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KLOHN LEONOFF
CONSULTING ENGINEERS

Our File: PB 3169-0101

January 26, 1984

Brinco Mining Ltd.
Cassiar Division
Cassiar, British Columbia
V0C 1E0

Mr. Peter C. Jones
Manager

Clinton Creek Asbestos Mine
Wolverine Creek Tailings Piles

Dear Peter:

We are pleased to submit six copies of our report on the Wolverine Creek tailings piles, dated January 26, 1984. We are also sending two copies directly to your Vancouver office.

Yours very truly,

KLOHN LEONOFF LTD.

Peter C. Lighthall, P.Eng. (B.C.)
Project Manager

Att.

PCL/ljd

REPORT ON WOLVERINE CREEK
TAILINGS PILES

PROJECT: CLINTON CREEK ASBESTOS MINE

LOCATION: CLINTON CREEK, YUKON TERRITORY

CLIENT: BRINCO MINING LTD.
CASSIAR DIVISION

OUR FILE: PB 3169-0101 JANUARY 26, 1984

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APPENDICES

DRAWINGS

1. INTRODUCTION

This report deals with the tailings piles in Wolverine Creek valley at the former Clinton Creek asbestos mine. The tailings piles were deposited from 1968 until 1978, at which time the mine closed when economic ore reserves were exhausted. This report summarizes the background and present conditions of the site and tailings piles, presents monitoring data on downslope movements of the piles and describes options for reclamation and abandonment of the site.

Klohn Leonoff were engaged by Brinco Mining in early 1983 to provide advice on stability and erosion control concerns at the Clinton Creek property. The objective of our work is to recommend reclamation measures which will satisfy the requirements of the Yukon Territory Water Board, the body which administers environmental regulations governing the mining industry in the Yukon. Klohn Leonoff's work was based on the following:

a) A site visit was made by Peter Lighthall of Klohn Leonoff, June 8 and 9, 1983, in company with P.C. Jones and R. Clark of Brinco Cassiar Division. Discussions were held on site on June 9 with Messrs. Bud McAlpine and Al Foster, representing the Yukon Territory Water Board, and Mr. Milos Stepanek, Hardy Associates, geotechnical consultant to the Water Board.

b) Previous and current monitoring data was reviewed.

c) Previous reports by Golder Associates were reviewed.

2. SITE DESCRIPTION

The Clinton Creek mine is located approximately 100 km northwest of Dawson City, at latitude 64° 27'N and 140° 45'W. The site is in an area of continuous permafrost. Average annual precipitation, based on a six year period of record during mine operation, is about 360 mm.

During production, asbestos ore was delivered to the mill by tramway from the open pit, located on the south side of the Clinton Creek valley. The millsite was located on a flat-topped ridge, at approximately elevation 1950 ft. The millsite overlooks Clinton Creek to the south and Wolverine Creek, a tributary of Clinton Creek, to the east. In the mill, asbestos fibres were separated from the ore and the dry tailings were discharged by a stacker conveyor onto the west slope of the valley of Wolverine Creek.

Wolverine Creek upstream of the tailings pile location drains an area of about 9 mi^2 (23 km^2). From hydrologic analyses carried out by Klohn Leonoff for the adjacent Clinton Creek drainage (Report on Mine Waste Dumps, August 16, 1983), we would expect a 100 year return period flood for Wolverine Creek to be in the order of 20 m^3/s.

The valley slopes from the millsite (elevation 1950 ft) at an average slope angle of about 16° to 17° to the valley bottom at about elevation 1300 ft. Soil conditions on the valley slope were described by Golder Associates in their July 1978 Report on Mine Waste Dump and Tailing Pile. According to Golder's report, the foundations of the tailings pile consist of a surface organic layer overlying a deposit of silty sandy gravel, followed by weathered argillite bedrock. The depth of silty sandy gravel soils decreases with elevation, from about 40 ft near the top of the slope to being virtually absent near the bottom. The foundation soils are frozen, except where placement of the tailings pile has altered the temperature regime.

The tailings material consists of well-graded, crushed serpentine rock containing some asbestos fibre not recovered in the milling process. Particle sizes range from about 1 inch to approximately 10% passing the #200 sieve size. The angle of internal friction of the tailings (Golder, 1978) ranges from over 40° at low confining stresses to 33° at higher stresses. The deposited tailings forms a crust so that dust from the tailings piles does not occur. Photograph 1 in Appendix I shows typical tailings material.

The tailings have been stacked in two piles, referred to as the north and south lobes. The south lobe was deposited from startup until 1974, when a failure of the tailings pile occurred and a segment of the pile moved downslope and blocked Wolverine Creek, creating a small lake in the valley bottom. The site of the segment that failed appeared to coincide with the location of a small watercourse on the valley slope.

Following the failure, the stacker was relocated northward and tailings were placed on the north lobe until the mine shut down in 1978. A plan of the tailings piles is shown on Drawing D-1004 and sections through the tailings piles are shown on Drawing D-1005.

Cassiar Asbestos Corporation Ltd., then owners of Clinton Creek, engaged Golder Associates as geotechnical consultants. Movement monitors were installed on the tailings piles and monitoring has been carried out since 1976, although none of the existing points provide continuous records since that time. Observations of these movements showed that the north tailings lobe was moving rapidly downslope (approximately 77 ft per year in 1978) and the failed (south) tailings lobe was continuing to move slowly downslope.

In their report dated July 1978, Golder recommended that:

a) A rock-lined channel be constructed to convey Wolverine Creek over the tailings deposited in the creek bottom by the 1974 failure, and

b) Unloading of the toe areas of both the north and south tailings lobes be carried out to improve stability of the tailings piles.

The rock-lined channel was installed in 1978 and appears to have operated satisfactorily to date.

The stabilization measures carried out have not been successful. It would appear that Golder's engineers assumed that the lower portions of the tailings piles were moving independently of the upper portions. Consequently, they were attempting to unload the tops of small slides near the toes. That program of excavation of tailings from the toe areas was unsuccessful in arresting movement of the tailings piles, and downslope movement has continued almost uninterrupted, much larger masses of material being involved.

3. OBSERVATIONS DURING SITE VISIT

During our 1983 site visit, a tour of the dump area was made on June 8 in company with Peter Jones and on the following day with Messrs. McAlpine, Foster and Stepanek.

Viewed from above, the north pile can be seen to be obviously undergoing considerable movement. The surface is highly distorted, with a continuous series of scarps from top to bottom (Photo 2). On the lower part of the tailings pile, a series of terraces were created when material was excavated in attempting to stabilize the north lobe in 1978. These terraces, which were originally nearly level, are now highly distorted and cracked, with the centre area displaced considerably downslope compared to the ends of the terraces (Photo 3). A lateral slip plane, shown on Drawing D-1004, can be seen along the north side of the dump where the tailings pile is moving relative to the material which was removed and placed on stable ground to the north.

