BCDM Property Files

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WILLOUGHBY

Tom Schroeter
July 18/89

REPORT

ON

WILBY CREEK GROUP

Meziadin Lake

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Portland Canal Mining Division

C.E. Gordon Brown,
Mining Engineer.

Copied in our office Mar '45 from report loaned to B T O G by St Eugene Exploration Co. / HS

INDEX

	Page
Summary	1
Location and Topography	1
Access	3
Climate	4
Timber	4
Power Resources	5
Millsite and tailings Disposal	5
Geology	5
Orebodies	8
Sampling	11
Engineering Considerations affecting Exploration of the deposits	14
1. Further Surface Exploration	14
2. Diamond Drilling from Surface	15
3. Underground Exploration	16
4. Transportation	17
Recommendations	17
1. Trail work	18
2. Camp Buildings	18
3. Geological and Topographical Survey	18
4. Surface Diamond Drilling	19

Appendix Map.
- Section of north side of Porter Creek (sketch)
- Wilby Group - Scale 1" = 300'.
- Property location - Scale 1" = 1 mi.

THE WILBY CREEK MINING SYNDICATE GROUP OF MINERAL CLAIMS, NEAR MEZIADIN LAKE, VICINITY OF STEWART, BRITISH COLUMBIA.

SUMMARY:

An ore body, or a series of ore bodies, possibly of large dimensions, is indicated on the Wilby Creek property. Grade of the ore will be low, probably in the order of $5.00 - $7.00 in gold per ton. Substantial values in zinc are anticipated. Location of the property is unfavorable, both by reason of it's remoteness and because it is situated in a glacial region, entirely surrounded by ice. Engineering difficulties, while admittedly great, are not overwhelming for a determined organization. Present information is not extensive enough to enable underground work to proceed. By the expenditure of approximately $56,000 in diamond drilling and geological work, sufficient additional information could be obtained which, if favorable, would enable underground development to be commenced with reasonable confidence. It is doubtful whether the same expenditure would enable the property to be completely eliminated as a commercial possibility.

The property known as the Wilby Group consists of ten mineral claims, Wilby Creek Gold Nos. 1 to 8, and Marjorie Nos. 1 and 2, held by location by the Wilby Creek Mining Syndicate of Stewart, B.C. The majority interest in the syndicate is held by Owen McFadden and H.C. Bennett of Stewart, B.C.

LOCATION AND TOPOGRAPHY:

The claims are located at elevation of 4000 - 6500 feet, approximately fourteen miles south of the west end of Meziadin Lake, at the head of a glacier which forms the source of Willoughby Creek. After flowing west for four miles from the snout of the glacier, Willoughby Creek joins the Nelson River which, in turn, enters the White River, 1 mile to the east. The White River, after flowing west-north-west for eight miles, enters the Nass River which flows southward to the sea. The accompanying map, fig. 1, was traced from "Topographical Plan, Vicinity of Meziadin and Bowser Lakes and Bell-Irving Valley, Cassiar District, 1927: 1 inch to 80 chains", obtainable from the Provincial Government. The accuracy of detail of this map appears to be in question.

The area comprizes a portion of the eastern slope of the Coast Range and is one of extreme topographical relief. The Cambria Icefield, a large ice-covered plateau, having an elevation of 6000-6500 feet, forms the summit of this portion of the Coast Range and extends westward sixteen miles from the property to the vicinity of the town of Stewart. Three steep glaciers, extending downward from the icefield, converge to form the comparatively level Willoughby Glacier which flows eastward for approximately 2½ miles to the point where the glacier ends as the source of Willoughby Creek. The located claims cover a precipitous bluff which projects from the ice between the central and northern feeders of the main glacier. The most westerly claims extend over the crest of the plateau onto the Cambria Icefield.

Eastward from the glacial area surrounding the Property, the topography rapidly becomes more gentle and rounded as the broad valley of the Nass River is approached. Willoughby Creek forms a hanging valley, caused by the faster erosion of the Nelson valley in glacial times, and, after flowing eastward for several miles at a moderate grade, enters the Nelson River through a series of canyons, falls and rapids.

ACCESS:

Travelling conditions to the property are at present very poor. The route at first follows the valleys of the Bear River and Strohn Creek to Meziadin Lake, a distance of approximately 37 miles. The first 13 miles to American Creek are covered by automobile. At American Creek, the valley of the Bear River turns eastward and a pack trail is followed for about 24 miles to Meziadin Lake. The trail is badly routed and overgrown with brush. At one point the Bear River glacier blocks the valley floor and the trail follows a precipitous route on the north side; this could be avoided by rerouting the trail at a lower elevation to take advantage of a recent recession of the ice nearer the valley floor.

