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File
Louise Group
Superior, Arizona

J. F. Enterprises

406 Broadway • Truth or Consequences
New Mexico 87901 • Phone (505) 894-6678

Jim French
President

November 12, 1973

Mr. Paul I. Eimon
Manager of Exploration
Essex International, Inc.
1704 West Grant Road
Tucson AZ 85705

Dear Mr. Eimon:

In response to your letter of November 7, 1973 asking whether there is any new information on our copper prospect, we are sending the enclosed report dated October 17, 1973. Since this report was written we have taken a few rock chip samples in an attempt to support the results of the soil anomaly. So far, only 20 rock chip samples have been taken. Values have ranged from 30 to 160 PPM copper and from 8 to 310 PPM zinc. We feel that too few chip samples have been taken to offer conclusive evidence by this method. More sampling will follow in the near future.

Our staff geologist will be back on the ground in the near future and, should you wish to inspect the property, perhaps we can coincide his visit with yours so that he can assist you in the field.

Sincerely,

Jim French

Jim French

EGH called 11-28-73
Don Fingado Geologist
505/ 894-6678 office
6837 home

He will keep us informed of any developments of his property in Ariz.

Hard Rock Mining inc.

406 Broadway / Truth or Consequences, New Mexico 87901 / (505) 894-6678

A SUMMARY REPORT ON THE SUPERIOR, ARIZONA COPPER PROJECT

History and General Information

It was stated in the initial confidential report titled, "Investigation of Emil Cody's 'Louise group' of Copper Claims (Data, Notes and Comments)" that, following the initial phase of geochemical sampling, which consisted of 38 soil and rock samples, there was a high copper-low zinc zone running from the vicinity of the W 1/4 corner of Section 22 Southwesterly through the W 1/4 corner of Section 33 [T. 1 S., R. 12E.]. It was due primarily to this discovery that the writer was encouraged to continue his investigation of the area.

During the week of July 23rd the writer returned to the area to continue taking soil samples in an effort to determine the boundaries of the copper anomaly. Rock types and other geologic features were also noted. Soil samples C-37 through C-94 were taken and C-2D, which was a duplication of C-2, was taken as a check against the earlier results. The results matched. A rock chip sample "A", was taken of the basalt country rock from near the site at which the ore sample number 9 had been taken earlier. The results of the copper determination for sample "A", which gave 51 PPM copper, eliminated the possibility of a high background in copper in this rock type as being the source of the anomalous copper content is the soils in this vicinity.

Although the daytime high temperatures were not quite so severe as during the previous visit, they still were hovering well above the 100° mark and tended to hinder the survey somewhat.

The results of this second set of samples further substantiates the conclusion tentatively arrived at previously that a copper anomaly, hinting at the possibility of the existence of a large, hidden ore body, originates in the vicinity of the W 1/4 of Section 22.

Some of the later soil samples were assayed for mercury and molybdenum. Although mercury was not detected, the molybdenum values were found to be highest in the vicinity in which the anomaly originates, that is, near the upstream limit of the anomaly.

During this visit to the area the writer checked the mining records at the Pinal County Recorder's office in Florence, and it was determined, with little room for doubt, that much of the area of interest was open for location. Superior Oil Company was found to own or otherwise have possession of the ground to the south (see accompanying map for property boundaries- Fig. 1).

The writer then returned again to the area, this time during the week of August 6th, with the purpose of locating mining claims to cover the bulk of the unclaimed portion of the anomaly. The writer was accompanied by his son, Francis, and Hugh Turner, also of Truth or Consequences, New Mexico. In all, fourteen claims situated in the E 1/2 of Section 21, the W 1/2 of Section 22, and overlaping slightly into Section 27 were located and most of the monuments were erected.

All data thus far accumulated has been carefully studied. A base map made from enlarging portions of the Superior, Arizona and Picketpost Mtn., Arizona quadrangle maps to the scale of 1 inch equals 1,000 feet has been prepared. The various data have been plotted onto transparent acetate sheets. These sheets serve as overlays upon which the data can be projected upon the base map. Data contained on these overlays are as follows:

Overlay Number 1 -- Boundaries of several mining properties, tertiary roads and trails, and windmills.

Overlay Number 2 -- Geology (incomplete).

Overlay Number 3 -- Sample site locations with symbols denoting the approximate values of copper in the soil samples.

Overlay Number 4 -- Outlines of each drainage area which each soil sample represents. The outlines are color-coded to denote various copper to zinc ratios for the purpose of detecting and displaying "zoning".

Overlay Number 5 -- Positions of profiles Nos. 1 - 20. These profiles depict graphically the variations in the copper content from the various sampled areas with respect to distance from a specific point.

Due to the size of these overlays, it is not possible for the writer to include copies with this report. Instead, Figures No. 1 through 4, which contain essentially the same information, have been prepared and are attached hereto and made a part of this report.

It was necessary for the writer to again return to the area during the week of September 24th to attend to the validation work on the company-owned claims. The work was contracted out and five holes ten-feet deep and 2 1/4 inches in diameter were put down and the holes cased. Cuttings were sent off for assay. The remaining nine claims are to be validated by the drilling of one deep hole. The proposed road leading to the proposed drill site, and the drill site itself were inspected and approved by Mr. Martinez from the Globe, Arizona office of the U. S. Forest Service. The proposed drill site is located along a northerly trending fault and at a point about 100 feet west from the South End Center monument of "Benefactor No. 3" lode claim.

Several companies were invited to inspect the area during the week while the writer was present and able to show their representatives some of the principal points of interest. A helicopter from Fire-Master Helicopters of Las Cruces, New Mexico was made available to Hard Rock Mining Co., Inc. by

Mr. French. The helicopter greatly facilitated the showing of the area to the various company's geologists and also allowed the writer to observe and sample specific areas which otherwise would have been impossible to visit at this time.

Special Studies

Upon comparing the metal content of the soil samples with the lithology of the drainage area represented by each soil sample, there appears to be a relatively high metal content "indigenous" or common within the cemented Quaternary and Tertiary gravels of the area. It is quite possible that a part of the copper content here has been derived from a more distant and unknown source. It was suspected also that the Magma Smelter (inoperative for the past two or three years) contributed some metal values to the surface soils. That this is the case, and to what extent, is graphically displayed by the profiles numbered 1 through 20. These profiles also clearly display a secondary source of copper having as its origin the area in and about the NW 1/4 of Section 22. (See also Fig No. 2). That the cemented gravels are now absent from the NW 1/4 of Section 22, and also absent from the higher elevations, is significant in that this potential source of contamination (?) does not exist. Yet another source of copper does exist.

Another possible source for the geochem copper is that area first observed and reported in the initial report as the "Upper Riley Workings" and the "Louise #30 SE end center". This area is uphill to the northeast of the northerly limit of the geochem copper soil anomaly (using as a lower limit 250 PPM copper). What is disturbing (to the writer, at least) about using the "Upper Riley Workings" area as the source of the copper within the indicated limits of the anomaly is the relatively high zinc to copper ratio (being on the order of 10 to 1) at the "Upper Riley Workings", compared to the area represented by soil sample number 13 where the ratio is reversed.

It is not known at present in what form (or forms) the zinc is occurring at the "Upper Riley Workings". However, it is known that the copper is occurring principally as the sulfide (chalcopyrite). Chalcopyrite would tend to concentrate downslope as a heavy mineral constituent of the soils. Perhaps the zinc is occurring in a more soluble form and therefore does not remain behind in the soils. This could be the explanation. However, if this were the case, how does one explain the relatively higher zinc to copper ratios of soil samples numbers 35 and 36? Observed mineral occurrences in place upstream from sample number 36 show the same type of mineralization (chalcopyrite with lesser malachite) as at the "Upper Riley Workings". Or could the high zinc to copper ratios displayed at samples 35, 36 and at the "Upper Riley Workings" and the "Louise #30 SE end-center" represent zoning about a major copper source?

Overlay Number 4 (Figure No. 3) demonstrates that zoning does appear to exist outward to the north, east, and west from the northerly portion of the anomaly. Upon comparing this portion of the anomaly with the geology (Overlay No. 2--Figure No. 4) it is observed that the anomaly coincides with that area where the structures (faults, dikes and veins) tend to intersect or converge. Dips of the various structures also tend to point to this area.

Pertinent Observations

A. Structural

The area of interest, which includes the "Benefactor ANomaly" and the surrounding ground within a radius of three miles, is observed to be situated along the northerly boundary of the Texas structural zone and along the center of the Wasatch-Jerome structural zone or orogen as these zones are outlined by Eardley (1) and Schmitt (2). This writer suggests that the Concentrator Fault,

Snake Fault, West Fault, Anomaly Fault and the other sub-parallel faults striking generally in a north-south direction belong to the Wasatch-Jerome orogen, and that the Conley Spring Fault, Bluebird Fault, and Ellen Fault belong to the Texas structural lineament (zone). In addition to these two structural trends there is a third, and northeasterly, trend displayed by the felsite dike ("Grandfather Lead") and the quartz vein which intersect with the first two trends at the "Benefactor Anomaly". This third trend is observed to parallel the schistosity of the Precambrian Pinal schist which, here, corresponds to the general regional northeast planar element in the older Precambrian.

B. Petrographical

Two appreciably large igneous intrusives occur within the area of interest. One, a stock of quartz diorite, intrudes into Precambrian and Paleozoic rocks and has an outcrop area of more than 1 1/2 square miles. This stock is itself intruded by a small body of diorite porphyry having an outcrop area of about 40 acres. These intrusives lie about two to two and one-half miles east and northeast of the Benefactor Anomaly. The second large igneous intrusive is a stock of quartz monzonite porphyry with an aphanitic border facies. This second stock penetrates only (?) Precambrian rocks and has an outcrop area which, the writer believes, exceeds that of the quartz diorite stock. The quartz monzonite intrusive lies some two to three miles north of the Benefactor Anomaly.

According to Peterson (3) the quartz diorite and the diorite porphyry are Cretaceous or Tertiary in age and the quartz monzonite porphyry is late Tertiary.

