87-102-15876.

Soil and Rock Geochemistry of Wanda - Stat Claims, Coal Harbour Area, Northern Vancouver Island

Nanaimo Mining Division

NTS 92L/12 E & W

Lat. 50 37'   Long. 127 45'

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Introduction

Description and Physiography

The Wanda-Stat Group consists of three mineral claims (Stat 1 to 3) totalling 55 units plus 15 two-post claims (Wanda 16 to 30) for an aggregate total of 70 units. The group is centered 13 km. west of Coal Harbour and 22 km. southwest of Port Hardy on Northern Vancouver Island. It lies along the northern shore of Holberg Inlet and extends from the flats along the inlet up onto the crest of the Pemberton Hills to the north. Maximum elevation is 582 M. Except at the highest elevations, the claims are covered by a dense growth of mature timber consisting largely of cedar and hemlock, although logging carried out over the past three years and currently continuing is creating large patches of clear ground.

Previous Work

The history of the area was covered in detail in a report submitted March 22, 1983. Briefly, much of the ground had been staked by Utah Construction and Mining Company (now Utah Mines) during the fall and winter of 1967-1968. At that time access was by boat along Holberg Inlet, or by an extremely difficult overland slog south from the logging road between Port Hardy and Holberg. Much of Utah's work was carried out from helicopter-supported base camps within the area. That company carried out soil geochemistry, and locally, detailed geological mapping, vertical magnetic intensity surveys using a fluxgate type magnetometer, and, in the vicinity of the Wanokana delta, an induced polarization survey. Two NQ drill holes approximately 550' in depth were put down just east of Wanokana Creek, a number of shallow X-ray holes were drilled on the summit of the Pemberton Hills, and another cluster of shallow holes were drilled east of the Wanokana delta on ground not held or under option by Utah. Some, but not all, of the work is covered in assessment reports by Ascensios, Clouthier and Young. (See bibliography.) Mapping on a regional scale has been carried out by Northcote, working for the B.C.D.M., and by Muller, working for the G.S.C.

Access and Acknowledgements

In recent years, an extensive network of logging roads has been developed in the area, initially by Rayonier, more recently by its successor company Western Forest Products. Our work has been aided by the easier access. (There is a logging road leading directly onto the property from Coal Harbour.) In addition numerous rock pits have been developed for road-fill. Other exposures of outcrop have been revealed by logging and slash-burning. We have also been assisted by the generosity of Western Forest Products in making available to us excellent topographic maps on scales of 1 inch to 400 feet, 1 to 5,000 and 1 to 15,000. We are grateful to Western's contractor in the area, Tribune Timber, for allowing us access through its locked gates.

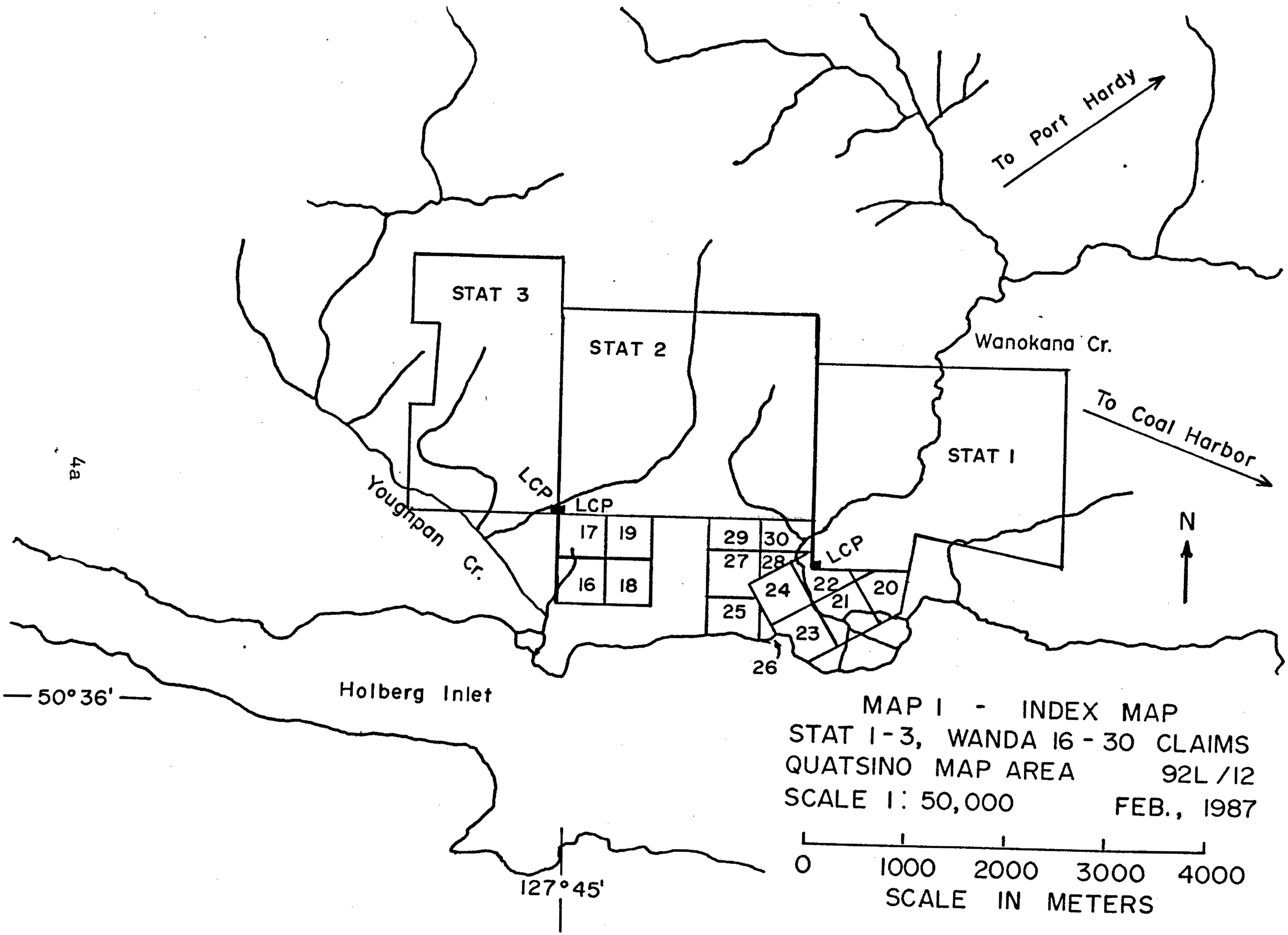
Objectives of Work

The programme for this past field season had several aims. We wished first of all to acquaint ourselves with the nature of outcrops created by road construction and pit excavation since our last visit to the area. We also wished to employ soil geochemical reconnaissance techniques in an effort to relocate and confirm a number of geochemical anomalies indicated by a soil survey carried out by Utah Mines in 1968, anomalies which that company never followed up. As well, we wished to check metal values in soils over areas where we knew or suspected the bedrock to carry sulfide mineralization, or to display hydrothermal alteration indicative of mineralizing processes.

We wished further to expand a data base of rock geochemical data for the various rock types which we had identified on the property and had started to characterize by hand-specimen and thin-section examination, as well as by less powerful techniques of analytical chemistry than are today available. The following sections deal in turn with these various aspects of the work. Conclusions are stated in each section in turn.

Table 1 Claim Record

Claim Name and number	Record number	Number of units	Owner
Wanda 16	1094(3)	1	B.D.Pearson
Wanda 17	1095(3)	1	B.D.Pearson
Wanda 18	1096(3)	1	B.D.Pearson
Wanda 19	1097(3)	1	B.D.Pearson
Wanda 20	1473(6)	1	M.J.Pearson
Wanda 21	1474(6)	1	M.J.Pearson
Wanda 22	1475(6)	1	M.J.Pearson
Wanda 23	1476(6)	1	M.J.Pearson
Wanda 24	1477(6)	1	M.J.Pearson
Wanda 25	1478(6)	1	M.J.Pearson
Wanda 26	1479(6)	1	M.J.Pearson
Wanda 27	1480(6)	1	M.J.Pearson
Wanda 28	1481(6)	1	B.D.Pearson
Wanda 29	1482(6)	1	B.D.Pearson
Wanda 30	1483(6)	1	B.D.Pearson
Stat 1	2322(4)	20	M.J.Pearson
Stat 2	2323(4)	20	M.J.Pearson
Stat 3	2324(4)	15	M.J.Pearson


To Port Hardy
Wanokana Cr.
To Coal Harbor
STAT 3
STAT 2
STAT 1
LCP
LCP
LCP
17
19
16
18
29
30
27
28
24
22
21
20
25
23
26
Youghpan Cr.
N
Holberg Inlet
50°36'
127°45'
MAP 1 - INDEX MAP
STAT 1-3, WANDA 16-30 CLAIMS
QUATSINO MAP AREA 92L/12
SCALE 1: 50,000 FEB., 1987
0 1000 2000 3000 4000
SCALE IN METERS

Soil Geochemical Grids

Six small reconnaissance soil grids were laid out on the property. Sampling was carried out in the B horizon using a long-handled soil auger made up for the purpose by Deakin Equipment, Ltd. of Vancouver. All samples were analyzed for gold by fire assay and neutron activation techniques and for 30 additional metallic elements by inductively coupled plasma techniques. Samples were digested using a nitric-aqua regia mixture. All analytical work was carried out by Chemex Labs, Ltd. of North Vancouver. In the case of the "P" grid and the "L"(west) grid, only selected samples were analyzed due to funding limitations.

The "P" grid was laid out in the vicinity of known gold mineralization. The "K" and "Q" grids were laid out in order to relocate and confirm the presence of copper anomalies located by Utah in 1968 but never followed up by that company. The "T" traverse was made to follow a new roadcut which reveals a hitherto unexposed highly sericitized intrusive cutting shattered andesitic rocks. The "L"(east) grid was put in to sample an area inferred by Utah to be underlain by advanced argillic alteration in an area of very sparse outcrop. The "L"(west) grid was laid out to the west of, and in the glacial shadow of a prominent knob of silica-pyrophyllite alteration. Each of these will be discussed in turn.

Our sample spacing has generally been 30 meters (100'). Line spacing has varied according to the particular circumstances. Utah's work was aimed at large porphyry-type copper deposits and so lines were spaced at five hundred foot intervals with sample spacing along lines at two hundred feet. Our work was aimed at detecting much smaller targets, if such exist. In particular, we were interested in detecting vein deposits which might contain precious metals, and massive sulfide deposits as well. Accordingly, much tighter spacings were used.

Results are presented on the maps which follow. A separate map has been prepared for each element which shows any amount of variation, even if that variation is small. If there is no variation, then no map is presented. For instance, only two grids, ("T" and "Q"), showed any variation in silver. Maps are presented showing the distribution of these values. No variation was present on the other grids, all values being either 0.2 or <0.2 ppm, so no maps were prepared for silver.

Additionally, only those metallic elements which form sulfides are presented in map form. (Manganese is an exception here. Maps of manganese content are presented for all grids.) The major rock-forming elements (potassium, sodium, calcium, magnesium, titanium and iron) have not been evaluated by us insofar as their relevance to soil work is concerned.

Important note: On all grid maps, an average value is given for the element with which the map deals. This average is the average for all soils analyzed in the course of this field programme (105), not the average for that particular grid. As such it allows the reader to better judge values for that grid within the context of the entire set of samples available.

"P" Grid. (See Appendix 1, Maps 1 to 9)

This grid, reached by driving to the western-most curve along logging spur "Wanokana 1000", was laid out across relatively shallow overburden surrounding a rock-pit cut into propyliticly altered andesitic tuffs cut by numerous pyrite veins and containing much disseminated pyrite. Rocks from these veins had been shown to contain significant amounts of gold (up to 876 ppb. See Dec. 1984 Assessment Report by Pearson.) The object of the present sampling programme was to ascertain whether such gold values were reflected in the overburden and whether or not any of the other elements available in the ICP scan showed enrichments which might suggest their utility as tracers for gold mineralization. Maps in the series P-1 to P-9 present the results. They suggest that gold mineralization in bedrock is indeed reflected in anomalous values in the overlying soil. They also suggest that arsenic, cobalt, lead, zinc and copper are significantly enriched in overlying soil.

"L"(east) Grid (See Appendix 2, Maps 1 to 10)

This grid is reached by traveling north along logging road "Wanokana 900", which roughly parallels Wanokana Creek on the east side. Except in one outcrop exposed by recent pit-rock excavation, no bedrock is exposed for several miles along the road. Utah's induced polarization work shows a major area here to be underlain by sulfide-rich rocks which represent an eastern extension of rocks exposed in the bed of Wanokana Creek, but largely hidden due to the impassibility of the canyon in that area. Utah confirmed the eastern extension by a deep (approx. 550") hole close to the canyon, and a second hole of similar depth located about 1000 meters to the east of the first hole. Rock exposed in the pit mentioned above shows little or no pyrite, but does give the impression of a slight pervasive silicification. The original rock was undoubtedly an andesitic tuff. Fracturing is very pervasive, but seems to be post-alteration in age.

The "L"(east) grid was laid out to the northeast of the rockpit. (See Appendix 2.) Several anomalies are developed here. Chromium shows eight samples (out of 32) with values of three to five times the overall average, but these values are scattered across the grid. The significance of chromium enrichments in the absence of very basic to ultrabasic rocks is unknown to the writer, who would like to consider it an indication of mariposite, but has seen no sign of that mineral as yet. Copper, zinc, arsenic and gold show no particular anomalies. However barium shows three samples at two to four times average grouped at the southern end of the grid, cobalt shows two samples in the same area at five to seven times average, and manganese shows two values in this zone at six and more than seventeen times average. Lead values are suggestive of a slight enrichment as are molybdenum values, but the higher values are scattered, not grouped. If future funding permits, we shall expand the sampling programme around the southern edge of the present grid.

"K" Grid (See Appendix 3, Maps 1 to 9)

The "K" Grid is reached by proceeding north along Pemberton Main after turning right from Wanokana Main just west of the Wanokana bridge crossing, subsequently turning right (east) onto Pemberton 420 till one reaches the junction with Pemberton 422.This grid was put in to relocate a north-south trending anomaly outlined by Utah in 1968 which was anomalous in each of the three elements for which Utah analyzed its samples (copper, zinc and molybdenum). Our results lead us to believe that our grid overlies at least a part of that anomaly.

We have found seven samples (out of eighteen) in which copper ranges from about two to seven and one half times overall average. Two cobalt values are about six times average. These same two samples show manganese values about three and nine times average and one of them is enriched in zinc by a factor of about four. An expansion of the grid is very definitely indicated.

"Q" Grid (See Appendix 4, Maps 1 to 11)

The "Q" Grid was put in to confirm, if possible, the presence of a rather tenuous copper anomaly developed by Utah in 1968. It showed as an elongate narrow east-west zone with its eastern edge close to the west edge of the Wanokana canyon. Since its trend conformed with the direction of glacial movement (nearly east-west), the possibility arose that soil values reflected mineralization occurring in sub-outcrop where soil cover was thin along the top of the canyon. Utah's work showed two soils on adjacent lines (500' apart) where copper values were 100 ppm and 380 ppm. (Average value for Utah's work was 30 ppm.) Adjacent soils to the east, while only slightly above average, none-the-less outlined a relatively coherent zone.

Our work here has not been conclusive. One soil (of 27 taken) was definitely anomalous in copper (189 ppm vs. an average of 41.2 ppm). A second sample was about twice average, but it was located 700' south of the first. One sample is slightly anomalous in gold (about five times average), and one sample is slightly (2.7X) anomalous in barium. Most other elements show no particular enrichment.

Chromium is an exception. A distinct anomaly is developed along the easternmost line of the grid. Values range from about three to about eleven times average. Six samples of the twenty - seven taken on the grid fall into this category. There is no bedrock exposed in the area, which is relatively flat-lying. No logging had been carried out at time of our work, so contamination from the tracks of heavy equipment can be discarded as a possible source of the element. Our comments and our puzzlement with respect to chromium anomalies on the "L"(east) Grid can also be taken to apply in this case.

"T" Traverse (See Appendix 5, Maps 1 to 9)

This traverse was made on the uphill side of a new roadcut on Pemberton 430 which sidehills up to the west along the southern slope of the eastern-most of the Pemberton Hills. The roadcut had exposed an excellent soil profile right down to bedrock, which was seen to consist of highly altered intrusive rock cutting extremely fractured andesitic volcanics. Both rock types were affected by sericitic alteration, converting them in places to masses of microscopically fine grained white powder. This feature is of particular interest, for on the Red Dog property to the northwest, such pods of sericite contain centers of massive molybdenite. Both rock and soil samples were gathered, but thus far only the soils have been analyzed due to financial limitations. Eighteen soils were collected in all.

One gold sample (T-2) is somewhat anomalous (29 ppb). The same sample is anomalous in silver (1.8 ppm), cobalt (four times average) and copper (twice average). No other samples are particularly noteworthy.

"L"(west) Grid (See Appendix 6, Maps 1 to 10)

This grid was put down to the west of and in the glacial shadow of a prominent knob of silica-pyrophyllite altered rock and stretches out between two somewhat similar knobs located a short distance to the west which are only poorly exposed, but apparently of similar character. A rock pit has been cut into a low hump just to the north of the southwestern knob. Exposed within this pit are a wide variety of rocks, very siliceous in nature (though with some basic sections, possibly later dykes) and containing notable amounts of well-banded pyrite, leading to the impression that it is an example of conformable sulfide deposition within a section of altered rhyolitic or exhalative siliceous rock. The rocks will be discussed further in the section on rock geochemistry.

Soils were taken at intervals of three meters along lines spaced fifteen meters apart. Lines were run north-south at right angles to the inferred strike of the rocks. The object was to locate any conformable mineralization which might have base or precious metal values. Due to funding limitations samples from only three of the eight lines have been analyzed thus far. These are 9E to the north of the baseline, 3W to the south of the baseline, and 4W to the north of the baseline, which follows the south edge of the Pemberton 100 spur. Of 105 samples taken over the grid, 39 have thus far been analyzed. Zero point on baseline has been taken at the entrance of the rockpit mentioned above.

Two gold values show up as particularly anomalous. These lie at 9E,1N and 3W,10S and are, respectively, 89 ppb and 149 ppb. These are the highest gold values we have encountered in the course of this season's work. Several samples are anomalous in lead (132 and 64 ppm vs. 7.4 ppm average), a single sample is three times average in barium, and four samples are two to three and one half times average in arsenic. Other base metals are well below average. Cobalt, for instance, averages only about 25% of the average for the programme as a whole, zinc only 43% the overall average, and copper only 55%. Anotherfeature is the definite lowering of copper values in soil as one proceeds west. Average copper in Line 9E is 32.1 ppm, in Line 3W 16.9 ppm and in Line 4W 11.2 ppm.

The low metal values would indicate that the siliceous rocks of this area are much depleted in these elements by comparison with the andesitic rocks which floor much of the property. Likewise the numbers give no encouragement for the idea that the conformable pyrite in the area may contain or be peripheral to conformable base metal concentrations. However the two high gold values noted above lend some credence to the idea that the siliceous rocks may host gold mineralization of some type, and encourage us to continue work in this area.

Rock Geochemical Work

Sixteen rocks of the 31 collected during the past field season were analyzed for gold using fire assay and neutron activation, and for a suite of 24 elements using inductively coupled plasma techniques. A nitric-perchloric-hydrofluoric acid digestion technique was used . As with the soils, all analytical work was carried out by Chemex Labs. Eight of the sixteen analyzed rocks were taken from the rock-pit on Pemberton 100 where banded pyritic mineralization was noted. These will be discussed as a group in a subsequent section.

The analyses which are discussed below represent an attempt to characterize further the various rock-types on the property, the description of which was begun in earlier reports. (See Pearson, 1983, 1984). To the various rock types known at that time, another can be added, a black amphibolitic dyke of probable Tertiary or recent age. Another rock-type previously described, and represented by Specimen 86-9-26-9, has been assigned a much younger age. Detailed discussion follows.

Specimen 86-9-26-9

This specimen was taken from an outcrop at the west end of the bridge crossing Wanokana Creek close to Holberg Inlet. It was referred to in my 1983 report as Unit D and a map of the outcrop area was prepared for the 1984 report by Pearson and St.John. We described the rock as a light green fragmental volcanic, probably of dacitic or andesitic composition. Fragments were small (generally less than 1 cm. in diameter), angular and consisted of a mixture of light and dark grey cherty tuffaceous sediments. Irregular dark green clots (almost certainly chloritic in nature) were ubiquitous throughout the matrix.

Muller (pers. comm.) speculated that the rock might be an ignimbrite. We mentioned locating fragments of a fossilized log within the unit. No signs of carbonization are apparent. Indeed, the fragments appear to have been completely silicified.

In our earlier report we commented upon the massive nature of the unit. We are now of the opinion that it is not a part of the surrounding Jurassic Bonanza volcanics. Aside from a few widely spaced north-south striking vertical joints, it is completely undeformed, in marked contrast with the complexly fractured and altered rocks which surround it. (Unfortunately all contacts are concealed.) It has certainly not had the deformational history of the Bonanza sequence, nor does it show any of the fracturing or folding of the Cretaceous rocks around Coal Harbour to the east. We conclude that it is probably of late Tertiary or recent age.

The ICP scan shows that sodium is the dominant element in the silicate minerals in the rock, at 4.80% , with iron next in importance at 2.76% . (There is no pyrite visible in hand specimen or in thin section.) Calcium is low (0.90%), as are sodium (0.82%) and magnesium (0.77%). Bulk analysis indicates that the rock is probably a rhyodacite. Such a conclusion may be false however, for the bulk composition may reflect in part the presence of a relatively high proportion of probably sedimentary siliceous chert fragments mentioned above. None of the trace elements are indicative of base or precious metal enrichment.

Specimen 86-9-26-8

This specimen comes from a rock-pit located just east of the Wanokana Bridge on a short spur (Wanokana 1200). The rock here is fairly typical of the bulk of the rocks in this area. It is a propyliticly-altered dark-green andesitic tuff. However, the rock in this particular pit differs slightly in having small pods of dark red hematitic chert. Calcium is substantially higher (at 3.47%) than in the specimen from the bridge area a few hundred feet to the west. Magnesium is also higher by a factor of two, at 1.57%. There is no hesitation about classing this rock as an andesite, which accords with the identification based on its gross appearance. The rocks in this general area were identified as Unit B in Pearson (1983) and classed as varying from dacite to pyroxene andesite.

Specimen 86-9-26-6

This specimen was taken from a small rock-pit on the downhill side of Wanokana Main, opposite the beginning of Wanokana 1000. It was referred to in the 1983 report as Unit C and described merely as intensely altered fragmental rock consisting mainly of clay, silica and pyrite. Small angular fragments of pyrophyllite are occasionally seen, but are not common.

Chemical analysis confirms the highly altered nature of the rock. Aside from iron, metal content is extremely depleted. Potassium is <0.01%, sodium is 0.10%, calcium is 0.07% and magnesium 0.01%. Aluminum is somewhat lower than normal for an average volcanic rock (6.44% vs. about 9%). The real clue to the rock's original composition comes from reference to the titanium content which was determined to be 0.280%. Since titanium is virtually immobile during alteration, this level would indicate that the original rock fell into the rhyolite-rhyodacite class.

Some base and precious metal enrichment is indicated. Gold content is 17 ppb, and silver 1.2 ppm. Iron, at 6.65%, is an indication of the visibly high pyrite content. Another sample taken from this pit in 1982 showed a mercury content of 1500 ppb, highly anomalous in the context of the small amount of mercury work we have done.

Specimen 86-7-17-9

This specimen was taken from a rock-pit located on Wanda 19 on the north side of Pemberton 100. The rock here was not exposed at the time of our previous work. It consists of a very fresh ,dense black, rather badly fractured amphibolite, generally fine-grained, but occasionally coarse enough to for the observer to note large masses of amphibole crystals using a hand-lens. It was our judgement that it represented a dyke of fairly recent age as evidenced by its lack of alteration in an area otherwise marked by intense siliceous, pyrophyllitic and advanced argillic alteration. We have since located it as float to the west (possibly due to glacial transport from the pit area, possibly due to suboutcrop close by the float occurrence), as highly fractured rubble and fault gouge in the rock-pit on the "P"(west) grid, and as float far to the east on Pemberton 410, close by the "Q" Grid.

With the idea that it might be responsible for the chromium anomaly on the "Q" grid, we were particularly interested in determining the chromium content of this rock-type. The analysis shown of Certificate #A8619283 is invalid and has been struck out. (Due to a laboratory error, it represents a replicate analysis of the preceding sample in the list, 86-7-17-8.) Refer instead to Certificate #A8621738, which contains analyses of a sample somewhat similar to, but not identical with, that originally assayed as 86-7-17-8. Sample #86-7-17-9 on Certificate #A8621738 is an analysis of a second specimen of the black amphibolitic dyke.

There is no sulfide mineralization associated with this rock, but occasional manganese stain in zones of fracturing. Reference to the assay shows chromium to be relatively low at 99 ppm. We conclude that this rock is not the source of our chromium soil anomalies. Calcium, sodium, magnesium and iron values, (the iron taken in conjunction with the fact that there are no sulfides) indicate to us that the rock is of basaltic composition. There are no base or precious metal values associated with the rock, nor would we expect any in the absence of alteration.

Specimen 86-9-25-2

This rock was taken from outcrops on Wanda 16 and is characteristic of our Unit G (Pearson, 1983), which we have described as a relatively basic fragmental basaltic andesite. Outcrops are common around the mouth of Youghpan Creek and west of that creek up into the hills. Small calcic feldspar phenocrysts are ubiquitous and the texture is that of an autoclastic breccia. Fragments see in outcrop along the shore of Holberg Inlet just west of the mouth of Youghpan Creek vary up to a foot or more in diameter, and are round to subround. There is essentially no difference in texture or composition between fragments and matrix. The rock weathers easily, becoming quite porous in the process. Occasional small red patches indicate the presence of hematite. No pyrite has been noted within the unit.

Outcrops on Wanda 16 are located just south of intensely silicified rocks of the Bonanza sequence described above near the "L"(west) grid. The complete lack of alteration in Unit G at this point would indicate to us that Unit G has been moved into fault contact with the altered rocks, or was extruded after alteration (presumably at the seawater-rock interface) had already taken place. Chemical analysis confirm our judgement that the rock is a basaltic andesite. Of some interest is a barium content about twice average, after discounting for several specimens which are known to be associated with conformable sulfides, with which barium is often associated.

Specimen 86-7-17-8

This specimen was taken from the knob at the eastern end of the "L"(west) grid on Wanda 17, about 25 meters east of Line 9E. Another specimen taken close by was identified by us as massive pyrophyllite. The specimen analyzed, however, appeared to be largely silica, with notable amounts of disseminated pyrite. It corresponds roughly with our Unit F (Pearson, 1983) which we described from outcrops located about 1000 to 1500 meters to the east. The rock is highly fractured, and, to judge by hand-specimen, it is an open question whether it represents a highly altered volcanic, or a hot-spring silica deposit.

Reference to the geochemical data (Cert. #A8621738, dated 13-Dec-86) indicates high alumina, but virtually no calcium, or alkali metals. Titanium, at 0.666%, would indicate that the rock was originally in the andesite-basalt field and has been very badly leached. It is not, therefore, a silica spring deposit.

Specimen 86-9-25-4

This specimen was picked up from road-fill along the southern edge of Pemberton 100 close to Line 9W, 0N on the "L"(west) grid. Although we cannot be certain of its origin, it is identical in appearance with rock taken from a rock-pit previously described and mapped by us, located about 750 meters west of the Wanokana bridge crossing. (See Map 4, Pearson and St.John, 1984). The rock resembles a lustrous dense white chert, but we speculated that it was actually a very fine grained rhyolitic tuff. A few small angular fragments located within the outcrop area lent weight to our speculations.

Reference to the analysis shows very high aluminum (13.74%), very low calcium ((0.11%) and alkali metals (K is 0.05% and Na is 0.24%). Titanium is relatively high, comparatively speaking, at 0.310%. On the basis of the overall composition, we conclude that the rock represents an indurated clay derived by weathering of a rock of original composition in the rhyodacite to dacite range.

Specimen 86-9-25-3

This specimen is questionably classed as a rock sample. Essentially it consists of a reddish orange sand occurring as overburden over the concealed contact between Unit G (the autoclastic breccia) and the very siliceous rocks to the north and east around "L"(west) grid. On the off-chance that the oxidized stain represented material derived by leaching from sulfides developed along the contact between these two units, we deemed it worth an analysis. Base metal contents offer us no encouragement. Overall composition suggests that the material represents sand derived by mechanical erosion and some oxidation of andesitic rock.

Rock Geochemistry: Pemberton 100 Rock Pit

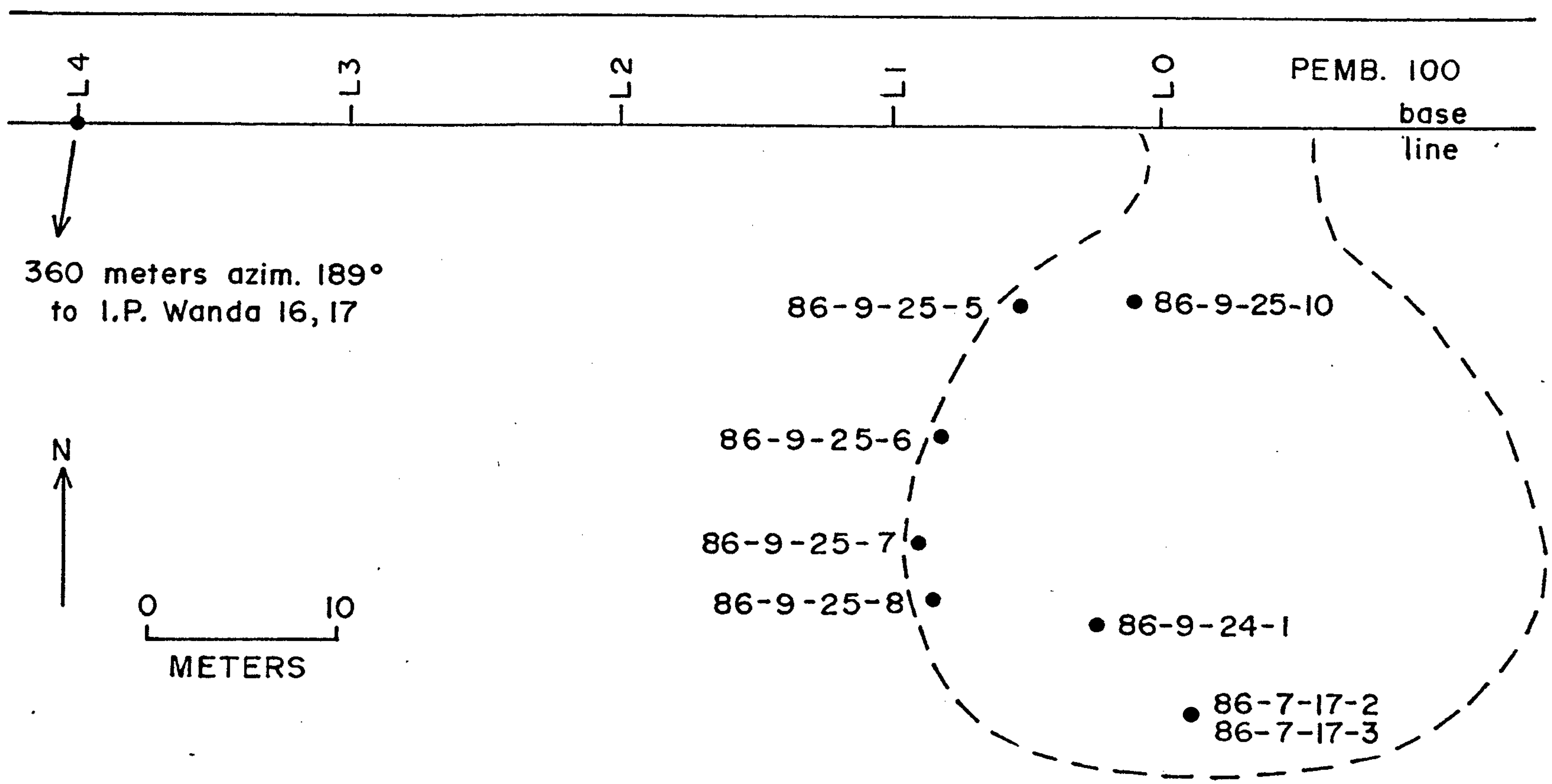
This pit is located on logging spur Pemberton 100 which crosses Wanda 17 from east to west. It lies just to the southwest of the L.C.P. for Stat 2 and Stat 3. Its location with respect to the I.P. for Wanda 16 and 17 is shown on Map 3 (overleaf), upon which we have also shown the base-line for the "L"(west) grid. See Map 2 (in pocket) for overall perspective on location.

The pit is of particular interest, for it exposes rock containing intensely folded, apparently conformably deposited, banded sulphides, enclosed in white and light grey banded volcanics. It was the purpose of our survey to check our judgement that the enclosing rocks were indeed volcanic in origin, and to ascertain whether the sulfides (entirely pyrite, to judge by our hand-lens examinations) carried any base or precious metal values. Although the pit area is obviously affected by faulting, some of it fairly obviously post-alteration, several zones of intense sericitic alteration lead us to believe that some faulting controlled penecontemporaneous alteration. We also judged some of the faulting to be slump faulting of unindurated tuffaceous material.

We have not as yet carried out detailed geological mapping of the pit. Relations are obscured by the work of the quarriers and the earth-moving machinery. We have, however, collected a variety of sample-types from various points in the pit, to reflect the variations in rock-type which occur from one point to another. Map 3 shows the location of these samples.

Specimen 86-7-17-2

This specimen was collected from the highly shattered back (south) wall of the pit, in a zone displaying deformation which we interpreted to be slump folding. It consisted of white, apparently volcanic rock heavily mineralized with fine-grained banded pyrite. Analysis shows almost complete absence of calcium



ROCK SAMPLE LOCATIONS

PEMB. 100 ROCK PIT

(with respect to L_{west} Grid)

See text for rock descriptions and analyses.

(0.05%), sodium (0.05%), potassium ((0.09%), and magnesium (0.03%). Aluminum is moderate at 4.33%. Titanium is relatively high, considering these foregoing figures, at 0.330%. On the basis of the titanium figure, we would be tempted to class the rock as a highly altered rhyodacite to dacite. However, certain other factors should be considered. See below.

Precious metal contents are at background levels, but base metal values are of some interest. Iron, as indicated by hand-specimen examination, is very high (18.60%). Copper, at 110 ppm, is a little over twice background for the general area. Lead, at 84 ppm, is slightly above twice background, and zinc, at 146 ppm, is about five times background. Reflecting the zinc value, cadmium is 6 ppm, whereas, in all other samples (save for a replicate of this sample) it is below detection limits (<0.05 ppm).

Barium is of particular interest in this sample. It seems outstandingly high at 2903 ppm. Since barite is often associated with submarine exhalative deposits, it would lend weight to our supposition that the conformable nature of the sulfides indicates such an origin. However the enrichment factors for the base metals listed above would lead us to believe that, if a center of base metal enrichment of economic proportions does exist, we are not yet very close to it. On the matter of original rock-type, we conclude that, after allowing for the content of pyrite in the original rock (assuming depositional layering), the aluminum and titanium content of the remaining siliceous rock is such as to indicate that it was more likely an andesite than a rhyodacite to dacite.

Specimen 86-7-17-3

This sample is essentially a replicate of the one previously described, taken from the same location, and differing in hand specimen only in having a lesser amount of pyrite visible to the naked eye. Analysis indicates that iron is indeed lower, at 10.40%. Titanium is considerably higher, (at 0.580 %), but aluminum is higher (at 7.15%) by about the same proportion. Calcium and the alkali metals are very low, as in the preceding specimen, and we conclude that this rock too was originally an andesite. Indeed, both rocks may have approached the basaltic class.

Enrichment in base metals in this specimen is not nearly as marked as in the preceding specimen. Zinc is slightly above background at 107 ppm, and cadmium reflects this at 1.5 ppm. Lead is as high as in the preceding specimen at 82 ppm, but copper is only questionably anomalous at 60 ppm. Barium is at background level. There is no significant precious metal enrichment.

Specimen 86-9-24-1

This specimen was gathered from the pit floor a few meters northwest of the preceding two specimens. The area had been compacted by the movement of earthmoving equipment, but we judged the material to be in place. It consisted of a clay of rich yellow color. We judged it to be a clay of hydrothermal origin or, possibly, of fault gouge origin. Only a few elements show any significant values. Iron, at 3.08%, magnesium at 0.44%, aluminum at 9.46%, titanium at 0.550% and potassium at 2.46% should be considered in evaluating the material. We would judge that the original rock was an andesite, and that it has been hydrothermally altered to sericite. There may have been some pyrite present, but it has been altered to limonite, presumably by surficial oxidation. There is no significant base metal content.

Specimen 86-9-25-10

This rock is a breccia, almost certainly volcanic in origin. It is conspicuous by the dark black color of the matrix and the fact that virtually all of the contained fragments, which make up about 5% of its volume, are white to light grey in color. Fragments vary from round to very angular, and numerous rectangular ones were noted. Some of the grey fragments have bleached rims and some contain bleached inclusions (altered phenocrysts?). Also present along irregular shear lines are small inclusions of what we interpret as coalified organic matter. One to two percent disseminated pyrite is visible under 20x handlens.

Analysis shows iron at 6.47%, titanium at 0.450%, and aluminum at 9.44%. Calcium and the alkali metals are insignificant. (Sodium, at 0.15%, is the highest of the three.) We would judge the rock to be a highly brecciated and altered andesite containing graphite and microscopic pyrite, and containing fragments of highly altered, more siliceous rock, probably a porphyritic volcanic. Base and precious metal values are extremely low with the exception of copper, which is slightly elevated at 102 ppm.

Specimen 86-9-25-5

This specimen was taken from a bank of fine-grained material heaped up along the western side of the pit. Color zones along this bank varied from north to south, and this plus the succeeding three samples were taken at intervals from north to south to sample each of these zones. This particular sample was a mixture of white and reddish-orange clay material.

