OFFICIAL FILE COPY
O. M. E.
RECEIVED SEP 26 1960

DATE	INITIALS	CODE
9-26	cae	220
"	EEJ	800
		500

FINAL REPORT

to the

OFFICE OF MINERALS EXPLORATIONS

(formerly Defense Minerals Exploration Administration)

Contract No. Idm-E 1224 (Nickel)

Docket No. DMEA-4947

Contract Date: 30 June 1958 Termination Date: 1 June 1960

by

ROLAND F. BEERS, INC. (Operator)
P. O. Box 1019
Troy, New York

Date of Report: 31 July 1960

TABLE OF CONTENTS

		Page
Text		
	Abstract	1
1.0	Location and Extent	3
2.0	Access and Transportation	4
3.0	History of the Crawford Pond Prospect	5
4.0	Physiographic Features	5
5.0	Geology	6
5.1	Petrology of the Intrusive	6
5.2	Structural Geology	9
5.3	Mineralogy of the Sulfides	10
6.0	Geophysics	11
7.0	Contracts with Defense Minerals Exploration Administration	11
8.0	The Core Drilling Program	12
9.0	Metallurgy	14
10.0	Results of the Exploration Program	16
10.1	Reconnaissance View of the Results	18
11.0	Summary and Conclusions	19

Works to which Reference is Made

Exhibit A -
Summary of Costs

Exhibit B -
Summary of Leases and State Claims

Exhibit C -
Geophysical Prospecting Methods Used on the Knox County Ore Deposits

Exhibit D -
Current Valuation of the Crawford Pond Ore Deposit

with

Schedule A - Table of Assay Evaluation
Schedule B - Summary Assay Evaluation Including Barren Rock
Schedule C - Summary Assay Evaluation Not Including Barren Rock
Schedule D - Cross Sections
Lines 4N, 2N
Line 0
Lines 2S, 4S, 6S, 9S, 12S, 14.3S, 15.8S, 17S

(Continued)

TABLE OF CONTENTS
(Continued)

Maps -

Property Map

Exploration Map, showing trends

Perpall
Geology, Magnetometer, SP, Horizontal-Loop, Vertical-Loop, PDR

Crawford Pond (Harriman 22N through 42S)
Geology, Magnetometer, SP, Horizontal-Loop, Vertical-Loop, PDR, Drill Hole Location Map (including Crawford Pond)

Knox Timber (P-3)
Magnetic Intensity 1" = 100'
Magnetic Survey, 1" = 50
Magnetic Profile 1" = 100'
Horizontal E-W 1" = 100'

Hupper-Soboleski
Geology, Magnetometer, SP, Horizontal-Loop

Simmons
Geology, Magnetometer, SP, Horizontal-Loop

Lamb (Lamb-Creamer)
Geology (Lamb-Creamer)
Magnetometer (Lamb-Creamer)
Horizontal-Loop (Lamb Prospect)

Hill
Geology, Magnetometer, SP, Horizontal-Loop

Burns
Geology, Magnetometer, SP, Horizontal-Loop, Vertical-Loop, Drill Hole Location

Walters
Geology, Magnetometer, SP, Horizontal-Loop

ABSTRACT

This report summarizes the procedures and results of a program of exploration for nickel in Maine, which was supported by The Office of Minerals Exploration, formerly the Defense Minerals Exploration Administration. Beginning on June 30, 1958 and terminating June 1, 1960, this program has established the presence of economic deposits of iron sulfide (pyrrhotite) associated with an ultrabasic intrusive which contain significant concentrations of nickel, copper and cobalt. The igneous intrusive is a sill-like body, presumably of Devonian age, injected into metasedimentary rocks of Cambrian age, with which it is structurally concordant. The intrusive varies in thickness from 50 to 380 feet.

At the outcrop, the body contains up to 35% total sulfides, with average content of nickel about one percent; copper, one-half percent; cobalt about one-tenth percent. The intrusive body is about 300 feet wide near the exposure, where it lies in a horizontal sheet about 50 feet thick. North and south of the outcrop the body twists and plunges underground, dipping down to the east from 0 to 90 degrees. The body pinches and swells along the direction of its trend, and the sulfide content varies from traces to massive sulfides at several intersections. The continuous length of the sulfide deposit as shown by core drilling and related geophysical measurements is 4.5 miles, with geophysical indications of further extensions to a total length of 8.6 miles. Continuity throughout the further

extensions has not yet been established by drilling. The limits of the body have not yet been determined either in its length or in its extension to depth below 350 feet.

Within the limits of drilling and the geophysical surveys which tie the drilling data together, it is possible to estimate 5.7 million tons of ore. Proof of the total tonnage and average grade must await further drilling. Moreover, the tonnage to be mined would be determined as the optimum figure resulting from detailed studies of ore grade distribution. Taking the entire mass between the limits of drilling, there results a figure of 5.7 million tons, with a gross value of $57 million. The estimates of ore reserves and their values are contained in Exhibit D. The computations in Schedule B include barren rock, whereas the computations in Schedule C do not include barren rock. The actual amount to be mined would vary from this figure either plus or minus, depending upon the outcome of further studies.

Recent developments in extractive metallurgy on samples of this ore by the U. S. Bureau of Mines Experiment Station at College Park, Maryland, have shown that a concentrate containing about five percent nickel at satisfactory recovery can be produced by simple flotation operations. Concentrates of this type, containing corresponding amounts of copper and cobalt, are in market demand at the present time. The possibility of recovering the iron and sulfur content is under investigation.

1.0 Location and Extent

The Knox County pyrrhotite deposits, containing significant concentrations of nickel, copper and cobalt, are presently known to occur within an area of about 40 square miles. This area lies in the towns of Hope, Union and Warren, ranging from north to south along an axis south 20 degrees west for a distance of about nine miles. The deposits have been mapped at their outcrops, at depth by core drilling, and by geophysical surveys over the limits stated. The full extent of the deposits has not been determined, either in length or in their extension to depths below 350 feet. Other deposits of similar nature, possibly related to these, are known to exist eight miles west of the Knox County trend.

The area of immediate economic interest lies wholly within Knox County, Maine. It is represented on U. S. G. S. quadrangles Belfast, Waldoboro and Rockland. The area contains a number of Great Ponds, where the minerals are owned by the State of Maine. On those ponds which lie over the sulfide deposits now mapped, claims have been staked, and mining leases have been executed with the State. Land areas, on which sulfides are believed to occur, have been purchased in fee, leased or are held under purchase and/or lease options. In all, 5426 acres of mineral rights are under the control of the manager of the American Syndicate, which owns the properties described. There are no mineral rights or mining activities

which compete with these developments of the Syndicate in Knox County.

2.0 Access and Transportation

The area extends north and south across state highway 17, about nine miles northwest along the route from Rockland, a seaport on the coast of Maine. Access to the area is from Route 17 along a number of secondary roads. Other state roads lead to the area from Camden, 10 miles, and Rockport, 9 miles, to the east, which lie on U. S. Highway 1, about six miles north of Rockland. Rockland is served by the Maine Central Railroad. It is an active industrial center for the region, supporting manufacturing, fishing and canning industries, and lime quarries. There is a Portland cement plant at Thomaston, three miles south. The Rockland business community is actively sponsoring new industry in the region through the State of Maine Industrial Building Authority. The Knox County Development Corporation is the local non-profit organization which qualifies as sponsor under the Maine Industrial Building Authority.

Harbor facilities at Rockland are good. Commercial wharfs are now in use for coastal steamships. Deep harbor facilities are a future possibility when the shipping industry can justify their development. The local development group is actively at work on this project. A mining operation in the area would encourage these plans.

3.0 History of the Crawford Pond Prospect

The first published reference on these deposits appears to be that of E. S. Bastin (1908) (see table of published references at end of this report). R. S. Houston (1954) also described the occurrence in his doctoral thesis, and again in Bulletin of the Maine Geological Survey (1956). Lindgren (1933) refers to Bastin's work and uses the occurrence of nickeliferous pyrrhotite-in-peridotite as an example of the liquid-magmatic origin of sulfide ores. He compares the Knox County deposits with occurrences of nickeliferous pyrrhotite elsewhere.

The prospect was first activated by this company when Lorenzo Blondeau, a Canadian prospector, brought in samples of outcropping rocks and stated that a lease could be obtained on the Harriman farm. The hand samples showed a positive reaction for nickel to dimethylglyoxime. Assays of grab samples showed nickel content up to about 0.9%, cobalt 0.1% and copper 0.5%. Sulfide content of outcrops ranged from 5% to 35%, with 20% as average.

4.0 Physiographic Features

The central part of the area lies along a small ridge trending N20°E. The western border of the ridge is held up in places by the underlying metamorphosed limestone and quartzite, dropping off abruptly to a small brook which flows southwest into Crawford Pond. To the east of the ridge, there are numerous small depressions (± 20 feet), and just south

of Miller Road, east of the ridge, lies a small pond which drains southwest through a branch into the brook mentioned above. Maximum topographic relief on the prospect is about 150 feet, with Crawford Pond at an elevation of 110 feet above sea level.

The "grain" of the country is evident from aerial photographs. Fracture pattern analysis has shown the consequence of subsurface structure and stratigraphy on the topography. The prospect area shows abundant evidence of glaciation and the work of ice and running water are recorded in the distribution and attitudes of glacial debris. In some places, peridotite boulder deposits have been observed to depths of 25 feet or so. The movement of these boulders along definite trains from their original locations has been a valuable guide in the exploration for mineral deposits. Ground water is abundant and closely related to the drainage pattern into Crawford Pond.

5.0 Geology

The nickeliferous pyrrhotite of this prospect occurs in an altered peridotite-pyroxenite sheet which has been intruded into biotite schists of the Penobscot formation of Cambrian age. The attitude of the layering of the peridotite and of the schistosity of the biotite schist wall rocks averages N18°E and vertical to steeply eastward in dip.

5.1 Petrology of the Intrusive

The predominant country rock in the immediate area of the Crawford

Pond peridotite is the Penobscot formation, a heterogeneous biotite schist which forms the east and west walls of the peridotite. Included in what is mapped as biotite schists are dense, black, fine-grained biotite schists, locally containing chalcopyrite and pyrrhotite-quartzo-feldspathic biotite schists which locally could be called lit-par-lit gneisses; medium-grained biotite granite and biotite granite pegmatite, rich in graphic microcline and locally carrying tourmaline. Cores have shown disseminated as well as massive occurrences of graphite and some garnet within the schists.

Locally, the granite pegmatite crosscuts and nearly obliterates zones of biotite schist. Small, irregular pegmatitic patches rimmed with thin biotite-amphibole reaction rims are very common in the peridotite. In some places, chalcopyrite has been concentrated to the extent of 5% to 10% in the pegmatite; at one place arsenides of cobalt and nickel have brought the nickel and cobalt content of a pegmatite up to about 9%.

East of the peridotite zone, apparently interbedded with the biotite schist, are two beds of white dolomitic marble of Cambro-Ordovician age, which Bastin (1908) calls the Rockland limestone. They are talcose and tremolitic locally and at the edges grade through an amphibole-rich calc-silicate rock into the biotite schists and gneisses. The marble is exposed in several prospect pits but generally does not outcrop.

The basic igneous rock which is host for the nickel ore is largely a peridotite or, more properly, a biotite lherzolite. Other basic rocks are present, however, and include biotite gabbro, biotite hornblende diorite, and diabase. Intermediate types such as plagioclase peridotites are also common and in some cases they are sulfide-rich. The peridotite was first described by E. S. Bastin as an olivine-biotite-plagioclase-hornblende rock which he called Lermondose. On the basis of a great many thin sections taken from cores, the unaltered peridotite appears to be a biotite-olivine-ortho- and clinopyroxene rock which could be called a biotite lherzolite. The terminology is not particularly critical due to the great amount of variation within the mass.

The peridotite has been intruded by pegmatites and shows uniform symmetrical zones of alteration around the pegmatite dikes. The alteration zones from the pegmatite outward are (1) biotite uralite, (2) steatite, (3) partially uralitized peridotite, (4) fresh peridotite (rare). The metamorphic minerals in the alteration zones are: amphiboles (cummingtonite, anthophyllite, actinolite), mica-structure minerals (biotite, clinochlore, penninite, talc), and secondary magnetite.

All of the secondary minerals but talc drive out the sulfides by displacing them by expansion during recrystallization. Chlorite is so effective at displacing sulfide that every chlorite patch has been poor in sulfide and every chlorite-rich rock has been low in sulfide. How

much sulfide is driven out of the system is dependent upon the original silicate-sulfide ratio and upon the species of metamorphic silicate formed. As a general rule the amount of alteration of the original igneous silicates determines the grade of the ore. Another variable affecting grade is the initial sulfide content of the peridotite, for all of the peridotite was not initially sulfide rich.

5.2 Structural Geology

The general attitude of the schists and gneisses is N20°E and vertical, but intense local contortions cause frequent variations from this, both in strike and dip. As near as can be ascertained from geological and geophysical data, the peridotite conforms to the general regional attitude. The axis of the conductor swings with the change in strike of the marble horizon to the east of the peridotite. The peridotite, having undergone metamorphism and folding, is assumed to be on the limb of a structure, but the position of the other limb (and whether or not it even exists) is not known at this time. Drag folding is complex within the schists and has not been mapped in detail; but on the basis of the preliminary geologic work, there seem to be two sets of drags, one plunging almost vertically and the other almost horizontally, striking about N20° E.

Faulting seems to be minor, and no transverse displacements of the peridotite or ore have yet been found. Presumably, with such high

angle folding, some thrusting is present. Some fault zones have been seen in the cores, but their significance has not yet been determined. One small slickensided surface which has nearly strike-slip movement with apparently negligible displacement was found at the edge of Crawford Pond at the end of the causeway.

5.3 Mineralogy of the Sulfides.

Samples of the ore show that the material to be mined will vary between two principal end types. The unaltered ore, T-1, contains pyrrhotite in disseminated form, together with pentlandite, the most important nickel-bearing sulfide, millerite, gersdorffite, chalcopyrite and pyrite in small amounts. The most highly altered ore, T-3, contains, in addition, a high percentage of talc. Alteration by pegmatite intrusives in some cases has resulted in concentration of the nickeliferous pyrrhotite, so that the talc-bearing sections often show massive occurrence of sulfides. Some of the pegmatites are highly mineralized, in one case showing an assay value of 9% nickel. The ore varies from T-1 to T-3 types, without evidence of any spatial pattern. One should assume that the mined product would average between the two end types.

6.0 Geophysics

The entire area of 40 square miles was surveyed geophysically, first in reconnaissance and subsequently in detail. The methods employed were airborne and ground magnetometer, using Sharpe type A-3 and A-2 vertical intensity magnetometers; vertical and horizontal coil electromagnetometers; AFMAG and radio frequency electromagnetic methods; self-potential and potential drop ratio (PDR) measurements. Depths to the conductor were determined in several locations by vertical resistivity profiling. The results of all geophysical surveys have been compiled and are represented on maps accompanying this report. A discussion of the geophysical methods is contained in Exhibit C.

7.0 Contracts with Defense Minerals Exploration Administration (now known as Office of Minerals Exploration)

Early promise of finding an economic deposit of nickel in Knox County led to the preparation and submission of an application to Defense Minerals Exploration Administration (DMEA) for financial aid in the exploration program. As a result, an agreement was executed on June 30, 1958, known as Contract No. Idm-E 1224. Under the provisions of this agreement, the government agreed to furnish 75% of the cost of specific items of exploration. These included geophysical surveys and drilling, as approved by the DMEA field team. The total sum authorized by the contract was $94,692.00.

$71,019.00 was agreed to be furnished by the government, and the sum of $23,673.00 to be furnished by the Operator (Roland F. Beers, Inc. as manager for the Syndicate).

The work authorized under this agreement was completed, except for writing the final report, on May 31, 1960. A total sum of $65,421.43 of government-furnished funds has been spent on this contract. The Syndicate share of the authorized expenses amounts to $21,807.14. Of the total amount of government funds, $58,406.76 (83.1%) was spent in the Knox County area. The remainder, $7,014.67, was spent on nickel prospects in Lincoln County, also included in the contract with DMEA. The costs incurred under the contract are summarized on Exhibit A . These sums stand as a loan from the government (without interest) for a period of fifteen years from June 30, 1958.

8.0 The Core Drilling Program

The core drilling program consists of three parts. Part A is the initial portion for which no DMEA financial assistance was given. It comprised a preliminary phase of shallow vertical holes drilled by pack-sack drill, and a later phase of shallow vertical holes by conventional core drill. The early phase of part A was undertaken to establish the assumption that the electrical conductor shown in

the EM surveys has its origin in the nickel-bearing sulfides. This phase consisted of 680 feet of pack-sack drilling.

Part B of the drilling program comprised 8094 feet of drilling in three phases under Stages I and II, as approved by DMEA. The immediate purpose of this program was to establish the presence of ore in grade and tonnage compatible with the objectives of DMEA, that is, to discover economic nickel-bearing ore.

Toward the end of the Part B drilling program, this company desired to collect more detailed information on grade and tonnage. It was decided to drill the ore body as completely as possible within the limitations of time, personnel and funds available. Since the contract funds had not been fully expended on the government-approved work by September 1959, an extension was granted to continue drilling until the funds were exhausted, or until June 1, 1960, whichever occurred first. The additional drilling was concluded on May 31, 1960 and amounted to 5907.5 feet (part C). Finally, drilling to the extent of 2561 feet was undertaken by the Syndicate without DMEA assistance. The total drilling in Knox County amounted to 15,927 feet and 635.5 feet in Lincoln County.

Much of the later drilling was done on the ice of Crawford Pond in February and March, 1960. The results of all drilling are shown

on the drill location map and cross-sections accompanying this report. All of the drilling locations were first determined by reconnaissance vertical coil EM surveys, and then checked in detail as the drill was moved into place. When the ground was no longer frozen on the land areas, PDR was used to confirm the location and magnitude of the EM anomalies which were subsequently to be drilled. This procedure, of checking and confirming the location of the conductor along its trend, resulted in a high degree of success in intersecting the conductor along its length from 24N to 96S on the Crawford Pond grid, a distance of 12,000 feet.

9.0 Metallurgy

In April 1959, it seemed likely that an economic ore body would be developed from the Knox County program. Before a decision could be made to mine and produce the ore it was necessary to know what metallurgical problems might arise in processing the mined production. Accordingly, a study was made to determine, by laboratory experiments, the nature of processes which would successfully extract the sulfides of nickel, copper and cobalt from the ore as produced. A second study was made to determine the economics of the entire operation, including mining and milling to the end product.

In summary, it may be said that subsequent investigations by the U. S. Bureau of Mines Experiment Station at College Park, Maryland, under the direction of John Shelton, Supervising Metallurgist, have entirely superseded the conclusions drawn from these two earlier investigations. However, it may be noted that the earlier reports furnished a basis upon which the exploration program was subsequently extended. This extension led to the discovery of larger tonnage than had been considered realizable in 1959, and for this reason, the earlier reports cannot be entirely discounted.

Briefly stated, the early reports indicated that a profitable operation might result if the capacity of mine and mill was not less than 2000 tons per day (tpd). To achieve this capacity, it would be necessary to find a deposit of economic grade of not less than 10 million tons. This volume would yield sufficient income to amortize capital costs over a ten year period, and to provide a satisfactory profit. However, the methods produced a concentrate with a maximum of 2.6% nickel, a product considered not competitive with the products of the Sudbury nickel mines, Ontario. It is therefore a great satisfaction to point to the superior product (Ni 5%) which will result from the USBM process. Furthermore, this process appears to offer lower unit operating costs.

10.0 Results of the Exploration Program

This section of the report will summarize the results of the exploration work conducted from October 1957 to May 31, 1960. The summary will give the estimate which has been made from the drilling of 15,927 feet of core holes, supplemented by the detailed geophysical measurements which tie the core hole data together.

This method of reporting the results of exploration is slightly unconventional. Estimates of ore grade and tonnage are usually based on data obtained solely from cores, pitting, trenching, shaft-and tunnel-drilling. Such estimates are customarily expressed in terms of "proven ore" and "inferred ore". The approved method of calculating these two classes of figures is to allot a "zone of influence" to each core hole, trench, shaft or tunnel. Such zones vary from prospect to prospect, depending upon local conditions. In the present case, it would be reasonable to allot 50 feet each side of a core hole in a plane transverse to the longitudinal axis of the ore body. In the direction of the long axis, the zone would extend halfway from one core hole to the next one. In the aggregate, this method establishes conservative values of tonnage. The grade is estimated from the blocks of ore thus computed. Finally an estimate of gross tonnage and of average grade is made for the entire body.

In the present report, a small variation has been adopted in making the estimate. The "zone of influence" method has been employed where

adequate information is available. Where only one core hole has been drilled, for example, the zone of influence may be somewhat smaller than that which results from the related detailed geophysical measurements at depth. In order to make the estimate as realistic as possible, the pertinent geophysical data have been used in these computations. By close calibration of the geophysical data with actual core hole data, it has been shown that the gaps in core hole data may be filled to a limited extent with geophysical data at depth. These measurements provide the equivalent, for these purposes, of core hole data which is desired, but not available due to limitations of time and funds. The detailed computations, using these methods, are given on the attached cross-sections.

There remain many problems to be investigated in any effort to establish more precise figures for grade and tonnage. Between 17S and 34S, e.g., the sulfide body indicated by geophysics has not been found by drilling. On the east side of the region between 24N and 36S there is a reliable conductor which evidently lies at a depth greater than 350 feet, not yet been penetrated by the drill. None of the conductors under Alford Pond has been drilled. None of these questionable zones was included in the estimate of tonnage and grade of the deposit.

In planning further investigation of these problems, much saving in time and expense may be expected from the use of geophysical methods, followed by a program of additional core drilling. The purpose of the

additional work is to establish more closely than funds and time have permitted, the actual grade and tonnage in these deposits. The evidence now in hand is considered adequate for a decision to proceed on this additional work.

10.1 Reconnaissance view of the results

A broad view of the discoveries will give perspective from which the details may be evaluated. The map enclosed shows several parallel heavy lines running about S20°W from the north shore of Alford Pond to the east shore of North Pond, a distance of about nine miles. These lines represent electrical conductors of sufficient magnitude to be considered significant to the distribution of the sulfides associated with the ultrabasic intrusive. This does not mean that these lines represent economic ore deposits at every point.

The main sulfide body established by drilling lies in the middle of the pattern of three principal conductors. It extends from the vicinity of 24N, south to 34S, where it is found in a shallow pit, and from this point it deflects to the east, where it becomes the eastern-most of the conductors found under Crawford Pond. Under the Pond, economic sulfide deposits have been found by core holes at 42S, 52S, 60S and by three holes centering around 94S. Further evidence of a conductor has been mapped by magnetometer and EM on the Simmons Grid, about

a mile and a half south of 94S. Other conductors have also been found further south, terminating in the Starrett-Wiley grid at the extreme south end of the map. Drilling has proved sulfide deposits at these places, but not sufficient drilling to provide data for estimating proven tonnage and grade.

The central portion of the prospect, that is, from 2N to about 18S (2000 feet), has been investigated in considerable detail by several geophysical methods and by core drilling. Within these limits it is possible to estimate about 3 million tons of ore. Extending the estimation to the region included between 42S and 94S, yields a total figure of 5.7 million tons.

11.0 Summary and Conclusions

Deposits of pyrrhotite containing significant concentrations of nickel, copper and cobalt have been discovered in Knox County, Maine. The occurrence is geologically similar to other primary deposits of nickel in Canada and elsewhere. Detailed mapping by geologic and geophysical methods has shown the location of continuous conductors over a length of about nine miles. Core drilling has confirmed the nickeliferous sulfides to be the most probable source of these conductive anomalies over a distance of about four and one-half miles. The probable influence of sedimentary graphite has been considered in making this statement.

Using core drill and related geophysical data, it is possible to estimate 5.7 million tons of ore, with a gross value of $57 million between those points where the sulfide body has been established by drilling. The exact tonnage to be mined and milled remains to be established from further investigations.

Extractive metallurgy developed by the U. S. Bureau of Mines on these ore deposits has resulted in a selective flotation process by which concentrates containing five percent nickel, with corresponding amounts of copper and cobalt, can be produced at reasonable costs.

Works to which reference is made

Bastin, E. S. (1908) Jour. Geol., 16, pp 124-138.

_____ (1908) U. S. Geol. Survey Atlas, Rockland Folio (no. 158).

Battelle Memorial Institute (May 29, 1959) The Preresearch evaluation of the recovery of nonferrous metal values from a Maine sulphide concentrate.

Colorado School of Mines Research Foundation, Inc. (Jan. 9, 1959), An Investigation of a nickel-copper ore.

_____ (Oct. 6, 1959), Mineralogical and Mineralographic study of nickel concentrates.

Houston, R. S. (1956) Bulletin, Maine State Geological Survey, Augusta, pp 117.

Lindgren, W. L. (1933) Mineral Deposits. McGraw-Hill, New York, pp 802-3.

EXHIBIT A

ROLAND F. BEERS, INC.

SUMMARY OF COSTS - Docket No. DMEA-4947 - Contract Idm-E 1224

	Units	Costs
Crawford Pond Prospect - Stage I, Area 1 :		
Phase I -		
Diamond core drilling	2940 ft.	$13,875.34
Core shed		350.00
		$14,225.34
Phase II -		
Diamond core drilling	3860 ft.	$17,266.98
Warren-Friendship Prospect - Stage I, Area 2 :		
Phase I -		
Magnetic survey		$ 2,399.57
Phase II -		
Magnetic survey		$ 8,508.15
Phase III -		
Diamond core drilling	1294 ft.	$ 5,838.22
Hope-Lincolnville Prospect - Stage II, Area 3 :		
Phase I -		
Magnetic survey		$ 5,955.17
Phase II -		
Magnetic survey		$ 1,914.52
Waldoboro Supplement to Warren-Friendship Prospect -		

EXHIBIT B

SUMMARY OF LEASES AND STATE CLAIMS

	Acres
Leases and State Claims - State of Maine by DMEA Contract Areas (Knox and Lincoln Counties)	
Area 1	671
Area 2	1,291.4
Area 3	2,387.5
Area 4	1,500
Total Leases and State Claims by DMEA Contract Areas	5,849.9

GEOPHYSICAL PROSPECTING METHODS USED ON THE KNOX COUNTY ORE DEPOSITS

Summary and Conclusions

A review of the three principal classes of geophysical exploration methods has been given. The characteristics, scope and limitations of individual methods are stated. Each method has particular advantages and disadvantages, so that the use of combined methods is essential. By their use, nearly all limitations may be overcome and a complete outline of conducting sulfide bodies may be attained.

In addition, correlation between methods offers strong confirmation of the facts essential for drilling a prospective ore body. By laboratory measurements, combined with field observations, specific information regarding the composition, size, shape and attitude of underground ore bodies may be inferred. From these conclusions, considerable saving in drilling for ore may be effected. These practices have been employed throughout the exploration of the Knox County sulfide deposits.

Three classes of geophysical prospecting methods have been found to be useful in the discovery and delineation of the Crawford Pond ore deposit. These are: steady-state magnetic, steady-state electric, and electromagnetic induction methods.

Magnetometer Survey

In the class of steady-state magnetic methods the instrument is a Sharpe Model A-2 vertical force magnetometer. This instrument is a precision magnetic field balance which measures deviations in the vertical component of the earth's magnetic field. Sensitivity of the balance is from 15 to 20 gammas per scale division which is ideal for this type of prospecting. Short-term and long-term stability are excellent.

Instrument performance is checked periodically by a laboratory procedure which calibrates the magnetic balance and the auxiliary magnets. Diurnal variations in background are checked against a base station. Data taken at 25 ft. intervals on the grid are contoured at 400 gamma intervals after suitable reduction.

The overall range of variation in vertical field intensity over the Crawford Pond prospect is found to be about plus or minus 5000 gammas with respect to background. Anomalous variations begin at about plus or minus 200 gammas, as determined by statistical procedures.

D. C. Methods

Four types of steady-state (D. C.) electrical methods have been found to be effective. These are:

Self-Potential
Applied Potential
Potential Drop Ratio
Resistivity.

Self-Potential Survey

The self-potential survey was conducted with standard porous pot equipment consisting of non-polarizing copper-sulphate electrodes and a potentiometer. Readings are taken at 50 ft. intervals along the traverses as well as along the baseline. Data reduction consists of adjusting all readings to a common reference datum, then adjusting the datum so that all deviations are negative. The end product is a left-skewed distribution of potentials which are contoured on 100 millivolt intervals. Overall relief on the Harriman prospect has been found to be approximately 800 millivolts. Anomalous contours begin at -200 millivolts.

Applied Potential

Another type of prospecting by D. C. potential measurement is the Applied Potential method. Here the conductor is energized relative to the surface of the ground by placing one electrode in a drill hole. Energy is supplied by a D. C. power supply consisting of an A. C. engine-driven generator and rectifier. The theory of operation for Applied Potential is that the ore body, being a good conductor, will be at a uniform potential throughout its extent. A conductor thus energized will present an electric field which can be measured at the surface of the ground.

Field procedure for mapping of a conductor is the same as for Self-Potential, with the exception that readings are taken at each station with the generator switched on and off. Deviations from SP due to the generator being switched on are calculated and are reduced in the same manner as SP data. The result is a map of potential distribution which may be plotted either in potential relief or as contoured intervals.

Although this method was found to be successful, it was not widely used on the Crawford Pond prospect due to variations in the location of drill holes with respect to the conductor(s).

Potential Drop Ratio

The Potential Drop Ratio (PDR) method measures resistivity contrast along a traverse without the depth-discriminating properties of a standard resistivity technique. Current-carrying electrodes are placed on either side of the conductor and are fed with a constant direct current which is alternately switched on and off. The electric field between points, approximately 100 ft. fromthe current electrodes, is essentially uniform. Any conductor located in this area will "short circuit" the normal potential drop, and therefore will become evident as an anomaly.

Readings of potential difference are taken successively at 50 ft. intervals along a traverse, using the same equipment as for SP. Data reduction consists of removing self-potential (background) readings from those for which the generator is applied. All data are adjusted for constant current and constant line length before the adjusted values are plotted and contoured.

Experience with PDR has shown that excellent conductors at shallow depth lie within the 0 millivolt contour, good conductors lie within the 10 millivolt contour, and 20 millivolts represents a reasonable cutoff between conductive and non-conductive zones.

Resistivity

Resistivity prospecting methods offer possibilities for both horizontal and vertical profiling. Because of the success experienced in the development of PDR technique, the use of resistivity has been restricted to vertical profiling. Vertical profiles using four and five electrode configurations have been found useful principally for measuring the depth of conductors. This information is desired in planning the location, angle and direction of inclined drill holes.

In practice the four (or five) electrodes are placed in a symmetrical manner along the line to be profiled. Current electrodes are located at the ends of the configuration, and potential electrodes are arranged about the center. For each step in expanding the pattern, data are taken from which the bulk resistivity of the subsurface soil and rock can be calculated. When a conductor is encountered, a sharp inflection in the resistivity curve will occur. At this point the distance separating the potential electrodes is an approximate measure of the depth of the conductor.

Very often a depth determination made in this way will be confirmed by repeating the procedure along a line at right angles to the first profile.

Electromagnetic Methods

Four types of electromagnetic induction methods have been used for mapping the Crawford Pond ore deposit. These are the (1) horizontal loop (Ronka) EM, (2) vertical loop (Sharpe) EM, (3) natural field (AFMAG), and (4) radio frequency (radio) EM methods. Each method has its own particular merits. All of them have been extremely valuable.

Electromagnetic methods of prospecting operate on the principle that an electromagnetic field which is changing in intensity (i.e. alternating) will induce a current to flow in a conducting mass. Such a current will itself set up a magnetic field in such a direction so as to oppose the initial (primary) field. The field due to a conductor is called the secondary field.

Field procedures for EM prospecting are designed to detect the presence of secondary fields and to measure them along profiles from which the position of the conductor may be interpreted. Two general methods of prospecting have been devised.

Method No. 1 measures variations in the magnitude of the secondary field as an instrument is moved across a conductor. Field theory tells us that the field from a current-carrying conductor will be strongest when one is at the closest proximity to the conductor. Measurements of intensity are therefore useful means of detection. Since most conductors are not ideal conductors, the form of the secondary field will be complex. It is possible to resolve secondary field measurements into components, thereby yielding additional information on the geometry of a conductor.

Method No. 2 measures variations in the direction of the secondary field as viewed from the surface of the ground. Three of the EM systems employed operate on this principle. Since it is impossible to separate the secondary field from the primary field it becomes necessary to maintain a sufficiently high ratio of these two quantities that the secondary field can be detected. As the instrument passes over a conductor, the angle of dip of the secondary field is observed to change direction (this action is called a crossover), thereby indicating the position of the conductor.

A. C. electromagnetic prospecting methods often encounter difficulties not experienced with D. C. methods, that is, they are affected by power and telephone lines and other man-made "conductors". These cultural conductors may produce two effects: first, they respond as anomalies; second, they become a strong source of noise which interferes with measurements on the conducting ore body.

Horizontal Loop EM (Ronka System)

The Ronka system of prospecting operates under the principles of Method No. 1, outlined above. The equipment consists of two horizontal coils and their associated electronic equipment, one a transmitter and the other a receiver. Both units are powered by batteries. The two coils are connected to each other through a 200 ft. cable which serves two functions. The cable is used to maintain the distance between the coils at a constant 200 ft., thereby eliminating any variations in primary field intensity due to errors in coil separation. The cable is also used to transmit to the receiver a small signal, representative of the primary field, which cancels the primary electromagnetic field coupling to the receiver. Because of this compensating method, readings of secondary field values can be made at increased sensitivity, allowing prospecting at greater depths.

The equipment operates at an audio frequency of 876 cycles per second. Measurements are taken by balancing an A. C. potential bridge, using headphones as detector.

Data are taken at 50 ft. intervals along traverses normal to the strike of the conductor. Data are plotted along these profiles in units of relative field strength for the in-phase and out-of-phase components which the instrument resolves.

Vertical Loop EM (Sharpe System)

In this system a transmitter having a vertical coil is placed directly over the conductor for maximum excitation. The receiver is carried by an operator along parallel traverses normal to the conductor at distances from 400 to 1600 ft. from the transmitter, depending upon the size and depth of the conductor and the ambient noise level. At each station the transmitter loop is rotated so as to place the receiver in the plane of the loop.

Operation of the receiver is essentially that of a direction finder, that is, the operator tilts the receiver coil in a direction parallel to the traverse until a null in the signal is produced. The angle of tilt is read from a clinometer and represents the reading for the station. As the receiving coil crosses a conductor, the dip angle changes from one side to the other (i.e. west to east), and the position of the crossover indicates the position of the conductor on the traverse. The transmitter is then moved to a new location as determined herein, and the process is repeated.

Power for the transmitter is derived from a gasoline engine-driven alternator operating at an audio frequency of 1000 cycles per second. The receiver is powered by batteries. It includes a high gain amplifier and a pair of headphones.

AFMAG

AFMAG is a recently developed EM system which has a sensitivity greater than that of the other described systems. A major advantage of higher sensitivity is that it allows for prospecting at greater depths. In contrast, a conventional system employs a transmitter which generates a pure tone, whereas AFMAG uses no transmitter. Sensitivity of the conventional system is limited by a combination of engineering practice and ambient noise. Sensitivity of the AFMAG system is limited only by practical engineering limits, ambient noise being regarded as the signal, or primary field.

Because the nature of a noise field is quite different from that of a pure tone, the instrument uses an electronic coincidence detector in place of headphones. Such a detector provides for increased sensitivity and greatly reduces errors in judgment on the part of the operator.

Successful operation of the AFMAG receiver depends upon the observed fact that the dominant portion of the audio frequency energy in the ambient noise field at the earth's surface will, for any given period of time, originate from a constant direction. This observation is generally attributed to the world-wide distribution of thunderstorm activity, which varies rather slowly with time. The AFMAG instrument is used as a direction finder to measure the azimuth and dip of this field. Over a conductor, anomalous variations in these parameters will be indicative of a secondary field. Profiles of these variations are interpreted to outline the location of the conductor.

Because of the electronic principles involved, the instrument uses two coils mounted at right angles to each other, instead of a single coil. The coil system is rotated by the operator so as to produce a null in one coil. Observation of the null is performed by the coincidence detector which compares the signals in the two coils. The null position is where the comparison changes from negative to positive.

Readings are taken in the field at 50 ft. intervals along parallel traverses. Data consist of azimuths and dips at each station for the two frequencies, 150 and 510 cycles per second.

Power for the AFMAG equipment is derived from batteries.

Radio EM

The fourth method of EM prospecting that has been used for mapping employs a portable radio receiver that has been modified as a direction finder. The radio is battery-powered and uses headphones for a detector.

Field operation is similar to AFMAG in that the direction and dip of the source must be located. It is preferable to use the signal from a radio broadcast transmitting station located approximately at a right angle to the strike of the conductor. Once the azimuth has been determined it is possible to walk the traverse out while taking continuous observations.

Anomalies from the radio-frequency EM method are well defined. It is often possible to locate a crossover within a distance of a few feet. Disseminated conductors produce a condition of elliptical polarization of the secondary field for which it may be difficult or impossible to locate a null plane.

Discussion and Comments on the Geophysical Methods

It might be asked why so many different types of exploration methods have been employed for locating and mapping conductors. The best answer to this question is that each method contributes a different type of information to the fund of knowledge about the conductor. Another significant reason is that certain limits exist for the areas over which all the methods can be used together. These limits are governed mainly by the fact that EM methods fail in the vicinity of power lines and that D. C. methods cannot be used on water, ice, or frozen ground.

It is desirable to map a conductor through such barriers with as much continuity as possible from an area which has been thoroughly outlined. The confidence which may be inferred from such a continuity can be very rewarding. A notable example of this is the Crawford Pond (east side) conductor. Here 5400 ft. of the conductor were mapped by Sharpe EM between the lower end of the Harriman grid and Spruce Island. Both of these areas were known to be mineralized from previous drilling. When the continuity had been established, four holes were successfully drilled into the conductor. Three of these holes intersected significant sulphides at depths in excess of 250 ft. Estimates of tonnage and grade from these drill holes are greater than those for the Harriman segment of the ore deposit.

All this has been accomplished by using a single instrument for mapping the conductor. Other instruments either could not be used or did not respond to the conductor due to its depth.

Measurements on Test Samples

Since all of the field methods employed in geophysical exploration of the Knox County nickel deposits are dependent upon the specific properties of the sulfides, it is desirable to know the range of the variations in these properties. The distribution of ore may thus be more precisely determined. Variations in the field anomalies will be affected by these specific properties, and by the geometry of the deposits as seen from the surface. If the effects of variations in electrical conductivity and magnetic susceptibility can be isolated, then inferences on the geometry of the deposits will be more precise.

For these reasons, considerable effort has been made to obtain measurements of the properties of the deposits in the laboratory. These attempts have not been uniformly successful, and work in this field is continuing. It has been found that measurement of the properties of ore in place is more significant than those of small core samples. The U. S. Geological Survey has cooperated by making similar measurements in bore holes. When the results of this work have been evaluated, it is likely that a better understanding of the fundamental relationships will be in hand.