Smaller intrusive bodies occur within the anomaly. One, a short dike or elongated plug of felsite, identical in appearance to the felsite mapped by Peterson (3), occurs along the anomaly fault in the SE 1/4 SE 1/4 of Section 21.

This intrusive lies about 200' northerly from the two shafts shown on the Picket Post Mtn., Arizona quadrangle map and extends northerly for approximately 150 feet to near the S. end center monument of Benefactor No. 3 lode claim. It is at this point that a 90-foot deep drill hole is to be put down.

A second dike-like intrusion of this felsite ("Grandfather Lead") exists about 2/3 mile to the northeast of the first and lies near the northeast limit of the anomaly. This dike strikes northeasterly and is displaced in steps to the south by faults.

A third dike-like intrusion of diorite porphyry striking northerly also lies near the northeasterly limit of the anomaly. Peterson dates these rock types as Cretaceous or Tertiary.

The "Benefactor" geochemical soil anomaly lies almost entirely within an area containing only Precambrian rocks (not withstanding the above mentioned intrusives) except where the anomaly trails off downslope to the south.

C. Mineralogical

Copper-zinc satellitic (?) ore bodies occur to the west, northwest and northeast within a distance of one mile from the anomaly boundary. Silver is occurring in modest amounts in these mineral occurrences and pyrite, which is somewhat scarce in most of them, is observed in abundance at the workings on the Bluebird Fault about 1/2 mile northwest of the anomaly.

Copper in the form of the carbonate, malachite, has been observed as coatings on Pinal schist occurring as float within the anomalous area. Malachite is also observed on the dump of the deeper of the two shafts located near the southerly end of the Anomaly Fault. At this point the copper is in a silicated limestone (Mescal) gouge.

About 500 feet north of the two above-mentioned shafts is an area on the Anomaly Fault and within Precambrian basalt which contains several percent specularite. An assay of a sample of this material ran 0.25% sulfur, 153 PPM copper, and-1 PPM silver. Nodules of specularite the size of a lemon and smaller have been observed as float within the anomaly. Most likely there are other, yet unknown, sources of this form of hematite.

Another occurrence of copper-poor specularite occurs in a saddle on the ridge just south of the geometric center of Section 16. This occurence is south of and on strike with the northwesterly-most mapped copper-zinc vein. Vein meterial from this source has assayed as much as 4.47% copper and 5.74% zinc. Chalcopyrite occurs here sparingly but is the principal copper mineral in the veins northeast of the anomaly. Specularite occurs with the copper and zinc at the prospect pit in the NW 1/4 Section 14. Here the gangue is both quartz and calcite. Elsewhere the gangue is principally quartz.

Chalcopyrite in float has been observed a mile to the east (SW 1/4 SW 1/4 Sec. 23) of the anomaly and in the same area (NE 1/4 Sec. 27) there is a fault-vein striking a little east of north which contains observable malachite coatings on fractures.

The Magma Mine, famous as an underground copper producer, lies 2 1/2 miles to the southeast.

In 1971 Superior Oil Company had two drill holes put down in an attempt to penetrate a geophysical target believed to be a continuation of the Magma vein west of the Concentrator Fault. The drilling is believed to have encountered the target but without success of encountering copper mineralization. The drilling succeeded in determining that the post-mineral rocks have a total thickness up to 4,060 feet at the drill hole designated Bonanza No. 2.

Magnetite occurs in abundance along the stream beds in the NW 1/4 Section 27.

D. Other

The area of the Benefactor Anomaly, when viewed at a distance from higher elevations on Peachville Mountain, takes on a reddish hue. Similar distinctive, reddish areas occur at the Bisbee, San Manuel, and Banner-Pima-Mission copper districts. Here, however, the reddish hue may be due only to syngenetic (?) iron oxides in the Precambrain Dripping Spring Quartzite which is one of the predominate rocks within the anomaly boundary.

CONCLUSIONS

The area of interest occupies a position favorable regionally, provincially, and structurally ["Triple or more complex intersections are especially potent as localizers for ore districts and smaller mineralized units."-Schmitt (2)]. The area is also favorable petrographically ["In the Ray and Miami Districts, much of the copper ore is mineralized Pinal Schist, the host rock for small intrusive masses believed to be related genetically to the copper mineralization." -Anderson (4). "At San Manuel, quartz monzonite of precambrian age has been intruded by much younger quartz monzonite prophyry; both rocks are mineralized and constitute the ore deposit."-Schwartz (5). "At Bagdad the mineralized stock of granodiorite prophyry invades a Precambrian terrane consisting of a large roof pendant of the Yavapai Series surrounded by younger granitic rocks."-Anderson, et al (6)]. Although our target area, the "Benefactor Anomaly" does not coincide with either of the two large intrusives occurring in the area of interest, this does not preclude the possibility of the existence of a major mineral deposit at the target area. It is not necessary for a copper porphyry ore body to exist within the intrusive but, wherever the ground preparation has been effected by structural openings ("plumbing") is where the ore is most likely to be localized, regardless of the type of host rock. Statistically, however, siliceous rocks are the most favorable host rocks. Siliceous rocks

exist in abundance within the target area, not only at the surface but particularly at depth. It is possible, even likely, that the two large intrusives are increasing in size with depth so that the target area is in closer proximity with these bodies at depth than with their surface out crops.

The geochemical copper soil anomaly (Fig. 2) overlies, and appears to be controlled by, the structural anomaly (Fig. 4), and zoning (Fig. 3) coincides with both anomalies. Molybdenum values in the soil, although weak at best, are strongest along the northeast axis of the anomaly. Some alteration in the form of bleaching also occurs along this axis.

Magnetite is more prevalent in the soils outside the anomaly boundary than within. Magnetite is commonly scarce above or within copper porphyry ore bodies due to hydrothermal alteration.

If a third major intrusive tops out at depth somewhere beneath the Benefactor Anomaly it necessarily must be of the passive type due to the ~~lack~~ paucity of any evidence of doming at this point.

These then are some of the positive evidence which make the Benefactor Anomaly an interesting and encouraging target area.

Although the writer may yet perform some statistical studies, such as significant difference tests and multiple correlations, using the various factors of copper values, zinc values, rock and soil types, structural features, and others, it appears that geochemistry has been applied about to the limit of its usefulness. To gain further evidence as to the existence or absence of a possible buried copper deposit it now becomes necessary to employ other exploration methods. Of the geophysical methods available, probably I.P. traverses stand first in line. Gravitymeter and magnetometer surveys could possibly also be useful. Unless a major target lies at a relatively shallow depth (<500 feet), drilling will be the last resort.

Respectfully submitted,

Donald G. Fingado

Donald G. Fingado
Staff GEologist

October 17, 1973
Truth or Consequences, New Mexico

LITERATURE CITED

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2. Titley and Hicks, 1966, Geology of the Porphyry Copper Deposits Southwestern North America (Section by Schmitt, H. A., The Porphyry Copper Deposits in their Regional Setting), The University of Arizona Press.

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4. Titley and Hicks, 1966, Geology of the Porphyry Copper Deposits Southwestern North America (section by Anderson, C. A., Areal Geology of the Southwest), The University of Arizona Press.

5. Schwartz, G. M., 1953, Geology of the San Manuel copper deposit, Arizona: U. S. Geol. Survey Prof. Paper 256, 63 p.

6. Anderson, C. A., Scholz, E. A., and Strobell, J. D., Jr., 1955, Geology and ore deposits of the Bagdad area, Yavapai County, Arizona: U. S. Geol. Survey Prof. Paper 278, 103 p.

Hard Rock Mng. Co., Inc. (Jim French, etal)