The toe of the north lobe has moved over 300 ft from its position as plotted in 1978, so that the tailings have nearly reached the lake impounded by the south lobe. The tailings pile forms a steep slope (about 38° to 40°) at the base of the north lobe (Photo 4). This steep slope was working actively at the time of our site visit, with material continually rolling down the slope. At the toe area nearest the lake, the tailings pile appears to be overriding the ground without noticeable foundation disturbance. At the northeast toe area, the ground is considerably disturbed, cracked and upthrust to an estimated distance of 150 ft from the toe, showing that movement of the foundation soils is occurring. Photographs 5 and 6 show the locations of the toe relative to the lake in June and September, 1983.

The south lobe appears in a more stable state than the north lobe, although movements are also occurring in this area. The surface is much smoother and does not contain the highly distorted cracking of the north lobe (Photo 7). At the top of the pile, an oversteepened face remains at the previous point of discharge of the stacker conveyor. At the base of this slope, at about the upper one-third point of the south lobe, cracks several feet in height can be seen (Photo 8). At the base of the south lobe in the valley bottom, a number of radial cracks indicate that the toe is continuing to spread. The channel conveying Wolverine Creek over the toe of the south lobe is being squeezed toward the east bank and the toe is moving upward at the channel location (Photo 9). The rock-lined channel downstream of the toe of the south lobe appears to be in satisfactory condition (Photo 10).

4. MONITORING DATA

4.1 GENERAL

Movement monitoring points, consisting of prisms set for EDM equipment, were installed on the tailings piles in 1978. Some of the original points have been lost and others added since. There are currently 14 intact monitoring points on the north lobe and 7 on the south lobe. The monitor locations are shown on Drawing D-1004. Monitoring data from surveys taken June 9 and September 22, 1983 are included in Appendix II. The data are expressed as rates in feet per year for both horizontal and vertical movements.

4.2 NORTH LOBE

Recent trends shown by the monitoring data on the north lobe are as follows:

a) The lower end of the north lobe (monitors 350-1A, 350-2A, 350-3A, 500-2, 650-2 and 80-7) appears to be moving downslope at an increasing rate, with points in the centre of the sliding area showing horizontal movement rates of up to 95 ft/yr, increasing from a maximum of less than 80 ft/yr in 1982.

b) Points in the centre of the north lobe (500-1 and 650-1) show slightly lower movement rates (50.2 and 32.6 ft/yr respectively) than those on the lower part of the lobe.

c) Points at about the upper third point of the north lobe (80-1, 26A and 80-2) show rates of less than 1.0 ft/yr horizontal movement.

d) Point 26, the highest monitoring point, showed an increased movement rate of 11.9 ft/yr in September 1983.

The movement rates shown are consistent with the suggestion made that the tailings lobe is sliding in a "caterpiller-like" manner. Segments of the slide move at varying rates, with slower moving segments later accelerating as support is removed by faster moving downslope segments.

The data also shows that the north lobe will begin displacing the lake in the valley bottom within the next few years.

4.3 SOUTH LOBE

Monitoring data on the south tailings lobe show the following:

a) Point 80-4, midway between the north and south lobes, shows that movement is small (1.14 ft/yr) in the area covered by tailings between the north and south lobes.

b) Movement rates of all monitoring points in the south lobe have increased in 1983. The surface of the lower half of the slide moved at rates varying between 14.1 and 23.5 ft/yr horizontally during the summer of 1983.

c) The monitoring data confirms that the toe area is both spreading horizontally and rising in elevation. Points 25-C and 80-9 moved upwards at rates of 3.93 and 1.93 ft in summer 1983. Point 25-C moved northward (away from the slide axis) at a rate of about 1 ft/yr and point 80-9 moved southward at a rate of 1.67 ft/yr.

5. ALTERNATIVES FOR RECLAMATION

Site observations and monitoring data indicate that downslope movement of the Wolverine Creek tailings piles will continue for a number of years, and that the process will cease only when most of the tailings have come to rest near the valley bottom. Brinco Mining wishes to leave the site in a condition which will have minimum detrimental environmental impact and which will be acceptable to the Yukon Territory Water Board. Until the tailings piles have reached a stable state, no permanent solution can be proposed.

The most practical approach to dealing with the tailings piles would be to continue the monitoring and maintenance program which Brinco has carried on to date. The aims of such a program would be to maintain an erosion-resistant channel over the tailings and to monitor the behaviour of the tailings piles. Annual visits would be made to survey monitoring points. Surveys should be carried out to determine the dimensions, slopes, gradients and lining details of the channel, and a more accurate assessment made of its flow capability. If found necessary, the channel should be upgraded. Periodic further earthworks to extend or maintain the channel may be required. Observations of movements may show that the tailings pile, or at least segments of the pile, could become more stable as the permafrost regime in the tailings and foundations approaches a new state of equilibrium. When the tailings piles have sufficiently stabilized, a final channel for Wolverine Creek can be designed and constructed.

Following are some of the alternate reclamation schemes which were also considered:

a) <u>Removal of the tailings piles</u> The most direct solution would be to excavate the tailings and place them in a permanently stable location. This solution would have the advantage that no on-going maintenance would be required. The impracticality of this solution is obvious, as the tailings volume is estimated at 10 million tons, or roughly 6 to 7 million cubic yards. The cost of removing the tailings would likely be in the order of $2 to 3 per cubic yard, or a total cost of $12 million to 20 million.

b) <u>Construction of a downstream sedimentation pond</u> Another solution to the problem would be to allow the tailings to slide into Wolverine Creek and allow the creek to erode the tailings. Downstream protection would be provided by constructing an earthfill dam downstream on Wolverine Creek to allow the tailings to settle out. Such a scheme would require a large dam, one which would create a reservoir large enough to contain most of the tailings. A concrete spillway would be required large enough to pass peak flood flows. The large volume of dam required, the difficulties of building earthfill dams in permafrost terrain and the necessity for long-term continuing maintenance make such a scheme impractical.

c) Conveyance of Wolverine Creek around the tailings piles Wolverine Creek could be carried around the tailings piles by tunnelling around the tailings pile area. A tunnel would have a length of about 2000 ft at a cost of about $1000 per foot and, with appurtenant works such as portal construction and inlet and outlet works, would cost in the order of $2.5 million. A tunnel would require on-going maintenance to prevent blockage.

6. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

6.1 PERFORMANCE OF TAILINGS PILES

The tailings piles on the west slope of Wolverine Creek valley are continuing to move downslope. The movement monitoring points in the lower portions of the north lobe increased to rates of up to 95 ft/yr horizontally during summer 1983. The north lobe will probably reach the small lake in the valley bottom during the next year. Movements of the south lobe monitoring points also increased in rate, to up to 23.5 ft/yr horizontally in the lower portion. The toe of the south lobe continues to spread in a radial fashion and to squeeze the stream channel. The need for maintenance should be assessed in spring 1984.