Iron is notable in the analysis at 4.32%, and probably occurs entirely as limonite. Aluminum is high at 10.35%, titanium also high at 0.650%, and potassium notable at 1.40%. Sodium at 0.63%, magnesium at 0.48% and calcium at 0.54% are not entirely depleted. Base and precious metal values are all of background levels. We judge that the material was originally an unmineralized volcanic , probably in the andesitic field, and has been partially but not completely decomposed by clay-altering processes, possibly surficial in nature. In other words, it is largely a soil.

Specimen 86-9-25-6

This material is a grey and white clay, taken from the west bank of the pit a few meters south of the preceding specimen. Chemically, this material is much like that of the preceding specimen. Potassium, however, is substantially higher at 2.37%. Manganese is very low (46 ppm) and iron somewhat lower (2.72%) which accounts for the much lighter color of the material. Base and precious metal values are very low.

If this is of soil origin, the soil was certainly not derived from the andesites which predominate over most of the property. In view of the titanium content (0.570%), we conclude that the ultimate origin was a rock of andesitic composition, but that it had been partially hydrothermally altered, and that the material lies almost in place.

Specimen 86-9-25-7

This specimen consisted of a dark rich reddish brown clay soil. There were fragments of what we judged to be amphibolite similar to the dyke material described earlier (Specimen 86-7-17-9) within the zone in which we obtained this fine material. On the basis of gross appearance, we judged the soil material to have been derived from fault-gouge within an extension of the dyke which passes through the pit area.

Analysis shows aluminum to be 9.20%, iron at 6.39%, potassium at 1.50%, sodium at 1.16%, calcium fairly low at 0.77%, but magnesium fairly high at 1.40%. Manganese, at a very high 2215 ppm, in conjunction with the high iron (presumably at least partially as limonite, in the apparent absence of sulfides) accounted for the very rich dark color of the material. There are striking similarities in relative metallic contents between this specimen and Specimen 86-7-17-9, the black amphibolitic dyke from Wanda 19, described in a preceding section. The only major difference is the much lower calcium content here (0.77% here vs. 4.59% in the dyke from Wanda 19. We conclude therefore that the material in the pit is derived from a fractured, partially leached extension of the dyke, or of another dyke of similar composition. Based on float and outcrop evidence, we believe it to be a single dyke of widely varying width, trending roughly east-west, and probably with subvertical dip.

Specimen 86-9-25-8

This specimen is a dark grey-green clay. Gross appearance suggests that it is a partially altered basic volcanic. Some pyrite crystals are visible in the matrix.

The analytical work shows that aluminum is relatively low at 7.59%, iron relatively high at 5.90 %. Since the rock has only two to three percent pyrite at most, a substantial part of the iron must be present in silicate form. Calcium is high at 3.28%, as is sodium at 2.65%. Potassium at 0.97% is minor but not completely leached out, and the original content may have been about what it is now. Titanium is high at 0.640%. Base and precious metal contents are negligible. We conclude that the rock represents sheared and somewhat pyritized andesite, which has not undergone significant alteration.

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Young, Maurice. 1969: Expo Group. Dept. of Mines Assess. Rpt. #2190

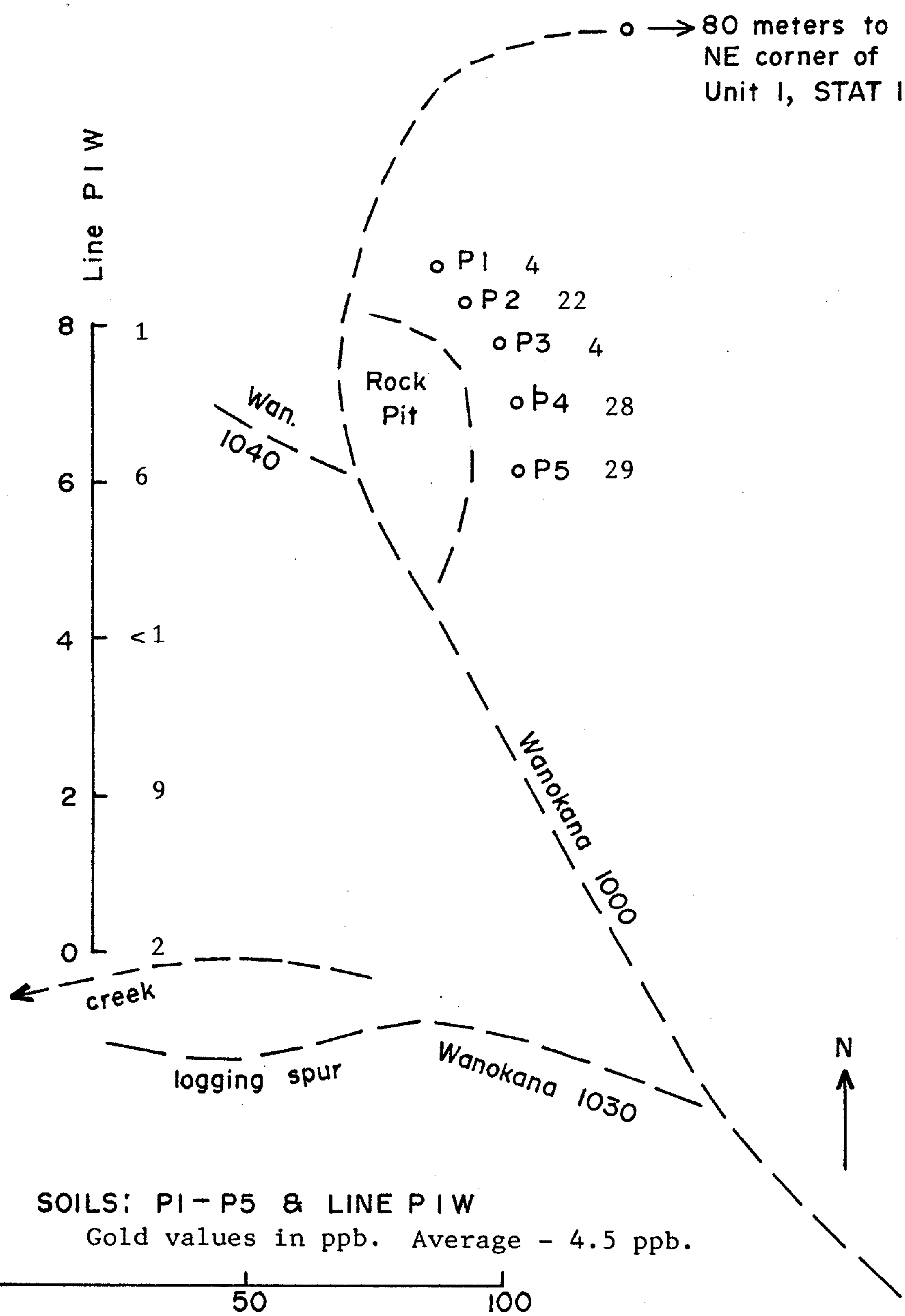
Statement of Qualifications

Bradford D. Pearson

- S.B., Massachusetts Institute of Technology, 1950
- M.A., Boston University, 1961
- Graduate work in Economic Geology, Harvard University 1955-1956
- Member, Assoc. Prof. Eng. of B.C.
- Fellow, Geol. Assoc. of Canada
- Member, Geol. Soc. Amer., A.A.P.G., A.A.A.S., M.A.C.
- Has practiced as mining and exploration geologist in Western Canada since 1962.
- Has been involved with Pemberton Hills area since 1967, when he was a field geologist with Utah Mines.

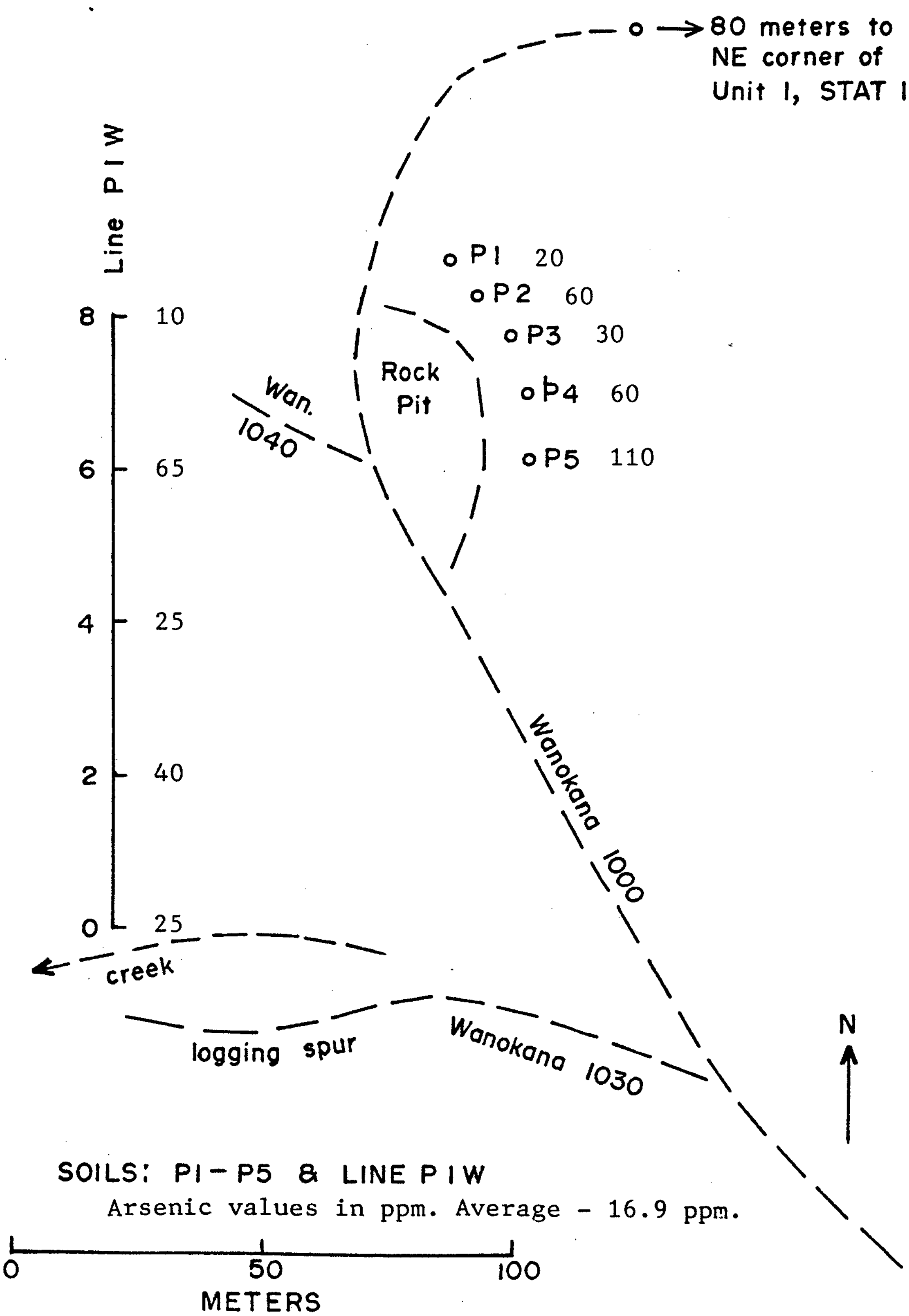
Robert W. St.John

- B.A.Sc., Univ. of B.C. (Geological Engineering, Geophysics option), 1972
- Registered as Prof. Geophysicist with Assoc. Prof. Eng., Geol., and Geophys. of Alberta.
- Member, Society of Exploration Geophysicists
- Member, Canadian Society of Exploration Geophysicists
- President, Statcom, Ltd., Calgary, Alta., offering seismic data processing and analysis.
- Has been involved with Pemberton Hills area since his student days as a field assistant with Utah Mines.



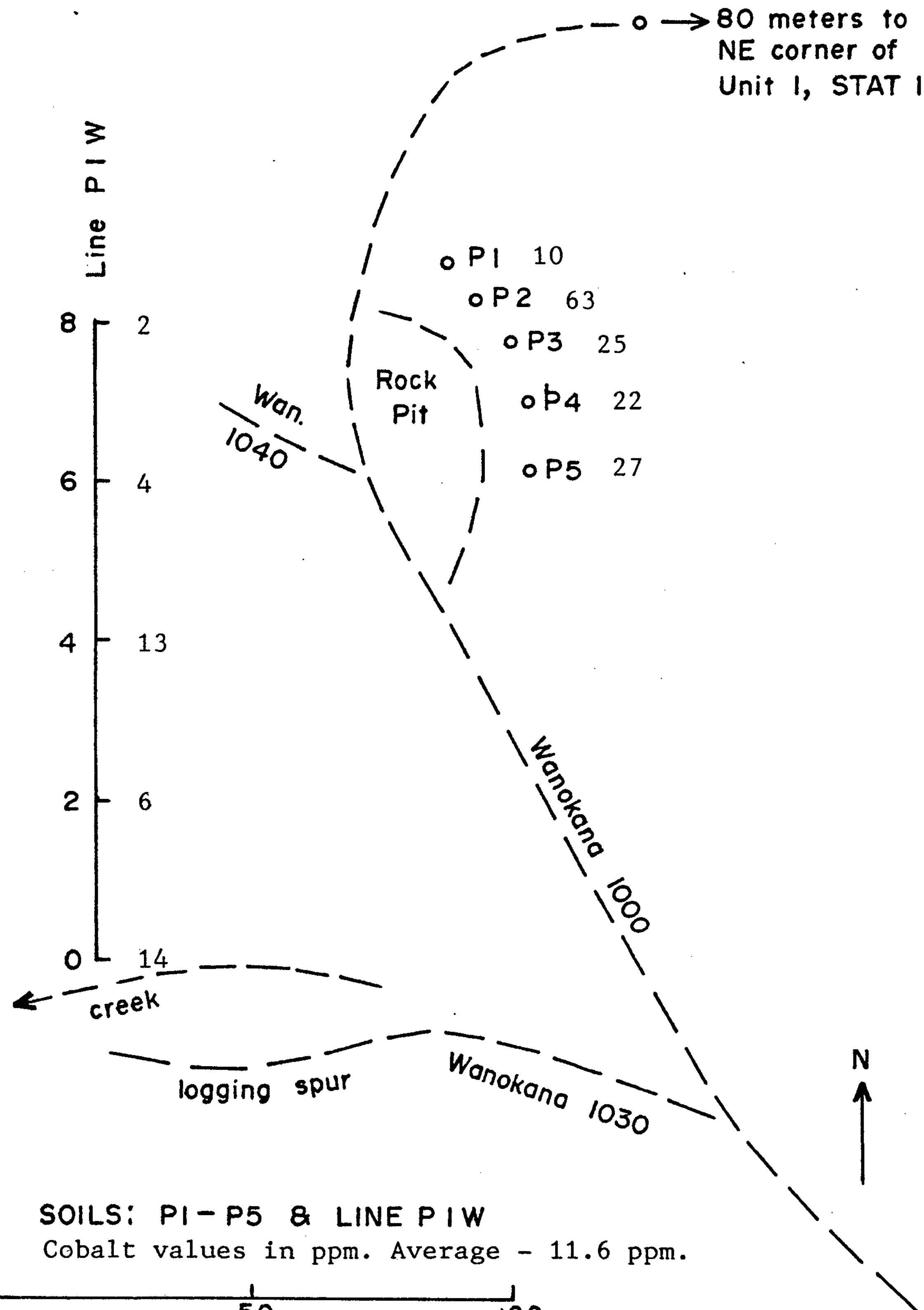
SOILS: P1 – P5 & LINE P1W

Gold values in ppb. Average - 4.5 ppb.

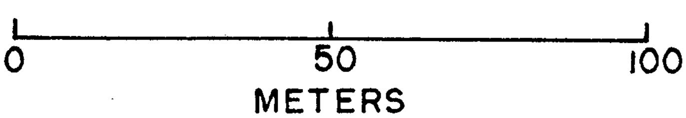


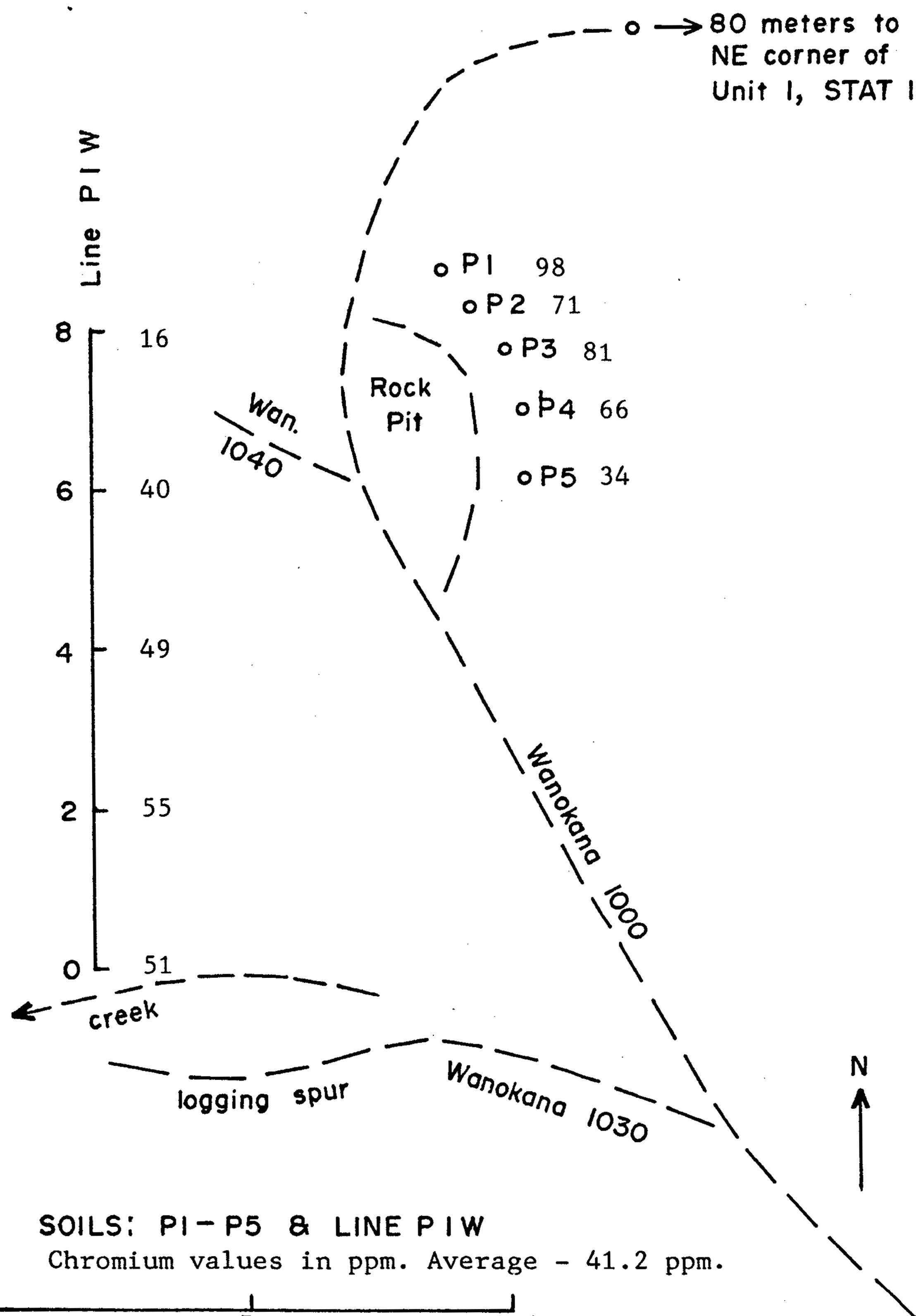
SOILS: P1 – P5 & LINE P1W

Arsenic values in ppm. Average – 16.9 ppm.

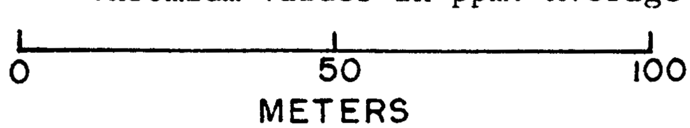


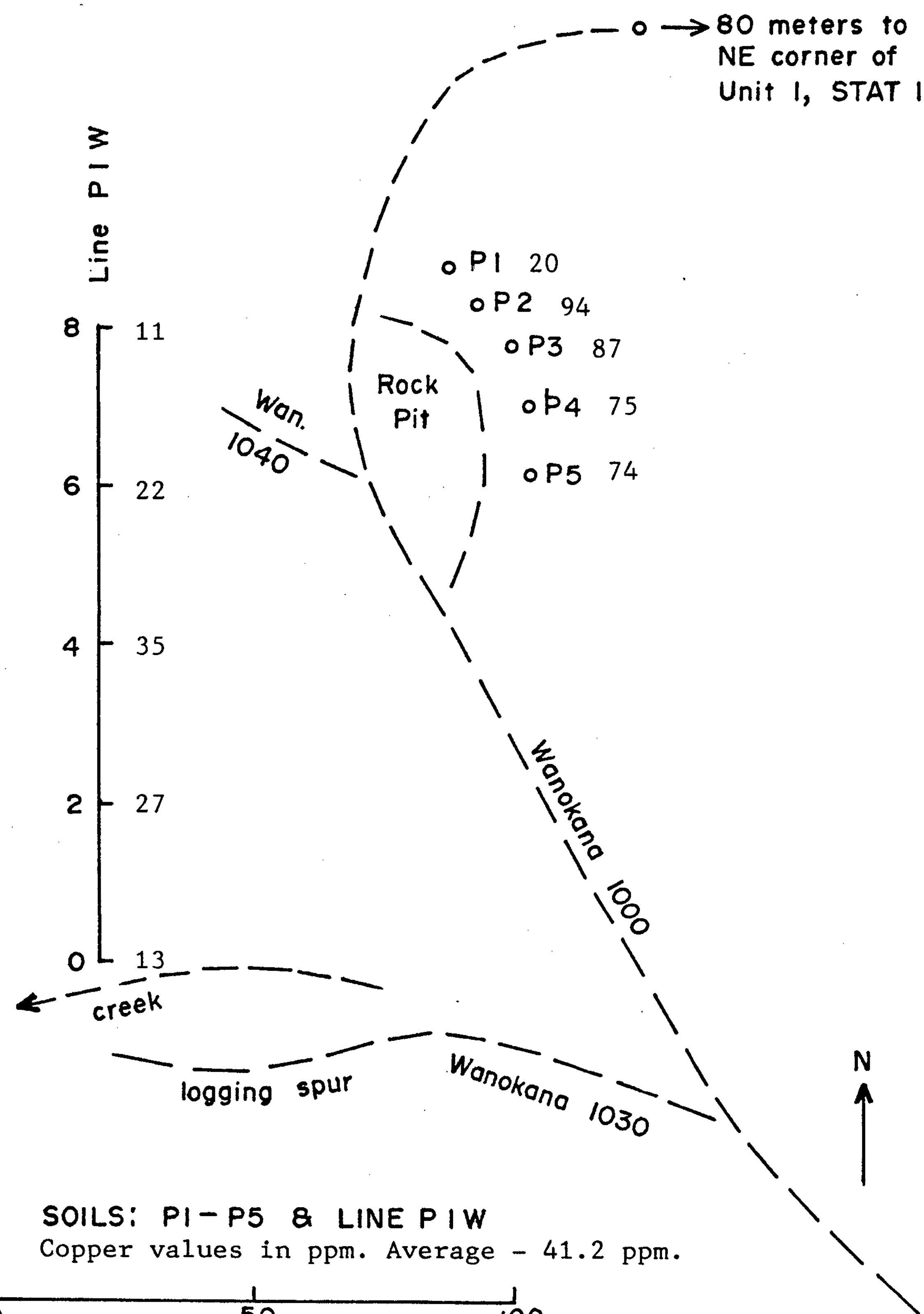
SOILS: P1 – P5 & LINE P1W
Cobalt values in ppm. Average – 11.6 ppm.



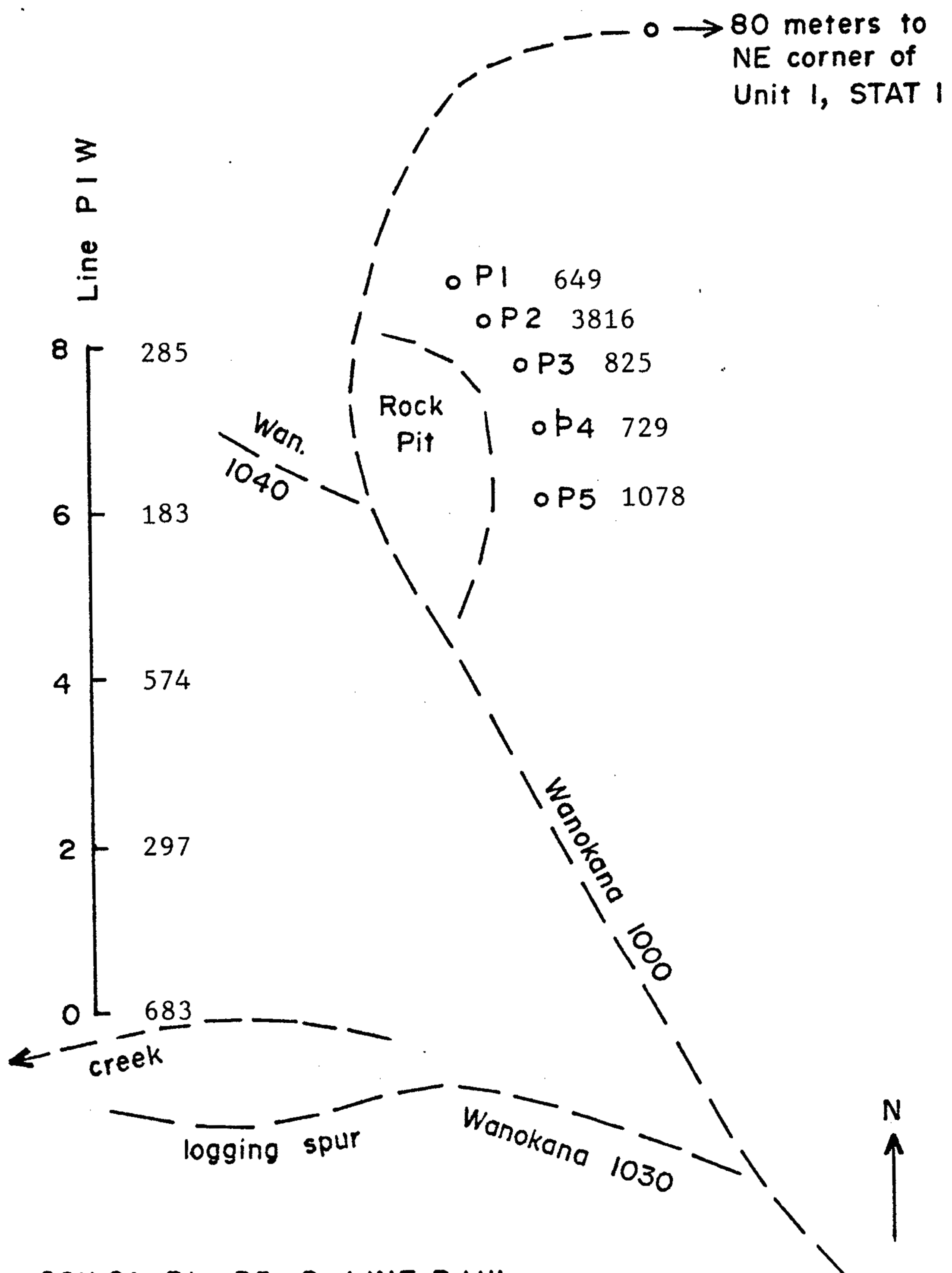


SOILS: P1 – P5 & LINE P I W
Chromium values in ppm. Average - 41.2 ppm.

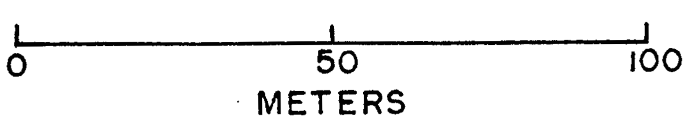


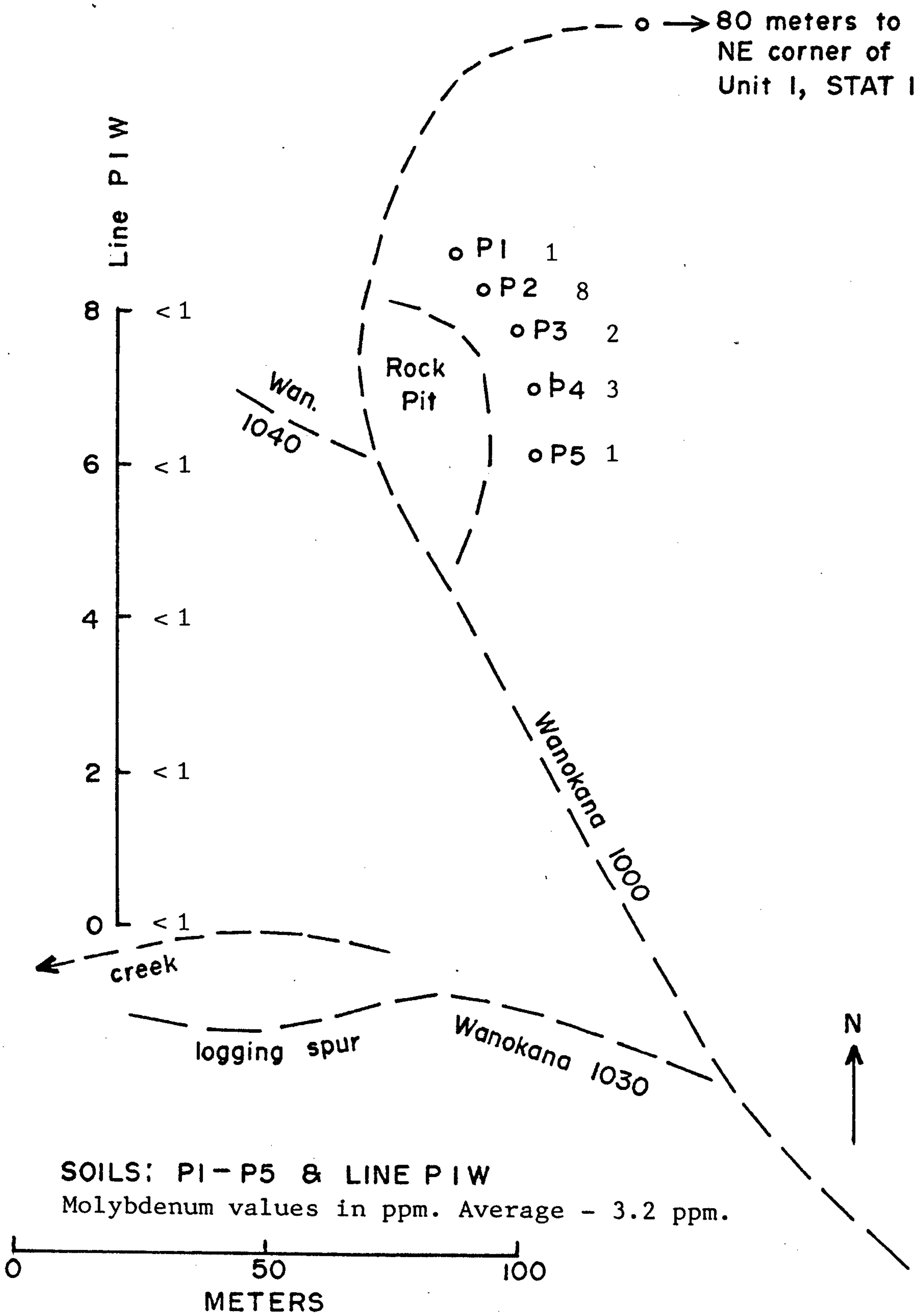


SOILS: P1 – P5 & LINE P I W
Copper values in ppm. Average – 41.2 ppm.



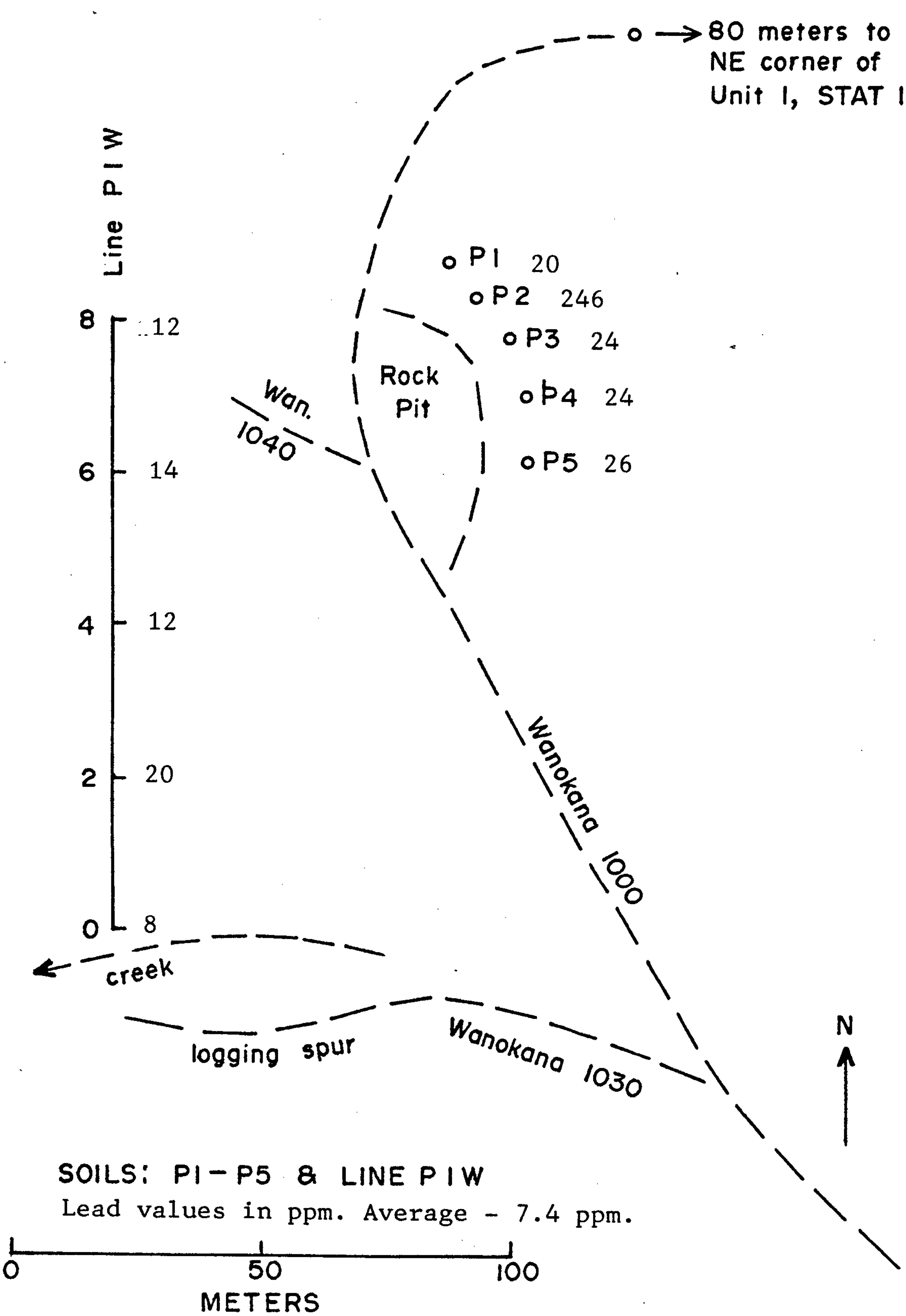
SOILS: P1 – P5 & LINE P I W
Manganese values in ppm. Average – 558 ppm.



