

File 63.681 (5)



42B03SE0002 63.681 COLLINS

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DOMINION GULF COMPANY

GEOLOGY OF CHEWETT I

COLLINS TOWNSHIP SECTION - LOTS 8, 9 & 10, CONC. I

BASE MAP 410/14N

ONTARIO

A. Stucken & G. E. Parsons

September 10, 1955

Autopositives filed separately.



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SUMMARY, CONCLUSIONS & RECOMMENDATIONS

This report covers 13 claims in Lots 8, 9 and 10, Concession I, Collins Township, Sudbury Mining Division, Ontario. They are some 18 air miles from the town of Chapleau on the C.P.R. transcontinental line.

Geologically, they occupy part of the northeast flank of a metasomatic aureole surrounding an alkaline plug. The rocks grade inward on this aureole from relatively unaltered gneiss to completely alkalinized gneisses (alkalic fenites). These alkalic fenites have an indicated width of almost a half mile. Evidence to date also indicates they may average 0.2% - 0.3% Cb_2O_5 and 0.02% - 0.03% U_3O_8 , with some areas up to 0.5% Cb_2O_5 and 0.03% U_3O_8 .

It is recommended that x-ray drill holes be drilled NE and SW from the alkalic fenite outcrops at 6/00S on Line 28W. This is for the purpose of further testing these favourable rocks.

It is also recommended that all claims be held for patenting, except possibly 86971 and -74, unless it is definitely proven that the columbium and uranium cannot be economically extracted from these rocks.

INTRODUCTION

The property consists of 13 claims situated wholly or in part on land in Lots 8, 9 and 10, Concession I, Collins Township, Sudbury Mining Division. The claim numbers are S-82918-19, S-82921, S-86968-76 and S-88753. The first three claims were staked in February 1955 to protect the north flank of an aeromagnetic anomaly, and the rest of the claims were added in June and August to protect formations believed favourable for columbium and associated minerals.

The property is accessible by three means of travel. First, it is some 18 miles by plane from Chapleau, Ontario, a town situated on the main C.P.R. transcontinental line. Second, the property is some 4 miles from the Bigelow Lumber Company roads. These lead north from Borden Lake and Devon, which is on the C.P.R. line. Third, it is possible to reach Nemegosenda Lake by canoe from the north or south via the Nemegosenda River system.

No evidence was found of previous staking or prospecting. Two blazed lines and an inscription on a blaze on the lake shore, dated 1951, indicated that timber cruisers had been through the area. Dr. R. Bell (Progress Report GSC 1880-2, p. 6c) mapped the shore line of Trout Lake (Nemegosenda Lake), and reported reddish granite, yellow-weathering pearlspar, calcspar, light green apatite and light green fluospar. Collins Township was subdivided by Rourke (O.L.S.) in 1905.

The claims were mapped by the writers and K. Sargent in the summer of 1955. This mapping was done using picket lines spaced at 400-foot intervals and traversing at 100-foot intervals between these lines. All outcrops were checked with the scintillometer and for magnetism. In June 1955, J. A. Lonergan (O.L.S.) ran a trial township line and established the true township line between Chewett and Collins Townships.

PICKET LINE LAYOUT & BASE MAP CONSTRUCTION

The picket line system was laid out and the base map constructed as follows:

Base Line "A" was run in the winter of 1955 in the considered position of the township line. The hub on the shore line was taken as 62/30 East of the west boundary of Chewett Township, and the base

line picketed accordingly. Lines 60E to 92E inclusive were cut north and south at right angles to this base line. The line 13N (13/00N) was run at right angles to L60E. The trial township line run by Lonergan established the true position of Base Line "A" and lines associated with it.

Line O East was turned off at right angles to Lonergan's trial township line. The zero point on this line is $0/65^{\circ}E$, $1/19^{\circ}N$ of his trial 8-9 lot post (iron pin). This OE line was extended north for 2600 feet. At this point, Base Line "E" was turned off at right angles and driven west to the shore.

At $0/55.5'$ West of line OE on B.L. "E", the old lot line 8-9 was located. This point was called $0/00W$ for B.L. "E". This base line extends $29/00W$ to the shore line.

Lot line between 8 and 9 was reopened and extended north to the concession line I-II, where the old lot post and bearing tree were located. This concession line was reopened west to the lake (1048 feet).

Lines were turned off B.L. "E" at 400-foot intervals, and were tied in with the above concession line and T.L. 13N of the Base Line "A" system.

In the base map construction, Line O East was considered to be exactly at right angles to Lonergan's trial township line or, that is, due north. Lot 8-9 line was established by joining the position of its intersection on B.L. "E" (55.5 West of $0/00$ Line) with the calculated position of the lot post on the established township line. This calculated position is $1/19N$ and $0/65$ West of Lonergan's trial lot post.

The distance east-west on T.L. 13N was tied to line 8 West. The picket 91/96E on T.L. 13N is 86 feet east of L&W.

The chainages of north-south picket lines were considered correct, which makes the concession line at an angle to the lot line, which may or may not be so.

TOPOGRAPHY

The south and central portion of these claims is occupied by a rather flat plateau, some 80 feet above the lake level. This plateau drops abruptly to the lake and also north to an east-west stream continuing across the northeast claim. The rock is of a ground moraine type, with boulder erratics along the surface and the lakeshore. There is a fair scattering of outcrops, but the overburden seems to be thick enough to obliterate any detectable basement-rock control for the topography. Slash is predominant along the shoreline and inland to a distance of 350 feet. Spruce and cedar then are prevalent for the next 1000 feet inland, where tall poplar and birch then predominate.

GEOLOGY

General

Gulf personnel mapping in this area have used the concept that H. von Eckermann developed in his study of the Alno alkaline intrusive in Sweden. That hypothesis considers these plug-like areas of alkaline rocks to be essentially derived from a K_2O carbonate-rich melt and its reaction with the acidic country rocks. These claims are on the northeast rim of such a plug. A master table of formations has been compiled for the area; however, only those rock types found on these claims in question are presented here.

Basically, the rock types are divided into three main groups from the centre of the plug outward:

1. alkaline intrusive;
2. contact zone;
3. fenites (metasomatically altered country rock).

They are then subdivided primarily on their mineralogical composition and their position in the metasomatic aureole.