6.2 RECLAMATION OF TAILINGS PILES

A number of major concepts have been considered for preparing the Wolverine Creek tailings site for abandonment. These concepts include removing the tailings, building a downstream sedimentation reservoir and conveying the stream around the tailings piles through a tunnel. All of these works would entail large costs and, except for the option of complete removal of the tailings, all would require on-going maintenance.

6.3 ONGOING INSPECTION AND MAINTENANCE

We recommend that the current program of inspection and maintenance be continued as the most practical strategy for controlling erosion of tailings by Wolverine Creek. When the tailings piles approach a stable state, a permanent channel for Wolverine Creek can be designed and installed.

KLOHN LEONOFF LTD.

Peter C. Lighthall, P.Eng.

PCL/nl

APPENDIX I

PHOTOGRAPHS

Date of Photographs June 9, 1983

Photograph 1: Close-up showing typical tailings material.

Photograph 2: View of north tailings lobe looking northeast up Wolverine Creek valley.

Date of Photographs June 9, 1983

Photograph 3: Looking south at terraces cut in north lobe during unloading work.

Photograph 4: Oversteepened slope at toe of north lobe. Failure lobe in background.

Photograph 5: Toe of north lobe, June 8, 1983.

Photograph 6: Toe of north lobe, September 1983.

Date of Photographs June 9, 1983

Photograph 7: View of south tailings lobe from the top.

Photograph 8: Looking up at upper portion of south lobe. Note cracking indicating some movement continuing.

Date of Photographs June 9, 1983

Photograph 9: Wolverine Creek channel at toe of south lobe. Note cracking from upward movement of toe.

Photograph 10: Rock-lined channel carrying Wolverine Creek over failed south tailings lobe.

APPENDIX II

JUNE 1983 AND SEPTEMBER 1983 MONITORING
DATA OF TAILINGS PILE

<u>WOLVERINE TAILINGS PILE</u>

<u>NORTH LOBE</u>

STATION	CO-ORDINATES & ELEVATIONS SEPT. 22/83	RATES OF MOVEMENT (ft/yr) HORIZONTAL			VERTICAL		
		JUN.82	JUN.83	SEP.83	JUN.82	JUN.83	SEP.83
26	N114491.70 E108227.57 1891.79	0.1	3.61	11.91	-0.30	-0.32	+0.17
80-2	N114318.00 E108436.42 1818.77	0.1	6.50	0.45	-0.05	-0.23	-0.59
26A	N114483.41 E108414.65 1837.45	0.3	0.62	0.93	-0.44	-0.36	+2.72
80-1	N114708.42 E108420.21 1832.99	0.6	0.77	0.76	-0.53	-0.67	+0.14
80-4	N114020.30 E108854.54 1667.10	0.9	1.96	1.14	-0.86	-0.61	-0.24
80-5	N114170.06 E108937.52 1615.75	-	32.64	12.43	-	-32.18	-12.16
500-1	N114510.89 E108856.73 1619.55	55.4	57.14	50.20	-32.82	-24.52	-16.36
650-1	N114714.91 E108849.98 1632.48	52.7	50.26	32.57	-26.53	-16.53	-10.36
350-1A	N114361.22 E109062.67 1576.20	-	55.99	79.47	-	-19.85	-23.45
500-2	N114497.95 E109144.84 1550.11	-	74.37	93.73	-	-27.28	-43.52
350-2A	N114341.10 E109218.67 1522.76	65.9	91.95	95.14	-27.16	-37.57	-29.41

WOLVERINE CREEK TAILINGS PILE

NORTH LOBE (Cont)

STATION	CO-ORDINATES AND ELEVATION SEPT.22/83	RATES OF MOVEMENT (ft/yr)					
		HORIZONTAL			VERTICAL		
		JUN.82	JUN.83	SEP.83	JUN.82	JUN.83	SEP.83
650-2	N114709.52 E109159.45 1529.13	72.2	88.62	66.66	-30.13	-42.99	-36.26
80-7	N114499.24 E109310.41 1483.92	71.0	103.27	94.49	-37.77	-42.96	-35.16
350-3A	N114395.27 E109321.13 1483.44	78.4	109.93	95.04	-32.90	-44.09	-43.11

WOLVERINE CREEK TAILINGS PILE

SOUTH LOBE

STATION	CO-ORDINATES & ELEVATIONS SEPT.22/83	RATES OF MOVEMENT (ft/yr) HORIZONTAL			VERTICAL		
		JUN.82	JUN.82	SEP.83	JUN.82	JUN.83	SEP.83
24	N113481.81 E108331.65 1826.05	0.9	-	1.73	-1.14	-	-1.17
24A	N113443.16 E108968.60 1604.25	12.4	16.39	21.52	-4.52	-5.77	-8.40
24B	N113468.60 E109160.83 1538.39	11.6	15.02	19.04	-4.30	-5.14	-6.40
24D	N113547.25 E109500.94 1425.91	9.1	10.87	14.29	-3.36	-3.79	-3.89
25B	N113553.26 E109629.60 1384.74	8.9	10.44	14.12	-2.12	-2.36	-1.93
25C	N113747.61 E109807.88 1352.18	5.0	3.43	7.99	+2.50	+2.64	+3.93
80-9	N113372.94 E109788.12 1341.77	2.1	2.72	3.68	+1.03	+0.87	+1.93