Status uncertain

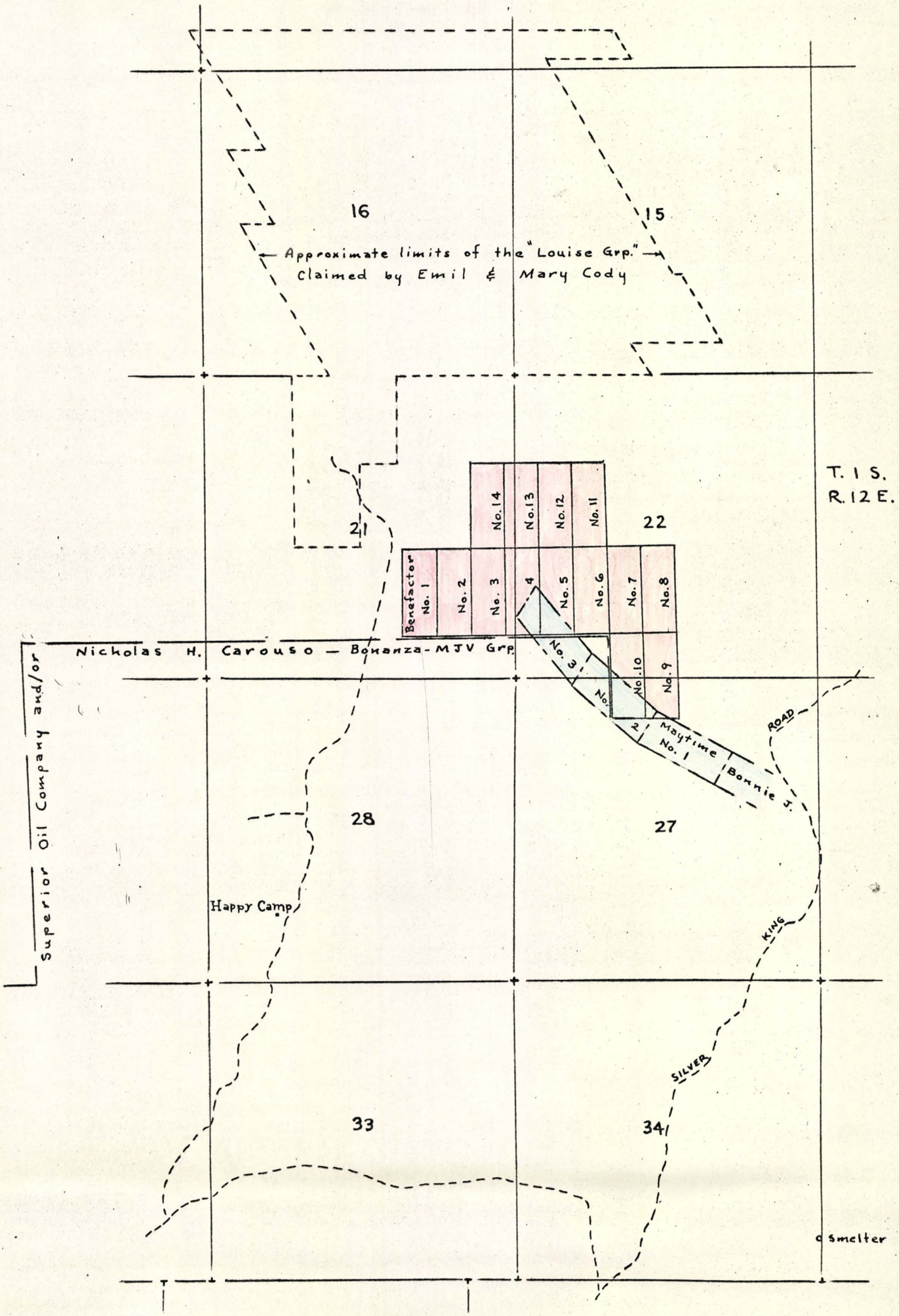
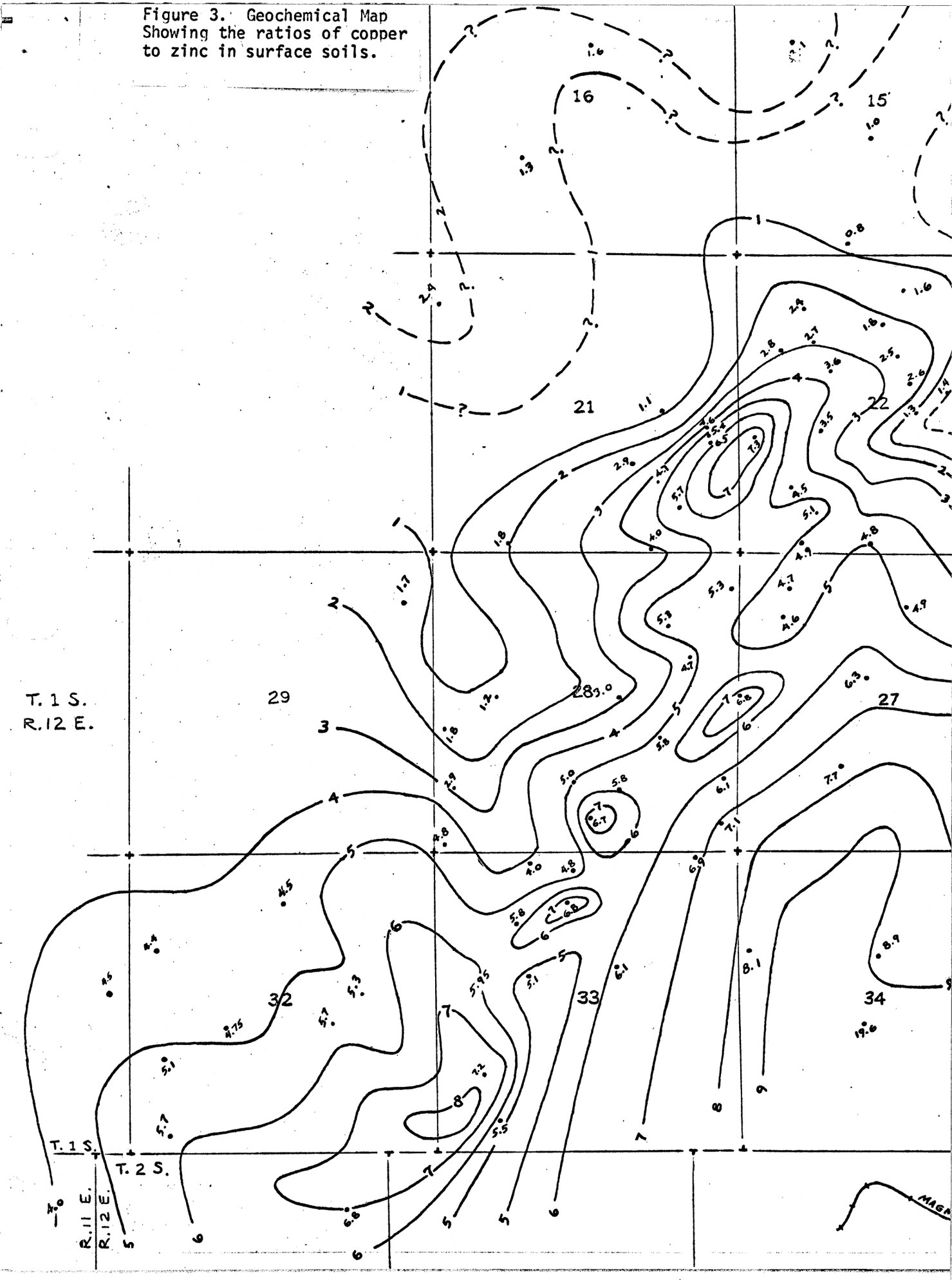


Figure 1. Claim map

Figure 3. Geochemical Map Showing the ratios of copper to zinc in surface soils.



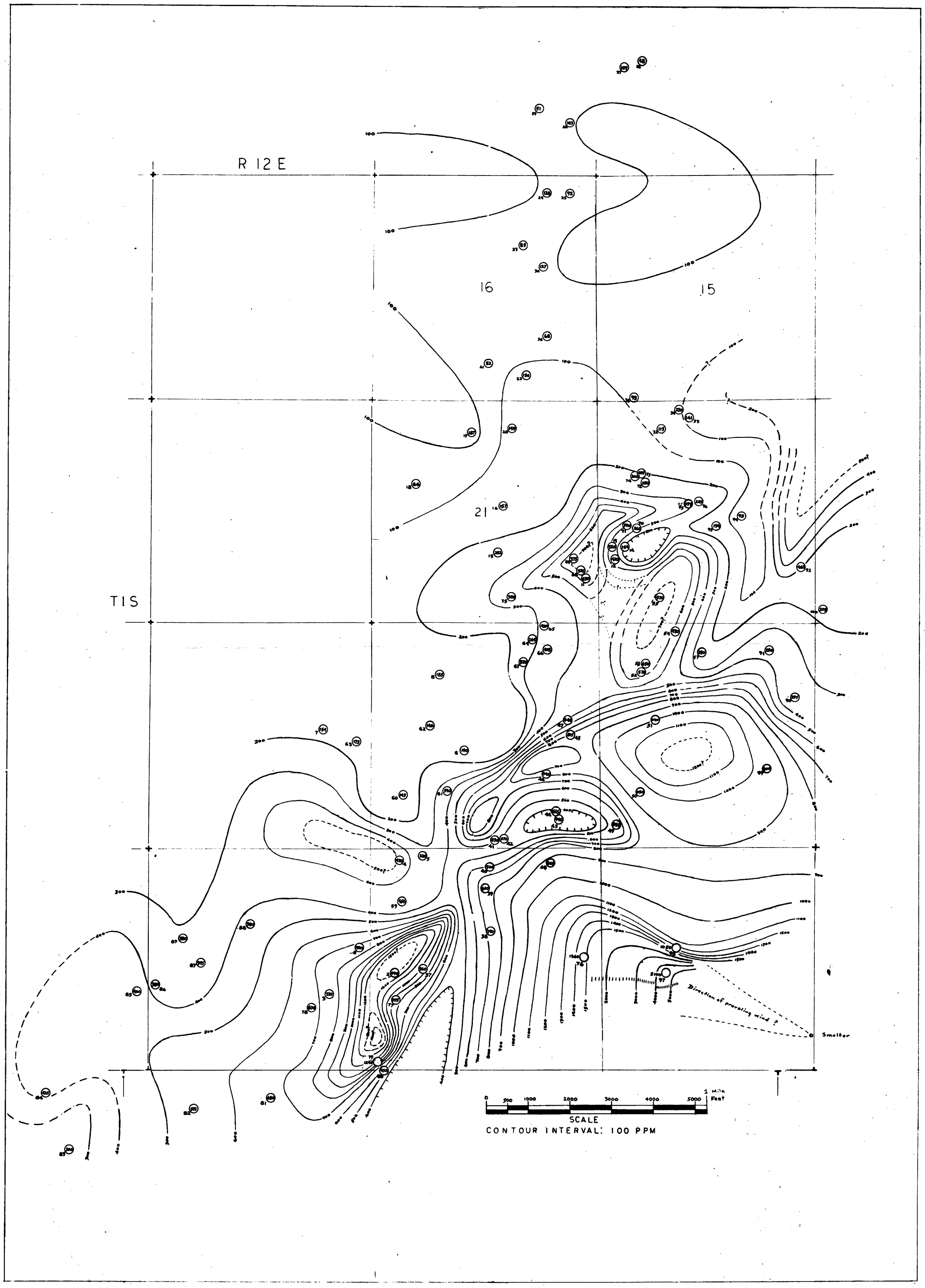


Figure 2. Geochemical Map showing copper values.