Meziadin Lake is traversed by canoe for 3½ miles to the south bank where a route leads over a 4000 foot divide to the Nelson River, following a line of least resistance. There is no trail in the strict sense although a small amount of work has been done to remove the worst of the brush and windfalls. The ascent from Meziadin and the descent to Nelson River are excessively steep. The latter river is crossed on a log. After this, a steep route through brush up Porter Creek leads to a cabin on the Porter Creek Group of claims. From this point over to Willoughby Creek a 5000 foot divide must be crossed, ascending by a watercourse and descending by a steep slope of dense Alder brush to the Willoughby glacier. The total distance from Meziadin Lake by this route is approximately 25 miles.

An excellently graded trail could be built starting at the lower or eastern end of Meziadin Lake to follow a southwesterly course across the low spur dividing the lake from Nelson River at this point. The river would be bridged above it's confluence with Willoughby Creek and a short steep climb out of the Nelson Valley, followed by an easy grade up Willoughby Creek would lead to the foot of the Willoughby Glacier. The total distance from the lake by this route would be about 14 miles. To provide all road connection with Stewart, approximately 20 miles of new road would be necessary between American Creek and the lake. This would entail perhaps 30% of rock excavation, the rest being sidehill gravel; several miles in the vicinity of the Bear Glacier would be subject to snow slides in winter. The following 12 miles of road around the south side of the lake would probably be all sidehill gravel with no danger from snow slides. The final 14 miles from the east end of the lake to the property would be mainly flat ground and sidehill gravel with no danger from slides, except possibly in the last two miles. The total distance of new road required would be about 46 miles.

CLIMATE:

Extremes of winter temperatures are moderately severe and the climate may be said to be colder than in Stewart. However, rain and snowfall, due to the location on the east flank of the mountains, are less than on the west flank. It appears to be generally agreed that snow is gone from the valleys a month earlier than in Stewart.

TIMBER:

No mining timber exists in the vicinity of the claims. A trail, routed from the lower end of the lake, would pass through several miles of hemlock, spruce and balsam of a grade that could be used for buildings and mine timber.

POWER RESOURCES:

The hanging valleys of Porter Creek, Willoughby Creek and the upper part of the Nelson River could probably be used to provide sufficient power for a large sized mining operation.

MILLSITE AND TAILINGS DISPOSAL:

An excellent millsite could be found at the lower end of the Willoughby Glacier. Ore transportation between mine and mill would be by aerial tram along the north side of the glacier, a distance of 2½-3 miles. One or two angle stations would be necessary on this tramline as the glacier makes a wide turn to the southeast.

The practice of dumping mill tailings direct into the rivers is usual in this country. However, since the tailings dumped into Willoughby Creek would eventually reach the Naas River, it is possible that the Federal Fisheries might object to the practice. Sufficient level ground is said to exist adjacent to Willoughby Creek for the construction of adequate tailings disposal facilities.

GEOLOGY:

The rocks of the Willoughby Creek-Meziadin Lake area consist of a sedimentary series of argillite and greywacke beds overlying an igneous series of massive and fragmental igneous rocks, interbedded with fine grained tuff and a minor proportion of argillite. The group has been described by Hanson, and named the "Hazelton Group". It is referred to the Jurassic. The regional structure may be most easily studied in the sedimentary part of the group, since the lower section of igneous rocks is, in the main, #

Hanson G. C.G.S. Mem.175 "Portland CanalArea, B.C pp 6-24

massive and does not show enough bedding to enable structures to be identified.

The sedimentary part of the Hazelton Group in the Porter-Willoughby creek district occupies the summits of the high ridges and has a general northerly to northeasterly dip of about 20-25 degrees. It consists of black argillite and light grey or brown greywacke in beds not usually exceeding 2 feet in thickness. Owing to the general northerly dip, successive ridges proceeding southward contain a smaller proportion of sediments. Thus, the ridge north of Porter Creek consists of approximately 30% of sediments; on the ridge south of Porter Creek, forming the divide between that creek and Willoughby Creek, sediments form only the upper 10% of the rocks. Proceeding still farther south, only the extreme summits south of Willoughby Creek consist of sedimentary rocks.

Beneath the sedimentary part of the group lies an igneous complex consisting principally of fine grained purple and green tuffs and breccia. Intruded into the complex are irregular bodies of feldspar porphyry and diorite, often highly brecciated. These may represent volcanic necks and flows which have later been brecciated by orogenic forces. As an indication that the igneous complex has been, in part at least, laid down in water, beds of argillite, several hundred feet in thickness, occur interbedded with massive volcanics.

