

Report on a
Geological Examination of
Normine Resources Ltd.
Pacific Eastern Property
and Surrounding Area
Lillooet Mining Division
British Columbia

50°45' North Latitude
122°45' West Longitude

July 16, 1984

R.J. Fraser
Kerr Addison Mines Ltd.

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1
SUMMARY AND CONCLUSIONS	2
PREVIOUS WORK	4
GENERAL GEOLOGY	4
PROPERTY EXAMINATION	6
Mix Area	6
Dan Tucker Area	7
Extension Creek Area	9
Butte-IXL Claims	10
Paymaster Claims	12
Red Hawk Claims	14
Hawthorn Creek Copper	16
REFERENCES	18
APPENDIX A: Rock Sampling Assay Results	
APPENDIX B: Soil Geochemical Results	
MAPS APPENDED:	
1. Geology and Sampling Plan	
2. Geochemical Survey	

INTRODUCTION

A group of 81 crown granted mineral claims and fractions held under option by Normine Resources Ltd., have been offered to Kerr Addison for consideration.

The claims are situated along Cadwallader Creek approximately 5½ kilometers southeast of the former Bralorne Mine, Bralorne, British Columbia. Bralorne is situated approximately 160 kilometers north of Vancouver, B.C.

The property as well as several other mineral occurrences in the area; the Paymaster, Red Hawk, Butte-IXL and the Hawthorne Creek Cu were examined and sampled by the author during the period July 4 to July 13, 1984.

SUMMARY AND CONCLUSIONS

The Pacific Eastern crown grants held by Normine Resources Ltd., and the immediate surrounding area represents an interesting geological bet for the discovery of gold mineralization similar to that previously mined at the Bralorne and Pioneer Mines.

The property lies along strike and encompasses the same favourable structural zone as the two former past producers, the ground lying between the Cadwallader Fault and the Fergusson overthrust.

The principal differences between the Bralorne-Pioneer area and the Normines property are as follows:

1. The absence or at least the lesser quantity of "Soda Granite", host to much of the ore in the camp, on the Normines property
2. The occurrence of mineralization within shears associated with dioritic to ultramafic rocks along and south of the Cadwallader shear.
3. The abundance of graphitic, argillaceous and sandy sediments which deform by more of a ductile rather than a brittle deformation. This results in fewer open fractures which presumably could become mineralised.

Numerous small mineral occurrences exist on and near the property however most appear to be of rather limited extent although do suggest that the gold mineralizing process was active in this part of the Bralorne district.

The application of modern exploration techniques to this property would be difficult primarily due to the steepness of the mountain slopes and the presence of much slide material.

This will greatly limit the effectiveness and create interpretational problems for many techniques, notably ground and airborne EM and conventional "B" horizon soil sampling.

Despite the differences in the overall geological setting of the Normines property with respect to the main portion of the Bralorne camp and the difficulties to be encountered in applying modern exploration techniques, the property represents an interesting geological bet, in close, to British Columbia's largest gold mining area.

Further exploration on the property and/or the surrounding area should be based on a consideration of both the most recent sampling by company personnel and Kerr Addison's overall philosophy towards grassroots gold exploration.

PREVIOUS WORK

The Normines property consists of claims originally held by Pacific Eastern Gold Mines, the geology of which has been fairly well documented by previous workers including Cairns (1937), Stevenson (1953) and Barclay (1979) and Stevenson (1983).

Some underground exploration has been undertaken on the property however no attempt has been made by the writer to evaluate this work. Reference can be made to previous writers for details of this work.

The most recent evaluation of the ground and the Bralorne area by Kerr Addison is a report by Arscott (1984), an office based study on which part of this report draws.

GENERAL GEOLOGY

The property is underlain by an oceanic assemblage comprising a composite lithological environment with major volcanics, sedimentary and intrusive units similar to other major British Columbia mining camps notably Rossland, Portland Canal, Hedley and Zeballos.

The oldest rocks in the area consist of a series of mafic volcanics and intercalated sediments locally known as the Fergusson Group. The sediments are well banded and consist primarily of chert and argillites often with a large graphite component. Minor amounts of bank type crystalline limestones are also present.

The Fergusson Group is conformably overlain by the Noel Formation which consists chiefly of argillites and granular siltstones to sandstones. Graphitic horizons are also present within this unit.

The Noel Formation is in turn overlain by the Pioneer Formation, a series of mafic to intermediate volcanic flows, tuffs and volcanoclastics. Quartz and Quartz-Feldspar porphyry dykes are common within this unit and may be largely co-magmatic. This unit is one of the principal host rocks for gold at the Bralorne and Pioneer Mines.

The Pioneer Formation is overlain by the Hurley Formation, a sequence of graphitic argillites with interbedded sandy and tuffaceous horizons. This unit closely resembles the Noel Formation and can only be distinguished when it has an appreciable limey component.

All of the above units have been intruded by rocks known as "Bralorne" Intrusions. These consist of augite diorites, diorites, gabbroic rocks, "soda granites" and albitites. On the Normines property diorite appears to be the most common intrusive, while "soda granite", a rock composed chiefly of quartz and sodic plagioclase was not conclusively observed.

The lack of "soda granite" is of considerable importance as it is the second major host lithology for gold mineralization at the Bralorne and Pioneer Mines, though it has been reported to occur in the crosscut driven by Pacific Eastern Gold Mines under Cadwallader Creek.

The last rock type of significance in the area is a serpentinized ultramafic. The ultramafics appear to be confined to fault zones and according to M. Rusmore (personal communication 1984) all ultramafics in the Bridge River Area are fault bound. No age relationships are known for the ultramafic rocks but the similarity of the lithological and tectonic setting of the Bridge River area to many gold camps in the Canadian Shield such as Timmins, Larder Lake and Val d'Or suggests that they may be related to the volcanic activity which produced the Pioneer Formation. Alpine-type ultramafic rocks, as well as extrusive ultramafics are common in the gold camps of the Canadian Shield.

The youngest known rocks in the area consist of the Bendor intrusives, chiefly late stage batholithic granodiorites.

PROPERTY EXAMINATION

The present work on the Normines property consisted of examination of known mineralized zones (where accessible), traverses cross-sectioning the property geology, tracing of the Cadwallader fault and systematic soil sampling on two traverse lines near the old underground workings.

All sampling locations and results are shown on the prints accompanying this report.

Three areas of known or suspected gold mineralization were examined and are described below, the Mix, the Dan Tucker and the Extension Creek Area.

MIX AREA

The Mix area was originally developed by two adits driven northward from near the north shore of Cadwallader Creek approximately 6 kilometers southeast of the Pioneer Mine.

No outcrop was observed in the vicinity of the adits but on the muck piles, argillaceous and limey sediments of the Fergusson group were observed. The sediments are often brecciated and contain fine disseminations and threads of pyrite and pyrrhotite. Locally narrow bands of magnetite and biotite are present and the rock tends to resemble a poorly developed skarn. Four rock samples were collected of which one, a silicified rock with abundant biotite and 3-4% pyrite and pyrrhotite occurring as small threads and disseminations, was submitted for assay.

Assay results are listed below:

Sample No.	ppb Au	ppm Ag	ppm As
F-NR-84-35	<5	0.3	4

The host rocks for this occurrence do not appear favourable and no further work appears to be justified at the present time.

