should be used for road fill as it is removed from the pit. Then it will be necessary to build the road from the Moose pit site to the highway. This requires rehabilitating the old access road. If unforeseen delays occur, a second crew can build the road north from the highway using fill from the gravel pits already opened close to the highway.

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4.1.1 ROAD CONSTRUCTION PROCEDURE (CONT'D)

With most of the early work concentrated in the Moose pit area, the most convenient camp site will be nearby.

4.1.2 CAMP SITE AND CAMP

Two alternative camps were investigated:

1. Motel at Fireside, B.C.

This motel is in receivership and is in the process of being sold. The interim receiver-manager was contacted and quoted a price of \$35. - \$40. per day for room only. Both the rates and availability of this motel are uncertain.

2. Caterer - Portable Camp

A June 1st, 1981 start-up time coincides with a slack period in oil well drilling and caterers have indicated that 15 to 20 men camps will be available in the Fort St. John's area. Fortier and Associates have quoted \$27.75 per man for 20 men, or \$32.50 per man day for 15 men, plus moving, propane, power and camp rental.

(APPENDIX III)

3. Rent camp bare plus cook (\$115./day) helper (\$95./day and bullcook (\$85./day)

Purchase of a permanent camp during the early part-time mining of direct shipping ore is not considered practical as it would require year round servicing and caretaking to prevent theft and vandalism. This alternative was not investigated beyond verbal quotes from Atco Ltd.

(APPENDIX III)

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4.1.3 ROAD CONSTRUCTION DETAILS

Preliminary road layout is being made from the 1" - 1,000' scale ortho photo mosaic to be supplied by Dresser Industries. Detailed layout must wait for spring when snow cover has melted.

The most important consideration in the location and construction of the road is the presence of intermittent permafrost. These patches of permafrost are probably confined to low swampy areas where moss cover is thickest. These areas should be avoided where possible.

The design criterion used on the Dempster Highway for preserving permafrost is 5 feet of gravel fill. This should be satisfactory for swampy crossings which cannot be avoided. Mined rock would be better if available. Wherever possible, the ground surface should be left undisturbed and filled over. On higher ground, 2 feet of good fill should be adequate. Apparently, in earlier road work, side cuts did not give trouble except in an area of loose sand near the highway exit.

For preliminary calculations, the following criteria have been used:

1. Length	6,439 metres
2. Crown	20 feet (6.1 metres)
3. Average fill	2 to 3 feet
4. Estimated fill volume	35,770 m ³
5. Leguil Creek crossing	Large culvert
6. Maximum grade	10%
7. Construction season	4 months
8. Labour & equipment:	
Day	12 hours
Weeks	6 days

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4.2 OPEN PIT STRIPPING AND MINING

Five barite occurrences are known on the Fireside property. Of these only the Moose deposit has sufficient information to permit a mining layout.

The Moose deposit was laid out for estimating purposes with a pit slope of 45° to a depth of 25 metres in 5 benches to yield 243,934 tonnes of barite, or just under seven years production.

This does not reach the requested ratio of 5 m³ of waste to 1 tonne barite but no further planning is justified without further positive drill information.

The West Bear deposit appears to contain a substantial amount of barite which can be detailed for mining by further diamond drilling.

The northward extension of the Moose deposit should yield mineable open pit barite if estimates are confirmed by further diamond drilling.

Less is known about the East Bear and Beaver deposits.

J.S. Carter of Dresser Industries estimates possible barite from geophysical indications and a few diamond drill intersections as follows:

<u>DEPOSIT</u>	<u>TONNES</u>	<u>DEPTH</u>	<u>SPECIFIC GRAVITY</u>
West Bear	210,000		4.25
Moose North Extension	50,000		4.25
East Bear	40,000		Low Grade
Beaver	18,000		4.25 (Narrow)

(APPENDIX I - FIGURES 4, 5 & 6)

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4.2 OPEN PIT STRIPPING AND MINING (CONT'D)

Mining all these deposits from underground below pit areas is technically feasible if sufficient tonnage and product price can be established. Underground mining may be required in 10 years. With present inflation rates (12%) underground mining costs could be between \$125.00 and \$150.00 per tonne of barite at that time. No detailed planning or costing is possible without further information.

4.2.1 MOOSE PIT STRIPPING AND MINING

The Moose barite deposit has the most detailed information and the largest probable reserves close to surface.

(APPENDIX I - FIGURE 4)

No on-site observations were made, but diamond drill cores, intersecting the barite and both east and west walls, were examined. These cores show substantial weathering to at least 30 feet. An early experiment indicated that the east wall argillite could be ripped for several feet with a D-8 Caterpillar tractor. On this basis, the pit was planned to use the ripper and scraper to cut the first 5 metres waste floor on the east wall of the barite. The barite bench will then be blasted to the first floor and loaded with an articulated front-end loader into tandem gravel trucks for transport to a gravel crusher for reduction to minus 4 inches.

Subsequent floors may require drilling and blasting and costs are calculated on the basis that one third of the waste can be ripped and two thirds drilled and blasted.

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4.2.1 MOOSE PIT STRIPPING AND MINING (CONT'D)

To maintain minimum shipping grade of 4.22 specific gravity, no more than 10% volume of wall rock can be accepted. This condition can best be attained by drilling and blasting each floor in three stages:

1. East wall argillite benched 4 to 5 metres wide to allow working room for equipment.
2. Barite seam
3. West wall. Waste to working width.

This procedure will probably require the extra cost of three separate set-ups for drilling in the soft, sheared and brecciated rock indicated by the diamond drilling.

4.2.2 MOOSE PIT SCHEDULING

YEAR 1

1. Strip overburden from the full length of the North and South pits to expose barite. Experiment with ripping and scraping the waste on the east wall of barite. Haul all suitable overburden and argillite to road fill. This stripping and hauling is costed in road construction for convenience because it is also a pre-production expense.
2. Drill and blast 30,000 tons of barite starting at the south limit about Section B on Map # 4 and finishing at approximately Section J. Set gravel crusher at a stockpile area close to the pit, crush and store temporarily near the south end of the pit until the road surface is ready for truck haulage. This may be after the road surface has frozen.
3. Haul crushed barite to main storage area or direct to shipping point.

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4.2.2 MOOSE PIT SCHEDULING (CONT'D)

YEAR 2

During Year 2 and subsequent years the mining of overburden, waste, and barite is charted on the following pages for the Moose deposit pit. A possible schedule for the West Bear and Moose North extension is also charted. No further scheduling is justified until more detailed information is obtained by drilling and stripping.

4.2.3 ILLUSTRATIONS

Proposed pit outline plan, longitudinal sections and typical cross sections are shown in the Appendix as Appendix I, Figures 4, 7, 8, 9, 10, & 11.

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PIT SCHEDULE - MOOSE BARITE DEPOSIT

YEAR	OVERBURDEN	WASTE	BARITE	BARITE t	RATIO WASTE m ³ /BARITE TONNES
1	25,000 m ³	15,000 m ³	6,405 m ³	27,223	1.47/1
2	17,750	38,800	7,046	29,946	1.89/1
3	17,750	38,800	7,686	32,666	1.73/1
4	17,750	38,800	8,327	35,389	1.60/1
5	17,750	38,800	8,967	38,111	1.48/1
6 (N.Ex.)	5,000 *	38,800	9,608	40,833	1.07/1
7	-	13,000	9,357	39,766	0.30/1
TOTALS	101,000	222,000	57,396	243,934	1.32/1

Note: Year 6 includes 5,000 m³ overburden stripping to expose Moose north extension.

(APPENDIX II)

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PIT SCHEDULE - WEST BEAR DEPOSIT

YEAR	OVERBURDEN	WASTE	BARITE	BARITE t	RATIO WASTE m ³ /BARITE TONNES
5					
6	14,000 m ³				
7	18,000	25,800	891	3,787	11.57/1
8	18,000	38,800	10,890	46,283	1.23/1
<u>MOOSE NORTH EXTENTION</u>					
9	18,000	30,000	11,531	49,007	0.98/1
	68,000	94,600	23,312	99,077	
TOTAL	169,000	316,600	80,708	343,011	1.42/1

Note: Mining Schedules for West Bear are tentative until these deposits are delineated.

They are included to illustrate continuity in production and costs only.

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	<u>BARITE t</u>	<u>STRIP m³</u>	<u>WASTE m³</u>
YEAR 1	27,223	25,000	15,000

Year 1 - Road requires 35,770 m³
Haul half way from pit and argillite finishing

621-B will haul 9 m³

Travel time averages distance 2 miles @ 15 m.p.h.

Travel 4 miles = $\frac{4}{15} \times 60$ = 16 minutes

Load & unload = 14 minutes

Trip time = 30 minutes

10 hours per day @ 70% = 7 x 2 = 14 trips

Total delivered to road = 14 x 9 = 126 m³/day

Total road = $\frac{35,770}{126}$ scraper days = 283 days

10 hour days - 2 machines @ 7 hours - 28 loads = 142 days

11 hour days - 2 machines @ 8 hours - 32 loads = 124 days

12 hour days - 2 machines @ 9 hours - 36 loads = 110 days

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5.0 COSTS - GENERAL

Costs have been divided into Pre-Production and Production costs.

Pre-Production costs include:

1. Engineering preparation and Government permit planning.
2. Mobilization and rehabilitation
3. Road and site construction which includes initial overburden stripping and waste removal from the pit.

Production costs include only supervision and barite mining costs for the first year. All costs are included in subsequent years with a straight line escalation of 12%.

To arrive at unit and yearly costs, two main approaches were used.

1. Equipment purchase or rental plus labor costs based on both mining and construction rates in the northern B.C. area.
2. Rental of camps and equipment complete with crews and maintenance plus administration and supervision costs.

Cost estimates were within 10% for both methods. For simplicity the all-found costs quoted by Grant Stewart of Watson Lake are used for calculation.

Camp and Administration costs have been arbitrarily split at 3 months pre-production and 1 month production for the first year.

APPENDIX III

AVAILABLE EQUIPMENT OPERATING COMPARISON

FINNING TRACTOR QUOTE (RENTAL BARE +)									G. STEWART QUOTE (ALL FOUND)		
MACHINE	YEAR	MONTHLY RENTAL	DAILY RENTAL	DRIVER	FUEL	LUB. & SERVICE	MAINT.	TOTAL	MACHINE	ALL FOUND	COST/m ³
D-8-K	1978	19,000.	731.00	262.17	121.50	30.00	100.00	1,244.67	D-8-H	1,240.00	
621-B (Qty. 2)	1976	34,000	1,307.00	486.20	135.00	50.00	120.00	2,098.20	621-B (Qty. 2)	1,980.00	
14-G Grader	1978	17,800	685.00	247.87	40.50	20.00	40.00	1,033.37	12-B Grader	540.00	
D-6-C	1976	8,900	342.00	262.17	67.50	30.00	50.00	751.67	D-6-C	900.00	
98C-B	1975	13,300	512.00	247.87	48.00	25.00	40.00	872.87	4 Yd. Loader	900.00	
30 t Trucks (Qty. 2-Est. Only)	1976	8,000	308.00	486.20	60.00	50.00	50.00	954.20	30 t Trucks (Qty. 2-Est. Only)	1,080.00	
TOTALS		101,000	3,885.00	1,992.48	472.50	205.00	400.00	6,954.98		6,640.00	
Gravel Crusher		-	-	-	-	-	-	-	Gravel Crusher	-	6.54
Air Trac. (Verbal) - Bits & Steel		2,460	94.60	273.79 273.79		30.00 60.00	30.00	488.39	Air Trac.	-	
Compressor(Verbal) (Gardner Denver) New		2,195	84.40	219.45	60.00	25.00	20.00	408.85	Compressor		7.55
TOTALS		4,655	179.00	767.03	60.00	115.00	50.00	1,171.03			

Note: 1. Calculated break - 1 machine - 2 shifts
 28 holes @ 5 m³ = 140 m³
 Cost m³ = $\frac{\$1171.03}{140 \text{ m}^3} = \$8.36/\text{m}^3 + \text{explosives } \$1.30/\text{m}^3$

Note: 2. Experience may indicate a greater hole spacing

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5.1 ROAD AND SITE COSTS

5.1.1 MOBILIZE, REHABILITATE EXISTING ROAD AND PREPARE CAMP SITE
(6 DAYS) - INCLUDES PRE-PLANNING AND PERMITS

	<u>TIME</u>	<u>RATE/DAY</u>	<u>TOTAL</u>
<u>Old Road</u>			
- D-8 Cat.	4 Days	1,260.00	\$ 5,040.00
- Grader	2 Days	540.00	1,080.00
- Laborer	6 Days	219.45	1,316.70
<u>Camp Site</u>			
- D-8 Cat.	2 Days	1,260.00	2,520.00
- Laborer	4 Days	219.45	877.90
<u>Install Camp</u>			
- Laborer	6 Days	219.45	1,316.70
- Small Cat (D-6)	2 Days	900.00	1,800.00
<u>Build Shop Shelter</u>			
- Tradesmen	4 Days	264.46	1,057.84
- Laborer	6 Days	219.45	1,316.70
- Materials (estimate)			3,000.00
			<u>19,325.84</u>
Pre-planning and Permits (Permits will require 3 months at least to obtain)			15,000.00
			<u>\$34,325.84</u> -----

5.1.2 BUILD ROAD

It is important that the road be completed in 3 months or less. The scrapers are considered to be the critical equipment in road building. In calculating machine times, the following assumptions were used:

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5.1.2 BUILD ROAD (CONT'D)

1. Average haul distance	3.2 km
2. Maximum speed - 631-B	24 km p.h.
3. Load and unload	14 minutes
4. Maximum load 631-B	15 m ³
5. Average trip time	30 minutes
6. Equipment availability is 75% (7.5 hours)	15 trips
7. 10 hour days - average daily haul @ 7.5 hours	225 m ³
8. 12 hour days - average daily haul @ 9.0 hours	270 m ³ 18 trips
9. 12 hour days - machine day for 35,770 m ³	133 machine days

∴ Require 2 machines for 67 days working 12 hours per shift. This represents 96 meters advance per day worked. All other jobs will then be scheduled around this requirement. Many of these job figures are necessarily vague because field conditions along the route are not known.