Fig. 2 represents a rough section, approximately east and west, parallel to the strike of the sediments, through the ridge forming the north side of Porter Creek. The section was sketched from the ridge forming the divide between Porter and Willoughby Creeks and therefore is not to scale. At the east end of the section thsediments are seen to be dipping normally: proceeding towards the center of the section, the argillites become closely folded and contain numerous quartz veins. At the west end of the section, information of a precise nature is lacking at present since time was not available for examination of the terrain. It appears from a distance, owing to the more rounded topography, as though there may be a contact between an intrusive and the volcanics and it was at first thought that this might be the southerly continuation of the granodiorite stock which outcrops in Strohn Creek two miles west of Meziadin Lake. Examination of the moraine of the Porter Glacier, however, failed to disclose sufficient granodiorite float to indicate the presence of a large body of this rock, although some quantity was present. Abundant feldspar porphyry and diorite float was seen, indicating an increase in the relative proportions of intrusive rocks to the west. The ridge between Porter and Willoughby Creeks presents a similar section at about 1000 feet lower horizon.

The mineral deposits of Porter and Willoughby Creeks occur as veins and sheared zones in the volcanics and related intrusives of the igneous complex underlying the closely folded part of the sedimentary series. Numerous quartz veins were also seen penetrating the folded sediments roofing the igneous complex. The whole occurrence closely resembles that part of the Alice Arm district described by Hanson under the terms "Klayduc, Theophilus and Kitsault igneous bodies." # These bodies are also igneous complexes, containing similar rock types. Their long axes strike north and south and they contain the principal mineral deposits of the Alice Arm area. Hanson suggests that the Kitsault igneous body may extend northerly under the icefield

Hanson G. op.cit. pp 13-18

into the Bear River area. This body is 33 miles long in the Alice Arm area and it's extension 16 miles farther north may well be represented by the igneous complex at the headwaters of Willoughby and Porter Creek.

OREBODIES:

The mineral deposit consists of a fractured and sheared body of diorite breccia, mineralized with pyrite, pyrrhotite, sphalerite and galena. Where unaltered, the breccia consists of fragments, up to 6" in diameter, of dark colored, medium grained diorite containing, principally, plagioclose and hornblende with a small proportion of quartz. The cementing material probably contains iron as broken fragments of rock weather to a purple color. The breccia may represent a volcanic plug or the feeder to a flow. The outcrop of diorite breccia is a bluff projecting from the ice between the central and northern feeders of the Willoughby Glacier and is entirely surrounded by ice, (Fig.2). It is extremely precipitous, having an average angle of 50-55 degrees. Owing to the steep nature of the ground and to the presence of ice on all sides, it is impossible for any but a fully equipped mountaineering party to examine or survey the outcrop. Consequently, the examination was confined to the very small accessible portion at the lower southeasterly corner of the showing. At this point, some 200 feet above the base of the bluff, a small amount of hand drilling has been done, enabling a ledge to be traversed across the face of the mountain following the line of least resistance for a short distance. The ledge crosses the most southerly of three very large oxidized areas which extend diagonally across the face of the bluff. This oxidized area is shown to be a fractured and sheared zone, striking approximately south west, exceeding 100 feet in width. The dip is indeterminate but is probably steep.

Within the fractured area, individual fractures vary in strike from N15E to N70E and appear mainly to be steeply dipping to the northwest. In the open cut at the lower end of the showing, mineralization is pyrite and pyrrhotite; higher horizons contain appreciable quantities of sphalerite and smaller quantities of galena, as shown by a large pile of float at the base of the bluff below the upper part of the showing.

The rocks in the fractured area are completely altered to a very light grey or white. Soft white sheared material in the open cut, thoroughly impregnated with pyrite and phrrhotite composes a large proportion of the zone at this point. Hard white bleached rock, usually barren, but sometimes with disseminated pyrite, occurs between fractures. Quartz veinlets, honeycombed by leaching of sulfides, are of common occurrence. Outside the actual zone of shearing, narrow compression fractures, 1/8 to 1/2 inch wide, are mineralized with pyrite and sphalerite. Two sets of these fractures, 80-85 degrees to each other, were measured. They are probably too widely spaced to be important commercially.

Owing to the presence of ice, the nearest outcrop of rock to the ore-bodies is a band of argillite 1200 feet northwest across the north glacial feeder. Since no shearing could be seen in the argillite, it would seem that the orebody is confined to the diorite breccia. The size of the ozidized areas visible in the face of the bluff must be seen to be appreciated. Rough triangulation with compass from a 600 foot base line, laid out on the ice, was attempted and is shown in the diagram Figs. 4 and 5. By these measurements, the outcrop was found to be in excess of 3000 feet long by 1400 feet high. The location of the opencut is shown by the point "k" in the diagram. Above the opencut, the most southerly shear, as shown by the area of exidation, opens out to approximately 400 feet in width. The center zone of oxidation is very much larger and is shown roughly sketched in the diagram. A third zone, apparently smaller, is indicated at the north end of the face. The aggregate area of oxidated rock is in excess of 50% of the exposed area of diorite breccia. It should be emphasized that most of the outcrop is, at present, impossible to examine and that the oxidized areas were sketched in from a range of over 3000 feet. However, it is logical to suppose, since the only oxidized portion of the face that could be examined was found to contain abundant pyrite, pyrrhotite, and sphalerite, that other portions similarly oxidized are similarly mineralized.