DAN TUCKER AREA

The Dan Tucker showing is located in the southeast portion of Normines claim block approximately 7 kilometers southeast of the Pioneer mine on a steep mountain slope on the south side of Cadwallader Creek.

The showing has been developed by a series of test pits along an arcuate shear and a short adit to intersect the shear at depth. Little evidence of this work remains, with only a few pits noted and a small muck pile outside the adit, now caved. No outcrop is present in the immediate area of the workings and all rock formerly exposed above the adit is now covered by slide material. A prominent ridge of brown weathering serpentized peridotite extends eastward from the adit area and appears to be on the north edge of a major southeast trending shear.

From an examination of material on the waste dump, the chief rock type appears to be a moderately serpentized peridotite with local quartz veining and patches of a greenish coloured silicic alteration. Other rock types present in the dump include banded crystalline limestone and a fine grained chloritic basalt.

The greenish coloured alteration is characterized by numerous stringers and fine disseminations of pyrite. The patches are not extensive but rather appear to be a spotty feature.

Six rock samples were collected from the waste dump of which four were sent in for assay. Assay results are listed below:

Sample No.	ppb Au	ppm Ag	ppm As	ppm Cu
F-NR-84-25	<5	0.1	100	--
F-NR-84-27	<5	0.1	5	940
F-NR-84-29	<5	0.1	3	--
F-NR-84-30	<5	0.1	5	--

The Dan Tucker showing appears to lie along the trend of the Cadwallader Fault with the fault trace being represented by the arcuate shearing and the serpentized ultramafics. The showing has a very similar geological setting to that of the Red Hawk, described later in this report.

Ultramafics are present along the Cadwallader Fault at both the Bralorne and Pioneer Mines similar to that at the Dan Tucker, as well, there are flexures similar to that at the Dan Tucker present at the Bralorne. Unfortunately there is no evidence for open cross-over structures or splays off the Cadwallader at the Dan Tucker which are primary ore controls elsewhere in the district. This particular piece of the Normines property can only be considered, at best a remote geological bet.

EXTENSION CREEK AREA

Ground geological traverses were made in the Extension Creek Area of the Normines property in order to investigate rock exposed by early sluicing operations, a small adit and to attempt to obtain a geological cross section of the property.

No outcrop was found in the area except in a few spots in the trenches excavated by previous workers by diverting the course of Extension Creek. The principal rock type exposed is a graphitic argillite with interbeds of sandy material. The rocks probably belong to the Hurley Formation. Three rock samples, grabs from the trenches were submitted for assays. Results are listed below:

Sample No.	ppb Au	ppm Ag	ppm As
F-NR-84-1	<5	0.2	7
F-NR-84-4	<5	0.1	6
F-NR-84-6	<5	0.1	9

In order to evaluate the feasibility of soil sampling on the Normines property, two traverse lines were run approximately 200 meters apart on either side of Extension Creek. Samples of the "B" horizon were collected at station intervals of 30 meters.

The "B" horizon is moderately well developed occurring at a depth of approximately 6-8 inches and averages about 2-3 inches in thickness.

The results of the soil sampling with analyses for Au, Ag and As are shown on the prints accompanying this report.

BUTTE-IXL CLAIMS

The writer was approached informally by Mr. Randy Polischuk of Lillooet, British Columbia, Ph 256-7962 and asked to examine the Butte-IXL claims, if time permitted. Mr. Polischuk in conjunction with other family members holds title to crown granted claims covering the Butte-IXL showing, the Standard and other properties in the area. The exact extent of the holdings are unknown to the writer.

The Butte-IXL claims were examined on July 9, 1984.

The property is situated approximately 10 kilometers southeast from the Pioneer Mine on the south side of Cadwallader Creek immediately south of the confluence with Piebiter Creek.

Access to the claims is best afforded by a 4 W D road leading southeast from the Pioneer Mine along the north side of Cadwallader Creek to Piebiter Creek. An old trail leads south from a bridge crossing Piebiter Creek to the old workings. No outcrop was seen in the immediate area of the old adit however Cairn's (1937) map, of Cadwallader Creek, suggest the area to be underlain by most of the rocks typical of the Bralorne Area; Fergusson volcanics, Noel Formation argillaceous sediments, Pioneer greenstone and ultramafic intrusives. The Cadwallader Creek shear can be interpreted as crossing through the ground just north of the adit, associated with a band of ultramafic rocks.

From an examination of rock samples from the mine dump numerous quartz-carbonate veins occasionally brecciated can be seen to be present with abundant sulphides, 2-5%, as fine disseminations stringers and small blebs. The sulphides are chiefly pyrite although locally chalcopyrite and sphalerite are present.

PAYMASTER CLAIMS

The Paymaster claims are situated on the southeast side of Crazy Creek approximately 5 km southeast of the Pioneer Mine and immediately south of Normines, Pacific Eastern property.

The ground was examined on July 6 and July 10, 1984 in conjunction with other reconnaissance work on the Pacific Eastern property.

Previous reports on the Paymaster report the occurrence of disseminated pyrrhotite and quartz stringers and masses occurring within an albitite dyke, six feet in width, in contact with argillaceous sediments. Cairns (19137), indicates the occurrence to lie within Hurley sediments intercalated with Pioneer greenstone.

Several old trenches were located by the writer on a steep slide surface, facing north. Weakly developed gossans are present contributing to their recognition. The trenches occur in an extensively faulted area with quartz porphyry intrusions infilling open faults in thinly bedded graphitic argillites. Mafic volcanics, highly altered to chlorite and biotite were observed south of the main showing.

Numerous 2-10 m. wide quartz veins often with good quartz crystal development were observed crosscutting a quartz porphyry intrusive. The quartz veins all have a fairly consistent orientation of 045°-055°, dipping 45°-60° southeast. The veins are confined to the more brittle quartz porphyry and terminate at the contact with graphitic argillites. Other narrow quartz porphyry dykes are mineralized in a similar fashion.

The host rock for the quartz veins appears to be a silicified volcaniclastic tuff in contact with thin bedded siltstones and other turbidites. The siltstones are in part argillaceous with a moderate graphitic component.

In a few locales on the waste dump a well bedded quartz-sericite schist with up to 3% pyrite was observed but is not a common rock type.

Alteration of the rocks appears to be chiefly silicification and sericitization and locally biotitic especially in the argillaceous horizons.

Eleven grab samples of rock from the muck pile, seven of which were sent for assay, are listed below:

Sample No.	oz/ton Au	oz/ton Ag	ppm As	%Cu	%Zn
F-B1XL-84-1	0.018	0.14	4	0.25	0.07
F-B1XL-84-2	0.028	0.04	5	0.07	0.08
F-B1XL-84-3	0.018	0.05	11	<0.01	0.01
F-B1XL-84-4	0.006	0.70	110	1.92	1.46
F-B1XL-84-6	0.008	0.28	11	0.58	0.70
F-B1XL-84-9	<0.003	0.01	6	0.06	0.17
F-B1XL-84-11	0.006	0.02	5	0.01	0.01

The Butte-IXL property represents the most interesting and encouraging signs of mineralization that were observed outside of the Bralorne and Pioneer Mine. The presence of base-metal sulphides within the quartz veins and the occurrence of a pyritiferous quartz sericite schist suggest that a mineralizing process was active in the area. The lack of "soda granite" and the fact that the mineralization appears to lie on the south side of Cadwallader Creek Shear can not be considered negative factors. Should the assay results prove to be sufficiently interesting, negotiations for ground in this area should be considered.

