85-975 - 14174
12/86

ASSESSMENT REPORT

GEOLOGY AND GEOCHEMISTRY

ON THE

EMERSON CLAIM GROUP

Latitude $54^{\circ}25'$N, Longitude $126^{\circ}54'$W

N.T.S. 93L/7W

OWNER/OPERATOR: SELCO DIVISION - BP MINERALS LIMITED
700 - 890 West Pender Street
Vancouver, B.C.
V6C 1K5

BPVR 85-30

C.M. Rebagliati, P.Eng.
J. Gravel, Geochemist

December, 1985

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SUMMARY AND CONCLUSIONS

The investigation of assessment records for potential precious metal prospects revealed a silver soil anomaly near Emerson Creek which had not been adequately evaluated by past operators. On the expiration of the Gooch claims in July, the ground was restaked by Selco-BP as the Emerson claims. A detailed soil grid was established over the area of the reported silver anomaly.

Two strong multielement anomalies were outlined over and adjacent to an altered stock. Enclosing the stock are possibly cogenetic felsic tuffs. The full extent of the two large soil anomalies and several smaller anomalies have not been determined.

Continued exploration is warranted to evaluate the prospect.

RECOMMENDATIONS

The following proposed exploration should be conducted in a sequential manner.

1. Complete the detailed 25 x 50 metre soil grid to define the presently identified multielement soil anomalies.

2. Cover the remainder of the claim block with a 50 x 100 metre soil grid to identify new anoamlies. Detail where appropriate.

3. Geologically map the entire claim block at a scale of not less than 1:5000 scale.

4. Utilize extensive backhoe trenching to evaluate the soil anomalies.

5. Contingent upon favourable trench results diamond drill mineralized zones.

INTRODUCTION

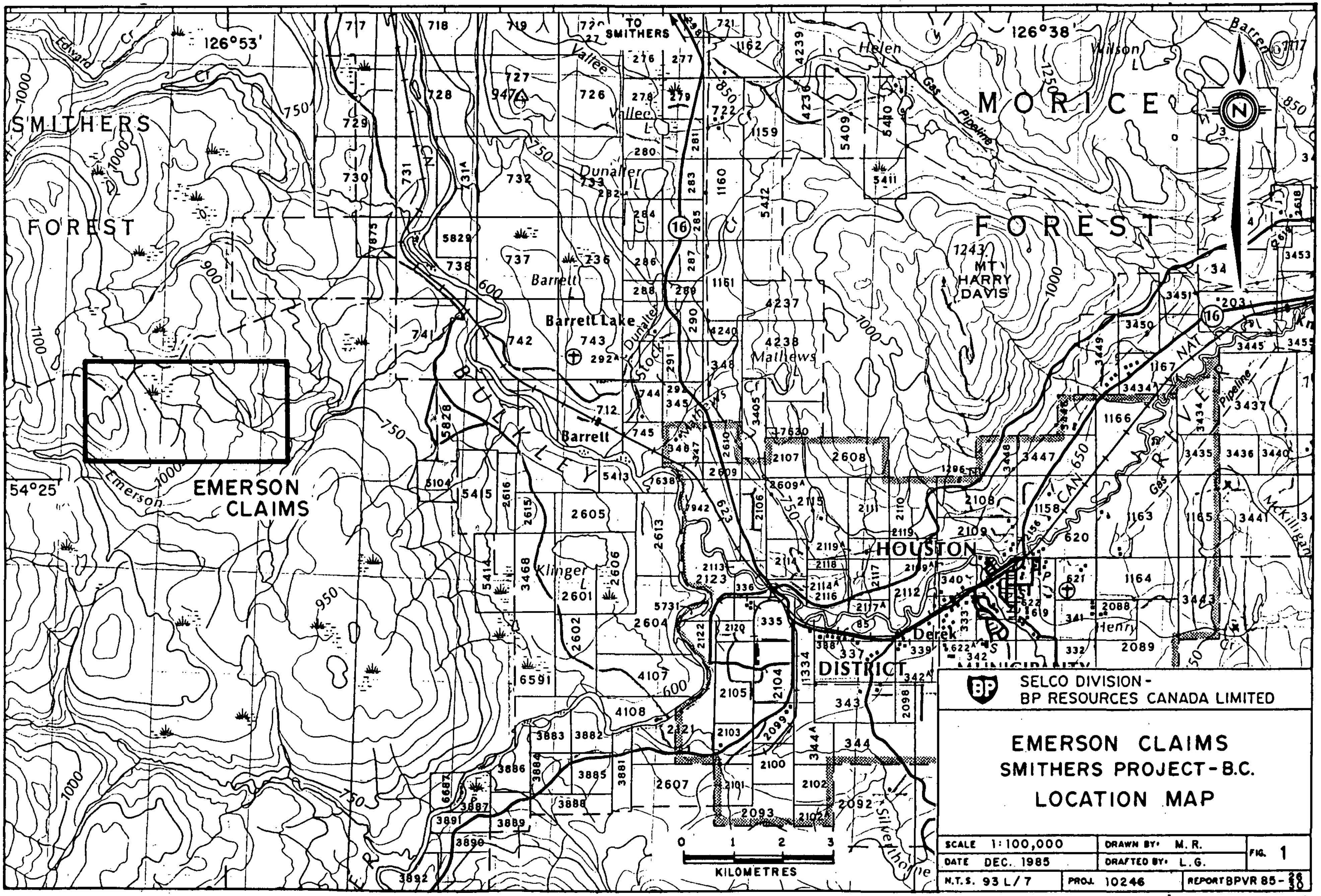
A search of government assessment records revealed a discontinuous silver soil anomaly with associated base metals had not been evaluated.

This report will summarize the geological and geochemical exploration carried out on the Emerson property in 1985 by Selco-BP.

LOCATION AND ACCESS

The Emerson claims are located in an area of gentle to moderate topography 15 kilometres westnorthwest of Houston and 40 kilometres southsoutheast of Smithers in west-central British Columbia at latitude $54^{\circ}25'$N and longitude $126^{\circ}54'$W on NTS map sheet 93L/7 (Figure 1). The centre of the property lies at approximately 975 metres above sea level.

Access from Houston is via the Morice River-Telkwa forestry road. Nine kilometres north of the Morice River bridge an old logging road branches off to the west and provides 4 x 4 truck access to the centre of the claims.


SELCO DIVISION -
BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
SMITHERS PROJECT - B.C.
LOCATION MAP
SCALE 1:100,000
DATE DEC. 1985
DRAWN BY: M. R.
DRAFTED BY: L. G.
FIG. 1
N.T.S. 93 L/7
PROJ. 10246
REPORT BPVR 85-26
KILOMETRES
0 1 2 3
EMERSON CLAIMS
SMITHERS
FOREST
MORICE
FOREST
TO SMITHERS
HOUSTON
DISTRICT
BULKLEY
Barrett Lake
Barrett
MT. HARRY DAVIS
126°53'
126°38'
54°25'
Emerson
Klinger L
Mathews
Dunalter L
Helen L
Gas Pipeline
Derek
Henry

CLAIMS

The property is comprised of two modified grid mineral claims containing 32 units (Figure 2).

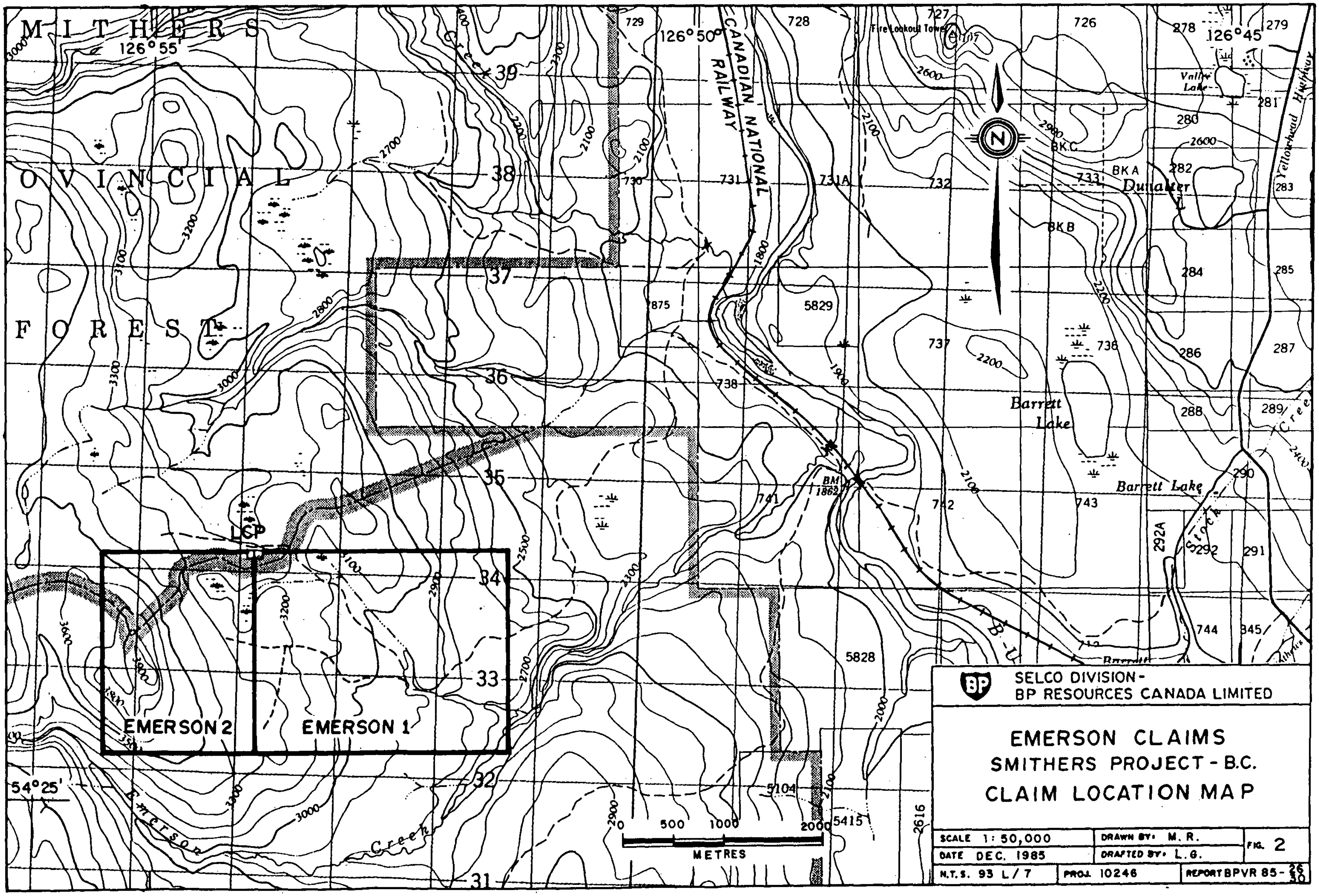
Claim Number	# of Units	Record #	Recording Date
EMERSON 1	20	7108	July 2, 1985
EMERSON 2	12	7205	August 7, 1985
TOTAL 2 claims	32 units		

The claims are located on claim map sheet 93L/7W in the Omenica Mining Division.

EXPLORATION HISTORY

Earliest recorded activity in the Gooch area (Howe, 1982) was in 1966 when W.H. Smith of Telkwa, B.C. staked the Lybdenum 103 claims and optioned them to Amax of Vancouver, who subsequently staked the Barr 1-42 claims immediately to the west. During the summers of 1966-68 Amax, as operators, conducted geological mapping, geochemical surveys for copper and molybdenum, 7 miles of I.P. work, approximately 4000 linear feet of trenching and diamond drilling totalling 3079 feet. Amax subsequently dropped the options giving both the Barr and Lybdenum claims back to Smith. No drill logs or assays were filed.

In 1969 Fortune Channel Mines staked the claims (Ba, Lb, Cu, Mag, Jane) around the Barr and Lybdenum claims.



SMITHERS PROVINCIAL FOREST
126°55'
126°50'
126°45'
54°25'
CANADIAN NATIONAL RAILWAY
Yellowhead Highway
Fire Lookout Tower
Valli Lake
Dunalter L
Barrett Lake
Barrett Lake
Emerson Creek
LCP
EMERSON 2
EMERSON 1
BM 1862
0 500 1000 2000
METRES
SELCO DIVISION - BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
SMITHERS PROJECT - B.C.
CLAIM LOCATION MAP
SCALE 1: 50,000
DATE DEC. 1985
N.T.S. 93 L/7
DRAWN BY: M. R.
DRAFTED BY: L. G.
PROJ. 10246
FIG. 2
REPORT BPVR 85-26/30

Fortune Channel conducted geochemcial and magnetometer surveys covering a total of 31.5 line miles between 1969 and 1971.

After 1971 it is believed all claims were allowed to lapse. There is no recorded activity between 1972 and 1976. In 1977, K.W. Livingstone staked the Jailbird and Jailbird 2 claims to cover ground once held by the Barr and Lybdenum claims. Work conducted in 1977 included a rock geochemical survey of the trenches. Samples were analyzed for copper, molybdenum, lead, zinc, tin, tungsten.

In 1982 SMD Mining Co. Ltd. restaked the property as the Gooch claims. Work conducted in 1982 included geological mapping and collecting approximately 300 soil samples. There was no further work undertaken until BP Minerals Limited restaked the property as the Emerson claims in 1985.

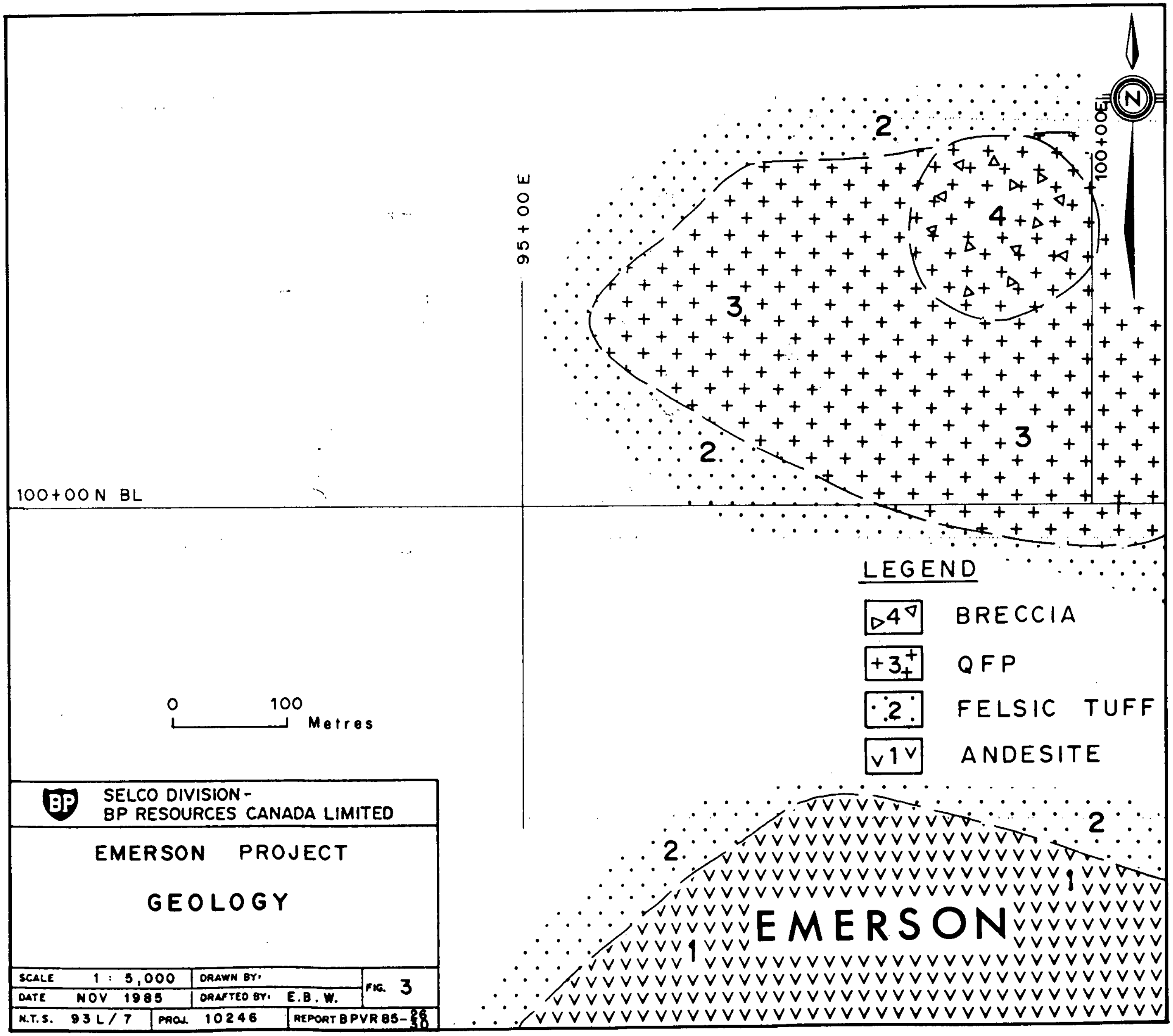
GEOLOGY

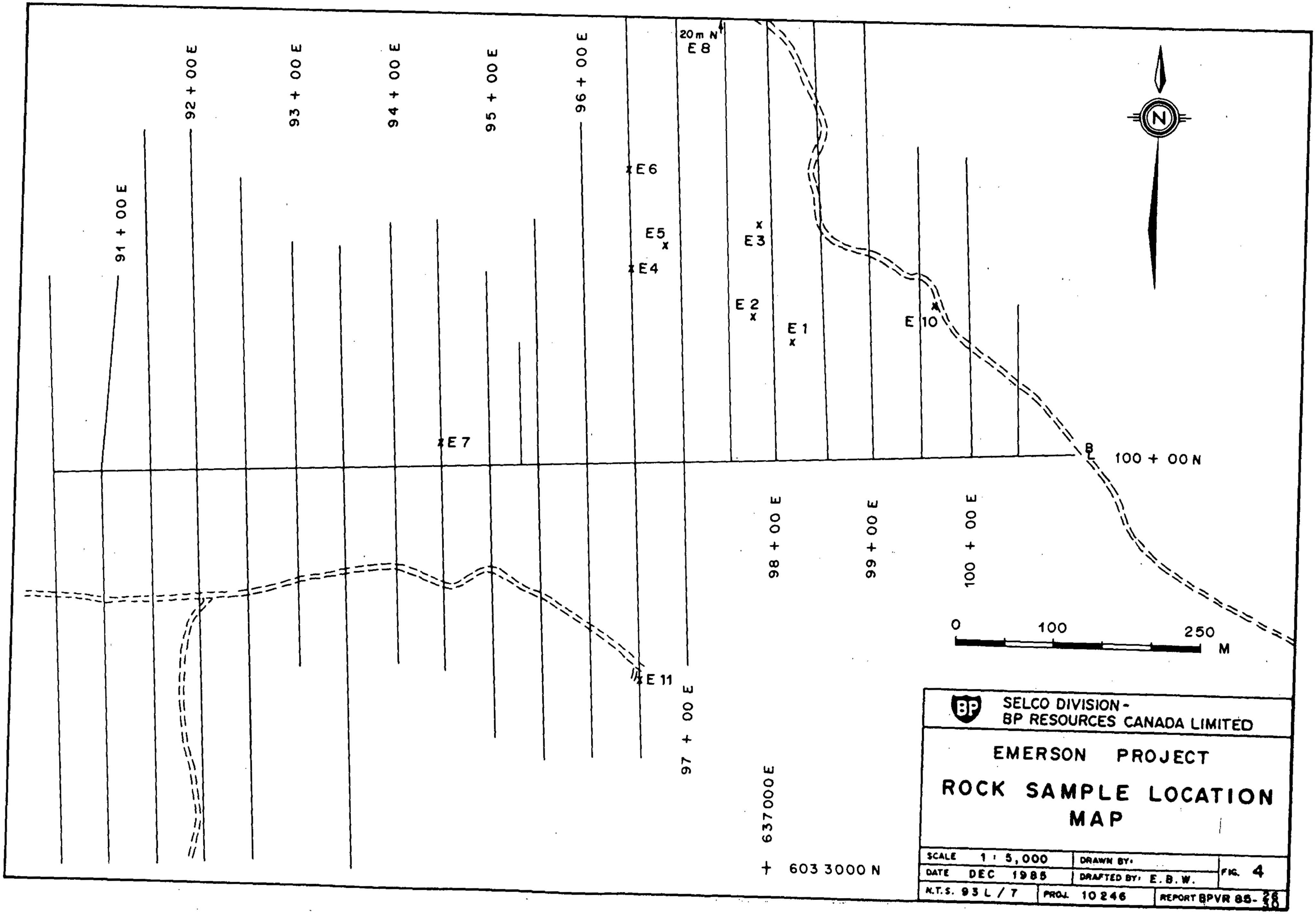
Regionally, the claim area is underlain by Early to Mid Jurassic andesitic to dacitic pyroclastics, epiclastics, flows and sedmintary rocks belonging to the Telkwa Formation of the Hazelton Group. Intruding the Hazelton volcainc rocks are numerous Upper Jurassic to Middle Miocene granite to diorite stocks.

On the Emerson claims, intrusive to the volcanic pile is an intensely altered quartz feldspar porphyry rhyolite (Harris, 1985) stock. Surrounding, and believed to be entrusive equivalents to the QFP are flow-banded rhyolites, and rhyolite crystal-tuffs of probable Late Cretaceous-Early Tertiary aged Ootsa Lake Group (Figure 3).

No geological mapping was undertaken in 1985. During scouting of the soil geochemical anomaly, eleven character samples of altered felsic rocks were selected and geochemically analysed (Figure 4). Thin sections were cut from eight of the samples and sent to Harris Exploration Services for petrographic examination (Appendix I).

Seven of the eight sections are interpreted to be porphyritic rhyolites which have suffered intense silica-clay-sericite alteration (samples E1, 2, 3, 5, 8, 10 and 11). These rhyolites and the monzonite (sample E4) have been intensely fractured and invaded by several generations of quartz stringers. At sample site E6 the veinlets and microveinlets fill a closely spaced (1-5 mm) parallel fracture set where as at the other sample sites veinlets are multidirectional and cross-cutting. A rare, younger set of drusy veinlets are accompanied by abundant course pyritohedral pyrite crystals. Minor late-stage vuggy chalcedonic


95+00 E
100+00 E
100+00 N BL
N
2
3
4
1
EMERSON
LEGEND
4 BRECCIA
3 QFP
2 FELSIC TUFF
1 ANDESITE
0 100 Metres
SELCO DIVISION -
BP RESOURCES CANADA LIMITED
EMERSON PROJECT
GEOLOGY
SCALE 1 : 5,000
DRAWN BY:
FIG. 3
DATE NOV 1985
DRAFTED BY: E.B.W.
N.T.S. 93 L / 7
PROJ. 10246
REPORT BPVR 85-26 30



91 + 00 E
92 + 00 E
93 + 00 E
94 + 00 E
95 + 00 E
96 + 00 E
97 + 00 E
98 + 00 E
99 + 00 E
100 + 00 E
20 m N
E 8
E 6
E 5
E 4
E 3
E 2
E 1
E 10
E 7
E 11
BL
100 + 00 N
N
0
100
250
M
637000 E
603 3000 N
SELCO DIVISION -
BP RESOURCES CANADA LIMITED
EMERSON PROJECT
ROCK SAMPLE LOCATION
MAP
SCALE 1 : 5,000
DATE DEC 1988
N.T.S. 93 L / 7
DRAWN BY:
DRAFTED BY: E. B. W.
PROJ. 10246
FIG. 4
REPORT BPVR 88-

quartz veining with grey, silica encapsulated sulphide patches occurs at sample site E5 and was found in rubble fragments at other localities.

A breccia, possibly an intrusive breccia, with a highly siliceous matrix and intensely argillized and sericitized fragments is situated at sample site E10.

Within the area examined, pyrite in low concentrations ranging from 1 to 4% is ubiquitious. Except for the few drusy veinlets, pyrite is not preferentially located within quartz veinlets.

LITHOGEOCHEMISTRY

The eleven rock samples analysed by A.A. methods for gold and by ICP for 30 elements were lithological character specemens and should not be considered representative of mineralization (Figure 6).

Samples E1 to 9 are geochemically enhanced in gold containing 18 to 505 ppb. Samples E1 and E6 contain 205 and 505 ppb respectively (Appendix II). The samples do not explain the two large silver-base metal-indicator element anomalies identified by the soil geochemical survey.

SOIL GEOCHEMISTRY

B horizon, 16 to 20 cm deep.

A north-south grid, with 50 metre line and 25 metre sample spacing, was established over the core of the silver anomaly indicated by the assessment records.

Two distinct multielement anomalies are identified. The northern east-west trending, gold, molybdenum, copper, lead, zinc anomaly is centered over the QFP rhyolite intrusion and generally is more intense over the breccia pipe (Figures 5, 6, 7, 8 and 9). The second anomaly with a similar metal association has an eastsoutheast trend. From the paucity of outcrop and the lack of geological mapping it is not known with certainty if the second anomaly is underlain by felsic tuffs or by the rhyolite intrusion. Silver (Figure 10) distributions vary from the other metals. While generally conforming to the distribution of the other elements within the confines of the two major anomalies it also displays a prominent northeast-southwest cross-cutting trend which connects the two major gold-base metal anomalies. This divergence suggests the presence of a separate silver mineralizaing event. The two major anomalies and several other smaller ones remain open to further expansion.

A more thorough examination of the soil geochemistry is contained in Gravel's report contained in Appendix III.

APPENDIX 1

SELECTED ROCK SAMPLES

/

RECEIVED

OCT 28 1985

SELCO - BP RESOURCES
VANCOUVER, B.C.