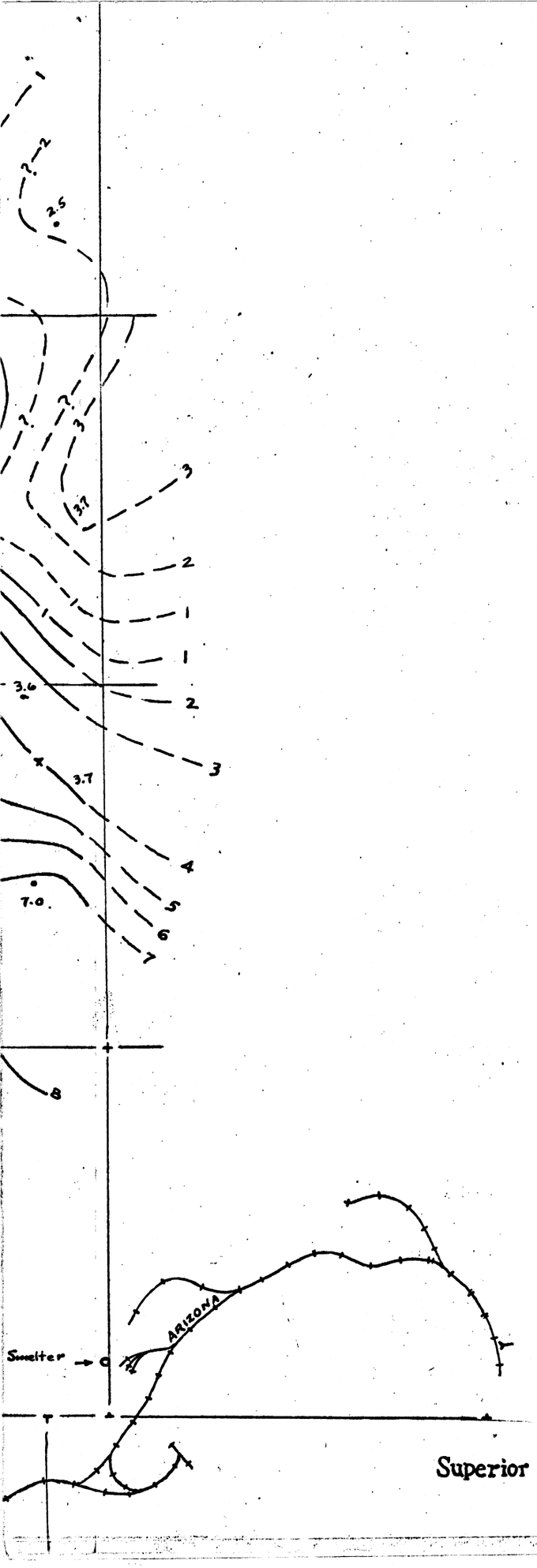
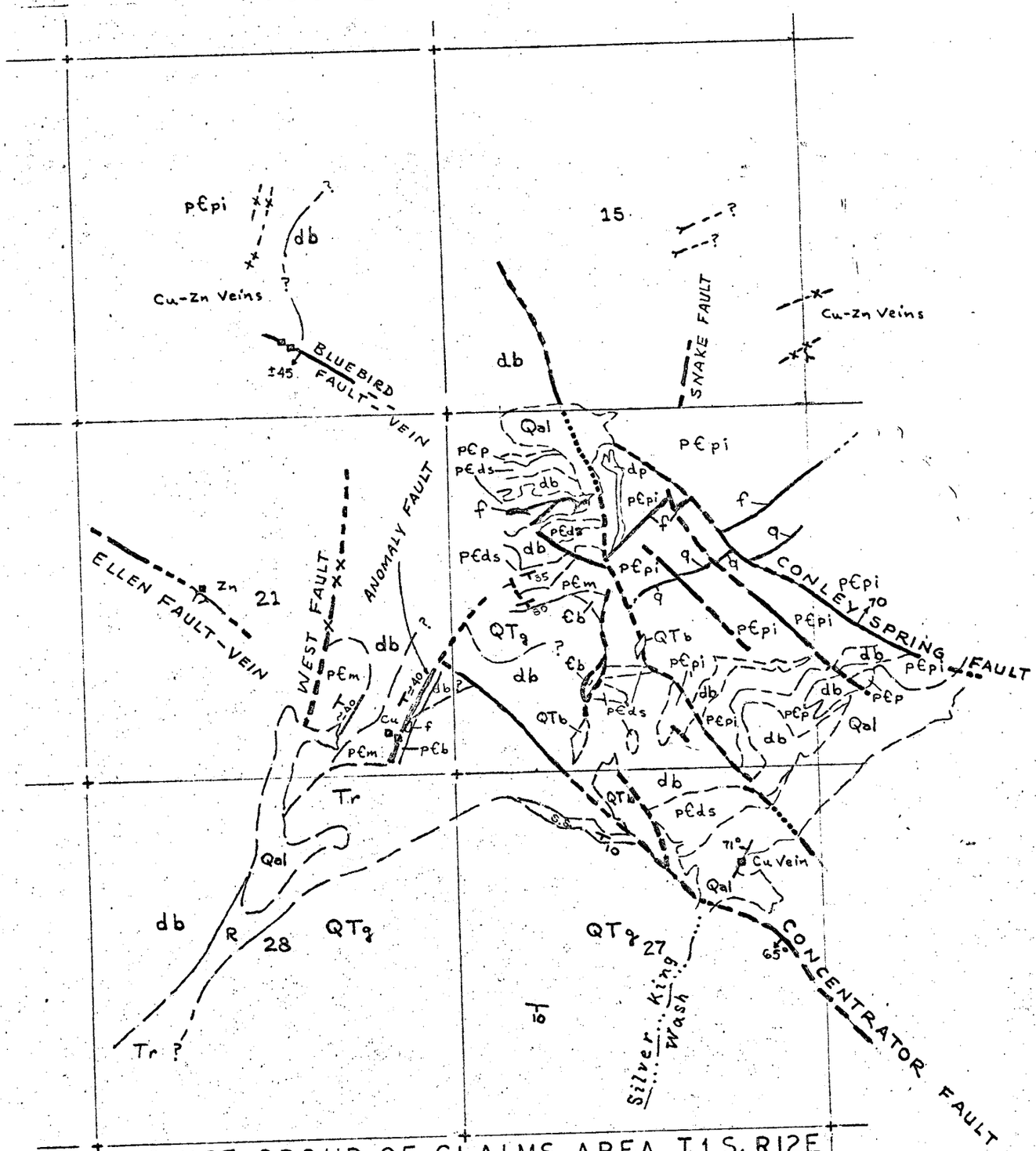

2.5
3.7
3.6
3.7
7.0
ARIZONA
Smelter
Superior

FIGURE 4. GEOLOGY MAP



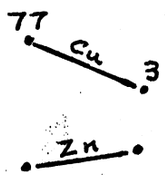
LOUISE GROUP OF CLAIMS AREA T1S, R12E

EXPLANATION

Qal - Quaternary Alluvium
QTq - Quaternary and Tertiary gravel & conglomerate
QTb - Quaternary and Tertiary Basalt
Tr - Tertiary? Rhyolite ? or Dacite
S.S. Tertiary? Sandstone
f - Felsite dike } Cretaceous or Tertiary
q - Quartz vein
dp - Diorite porphyry
db - Diabase
p€b - Basalt
p€m - Mescal Limestone
p€ds - Dripping Springs Quartzite
p€p - Pioneer Formation } Precambrian
p€pi - Pinal Schist

EPS PROTECTOR GRAYARC 882 3rd AVE., BKLYN, N. Y. 11232

EXPLANATION OF PROFILES NOS. 1-20



Graphs of Copper and Zinc values in PPM (parts per million). Numbers represent the soil sample number. Distances from the Magma Copper Company smelter stack are measured to the center of the drainage areas represented by their respective soil samples.

S 87° W
84

The bearing figures appearing above a particular sample number is the direction of that point measured from the smelter stack. Although bearings vary from point to point along each profile, the final bearing given (at greatest distance from smelter stack) can be taken as the approximate bearing for the entire profile.

pЄds | db

Rock types encountered along profile line. Vertical lines represents approximate location of contacts with respect to distance from the smelter stack.

REMARKS

Profile No. 1 -High metal values at sample 92 may represent metal derived from a continuation of the copper vein plotted on the geology map at a point about 600 feet SW of the windmill in the NE 1/4 Section 27.

The decline in metal content from sample 90 to sample 100 may represent drop in smelter-fed contamination with increasing distance from smelter. However, this decline could be due, either wholly or in part, to the change in rock types.

Profile No. 2 -Both the copper and zinc curves shown here are believed to represent primarily the "normal" decline in smelter-fed contamination with respect to distance from the smelter in this general direction (north-north-westerly).

Explanation of Profiles Nos. 1-20

Remarks Cont'd.

Profile No. 3 -The peak at sample 96 is believed to represent the northeasterly-most, and beginning, expression of the "Benefactor Anomaly" super-imposed on an other-wise "normal" curve representing the decline in smelter-fed contamination with respect to distance from the smelter.

Profile No. 5 -The deviation from the smelter-fed contamination curve between points 57 and 31 represents the "Benefactor Anomaly".

Profile No. 7 -The peak at points 13 and 17 is near the "apex"of the anomaly.

Profile No. 8 -This profile is a cross-section through the center of the anomaly and depicts the NW-SE dimension of the anomaly. The anomaly here is about 6000 feet wide which is about "normal" for a copper porphyry ore body.