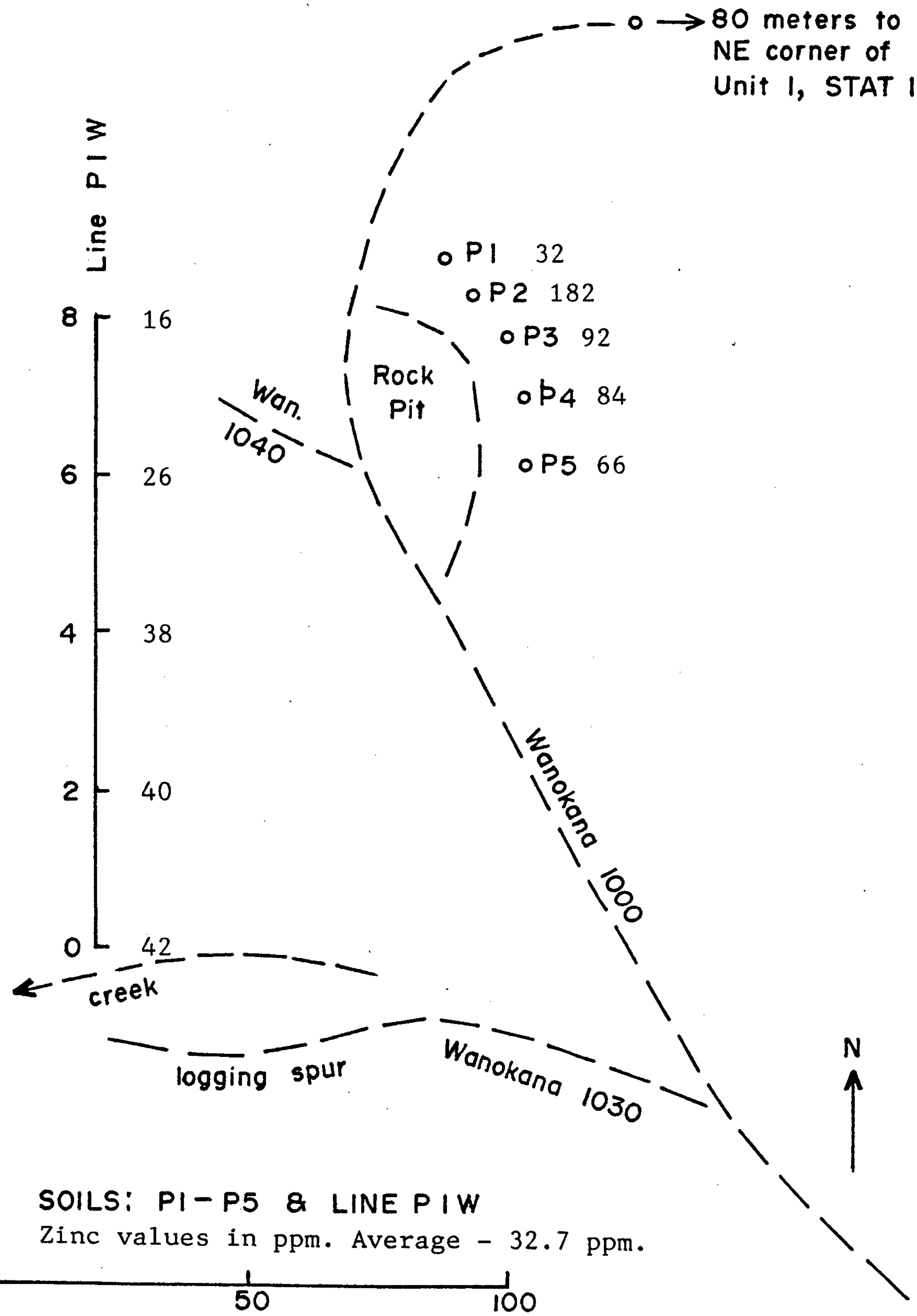


SOILS: P1 – P5 & LINE P I W

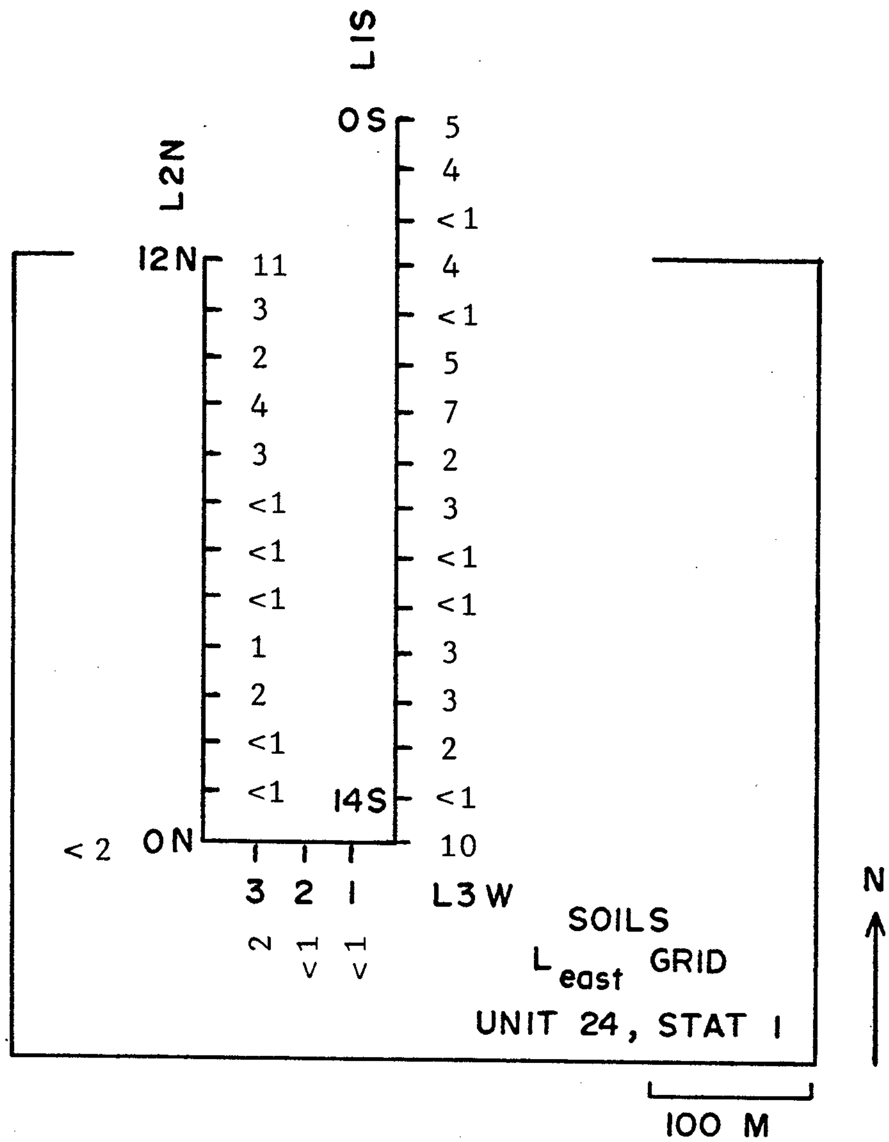
Molybdenum values in ppm. Average – 3.2 ppm.



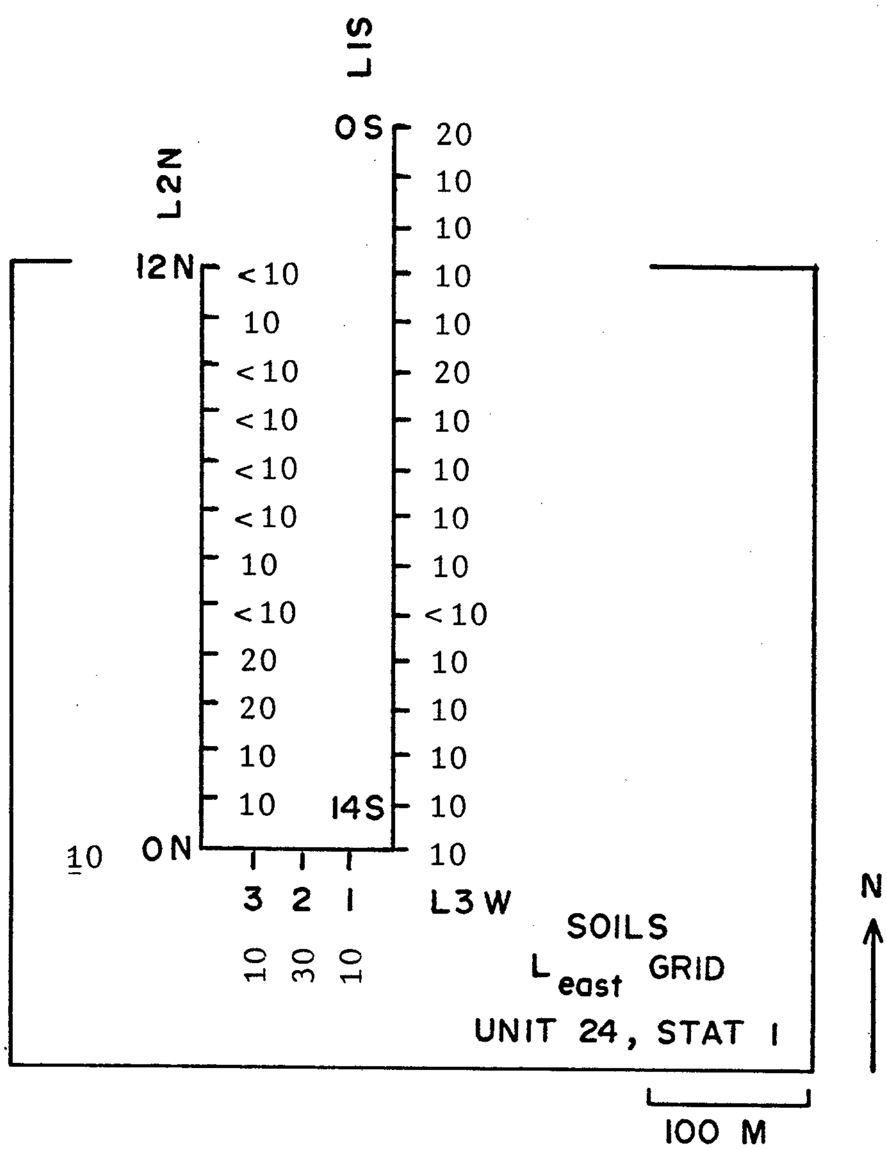
SOILS: P1 – P5 & LINE P1W
Lead values in ppm. Average - 7.4 ppm.



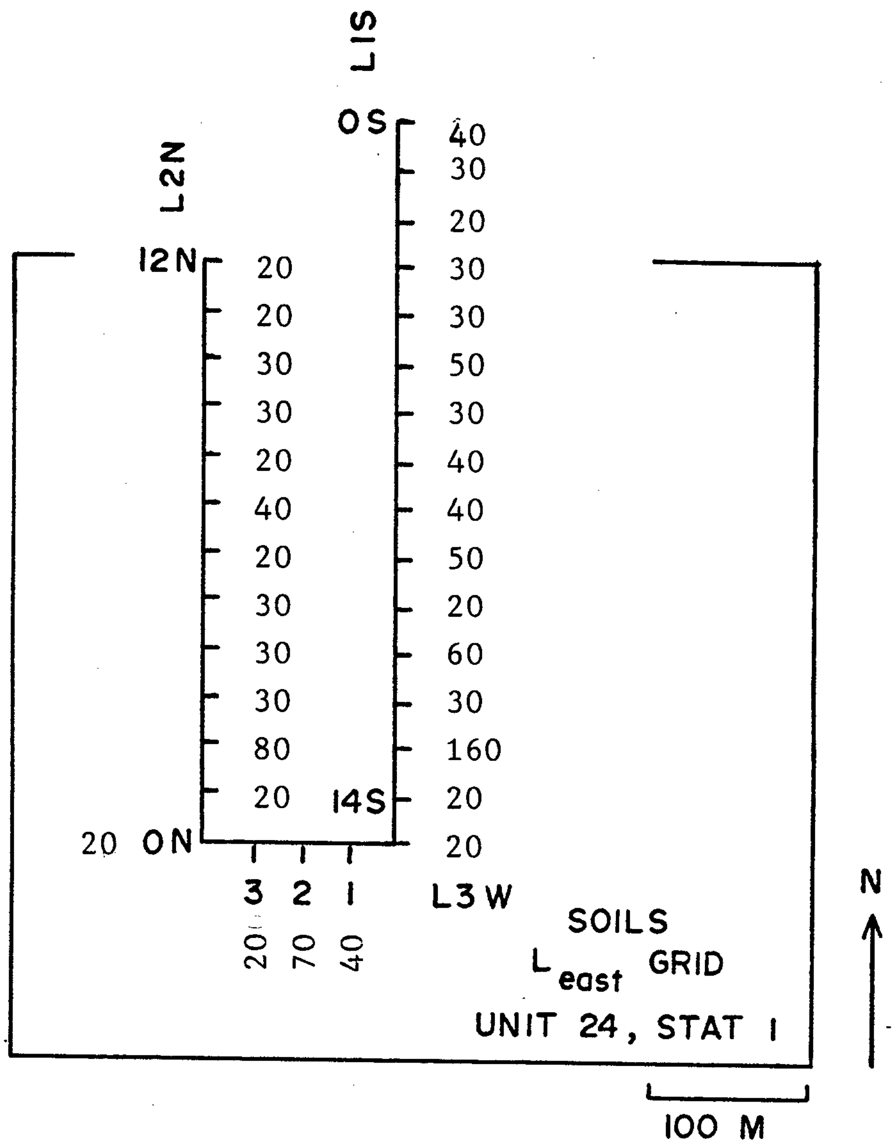
SOILS: P1–P5 & LINE P1W
Zinc values in ppm. Average - 32.7 ppm.



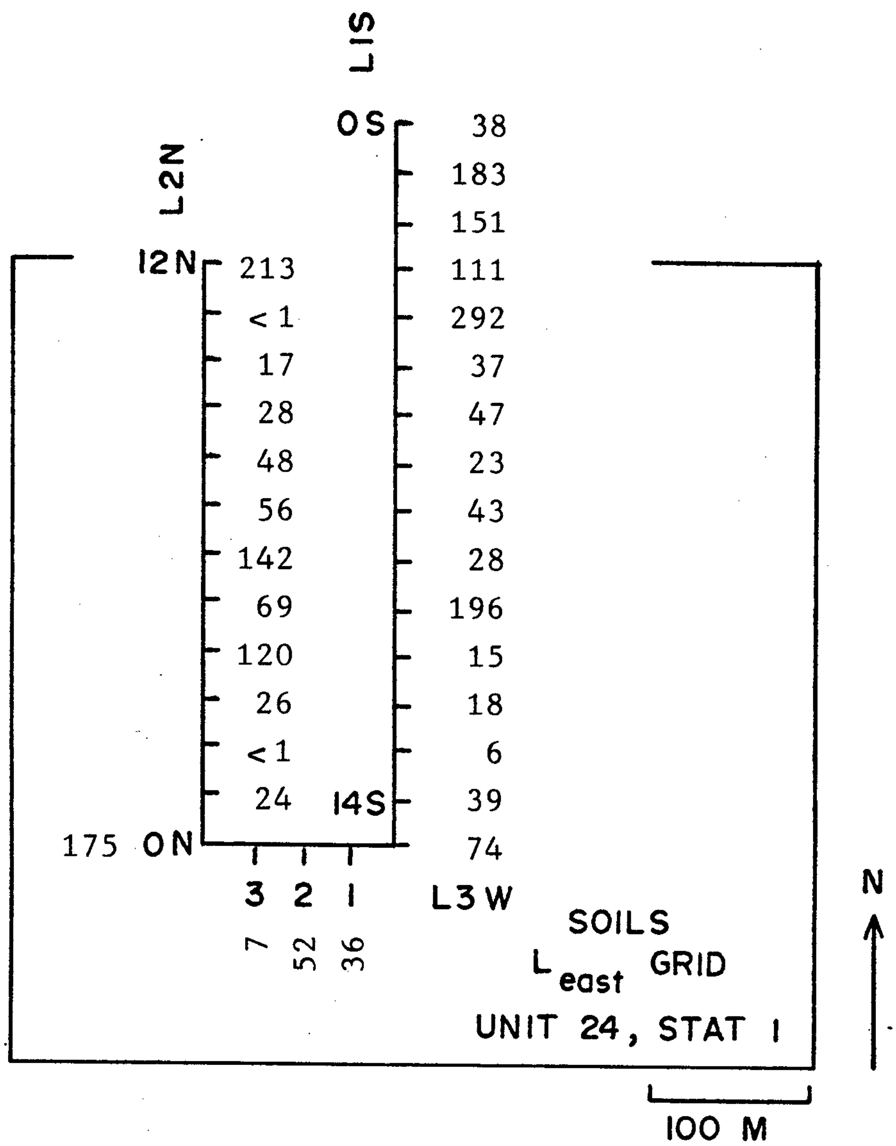
Gold values in ppb. Average - 4.5 ppb.



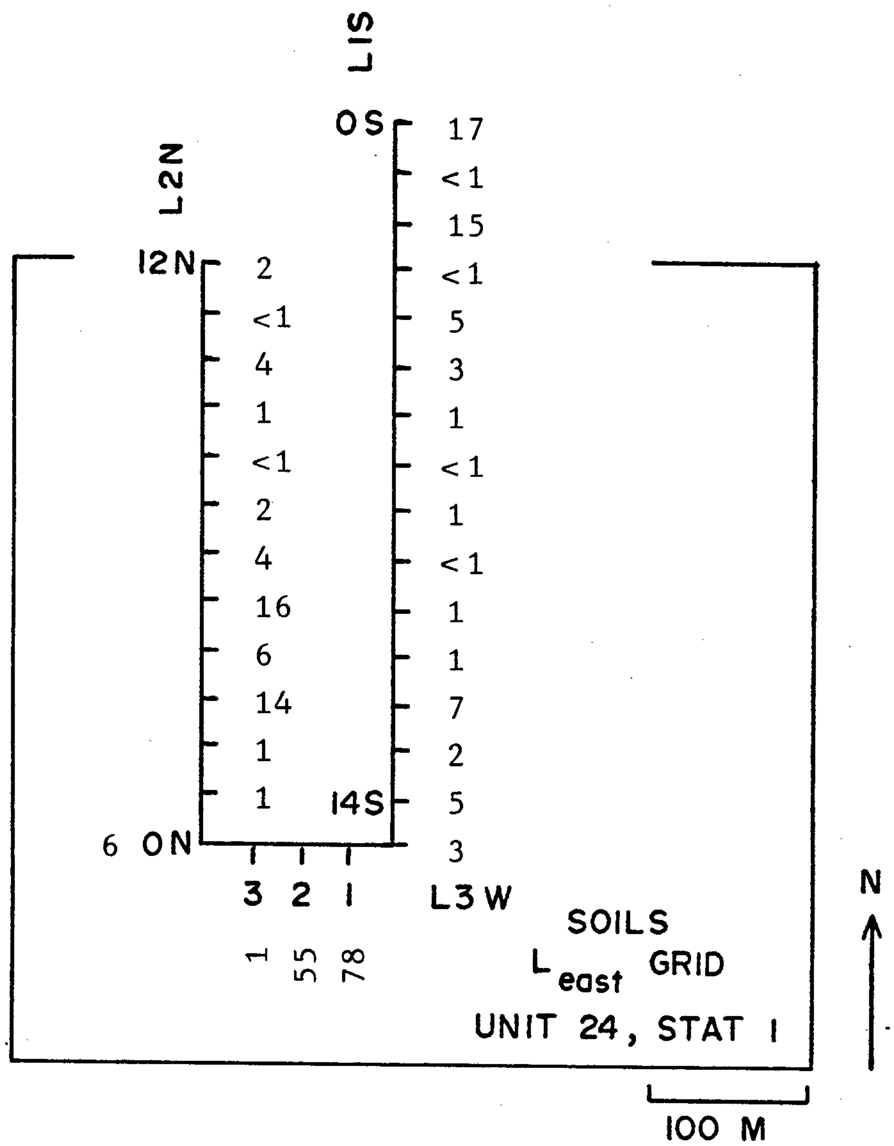
Arsenic values in ppm. Average - 16.9 ppm.



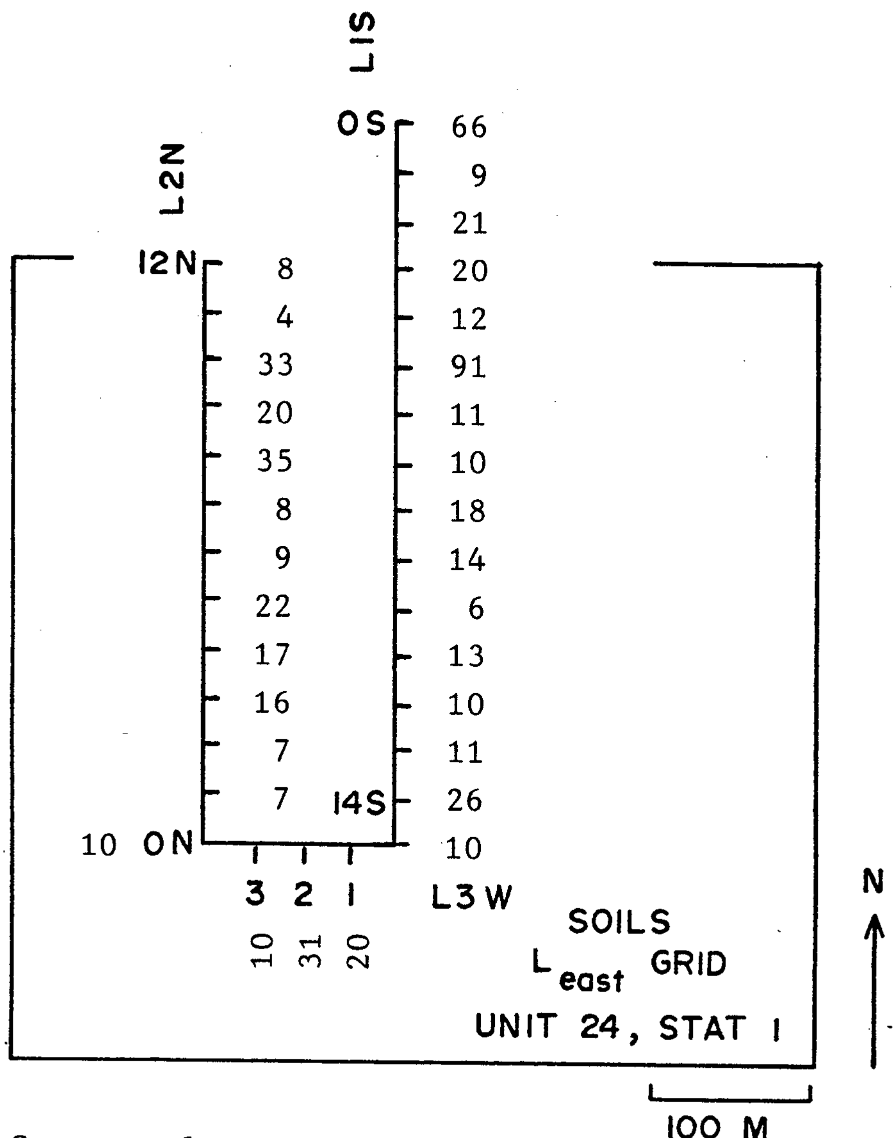
Barium values in ppm. Average - 36.6 ppm.



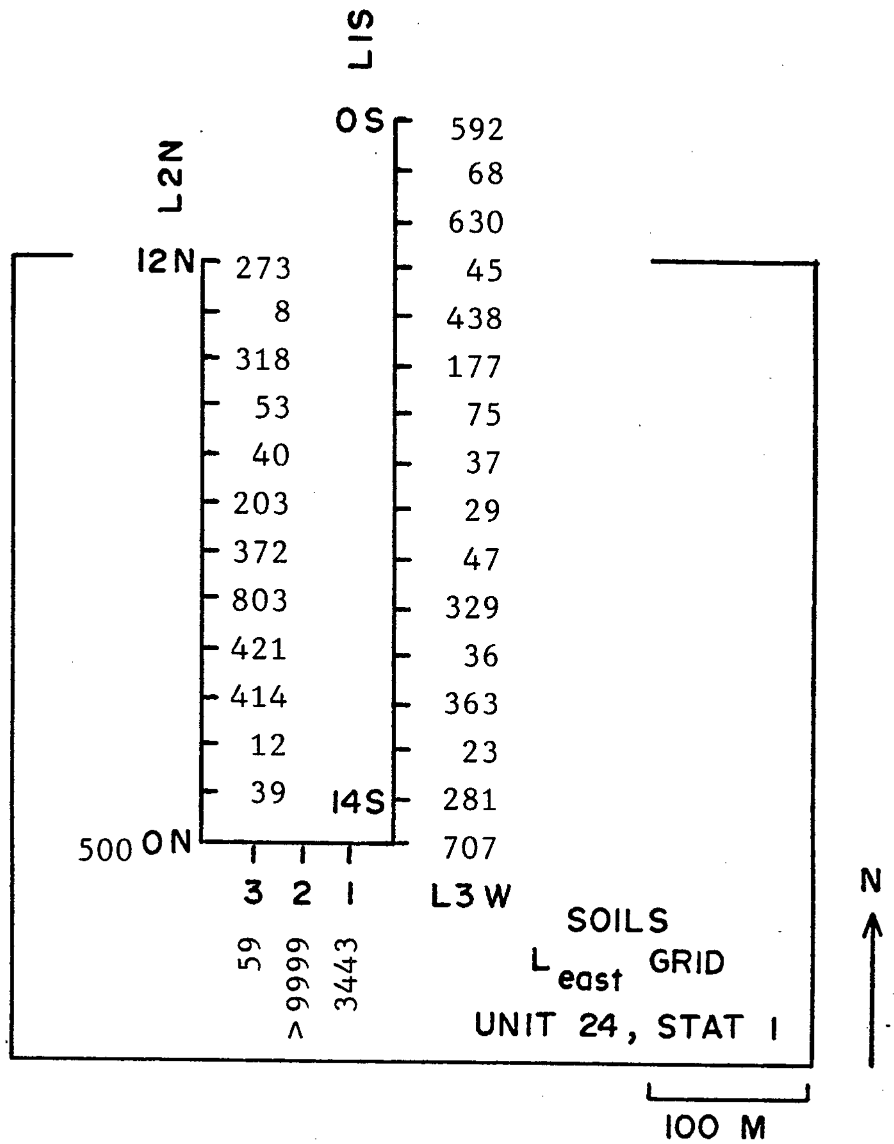
Chromium values in ppm. Average - 41.2 ppm.



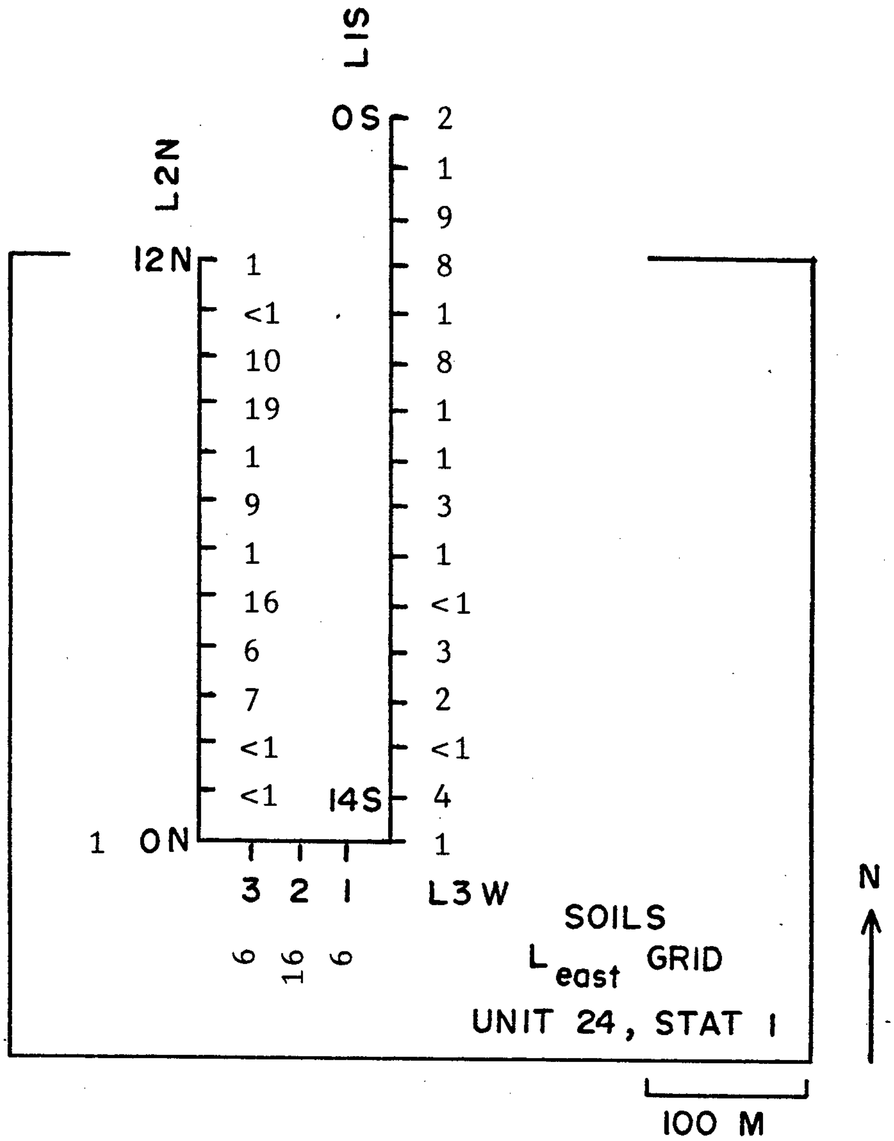
Cobalt values in ppm. Average - 11.6 ppm.



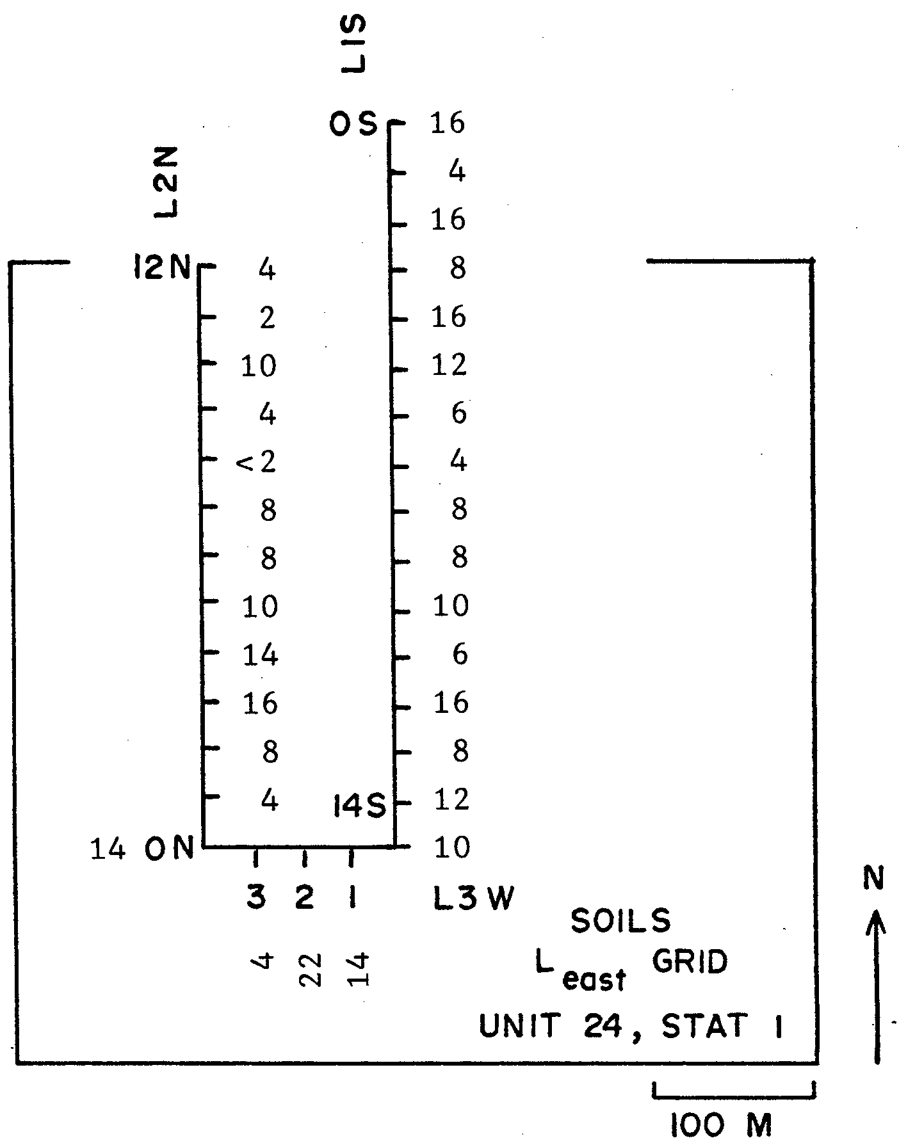
Copper values in ppm. Average - 41.2 ppm.



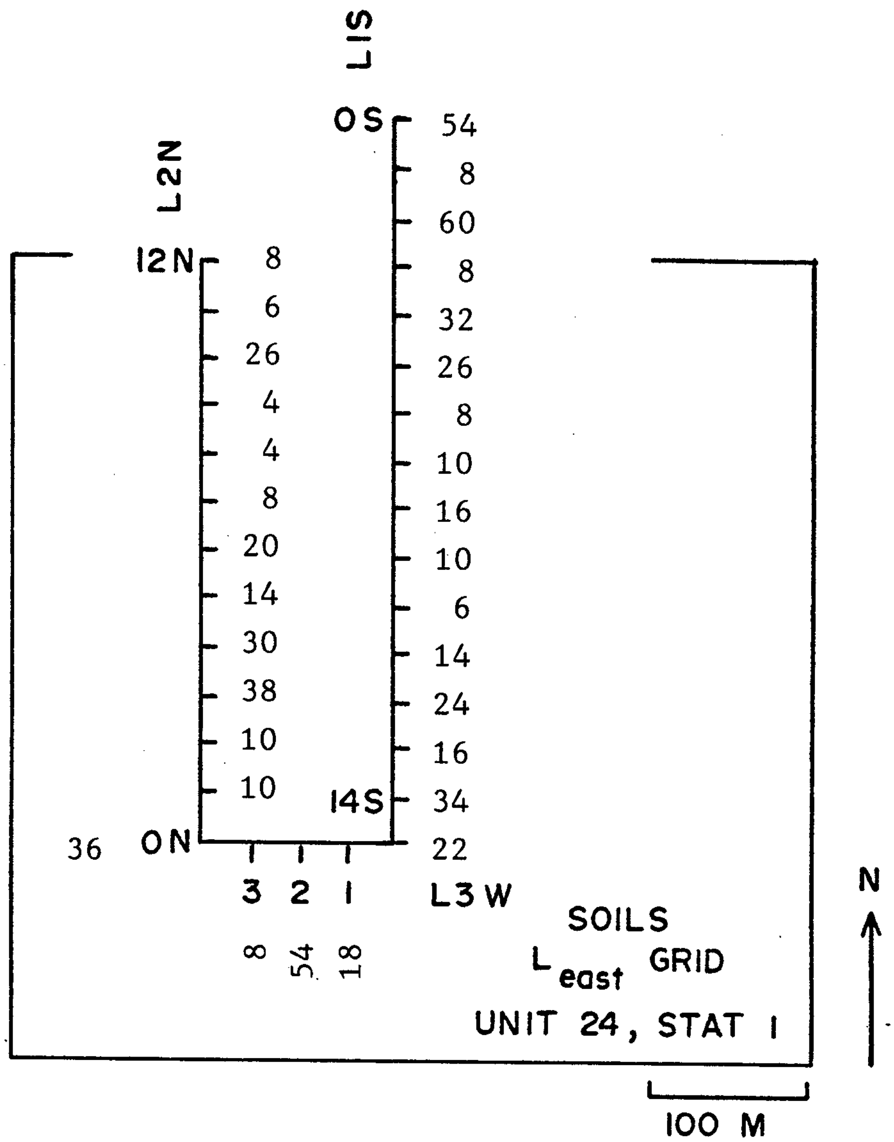
Manganese values in ppm. Average - 558 ppm.



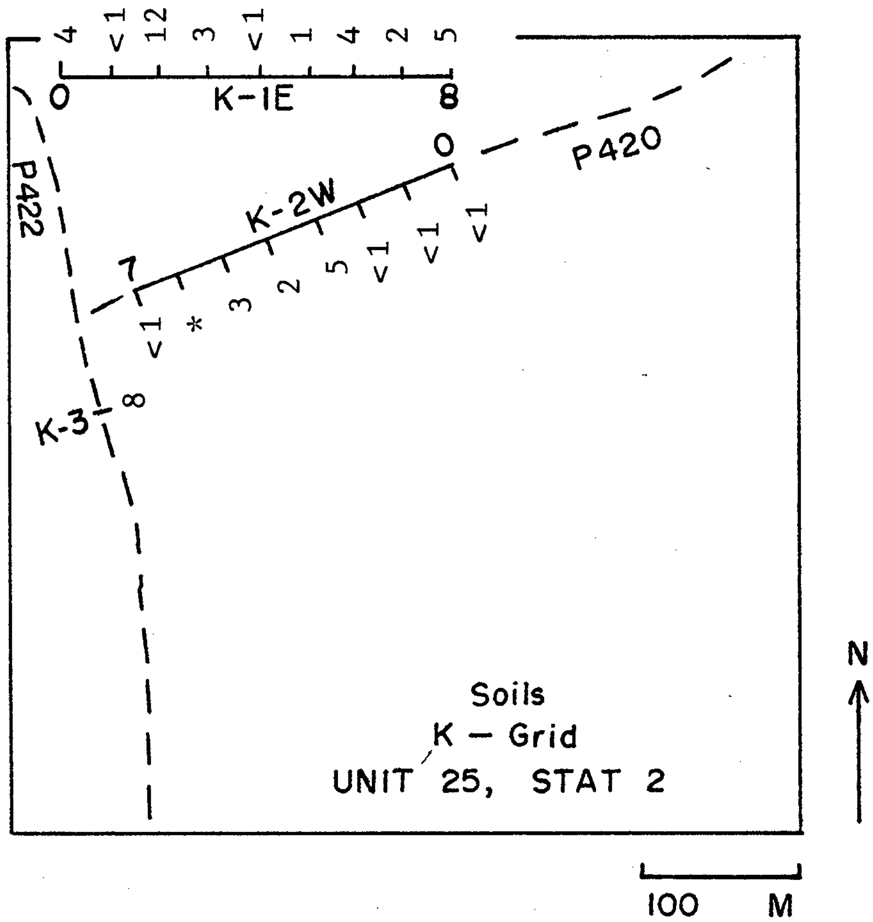
Molybdenum values in ppm. Average - 3.2 ppm.



Lead values in ppm. Average - 7.4 ppm.

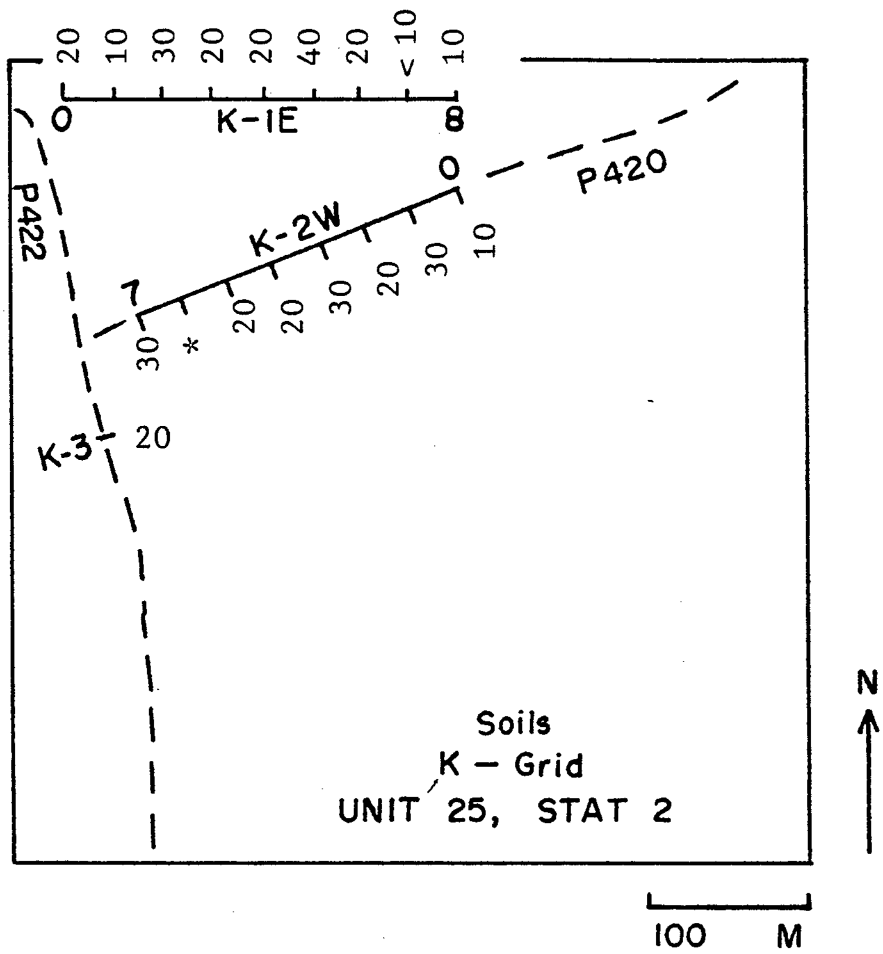


Zinc values in ppm. Average - 32.7 ppm.