Several narrow shear zones are present north of the main showing with silicified breccias being common, however the quartz vein bearing quartz porphyries appear to be absent.

Twenty grab and chip samples of rock were collected from three principal areas of shearing and quartz porphyry intrusion of which nine were submitted for assay. Results are listed below:

Sample No.	ppb Au	ppm Ag	ppb As
F-NR-84-16	<5	0.1	3
F-NR-84-19	<5	0.1	9
F-NR-84-20	<5	0.1	120
F-NR-84-55	<5	0.1	12
F-NR-84-56	<5	0.1	5
F-NR-84-57	5	0.1	7
F-NR-84-59	<5	0.1	6
F-NR-84-62	<5	0.1	33
F-NR-84-63	<5	0.1	48

This occurrence appears to be of limited potential due to the restricted extent of the quartz veins within the porphyries. Difficult access and the presence of an extremely unstable slope are degrading factors. Further work on this occurrence could only be justified if carried out in conjunction with work on the Pacific Eastern property.

REDHAWK CLAIMS

The Redhawk showing is situated south of Cadwallader Creek approximately 8 kilometers southeast of the Pioneer Mine and immediately southeast and on strike with the Pacific Eastern claims.

The property has been developed by a small adit, now caved in. A small waste dump is present with abundant white quartz visible.

The predominant rock type present is a fine to medium grained diorite with a poorly developed spaced cleavage present, infilled with 2 mm wide quartz veins. Minor amounts of thinly bedded weakly graphitic argillite with silty layers and lenses was also observed. A small quantity of mafic to ultramafic material moderately chloritized and serpentized was also observed.

The predominant mineralization consists of a milky white quartz, poorly fractured with only traces of pyrite present. Locally there are silicified border zones adjacent to the quartz veins with 1-2% pyrite but in general they are not very common. Eight grab samples of rock were collected from the muck pile of which three were submitted for assays. The results are listed below:

Sample No.	ppb Au	ppm Ag	ppm As
F-NR-84-50	<5	0.2	5
F-NR-84-52	2000	4.0	29
F-NR-84-53	10	0.3	30

A large shear zone in fine to medium grained diorite was located south of the Red Hawk adit approximately 150 meters higher in elevation. The shear zone is arcuate in shape and was traced for a distance of approximately 325 meters. It is open at both ends along strike. It trends @ 134° dipping 75-80° southwest, immediately above the Red Hawk adit, gradually turning southward to 160°.

The diorite is locally intensely sheared with abundant chlorite and serpentine alteration. Occasionally relict feldspars can be seen. The shear has been cut by numerous quartz and calcite veins with up to 2-3% pyrrhotite in small masses and threads of chalcopyrite.

Ten old trenches were located along the shear zone of which five of them were sampled. Assay results are listed below:

Sample No.	ppb	ppm	ppm	ppm
	Au	Ag	As	Cu
F-NR-84-37	<5	0.1	7	98
F-NR-84-39	<5	0.2	14	230
F-NR-84-41	<5	0.1	1	--
F-NR-84-42	30	0.2	50	--
F-NR-84-43	<5	0.1	6	--
F-NR-84-44	<5	0.1	27	--
F-NR-84-45	<5	0.1	9	--

Previous reports on the property suggest the presence of other shear zones also of great length. Should the assay results from the preliminary sampling be encouraging, additional work may be warranted in the area.

HAWTHORN CREEK COPPER

The Hawthorn Creek Copper occurrence is located on the south side of Cadwallader Creek immediately across from the confluence of Hawthorn and Cadwallader Creeks. It is situated approximately 9 kilometers southeast of the Pioneer Mine on the Mara Claim Block, No. 1196. The showing lies just outside the northern claim line of the Pacific Eastern block.

An old trench approximately 1.5m x 1.5m x 2.0m was found and re-excavated.

The showing consists of a narrow sulphide zone approximately 0.5 to 0.6 m in width of 5-10% pyrite with 2% chalcopyrite as threads, stringers and small blebs within heavily chloritized and biotitic mafic volcanics. Silicification is also widely present.

The sulphide zone is underlain by a 0.4 m wide chert bed, recrystallized to give a sugary texture.

The structural footwall is represented by a highly altered mafic volcanic with abundant, chlorite, biotite and serpentine. A fibrous, blade like texture is evident in some of the alteration minerals somewhat similar in appearance to anthophyllite rosettes. Locally the footwall is fragmented and has been intruded by narrow quartz veins and Bralorne intrusives, possibly "soda granite". The intrusives have been elongated and fragmented or boudinaged parallel to the S1 cleavage imparting a brecciated appearance to the rock.

Two periods of folding are present in the rocks, a first phase of tight isoclinal folding and a second more open style which folded the axial planes of the F1 isoclinal folds producing Monk's Cap structures. The S1 fabric trends @ 149° and dips near vertical. It is probably closely related to the Cadwallader shear.

The hanging wall rocks are also highly altered mafic volcanics but lack the numerous small intrusions and strong cleavage characteristic of the footwall.

Stratigraphic relations with other lithologies are not known but it is believed that the mafic volcanics are part of the Fergusson Group and are of limited extent, being surrounded by argillites and siltstones.

The showing itself does appear to be of limited extent but its close resemblance to alteration zones characteristic of volcanogenic sulphide deposits suggest the possibility of other, larger deposits of a similiar nature in the Cadwallader Creek Area.

Ten grab and chip samples of mineralized and footwall material were collected from the immediate area of the trench of which five were submitted for assay. Assay results are listed below:

Sample No.	oz/ton Au	oz/ton Ag	ppm As	% Cu	% Zn	% Co
F-NR-84-68	0.006	0.02	9	0.06	0.02	0.004
F-NR-84-70	<0.003	0.14	3	0.07	0.06	0.001
F-NR-84-72	0.022	0.24	4	0.33	0.33	0.003
F-NR-84-73	0.005	0.27	9	0.32	0.19	0.003
F-NR-84-75	0.020	0.04	4	0.05	0.05	0.002



REFERENCES

Arscott, D. (1984)

Bralorne Camp and Pacific Eastern Claims.
Review and Exploration Potential; Unpublished company
report, Kerr Addison Mines Ltd.

Barclay, R.J. (1979)

A geological compilation of the Pacific Eastern crown
granted claims, Bralorne, B.C. unpublished company
report for Monitor Resources Ltd.

Cairns, C. (1937)

Geology and mineral deposits of the Bridge River
Mining Camp; Geol. Surv. Can. Memoir 213.

Stevenson, J.S. (1953)

Bridge River Map Area; unpublished bulletin, B.C.
Dept of Mines.

Stevenson, W.G. (1983)

Geological report on Pacific Eastern Property, in
the Lillooet Mining Division, British Columbia;
unpublished company report for Normine Resources
Ltd.

have been driven into the face of a perpendicular cliff to explore and mine flat-lying lenses of quartz which apparently dip and strike parallel to the enclosing light-grey argillites. Mineralization in evidence consists of scattered pyrite.