Table of Formations

Diabase (age unknown)

A. Alkaline Intrusives

- A₁ Sovite - carbonate dikes.
- A₂ Pulaskite - orthoclase-rich syenite.
- A_{4a} Pyroxenite
- A_{4b} Biotite.

C. Contact Zone - rheomorphic and ultra-fenites

- C₃ Intermediate types
- C₄ Acid.

F. Fenites

- F₁ Alkalic Fenites (completely alkalinized gneisses)
- F_{1a} Porphyritic Fenites (soda-orthoclase metacrysts)
- F_{1b} Dark (ferromagnesian-rich)
- F_{1c} Red (red hydrated feldspar-rich)
- F₂ Syenitic Fenites
- F_{2a} Feldspar base completely red or pink hydrated feldspar
- F_{2b} " " over 50% red or pink hydrated feldspar.
- F₃ Fenite (slightly alkalinized quartz-feldspar-biotite gneisses and hornblende gneisses)

F_{3a} Aegirite augite metacrysts present.

F_{3b} Aegirite locally replacing quartz, but not in metacrysts.

F_{3c} Gneisses little or unaffected by alkalic solutions.

Description of Formations

Fenites

These are the gneisses common to the area that have been slightly to totally altered "in situ" by the metasomatic alkalic solutions.

Those on the outer rim of the metasomatic aureole, i.e., type F_{3b}, vary from typical quartz-biotite to quartz-felspar-biotite to hornblende and/or augite-rich gneisses. There is generally some observable evidence that they have been attacked by alkalic solution, e.g., green aegirite-augite replacing quartz out from cracks, and orthoclase-aegirite augite seams cutting the rocks. These gneisses are exposed in the north and east part of the claim group. The outcrops just east of claim S-88753 are slightly pink weathering, finely gneissic quartz-felspar-biotite gneisses with some evidence of aegirite-augite. All the outcrops on Line 4E, just north of base line "E", are of a similar type of gneiss except there is more evidence of aegirite being developed and possibly even some hydration of the felspars. The two outcrops just west of 12/00N on Line 4E are also quartz-felspar gneisses, however, with some interbanded hornblende gneiss. The outcrops strung from 10/00N on the lot line to 0/50W of 10/50N on Line 4W are the sole representatives of a mafic-rich gneiss of hornblende, biotite, quartz and magnetite.

The next fenite horizon mapped is type F_{3a}. These rocks are recognized by the pronounced development of aegirite-augite metacrysts in a granular grey feldspathic and/or quartzitic base. A single outcrop is exposed at 0/75W of 7/75S on Line 4W, and is a very good example of the rock type.

The next type, F_{2b}, is similar to type F_{3a}, except the feldspathic base has taken on a definite pink to red colour due to hydration. The outcrops around 10/00N on L24W are mostly of this type. These outcrops are cut by rather numerous aegirite filled cracks.

Moving still inward on the metasomatic aureole, the next type mapped is F_{2a}. This type is similar to the above type, except the base consists completely of pink or red hydrated feldspars. The quartz is now all or largely replaced, and the augite metacrysts are still a distinctive and diagnostic feature. The outcrop between lines 4W and 8W at 15/00S is a good type outcrop and the only exposure on these claims.

The innermost zone of the fenite aureole is called the alkalic fenite, type F₁. All the original features and minerals of the original gneisses are practically destroyed. This is the zone of maximum hydration and where recrystallization begins. Alkalic minerals, as aegirite and orthoclase, predominate with various proportions of carbonates, chlorites, saussurite, sericite and nepheline. The only sizable area of these rocks is from 5/00S to 7/00S on L28W. Here, the outcrops all have a rough weathered surface varying from dark green to dark red, depending on the proportion of ferromagnesian

and orthoclase. Oriented patches and seams of mafic minerals give the rock a lineated appearance. The crystallization of tabular soda-orthoclase crystals and fine aegirite needles gives the rock also locally a porphyritic to trachytic texture. This rock type is the first one to show any appreciable radioactivity. These outcrops gave readings from 100-300 c/s.

Contact Zone

North of the pulaskites on the township line near the lake is a rather heterogeneous group of outcrops. They are considered to be brecciated and rheomorphic fenites. Those outcrops near the pulaskite have coarse feldspar porphyroblasts in a dark green matrix, giving the rock a pseudo-fragmental appearance. Mineralogically, the mineral constituents are similar to the pulaskite except they are high in saussurite (20%) and also carry some garnet, carbonate, pyrochlore and more apatite. These rocks are always radioactive, giving scintillometer counts up to 800 c/s.

Pulaskite

Outcrops of this rock type were only found on these claims near the lake shore at the Chewett-Collins township line, or in small dikes cutting the other rocks. They are dark reddish, massive, granitoid rocks. They are generally medium grained, although locally they are porphyritic. Mineralogically, they consist of orthoclase aegirite, biotite and sericite, with minor nepheline, magnetite and apatite. These rocks are weakly radioactive.

Diabase

One outcrop of diabase occurs in claim 86971. It is a normal diabase; however, there is no well developed jointing present that might indicate its strike. Its age is not known, but is possibly pre-alkalic intrusive.

Structure

The formations throughout the claims in question trend in a southeasterly direction and dip from steep to rather flatly southward. This trend and the distribution of formations are presented in an inserted sketch (Geology - 1" = 1320'). There are variations from average dip and strike; however, some of these may not be rock in place but rather giant erratics resembling outcrops. On the other hand, some of the variations may actually be due to local structure disturbances as might be expected. The outcrops are not plentiful enough to make any more detail interpretation than that presented. However, the outcrops are rather scattered, giving a fair sampling of the area. The most significant feature is the indicated width ($\frac{1}{2}$ mile) of the alkalic fenite zone (F₁).

Mineralization

As just stated, the alkalic fenite zone is indicated to be $\frac{1}{2}$ mile wide where it crosses the corner of this claim. All the outcrops found are radioactive 100-300 c/s. This rock has never been found to be otherwise in the Chewett area, and the indications are that it will average at least 0.2% and possibly 0.3% Cb₂O₅. It is quite conceivable that higher grade areas may be located in it. Sample No. 2786, taken from a small area on an outcrop 0/50 feet east of L28W and 6/00S of base line E, gave in semi-quantitative spectrographic analysis

Cb ₂ O ₅	0.4%	ThO ₂	0.06%
CeO ₂	T(.01-.1%)	MnO	0.5%
U ₃ O ₈	0.03%	Gold	0.01 oz.