Pioneer, Clear, Survey and Build

- Laborer @ 15 days/mile	- 60 Days @	219.45	\$	13,167.00
- 631-B Scraper (2 Units)	- 67 Days @	1,980.00		132,660.00
- Small Cat (D-6)	- 67 Days @	900.00		60,300.00
- Grader	- 67 Days @	540.00		36,180.00

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5.1.2 BUILD ROAD (CONT'D)

Equipment and Labor

- Dump Truck	- 15 Days @ 540.00	\$ 8,100.00
- 5 yd.Loader	- 15 Days @ 900.00	13,500.00
- D-8 Cat.	- 67 Days @ 1,260.00	84,420.00
- Air Trac., Compressor + Operator	- 20 Days @ 504.24	10,084.80
- Culvert		10,000.00
		\$ 368,411.80

Note: Air Trac., Compressor + Operator
will be approximately \$5.77/cu.yd.
(\$7.54/cu.m.)

5.1.3 STOCKPILE SITE PREPARATION (5 DAYS)

Regardless of location

Require 3 acres @ \$5,000./acre \$ 15,000.00

5.1.4 PIT SITE CLEARING AND BURNING

Pit area $\frac{2000' \times 400'}{43560} = 18.37$ acres

18.37 acres x cost estimate of \$1,000./acre \$ 18,370.00

Low Grade Stockpile area

Clear and level $\frac{300' \times 200'}{43560} \times \$1,500.$ 2,066.00

Waste piles, area -

TOTAL SITE PREPARATION \$ 20,436.00

DRESSER INDUSTRIES INC.
FIRESIDE PROJECT

5.1.5 CAMP COSTS COMPARISON

1. Fireside Motel (Telephone Calls)

Rooms quoted @ \$35.-\$40./Day (Estimate)	37.50
Meals (Estimate)	20.00
Total Rate Per Man Day	57.50

2. Fortier Bid

20 man camp, food & staff	555.00
Camp rental	250.00
Grocery delivery $.550 \times 1.6 \times \frac{70}{7}$	88.00
20 k.w. light plant	49.00
Propane tank	7.00
Incinerator	30.00
Propane @ 1.5 gal. per man = 30 gal.	30.00
Diesel @ 20 gal. per day x \$1.50	30.00
Freight, etc. (Estimate):	
Move-in (Ft.St.John)-5 loads	\$2,750.00
Move-out(Ft.St.John)-5 loads	2,750.00
Set-up and tear down	4,000.00
120 Days (4 mo.) ÷	\$9,500.00 79.00
Total Rate Per Day	1,118.00
Total Rate Per Man Day ÷ 18 Men	62.11

3. Company camps and company staff are available for rental-lease or for purchase, however, these were not investigated. The estimated cost is about the same as A and B with some extra disadvantages in organizing crew, supplies and security.

A camp purchased and left on site inactive for several months will invite vandalism and theft unless it is occupied full-time by a caretaker.

(APPENDIX FIGURE III)

DRESSER INDUSTRIES INC.
FIRESIDE PROJECT

5.1.5 CAMP COSTS COMPARISON (CONT'D)

Camp costs are estimated at \$60.00/man day

\$60. x 18 men x 90 days \$ 97,200.00

5.1.6 SUPERVISION, ADMINISTRATION AND MISC. LABOR (5 MEN)

Mining Superintendent	\$325.09 x 78 days	\$ 25,357.02
Mine Forman (Blasting Papers)	\$270.75 x 78 days	21,118.50
Mining Geologist - Surveyor	\$270.75 x 78 days	21,118.50
Laborer	2 x \$219.45 x 78 days	34,234.20
		\$ <u>101,828.22</u>

5.1.7 PRE-PRODUCTION COST SUMMARY

Mobilize, rehabilitate existing road and prepare camp site (6 days) - Includes pre- planning and permits	\$ 34,326.00
Build Road - Pioneer, clear, survey and build - Equipment and labor	368,412.00
Stockpile site preparation (5 days)	15,000.00
Pit site clearing and burning	20,436.00
Camp costs estimate	97,200.00
Supervision, Administration and misc. Labor (5 men)	101,828.00
	637,202.00
TOTAL	637,202.00
CONTIGENCIES @ 15%	95,580.00
	95,580.00
TOTAL PRE-PRODUCTION COSTS	\$ 732,782.00

DRESSER INDUSTRIES INC.
FIRESIDE PROJECT

5.2 OPERATING COSTS

Operating costs were calculated on the assumption that all work will be done during the construction season June 1st to September 30th.

Assuming one third of the waste can be ripped, one D-8 cat., one scraper, one loader and 2 - 30 ton trucks working 12 hour shifts will handle waste and barite removal. In addition 2 air trac.-compressor units on double shift or 4 units on single shift will be required to break waste and barite. A grader will be required part-time to maintain roads. For costing this requirement has been set at 26 days.

It may be possible to sub-contract grader work to the highway maintenance crews stationed at Fireside.

DRESSER INDUSTRIES INC.
FIRESIDE PROJECT

OPERATING COSTS SUMMARY - 3 PITS

YEAR	OVERBURDEN & WASTE		BARITE		CAMP & ADMIN.	TOTAL	BARITE \$/TONNE
	m ³	\$	TONNE	\$	\$		
1981	-	-	27,223	201,534	80,383	281,917	10.35
1982	56,550	530,944	29,946	239,006	312,941	1,082,891	36.16
1983	56,550	586,958	32,666	288,415	346,471	1,221,844	37.40
1984	56,550	643,760	35,389	342,686	380,000	1,366,446	38.61
1985	56,550	700,562	38,111	401,586	413,530	1,515,678	39.77
1986	57,800	767,566	40,833	465,180	447,059	1,679,805	41.14
1987	56,800	816,361	43,553	533,379	480,589	1,830,329	42.03
1988	56,800	873,316	46,283	606,338	514,118	1,993,772	43.08
1989	48,000	713,904	49,007	683,899	547,647	1,945,450	39.70

Note: All figures in even dollars

1981 overburden and waste removal included in pre-production cost of road.

DRESSER INDUSTRIES INC.
FIRESIDE PROJECT

5.2.1 EQUIPMENT PERFORMANCE

1. Scraper 621-B - Capacity 11 m³

Assume overburden and 1/3 of waste can be moved by scraper
one half mile.

Then load and dump	12 minutes
Travel 1 mile @ 10 m.p.h.	6 minutes
	<hr/>
Time per load	18 minutes

Loads per day (9 hr.)	$\frac{9 \times 60}{18}$	30 loads
-----------------------	--------------------------	----------

Volume per day		330 m ³
Require burden	17,750 m ³	54.0 days
Ripped waste	<u>12,933 m³</u>	<u>39.0 days</u>
Total		30,683 m ³

Days required	$\frac{30,683}{330}$	93 days
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Days available		104 days
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* One Machine O.K.

2. D-8-K - Ripping 330 m³/Day

Volume to rip		12,933 m ³
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Days to rip	$\frac{12,933}{330}$	39 Days
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Roads and stripping estimate		30 Days
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DRESSER INDUSTRIES INC.
FIRESIDE PROJECT

5.2.1 EQUIPMENT PERFORMANCE (CONT'D)

3. Air Trac. & Compressor

Drill and blast required 25,867 m³ waste
7,046 m³ barite

Drill pattern - waste & ore 1m x 1m x 5.5 m

Break 5 m³ per hole

Drill 18' holes - 250' per shift 14 holes/shift

Require 32,867 m³

Require $\frac{32,867}{5}$ holes 6,578 holes

Require $\frac{6578}{14}$ drill shifts 470 shifts

Require 2 drills 2 shifts $\frac{470}{4}$ 117 days

4. Two Trucks and Loader a waste 25,867 m³

4 yard loader load 30 ton truck 27 tonnes = .10 m³

4 buckets per truck @ 1.5 minutes 6 minutes

Haul 2 x 0.5 minutes @ 10 m.p.h. 6 minutes

Dump 2 minutes

Per load 14 minutes

Per truck day $\frac{9 \times 60}{14}$ 38.5 loads

2 trucks 77 load/day
770 m³/day

Require $\frac{25,867}{770}$ m³ 34 days

DRESSER INDUSTRIES INC.
FIRESIDE PROJECT

5.2.1 EQUIPMENT PERFORMANCE (CONT'D)

Load and Haul Barite 7,046 m³

1. Pit to crusher $\frac{1}{2}$ mile

Trucks	27 tons	6.5 m ³ barite
Load	3 buckets per truck @ 1.5 min.	4.5 minutes
Haul	2 x 0.5 m @ 10	6.0 minutes
Dump		2.5 minutes
Per load		<u>13.0 minutes</u>
Trucks	$\frac{9 \times 60}{13}$ / day	41.5 loads
Required	$\frac{7046}{41.5 \times 6.5}$	26 days

2. Crusher to stockpile 4 miles (6.5 kilometres)

Load	4 yd. loader 3 loads @ 1.5 miles	4.5 minutes
Haul	$\frac{2 \times 4 \times 60}{15}$ @ 15 m.p.h.	32.0 minutes
Dump		<u>2.5 minutes</u>
Per load		39.0 minutes
Loads per day	$\frac{9 \times 60}{39}$	13.8 loads/day
Require	$\frac{29,946}{27}$	1,109 loads
Total days	$\frac{1109}{13.8}$	80 days
Say 2 trucs		40 days

TOTAL 2 TRUCKS & LOADER

Waste	34 days
Barite to crusher	13 days
Barite to stockpile	40 days
TOTAL	<u>87 days O.K.</u>

DRESSER INDUSTRIES INC.
FIRESIDE PROJECT

OPERATING COSTS FOR 1981

OPERATION	EQUIPMENT	BASE COST /UNIT	INFORMATION SOURCE	DAYS	TOTAL COST	COST /m ³	COST BARITE /TONNE
<u>Waste</u>	-	-			-	-	-
<u>Barite</u> (27,223 t)							
Drill & Blast	Air Trac. Compressor	5.77/cu.yd.	Quote	46	48,358	7.55	
	Explosives	1.30/m ³	Estimate	46	8,357	1.30	
Haul to Crusher	Loader	900.00/day	Quote	12	10,800	1.69	
	2 Trucks	10.80/day	Quote	12	12,960	2.02	
TOTAL MINING					80,445	12.56	2.95
Crushing	Crusher	5.00/cu.yd.	Quote	-	41,889	6.54	1.54
Haul to Stockpile	Loader	900.00/day	Quote	40	36,000	5.62	
	2 Trucks	10.80/day	Quote	40	43,200	6.74	
					79,200	12.36	2.91
<u>General Expense</u>							
Road Maintenance	Grader	540.00/day	Quote	26	14,040	2.19	
Camp	Camp	18 x \$60.	Quote	30	32,400	5.05	
Administration		1,305.49/day	Quote	26	33,943	5.30	
TOTAL GENERAL					80,383	12.54	2.95
GRAND TOTAL					281,917	44.00	10.35

LESSER INDUSTRIES INC.
FIRESIDE PROJECT

OPERATION COSTS FOR 1982

OPERATION	EQUIPMENT	BASE COST /DAY	X	ESCALATOR	X	COST/DAY	X	DAYS	TOTAL COSTS	ESCALATOR COST/UNIT m ³	1981 BASE COST/UNIT m ³	COST/ TONNE BARITE
<u>Overburden</u>												
Strip	621-B	990.00		1.12		1,108.80		54	59,875.	3.37	3.00	
17,750 m ³	D-8-K	1,240.00		1.12		1,388.80		30	41,664.	2.35	2.10	
									101,539.	5.72	5.10	
Rip Waste	621-B	990.00		1.12		1,108.80		39	43,243.	3.34	2.98	
12,933 m ³	D-8-K	1,240.00		1.12		1,388.80		39	54,163.	4.19	3.74	
									97,406.	7.53	6.72	
Drill & Blast	2 Air Trac.	-		1.12		-						
Haul Waste	2 Compressors	-		1.12		-		92	218,835.	8.46	7.55	
	Explosives	-		1.12		-			37,766.	1.46	1.30	
25,867 m ³	Loader	900.00		1.12		1,008.00		34	34,272.	1.32	1.17	
	2 Trucks	1,080.00		1.12		1,209.60		34	41,126.	1.59	1.42	
									331,999.	12.83	11.44	
<u>SUB-TOTAL</u>									530,944.	9.38	8.38	17.73
<u>Barite</u>												
Drill & Blast	2 Air Trac.	-		1.12		-		25	59,609.	8.46	7.55	
	2 Compressors	-		1.12		-						
	Explosives	-		1.12		-			10,287.	1.46	1.30	
7,046 m ³	Loader	900.00		1.12		1,008.00		13	13,104.	1.86	1.66	
(29,946t)	2 Trucks	1,080.00		1.12		1,209.60		13	15,725.	2.23	1.99	
									98,725.	14.01	12.50	3.30
Crush	Crusher	-		1.12		-			51,577.	7.32	6.53	1.72
Haul to Stockpile	Loader	900.00		1.12		1,008.00		40	40,320.	5.72	5.10	
	2 Trucks	1,080.00		1.12		1,209.60		40	48,384.	6.86	6.13	
									88,704.	12.58	11.23	2.96
<u>SUB-TOTAL</u>									239,006.	33.91	30.28	7.98
<u>Camp & Administration</u>												
Camp	20 man	1,080.00		1.12		1,209.60		120	145,152.			
Administration	5 men	1,305.50		1.12		1,462.15		104	152,064.			
Grader		540.00		1.12		604.80		26	15,725.			
									312,941.			10.45
<u>GRAND TOTAL</u>									1,082,891.			36.16

BARITE COSTS $\frac{\$1,089,891}{29,946} = \36.16 per ton of barite

DRESSER INDUSTRIES INC.