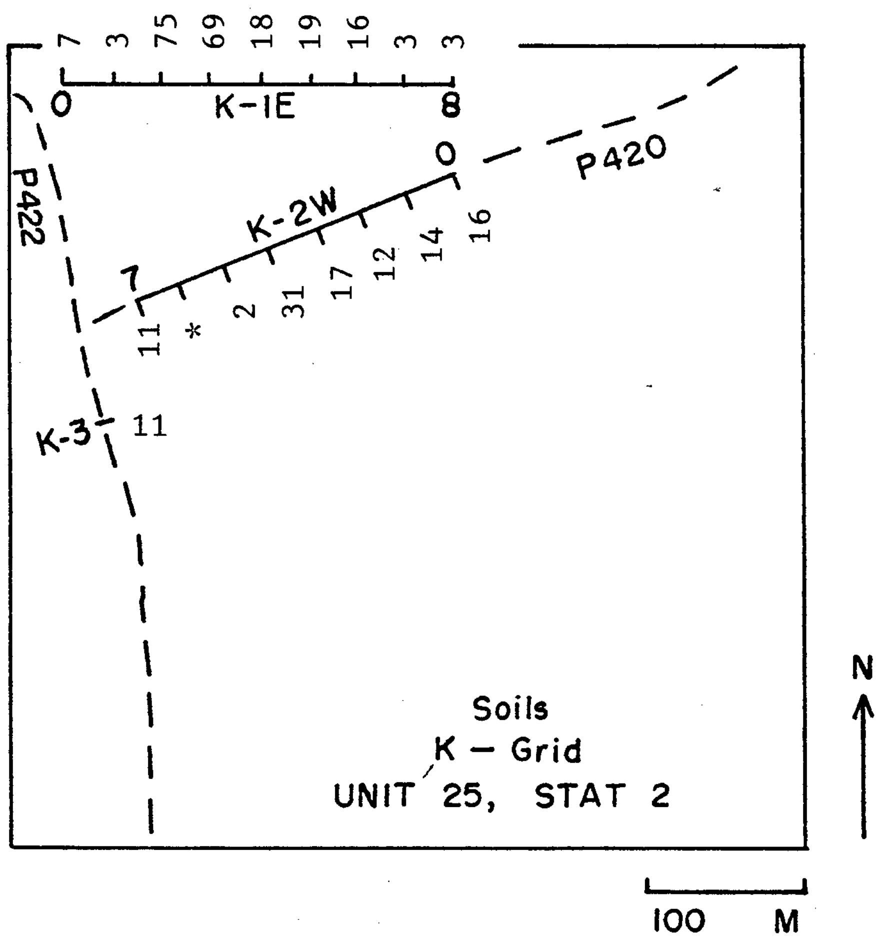
Gold values in ppb. Average - 4.5 ppb.

* K2- 6W (Upper clay) 6 ppb.
K2- 6W (Peat) 14 ppb.
K2- 4+50W 5 ppb.
K2- 4+70W 7 ppb.



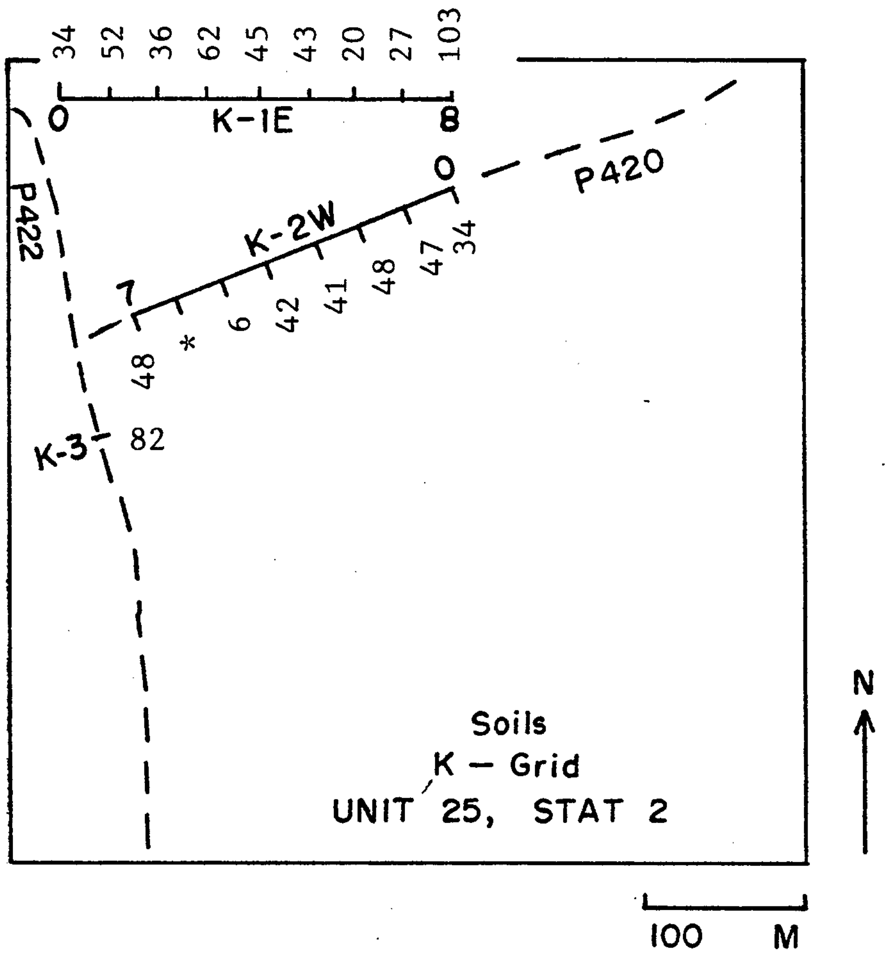
Arsenic values in ppm. Average - 16.9 ppm.

* K2-6W (Upper clay) 30 ppm.
K2-6W (Peat) 20 ppm.
K2-4+50W 20 ppm.
K2-4+70W 30 ppm.



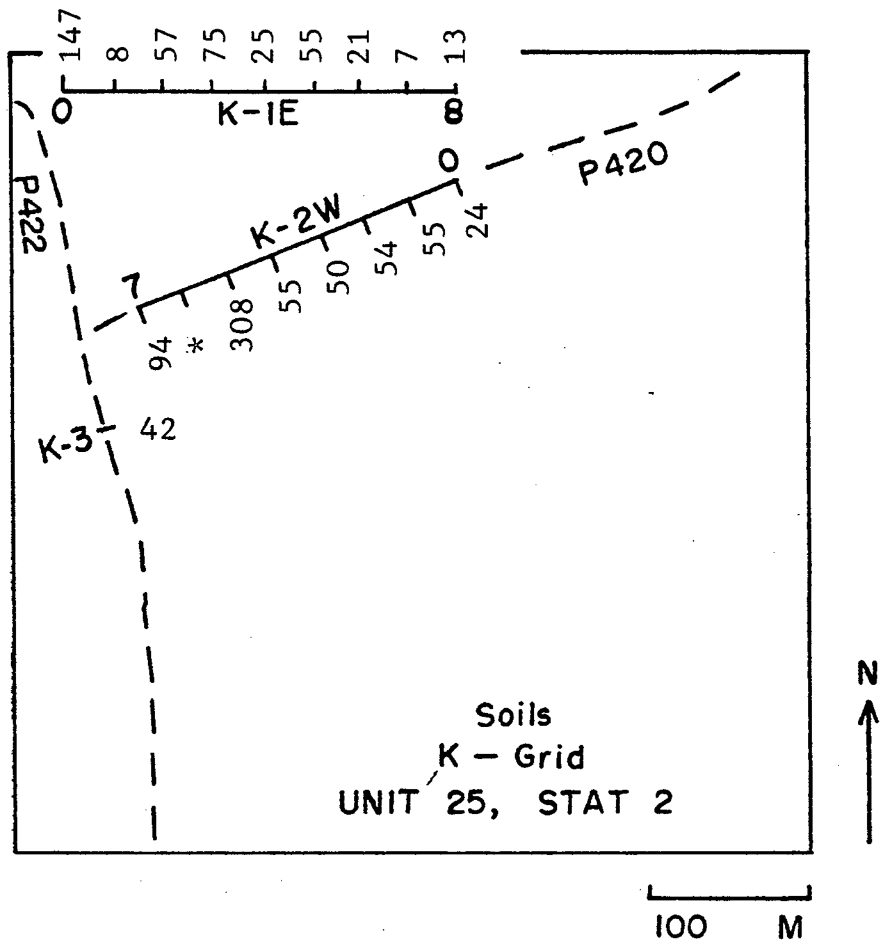
Cobalt values in ppm. Average - 11.6 ppm.

* K2- 6W (Upper clay) 10 ppm.
K2- 6W (Peat) 3 ppm.
K2- 4+50W 6 ppm.
K2- 4+70W 3 ppm.



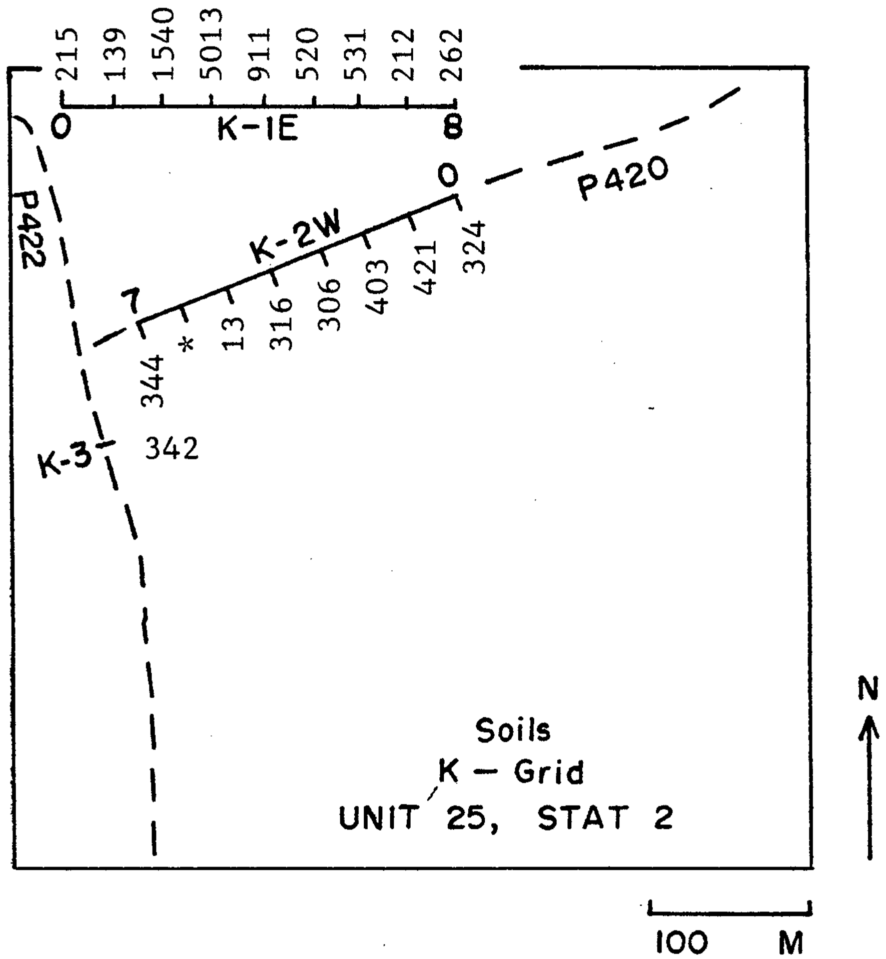
Chromium values in ppm. Average - 41.2 ppm.

* K2- 6W (Upper clay) 61 ppm.
K2- 6W (Peat) 25 ppm.
K2- 4+50W 13 ppm.
K2- 4+70W 16 ppm.



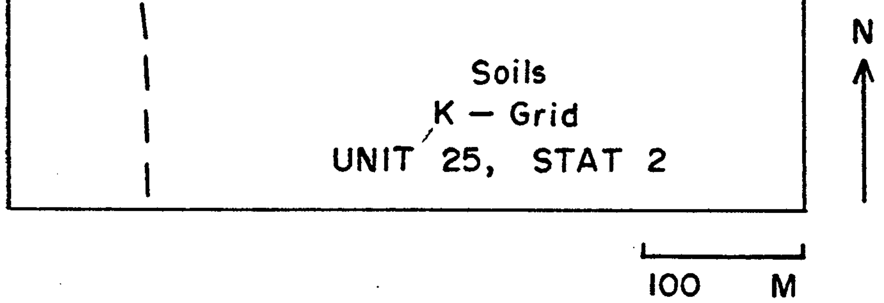
Copper values in ppm. Average - 41.2 ppm.

* K2- 6W (Upper clay) 139 ppm.
K2- 6W (Peat) 240 ppm.
K2- 4+50W 88 ppm.
K2- 4+70W 53 ppm.



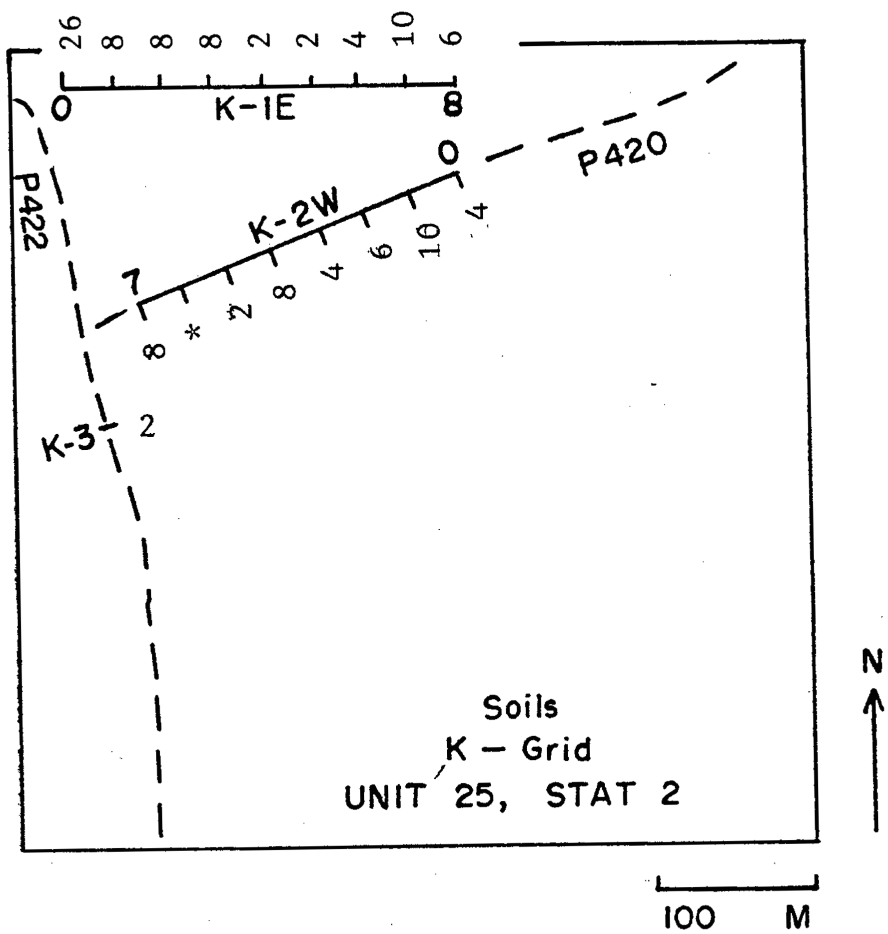
Manganese values in ppm. Average - 558 ppm.

* K2- 6W (Upper clay) 582 ppm.
K2- 6W (Peat) 60 ppm.
K2- 4+50W 48 ppm.
K2- 4+70W 24 ppm.



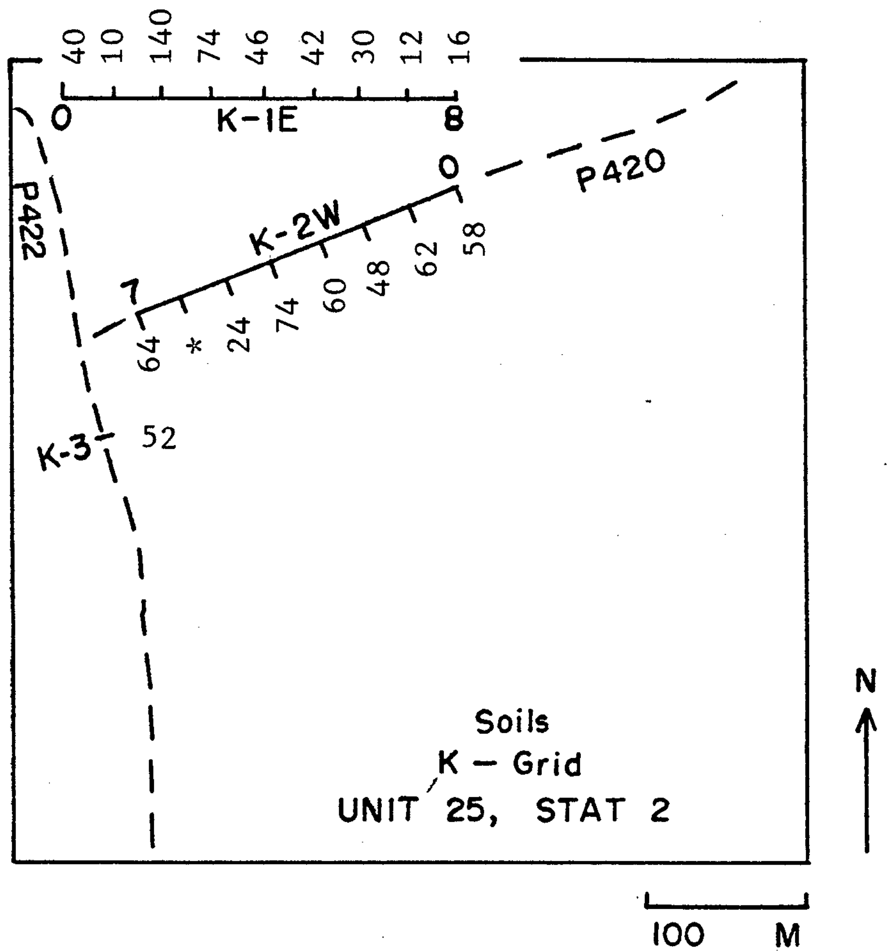
Molybdenum values in ppm. Average - 3.2 ppm.

* K2- 6W (Upper clay) 6 ppm.
K2- 6W (Peat) 1 ppm.
K2- 4+50W 4 ppm.
K2- 4+70W < 1 ppm.



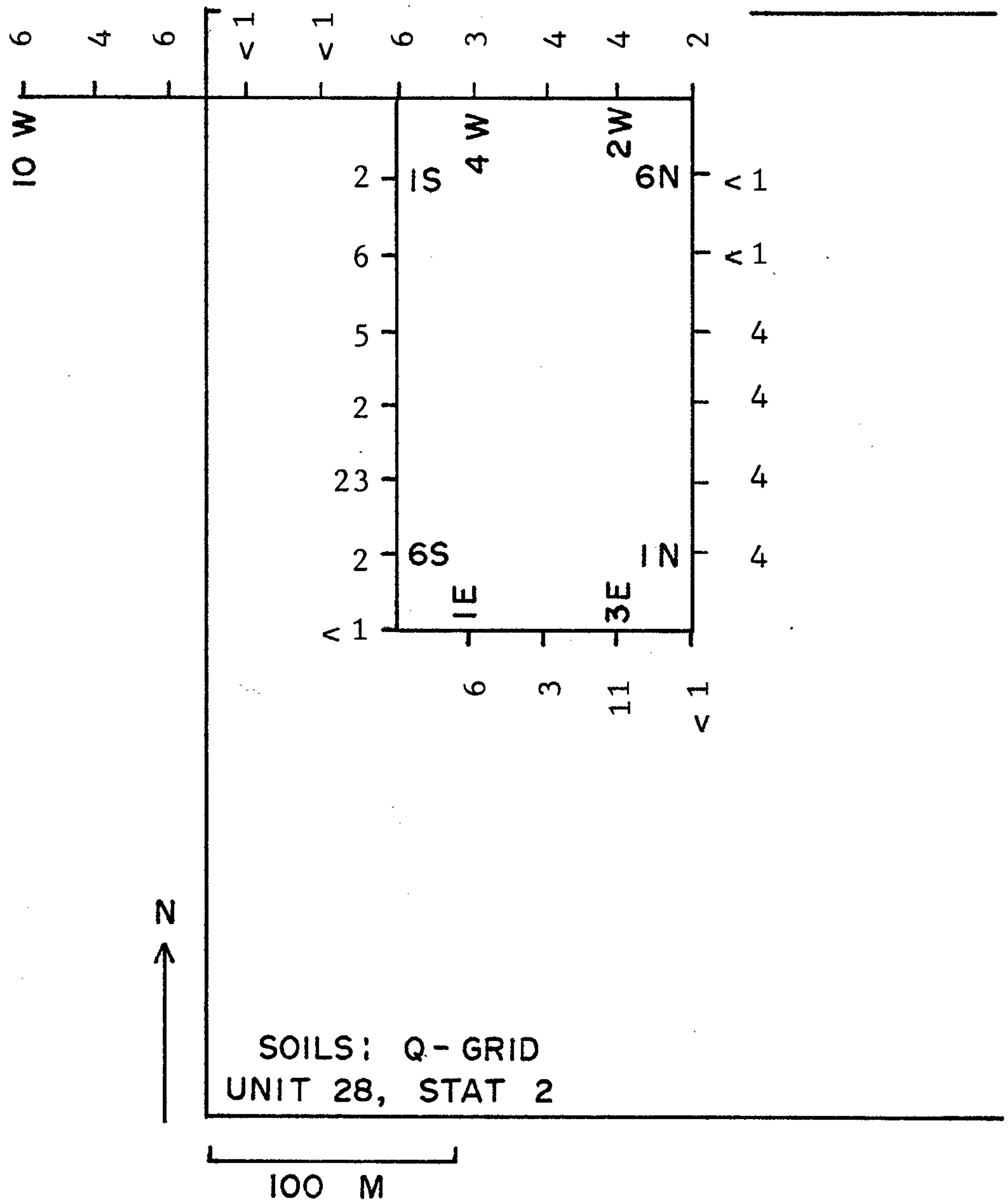
Lead values in ppm. Average - 7.4 ppm.

* K2- 6W (Upper clay) 16 ppm.
K2- 6W (Peat) < 2 ppm.
K2- 4+50W < 2 ppm.
K2- 4+70W < 2 ppm.

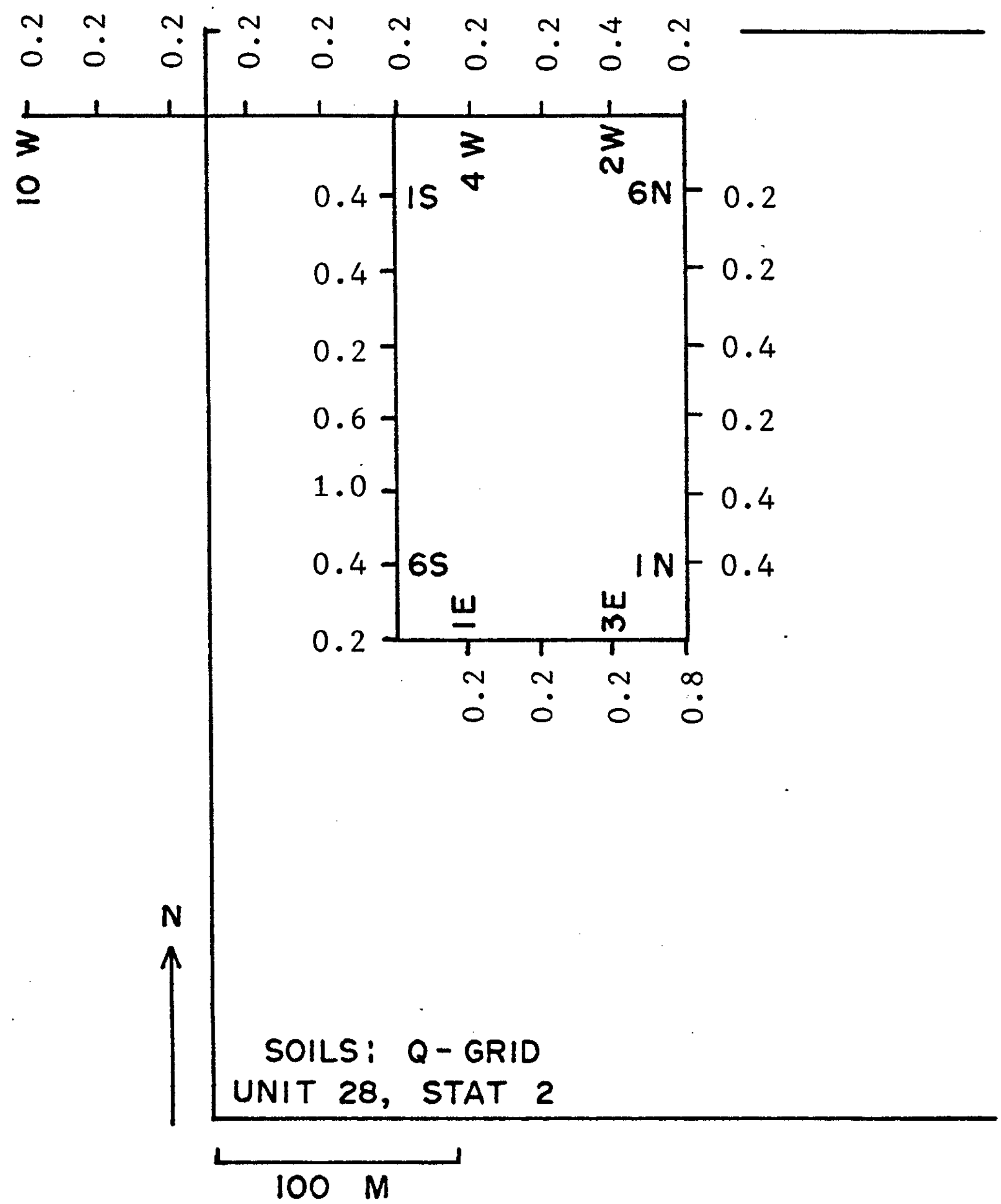


Zinc values in ppm. Average - 32.7 ppm.

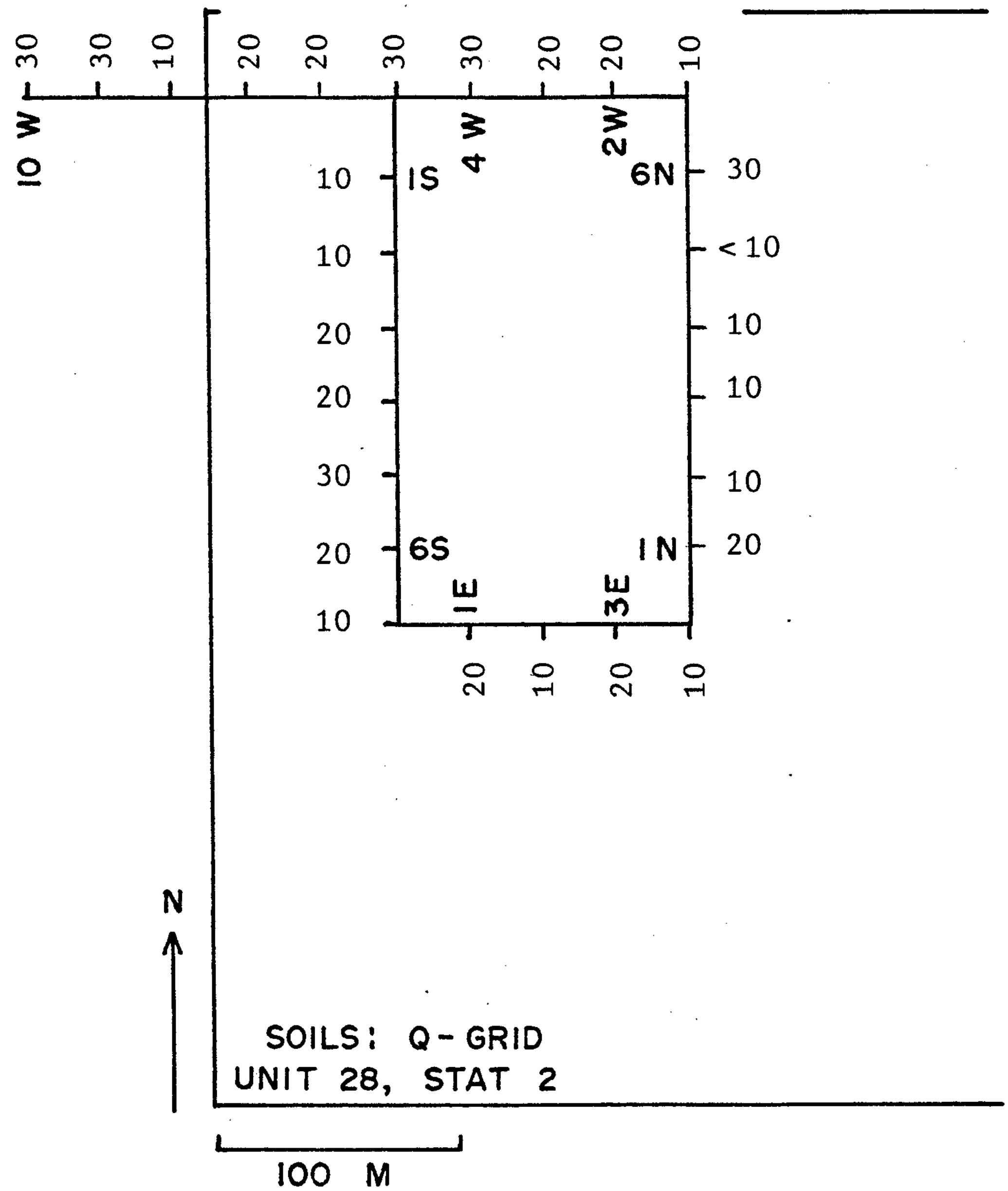
* K2- 6W (Upper clay) 76 ppm.
K2- 6W (Peat) 16 ppm.
K2- 4+50W 20 ppm.
K2- 4+70W 10 ppm.



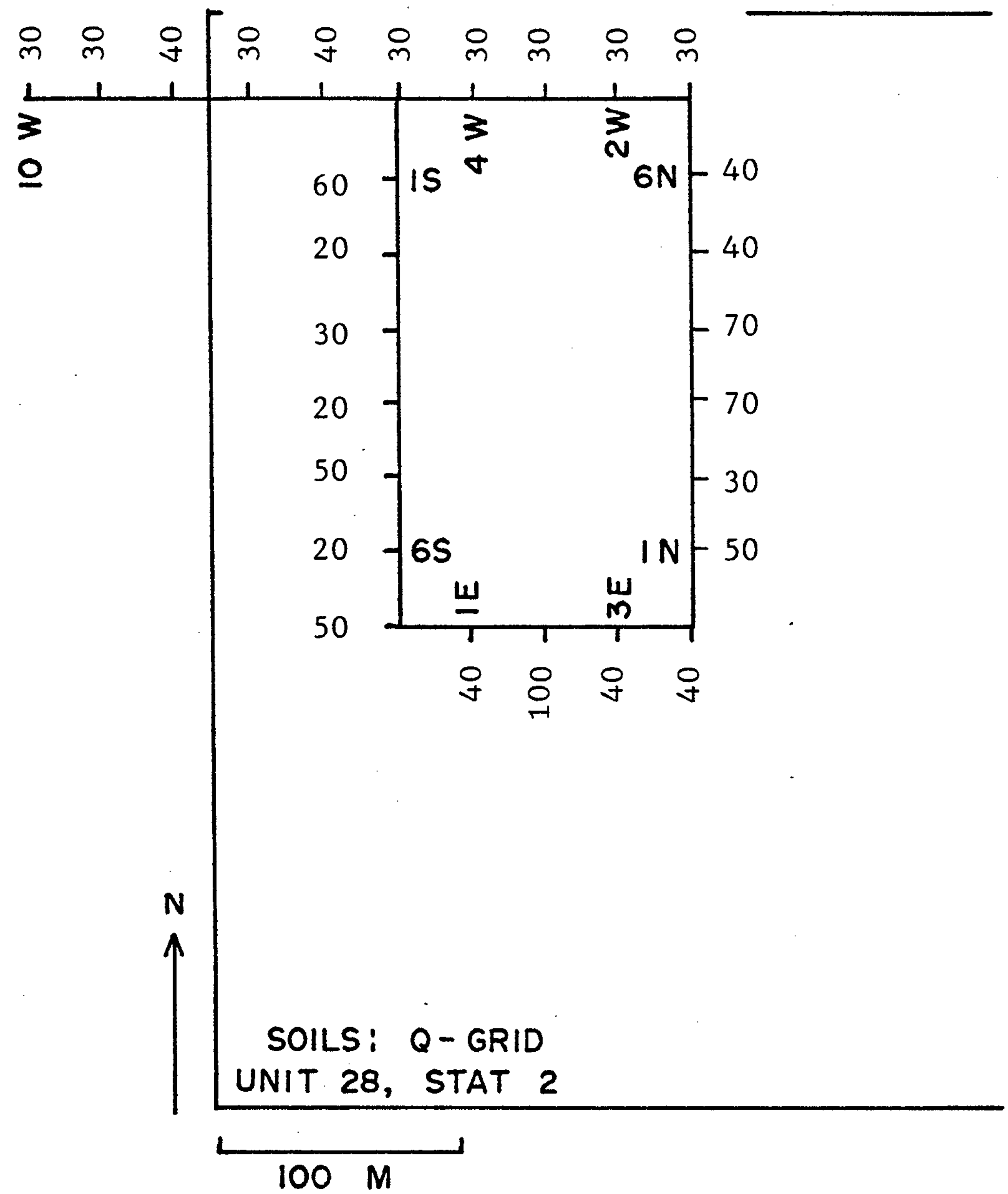
Gold values in ppb. Average - 4.5 ppb.



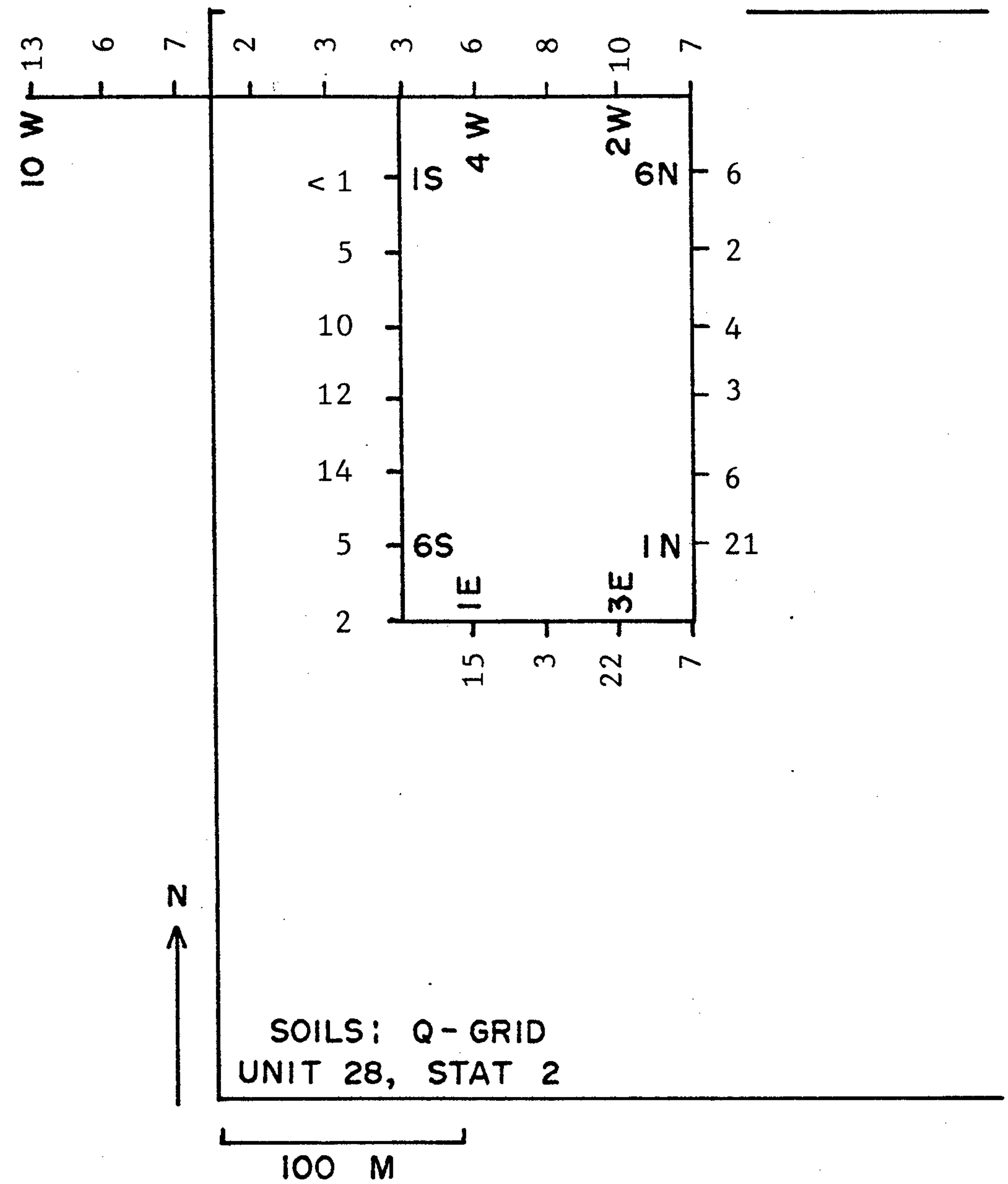
Silver values in ppm. Average - 0.27 ppm.