The adit-portals extend south-westerly along the cliff-face from elevations of 2,850 to 2,882 feet. The three adits at the lower (or north-eastern) end, enclosed within a length of 60 feet, give access to a stope of irregular outline. This stope, from which quartz was formerly trammed to the old 10-stamp mill, is about 105 feet long, up to 50 feet wide, and up to 20 feet thick. The longest dimension is along the strike, which is approximately north-west. The width measured along the dip to the north-east of between 14 and 25 degrees is from 50 feet near the outcrop to 10 feet at the back or north-western end. Surrounding the edges of the stope, where small lenses and stringers of quartz remain, prospect-workings, consisting of short levels, a raise, and a winze, failed to prove the continuity at depth or along the strike. Diamond-drilling was done in 1934 as follows: Holes Nos. 1 and 2, 265 and 250 feet long respectively, were drilled to the north-east of the stope to explore the ground on the projected dip of the mined area. A third hole was put down 500 feet vertically to explore the ground along the strike to the south-east at the foot of the bluffs. A sample which assayed: Gold, trace, and silver, trace, represents selected quartz-remnants from the big stope. The other two adits on the cliff-face, in order from the south-western extremity of the stope-workings, are in 8 and 18 feet respectively. They explore flat-lying quartz stringers and lenses in the argillites. In the first or shorter adit a sample which assayed: Gold, trace, and silver, trace, represents a width of 4 feet on the north-east side of the portal, no appreciable amount of quartz being present on the south-west side. The quartz is slightly iron-stained and contains minor amounts of pyrite. At the portal of the other adit a sample was taken across 2 feet of inter-banded quartz stringers and country-rock, no mineralization being noted. This assayed: Gold, trace; silver, trace. The ground along the strike of these lenticular quartz-showings was tested without success by a branch working extending south-westerly from the stope below. At 2,650 feet elevation, on the edge of a rock-slide at the base of the cliff, an old adit has been driven slightly west of north for a length of 180 feet in massive, greenish limy rock. Thin scales of calcite have been deposited on the walls of the working in places where water is dripping. This working explores the ground below the north-western extremity of the stoped area. It would have to be extended some distance easterly to test the projected downward continuation of the stoped area, which dips flatly to the north-east.

Morning Glory.—On this claim on Phair (Cottonwood) creek, 1.75 miles by trail from Cayoosh creek, some shallow prospecting-work was done in 1934 on a quartz-showing out-cropping along the edge of the creek, which at this point flows through a narrow rocky canyon. The elevation is 2,280 feet. The small amount of work done indicates stringers and elongated lenses of quartz conforming in attitude with the locally folded and contorted dark-coloured argillaceous rocks. Mineralization consists of scattered disseminations of pyrrhotite and pyrite. Individual lenses up to 5 feet in width occur in a zone up to 12 feet in width. Three samples represent, first, silicified country-rock containing thin films of pyrrhotite; secondly, selected quartz mineralized with disseminated pyrrhotite; and, thirdly, selected quartz with pyrite. These assayed: Gold, *nil*; silver, *nil*. In the hanging-wall section of the quartz-showings there is a dyke of fine-grained diorite, possibly quartz diorite, 10 to 15 feet wide, also apparently conforming in strike and dip to the bedding-planes of the argillites.

Marygold.—The two claims comprising this group were not visited. These were recent locations, two assessments having been recorded in connection with open-cuts made.

This group, in the Lillooet Mining Division, comprises eighteen mineral

Silver Queen. claims which are held by location and owned by S. Beiler and W. G. McMorris.

No map showing the local geographical features correctly is available.

The property is about three-quarters of a mile westerly from the north-eastern end of Duffey lake, which is at the head of Cayoosh creek, flowing north-easterly to Lillooet. The workings are situated above timber-line on the steep to precipitous ground forming the eastern and south-eastern sides of the basin at the head of the small stream locally known as Beiler creek, which, flowing north-easterly, joins Cayoosh creek at a point about 2 miles north-east of Duffey lake. Elevations of the workings inspected range from 6,550 to 7,030 feet. The present means of access is by pack-trail, about 20 miles in length, from D'Arcy Station, on the Pacific Great Eastern Railway, at the southern end of Anderson lake. From this point the trail extends

along the valley of Haylmore (Cedar) creek to its north-westerly-flowing tributary, locally known as Common Johnny creek; then along the latter stream to near its head (west of Duffey lake), where the trail climbs in switchbacks from 5,000 feet elevation to the summit, at 7,350 feet elevation, which forms the divide between the streams flowing northerly into the Gates River (flowing into Anderson lake) and Cayoosh Creek watershed areas. The valleys of Haylmore (Cedar) and Common Johnny creeks are well wooded. From the summit the trail descends in switchbacks to the cabin, at 6,500 feet elevation, in the Beiler Creek basin. The natural, but considerably longer, route would be to connect with the old trail, fallen into disuse, which follows Cayoosh creek to the end of the motor-road at the *Bonanza Cache* property, about 12 miles from Lillooet.

The local geology has not been mapped, the nearest work of this nature being as shown on Fig. 5, opposite page 70-A, Geological Survey of Canada Summary Report, 1933, Part A, "Lillooet Map-area." On the summit at the south-western end of the *Silver Queen* basin there are outcrops of a wide granitic dyke. In the immediate vicinity of the deposits the formation consists chiefly of metamorphosed, schistose, sediments grading from shale to argillite. The local strike of these rocks, which are possibly members of the Bridge River series, is from north 10 degrees west to north 12 degrees west, dips being from 40 to 75 degrees or more to the north-east. Traversing these rocks are quartz-filled fractures striking south 75 degrees east (uphill), with dips between 45 and 67 degrees or more to the south-west. Cutting these, and generally displacing them for a few feet, there are several basic dykes striking south 50 degrees east, with dips of from 50 to 55 degrees to the north-east. Most of the superficial work has been done along the outcrop of two veins which have been exposed for lengths of 355 and 225 feet respectively. In the first case the ground is covered at the extremities, and in the second case there is evidently no continuity beyond the length specified as the vein does not persist into the rock bluffs directly along the strike at both ends of the developed section. Mineralization, consisting of streaks and disseminations of argentiferous tetrahedrite, is generally sparsely distributed but somewhat concentrated where the vitreous quartz is shattered or fractured. Oxidation is limited to copper-carbonate stains. The discoveries were made by S. Beiler in 1922 when the first claims were staked. The quartz vein-showings are on the south-eastern and on the eastern side of the basin. The southerly one, traced for a length of 355 feet, dips at 45 degrees to the south-west, or into the hill, the outcrop following the contour of the steep ground from 7,015 to 7,030 feet elevation. Starting at the eastern or higher end and chaining in feet westerly, the exposures are briefly as follows: From zero to 50, some stripping in which the quartz, 10 inches wide, is sparsely mineralized with disseminated tetrahedrite; from 50 to 208, outcrop covered with talus; from 208 to 214, an open-cut showing sparsely mineralized quartz, 18 to 20 inches wide, from which some tetrahedrite has been extracted and piled close by; from 214 to 239, outcrop covered with snow; from 239 to 247, some quartz, 16 to 18 inches wide, containing widely separated streaks of tetrahedrite; at 259 a caved open-cut filled with snow and a pile of quartz containing disseminated tetrahedrite which indicates continuity; at 314 to 319, there is an adit 20 feet long, described later; at 320 beyond a dyke to 355, some stripping exposes quartz 8 to 16 inches wide, irregularly mineralized with streaks of tetrahedrite. Beyond the latter point the vein narrows down to where it is covered by talus. The adit previously mentioned has been driven 20 feet along a basic dyke, striking south 50 degrees east, and forming the south-western wall of the working. The quartz vein is exposed on the opposite wall and in the face. At the latter point it is 19 inches wide and very sparsely mineralized. At 2 feet back from the face it consists of interbanded quartz and country-rock over an aggregate width of 33 inches, tetrahedrite being somewhat concentrated in the hanging-wall 13-inch band. A selected sample from 3 or 4 tons of sorted material piled at the portal assayed: Gold, 0.03 oz. per ton; silver, 206.6 oz. per ton. Below the outcrop-workings and at 6,940 feet elevation a crosscut has been started. The workings on the parallel vein, about 2,300 feet to the north-east, are distributed over an outcrop-length of 225 feet between elevations of 6,830 and 6,925 feet. This vein dips at about 67 degrees to the south-west, or into the hill. Chaining westerly from the highest point and diagonally along the very steep, "bluffy," slope, conditions are briefly as follows: From zero to 6 feet, a 10- to 12-inch width of quartz, very sparsely mineralized with tetrahedrite; from 30 to 33 feet, a quartz-exposure, 12 inches wide, with no appreciable mineralization; from 88 to 93 feet, an open-cut showing a 64-inch width of quartz and included