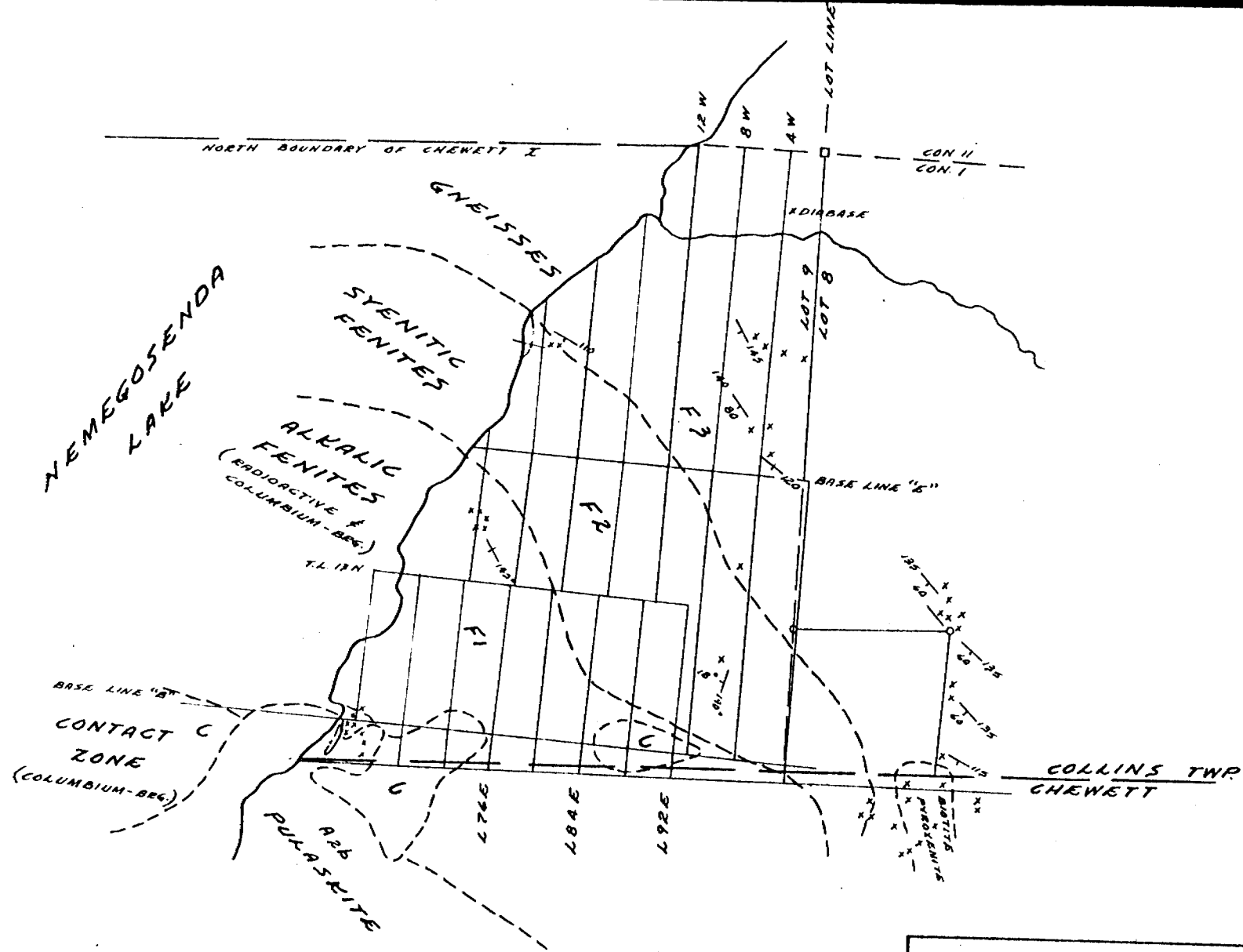
Some of the more favourable contact pyroxenite zones may extend north into the claims. The outcrops of this type that are exposed on Base Line "B", at the lake shore, are rather local in occurrence and the radioactivity, although locally high, is rather erratic.

G. E. Parsons
A. Stucken

GEP:AS/bh
Duplicate - Mr. Wyckoff

ATTACHMENTS

1. DGC Sample Record Sheets.
2. DGC Geology - Chewett I - Collins Twp. Sec. - Lots 8, 9, 10, Con. J - Scale 1" = 200' - A. Stucken & G. E. Parsons - September 10, 1955.



DOMINION GULF COMPANY
GEOLOGY
CHEWETT I
COLLINS TWP. SECTION
SCALE 1"=1320' SEPT 27, 1955



COLLINS TWP
CHEWETT TWP

Dominion Gulf Co
 Geology
 Chewett I - Collins Twp Sec.
 Scale 1 in = 1320 ft
 10 Sept G.E.P.



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DOMINION GULF COMPANY

ASSESSMENT GEOLOGICAL REPORT

Concession VI Chewett Twp.

Sudbury Mining Division, Ontario.

G. E. Parsons

16th January, 1956



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INTRODUCTION

This report covers 24 claims in Lots 8, 9 and 10, Chewett Township, Sudbury Mining Division. The claim numbers are: S-82902-03, S-82906-17, S-85644-45, S-85648-50 and S-86963-67. The property is some 16 air miles from the town of Chapleau which is on the C.P.R. transcontinental line. Roads of Bigelow Lumber Company penetrate within 3 miles of these claims.

Staking was initiated in the area in February 1955 on the evidence from an aeromagnetic survey. Minor geological investigation in the same Winter revealed the presence of a nepheline syenite intrusive. Additional claims were added in June to cover interesting magnetics and radioactivity.

The claims were covered in great detail by R. Elver, A. Stucken, the writer and other Dominion Gulf personnel during 1955. Picket lines with a maximum spacing of 400 feet and as close as 100 feet were used for control. Scintillometers were carried throughout the survey.

In the last part of June, A. Lonergan, O.E.S., reopened the concession V - Concession VI line, lot 8 - lot 9 line, and ran a trial township line between Chewett and Collins Township. The geological map attached is based on that survey.