WOLVERINE CREEK TAILINGS PILÈ

NORTH LOBE

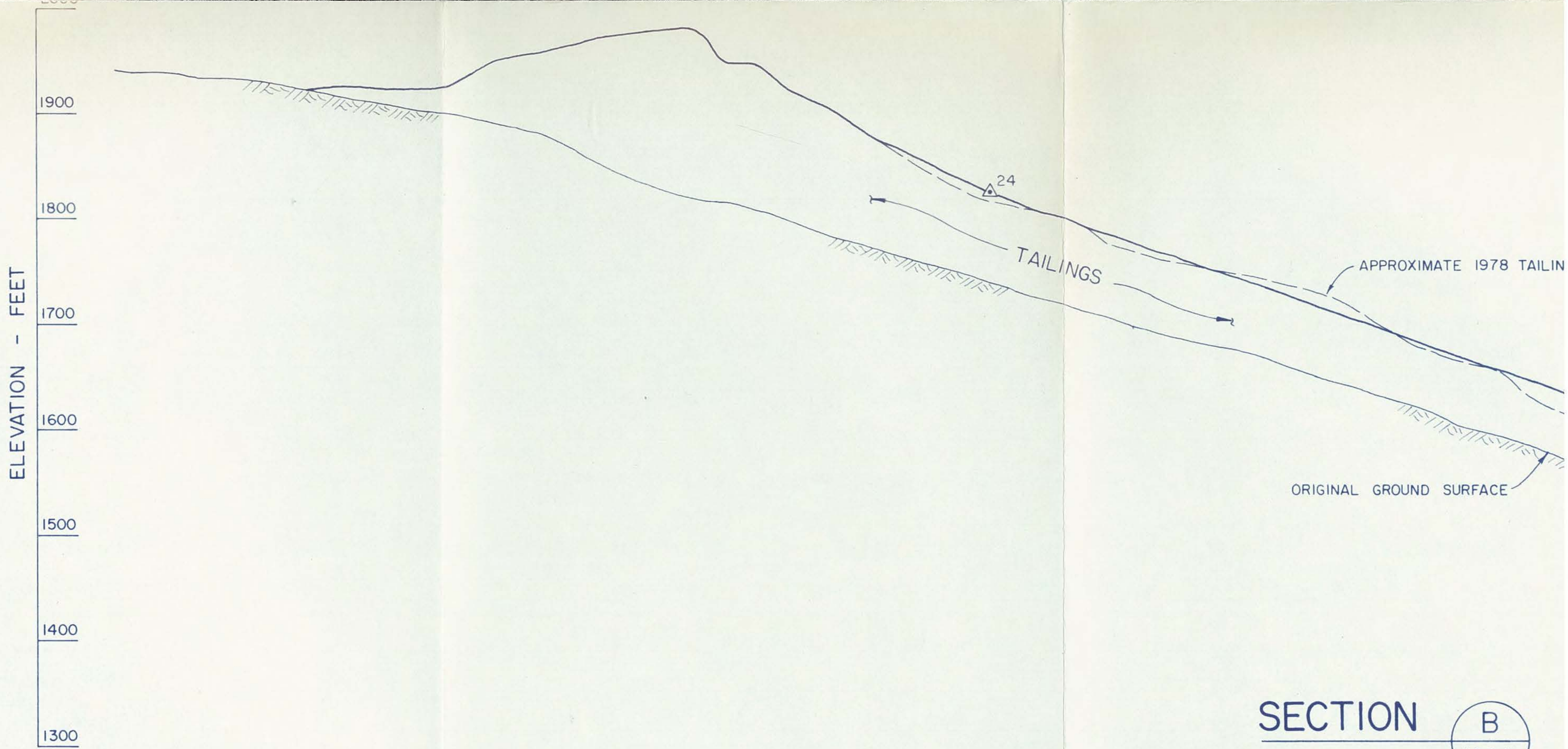
STATION	CO-ORDINATES AND ELEVATIONS (JUNE 9, 1983)	RATES OF MOVEMENT (ft/yr) HORIZONTAL			VERTICAL		
		Aug. 81	June 82	June 83	Aug.81	June 82	June 83
26	N114,489.77 E108,224.38 1,891.74	4.6	0.1	3.61	+0.85	-0.30	-0.32
80-2	N114,318.07 E108,436.31 1,818.94	4.4	0.1	6.50	0.00	-0.05	-0.23
26-A	N144,483.61 E108,414.47 1,836.66	4.9	0.3	0.62	+0.52	-0.44	-0.36
80-1	N114,708.52 E108,420.02 1,832.95	5.4	0.6	0.77	-0.33	-0.53	-0.67
80-4	N114,020.34 E108,854.21 1,667.17	-	0.9	1.96	-	-0.86	-0.61
80-5	N114,169.29 E108,933.99 1,612.28	-	-	32.64	-	-	-32.18
500-1	N114,511.85 E108,842.18 1,624.30	48.9	55.4	57.14	-26.26	-32.82	-24.52
650-1	N114,716.82 E108,840.71 1,635.49	49.1	52.7	50.26	-19.72	-26.53	-16.81
350-1A	N114,363.84 E109,039.74 1,583.01	48.8	-	54.99	-14.79	-	-39.69
500-2	N114,497.27 E109,117.63 1,562.75	57.6	-	74.37	-26.26	-	-54.55
350-2A	N114,340.60 E109,191.24 1,531.30	57.3	65.9	91.95	-17.11	-27.16	-37.57
650-2	N114,710.66 E109,139.80 1,539.60	61.7	72.2	88.62	-21.09	-30.13	-42.99
80-7	N114,497.12 E109,283.05 1,494.13	58.9	71.0	103.27	-22.94	-37.77	-42.96
350-3A	N114,393.96 E109,293.56 1,495.96	60.6	78.4	109.93	-33.32	-32.90	-44.09
80-8	DESTROYED						

WOLVERINE CREEK TAILINGS PILE

SOUTH LOBE

STATION	CO-ORDINATES AND ELEVATION (JUNE 9, 1983)	RATES OF MOVEMENT (ft/yr)					
		HORIZONTAL			VERTICAL		
		Aug. 81	June 82	June 83	Aug. 81	June 82	June 83
24 (12/6/82)	N113,482.17 E108,329.43 1,827.56	2.5	0.9	-	-0.14	-1.14	-
24A	N113,442.00 E108,962.46 1,606.69	13.3	12.4	16.39	-3.79	-4.52	-5.77
24B	N113,467.65 E109,155.38 1,540.25	12.5	11.6	15.02	-3.65	-4.30	-5.14
24D	N113,546.26 E109,496.91 1,427.04	11.3	9.1	10.87	-2.61	-3.36	-3.79
25B	N113,552.13 E109,625.66 1,385.30	11.2	8.9	10.44	-2.23	-2.12	-2.36
25C	N113,747.32 E109,801.12 1,351.04	7.8	5.0	3.43	+2.65	+2.50	+2.64
80-9	N113,373.42 E109,787.16 1,341.21	4.3	2.1	2.72	+1.04	+1.03	+0.87