country-rock. In tetrahedrite. The open-cut, or betwesterly, at chacontains sparse 12-inch section a small quantities 160 feet there is over an aggregastreaks of tetrastringers with containing spar the 225-foot lenvein-continuity hedrite mineral or fractured qu could be sorted mining-widths to assessment

Twin Lake.

available. The from D'Arcy, prospected gro above timber-summits are u trees extendin elevation, is traversed, dis to the junction latter stream trail then cor southerly-flow cuts and stri exposed by C Above 7,330 elevation, ser dips of from of a large ar weathering a serpentine, lo the ridge for black basic c silicified or iron sulphide of cubes $\frac{1}{8}$ i be exposed e sediments w point, about 70 feet wide intervening assayed: G

In the : streaks and from south

country-rock. In the centre there is a 4-inch streak of shattered quartz well mineralized with tetrahedrite. This showing is not continuous across the cut, 5 feet away. Just east of the open-cut, or between chainages 84 and 88 feet, the vein is cut by a basic dyke. Continuing westerly, at chainage 128 feet, there is an open-cut in shale where the quartz, 63 inches wide, contains sparse streaks of tetrahedrite, this mineral being more highly concentrated over the 12-inch section adjoining the hanging-wall. A selected sample, such as might be sorted in very small quantities, assayed: Gold, 0.03 oz. per ton; silver, 493.9 oz. per ton. At chainage 160 feet there is an adit, 10 feet long, exposing quartz interbanded with crushed country-rock over an aggregate width of 32 inches. The 12-inch section adjoining the hanging-wall contains streaks of tetrahedrite. At chainage 225 feet, stripping shows the vein has split into quartz stringers with no appreciable mineralization. At this point there is a small pile of quartz containing sparsely disseminated tetrahedrite. At both eastern and western extremities of the 225-foot length, including the showings, there are bluffs, directly along the strike, in which vein-continuity is lacking. Summarizing conditions at the two points inspected, the tetrahedrite mineralization over narrow widths shows a habit of extreme localization, as in shattered or fractured quartz areas. A few tons of high-grade silver ore, similar to the material assayed, could be sorted out, but, as continuity of mineralization is lacking, systematic sampling over mining-widths would serve no useful purpose. Seasonal work on the claims has been limited to assessment requirements.

This group, in the Lillooet Mining Division, consists of eight mineral claims held by location, which are owned by J. Morrison, A. McRae, and W. C. Elliott. No map correctly showing the local geographical features is available. The camp-site is situated on Elliott (Lawlaton) creek, about 15 miles south-easterly from D'Arcy, on the Pacific Great Eastern Railway, at the west end of Anderson lake. The prospected ground in the rugged Cayoosh mountains lies on steep, grassy, or bare rocky slopes above timber-line, between elevations of 6,800 and 8,150 feet. Altitudes of the adjacent summits are up to 9,000 feet or more. Creek-valleys in the vicinity are well wooded, the useful trees extending in general to an elevation of about 6,000 feet. The tent-camp, at 5,800 feet elevation, is reached by pack-trail about 17½ miles in length from D'Arcy. The route traversed, distances being roughly estimated, follows Haylmore (Cedar) creek for 13 miles to the junction with Common Johnny creek, its north-westerly-flowing tributary; then up the latter stream for about 2 miles to Elliott creek, which flows into it from the north-east. The trail then continues up Elliott creek for 2½ miles to the camp situated opposite a small southerly-flowing tributary locally known as Crystal creek. Prospecting, consisting of open-cuts and stripping, has been done at numerous widely separated points. A section of rock exposed by Crystal creek going south from the lower of two small adjoining lakes is as follows: Above 7,330 feet elevation, greenstone of unknown extent; between 7,330 and 7,250 feet elevation, serpentine 300 feet wide, which locally strikes about north 40 degrees west, with dips of from 55 to 60 degrees to the north-east; between 7,250 and 6,800 feet elevation, part of a large area of sediments, chiefly consisting of schistose, argillaceous sediments and brown-weathering argillites, but including quartzite and cherty quartzite. The heavily iron-stained serpentine, locally described as the "red dyke," is a prominent feature forming the summit of the ridge for some distance easterly from the twin lakes. It is cut by irregularly branching, black basic dykes which have the same general trend. Adjoining the dykes the serpentine is silicified or contains quartz stringers accompanied by pyritization of the adjacent rock; the iron sulphides occur in some places as fine, granular disseminations, and in others in the form of cubes ¼ inch in diameter. Granitic or dioritic rocks, while not actually seen, are known to be exposed across the valley of Elliott creek. All the mineralized occurrences are within the sediments which adjoin the lower serpentine-contact for a length of at least 1 mile. At one point, about 3,000 feet easterly from Crystal creek, there is a parallel band of serpentine, 70 feet wide or more, 200 feet stratigraphically lower than the upper one, with sediments in the intervening area. A specimen of the lower serpentine, containing finely disseminated sulphides, assayed: Gold, trace; silver, 3.2 oz. per ton; platinum, *nil*.