FIRESIDE PROJECT

OPERATING COSTS FOR 1983

OPERATION	QUANTITY m ³	X	BASE UNIT COST	X	24 % ESCALATION	ESCALATED COST	APPROX. ESCALATED UNIT m ³	COSTS · TONNE BARITE
<u>Overburden</u>								
Strip Overburden	17,750		5.10		1.24	112,251	6.32	
Rip Waste	12,933		6.72		1.24	107,768	8.33	
Drill & Blast and Haul Waste	25,867		11.44		1.24	366,939	14.19	
SUB-TOTAL	56,550					586,958	10.38	17.96
<u>Barite</u>								
Drill & Blast and Haul Barite	7,686 (32,666.t)		12.50		1.24	119,133	15.50	3.65
Crush	7,686		6.53		1.24	62,253	8.10	1.91
Haul to Stockpile	7,686		11.23		1.24	107,029	13.93	3.28
SUB-TOTAL	7,686					288,415	37.52	8.84
<u>Camp & Admin.</u>								
Grader	26 Days		540.00		1.24	17,410	669.60	
Camp	120 Days		1,080.00		1.24	160,704	1,339.20	
Administration	104 Days		1,305.50		1.24	168,357	1,618.82	
SUB-TOTAL						346,471		10.60
YEAR TOTAL						1,221,844		37.40

BARITE COSTS \$ 1,221,844 \$ 37.40 per tonne of barite
32,666

DRESSER INDUSTRIES INC.

FIRESIDE PROJECT

OPERATING COSTS FOR 1984

OPERATION	QUANTITY m ³	X	BASE UNIT COST	X	36 % ESCALATION	ESCALATED COST	APPROX. ESCALATED UNIT m ³	COSTS TONNE BARITE
<u>Overburden</u>								
Strip Overburden	17,750		5.10		1.36	123,114	6.93	
Rip Waste	12,933		6.72		1.36	118,197	9.14	
Drill & Blast and Haul Waste	25,867		11.44		1.36	402,449	15.56	
SUB-TOTAL	56,550					643,760	11.38	18.19
<u>Barite</u>								
Drill & Blast and Haul Barite	8,327 (35,389 t)		12.50		1.36	141,559	17.00	4.00
Crush	8,327		6.53		1.36	73,950	8.88	2.09
Haul to Stockpile	8,327		11.23		1.36	127,177	15.27	3.59
SUB-TOTAL						342,686	41.15	9.68
<u>Camp & Admin.</u>								
Grader	26 Days		540.00		1.36	19,094	734.40	
Camp	120 Days		1,080.00		1.36	176,256	1,468.80	
Administration	104 Days		1,305.50		1.36	184,650	1,775.48	
SUB-TOTAL						380,000		10.74
YEAR TOTAL						1,366,446		38.61

BARITE COSTS \$ 1,366,446 = \$38.61 per tonne barite
35,389

DRESSER INDUSTRIES INC.

FIRESIDE PROJECT

OPERATING COSTS FOR 1985

OPERATION	QUANTITY m ³	X	BASE UNIT COST	X	48 % ESCALATION	ESCALATED COST	APPROX. ESCALATED UNIT m ³	COSTS TONNE BARITE
<u>Overburden</u>								
Strip Overburden	17,750		5.10		1.48	133,977	7.55	
Rip Waste	12,933		6.72		1.48	128,626	9.95	
Drill & Blast and Haul Waste	25,867		11.44		1.48	437,959	16.93	
SUB-TOTAL	56,550					700,562	12.39	18.38
<u>Barite</u>								
Drill & Blast and Haul Barite	8,967 (38,111 t)		12.50		1.48	165,890	18.50	4.35
Crush	8,967		6.53		1.48	86,661	9.66	2.27
Haul to Stockpile	8,967		11.23		1.48	149,035	16.62	3.91
SUB-TOTAL	8,967					401,586	44.78	10.53
<u>Camp & Admin.</u>								
Grader	26 Days		540.00		1.48	20,779	799.20	
Camp	120 Days		1,080.00		1.48	191,808	1,598.40	
Administration	104 Days		1,305.50		1.48	200,943	1,932.14	
SUB-TOTAL						413,530		10.86
YEAR TOTAL						1,515,678		39.77

BARITE COSTS \$ $\frac{1,515,678}{38,111}$ = \$39.77 per tonne barite

DRESSER INDUSTRIES INC.

FIRESIDE PROJECT

OPERATING COSTS FOR 1986

OPERATION	QUANTITY m ³	X	BASE UNIT COST	X	60 % ESCALATION	ESCALATED COST	APPROX. ESCALATED UNIT m ³	COSTS TONNE BARITE
<u>Overburden</u>								
Strip Overburden	19,000		5.10		1.60	155,040	8.16	
Rip Waste	12,933		6.72		1.60	139,056	10.75	
Drill & Blast and Haul Waste	25,867		11.44		1.60	473,470	18.30	
SUB-TOTAL	57,800					767,566	13.28	18.79
<u>Barite</u>								
Drill & Blast and Haul Barite	9,608 (40,833 t)		12.50		1.60	192,160	20.00	4.71
Crush	9,608		6.53		1.60	100,384	10.45	2.46
Haul to Stockpile	9,608		11.23		1.60	172,636	17.97	4.23
SUB-TOTAL	9,608					465,180	48.42	11.40
<u>Camp & Admin.</u>								
Grader	26 Days		540.00		1.60	22,464	864.00	
Camp	120 Days		1,080.00		1.60	207,360	1,728.00	
Administration	104 Days		1,305.50		1.60	217,235	2,088.80	
SUB-TOTAL						447,059		10.95
YEAR TOTAL						1,679,805		41.14

BARITE COSTS \$ 1,679,805 = \$41.14 per tonne barite
40,833

DRESSER INDUSTRIES INC.

FIRESIDE PROJECT

OPERATING COSTS FOR 1987

OPERATION	QUANTITY m ³	X	BASE UNIT COST	X	72% ESCALATION	ESCALATED COST	APPROX. ESCALATED UNIT m ³	COSTS TONNE BARITE
<u>Overburden</u>								
Strip Overburden	18,000		5.10		1.72	157,896	8.77	
Rip Waste	12,933		6.72		1.72	149,485	11.56	
Drill & Blast and Haul Waste	25,867		11.44		1.72	508,980	19.68	
SUB-TOTAL	56,800					816,361	14.37	18.75
<u>Barite</u>								
Drill & Blast and Haul Barite	10,248 (43,553 t)		12.50		1.72	220,332	21.50	5.06
Crush	10,248		6.53		1.72	115,101	11.23	2.64
Haul to Stockpile	10,248		11.23		1.72	197,946	19.31	4.54
SUB-TOTAL	10,248					533,379	52.04	12.24
<u>Camp & Admin.</u>								
Grader	26 Days		540.00		1.72	24,149	928.80	
Camp	120 Days		1,080.00		1.72	222,912	1,857.60	
Administration	104 Days		1,305.50		1.72	233,528	2,245.46	
SUB-TOTAL						480,589		11.04
YEAR TOTAL						1,830,329		42.03

BARITE COSTS $\frac{\$1,830,329}{43,553}$ = \$42.03 per tonne barite

DRESSER INDUSTRIES INC.

FIRESIDE PROJECT

OPERATING COSTS FOR 1988

OPERATION	QUANTITY m ³	X	BASE UNIT COST	X	84 % ESCALATION	ESCALATED COST	APPROX. ESCALATED UNIT m ³	COSTS TONNE BARITE
<u>Overburden</u>								
Strip Overburden	18,000		5.10		1.84	168,912	9.38	
Rip Waste	12,933		6.72		1.84	159,914	12.36	
Drill & Blast and Haul Waste	25,867		11.44		1.84	544,490	21.05	
SUB-TOTAL	56,800					873,316	15.38	18.87
<u>Barite</u>								
Drill & Blast and Haul Barite	10,890 (46,283 t)		12.50		1.84	250,470	23.00	5.41
Crush	10,890		6.53		1.84	130,846	12.02	2.83
Haul to Stockpile	10,890		11.23		1.84	225,022	20.66	4.86
SUB-TOTAL	10,890					606,338	55.68	13.10
<u>Camp & Admin.</u>								
Grader	26 Days		540.00		1.84	25,834	993.60	
Camp	120 Days		1,080.00		1.84	238,464	1,987.20	
Administration	104 Days		1,305.50		1.84	249,820	2,402.12	
SUB-TOTAL						514,118		11.11
YEAR TOTAL						1,993,772		43.08

BARITE COSTS \$ $\frac{1,993,772}{46,283}$ = \$43.08 per tonne barite

DRESSER INDUSTRIES INC.

FIRESIDE PROJECT

OPERATING COSTS FOR 1989

OPERATION	QUANTITY m ³	X	BASE UNIT COST	X	96 % ESCALATION	ESCALATED COST	APPROX. ESCALATED UNIT m ³	COSTS TONNE BARITE
<u>Overburden</u>								
Strip Overburden	18,000		5.10		1.96	180,000	10.00	
Rip Waste	15,000		6.72		1.96	197,568	13.17	
Drill & Blast and Haul Waste	15,000		11.44		1.96	336,336	22.42	
SUB-TOTAL	48,000					713,904	14.87	14.57
<u>Barite</u>								
Drill & Blast and Haul Barite	11,531 (49,007 t)		12.50		1.96	282,510	24.50	5.76
Crush	11,531		6.53		1.96	147,583	12.80	3.01
Haul to Stockpile	11,531		11.23		1.96	253,806	22.01	5.18
SUB-TOTAL	11,531					683,899	59.31	13.95
<u>Camp & Admin.</u>								
Grader	26 Days		540.00		1.96	27,518	1,058.40	
Camp	120 Days		1,080.00		1.96	254,016	2,116.80	
Administration	104 Days		1,305.50		1.96	266,113	2,558.78	
SUB-TOTAL						547,647		11.18
YEAR TOTAL						1,945,450		39.70

BARITE COSTS \$ $\frac{1,945,450}{49,007}$ = \$39.70 per tonne barite

DRESSER INDUSTRIES INC.
FIRESIDE PROJECT

<u>LABOUR RATES ESTIMATION</u>	<u>HOURLY RATE</u>	<u>10 HOUR/DAYS</u>	<u>12 HOUR/DAYS</u>
1. Mining Geologist - Surveyor (\$2,500 mo. plus overtime)			
40 hrs/week x	14.20	568.00	568.00
20 hrs/week o.t. x 1.5 x	14.20	426.00	
32 hrs/week o.t. x 1.5 x	14.20		<u>681.60</u>
Total Weekly		<u>994.00</u>	<u>1,249.60</u>
Weekly ÷ 6 Day Weeks		165.67	208.27
Benefits, etc. + 30%		<u>49.70</u>	<u>62.48</u>
TOTAL DAILY AVERAGE		<u><u>215.37</u></u>	<u><u>270.75</u></u>
2. Mining Superintendent (\$3,000.mo plus overtime)			
40 hrs/week x	17.05	682.00	682.00
20 hrs/week o.t. x 1.5 x	17.05	511.50	
32 hrs/week o.t. x 1.5 x	17.05		<u>818.40</u>
Total Weekly		<u>1,193.50</u>	<u>1,500.40</u>
Weekly ÷ 6 Day Weeks		198.90	250.07
Benefits, etc. + 30%		<u>59.67</u>	<u>75.02</u>
TOTAL DAILY AVERAGE		<u><u>258.57</u></u>	<u><u>325.09</u></u>
3. Mine Foreman (Blasting Papers) (\$2,500. mo. plus overtime)			
40 hrs/week x	14.20	568.00	568.00
20 hrs/week o.t. x 1.5 x	14.20	426.00	
32 hrs/week o.t. x 1.5 x	14.20		<u>681.60</u>
Total Weekly		<u>994.00</u>	<u>1,249.60</u>
Weekly ÷ 6 Day Weeks		165.67	208.27
Benefits, etc. + 30%		<u>49.70</u>	<u>62.48</u>
TOTAL DAILY AVERAGE		<u><u>215.37</u></u>	<u><u>270.75</u></u>

DRESSER INDUSTRIES INC.
FIRESIDE PROJECT

	<u>HOURLY RATE</u>	<u>10 HOUR/DAYS</u>	<u>12 HOUR/DAYS</u>
4. Bulldozer Operator			
40 hrs/week x	13.75	550.00	550.00
20 hrs/week o.t. x 1.5 x	13.75	412.50	
32 hrs/week o.t. x 1.5 x	13.75		<u>660.00</u>
Total Weekly		<u>962.40</u>	<u>1,210.00</u>
Weekly ÷ 6 Day Weeks		160.42	201.67
Benefits, etc. + 30%		<u>48.13</u>	<u>60.50</u>
TOTAL DAILY AVERAGE		<u><u>208.55</u></u>	<u><u>262.17</u></u>
5. Front End Loader Operator			
40 hrs/week x	13.00	520.00	520.00
20 hrs/week o.t. x 1.5 x	13.00	390.00	
32 hrs/week o.t. x 1.5 x	13.00		<u>624.00</u>
Total Weekly		<u>910.00</u>	<u>1,144.00</u>
Weekly ÷ 6 Day Weeks		151.67	190.67
Benefits, etc. + 30%		<u>45.50</u>	<u>57.20</u>
TOTAL DAILY AVERAGE		<u><u>197.17</u></u>	<u><u>247.87</u></u>
6. Air Drill Operator			
40 hrs/week x	14.36	574.40	574.40
20 hrs/week o.t. x 1.5 x	14.36	430.80	
32 hrs/week o.t. x 1.5 x	14.36		<u>689.28</u>
Total Weekly		<u>1,005.20</u>	<u>1,263.68</u>
Weekly ÷ 6 Day Weeks		167.53	210.61
Benefits, etc. + 30%		<u>50.26</u>	<u>63.18</u>
TOTAL DAILY AVERAGE		<u><u>217.79</u></u>	<u><u>273.79</u></u>
7. Grader Operator			
40 hrs/week x	13.00	520.00	520.00
20 hrs/week o.t. x 1.5 x	13.00	390.00	
32 hrs/week o.t. x 1.5 x	13.00		<u>624.00</u>
Total Weekly		<u>910.00</u>	<u>1,144.00</u>
Weekly ÷ 6 Day Weeks		151.67	190.67
Benefits, etc. + 30%		<u>45.50</u>	<u>57.20</u>
TOTAL DAILY AVERAGE		<u><u>197.17</u></u>	<u><u>247.87</u></u>