Comments about the Individual Methods

Magnetometer

One of the properties of the sulphide mineral deposit is that is is moderately ferromagnetic. Mapping by magnetometer is therefore a valuable method both for detail and for reconnaissance. The magnetometer can be operated over land and water. It is not affected by power lines, weather, or other electrical disturbances.

Self-Potential

The generation of self-potential, as derived from earth currents, is another characteristic of sulphide deposits. Self-potential surveys can be correlated closely with other type surveys to provide information about the width of conductors. This method is not affected by power lines. Operation is confined to land areas. The depth to which such a survey is effective is comparable with magnetic surveys.

Applied Potential

The size of the conductor in the ground is so large that it is difficult

to energize it over great distances by direct electrical conduction. Thus the method is not generally as useful as other types of surveys. The requirement for placing an electrode in a drill hole places severe limitations on the distribution of data. Data can only be obtained on land in the vicinity of drill holes which have intersected the conductor. This method will find its maximum usefulness in special applications.

PDR (Potential Drop Ratio)

Of all the geophysical methods, PDR presents probably the most unbiased picture of a conductor. Good correlation between PDR and other methods has been uniform and consistent. PDR is useful for measuring the width of conductors. In this application it correlates best with Ronka data.

PDR is free from the effects of power lines. Like the other D. C. methods it cannot be operated on water, ice, or frozen ground.

Resistivity

Resistivity, as noted above, is used mainly for depth determination by vertical profiling. In the realm of special applications the method would be a valuable tool for selective horizontal profiling. The difference between resistivity and PDR is one of electrode spacing.

Ronka EM

Ronka and other EM methods may be operated on land, water, ice and snow. Data from the Ronka equipment provide information regarding the location, width, attitude, depth and conductivity of a conductor.

Limitations in the use of this equipment are due to noise from power line interference, and the inability to map conductors at depths greater than 150 ft.

Sharpe EM

The strength of the Sharpe transmitter allows for considerable variation in receiver separation, thereby providing control over the depth of penetration. Conductors which have been lost, using a

400 ft. separation, are easily traced using separations of 600 or 800 ft.

The Sharpe instrument is extremely versatile. It is useful for detail and for reconnaissance work. It can be operated in summer and winter and over land and water. Power line noise is the principal limiting factor.

AFMAG

AFMAG is more difficult to operate than the other types of EM systems. Four readings are required at a station instead of one or two. This procedure can be time-consuming to the point where other EM methods may be preferred.

In many locations the dominant component of the ambient noise field originates in power stations and transmission lines, instead of distant electrical storm activities. The instrument is designed to operate in between harmonics of 60 cycles, but when the field is strong enough, nothing can be done about the noise frequencies that occur in the intervals between harmonics. As long as one is prospecting far enough away from the energy source this is not a problem. The difficulty is that the noise energy from this type of source arrives in a direction nearly vertical to the surface of the ground. Azimuth determination becomes difficult under this condition, and dips are always nearly 90°.

Natural noise energy, on the other hand, arrives in a horizontal direction. Variations in azimuth and dip are easily read under these conditions.

It may be concluded from this discussion that AFMAG is best applied to work in areas that are remote from inhabited locations.

Radio EM

This is the only ground geophysical instrument used that can be operated continuously while traversing the grid. Readings from this system are qualitative instead of quantitative. The character of the response, i.e. broad null, no null, crossover, west dip or east dip, is recorded by the operator over the interval for which it is observed. A completed map of such indications provides a picture which may be correlated with other geophysical data.

Current Valuation of the Crawford Pond Ore Deposit

This evaluation is limited to those parts of the Crawford Pond ore deposit which have been shown by drilling to be mineralized. Although sections other than those included are known to exist they are not a part of this calculation as they have not been "proven" by drilling.

The intervals that were used for the evaluation are (1) from 4N to 17S on the Harriman grid, and (2) from 42S to 94S on Crawford Pond, a total length of 7300 feet. Extensions beyond these limits have been partially mapped by geophysical methods, but have not yet been drilled. The 2500 ft. gap between these intervals has been thoroughly outlined by geophysics. Three holes drilled in this segment have failed to intersect the ore body. Further investigation in this segment is warranted, but has been prevented by lack of time.

Cross-sections on the Harriman segment were prepared from drill hole information and from geophysical data. Cross-sections on the Crawford Pond segment were prepared from drill hole information only, allowing a zone of influence to be 50 ft. on either side of the drill hole.

All intervals from the drill holes that were assayed were included. For the calculations of Schedule B, values attached to these intervals are diluted by barren rock or unassayed intervals wherever they occur between the upper and lower limits of the assayed material. Overburden is not included. In the calculations of Schedule C, all assayed intervals are

considered; unassayed intervals are omitted. Width of the cross-sections is determined by tapering from the assayed intervals to the boundaries established by geophysics. Every effort was made to keep estimates of cross-sectional size on the conservative side. Where more than one hole is present on a cross section, values from one hole are applied over the area half-way to the next hole.

Method of Calculation

For each drill hole, the intervals assayed are assigned a gross value in $/ton for each of the elements nickel, cobalt, and copper. These determinations are based upon the current prices of $0.74/lb. for nickel, $1.50/lb. for cobalt, and $0.326/lb. for copper, as reported in Engineering and Mining Journal for June, 1960. Schedule A is a representative sample of such a computation. The value for the hole in Schedule B is determined by taking a weighted average from Schedule A of all the assayed intervals with unassayed intervals included. This is determined for each element. In Schedule C the value is determined by omitting the unassayed intervals.

The weighted averages are then applied to the area of influence, as measured on the cross-section to produce a set of cross-section values in ft^2 $/ton. If more than one hole is present, each hole will have its own area of influence, as described in the preceding paragraphs.

Cross-section values from one cross-section to the next are averaged and multiplied by the separation of the cross sections to produce a figure in ft^3 \$/ton. Division of this factor by the total volume between cross-sections produces an average grade in \$/ton over the longitudinal interval. Tonnage between cross-sections was calculated using a density of 0.106 tons/ft^3. Dollar value is the product of tonnage and the average \$/ton.

Results

A line-by-line analysis and summary of tonnage, value per ton, and gross value is presented in Schedule B for the case where barren rock, represented by unassayed intervals, is included. This represents the gross value of the ore body in place, that is, the total amount to be mined. Extensions which have not been proven by drilling are not included in this report. Schedule B states, in summary, a gross amount of 5.756 million tons of ore at an average value of \$9.90/ton gross, totalling 57.0 million dollars.

Schedule C is a similar analysis, in which the unassayed intervals have been omitted. Schedule C summarizes at 4.459 million tons of ore grade material at \$12.75/ton, gross value, a total value of 57 million dollars.

Comparison of the two schedules brackets the ore deposit between a completely unclassified ore to an upper limit for classified ore, assuming that all the material outlined herein will be mined. Further classification by economic considerations has not been applied as specific limits have not as yet been established.

Comments

The two sets of calculations (Schedule B and Schedule C) presented in this evaluation represent the ultimate value of the metals nickel, cobalt and copper contained in the "proven" portion of the primary ore deposit at Crawford Pond. Schedule B tells the average value of the ore as it is removed from the ground; Schedule C tells the value as it might be fed to the mill. It has been assumed that barren rock can be sorted from ore grade material prior to concentration.

The purpose of making the evaluation this way is to determine the tonnage and grade of the ore that has been found. No economic level of cutoff has been used in making this determination. Such an evaluation naturally produces a maximum dollar value, maximum tonnage, and minimum grade of ore. It is expected that the economics of mining and milling will impose a level of cutoff which will alter these figures somewhat.

Although the estimates of tonnage and value for the Crawford Pond segment are founded upon very limited information, it is believed that they are low. It is unlikely that the drill intersected the ore deposit at its thickest dimension at all locations. The estimate of 100 ft. of width is considerably less than widths measured over the Harriman section by geophysics and by drilling. This is one side of the argument. A more convincing argument can be presented through the way this

conductor was discovered. Because of its depth, the conductor defied detection by all the geophysical methods that were tried, excepting vertical-loop EM. Even with this instrument special techniques had to be employed. Comparison of responses over the Crawford Pond segment with those of the Harriman segment reveals that this conductor would not have been detected at such a depth unless it was considerably larger than the ore deposit at Harriman.

Line 4N

Assayed Hole: CP-10

CP-10	Interval	Interval Length	% Ni	$/ton Ni	ft x $/ton Ni	% Co	$/ton Co	ft x $/ton Co	% Cu	$/ton Cu	ft x $/ton Cu
-1	5'5" - 10'0"	4.58	0.223	3.30	15.11	0.029	0.87	3.98	0.088	0.57	2.61
-2	10'0" - 15'0"	5.00	0.215	3.18	15.90	0.036	1.08	5.40	0.088	0.57	2.85
-3	19'0" - 24'0"	5.00	0.240	3.55	17.75	0.036	1.08	5.40	0.069	0.45	2.25
-4	24'9" - 29'0"	4.25	0.166	2.46	10.46	0.044	1.32	5.61	0.081	0.53	2.25
-5	46'0" - 51'3"	5.25	0.207	3.06	16.06	0.036	1.08	5.67	0.081	0.53	2.78
-7	73'3" - 78'3"	5.00	0.191	2.83	14.15	0.029	0.87	4.35	0.100	0.65	3.25
-6	88'0" - 93'0"	5.00	0.122	1.81	9.05	0.036	1.08	5.40	0.126	0.82	4.10
	Ft assayed	34.08			98.48			35.81			20.09
	Not assayed	53.50									
	Total	87.58									

Ni value $\frac{98.48}{87.58}$ = $1.124/ton

Co value $\frac{35.81}{87.58}$ = $0.409/ton

Cu value $\frac{20.09}{87.58}$ = $0.229/ton

Ni value $\frac{98.48}{34.08}$ = $2.89/ton

Co value $\frac{35.81}{34.08}$ = $1.05/ton

Cu value $\frac{20.09}{34.08}$ = $0.59/ton

SCHEDULE A

Line 2N

Holes Assayed: CP-B, CP-18
Not assayed: CP-34

		Interval Length	% Ni	$ / ton Ni	ft x $/ton Ni	% Co	$ / ton Co	ft x $/ton Co	% Cu	$ / ton Cu	ft x $/ton Cu
CP-B											
-1	6' - 11'	5.00	0.292	4.32	21.60	0.036	1.08	5.40	0.151	0.98	4.90
-2	11' - 15'	4.00	0.321	4.75	19.00	0.036	1.08	4.32	0.189	1.23	4.92
-3	15' - 20'	5.00	0.313	4.63	23.15	0.029	.87	4.35	0.258	1.68	8.40
-4	20' - 25'	5.00	0.361	5.34	26.70	0.029	.87	4.35	0.132	0.86	4.30
-5	25' - 30'	5.00	0.291	4.31	21.55	0.029	.87	4.35	0.189	1.23	6.15
	Total ft.	24.00			112.00			22.77			28.67

Ni value $\frac{112.00}{24.00}$ = $4.667/ton Co value $\frac{22.77}{24.00}$ = $0.949/ton Cu value $\frac{28.67}{24.00}$ = $1.194/ton

CP-18											
-1	41'0" - 46'8"	5.67	0.983	14.55	82.50	0.051	1.53	8.68	0.500	3.26	18.48
-2	52'2" - 54'6"	2.33	0.148	2.19	5.10	0.007	0.21	0.50	0.138	0.90	2.10
-3	54'6" - 56'6"	2.00	1.561	23.10	46.20	0.066	1.98	3.96	0.340	2.22	4.44
	Ft. assayed	10.00			133.80			13.14			25.02
	Not assayed	5.50									
		15.50									

Ni value $\frac{133.80}{15.50}$ = $8.632/ton Co value $\frac{13.14}{15.50}$ = $0.848/ton Cu value $\frac{25.02}{15.50}$ = $1.614/ton

Ni value $\frac{133.80}{10.00}$ = $13.38/ton Co value $\frac{13.14}{10.00}$ = $1.31/ton Cu value $\frac{25.02}{10.00}$ = $2.50/ton

LINE 0

Holes Assayed: CP-33, CP-31
Not Assayed: CP-32, CP-4

CP-33	Interval	Interval Length	% Ni	$/ton Ni	ft x $/ton Ni	% Co	$/ton Co	ftx $/ton Co	% Cu	$/ton Cu	ft x $/ton Cu
-1	10 - 15	5.00	0.926	13.70	68.50	0.088	2.64	13.20	0.302	1.97	9.85
-2	15 - 20	5.00	0.800	11.84	59.20	0.073	2.19	10.95	0.258	1.68	8.40
-3	20 - 25	5.00	0.751	11.11	55.55	0.080	2.40	12.00	0.296	1.93	9.65
-4	25 - 30	5.00	20.00 0.650 0.782	9.62	48.10	0.080	2.40	12.00	20 0.441 0.324	2.88	14.40
-5	30 - 35	5.00	0.316	4.68	23.40	0.044	1.32	6.60	0.157	1.02	5.10
-6	35 - 42	7.00	12.00 0.260 0.283	3.85	26.95	0.044	1.32	9.24	12 0.220 0.194	1.43	10.01
	Total ft.	32.00	32.0 0.595		281.70			63.99	32 0.275		57.41

Ni value $\frac{281.70}{32.00}$ = $8.803/ton Co value $\frac{63.99}{32.00}$ = $2.000/ton Cu value $\frac{57.41}{32.00}$ = $1.794/ton

CP-31											
-1	9 - 14	5.00	0.979	14.49	72.45	0.102	3.06	15.30	0.434	2.83	14.15
-2	14 - 19	5.00	0.955	14.13	70.65	0.110	3.30	16.50	0.333	2.17	10.85
-3	19 - 24	5.00	0.747	11.06	55.30	0.073	2.19	10.95	0.233	1.52	7.60
-4	24 - 29	5.00	0.837	12.39	61.95	0.080	2.40	12.00	0.491	3.20	16.00
-5	29 - 37'3"	8.25	0.422	6.25	51.56	0.052	1.56	12.87	0.176	1.15	9.49
-6	37'3" - 42'	4.75	0.796	11.78	55.95	0.073	2.19	10.40	0.258	1.68	7.98
-7	42 - 47	5.00	0.800	11.84	59.20	0.073	2.19	10.95	0.321	2.09	10.45
-8	47 - 53	6.00	0.625	9.25	55.50	0.058	1.74	10.44	0.163	1.06	6.36
	Total ft.	44.00	0.741		482.56			99.41	0.289		82.88

Ni value $\frac{482.56}{44.00}$ = $10.967/ton Co value $\frac{99.41}{44.00}$ = $2.259/ton Cu value $\frac{82.88}{44.00}$ = $1.884/ton

Line 9S

Assayed Holes: CP-6, CP-17

CP-6	Interval	Interval Length	% Ni	$/ton Ni	ft x $/ton Ni	% Co	$/ton Co	ft x $/ton Co	% Cu	$/ton Cu	ft x $/ton Cu
-1	150'6" - 155'4"	4.83	0.205	3.03	14.63	0.058	1.74	8.40	0.189	1.23	5.94
-2	155'4" - 160'4"	5.00	0.289	4.28	21.40	0.066	1.98	9.90	0.144	0.94	4.70
-3	160'4" - 165'4"	5.00	0.189	2.80	14.00	0.044	1.32	6.60	0.119	0.78	3.90
-4	216'3" - 221'3"	5.00	0.278	4.11	20.55	0.051	1.53	7.65	0.170	1.11	5.55
-5	221'3" - 226'	4.75	0.405	5.99	28.45	0.058	1.74	8.26	0.258	1.68	7.98
-6	226' - 231'	5.00	0.695	10.29	51.45	0.073	2.19	10.95	0.245	1.60	8.00
-7	231' - 236'	5.00	1.004	14.86	74.30	0.102	3.06	15.30	0.674	4.39	21.95
-8	236' - 241'	5.00	0.469	6.94	34.70	0.066	1.98	9.90	0.390	2.54	12.70
-9	241' - 249'	8.00	0.941	13.93	111.44	0.080	2.40	19.20	0.182	1.19	9.52
	Ft assayed	47.58			370.92			96.16			80.24
	Not assayed	50.92									
	Total ft.	98.50									

Ni value $\frac{370.92}{98.50}$ = $3.766/ton Co value $\frac{96.16}{98.50}$ = $0.976/ton Cu value $\frac{80.24}{98.50}$ = $0.815/ton

Ni value $\frac{370.92}{47.58}$ = $7.796/ton Co value $\frac{96.16}{47.58}$ = $2.021/ton Cu value $\frac{80.24}{47.58}$ = $1.686/ton

CP-17

-1	214 - 219	5.00	0.052	0.77	3.85	0.007	0.21	1.05	0.006	0.04	0.20
-2	219 - 224	5.00	0.064	0.95	4.75	0.022	0.66	3.30	0.012	0.08	0.40
-3	224 - 229	5.00	0.056	0.83	4.15	0.015	0.45	2.25	0.018	0.12	0.60
	Ft assayed	15.00			12.75			6.60			1.20
	Total ft.	15.00									

Ni value $\frac{12.75}{15}$ = $0.850/ton Co value $\frac{6.60}{15}$ = $0.440/ton Cu value $\frac{1.20}{15}$ = $0.080/ton

Line 12S

Assayed Holes: CP-1, CP-36
Not assayed: CP-7

CP-1	Interval	Interval Length	% Ni	$/ton Ni	ft x $/ton Ni	% Co	$/ton Co	ft x $/ton Co	% Cu	$/ton Cu	ft x $/ton Cu
-1	138'6" - 143'3"	4.75	0.821	12.15	57.71	0.073	2.19	10.40	0.069	0.45	2.14
-2	144'8" - 149'8"	5.00	0.938	13.88	69.40	0.080	2.40	12.00	0.081	0.53	2.65
-3	149'8" - 154'0"	4.33	0.475	7.03	30.44	0.081	2.43	10.52	0.075	0.49	2.12
-4	154'0" - 159'7"	5.58	0.585	8.66	48.32	0.110	3.30	18.41	0.195	1.27	7.09
-5	159'7" - 164'2"	4.58	0.934	13.82	63.30	0.102	3.06	14.01	0.214	1.40	6.41
-6	164'2" - 169'4"	5.17	0.817	12.09	62.50	0.117	3.51	18.15	0.289	1.88	9.72
-7	169'4" - 174'6"	5.17	0.796	11.78	60.90	0.125	3.75	19.39	0.447	2.91	15.04
-8	174'6" - 179'9"	5.25	0.768	11.37	59.69	0.125	3.75	19.69	0.207	1.35	7.09
-9	179'9" - 184'4"	4.58	0.813	12.03	55.10	0.102	3.06	14.01	0.151	0.98	4.49
-10	205'1" - 210'9"	5.67	0.792	11.72	66.45	0.066	1.98	11.23	0.541	3.53	20.01
-11	214'8" - 219'8"	5.00	0.731	10.82	54.10	0.073	2.19	10.95	0.327	2.13	10.65
-12	219'8" - 225'0"	5.33	1.040	15.39	82.03	0.066	1.98	10.55	0.233	1.52	8.10
-13	226'4" - 228'10"	2.50	0.508	7.52	18.80	0.058	1.74	4.35	0.182	1.19	2.98
-14	228'10"-232'2"	3.38	2.767	40.95	138.41	0.125	3.75	12.67	0.245	1.60	5.40
-15	234'11"-239'11"	5.00	0.878	12.99	64.95	0.073	2.19	10.95	0.441	2.87	14.35
-16	239'11"-243'8"	3.75	1.150	17.02	63.82	0.088	2.64	9.90	0.541	3.53	13.24
	Ft assayed	75.04			995.92			207.18			131.48
	Not assayed	30.13									
	Total ft.	105.17									

Ni value $\frac{995.92}{105.17}$ = $9.470/ton Co value $\frac{207.18}{105.17}$ = $1.970/ton Cu value $\frac{131.48}{105.17}$ = $1.250/ton

Ni value $\frac{995.92}{75.04}$ = $13.271/ton Co value $\frac{207.18}{75.04}$ = $2.761/ton Cu value $\frac{131.48}{75.04}$ = $1.752/ton

CP-36

-1	236'4" - 241'4"	5.00	0.365	5.40	27.00	0.095	2.85	14.25	0.264	1.72	8.60
-2	241'4" - 244'9"	3.42	8.4 0.426 0.391	6.30	21.55	0.102	3.06	10.47	0.277 0.269	1.81	6.19
-3	248'7" - 253'7"	5.00	0.568	8.41	42.05	0.117	3.51	17.55	0.289	1.88	9.40
-4	253'7" - 258'7"	5.00	0.588	8.70	43.50	0.110	3.30	16.50	0.346	2.26	11.30
-5	258'7" - 266'	7.42	17.4 0.564 0.573	8.35	61.96	0.117	3.51	26.04	0.119 0.233	0.78	5.79
	Ft assayed	25.84			196.06			84.81			41.28
	Not assayed	3.83									
	Total ft.	29.67									

Ni value $\frac{196.06}{29.67}$ = $6.608/ton Co value $\frac{84.81}{29.67}$ = $2.858/ton Cu value $\frac{41.28}{29.67}$ = $1.391/ton

Ni value $\frac{196.06}{25.84}$ = $7.587/ton Co value $\frac{84.81}{25.84}$ = $3.282/ton Cu value $\frac{41.28}{25.84}$ = $1.597/ton

Line 14.3S

CP-5	Hole Assayed: CP-5	Interval Length	% Ni	$/ton Ni	ft x $/ton Ni	% Co	$ / ton Co	ft x $/ton Co	% Cu	$ / ton Cu	ft x $/ton Cu
-1	235'10" - 240'10"	5.00	0.593	8.78	43.90	0.132	3.96	19.80	0.434	2.83	14.15
-2	240'10" - 245'10"	5.00	0.565	8.36	41.80	0.088	2.64	13.20	0.207	1.35	6.75
-3	245'10" - 250'10"	5.00	0.656	9.71	48.55	0.103	3.09	15.45	0.252	1.64	8.20
-4	250'10" - 255'10"	5.00	0.681	10.08	50.40	0.088	2.64	13.20	0.233	1.52	7.60
-5	255'10" - 260' 4'	4.17	0.703	10.40	43.37	0.081	2.43	10.13	0.315	2.05	8.55
-6	264' - 270'6" 3'-2"	6.50	0.528	7.81	50.76	0.059	1.77	11.50	0.233	1.52	9.88
-7	273'8" - 278'8"	5.00	0.809	11.97	59.85	0.066	1.98	9.90	0.447	2.91	14.55
-8	278'8" - 281'11" 1'-3"	3.25	0.589	8.72	28.34	0.059	1.77	5.75	0.277	1.81	5.88
-9	283'2" - 286'7" 4'-2"	3.42	0.756	11.19	38.27	0.051	1.53	5.23	0.239	1.56	5.34
-10	290'9" - 296'	5.25	1.245	18.43	96.76	0.088	2.64	13.86	0.302	1.97	10.34
-11	296' - 301'	5.00	1.235	18.28	91.40	0.103	3.09	15.45	0.270	1.76	8.80
-12	301' - 306'	5.00	0.977	14.46	72.30	0.088	2.64	13.20	0.214	1.40	7.00
-13	306' - 311'	5.00	0.874	12.94	64.70	0.066	1.98	9.90	0.170	1.11	5.55
-14	311' - 316'	5.00	1.012	14.98	74.90	0.081	2.43	12.15	0.409	2.67	13.35
-15	316' - 321'	5.00	0.650	9.62	48.10	0.066	1.98	9.90	0.113	0.74	3.70
-16	321' - 326'	5.00	0.813	12.03	60.15	0.059	1.77	8.85	0.138	0.90	4.50
-17	326' - 331'	5.00	0.888	13.14	65.70	0.073	2.19	10.95	0.321	2.09	10.45
-18	331' - 336'	5.00	1.406	20.81	104.05	0.081	2.43	12.15	0.371	2.42	12.10
-19	336' - 341'	5.00	0.857	12.68	63.40	0.066	1.98	9.90	0.378	2.46	12.30
-20	341' - 345'10"	4.83	0.752	11.13	53.76	0.059	1.77	8.55	0.453	2.95	14.25
	Ft. Assayed	97.42			1200.46			229.02			183.24
	Not assayed	12.58									
	Total ft.	110.00									

Ni value $\frac{1200.46}{110.00}$ = $10.913/ton Co value $\frac{229.02}{110.00}$ = $2.082/ton Cu value $\frac{183.24}{110.00}$ = $1.666/ton

Ni value $\frac{1200.46}{97.42}$ = $12.322/ton Co value $\frac{229.02}{97.42}$ = $2.351/ton Cu value $\frac{183.24}{97.42}$ = $1.881/ton

Line 15.8S

Assayed Hole H-15.8S-1

H-15.8S-1	Interval	Interval Length	% Ni	$/ton Ni	ft x $/ton Ni	% Co	$/ton Co	ft x $/ton Co	% Cu	$/ton Cu	ft x $/ton Cu
-1	286'8" - 291'8"	5.00	0.187	2.77	13.85	0.022	0.66	3.30	0.044	0.29	1.45
-2	309'7" - 314'7"	5.00	3.582	53.01	265.05	0.176	5.28	26.40	0.195	1.27	6.35
-3	314'7" - 318'7"	4.00	0.794	11.75	47.00	0.073	2.19	8.76	0.220	1.43	5.72
-4	319'8" - 323'6"	3.83	0.278	4.11	15.74	0.044	1.32	5.06	0.100	0.65	2.49
-5	323'6" - 328'6"	5.00	0.292	4.32	21.60	0.036	1.08	5.40	0.126	0.82	4.10
-6	333'2" - 338'2"	5.00	0.713	10.55	52.75	0.058	1.74	8.70	2.217	14.45	72.25
-7	338'2" - 343'2"	5.00	0.496	7.34	36.70	0.051	1.53	7.65	0.239	1.56	7.80
-8	343'2" - 348'2"	5.00	0.288	4.26	21.30	0.036	1.08	5.40	0.170	1.11	5.55
-9	348'2" - 353'2"	5.00	0.329	4.87	24.35	0.036	1.08	5.40	0.138	0.90	4.50
-10	353'2" - 358'2"	5.00	0.386	5.71	28.55	0.044	1.32	6.60	0.132	0.86	4.30
-11	358'2" - 363'2"	5.00	0.341	5.05	25.25	0.036	1.08	5.40	0.132	0.86	4.30
-12	363'2" - 368'2"	5.00	0.376	5.56	27.80	0.036	1.08	5.40	0.119	0.78	3.90
-13	368'2" - 371'4"	3.17	0.412	6.10	19.34	0.044	1.32	4.18	0.144	0.94	2.98
-14	371'4" - 376'4"	5.00	0.890	13.17	65.85	0.073	2.19	10.95	0.907	5.91	29.55
-15	387'3" - 392'3"	5.00	0.101	1.49	7.45	0.014	0.42	2.10	0.056	0.37	1.85
-16	330' - 334'1"	4.08	0.304	4.50	18.36	0.036	1.08	4.41	0.403	2.63	10.73
-17	376'4" - 381'5"	5.08	0.664	9.83	49.94	0.051	1.53	7.77	0.107	0.70	3.56
	Ft. assayed	80.16			740.88			122.88			171.38
	Not assayed	25.42									
	Total ft.	105.58									

Ni value $\frac{740.88}{105.58}$ = $7.017/ton Co value $\frac{122.88}{105.58}$ = $1.164/ton Cu value $\frac{171.38}{105.58}$ = $1.623/ton

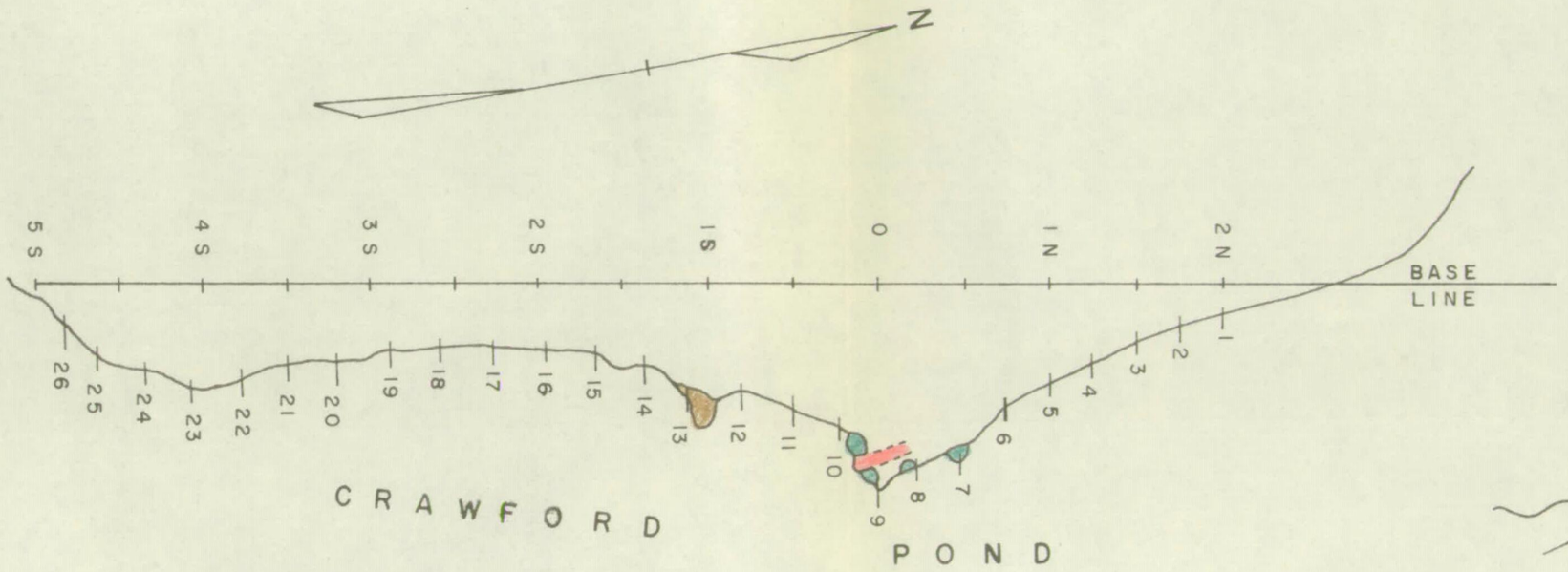
Ni value $\frac{740.88}{80.16}$ = $9.242/ton Co value $\frac{122.88}{80.16}$ = $1.532/ton Cu value $\frac{171.38}{80.16}$ = $2.138/ton

Line 17S

Assayed Hole: CP-13
Not assayed: CP-8

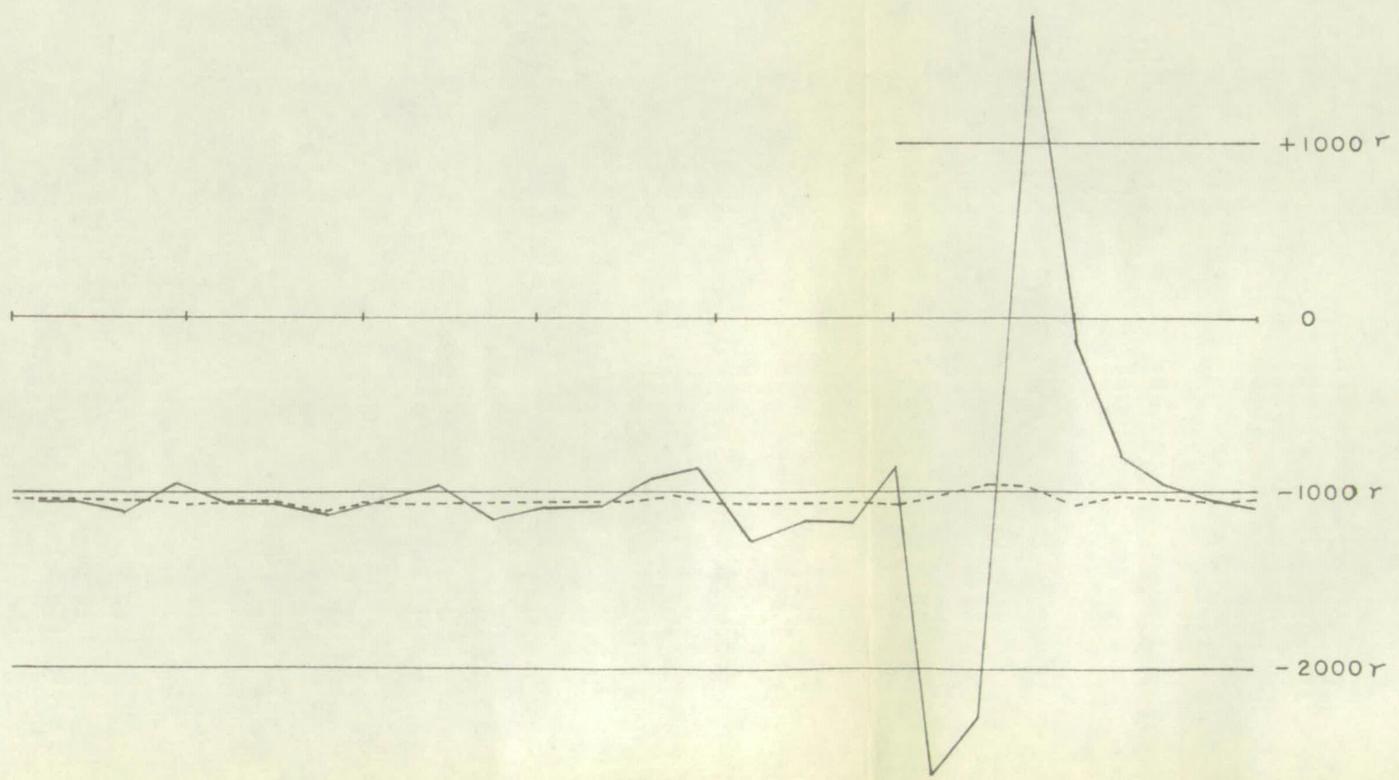
CP-13	Interval	Interval Length	% Ni	$/ton Ni	ft x $/ton Ni	% Co	$/ton Co	ft x $/ton Co	% Cu	$/ton Cu	ft x $/ton Cu
-1	191' - 196'	5.00	0.392	5.80	29.00	0.022	0.66	3.30	0.114	0.74	3.70
-2	196' - 201'	5.00	0.173	2.56	12.80	0.022	0.66	3.30	0.094	0.61	3.05
-3	201' - 206'	5.00	0.209	3.09	15.45	0.029	0.87	4.35	0.094	0.61	3.05
	Ft. assayed	15.00			57.25			10.95			9.80
	Total ft.	15.00									

Ni value $\frac{57.25}{15}$ = $3.817/ton Co value $\frac{10.95}{15}$ = $0.730/ton Cu value $\frac{9.80}{15}$ = $0.653/ton



LEGEND

- Shore line
- Mag. profile A
- Mag. profile B



LITHOLOGY

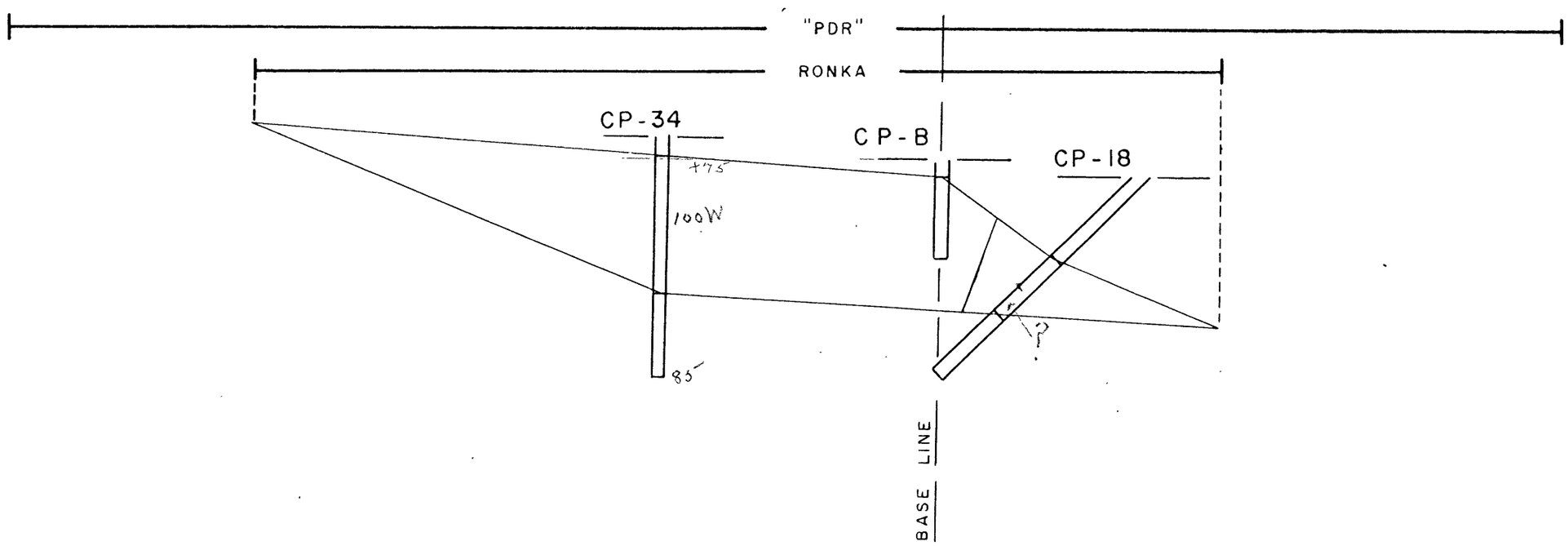
- Pegmatite
- Peridotite
- Quartz-biotite schist

0 100 ft. 200 ft. 300 ft.

NOTE: Numbers 1 thru 26 are shore line traverse

Stage 1 Area 2 Phase 1 (b)	Drawn by: Traced by: S.H.C. Approved by:	ROLAND F. BEERS, INC. TROY, N.Y. KNOX TIMBER PROSPECT (P-3) MAGNETOMETER PROFILE
		County: KNOX · Twnp: WARREN · Scale: 1in.=100ft.