ACME ANALYTICAL LABORATORIES LTD. 852 E.HASTINGS ST.VANCOUVER B.C. V6A 1R6 PHONE 253-3158 DATA LINE 251-1011

GEOCHEMICAL ICP ANALYSIS

.500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN.FE.CA.P.CR.MG.BA.TI.B.AL.NA.K.W.SI.ZR.CE.SN.Y.NB AND TA. AU DETECTION LIMIT BY ICP IS 3 PPM.
TE ANALYSIS MIBK EXTRACTION AND GRAPHITE FURNACE BY AA. F* - NAOH FUSION - SPECIFIC ION ELECTRODE ANALYSIS.
- SAMPLE TYPE: ROCK CHIPS AU** ANALYSIS BY FA+AA FROM 20 GRAM SAMPLE.

EMERSON

DATE RECEIVED: OCT 21 1985 DATE REPORT MAILED: Oct 24/85 ASSAYER.. D. Toye DEAN TOYE OR TOM SAUNDRY. CERTIFIED B.C. ASSAYER

SELCO-A DIVISION OF BP PROJECT - 102[illegible]6-903 FILE # 85-2881 PAGE 1

	SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	W PPM	Au** PPB
E 1	133549121	15	21	20	12	.2	7	6	29	1.64	2	5	ND	6	10	1	2	2	2	.06	.04	16	3	.04	50	.01	3	.31	.01	.17	1	205
	STD C	21	60	38	132	7.5	69	29	1168	3.88	38	17	8	34	46	18	16	21	58	.47	.15	38	57	.86	178	.07	36	1.70	.06	.10	12	-
E 2	133549122	17	78	116	65	2.0	8	7	49	2.14	22	5	ND	6	10	1	7	2	5	.19	.18	12	4	.05	24	.01	7	.36	.01	.20	1	22
E 3	133549123	56	60	11	43	.2	20	13	50	2.73	2	5	ND	6	7	1	2	2	5	.14	.13	14	7	.16	21	.01	3	.39	.02	.16	1	18
E 4	133549124	61	520	12	141	.2	16	21	1848	4.74	2	5	ND	5	27	1	2	2	47	.59	.13	13	18	.81	484	.01	2	1.33	.03	.07	1	55
E 5	133549125	20	26	4	13	.3	13	10	110	3.09	4	5	ND	6	5	1	2	2	3	.09	.03	5	3	.06	18	.01	2	.25	.01	.13	1	26
E 6	133549126	297	30	23	11	3.4	4	2	51	1.94	70	5	ND	3	12	1	2	6	5	.04	.03	15	6	.03	208	.01	4	.20	.05	.12	1	505
E 7	133549127	4	6	433	14	1.4	4	1	15	.65	16	5	ND	8	8	1	9	2	2	.01	.02	18	2	.02	297	.01	2	.23	.01	.13	1	28
E 8	133549128	2	11	17	15	10.3	9	4	17	1.80	4	5	ND	2	12	1	3	2	1	.01	.01	2	2	.02	58	.01	2	.20	.01	.12	1	50
	RE 133549124	63	515	12	143	.2	14	22	1864	4.82	2	5	ND	5	28	1	3	4	48	.60	.13	14	13	.82	505	.01	3	1.35	.03	.07	1	52
E 9	133549130	2	7	26	23	.3	16	6	26	2.83	2	5	ND	2	6	1	2	2	2	.01	.01	2	2	.03	25	.01	2	.23	.01	.14	1	29
E 10	133549131	3	7	19	14	1.2	11	6	60	2.71	107	5	ND	5	5	1	3	2	5	.03	.12	16	4	.06	37	.01	2	.26	.02	.11	1	4
E 11	133549132	13	40	14	78	.1	53	16	703	3.80	2	5	ND	3	18	2	2	2	54	.18	.12	5	20	.70	26	.05	4	.89	.01	.07	1	1
	STD C/AU-0.5	20	61	39	136	7.5	70	29	1177	3.95	40	19	8	34	47	17	15	20	60	.48	.15	37	60	.88	186	.08	38	1.73	.06	.10	13	485

10.

APPENDIX II

PETROGRAPHIC REPORT, HARRIS J.F. PhD.

Harris
EXPLORATION
SERVICES

MINERALOGY AND GEOCHEMISTRY

534 ELLIS STREET, NORTH VANCOUVER, B.C., CANADA V7H 2G6 TELEPHONE (604) 929-5867

Job #85-65

November 8th, 1985

Report for: Mark Rebagliati,
B.P./Selco,
700-890 West Pender St.,
Vancouver, B.C.
V6C 1K5

Samples:

8 rock samples from Project 10246 for thin sectioning and petrographic study. Samples are numbered E-1, 2, 3, 4, 5, 8, 10 and 11. Corresponding slide numbers are 85-198X through 205X.

Summary:

With one exception (E-4), these samples are of similar compositional type. They are felsic igneous rocks which have been intensely altered and are now composed largely of quartz and sericite.

They show a range in intensity of alteration (as measured by the abundance of remnant plagioclase). E-11 is the least altered, E-3 more so, E-1 and 5 contain only traces of relict plagioclase, and E-2, E-8 and E-10 contain none.

E-1, 2, 3, 5 and 11 exhibit more or less well-marked porphyritic textures (with pseudomorphed phenocrysts of plagioclase and biotite and a few phenocrysts of primary quartz). E-8 and 10 are less clear-cut texturally and differ in containing a proportion of clays with the sericite; however, both contain scattered quartz phenocrysts, indicative of an intrusive or effusive origin similar to the other samples. None of the rocks show fragmental textures indicative of tuffs.

The highly siliceous, leucocratic composition prompts the classification of these rocks as rhyolites. The phenocrysts and at least part of the groundmass quartz appear to be primary. There is also a gradation of deuteric to hydrothermal segregation/silicification in the form of diffuse networks, pockets and veinlets of quartz.

The lack of any K-feldspar could be judged atypical of rhyolite, but the high concentration of sericite in these rocks is suggestive of an original composition high in potassium.

All the samples contain disseminated pyrite. This exhibits no consistent relationship to the primary grain structure, alteration features or siliceous veining, and appears to be a part of the overall process of alteration. No detailed observation of the sulfides as regards minor associated phases was possible in the absence of polished sections. Traces of a metallic grey material (molybdenite?) were seen in E-3 and E-5.

Sample E-4 is of different composition, containing K-feldspar and exhibiting chlorite-carbonate-amphibole ateration as well as silicification. It appears to be a form of monzonite or quartz monzonite.

Individual petrographic descriptions of each sample are attached.

The enclosed photomicrographs illustrate some of the features indicative of porphyritic character in these rocks, as well as the style of sericitic and siliceous alteration.

J.F. Harris Ph.D.

Sample E-1 (Slide 85-198X) ALTERED PORPHYRITIC RHYOLITE

Estimated mode

Quartz	45
Plagioclase	8
Sericite	46
Pyrite	1
Rutile) Sphene)	trace

This is an intensely altered rock in which original textures and mineralogy have been largely destroyed. It now consists essentially of fine-grained felted sericite and granular quartz.

The quartz, which is mainly as mosaics and loose clusters of anhedral grains, 0.02 - 0.2mm in size, forms irregular patches and discontinuous networks containing more or less intergrown fine-grained sericite. Fairly well-defined veins and scattered pockets of coarser, sericite-free quartz are also common.

The quartzose material surrounds and outlines sub-prismatic patches, 0.05 - 2.0mm in size, of homogenous fine-grained felted sericite, within which diffuse remnants of plagioclase are sometimes recognizable. These sericite patches, though lacking sharp outlines, probably represent altered plagioclase phenocrysts.

Scattered quartz phenocrysts, 0.5 - 1.0mm in size, are also present.

It is unclear how much of the pervasive network quartz is an original primary component. It seems likely that it is, at least in part, of an introduced nature. Certainly this is true of the coarser, pockety segregations and veins within it.

Pyrite forms small disseminated grains, 0.02 - 0.2mm. These appear randomly distributed without obvious structural control. They occur in quartzose and sericitic areas alike, and also fill microfractures in quartz phenocrysts.

Sample E-2 (Slide 85-199X) ALTERED PORPHYRITIC RHYOLITE

Estimated mode

Quartz	45
Sericite	53
Pyrite	2
Rutile) Sphene)	trace

This is a similar rock to E-1 but even more intensely altered. No remnant feldspar is recognizable.

Despite the total alteration, the original porphyritic texture is better preserved than in E-1, principally because of a lack of vein-type or fracture controlled quartz.

The rock consists of abundant, rather well-defined, angular, prismatic patches, 0.5 - 5.0mm in size, of fine-grained felted sericite, clearly pseudomorphous after feldspar (probably plagioclase) phenocrysts.

These are set in a groundmass of evenly granular, anhedral, mosaic quartz (0.05 - 0.1mm), containing more or less intergranular sericite and small concentrated patches of sericite representing partially assimilated smaller plagioclase grains.

Also present are scattered prismatic pseudomorphs, 0.5 - 2.0mm in size, of better crystallized sericite or muscovite with cleavages emphasized by inclusions of fine-grained rutile and sphene. These probably represent original biotite. Sparse quartz phenocrysts to 1.0mm in size are also seen.

Pyrite forms randomly disseminated clumps of subhedral grains 0.02 - 0.2mm. These are mainly in the siliceous groundmass but also occur within altered biotite and altered feldspar pseudomorphs.

The origin of the granular quartz of the groundmass is arguable. This sample lacks obviously introduced quartz in the forms of veinlets and pockets. The fact that the sericitized feldspar pseudomorphs are totally unsilicified suggests that much of the groundmass quartz may be primary. The alternative is that it is a product of wholesale pervasive silicification.

Sample E-3 (Slide 85-200X) ALTERED PORPHYRITIC RHYOLITE

Estimated mode

Quartz	40
Plagioclase	16
Sericite	42
Pyrite	2
Rutile) Sphene)	trace

This rock is very similar to E-1 in that it contains a proportion of remnant, unsericitized plagioclase, and that it exhibits veniform and diffuse silicification. The phenocrysts are, however, somewhat coarser.

Plagioclase phenocrysts, 0.5 - 5.0mm in size, are intensely (70% - 80%) replaced by fine-grained felted sericite to form somewhat diffuse-outlined sub-prismatic pseudomorphs.

These are set in a matrix of anhedral granular quartz, 0.05 - 0.1mm, with intergranular flecks of sericite and relatively unaltered plagioclase grains of similar size to the quartz.

This matrix or groundmass contains ill-defined pockets of coarser-grained quartz which is probably related to the more or less definite quartz veins which cut of the sample.

A few prismatic pseudomorphs of platy muscovite, 0.5 - 2.0mm in size, with fine-grained rutile/sphene occur. These probably represent altered biotite. More abundant smaller flakes of similar material in the size range 0.1 - 0.2mm occur throughout. Rare small quartz phenocrysts are also present.

Pyrite occurs as randomly disseminated grains, 0.02 - 0.2mm, often clustered or coalescent. They locally show structural control in that they form linear trains and some are of an intergranular mode in vein quartz. For the most part, they show no consistent relationship to the silicification or the primary textural features. Minute traces of a metallic grey mineral were noted in the vein quartz.

Sample E-4 (Slide 85-201X) SILICIFIED MONZONITE?

Estimated mode

Quartz	20
Plagioclase	40
K-feldspar	15
Sericite	2
Chlorite	8
Carbonate	5
Secondary amphibole	7
Rutile) Leucoxene)	1
Fe-Ti oxides	2
Sulfides	trace

This sample exhibits features distinguishing it from others of the suite - notably the presence of K-feldspar and chlorite. It is a rather messy heterogenous rock, though recognizably of igneous origin.

Plagioclase is the dominant constituent. This occurs as phenocryst-like masses, 0.5 - 3.0mm in size, set in a granular feldspathic groundmass with patchily distributed intergrown K-feldspar and granular quartz of grain size 0.05 - 0.1mm.

The coarser plagioclase masses are sometimes somewhat irregular in shape and appear to be polycrystalline, but some are of normal prismatic form. They typically show more or less strong alteration of a distinctive (and rather unusual) type, to various combinations of fine-grained carbonate, chlorite, olive green secondary amphibole and sericite.

Chlorite is also widely distributed as ragged flakes, pseudomorphic patches, veinlets and interstitial flecks in the groundmass.

Opaques, which occur as disseminated clusters of irregular to subhedral grains (0.01 - 0.1mm) seem to be mainly oxides. They often show intergrown fine-grained rutile and leucoxene. They are randomly distributed, sometimes showing an association with pockets of chlorite and also occurring in quartz veinlets. Rare traces of sulfides (pyrite and possibly chalcopyrite) are seen.

The rock is cut by rather numerous veinlets of granular quartz which, in thin section, show rather ill-defined contacts with the adjacent feldspathic matrix. It is possibly that much of the granular quartz of the matrix - which tends to occur as pockets and networks - is of introduced origin, related to the veining quartz.

This rock is something of an enigma. It may be a minor intrusive of silicified monzonite or quartz monzonitic composition.

Sample E-5 (Slide 85-202X) ALTERED PORPHYRITIC RHYOLITE

Estimated mode

Quartz	45
Plagioclase	4
Sericite	47
Rutile) Sphene)	1
Pyrite	3

This is another rock of similar type to E-1.

Plagioclase phenocrysts, 0.5 - 2.0mm in size, are completely altered, being represented by rather poorly-defined sub-prismatic patches of fine-grained, felted sericite.

These are set in a groundmass consisting of anhedral quartz grains, 0.05 - 0.1mm in size, in small mosaic patches and "floating" in sericite which represents original intergrown feldspar. A few small remnants of plagioclase are locally recognizable in this association.

Small muscovite flakes with dusty rutile (altered biotite) are scattered through the groundmass and there are rare, coarser, prismatic altered biotite phenocrysts to 0.5 - 1.0mm. No quartz phenocrysts were seen in this slide.

Quartz of coarser grain size (0.1 - 0.3mm) forms more or less well-defined veins as well as diffuse replacement pockets. A few of the sericite masses (plagioclase pseudomorphs) have core replacements of vuggy quartz and/or pyrite.

Pyrite forms relatively abundant clumps of subhedral granules to 0.5mm. These occur in diverse modes. Some show linear distribution (control by microfractures); some are in fractures and pockety replacements of the coarser quartz veins; some in altered plagioclase and mafic pseudomorphs; and some randomly distributed through the siliceous groundmass. There is no specific associated gangue component with the pyrite.

Sample E-8 (Slide 85-203X) ALTERED RHYOLITE

Estimated mode

Quartz	46
Sericite	40
Clays	10
Rutile) Sphene)	1
Pyrite	3

This is a rock composed of the essentially same minerals as E-1, 2, 3 and 5, but showing a subtly different texture. The areas of sericite are often very ill-defined and gradational with the siliceous groundmass. The latter is mainly finer grained than in the earlier rocks, consisting of a cherty aggregate of grains around 0.01mm in size, often with more or less intergrown sericite.

The sericitic masses (which appear much more distinct on the etched chip than they do in the thin section) also exhibit distinctive features. They tend to consist of patchy intergrowths of extremely fine-grained material (brownish, with colloform-like zoning in ordinary light) which is probably a clay, and sheaves and meshworks of a slender, elongate, almost acicular sericite.

It is uncertain whether these masses are altered phenocrysts like the even-grained, felted sericite masses of earlier samples. The quartz and sericite/clays are much more diffusely intermixed in this rock and it seems possible that it was more of a felsitic, or even glassy, type of rhyolite than the other (porphyritic) samples.

The characteristic biotite pseudomorphs of earlier samples are absent. A few strongly corroded, or partially assimilated, quartz phenocrysts are, however, present.

No quartz veining is detectable but irregular patches and pockets of rather coarser-grained quartz (grain size up to 0.2mm) are scattered throughout. The impression is that much of the quartz may be a product of pervasive silicification.

Tiny granules of brown rutile and/or sphene are rather common, as random disseminations and clusters associated with the meshwork sericite.

Pyrite exhibits the usual features. It occurs as grains 0.05 - 0.2mm, often clumped. Structural control is apparently lacking. There is a distinct tendency for the pyrite to concentrate within the larger patches of clays and sericite, often in vuggy pockets with associated quartz.

Sample E-10 (Slide 85-204X) ALTERED RHYOLITE

Estimated mode

Quartz	50
Sericite	35
Clays	9
Rutile) Sphene)	2
Pyrite	4

This is a rock of similar type to E-8. It is texturally heterogenous and appears intensely altered.

Quartz of highly variable grain size (ranging down to about 0.02mm) is intimately and diffusely intergrown with irregular areas of sericite and clays. The most clearly defined prismatic forms are made up of masses of fine-grained reticulate sericite with tiny interstitial granules of rutile and sphene. These may represent altered mafic phenocrysts. Some examples of the flaky muscovite grains with rutile inclusions in cleavages (described in other samples of the suite as pseudomorphs of biotite) are also present, as are a few rounded, corroded quartz phenocrysts to 2.0mm.

The latter are quite distinct from the abundant, irregular to elongate patches and scattered grain clusters of anhedral mosaic quartz (grain size 0.1 - 0.3mm) which occur throughout. These seem to represent a pervasive silicification or late stage deuteric segregation effect.

Disseminated pyrite is rather abundant and attains grain sizes up to 0.5mm (sometimes coalescing to coarser clumps and networks). It shows the usual diverse association, but is notably concentrated as interstitial networks in some of the granular quartz pockets and as clusters within the larger sericite/clay pseudomorphs.

Sample E-11 (Slide 85-205X) PORPHYRITIC RHYOLITE

Estimated mode

Quartz	35
Plagioclase	29
Sericite	35
Rutile) Sphene)	trace
Limonite) Jarosite)	trace
Pyrite	1

This sample represents another variant of the felsic porphyries constituting the suite. It is noticeably less altered than the majority and contains considerable remnant plagioclase.

Phenocrysts are dominantly plagioclase. These range up to 3mm in size but many are quite small, in the 0.2 - 1.0mm range. They are sharply euhedral, prismatic and well-defined. They consistently show argillic cloudiness, together with a highly variable degree of sericitization - ranging from essentially nil to almost complete conversion to felted sericite. The majority are relatively lightly altered.

Quartz phenocrysts, 0.2 - 1.5mm in size, of typical sub-rounded, corroded form, are noticeably more abundant than in other rocks of the suite.

Scattered well-formed prismatic pseudomorphs of flaky muscovite with rutilized cleavages are also present.

These phenocrysts are set in a groundmass of evenly felted, very fine-grained sericite within which are set abundant more or less diffuse patches of granular mosaic quartz of grain size 0.05 - 0.1mm. This may well be a primary constituent of the groundmass, the intergrown feldspathic component of which has been totally sericitized.

Some areas of the slide include irregular, inter-connected pockets and networks of much coarser quartz (grain size to 2.0mm) which shows strain polarization, a tendency to radial or feathery structure, and zonal patterns of elongate, vermicular fluid inclusions. This is probably of late magmatic/deuteric origin.

Pyrite is relatively sparse and fine-grained. It is randomly distributed and shows no association with the coarser quartz pockets.

The slide is traversed by a fracture zone with staining and encrustations of limonite and marginal impregnations of what appears to be jarosite. This limonite appears to be introduced rather than derived by oxidation of contained pyrite.

Harris
EXPLORATION SERVICES

MINERALOGY AND GEOCHEMISTRY

534 ELLIS STREET, NORTH VANCOUVER, B.C., CANADA V7H 2G6 TELEPHONE (604) 929-5867

Invoice #85-65

November 8th, 1985

In account with: Selco division of B.P. Canada,
700-890 West Pender St.,
Vancouver, B.C.
V6C 1K5

Charges for professional services re petrographic study of rock samples from Project 10246 for Mark Rebagliati.

Preparation (at cost)		
8 thin sections (including impregnation & staining)	$	74.00
Microscopic examinations & report		360.00
Photomicrographs (10)		95.00
Total	$	529.00

[signature] 10246

APPENDIX III

1985 STATEMENT OF EXPENDITURES
EMERSON 1 & 2 CLAIMS

APPENDIX III

1985 STATEMENT OF EXPENDITURES - EMERSON 1 & 2 CLAIMS

Labour

John Gravel - Geochemist				
August 10-14	5 days @125/day	$625		
October 8-9	2 days @125/day	$250		
		$875		
Gordon Campbel - Assistant				
August 10-13	4 days @65/day	$260		
Rick Diment - Assistant				
August 11-14	4 days @65/day	$260		
Chris Nichols - Assistant				
August 11-14	4 days @65/day	$260		
October 4, 8-9	3 days @65/day	$195		
Waldy Piotrowski - Assistant				
October 4, 8-9	3 days @65/day	$195		
		$1170		$2045

Food and Accomodation

25 Man Days @60/Man Day	$1500

Transportation

Truck Rental, Mileage and Gas 8 days @90/day	$720

Field Supplies

Flagging, Topofil Thread, Sample Bags, etc.	$200

Analytical Costs

Shipping, Processing and Analysis 662 Samples @$12.50/sample	$8275

Computer Processing

Digitizing, Keypunching, Stats and Plotting 662 Samples @$1.85/sample	$1225

Geology

C.M. Rebagliati - Senior Geologist		
October 2 and 3	2 days @$200/day	$400
Harris Exploration Services		
Petrographic Study		$529

Report Preparation

Writing, Word Processing, Drafting		
6 days @$150/day		$900
		========
	TOTAL	$15,794
		========

APPENDIX IV

STATEMENT OF QUALIFICATIONS

APPENDIX IV

STATEMENT OF QUALIFICATIONS

C.M. Rebagliati, P.Eng.

B.Sc. Geological Engineering, 1969
Michigan Technological University
Houghton, Michigan, U.S.A.

Registered Professional Engineer in The Association of Professional Engineers of the Province of British Columbia.

J.L. Gravel, M.Sc.A.

B.Sc. Geology, 1979
McGill University
Montreal, Quebec

M.Sc.A. Geology, 1985
McGill University
Montreal, Quebec

Member of Association of Exploration Geochemists.

APPENDIX V

GEOCHEMICAL REPORT, GRAVEL J.

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SUMMARY AND CONCLUSIONS

A soil survey was conducted on the Emerson property from August to October 1985 to test a Au-Ag-Mo target. A total of 662 soil samples were collected using a 50 metre X 25 metre grid density. Eight composite rock chip samples were gathered from trenches present. Two polymetallic zones of interest were uncovered in the northeast grid quadrant corresponding to a trenched region and in the southwest quadrant in an area of outwash and swamps.

Analysis of soils and rock chips confirm anomalous concentrations in the trenched area of gold (soils: 80-350 ppb, trenches: 40-250 ppb), silver (soils: 3-11 ppm, trenches: 2-25 ppm), molybdenum (soils: 20-115 ppm, trenches: 10-56 ppm), copper (soils: 90-180 ppm, trenches: 50-930 ppm) and lead (soils: 125-2200 ppm, trenches: 90-130 ppm). Anomalous soils define an area 400+ metres long X 300 metres wide and open to the east and west.

Multielement Anomaly 2 defines a west to northwest trend 400+ metres long. The suite of anomalous elements is much like Anomaly 1; gold 80-350 ppb, silver 2-12 ppm, copper 90-190 ppm, lead 125-760 ppm, zinc 300-650 ppm and arsenic 40-300 ppm. Maximum concentrations generally correlate to boggy ground. Coincident maximum levels of manganese suggest two possible conditions, either manganese enrichment in relation to bedrock mineralization, a common feature in several deposit types, or manganese scavenging.

RECOMMENDATIONS

1. Completion of the soil grid is required to fully outline the two polymetallic zones. Recommended grid extensions are given in Figure 1.

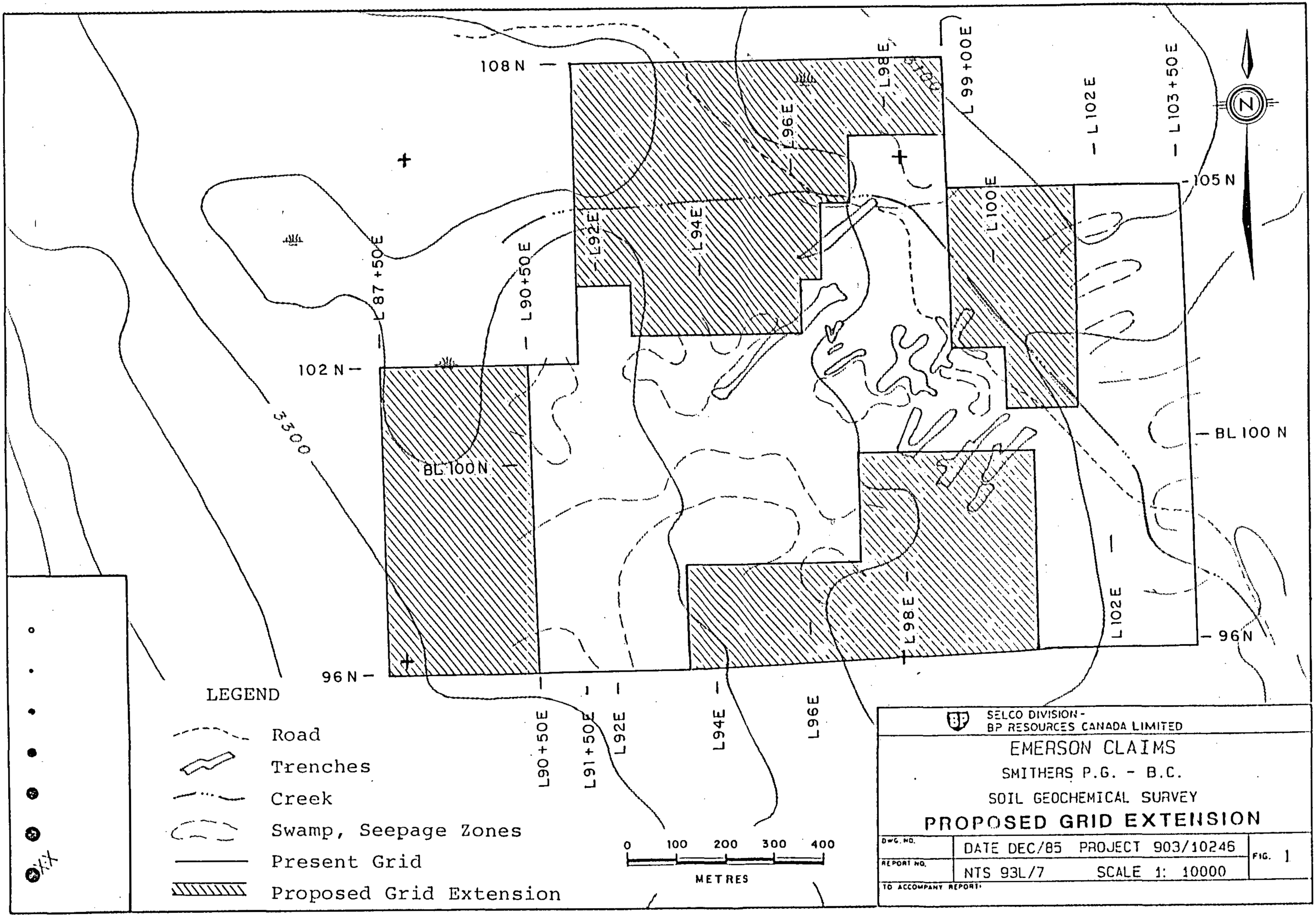
2. Trenching of both zones is needed to define mineralization patterns and understand the geology. Figure 2 describes the recommended trenches.