The possibility that the shear zones do not, in reality, strike to the southwest but actually coincide with the erosion surface of the outcrop might be advanced. In this event, the oxidation would merely represent a skin of mineralization on the face of the bluff, with no lateral extent beyond the present exposure. The possibility is considered remote for the following reasons. First, all individual fractures are transverse to the direction of the face, having a general southwesterly strike. Secondly, the face is by no means regular but contains large protuberances, indentations and embayments: consequently, a single shear zone would have to have been several hundred feet wide to produce uniformly distributed oxidation on so large a scale over such an irregular erosion surface. In any event, surface diamond drilling would immediately establish whether this were the case by absence of any shearing or rock alteration in the drill core.

SAMPLING:

The only portion of the deposit that could be inspected in place was the ledge (near the point "k") and the ground immediately adjacent to the ledge in the face above. At this locality, 86 feet across the most southerly orebody, and two small opencuts close to the ledge, were sampled with the results noted below. Mineralization in this place consisted almost entirely of pyrite and pyrrhotite. Samples were later cut down to about 1 lb. in weight owing to difficulty of transportation.

Sample No.		Au.	Ag.	Zn.
2951	Across 5'	.02	.86	.1
2	Next 5' proceeding North	.07	.66	.2
3	Next 5' " "	.10	.36	T
4	Next 5' " "	.02	.44	.5
5	Next 5' " "	.09	.38	.9
6	Next 5' " "	.10	.78	Nil
8	Next 5' " "	.96	1.40	.6
9	Next 5' " "	.15	.40	1.0
2960	Next 13' " "	.19	.44	.1
1	Next 5' " "	.18	1.50	Nil
2	Next 5' " "	.12	1.20	T
3	Next 5' " "	.03	.96	.4
4	Next 8' " "	.03	.72	.5
5	Next 5' " "	.01	.52	.3
6	Next 5' " "	.02	1.20	.5
2957	Small opencut at sample 2958 across 4'	.13	2.10	.1
2967	Small opencut 16' west of sample 2955, across 4'	.30	2.20	.3

The average value, without cutting the high value of sample 2958 over 86' is slightly under .14. The best 53' average .20 oz/ton gold. Beyond sample 2967, the oxidation continues for at least 30 feet but is not accessible for sampling.

The upper part of the most southerly orebody, which is inaccessible, is represented by a large pile of float at the foot of the bluff. Examination of this debris indicates that three types of mineralization are present, namely, pyrite alone, pyrite and sphalerite, and pyrite and galena. Grab samples of the three types were taken with the following results:

Sample No.		Au.	Ag.	Zn.
2968	Pyrite ore, float, representing about 75% of the total.	.26	.54	2.0%
2969	Galena and Pyrite float, representing about 5% of the total	.80	7.70	4.9%
2970	Sphalerite and Pyrite float, representing about 20% of the total	.005	.56	8.2%

Since it is hardly possible to have too much information regarding an orebody of this size, the following assay returns, obtained from the Premier Company, are offered in evidence. These show the results of sampling by E.G. Langille, Premier geologist, in 1941.

Sample No.		Au.	Ag.	Cu.	Zn.
91982/ 4347	Float on vein	.50	4.86	T	
3/ 8	Vuggy Quartz	2.60	2.92		
4/ 9	16' in Creek	.24	5.56		
5/4350	Broken on orebody	.06	.18	Nil	8.6
6/ 1	Left hand side Canyon	T	T	Nil	9.6
7/ 2	Bottom of tunnel	.16	.92	T	
8/ 3	Glacier Slide	.04	.56	T	10.7
9/ 4	Float on vein	.20	.20	Nil	4.7
91990/ 5	Center of orebody	.16	.24	T	3.0
1/ 6	Broken from big showing	.04	.16	T	

These assays are given without comment and without knowledge of the exact meaning of Mr. Langville's notations opposite each sample.

It is evident that the most southerly area of oxidation at least overlies an orebody, parts of which may be expected to average $5.00 per ton or more in gold. The size of this orebody is unknown but is possibly very large. A substantial quantity of zinc could be expected as a by-product if a market could be found for same. If the other oxidized areas are found to overlie similar mineralization, a low grade gold-zinc operation of large dimensions could reasonably be expected. The possibility of an increase of values on the surface of the outcrop by secondary enrichment has been considered. There is little evidence that this has occurred. The depth of oxidation is very slight, usually amounting to less than a foot. Glacial striae were observed on all the accessible parts of the outcrop and it is evident that the outcrop has only comparatively recently emerged from the ice. The extensive oxidation of the deposit is ascribed to the abundance of pyrrhotite in the mineralization rather than to prolonged exposure to weathering.