DRAWINGS



B

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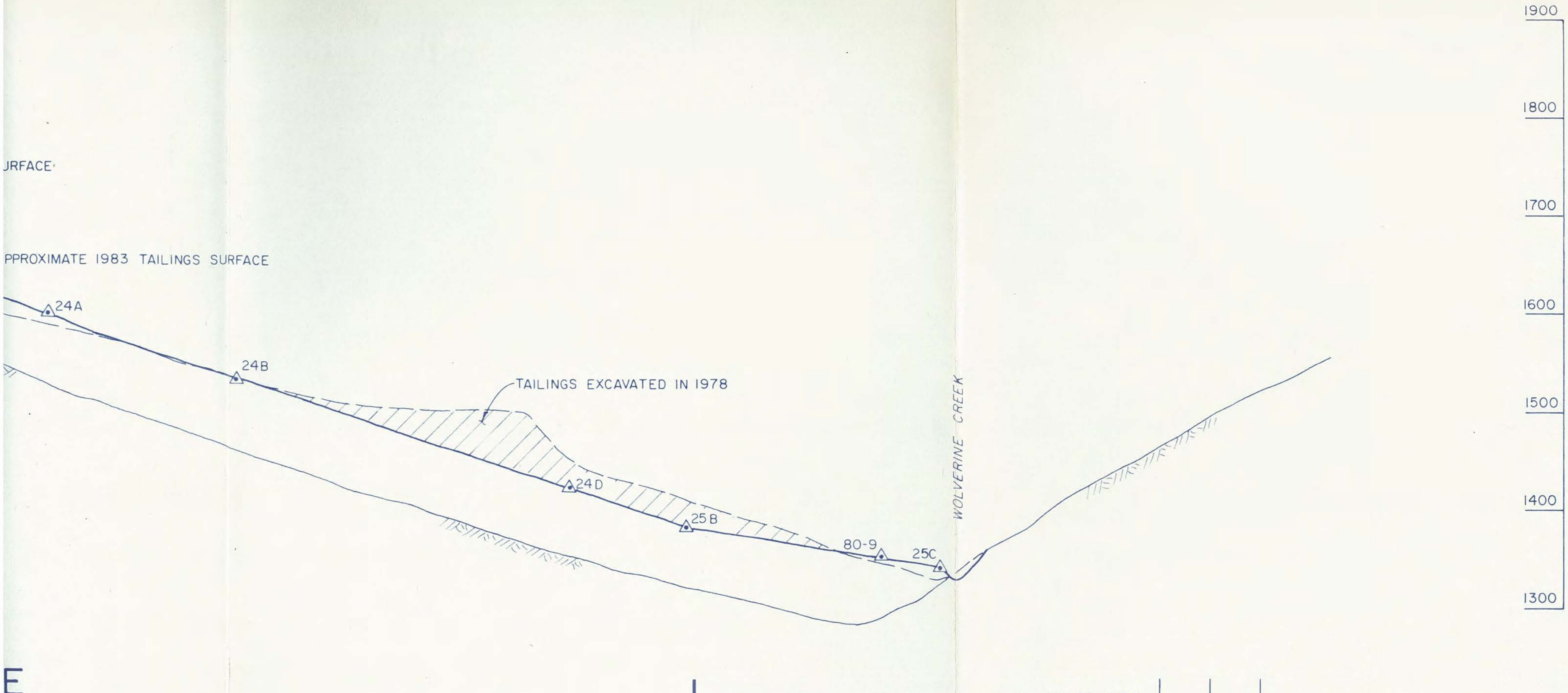
SECTION B/1004

SOUTH TAILINGS L

LEGEND

$\triangle^{26A}$ Monitoring Point

NCI - 603



TO BE READ WITH KLOHN LEONOFF REPORT DATED JAN. 26, 1984

SCALE: 100 0 100 200 ft

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KLOHN LEONOFF LTD.
CONSULTING ENGINEERS

CLIENT: BRINCO MINING LIMITED
CASSIAR DIVISION

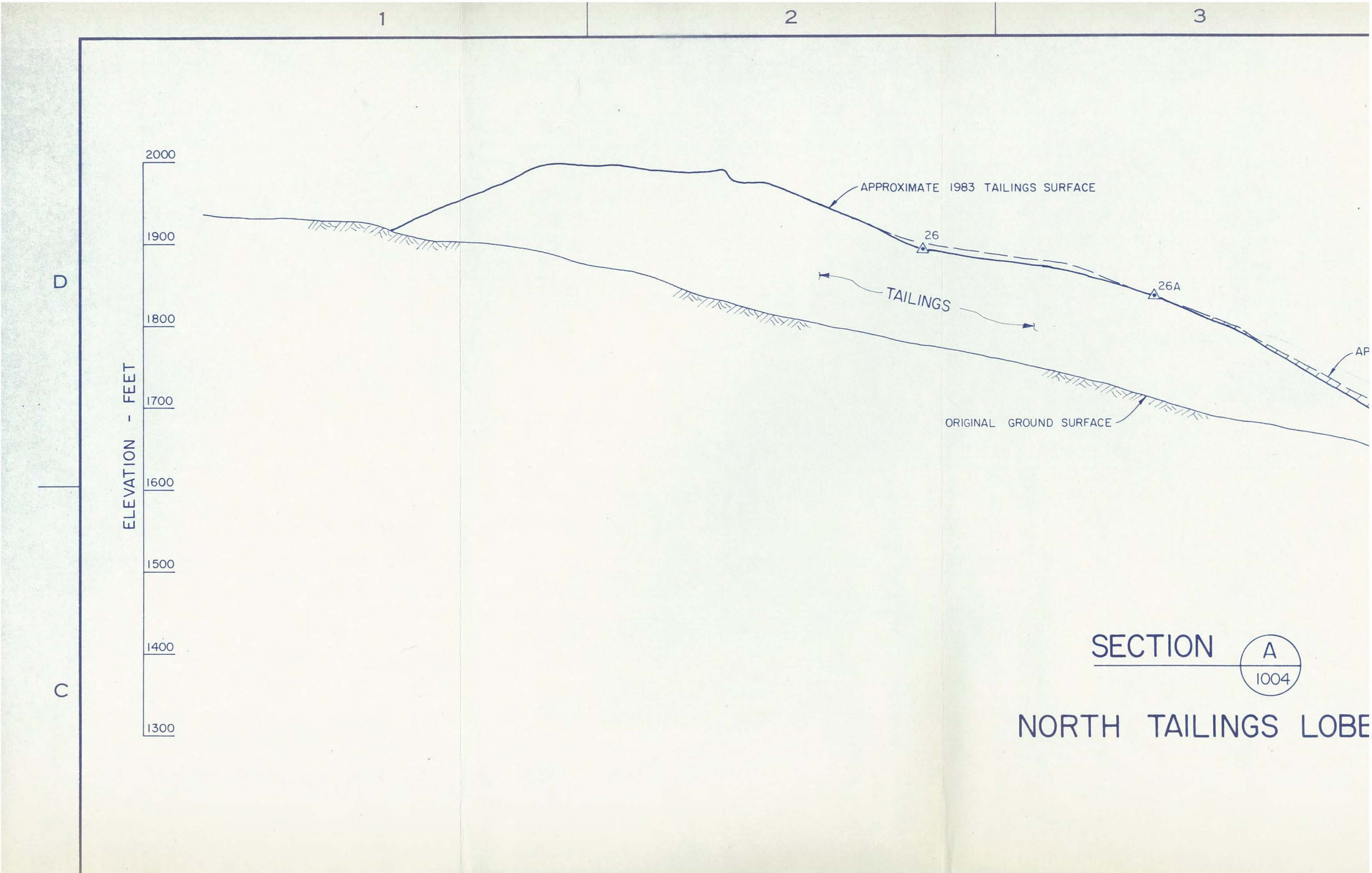
REV.	DATE	REVISION DETAILS

DESIGN	DRAWN	DATE	SCALES
P.C.L.	F.C.	DEC. 1983	1" = 100'