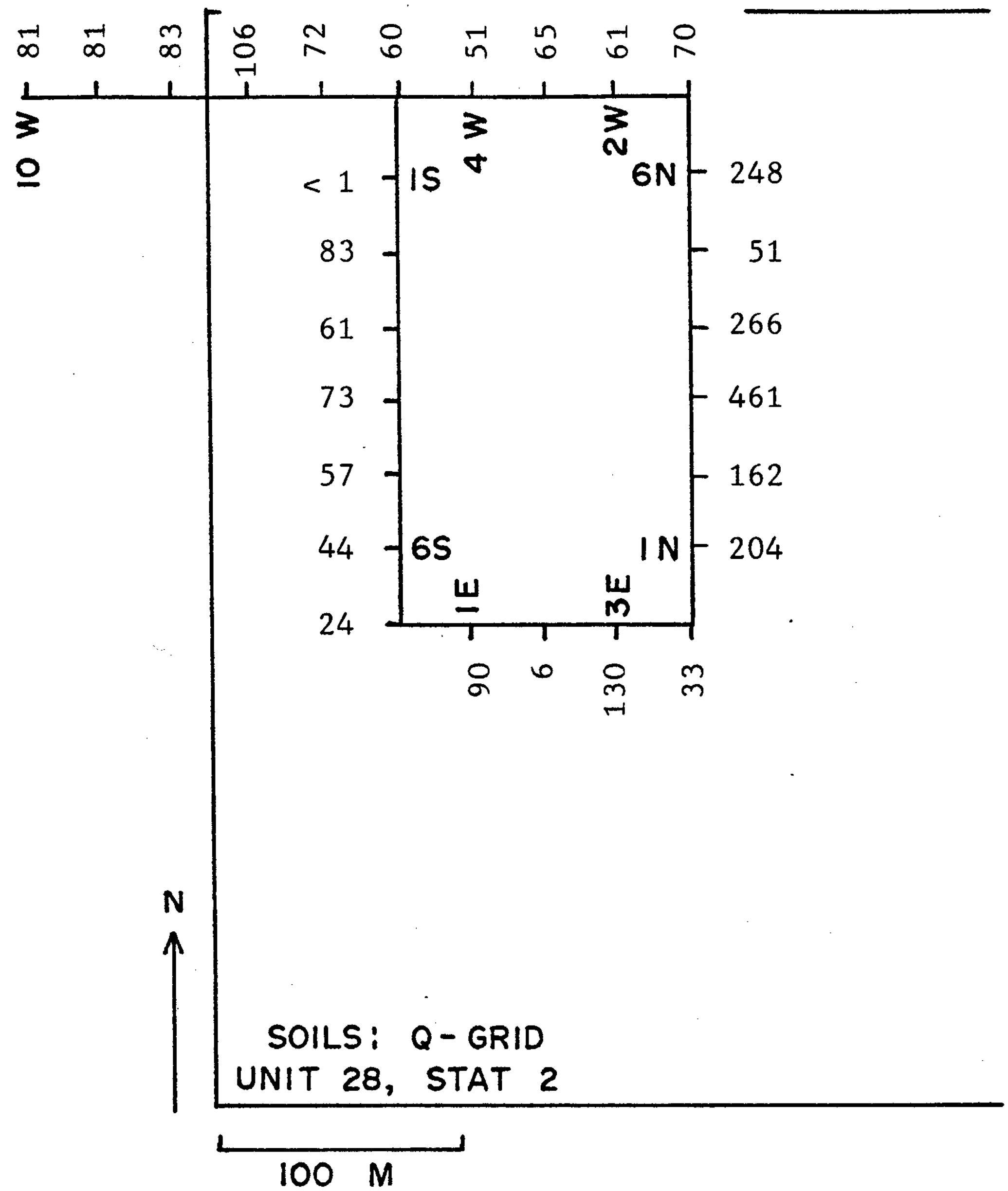
Arsenic values in ppm. Average - 16.9 pp.



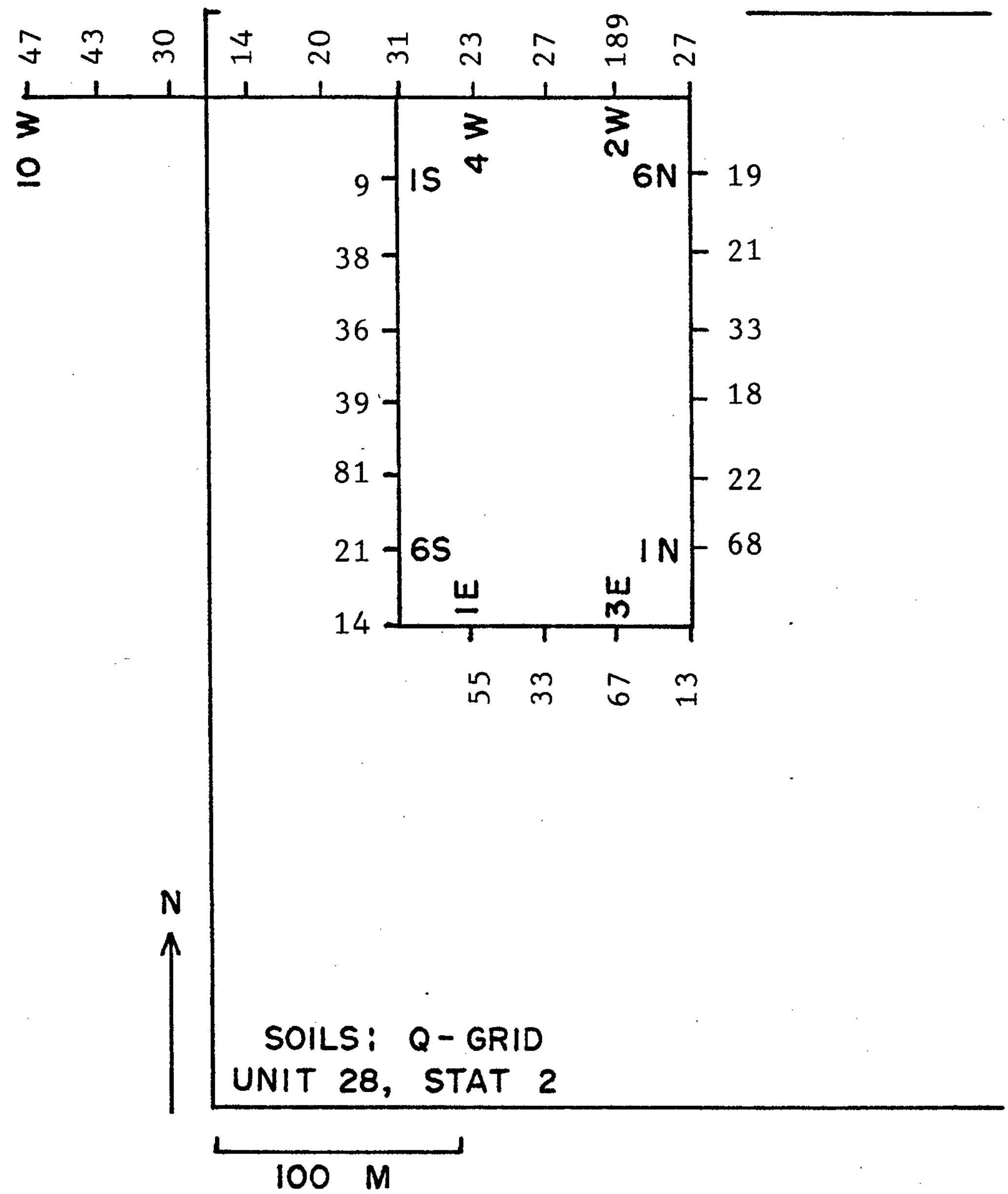
Barium values in ppm. Average - 36.6 ppm.



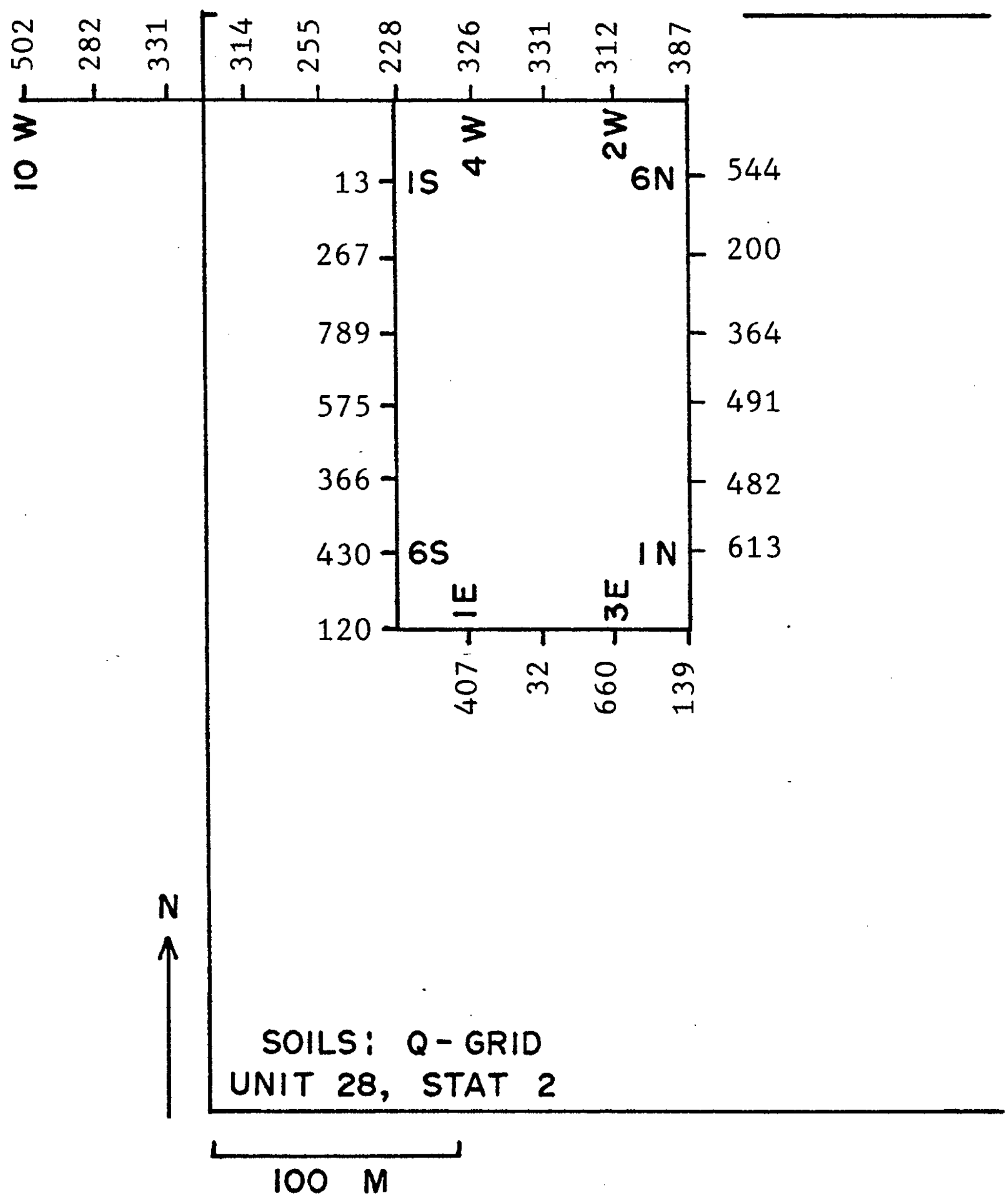
Cobalt values in ppm. Average - 11.6 ppm.



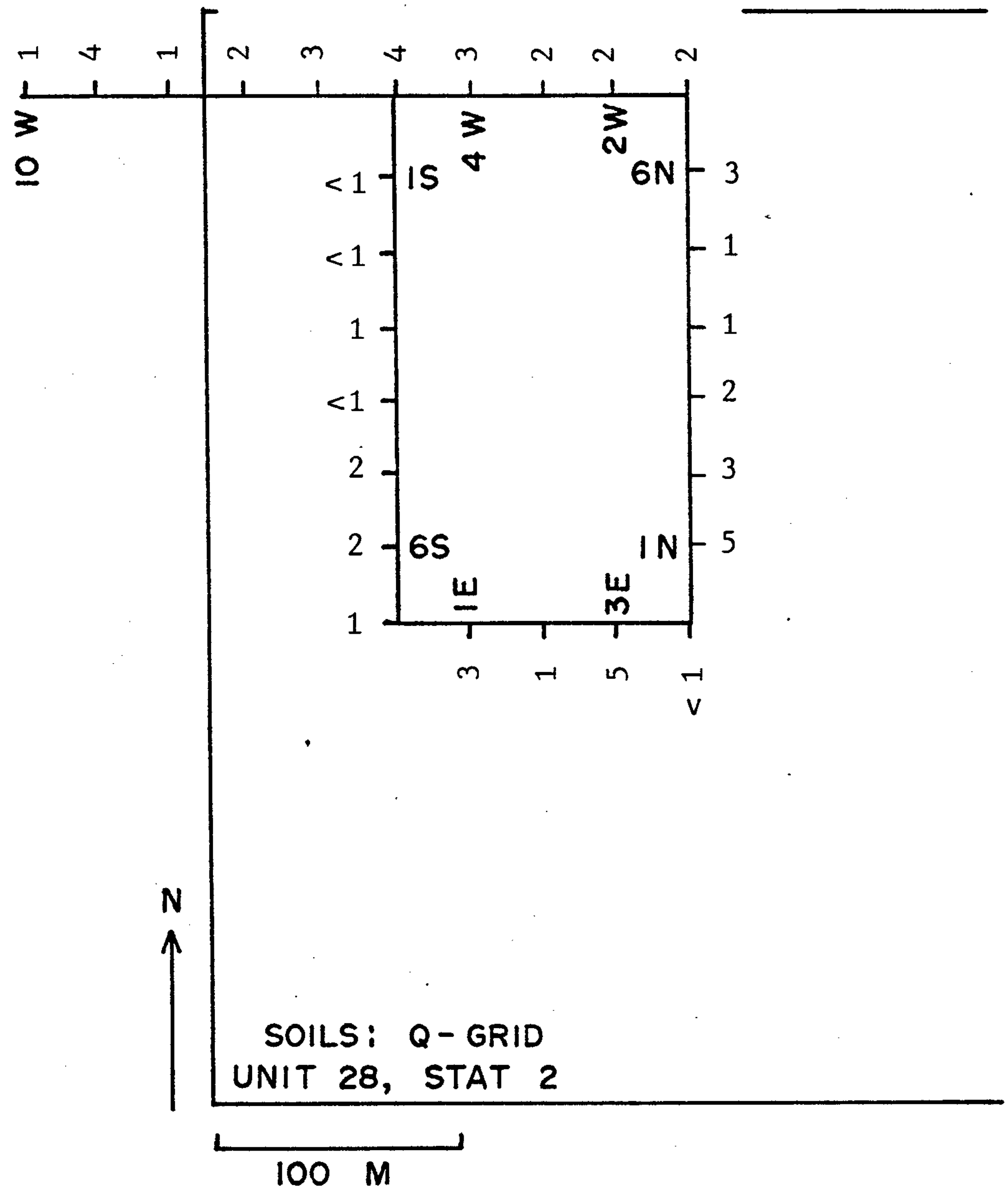
Chromium values in ppm. Average - 41.2 ppm.



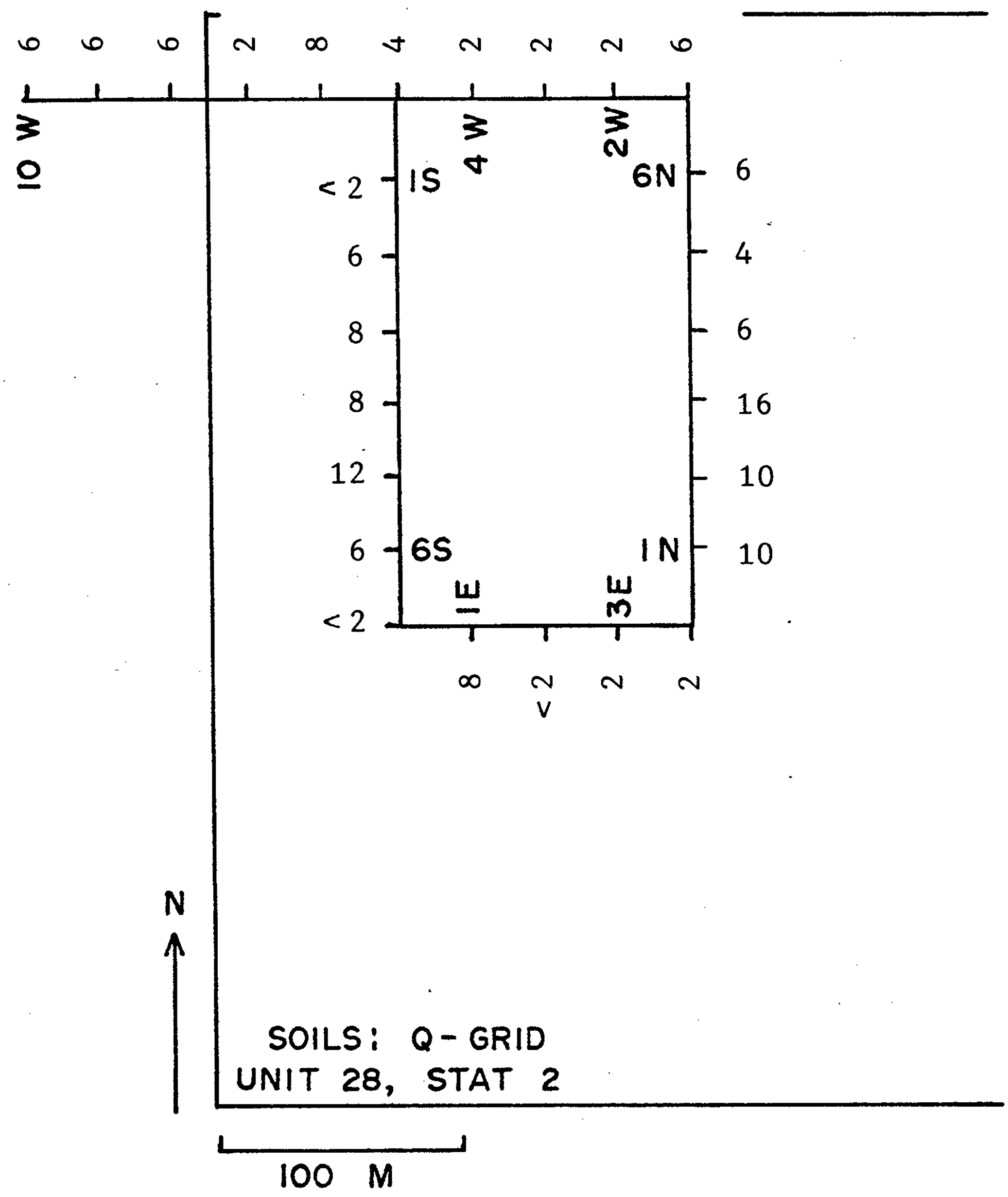
Copper values in ppm. Average - 41.2 ppm.



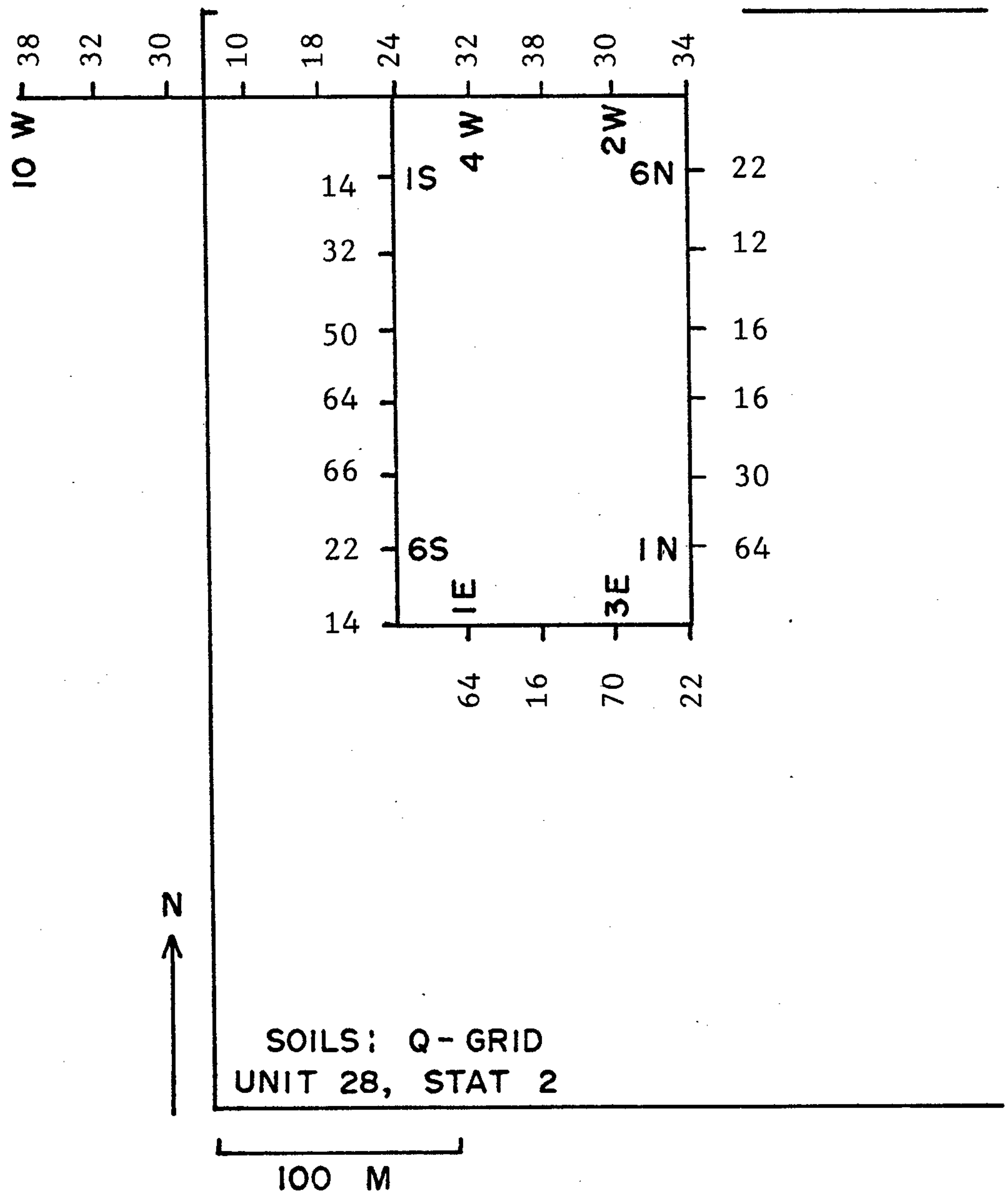
Manganese values in ppm. Average - 558 ppm.



Molybdenum values in ppm. Average - 3.2 ppm.

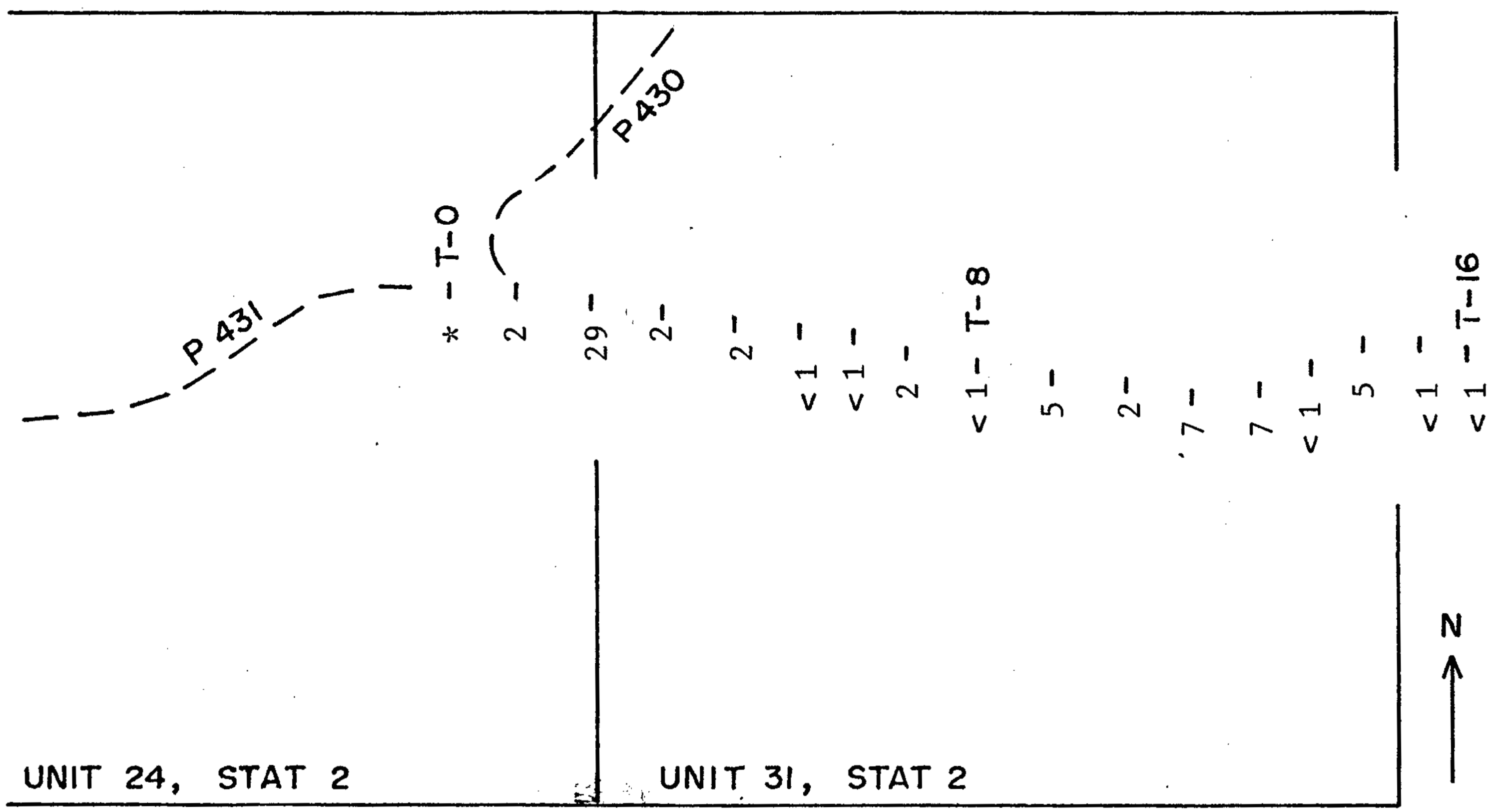


Lead values in ppm. Average - 7.4 ppm.



Zinc values in ppm. Average - 32.7 ppm.

T-1

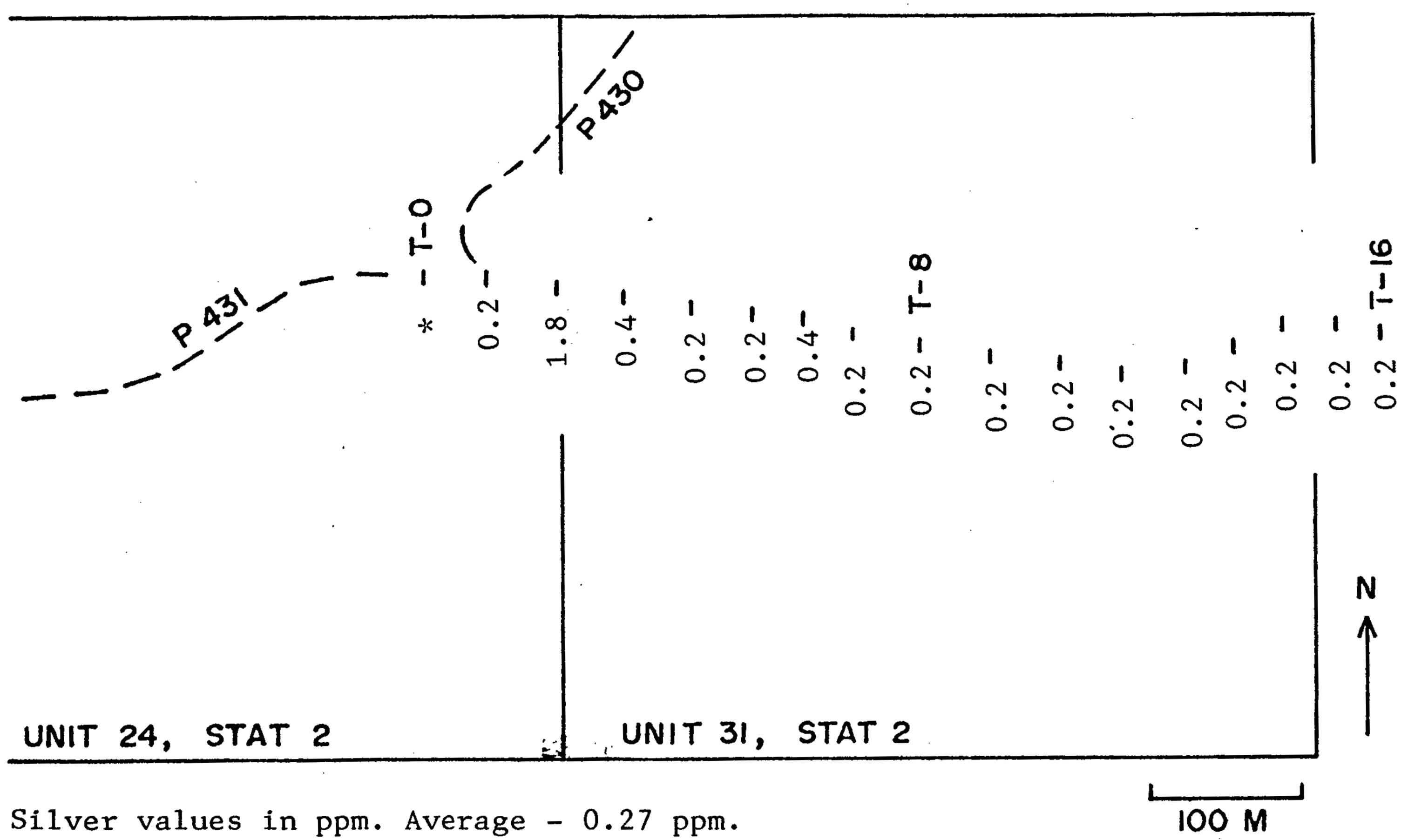


Gold values in ppb. Average - 4.5 ppb.

* T-0 (orange colored soil) 6 ppb.
T-0 (grey colored soil) 1 ppb.

100 M

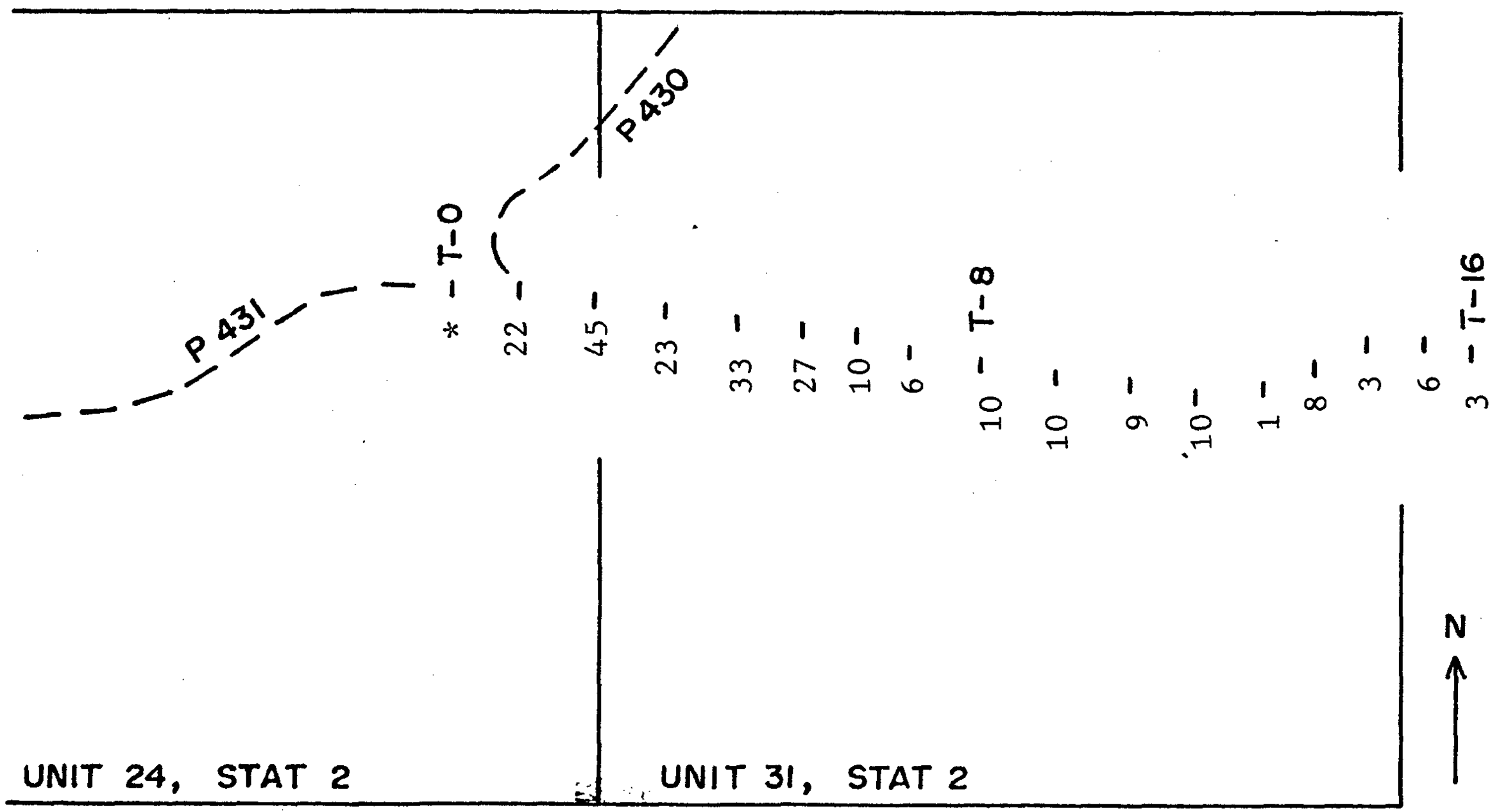
T - Traverse : Soils



Silver values in ppm. Average - 0.27 ppm.

* T-0 (orange colored soil) 0.4 ppm.
T-0 (grey colored soil) 0.2 ppm.

T - Traverse : Soils

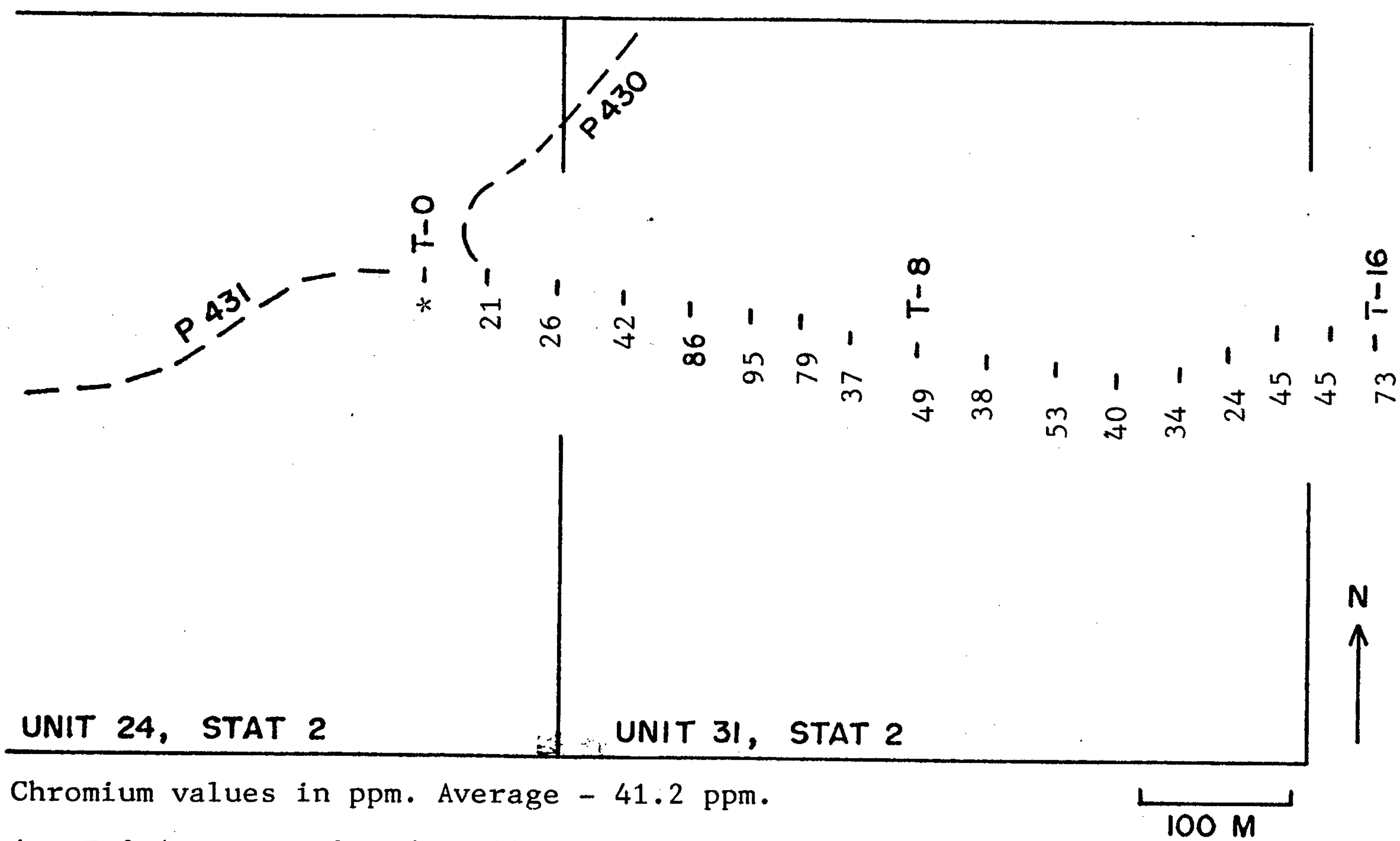


Cobalt values in pp. Average - 11.6 ppm.