"2 N" TRAVERSE



CP-B

9225 ft^2 at $6.81/ton

Ni value	4.667 x 9225	=	43,053	ft^2/ton
Co value	0.949 x 9225	=	8,754	"
Cu value	1.194 x 9225	=	11,015	"

CP-18

1425 ft^2 at $11.09/ton

Ni value	8.632 x 1425	=	12,300	ft^2/ton
Co value	0.848 x 1425	=	1,208	"
Cu value	1.614 x 1425	=	2,300	"

Average value = $7.38/ton

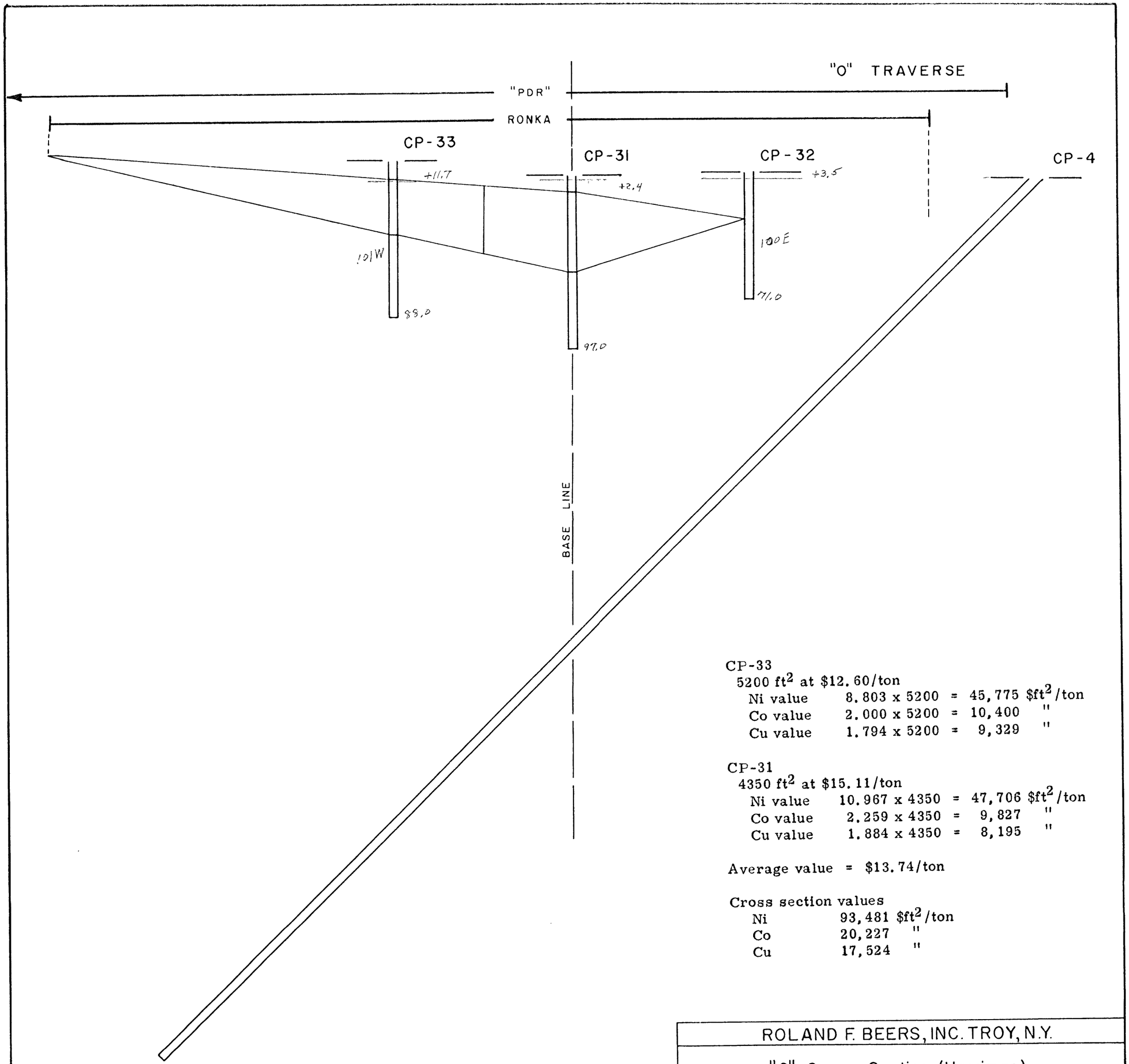
Cross section values

Ni	55,353	ft^2/ton
Co	9,962	"
Cu	13,315	"

ROLAND F. BEERS, INC. TROY, N.Y.

2 North Cross Section (Harriman)

Township UNION	County KNOX, MAINE	Scale 1" = 50'



CP-33
5200 ft^2 at $12.60/ton

Ni value	8.803 x 5200	=	45,775	ft^2/ton
Co value	2.000 x 5200	=	10,400	"
Cu value	1.794 x 5200	=	9,329	"

CP-31
4350 ft^2 at $15.11/ton

Ni value	10.967 x 4350	=	47,706	ft^2/ton
Co value	2.259 x 4350	=	9,827	"
Cu value	1.884 x 4350	=	8,195	"

Average value = $13.74/ton

Cross section values

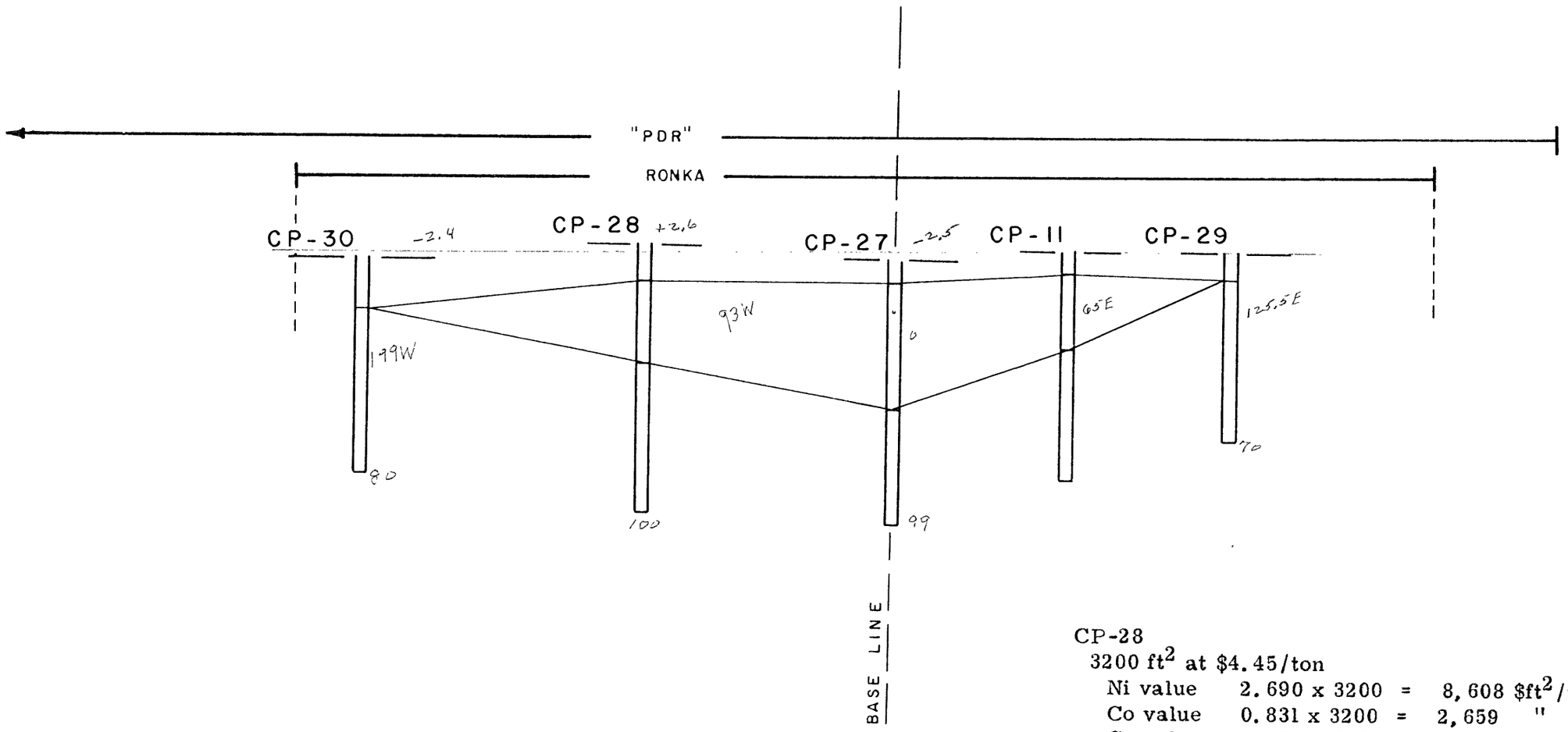
Ni	93,481	ft^2/ton
Co	20,227	"
Cu	17,524	"

ROLAND F. BEERS, INC. TROY, N.Y.

"O" Cross Section (Harriman)

Township UNION	County KNOX, MAINE	Scale 1" = 50'

"2 S" TRAVERSE



CP-28
3200 ft^2 at $4.45/ton

Ni value	2.690 x 3200	=	8,608	ft^2/ton
Co value	0.831 x 3200	=	2,659	"
Cu value	0.934 x 3200	=	2,989	"

CP-27
3450 ft^2 at $14.65/ton

Ni value	10.523 x 3450	=	36,304	ft^2/ton
Co value	2.098 x 3450	=	7,238	"
Cu value	2.033 x 3450	=	7,014	"

CP-11
1825 ft^2 at $15.48/ton

Ni value	11.562 x 1825	=	21,100	ft^2/ton
Co value	1.606 x 1825	=	2,930	"
Cu value	2.309 x 1825	=	4,214	"

Average value $10.98/ton

Cross section values

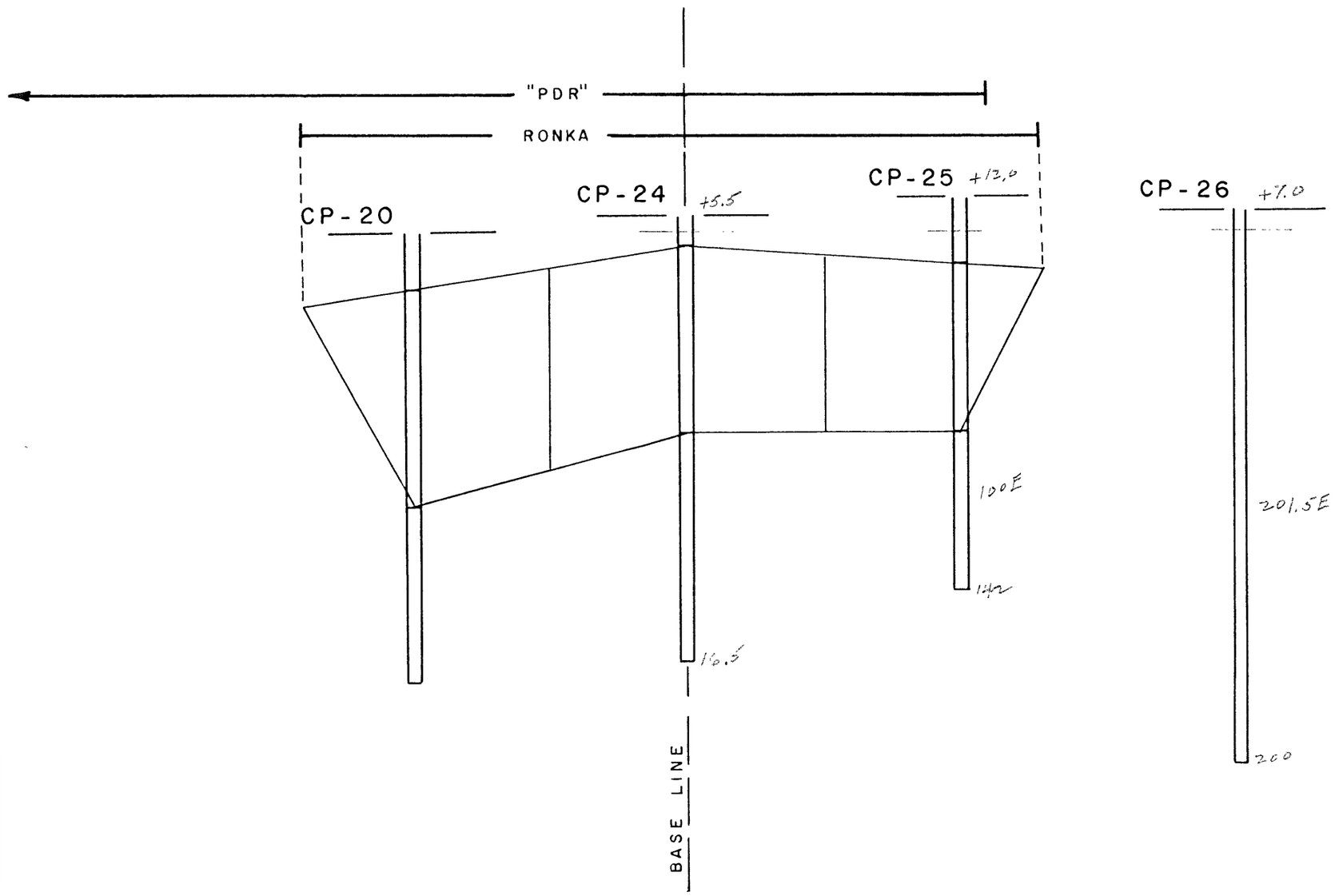
Ni	66,012	ft^2/ton
Co	12,827	"
Cu	14,217	"

ROLAND F. BEERS, INC. TROY, N.Y.

2 South Cross Section (Harriman)

Township UNION	County KNOX, MAINE	Scale 1"=50'

"4 S" TRAVERSE



CP-20
5350 ft^2 at $4.71/ton

Ni value	3.090 x 5350	=	16,531 $ft^2/ton
Co value	0.970 x 5350	=	5,190 "
Cu value	0.649 x 5350	=	3,472 "

CP-24
6875 ft^2 at $9.90/ton

Ni value	6.491 x 6875	=	44,626 $ft^2/ton
Co value	1.380 x 6875	=	9,487 "
Cu value	2.030 x 6875	=	13,956 "

CP-25
4075 ft^2 at $8.42/ton

Ni value	5.485 x 4075	=	22,351 $ft^2/ton
Co value	1.684 x 4075	=	6,862 "
Cu value	1.249 x 4075	=	5,090 "

Average value = $7.83/ton

Cross section values

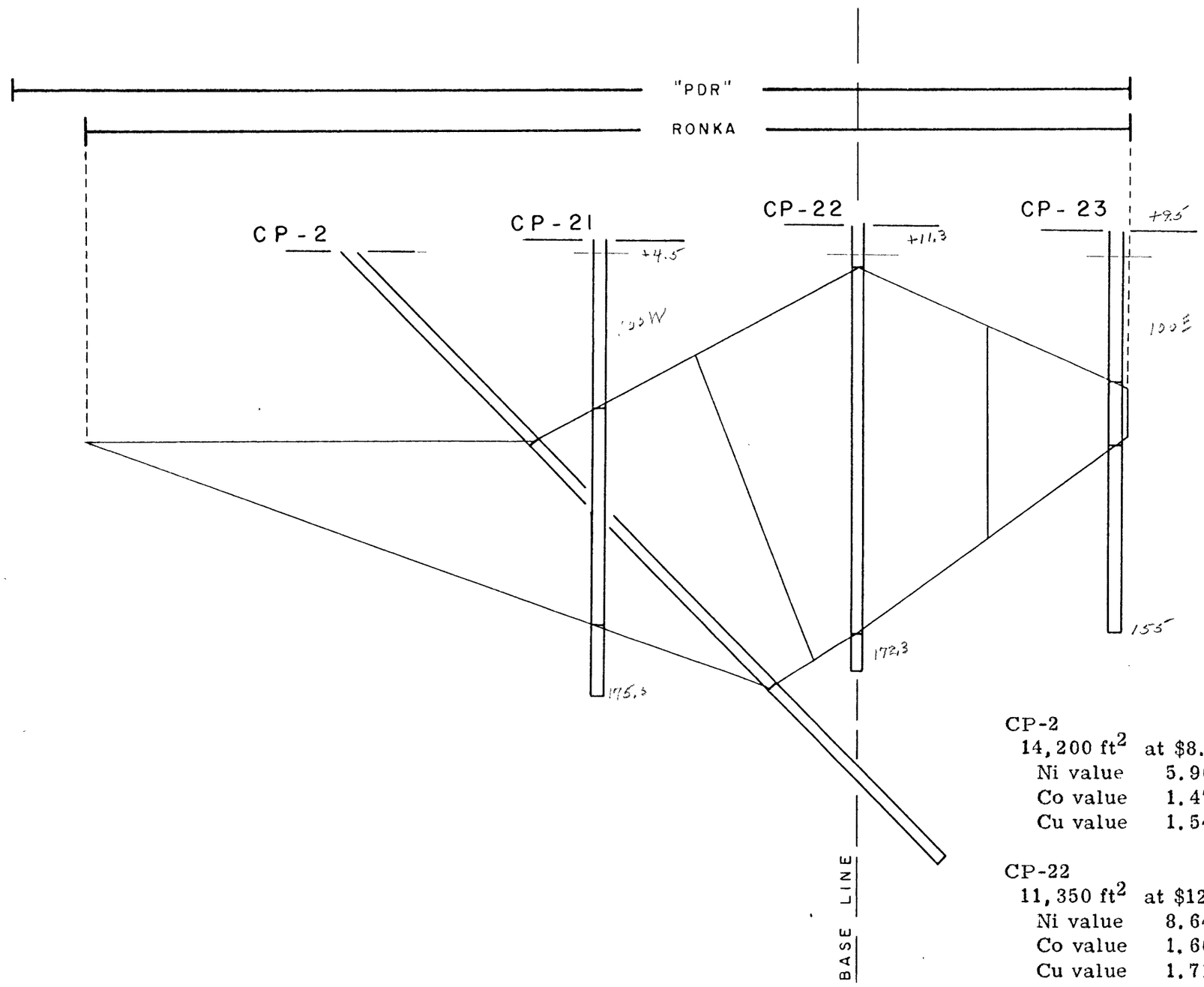
Ni	83,508 $ft^2/ton
Co	21,539 "
Cu	22,518 "

ROLAND F. BEERS, INC. TROY, N.Y.

4 South Cross Section (Harriman)

Township UNION	County KNOX, MAINE	Scale 1" = 50'

"6 S" TRAVERSE



CP-2
14,200 ft^2 at $8.99/ton
Ni value 5.969 x 14,200 = 84,760 ft^2/ton
Co value 1.478 x 14,200 = 20,987 "
Cu value 1.542 x 14,200 = 21,896 "

CP-22
11,350 ft^2 at $12.03/ton
Ni value 8.648 x 11,350 = 98,155 ft^2/ton
Co value 1.663 x 11,350 = 18,875 "
Cu value 1.716 x 11,350 = 19,477 "

CP-23
2,725 ft^2 at $9.83/ton
Ni value 6.494 x 2725 = 17,696 ft^2/ton
Co value 1.306 x 2725 = 3,559 "
Cu value 2.035 x 2725 = 5,545 "

Average value = $10.29/ton

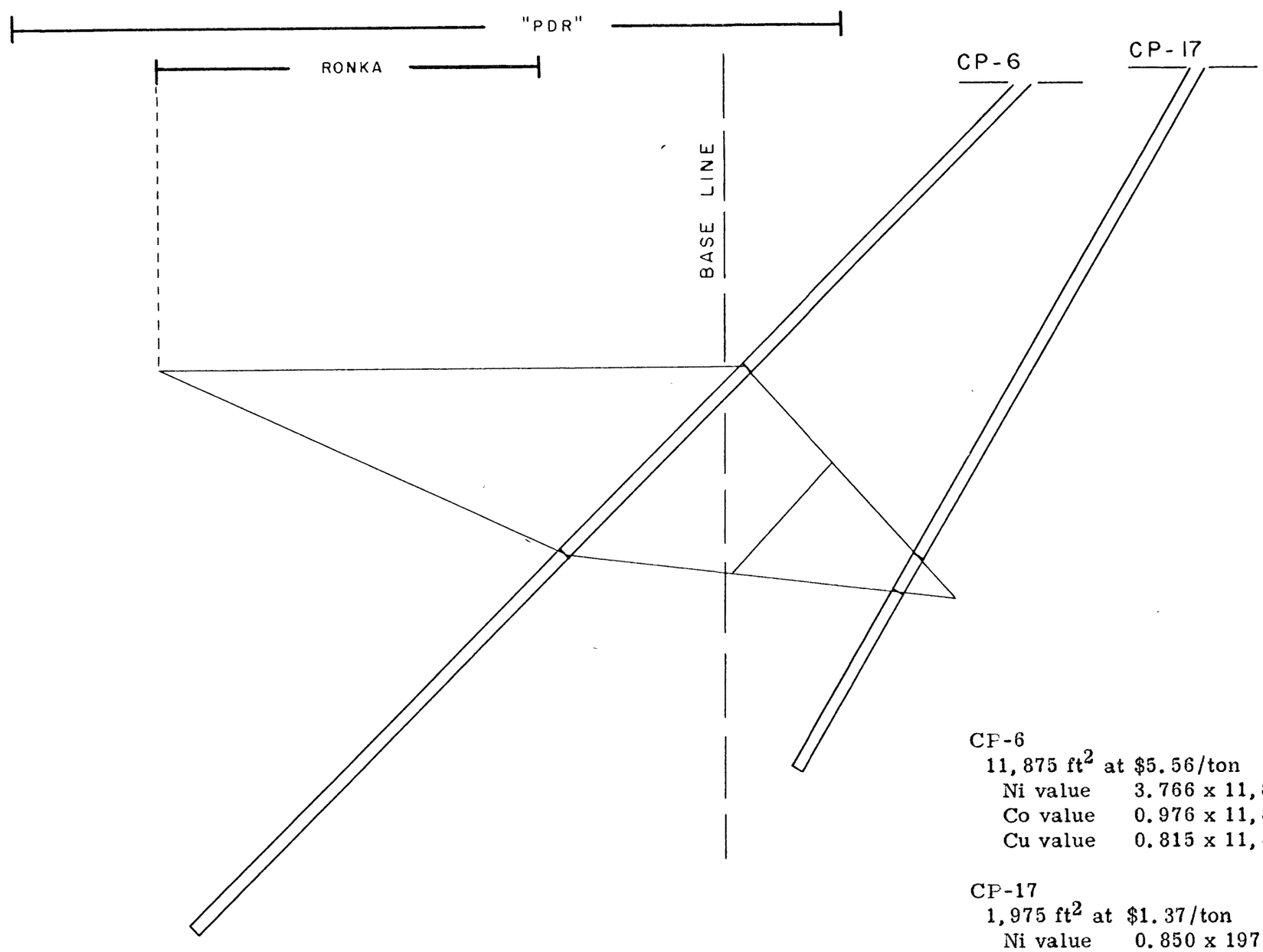
Cross section values
Ni 200,611 ft^2/ton
Co 43,421 "
Cu 46,918 "

ROLAND F. BEERS, INC. TROY, N.Y.

6 South Cross Section (Harriman)

Township UNION	County KNOX, MAINE	Scale 1"=50'

"9 S" TRAVERSE



CP-6
11,875 ft^2 at $5.56/ton

Ni value	3.766 x 11,875	=	44,721 ft^2/ton
Co value	0.976 x 11,875	=	11,590 "
Cu value	0.815 x 11,875	=	9,678 "

CP-17
1,975 ft^2 at $1.37/ton

Ni value	0.850 x 1975	=	1,678 ft^2/ton
Co value	0.440 x 1975	=	869 "
Cu value	0.080 x 1975	=	158 "

Average value = $4.96/ton

Cross section values

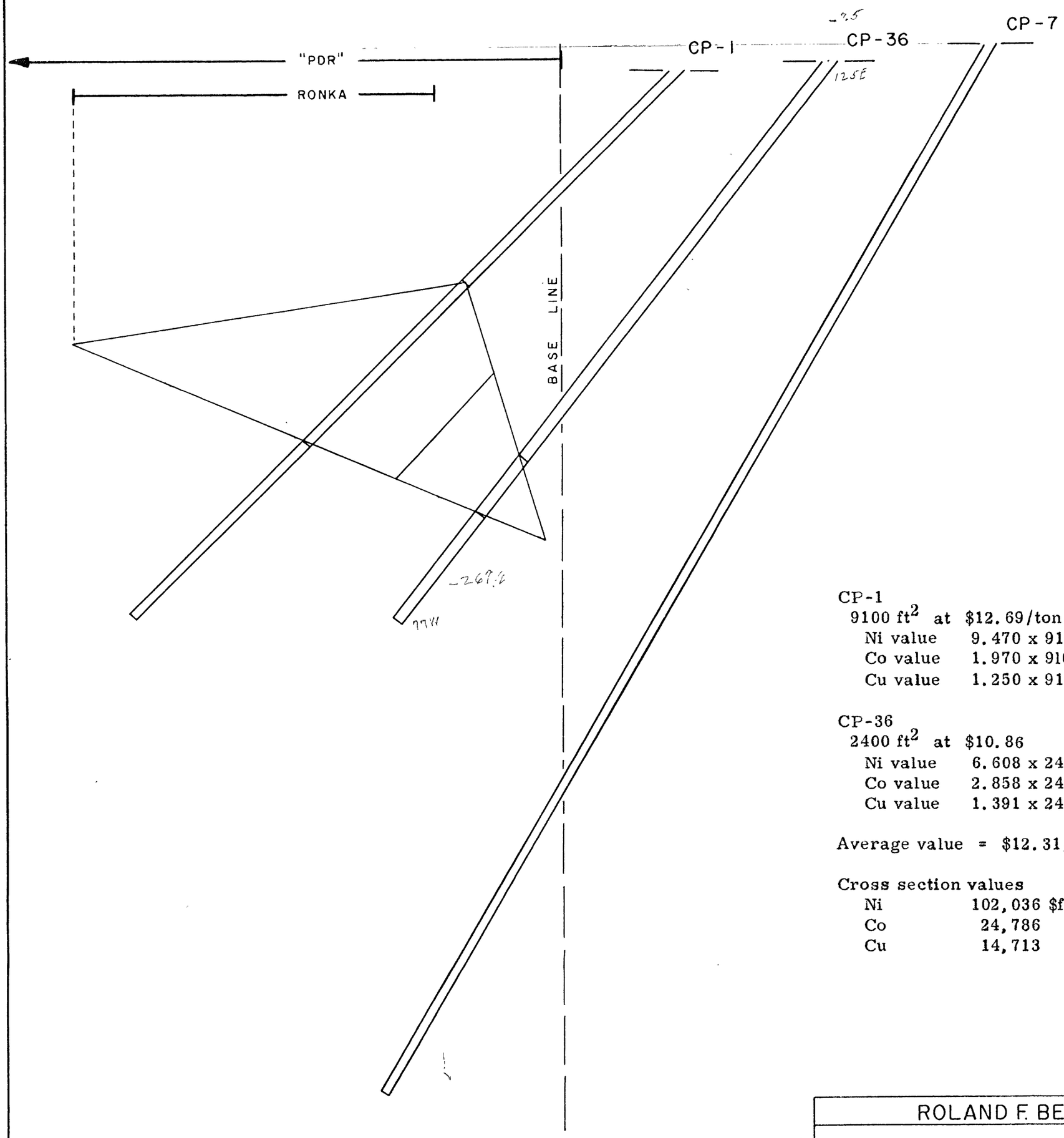
Ni	46,399 ft^2/ton
Co	12,459 "
Cu	9,836 "

ROLAND F. BEERS, INC. TROY, N.Y.

9 South Cross Section (Harriman)

Township UNION	County KNOX, MAINE	Scale 1" = 50'

"12 S" TRAVERSE



CP-1
9100 ft^2 at $12.69/ton
Ni value 9.470 x 9100 = 86,177 ft^2/ton
Co value 1.970 x 9100 = 17,927 "
Cu value 1.250 x 9100 = 11,375 "

CP-36
2400 ft^2 at $10.86
Ni value 6.608 x 2400 = 15,859 ft^2/ton
Co value 2.858 x 2400 = 6,859 "
Cu value 1.391 x 2400 = 3,338 "

Average value = $12.31/ton

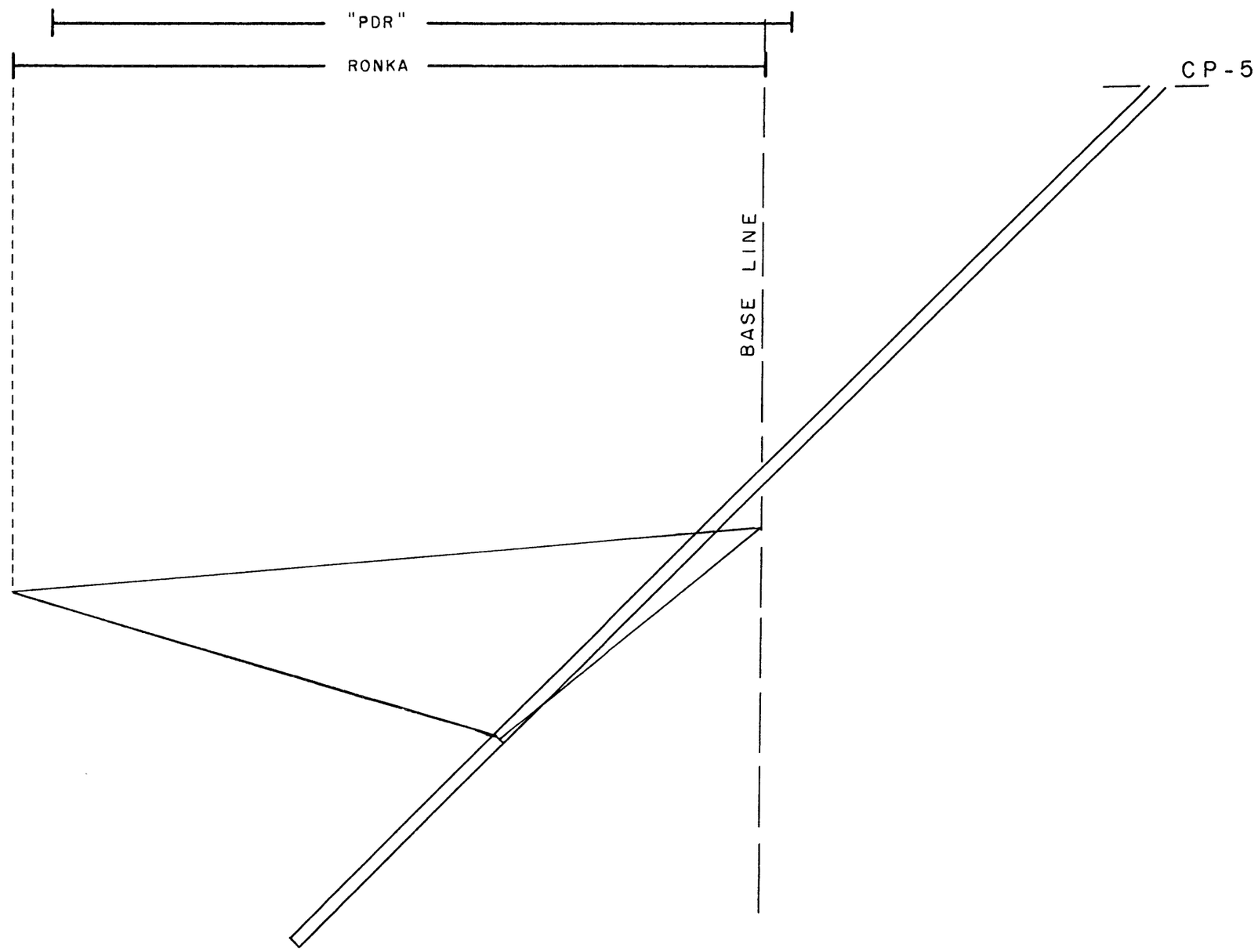
Cross section values
Ni 102,036 ft^2/ton
Co 24,786 "
Cu 14,713 "

ROLAND F. BEERS, INC. TROY, N.Y.

12 South Cross Section (Harriman)

Township UNION	County KNOX, MAINE	Scale 1"=50'

"14.3 S" TRAVERSE



CP-5
9,750 ft^2 at $14.67/ton

Cross section values

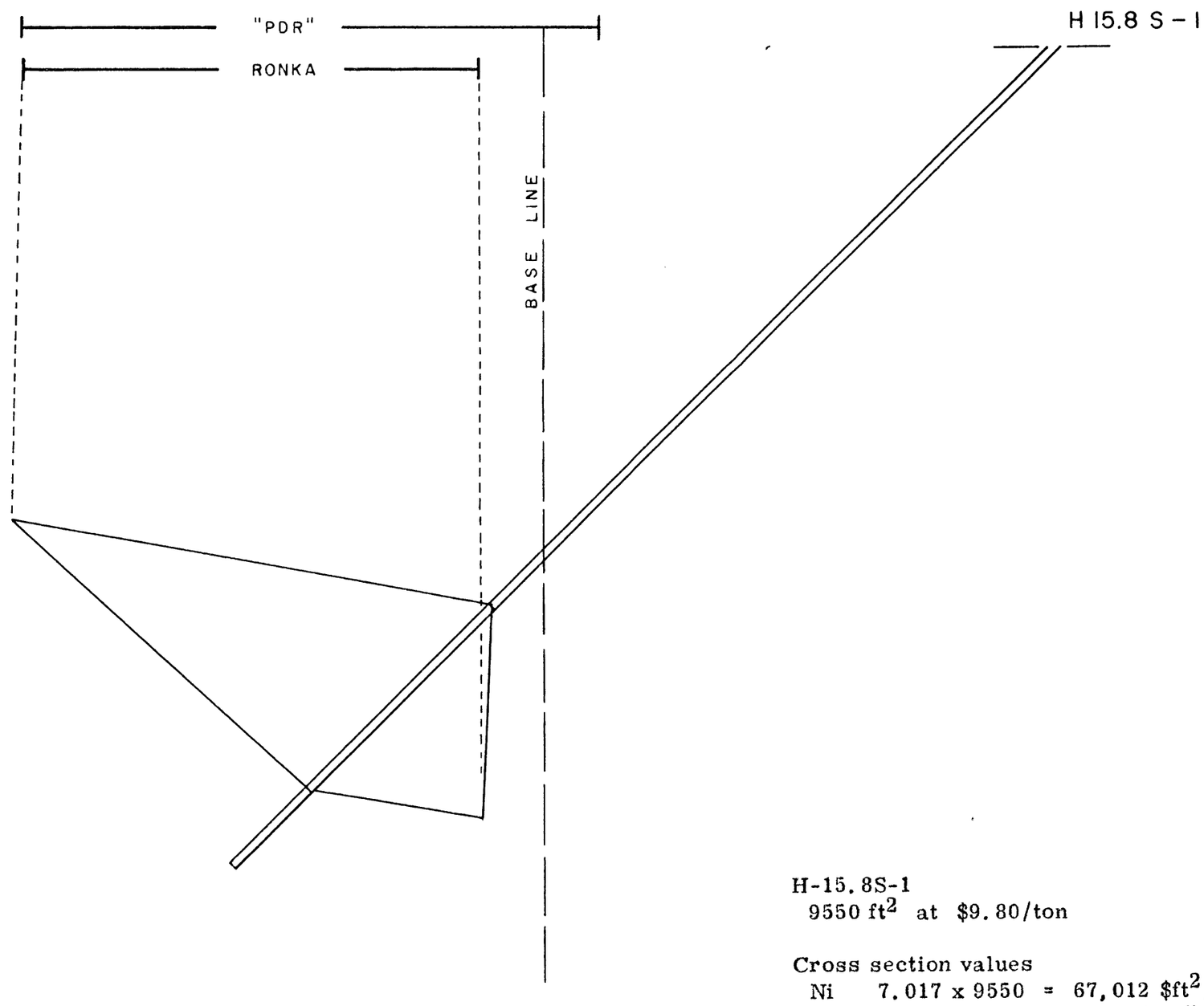
Ni	106,402	$ft^2/ton
Co	20,300	"
Cu	16,292	"

ROLAND F. BEERS, INC. TROY, N.Y.

14.3 South Cross Section (Harriman)

Township UNION	County KNOX, MAINE	Scale 1" = 50'

"15.8 S" TRAVERSE



H-15.8S-1
9550 ft^2 at $9.80/ton

Cross section values

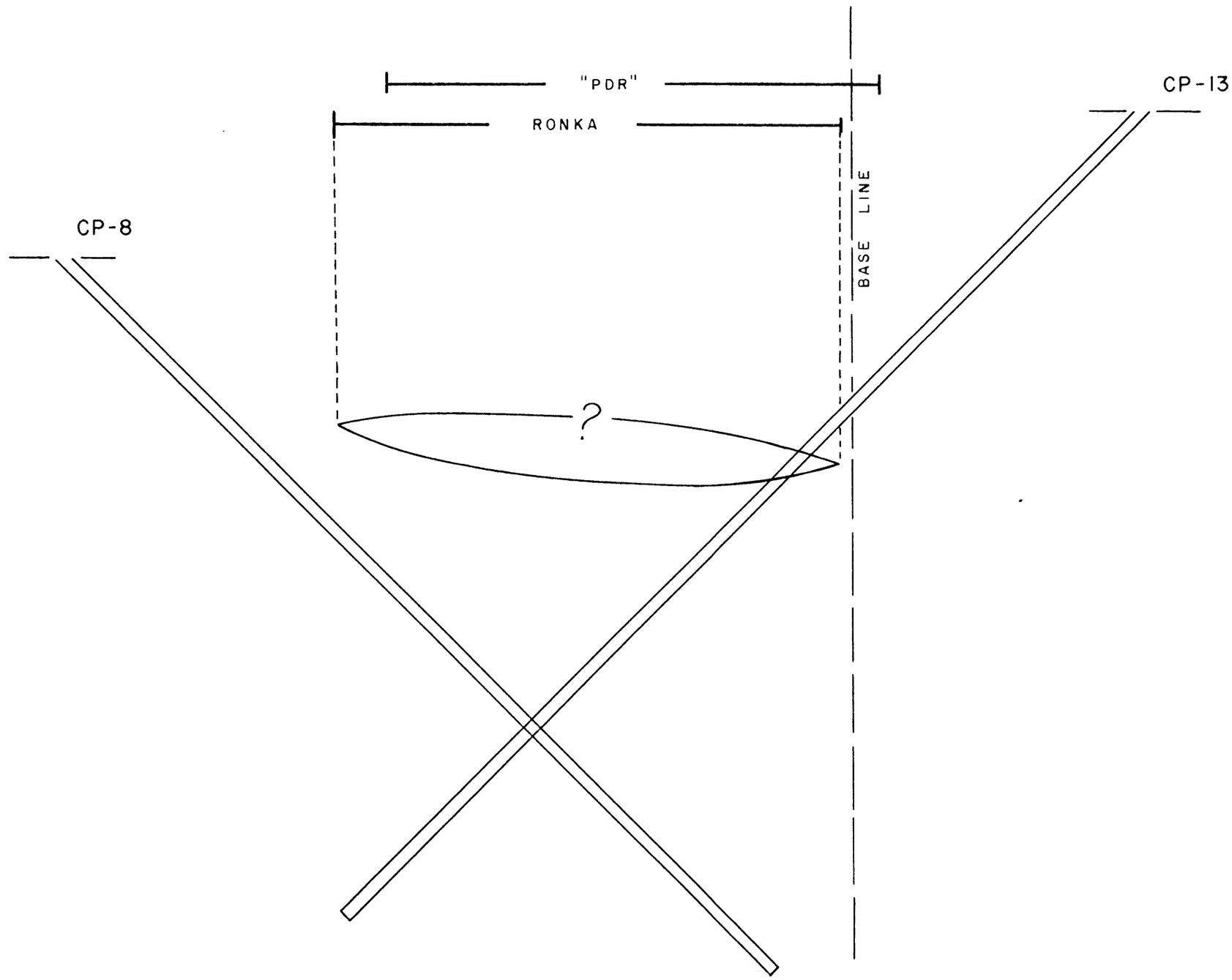
Ni	7.017 x 9550	=	67,012 $\$ft^2$/ton
Co	1.164 x 9550	=	11,116 "
Cu	1.623 x 9550	=	15,500 "

ROLAND F. BEERS, INC. TROY, N.Y.