DESCRIPTION OF RESULTS

1. Gold (Fig. 3A)

   Gold is predominantly concentrated in the northeast quadrant of the Emerson grid in a region of thin till over altered bedrock that has been abundantly trenched. A northwesterly trend is described by a high concentration zone of samples ranging from 100 to 350 ppb.

   A string of isolated gold enriched samples roughly define a northwest trend in the southwest quadrant.



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EMERSON CLAIMS

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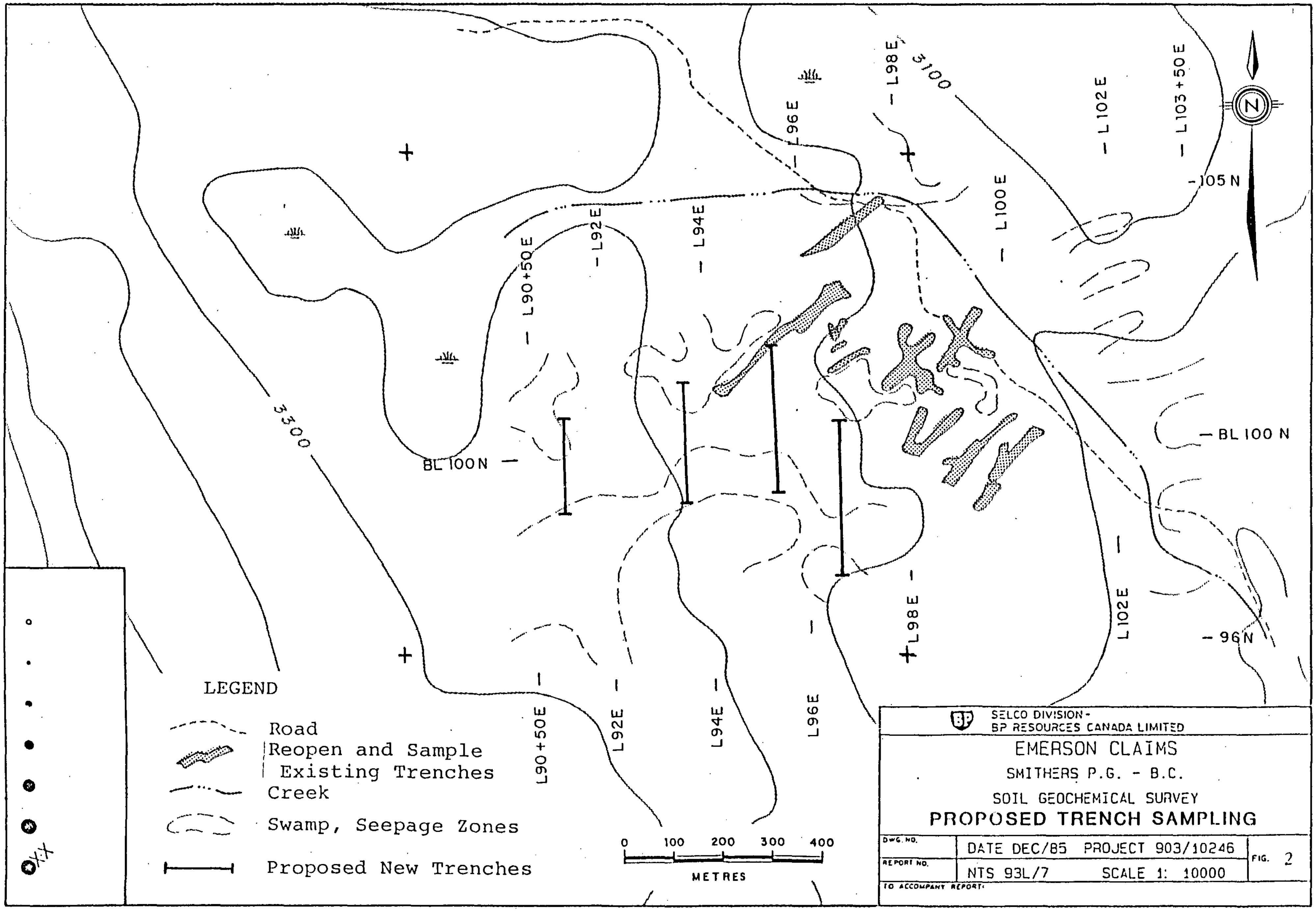
SOIL GEOCHEMICAL SURVEY

PROPOSED GRID EXTENSION

DWG. NO.	DATE DEC/85 PROJECT 903/10246	FIG. 1
REPORT NO.	NTS 93L/7 SCALE 1: 10000	
TO ACCOMPANY REPORT:		



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PROPOSED TRENCH SAMPLING

DWG. NO.	DATE DEC/85 PROJECT 903/10246	FIG. 2
REPORT NO.	NTS 93L/7 SCALE 1: 10000	
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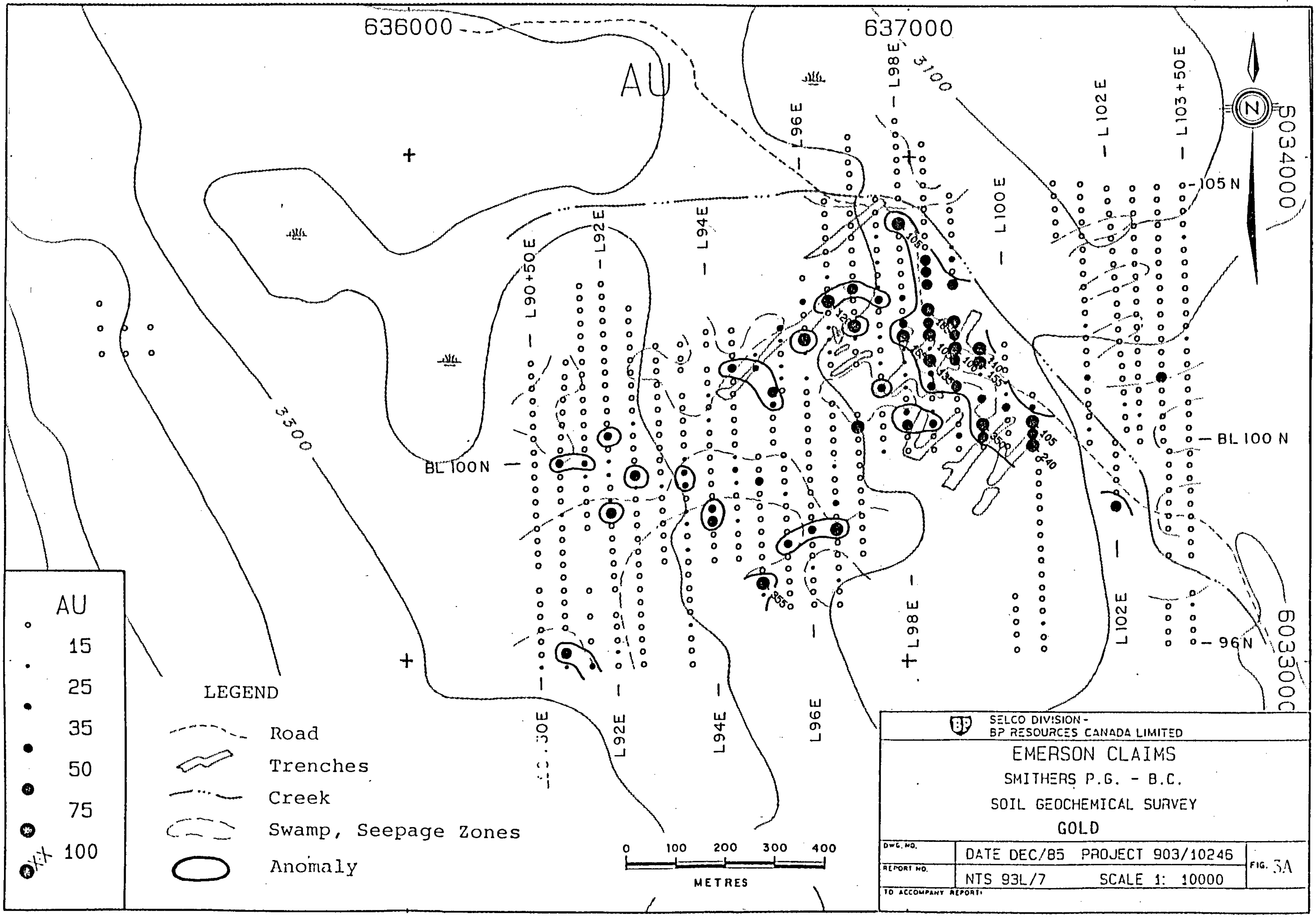

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SOIL GEOCHEMICAL SURVEY

GOLD

DWG. NO.	DATE DEC/85 PROJECT 903/10246	FIG. 3A
REPORT NO.	NTS 93L/7 SCALE 1: 10000	
TO ACCOMPANY REPORT:		

2. Silver (Fig. 3B)

Anomalous silver describes a Y shaped anomaly having a lower west to northwest arm and an upper southwesterly arm extending from the trench zone. Silver roughtly coincides with gold in each arm. Maximum values range from 5.0 to 11.7 ppm Ag, a·10 to 20 fold increase over background concentrations.

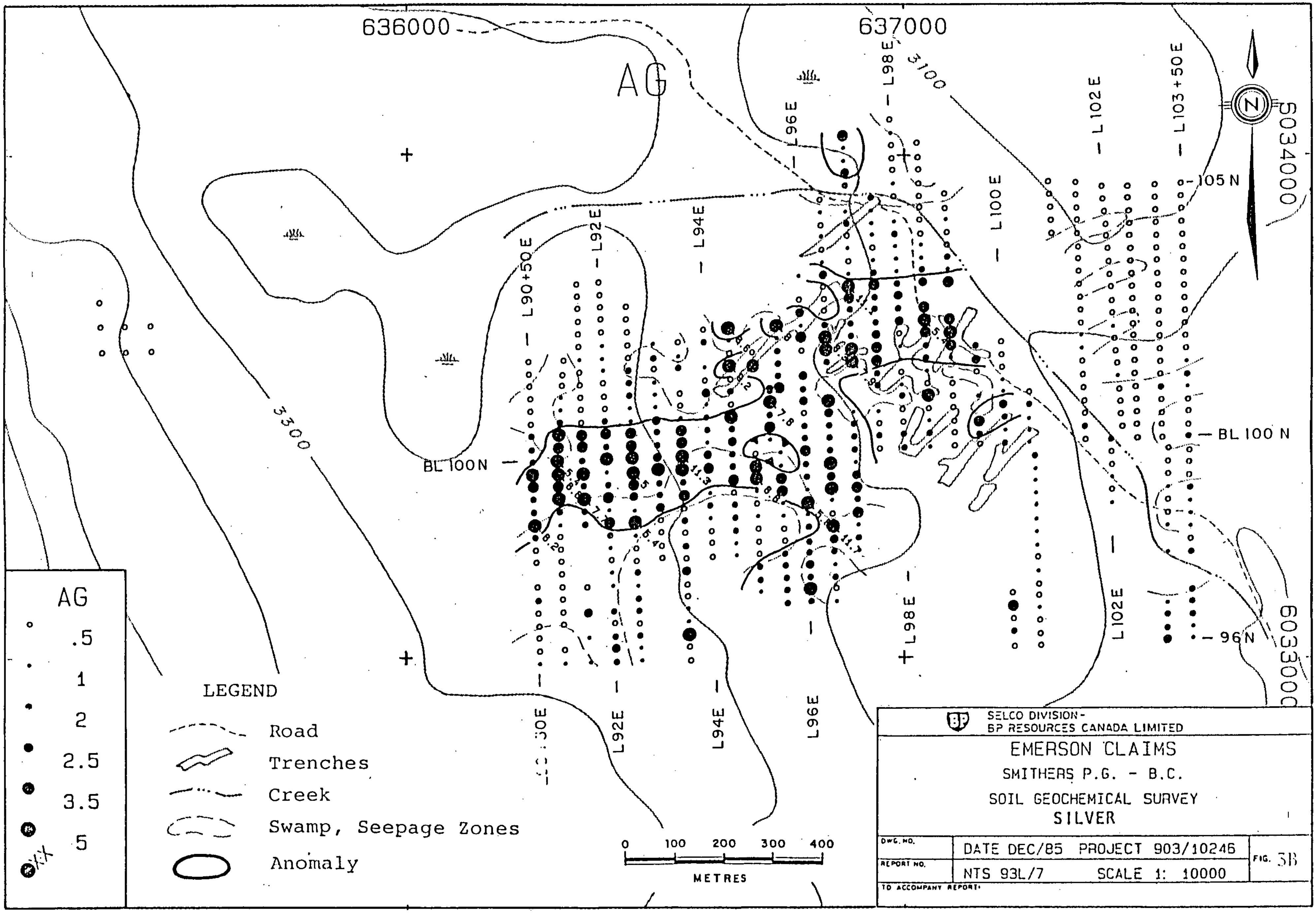
3. Molybdenum (Fig. 3C)

Two anomalous molybdenum areas have been outlined, the largest (approximately 700 m^2) correlates gold in the trench zone, similar to gold and silver. Anomaly trend is to the northwest. Maximum concentration is 115 ppm, a 23 fold increase over background.

Two samples define the second anomaly also coincident to gold and silver lying 150 metres southwest of an Anomaly 1 in a westerly trending zone of enhanced background. Peak concentration is 68 ppm.

4. Copper (Fig. 3D)

Anomalous copper in soils forms three clusters of anomalies. Cluster 1 lies in the southwest grid quadrant and has westerly to northwesterly trend. Length of the cluster is



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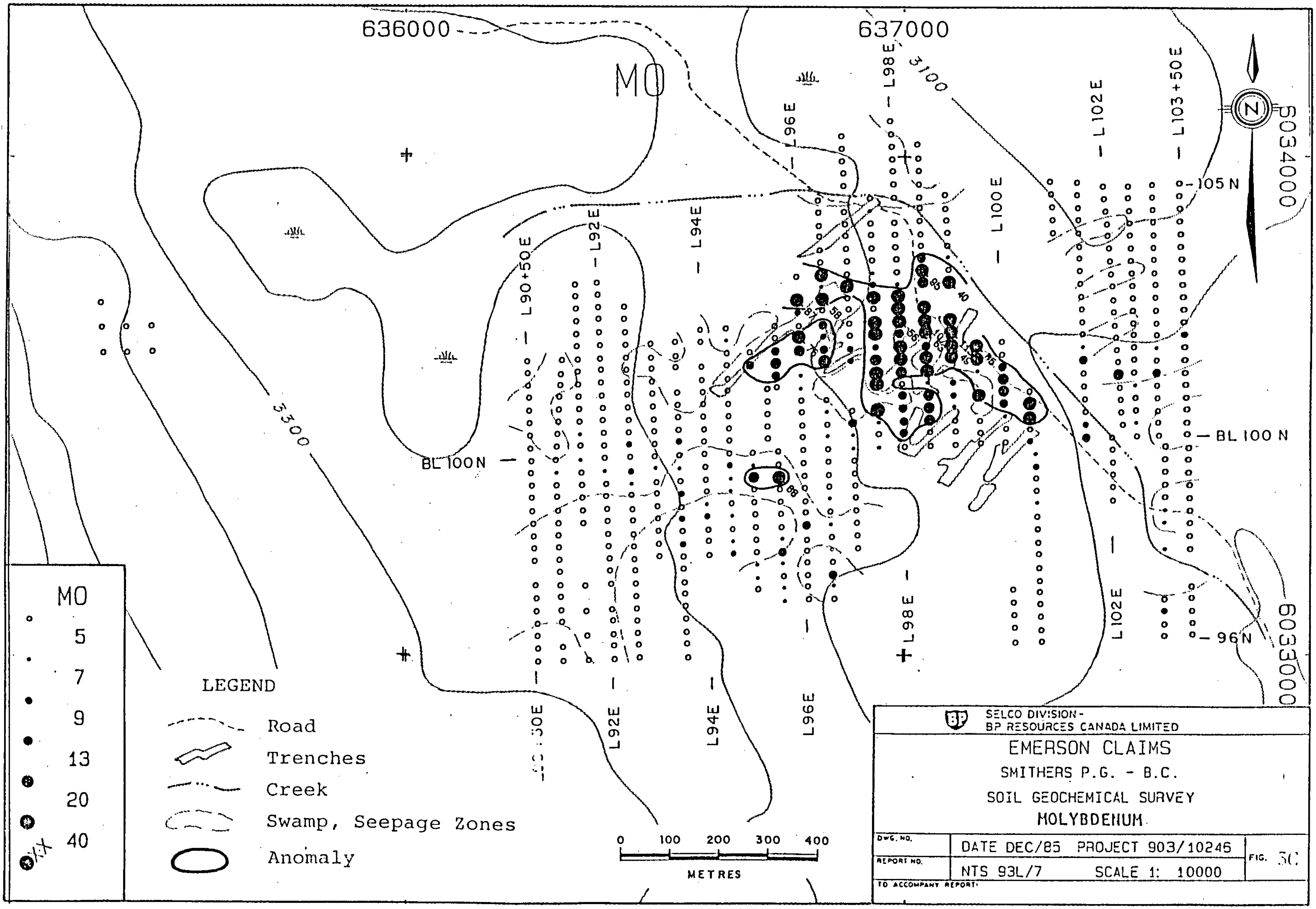
SOIL GEOCHEMICAL SURVEY

SILVER

DWG. NO.	DATE DEC/85 PROJECT 903/10246	FIG. 5B
REPORT NO.	NTS 93L/7 SCALE 1: 10000	
TO ACCOMPANY REPORT:		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L 103+50E
105 N
BL 100N
BL 100 N
96 N
5034000
5033000
MO
5
7
9
13
20
40
LEGEND
Road
Trenches
Creek
Swamp, Seepage Zones
Anomaly
0 100 200 300 400
METRES
SELCO DIVISION -
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EMERSON CLAIMS
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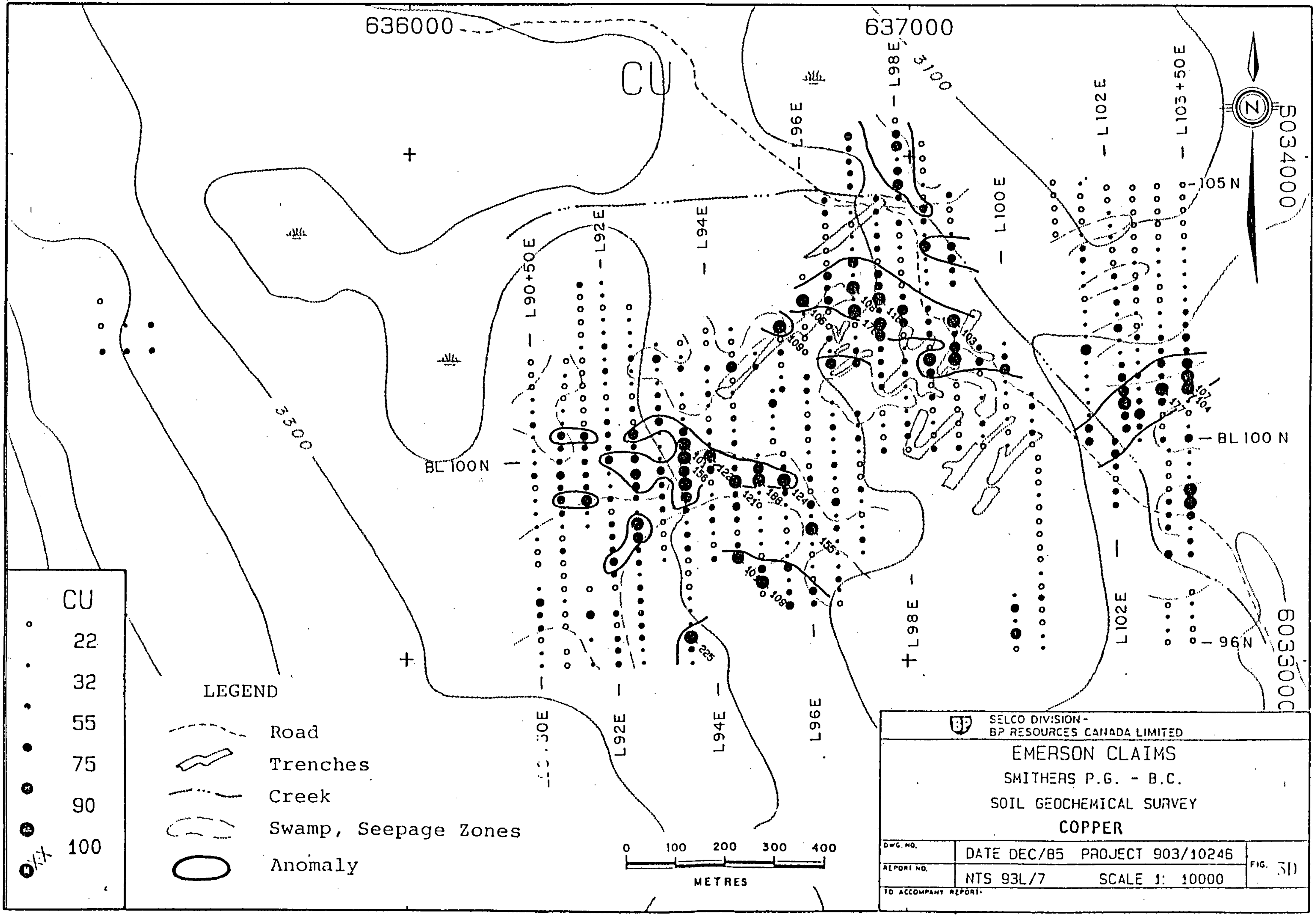
SOIL GEOCHEMICAL SURVEY
MOLYBDENUM
DWG. NO.
DATE DEC/85 PROJECT 903/10246
FIG.
REPORT NO.
NTS 93L/7 SCALE 1: 10000
TO ACCOMPANY REPORT:



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L98E
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L102E
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BL 100 N
96 N
5034000
5033000
3100
3300
CU
22
32
55
75
90
100
LEGEND
Road
Trenches
Creek
Swamp, Seepage Zones
Anomaly
0 100 200 300 400
METRES
SELCO DIVISION -
BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
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SOIL GEOCHEMICAL SURVEY
COPPER
DWG. NO.
DATE DEC/85 PROJECT 903/10246
REPORT NO.
NTS 93L/7 SCALE 1: 10000
FIG. 5D
TO ACCOMPANY REPORT:

500 metres. Peak enrichment is 188 ppm, roughly 7X background.

Numerous copper anomalies defining a northwesterly trend and coinciding with enriched gold, silver and molybdenum are found over the trenched zone. Maximum copper enhancement ranges from 100 ppm to 176 ppm.