X-ray diamond drilling commenced in July, and this was followed by A-core drilling starting in September.

2. TOPOGRAPHY

This is illustrated on the attached map by hachuring. Immediately east of Nemegosenda Lake the ground rises sharply some 80 feet to level off into an exceedingly flat plateau. This plateau extends for over a mile east along the township line and for a half-mile along Concession V - Concession VI line. East of the plateau are rolling hills interspersed with rather extensive cedar swamps. This later country appears to be mostly boulder ground moraine with numerous boulder erratics. There is a definite thickening of boulders of the basement rock types where these rock types outcrop.

The dry ground is forested with poplar, birch, spruce and locally some pine. The low ground, by cedar, spruce and some tamarack.

This topography and tree types are recorded on the accompanying map.

3. GEOLOGY

(a) Regional Geology

The claims mapped covered part of an alkaline intrusive and the surrounding metasomatically altered country rocks. Little is known of the rocks beyond the immediate area. The meagre data available indicates the basement rocks of the surrounding area are gneisses for the most part striking north-east and dipping northwest. The gneisses vary in composition from quartz-rich to gabbroic and hornblende-rich.

The only published geological data in the area is a brief reference made to the geology around Trout Lake (Nemegosenda Lake) in Geological Survey of Canada Progress Report 1880-1-2 p.6C by Dr. Bell.

(b) Detail Geology

(i) General

The claim group has been mapped using the concept that Von Eckermann developed in his study of the Alno Alkaline area in Sweden. That hypotheses considers these plug-like areas of alkaline rocks to be derived essentially from a potassium carbonate-rich melt and its reaction on the acidic country rocks. The nomenclature used here is largely that employed by Von Eckermann. The legend on the accompanying map is designed to include all the rock types encountered to date in the area, and some do not occur in the claims here described.

In the classification, the rocks are divided into three main divisions:

- (1) Alkaline Intrusives
- (2) Contact Rocks
- (3) Fenites and Country Rocks

Under Alkaline intrusives are grouped all those rocks derived from true mobile magmas and that have the normal characteristics of intrusive rocks as chilled contacts, homogeneity, normal sequence of mineral crystallization from melts, igneous textures, etc.

Under Contact Rocks are grouped the mixed complex, hybridic metasomatic types immediately surrounding the above igneous core. Their composition and texture varies from one extreme to the other. They are in the zone of pyrometasomatism, dehydration and reduction. This group corresponds to Von Eckermann's "mixed alkaline rocks at the inner fenite boundary", i.e. his alkaline ultra-fenites and his rheomorphic fenites.

The Fenite and Country Gneiss group includes those rocks surrounding the above contact zone. These rocks are in the zone of hydration and oxidation. They include Von Eckermann's thermal shock zone, quartz-syenitic zone, syenitic zone and alkalic fenite zone. They are always lineated or gneissic and vary in composition from totally alkalized gneisses to gneisses relatively unaffected by alkaline solutions.

(ii) Description of Rock Types

Alkaline Intrusives

Included in this group are the silicate rocks of the central core and the dike rocks emanating from that core. As the name applies, they are characterized by their alkalic minerals and the lack of quartz. Also included in this group are the intrusive sovites (carbonatites) and jacupirangites. A description of these rocks and their outcrop areas follows.

Pulaskite - outcrops of this type are confined to claim S-82911 and immediately north of this claim. The term is used to cover rocks rich in soda-orthoclase with lesser amounts of aegirite and nepheline. Magnetite, biotite, zircons and apatite

may also be present. Where exposed it is a rather uniform massive, medium textured red coloured rock with a slight blue or purple tinge. Near its contact it becomes contaminated with fragments of fenite. Its radioactivity is normally about twice background.

Malignite - outcrops of this type occur in Claims S82903 and 04. The term was created by Lawson to designate a melanocratic rock consisting of orthoclase intergrown with acidic plagioclase, aegerite-augite, biotite and soda-hornblende. Here it is used to describe a rock of essentially the same description with the ferromagnesian and feldspars being present in about equal proportions. It outcrops as reddish brown bluffs. It is an exceedingly uniform medium textured massive rock. This rock is weakly radioactive.

Pyroxenite - along the common boundary of Claims S-86966 and S-86967, and Claims S-85650 and S-86965 are a number of outcrops of this type. They appear to belong to a mass of rock trending in a north-south direction. In the outcrops the rock is rather coarse grained and consists of biotite and pyroxene with varying and minor amounts of apatite. It is non-magnetic and only locally radioactive.

Sovites - in claim S-85650 is an outcrop area of carbonate rocks. In the southern part of this outcrop area, the rock is very coarse grained and consists of "nodular-like" massives of biotite and pyroxene in coarse white calcite. The weathered surface is exceedingly rough due to differential weathering. On the north side of the outcrop area the rock is very fine grained, deep weathering, and a dark grey green colour. This

●ck consists essentially of carbonates and fine pyroxene. These rocks are up to 10X background in radioactivity.

Contact Rocks

There are very few outcrops in this contact. However numerous boulders in the lots 8 and 9 indicate a wide range of complex metasomatic and hybrid types. The legend on the accompanying map is based primarily on evidence from diamond drilling and not on the evidence from outcrops with which this report is concerned.

A description of the outcrops from the southeast to the northeast corner of claim is as follows:

Two small outcrops located just south of TL 6N and between lines L108E and L109E Claim S-85645, are dark weathering and rather highly fractured. They are characterized by distinct yet small transparent soda-orthoclase metacrysts in a dark fine textured groundmass. This groundmass is believed to essentially consist of aegirite and nepheline. The outcrops are radioactive - 10 to 20X background.

An outcrop on TL 15N just west of L112E Claim S-85644 is a similar type with minor apatite and cut by orthoclase-rich dikes. These dikes appear to have sweated out off the enclosing rocks and are called acid rheomorphics on the accompanying legend.

A 100 ft. northwest of this outcrop is an outcrop of peculiar breccia. It is full of angular fragments and variously coloured. The fragments quite often show several reaction rims. The chief minerals present in the rock are biotite, orthoclase, carbonates, and aegerite. The rock appears to have been a fenite that has been ripped apart and brecciated and then altered by

potassic and carbonate solution.