15.8 South Cross Section (Harriman)

Township UNION	County KNOX, MAINE	Scale 1" = 50'

"17 S" TRAVERSE



CP-13
3500 ft^2 at $5.20/ton

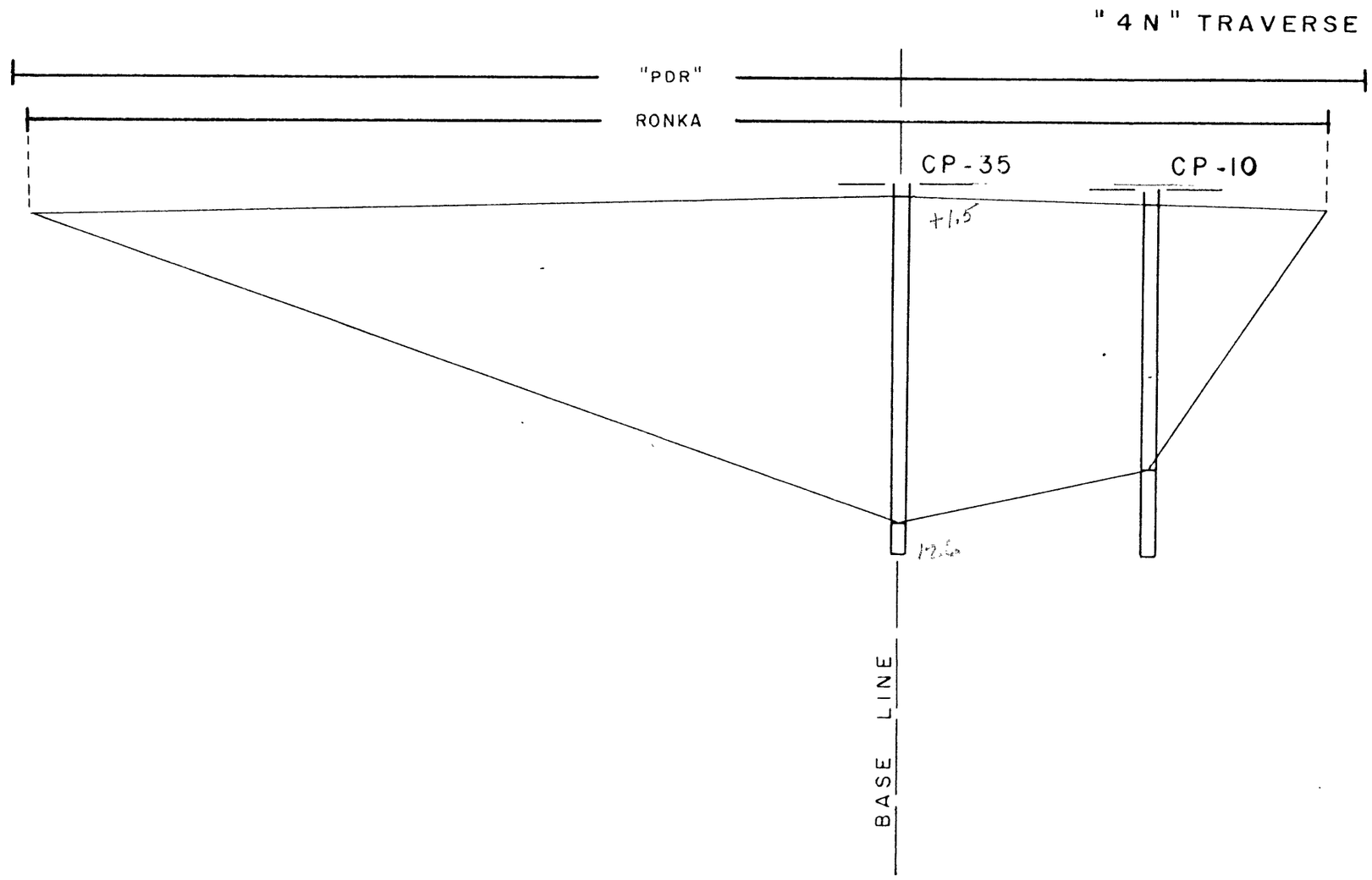
Cross section values

Ni	3.817 x 3500	=	13,360 $ft^2/ton
Co	0.730 x 3500	=	2,555 "
Cu	0.653 x 3500	=	2,285 "

ROLAND F. BEERS, INC. TROY, N.Y.

17 South Cross Section (Harriman)

Township UNION	County KNOX, MAINE	Scale 1" = 50'



CP-10

28,250 ft^2 at $1.76/ton

Ni value	1.124 x 28,250 = 31,753	$\$ft^2$/ton
Co value	0.409 x 28,250 = 11,554	"
Cu value	0.229 x 28,250 = 6,469	"

ROLAND F. BEERS, INC. TROY, N.Y.

4 North Cross Section (Harriman)

Township UNION	County KNOX, MAINE	Scale 1" = 50'

Line 2S

Assayed Holes: CP-28, CP-27, CP-11
Not assayed : CP-30, CP-29

CP-28	Interval	Interval Length	% Ni	$/ton Ni	ft x $/ton Ni	% Co	$/ton Co	ft x $/ton Co	% Cu	$/ton Cu	ft x $/ton Cu
-1	14' - 20'	6.00	0.264	3.91	23.46	0.051	1.53	9.18	0.113	0.74	4.44
-2	22' - 27'	5.00	0.186	2.75	13.75	0.036	1.08	5.40	0.132	0.86	4.30
-3	31' - 34'6"	3.50	0.312	4.62	16.17	0.044	1.32	4.62	0.648	4.22	14.77
-4	40'7"-43'9"	3.17	0.568	8.41	26.66	0.058	1.74	5.52	0.207	1.35	4.28
	Ft assayed	17.67			80.04			24.72			27.79
	Not assayed	12.08									
	Total ft.	29.75									

Ni value $\frac{80.04}{29.75}$ = $2.690/ton Co value $\frac{24.72}{29.75}$ = $0.831/ton Cu value $\frac{27.79}{29.75}$ = $o.934/ton

Ni value $\frac{80.04}{17.67}$ = $4.530/ton Co value $\frac{24.72}{17.67}$ = $1.400/ton Cu value $\frac{27.79}{17.67}$ = $1.573/ton

CP-27

-1	9'4" - 17'	7.67	1.060	15.69	120.34	0.095	2.85	21.86	0.312	2.03	15.57
-2	17' - 22'5"	5.42	0.906	13.41	72.68	0.073	2.19	11.87	0.485	3.16	17.13
-3	22'5" - 29'2"	19.8 6.75	1.056/1.017	15.63	105.50	0.102	3.06	20.65	19.8 0.333 0.366	2.17	14.65
-4	35'10" - 40'10"	5.00	1.190	17.61	88.05	0.102	3.06	15.30	0.245	1.60	8.00
-5	40'10" - 45'5"	4.58	9.6 0.475 0.848	7.03	32.20	0.058	1.74	7.97	0.296 0.269	1.93	8.84
-6	45'5" - 50'	4.58	4.6 0.264	3.91	17.91	0.052	1.56	7.14	0.497	3.24	14.84
-7	50' - 55'9"	5.75	5.7 0.609	9.01	51.81	0.073	2.19	12.59	0.409	2.67	15.35
	Ft assayed	39.75	19.9 0.645		488.49			97.38	19.9 0.362		94.38
	Not assayed	6.67									
	Total ft.	46.42									

Ni value $\frac{488.49}{46.42}$ = $10.523/ton Co value $\frac{97.38}{46.42}$ = $2.098/ton Cu value $\frac{94.38}{46.42}$ = $2.033/ton

Ni value $\frac{488.49}{39.75}$ = $12.289/ton Co value $\frac{97.38}{39.75}$ = $2.450/ton Cu value $\frac{94.38}{39.75}$ = $2.374/ton

CP-11

-1	8' - 12'	4.00	1.003	14.84	59.36	0.066	1.98	7.92	0.994	6.48	25.92
-2	12' - 17'	5.00	0.751	11.11	55.55	0.044	1.32	6.60	0.277	1.81	9.05
-3	17' - 21'9"	4.75	0.674	9.98	47.40	0.051	1.53	7.27	0.189	1.23	5.84
-4	22'2"-27'0"	4.83	0.621	9.19	44.39	0.051	1.53	7.39	0.226	1.47	7.10
-5	27' - 32'	5.00	0.869	12.86	64.30	0.058	1.74	8.70	0.189	1.23	6.15
-6	32' - 37'	5.00	0.869	12.86	64.30	0.058	1.74	8.70	0.396	2.58	12.90
	Ft assayed	28.58			335.30			46.58			66.96
	Not assayed	0.42									
	Total ft.	29.00									

Ni value $\frac{335.30}{29.00}$ = $11.562/ton Co value $\frac{46.58}{29.00}$ = $1.606/ton Cu value $\frac{66.96}{29.00}$ = $2.309/ton

Ni value $\frac{335.30}{28.58}$ = $11.732/ton Co value $\frac{46.58}{28.58}$ = $1.630/ton Cu value $\frac{66.96}{28.58}$ = $2.343/ton

LINE 4S

Holes Assayed: CP-20, CP-24, CP-25
Not assayed: CP-26

	Interval	Interval Length	% Ni	$/ton Ni	ft x $/ton Ni	% Co	$/ton Co	ft x $/ton Co	% Cu	$/ton Cu	ft x $/ton Cu
CP-20											
-1	21 - 26	5.00	0.235	3.48	17.40	0.051	1.53	7.65	0.327	2.13	10.65
-2	26 - 31	5.00	0.231	3.42	17.10	0.051	1.53	7.65	0.119	0.78	3.90
-3	31 - 36	5.00	0.235	3.48	17.40	0.044	1.32	6.60	0.138	0.90	4.50
-4	36 - 41	5.00	0.203	3.00	15.00	0.044	1.32	6.60	0.138	0.90	4.50
-5	41 - 46	5.00	0.166	2.46	12.30	0.029	0.87	4.35	0.100	0.65	3.25
-6	46 - 51'8"	5.67	0.259	3.83	21.72	0.044	1.32	7.48	0.132	0.86	4.88
-7	55- 58'6"	3.50	0.194	2.87	10.04	0.036	1.08	3.78	0.119	0.78	2.73
-8	61 - 64'4"	3.33	0.523	7.74	25.77	0.058	1.74	5.79	0.182	1.19	3.96
-9	76 - 81	5.00	0.357	5.28	26.40	0.044	1.32	6.60	0.113	0.74	3.70
-10	81 - 85	4.00	0.337	4.99	19.96	0.044	1.32	5.28	0.144	0.94	3.76
-11	89'2" - 94'	4.83	0.215	3.18	15.36	0.036	1.08	5.22	0.069	0.45	2.17
-12	94 - 99	5.00	0.576	8.52	42.60	0.058	1.74	8.70	0.081	0.53	2.65
	Ft. assayed	56.33			241.05			75.70			50.65
	Not assayed	21.67									
	Total Ft.	78.00									

Ni value $\frac{241.05}{78.00}$ = $3.090/ton Co value $\frac{75.70}{78.00}$ = $0.970/ton Cu value $\frac{50.65}{78.00}$ = $0.649/ton

Ni value $\frac{241.05}{56.33}$ = $4.279/ton Co value $\frac{75.70}{56.33}$ = $1.344/ton Cu value $\frac{50.65}{56.33}$ = $0.899/ton

CP-24											
-1	11 - 16	5.00	0.532	7.87	39.35	0.073	2.19	10.95	0.598	3.90	19.50
-2	16 - 21	5.00	0.512	7.58	37.90	0.066	1.98	9.90	0.264	1.72	8.60
-3	21 - 26	5.00	0.510	7.55	37.75	0.066	1.98	9.90	0.365	2.38	11.90
-4	26 - 31	5.00	0.508	7.52	37.60	0.066	1.98	9.90	0.415	2.71	13.55
-5	31 - 36	5.00	0.463	6.85	34.25	0.044	1.32	6.60	0.333	2.17	10.85
-6	36 - 41	5.00	0.638	9.44	47.20	0.058	1.74	8.70	0.371	2.42	12.10
-7	41 - 46	5.00	0.581	8.60	43.00	0.051	1.53	7.65	0.346	2.26	11.30
-8	46 - 51	5.00	40.0 0.638 0.548	9.44	47.20	0.058	1.74	8.70	0.516 0.339	3.36	16.80
-9	51 - 56	5.00	0.284	4.20	21.00	0.036	1.08	5.40	0.258	1.68	8.40
-10	61 - 66	5.00	0.386	5.71	28.55	0.029	.87	4.35	0.170	1.11	5.55
-11	66 - 71	5.00	0.306	4.53	22.65	0.029	.87	4.35	0.201	1.31	6.55
-12	71 - 78	7.00	17.0 0.371 0.356	5.49	38.43	0.029	.87	6.09	0.239 0.208	1.56	10.92
	Ft. assayed	62.00			434.88			92.49			136.02
	NNot assayed	5.00									
	Total Ft.	67.00									

Ni value $\frac{434.88}{67.00}$ = $6.491/ton Co value $\frac{92.49}{67.00}$ = $1.380/ton Cu value $\frac{136.02}{67.00}$ = $2.030/ton

Ni value $\frac{434.88}{62.00}$ = $7.014/ton Co value $\frac{92.49}{62.00}$ = $1.492/ton Cu value $\frac{136.02}{62.00}$ = $2.194/ton

CP-25											
-1	23 - 29'6"	6.50	0.701	10.37	67.40	0.117	3.51	22.82	0.642	4.19	27.23
-2	43'2" - 48'	4.83	0.422	6.25	30.19	0.066	1.98	9.56	0.151	0.98	4.73
-3	48' - 53'	5.00	0.373	5.52	27.60	0.066	1.98	9.90	0.163	1.06	5.30
-4	53' - 58'	5.00	0.304	4.50	22.50	0.058	1.74	8.70	0.144	0.94	4.70
-5	58' - 63'	5.00	15.0 0.396 0.358	5.86	29.30	0.058	1.74	8.70	0.258 0.188	1.68	8.40
-6	63' - 68'	5.00	0.581	8.60	43.00	0.088	2.64	13.20	0.252	1.64	8.20
-7	68' - 74'6"	6.50	11.5 0.873 0.746	12.92	83.98	0.102	3.06	19.89	0.252	1.64	10.66
-8	79'6" - 84'3"	4.75	0.455	6.73	31.97	0.073	2.19	10.40	0.233	1.52	7.22
	Ft. Assayed	42.58			335.94			103.17			76.44
	Not assayed	18.67									
	Total Ft.	61.25									

Ni value $\frac{335.94}{61.25}$ = $5.485/ton Co value $\frac{103.17}{61.25}$ = $1.684/ton Cu value $\frac{76.44}{61.25}$ = $1.248/ton

Ni value $\frac{335.94}{42.58}$ = $7.877/ton Co value $\frac{103.17}{42.58}$ = $2.423/ton Cu value $\frac{76.44}{42.58}$ = $1.795/ton

LINE 6S

Assayed Holes: CP-2, CP-22, CP-23
Not assayed: CP-21

CP-2	Interval	Interval length	% Ni	$/ton Ni	ft x $/ton Ni	% Co	$/ton Co	ft x $/ton Co	% Cu	$/ton Cu	ft x $/ton Cu
-1	102'7" - 107'10"	5.25	0.175	2.59	13.60	0.044	1.32	6.93	0.075	0.49	2.57
-2	107'10" - 112'11"	5.08	0.142	2.10	10.67	0.044	1.32	6.71	0.056	0.36	1.83
-3	112'11" - 117'9"	4.83	0.134	1.98	9.56	0.044	1.32	6.38	0.094	0.61	2.95
-4	117'9" - 120'7"	2.83	0.130	1.92	5.43	0.051	1.53	4.33	0.157	1.02	2.89
-5	128'6" - 134'	5.50	0.179	2.65	14.57	0.044	1.32	7.26	0.100	0.65	3.57
-6	134' - 139'	5.00	0.142	2.10	10.50	0.058	1.74	8.70	0.113	0.74	3.70
-7	139' - 143'10"	4.83	0.130	1.92	9.27	0.044	1.32	6.38	0.151	0.98	4.73
-8	144'2" - 149'2"	5.00	0.162	2.40	12.00	0.051	1.53	7.65	0.214	1.40	7.00
-9	149'2" - 154'	4.83	0.264	3.91	18.89	0.036	1.08	5.22	0.252	1.64	7.92
-10	154' - 159'	5.00	0.398	5.89	29.45	0.044	1.32	6.60	0.264	1.72	8.60
-11	159' - 163'9"	4.75	0.471	6.97	33.11	0.051	1.53	7.27	0.289	1.88	8.93
-12	163'9" - 168'9"	5.00	0.477	7.06	35.30	0.051	1.53	7.65	0.182	1.19	5.95
-13	168'9" - 173'10"	5.08	0.370	5.48	27.84	0.051	1.53	7.77	0.182	1.19	6.05
-14	173'10" - 179'	5.17	0.455	6.73	34.79	0.058	1.74	9.00	0.365	2.38	12.30
-15	179' - 184'2"	5.17	0.516	7.64	39.50	0.058	1.74	9.00	0.308	2.01	10.39
-16	184'2" - 189'3"	5.08	0.544	8.05	40.89	0.051	1.53	7.77	0.195	1.27	6.45
-17	189'3" - 194'3"	5.00	0.626	9.26	46.30	0.051	1.53	7.65	0.819	5.34	26.70
-18	194'3" - 199'3"	5.00	0.882	13.05	65.25	0.080	2.40	12.00	0.403	2.63	13.15
-19	199'3" - 205'	5.75	1.004	14.86	85.44	0.088	2.64	15.18	0.661	4.31	24.78
-20	206'8" - 210'5"	3.75	0.914	13.53	50.74	0.066	1.98	7.42	0.573	3.74	14.02
-21	214'4" - 220'	5.67	0.979	14.49	82.16	0.080	2.40	13.61	0.447	2.91	16.50
-22	220' - 225'	5.00	0.719	10.64	53.20	0.066	1.98	9.90	0.321	2.09	10.45
-23	225' - 230'	5.00	0.512	7.58	37.90	0.051	1.53	7.65	0.075	0.49	2.45
-24	230' - 235'	5.00	0.325	4.81	24.05	0.051	1.53	7.65	0.010	0.07	0.35
	Ft. assayed	118.57			790.41			195.68			204.23
	Not assayed	13.84									
	Total ft.	132.41									

Ni value $\frac{790.41}{132.41}$ = $5.969/ton Co value $\frac{195.68}{132.41}$ = $1.478/ton Cu value $\frac{204.23}{132.41}$ = $1.542/ton

Ni value $\frac{790.41}{118.57}$ = $6.666/ton Co value $\frac{195.68}{118.57}$ = $1.650/ton Cu value $\frac{204.23}{118.57}$ = $1.722/ton

CP-22											
-1	16' - 21'	5.00	0.703	10.40	52.00	0.088	2.64	13.20	0.365	2.38	11.90
-2	21' - 26'	5.00	0.764	11.31	56.55	0.081	2.43	12.15	0.428	2.79	13.95
-3	26' - 31'	5.00	0.658	9.74	48.70	0.073	2.19	10.95	0.491	3.20	16.00
-4	31' - 36'	5.00	0.813	12.03	60.15	0.088	2.64	13.20	0.604	3.94	19.70
-5	36' - 41'	5.00	0.762	11.28	56.40	0.080	2.40	12.00	0.409	2.67	13.35
-6	41' - 46'	5.00	0.745	11.03	55.15	0.073	2.19	10.95	0.333	2.17	10.85
-7	46' - 51'	5.00	0.758	11.22	56.10	0.073	2.19	10.95	0.359	2.34	11.70
-8	51' - 55'	4.00	39 0.512 0.720	7.58	30.32	0.058	1.74	6.96	0.160 0.400	1.04	4.16
-9	64'6" - 69'6"	5.00	0.367	5.43	27.15	0.051	1.53	7.65	0.201	1.31	6.55
-10	69'6" - 75'	5.50	0.300	4.44	24.42	0.036	1.08	5.94	0.157	1.02	5.61
-11	75' - 80'	5.00	15.5 0.292 0.319	4.32	21.60	0.036	1.08	5.40	0.157 0.171	1.02	5.10
-12	97' - 102'	5.00	0.680	10.06	50.30	0.066	1.98	9.90	0.396	2.58	12.90
-13	102' - 107'	5.00	0.560	8.29	41.45	0.044	1.32	6.60	0.094	0.61	3.05
-14	107' - 112'	5.00	0.747	11.06	55.30	0.066	1.98	9.90	0.100	0.65	3.25
-15	112' - 117'	5.00	0.782	11.57	57.85	0.066	1.98	9.90	0.642	4.19	20.95
-16	117' - 122'	5.00	1.591	23.55	117.75	0.117	3.51	17.55	0.252	1.64	8.20
-17	122' - 127'	5.00	1.036	15.33	76.65	0.102	3.06	15.30	0.466	3.04	15.20
-18	127' - 132'	5.00	0.670	9.92	49.60	0.066	1.98	9.90	0.504	3.29	16.45
-19	132' - 137'	5.00	0.717	10.61	53.05	0.073	2.19	10.95	0.352	2.29	11.45
-20	137' - 142'	5.00	0.538	7.96	39.80	0.036	1.08	5.40	0.195	1.27	6.35
-21	142' - 147'	5.00	50.0 1.835 0.916	27.15	135.75	0.133	3.99	19.95	0.283 0.328	1.85	9.25
-22	147' - 152'	5.00	0.345	5.11	25.55	0.036	1.08	5.40	0.214	1.40	7.00
-23	152' - 157'	5.00	10.0 0.376 0.360	5.56	27.80	0.029	0.87	4.35	0.277 0.246	1.81	9.05
	Ft. assayed	114.50			1219.39			234.45			241.97
	Not assayed	26.50									
	Total ft.	141.00									

Ni value $\frac{1219.39}{141.00}$ = $8.648/ton Co value $\frac{234.45}{141.00}$ = $1.663/ton Cu value $\frac{241.97}{141.00}$ = $1.716/ton

Ni value $\frac{1219.39}{114.50}$ = $10.649/ton Co value $\frac{234.45}{114.50}$ = $2.048/ton Cu value $\frac{241.97}{114.50}$ = $2.113/ton

CP-23											
-1	58'1" - 63'1"	5.00	0.522	7.73	38.65	0.044	1.32	6.60	0.806	5.26	26.30
-2	63'1" - 68'	4.90	9.9 0.739 0.629	10.94	53.61	0.058	1.74	8.53	0.277 0.544	1.81	8.87
-3	68' - 73'	5.00	0.374	5.54	27.70	0.036	1.08	5.40	0.119	0.78	3.90
-4	73' - 78'	5.00	0.319	4.72	23.60	0.044	1.32	6.60	0.245	1.60	8.00
-5	78' - 83'	5.00	16.0 0.245 0.313	3.63	18.15	0.036	1.08	5.40	0.110 0.158	0.72	3.60
	Ft. assayed	24.90			161.71			32.53			50.67
	Total ft.	24.90									

Ni value $\frac{161.71}{24.90}$ = $6.494/ton Co value $\frac{32.53}{24.90}$ = $1.306/ton Cu value $\frac{50.67}{24.90}$ = $2.035/ton

Line 42S

Assayed Hole: E-1

E-1	Interval	Interval Length	% Ni	$/ton Ni	ft x $/ton Ni	% Co	$/ton Co	ft x $/ton Co	% Cu	$/ton Cu	ft x $/ton Cu
-1	282'8" - 287'8"	5.00	0.301	4.45	22.25	0.029	0.87	4.35	0.126	0.82	4.10
	Ft assayed	5.00									

Ni value $\frac{22.25}{5}$ = $4.45/ton Co value $\frac{4.35}{5}$ = $0.87/ton Cu value $\frac{4.10}{5}$ = $0.82/ton

Line 52S

Assayed Hole: E-3

E-3	Interval	Interval Length	% Ni	$/ton Ni	ft x $/ton Ni	% Co	$/ton Co	ft x $/ton Co	% Cu	$/ton Cu	ft x $/ton Cu
-1	259'8" - 265'0"	5.33	0.792	11.72	62.47	0.073	2.19	11.67	0.283	1.85	9.86
-2	265' - 270'	5.00	0.686	10.15	50.75	0.073	2.19	10.95	0.308	2.01	10.05
-3	270' - 275'	5.00	0.873	12.92	64.60	0.088	2.64	13.20	0.289	1.88	9.40
-4	275' - 281'	6.00	0.802	11.87	71.22	0.080	2.40	14.40	1.026	6.69	40.14
-5	282' - 287'	5.00	0.684	10.12	50.60	0.080	2.40	12.00	0.598	3.90	19.50
-6	287' - 291'6"	4.50	0.703	10.40	46.80	0.073	2.19	9.85	0.844	5.50	24.75
-7	291'6" - 297'6"	6.00	0.371	5.49	32.94	0.036	1.08	6.48	0.233	1.52	9.12
	Ft assayed	36.83			379.38			78.55			122.82
	Not assayed	1.00									
	Total ft.	37.83									

Ni value $\frac{379.38}{37.83}$ = $10.028/ton Co value $\frac{78.55}{37.83}$ = $2.076/ton Cu value $\frac{122.82}{37.83}$ = $3.246/ton

Ni value $\frac{379.38}{36.83}$ = $10.30/ton Co value $\frac{78.55}{36.83}$ = $2.133/ton Cu value $\frac{122.82}{36.83}$ = $3.335/ton

Line 60S

Assayed Hole: E-4

E-4	Interval	Interval Length	% Ni	$/ton Ni	ft x $/ton Ni	% Co	$/ton Co	ft x $/ton Co	% Cu	$/ton Cu	ft x $/ton Cu
-1	357'10" - 362'11"	5.08	0.475	7.03	35.71	0.073	2.19	11.13	0.138	0.90	4.57
-2	398'4" - 403'4"	5.00	0.784	11.60	58.00	0.088	2.64	13.20	0.302	1.97	9.85
-3	403'4" - 408'4"	5.00	0.967	14.31	71.55	0.110	3.30	16.50	0.333	2.17	10.85
-4	408'4" - 413'4"	5.00	1.077	15.94	79.70	0.117	3.51	17.55	0.396	2.58	12.90
-5	413'4" - 418'4"	5.00	0.998	14.77	73.85	0.117	3.51	17.55	0.655	4.27	21.35
-6	418'4" - 424'	5.67	0.601	8.89	50.41	0.073	2.19	12.42	0.422	2.75	15.59
-7	424' - 429'	5.00	0.459	6.79	33.95	0.051	1.53	7.65	0.207	1.35	6.75
-8	429' - 434'	5.00	0.534	7.90	39.50	0.051	1.53	7.65	0.258	1.68	8.40
-9	434' - 439'	5.00	0.435	6.44	32.20	0.044	1.32	6.60	0.390	2.54	12.70
-10	439' - 445'	6.00	0.274	4.06	24.36	0.044	1.32	7.92	0.245	1.60	9.60
-11	393' - 398'4"	5.33	0.528	7.81	41.63	0.051	1.53	8.15	0.189	1.23	6.56
-12	388' - 393'	5.00	0.347	5.14	25.70	0.036	1.08	5.40	0.453	2.95	14.75
-13	383' - 388'	5.00	0.345	5.11	25.55	0.044	1.32	6.60	0.119	0.78	3.90
	Ft assayed	67.08			592.11			138.32			137.77
	Not assayed	20.09									
	Total ft.	87.17									

Ni value $\frac{592.11}{87.17}$ = $6.792/ton Co value $\frac{138.32}{87.17}$ = $1.586/ton Cu value $\frac{137.77}{87.17}$ = $1.580/ton

Ni value $\frac{592.11}{67.08}$ = $8.827/ton Co value $\frac{138.32}{67.08}$ = $2.062/ton Cu value $\frac{137.77}{67.08}$ = $2.053/ton

Line 94S

Assayed Hole: S-1

S-1	Interval	Interval Length	% Ni	$/ton Ni	ft x $/ton Ni	% Co	$/ton Co	ft x $/ton Co	% Cu	$/ton Cu	ft x $/ton Cu
-1	51'6" - 54'6"	3.00	0.934	13.82	41.46	0.088	2.64	7.92	0.170	1.11	3.33
-2	54'6" - 59'	4.50	1.446	21.40	96.30	0.117	3.51	15.80	0.466	3.04	13.68
-3	60'6" - 62'7"	2.08	0.365	5.40	11.23	0.058	1.74	3.62	0.809	5.27	10.96
-4	66'4" - 68'4"	2.00	0.710	10.51	21.02	0.080	2.40	4.80	0.176	1.15	2.30
	Ft assayed	11.58			170.01			32.14			30.27
	Not assayed	5.25									
	Total ft.	16.83									

Ni value $\frac{170.01}{16.83}$ = $10.101/ton Co value $\frac{32.14}{16.83}$ = $1.909/ton Cu value $\frac{30.27}{16.38}$ = $1.798/ton

Ni value $\frac{170.01}{11.58}$ = $14.689/ton Co value $\frac{32.14}{11.58}$ = $2.775/ton Cu value $\frac{30.27}{11.58}$ = $2.614/ton

SCHEDULE B

SUMMARY, ASSAY EVALUATION
INCLUDING BARREN ROCK

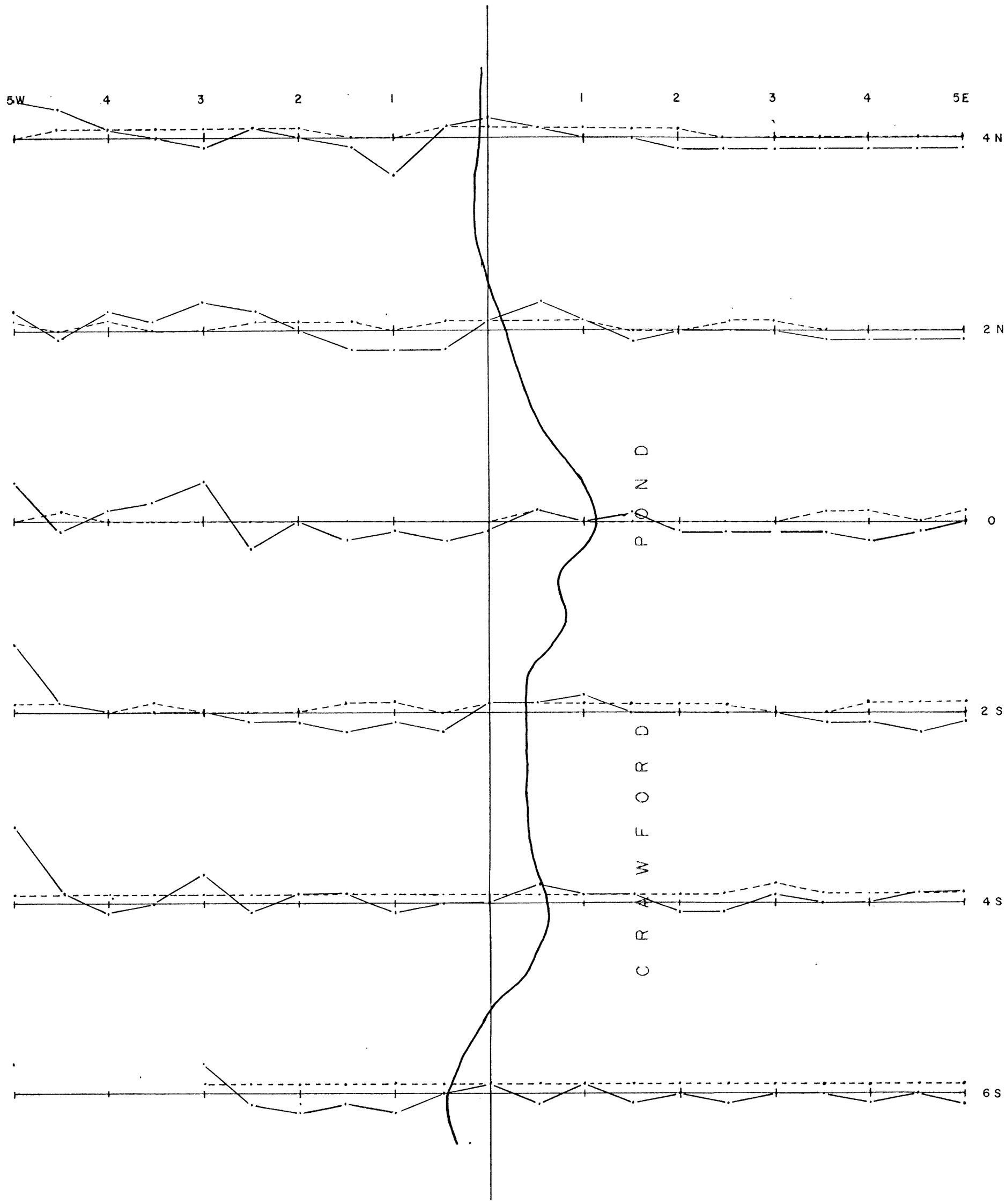
Line	Hole	Area (ft^2)	$ / ton Value	Cross-section Value Ni $ft^2 \times \$/ton$	Co $ft^2 \times \$/ton$	Cu $ft^2 \times \$/ton$	Longitudinal interval	Volume (ft^3) ($\times 10^6$)	Tons ($\times 10^6$)	$ / ton Ni	Total $ Ni ($\times 10^6$)	$ / ton Co	Total $ Co ($\times 10^6$)	$ / ton Cu	Total $ Cu ($\times 10^6$)
Harriman															
4N	CP-10	28,250	1.76	31,753	11,554	6,469	4N - 2N	3.89	0.412	2.24	.92	.55	0.23	0.51	0.21
2N	CP-B	9,225	6.81	43,053	8,754	11,015									
2N	CP-18	1,425	11.09	12,300	1,208	2,300									
		10,650	7.38*	55,353	9,962	13,315	2N - 0	2.02	0.214	7.37	1.58	1.49	0.32	1.53	0.33
0	CP-33	5,200	12.60	45,775	10,400	9,329									
0	CP-31	4,350	15.11	47,706	9,827	8,195									
		9,550	13.74*	93,481	20,227	17,524	0 - 2S	1.80	0.191	8.86	1.69	1.84	0.35	1.76	0.34
2S	CP-28	3,200	4.45	8,608	2,659	2,989									
2S	CP-27	3,450	14.65	36,304	7,238	7,014									
2S	CP-11	1,825	15.48	21,100	2,930	4,214									
		8,475	10.98*	66,012	12,827	14,217	2S - 4S	2.48	0.263	6.03	1.59	1.38	0.36	1.48	0.39
4S	CP-20	5,350	4.71	16,531	5,190	3,472									
4S	CP-24	6,875	9.90	44,626	9,487	13,956									
4S	CP-25	4,075	8.42	22,351	6,862	5,090									
		16,300	7.83*	83,508	21,539	22,518	4S - 6S	4.46	0.473	6.37	3.01	1.46	0.69	1.56	0.74
6S	CP-2	14,200	8.99	84,760	20,987	21,896									
6S	CP-22	11,350	12.03	98,155	18,875	19,477									
6S	CP-23	2,725	9.83	17,696	3,559	5,545									
		28,275	10.29*	200,611	43,421	46,918	6S - 9S	6.32	0.67	5.86	3.92	1.33	0.89	1.35	0.90
9S	CP-6	11,875	5.56	44,721	11,590	9,678									
9S	CP-17	1,975	1.37	1,678	869	158									
		13,850	4.96*	46,399	12,459	9,836	9S - 12S	3.80	0.403	5.86	2.36	1.47	0.59	0.97	0.39
12S	CP-1	9,100	12.69	86,177	17,927	11,375									
12S	CP-36	2,400	10.86	15,859	6,859	3,338									
		11,500	12.31*	102,036	24,786	14,713	12S - 14.3S	2.44	0.259	9.82	2.54	2.12	0.55	1.46	0.38
14.3S	CP-5	9,750	14.67	106,402	20,300	16,292	14.3S-15.8S	1.48	0.157	8.79	1.38	1.59	0.25	1.61	0.25
15.8S	H-15.8S-1	9,550	9.80	67,012	11,116	15,500	15.8S - 17S	0.78	0.083	6.18	0.51	1.05	0.09	1.37	0.11
17S	CP-13	3,500	5.20	13,360	2,555	2,285									
	Total for Harriman							29.47	3.125		19.50		4.32		4.04
	Value for Harriman											27.86 x 10^6			
Crawford Pond															
42S	E-1	500	6.14	2,225	435	410	42S - 52S	2.14	0.227	9.38	2.13	1.78	0.40	2.96	0.67
52S	E-3	3,783	15.18	37,936	7,207	12,280	52S - 60S	5.00	0.530	7.77	4.12	1.68	0.89	2.08	1.10
60S	E-4	8,717	9.95	59,206	13,825	13,712	60S - 94S	17.68	1.874	7.33	13.74	1.64	3.07	1.67	3.02
94S	S-1	1,683	13.81	17,000	3,212	3,026									
	Total for Crawford Pond							24.82	2.631		19.99		4.36		4.79
	Value for Crawford Pond											29.14 x 10^6			
	Grand Total							54.29	5.756		39.49		8.68		8.83
	Value for Harriman and Crawford Pond											57.00 x 10^6			
	Average value per ton ($57.00 \times 10^6 \div 5.756 \times 10^6$)								$9.90/ton						