ENGINEERING CONSIDERATIONS AFFECTING EXPLORATION OF THE DEPOSITS:

Since it would appear that the whole body of diorite breccia must be considered as being potentially valuable, it is evident that unusual difficulties are presented in testing thoroughly so large a piece of ground in such a location. The most important engineering considerations affecting the choice of method to accomplish this purpose may be considered in the following detail.

(1) Further Surface Exploration. - The average angle of the face of the outcrop, though steep, is not inaccessible to a well

equipped mountaineering party. Although it would probably not be possible to do any opencutting or hand mining, an inspection of the oxidized areas and sampling would provide exceedingly valuable information. Further, such a party would be able to reach the summit of the outcrop and examine the ground adjacent to the crest of the ridge leading to the icefield.

(2) Diamond Drilling from the Surface. - The extent to which the deposit can be explored by diamond drilling from the surface is severely limited by the fact that only the lower southeast corner of the outcrop is accessible: that is, all surface drilling must be done from a few closely spaced setups in the vicinity of the point "k" on the diagram. From this point, approximately 20% of the total area of the outcrop could be adequately explored, excepting the highest horizons. With so large a portion of the total area remaining unexplored, it would seem doubtful whether unsatisfactory drill results could be interpreted in such a way as to eliminate the commercial possibilities of the deposit unless there was a complete blank, that is, no rock alteration, no shearing and no mineralization in the drill core; in this case the shearing could be interpreted as being parallel to the slope of the outcrop, a rather remote possibility referred to in a previous paragraph. On the other hand, good, or even fairly good drill core would immediately justify considerable expenditure in underground work. On the whole, it is thought that the probabilities of inconclusive results are rather greater than is usual in the case of a surface diamond drilling campaign.

(3) Underground Exploration. - The choice of a site for portal, camp buildings and workshops is also strictly limited for topograph-

ical reasons. Although it might be possible to do a small amount of underground work from a portal located on the outcrop, with a portable compressor placed on the ice of the main glacier, the placing of permanent buildings on the outcrop is completely precluded by reason of danger from rock and ice falls and by the difficulty of serviceing a camp over the steep ice and rock slopes at the foot of the bluff. The only possible location for portal and campsite, within a reasonable distance of the outcrop, is to be found on the moraine of the north side of the main glacier, under the truncated spurs of a series of small ridges, immediately east of the north feeder glacier. At this point the moraine could be levelled off to form a flat space, approximately 100 feet wide, against a low bluff, protected from snow slides and rock falls. The location of the proposed campsite is shown in the diagram, Fig. 4.

From this point, it would be necessary to tunnel under the north feeder glacier to reach the outcrop, a distance of 1400-2000 feet dependent on the depth of ice. This distance might not all be dead work as the location of the argillite-diorite breccia contact has not been established and may be considerably nearer to the proposed portal, under the ice. From such a tunnel, the deposit could be completely explored with upwards of 5000 feet of additional footage and by diamond drilling. The elevation of the tunnel would be approximately 3600 feet or 400 feet below the lowest point of the outcrop. Care would be necessary in the location of the portal to provide sufficient dump space for waste rock. No particular difficulty is anticipated in locating the valley floor under the glacier since this could be found by keeping a diamond drill hole ahead of and to the left of the face as the tunnel progressed.

(4) Transportation. - Since the costs of exploring the deposit are greatly affected by the difficulties of transportation, some further consideration of this subject is necessary. Air transport to Meziadin Lake will undoubtedly prove an important factor in the development of the deposit but the full benefit of this mode of transport will not be realized until the construction of the 14 miles of road from the lake to Willoughby Creek is justified. In the early stages, transport by pack horse, at least for this last stage, will be used. The best time of year to move fuel, machinery, camp equipment and building materials is the month of March, during which large double ended sleighs, drawn by horses, can travel over the snow from Stewart without being dependent on trails. Several hundred tons of freight can be handled in this way during this month by a crew with a dozen or more horses. Owing to the heavy snowfall, tractors have proved difficult to operate in this country unless there is sufficient traffic to keep a trail constantly broken. A tractor could, however, be used to advantage in the summer for transportation on the main Willoughby Glacier.