PROJECT: CLINTON CREEK MINE RECLAMATION

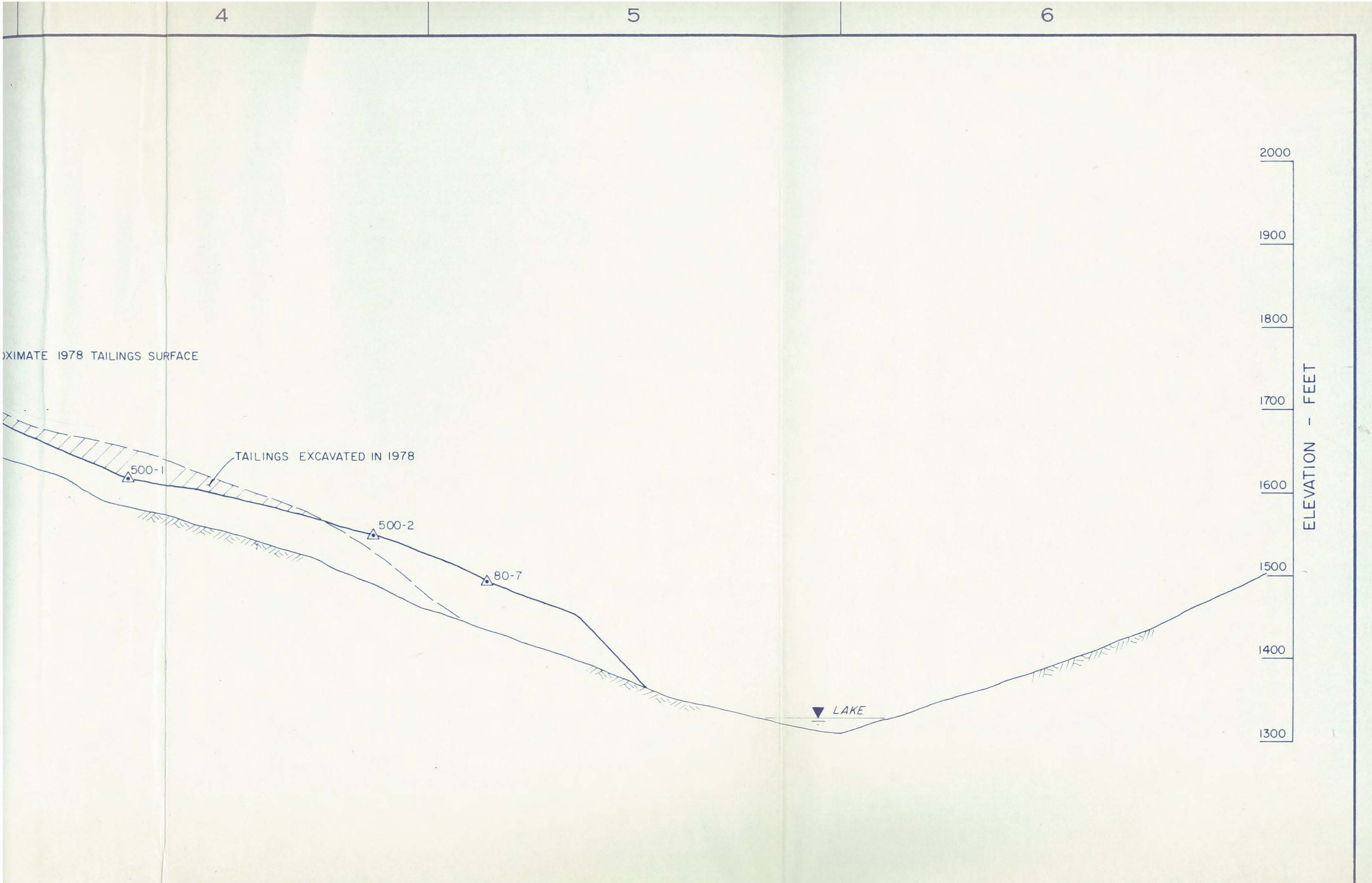
TITLE: WOLVERINE CREEK TAILINGS PILES
SECTIONS 'A' AND 'B'