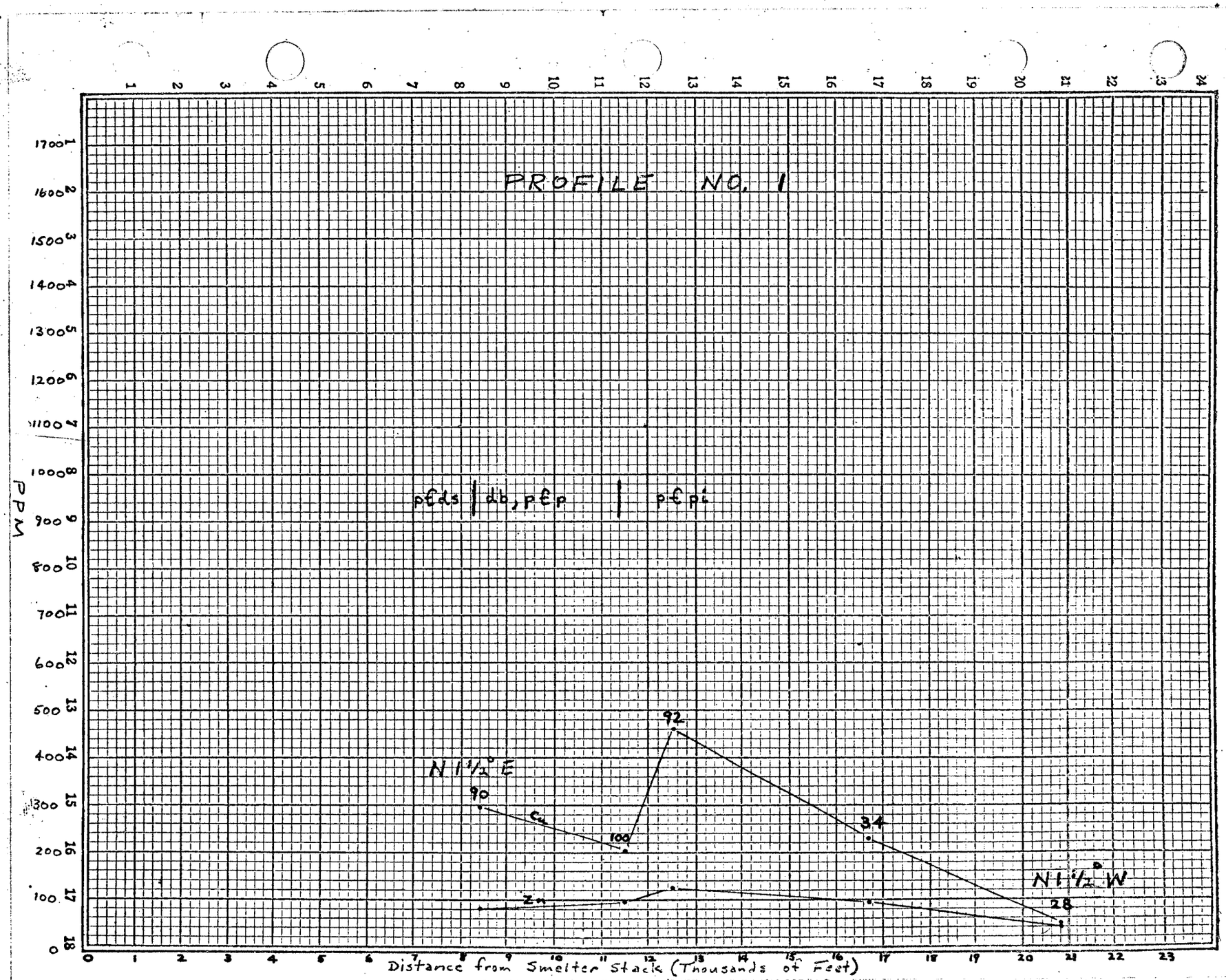
Profile No. 9 -The copper values attributable to the Benefactor Anomaly are shown here to be diminishing rapidly. This may be due to the post-mineral rock cover consisting of rhyolite (or dacite?) at point 66.

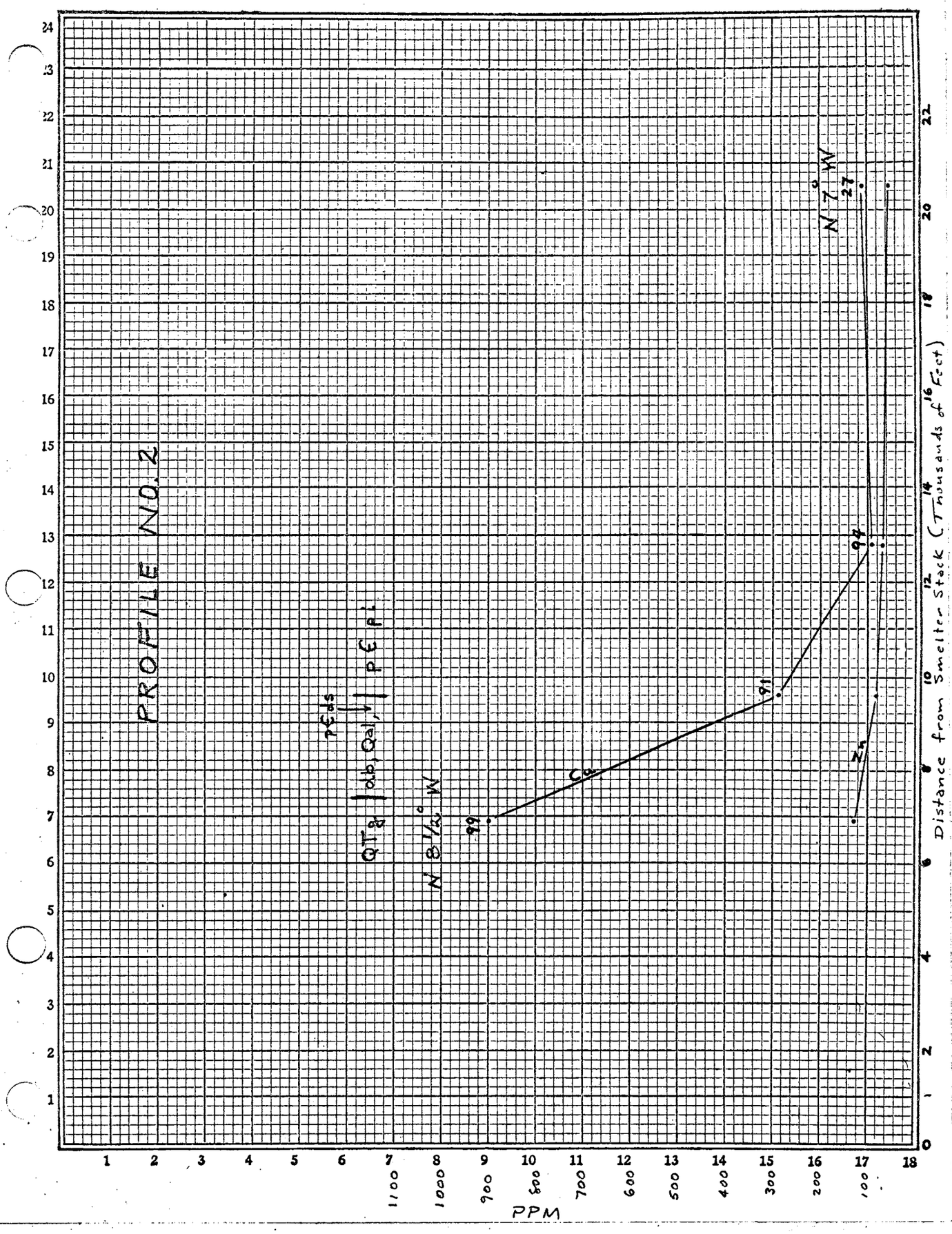
Profile No. 11 -The peak at point 46 represents the trail downhill from the anomaly rather than being a part of the anomaly proper.

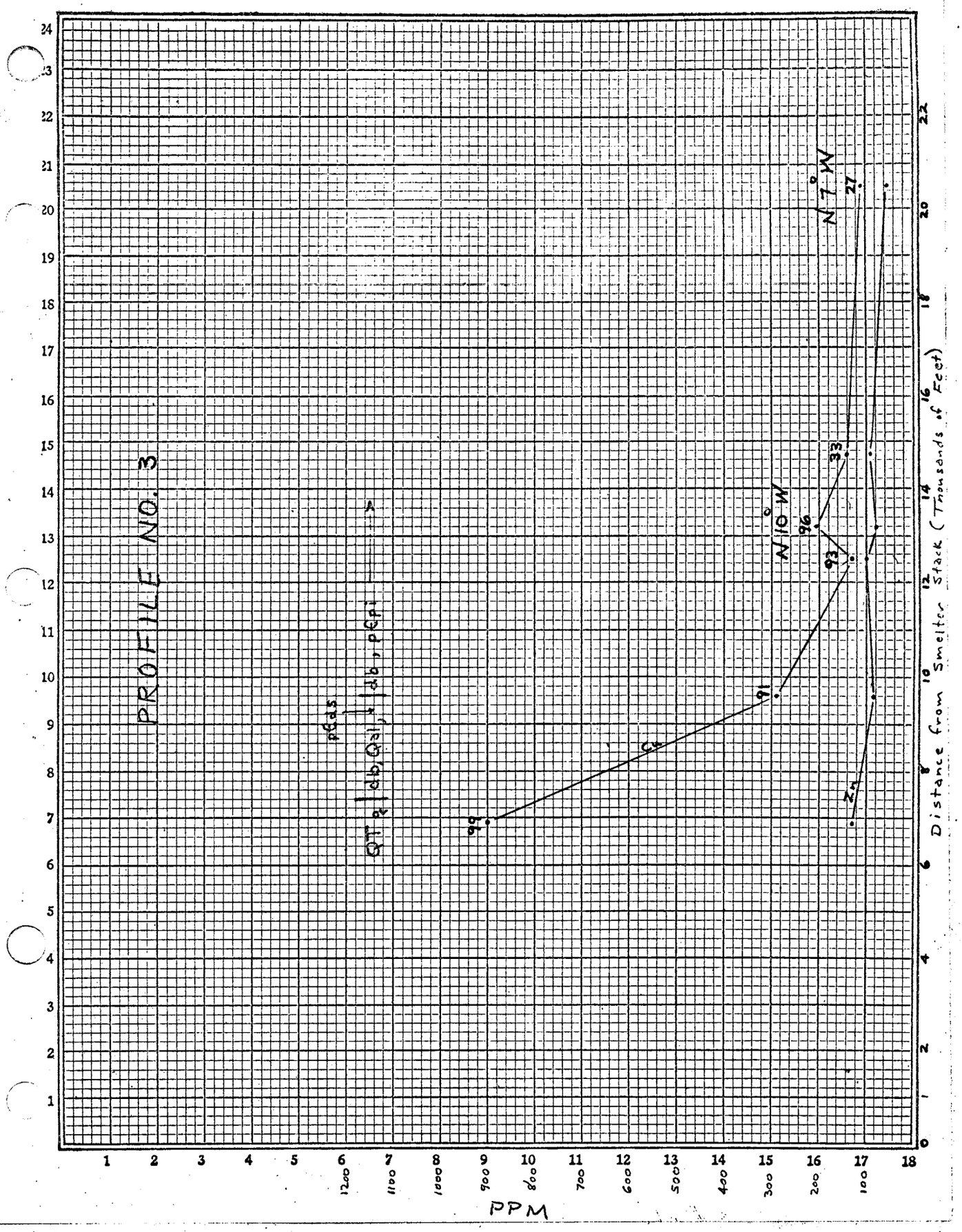
Profile No. 17 - Like in Profile No. 11 the peak here, point 2, represents the trail downhill (downstream) from the "Benefactor Anomaly" or from some other more distant source of copper, other than that of the Magma Smelter.