RECOMMENDATIONS: - It is considered that the property deserves a determined effort to prove or disprove it's commercial possibilities. However, existing information is not yet sufficient to justify the layout of a large sum of money for an underground program as outlined above. Accordingly, it is thought that, for the first one or two seasons, the objective should be limited to obtaining further knowledge of the deposit by a program of geological and topographical surveying and by surface diamond drilling. The following work is suggested: (1) Trail Work. - The present route or foot trail via Porter Creek Should be abandoned. Instead, communications should be improved by the construction of a first class pack trail from the lower end of Meziadin Lake to the glacier and a bridge across the Nelson River. A boat with outboard motor should be constructed in sections in Vancouver and taken to the lake. A cabin, a storehouse and a landing float are necessary at the lake; also some shelter or cabin at the lower end of the glacier. (2) Camp Buildings. - Since the work can hardly be accomplished in one season and considering the discomforts of the location on the side of the glacier, a camp of a permanent nature is recommended. Bunkhouse and cookhouse accomodation for 15-20 men will be necessary. Buildings should be of the "lean to" type of construction, oil heated; roofs should be of steep pitch, covered with corrugated iron and built to withstand a heavy snow lead and the occasional small rock falling from the slopes above. (3) Geological and Topographical Survey. - An experienced mountaineering party could further explore the outcrop. It will be necessary to make several traverses across the face of the bluff, installing eyebolts and fixed ropes in the most difficult places. It should be noted that, besides the geologist, the party should include at least two experienced mountaineers, thoroughly competent in ice and rock climbing and in the use of the rope, to be responsible for the safety of the party, while the geologist concentrates on his work. Mutual confidence will be necessary and the use of inexperienced men would invite a serious accident. In this way, the outcrop could be thoroughly explored and sampled, including the glacier at the foot of the bluffs and the summit ridge. A topographical survey party should establish the position of the climbing party at intervals from the ice by triangulation. (4) Surface Diamond Drilling. - Upwards of 6000 feet of diamond drilling is recommended. Setups may have to be blasted out at the foot of the bluffs to obtain protection for the drillers from falling rock. Any estimate of the cost of the above program cannot be much better than a mere guess. It is doubtful whether any packer could be found who would quote a contract price on the moving of the 300 - 500 tons of freight necessary nor could a drilling concern be induced to quote on drill footage on anything except on a cost plus basis. It is thought, however, that the operation could be conducted inside the following figures (freight included):

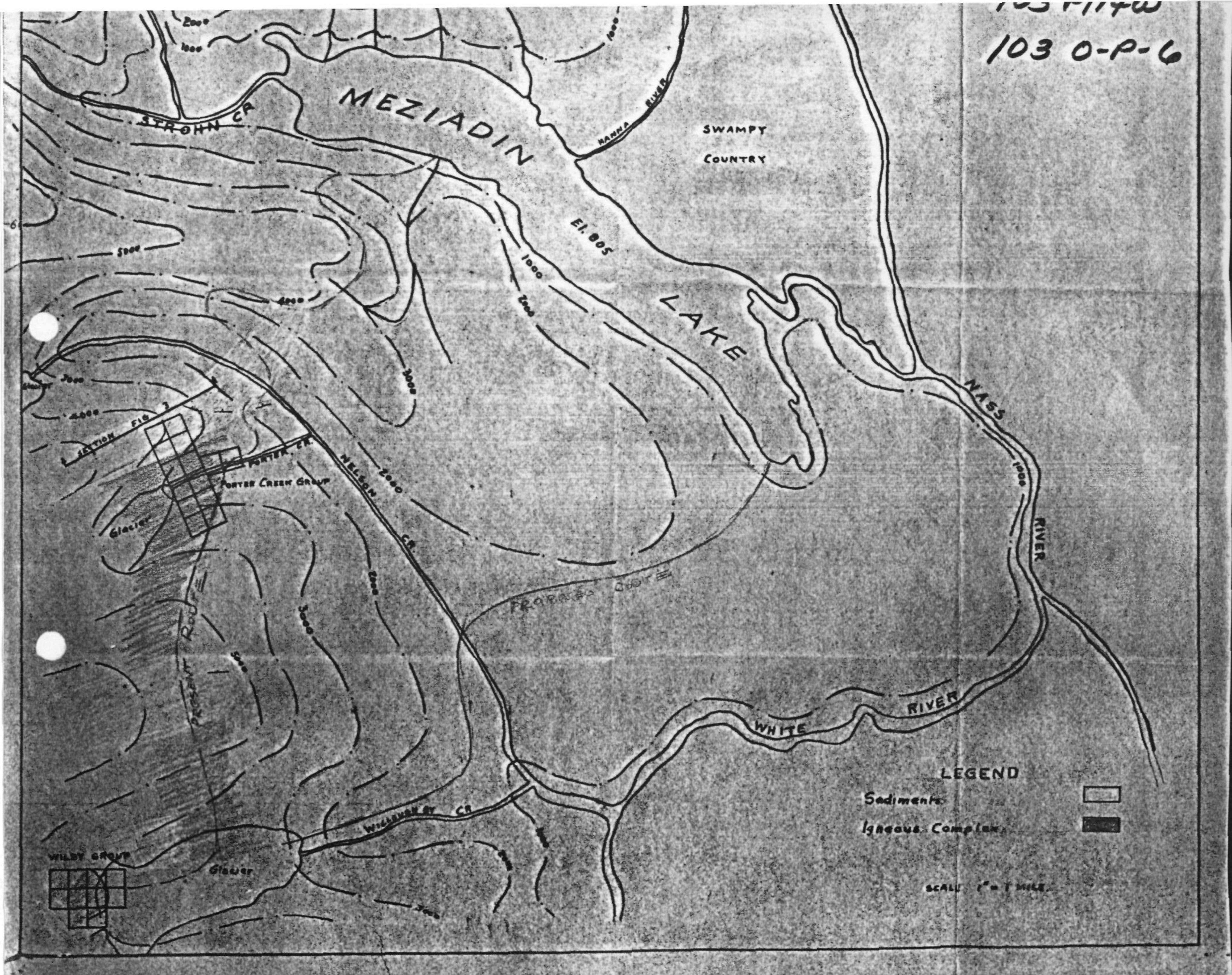
Trail Work.	$2,000.00
Boat and Motor.	1,500.00
Camp Buildings.	15,000.00
Geological work (5 months @ $1,500)	7,500.00
Diamond drilling (6000 ft. @ $5.00)	30,000.00
	$56,000.00