DATE OF ISSUE	PROJECT No.	DWG. No.	REV.
JAN. 26, 1984 APPROVED	PB 3169-01	D-1005	



SECTION A/1004

NORTH TAILINGS LOBE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6
XIMATE 1978 TAILINGS SURFACE
TAILINGS EXCAVATED IN 1978
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500-2
80-7
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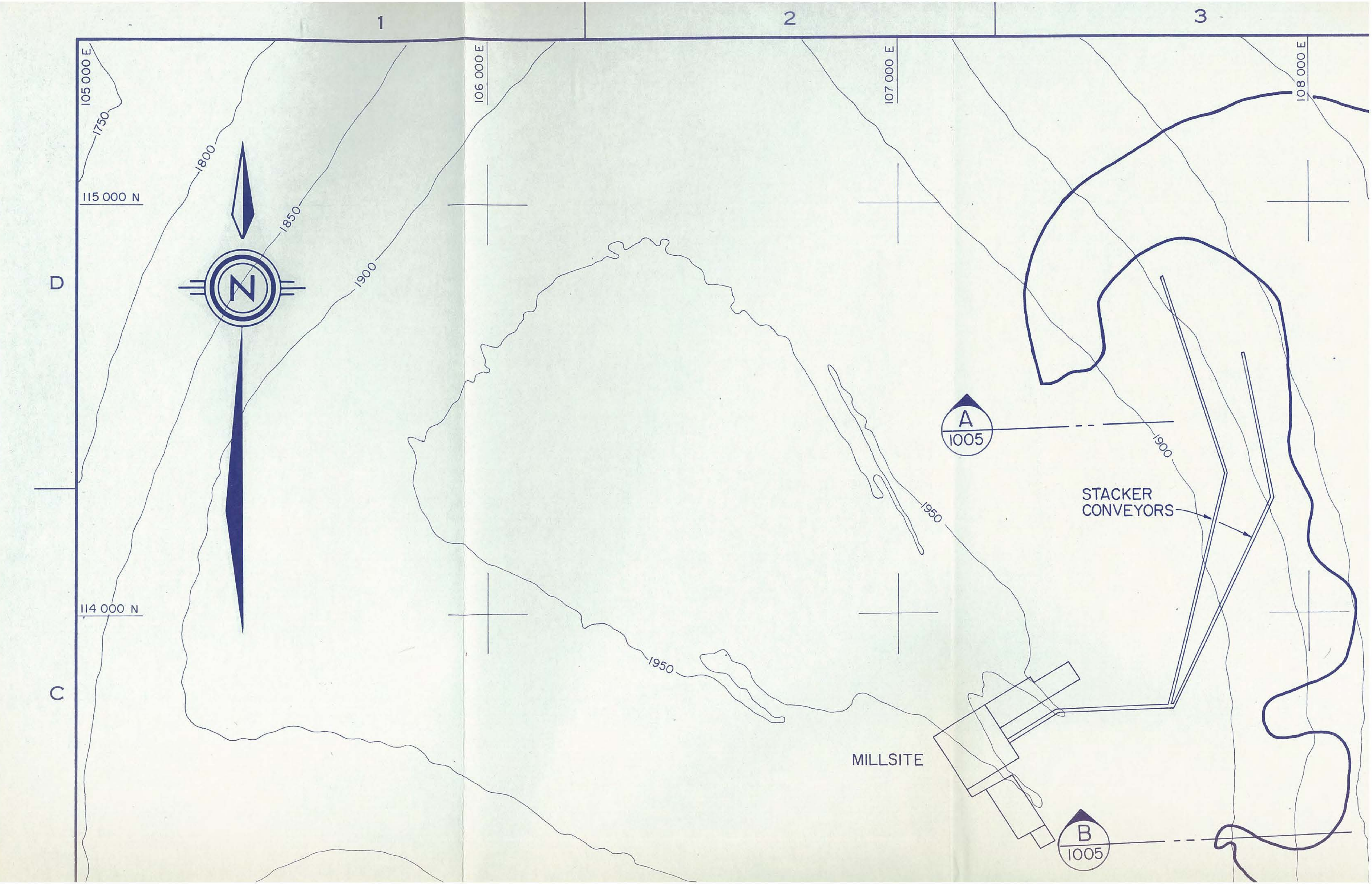
1900
1800
1700
1600
1500
1400
1300
ELEVATION - FEET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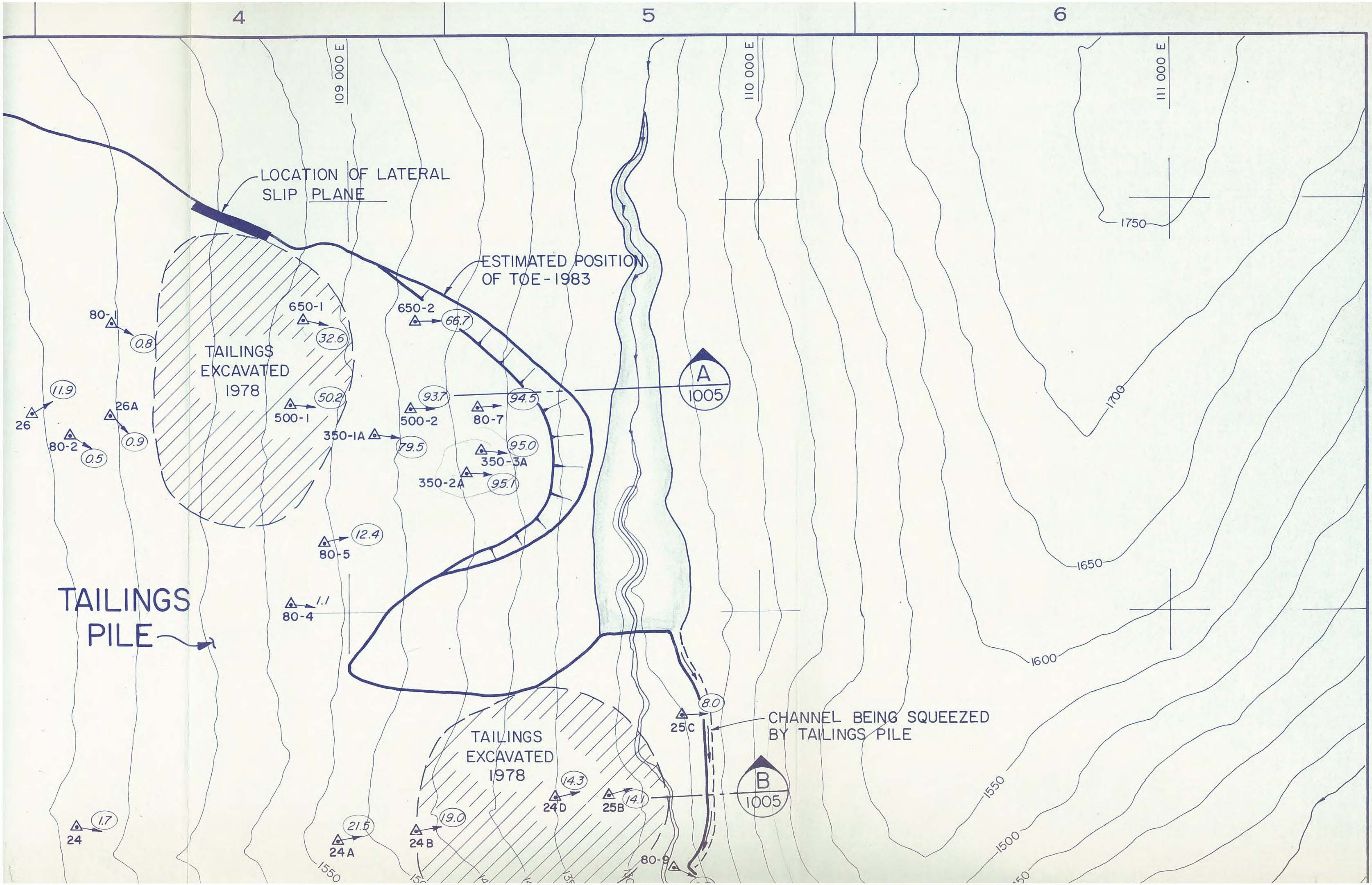
STACKER
CONVEYORS
MILLSITE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111 000 E
LOCATION OF LATERAL SLIP PLANE
ESTIMATED POSITION OF TOE - 1983
TAILINGS EXCAVATED 1978
TAILINGS PILE
CHANNEL BEING SQUEEZED BY TAILINGS PILE
A
1005
B
1005
80-1
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650-1
32.6
650-2
66.7
11.9
26
26A
0.9
80-2
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500-1
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94.5
500-2
80-7
350-1A
79.5
95.0
350-3A
350-2A
95.1
80-5
12.4
80-4
1.1
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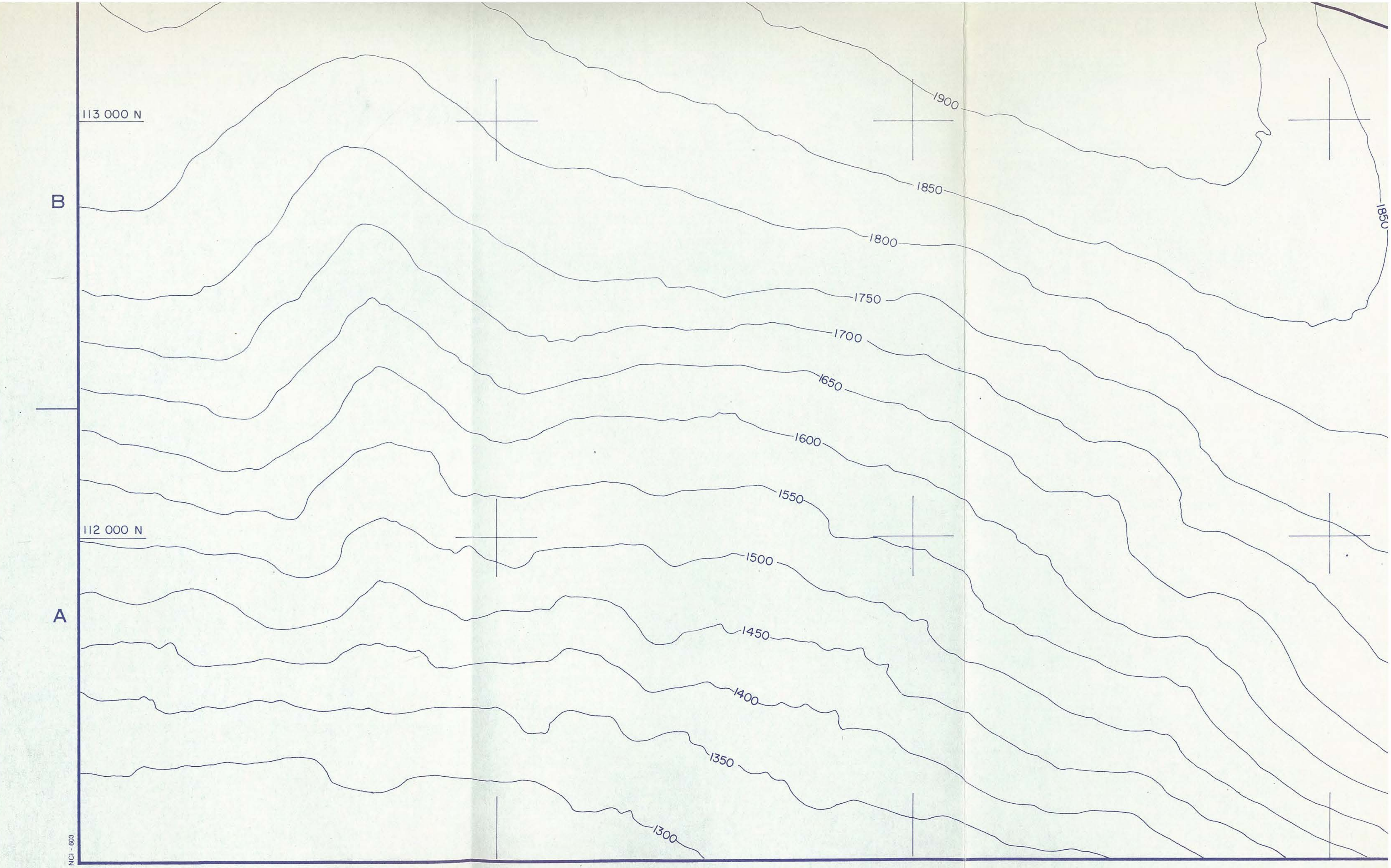
8.0
14.3
24D
25B
14.1
24
1.7
24A
21.5
24B
19.0
80-9
1750
1700
1650
1600
1550
1500