* denotes Average Value

SUMMARY, ASSAY EVALUATION
NOT INCLUDING BARREN ROCK

Line	Hole	Area (ft^2)	$/ton value	Cross-Section Value: Ni ft^2 x $/ton	Co ft^2 x $/ton	Cu ft^2 x $/ton	Longitudinal Interval	Volume ft^3 ($x 10^6$)	Tons ($x 10^6$)	$ Ton Ni	Total Ni ($x 10^6$)	$ Ton Co
Harriman												
4N	CP-10	10,989	4.53	31,753	11,554	6,469						
							4N - 2N	2.11	0.224	4.13	.92	1.02
2N	CP-B	9,225	6.81	43,053	8,754	11,015						
2N	CP-18	919	17.19	12,300	1,208	2,300						
		10,144	7.75*	55,353	9,962	13,315						
							2N - 0	1.97	0.209	7.56	1.58	1.53
0	CP-33	5,200	12.60	45,775	10,400	9,329						
0	CP-31	4,350	15.11	47,706	9,827	8,195						
		9,550	13.74*	93,481	20,227	17,524						
							0 - 2S	1.62	0.172	9.84	1.69	2.04
2S	CP-28	1,898	7.50	8,608	2,659	2,989						
2S	CP-27	2,953	17.11	36,304	7,238	7,014						
2S	CP-11	1,798	15.70	21,100	2,930	4,214						
		6,649	14.00*	66,012	12,827	14,217						
							2S - 4S	1.97	0.209	7.59	1.59	1.74
4S	CP-20	3,863	6.52	16,531	5,190	3,472						
4S	CP-24	6,359	10.70	44,626	9,487	13,956						
4S	CP-25	2,832	12.10	22,351	6,862	5,090						
		13,054	9.77*	83,508	21,539	22,518						
							4S - 6S	3.77	0.400	7.54	3.01	1.72
6S	CP-2	12,666	10.04	84,760	20,987	21,896						
6S	CP-22	9,216	14.81	98,155	18,875	19,477						
6S	CP-23	2,725	9.83	17,696	3,559	5,545						
		24,607	11.82*	200,611	43,421	46,918	6S - 9S	4.85	0.514	7.64	3.92	1.73
9S	CP-6	5,736	11.50	44,721	11,590	9,678						
9S	CP-17	1,975	1.37	1,678	869	158						
		7,711	8.91*	46,399	12,459	9,836						
							9S - 12S	2.44	0.259	9.12	2.36	2.29
12S	CP-1	6,488	17.78	86,177	17,927	11,375						
12S	CP-36	2,088	12.47	15,859	6,859	3,338						
		8,576	16.50*	102,036	24,786	14,713						
							12S - 14.3S	1.98	0.210	12.11	2.54	2.62
14.3S	CP-5	8,629	16,55	106,402	20,300	16,292						
							14.3S - 15.8S	1.19	0.126	10.93	1.38	1.98
15.8S	H-15.8S-1	7,248	12.91	67,012	11,116	15,500						
							15.8S-17S	0.64	0.068	7.53	0.51	1.28
17S	CP-13	3,500	5.20	13,360	2,555	2,285						
	Total for Harriman							22.54	2.391	0.847	19.50	.0097
	Value for Harriman											
Crawford Pond												
42S	E-1	500	6.14	2,225	435	410						
							42S - 52S	2.90	0.222	9.61	2.13	1.83
52S	E-3	3,683	15.77	37,936	7,207	12,280						
							52S-60S	4.15	0.440	9.36	4.12	2.03
60S	E-4	6,703	12.94	59,206	13,825	13,712						
							60S - 94S	13.36	1.416	9.70	13.74	2.17
94S	S-1	1,158	20.08	17,000	3,212	3,026						
	Total for Crawford Pond							20.41	2.078		19.99	
	Value for Crawford Pond											
	Grand total							42.95	4.469		39.49	
	Value for Harriman and Crawford Pond											
	Average value ($57.00 \times 10^6 \div 4.469 \times 10^6$)							$12.75/ton				

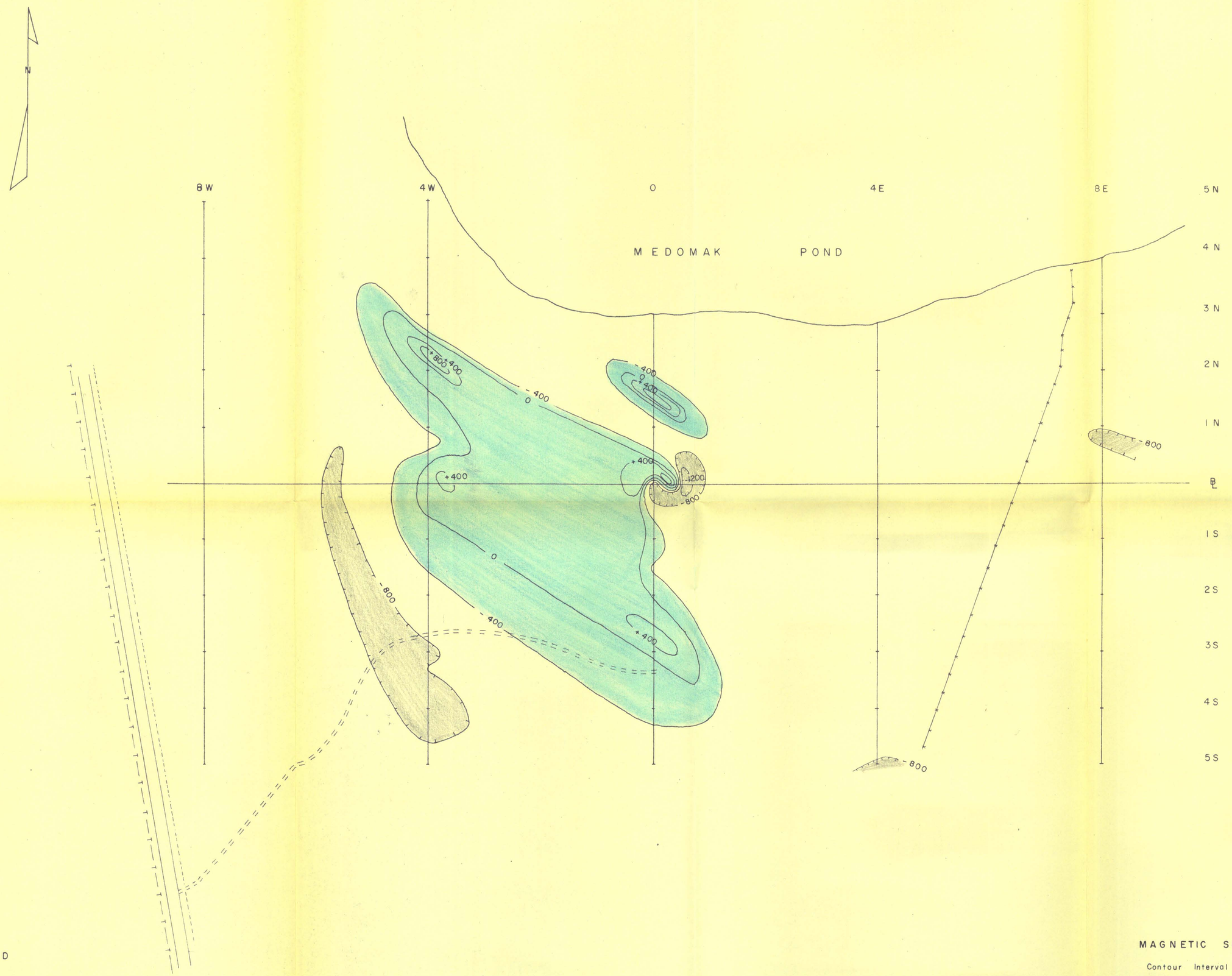
* denotes Average Value



1" = 10 %

—— In
- - - - Ou

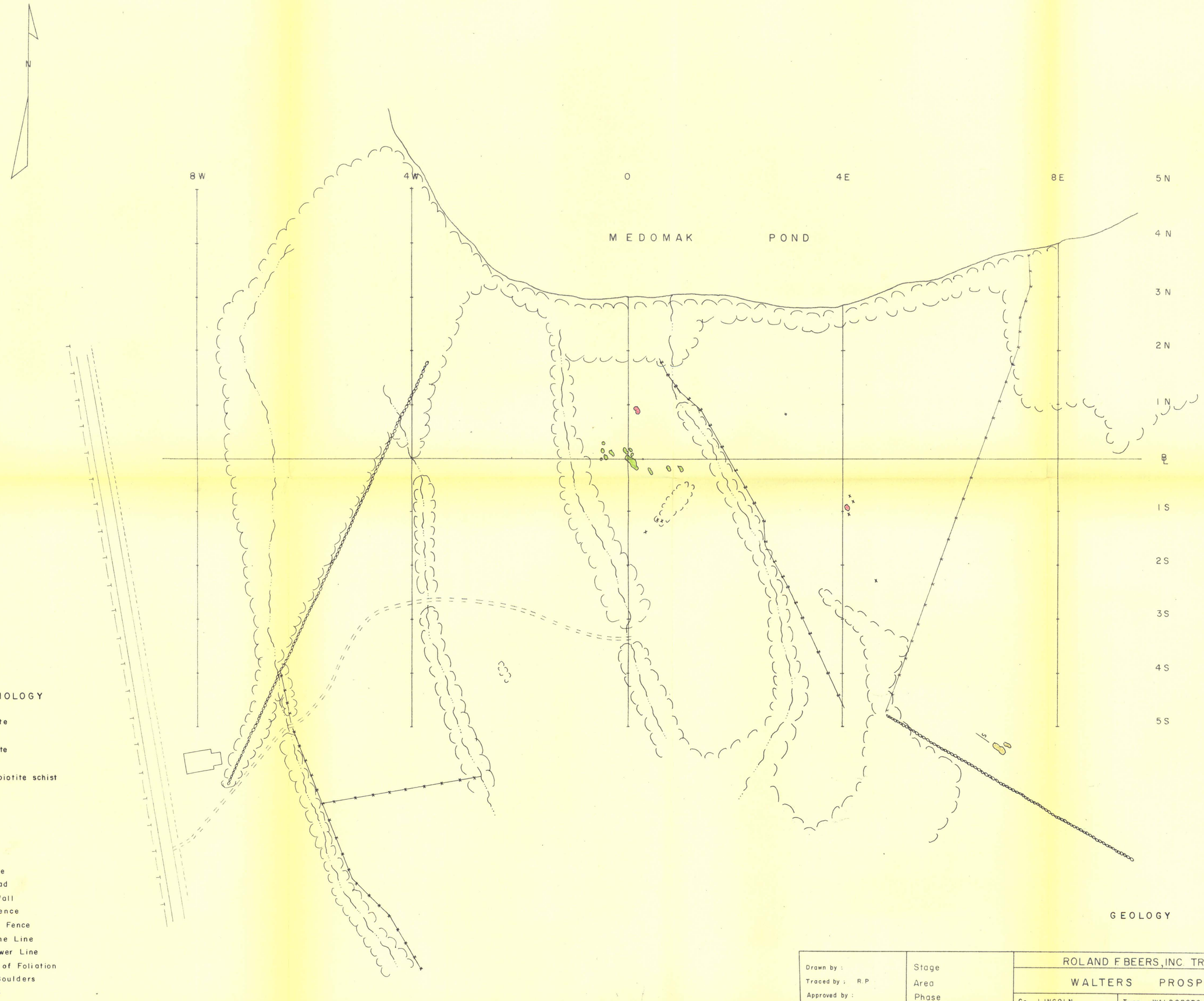
Stage 1 Area 2 Phase 1 (b)	ROLAND F. BEERS, INC. KNOX TIMBER PROS HORIZONTAL LO
	County: KNOX — Twnp: WARR



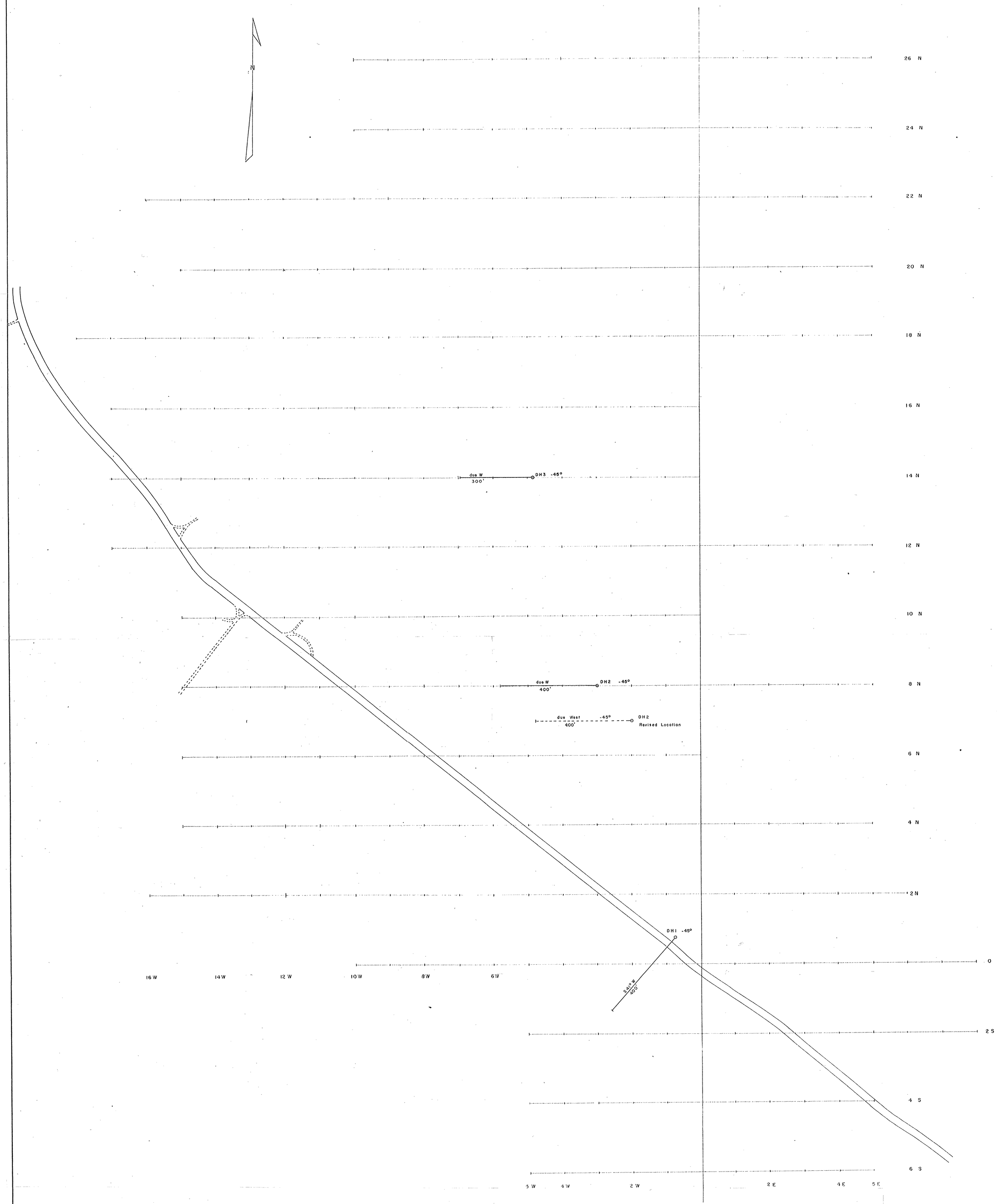
MAGNETIC SURVEY

Contour Interval 400 γ

Drawn by :	Stage	ROLAND F. BEERS, INC. TROY, N.Y.
Traced by : R.P.	Area	WALTERS PROSPECT
Approved by :	Phase	Co. LINCOLN · Twnp. WALDOBORO · Scale : 1 in = 100 ft.



Drawn by :	Stage	ROLAND F BEERS, INC TROY, N.Y.
Traced by : R.P.	Area	WALTERS PROSPECT
Approved by :	Phase	Co. LINCOLN · Twnp. WALDOBORO · Scale: 1 in. = 100 ft.



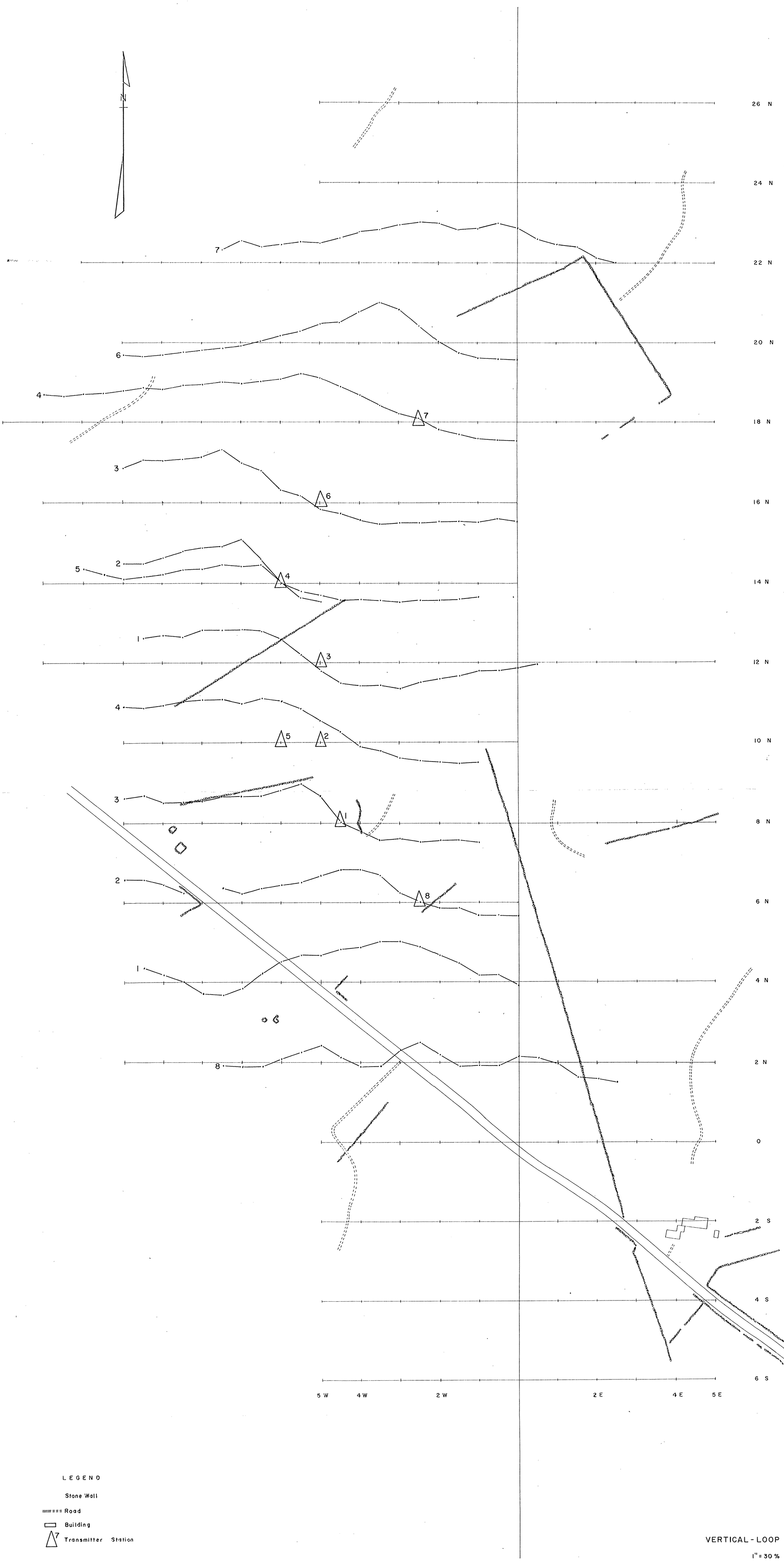
Drill Hole Location Map showing
revised location of Drill Hole No.2

November 1959

ROLAND F BEERS, INC. TROY, N.Y

BURNS PROSPECT

Co. LINCOLN	Twp. WALDOBORO	Scale 1in=100 ft



LEGEND

Stone Wall

Road

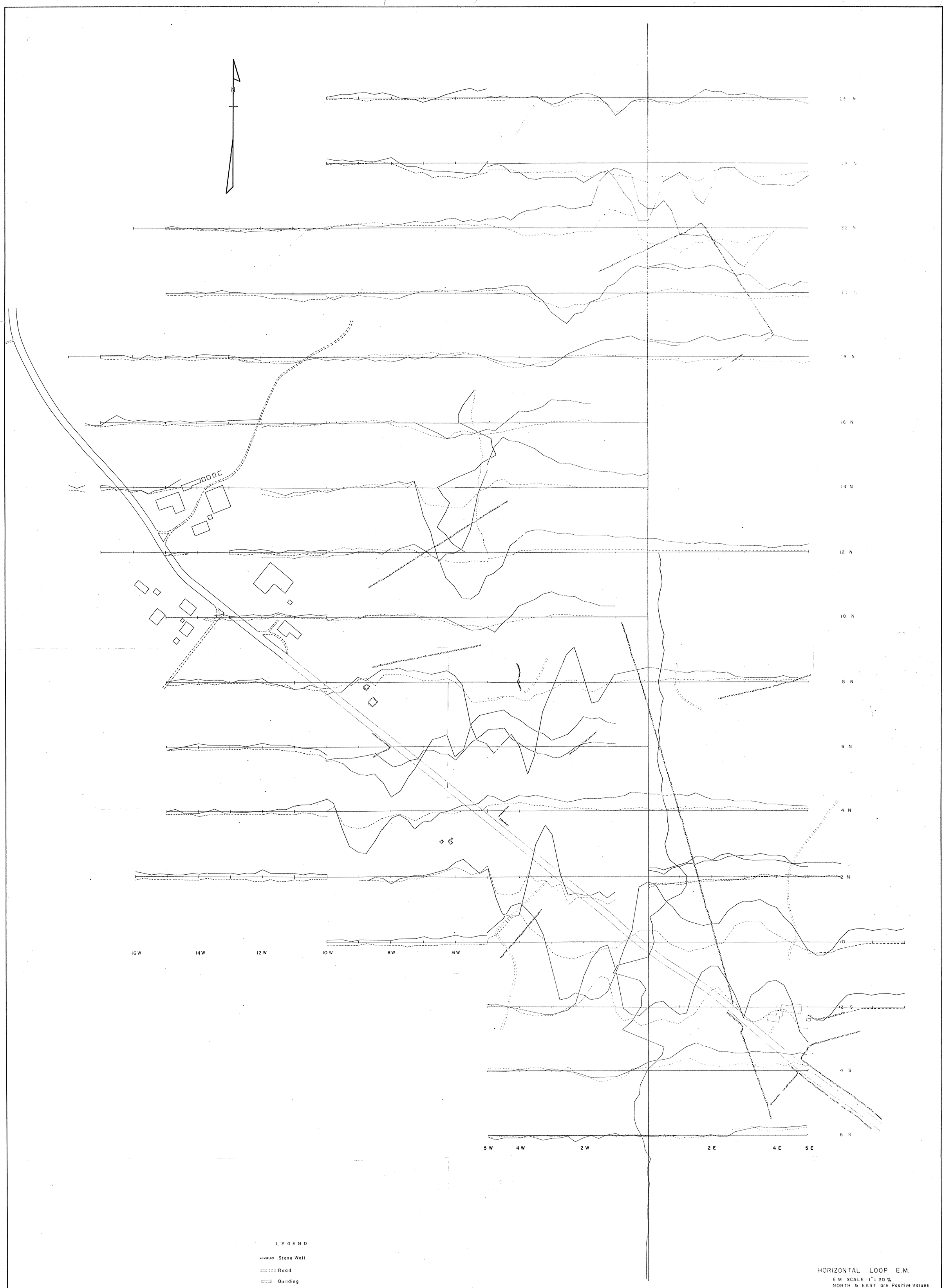
Building

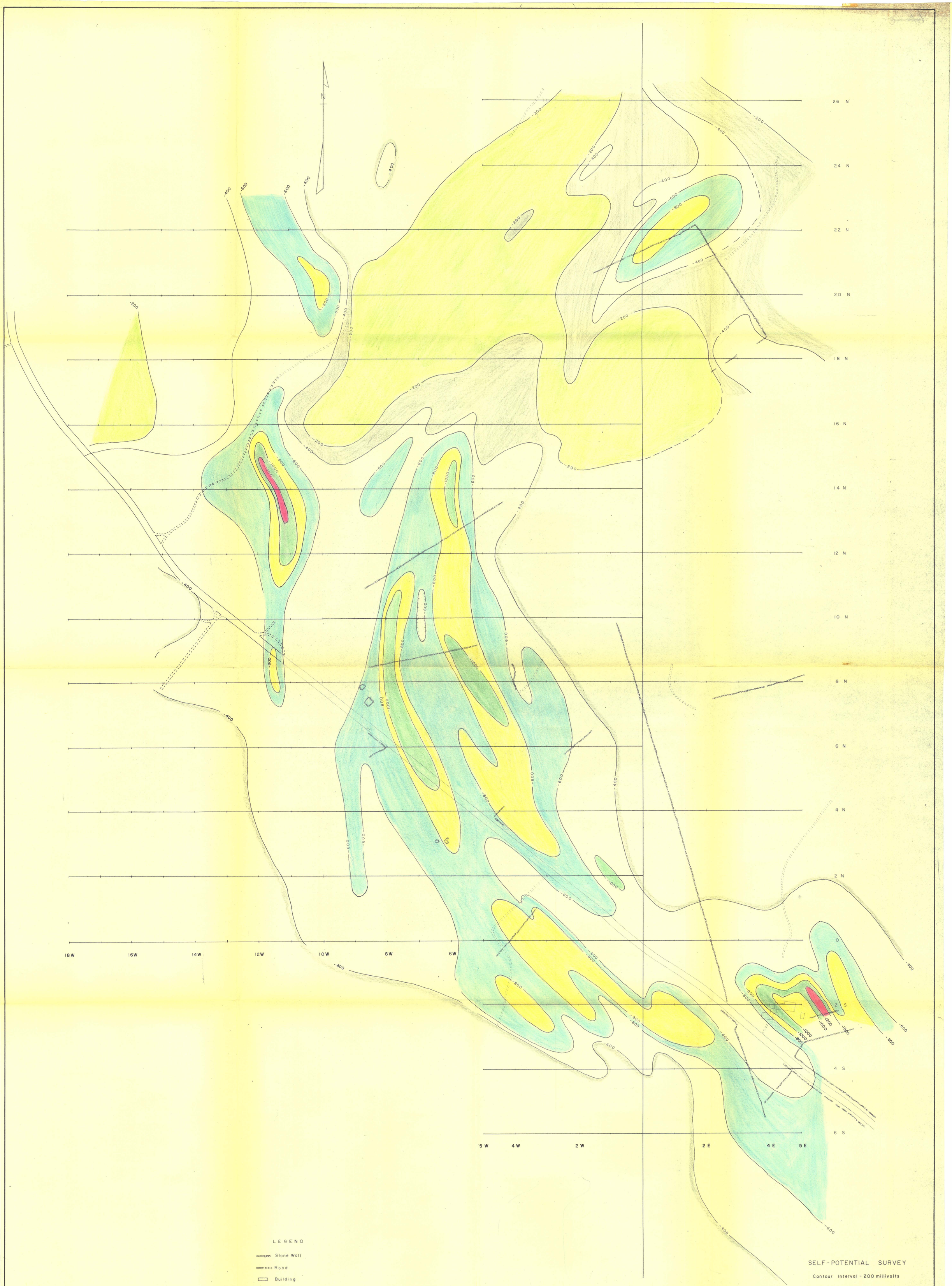
Transmitter Station

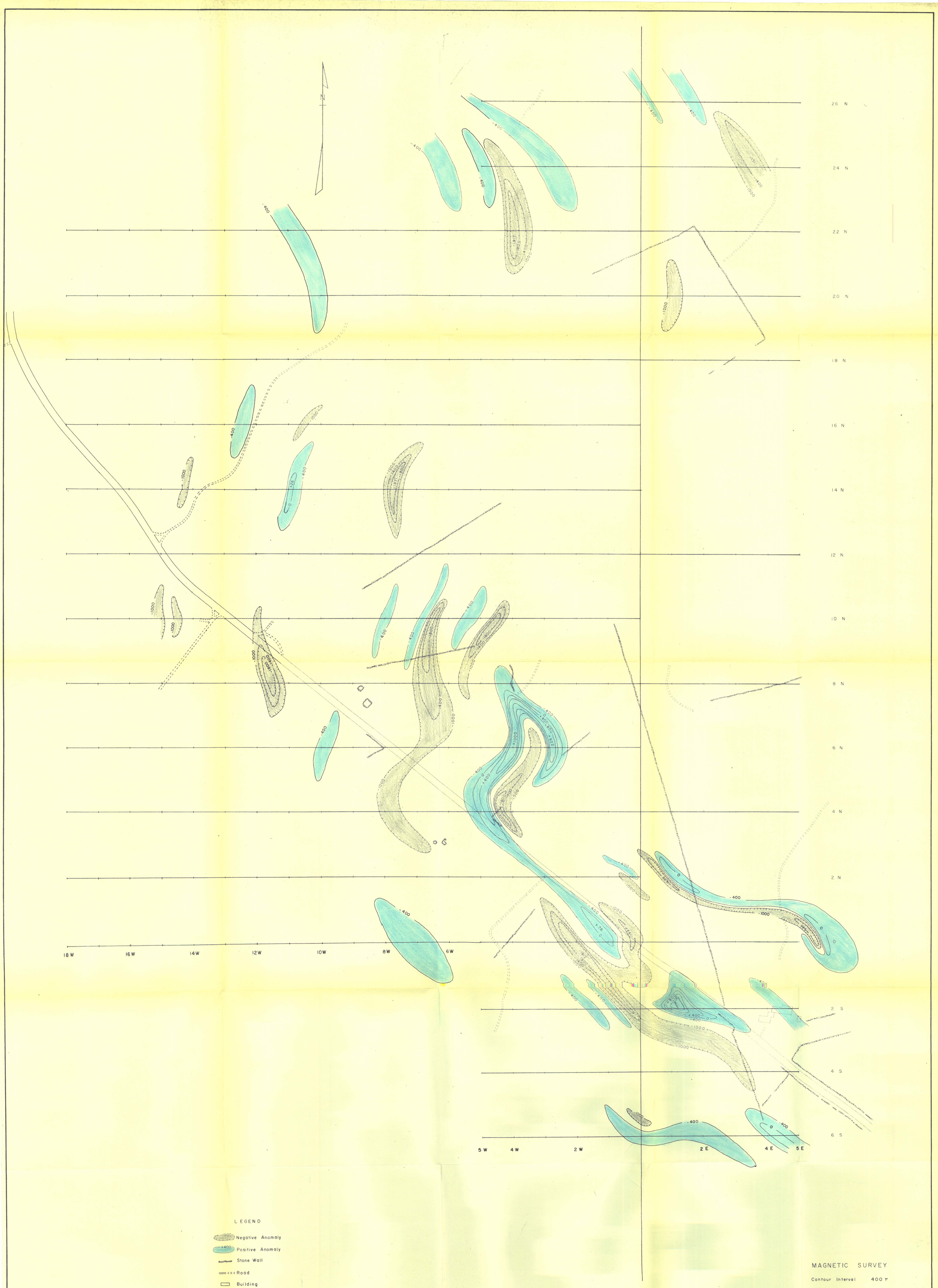
VERTICAL-LOOP EM SURVEY

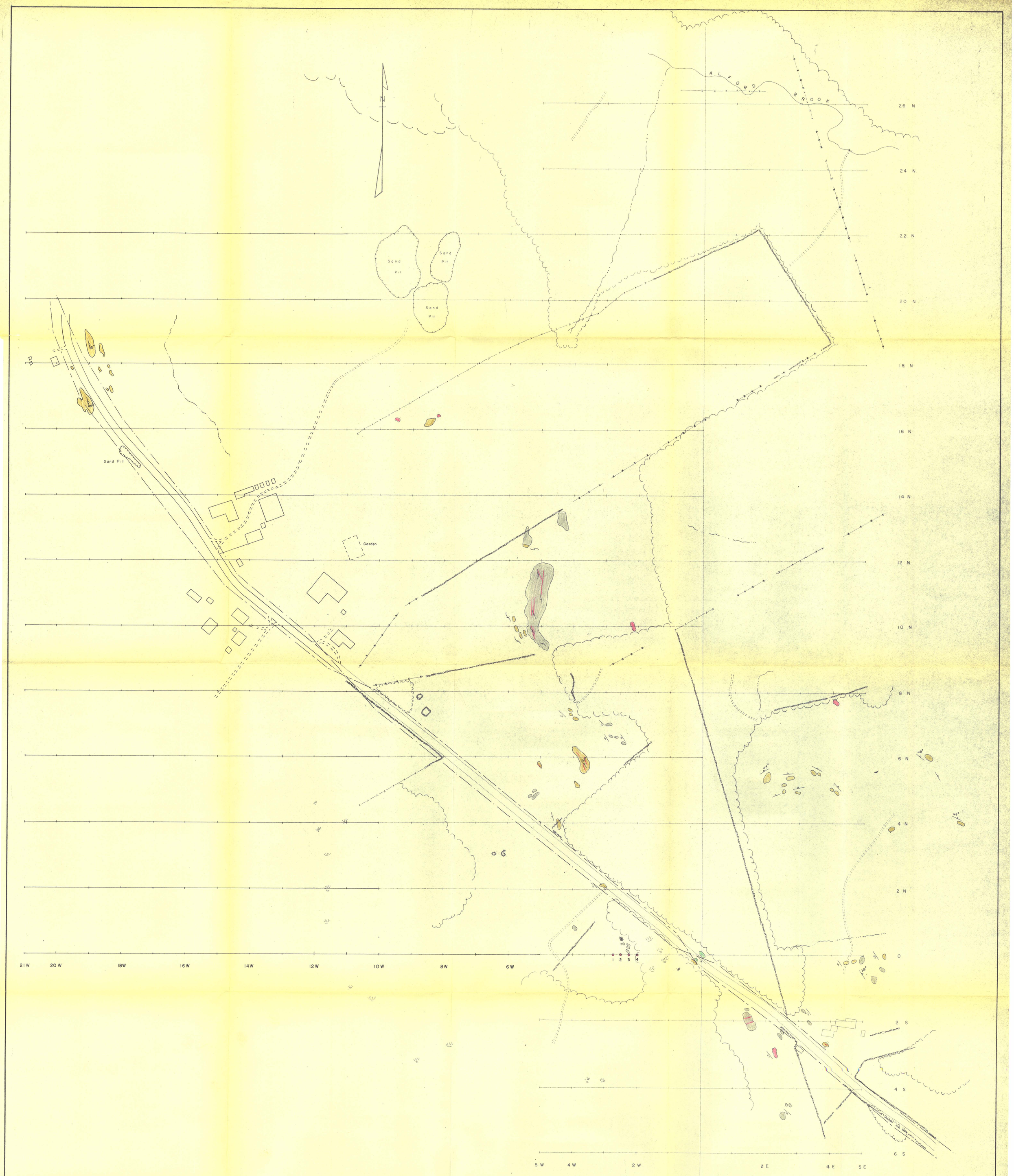
1" = 30 %

Drawn by	Stage 2	ROLAND F. BEERS, INC. TROY, N.Y.
Traced by : S.H.C.	Area 4	BURNS PROSPECT
Approved by :	Phase 2	Co. LINCOLN · Twnp. WALDOBORO · Scale: 1 in = 100 ft.


N
20 N
18 N
16 N
14 N
12 N
10 N
8 N
6 N
4 N
2 N
0
2 S
4 S
6 S
16 W
14 W
12 W
10 W
8 W
6 W
5 W
4 W
2 W
2 E
4 E
5 E
LEGEND
Stone Wall
Road
Building
In-Phase
Out-of-Phase
HORIZONTAL LOOP E.M.
E M SCALE 1" = 20 %
NORTH & EAST are Positive Values
Drawn by
Traced by S.H.C.
Approved by
Stage
Area
Phase
ROLAND F. BEERS, INC. TROY, N.Y.
BURNS PROSPECT
Co. LINCOLN
Twp. WALDOBORO
Scale: 1 in = 100 ft.


N
26 N
24 N
22 N
20 N
18 N
16 N
14 N
12 N
10 N
8 N
6 N
4 N
2 N
0
2 S
4 S
6 S
18W
16W
14W
12W
10W
8W
6W
5W
4W
2W
2E
4E
5E
LEGEND
Stone Wall
Road
Building
SELF-POTENTIAL SURVEY
Contour interval - 200 millivolts
Drawn by
Traced by S.H.C.
Approved by
Stage
Area
Phase
ROLAND F. BEERS, INC. TROY, N.Y.
BURNS PROSPECT
Co. LINCOLN
Twnp. WALDOBORO
Scale: 1 in = 100 ft.


N
26 N
24 N
22 N
20 N
18 N
16 N
14 N
12 N
10 N
8 N
6 N
4 N
2 N
0
2 S
4 S
6 S
18 W
16 W
14 W
12 W
10 W
8 W
6 W
5 W
4 W
2 W
2 E
4 E
5 E
LEGEND
Negative Anomaly
Positive Anomaly
Stone Wall
Road
Building
MAGNETIC SURVEY
Contour Interval 400 γ
Drawn by
Traced by S.H.C.
Approved by
Stage
Area
Phase
ROLAND F. BEERS, INC. TROY, N.Y.
BURNS PROSPECT
Co. LINCOLN
Twnp. WALDOBORO
Scale: 1 in = 100 ft.