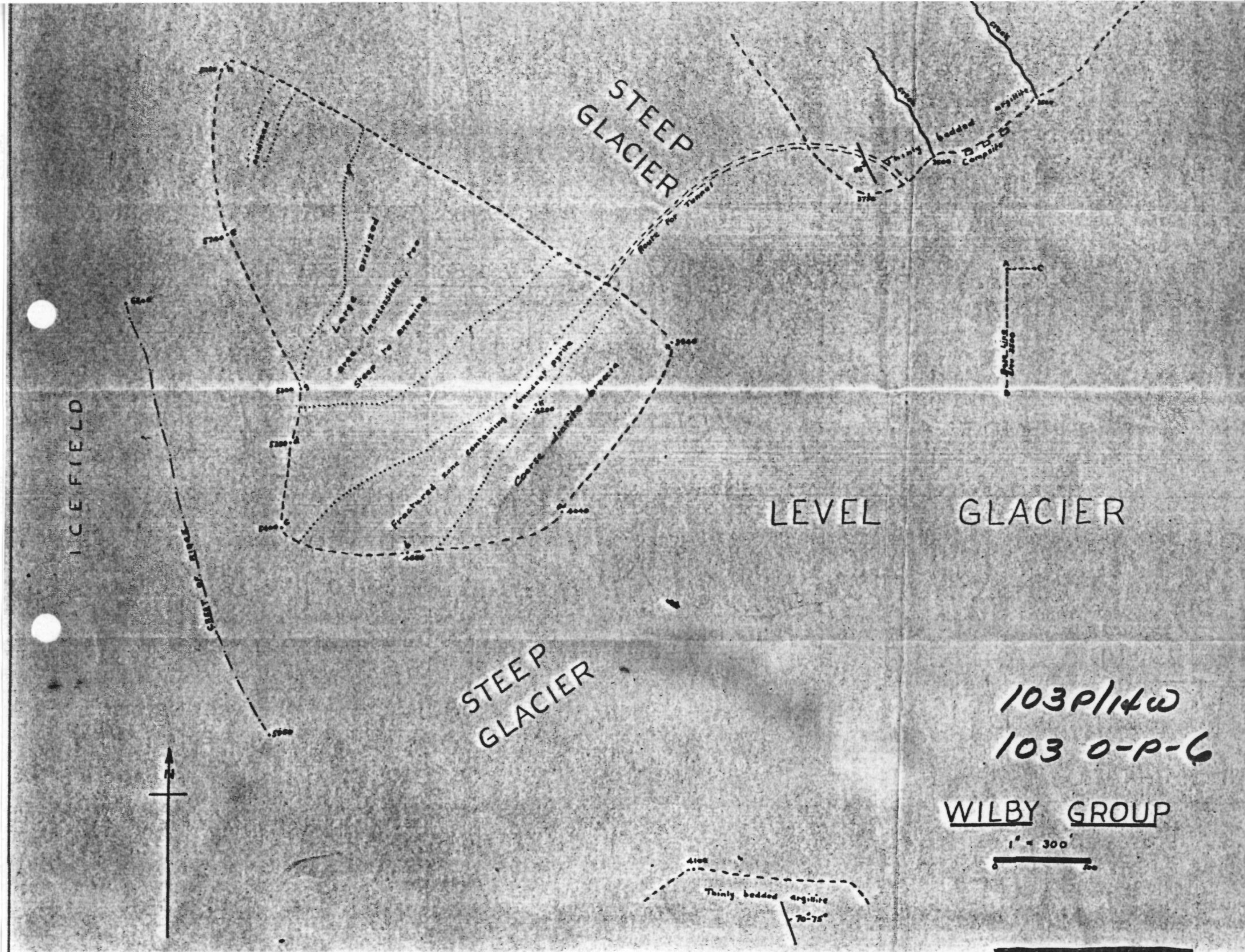
By the expenditure of the above amount of money, there is thought to be a good chance of obtaining sufficient encouragement to justify the layout of a much larger amount in the following year for underground work.