113 000 N
112 000 N
B
A
1900
1850
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1800
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1700
1650
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1450
1400
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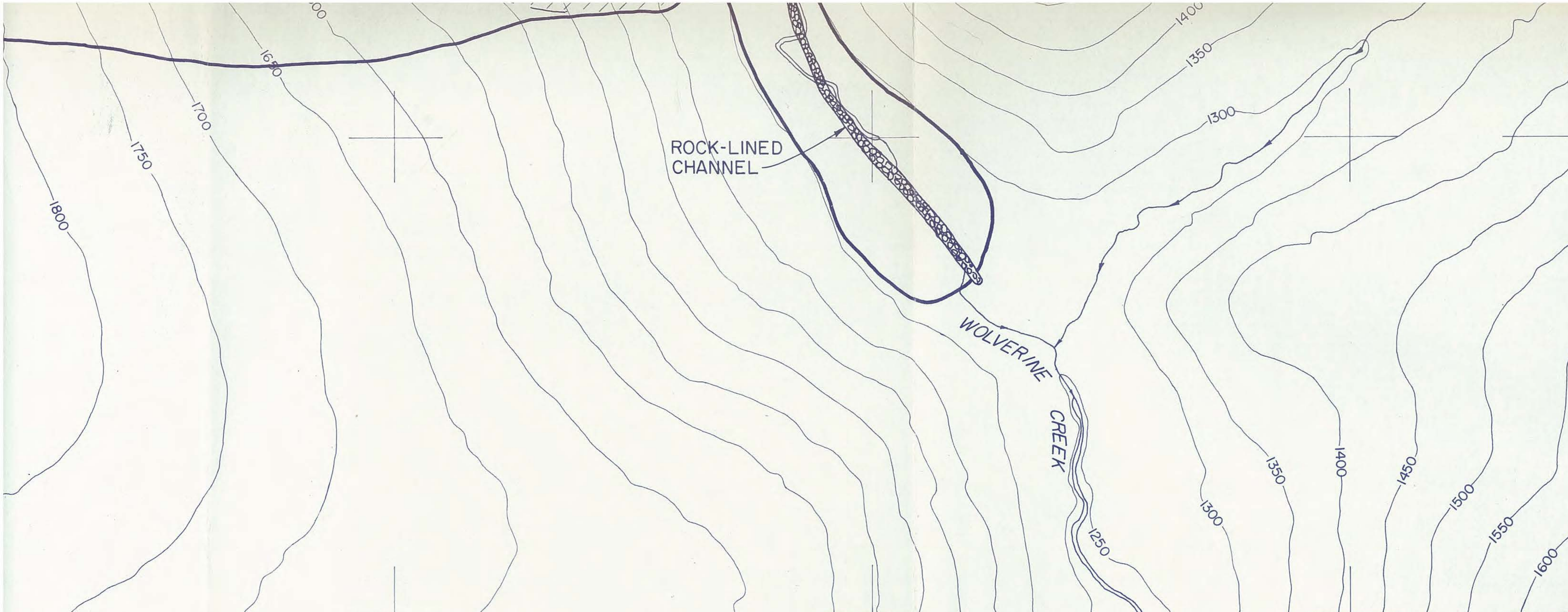
NCI - 603



LEGEND

24 (1.7) Monitoring Point (Rate of movement - ft/yr)

NOTE

TOPOGRAPHY TRACED FROM CASSIAR ASBESTOS CORPORATION LIMITED SHEET No. 223, COMPILED IN 1965 BY McELHANNEY AIR SURVEYS LTD.

TO BE READ WITH KLOHN LEONOFF REPORT DATED JAN. 26, 1984

SCALE: 200 0 200 400 ft.

REV.	DATE	REVISION DETAILS

DESIGN	DRAWN	DATE	SCALES
P.C.L.	F.C.	DEC. 1983	1" = 200'

KLOHN LEONOFF LTD.
CONSULTING ENGINEERS

PROJECT: CLINTON CREEK MINE RECLAMATION

TITLE: PLAN OF WOLVERINE CREEK TAILINGS PILES

CLIENT: BRINCO MINING LIMITED CASSIAR DIVISION

DATE OF ISSUE	PROJECT No.	DWG. No.	REV.
JAN. 26, 1984	PB 3169-01	D-1004	

APPROVED