LEGEND

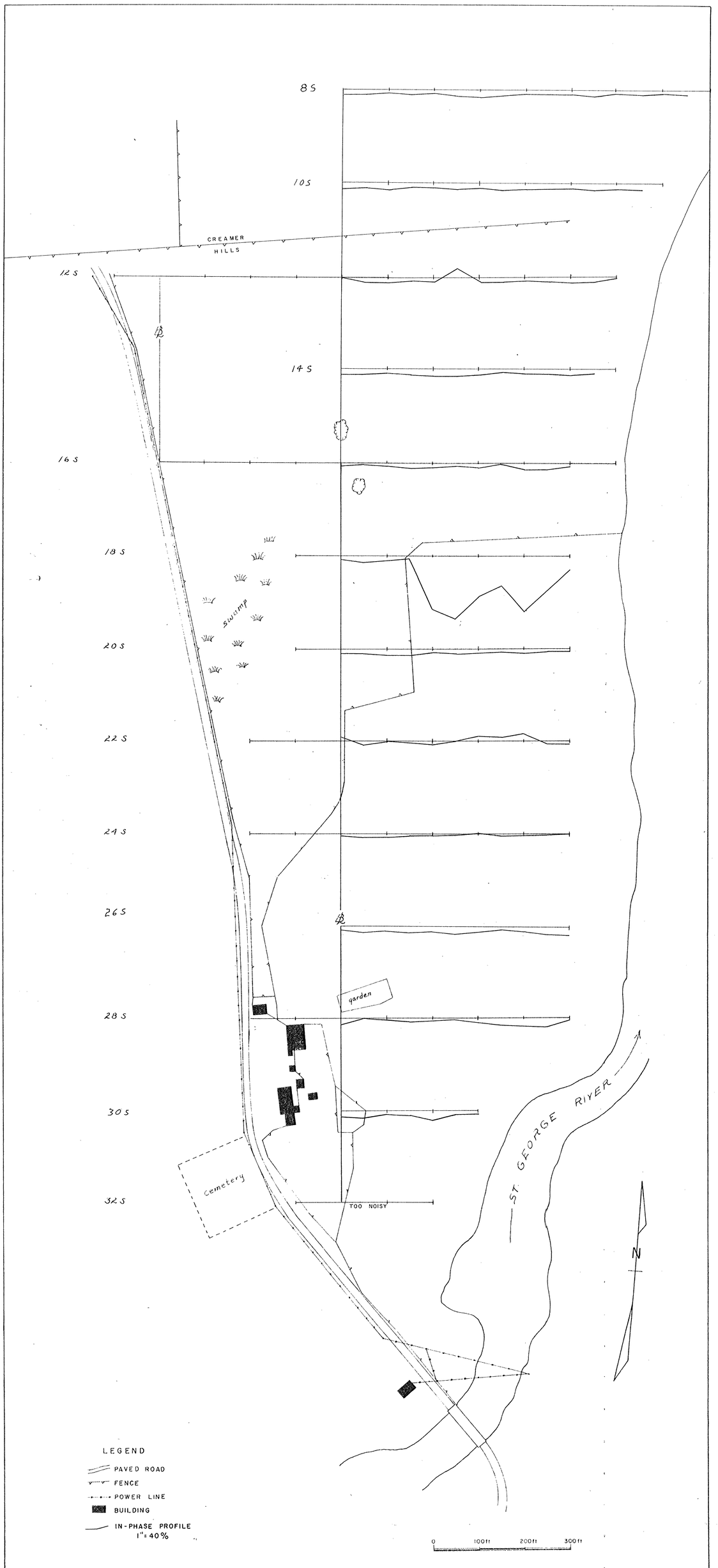
- Strike & Dip
- Strike of Foliation
- Float & Outcrop
- Stream
- Stone Wall
- Wire Fence
- Road
- Building
- Swamp
- Woods Line
- Low Power Line
- Telephone Line
- Packsack Drill Holes

LITHOLOGY

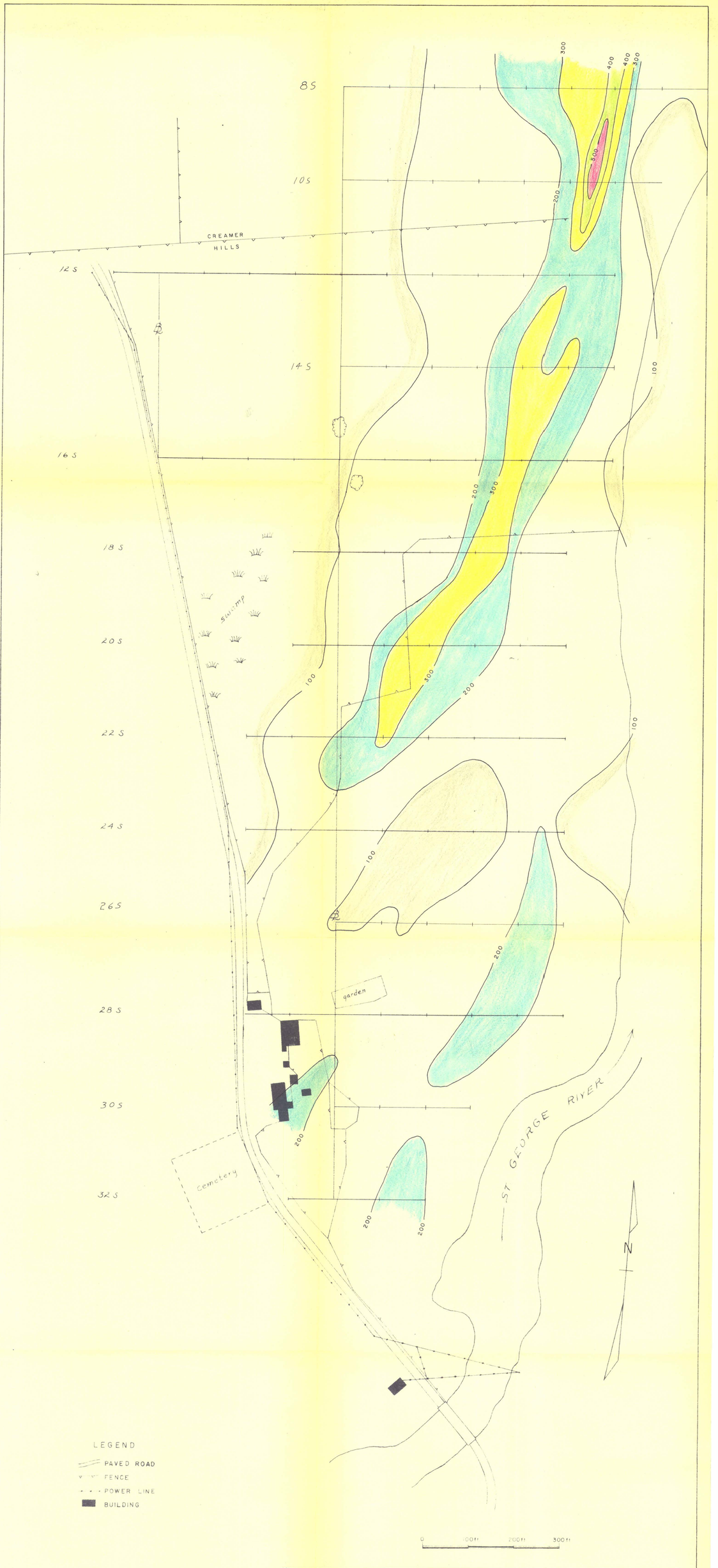
- Quartz biotite schist
- Pegmatite
- Peridotite
- Hornblende schist & Altered ultrabasics

GEOLOGY

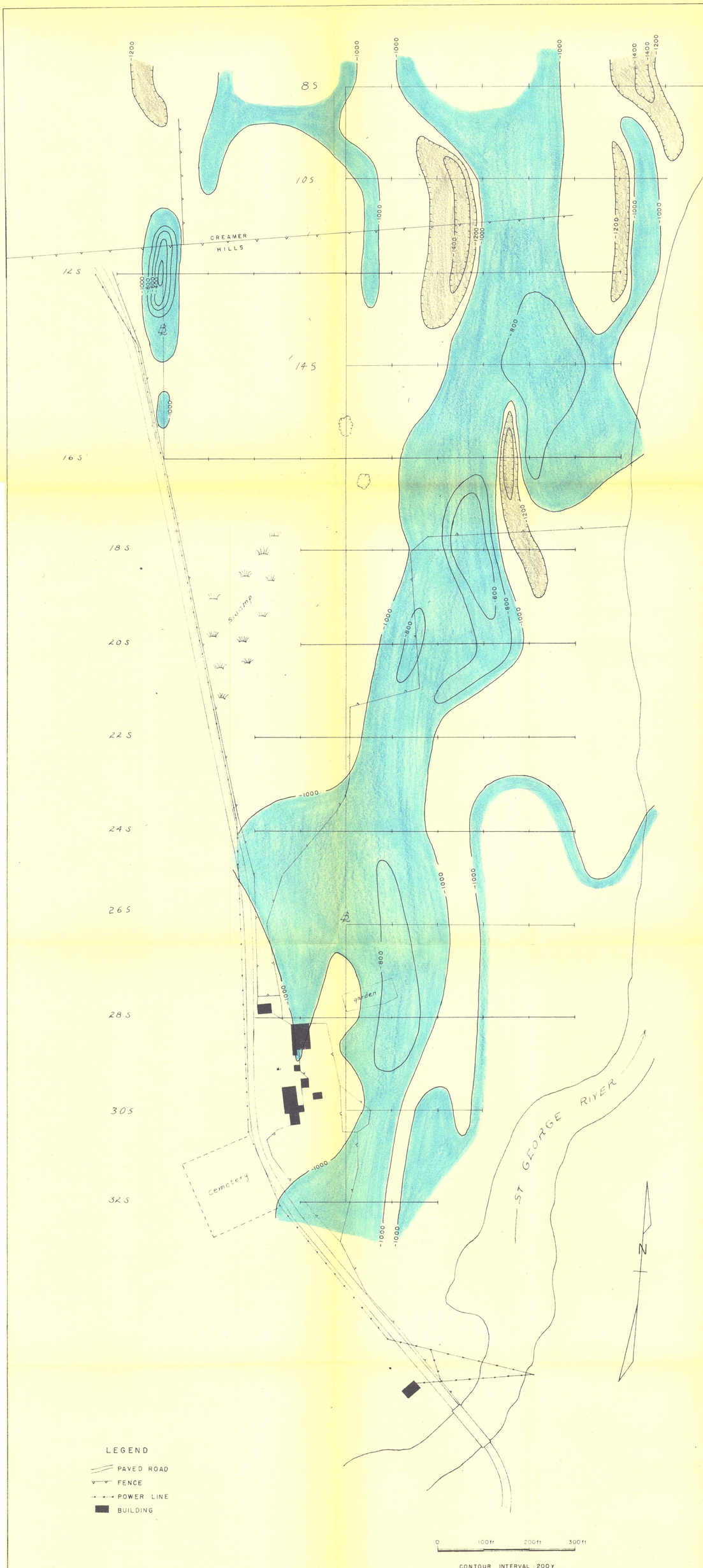
Drawn by	Stage	ROLAND F. BEERS, INC. TROY, N.Y.
Traced by S.H.C.	Area	BURNS PROSPECT
Approved by	Phase	Co. LINCOLN · Twnp. WALDOBORO · Scale: 1 in = 100 ft.



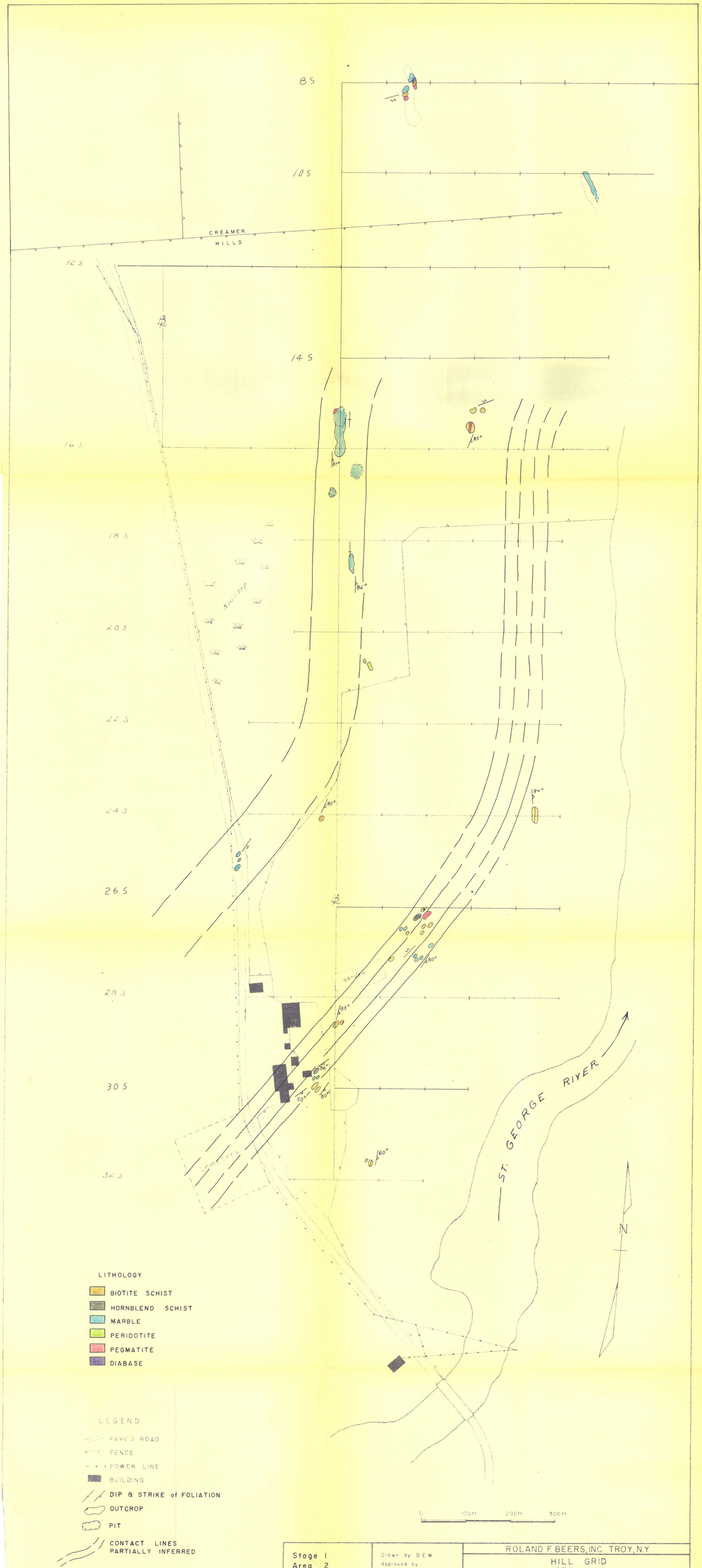
Stage 1 Area 2 Phase 2	Drawn by Approved by	ROLAND F. BEERS, INC. TROY, N.Y. HILL GRID HORIZONTAL-LOOP E.M. County KNOX · Twnp. WARREN · Scale: 1in.=100ft.

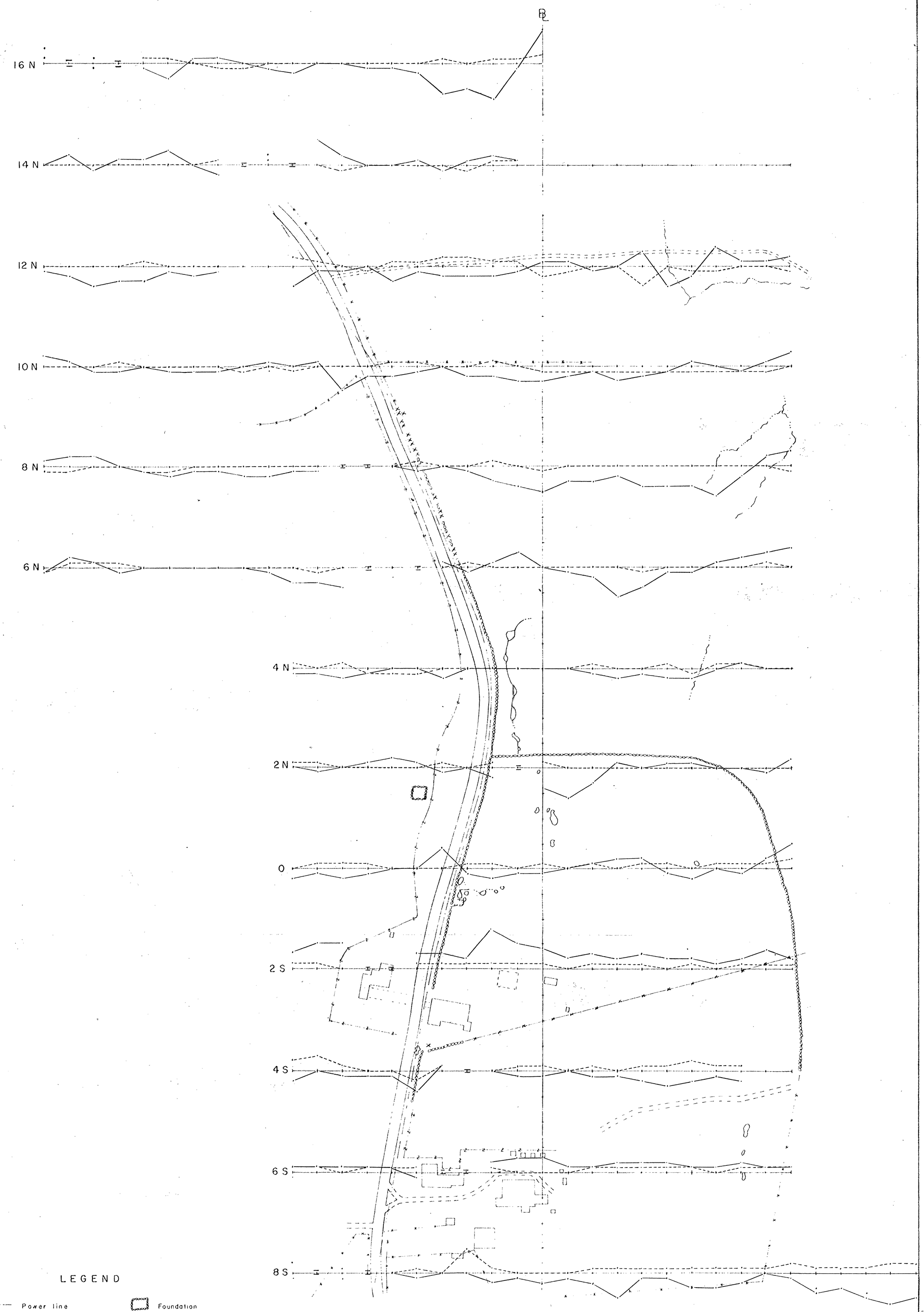


Stage 1 Area 2 Phase 2	Drawn by D.E.W. Approved by	ROLAND F. BEERS, INC. TROY, N.Y. HILL GRID SELF-POTENTIAL SURVEY County KNOX · Twnp. WARREN · Scale 1in = 100ft



Stage 1 Area 2 Phase 2	Drawn by: D.E.W. Approved by:	ROLAND F. BEERS, INC. TROY, N.Y. HILL GRID MAGNETOMETER SURVEY
		County: KNOX · Twnp.: WARREN · Scale: 1in.=100ft.


8S
10S
CREAMER HILLS
12S
14S
16S
18S
20S
22S
24S
26S
28S
30S
32S
SWAMP
ST. GEORGE RIVER
N
LITHOLOGY
BIOTITE SCHIST
HORNBLEND SCHIST
MARBLE
PERIDOTITE
PEGMATITE
DIABASE
LEGEND
PAVED ROAD
FENCE
POWER LINE
BUILDING
DIP & STRIKE of FOLIATION
OUTCROP
PIT
CONTACT LINES PARTIALLY INFERRED
0 100ft 200ft 300ft
Stage 1
Area 2
Phase 2
Drawn by D.E.W.
Approved by
ROLAND F. BEERS, INC. TROY, N.Y.
HILL GRID
GEOLOGY
County KNOX
Twnp WARREN
Scale: 1in.=100ft.



LEGEND

- Power line
- Building
- Stream
- Paved highway
- Unpaved highway
- Foundation
- Stone fence
- Wire fence
- Electric fence

1" = 10 %

In-Phase Profile

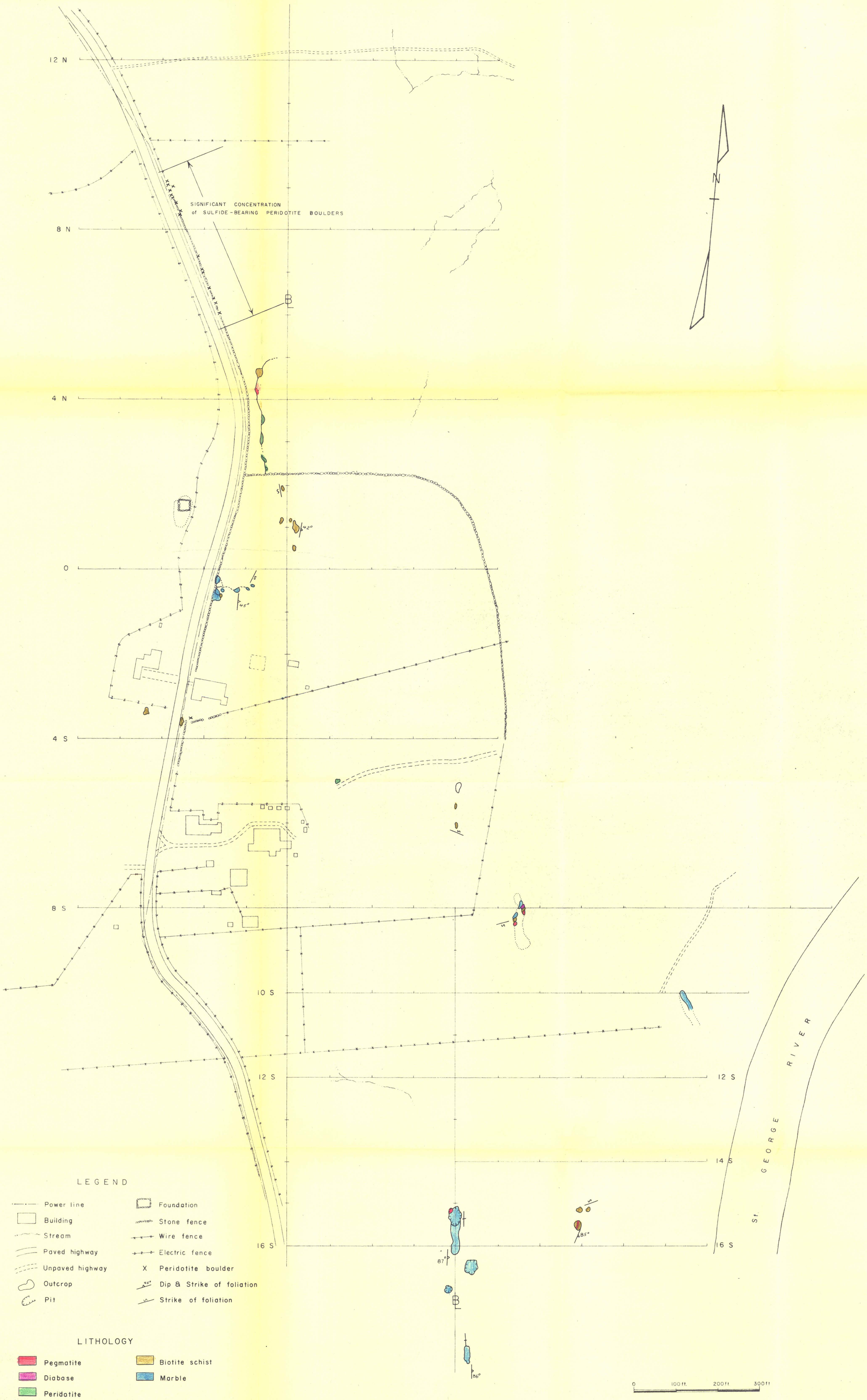
Out-of-Phase Profile

= Indicates areas of power-line interference

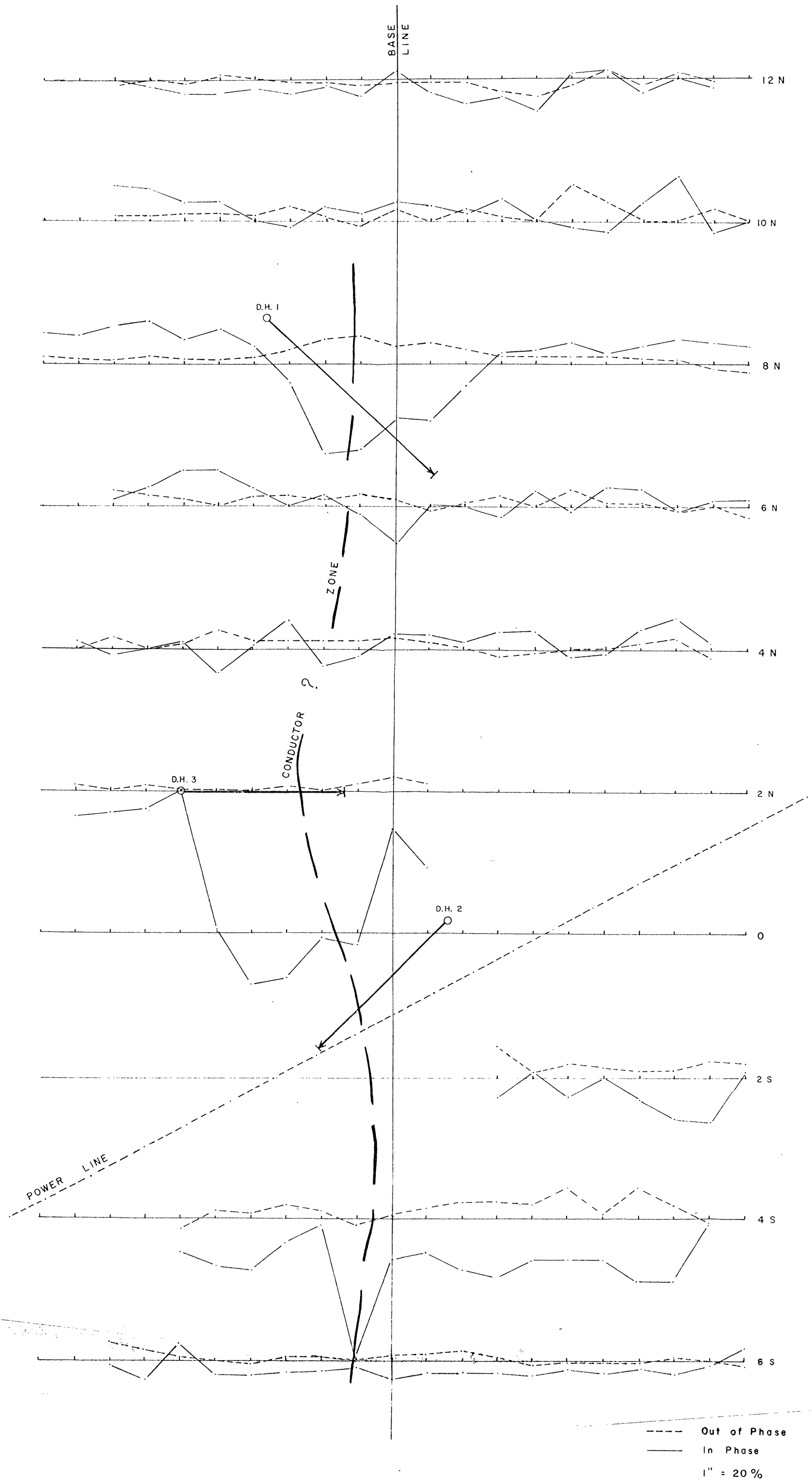
0 100 ft. 200 ft. 300 ft.

Stage 1 Area 2 Phase 2	Traced by: R. P Approved by:	ROLAND F BEERS, INC. TROY, N.Y. LAMB PROSPECT HORIZONTAL LOOP E.M. County: KNOX · Twp: WARREN · Scale: 1in = 100 ft.

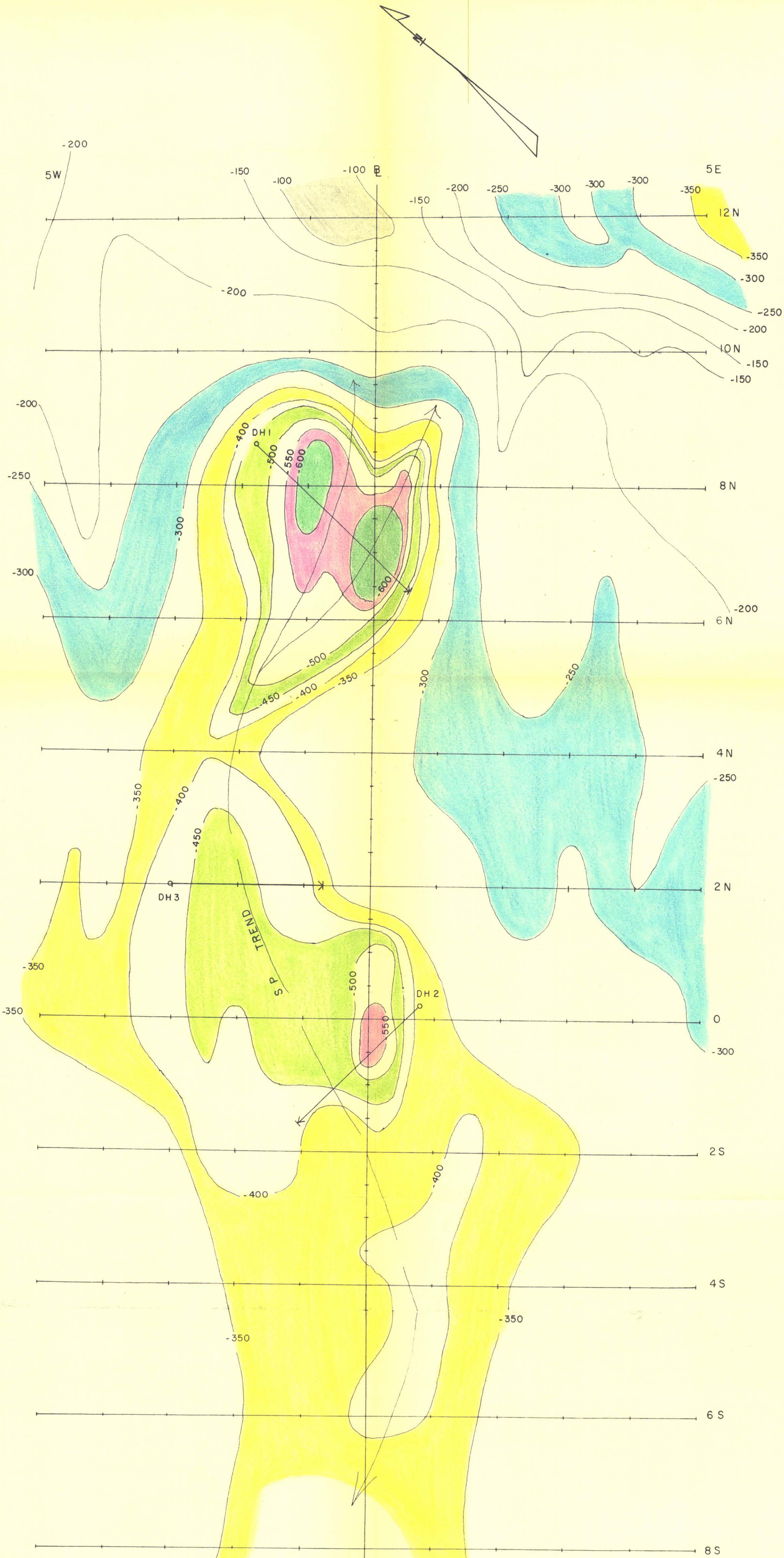
Stage 1 Area 2 Phase 1(b)	Drawn by: Traced by: S.H.C. Approved by:	ROLAND F. BEERS, INC. TROY, N.Y. LAMB - CREAMER GRID MAGNETOMETER SURVEY
		County: KNOX · Twnp: WARREN · Scale: 1in = 100 ft.



Stage 1 Area 2 Phase 1(b)	Drawn by: Traced by: S.H.C. Approved by:	ROLAND F. BEERS, INC. TROY, N.Y. LAMB - CREAMER GRID GEOLOGY MAP
		County: KNOX · Twnp: WARREN · Scale: 1 in = 100 ft



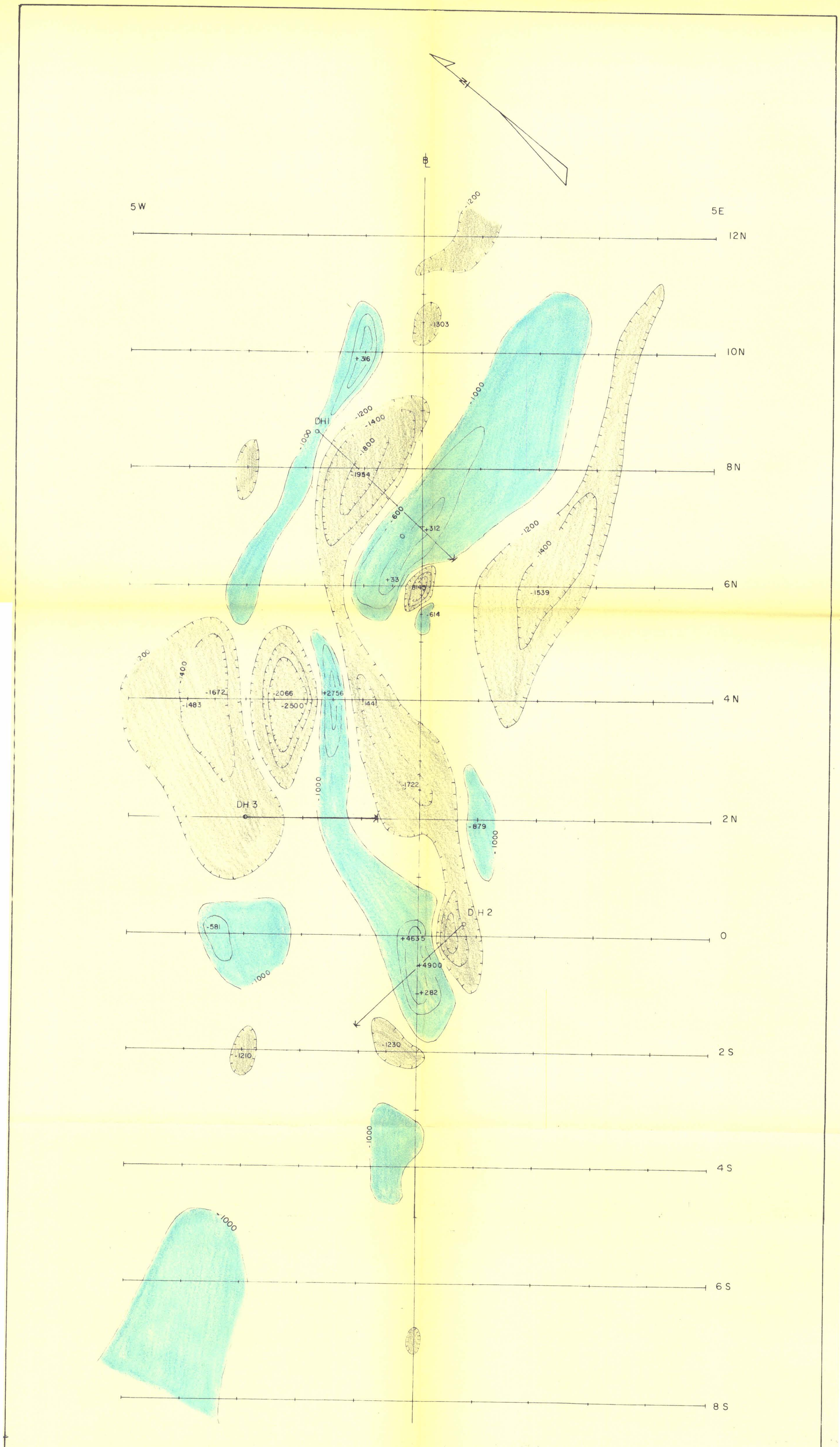
Stage 1 Area 2 Phase 1(b)	ROLAND F. BEERS, INC. TROY, N.Y. SIMMONS PROSPECT HORIZONTAL LOOP EM SURVEY County: KNOX · Twnp. WARREN · Scale 1in. = 100 ft.



CONTOUR INTERVAL : 50 MILLIVOLTS
ALL VALUES PLOTTED NEGATIVE

DRILL HOLE

Drawn by: R Curvis Approved by:	Stage 1 Area 2 Phase 2	ROLAND F. BEERS, INC. TROY, N.Y. SIMMONS GRID SELF-POTENTIAL SURVEY County: KNOX · Twnp: WARREN · Scale: 1in.=100ft.



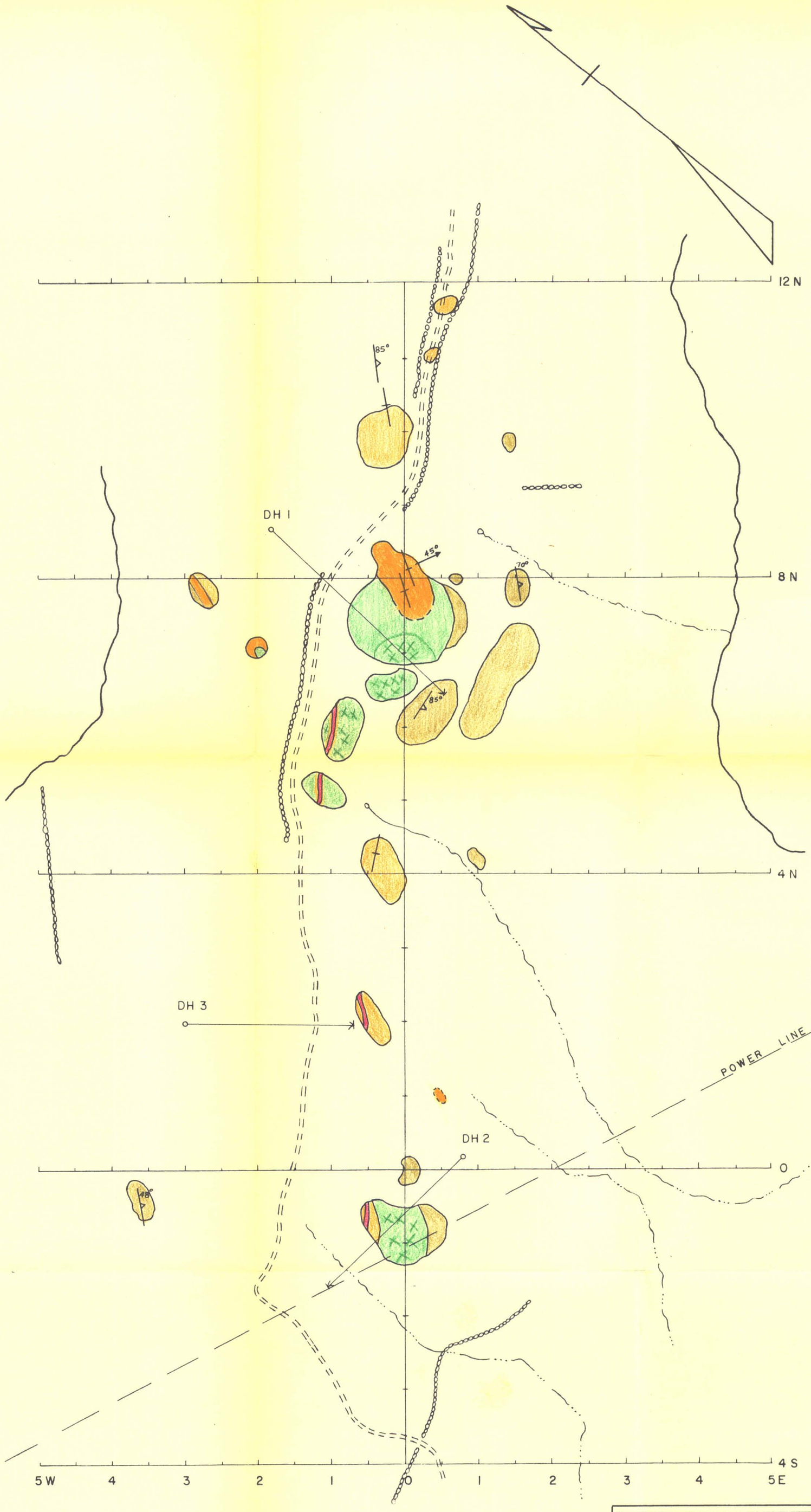
CONTOUR INTERVALS AS SHOWN
CONTOURS BASED ON 50' STATIONS

0 γ
-600 γ } POSITIVE CONTOURS
-1000 γ

BACKGROUND : -1000 to -1200 γ

-1200 γ
-1400 γ } NEGATIVE CONTOURS
-1800 γ

Drawn by : R. Owens Approved by :	Stage 1 Area 2 Phase 2	ROLAND F. BEERS, INC. TROY, N.Y. SIMMONS GRID MAGNETIC MAP
		County : KNOX · Twnp. : WARREN · Scale : 1in. = 100 ft.