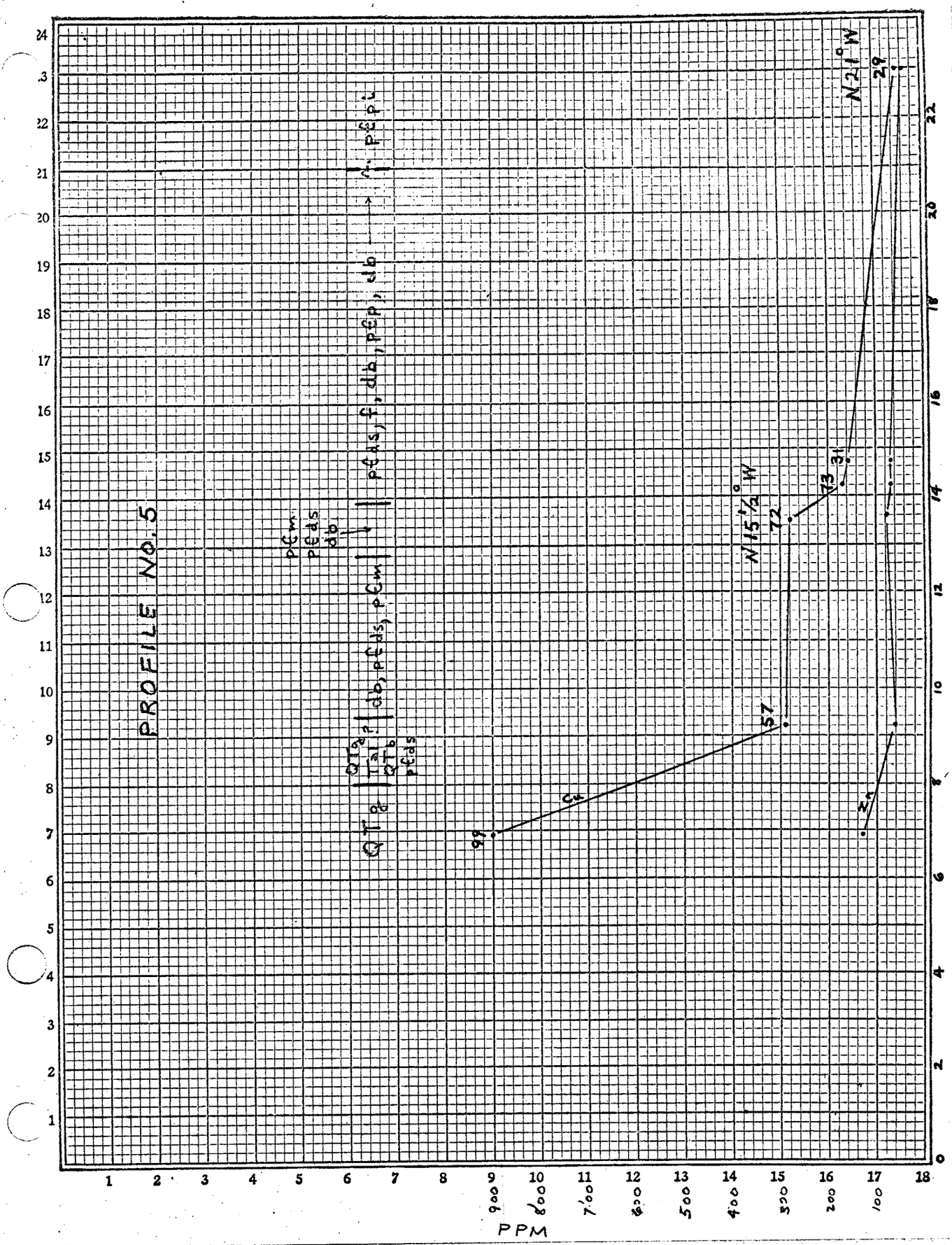
Profile No. 20 -The southerly-most profile. This profile extends almost due west from the smelter stack.

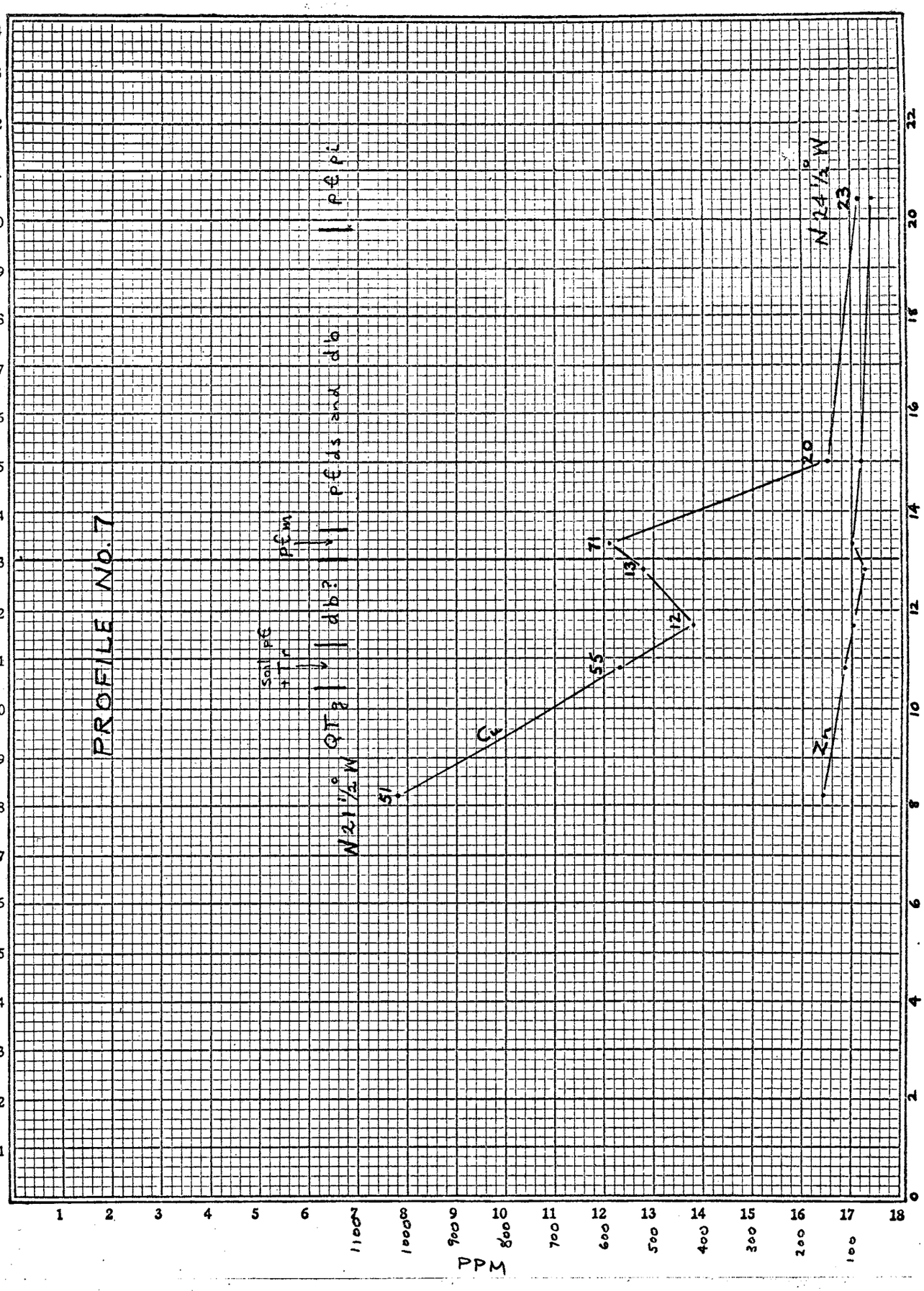
Note: -The profiles included here were selected for their ability to most graphically depict the information required. To have included all 20 profiles would not have contributed appreciably more.