DRESSER INDUSTRIES INC.
FIRESIDE PROJECT

	HOURLY RATE	<u>10 HOUR/DAYS</u>	<u>12 HOUR/DAYS</u>
8. Mechanic			
40 hrs/week x	13.87	554.80	554.80
20 hrs/week o.t. x 1.5 x	13.87	418.10	
32 hrs/week o.t. x 1.5 x	13.87		<u>665.76</u>
Total Weekly		<u>970.90</u>	<u>1,220.56</u>
Weekly ÷ 6 Day Weeks		161.82	203.43
Benefits, etc.		<u>48.54</u>	<u>61.03</u>
TOTAL DAILY AVERAGE		<u>210.36</u>	<u>264.46</u>
9. Expeditor (First Aid)			
40 hrs/week x	12.56	502.40	502.40
20 hrs/week o.t. x 1.5 x	12.56	376.80	
32 hrs/week o.t. x 1.5 x	12.56		<u>602.88</u>
Total Weekly		<u>879.20</u>	<u>1,105.28</u>
Weekly ÷ 6 Day Weeks		146.53	184.21
Benefits, etc. + 30%		<u>43.96</u>	<u>55.26</u>
TOTAL DAILY AVERAGE		<u>190.49</u>	<u>239.47</u>
10. Truck Driver (Driver 1)			
40 hrs/week x	12.75	510.00	510.00
20 hrs/week o.t. x 1.5 x	12.75	382.50	
32 hrs/week o.t. x 1.5 x	12.75		<u>612.00</u>
Total Weekly		<u>892.50</u>	<u>1,122.00</u>
Weekly ÷ 6 Day Weeks		148.75	187.00
Benefits, etc. + 30%		<u>44.63</u>	<u>56.10</u>
TOTAL DAILY AVERAGE		<u>193.38</u>	<u>243.10</u>
11. Truck Driver (Driver 2)			
40 hrs/week x	12.75	510.00	510.00
20 hrs/week o.t. x 1.5 x	12.75	382.50	
32 hrs/week o.t. x 1.5 x	12.75		<u>612.00</u>
Total Weekly		<u>892.50</u>	<u>1,122.00</u>
Weekly ÷ 6 Day Weeks		148.75	187.00
Benefits, etc. + 30%		<u>44.63</u>	<u>56.10</u>
TOTAL DAILY AVERAGE		<u>193.38</u>	<u>243.10</u>

DRESSER INDUSTRIES INC.
FIRESIDE PROJECT

	<u>HOURLY RATE</u>	<u>10 HOUR DAYS</u>	<u>12 HOUR DAYS</u>
12. Drill Helper			
40 hrs/week x	11.51	460.40	460.40
20 hrs/week o.t. x 1.5 x	11.51	345.30	
32 hrs/week o.t. x 1.5 x	11.51		<u>552.48</u>
Total Weekly		<u>805.70</u>	<u>1,012.88</u>
Weekly ÷ 6 Day Weeks		134.28	168.81
Benefits, etc. + 30%		<u>40.28</u>	<u>50.64</u>
TOTAL DAILY AVERAGE		<u>174.56</u>	<u>219.45</u>
13. Labourer (1)			
40 hrs/week x	11.51	460.40	460.40
20 hrs/week o.t. x 1.5 x	11.51	345.30	
32 hrs/week o.t. x 1.5 x	11.51		<u>552.48</u>
Total Weekly		<u>805.70</u>	<u>1,012.88</u>
Weekly ÷ 6 Day Weeks		134.28	168.81
Benefits, etc. + 30%		<u>40.28</u>	<u>50.64</u>
TOTAL DAILY AVERAGE		<u>174.56</u>	<u>219.45</u>
14. Labourer (2)			
40 hrs/week x	11.51	460.40	460.40
20 hrs/week o.t. x 1.5 x	11.51	345.30	
32 hrs/week o.t. x 1.5 x	11.51		<u>552.48</u>
Total Weekly		<u>805.70</u>	<u>1,012.88</u>
Weekly ÷ 6 Day Weeks		134.28	168.81
Benefits, etc. + 30%		<u>40.28</u>	<u>50.64</u>
TOTAL DAILY AVERAGE		<u>174.56</u>	<u>219.45</u>
TOTAL DAILY AVERAGE (Workers 1 - 14)		2,821.28	3,546.77
TOTAL MONTHLY AVERAGE (26 Day Months)		73,353.28	92,216.02
LABOUR - 4 MONTHS OF OPERATION		293,312.12	368,864.08
**			
Cooking Staff at \$295.00/Day x 30 Day Months		8,850.00	8,850.00
Cooking Staff - 4 Months of Operation		35,400.00	35,400.00



1595 Clark Blvd.
Brampton, Ontario
L6T 4C1

PROJECT Fireside

DETAIL Moose Pit Summary by Floor and Year

South Pit Floor 1 - Years 1 and 2

Page	Floor	m ³		Waste	m ³		t	t
		Strip	cum. Total		cum. Total		Barite	cum. Total
	Road	850	850	-	-	-	-	-
1	1	1445	2295	963	963	12642	12642	
2	1	1983	4278	382	1345	4688	17330	
3	1	737	5015	658	2003	3730	21060	
4	1	3058	8073	913	2916	5831	26891	
5	1	1883	9956	1168	4084	332	27223	
TOTAL	YEAR 1	9956	9956	4084	4084	27223	27223	
5	1	-	-	-	-	7649	34872	
6	1	1940	11896	446	4530	2341	37213	
7	1	2190	14086	764	5296	3790	41003	
SOUTH TOTAL	PIT FLOOR 1	14086	14086	5294	5294	41003	41003	
NORTH	PIT FLOOR 1							
8	Road	991	15077	708	6002	-	-	
	1	7985	23062	2577	8579	12757	53760	
TOTAL N & S	FLOOR 1 PITS	23062	23062	8579	8579	53760	53760	
				2 YEARS PRODUCTION =			57169	
				REQUIRED FROM FLOOR 2			3409	



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PROJECT Fireside

DETAIL Moose Pit Summary by Floor and Year

South Pit Floor 2 - Year 1 and 2

Page	Floor	Strip	cum. Total	Waste	cum. Total	t Barite	t cum. Total
9	Road 2	2357	25419	5584	14163	3409	57169
TOTAL	YEAR 2	15463	25419	10079	14163	29946	57169
9	2	-	-	-	-	10166	67335
10	2	2295	27714	7445	21608	12594	79929
11	2 (W)	2423	30147	11715	33323	9906	89835
TOTAL	YEAR 3	4718	30137	19160	33323	32666	89835
11	2	-	-	-	-	8773	98608
NORTH	<u>PIT FLOOR 2</u>						
12	2	4855	34992	5530	38853	14250	112858
TOTAL	FLOOR 2	11930	34992	30274	38853	59098	112858
SOUTH	<u>PIT FLOOR 3</u>						
13	3	2583	37575	7575	46428	12812	125670
TOTAL	YEAR 4	7438	37575	13105	46428	35835	125670



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PROJECT Fireside

DETAIL Moose Pit Summary by Floor and Year

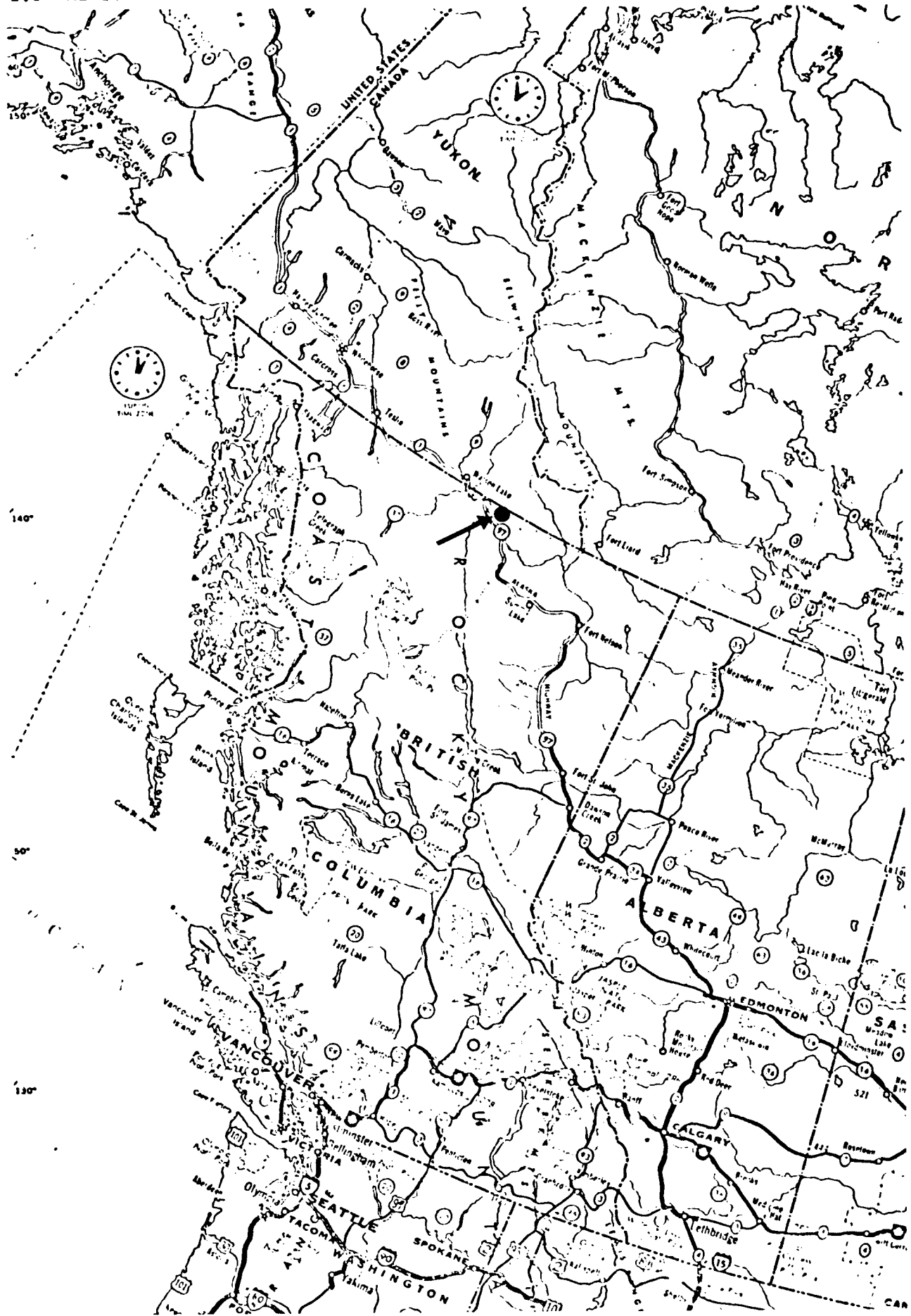
Year 5, 6 and 7

Page	Floor	Strip	cum.Total	Waste	cum. Total	t Barite	t cum. Total
14	3	877	38452	6959	53387	4908	130578
15	3	1795	40247	9071	62458	14118	144696
16	3	3460	43707	9750	72208	7569	152265
MOOSE NORTH PIT							
17	3	12761	56468	13254	85462	11070	163335
TOTAL	YEAR 5	18893	56468	39034	85462	37665	163335
17	3	END OF FLOOR 3				4335	167670
20	4	2436	58904	6328	91790	8701	176371
21	4	1274	60178	8978	100768	3412	179783
22	4	2547	62725	10542	111310	13846	193629
23	4	3398	66123	14754	126064	7920	201549
SOUTH PIT FINISH							
NORTH PIT							
24	4	708	66831	3058	129122	2619	204168
TOTAL	YEAR 6	10363	66831	43660	129122	40833	204168
24	4	6682	73513	12020	141142	14156	218324
END OF FLOOR 4							
25	5	12191	85704	47031	188172	14827	233151
26	5	9769	95473	33472	221645	10783	243934
TOTAL	FLOOR 5	21960	95473	80503	221645	25610	243934
TOTAL	YEAR 7	28642	95473	92523	221645	39766	243934

DRESSER INDUSTRIES INC.
FIRESIDE PROJECTLIST OF ILLUSTRATIONS

1. Regional Map - Scale 1" = 250 miles
2. Claim Map - Scale 1:50,000
Property and mineral reservations
3. Contour Map - Scale 1" = 1,000'
Road, stockpiles, pit areas & approximate
claim locations.
4. Moose Deposit - Scale 1" = 50'
Show pit outline and entries
5. West Bear Deposit - Scale 1" = 50'
Possible barite outline
6. Moose North Extension - Scale 1" = 50'
Possible barite outline
7. Moose Pit Longitudinal Sections - Scale 1" = 20'
Shows mining floors
8. Moose Pit Longitudinal Sections - Scale 1" = 20'
Shows mining floors
9. Cross Sections - Scale 1" = 20'
Mining sequence & floors
10. Cross Sections - Scale 1" = 20'
Mining sequence & floors
11. Cross Sections - Scale 1" = 20'
Mining sequence & floors

1.0 REGIONAL MAP



C.A.H.

SCALE 1" = 250 miles

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT

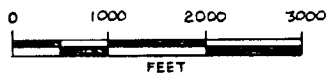
9052

NO.