RUSTY SCHIST

GRANITIC ROCK

METASEDIMENTS

PEGMATITE

GABBROIC ROCK

PERIDOTITE

ROCK WALL

FOLIATIONS

DRAG FOLDS

DRILL HOLE

WARREN-FRIENDSHIP PROSPECT

AREA 2

STAGE 1

PHASE 1B

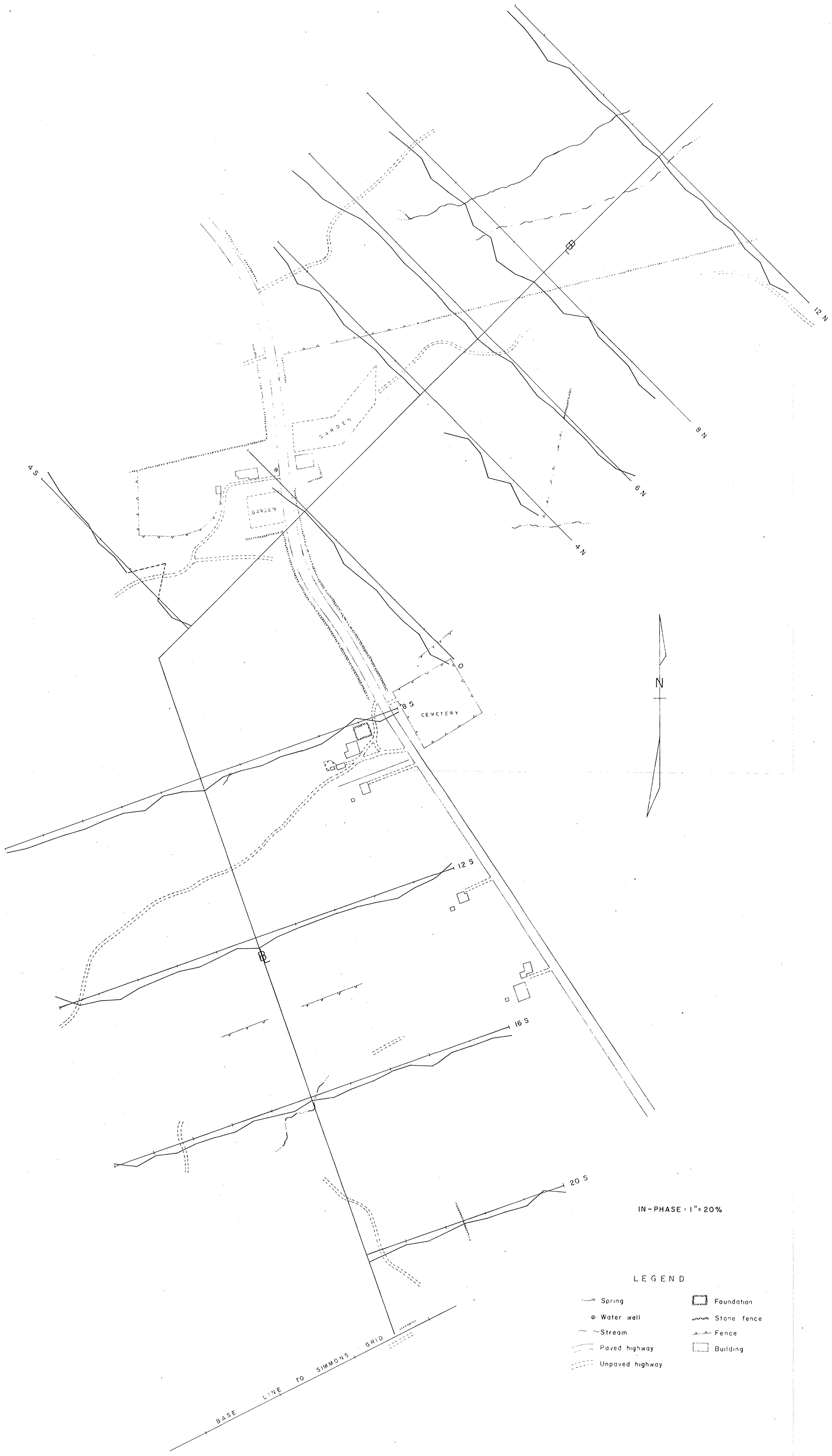
scale 1"=100'

SIMMONS PROSPECT

WARREN TWP., KNOX COUNTY, MAINE.

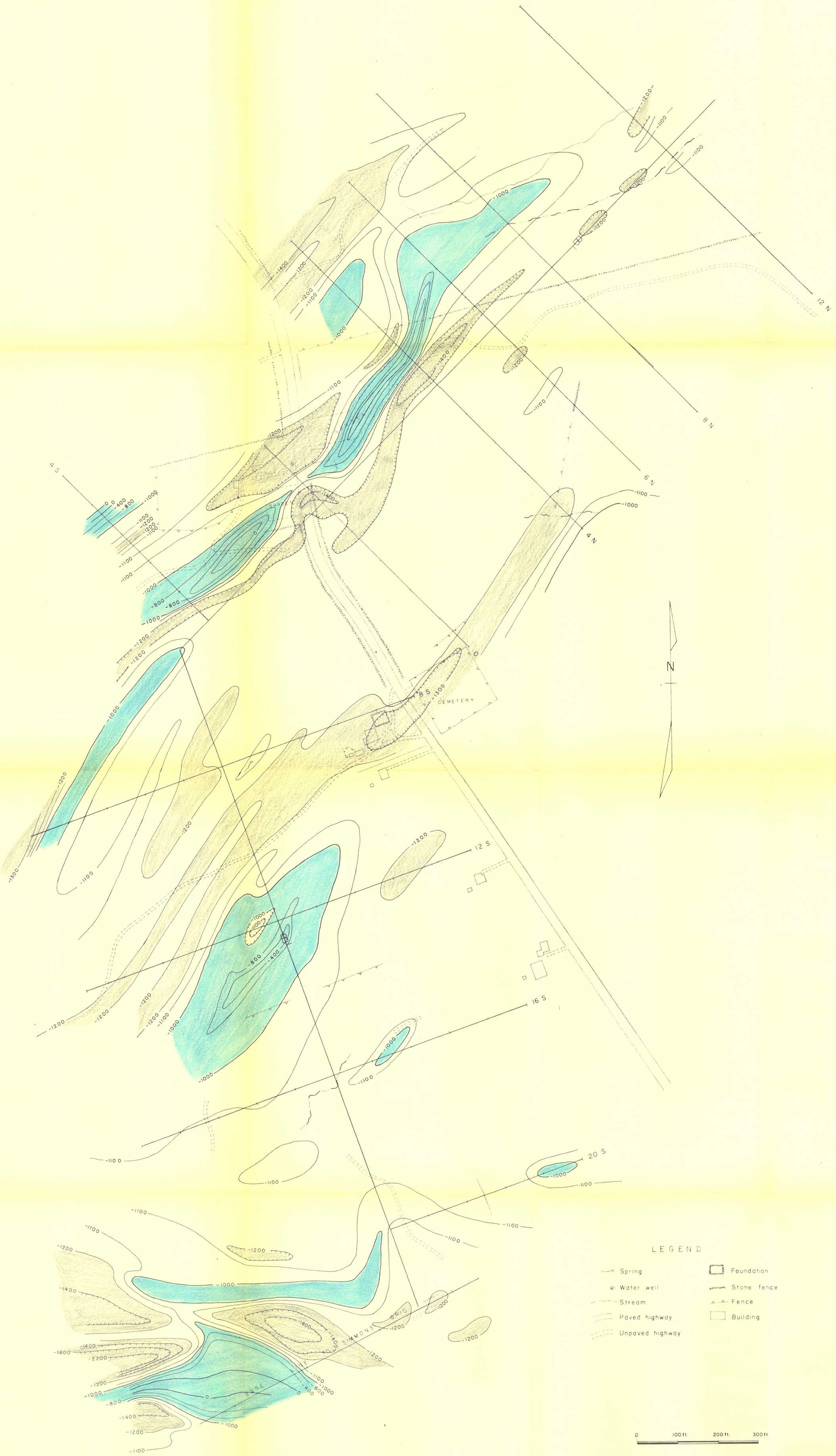
DMEA-4947

Roland F. Beers, Inc.



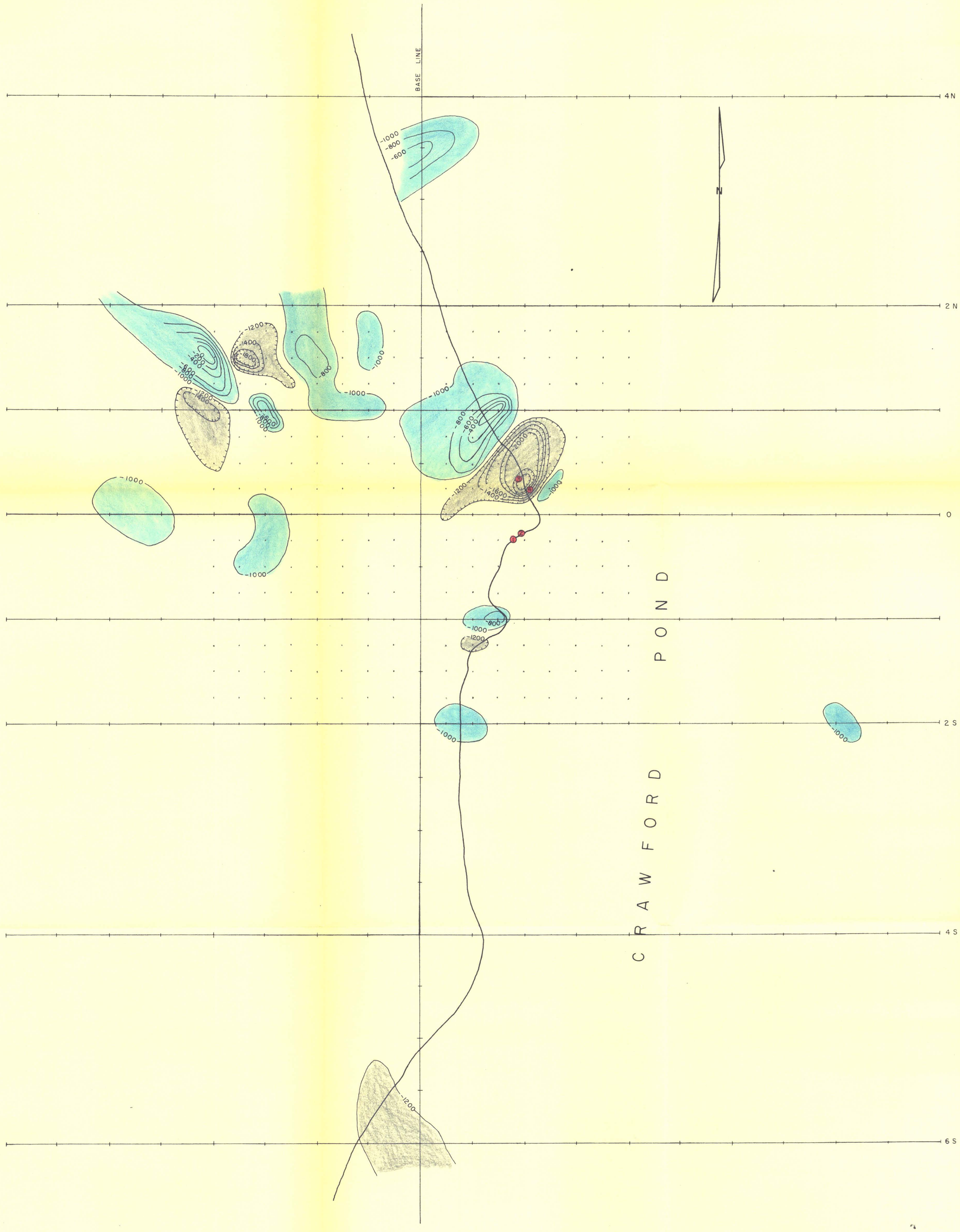
Stage 1 Area 2 Phase 1(b)	Drawn by: D.E.W. Traced by: S.H.C. Approved by:	ROLAND F. BEERS, INC. TROY, N.Y. HUPPER - SOBELESKI GRID HORIZONTAL LOOP E.M. SURVEY County: KNOX · Twnp: WARREN · Scale: 1in. = 100 ft.

Stage 1 Area 2 Phase 1(b)	Drawn by: D.E.W. Traced by: S.H.C. Approved by:	ROLAND F. BEERS, INC. TROY, N.Y. HUPPER - SOBELESKI GRID SELF-POTENTIAL SURVEY County: KNOX · Twnp: WARREN · Scale: 1 in. = 100 ft.



Stage 1 Area 2 Phase 1(b)	Drawn by D.E.W. Traced by S.H.C. Approved by	ROLAND F. BEERS, INC. TROY, N.Y. HUPPER - SOBELESKI GRID MAGNETOMETER SURVEY County: KNOX · Twnp: WARREN · Scale: 1 in. = 100 ft.

Stage 1 Area 2 Phase 1(b)	Drawn by: D.E.W. Traced by: S.H.C. Approved by:	ROLAND F. BEERS, INC. TROY, N.Y. HUPPER - SOBELESKI GRID GEOLOGY County: KNOX · Twnp: WARREN · Scale: 1 in. = 100 ft.

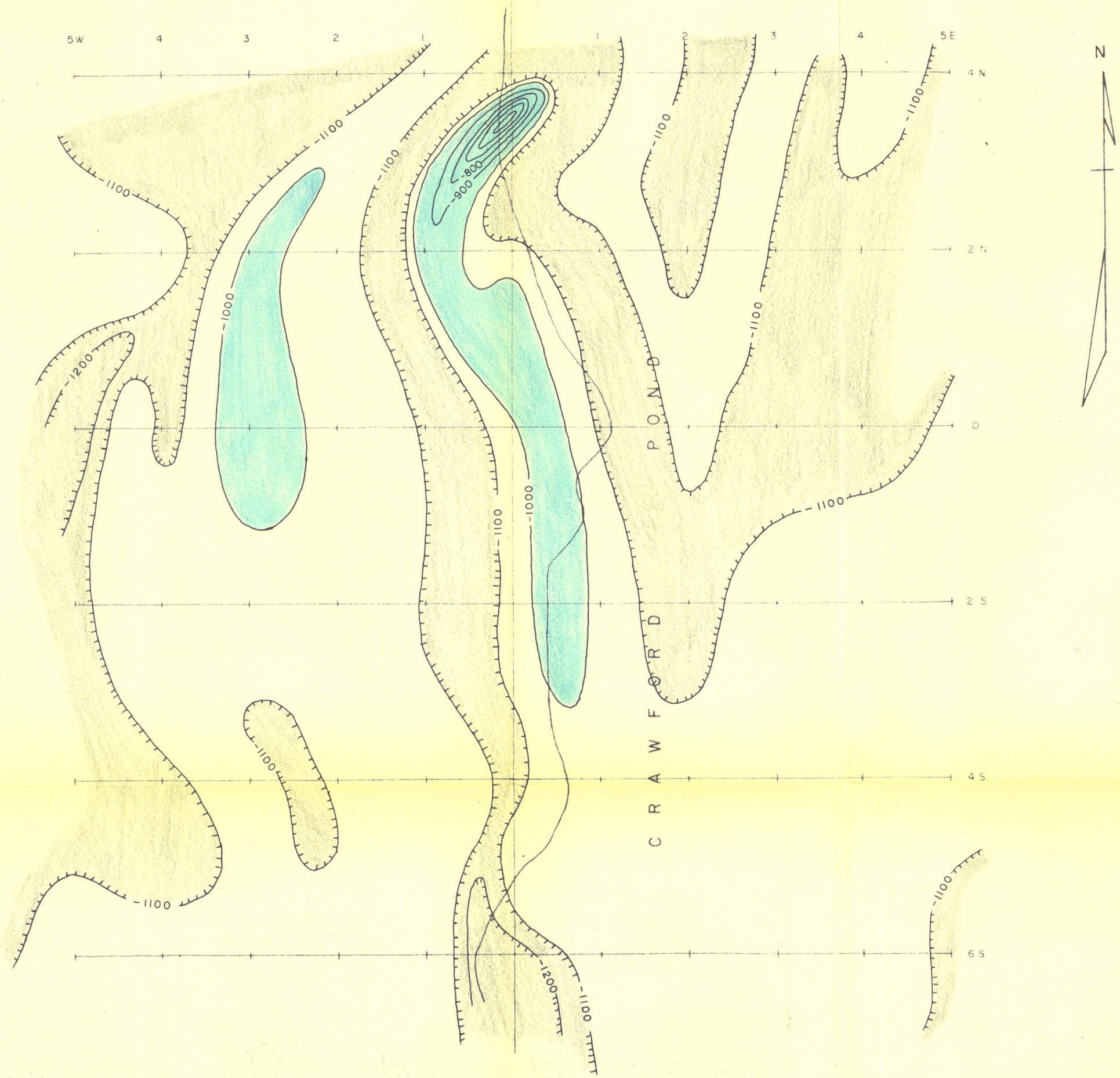


CONTOUR INTERVAL 200 γ

● PACK-SACK DRILL HOLE

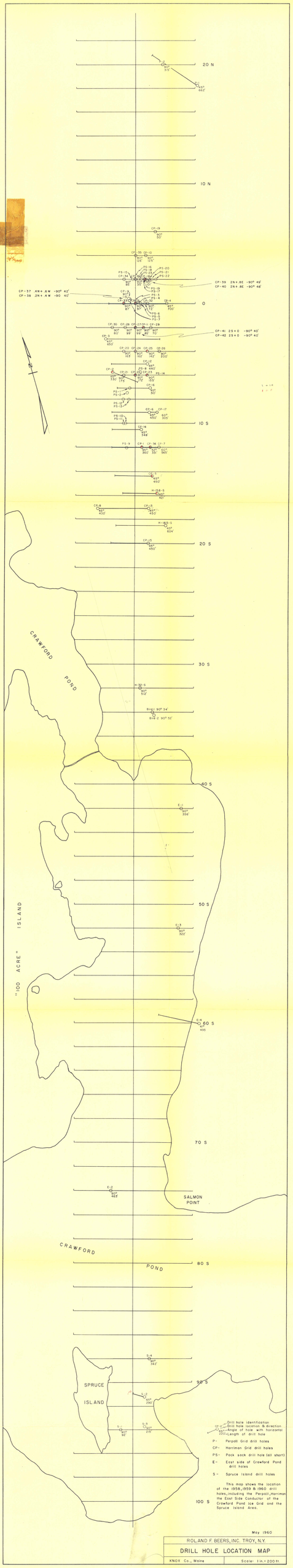
January 1959

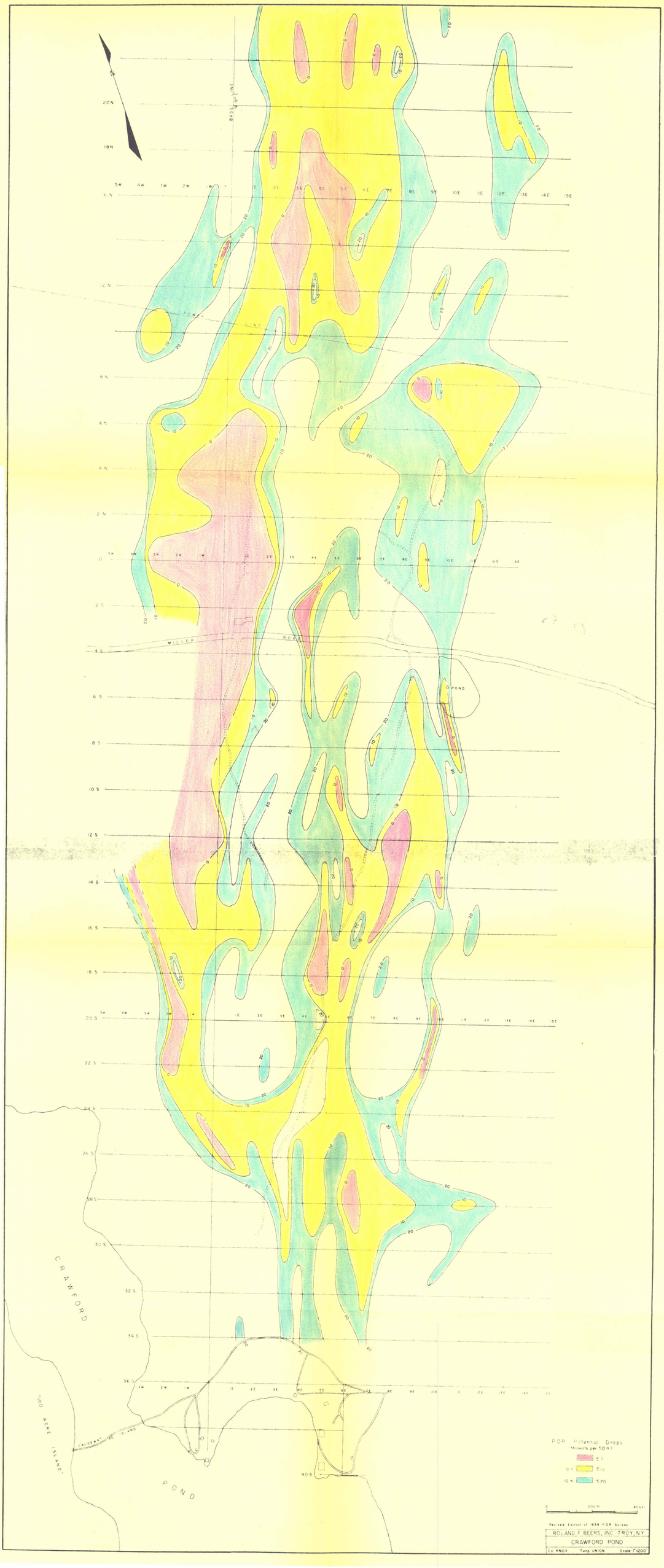
Stage 1 Area 2 Phase 2	ROLAND F BEERS, INC TROY, N.Y. KNOX TIMBER PROSPECT - P3 MAGNETOMETER SURVEY COUNTY: KNOX · TOWN: WARREN · SCALE: 1" = 50'

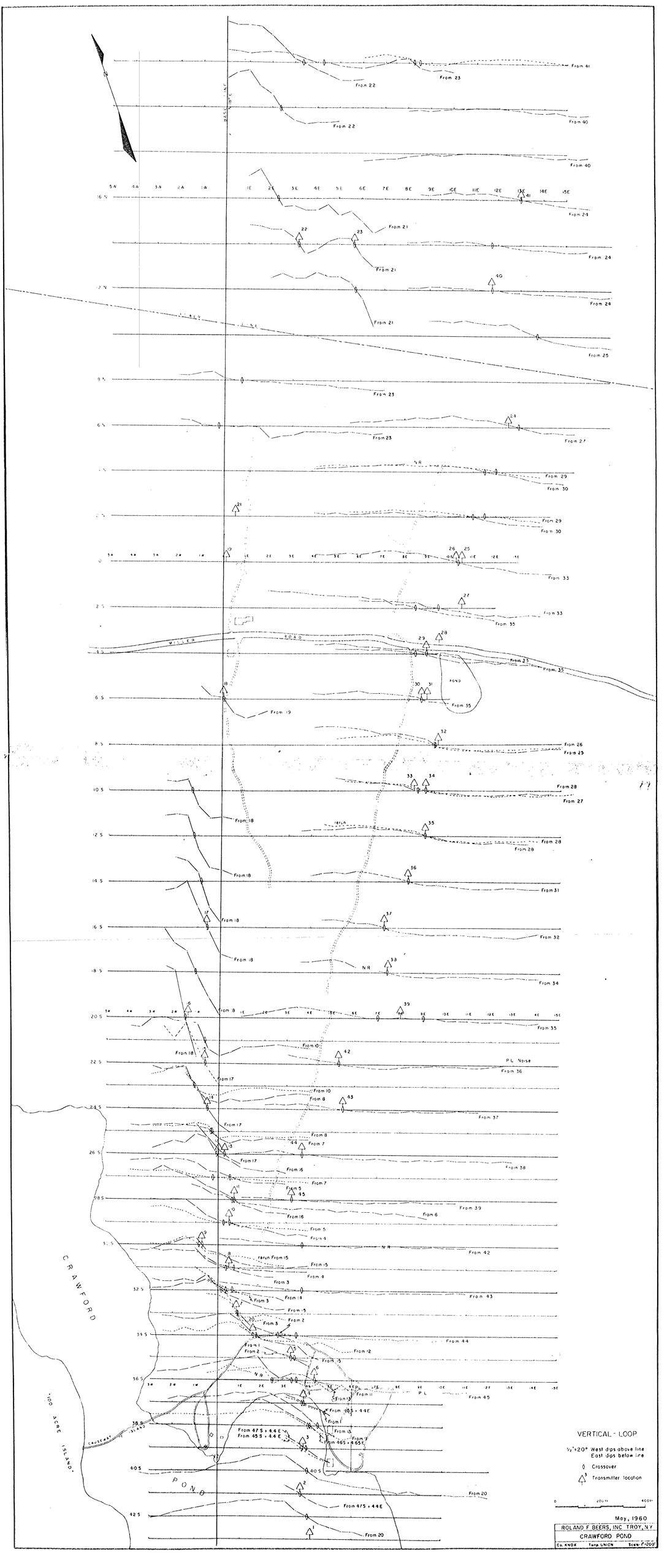


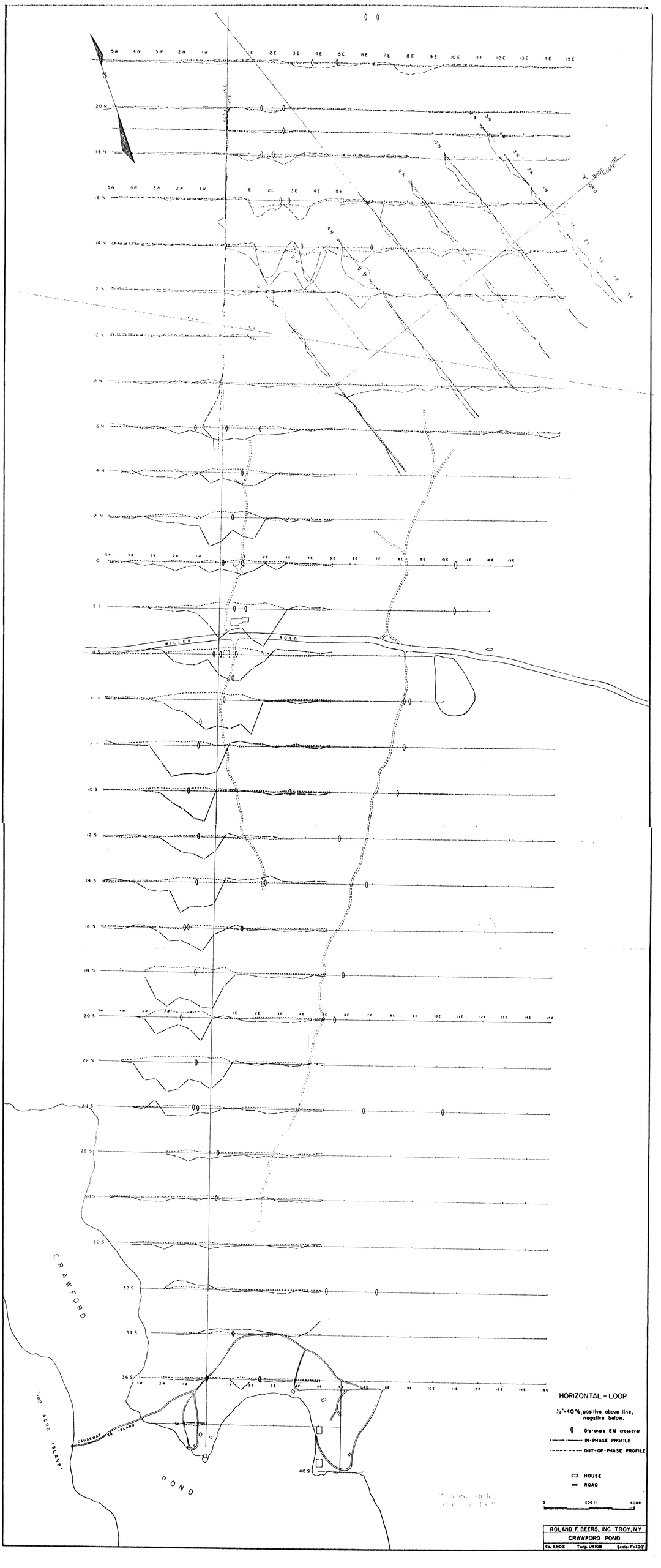
Contour Interval: 100 γ

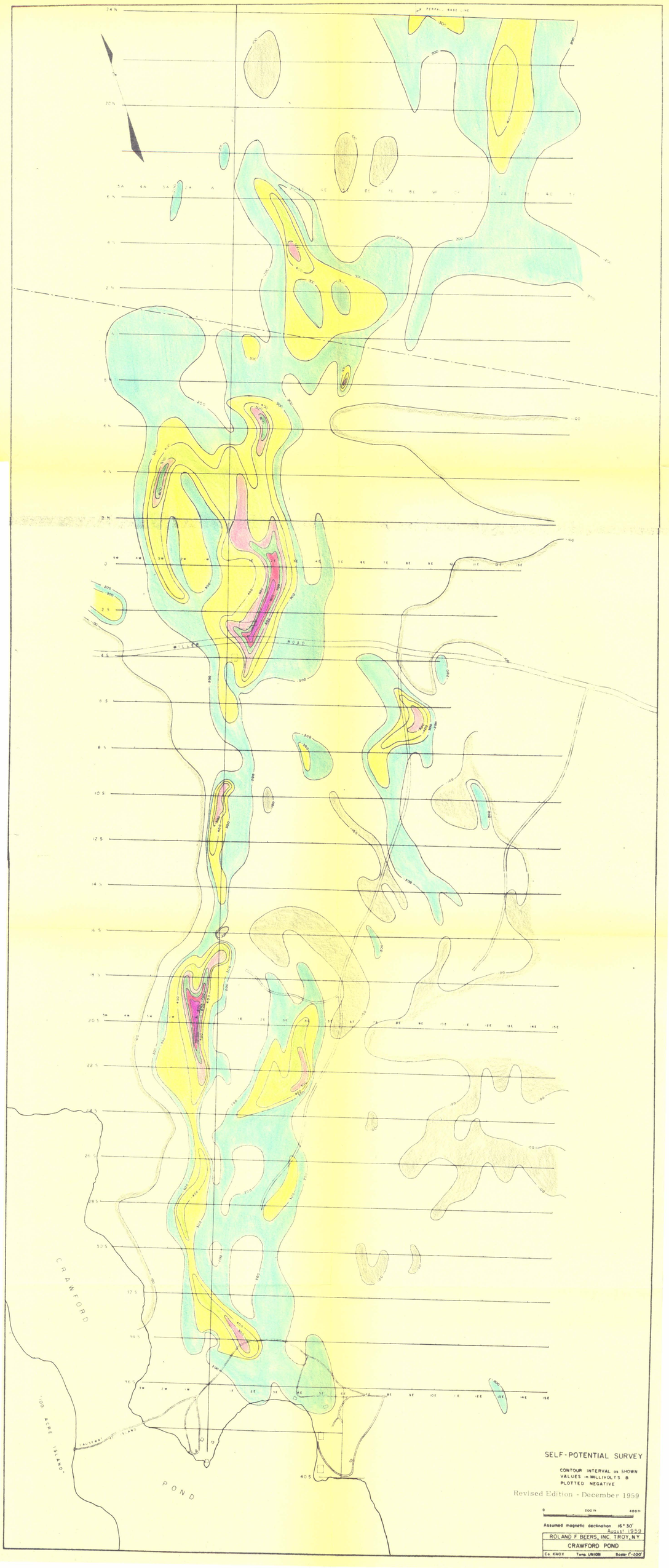
Stage 1 Area 2 Phase 1 (b)	ROLAND F. BEERS, INC. TROY, N.Y. KNOX TIMBER PROSPECT (P-3) MAGNETIC INTENSITY
	County: KNOX · Twnp: WARREN · Scale: 1in. = 100 ft

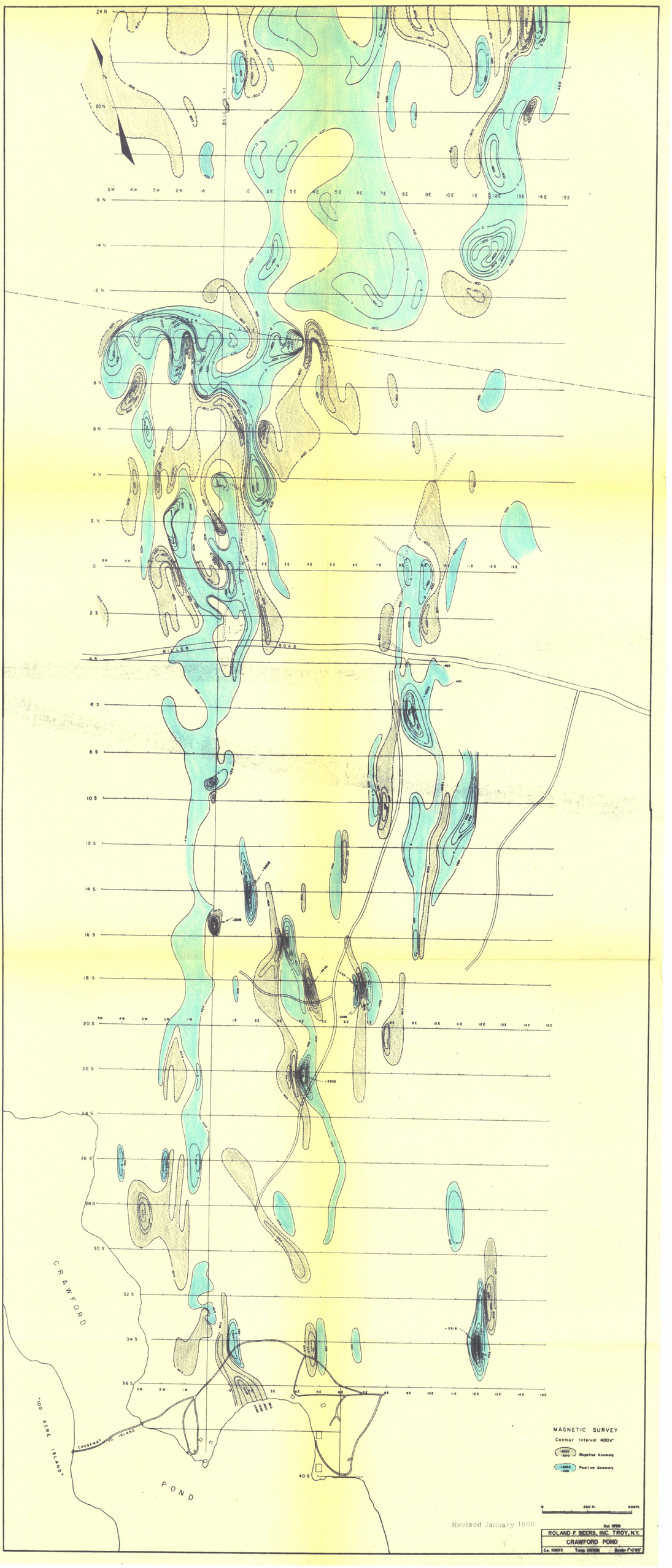

20 N
10 N
0
10 S
20 S
30 S
40 S
50 S
60 S
70 S
80 S
90 S
100 S
CP-39 2N+.8E -90° 49'
CP-40 2N+.8E -90° 49'
CP-37 4N+.6W -90° 42'
CP-38 2N+.4W -90 40'
CP-41 2S+0 -90° 45'
CP-42 2S+0 -90° 40'
CRAWFORD POND
"100 ACRE" ISLAND
SALMON POINT
SPRUCE ISLAND
Drill hole identification
Drill hole location & direction
Angle of hole with horizontal
Length of drill hole
P- Perpoll Grid drill holes
CP- Harriman Grid drill holes
PS- Pack sack drill hole (all short)
E- East side of Crawford Pond drill holes
S- Spruce Island drill holes
This map shows the location of the 1958, 1959 & 1960 drill holes, including the Perpoll, Harriman the East Side Conductor of the Crawford Pond Ice Grid and the Spruce Island Area.
May 1960
ROLAND F. BEERS, INC. TROY, N.Y.
DRILL HOLE LOCATION MAP
KNOX Co., Maine
Scale: 1 in. = 200 ft.