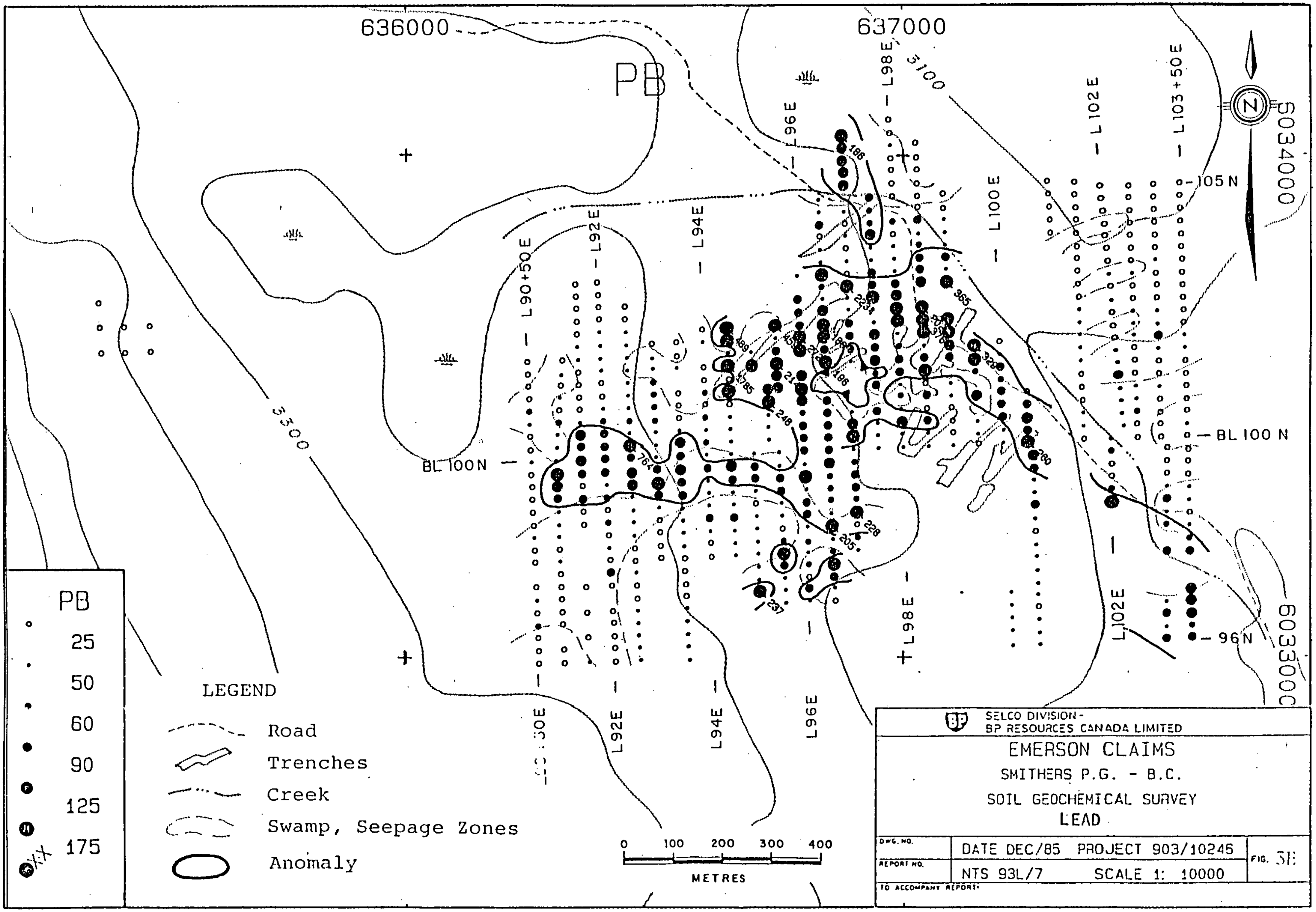
Enriched copper (up to 177 ppm) in soils forms a northeasterly trending anomaly that extends off the eastern grid boundary.

5. Lead (Fig. 3E)

Enhanced lead in soils describes a single anomaly similar to silver having several higher concentrations cores.

The west to northwesterly portion of the anomaly correlates to elevated silver, molybdenum and copper in the southwest quadrant of the grid. Maximum concentration is 764 ppm.

Enrichment is greatest (400-2200 ppm) over the western half of the trenched zone. Southwesterly and southeasterly trending extensions are observed leading from the trench zone. A small, moderate grade anomaly lies on the northen tip of the grid 50 to 75 metres from the trench zone.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L 98 E
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BL 100 N
96 N
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5033000
N
PB
25
50
60
90
125
175
LEGEND
Road
Trenches
Creek
Swamp, Seepage Zones
Anomaly
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100
200
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400
METRES
SELCO DIVISION -
BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
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SOIL GEOCHEMICAL SURVEY
LEAD
DWG. NO.
REPORT NO.
TO ACCOMPANY REPORT:
DATE DEC/85
PROJECT 903/10245
NTS 93L/7
SCALE 1: 10000
FIG. 3E

6. Zinc (Fig. 3F)

Anomalous zinc defines three zones. The largest lies in the southwest grid quadrant similar to molybdenum, copper and lead. Maximum values are from 400 to 656 ppm.

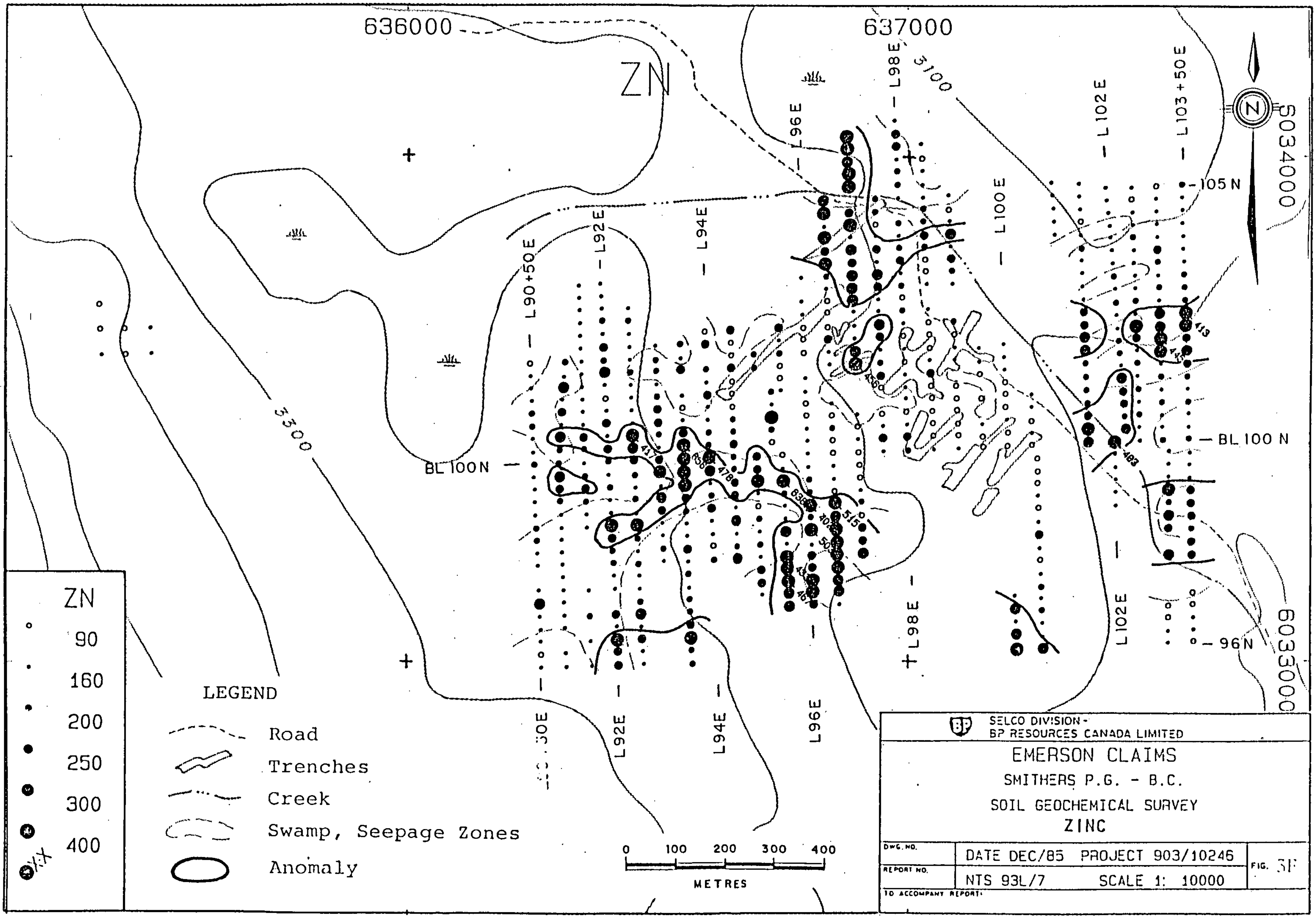
A four sample anomaly is found in the trenched zone, peak concentration is 456 ppm. A moderate grade zinc anomaly extends off the grid north of the trenched zone. Several anomalies are found on the east edge of the grid roughly corresponding to a zone of anomalous copper.

7. Arsenic (Fig. 3G)

Enriched arsenic in soils cluster in the south-central, north-central and southeastern portions of the grid. Anomalous levels range from 50 ppm to 301 ppm. A northeasterly trend is suggested in each case.

8. Antimony (Fig. 3H)

Antimony does not describe a well defined pattern of anomalies as seen in previous elements. Elevated values are generally found in the central portion of the grid. Maximum concentration of antimony in soil is 41 ppm.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96 N
5034000
5033000
N
ZN
90
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LEGEND
Road
Trenches
Creek
Swamp, Seepage Zones
Anomaly
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METRES
SELCO DIVISION -
BP RESOURCES CANADA LIMITED
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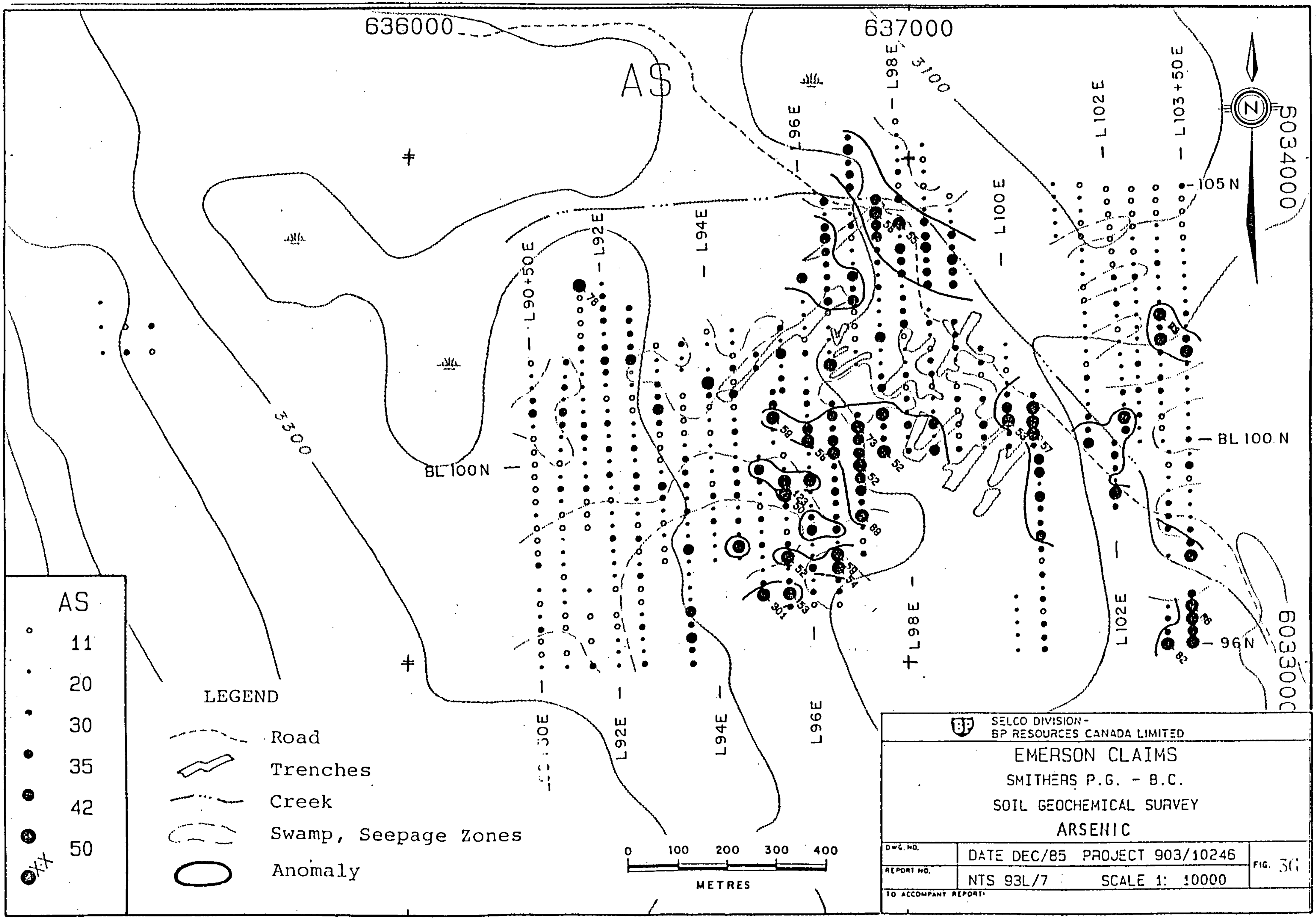
SOIL GEOCHEMICAL SURVEY
ZINC
DWG. NO.
DATE DEC/85
PROJECT 903/10246
REPORT NO.
NTS 93L/7
SCALE 1: 10000
TO ACCOMPANY REPORT:
FIG. 5F



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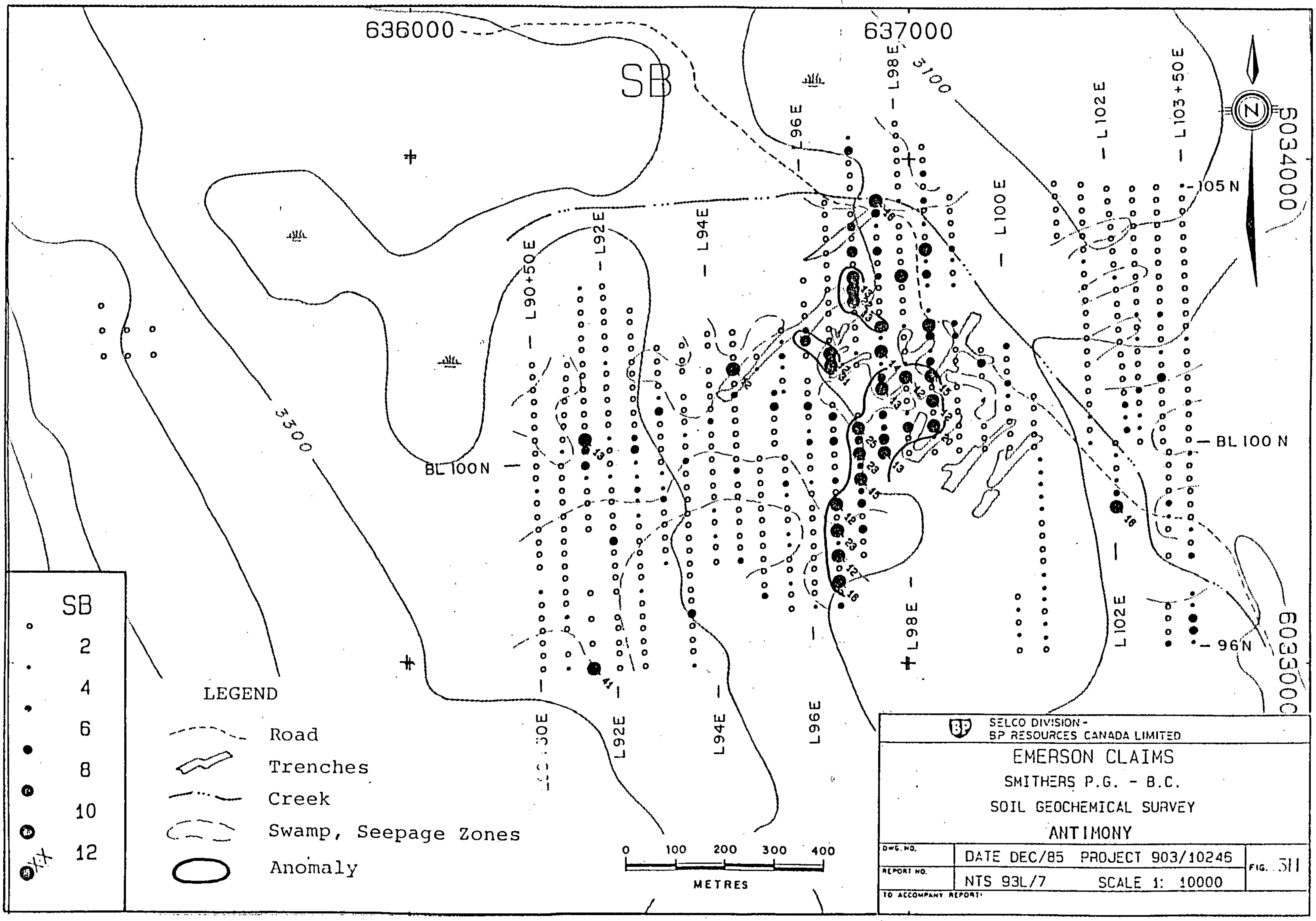
SOIL GEOCHEMICAL SURVEY

ARSENIC

DWG. NO.	DATE DEC/85 PROJECT 903/10246	FIG. 3G
REPORT NO.	NTS 93L/7 SCALE 1: 10000	
TO ACCOMPANY REPORT		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BL 100N
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L 98 E
L 100 E
L 102 E
L 103+50 E
SB
2
4
6
8
10
12
LEGEND
Road
Trenches
Creek
Swamp, Seepage Zones
Anomaly
0 100 200 300 400
METRES
SELCO DIVISION - BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
SMITHERS P.G. - B.C.
SOIL GEOCHEMICAL SURVEY
ANTIMONY
DATE DEC/85 PROJECT 903/10246
NTS 93L/7 SCALE 1: 10000
FIG. 5H

9. Nickel (Fig. 3I)

Anomalous nickel is present in three areas; in the southwest quadrant, north of the trench zone and along the east edge of the grid. Highest concentrations are 40 to 74 ppm, a 3 to 5 fold increase over background.

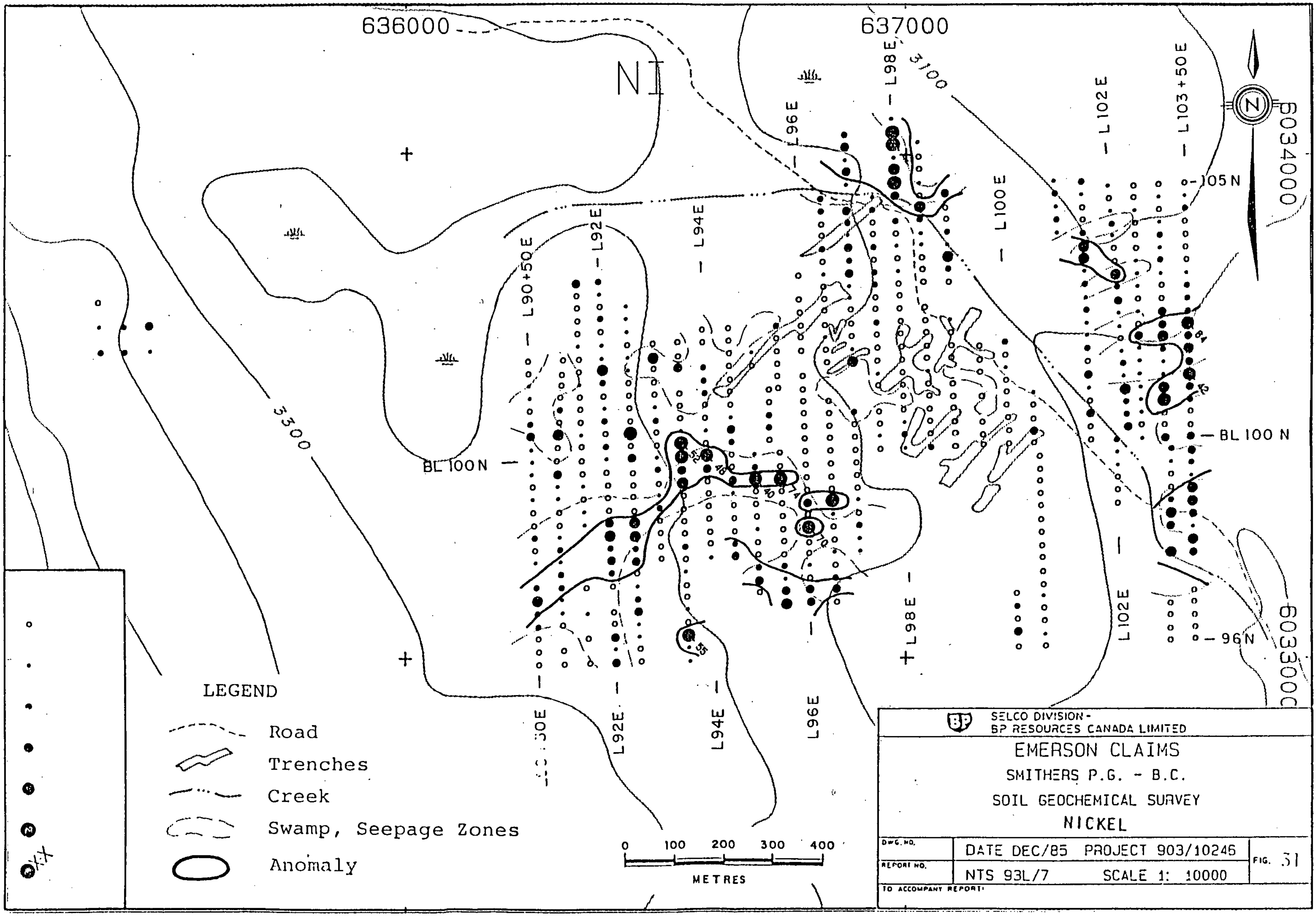
10. Manganese (Fig. 3J)

Anomalous manganese is observed coincident to the multielement enhancement zone in the southwest grid quadrant. Peak soil concentrations range from 3500 to 19,800 ppm.

Moderately enhanced manganese levels correlating to anomalous nickel, zinc and lead lies north of the trench zone. Background concentrations predominate over the trenched area. Manganese forms several anomalies on the east edge of the grid similar to nickel, zinc and lead.

11. Iron (Fig. 3K)

Anomalous iron levels are principally found over the trenched area with an extension to the southeast. Elevated values range from 8% to 16%. Anomaly distribution resembles the lead pattern best, elevated iron values are absent in the southwest grid quadrant.



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L 103+50E
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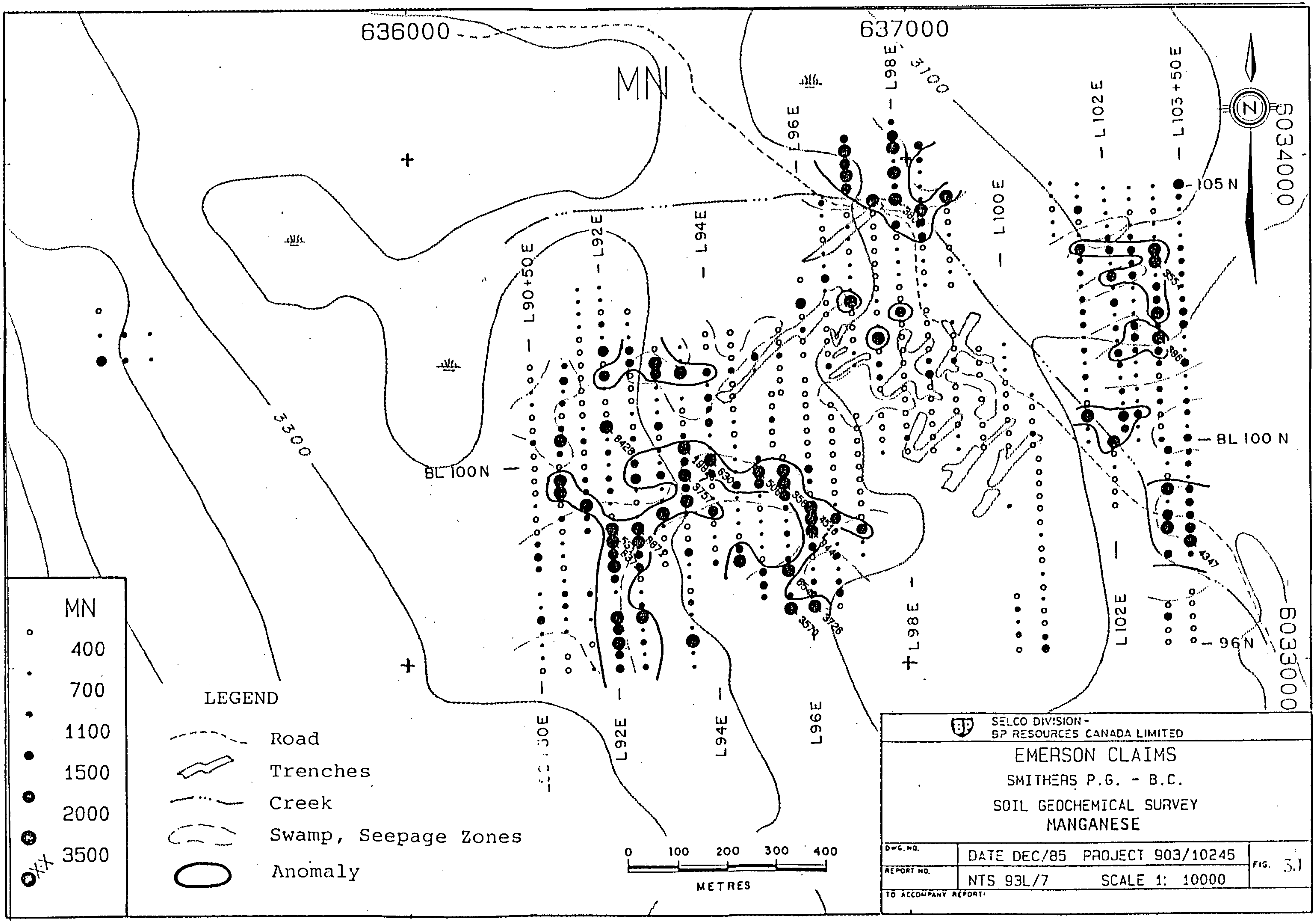
BL 100N
BL 100 N
96N
52
48
40
74
70
55
84
42
LEGEND
Road
Trenches
Creek
Swamp, Seepage Zones
Anomaly
0 100 200 300 400
METRES
SELCO DIVISION -
BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
SMITHERS P.G. - B.C.
SOIL GEOCHEMICAL SURVEY
NICKEL
DWG. NO.
DATE DEC/85
PROJECT 903/10246
FIG. 51
REPORT NO.
NTS 93L/7
SCALE 1: 10000
TO ACCOMPANY REPORT:



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Trenches
Creek
Swamp, Seepage Zones
Anomaly
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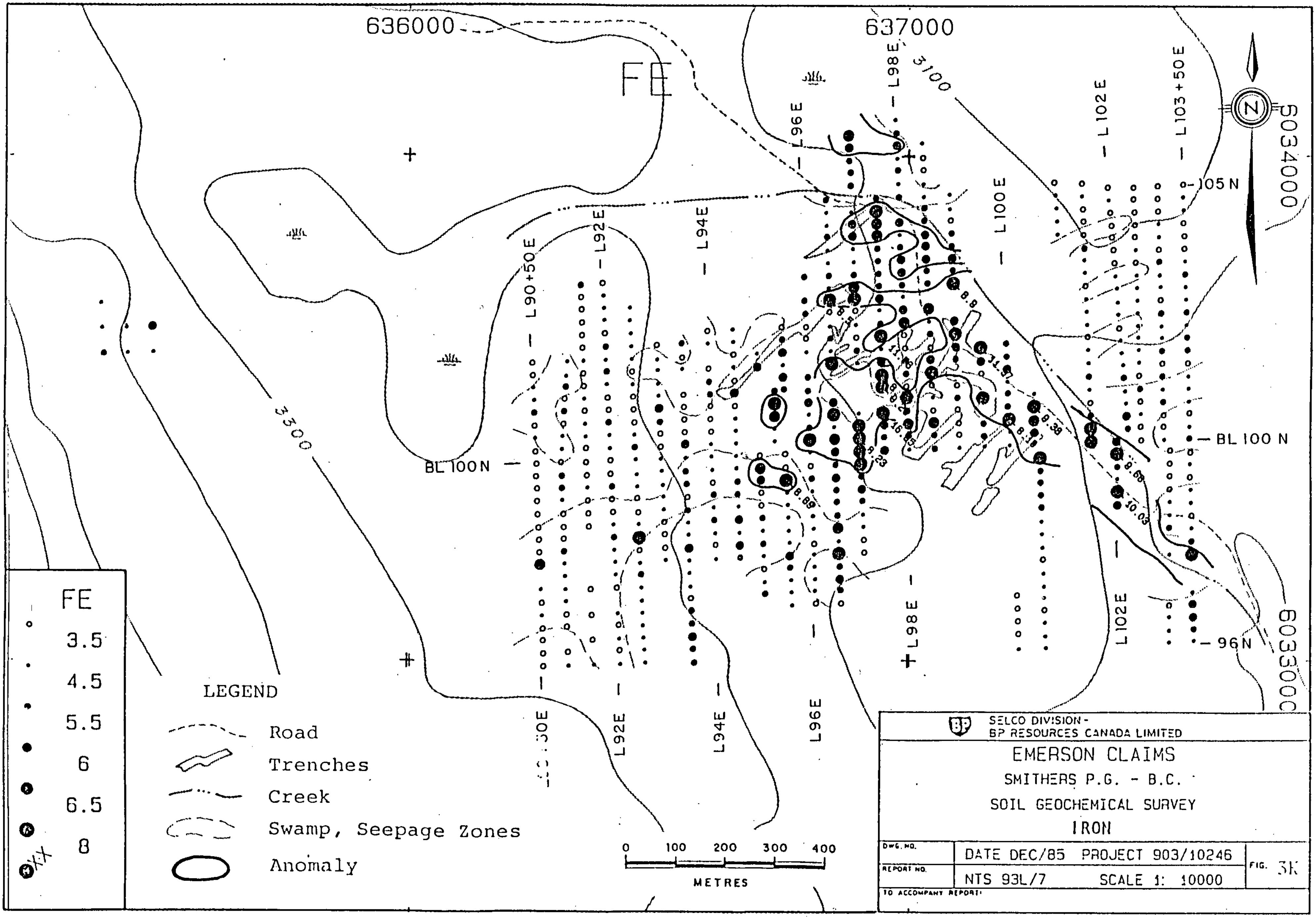
METRES
SELCO DIVISION -
BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
SMITHERS P.G. - B.C.
SOIL GEOCHEMICAL SURVEY
MANGANESE
DWG. NO.
DATE DEC/85
PROJECT 903/10246
REPORT NO.
NTS 93L/7
SCALE 1: 10000
TO ACCOMPANY REPORT:
FIG. 3.1



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6.5
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LEGEND
Road
Trenches
Creek
Swamp, Seepage Zones
Anomaly
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400
METRES
SELCO DIVISION -
BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
SMITHERS P.G. - B.C.
SOIL GEOCHEMICAL SURVEY
IRON
DWG. NO.
DATE DEC/85
PROJECT 903/10246
FIG. 3K
REPORT NO.
NTS 93L/7
SCALE 1: 10000
TO ACCOMPANY REPORT:

12. Cobalt (Fig. 3L)

Elevated cobalt levels correlate well to all zones of base metal enrichment. Concentrations in these areas are generally at enhanced background to threshold levels. Maximum concentrations range from 24 ppm to 123 ppm.

13. Cadmium (Fig. 3M)

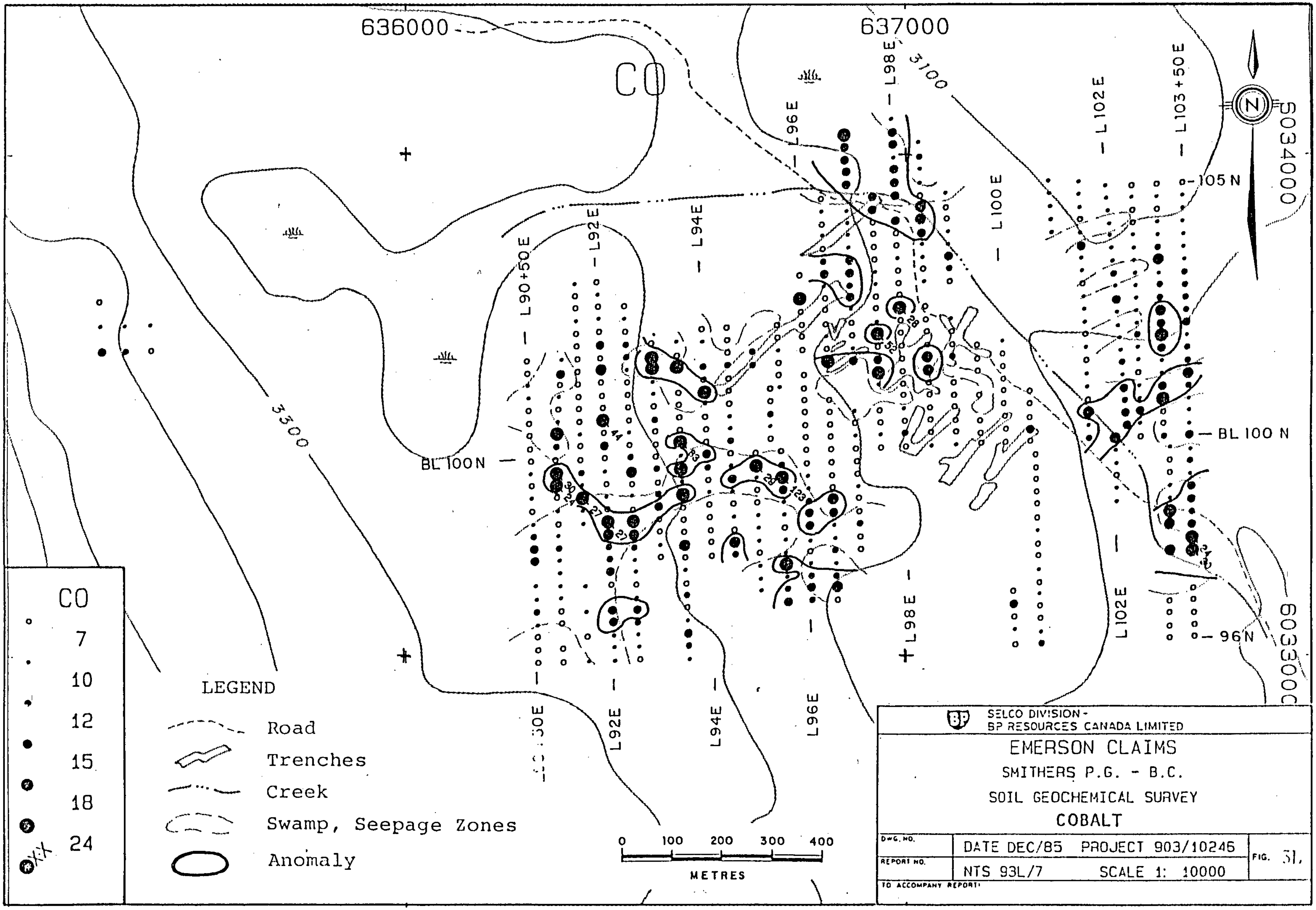
Thirteen samples contain cadmium in detectable amounts, highest concentration is 14 ppm. Cadmium follows zinc in its distribution pattern.

14. Vanadium (Fig. 3N)

The vanadium plot is very noisy having a shot-gun pattern of anomalous samples indicating random distribution of a normal background range of values.

15. Barium (Fig. 3Ø)

Enhanced barium forms soil anomalies in the southwest quadrant, over the trenched area and along the northedge of the grid. Trend directions are predominantly to the northwest. Peak concentrations are from 500 to 1200 ppm.



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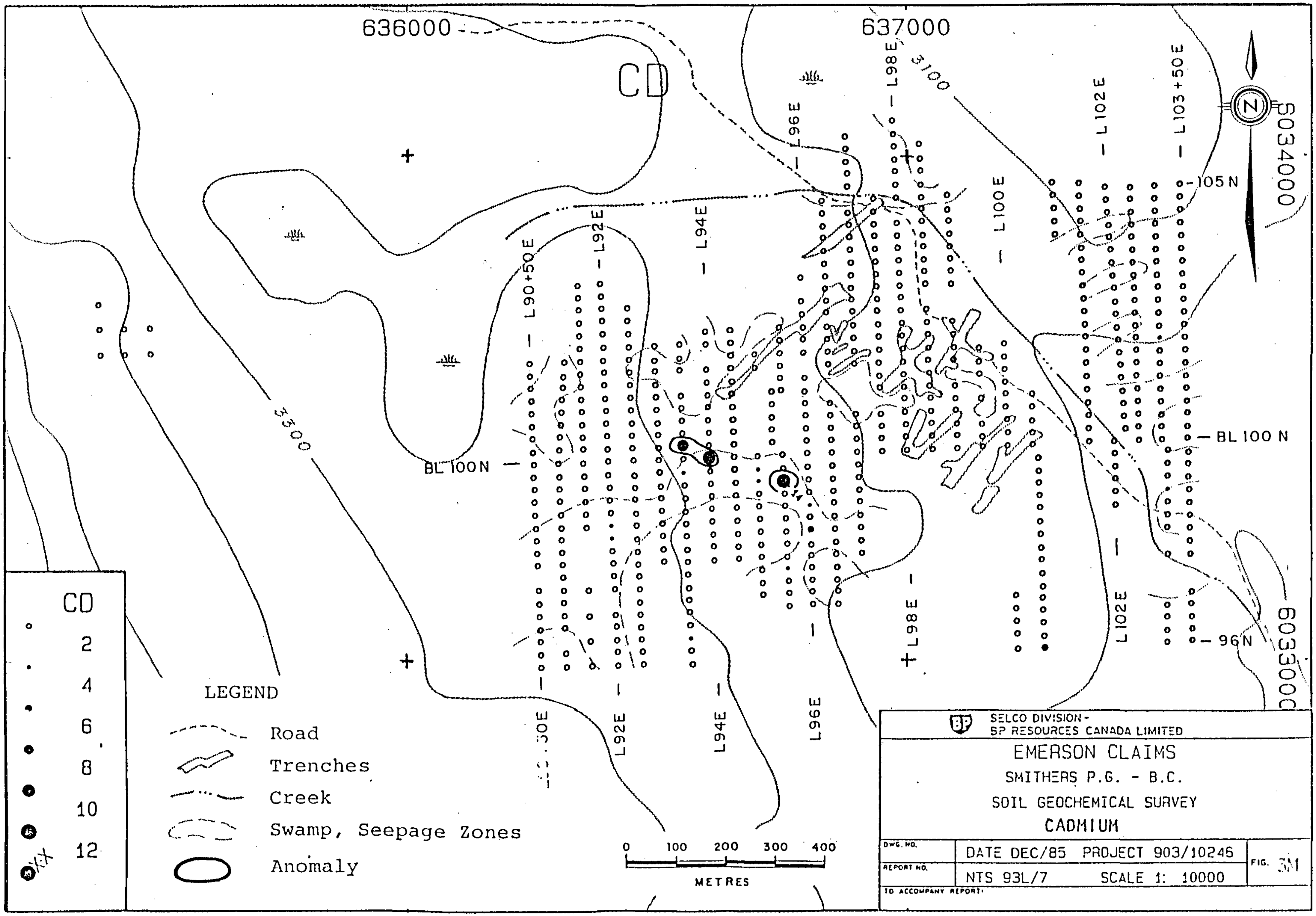
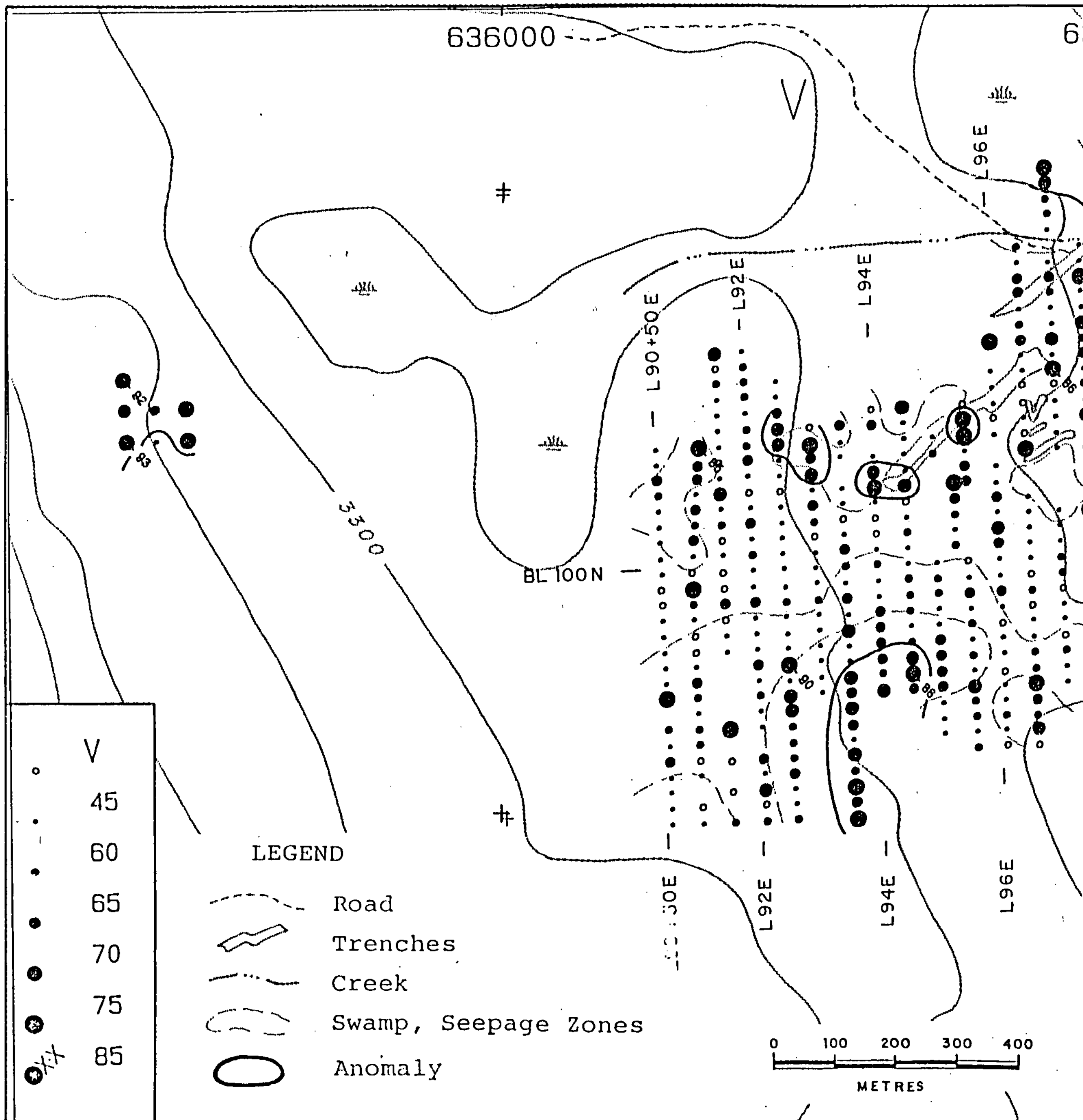
BL 100 N
BL 100N
96N
5034000
5033000
CO
7
10
12
15
18
24
LEGEND
Road
Trenches
Creek
Swamp, Seepage Zones
Anomaly
0 100 200 300 400
METRES
SELCO DIVISION - BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
SMITHERS P.G. - B.C.
SOIL GEOCHEMICAL SURVEY
COBALT
DWG. NO.
DATE DEC/85 PROJECT 903/10246
FIG. 31
REPORT NO.
NTS 93L/7 SCALE 1: 10000
TO ACCOMPANY REPORT



636000
637000
CD
3100
3300
L90+50E
L92E
L94E
L96E
L98E
L100E
L102E
L103+50E
105N
BL 100 N
BL 100N
96N
5034000
5033000
N
CD
2
4
6
8
10
12
LEGEND
Road
Trenches
Creek
Swamp, Seepage Zones
Anomaly
0
100
200
300
400
METRES
SELCO DIVISION -
BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
SMITHERS P.G. - B.C.
SOIL GEOCHEMICAL SURVEY
CADMIUM
DWG. NO.
REPORT NO.
TO ACCOMPANY REPORT:
DATE DEC/85
PROJECT 903/10246
NTS 93L/7
SCALE 1: 10000
FIG. 3M



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BP RESOURCES CANADA LIMITED

EMERSON CLAIMS

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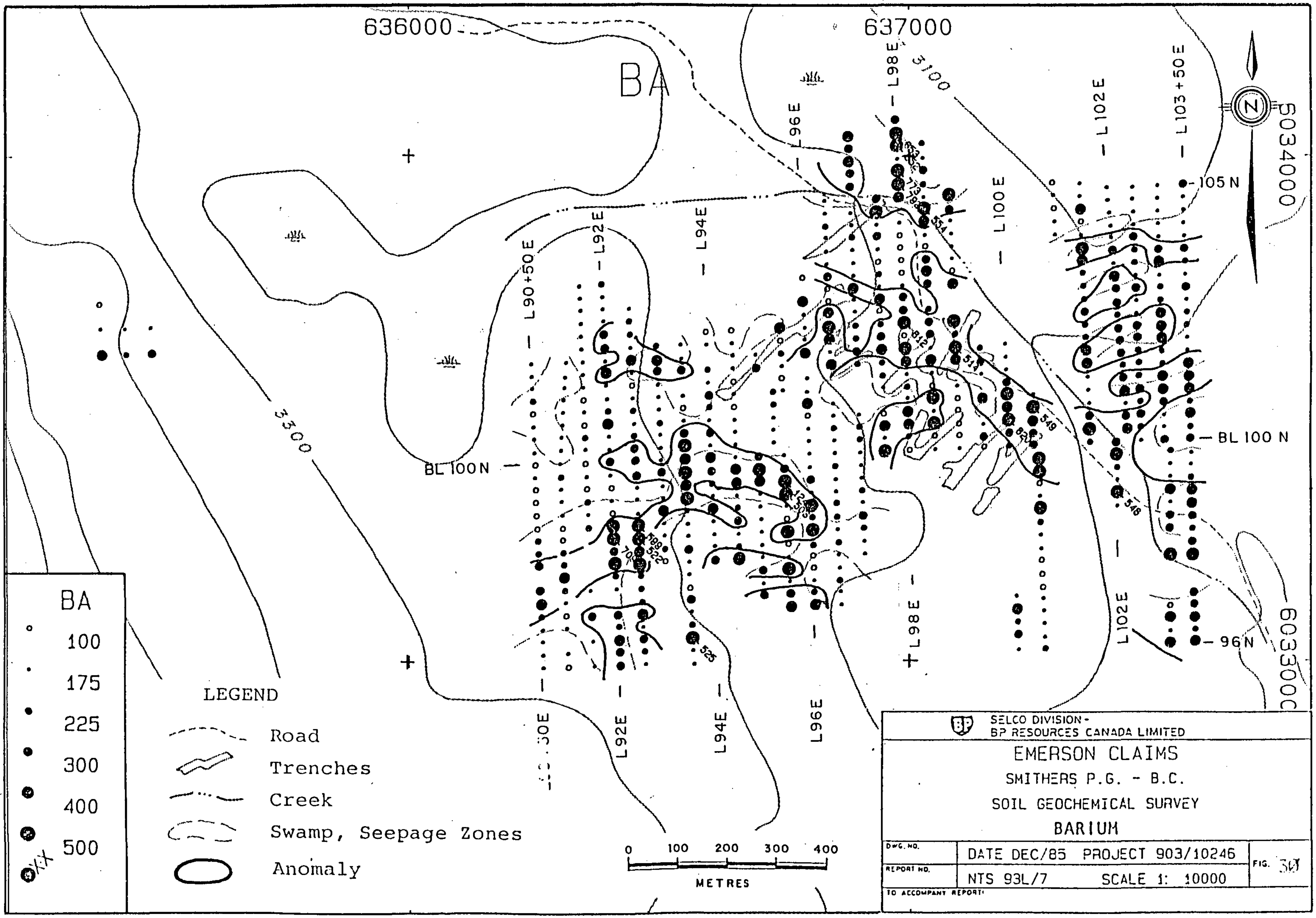
SOIL GEOCHEMICAL SURVEY

VANADIUM

DWG. NO.	DATE DEC/85 PROJECT 903/10246	FIG. 5N
REPORT NO.	NTS 93L/7 SCALE 1: 10000	
TO ACCOMPANY REPORT:		



636000
637000
BA
3100
3300
L90+50E
L92E
L94E
L96E
L98E
L100E
L102E
L103+50E
105 N
BL 100 N
96 N
6034000
6033000
N
BA
100
175
225
300
400
500
LEGEND
Road
Trenches
Creek
Swamp, Seepage Zones
Anomaly
0 100 200 300 400
METRES
SELCO DIVISION -
BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
SMITHERS P.G. - B.C.
SOIL GEOCHEMICAL SURVEY
BARIUM
DWG. NO.
DATE DEC/85 PROJECT 903/10246
REPORT NO.
NTS 93L/7 SCALE 1: 10000
FIG.
TO ACCOMPANY REPORT

16. Strontium (Fig. 3P)

Anomaly patterns for strontium are nearly identical to calcium. Scattered enriched strontium samples are noted associated with the trenched zone. Peak concentration is 151 ppm.

17. Aluminum (Fig. 3Q)

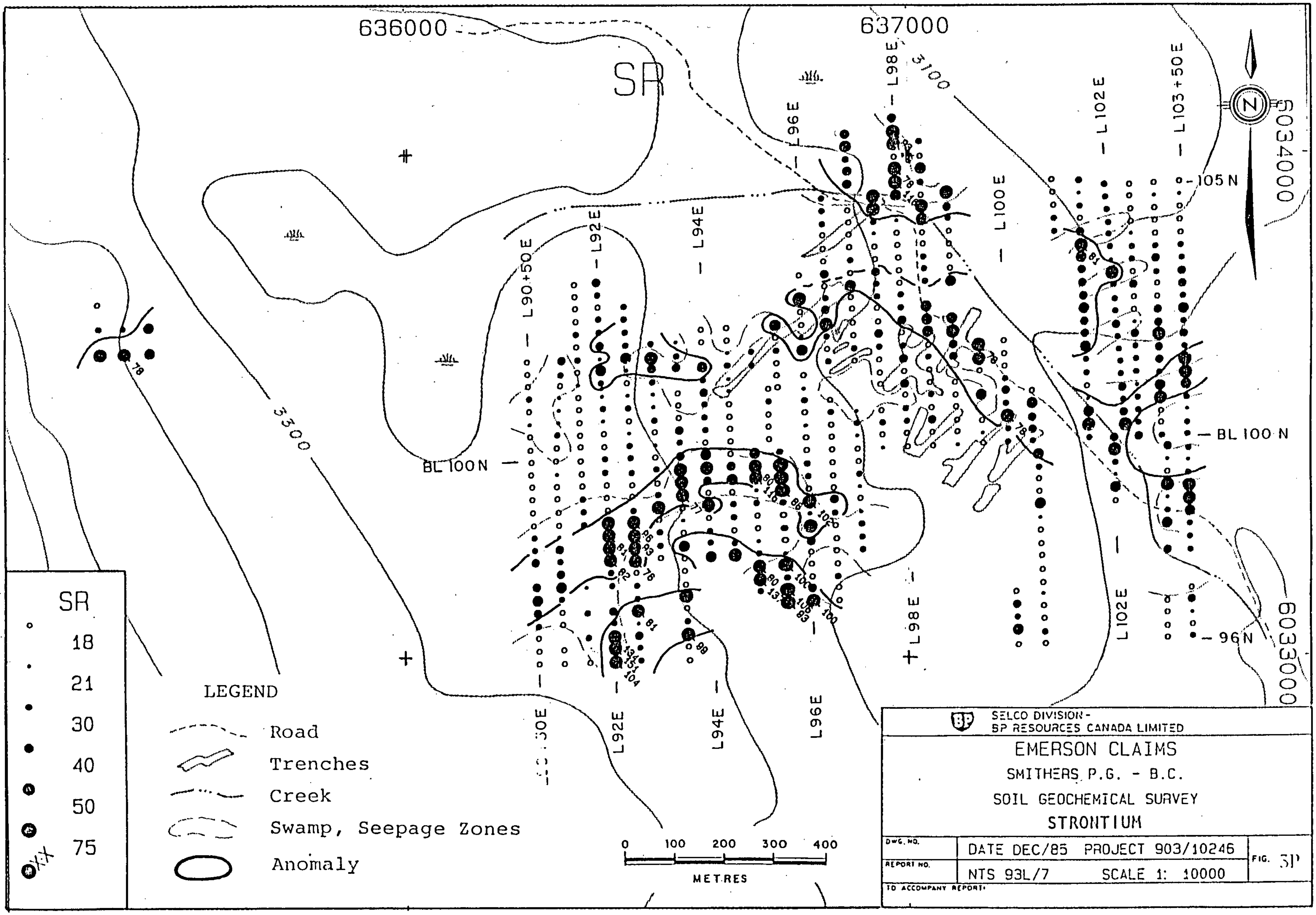
The aluminum distributin pattern is fairly similar to vanadium in that it exhibits a high degree of anomaly randomness. A slightly higher concentration of enhanced sample sites is noted north of the trenched areas.