LEGEND

- ▬ ALASKA HIGHWAY
- ▬ YUKON PIPELINE R.O.W.
- ▬ PREFERRED ACC. ROAD
- ▬ ALTERNATE ACC. ROADS
- ▬ EXISTING ROADS
- ▬ CLAIM BLOCKS
- ORE BODIES
- CAMPSITE
- POSSIBLE STOCKPILES



DWG. NO.	REFERENCE DRAWINGS	DWG. NO.	REFERENCE DRAWINGS	NO.	DESCRIPTION OF REVISION	DATE	BY	NO.	DESCRIPTION OF REVISION	DATE	BY	APPROVED
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				6				2				
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SCALE: 1" = 1000'
 DESIGNED: A.M. MAR, 81
 DRAWN: R.B. MAR, 81
 CHECKED: C.G. MAR, 81




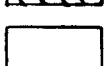
ORESSER INDUSTRIES INC.
 FIRESIDE PROJECT
 CONTOUR MAP

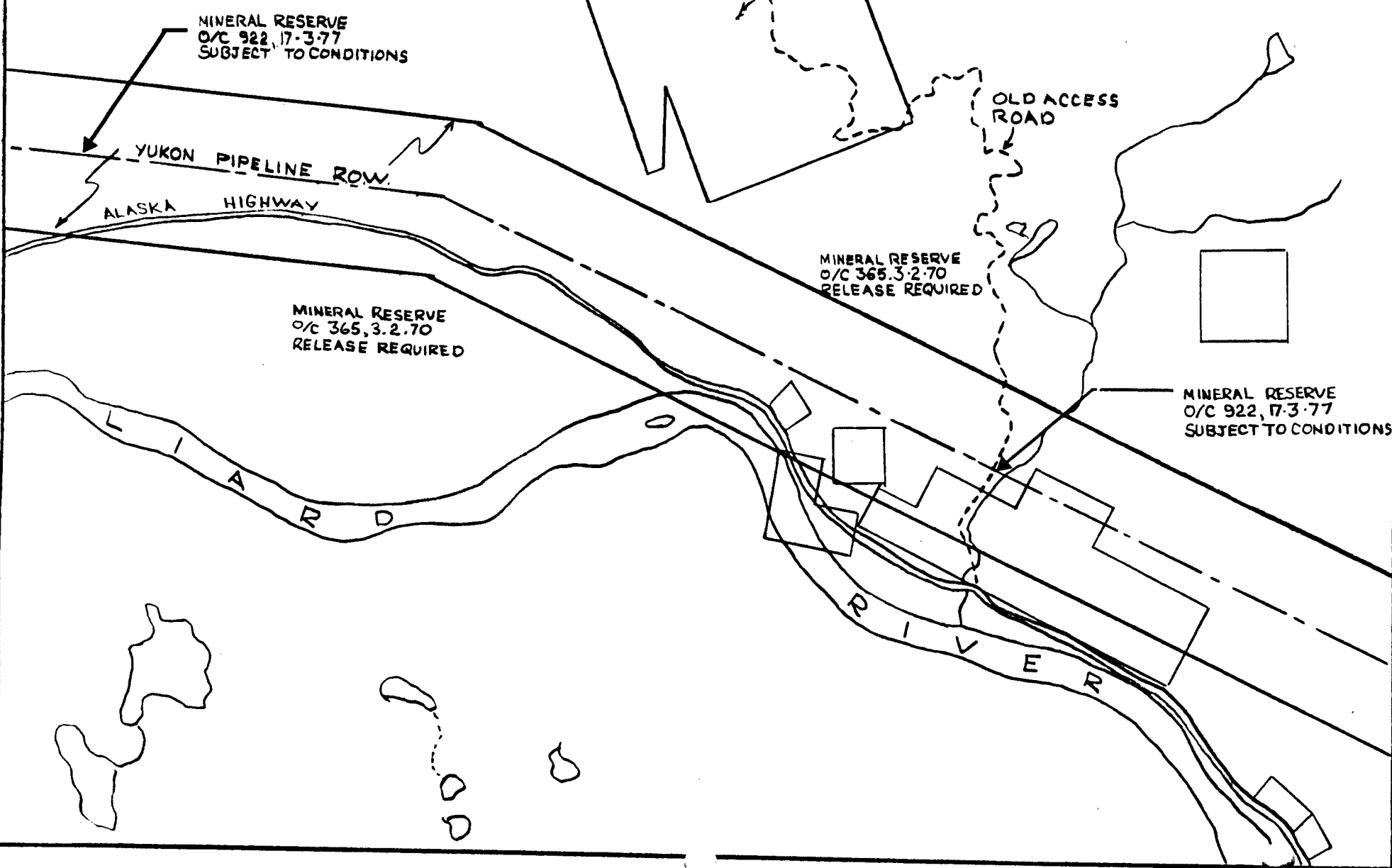
CANADIAN MINE SERVICES LTD.
 BRAMALEA, ONT. CANADA
 DWG. NO. 115 6231 001 REV.

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
9052
No. _____


CANADIAN MINE SERVICES LTD. BRAMALEA, ONT. CANADA		DATE	MAR '81
DRESSER INDUSTRIES INC. FIRESIDE PROJECT CLAIM MAP		SCALE	1:50,000
DESIGNED	A.M.	Dwg. No.	113-6231-001
DRAWN	R.B.	Rev.	
TRACED			
CHECKED	<i>C.G.M.</i>		



 CLAIMS IN GOOD STANDING
 CLAIMS REVERTED TO CROWN



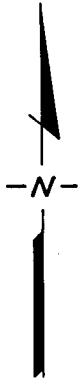
REVISIONS	
Date	By
1968	DDH
1968	DDH
1968	DDH
1971	DDH
1972	DDH
1973	DDH
1973	DDH
1973	DDH

	
SURFACE CONTOUR MAP BARITE - MOOSE DEPOSIT FIRESIDE, BRITISH COLUMBIA.	
CONTOUR INTERVAL, 10 FEET	
Technical Work By	Scale
JOHN S. CARTER	1" = 50 FEET
Drawn By	Date
C. R.	OCT. 1973
Approved By	Drawing Number
	111-6231-001

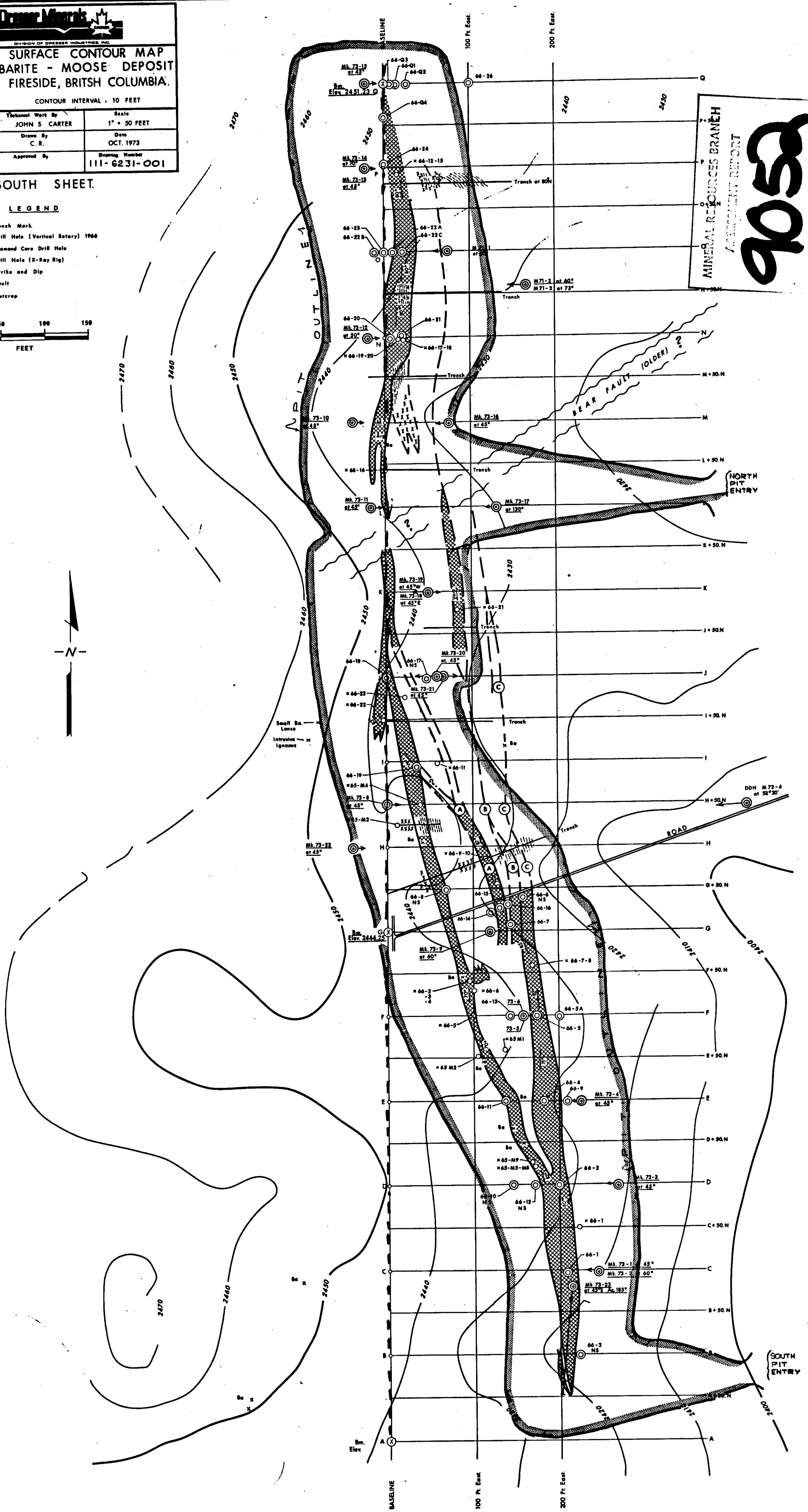
SOUTH SHEET.

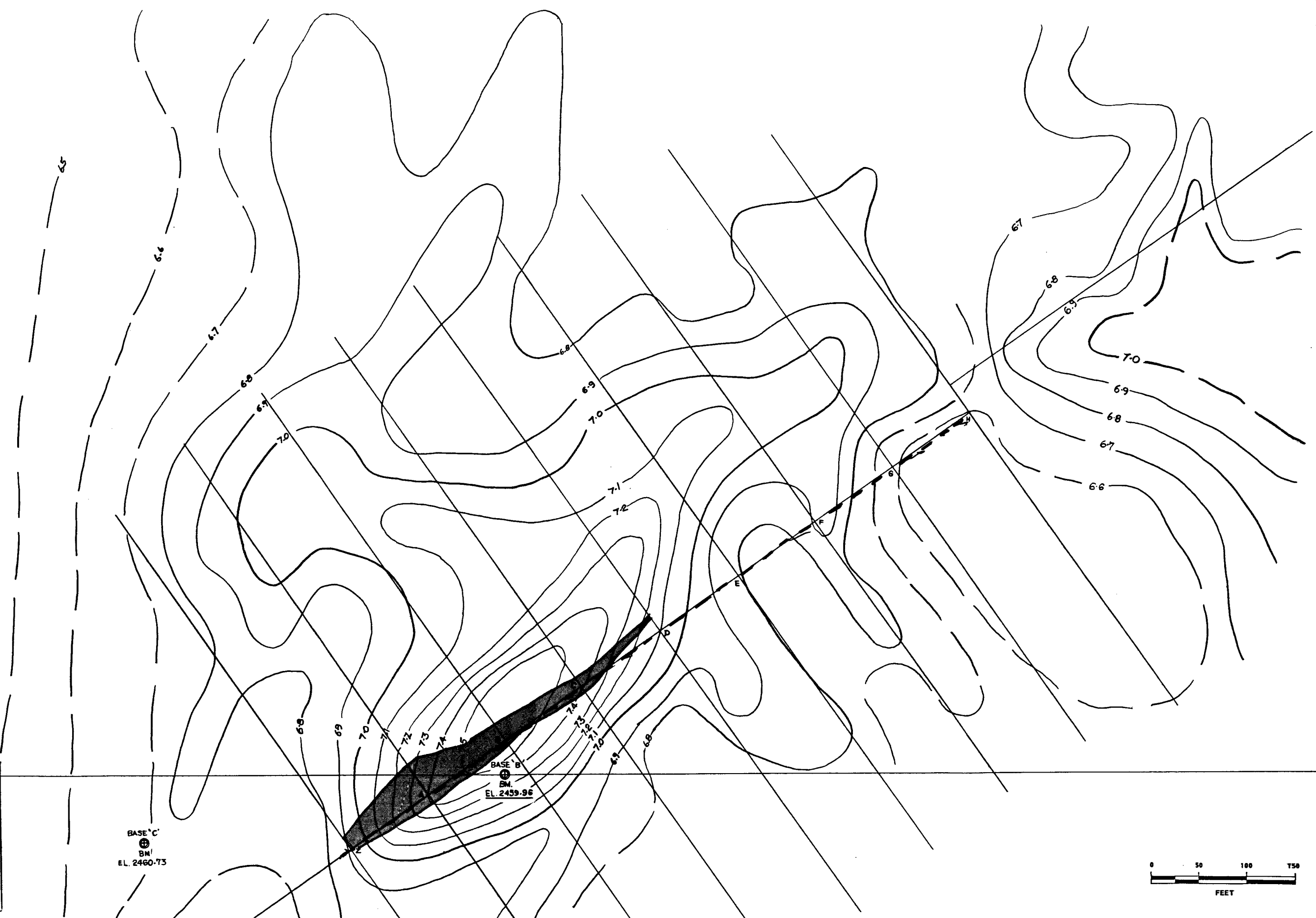
LEGEND

- Bench Mark
- ⊙ Drill Hole (Vertical Rotary) 1968
- ⊙ Diamond Core Drill Hole
- ⊙ Drill Hole (X-Ray Rig)
- ↘ Strike and Dip
- Fault
- X Outcrop



MINERAL RESOURCES BRANCH
 ASSESSMENT REPORT
9052
 NO.

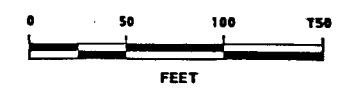




GRAVITY DATUM 1972
 MINERAL RESOURCES BRANCH
 ASSESSMENT REPORT
9052
 NO.