100 M

* T-0 (orange colored soil) 8 ppm.
T-0 (grey colored soil) 15 ppm.

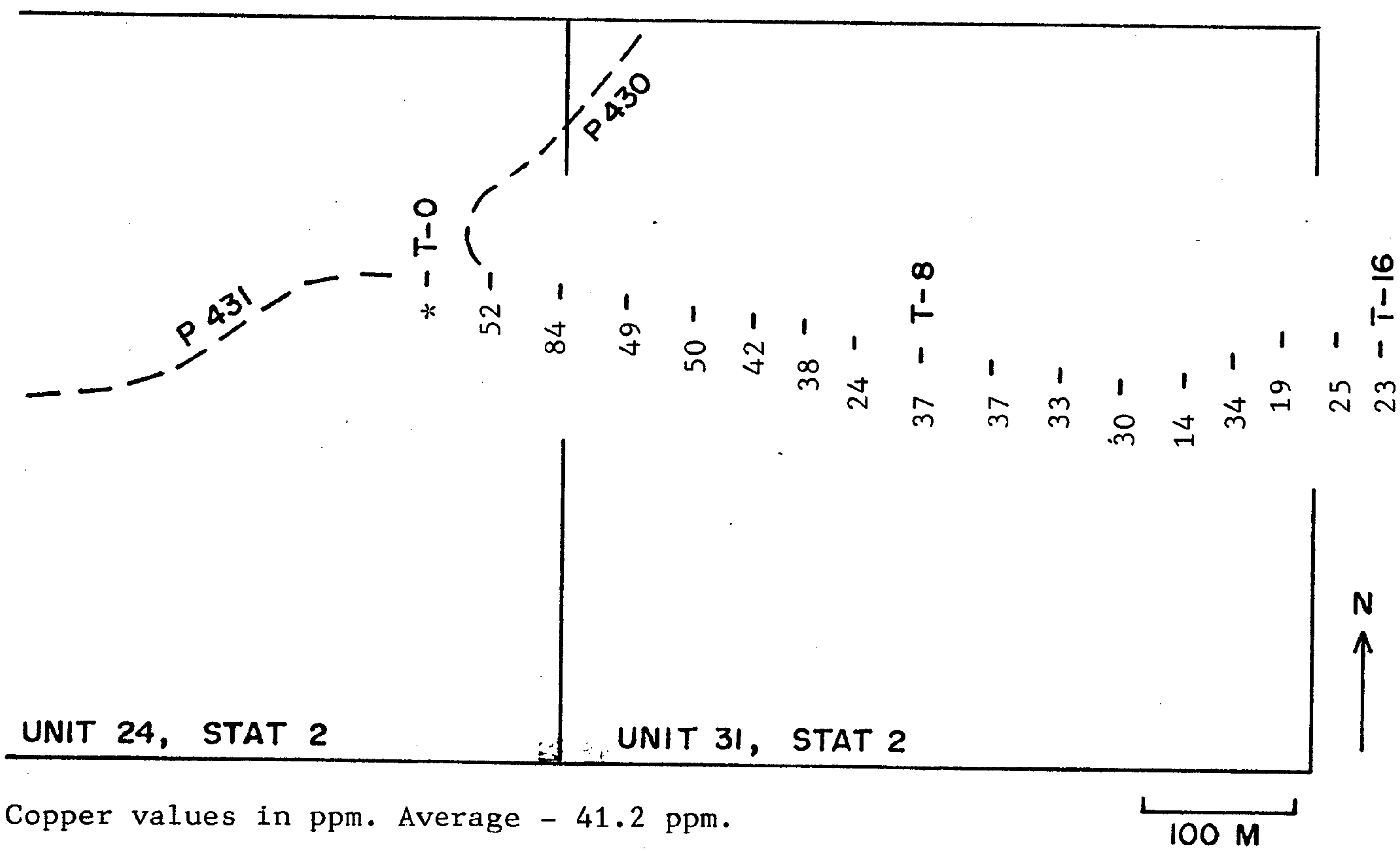
T - Traverse : Soils



Chromium values in ppm. Average - 41.2 ppm.

* T-0 (orange colored soil) 27 ppm.
T-0 (grey colored soil) 10 ppm.

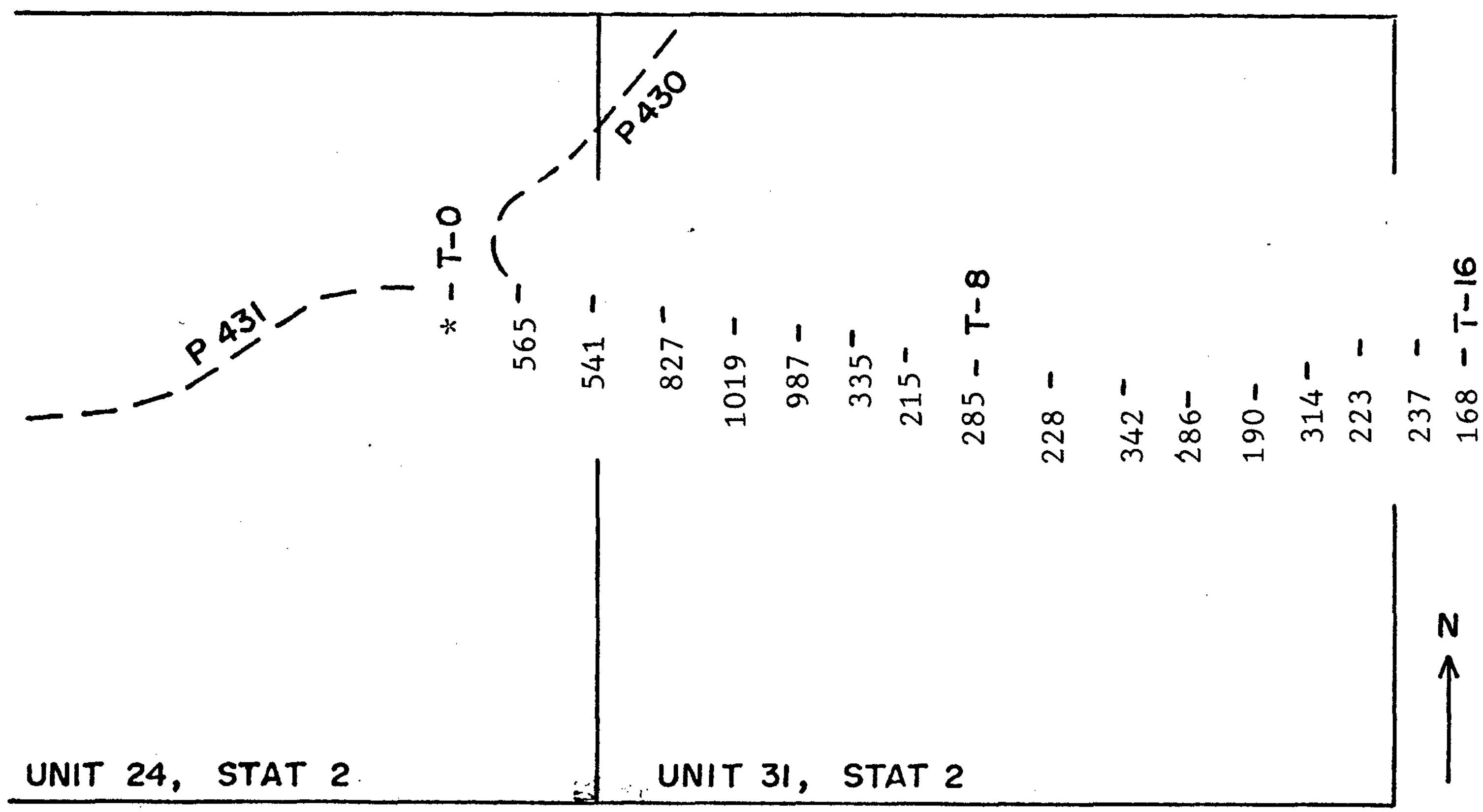
T – Traverse : Soils



Copper values in ppm. Average - 41.2 ppm.

* T-0 (orange colored soil) 45 ppm.
T-0 (grey colored soil) 13 ppm.

T - Traverse : Soils

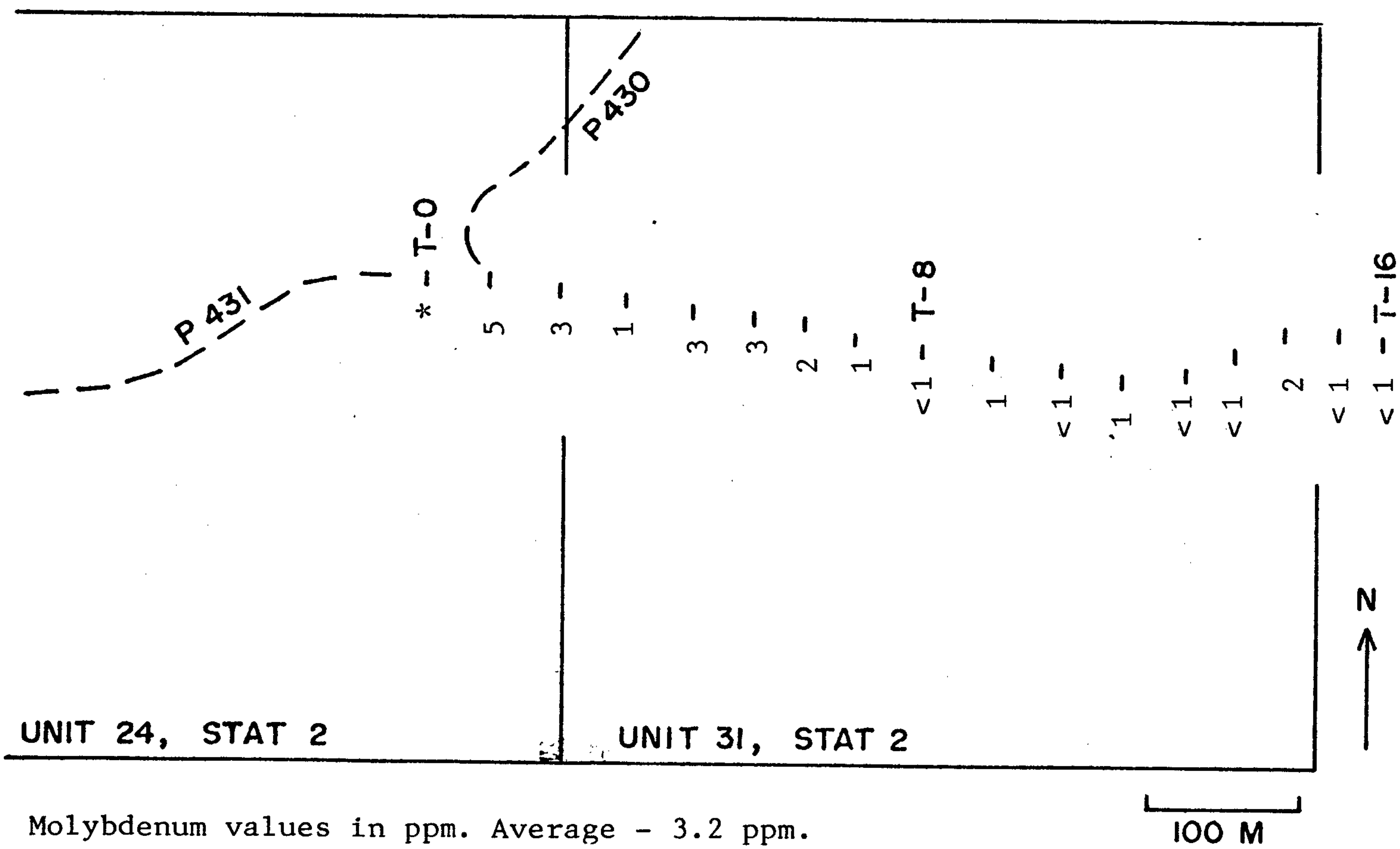


100 M

Manganese values in ppm. Average - 558 ppm.

*   T-0 (orange colored soil) 324 ppm.
     T-0 (grey colored soil) 506 ppm.

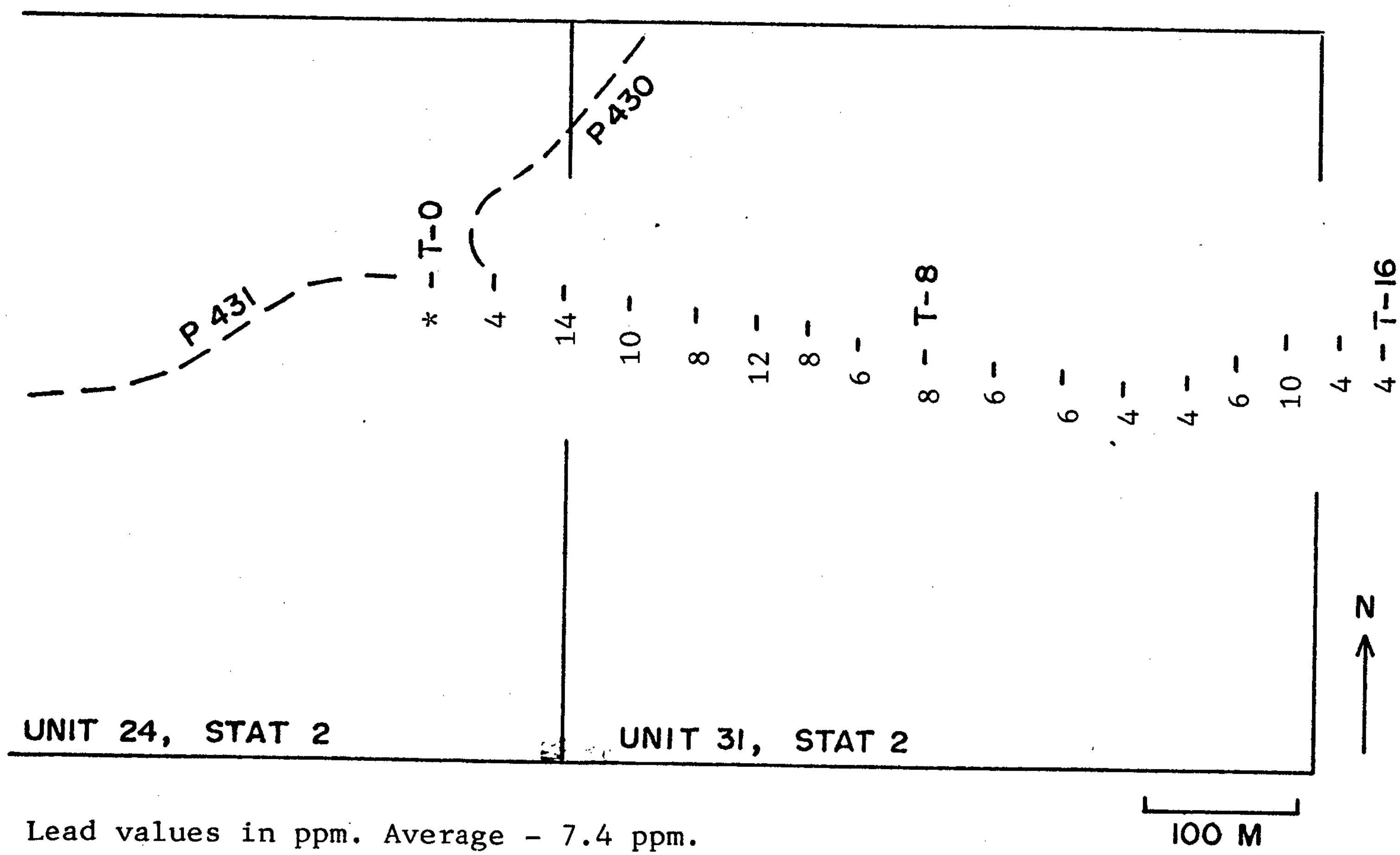
T - Traverse : Soils



Molybdenum values in ppm. Average - 3.2 ppm.

* T-0 (orange colored soil) 1 ppm.
T-0 (grey colored soil) 3 ppm.

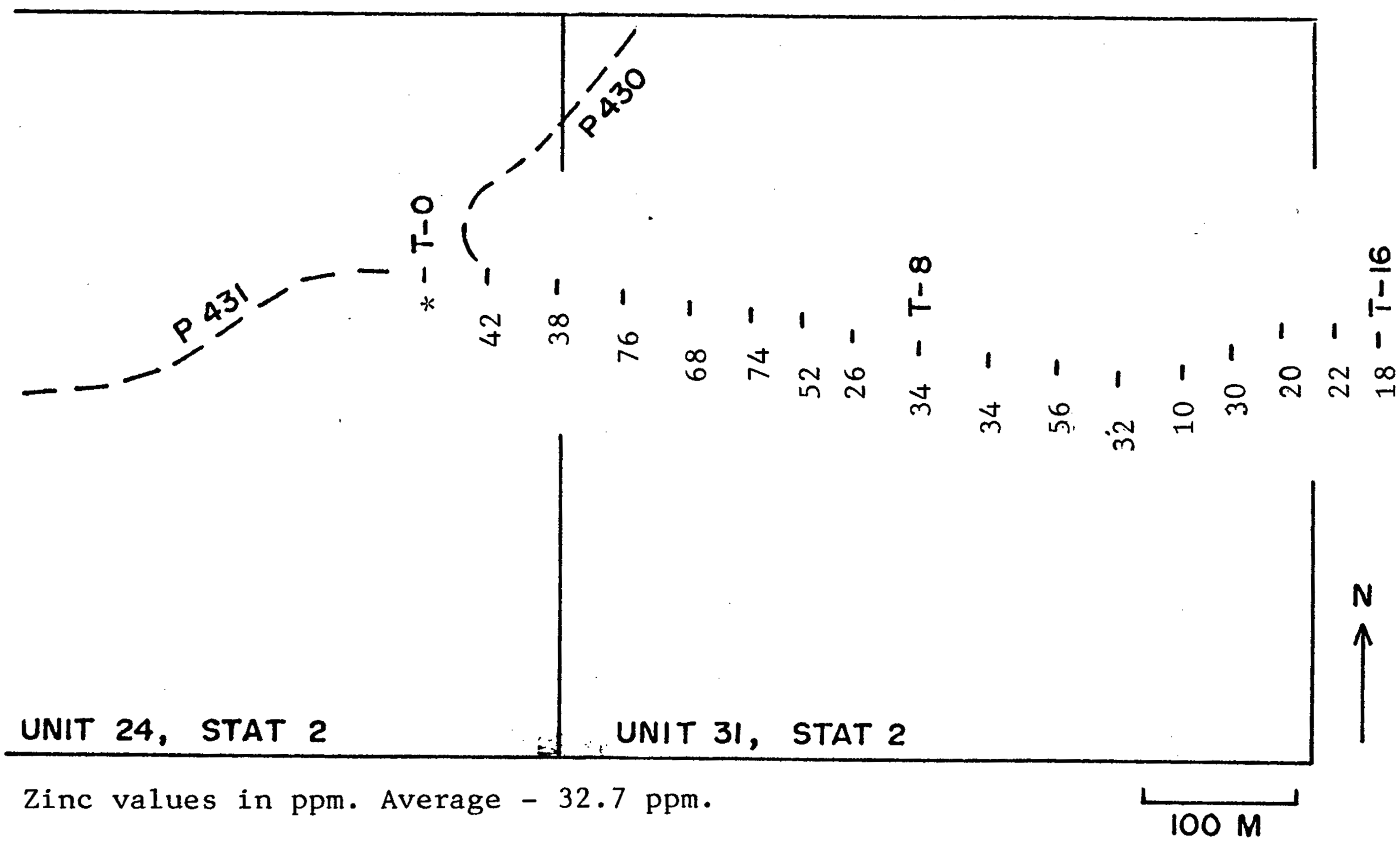
T – Traverse : Soils



Lead values in ppm. Average - 7.4 ppm.

* T-0 (orange colored soil) <2 ppm.
T-0 (grey colored soil) 4 ppm.

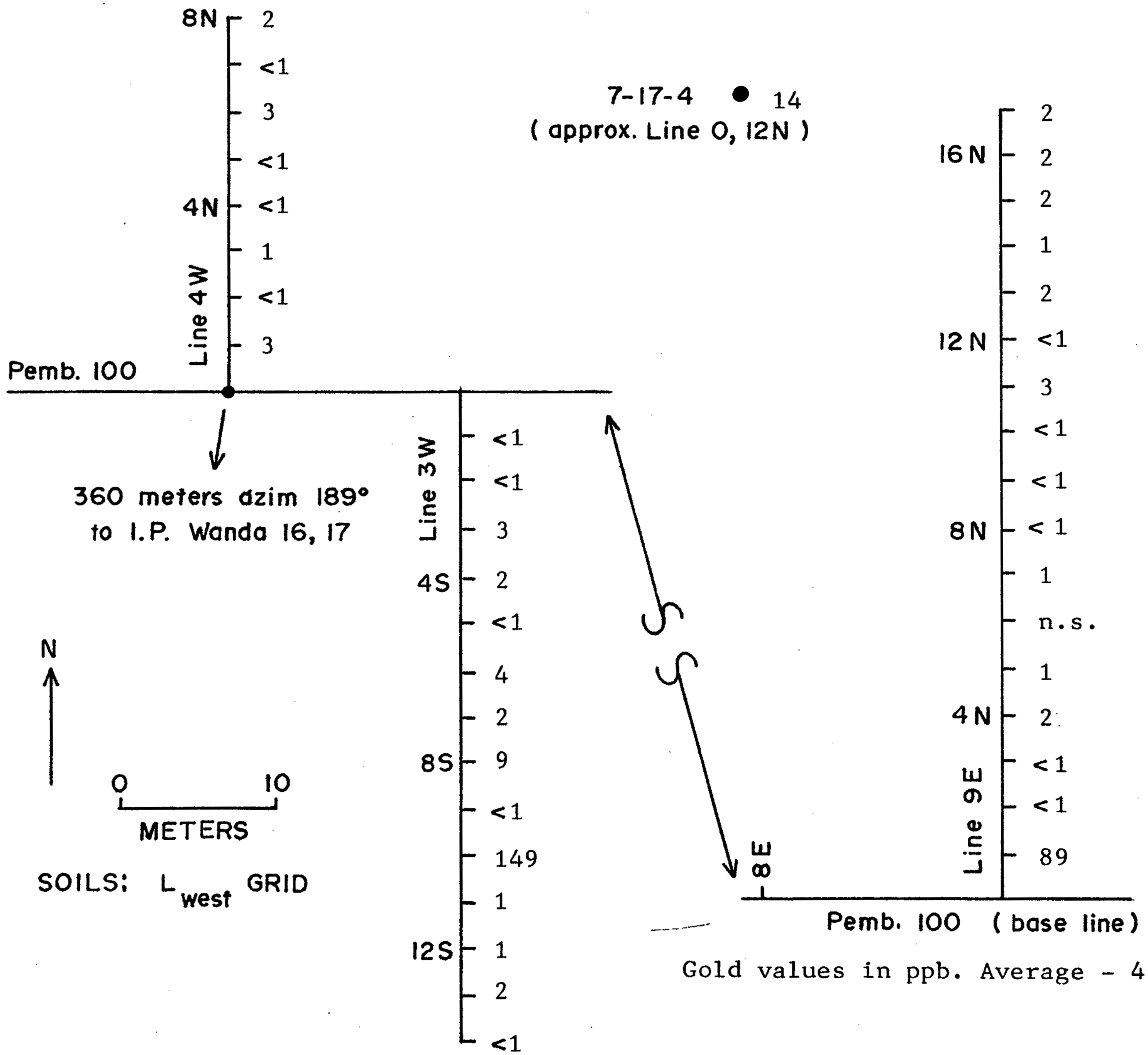
T - Traverse : Soils



Zinc values in ppm. Average - 32.7 ppm.

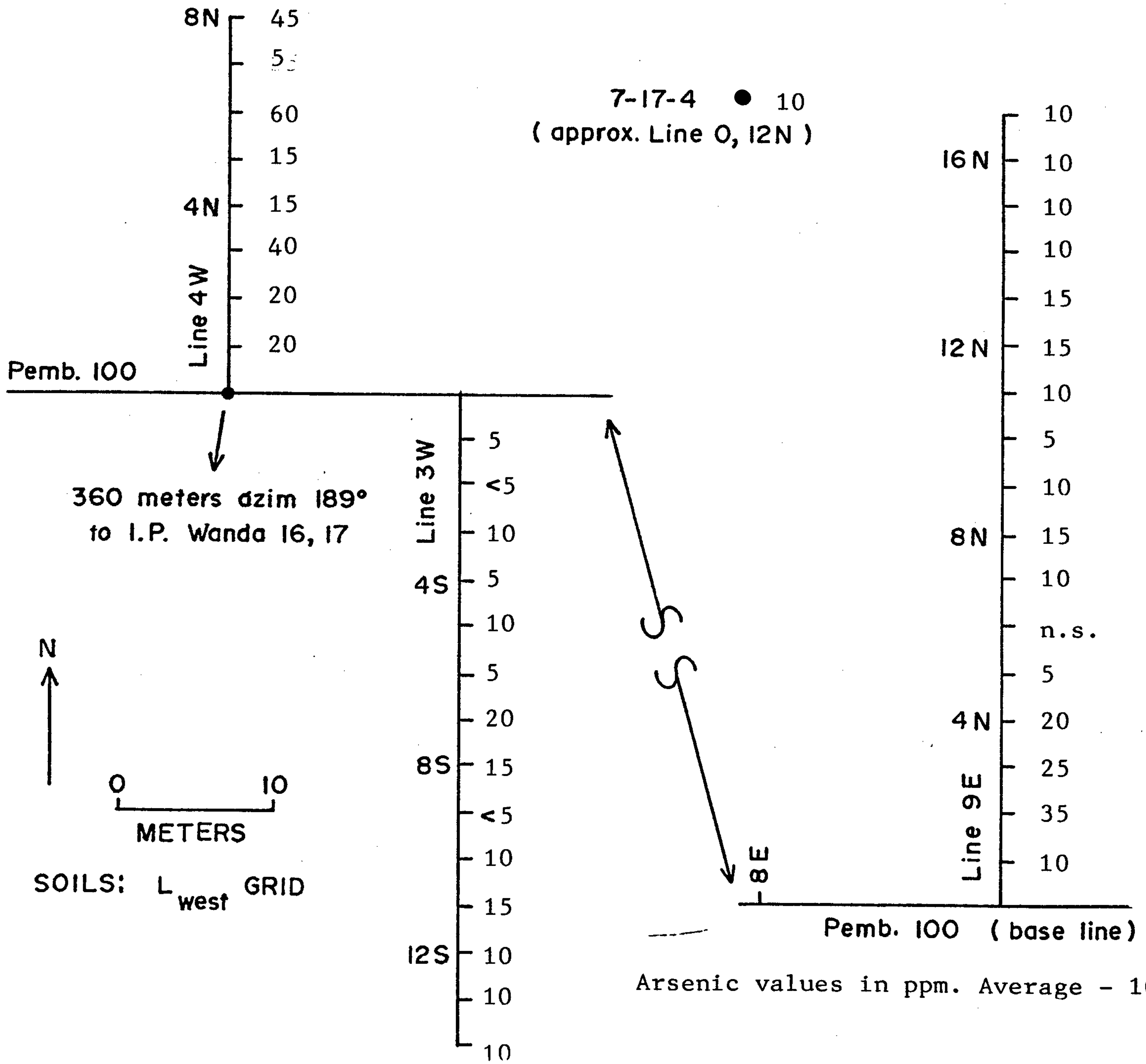
* T-0 (orange colored soil) 44 ppm.
T-0 (grey colored soil) 36 ppm.

T – Traverse : Soils



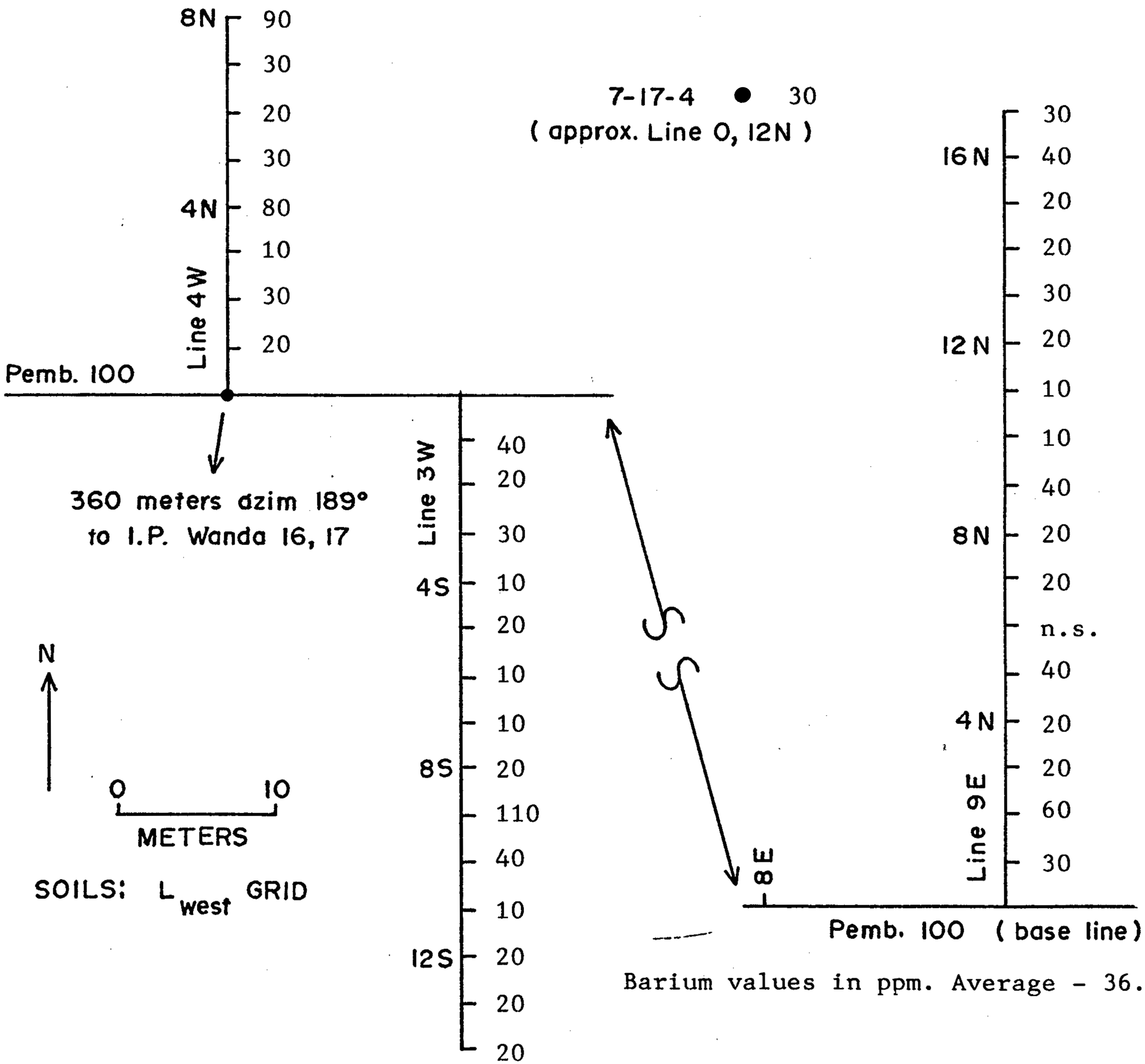
Gold values in ppb. Average - 4.5 ppb.

L(w)-2



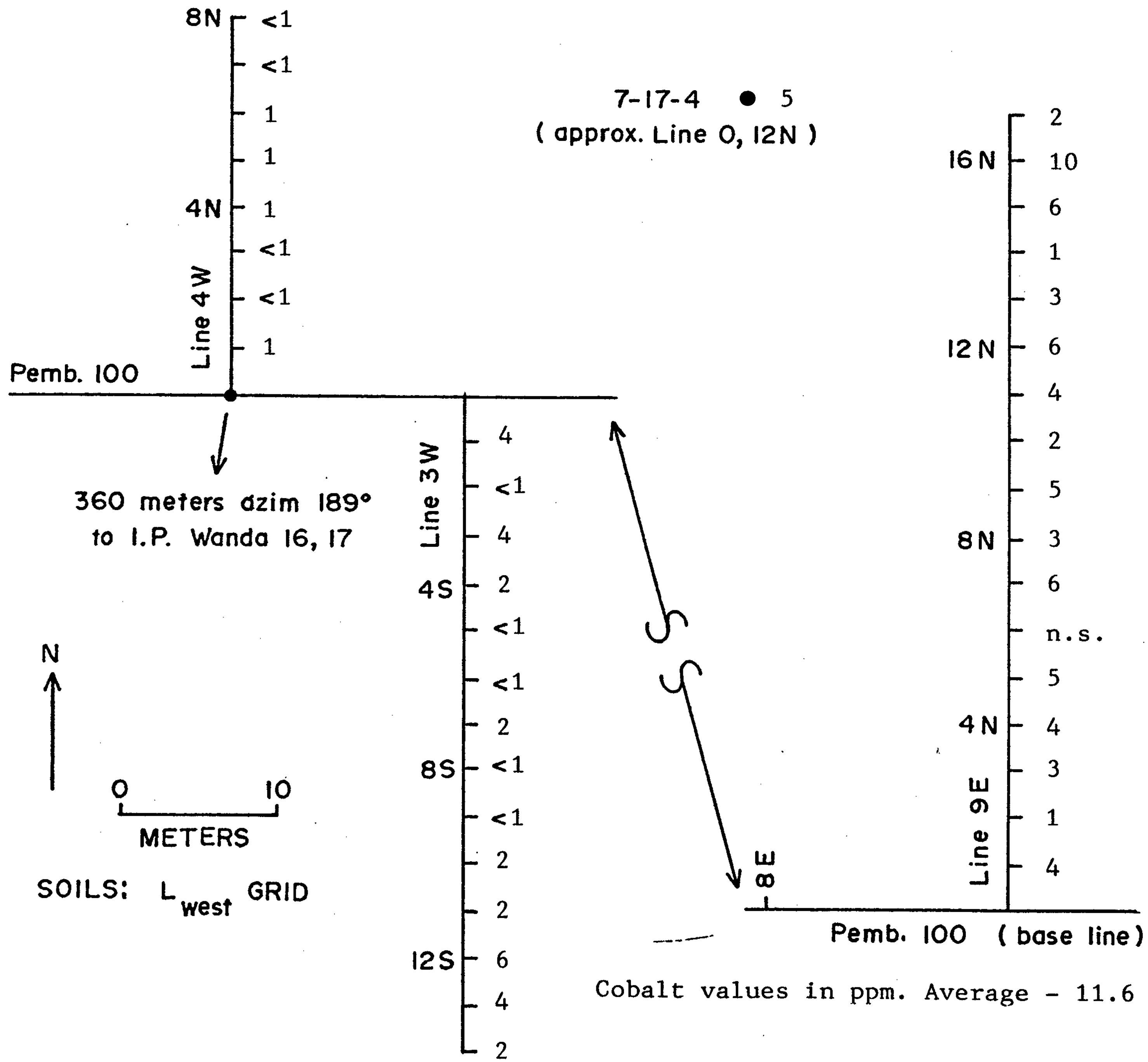
Arsenic values in ppm. Average - 16.9 ppm.

L(w)-3

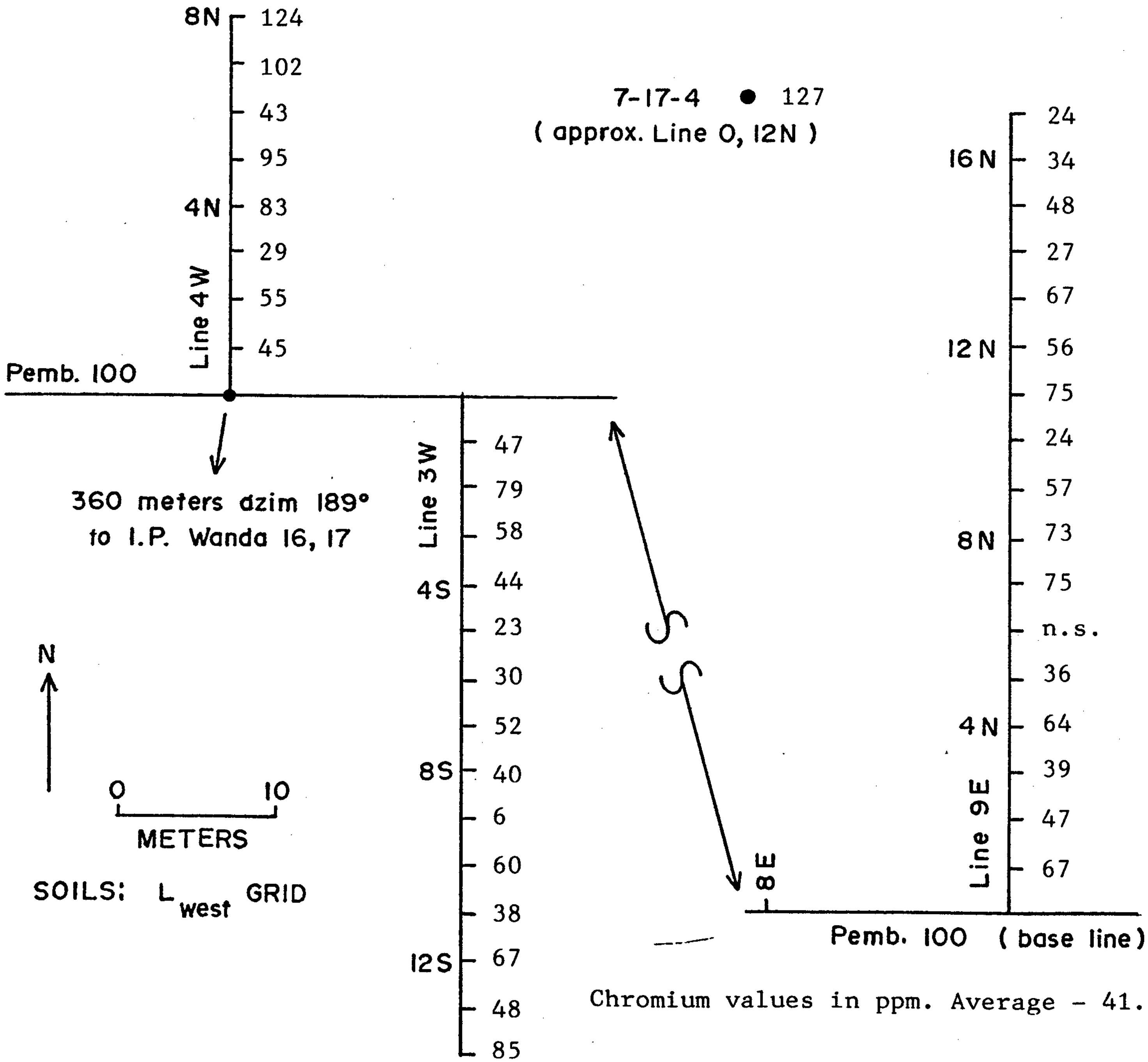


Barium values in ppm. Average - 36.6 ppm.