Respectfully submitted,

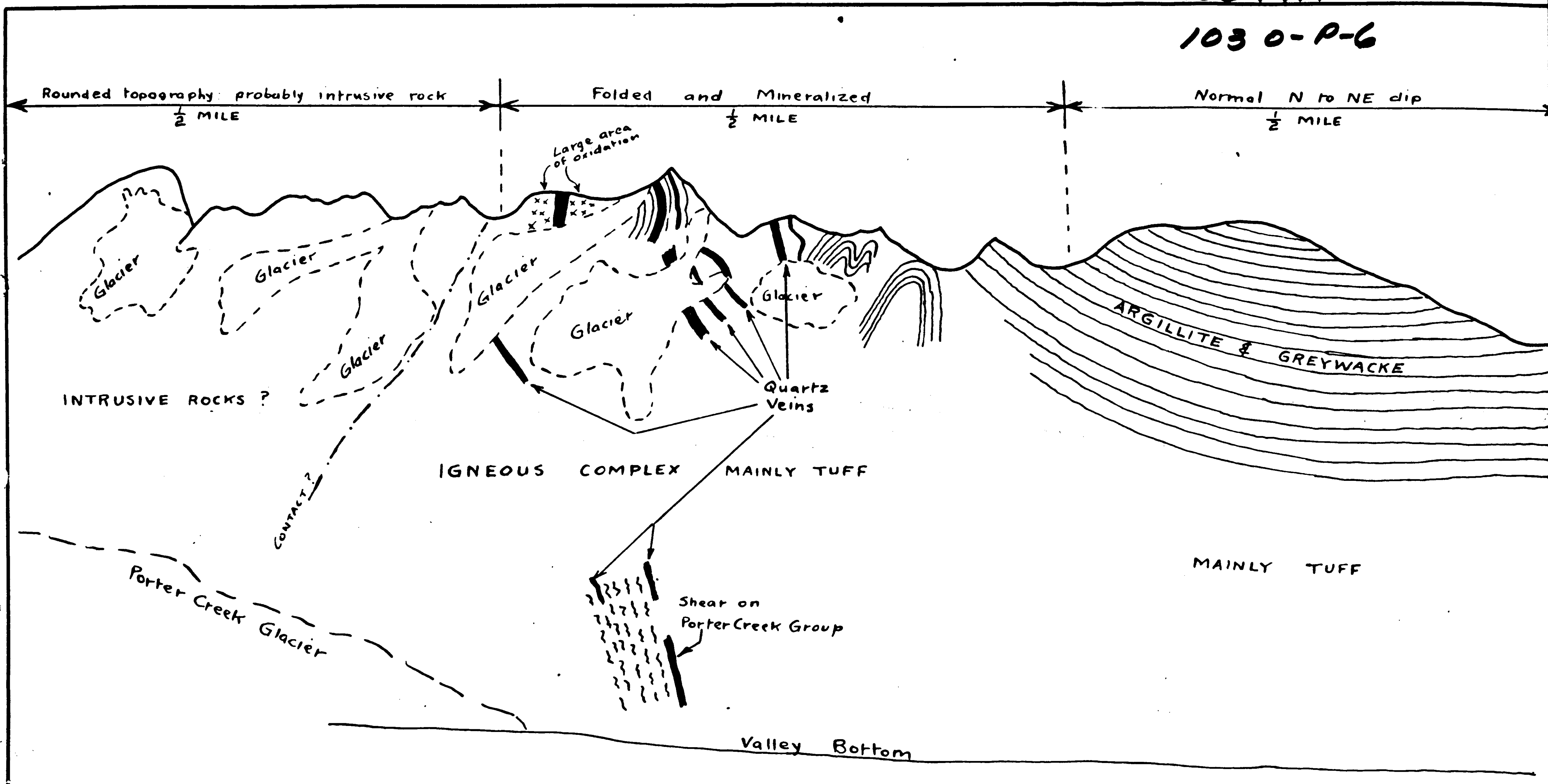
"C.E. Gordon Brown"

103 P/14W
103 O-P-6




STEEP GLACIER
ICEFIELD
Large area oxidized
Inaccessible, too steep to examine
Fractured zone containing abundant pyrite
Route for Tunnel
Thinly bedded argillite
LEVEL GLACIER
STEEP GLACIER
103P/14W
103 O-P-6
WILBY GROUP
1" = 300'
Thinly bedded argillite
70°-75°
N

103 P/14W
103 O-P-6



SECTION OF NORTH SIDE OF PORTER CREEK [Sketched from Porter-Willoughby Ridge: not to scale]