N
BASE LINE
ROAD
MILLER ROAD
POND
CRAWFORD
100 ACRE ISLAND
CAUSEWAY TO ISLAND
POND
PDR Potential Drops
Millivolts per 50 ft
≤ 0
0 < ≤ 10
10 < ≤ 20
0
200 ft
400 ft
Revised Edition of 1959 PDR Survey
ROLAND F. BEERS, INC. TROY, N.Y.
CRAWFORD POND
Co. KNOX
Twp. UNION
Scale: 1"=200'

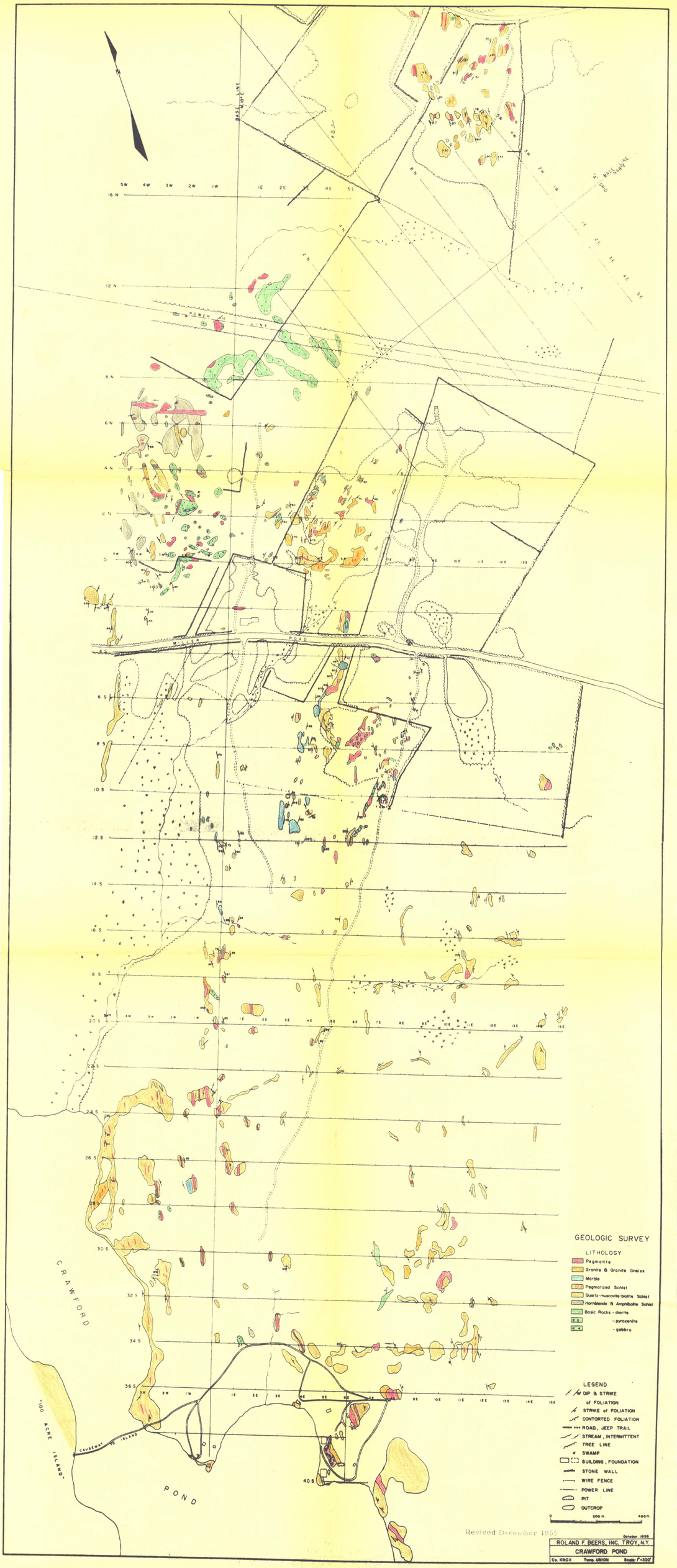

VERTICAL - LOOP
½"=20° West dips above line
East dips below line
Crossover
Transmitter location
0 200 FT 400 FT
May, 1960
ROLAND F. BEERS, INC. TROY, N.Y.
CRAWFORD POND
Co. KNOX Twp. UNION Scale 1"=200'
CRAWFORD
POND
100 ACRE ISLAND
MILLER ROAD
POND
PL Noise
NR
From 41
From 40
From 24
From 21
From 25
From 23
From 27
From 29
From 30
From 33
From 35
From 19
From 26
From 28
From 31
From 32
From 34
From 36
From 37
From 38
From 39
From 42
From 43
From 44
From 45
From 20
From 47S + 4.4E
From 45S + 4.4E
From 46S + 4.6SE
From 40S + 4.4E
From 41S + 4.4E

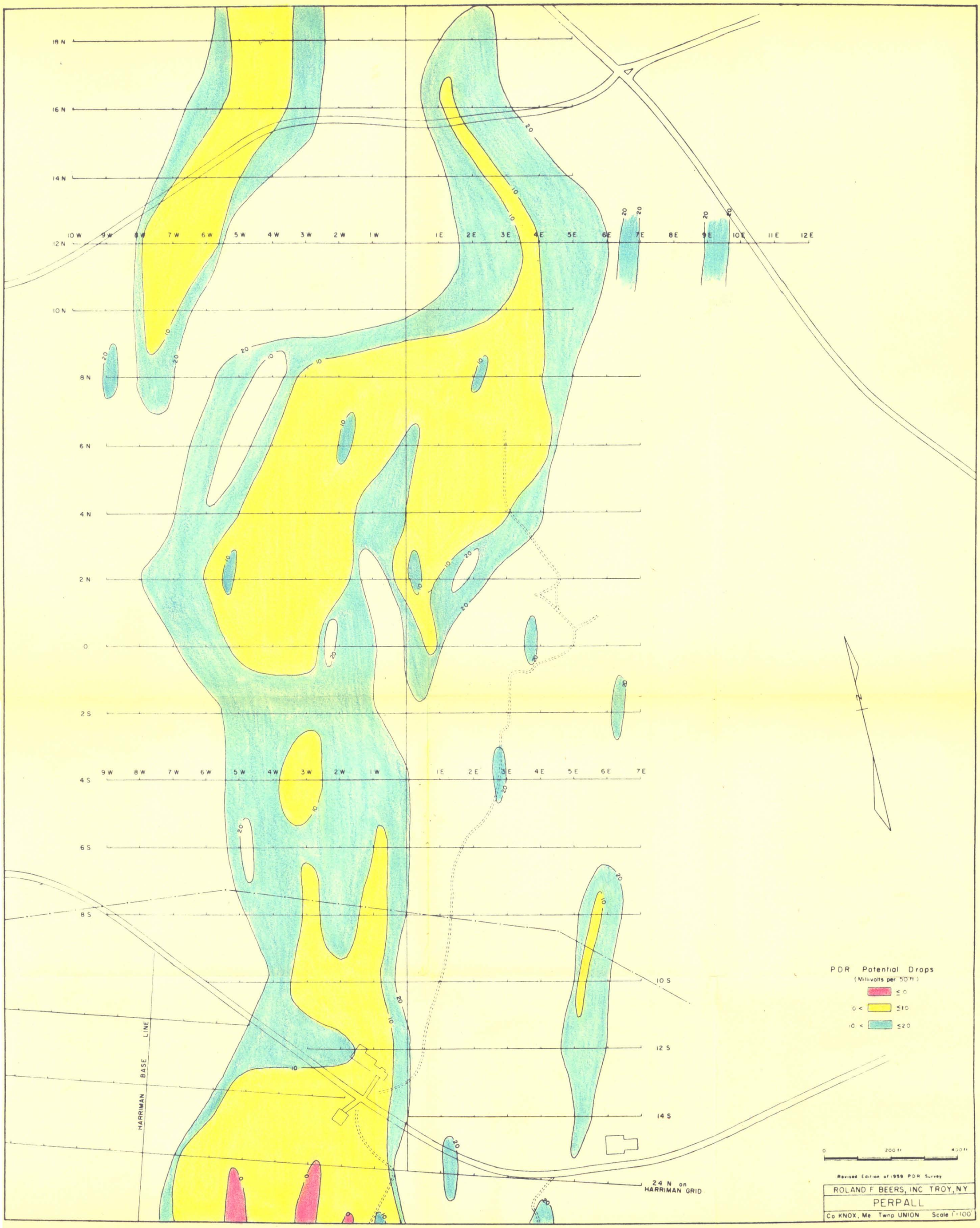

HORIZONTAL - LOOP
⅓"=40%, positive above line, negative below.
Dip-angle EM crossover
IN-PHASE PROFILE
OUT-OF-PHASE PROFILE
HOUSE
ROAD
0
200 ft
400 ft
ROLAND F. BEERS, INC. TROY, N.Y.
CRAWFORD POND
Co. KNOX
Twp. UNION
Scale: 1"=100'
MILLER ROAD
CRAWFORD
POND
"100 ACRE ISLAND"
CAUSEWAY TO ISLAND
BASE LINE
20 N
18 N
16 N
14 N
12 N
10 N
8 N
6 N
4 N
2 N
0
2 S
4 S
6 S
8 S
10 S
12 S
14 S
16 S
18 S
20 S
22 S
24 S
26 S
28 S
30 S
32 S
34 S
36 S
40 S

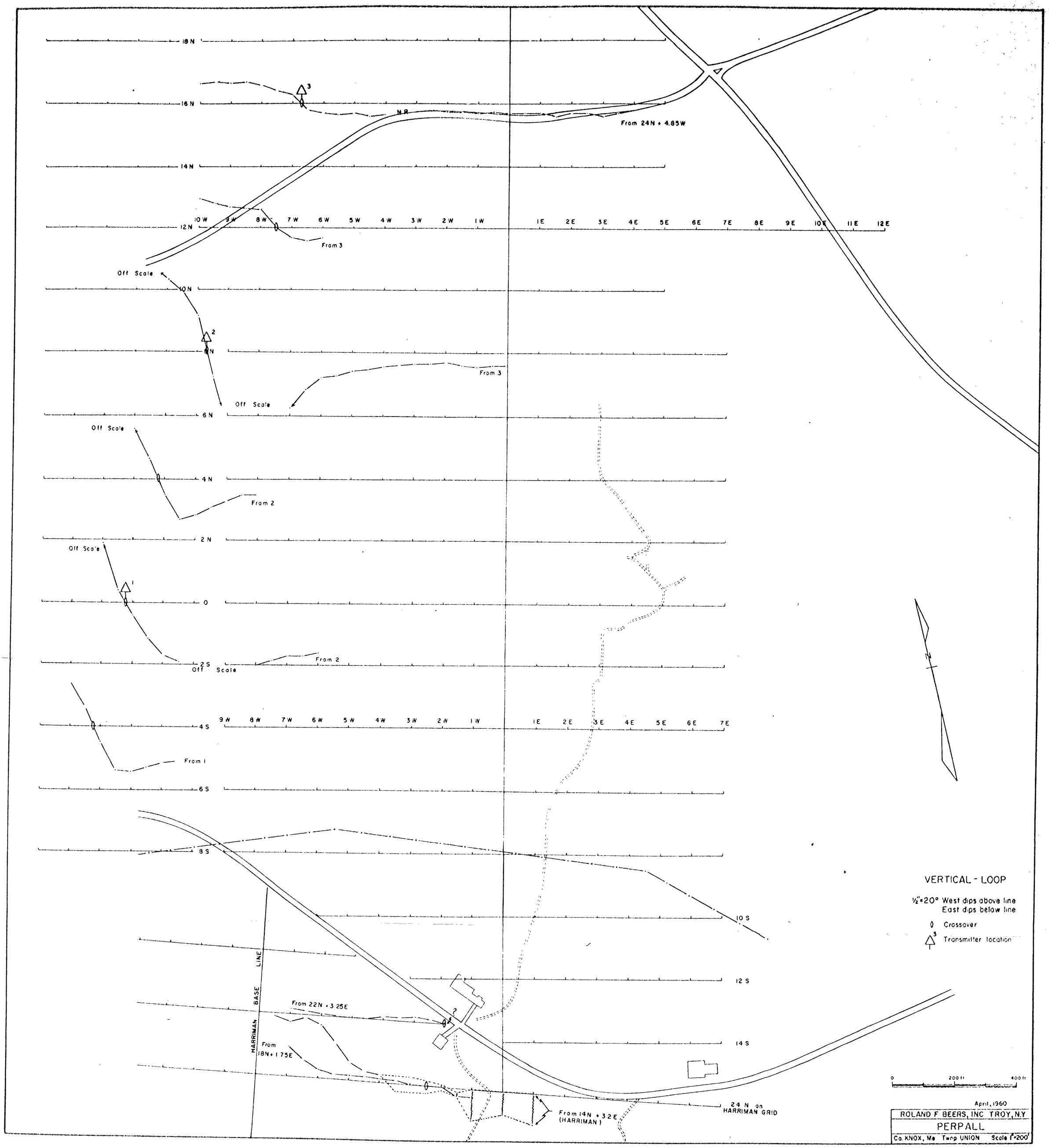

CRAWFORD
POND
"100 ACRE ISLAND"
ROAD
SELF-POTENTIAL SURVEY
CONTOUR INTERVAL as SHOWN
VALUES in MILLIVOLTS &
PLOTTED NEGATIVE
Revised Edition - December 1959
0 200 ft 400 ft
Assumed magnetic declination 16° 30'
August 1959
ROLAND F. BEERS, INC. TROY, N.Y.
CRAWFORD POND
Co. KNOX Twp. UNION Scale 1"=200'

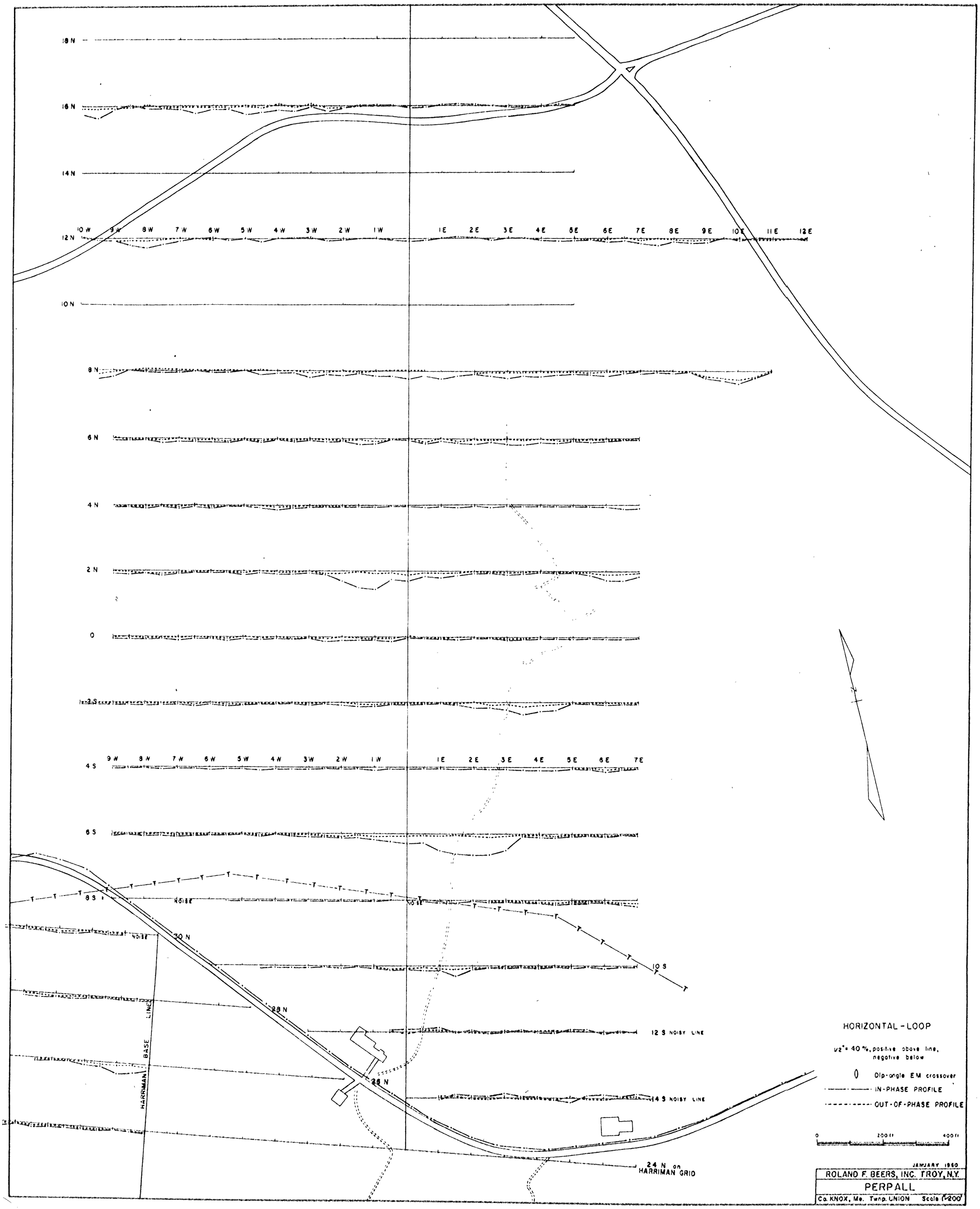


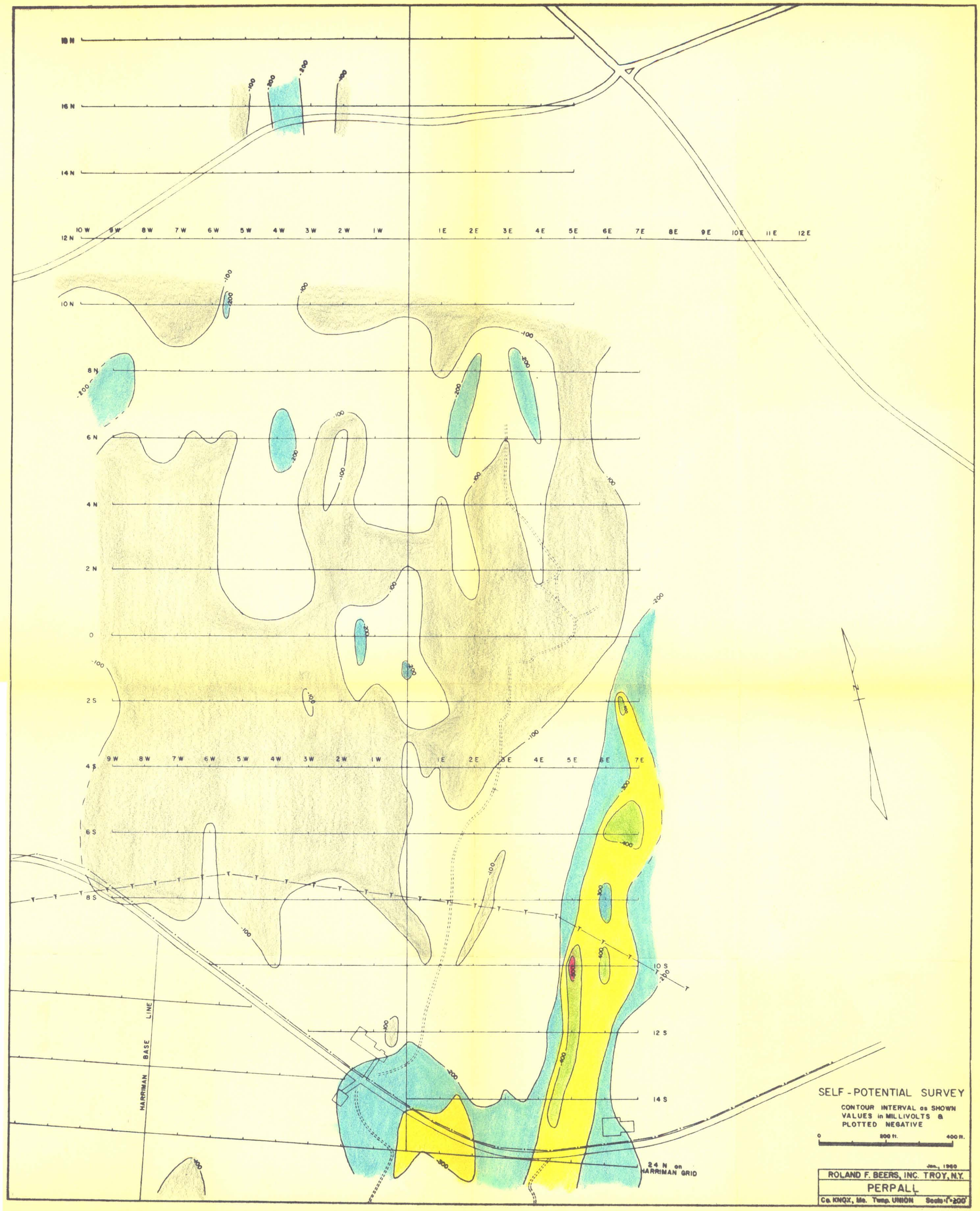
Revised January 1960

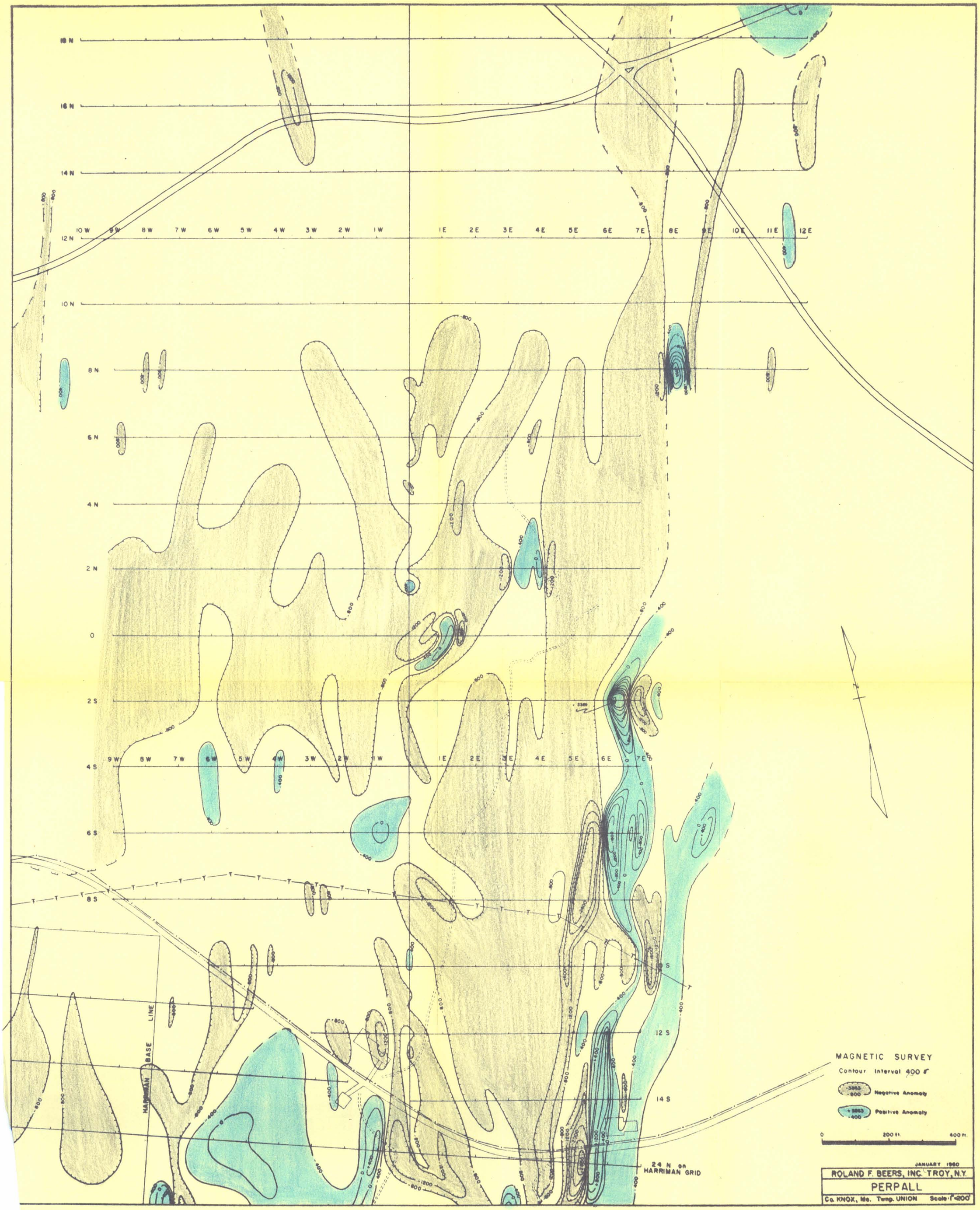

BASE LINE
POWER LINE
MILLER ROAD
CRAWFORD
POND
"100 ACRE ISLAND"
CAUSEWAY TO ISLAND
GEOLOGIC SURVEY
LITHOLOGY
Pegmatite
Granite & Granite Gneiss
Marble
Pegmatized Schist
Quartz-muscovite-biotite Schist
Hornblende & Amphibolite Schist
Basic Rocks - diorite
- pyroxenite
- gabbro
LEGEND
DIP & STRIKE of FOLIATION
STRIKE of FOLIATION
CONTORTED FOLIATION
ROAD, JEEP TRAIL
STREAM, INTERMITTENT
TREE LINE
SWAMP
BUILDING, FOUNDATION
STONE WALL
WIRE FENCE
POWER LINE
PIT
OUTCROP
0 200 ft 400 ft
Revised December 1956
October 1939
ROLAND F. BEERS, INC. TROY, N.Y.
CRAWFORD POND
Co. KNOX
Twp. UNION
Scale: 1" = 200'

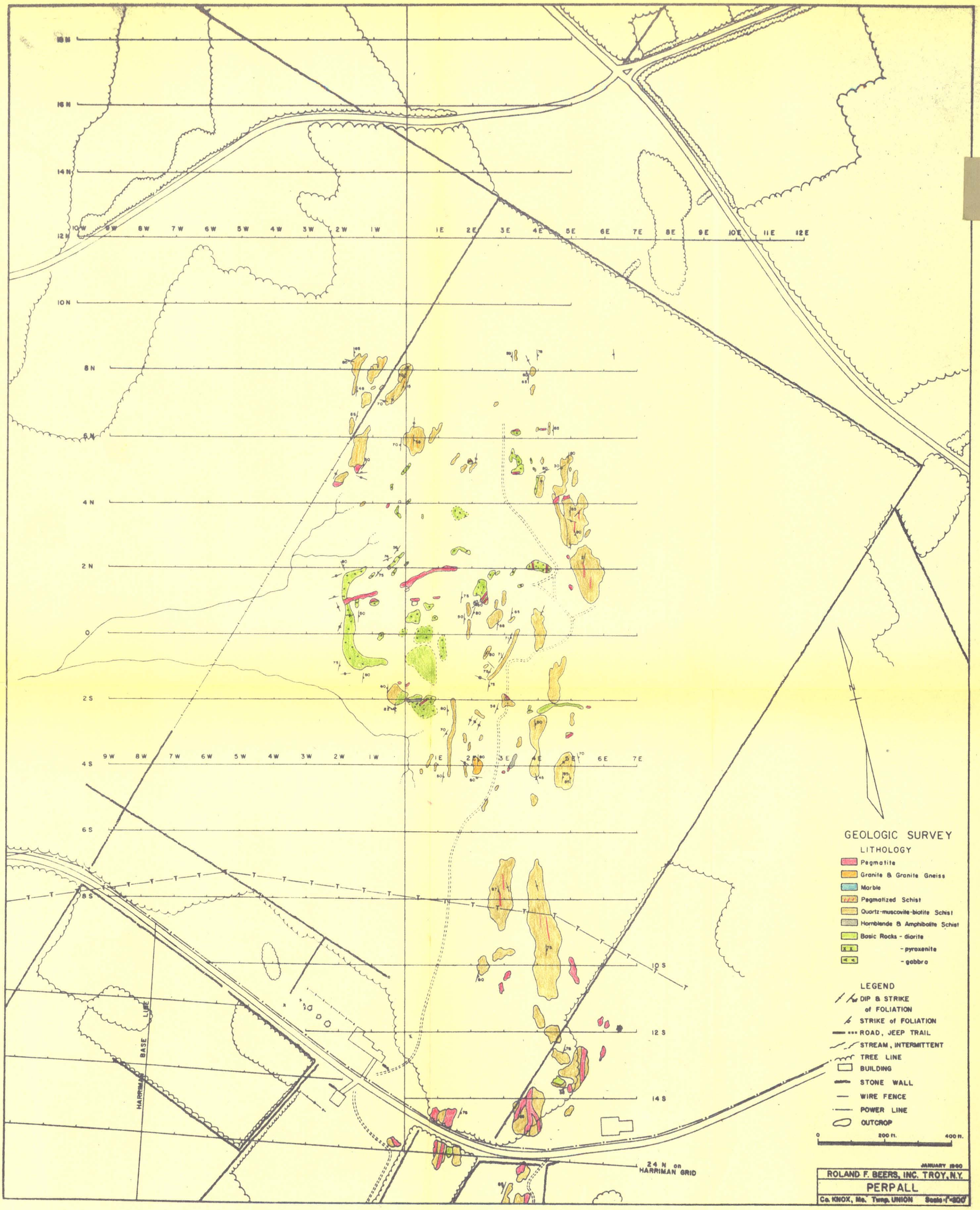

18 N
16 N
14 N
12 N
10 N
8 N
6 N
4 N
2 N
0
2 S
4 S
6 S
8 S
10 S
12 S
14 S
24 N on HARRIMAN GRID
HARRIMAN BASE LINE
10 W 9 W 8 W 7 W 6 W 5 W 4 W 3 W 2 W 1 W 1 E 2 E 3 E 4 E 5 E 6 E 7 E 8 E 9 E 10 E 11 E 12 E
9 W 8 W 7 W 6 W 5 W 4 W 3 W 2 W 1 W 1 E 2 E 3 E 4 E 5 E 6 E 7 E
N
PDR Potential Drops
(Millivolts per 50 ft)
≤ 0
0 < ≤10
10 < ≤20
0 200 ft 400 ft
Revised Edition of 1959 PDR Survey
ROLAND F BEERS, INC TROY, NY
PERPALL
Co KNOX, Me Twnp UNION Scale 1"=100'


18 N
16 N
14 N
12 N
10 N
8 N
6 N
4 N
2 N
0
2 S
4 S
6 S
8 S
10 S
12 S
14 S
10 W 9 W 8 W 7 W 6 W 5 W 4 W 3 W 2 W 1 W
1 E 2 E 3 E 4 E 5 E 6 E 7 E 8 E 9 E 10 E 11 E 12 E
9 W 8 W 7 W 6 W 5 W 4 W 3 W 2 W 1 W
1 E 2 E 3 E 4 E 5 E 6 E 7 E
3
N R
From 24N + 4.85W
From 3
Off Scale
2
From 3
Off Scale
Off Scale
From 2
Off Scale
1
From 2
Off Scale
From 1
HARRIMAN BASE LINE
From 22N + 3.25E
From 18N + 1.75E
From 14N + 3.2E (HARRIMAN)
24 N on HARRIMAN GRID
N
VERTICAL - LOOP
½" = 20° West dips above line
East dips below line
Crossover
Transmitter location
0 200 ft 400 ft
April, 1960
ROLAND F BEERS, INC TROY, N.Y
PERPALL
Co. KNOX, Me Twnp UNION Scale 1" = 200'

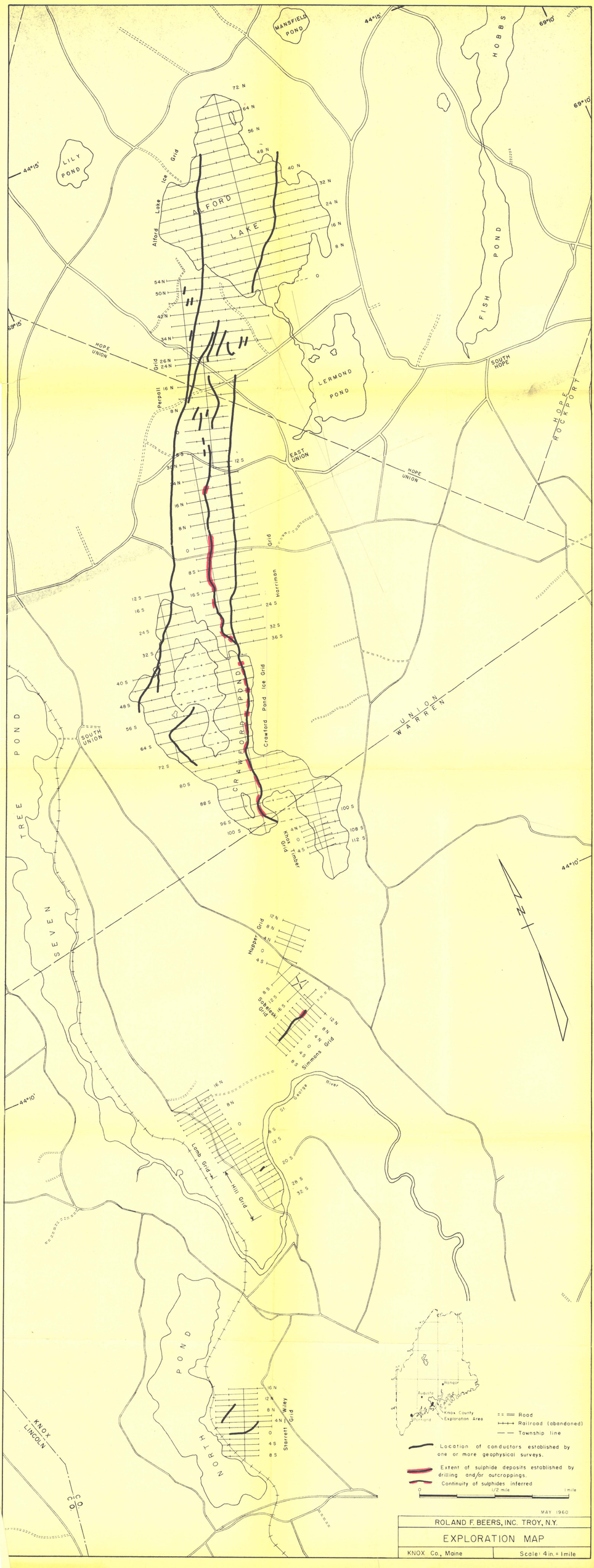

18 N
16 N
14 N
12 N
10 N
8 N
6 N
4 N
2 N
0
2 S
4 S
6 S
8 S
10 S
12 S NOISY LINE
14 S NOISY LINE
10 W 9 W 8 W 7 W 6 W 5 W 4 W 3 W 2 W 1 W
1 E 2 E 3 E 4 E 5 E 6 E 7 E 8 E 9 E 10 E 11 E 12 E
9 W 8 W 7 W 6 W 5 W 4 W 3 W 2 W 1 W
1 E 2 E 3 E 4 E 5 E 6 E 7 E
NOISE
30 N
28 N
26 N
24 N on HARRIMAN GRID
HARRIMAN BASE LINE
HORIZONTAL - LOOP
1/2" = 40 %, positive above line, negative below
Dip-angle EM crossover
IN-PHASE PROFILE
OUT-OF-PHASE PROFILE
0
200 ft
400 ft
JANUARY 1960
ROLAND F. BEERS, INC. TROY, N.Y.
PERPALL
Co. KNOX, Me. Twnp. UNION Scale 1"=200'

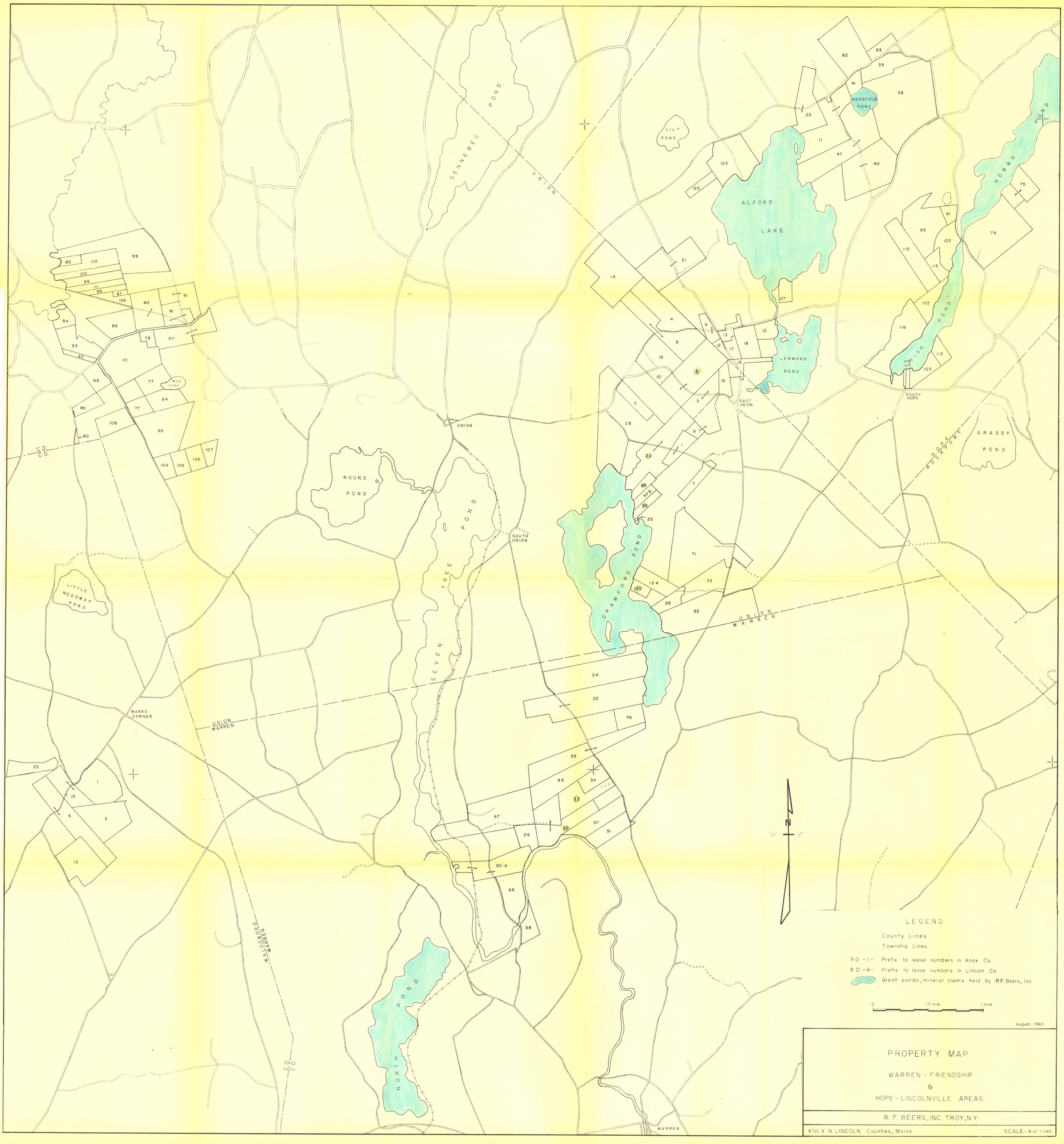

SELF-POTENTIAL SURVEY
CONTOUR INTERVAL as SHOWN
VALUES in MILLIVOLTS &
PLOTTED NEGATIVE
0
200 ft.
400 ft.
Jan., 1960
ROLAND F. BEERS, INC. TROY, N.Y.
PERPALL
Co. KNOX, Me. Twp. UNION
Scale 1"=200'
HARRIMAN BASE LINE
24 N on HARRIMAN GRID
N


MAGNETIC SURVEY
Contour Interval 400 γ
Negative Anomaly
Positive Anomaly
0
200 ft.
400 ft.
JANUARY 1960
ROLAND F. BEERS, INC. TROY, N.Y.
PERPALL
Co. KNOX, Me. Twnp. UNION
Scale 1"=200'
24 N on HARRIMAN GRID
HARRIMAN BASE LINE



Perpall Geology.


MANSFIELD POND
LILY POND
HOBBS
FISH POND
ALFORD LAKE
Alford Lake Ice Grid
LERMOND POND
HOPE
UNION
EAST UNION
SOUTH HOPE
ROCKPORT
Perpall Grid
Harriman Grid
CRAWFORD POND
Crawford Pond Ice Grid
Knox Grid Timber
UNION
WARREN
SOUTH UNION
TREE POND
SEVEN
Hupper Grid
Sobieski Grid
Simmons Grid
Lamb Grid
Hill Grid
Kennebec River
NORTH POND
Starrett Wiley Grid
KNOX
LINCOLN
Bangor
Augusta
Portland
Knox County Exploration Area
Road
Railroad (abandoned)
Township line
Location of conductors established by one or more geophysical surveys.
Extent of sulphide deposits established by drilling and/or outcroppings.
Continuity of sulphides inferred
1/2 mile
1 mile
MAY 1960
ROLAND F. BEERS, INC. TROY, N.Y.
EXPLORATION MAP
KNOX Co., Maine
Scale: 4 in. = 1 mile


PROPERTY MAP
WARREN - FRIENDSHIP
&
HOPE - LINCOLNVILLE AREAS
R. F. BEERS, INC. TROY, N.Y.
KNOX & LINCOLN Counties, Maine
SCALE: 4 in. = 1 mi.
August, 1960
LEGEND
County Lines
Township Lines
9.0 -1- Prefix to lease numbers in Knox Co.
9.0 -4- Prefix to lease numbers in Lincoln Co.
Great ponds, mineral claims held by R.F. Beers, Inc.
0
1/2 mile
1 mile
N
W
E
ALFORD LAKE
LERMOND POND
CRAWFORD POND
MANSFIELD POND
HOBBS POND
FISH POND
GRASSY POND
SENNEBEC POND
LILY POND
ROUND POND
SEVEN TREE POND
NORTH POND
LITTLE MEDOMAK POND
MUD POND
UNION
EAST UNION
SOUTH UNION
SOUTH HOPE
HOPE
ROCKPORT
UNION
WARREN
WALDOBORO
WARREN
MANKS CORNER
CO.
CO.
WARREN