At 0°30'E of 36°00N on Line 106E, Claim S-85650 is small dark weathering outcrop. Pyroxene, orthoclase, aegerite and garnet appear to be the chief minerals. It is rather fine textured and up to 20X background in radioactivity.

Just south of the township line in Claim S-82913 is another single outcrop. This consists of a coarse pulaskitic rock type on its northeast side and a dark pyroxene-rich rock on its south side. Evidence from diamond drilling indicates this south part of the outcrop is a more basic phase of the porphyritic fenite described in the next group.

Boulders indicate that this contact area is underlain with rock types varying from lineated to igneous-like in texture and in composition from carbonate-rich, to orthoclase-biotite-rich, to aegerite-rich, to magnetite-rich and to apatite-rich. They are generally radioactive to quite radioactive (500 x background).

Fenites and Country Gneisses.

These rocks constitute most of the exposed rock in the claims under discussion and are exposed mostly in the east part.

Von Eckermann defines fenites as in-situ metasomatically altered (with or without substantial material exchanges) older contacting rocks. It is used with that meaning in this report.

In the claims being described, the fenites are derived from predominantly silica-rich gneisses and show a complete series of rocks from gneisses relatively unaltered by alkalic metasomatism to rocks in which the original minerals have been completely destroyed. The minerals destroyed are quartz, plagioclase, biotite, hornblende, augite and magnetite. The new

Minerals formed are potassic and sodic feldspars, nepheline, aegerite plus varying quantities of chlorites, carbonates, sericite, soda-hornblende, epidote and limonite. The chief chemical component added is K_2O and H_2O plus possibly some NaO_2 while chief chemical component withdrawn is SiO_2 . X

The metasomatic agent or agents active in this outer fenite zone appear to have been capable of transforming the rocks without appreciable fracturing or brecciation. Fractures that are present, however, are generally filled with sodic ferromagnesian.

The gneisses consist essentially of quartz, biotite and plagioclase. Minor hornblende-rich bands are present. The first signs of alkalic metasomatism is the development of aegerite-augite along fractures. However, on the claims being covered very few such fractures were noted. The next step in the fenitization is the development of augite metacrysts. They are rather uniformly distributed, about $\frac{1}{4}$ " long, rather stubby, and give the gneisses a distinctive appearance.

Moving further inward in the metasomatic aureole, the weathered surface of the outcrops take on a pink cast which colouration eventually appears on the groundmass of the gneiss. This reddening is believed to be caused by the hydration of the feldspars due to the ex-solution and oxidation of the iron molecules originally trapped within the feldspar lattices. Augite metacrysts continue to develop until the gneiss is composed of about 30% of them. The quartz in the gneiss eventually totally disappears and feldspars come completely reddened.

This alkalic metasomatism continues until the gross

structure and minerals of the gneisses are completely destroyed and we have a brick-red lineated rock consisting entirely of alkalic minerals as orthoclase nepheline aegerite, etc. These rocks show radioactivity from 5 to 10X background, and seldom assay under 0.2% Cb_2O_5 . These rocks are called red alkalic fenites on the legend and mark the zone of maximum hydration.

As the intrusive centre is approached still closer dehydration sets in. Light coloured more-or-less transparent soda-orthoclase metacrysts start developing and they give the red alkalic fenite a distinctive porphyritic texture. This rock is called porphyritic fenite.

These gneisses and altered gneisses have been mapped strictly on the degree of metasomatism. Since the metasomatism is gradational, the contacts between types will never be a straight line feature. Three main groups are distinguished on the following criteria:

- F₁ Alkalic Fenites, all the original gneiss-minerals destroyed and replaced by alkalic and associated minerals; start of mineral nepheline.
- F₂ Syenitic Fenites quartz, i.e. if originally present in the gneiss, all destroyed and the feldspars hydrated and reddened.
- F₃ Fenitic Gneisses quartz-bearing, i.e. if originally present in gneiss, minor alkalic alteration.

These groups are further broken down in the legend and this further break-down is explained there.

The distribution of the outcrop and an interpretation of the distribution of each type is given on the accompanying map.

Structurally they trend slightly north of west and dip steeply towards the central igneous core.

4. STRUCTURE

The claims being described are in the northeast flank of an alkaline plug. The gneisses and fenites derived from them curve around this plug and dip steeply inwarded.

There appears to be an interruption in the trend of the fonitic gneisses approximately in the centre of Lot 8 and a fault is interpreted here trending northeasterly.

5. MINERALIZATION

All the rocks from the red alkalic fenites inward to the igneous core are abnormally radioactive. This radioactivity is caused by uranium and thorium bearing pyrochlore and rare-earth minerals. Indications of significant concentrations of these minerals have been obtained, but these have been largely from boulders. Diamond drilling is now being done to assess these indications.

Magnetite, apatite and zircon are also present, but to date no body of commercial size of any of these minerals has been indicated. The magnetite and zircon appear to be largely of a metasomatic replacement type, while the apatite is both of a replacement and igneous-like injection type. The magnetite occurs chiefly as dense bands replacing to various degrees the fenites and occurs chiefly with the pyroxene-rich phases. The zircon, on the other hand, prefers the orthoclase-rich phase.

ATTACHMENT

DGC Geology

Chewett I

Lot 8, 9 and 10 Con. VI

41 O/14 N Ontario

Scale: 1" = 200' January 16, 1956

File 63.681 (3)



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DOMINION GULF COMPANY

GEOLOGY - CHEWETT I

(PATTINSON TOWNSHIP SECTION)

BASE MAP 42B/3S

ONTARIO

R. B. Elver

August 11, 1955



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SUMMARY CONCLUSIONS

The claim block consists of seven claims in Pattinson Township in Lots 1 and 2, Concession 1. It is situated on the west shore of Nemegosenda Lake, some twenty air miles from the C.P.R. railway town of Chapleau, Ontario.