18. Calcium (Fig. 3R)

Four, well defined calcium anomalies are observed in the southwest quadrant, in the northwest grid corner, north of the trenched zone and along the east edge of the grid. Elevated concentrations vary from 0.9 to 2.39%.

19. Magnesium (Fig. 3S)

Magnesium follows calcium and strontium in the distribution of anomalies. Peak enhancement is 1.45%.



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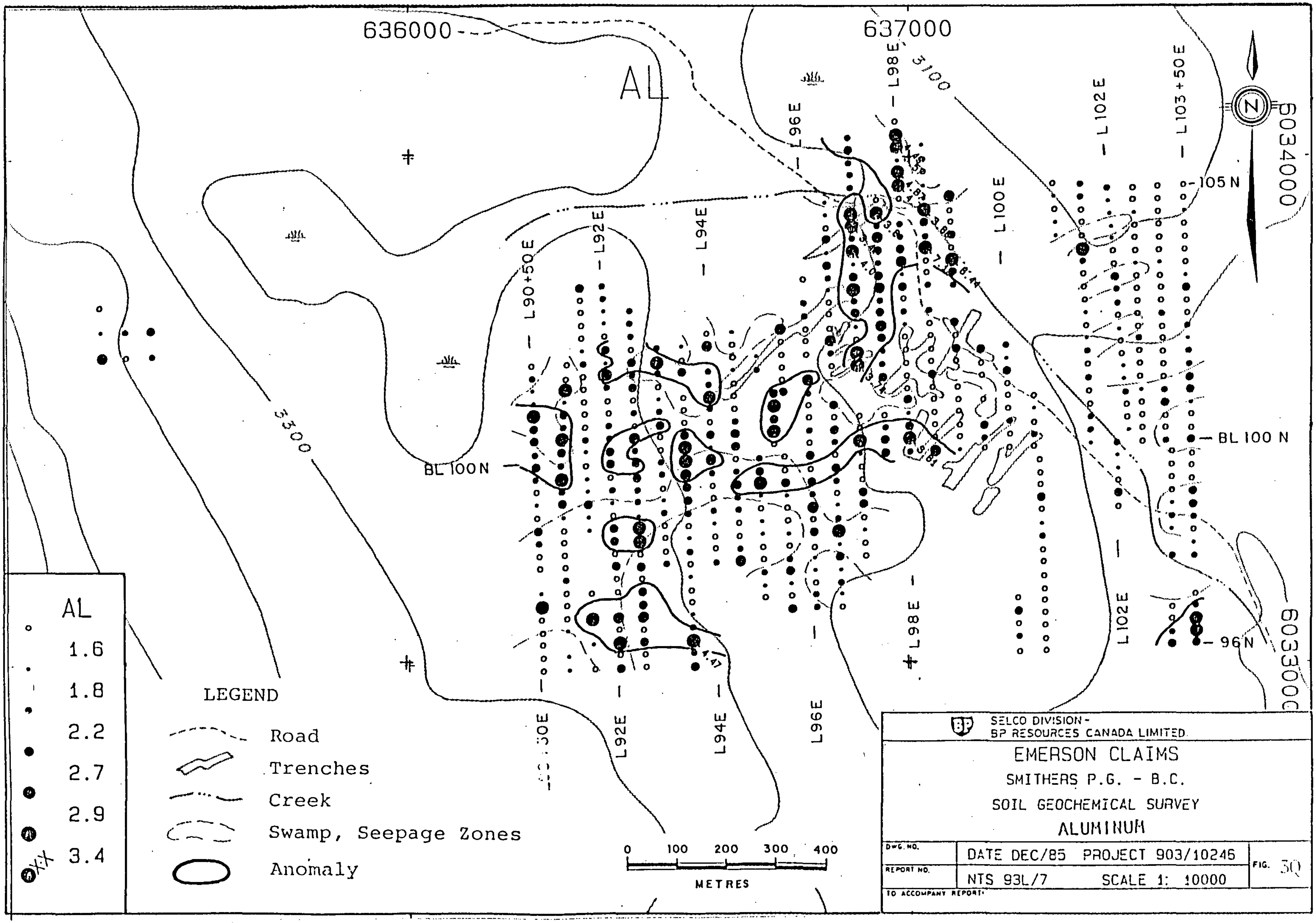
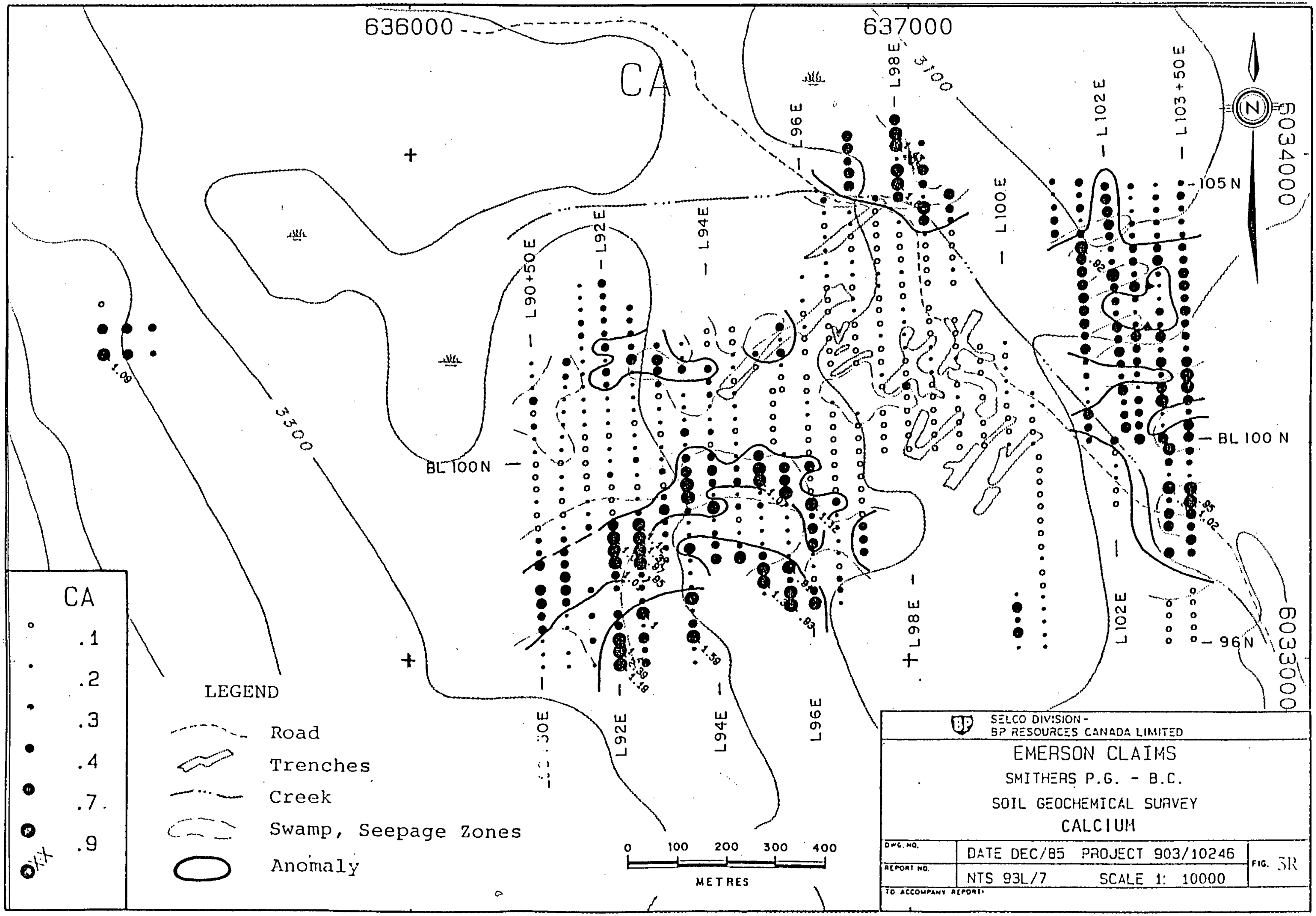
SOIL GEOCHEMICAL SURVEY

STRONTIUM

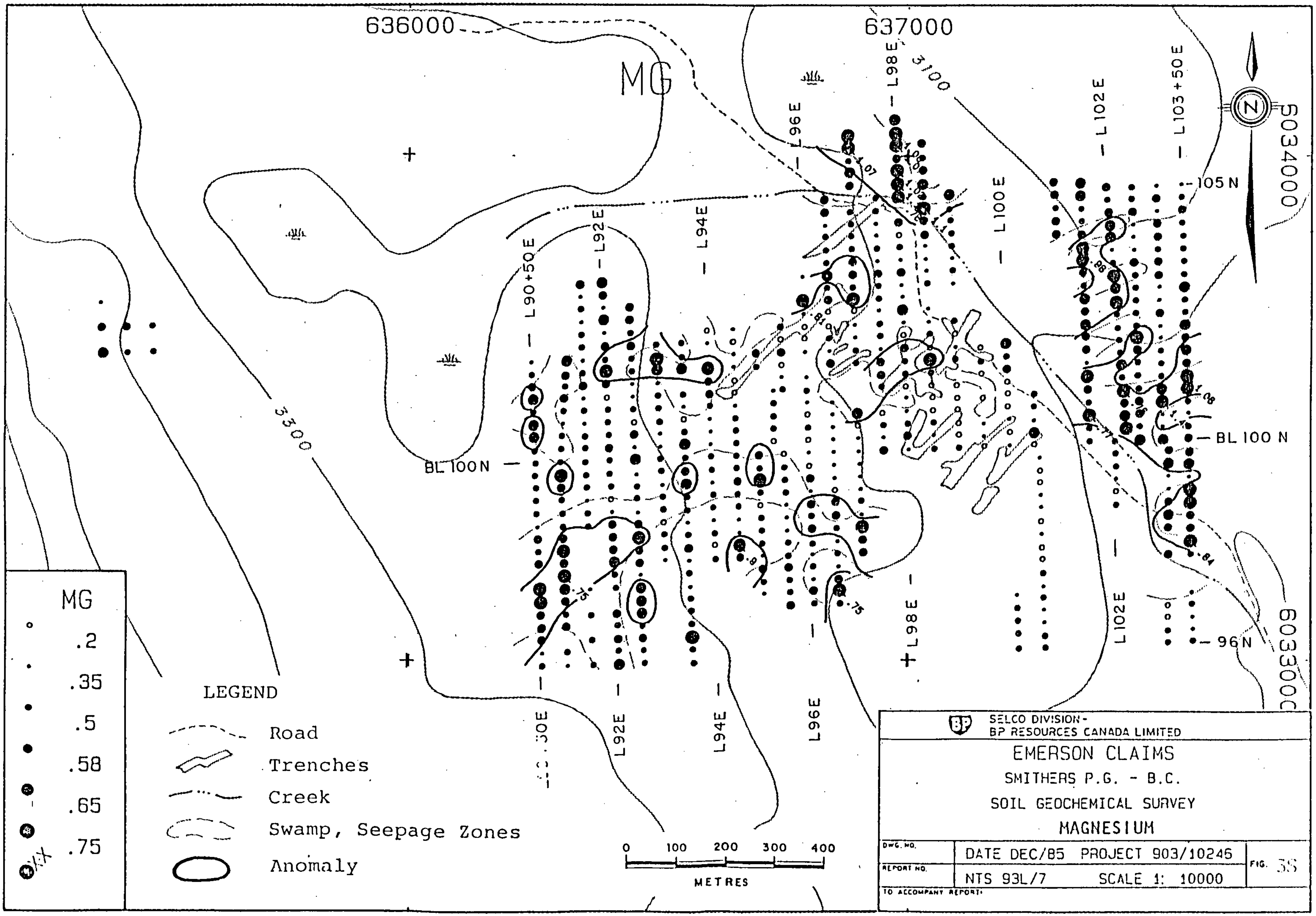
DWG. NO.	DATE DEC/85	PROJECT 903/10246	FIG. 5P
REPORT NO.	NTS 93L/7	SCALE 1: 10000	
TO ACCOMPANY REPORT:			



636000
637000
AL
6034000
6033000
105 N
BL 100 N
96 N
L 90+50 E
L 92 E
L 94 E
L 96 E
L 98 E
L 100 E
L 102 E
L 103+50 E
3100
3300
AL
1.6
1.8
2.2
2.7
2.9
3.4
LEGEND
Road
Trenches
Creek
Swamp, Seepage Zones
Anomaly
0 100 200 300 400
METRES
SELCO DIVISION - BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
SMITHERS P.G. - B.C.
SOIL GEOCHEMICAL SURVEY
ALUMINUM
DATE DEC/85 PROJECT 903/10246
NTS 93L/7 SCALE 1: 10000
FIG. 30



636000
637000
CA
6034000
6033000
3300
3100
L90+50E
L92E
L94E
L96E
L98E
L100E
L102E
L103+50E
105N
BL 100N
96N
CA
.1
.2
.3
.4
.7
.9
XX
LEGEND
Road
Trenches
Creek
Swamp, Seepage Zones
Anomaly
0 100 200 300 400
METRES
SELCO DIVISION -
BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
SMITHERS P.G. - B.C.
SOIL GEOCHEMICAL SURVEY
CALCIUM
DWG. NO.
REPORT NO.
TO ACCOMPANY REPORT:
DATE DEC/85 PROJECT 903/10246
NTS 93L/7 SCALE 1: 10000
FIG. 5R



636000
637000
MG
3100
3300
L 90+50 E
L 92 E
L 94 E
L 96 E
L 98 E
L 100 E
L 102 E
L 103+50 E
105 N
BL 100 N
96 N
5034000
5033000
N
MG
.2
.35
.5
.58
.65
.75
LEGEND
Road
Trenches
Creek
Swamp, Seepage Zones
Anomaly
0
100
200
300
400
METRES
SELCO DIVISION -
BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
SMITHERS P.G. - B.C.
SOIL GEOCHEMICAL SURVEY
MAGNESIUM
DWG. NO.
REPORT NO.
TO ACCOMPANY REPORT:
DATE DEC/85
PROJECT 903/10245
NTS 93L/7
SCALE 1: 10000
FIG. 3S

20. Potassium (Fig. 3T)

A single potassium anomaly is observed trending to the northwest across the trenched area. Anomalous concentrations range from 0.2% to .56%.

21. Phosphorus (Fig. 3U)

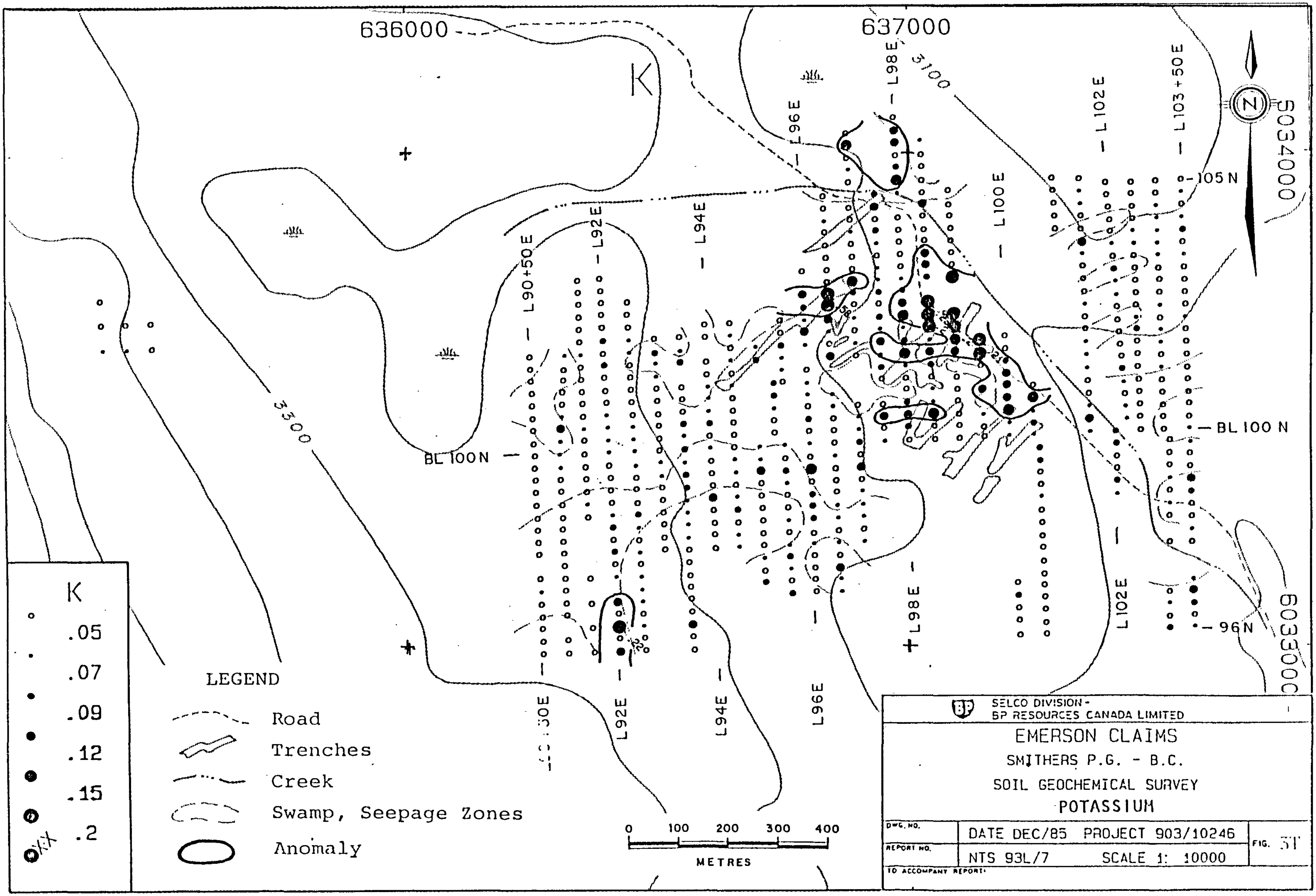
A well developed phosphorus anomaly extends from the trenched areas in the grid centre to southeastwards to the grid corner. Enriched values range from 0.40% to 0.83%. Elevated background values are noted in the multielement zone.

22. Chromium (Fig. 3V)

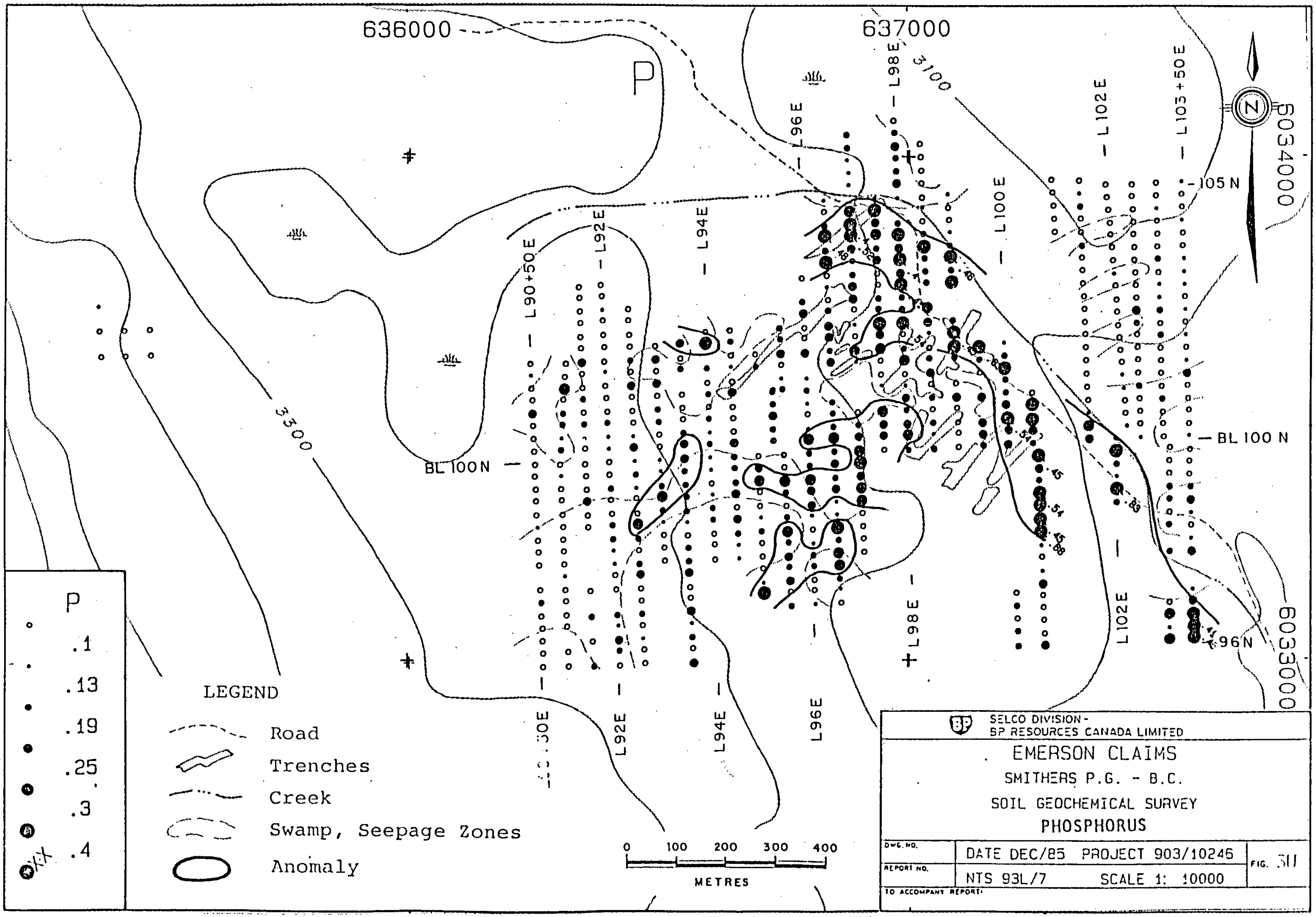
Anomalous chromium samples are predominantly scattered across the grid in a random manner. Multisample anomalies are found along the eastern and northern grid edges. Concentrations are low, the highest value (49 ppm) is less than twice the background average of 28 ppm.

23. Lanthanum (Fig. 3W)

Low to moderately anomalous (maximum 52 ppm) levels of lanthanum are observed along the northern and eastern grid edges, over the trenched zone and in the southwest quadrant.