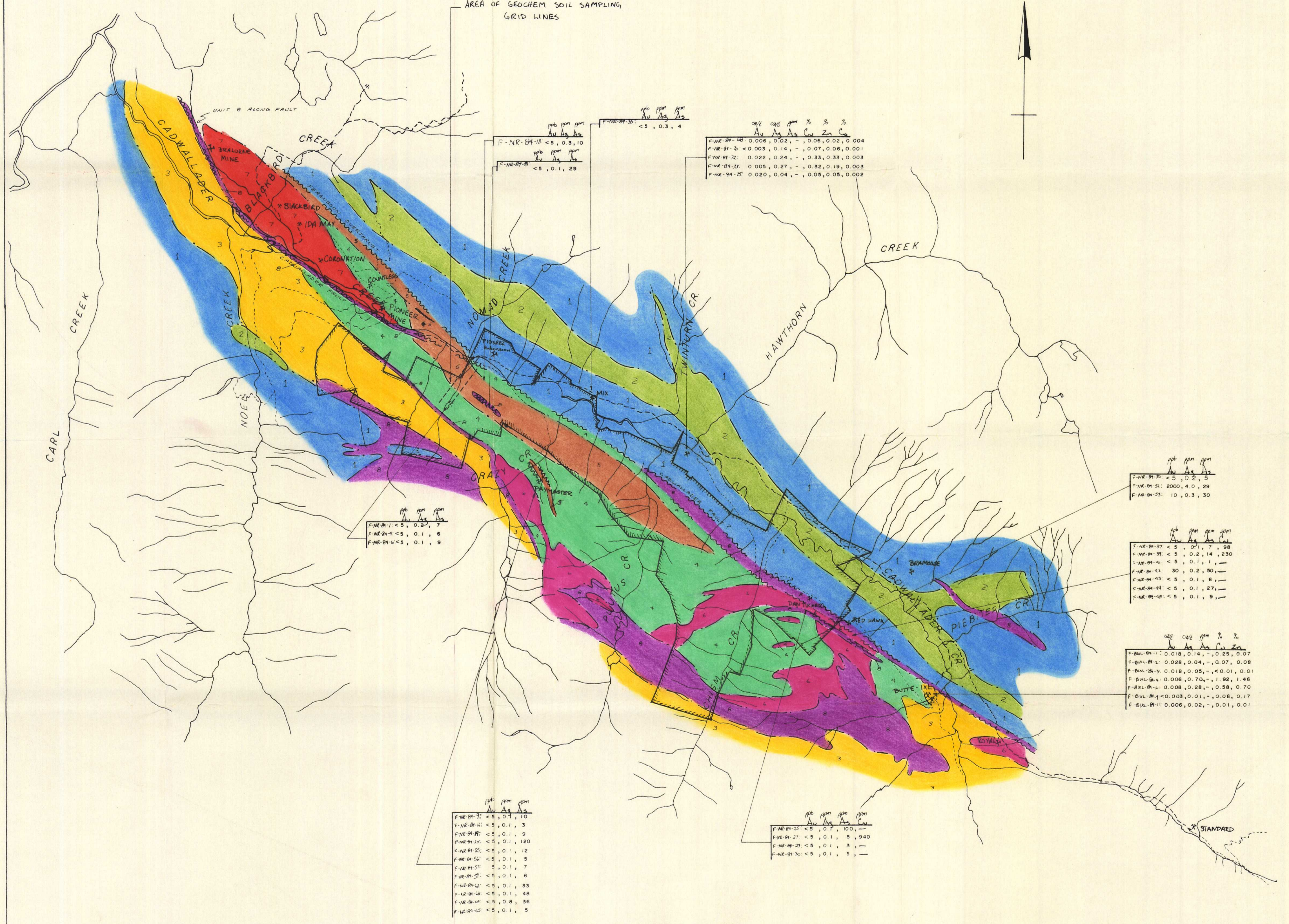
In the argillaceous rocks, mineralization consists of argentiferous tetrahedrite in scattered streaks and disseminations in quartz-filled fractures striking diagonally up the mountain-side from south 70 degrees east to east and dipping to the north at angles of from 65 to 73 degrees.

122° 40' 00" W



58° 45' 00" N

AREA OF GEOCHEM SOIL SAMPLING GRID LINES



LEGEND

- 8 ULTRAMAFIC ROCKS (PRESIDENT GROUP)
- 7 SODA GRANITE and RELATED (BRALORNE INTRUSIVES) ROCKS
- 6 GABBRO and DIORITE " "
- 5 ARGILLACEOUS and TUFFACEOUS (HURLEY FORMATION) SEDIMENTS, LIMEY
- 4 MAFIC VOLCANIC FLOWS and TUFFS (PIONEER FORMATION)
- 3 ARGILLACEOUS and TUFFACEOUS (NOEL FORMATION) SEDIMENTS with SANDY LAYERS
- 2 MAFIC VOLCANIC ROCKS (FERGUSON GROUP)
- 1 INTERBEDDED CHERT and ARGILLITE; CRYSTALLINE LIMESTONE " "

ppb ppm ppm

F-NR-84-1	<5	0.2	7
F-NR-84-4	<5	0.1	6
F-NR-84-6	<5	0.1	9

ppb ppm ppm

F-NR-84-15	<5	0.3	10
F-NR-84-8	<5	0.1	29

ppb ppm ppm

F-NR-84-35	<5	0.3	4
------------	----	-----	---

ppb ppm ppm % % %

F-NR-84-40	0.006	0.02	-	0.06	0.02	0.004
F-NR-84-2	<0.003	0.14	-	0.07	0.06	0.001
F-NR-84-22	0.022	0.24	-	0.33	0.33	0.003
F-NR-84-23	0.005	0.27	-	0.32	0.19	0.003
F-NR-84-25	0.020	0.04	-	0.05	0.05	0.002

ppb ppm ppm

F-NR-84-30	<5	0.2	5
F-NR-84-34	2000	4.0	29
F-NR-84-35	10	0.3	30

ppb ppm ppm ppm

F-NR-84-37	<5	0.1	7	98
F-NR-84-38	<5	0.2	14	230
F-NR-84-41	<5	0.1	1	-
F-NR-84-42	30	0.2	50	-
F-NR-84-43	<5	0.1	6	-
F-NR-84-44	<5	0.1	27	-
F-NR-84-45	<5	0.1	9	-

ppb ppm ppm % % %

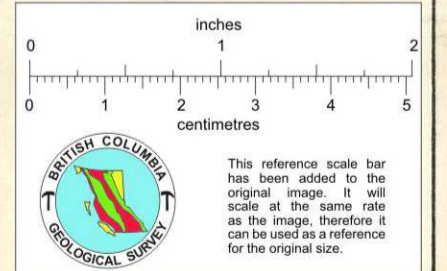
F-NR-84-11	0.018	0.14	-	0.23	0.07
F-NR-84-12	0.028	0.04	-	0.07	0.08
F-NR-84-13	0.018	0.05	-	0.01	0.01
F-NR-84-14	0.006	0.70	-	1.92	1.46
F-NR-84-16	0.008	0.28	-	0.58	0.70
F-NR-84-17	<0.003	0.01	-	0.06	0.17
F-NR-84-18	0.006	0.02	-	0.01	0.01

ppb ppm ppm

F-NR-84-7	<5	0.1	10
F-NR-84-8	<5	0.1	3
F-NR-84-9	<5	0.1	9
F-NR-84-10	<5	0.1	120
F-NR-84-11	<5	0.1	12
F-NR-84-12	<5	0.1	5
F-NR-84-13	5	0.1	7
F-NR-84-14	<5	0.1	6
F-NR-84-15	<5	0.1	33
F-NR-84-16	<5	0.1	48
F-NR-84-17	<5	0.8	36
F-NR-84-18	<5	0.1	5