Geological mapping by the writer and party during July and August 1955 located two definite outcrops and one possible outcrop. The definite outcrops indicate that radioactive red fenites form a zone of the alkaline plug complex, as described by G. E. Parsons in his work on the entire Nemegosenda Lake area. As indicated by ground and aeromagnetics, and by the evidence of probable outcrop in the northern part of the property, it is implied that the quartz-bearing fenite zone forms an outside concentric ring enclosing the red fenite zone. There is also an inside concentric ring of rocks forming a contact zone between the country rocks and fenites and the true intrusive. High ground magnetics lend support to this, and are situated about 2,500 feet off shore. The red fenite outcrop on shore, fifty feet south of the Township Line, gave very interesting assays of Cb_2O_5 , U_3O_8 and ThO_2 . Radioactivity around the red fenite outcrops is as high as 280 c.p.s., but heavy overburden eliminates the possibility of locating an anomalous radioactive body. Bulk samples taken of the red fenite outcrops gave 0.2% Cb_2O_5 by semi-quantitative spectrographic analysis. This zone is probably continuous over a 3,500-foot strike length on the property and of unknown width.

RECOMMENDATIONS

Further investigation in the area will not likely find any more outcrops, but might extend the ones now found. Further trenching on our ground, along with more sampling, is recommended, in order to determine the extent of the radioactive red fenite outcrop. If the assay results

are respectable, immediate diamond drilling should be done on the outcrop as well as off-shore drilling on the high magnetic anomaly. The ground to the south of our property in McGee Township, patented by C.I.P., should also be optioned along the shore for at least one-half a mile and inland a quarter of a mile. I also recommend that all claims staked in the area be held. As recommended by Dr. A. R. Graham, work on the extraction and concentration of columbium from the rock should be initiated.

INTRODUCTION

The property consists of seven claims situated in whole or in part on land in the southeast corner, Lots 1 and 2, Concession I, Pattinson Township. The claims have the following numbers: S-86949, S-86950, S-86951, S-86952, S-86953, S-86957 and S-86958. Also taken into account is claim number S-86959, in Collins Township. This block of claims borders on the western shore of Lake Nemegosenda.

The property is accessible by two modes of travel. One is to follow the Nemegosenda River from the village of Devon to Lake Nemegosenda, and hence to the property. The other is to fly directly from the town of Chapleau, which is a distance of about twenty air miles. There is also the possibility of building a road into the camp. The lumber company has roads to within one-quarter mile from the southern end of the lake at least. It is therefore feasible to think of a possible road.

During my investigation of the property, I found no evidence of previous staking or prospecting. The only evidence of previous work is the surveyed Township Lines, cut in 1906. No work had been done on the property by Dominion Gulf prior to staking on July 19, 1955. Shore geology had been done in the same month prior to staking.

Personnel that worked on the property included the following:

O. Eliason, F. Faulkner, W. J. Gannon, A. Stucken, G. E. Parsons and the writer. O. Eliason cut lines early in the program. F. Faulkner and W. J. Gannon cut lines and did the ground magnetometer work. A. Stucken aided me in chaining the lines, as well as with some of the mapping.

The lines were laid out according to the following plan. The iron pin, which marks the boundary between McGee and Pattinson Townships, was found, and a picket line was established along the old, blazed Township Line for a distance of 1,800 feet west. This is called Line 0/00N. At 4/00N, a line was turned off at right angles. This is Base Line "D". This was cut to 4,000 feet north of LO/00N. A line was then turned at right angles to Base Line "D" and driven east to the lake. Intermediate lines were turned off Base Line "D" at 400-foot intervals and cut to the lake, with lines 4/00N, 8/00N and 12/00N being cut west to the claim line. Tie lines 16W and 17E were also cut to tie in the ends of the line. The iron pin on the shore of the lake, which divides Pattinson and Collins Townships, was found, the line cleaned out and tied in with our picket lines.

The ground magnetometer was used on all the lines at intervals of 100 feet. Detail lines were not needed, as the contouring showed that the property is quite flat magnetically.

The scintillometer (C.A.E. Model 963) was carried in the area, but heavy overburden blocked out any possible radioactivity except on the actual outcrops.

All the lines, and the area between the lines, were mapped. The lines have 100-foot pickets on them. Intermediate footages for mapping purposes were determined by pacing. Compass traverses were run between the lines at 100-foot intervals, to pick up any outcrop and the main topographical boundaries. Strikes and dips were determined with a Brunton

compass. The boundaries of the shore were determined from chainage distances from Base Line "D", observation, and from aerial photographs.

TOPOGRAPHY

Throughout the property the drainage pattern runs east and southeast to the lake. Back from the shore line between 50 and 500 feet, the ground dips sharply towards the lake with a vertical descent up to 150 feet. Very little rock is exposed on these hills, with the ground consisting mainly of fine sands and gray clays. The higher portion of the terrain could be referred to as a "plateau". This plateau is cut down in many places by erosion, giving V-shaped valleys and drainage channels to the lake. The ground on the property is well drained, except for a draw in the northern section and a swamp on the western claim line. This swamp drains through a creek with a boulder bed. Tall poplar and birch are the prominent trees near the lake along with shorter spruce. Spruce is more prominent inland and the trees are markedly shorter. Slash is more evident in the western part of the property. Since very little rock is exposed, and since the overburden seems quite thick, it appears as if the underlying bedrock has no bearing on the topography, although a bigger picture of a larger area may show the converse of the preceding statement. Throughout the area, large, ragged boulders lie on the surface of the ground, indicating that they are not far removed from their original setting.

At various locations throughout the property, determinations of the type of soil present were performed. The soil varied from an orange sand, to fine orange-gray sand to gray clay. Along the shore in spots, glacial boulders were observed to be overlain by glacial sands.

GEOLOGYTable of Formations

The table of formations which follows G. E. Parsons concept of the entire Nemegosenda Lake area is as follows:

Fenites (metasomatically altered gneisses)

F₁ - alkalic fenites

F_{1a} - porphyritic fenites

F_{1c} - red fenites

F₂ - syenitic fenites

F₃ - quartz-bearing fenites

F_{3a} - augite phenocrysts

F_{3b} - normal country rock.