BASE 'C'
 BM
 EL. 2460.73

BASE 'B'
 BM
 EL. 2459.96



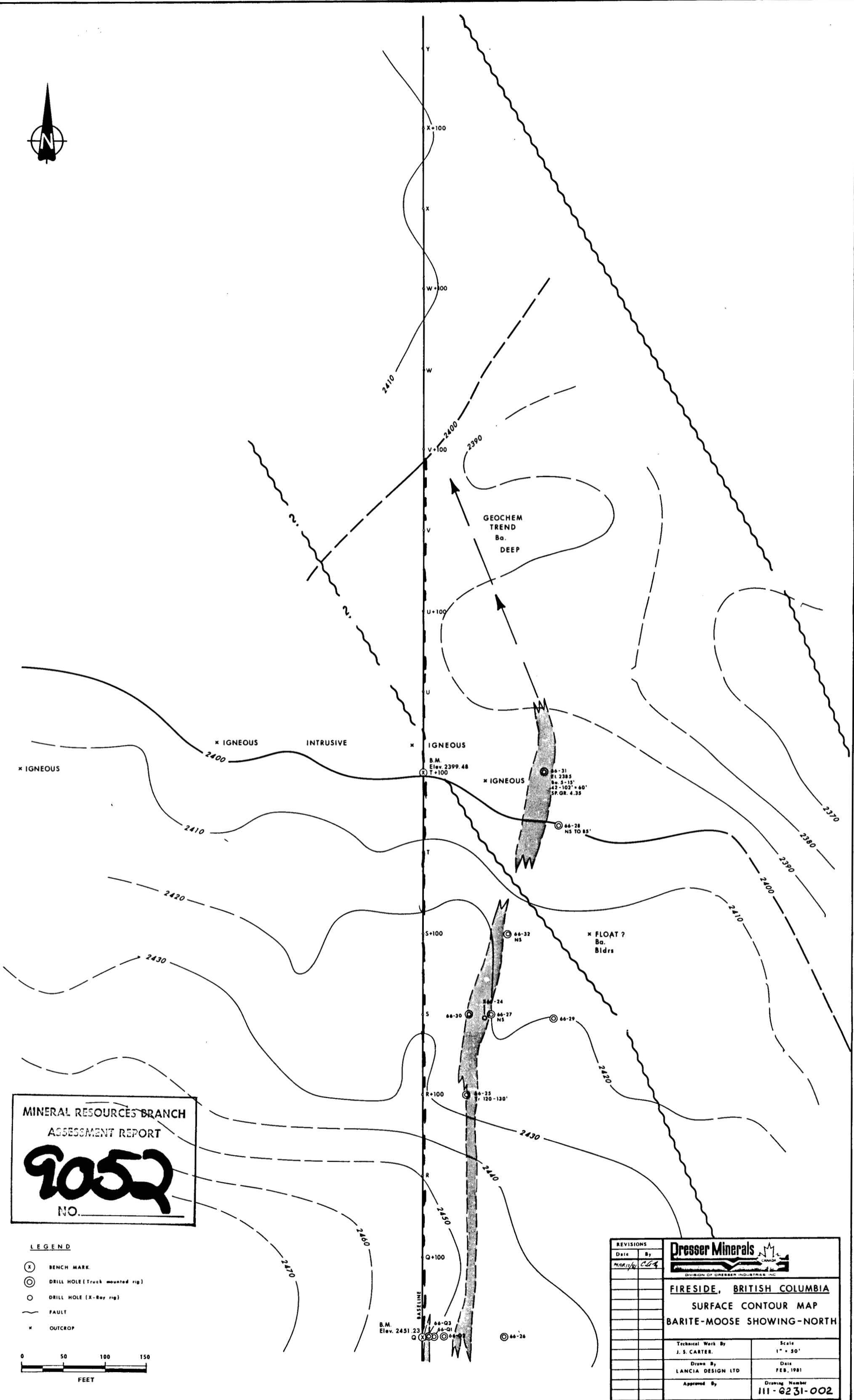
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				6				2			
				5				1			
				4				0			

SCALE: 1" = 50'
 DESIGNED: A.M. MAR, 81
 DRAWN: R.B. MAR, 81
 CHECKED: C.O.S. MM/1/81




ORESSER INDUSTRIES INC.
 FIRESIDE PROJECT
 WEST BEAR DEPOSIT

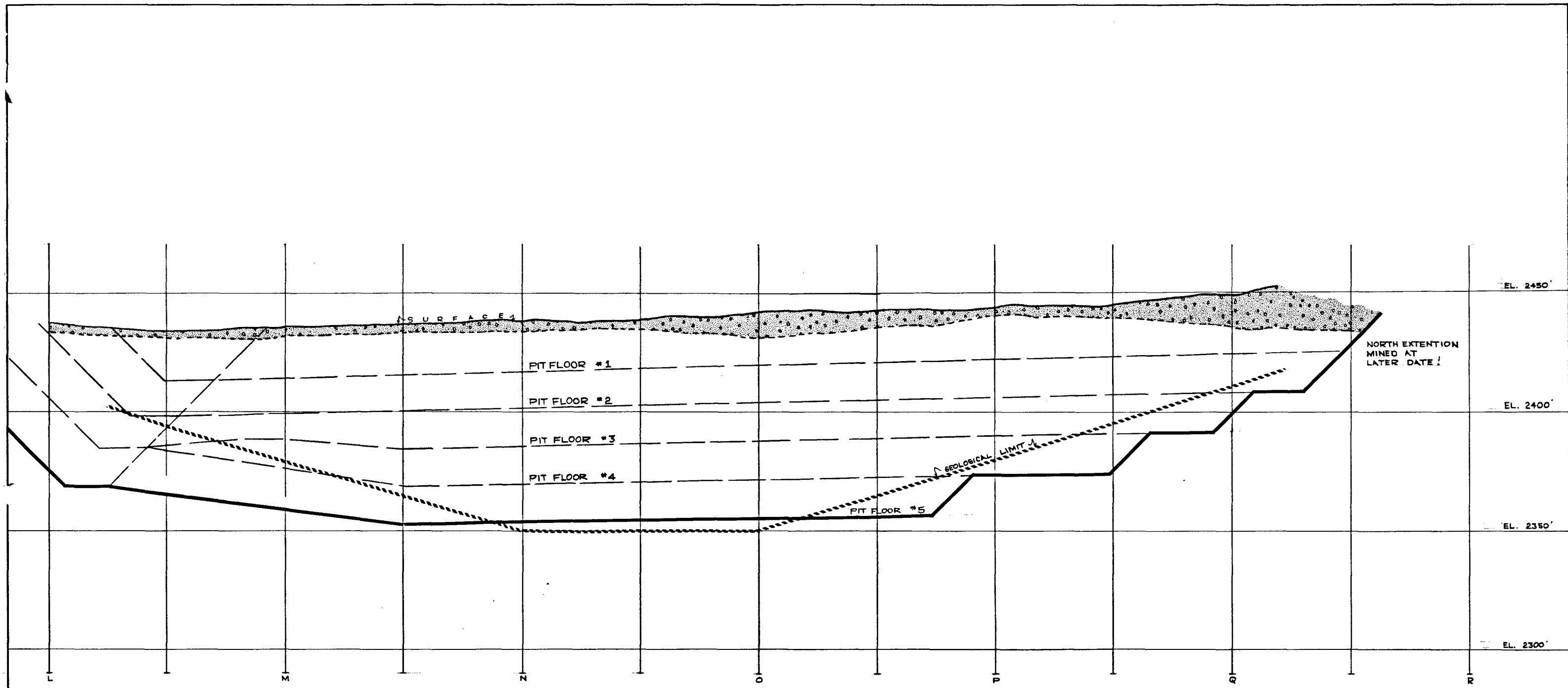
CANADIAN MINE SERVICES LTD.
 BRAMALEA, ONT. CANADA
 DWG. NO. 115 6231 002 REV.



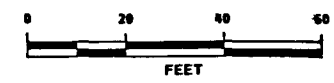
MINERAL RESOURCES BRANCH
 ASSESSMENT REPORT
9052
 NO. _____

- LEGEND**
- (X) BENCH MARK.
 - (C) DRILL HOLE (Truck mounted rig)
 - (O) DRILL HOLE (X-Ray rig)
 - - - FAULT
 - * OUTCROP
- 0 50 100 150
 FEET

REVISIONS		 DIVISION OF DRESSER INDUSTRIES INC.
Date	By	
MAR 1981	CLG	FIRESIDE, BRITISH COLUMBIA SURFACE CONTOUR MAP BARITE-MOOSE SHOWING-NORTH
Technical Work By J. S. CARTER.		Scale 1" = 50'
Drawn By LANCIA DESIGN LTD		Date FEB, 1981
Approved By		Drawing Number 111-6231-002



MINERAL RESOURCES BRANCH
 ASSESSMENT REPORT
9052
 NO.



DWG. NO.	REFERENCE DRAWINGS	DWG. NO.	REFERENCE DRAWINGS	NO.	DESCRIPTION OF REVISION	DATE	BY	NO.	DESCRIPTION OF REVISION	DATE	BY	APPROVED:	SCALE: 1" = 20'	DATE	DESIGNED: A.M. MAR. 81	DRAWN: R.B. MAR. 81	CHECKED: C.G. MAR. 7/81	DRESSER INDUSTRIES INC.	CANADIAN MINE SERVICES LTD.	BRAMALEA, ONT.	CANADA	DWG. NO. 115 6231 004	REV.
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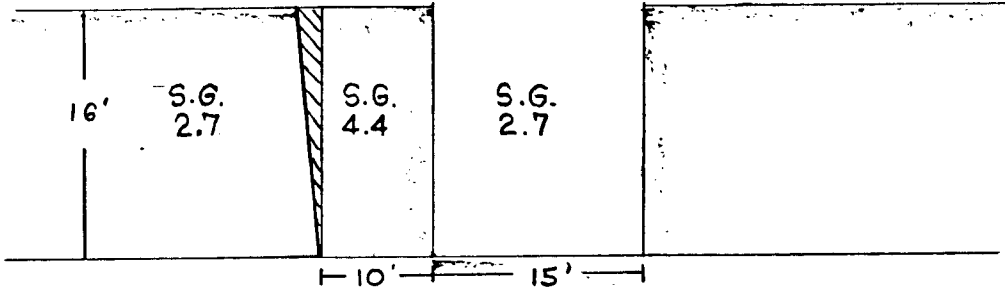


DRESSER INDUSTRIES INC.
 FIRE SIDE PROJECT
 MOOSE PIT LONG. SECTION

CANADIAN MINE SERVICES LTD.
 BRAMALEA, ONT. CANADA
 DWG. NO. 115 6231 004

NOTES ON DILUTION

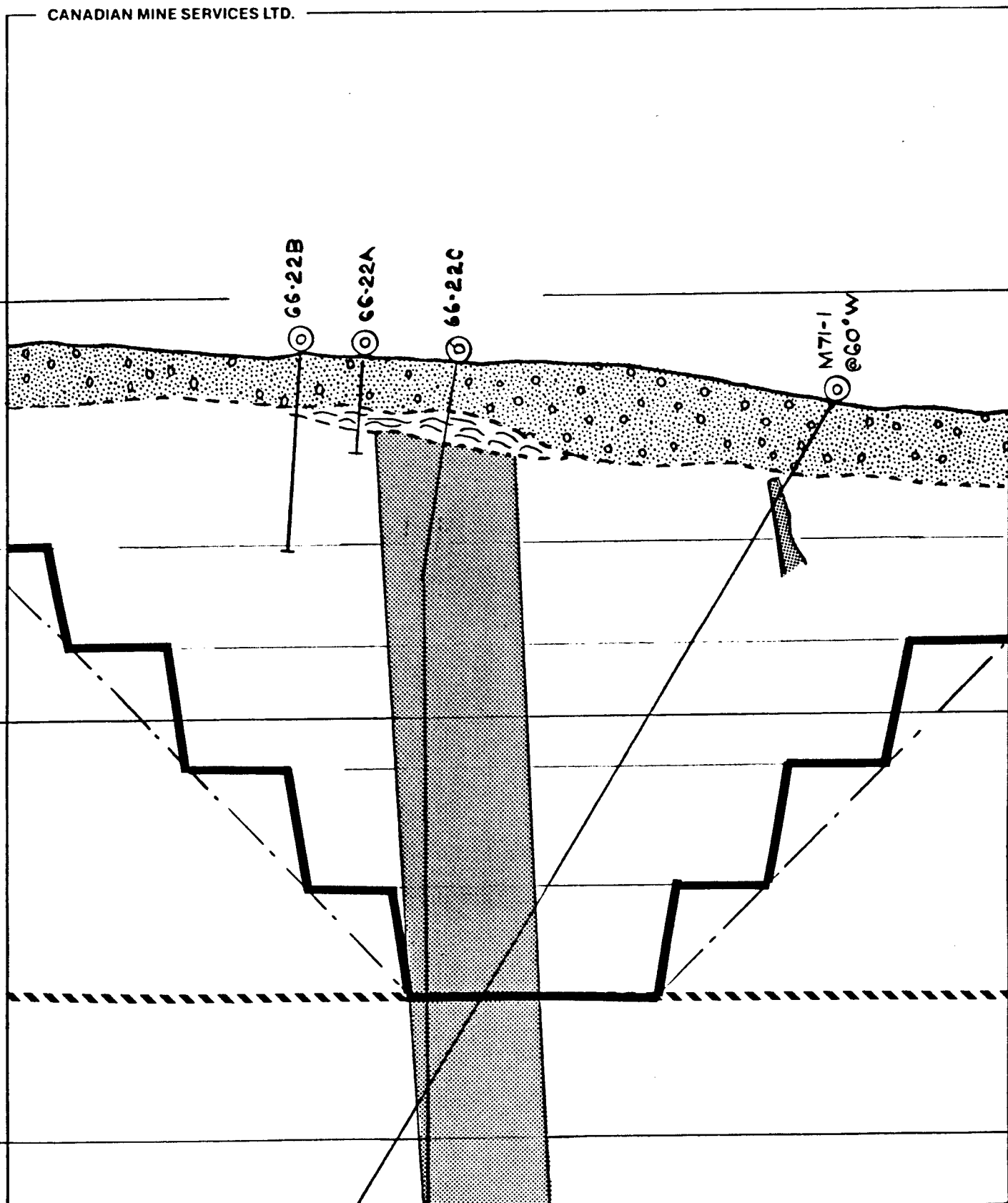
C = 1'
 B = 1.5'
 A = 2'