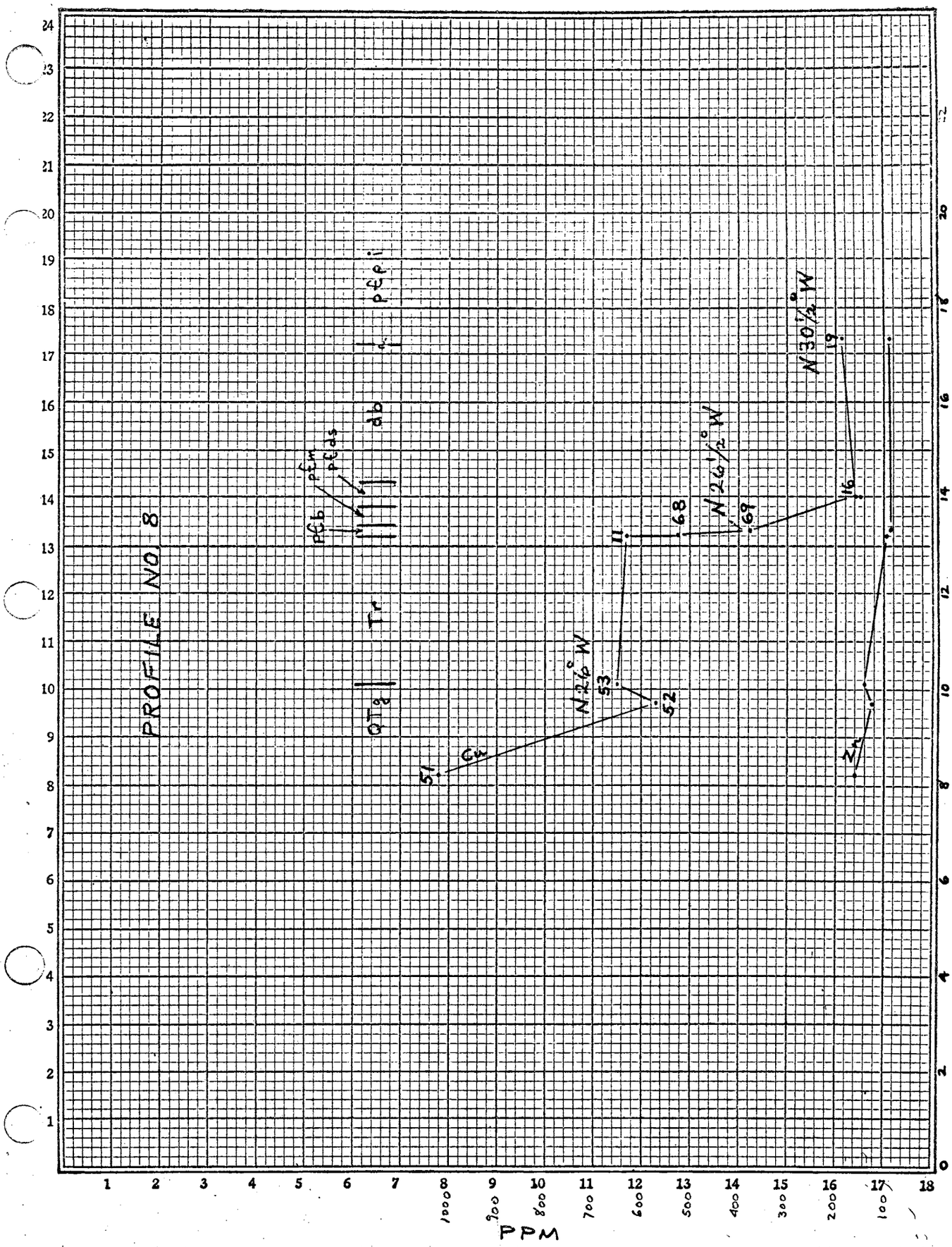

PROFILE NO. 1
pЄds | db, pЄp | pЄpi
N 1½° E
N 1½° W
Cu
Zn
90
100
92
34
28
PPM
Distance from Smelter Stack (Thousands of Feet)

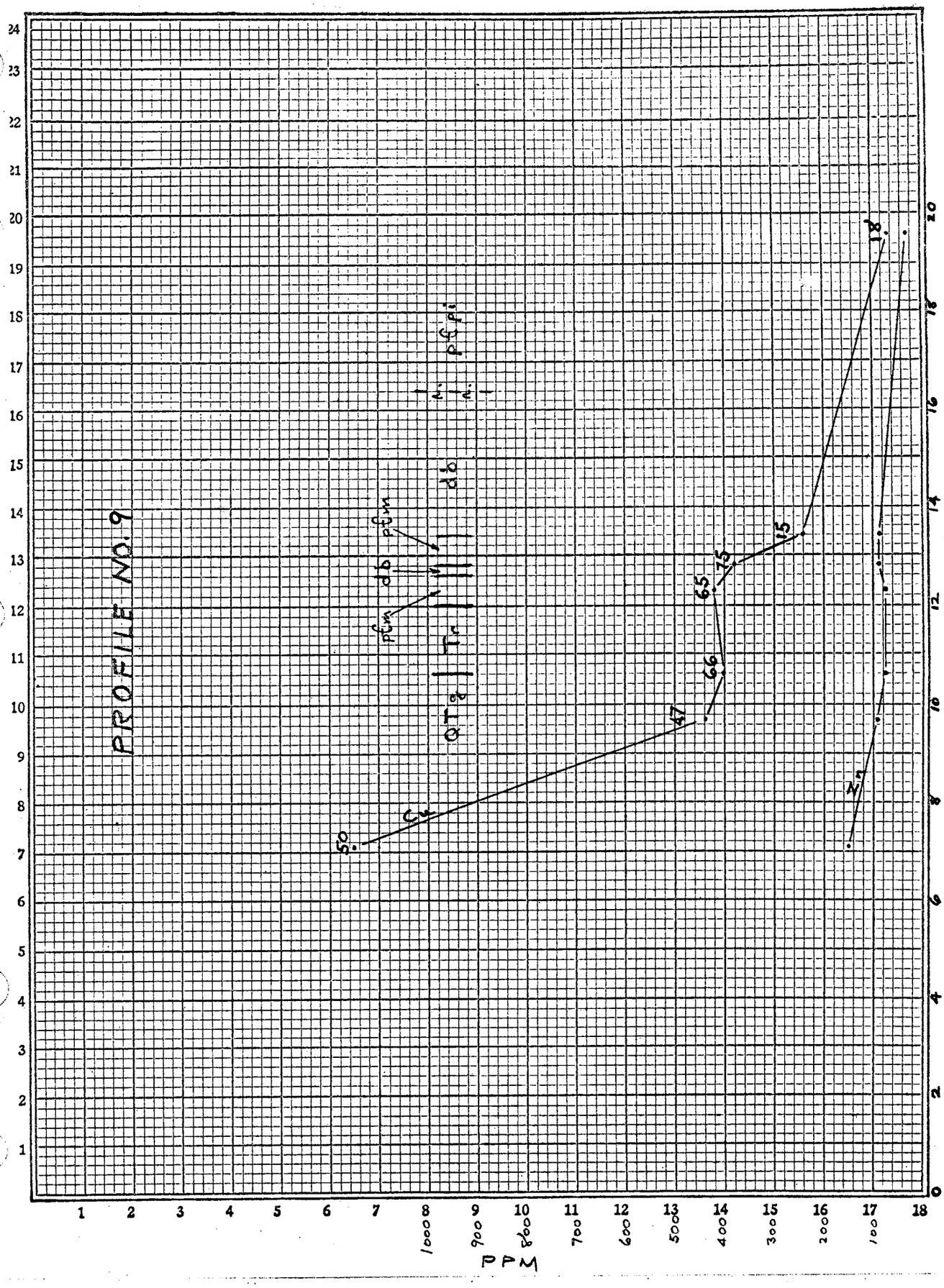

PROFILE NO. 2
QTg | ab, Qal, | pЄ pi
pЄds
N 8 1/2° W
N 7° W
99
91
94
27
Ca
Zn
Distance from Smelter Stack (Thousands of Feet)
PPM
1100
1000
900
800
700
600
500
400
300
200
100

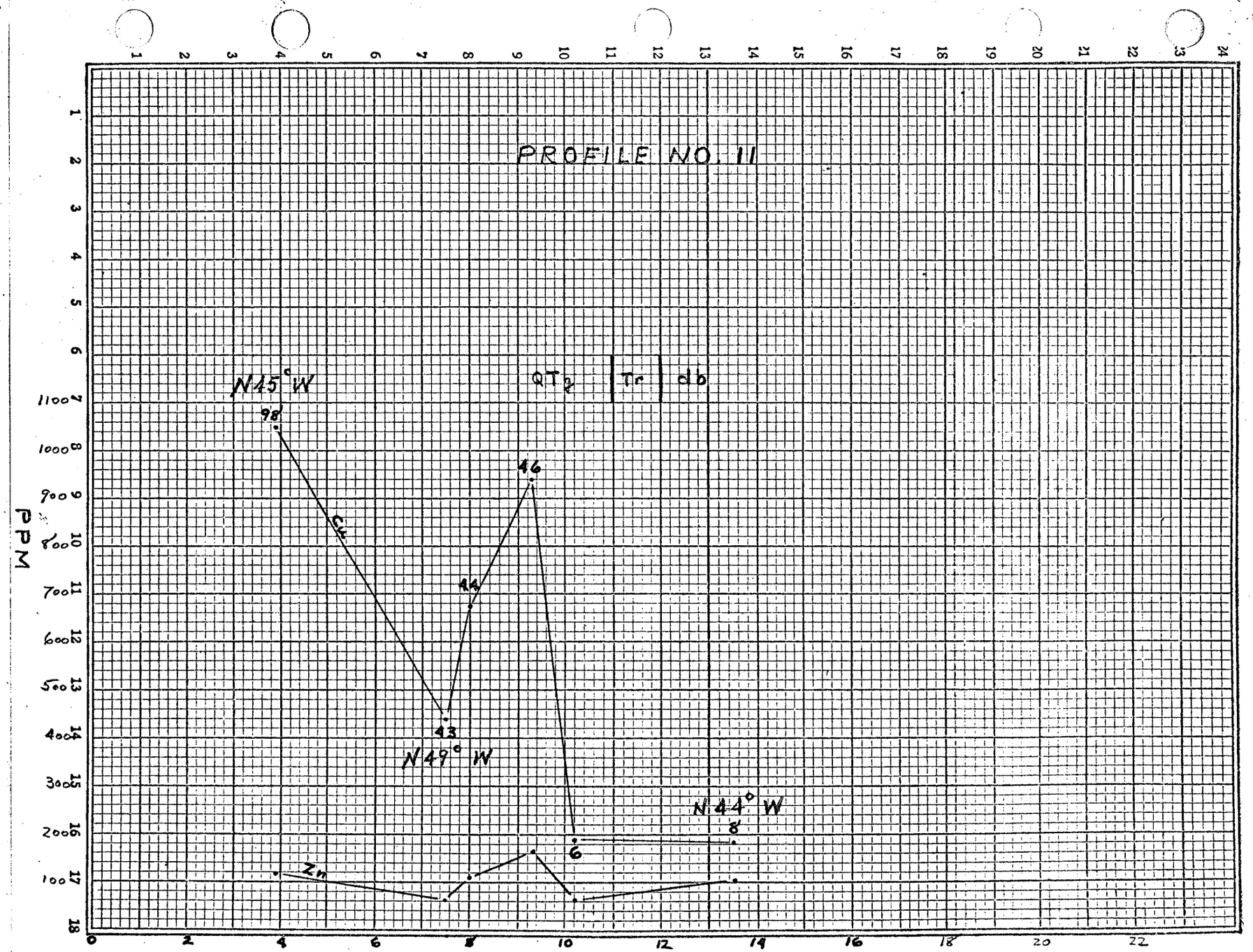

PROFILE NO. 3
QT
db, Qal
pЄds
db, pЄpi
99
Cu
91
Zn
93
96
33
27
N 10° W
N 7° W
PPM
1200
1100
1000
900
800
700
600
500
400
300
200
100
Distance from Smelter Stack (Thousands of Feet)