Description of Formations

These fenites represent a gradational group of rocks that have been altered metasomatically by the intrusion of an alkaline plug, which isn't seen on the property, but has been observed on the eastern shore of the lake. The quartz-bearing fenites are the rocks farthest away from the centre of the plug, and show very few effects of the intrusion except for granulation of the constituent minerals. These rocks retain their original gneissic properties. F_{3b} is a gneiss containing quartz, feldspar and biotite. F_{3a} is characterized by aegirine-augite phenocrysts developing, the quartz has entirely disappeared or nearly so, and the feldspars are white. F_{3a} and F_{3b} have been found in abundance in the form of large boulders as seen on the accompanying map. One possible outcrop of F_{3a} has seams of aegirine-augite cutting across the trend of lineation as well as seams of carbonates, books of biotite and apatite. This location, 125 feet south of L36N, 24/00E, has the possible outcrop protruding from underneath a sand hill not unlike a wedge. The F₂ (syentic fenites) are not

found on the property, but this does not say that they are not present. This group represents an intermediate phase between the F_3 and the F_1 phases, with the total disappearance of quartz, the feldspars becoming redder, more pyroxene present and most of its original structure retained. The F_1 's (alkalic fenites) are found in the southern part of the property (LB/00N, 6/40E, 70S), and along the shore for 100 feet south of the Township Line and 600 feet along ridges back of the shore line. The F_{1a} (porphyritic fenites) have been recrystallized with the formation of soda orthoclase phenocrysts taking on an igneous texture, but are still definitely lineated. The outcrops of red fenites have places in them that are quite sheared and foliated with a strike of $N30^{\circ}E$. The F_{1c} is a deep red, due to the feldspars hydrating. Needles of green aegirine augite are developed in it, and it is still lineated although to a much lesser degree than the F_2 or F_3 .

Structure

As can be expected from the ground and aeromagnetic maps, the structure of the Nemegosenda Lake area is circular, following the pattern of the alkalic plug. The property in discussion is on the outer rim of this plug. In the southern part of the property, the strike of the F_{1c} zone ranges from $25^{\circ} - 30^{\circ}$ northeast with a dip of $75^{\circ} - 80^{\circ}$ to the east, towards the centre of the plug. As can be seen from the ground magnetometer map, and from the probable outcrop, the strike in the northern section is about 40° northeast with a dip of about 80° to the east. The strikes of the rock formations on the property form an arc which approximates the arc of the shore line. From this, it can be deduced that the shape of the lake has been, in part, controlled by the alkalic plug. On the shore opposite the F_{1c} outcrops, the boulders are large and sharp, and are almost entirely F_{1c} . These are possibly derived from two sources.

One is the breaking down of the outcrop and deposition of the boulders on shore. The other is that the ice and water of the lake have heaved up F_{1c} boulders from the lake bottom. A combination of both is the likely answer. Along the northern shore of the property, F_{3a} boulders are very abundant. They are jagged and quite large. I therefore deduce that, if bedrock were found in the northern section, it would probably be F_{3a} or F_{3b} . This would form a zone of rocks arcing to the west of the F_1 zone.

Alteration & Mineralization

In the northern section, no mineralization was encountered, along with no radioactivity. This lack of evidence does not obliterate the possibility of finding these properties present. Lack of outcrops and heavy overburden hinder the determinations of whether there is or is not. In the south, in the F_{1c} zone, mineralization was found along with radioactivity up to 280 c.p.s. throughout the length of the outcrop. One sample was taken on the outcrop along the shore, 50 feet south of the township. This assayed 0.50% Cb_2O_5 , 0.04% U_3O_8 and 0.03% ThO_2 by x-ray fluorescent methods. Two separate bulk samples have been taken from this area, and gave much lower columbium values, 0.2% by semi-quantitative spectrographic. Dr. A. R. Graham has identified pyrochlore from a sample submitted by G. E. Parsons from the lake shore, 50 feet south of the Township Line. No petrographic work has been done on specimens collected by the writer.

R. B. Elver

RBE:bh
Duplicate - Mr. Wyckoff

ATTACHMENTS

1. DGC Geology - Chewett I - Pattinson Twp. Section - Base Map 42B/3S, Ont. - Scale 1" - 200' - August 11, 1955 - R. Elver.
2. DGC Rock specimen Record Sheet.

DOMINION GULF COMPANY

SAMPLE RECORD

Property Name **Chewett I (Pattinson Twp. Section)**
 Area
 Collected By **R. B. Elver**
 Submitted By **R. B. Elver**
 Date **August 10, 1955**
 Property No. **208**
 Map No. **42B/3S**

State reason(s) for
 any special laboratory
 work requested at bottom
 of last page.

General File No.	Field No.	Location	Rock Type (Field)	Sample Purpose	Lab Work (Assay etc)
12677	208-RE-14	LO/00N 1W 5S McGee Twp.	F1c	Specimen	
78	15	LO/00N 1W 4/50S McGee Twp.	F1c	"	
79	16	LO/00N 1W 3/50S McGee Twp.	F1c	"	
80	17	LO/00N 1W 2/50S McGee Twp.	F1c	"	
81	18	LO/00N 0W 0/50S along shore, McGee Twp.	F1c, Radioactive shear zone	"	
82	19	Near I.P., 0/00N, 0W	F1c	"	
83	20	LB/00N 70S, 6/40E	F1c	"	
84	21	LB/00N 70S, 6/40E	F1c-b	"	
85	22	L36/00N 21/25E, 1/20S	F3a	"	
86	23	L36/00N 21/25E, 1/20S	F3a (span)	"	



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DOMINION GULF COMPANY

ASSESSMENT REPORT

CHEWETT I, PATTINSON TOWNSHIP SECTION

CLAIMS S-90700, 90701

A. Stucken
A. K. Temple

August 1, 1956.



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SUMMARY

The two claims covered in this report, S-90700, 90701, are situated in Concession II, Pattinson Township. Both claims are located inland from the north-west shore of Lake Nemegosenda.

Detailed geological mapping of the claims failed to reveal outcrop. Both claims are situated on the conjectured outer periphery of the Chewett I alkaline intrusive.

RECOMMENDATIONS

The two claims should be held.

INTRODUCTION

Two claims are covered in this report. Claim S-90700 is situated in the northeast quarter of the south half of Lot eleven, Concession I Pattinson Township, approximately a quarter of a mile west of the north-west shore of Nemegosenda Lake. Claim S-90701 is situated in the northeast quarter of the north half of lot twelve, Concession I, Pattinson Township.