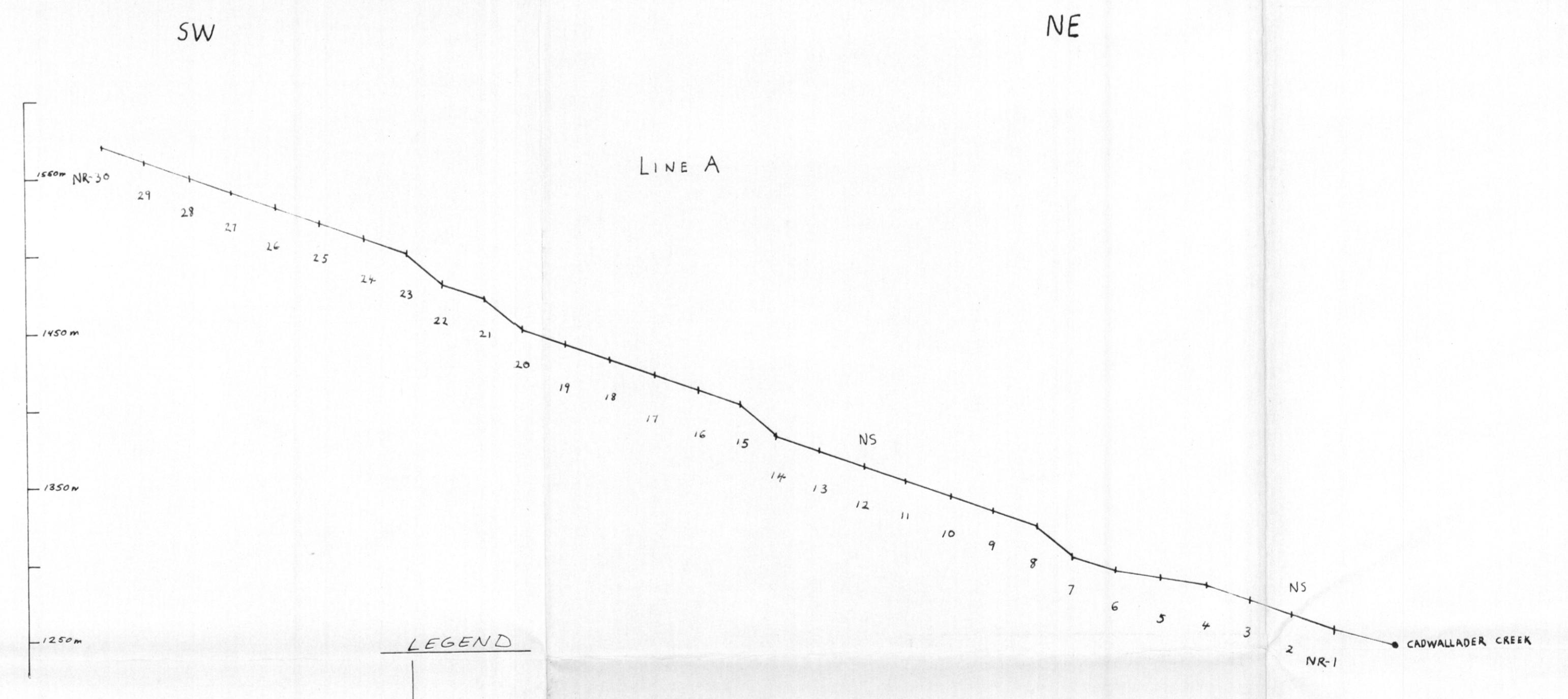
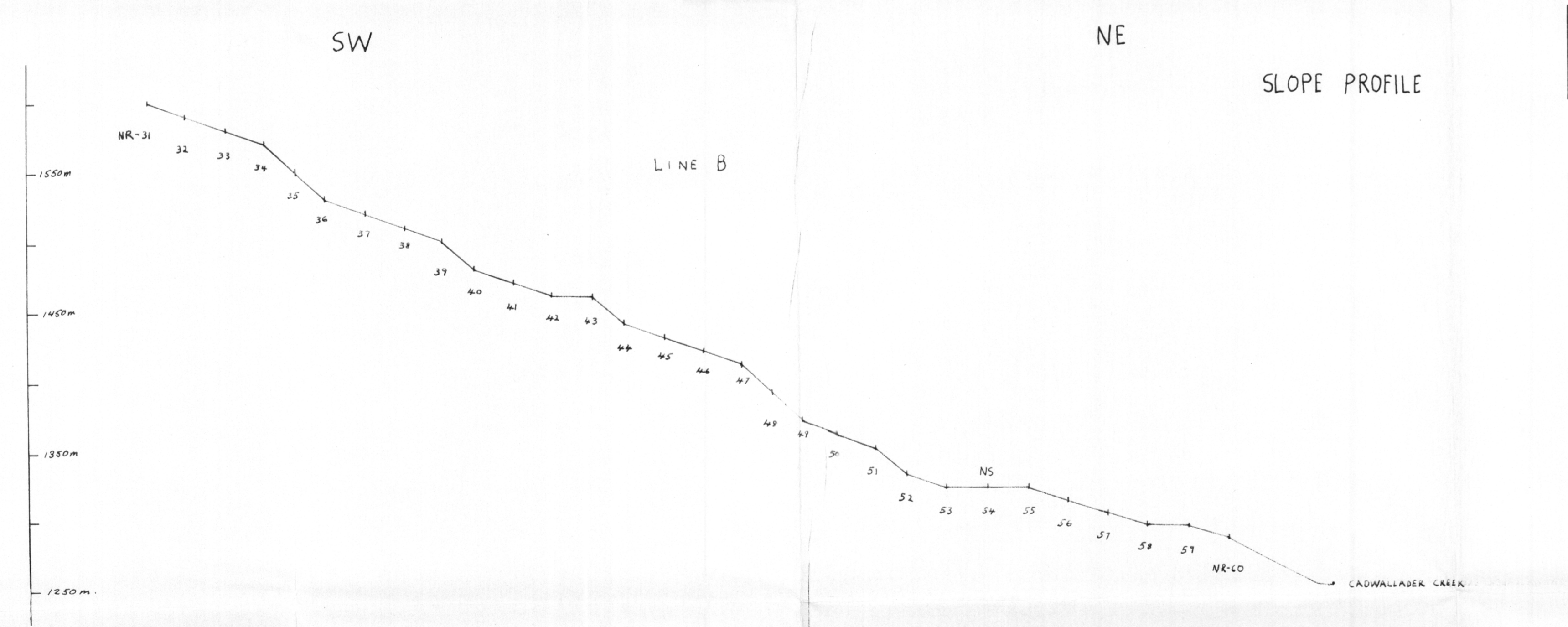
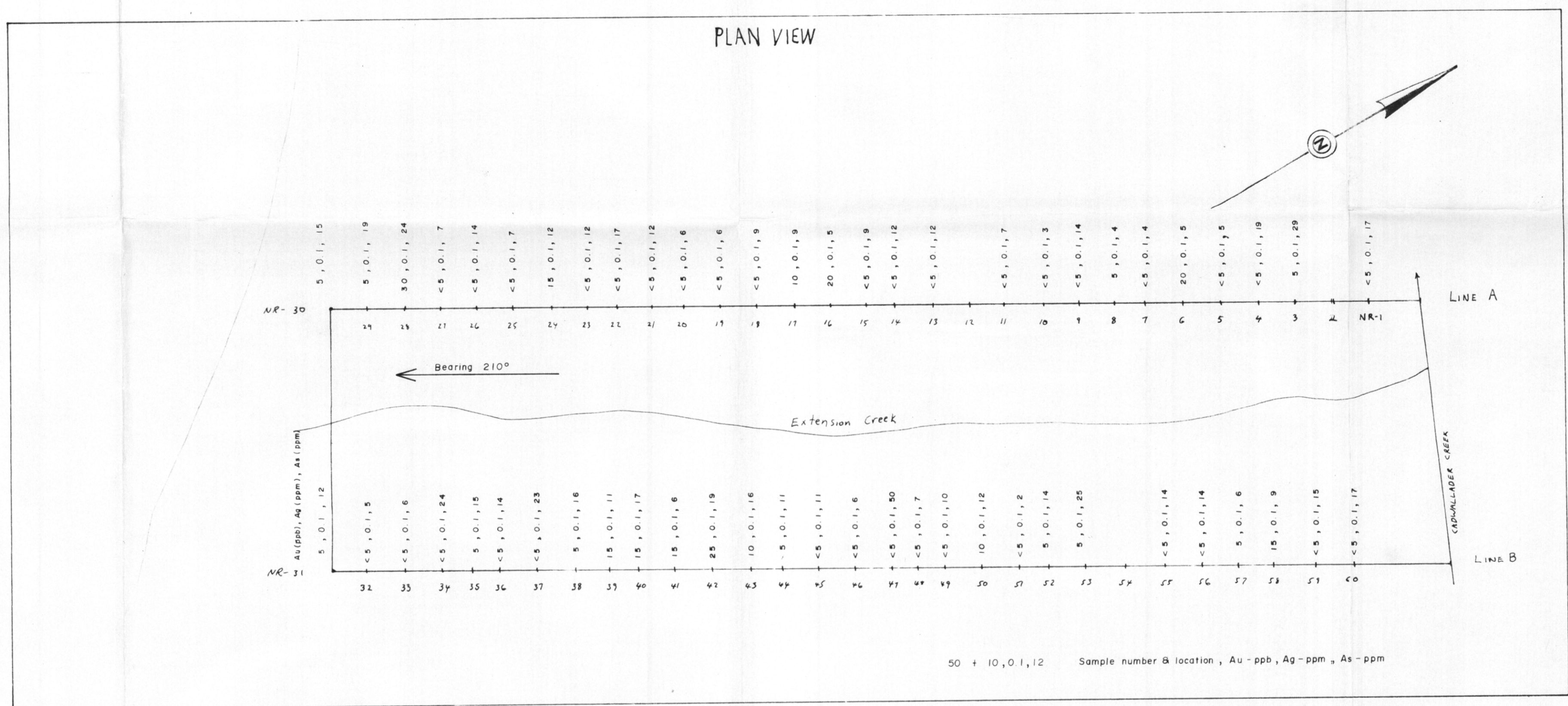
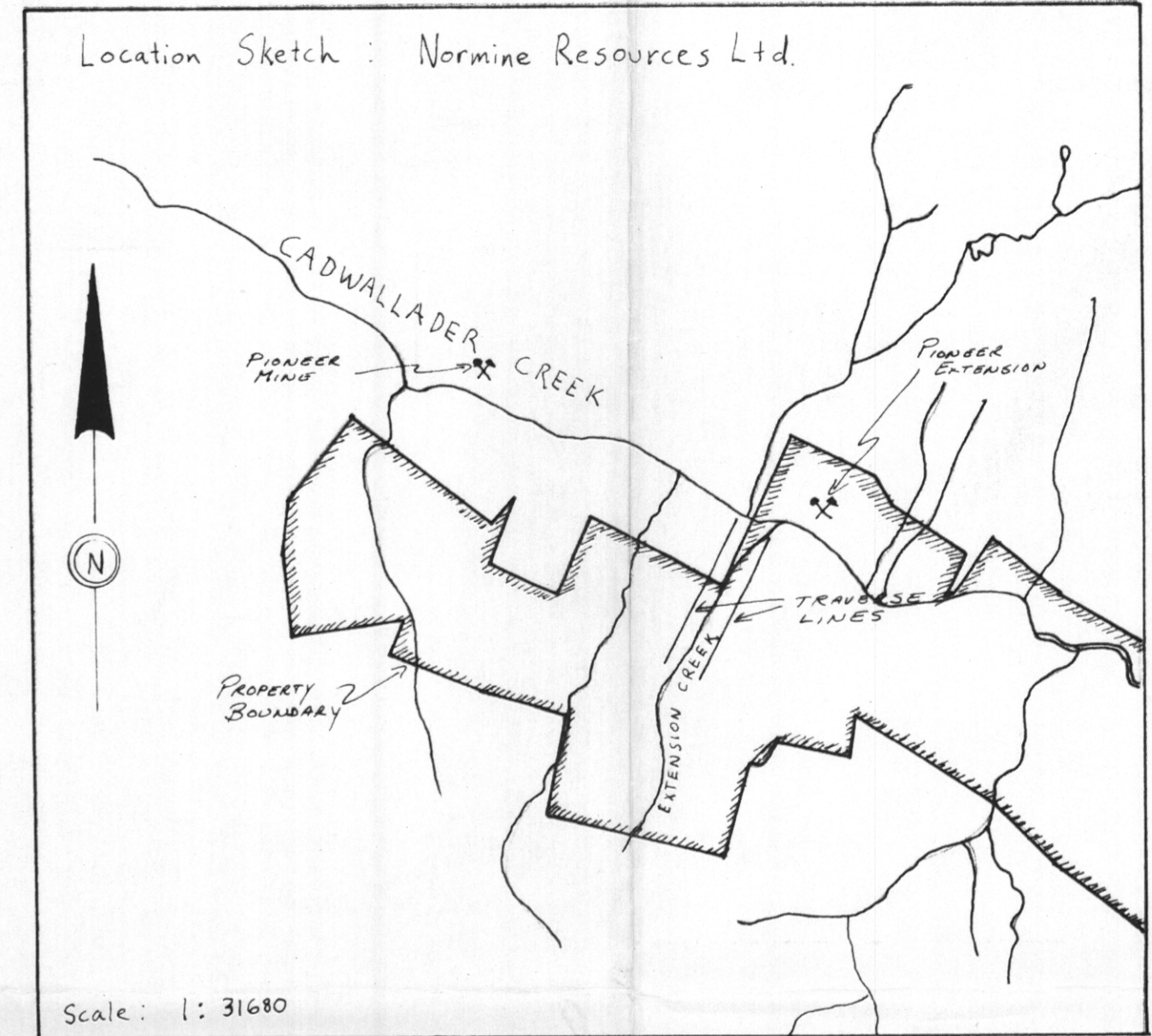
ppb ppm ppm ppm

F-NR-84-25	<5	0.1	100	-
F-NR-84-27	<5	0.1	5	940
F-NR-84-28	<5	0.1	3	-
F-NR-84-30	<5	0.1	5	-



GEOLOGY AND SAMPLING PLAN

NORMINES PROPERTY
 BRALORNE BC
 92110 E & W
 92115 E & W
 SCALE: 1:31680
 DRAWN BY: S. DAVIES JULY 84



LEGEND

Au (ppb) Ag (ppm) As (ppm)

GEOCHEMICAL SURVEY
 NORMINES PROPERTY
 EXTENSION CREEK AREA

BRALORNE B.C.

92/J 10W

SCALE 1:2,500

SAMPLED AND DRAWN BY: J. THOMLINSON
 July 01