L(W)-4

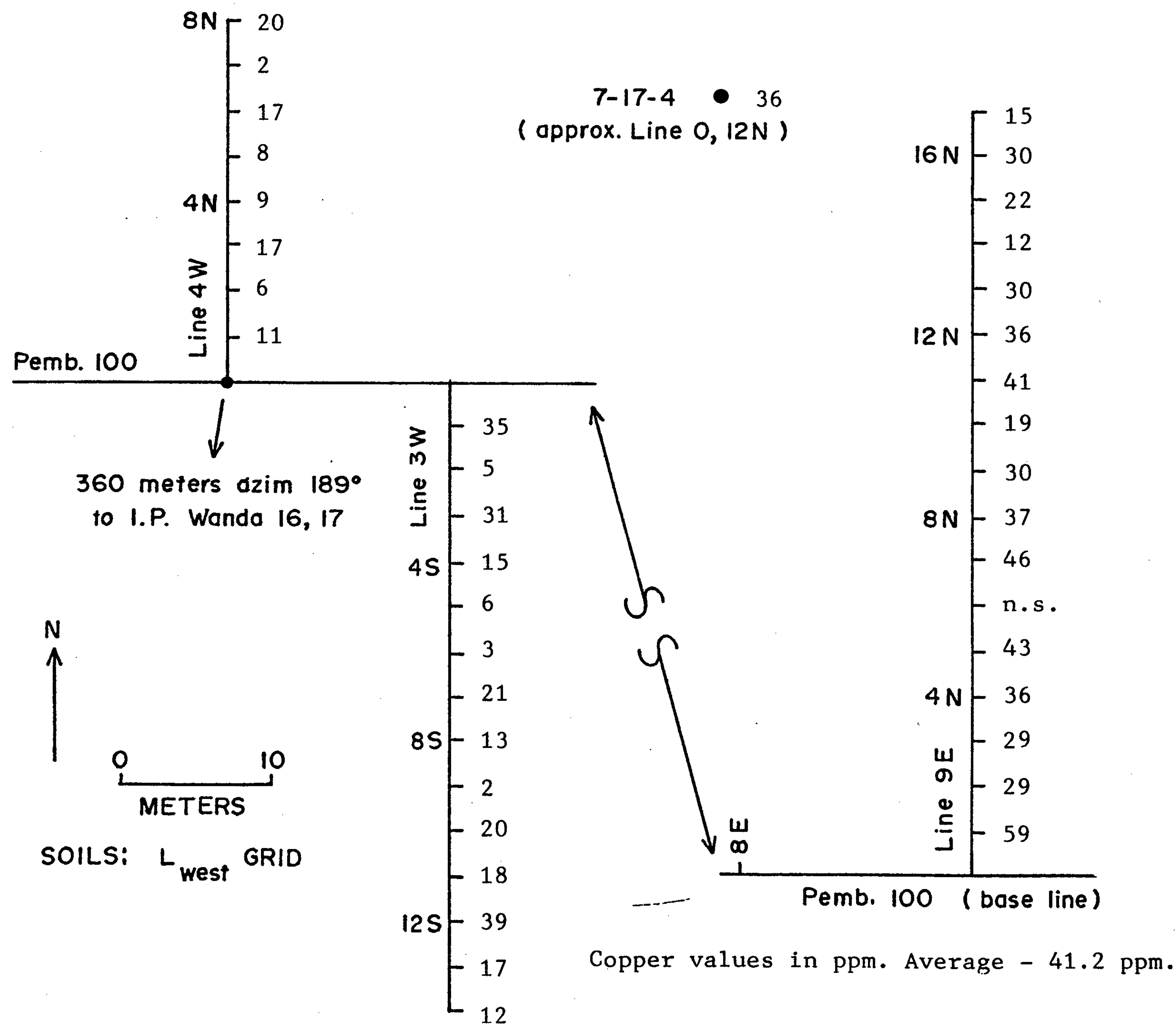


Cobalt values in ppm. Average - 11.6 ppm.



Chromium values in ppm. Average - 41.2 ppm.

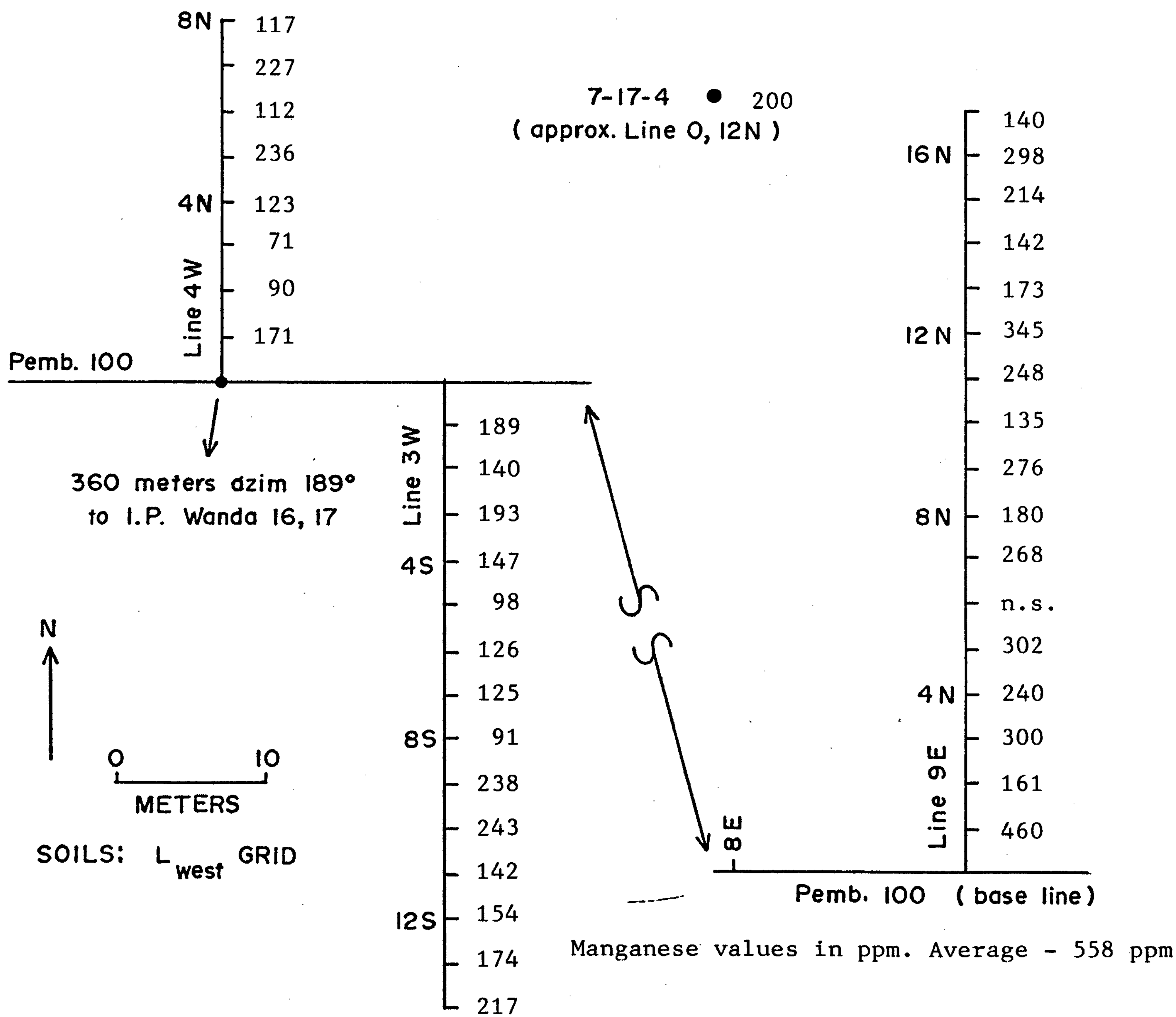
L(w)-5



Copper values in ppm. Average - 41.2 ppm.

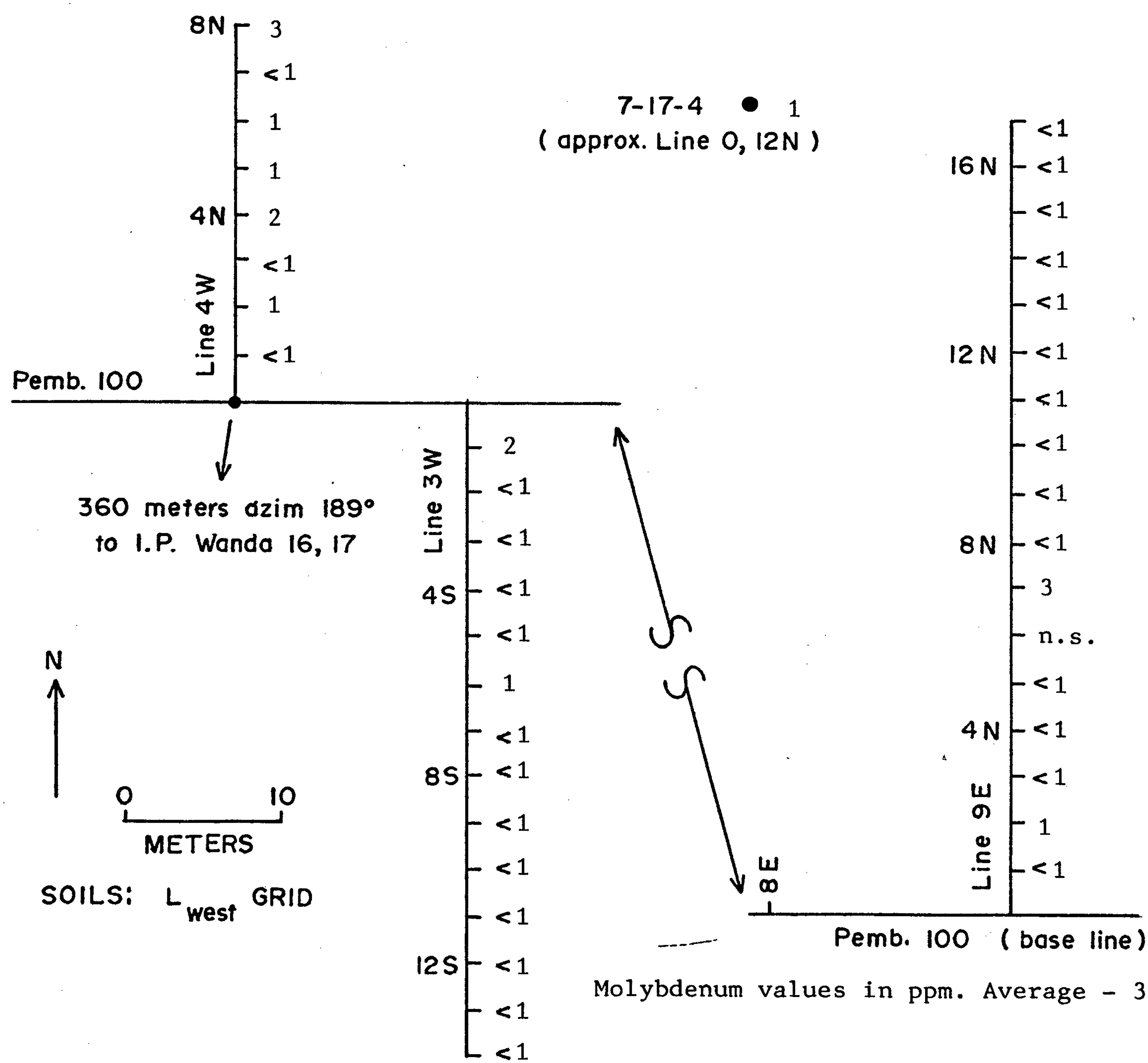
L(W)-6

L(W)-7

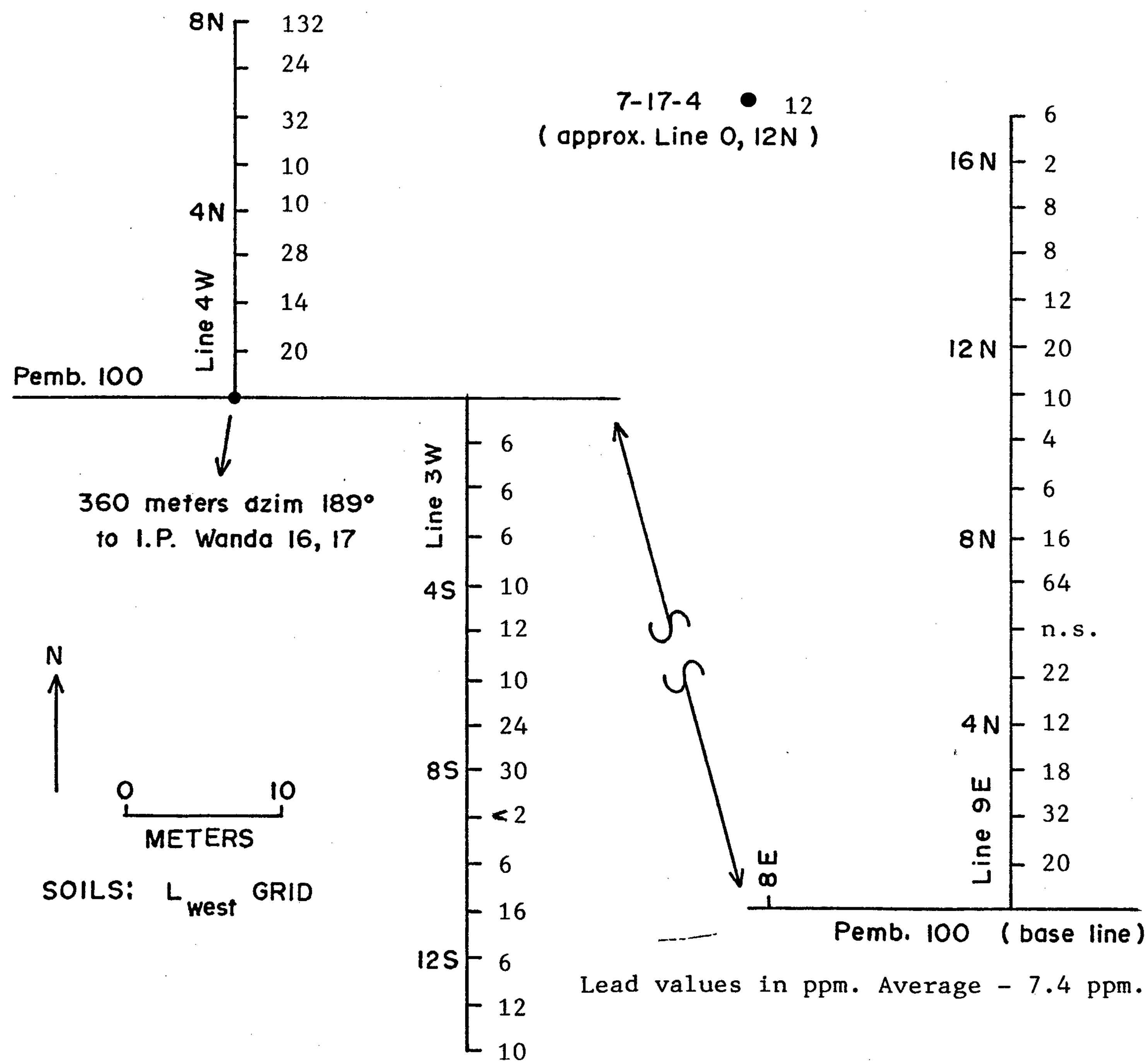


Manganese values in ppm. Average - 558 ppm.

L(W)-8

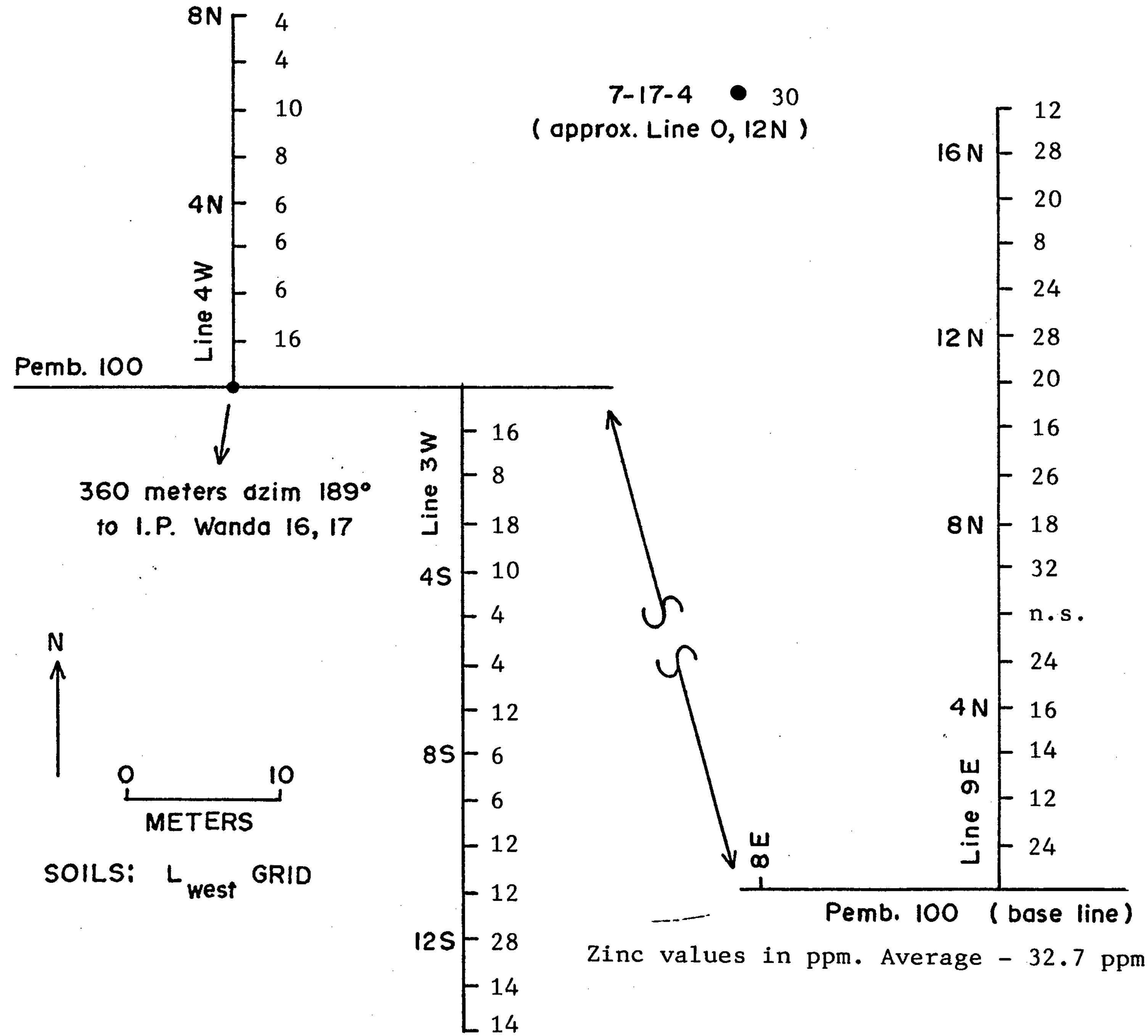


Molybdenum values in ppm. Average - 3.2 ppm.


8N
132
24
32
10
4N
10
28
14
20
Line 4W
Pemb. 100
360 meters azim 189°
to I.P. Wanda 16, 17
7-17-4
12
(approx. Line 0, 12N)
Line 3W
6
6
6
4S
10
12
10
24
8S
30
<2
6
16
12S
6
12
10
6
16 N
2
8
8
12
12 N
20
10
4
6
8 N
16
64
n.s.
22
4 N
12
18
32
20
Line 9E
8E
Pemb. 100 (base line)
N
0
10
METERS
SOILS: L west GRID
Lead values in ppm. Average - 7.4 ppm.

L(W)-9

L(w)-10



Zinc values in ppm. Average - 32.7 ppm.

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CERTIFICATE OF ANALYSIS

TO : PEARSON, MR. BRAD
7431 LINDSAY ROAD
RICHMOND, B.C.
V7C 3M7

CERT. # : A8615645-001-A
INVOICE # : I8615645
DATE : 11-AUG-86
P.O. # : NONE

Semi quantitative multi element ICP analysis

Nitric-Aqua-Regia digestion of 0.5 gm of material followed by ICP analysis. Since this digestion is incomplete for many minerals, values reported for Al, Sb, Ba, Be, Ca, Cr, Ga, La, Mg, K, Na, Sr, Tl, Ti, W and V can only be considered as semi-quantitative.

COMMENTS :

Sample description	Au NAA ppb	Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	K %	La ppm	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm	
7-17-4	14	8.02	0.2	10	30	<0.5	<2	0.38	<0.5	5	127	36	8.85	10	0.01	<10	0.30	200	1	0.01	17	360	12	<10	18	0.41	<10	<10	192	<10	30	--
L1 00S	5	6.85	0.2	20	40	<0.5	<2	1.33	<0.5	17	38	66	4.16	10	0.03	20	0.61	592	2	0.02	21	1290	16	<10	57	0.27	<10	<10	136	<10	54	--
L1 01S	4	0.77	0.2	10	30	<0.5	<2	0.10	<0.5	<1	153	5	0.74	<10	<0.01	<10	0.03	58	1	0.04	3	480	4	<10	12	0.17	<10	<10	34	<10	2	--
L1 02S	<1	3.16	0.2	10	20	<0.5	<2	1.02	<0.5	15	151	21	10.44	20	0.01	10	2.04	630	9	0.03	57	650	16	<10	18	0.47	<10	<10	352	<10	60	--
L1 03S	4	1.32	0.2	10	30	<0.5	<2	0.18	<0.5	<1	111	20	2.10	<10	<0.01	<10	0.04	45	8	0.02	5	1150	8	<10	13	0.14	<10	<10	32	<10	2	--
L1 04S	<1	2.12	0.2	10	30	<0.5	<2	0.81	<0.5	5	292	12	6.88	30	0.07	10	0.53	438	1	0.06	15	240	16	<10	47	0.48	<10	<10	310	<10	32	--
L1 05S	5	4.28	0.2	20	50	<0.5	<2	0.56	<0.5	3	37	91	1.15	10	<0.01	20	0.21	177	8	0.01	9	1490	12	<10	33	0.12	<10	<10	75	<10	26	--
L1 06S	7	0.81	0.2	10	30	<0.5	<2	0.11	<0.5	1	47	11	0.86	<10	0.01	<10	0.05	75	1	0.01	2	620	6	<10	15	0.10	<10	<10	36	<10	8	--
L1 07S	2	0.50	0.2	10	40	<0.5	<2	0.29	<0.5	<1	23	10	0.57	<10	<0.01	<10	0.06	27	1	0.02	2	530	4	<10	24	0.04	<10	<10	13	<10	10	--
L1 08S	3	1.44	0.2	10	40	<0.5	<2	0.14	<0.5	1	43	18	0.96	<10	<0.01	<10	0.03	29	3	0.03	4	1650	8	<10	11	0.03	<10	<10	23	<10	16	--
L1 09S	<1	1.05	0.2	10	50	<0.5	<2	0.30	<0.5	<1	28	14	1.22	<10	<0.01	<10	0.05	47	1	0.02	3	610	9	<10	23	0.06	<10	<10	28	<10	10	--
L1 10S	<1	0.73	0.2	<10	20	<0.5	<2	0.18	<0.5	1	196	6	2.82	10	0.05	<10	0.06	329	<1	0.02	5	140	10	<10	11	0.43	<10	<10	136	<10	6	--
L1 11S	3	1.15	0.2	10	60	<0.5	<2	0.36	<0.5	1	15	13	0.91	<10	<0.01	<10	0.08	36	3	0.02	4	830	6	<10	37	0.04	<10	<10	21	<10	14	--
L1 12S	3	1.95	0.2	10	30	<0.5	<2	0.33	<0.5	2	18	10	5.49	20	0.04	10	0.64	363	2	0.02	10	440	16	<10	30	0.32	<10	<10	133	<10	24	--
L1 13S	2	0.30	0.2	10	160	<0.5	2	0.80	<0.5	2	6	11	0.37	<10	<0.01	<10	0.12	22	<1	0.02	4	490	8	<10	89	<0.01	<10	<10	2	<10	16	--
L1 14S	<1	5.78	0.2	10	20	<0.5	<2	0.30	<0.5	5	59	39	5.45	10	<0.01	10	0.36	281	4	0.02	11	460	12	<10	18	0.35	<10	<10	161	<10	34	--
L1 15S	10	1.31	0.2	10	20	<0.5	<2	0.56	<0.5	3	74	10	4.48	10	0.03	<10	0.25	707	1	0.03	11	530	10	<10	25	0.33	<10	<10	144	<10	22	--
L2 00N	<2	1.52	0.2	10	20	<0.5	<2	0.60	<0.5	6	175	10	3.81	10	0.04	10	0.45	500	1	0.05	11	700	14	<10	34	0.25	<10	<10	115	<10	36	--
L2 01N	<1	0.33	0.2	10	20	<0.5	<2	0.23	<0.5	1	24	7	0.64	<10	<0.01	<10	0.10	39	<1	0.02	1	440	4	<10	26	0.04	<10	<10	25	<10	10	--
L2 02N	<1	0.22	0.2	10	80	<0.5	2	0.08	<0.5	1	<1	7	0.09	<10	<0.01	<10	0.25	12	<1	0.03	2	400	8	<10	75	<0.01	<10	<10	1	<10	10	--
L2 03N	2	2.67	0.2	20	30	<0.5	<2	0.52	<0.5	14	26	16	4.08	20	0.04	10	0.42	414	7	0.02	9	310	16	<10	27	0.30	<10	<10	134	<10	38	--
L2 04N	1	3.02	0.2	20	30	<0.5	<2	0.53	<0.5	6	120	17	6.04	20	0.05	10	0.38	421	6	0.04	10	410	14	<10	33	0.37	<10	<10	181	<10	30	--
L2 05N	<1	2.45	0.2	<10	30	<0.5	<2	0.20	<0.5	16	59	22	2.92	<10	<0.01	10	0.15	808	16	0.02	5	360	10	<10	15	0.20	<10	<10	133	<10	14	--
L2 06N	<1	1.12	0.2	10	20	<0.5	<2	0.52	<0.5	4	142	9	3.58	<10	0.03	<10	0.42	372	1	0.04	9	300	8	<10	28	0.31	<10	<10	138	<10	20	--
L2 07N	<1	1.09	0.2	<10	40	<0.5	<2	0.24	<0.5	2	56	8	1.52	<10	0.02	<10	0.11	203	9	0.02	3	400	8	<10	21	0.18	<10	<10	93	<10	8	--
L2 08N	3	3.50	0.2	<10	20	<0.5	<2	0.10	<0.5	<1	48	35	1.37	<10	<0.01	10	0.03	40	1	0.01	3	650	<2	<10	9	0.07	<10	<10	41	<10	4	--
L2 09N	4	1.90	0.2	<10	30	<0.5	<2	0.35	<0.5	1	20	20	0.31	<10	<0.01	10	0.03	53	19	0.01	3	760	4	<10	21	0.10	<10	<10	77	<10	4	--
L2 10N	2	2.23	0.2	<10	30	<0.5	<2	0.40	<0.5	4	17	33	1.19	<10	<0.01	10	0.25	318	10	0.02	5	250	10	<10	35	0.29	<10	<10	116	<10	26	--
L2 11N	3	0.09	0.2	10	20	<0.5	<2	0.44	<0.5	<1	<1	4	0.07	<10	<0.01	<10	0.08	3	<1	0.02	<1	280	2	<10	29	<0.01	<10	<10	<1	<10	6	--
L2 12N	11	0.45	0.2	<10	20	<0.5	<2	0.22	<0.5	2	213	8	2.81	<10	0.01	<10	0.06	273	1	0.01	6	170	4	<10	16	0.26	<10	<10	138	<10	8	--
L3 01W	<1	1.29	0.2	10	40	<0.5	<2	0.32	<0.5	78	36	20	1.50	<10	<0.01	<10	0.11	3443	1	0.02	6	730	14	<10	25	0.10	<10	<10	46	<10	18	--
L3 02W	<1	4.56	0.2	30	70	<0.5	<2	0.34	<0.5	55	52	31	2.59	<10	<0.01	10	0.43	>9999	3	0.04	16	900	22	<10	25	0.13	<10	<10	81	<10	54	--
L3 03W	2	1.37	0.2	10	20	<0.5	<2	0.08	<0.5	1	7	10	0.67	<10	<0.01	10	0.02	59	<1	0.02	6	1250	4	<10	7	0.01	<10	<10	15	<10	6	--
P 01	4	2.44	0.2	20	30	<0.5	<2	0.87	<0.5	10	98	20	5.59	10	0.01	<10	0.27	649	1	0.02	12	780	20	<10	48	0.36	<10	<10	176	<10	52	--
P 02	22	7.50	0.2	60	30	<0.5	<2	0.83	<0.5	53	71	94	5.82	10	0.10	10	1.14	3516	5	0.01	25	1350	246	10	37	0.21	<10	<10	93	<10	182	--
P 03	4	5.39	0.2	30	60	<0.5	<2	0.92	<0.5	25	81	87	5.28	20	0.10	10	1.02	925	2	0.02	32	910	24	<10	50	0.35	<10	<10	137	<10	92	--
P 04	29	6.48	0.2	60	30	<0.5	<2	0.58	<0.5	22	66	75	5.71	10	0.02	10	0.62	729	3	0.01	26	1890	24	<10	26	0.25	<10	<10	138	<10	84	--
P 05	29	2.94	0.2	110	40	<0.5	<2	1.28	<0.5	27	34	74	5.41	10	0.06	10	1.03	1078	1	0.01	21	1140	46	<10	60	0.32	<10	<10	110	<10	66	--
R1 00E	4	6.50	0.2	20	20	<0.5	<2	0.33	<0.5	7	34	147	0.32	10	0.04	40	0.34	215	2	0.01	13	1110	26	<10	21	0.06	30	<10	27	<10	40	--
R1 01E	<1	0.91	0.2	10	20	<0.5	<2	0.23	<0.5	3	32	8	1.70	<10	<0.01	<10	0.06	139	2	0.02	4	320	8	<10	21	0.18	<10	<10	85	<10	10	--

Certified by ....

A-1

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CERTIFICATE OF ANALYSIS

TO : PEARSON, MR. BRAD

7431 LINDSAY ROAD
RICHMOND, B.C.
V7C 3M7

CERT. # : A8615645-003-A
INVOICE # : I8615645
DATE : 11-AUG-86
P.O. # : NONE

Semi quantitative multi element ICP analysis

Nitric-Aqua-Regia digestion of 0.5 gm of material followed by ICP analysis. Since this digestion is incomplete for many minerals, values reported for Al, Sb, Ba, Be, Ca, Cr, Ga, La, Mg, K, Na, Sr, Tl, Ti, W and V can only be considered as semi-quantitative.

COMMENTS :

Sample description	Au NAA ppb	Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	K %	La ppm	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm	
Q 02S	6	4.34	0.4	10	20	<0.5	<2	0.43	<0.5	5	83	38	3.68	<10	<0.01	10	0.42	267	<1	0.02	11	540	6	<10	27	0.39	<10	<10	146	<10	32	--
G 03S	5	2.93	0.2	20	30	<0.5	<2	0.70	<0.5	10	61	36	5.64	<10	0.04	10	1.04	789	1	0.02	16	940	8	<10	39	0.34	<10	<10	172	<10	50	--
Q 04S	2	4.23	0.6	20	20	<0.5	<2	0.62	<0.5	12	73	39	5.39	<10	0.02	10	0.87	575	<1	0.02	17	520	8	<10	35	0.37	<10	<10	185	<10	64	--
Q 05S	23	4.99	1.0	30	50	<0.5	<2	0.70	<0.5	14	57	81	3.11	<10	0.01	10	0.61	366	2	0.02	17	620	12	<10	40	0.47	<10	<10	157	<10	66	--
Q 06S	2	1.68	0.4	20	20	<0.5	<2	0.34	<0.5	5	44	21	5.27	10	0.03	<10	0.27	430	2	0.01	6	320	6	<10	58	0.42	<10	<10	275	<10	22	--
Q 07S	<1	0.79	0.2	10	50	<0.5	<2	0.13	<0.5	2	24	14	3.62	<10	0.03	<10	0.17	120	1	0.02	2	450	<2	<10	29	0.11	<10	<10	145	<10	14	--
T-0E ORANGE	6	6.38	0.4	10	40	<0.5	<2	0.37	<0.5	8	27	45	4.17	<10	0.02	10	0.61	324	1	0.01	12	570	<2	<10	40	0.25	<10	<10	98	<10	44	--
T-0E GREY	1	2.18	0.2	10	30	<0.5	<2	0.76	<0.5	15	10	13	2.09	<10	0.16	10	1.30	506	3	<0.01	21	270	4	<10	13	0.28	<10	<10	42	<10	36	--
T 01E	2	4.78	0.2	10	30	<0.5	<2	0.91	<0.5	22	21	50	5.91	10	0.02	10	0.69	565	5	0.01	11	510	4	<10	49	0.30	<10	<10	148	<10	42	--
T 02E	35	9.72	1.9	<10	30	<0.5	<2	0.61	<0.5	45	25	84	2.75	10	0.02	30	0.51	541	3	0.01	13	1180	14	<10	27	0.17	<10	<10	57	<10	39	--
T 03E	2	4.25	0.4	10	30	<0.5	<2	1.07	<0.5	23	42	49	4.94	10	0.05	10	1.77	527	1	0.02	23	520	10	<10	82	0.32	<10	<10	135	<10	76	--
T 04E	2	4.44	0.2	<10	40	<0.5	<2	0.76	<0.5	33	86	50	5.28	10	0.05	10	0.54	1019	3	0.03	19	410	8	<10	45	0.41	<10	<10	175	<10	68	--
T 05E	<1	4.34	0.2	<10	50	<0.5	<2	0.77	<0.5	27	95	42	4.41	10	0.13	10	0.86	987	3	0.06	14	520	12	<10	41	0.33	<10	<10	120	<10	74	--
T 06E	<1	8.03	0.4	<10	60	<0.5	<2	0.54	<0.5	10	79	38	5.06	10	0.05	10	0.34	335	2	0.04	12	630	8	<10	44	0.34	<10	<10	122	<10	52	--
T 07E	2	7.19	0.2	10	40	<0.5	<2	0.28	<0.5	6	37	24	5.70	10	0.03	10	0.37	215	1	0.02	7	480	6	<10	30	0.37	<10	<10	127	<10	25	--
T 08E	<1	4.44	0.2	<10	40	<0.5	<2	0.49	<0.5	16	49	37	4.14	<10	0.03	10	0.41	255	<1	0.02	16	330	8	<10	25	0.31	<10	<10	129	<10	34	--
T 09E	5	4.67	0.2	<10	20	<0.5	<2	0.40	<0.5	10	28	37	5.46	10	0.02	10	0.38	228	1	0.01	14	320	6	<10	24	0.38	<10	<10	159	<10	34	--
T 10E	2	5.68	0.2	<10	40	<0.5	<2	0.46	<0.5	9	53	33	5.33	<10	0.02	10	0.19	342	<1	0.02	14	400	6	<10	25	0.40	<10	<10	177	<10	56	--
T 11E	7	4.90	0.2	<10	30	<0.5	<2	0.43	<0.5	10	40	20	2.96	<10	0.02	10	0.41	286	1	0.01	17	480	4	<10	21	0.30	<10	<10	116	<10	32	--
T 12E	7	1.59	0.2	<10	20	<0.5	<2	0.23	<0.5	1	34	14	5.91	10	<0.01	<10	0.09	190	<1	0.01	7	90	4	<10	13	0.38	<10	<10	237	<10	10	--
T 13E	<1	1.54	0.2	10	20	<0.5	<2	1.63	<0.5	8	24	34	2.73	10	0.04	10	0.54	214	<1	0.06	10	540	6	<10	49	0.21	<10	<10	55	<10	30	--
T 14E	5	3.46	0.2	<10	30	<0.5	<2	0.25	<0.5	3	45	19	6.18	10	0.02	<10	0.54	223	2	0.01	11	330	10	<10	20	0.35	<10	<10	210	<10	21	--
T 15E	<1	2.75	0.2	<10	20	<0.5	<2	0.55	<0.5	6	45	25	3.98	<10	0.02	10	0.24	237	<1	0.01	12	190	4	<10	16	0.33	<10	<10	135	<10	22	--
T 16E	1	4.71	0.2	<10	20	<0.5	<2	0.34	<0.5	3	73	23	6.42	10	0.01	<10	0.26	168	<1	0.01	10	180	4	<10	15	0.33	<10	<10	143	<10	18	--

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CERTIFICATE OF ANALYSIS

TO : PEARSON, MR. BRAD

7431 LINDSAY ROAD
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CERT. # : A8615645-002-A
INVOICE # : I8615645
DATE : 11-AUG-86
P.O. # : NONE

Semi quantitative multi element ICP analysis

Nitric-Aqua-Regia digestion of 0.5 gm of material followed by ICP analysis. Since this digestion is incomplete for many minerals, values reported for Al, Sb, Ba, Be, Ca, Cr, Ga, La, Mg, K, Na, Sr, Tl, Ti, W and V can only be considered as semi-quantitative.