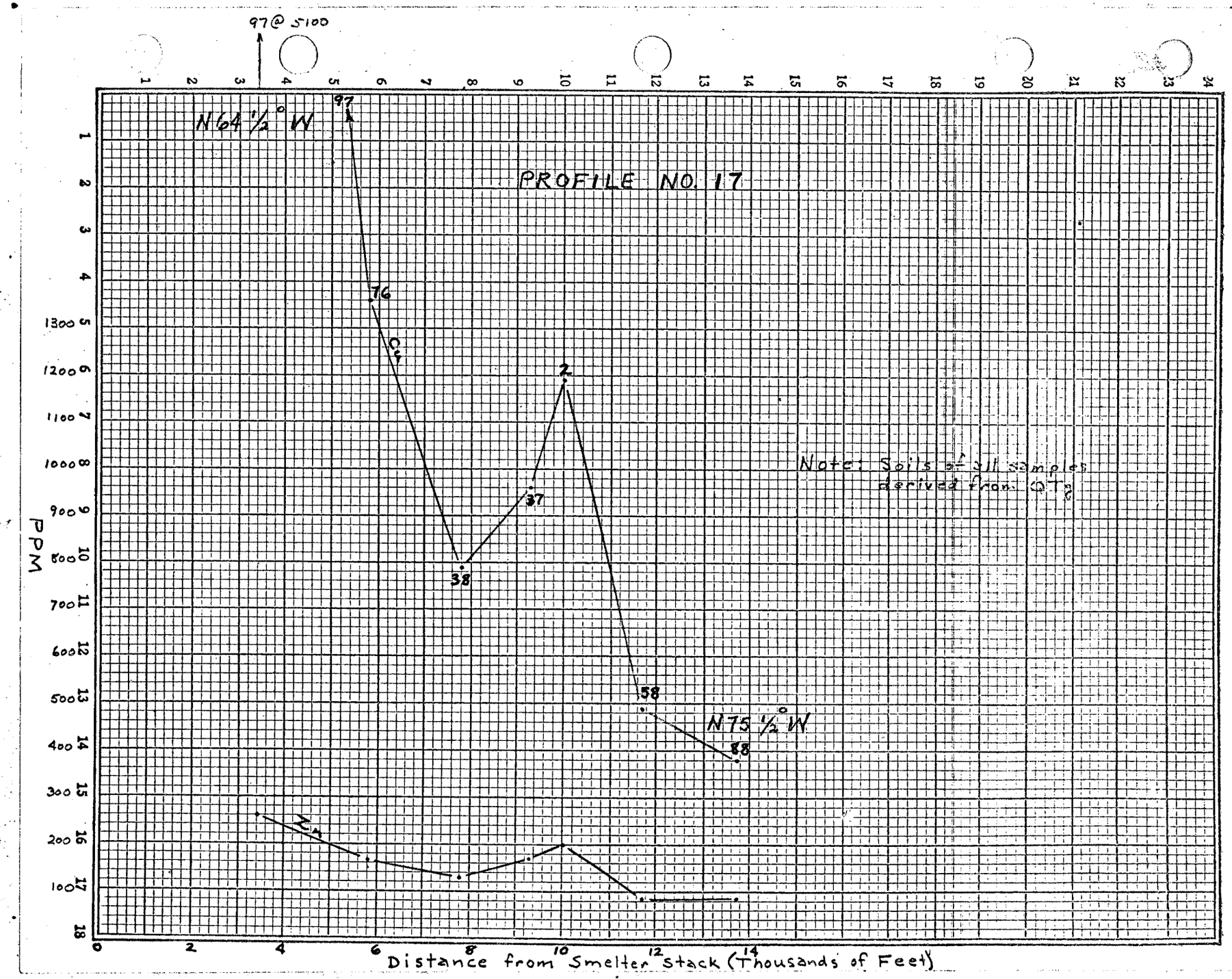

PROFILE NO. 5
QTg
QTg / Tal / QTb
pЄds
db, pЄds, pЄm
pЄm
pЄds
db
pЄds, f, db, pЄp, db
pЄpi
N 15½° W
N 21° W
99
57
72
73
31
29
Cu
Zn
PPM
900
800
700
600
500
400
300
200
100

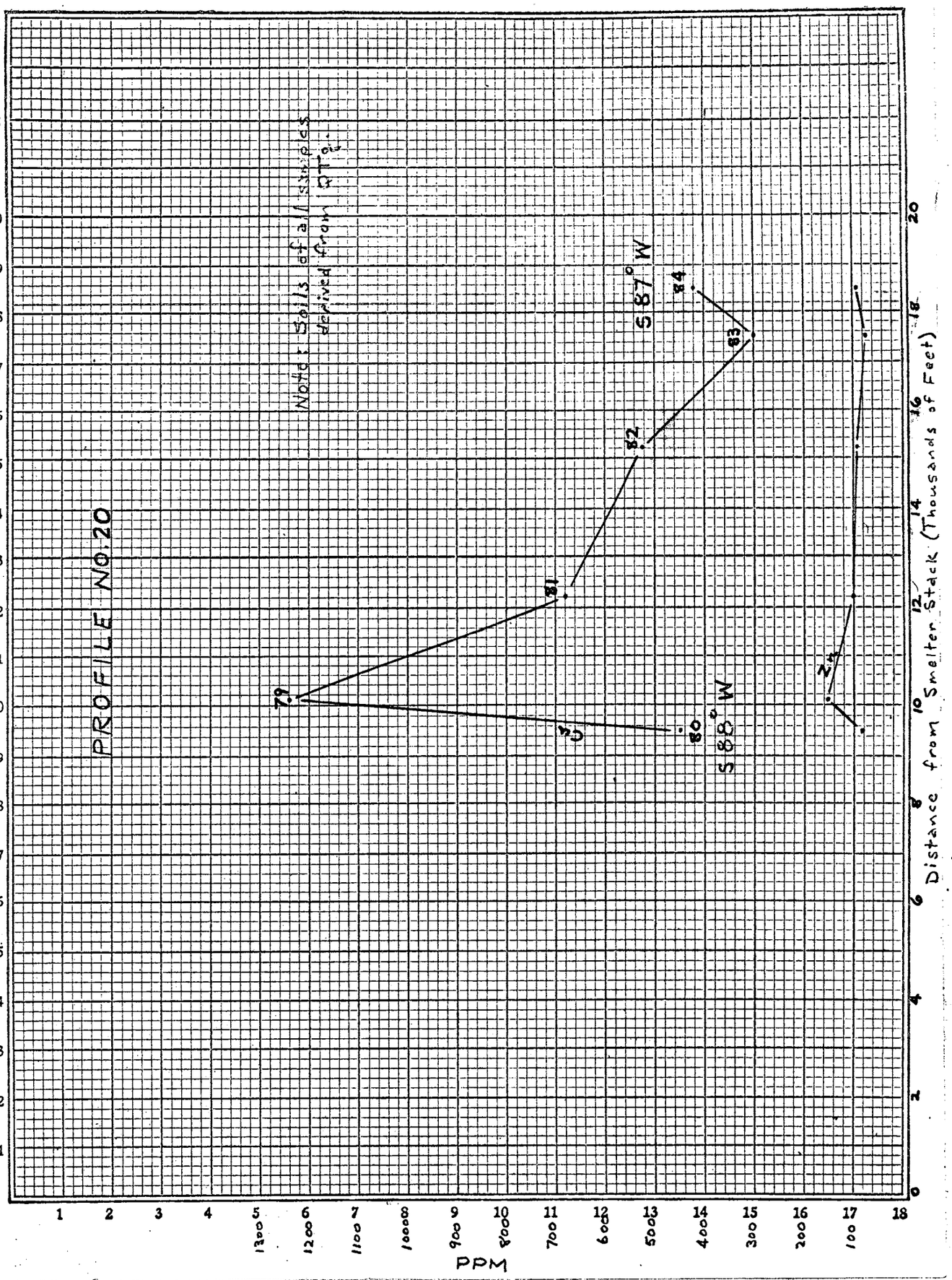

PROFILE NO. 7
N 21 1/2° W
QTg
Soil pЄ + Tr
db?
pЄm
pЄ ds and db
pЄ pi
Cu
Zn
N 24 1/2° W
51
55
12
13
71
20
23
PPM
1100
1000
900
800
700
600
500
400
300
200
100


PROFILE NO. 8
QTg
Tr
pЄb
pЄm
pЄds
db
pЄpi
N26° W
N26½° W
N30½° W
Cu
Zn
51
52
53
11
68
69
16
19
PPM
1000
900
800
700
600
500
400
300
200
100


PROFILE NO. 9
PPM
1000
900
800
700
600
500
400
300
200
100
50
47
66
65
75
15
18
Cu
Zn
pfm
db
pfm
db
pfpi
QTg
Tr


PROFILE NO. 11
N45°W
QTz
Tr
db
98
46
44
43
N49° W
N44° W
8
6
Cu
Zn
PPM
1100
1000
900
800
700
600
500
400
300
200
100
0
2
4
6
8
10
12
14
16
18
20
22


97@ 5100
N64 1/2° W
PROFILE NO. 17
97
76
Cu
38
37
2
58
N75 1/2° W
88
Zn
Note: Soils of all samples derived from Pb
PPM
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
Distance from Smelter stack (Thousands of Feet)


PROFILE NO. 20
Note: Soils of all samples derived from QTz.
S 87° W
S 88° W
79
80
81
82
83
84
Distance from Smelter Stack (Thousands of Feet)
PPM
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100