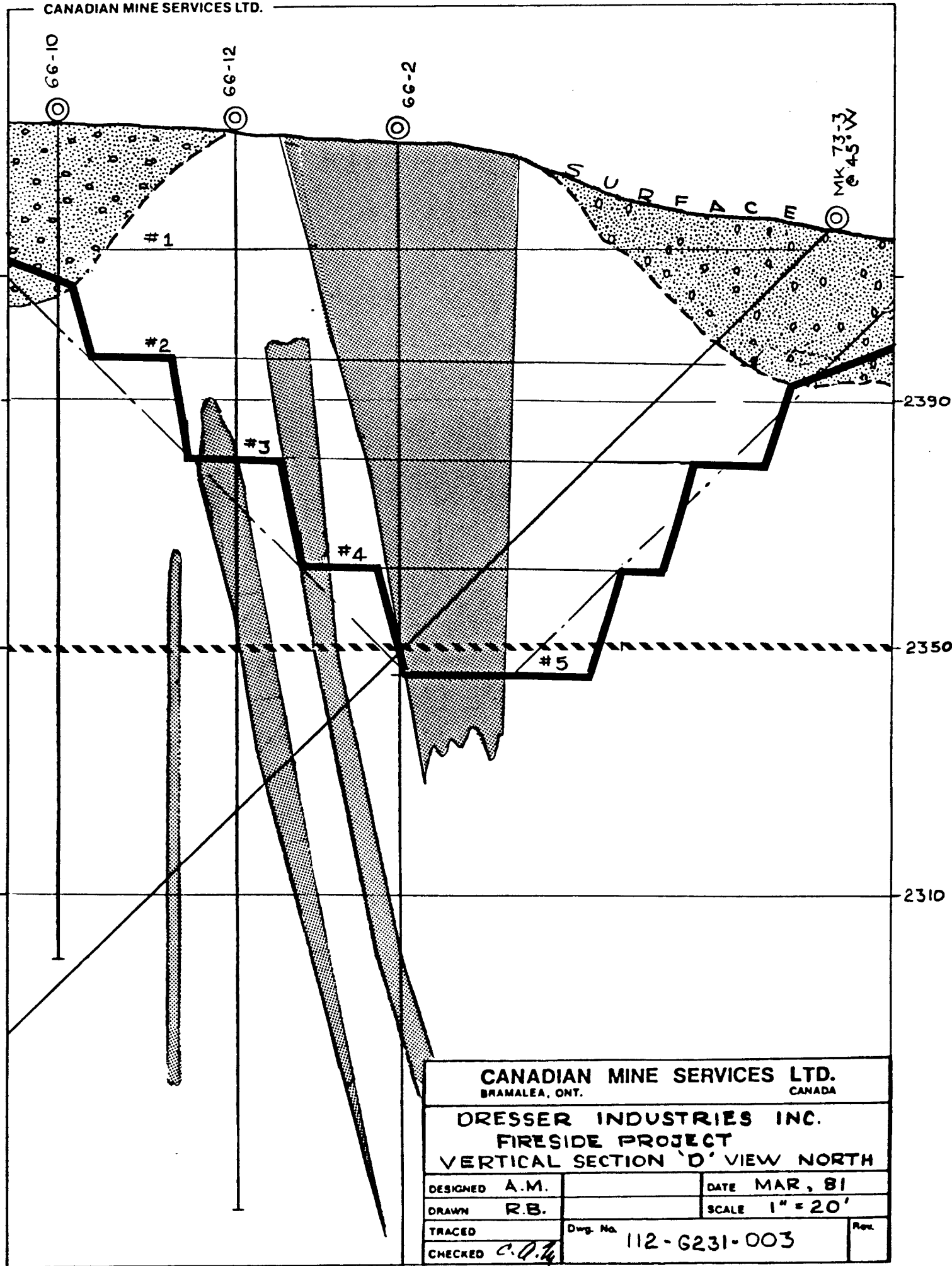
	<u>WIDTH</u>	<u>SPECIFIC GRAVITY</u>	<u>WIDTH x SPECIFIC GRAVITY</u>
Ⓐ	10'	4.4	44
	2'	2.7	5.4
	12'	<u>4.11</u>	49.4
Ⓑ	10'	4.4	44
	1.5'	2.7	4.05
	11.5'	<u>4.17</u>	48.05
Ⓒ	10'	4.4	44
	1'	2.7	2.7
	11'	<u>4.24</u>	46.7

∴ MAX DILUTION = 10%

CANADIAN MINE SERVICES LTD. BRAMALEA, ONT. CANADA		
DRESSER INDUSTRIES INC. FIRESIDE PROJECT NOTES ON DILUTION		
DESIGNED A.M.		DATE MAR, 81
DRAWN R.B.		SCALE NONE
TRACED	Dwg. No.	Rev.
CHECKED C.A.K.	112-6231-001	



CANADIAN MINE SERVICES LTD. BRAMALEA, ONT. CANADA		
DRESSER INDUSTRIES INC. FIRESIDE PROJECT VERTICAL SECTION 'O' VIEW NORTH		
DESIGNED	A.M.	DATE
DRAWN	R.B.	MAR, 81
TRACED		SCALE
CHECKED	<i>o.g.</i>	1" = 20'
Dwg. No.		Rev.
112-6231-002		



CANADIAN MINE SERVICES LTD.
BRAMALEA, ONT. CANADA

DRESSER INDUSTRIES INC.
FIRESIDE PROJECT
VERTICAL SECTION 'D' VIEW NORTH

DESIGNED	A.M.	DATE	MAR, 81
DRAWN	R.B.	SCALE	1" = 20'
TRACED		Dwg. No.	112-6231-003
CHECKED	<i>C.D.H.</i>	Rev.	



1595 Clark Blvd.
Brampton, Ontario
L6T 4C1

SHEET _____ OF _____

DATE _____

DEPT. _____ DWG. NO. _____

PROJECT Fireside

DETAIL Moose Pit Summary by Year

Year	Floor	Strip	m ³ Cum. Total	Waste	m ³ Com. Total	t Barite	t Cum. Total
1	1	9956	9956	4084	4084	27223	27223
2	1 & 2	15463	25419	10079	14163	29946	57169
3	2	4718	30137	19160	33323	32666	89835
4	2 & 3	7438	37575	13105	46428	35835	125670
5	3	18893	56468	39034	85462	37665	163335
6	3 & 4	10363	66831	43660	129122	40833	204168
7	4 & 5	28642	95473	92523	221645	39766	243934

NOTE: This summary is used for total volumes only.

DRESSER INDUSTRIES INC.
FIRESIDIE PROJECT

ATCO BID

Atco made a telephone bid on 2 camps as follows:

A. 3-Unit Camp - F.O.B. Calgary

<u>ITEM</u>	<u>PURCHASE PRICE</u>	<u>MONTHLY RENTAL</u>	<u>HAUL</u>
10' x 44' Combine Cook - Dining - Wash.	31,000	1,840	\$2/mile
10' x 44' - 10 Man	18,300	850	\$2/mile
10' x 44' - 10 Man	18,300	850	\$2/mile
	<u>67,600</u>	<u>3,540</u>	<u>\$6/mile</u>

B. 4-Unit Camp - F.O.B. Calgary

Kitchen - Dining (1)	}	180,000	13,000	\$8/mile
Recreation Room (2)				
20 Man Bunk - Wash.(3)				
(4)				

FORTIER & ASSOCIATES

INDUSTRIAL CAMPS

CATERING

HEAD OFFICE:
3050 PARSONS ROAD, EDMONTON, ALBERTA T6N 1B1
OTHER OFFICES: CALGARY, ALBERTA
SALT LAKE CITY, UTAH.
DENVER, COLORADO

TELEPHONE:
(403) 463-2323
(403) 263-3622
(801) 355-4157
(303) 893-0914

February 27, 1981

BID #811

Canadian Mines Service Ltd.
Suite #403, 300 - 5th Avenue S.W.
Calgary, Alberta
T2P 3C4

ATTENTION: MR. AL MCLEISH

Dear Sirs:

Re: Camp and Catering Services

We are pleased to quote our camp and catering services as follows:

LOCATION: Fireside, B.C. (Mile 550 Alaska Highway)

DURATION: June - October, 1981

CATERING SERVICES

Fortier & Associates will provide the following services:

Competent Catering Staff (3 staff)
Top Grade Food
Bedding and Dishes
Laundry of Bedding
Janitorial Services and Supplies

For supplying three meals per man per day, Fortier & Associates would be reimbursed as follows:

20 man guarantee (3 staff) at \$27.75 per man per day
15 man guarantee (3 staff) at \$32.50 per man per day

Groceries would be supplied weekly at \$.70 per running kilometer, F.O.B. Ft. St. John and transportation of catering personnel would be F.O.B. the site.

Start up rate for 48 hours, for under 12 men, would be \$17.75 per man per day, plus labour of \$105.00 per day for cook, \$85.00 per day for cook's helper, and \$75.00 per day for camp attendant.

...../2

Rates quoted supply a cook for 10 working hours per day and cook's helper and camp attendant for 9 working hours per day. Any overtime over these hours authorized by your field representative will be charged for your account.

Catering prices are firm until October 1, 1981, at which time escalation may apply.

Attached please find a copy of our standard contract Schedules A and D.

CAMP SERVICES

Fortier & Associates would provide a 4-unit skid camp consisting of the following:

- One kitchen/diner/storage
- One utility/cook's and toolpush quarters
- Two sleepers

Our rental rate on this camp would be \$240.00 per day. These units would be F.O.B. Ft. St. John, B.C.

EQUIPMENT OPTIONS

20 KW light plant	\$1,454.25 per month
Propane tank skid mounted	7.00 per day
Incinerator	30.00 per day

This equipment would be F.O.B. Ft. St. John.

Minimum guarantee would be for one month.

Camp prices are firm until October 1, 1981 at which time escalation may apply.

The client would be responsible for providing sound, level location, fuel, fuel storage, water and sump.

Fortier & Associates will attempt to provide a serviceman for up to 8 hours to assist in the setting up of Fortier camps at no charge. Hours in excess of 8 hours will be charged at current service rates.

Transportation of the camp from the F.O.B. point to the site and return is the client's responsibility. If desired, Fortier will act as a subcontractor and will arrange the transportation services in which case a 15% administration charge will be added to the invoice cost of such services. The current quoted rate for transportation is approximately \$55.00 per load per hour.

FORTIER & ASSOCIATES

BID #811

Page 3

February 27, 1981

Attached please find a copy of our standard contract Schedule C and C Third Party.

Our terms are net 30 days from date of invoice.

Fortier & Associates honour terms of this bid for a period of sixty (60) days from today's date, after which it will be considered inactive.

Thank you for the opportunity of submitting this quotation. If you require further information, do not hesitate in contacting the writer or Glen Alexander, Camp Marketing Manager.

Yours truly,

FORTIER & ASSOCIATES LIMITED



Barbara Jessiman
Customer Service Coordinator

BJ/dd
Enc.

FORTIER & ASSOCIATES LIMITED
3050 Parsons Road,
Edmonton, Alberta T6N 1B1

CATERING SERVICES

1.1 Fortier & Associates Limited will supply catering services as follows:

Catering personnel
Transportation of catering personnel
Top grade groceries, meat and supplies
Preparation of 3 meals a day and mug-up,
dishes, pots, pans, bedding, laundry of
bedding, janitorial supplies. We will
maintain the camp in a sanitary condition.

1.2 ROTATION OF CREWS

The scheduling of all camp and catering personnel hours of work and days of rest is the responsibility of Fortier. At the request of the client, Fortier will change all camp and catering personnel once at the cost of Fortier. Any additional changes of camp and catering personnel shall be done at the cost of the client.

In operation of remote areas (ie: Ft. Nelson) the client is responsible for all charges incurred in making crew changes such as hotel rooms, waiting time, transportation to and from the airport.

1.3 ESCALATION

Escalation of the cost per man day to be effective upon 30 days notice and to be based on recognized increases in food and labour.

1.4 RECORDS

Fortier will provide a record of workmen (weekly meal sheet) which shall be kept up-to-date by Fortier. The record of workmen signed by both the client's and Fortier's representative shall constitute the record for the preparation of Fortier's invoices to the client.

1.5 DAILY GUARANTEE

The client shall pay to Fortier the amount representing the cost per man day for services as evidenced by Fortier's record for each day that Fortier's services are employed, provided that where the number of workmen falls below the minimum number of workmen guaranteed, as set out above, the number of workmen for the purposes of such computation shall be deemed to be the guaranteed minimum number of workmen.

1.6 START-UP AND CLOSE-DOWN

When the number of workmen is less than 12 men at the beginning or completion of the job, a rate as set out in Schedule B shall apply. This condition will apply for a maximum of 48 hours. Following that, the guaranteed rate will be charged.

1.7 TEMPORARY SHUT-DOWNS

When requested by the client to leave food and supplies in camp for a temporary shut-down, and no Fortier personnel are left in camp, a \$50.00 per day charge will apply. (For this charge, up to three client personnel may use the food, etc. Any additional personnel will be charged at normal man day rates.)

1.8 GROCERY HAULING

- a. Lease roads should be maintained in a driveable condition. The camp should be "accessible without assistance". Should lease roads not be in a passible condition, certain extra charges outlined below may apply.
- b. Our drivers are instructed to not accept excessive towing, as any damage due to towing will become the client's liability, and repairs can be charged back to the client.
- c. On rig moves, start-ups or shut-downs, delays beyond two hours of the "requested arrival time" may result in stand-by charges to the client. Any meals, extra mileage or hotel rooms required during these delays will become the client's liability and be charged back to the client.
- d. Stand-by time may be charged when a grocery vehicle is either stuck in mud or snow, or being towed on lease roads.
- e. A minimum of twelve hours' notification is requested when cancelling a start-up directive.
- f. Fortier & Associates will deliver groceries to camps once each week, at the attached rates, unless other arrangements have been mutually agreed.
- g. Extra deliveries will be charged back to the client due to:
 - (i) Extra men in camp without notification to Fortier & Associates in time to stock the camp appropriately;
 - (ii) Stolen articles;
 - (iii) Damaged goods during rig moves;
 - (iv) Damaged applicances due to power surges.
- h. Camp moves requiring a grocery hauling vehicle for the second time in one week will be charged back at the standard rates.
- i. The regularly scheduled delivery day is assigned by the Truck Dispatcher, and may vary with the rig location or weekly truck routing.
- j. Notification of rig moves is requested to Fortier & Associates forty-eight hours prior to move date, to fascilitate reschedule of the camp's grocery delivery.
- k. Mileage and time incurred delivering groceries to a vacated lease site will be charged back to the client.

FORTIER & ASSOCIATES LIMITED
3050 Parsons Road
Edmonton, Alberta T6N 1B1

CAMP SERVICES

2.1 CLIENT'S RESPONSIBILITY

1. Sound level location.
2. Power to panel & hook-up, including cable.
3. Water storage for cooking and washrooms.
4. Fuel for cooking & heating & storage tanks.
5. Sewage disposal.
6. Garbage disposal.
7. Labour force to install prefabs.
8. Labour for hooking up the camp.
9. Any local taxes or permits.
10. Clean-up of site on completion.

2.2 CAMP RENTAL

Camp rental commences the day the camp is moved and ceases on its return to the F.O.B. point.