636000
637000
K
3100
3300
L90+50E
L92E
L94E
L96E
L98E
L100E
L102E
L103+50E
105 N
BL 100 N
96N
5034000
6033000
K
.05
.07
.09
.12
.15
.2
LEGEND
Road
Trenches
Creek
Swamp, Seepage Zones
Anomaly
0
100
200
300
400
METRES
SELCO DIVISION -
BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
SMITHERS P.G. - B.C.
SOIL GEOCHEMICAL SURVEY
POTASSIUM
DWG. NO.
REPORT NO.
TO ACCOMPANY REPORT:
DATE DEC/85
PROJECT 903/10246
NTS 93L/7
SCALE 1: 10000
FIG. 5T



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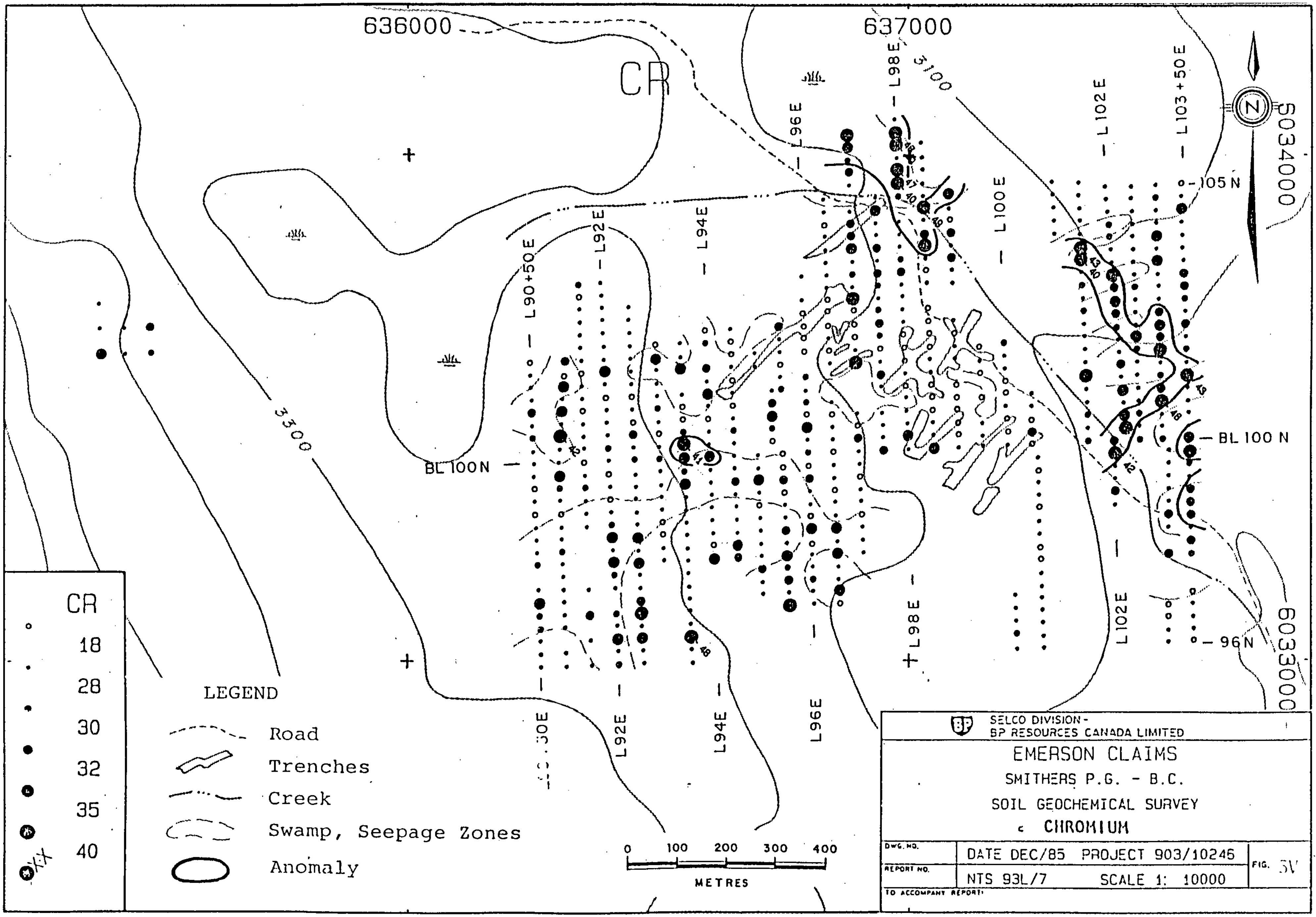
SOIL GEOCHEMICAL SURVEY

PHOSPHORUS

DWG. NO.	DATE DEC/85 PROJECT 903/10246	FIG. 30
REPORT NO.	NTS 93L/7 SCALE 1: 10000	
TO ACCOMPANY REPORT:		



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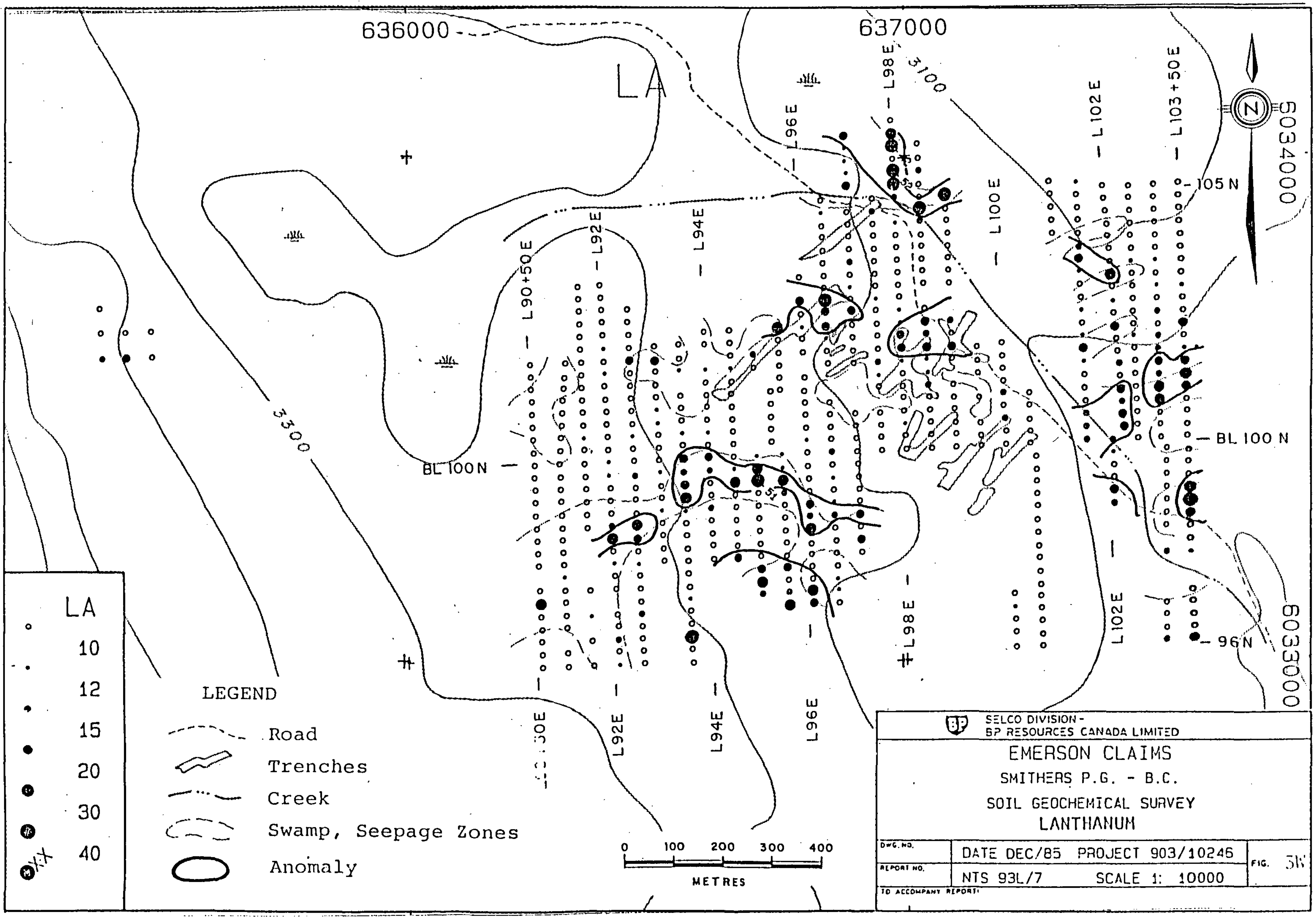
SOIL GEOCHEMICAL SURVEY

CHROMIUM

DWG. NO.	DATE DEC/85 PROJECT 903/10246	FIG. 5V
REPORT NO.	NTS 93L/7 SCALE 1: 10000	

TO ACCOMPANY REPORT:



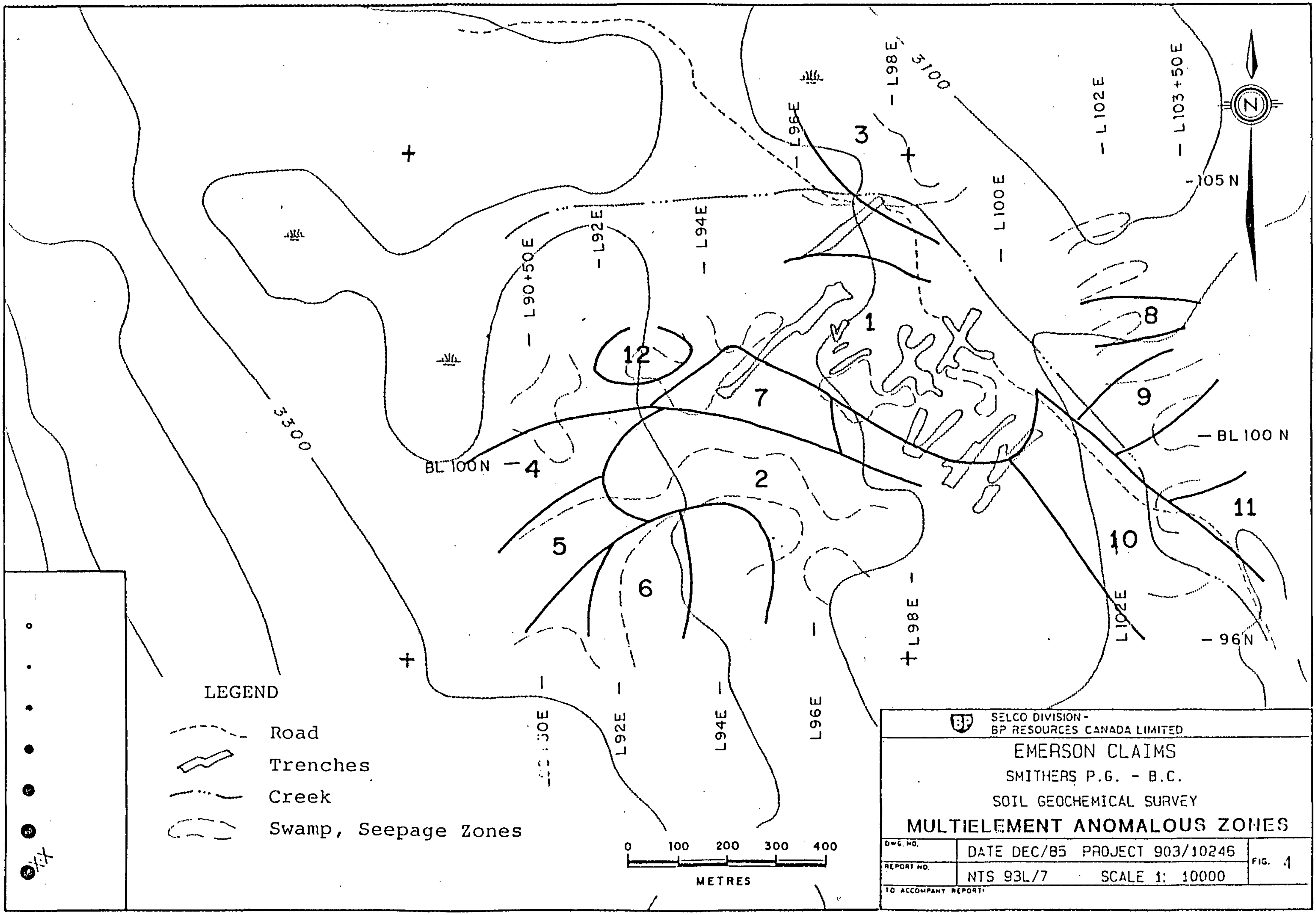
636000
637000
LA
3100
3300
L90+50E
L92E
L94E
L96E
L98E
L100E
L102E
L103+50E
105 N
BL 100 N
BL 100N
96 N
5034000
5033000
LA
10
12
15
20
30
40
LEGEND
Road
Trenches
Creek
Swamp, Seepage Zones
Anomaly
0 100 200 300 400
METRES
SELCO DIVISION -
BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
SMITHERS P.G. - B.C.
SOIL GEOCHEMICAL SURVEY
LANTHANUM
DWG. NO.
REPORT NO.
TO ACCOMPANY REPORT:
DATE DEC/85 PROJECT 903/10246
NTS 93L/7 SCALE 1: 10000
FIG.

DISCUSSION OF RESULTS

Elemental associations have been compiled on Figure 4 and Table 1. Twelve multielement associations have been highlighted. Anomaly rating scores have been tabulated for each zone by assigning a 2 for each highly anomalous base, precious and pathfinder element, a 1 for each moderately anomalous element and then summing the multielement scores for each zone.

Two areas stand out, these being; the trenched area (No. 1) and the west to southwest trending zone in the southwest quadrant of the grid (No. 2). The remaining ten zones have considerably lower scores and either form lower contrast extensions (Nos. 3, 4, 7, 10) of the two zones described above or represent geochemical features of predominantly non-ore elements (No.s 5, 6, 8, 9, 11, 12).

Silver, gold, molybdenum, copper and lead in soils outline a 400 X 300 metre enrichment zone over the trenched area in the northeastern grid quadrant (Figures 5a & 5b). Maximum concentration ranges are; gold 80-185 ppb, silver 3-11 ppm, molybdenum 20-115 ppm, copper 90-180 ppm and lead 125-2200 ppm. Highest values in soils generally lie in proximity to trenches. Sources of the anomaly is attributed to the underlying bedrock. Composite rock chip samples gathered over 10 metre intervals from



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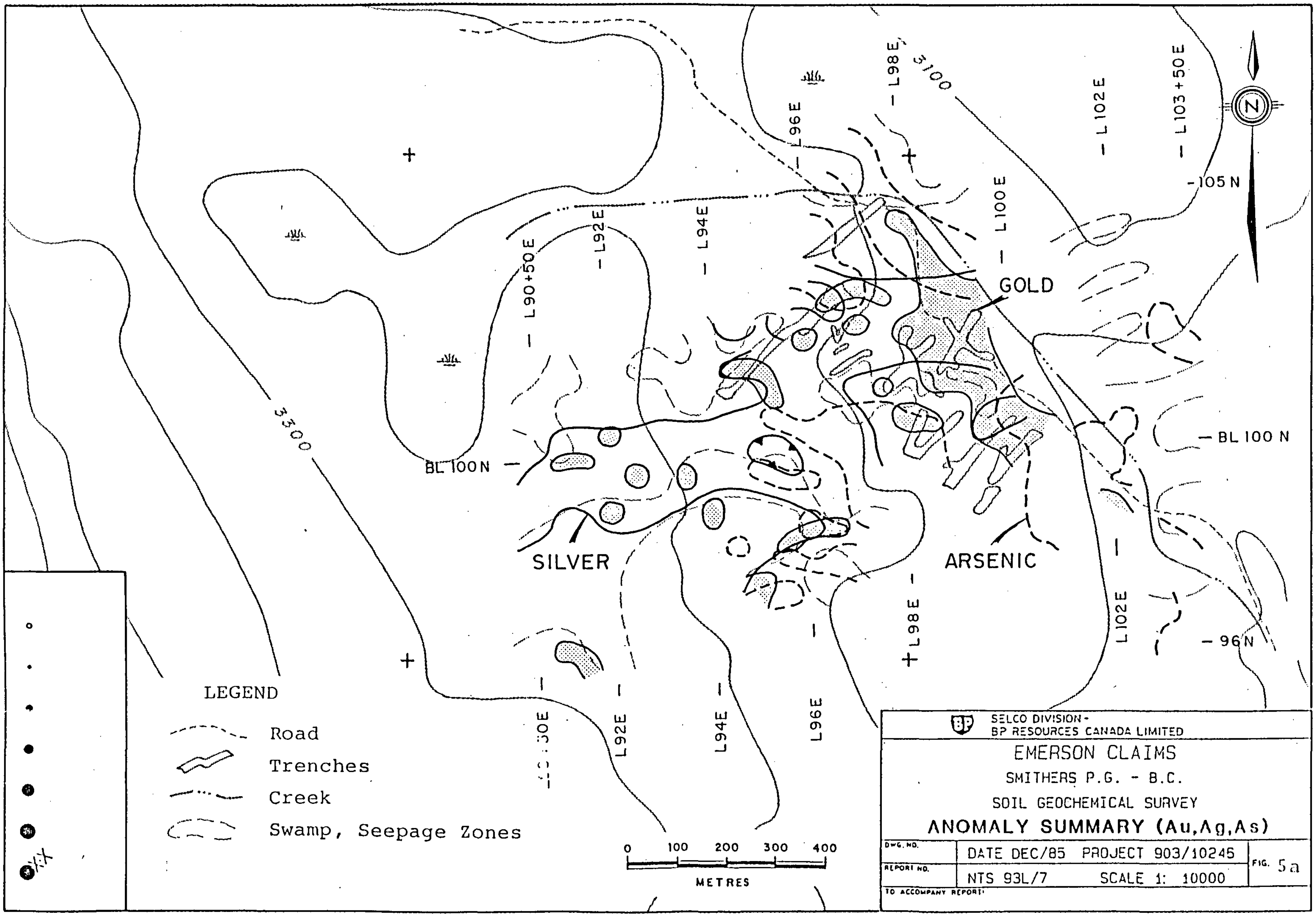
SOIL GEOCHEMICAL SURVEY

MULTIELEMENT ANOMALOUS ZONES

DWG. NO.	DATE DEC/85 PROJECT 903/10246	FIG. 4
REPORT NO.	NTS 93L/7 SCALE 1: 10000	
TO ACCOMPANY REPORT:		



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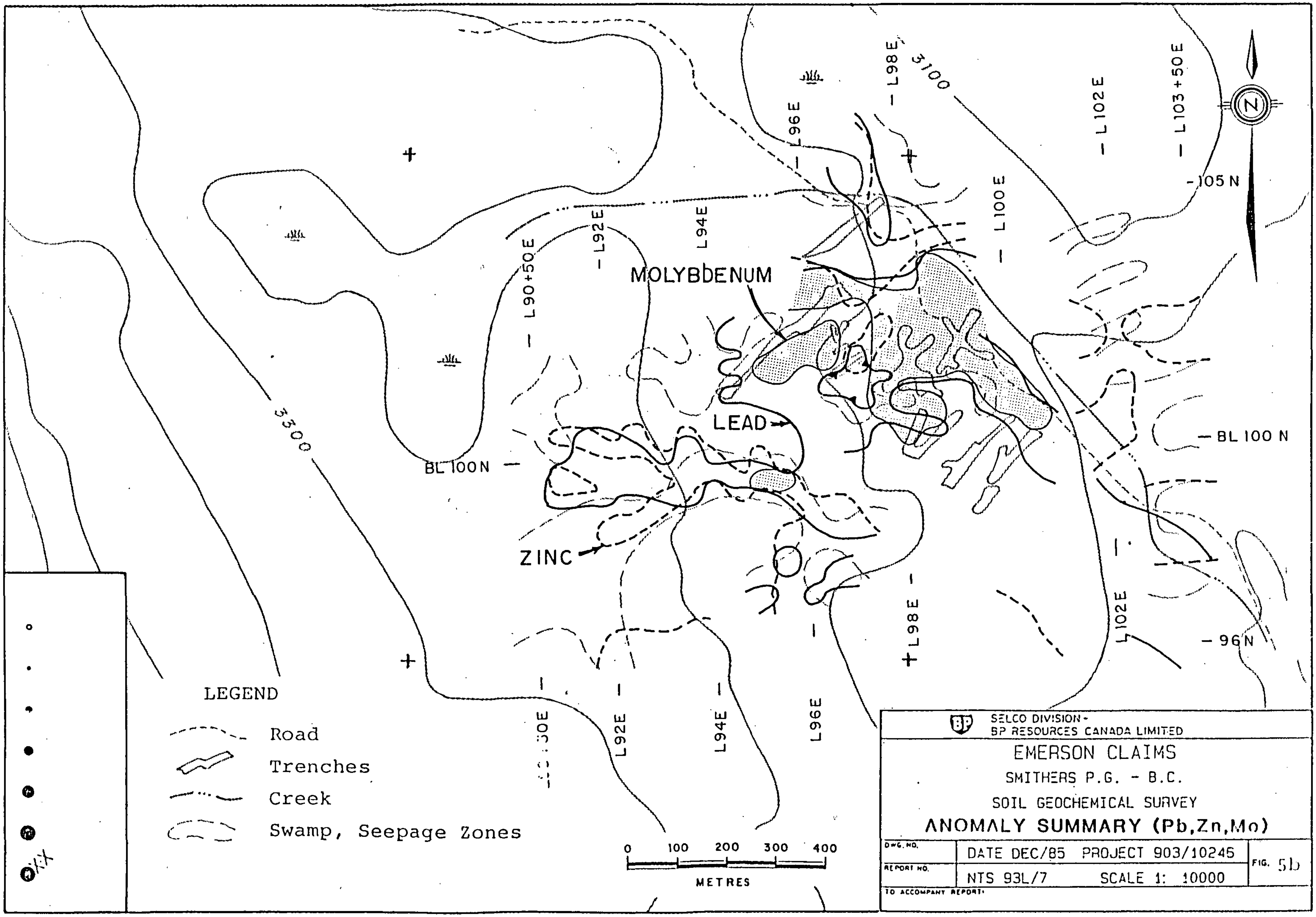
SOIL GEOCHEMICAL SURVEY

ANOMALY SUMMARY (Au,Ag,As)

DWG. NO.	DATE DEC/85 PROJECT 903/10245	FIG. 5a
REPORT NO.	NTS 93L/7 SCALE 1: 10000	
TO ACCOMPANY REPORT:		


3100
3300
L 90+50E
L 92E
L 94E
L 96E
L 98E
L 100E
L 102E
L 103+50E
105N
BL 100N
96N
MOLYBDENUM
LEAD
ZINC
LEGEND
Road
Trenches
Creek
Swamp, Seepage Zones
0 100 200 300 400
METRES
SELCO DIVISION -
BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
SMITHERS P.G. - B.C.
SOIL GEOCHEMICAL SURVEY
ANOMALY SUMMARY (Pb,Zn,Mo)
DWG. NO.
DATE DEC/85 PROJECT 903/10245
FIG. 5b
REPORT NO.
NTS 93L/7 SCALE 1: 10000
TO ACCOMPANY REPORT

the trenches are highly altered and sulphide-bearing, analysis confirms the presence of anomalous amounts of base and precious metals (see Figure 6 and Table 2). The zone is open to the east and west.

Table 1

ELEMENT ASSOCIATIONS IN ANOMALOUS ZONE

I BASE, PRECIOUS AND PATHFINDER

	1	2	3	4	5	6	7	8	9	10	11	12
Au	X	x					x			X		
Ag	X	X		X			X					
Mo	X	x										
Cu	X	X	x	x	x	x			X		x	
Pb	X	X	X	X			X			X		
Zn	x	X	X	x	x	x		X	X		x	
As	x	X	X					x	x	X		
Sb	x	x					x					
Score	13	13	7	6	2	2	6	3	5	6	2	

II NON-ORE ELEMENTS

	1	2	3	4	5	6	7	8	9	10	11	12
Ni		X	X		X			X	X		x	
Mn	x	X		X		X		x	x		x	x
Fe	X	x	x				X			X		
Co	x	X	X			x		x	X		X	X
Cd		x										
V			x			x						
Ba	X	X	X		X	x		x	x	X	x	x
Sr	x	X	X		X	X			x	X	x	x
Al	x	x	X	x		x	x					x
Ca		X	X		X	X		x	x		X	X
Mg	x	x	X		X				X		X	x
K	X		x			x					x	
P	X	x								X		x
Cr		x	X					x	x		x	
La	x	x	x					x				

X - Highly anomalous - Anomaly score = 2
x - Moderately anomalous - Anomaly score = 1

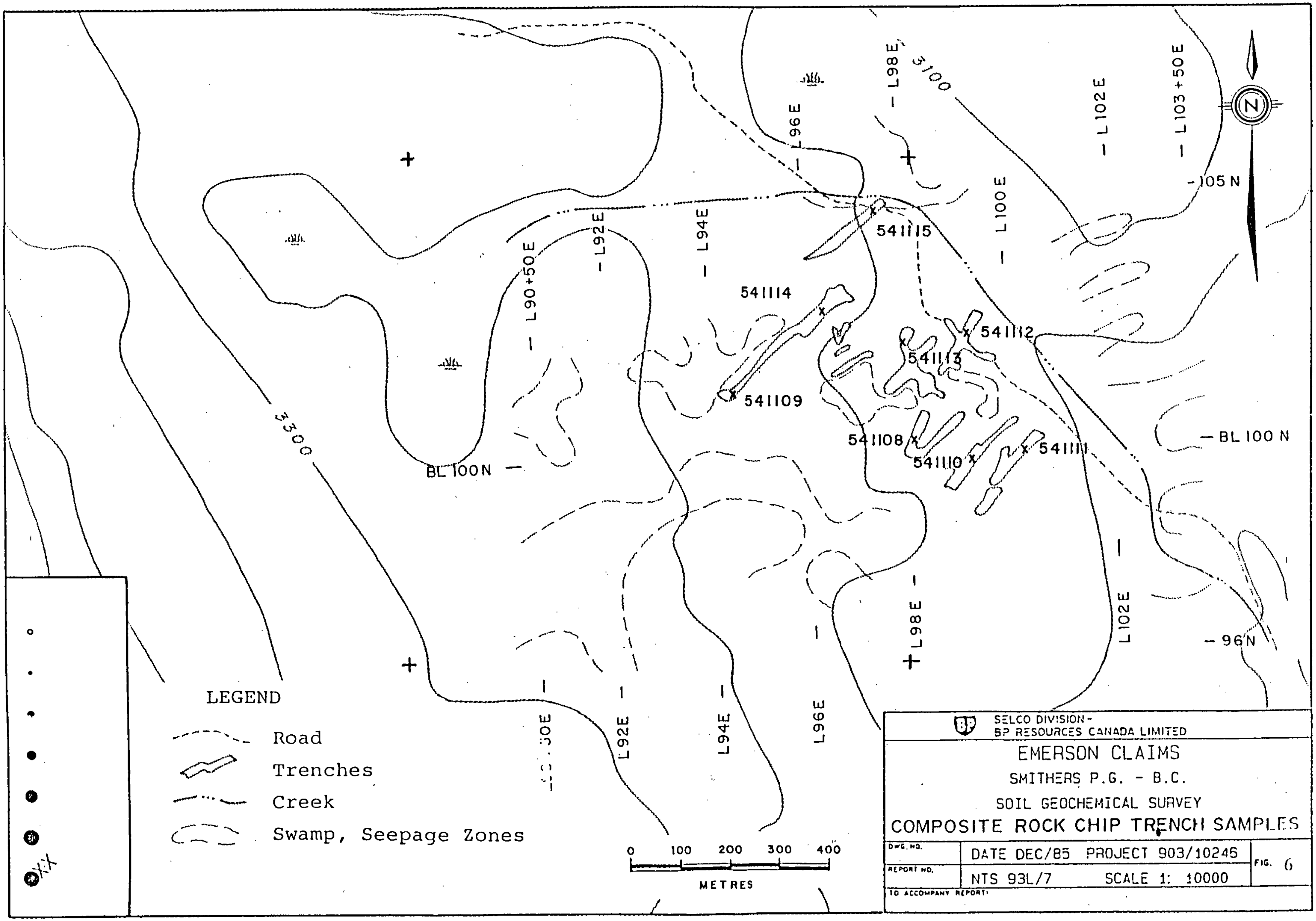

L98E
3100
L96E
L102E
L103+50E
105 N
L100E
541115
L90+50E
L92E
L94E
541114
541112
541113
541109
541108
541110
541111
BL 100 N
3300
BL 100N
96N
L98E
L102E
L92E
L94E
L96E
LEGEND
Road
Trenches
Creek
Swamp, Seepage Zones
0 100 200 300 400
METRES
SELCO DIVISION -
BP RESOURCES CANADA LIMITED
EMERSON CLAIMS
SMITHERS P.G. - B.C.
SOIL GEOCHEMICAL SURVEY
COMPOSITE ROCK CHIP TRENCH SAMPLES
DWG. NO.
DATE DEC/85 PROJECT 903/10246
FIG. 6
REPORT NO.
NTS 93L/7 SCALE 1: 10000
TO ACCOMPANY REPORT:

Table 2

BASE, PRECIOUS AND PATHFINDER ELEMENTS
FROM COMPOSITE TRENCH SAMPLES
(All values in ppm Except For Au in ppb)

	Au	Ag	Mo	Cu	Pb	Zn	As	Sb
541108	23	2.1	1	6	33	11	7	2
541109	65	.2	3	15	31	11	17	2
541110	25	.2	11	11	22	20	2	2
541111	80	.4	15	68	25	52	4	2
541112	32	.4	56	49	27	71	6	2
541113	250	25.0	28	932	132	403	64	17
541114	36	1.2	10	55	95	46	7	6
541115	22	.5	4	17	25	19	30	9

Multielement Anomaly 2 lies 150 metres southwest of the trenched zone in a region of outwash and swamps. Enriched levels of gold (80-355 ppb), silver (2-12 ppm), copper (90-188 ppm), lead (125-760 ppm), zinc (300-650 ppm) and arsenic (40-300 ppm) outline a west to northwest trending zone 400+ metres long and 200-400 metres wide (Figures 5a & 5b). Angular coarse fragments were noted at several sample sites suggesting locally thin overburden. Polymetal Anomaly 2 is believed to be valid, supported by a northwest linear string of gold anomalies. The high concentration core lies within a swamp and corresponds to maximum levels of manganese. Manganese scavenging could be the cause of metal enrichment or equally likely, the elevated manganese is in response to local bedrock mineralization, an association common to several types of deposits.