COMMENTS :

Sample description	Au NAA ppb	Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	K %	La ppm	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm	
K1 02E	12	4.60	0.2	30	60	<0.5	<2	1.11	<0.5	75	36	57	4.08	10	0.07	10	0.94	1540	2	0.02	39	720	8	10	52	0.16	<10	<10	110	<10	140	--
K1 03E	3	4.64	0.2	20	70	<0.5	<2	0.87	0.5	69	62	75	4.03	10	0.03	30	0.37	5013	12	0.02	32	790	8	<10	36	0.28	<10	<10	122	<10	74	--
K1 04E	<1	3.07	0.2	20	60	<0.5	<2	0.58	<0.5	19	45	25	6.08	10	0.04	10	0.63	911	3	0.02	12	410	2	<10	40	0.27	<10	<10	148	<10	46	--
K1 05E	1	5.47	0.2	40	50	<0.5	<2	0.91	<0.5	19	42	55	4.33	10	0.01	20	0.43	520	5	0.02	18	530	2	<10	33	0.32	<10	<10	110	<10	42	--
K1 06E	4	2.58	0.2	20	40	<0.5	<2	0.44	<0.5	16	20	21	7.92	20	<0.01	10	0.24	531	7	0.01	8	320	4	<10	20	0.34	<10	<10	262	<10	30	--
K1 07E	2	0.65	0.2	<10	10	<0.5	<2	0.31	<0.5	3	27	7	5.03	10	<0.01	<10	0.09	212	1	0.01	5	180	10	<10	19	0.46	<10	<10	254	<10	12	--
K1 08E	5	1.37	0.2	10	20	<0.5	<2	0.48	<0.5	3	103	13	2.21	<10	0.03	10	0.21	262	2	0.03	7	300	6	<10	31	0.37	<10	<10	111	<10	16	--
K2 00W	<1	3.82	0.2	10	50	<0.5	<2	0.75	<0.5	16	34	24	2.72	10	0.02	10	0.49	324	8	0.02	17	730	4	<10	36	0.33	<10	<10	104	<10	58	--
K2 01W	<1	3.87	0.2	30	50	<0.5	<2	1.00	<0.5	14	47	53	4.26	10	0.03	10	0.73	421	12	0.02	22	550	10	<10	48	0.36	<10	<10	228	<10	52	--
K2 02W	<1	3.37	0.2	20	50	<0.5	<2	1.23	<0.5	12	48	54	3.05	10	0.02	10	0.68	403	9	0.02	22	860	6	<10	48	0.37	<10	<10	185	<10	48	--
K2 03W	5	4.84	0.2	30	30	<0.5	<2	0.63	<0.5	17	41	50	2.46	10	0.04	10	0.41	308	5	0.01	19	450	4	10	32	0.34	<10	<10	211	<10	60	--
K2 04W	2	4.87	0.2	20	30	<0.5	<2	0.63	<0.5	31	42	55	2.52	10	0.02	10	0.39	316	9	0.01	22	620	8	<10	33	0.37	<10	<10	133	<10	74	--
K2 04+50W	5	13.98	0.2	20	<10	1.0	<2	0.16	<0.5	6	13	88	0.21	<10	<0.01	10	0.06	48	4	<0.01	7	950	<2	10	7	0.05	<10	<10	5	<10	20	--
K2 04+70W	7	14.50	0.2	30	<10	0.5	<2	0.09	<0.5	3	16	53	0.06	<10	<0.01	10	0.03	24	<1	<0.01	4	1000	<2	10	3	0.01	<10	<10	<1	<10	10	--
K2 05W	3	5.25	1.0	20	<10	0.5	<2	0.45	<0.5	2	6	308	0.40	<10	<0.01	30	0.03	13	1	0.01	8	1890	2	<10	21	<0.01	<10	<10	10	<10	24	--
K2 05W UPPERCLAY	6	7.77	0.2	30	50	<0.5	<2	0.70	<0.5	10	61	139	3.62	10	0.05	20	1.16	582	6	0.02	24	720	18	10	47	0.25	<10	<10	218	<10	76	--
K2 06W PEAT	14	5.60	0.8	20	10	<0.5	<2	0.56	<0.5	3	25	240	1.59	<10	<0.01	30	0.12	60	1	0.01	11	1530	<2	<10	52	0.03	<10	<10	33	<10	13	--
K2 07W	<1	6.33	0.2	30	30	<0.5	<2	0.53	<0.5	11	48	94	1.64	<10	0.04	30	0.70	344	4	0.02	20	760	8	10	31	0.18	<10	<10	78	<10	64	--
K3 +	8	5.03	0.2	20	20	<0.5	<2	0.61	<0.5	11	82	42	6.29	10	0.02	20	0.59	342	2	0.02	21	420	2	<10	28	0.44	<10	<10	160	<10	52	--
Q 01W	2	5.08	0.2	10	30	<0.5	<2	0.47	<0.5	7	70	27	5.68	10	0.03	10	0.58	387	2	0.02	13	790	6	<10	29	0.35	<10	<10	155	<10	34	--
Q 02W	4	5.56	0.4	20	30	<0.5	<2	0.37	<0.5	10	61	139	3.27	<10	0.02	10	0.54	312	2	0.02	11	2060	2	10	24	0.23	<10	<10	96	<10	30	--
Q 03W	4	4.30	0.2	20	30	<0.5	<2	0.36	<0.5	8	65	27	6.02	10	0.02	10	0.38	331	2	0.02	10	670	2	<10	28	0.34	<10	<10	184	<10	38	--
Q 04W	3	4.84	0.2	20	30	<0.5	<2	0.70	<0.5	6	51	22	6.09	10	0.02	10	0.48	326	3	0.02	9	690	2	<10	26	0.36	<10	<10	178	<10	32	--
Q 05W	6	4.10	0.2	30	30	<0.5	<2	0.28	<0.5	3	60	31	6.71	<10	0.04	10	0.29	228	4	0.01	7	740	4	<10	20	0.32	<10	<10	132	<10	24	--
Q 06W	<1	2.52	0.2	20	40	<0.5	<2	0.24	<0.5	3	72	20	5.57	<10	0.05	10	0.22	255	3	0.02	4	470	8	<10	20	0.32	<10	<10	151	<10	18	--
Q 07W	<1	1.69	0.2	20	30	<0.5	<2	0.30	<0.5	2	106	14	5.29	<10	0.03	10	0.08	314	2	0.02	4	270	2	<10	25	0.39	<10	<10	199	<10	10	--
Q 08W	3	3.58	0.2	10	40	<0.5	<2	0.57	<0.5	7	83	30	5.75	<10	0.04	10	0.39	331	1	0.03	12	660	6	<10	38	0.37	<10	<10	176	<10	30	--
Q 09W	4	5.48	0.2	30	30	<0.5	<2	0.34	<0.5	6	81	43	8.04	10	0.04	10	0.39	392	4	0.02	11	670	6	10	22	0.43	<10	<10	184	<10	32	--
Q 10W	3	2.41	0.2	30	30	<0.5	<2	1.04	<0.5	12	81	47	4.69	<10	0.05	10	0.80	502	1	0.04	20	710	3	<10	46	0.33	<10	<10	140	<10	38	--
Q 01E	6	4.57	0.2	20	40	<0.5	<2	0.59	<0.5	15	90	55	5.92	10	0.03	10	0.66	407	3	0.03	17	500	8	<10	39	0.50	<10	<10	216	<10	54	--
Q 02E	3	2.97	0.2	10	100	<0.5	<2	0.24	<0.5	3	6	33	1.68	<10	<0.01	10	0.07	32	1	0.01	9	860	<2	<10	33	0.03	<10	<10	12	<10	16	--
Q 03E	11	5.23	0.2	20	40	<0.5	<2	0.56	<0.5	22	130	67	5.79	<10	0.03	10	0.54	660	5	0.03	19	540	2	10	38	0.39	<10	<10	156	<10	70	--
Q 04E	<1	0.92	0.2	10	40	<0.5	<2	0.65	<0.5	7	33	13	2.18	<10	0.02	<10	0.41	139	<1	0.01	9	550	2	<10	61	0.20	<10	<10	94	<10	22	--
Q 01N	4	5.11	0.4	20	50	<0.5	<2	0.75	<0.5	21	264	68	4.12	<10	0.05	20	0.90	613	5	0.04	20	1190	10	10	50	0.32	<10	<10	175	<10	64	--
Q 02N	4	2.31	0.4	10	30	<0.5	<2	0.34	<0.5	6	162	22	11.66	10	0.01	10	0.24	482	2	0.02	10	560	10	<10	31	0.63	<10	<10	342	<10	30	--
Q 03N	4	2.05	0.2	10	70	<0.5	<2	0.55	<0.5	3	461	18	3.03	10	0.07	10	0.17	491	2	0.04	7	300	16	<10	51	0.37	<10	<10	122	<10	16	--
Q 04N	4	1.55	0.4	10	70	<0.5	<2	0.32	<0.5	4	266	33	4.37	<10	0.03	10	0.11	364	1	0.03	10	260	6	<10	31	0.39	<10	<10	204	<10	16	--
Q 05N	<1	0.83	0.2	<10	40	<0.5	<2	0.23	<0.5	2	51	21	3.05	<10	0.02	<10	0.12	200	1	0.03	4	430	4	<10	26	0.21	<10	<10	129	<10	12	--
Q 06N	<1	2.73	0.2	30	40	<0.5	<2	0.49	<0.5	5	248	10	7.04	10	0.03	10	0.21	544	3	0.05	8	580	6	<10	39	0.44	<10	<10	259	<10	22	--
Q 01S	2	0.25	0.4	10	60	<0.5	<2	0.18	<0.5	<1	<1	9	0.10	<10	<0.01	<10	0.01	13	<1	0.02	1	340	<2	<10	53	<0.01	<10	<10	<1	<10	14	--

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CERTIFICATE OF ANALYSIS

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CERT. # : A8619276-001-A
INVOICE # : I8619276
DATE : 23-OCT-86
P.O. # : NONE

Semi quantitative multi element ICP analysis

Nitric-Aqua-Regia digestion of 0.5 gm of material followed by ICP analysis. Since this digestion is incomplete for many minerals, values reported for Al, Sb, Ba, Be, Ca, Cr, Ga, La, Mg, K, Na, Sr, Tl, Ti, W and V can only be considered as semi-quantitative.

COMMENTS :

A-4

Sample description	Au NAA ppb	Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	K %	La ppm
L9E 01N	89	3.35	<0.2	10	30	<0.5	<2	0.53	<0.5	4	67	59	10.05	10	0.05	<10
L9E 02N	<1	2.01	<0.2	35	60	<0.5	<2	0.24	<0.5	1	47	29	7.26	<10	0.01	<10
L9E 03N	<1	2.36	<0.2	25	20	<0.5	<2	0.29	<0.5	3	39	29	7.41	<10	0.05	<10
L9E 04N	2	3.61	<0.2	20	20	<0.5	<2	0.45	<0.5	4	64	36	4.91	<10	0.02	<10
L9E 05N	1	3.34	<0.2	5	40	<0.5	<2	0.34	<0.5	5	36	43	10.81	<10	0.02	<10
L9E 07N	1	3.19	<0.2	10	20	<0.5	<2	0.39	<0.5	6	75	46	9.33	<10	0.03	<10
L9E 08N	<1	3.67	<0.2	15	20	<0.5	<2	0.20	<0.5	3	73	37	10.23	10	<0.01	<10
L9E 09N	<1	2.05	<0.2	10	40	<0.5	<2	0.34	<0.5	5	57	30	4.77	<10	0.04	<10
L9E 10N	<1	1.42	<0.2	5	10	<0.5	<2	0.40	<0.5	2	24	19	3.97	<10	0.01	<10
L9E 11N	3	1.02	<0.2	10	10	<0.5	<2	0.20	<0.5	4	75	41	7.95	10	<0.01	<10
L9E 12N	<1	1.94	<0.2	15	20	<0.5	<2	0.51	<0.5	6	56	36	5.81	10	0.02	<10
L9E 13N	2	3.63	<0.2	15	30	<0.5	<2	0.24	<0.5	3	67	30	6.55	<10	0.02	<10
L9E 14N	1	1.01	<0.2	10	20	<0.5	<2	0.09	<0.5	1	27	12	4.30	10	<0.01	<10
L9E 15N	2	3.83	<0.2	10	20	<0.5	<2	0.40	<0.5	6	48	22	3.87	<10	0.01	<10
L9E 16N	2	2.44	<0.2	10	40	<0.5	<2	0.63	<0.5	10	34	30	4.09	<10	0.03	10
L9E 17N	2	1.28	<0.2	10	30	<0.5	<2	0.27	<0.5	2	24	15	3.72	<10	0.01	<10
L3W 01S	<1	3.86	<0.2	5	40	<0.5	<2	0.31	<0.5	4	47	35	2.03	<10	0.01	<10
L3W 02S	<1	0.54	<0.2	<5	20	<0.5	<2	0.36	<0.5	<1	79	5	1.03	<10	0.02	<10
L3W 03S	3	4.71	<0.2	10	30	<0.5	<2	0.31	<0.5	4	58	31	5.89	<10	0.01	<10
L3W 04S	2	1.59	<0.2	5	10	<0.5	<2	0.22	<0.5	2	44	15	5.35	<10	0.01	<10
L3W 05S	<1	1.50	<0.2	10	20	<0.5	<2	0.20	<0.5	<1	23	6	2.39	10	0.01	<10
L3W 06S	4	0.77	<0.2	5	10	<0.5	<2	0.14	<0.5	<1	30	3	1.13	10	0.02	<10
L3W 07S	2	1.98	<0.2	20	10	<0.5	<2	0.20	<0.5	2	52	21	6.81	<10	0.02	<10
L3W 08S	9	1.10	<0.2	15	20	<0.5	<2	0.21	<0.5	<1	40	13	4.47	10	0.01	<10
L3W 09S	<1	0.27	<0.2	<5	110	<0.5	<2	1.06	<0.5	<1	6	2	0.18	<10	<0.01	<10
L3W 10S	149	2.31	<0.2	10	40	<0.5	<2	0.32	<0.5	2	60	20	3.35	<10	0.03	<10
L3W 11S	1	1.35	<0.2	15	10	<0.5	<2	0.31	<0.5	2	38	18	7.40	<10	0.02	<10
L3W 12S	1	5.56	<0.2	10	20	<0.5	<2	0.29	<0.5	6	67	39	5.27	<10	0.01	<10
L3W 13S	2	1.37	<0.2	10	20	<0.5	<2	0.28	<0.5	4	48	17	7.34	10	0.02	<10
L3W 14S	<1	1.53	<0.2	10	20	<0.5	<2	0.26	<0.5	2	85	12	4.57	10	0.03	<10
L4W 01N	3	1.09	<0.2	20	20	<0.5	<2	0.16	<0.5	1	45	11	6.42	<10	0.03	<10
L4W 02N	<1	0.47	<0.2	20	30	<0.5	<2	0.19	<0.5	<1	55	6	3.98	<10	0.02	<10
L4W 03N	1	0.78	<0.2	40	10	<0.5	<2	0.09	<0.5	<1	29	17	10.75	<10	<0.01	<10
L4W 04N	<1	0.53	<0.2	15	80	<0.5	<2	0.29	<0.5	1	83	9	3.05	<10	0.02	<10
L4W 05N	<1	0.42	<0.2	15	30	<0.5	<2	0.25	<0.5	1	95	8	2.97	<10	0.03	<10
L4W 06N	3	1.94	<0.2	60	20	<0.5	<2	0.20	<0.5	1	43	17	8.34	<10	0.02	<10
L4W 07N	<1	0.57	<0.2	5	30	<0.5	<2	0.16	<0.5	<1	102	2	1.05	<10	0.02	<10
L4W 08N	2	1.16	<0.2	45	90	<0.5	<2	0.16	<0.5	<1	124	20	5.32	10	0.04	<10
P1W 0N	2	2.20	<0.2	25	20	<0.5	<2	0.62	<0.5	14	51	13	4.20	<10	0.05	<10
P1W 2N	9	3.63	<0.2	40	30	<0.5	<2	0.56	<0.5	6	55	27	5.37	<10	0.04	<10

Sample description	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm	
L9E 01N	0.20	460	<1	0.01	4	570	20	<5	9	0.39	<10	<10	270	<5	24	--
L9E 02N	0.13	161	1	<0.01	2	400	32	<5	11	0.21	<10	<10	167	<5	12	--
L9E 03N	0.18	300	<1	<0.01	3	560	18	<5	9	0.23	<10	<10	187	<5	14	--
L9E 04N	0.33	240	<1	0.01	6	480	12	<5	12	0.27	<10	<10	154	<5	16	--
L9E 05N	0.41	302	<1	0.01	5	630	22	<5	8	0.25	<10	<10	164	<5	24	--
L9E 07N	0.49	268	3	0.01	7	520	64	<5	19	0.27	<10	<10	178	<5	32	--
L9E 08N	0.17	180	<1	0.01	5	490	16	<5	8	0.40	<10	<10	316	<5	18	--
L9E 09N	0.44	276	<1	0.01	10	450	6	<5	14	0.23	<10	<10	156	<5	26	--
L9E 10N	0.13	135	<1	0.01	3	460	4	<5	10	0.27	<10	<10	180	<5	16	--
L9E 11N	0.14	248	<1	<0.01	3	330	10	<5	8	0.44	<10	<10	441	<5	20	--
L9E 12N	0.45	345	<1	0.01	9	440	20	<5	28	0.25	<10	<10	173	<5	28	--
L9E 13N	0.24	173	<1	0.01	6	550	12	<5	11	0.25	<10	<10	183	<5	24	--
L9E 14N	0.07	142	<1	<0.01	1	210	8	<5	7	0.37	<10	<10	241	<5	8	--
L9E 15N	0.38	214	<1	0.01	10	280	8	<5	15	0.26	<10	<10	109	<5	20	--
L9E 16N	0.48	298	<1	0.02	13	410	2	<5	20	0.24	<10	<10	120	<5	28	--
L9E 17N	0.20	140	<1	0.01	4	340	6	<5	14	0.19	<10	<10	123	<5	12	--
L3W 01S	0.30	189	2	0.01	7	430	6	<5	14	0.21	<10	<10	122	<5	16	--
L3W 02S	0.08	140	<1	<0.01	2	190	6	<5	16	0.17	<10	<10	78	<5	8	--
L3W 03S	0.21	193	<1	0.01	5	400	6	<5	13	0.25	<10	<10	156	<5	18	--
L3W 04S	0.19	147	<1	<0.01	3	180	10	<5	12	0.31	<10	<10	211	<5	10	--
L3W 05S	0.10	98	<1	<0.01	1	160	12	<5	15	0.35	<10	<10	164	<5	4	--
L3W 06S	0.08	126	1	<0.01	<1	160	10	<5	12	0.26	<10	<10	120	<5	4	--
L3W 07S	0.21	125	<1	<0.01	2	310	24	<5	12	0.22	<10	<10	181	<5	12	--
L3W 08S	0.05	91	<1	<0.01	2	130	30	<5	11	0.45	<10	<10	254	<5	6	--
L3W 09S	0.10	238	<1	0.01	1	220	<2	<5	47	0.01	<10	<10	9	<5	6	--
L3W 10S	0.21	243	<1	0.01	4	370	6	<5	21	0.26	<10	<10	170	<5	12	--
L3W 11S	0.14	142	<1	<0.01	4	370	16	<5	15	0.34	<10	<10	265	<5	12	--
L3W 12S	0.26	154	<1	0.01	11	340	6	<5	12	0.28	<10	<10	136	<5	28	--
L3W 13S	0.29	174	<1	0.01	9	240	12	<5	17	0.46	<10	<10	281	<5	14	--
L3W 14S	0.23	217	<1	0.01	4	180	10	<5	18	0.42	<10	<10	286	<5	14	--
L4W 01N	0.18	171	<1	0.01	2	310	20	<5	11	0.25	<10	<10	193	<5	16	--
L4W 02N	0.06	90	1	<0.01	1	280	14	<5	20	0.17	<10	<10	170	<5	6	--
L4W 03N	0.07	71	<1	<0.01	1	250	28	<5	7	0.34	<10	<10	235	<5	6	--
L4W 04N	0.02	123	2	<0.01	2	240	10	<5	38	0.07	<10	<10	93	<5	6	--
L4W 05N	0.08	236	1	<0.01	3	320	10	<5	18	0.20	<10	<10	146	<5	8	--
L4W 06N	0.09	112	1	<0.01	1	720	32	<5	17	0.28	<10	<10	206	<5	10	--
L4W 07N	0.07	227	<1	0.01	1	100	24	<5	15	0.22	<10	<10	76	<5	4	--
L4W 08N	0.10	117	3	<0.01	1	500	132	<5	24	0.28	<10	<10	161	<5	4	--
P1W 0N	0.66	683	<1	0.01	13	440	8	<5	31	0.26	<10	<10	116	<5	42	--
P1W 2N	0.28	297	<1	0.01	5	630	20	<5	32	0.27	<10	<10	135	<5	40	--

10

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V03 rev 11/85

Chemex Labs Ltd.

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212 Brooksbank Ave.
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Telex: 043-52597

CERTIFICATE OF ANALYSIS

TO : PEARSON, MR. BRAD

7431 LINDSAY ROAD
RICHMOND, B.C.
V7C 3M7

CERT. # : A8619276-002-A
INVOICE # : I8619276
DATE : 23-OCT-86
P.O. # : NONE

Semi quantitative multi element ICP analysis

Nitric-Aqua-Regia digestion of 0.5 gm of material followed by ICP analysis. Since this digestion is incomplete for many minerals, values reported for Al, Sb, Ba, Be, Ca, Cr, Ga, La, Mg, K, Na, Sr, Tl, Ti, W and V can only be considered as semi-quantitative.

COMMENTS :

Sample description	Au NAA ppb	Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	K %	La ppm	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm	
P1W 4N	<1	2.56	<0.2	25	50	<0.5	<2	0.58	<0.5	13	49	35	4.52	<10	0.08	10	0.21	574	<1	0.01	6	380	20	<5	32	0.24	<10	<10	161	<5	38	--
P1W 6N	6	2.67	<0.2	65	40	<0.5	<2	0.43	<0.5	4	40	22	6.17	<10	0.03	<10	0.15	183	<1	0.01	2	380	14	<5	27	0.28	<10	<10	163	<5	26	--
P1W 8N	1	1.65	<0.2	10	20	<0.5	<2	0.41	<0.5	2	16	11	5.44	10	0.02	<10	0.14	285	<1	<0.01	1	350	12	<5	27	0.47	<10	<10	192	<5	16	--

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V03 rev. 11/85

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CERTIFICATE OF ANALYSIS

TO : PEARSON, MR. BRAD
7431 LINDSAY ROAD
RICHMOND, B.C.
V7C 3M7

CERT. # : A8619283-001-B
INVOICE # : I8619283
DATE : 7-NOV-86
P.O. # : NONE

Sample description	K % (ICP)																							
86-7-17-2	0.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
86-7-17-3	<0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
86-7-17-8	1.30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
86-7-17-9	[illegible]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
86-9-24-1	2.46	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
86-9-25-2	1.66	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
86-9-25-3	1.24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
86-9-25-4	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
86-9-25-5	1.40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
86-9-25-6	2.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
86-9-25-7	1.50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
86-9-25-8	0.97	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
86-9-25-10	0.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
86-9-26-6	<0.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
86-9-26-8	1.51	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
86-9-26-9	0.82	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

A-6

Certified by B. Cargo........

Chemex Labs Ltd.

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Telex: 043-52597

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CERTIFICATE OF ANALYSIS

TO : PEARSON, MR. BRAD

7431 LINDSAY ROAD
RICHMOND, B.C.
V7C 3M7

CERT. # : A8619283-001-A
INVOICE # : I8619283
DATE : 7-NOV-86
P.O. # : NONE

Sample description	Au NAA ppb	Mo ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)	P ppm (ICP)	Pb ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Ni ppm (ICP)	Ba ppm (ICP)
86-7-17-2	<1	9	20	146	150	84	<2	6.0	2	<1	2903
86-7-17-3	2	2	20	107	680	82	<2	1.5	16	15	448
86-7-17-8	<1	<1	10	66	680	26	<2	<0.5	14	10	658
~~86-7-17-9~~	~~<1~~	~~<1~~	~~10~~	~~70~~	~~690~~	~~28~~	~~<2~~	~~<0.5~~	~~15~~	~~9~~	~~624~~
86-9-24-1	1	4	<10	18	590	10	<2	<0.5	<1	1	539
86-9-25-2	<1	<1	20	62	1190	8	<2	<0.5	14	<1	1127
86-9-25-3	2	<1	<10	49	600	4	<2	<0.5	12	18	591
86-9-25-4	<1	2	<10	<1	1360	18	<2	<0.5	<1	3	975
86-9-25-5	<1	3	<10	14	730	10	<2	<0.5	5	4	361
86-9-25-6	<1	6	<10	10	490	14	<2	<0.5	<1	<1	976
86-9-25-7	<1	<1	<10	68	710	12	<2	<0.5	32	17	443
86-9-25-8	2	<1	<10	37	760	4	<2	<0.5	12	15	161
86-9-25-10	<1	3	<10	40	170	8	<2	<0.5	12	8	240
86-9-26-6	17	1	<10	<1	740	14	<2	<0.5	15	6	195
86-9-26-8	<1	<1	<10	52	770	2	<2	<0.5	13	6	491
86-9-26-9	1	<1	<10	45	510	8	<2	<0.5	8	<1	321

Sample description	Fe % (ICP)	Mn ppm (ICP)	Cr ppm (ICP)	Mg % (ICP)	V ppm (ICP)	Al % (ICP)	Be ppm (ICP)	Ca % (ICP)	Cu ppm (ICP)	Ag ppm AAS	Ti % (ICP)	Sr ppm (ICP)	Na % (ICP)
86-7-17-2	18.60	84	149	0.03	37	4.33	<0.5	0.05	110	0.2	0.330	109	0.05
86-7-17-3	10.40	42	106	0.01	86	7.15	<0.5	0.07	60	0.2	0.580	476	0.09
86-7-17-8	4.77	1000	82	1.65	157	9.37	<0.5	4.51	32	0.2	0.460	377	2.86
~~86-7-17-9~~	~~4.73~~	~~982~~	~~117~~	~~1.63~~	~~155~~	~~9.27~~	~~<0.5~~	~~4.46~~	~~30~~	~~0.2~~	~~0.450~~	~~371~~	~~2.80~~
86-9-24-1	3.08	116	98	0.44	96	9.46	<0.5	0.15	18	0.2	0.550	52	0.21
86-9-25-2	5.72	1211	25	1.62	161	9.58	<0.5	3.54	36	0.2	0.600	306	3.59
86-9-25-3	6.39	696	128	1.22	176	8.45	<0.5	2.54	56	0.2	0.630	295	2.66
86-9-25-4	0.16	13	22	0.02	73	13.74	<0.5	0.11	10	0.2	0.310	945	0.24
86-9-25-5	4.32	224	74	0.48	182	10.35	<0.5	0.54	36	0.2	0.650	116	0.63
86-9-25-6	2.72	46	81	0.31	91	9.59	<0.5	0.05	16	0.2	0.570	86	0.21
86-9-25-7	5.39	2215	84	1.40	159	9.20	<0.5	0.77	82	0.2	0.550	153	1.16
86-9-25-8	5.90	641	152	1.23	168	7.59	<0.5	3.28	36	0.2	0.640	325	2.65
86-9-25-10	6.47	75	65	0.03	130	9.44	<0.5	0.04	102	0.2	0.450	89	0.15
86-9-26-6	6.65	24	43	0.01	117	6.44	<0.5	0.07	60	1.2	0.290	714	0.10
86-9-26-8	4.12	926	32	1.57	124	9.10	<0.5	3.47	42	0.2	0.510	337	3.15
86-9-26-9	2.76	445	26	0.77	69	9.13	<0.5	0.90	24	0.2	0.340	394	4.80

A-7

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212 BROOKSBANK AVE., NORTH VANCOUVER,
BRITISH COLUMBIA, CANADA V7J-2C1
PHONE (604) 984-0221

CERTIFICATE OF ANALYSIS A8621738

To: PEARSON, MR. BRAD

7431 LINDSAY ROAD
RICHMOND, B.C.
V7C 3M7

Project :
Comments:

Page No. : 1-A
Tot. Pages: 1
Date : 13-DEC-86
Invoice # : I-8621738
P.O. # : NONE

SAMPLE DESCRIPTION	PREP CODE		Mo ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)	P ppm (ICP)	Pb ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Ni ppm (ICP)	Ba ppm (ICP)	Fe % (ICP)	Mn ppm (ICP)	Cr ppm (ICP)	Mg % (ICP)
86-7-17-8	214	—	7	< 10	< 1	950	20	2	< 0.5	8	5	3970	1.27	31	44	0.05
86-7-17-9	214	—	4	< 10	62	560	5	< 1	< 0.5	14	15	620	5.30	1040	99	1.93

CERTIFICATION : B. Cargl

Chemex Labs Ltd.
Analytical Chemists • Geochemists • Registered Assayers
212 BROOKSBANK AVE., NORTH VANCOUVER, BRITISH COLUMBIA, CANADA V7J-2C1
PHONE (604) 984-0221

CERTIFICATE OF ANALYSIS A8621738

To: PEARSON, MR. BRAD
7431 LINDSAY ROAD
RICHMOND, B.C.
V7C 3M7

Project :
Comments:

Page No. : 1-B
Tot. Pages: 1
Date : 13-DEC-86
Invoice # : I-8621738
P.O. # : NONE

SAMPLE DESCRIPTION	PREP CODE		V ppm (ICP)	Al % (ICP)	Be ppm (ICP)	Ca % (ICP)	Cu ppm (ICP)	Ag ppm AAS	Ti % (ICP)	Sr ppm (ICP)	Na % (ICP)	K % (ICP)				
86-7-17-8	214	—	53	12.50	0.5	0.16	24	< 0.5	0.666	435	0.14	0.07	—	—	—	—
86-7-17-9	214	—	147	9.58	1.5	4.59	29	< 0.5	0.459	455	2.81	1.26	—	—	—	—

CERTIFICATION : B. Cargl

Chemex Labs Ltd.
Analytical Chemists • Geochemists • Registered Assayers
212 BROOKSBANK AVE., NORTH VANCOUVER,
BRITISH COLUMBIA, CANADA V7J-2C1
PHONE (604) 984-0221

CERTIFICATE OF ANALYSIS A8621737

To : PEARSON, MR. BRAD

7431 LINDSAY ROAD
RICHMOND, B.C.
V7C 3M7

Project :
Comments:

Page No. : 1
Tot. Pages: 1
Date : 16-DEC-86
Invoice # : I-8621737
P.O. # : NONE

SAMPLE DESCRIPTION	PREP CODE		Au NAA ppb									
86-7-17-8	205	--	5	-----	-----	-----	-----	-----	-----	-----	-----	-----
86-7-17-9	205	--	< 1	-----	-----	-----	-----	-----	-----	-----	-----	-----

A-10

CERTIFICATION : Hart Bichler

Statement of Costs

PERSONNEL

BD.Pearson	Field Time	July 14-19	6	m/d@$425.00	$2,550.00
	" "	Sept. 23-27	5	" "	2,125.00
	Office "	Feb. 23-Mar.17	15	" "	6,375.00
R.St.John	Field "	July 14-19	6	" "	2,550.00
	" "	Sept. 23-27	5	" "	2,125.00

TRUCK CHARGES

July 14-19	1298 km. @ $0.20	155.76
	6 days @ $40.00	240.00
	Gasoline	55.22
Sept. 23-27	1102 km. @ $0.20	132.24
	5 days @ $40.00	200.00
	Gasoline	59.50

MOTELS

July 14-19, Sept. 23-27	389.71

MEALS

July 14-19, Sept. 23-27	422.52

FIELD SUPPLIES

July 14-19, Sept. 23-27	117.00

FERRY

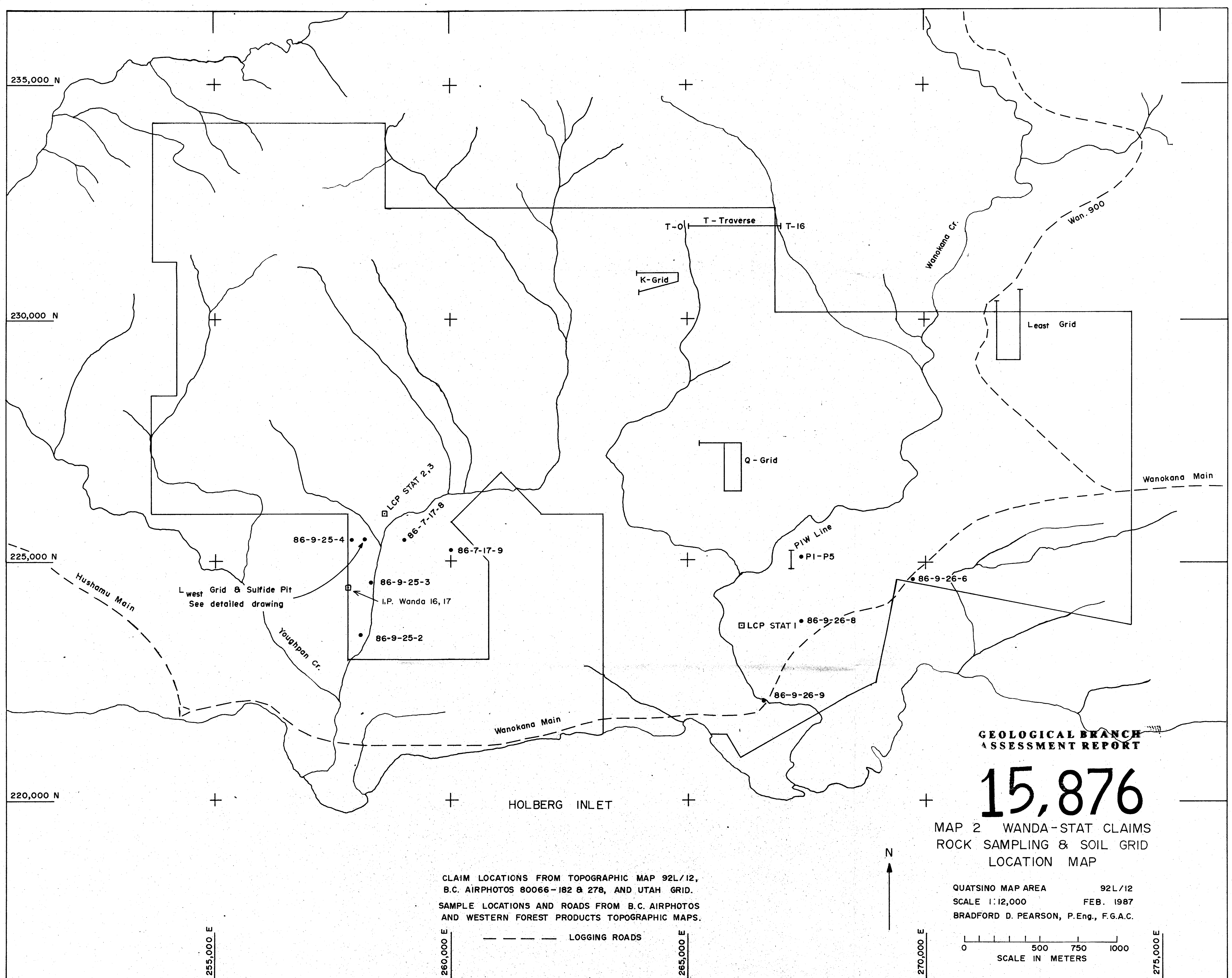
July 14,19, Sept. 23,27	92.00

ASSAYS

Sept. 3, Nov. 10	2,475.55

XEROXING & MAP REPRODUCTION

Feb. 23 - March 17	73.22
	$20,137.72
From P.A.C.	4,962.28
Total	$25,100.00


235,000 N
230,000 N
225,000 N
220,000 N
255,000 E
260,000 E
265,000 E
270,000 E
275,000 E
T-0
T - Traverse
T-16
K-Grid
Least Grid
Wan. 900
Wanokana Cr.
Q - Grid
Wanokana Main
LCP STAT 2,3
86-7-17-8
86-9-25-4
86-7-17-9
PIW Line
P1-P5
86-9-26-6
Lwest Grid & Sulfide Pit
See detailed drawing
86-9-25-3
I.P. Wanda 16, 17
Hushamu Main
LCP STAT 1
86-9-26-8
Youghpan Cr.
86-9-25-2
86-9-26-9
Wanokana Main
HOLBERG INLET
GEOLOGICAL BRANCH
ASSESSMENT REPORT
15,876
MAP 2 WANDA-STAT CLAIMS
ROCK SAMPLING & SOIL GRID
LOCATION MAP
N
QUATSINO MAP AREA 92L/12
SCALE 1:12,000 FEB. 1987
BRADFORD D. PEARSON, P.Eng., F.G.A.C.
0 500 750 1000
SCALE IN METERS
CLAIM LOCATIONS FROM TOPOGRAPHIC MAP 92L/12,
B.C. AIRPHOTOS 80066-182 & 278, AND UTAH GRID.
SAMPLE LOCATIONS AND ROADS FROM B.C. AIRPHOTOS
AND WESTERN FOREST PRODUCTS TOPOGRAPHIC MAPS.
LOGGING ROADS