2.3 DAMAGES

Fortier issues a camp condition report on every camp rented to its clients. Prior to acceptance of the camp, it is the client's responsibility to review this condition report and sign same. This report forms a part of this contract document. If the client does not wish to review the camp prior to acceptance, then the client must accept Fortier's assessment of the condition of the camp upon its return and all damages and missing equipment, etc., will be charged back to the client at our normal shop rates.

The client is responsible for all abnormal damage costs over and above normal wear and tear to Fortier buildings and equipment on the move or on the site. Damages resulting from improper power supply is the client's responsibility. All buildings and equipment must be returned to the F.O.B. point indicated above for inspection and repair.

2.4 SET-UP ASSISTANCE

Fortier will attempt to provide a serviceman for up to 8 hours to assist in the initial setting up of Fortier camps. The 8 hours shall commence at the time Fortier was instructed by the client to be at the location. Hours in excess of 8 hours per set-up will be charged to the client at current service rates. In the event that a Fortier serviceman is not available, then it is the client's responsibility for the proper installation and dismantling of Fortier's equipment. Fortier servicemen are not responsible for the start-up or hook-up of power plants. Assistance for re-starts or moves shall be charged to the client at normal rates.

2.5 RETURN OF BUILDINGS

All camp and catering facilities and furnishings shall be returned to the F.O.B. base at the cost of the client as required by this Agreement on the day which the camp site is shut down, unless otherwise authorized in writing by Fortier. Where the caterer's personnel are instructed to leave the camp site unattended, or where camp or catering facilities or furnishings are deposited at a location other than at the F.O.B. base, regardless of whether Fortier authorized such deposit or not, the client shall be responsible for any damage (including that done by animals), theft, or loss howsoever caused while under transport to such location and at such location until released in writing by Fortier or such furnishings or facilities become the subject of a subsequent agreement for services between Fortier and another client.

FORTIER & ASSOCIATES
3050 Parsons Road
Edmonton, Alberta

THIRD PARTY CAMP SERVICES

2.1 CLIENT'S RESPONSIBILITY

1. Sound Level Location
2. Power to panel & hook-up including cabtire
3. Water storage for cooking and washrooms
4. Fuel for cooking & heating & storage tanks
5. Sewage disposal
6. Garbage disposal
7. Labour force to install prefabs
8. Labour for hooking up the camp
9. Any local taxes or permits
10. Clean-up of site on completion

2.2 CAMP RENTAL

Camp rental commences the day the camp is moved and ceases on its return to the F.O.B. point. Rentals to be payable monthly in advance.

2.3 DAMAGES

Fortier issues a camp condition report on every camp rented to its clients. Prior to acceptance of the camp, it is the client's responsibility to review this condition report and sign same. This report forms a part of this contract document. If the client does not wish to review the camp prior to acceptance, then the client must accept Fortier's assessment of the condition of the camp upon its return and all damages and missing equipment, etc., will be charged back to the client at our normal shop rates. The client is responsible for all abnormal damage costs over and above normal wear and tear to buildings and equipment on the move or on the site. Damages resulting from improper power supply is the client's responsibility. All buildings and equipment must be returned to the F.O.B. point indicated above for inspection and repair.

2.4 SET-UP AND TEAR-OUT

Fortier will attempt to provide a serviceman, at a charge of \$250.00 for up to 8 hours to assist in the initial setting up and dismantling of third party camps. The 8 hours shall commence at the time Fortier was instructed by the client to be at the location. Hours in excess of 8 hours per set-up will be charged at current service rates. In the event that a Fortier serviceman is not available, then it is the client's responsibility for the proper installation and dismantling of the equipment. Fortier servicemen are not responsible for the start-up or hook-up of power plants.

2.5 RETURN OF BUILDINGS

All camp and catering facilities and furnishings shall be returned to the F.O.B. base at the cost of the client as required by this Agreement on the day which the camp site is shut down, unless otherwise authorized in writing by Fortier. Where the caterer's personnel are instructed to leave the camp site unattended, or where camp or catering facilities or furnishings are deposited at a location other than the F.O.B. base, regardless of whether Fortier authorized such deposit or not, the client shall be responsible for any damage (including that done by animals), theft or loss howsoever caused while under transport to such location and at such location until released in writing by Fortier or such furnishings or facilities become the subject of a subsequent agreement for services between Fortier and another client.

FORTIER & ASSOCIATES LIMITED

GENERAL3.1 DURATION OF JOB

Where the duration of the job is less than 14 days, a surcharge of \$500.00 will be charged for the opening and closing.

3.2 THEFT

The client will be responsible for any theft of Fortier equipment, supplies and food, bedding and dishes, etc.; that is, in the camp. Normal usage or wear and tear is Fortier's responsibility. All foodstuffs are the property of Fortier until consumed and any shortages or spoilage of foodstuffs shall be charged to the client.

3.3 OTHER SERVICES

When Fortier supplies a service as a sub-contractor, such as arranging of transportation, propane, etc., there will be an administration charge of 15% of the invoiced cost of the service.

3.4 STOCK PILING

Any stock piling of groceries is the responsibility of the client. Should the job close down, groceries must be returned to Fortier and if unable to be returned, the client will pay for the inventory taken at the time. Credit will be issued against the inventory when Fortier has access to the goods.

3.5 SHUT-DOWN

Fortier will have a value of \$100.00 per man based on the camp strength of inventory of food and supplies in the camp. We require a full 24 hours notice to the area office of Shutdown. This is in order to allow us to inventory and control our supplies and groceries. If we do not have this opportunity to protect our inventory, we will charge the client the aforementioned inventory value, less the value of goods received at our warehouse.

3.6 INSURANCE

Fortier & Associates carry insurance on their own camps and equipment. If the camp belongs to the client, Fortier & Associates' equipment and supplies must be covered by the client. Insurance coverage amounting to \$5,000.00 is the client's responsibility. This coverage is based on a 20 man camp and insurance coverage should be proportionately larger if camp strength exceeds this number. This insurance is only valid in case of fire. When client has care, custody and control, all damage, except for normal wear and tear and fire, are the responsibility of the client.

3.7 CANCELLATION

Either party can cancel this agreement with a 30 day notice in writing and by registered mail.

3.8 TERMS

All invoices are due 30 days from invoice date. Interest at 1.5% per month (18% per annum) will be charged on unpaid invoices more than 30 days past invoice date.

3.9 FAILURE TO COMMENCE WORK AND WAITING TIME

If Fortier's services are not required pursuant to this Agreement due to the failure of the client to commence its work (for any reason) in addition to any other costs chargeable by Fortier to the client under this Agreement, the client shall pay Fortier's reasonable costs to the date of notification of termination of services, such costs to include:

- (a) rental & transportation costs of camp and catering services;
- (b) living & transportation costs of the caterer's personnel;
- (c) any damage or loss of foodstuffs or other camp & catering furnishings.

The charges in this contract for catering services cover delivery of food, labour, and the cost of food. They do not include waiting time where the client has stated that a camp will be ready for our services and it is not. Therefore, all charges relating to our delivery system and personnel are for the account of the client if the camp is not ready for occupancy at the time specified. When we have been given a start-up time, the client has up to 12 hours prior in which to alter that time without any additional charges being incurred. Failure to give this notice will result in these additional charges.

Fortier

CANMS CGY

FOR-NOR EDM
FEBRUARY 27, 1981

CANADIAN MINES SERVICES LTD.
ATT: AL MCLEISH

RE: CAMP AND CATERING (JUNE-OCTOBER/81)
FIRESIDE, B.C.

15 MAN GUARANTEE AT 32.50 PER MAN PER DAY
20 MAN GUARANTEE AT 27.75 PER MAN PER DAY

GROCERIES SUPPLIED WEEKLY AT .70 PER RUNNING KILOMETER F.O.B.
F.S.J. THREE CATERING STAFF F.O.B. THE SITE

STARTUP RATE FOR 48 HOURS, FOR UNDER 12 MEN:
17.75 PER MAN PER DAY PLUS 105.00 PER DAY FOR COOK, 85.00 PER
DAY FOR COOKS HELPER, 75.00 PER DAY FOR CAMP ATTENDANT

4-UNIT SKID CAMP (SLEEPS 20 MEN) AT 240.00 PER DAY F.O.B. *
F.S.J.

20 KW LIGHT PLANT AT 1,454.25 PER MONTH
PROPANE TANK AT 7.00 PER DAY
INCINERATOR AT 30.00 PER DAY

COMPLETE WRITTEN BID WILL FOLLOW BY MAIL

BARB JESSIMAN
CUSTOMER SERVICE COORDINATOR
FOR-NOR EDM

CANMS CGY

* ITEM TO BE CLARIFIED MONDAY

*Separate cost 9 items
CANMS*

1/28/81

☐
CANMS CGY

FINNING UCR

072 02/26/83:55

FROM MR. LOUIS RIVEST RENTALS - FINNING TRACTOR VANCOUVER BC

TO MR. AL MCKLEISH - CANADIAN MINE SERVICES LTD.
CALGARY, ALTA.

RE: RENTAL RATES FOR 4 MONTHS ON THE FOLLOWING UNITS:

D8K

621B

627B

966

980

MOTOR GRADERS (2)

235 EXCAVATOR

THE RENTAL RATES THAT WERE QUOTED TO YOU ON THE PHONE ARE SUBJECT TO
PRIOR SALE AND AVAILABILITY. THESE ARE BUDGETARY PRICES AND CAN BE
LOWERED AT THE TIME THE MACHINES ARE REQUIRED.

☐
CANMS CGY

CANMS CGY

FINNING UCR

099 02/27/10:30

FROM DENIS PREVOST - USED EQUIPMENT - FINNING TRACTOR VANCOUVER BC
TO: AL MCKLEISH - CANADIAN MINE SERVICES LTD.
CALGARY, ALTA.

FURTHER TO OUR PHONE CONVERSATION, WE ARE PLEASED TO SUBMIT THE
FOLLOWING MACHINES FOR YOUR CONSIDERATION. MAXIMUM RENTAL RATE
WOULD BE 10 0/0 OF LISTED SELLING PRICE, FOR NORMAL OPERATION.
RATES ARE BUDGETARY ONLY AND CAN BE LOWERED AT TIME OF ORDER.
MACHINES SUBJECT TO PRIOR SALES AND/OR AVAILABILITY.

MODEL	YEAR	PRICE	OUR STOCK NBR.	LOCATION
D8K	78	DLRS 190,000	FT 1040	WHITEHORSE
D6C	76	89,000	FT 1267	DAWSON CREEK
980B	75	133,000	FT 9941	WHITEHORSE
14G	78	178,000	FT 1029	VERNON
(2) 621B	76	170,000 EA.	FT 9702 + 03	DAWSON CREEK
235	76	220,000	FT 9799	CRANBROOK

REGARDS

CANMS CGY

GRANT STEWART CONSTRUCTION LTD.

4027 - 25th AVE. S.W. - CALGARY, ALBERTA T3E 0L7
TELEPHONE: (403) 249-3680

P.O. BOX 410
WATSON LAKE
YUKON Y0A 1C0
TELEPHONE (403) 536-7472

P.O. BOX 160
CASSIAR, B.C.
V0C 1E0
TELEPHONE (604) 778-7455

February 27, 1981

Canadian Mine Service Ltd.
Suite 403
300 - 5th Ave. S.W.
Calgary, Alberta
T2P 3C4

Attention: Mr. Al McLeish

Regarding the rock crushing, we were able to get a quote over the phone this morning, from a crushing contractor out of Whitehorse.

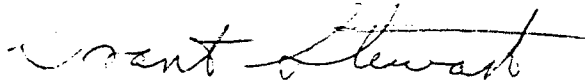
Rock crushing ---- \$5.00 per yard.

After he looks at the pit, he may be able to do better; but the price would be no higher.

The Client would supply Room and Board.

Yours truly,

GRANT STEWART CONSTRUCTION LTD.



Grant Stewart

SS:sl

*Rec'd 13:30 Hrs.
Mar 5/81
G.S.*

GRANT STEWART CONSTRUCTION LTD.

4027 - 25th AVE. S.W. - CALGARY, ALBERTA T3E 0L7
TELEPHONE: (403) 249-3680

P.O. BOX 410
WATSON LAKE
YUKON Y0A 1C0
TELEPHONE (403) 536-7472

P.O. BOX 160
CASSIAR, B.C.
V0C 1E0
TELEPHONE (604) 778-7455

February 27, 1981

Canadian Mine Service Ltd.
Suite 403
300 - 5th Ave. S.W.
Calgary, Alberta
T2P 3C4

Attention: Mr. Al McLeish

Dear Mr. McLeish:

Further to our recent conversation regarding rental rates on our equipment, we put forth the following quotation for your consideration. Rates are subject to change after thirty days.

D8H Dozer, double tilt and ripper, Rate per hour -----	\$140.00
621 Cat Scraper, rate per hour -----	\$110.00
966 Cat Loader, rate per hour -----	\$ 90.00
988 Cat Loader, rate per hour -----	\$120.00
Drilling and Blasting, rate per cubic yard ---	\$ 5.77

These rates are all found rates, with the exception of Room and Board.

Should you require any further information, please feel free to contact us at anytime.

Yours truly,

Grant Stewart
GRANT STEWART CONSTRUCTION LTD.

Grant Stewart
GS:sl

*Rec'd 13.36 Hrs
June 5/81
C.A.M.*

GRANT STEWART CONSTRUCTION LTD.

4027 - 25th AVE. S.W. - CALGARY, ALBERTA T3E 0L7
TELEPHONE: (403) 249-3680

P.O. BOX 410
WATSON LAKE
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TELEPHONE (403) 536-7472

P.O. BOX 160
CASSIAR, B.C.
V0C 1E0
TELEPHONE (604) 778-7455

February 27, 1981

Canadian Mine Service Ltd.
Suite 403
300 - 5th Ave. S.W.
Calgary, Alberta
T2P 3C4

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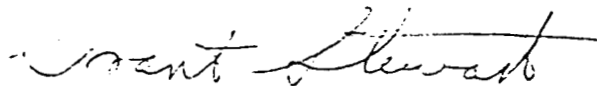
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Yours truly,

GRANT STEWART CONSTRUCTION LTD.



Grant Stewart

GS:sl

*Rec'd 13:30 Hr.
Mar 5/81
COA*