Multielement enrichment zones 3, 4, 7 and 10 have moderate anomaly scores. Zones 3, 7 and 10 form northern, southwestern and southeastern extensions of polymetal Anomaly 1 described above, zone 4 is a western extension of Anomaly 2. Base and precious metal concentrations are typically low to moderate. Enrichment zones 5, 6, 8, 9, 11 and 12 are principally enhanced in the non-ore elements and are of little encouragement.

A strong correlation is noted between multielement anomalies and the positions of swamps and seepage zones described in the field notes. Anomalous manganese, calcium and strontium, all indicators of water saturated ground, exhibit the best correspondence. Groundwater is believed to be a controlling factor in and extension zones 3 and 10. Anomaly 3, is also probably due to manganese scavenging in a seepage zone. Anomaly 10 is confined to a southwest stream bank and comprises those elements that migrate as detrital grains in the secondary environment. This zone is the product of down-stream migration and comminution of sulphide particles derived from the trenched area.

Followup geochemical exploration will require the completion of the soil grid to fully outline anomalies of interest, trenching and trench sampling over anomalous areas to pinpoint sources and to determine geology.

APPENDIX I

GEOCHEMICAL PREPARATION AND ANALYTICAL PROCEDURES

ACME ANALYTICAL LABORATORIES LTD.
Assaying & Trace Analysis
852 E. Hastings St., Vancouver, B.C. V6A 1R6
Telephone : 253 - 3158

GEOCHEMICAL LABORATORY METHODOLOGY - 1984

Sample Preparation

1. Soil samples are dried at 60°C and sieved to -80 mesh.
2. Rock samples are pulverized to -100 mesh.

Geochemical Analysis (AA and ICP)

0.5 gram samples are digested in hot dilute aqua regia in a boiling water bath and diluted to 10 ml with demineralized water. Extracted metals are determined by :

A. Atomic Absorption (AA)

Ag*, Bi*, Cd*, Co, Cu, Fe, Ga, In, Mn, Mo, Ni, Pb, Sb*, Tl, V, Zn
(* denotes with background correction.)

B. Inductively Coupled Argon Plasma (ICP)

Ag, Al, As, Au, B, Ba, Bi, Ca, Cd, Co, Cu, Cr, Fe, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Sr, Th, Ti, U, V, W, Zn.

Geochemical Analysis for Au*

10.0 gram samples that have been ignited overnite at 600°C are digested with hot dilute aqua regia, and the clear solution obtained is extracted with Methyl Isobutyl Ketone.

Au is determined in the MIBK extract by Atomic Absorption using background correction (Detection Limit = 5 ppb direct AA and 1 ppb graphite AA.)

Geochemical Analysis for Au**, Pd, Pt, Rh

10.0 - 30.0 gram samples are subjected to Fire Assay preconcentration techniques to produce silver beads.

The silver beads are dissolved and Au, Pd, Pt and Rh are determined in the solution by graphite furnace Atomic Absorption.

Geochemical Analysis for As

0.5 gram samples are digested with hot dilute aqua regia and diluted to 10 ml. As is determined in the solution by Graphite Furnace Atomic Absorption (AA) or by Inductively Coupled Argon Plasma (ICP).

Geochemical Analysis for Barium

0.1 gram samples are digested with hot NaOH and EDTA solution, and diluted to 10 ml.

Ba is determined in the solution by Atomic Absorption or ICP.

Geochemical Analysis for Tungsten

1.0 gram samples are fused with KCl, KNO_3 and Na_2CO_3 flux in a test tube, and the fusions are leached with 20 ml water. W in the solution determined by ICP with a detection of 1 ppm.

ACME ANALYTICAL LABORATORIES LTD.
Assaying & Trace Analysis
852 E. Hastings St., Vancouver, B.C. V6A 1R6
Telephone : 253 - 3158

Geochemical Analysis for Uranium

0.5 gram samples are digested with hot aqua regia and diluted to 10 ml.

Aliquots of the acid extract are solvent extracted using a salting agent and aliquots of the solvent extract are fused with NaF, K_2CO_3 and Na_2CO_3 flux in a platinum dish.

The fluorescence of the pellet is determined on the Jarrel Ash Fluorometer.

Geochemical Analysis for Fluorine

0.25 gram samples are fused with sodium hydroxide and leached with 10 ml water. The solution is neutralized, buffered, adjusted to pH 7.8 and diluted to 100 ml.

Fluorine is determined by Specific Ion Electrode using an Orion Model 404 meter.

Geochemical Analysis for Tin

1.0 gram samples are fused with ammonium iodide in a test tube. The sublimed iodine is leached with dilute hydrochloric acid.

The solution is extracted with MIBK and tin is determined in the extract by Atomic Absorption.

Geochemical Analysis for Chromium

0.1 gram samples are fused with Na_2O_2. The melt is leached with HCl and analysed by AA or ICP.

Geochemical Analysis for Hg

0.5 gram samples is digested with aqua regia and diluted with 20% HCl.

Hg in the solution is determined by cold vapour AA using a F & J Scientific Hg assembly. An aliquot of the extract is added to a stannous chloride / hydrochloric acid solution. The reduced Hg is swept out of the solution and passed into the Hg cell where it is measured by AA.

Geochemical Analysis for Ga & Ge

0.5 gram samples are digested with hot aqua regia with HF in pressure bombs.

Ga and Ge in the solution are determined by graphite furnace AA.

Geochemical Analysis for Tl (Thallium)

0.5 gram samples are digested with 1:1 HNO_3. Tl is determined in the extract by graphite AA.

Geochemical Analysis for Te (Tellurium)

0.5 gram samples are digested with hot aqua regia. The Te extracted in MIBK is analysed by AA graphite furnace.

APPENDIX II

LIST OF ANALYTICAL DATA

GENERAL

1-2 SAMPLE TYPE

- 10. Stream sediment
- 11. Stream water
- 12. Drainage ditch sediment
- 18. Heavy mineral concentrate
- 20. Seepage (spring) sediment
- 21. Seepage (spring) water
- 30. Lake sediment - lake center
- 31. Lake water
- 32. Lake sediment-near shore
- 40. Bog-upper 100 cm
- 41. Bog-stagnant water
- 42. Bog-below 100 cm
- 43. Bog-organic material at mineral horizon interface
- 44. Bog-mineral horizon
- 50. Soil-top of the B horizon (or top of the C horizon if B horizon absent)

1-2 SAMPLE TYPE Cont.

- 51. Soil-other horizons (organic-rich samples or when 2 samples taken at same hole)
- 52. Frost boil or seepage boil
- 54. Groundwater sample
- 55. Deep overburden sample
- 58. Heavy mineral concentrate
- 60. Talus fines
- 63. Talus blocks-hand sample
- 64. Talus blocks-chips
- 68. Heavy mineral concentrate
- 70. Biogeochemical sample
- 75. Radon
- 80. Bedrock hand specimen
- 81. Bedrock chips + hand sample
- 82. Float hand specimen
- 83. Float chips + hand sample
- 84. Drill core specimens

1-2 SAMPLE TYPE Cont.

- 85. Channel sample/split core
- 86. Drill chips
- 87. Drill sludge
- 88. Heavy mineral concentrate
- *89. High grade sample
- *90. Special sample-specify
- 99. Standard sample

*Clearly label if high grade.

Special Note
For keypunchers benefit, 7's should be crossed 7 and O's (letter) should be slashed Ø

3-4 YEAR

5-7 PROJECT NUMBER

8 PROJECT IDENTIFICATION
Blank-reconnaissance
A,B,C, etc. - properties, anomalies, (List 6)

9 DUPLICATE SAMPLES
Label duplicates as 1,2, etc. (collect 1 duplicate pair in 30)

10-12 (10-11) SAMPLER IDENTIFICATION (List 7)

13-15 (12-15) SAMPLE NUMBER

19-24 EAST COORDINATE

25-31 NORTH COORDINATE

34-38 NTS MAP SHEET NUMBER
Example: record 92F/3 as 92F03

STREAM SEDIMENTS

40 SAMPLE ENVIRONMENT

- 1. Side of creek
- 4. Middle of stream
- 9. Composite across stream
- A. Soil

41 WATER MURKINESS

- Blank-clear
- 1. Murky (report findings in note section)

42 PRECIPITATE

- Blank-none
- 1. Record colour (report presence of precipitate in immediate vicinity in stream bed. If heavy precipitate, sample separately as sample type 90)

43 OVERBURDEN TRANSPORT

- L. Local
- E. Extensive
- U. Unknown
- M. Mixed local & extensive

45 OVERBURDEN ORIGIN

- 1. Till-angular boulders
- 2. Outwash-sandy, rounded boulders
- 3. Lake sediment-sand/silt
- 4. Alluvium-stream deposit
- 5. Peat-bog
- 6. Colluvium*

45 OVERBURDEN ORIGIN Cont.

- 7. Lake sediment-clay
- 8. Talus
- 9. Residual
- C. Boulder field*
- D. Gravel*
- E. Soil*

*use only if former origin cannot be identified

46 BEDROCK

- M. Mineralized
- P. Present within 100m upslope
- D. Present within 100m downslope
- B. Underlies sample site
- G. Gossan
- F. Fe surface stains
- R. Radioactivity

47-48 pH

49 SAMPLE TEXTURE

- 0. Organic-decomposed
- 1. Clay
- 2. Silt and fine sand
- 3. Sand
- 4. Gravel
- 6. Cemented
- 7. Precipitate
- 8. Twigs or undecomposed organic matter

50-52 AVERAGE WIDTH OF STREAM-M
Decimal point in col 51 (or col 52 if stream > 10m wide)

53-55 AVERAGE DEPTH OF STREAM-CM

56 STREAM VELOCITY

- 1. Dry
- 2. Stagnant
- 3. Slow
- 4. Moderate
- 5. Fast
- 6. Turbulent

57 INDICATE AS TRIBUTARY

- R. Stream enters on the right looking down main stream
- L. Stream enters on left looking down main stream

58-60 LOCAL BEDROCK COMPOSITION
Estimate-use Lists 1-4

61-66 COLOUR
Munsell notation or abbreviation

67 CONTAMINATION

Blank - none	L - logging
C - culvert	M - mine
F - farming	R - road
G - garbage	T - trench
H - house	Ø - other - spec.
I - industry	

68 ORGANIC FRACTION *(Complete where sediment composition is unusual)

- 2. Large amount of undecomposed leaves, twigs, etc.
- 4. Large amount of well-decomposed vegetation
- 5. Moss
- 7. Sediment grains coated in organic matter
- 8. Lake sediment ooze.

69 MINERAL FRACTION *(Complete where composition is unusual)

- 1. Notable content of mafic minerals, resistates
- 4. Very high content of mafics, resistates

71 SCINTILLOMETER NUMBER

72-75 GAMMA COUNT AT SAMPLE DEPTH
(make note if landscape is affecting gamma count)

76 ROCK
*Star if bedrock is influencing scint count

77-78 APPROXIMATE SLOPE ANGLE

79-80 APPROXIMATE SLOPE DIRECTION

SOILS

40 SITE TOPOGRAPHY

- 1. Hill top
- 2. Gentle slope
- 3. Steep slope > 20°
- 4. Base of slope
- 5. Valley floor
- 6. Depression
- 7. Level
- 8. Rolling
- 9. Bog

41 SAMPLE ENVIRONMENT

- 1. Tundra-hummocky
- 2. Tundra-dry
- 3. Tundra-swampy
- 4. Grassland, meadows
- 5. Peat mounds
- 6. Bog in depression
- 7. Forest-coniferous
- 8. Forest-deciduous
- 9. Forest-mixed
- A. Alder or willows
- B. Cultivated land
- C. Desert, semi-arid
- D. Barren
- E. Talus fan
- F. Bank soil-stream
- G. Bank soil-lake
- H. Road cut

42 SITE DRAINAGE

- 1. Dry
- 2. Moist
- 3. Wet
- 4. Saturated

43 OVERBURDEN TRANSPORT

- L. Local
- E. Extensive
- U. Unknown
- M. Mixed

44 WATER MOVEMENT

- S. Seepage

45 OVERBURDEN ORIGIN

- 1. Till-angular boulders
- 2. Outwash-sandy, rounded boulders
- 3. Lake sediment-sand/silt
- 4. Alluvium-stream deposit
- 5. Peat-bog
- 6. Colluvium
- 7. Lake sediment-clay
- 8. Talus
- 9. Residual
- A. Frost boils*
- B. Seepage boils*
- C. Boulder field*
- D. Gravel*

* Use only if former origin cannot be identified.

46 BEDROCK

- M. Mineralized
- P. Present within 100m upslope
- D. Present within 100m downslope
- B. Underlies sample site
- G. Gossan
- F. Fe surface stains
- R. Radioactivity

47-48 pH

49 SAMPLE TEXTURE

- Ø. Organic muck
- 1. Fibrous, peaty organic matter
- 2. Very sandy
- 3. Sandy
- 4. Sand-silt
- 5. Sand-silt-clay
- 6. Silt
- 7. Silt-clay
- 8. Clay
- 9. Gravel

50-51 THICKNESS OF SOIL SAMPLE INTERVAL-CM

52-54 BOTTOM OF SOIL SAMPLE INTERVAL-CM

55-56 SOIL HORIZON

- LH. Leaf, humus layer, undecomposed vegetation lying on the ground surface (do not sample)
- AH. Dark grey to black, organic-rich mineral horizon usually no deeper than 15cm from the surface (do not sample)
- AE. Grey to white (occassionally brown) leached mineral horizon near ground surface, usually sandy; accompanied by BF or BT horizon at depth (do not sample)
- BH. Black, organic-rich mineral horizon at depths greater than 15cm (do not sample)
- BF. Red-brown, iron-rich horizon
- BT. Brown, clay-rich horizon
- BG. Horizon which is water-saturated most of the year, identified by red brown mottles
- BM. Brown horizon which is only slightly different in appearance from underlying parent material
- C1,C2,C3, etc. Parent material for soil
- CA. White calcium carbonate precipitate in C horizon
- Ø1,Ø2,Ø3, etc. Bog sample at various depths
- TF. Talus fines

57 SOIL TYPE

- C. Chernozem-prairie soil usually under grassland or meadow, thick AH > 10cm, CA horizon at depth
- S. Solonetz-saline soil, high content of NaCl

57 SOIL TYPE Cont.

- L. Luvisol-BT horizon diagnostic
- P. Podzol-BF horizon diagnostic
- B. Brunisol-BM horizon is only B horizon of profile
- R. Regosol-little or no soil development. No B soil horizon, only LH (maybe) and C horizon
- G. Gleysol-BG horizon diagnostic
- Ø. Organic soil-bog vegetation-no mineral matter

58-60 LOCAL BEDROCK COMPOSITION
Estimate-use Lists 1-4

61-66 COLOUR
Munsell notation or abbreviation

67 CONTAMINATION

Blank - none	L - logging
C - culvert	M - mine
F - farming	R - road
G - garbage	T - trench
H - house	Ø - other - spec.
I - industry	

68-69 % COARSE FRAGMENTS

70 SHAPE OF COARSE FRAGMENTS

- A. Angular
- R. Rounded
- S. Subrounded
- M. Mixed above types

71 SCINTILLOMETER NUMBER

72-75 GAMMA COUNT AT SAMPLE SITE
Scint reading at ground level over hole

76 ROCK
*Star if bedrock is influencing scint counts

77-78 APPROXIMATE SLOPE ANGLE

79-80 APPROXIMATE SLOPE DIRECTION

LIST 1

1-- INTRUSIVE ROCKS

- -1- QUARTZ RICH
- --1 Granite
- --2 Quartz Monzonite
- --3 Granodiorite
- --4 Quartz diorite
- -2- INTERMEDIATE
- --1 Syenite
- --2 Monzonite
- --3 Diorite
- --4 Gabbro
- -3- FELDSPATHOID RICH
- --1 Nepheline Syenite
- --2 Nepheline Monzonite
- -40 ULTRABASIC
- -50 CARBONATITES
- -6- SPECIAL TYPES
- --1 Pegmatite
- --2 Aplite
- --3 Lamprophyre
- --4 Trap
- --5 Felsite
- --6 Intrusion Breccia
- --7 Diabase

LIST 2

2-- VOLCANIC ROCKS

- -0- UNDIFFERENTIATED
- -1- BASALT
- -2- ANDESITE
- -3- DACITE
- -4- RHYOLITE
- -5- QUARTZ LATITE
- -6- LATITE
- -7- TRACHYTE
- -8- PHONOLITE
- -9- NEPHELINE LATITE
- --1 Fine grained flows
- --2 Prophyritic flows
- --3 Crystal tuffs
- --4 Ash tuffs
- --5 Lapilli tuffs
- --6 Agglomerate
- --7 Lapilli breccia
- --8 Block breccia
- --9 Turbidite

LIST 3

3-- SEDIMENTARY ROCKS

- -1- ARENACEOUS
- --1 Siltstone
- --2 Mudstone
- --3 Greywake
- --4 Sandstone
- --5 Quartzite
- --6 Conglomerate
- -2- ARGILLACEOUS
- --1 Shale
- --2 Argillite
- -3- CALCAREOUS
- --1 Limestone
- --2 Dolomite
- -4- CHEMICAL PRECIPITATE
- --1 Chert
- --2 Marble
- --3 Iron Formation

LIST 4

4-- METAMORPHIC ROCKS

- -10 FINE GRAINED CONTACT
- -2- PHANERITIC
- --1 Meta quartzite
- --2 Marble
- --3 Soapstone
- --4 Hornfels
- --5 Serpentine
- --6 Skarn
- --7 Amphibolite
- --8 Eclogite
- -3- MECHANICAL
- --1 Mylonite
- --2 Flaser
- --3 Augen
- --4 Ultramylonite
- -40 SLATE
- -50 PHYLLITE
- -60 SCHIST
- -7- GNEISS *
- -8- MIGMATITE *
- --1 *Granite
- --2 Monzonite
- --3 Granodiorite
- --4 Conglomerate
- --5 Sandstone
- --6 Augen
- --7 Granulite
- --8 Quartz diorite
- --9 Diorite
- --0 Amphibolite

APPENDIX III

METHOD OF HISTOGRAM INTERPRETATION

Rules for choice of size coding or contouring intervals

(1) Examine both arithmetic and logarithmic histograms for each type of survey data. Choose the histogram which most closely approximates a normal (or lognormal) distribution. If there are several populations exhibited on the histogram, subjectively divide the data into a series of normal or lognormal distributions. Avoid interpreting histograms which are strongly skewed. Portions of the arithmetic or logaritmic histograms may be chosen for data interpretation over specific metal concentration intervals, if this allows for the best portrayal of the data in graphical form.

(2) Choose, as two of the coding intervals, points which represent between 90% and 95%, and 95% and 97.5% of the data, two different numbers. These choices highlight 1 in 10 and 1 in 20 samples which are considered slightly anomalous and definately anomalous, respectively. These limits are optimistic in that the two categories are defined to be anomalous regardless of the distribution of values on the remainder of the histogram. A rigorous statistical approach would suggest that only the 97.5% value be considered the anomaly threshold.

(3) Divide the remaining portion of the histogram into recognizable populations. The dividing point of each of these populations is chosen as a coding interval. Minimums caused by the failure of a laboratory to record specific concentration values are ignored. These artificial breaks in the histogram can be recognized by scanning the laboratory reports.

(4) For each population, choose one or two numbers which correspond to the 90% and 95% cumulative frequencies for that population (1 in 10 and 1 in 20 samples for that population respectively). These will also be used to represent anomalous conditions for each population.

(5) A maximum of six numbers can be chosen to plot symbol maps. This number is dictated by the ability to present data in graphical form with sufficiently different symbol sizes to be easily distinguishable, particularly if maps are to be reduced. The seven defined concentration classes are normally sufficient to represent geochemical data on a map. More intervals can be chosen if data are to be controured. Avoid choosing arithmetic intervals without considering rules (1) and (4).

(6) Maps plotted using the preceeding instructions might result in two areas being distinguished from each other by a relatively uniform density of symbol sizes, yet only poor contrast anomalies are indicated. Differences between the two areas, A and B, might be due to underlying geology, overburden character, soils etc. Whatever the cause, the data are not well displayed. If the underlying control distinguishing A and B can be recognized , the data must be divided and re-interpreted following steps (1) to

(5). Two sets of maps can be drawn, or both sets of interpreted data can be plotted on a single map. For such superimposed geochemical maps the symbol sizes lose their absolute meaning but assume a more important stance, that of reflecting anomalous conditions regardless of the underlying control. To illustrate, consider the case where A and B are areas underlain by very different geology. Anomalous conditions for low background rock types might be concentrations which are much lower than average values for the high background rock types. Nevertheless, anomalies defined in each area are to be considered significant. Reliance on absolute concentrations can be misleading in such cases.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

14,174

100 200 300 400 500 M

SELCO DIVISION -
BP RESOURCES CANADA LIMITED

EMERSON PROJECT

GOLD (ppb)

SOIL GEOCHEMISTRY

SCALE 1 : 5,000		DRAWN BY:	FIG. 5
DATE DEC' 1985		DRAFTED BY: E.B.W.	
N.T.S. 93 L	PROJ. 10246	REPORT BPVR 85- 26/30	

GEOLOGICAL BRANCH
ASSESSMENT REPORT

14,174

0 100 200 300 400 500 M

SELCO DIVISION -
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EMERSON PROJECT

MOLYBDENUM (ppm)

SOIL GEOCHEMISTRY

SCALE 1 : 5,000	DRAWN BY:		FIG. 6
DATE DEC' 1985	DRAFTED BY: E. B. W.		
N.T.S. 93 L	PROJ. 10246	REPORT BPVR 85-26/30	

GEOLOGICAL BRANCH
ASSESSMENT REPORT

14,174

0 100 200 300 400 500 M

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COPPER (ppm)

SOIL GEOCHEMISTRY

SCALE 1 : 5,000		DRAWN BY:	FIG. 7
DATE DEC' 1985		DRAFTED BY: E. B. W	
N.T.S. 93 L	PROJ. 10246	REPORT BPVR 85- 26/30	

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0 100 200 300 400 500 M

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LEAD (ppm)

SOIL GEOCHEMISTRY

SCALE 1 : 5,000	DRAWN BY:		FIG. 8
DATE DEC 1985	DRAFTED BY: E. B. W.		
N.T.S. 93 L	PROJ. 10246	REPORT BPVR 85-26/30	

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0 100 200 300 400 500 M

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ZINC (ppm)

SOIL GEOCHEMISTRY

SCALE 1 : 5,000	DRAWN BY:		FIG. 9
DATE DEC' 1985	DRAFTED BY: E. B. W.		
N.T.S. 93 L	PROJ. 10246	REPORT BPVR 85- 26/30	

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SILVER (ppm)

SOIL GEOCHEMISTRY

SCALE 1 : 5,000		DRAWN BY:	FIG. 10
DATE DEC' 1985		DRAFTED BY: E.B.W.	
N.T.S. 93 L	PROJ. 10246	REPORT BPVR 85-26/30	

GEOLOGICAL BRANCH
ASSESSMENT REPORT

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0 100 200 300 400 500 M

SELCO DIVISION -
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ARSENIC (ppm)

SOIL GEOCHEMISTRY

SCALE 1 : 5,000	DRAWN BY:		FIG. 11
DATE DEC' 1985	DRAFTED BY: E.B.W.		
N.T.S. 93 L	PROJ. 10246	REPORT BPVR 85 - 26/30	

GEOLOGICAL BRANCH
ASSESSMENT REPORT

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0 100 200 300 400 500 M

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SAMPLE LOCATION

SOIL GEOCHEMISTRY

SCALE 1 : 5,000		DRAWN BY:	FIG. 12
DATE DEC' 1985		DRAFTED BY: E.B.W.	
N.T.S. 93 L	PROJ. 10246		REPORT BPVR 85 - 26/30