Picket lines on Claim S-90700 were turned off from Base Line D, which in turn was turned off from the Pattinson-McGee Township Line, 400' west of the iron pin near the shore of Nemegosenda Lake.

Picket lines on Claim S-90701 were turned off from Base Line F, which was turned off from the Pattinson-Collins Twp. Line in the considered position of the Concession I/II line. The lines were tied in to L 40 N of the claims to the south.

The claims were mapped in the summer of 1956. No outcrop was located.

Topographically Claim S-90700 is situated on the plateau behind Nemegosenda Lake. The centre of the claim is largely occupied by spruce and cedar swamp.

Claim S-90701 is drained by a small river running east into Nemegosenda Lake. The centre of the claim is low spruce swamp, and is flanked on the north and south by fairly steep hills.

GEOLOGY

As previously noted, no outcrops were discovered.

Regionally the claims are located on the northwest flank of the Chewett I alkaline area. By comparison with conjectured projection of known rock types, the claim should be underlain by fenitic gneisses, little altered country rock unfavourable for mineralization. There is a very slight possibility that the rock types encountered in Concession II, Collins Township, namely ultra and rheomorphic fenites, may extend down into claim S-90701.

The claims are considered to be of protective value only.

ATTACHMENTS

Dominion Gulf Company Maps of Claims S-90700, 90701.



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DOMINION GULF COMPANY

GEOLOGICAL ASSESSMENT REPORT

Claims S-87030-37, S-91706-7, S-85653, S-85657

CHEWETT TOWNSHIP SUDBURY MINING DIVISION

A. Stucken, A. K. Temple and G. E. Parsons

August 1, 1956.



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INTRODUCTION

This report covers twelve claims in Chewett Township, their numbers are S-85653, S-85657, S-87030-S-87037, S-91707 and S-91706, Sudbury Mining Division. The claims, with the exception of S-91706, S91707 were staked in June and July of 1955. The latter two were staked in December of 1955.

The claims are some 17 air miles from the town of Chapleau which is on the C. P. R. transcontinental line. There was no evidence of previous prospecting or staking in the area of the claims.

The present geological and geophysical investigation was done by the writers and P. Carr, linecutting was done by various Dominion Gulf personnel.

The Con. III-IV line, through lots 9, 10 and 11 was re-opened by A. Lonergan, O. L. S., in February, 1956. The centre line through Concession IV was established at the same time. The former was used as a baseline and the latter as a tie-line for the four hundred foot spaced picket lines.

Three drill holes (No. 19, 21 and 23) were drilled off the ice in January and February 1955. However only No. 21 which was collared in rock off the claim block returned core.

Summary, Conclusions and Recommendations

The claims straddle the contact between a leucocratic alkaline intrusive exposed off the northwest corner of the group and gneisses exposed on the southeast corner of the group.

It is considered highly probable that metasomatic rock types favourable for columbium mineralization exist between these two types. The most favourable area is probably that interpreted as melanocratic rheomorphic in claim S-85657.

Overburden is probably quite deep over most of the group except possibly in the east and northeast part of the group making diamond drill testing difficult.

It is recommended that a further attempt be made to test the anomaly in claim S-85657.

TOPOGRAPHY

The west two claims mostly underlie the Nemegosenda Lake; the rest of the group joins high ground that is dissected by the Nemegosenda River. This river flows in a westerly direction through the south half of the claim block. Except for a small lake-expanse in claim S-87037, the river is a continuous series of rapids. The original township land surveyor L. V. Rorke (1905) reports a 100 ft. fall from this lake-expanse to the river mouth. Through this section the river is flanked by steep glacial hills.

Away from the river, the country is gently rolling terrain and swamps. Sand ridges are prevalent in the south part of the group. The overburden is believed to be deep because of the lack of outcrops, the absence of boulders of the rock types thought to underlie the claims, and the ground magnetics. An exception to this is in the extreme east and northeast parts.

GEOLOGY

(a) Regional

The claims are on the southeast flank of an alkaline plug. The country rock for the plug is gneiss, trending slightly north of east to northeast and dipping north. Beyond this little is known of the regional geology.

(b) Description of Formations

The only rock exposures found are in the east part of the group. These consist of well lineated gneisses. These vary in composition from types rich in quartz and felspar to types rich in hornblende. Biotite is present in the quartz-bearing types. The felspar is suspected to be mostly plagioclase. Red garnets are locally developed.

(c) Structure

The exposed gneisses trend on the average N 70° E and dip 50° north. This is believed to be the regional trend for the area to the east of the claim block as indicated from the topography on the aerial photographs. Magnetics indicate that this trend prevails for the gneisses across the claim block. No other structural features are indicated.

(d) Metamorphism

Evidence of alkalic metasomatism is slight in contrast to other areas as close to the alkaline plug. The normal evidence of the proximity to the alkaline plug and its associated metasomatic aureole as fractures filled with "dikes" of biotite, hornblende, carbonates, apatite and fluorite and also the hydration of the felspars were not noted.

(e) Mineralization

No economic mineralization was noted on the claim block.

(f) Geological Interpretation

A very generalized interpretation of the probable rocks underlying the claim block is given on an attached map. This is based on the general geological sequence believed to exist in proximity to the alkaline plug, on some outcrops that exist just off the claim block, on one drill hole (No. 21) and on the ground magnetics.

ATTACHMENTS

- Map 1 - Dominion Gulf Company - Geology of Chewett I, Concession IV, 410/14N, Ontario, Scale 1 inch = 200 feet, August 1, 1956.
- Map 2 - Dominion Gulf Company - Geological Interpretation, Chewett I, Concession IV, 410/14N, Ontario - Scale 1 inch = 200 feet, August 1, 1956.

INTRODUCTION

This report covers six claims in the west half of the south half of Lot 7, Con. VI and the west half of Lot 7, Con. V, Chewett Twp, Sudbury Mining Division. The claim numbers are S-90694-99 inclusive. These claims were staked in the fall of 1955 to protect the eastern flank of metasomatic mineralized aureole.

The claims are some 18 air miles from the town of Chapleau, which is on the C. P. R. transcontinental line. Roads of the Bigelow lumber company penetrate within $1\frac{1}{2}$ miles of these claims.

No evidence of previous staking or prospecting was noted on the claims.

The present geological and geophysical investigation was done by the writers, W. Gannon, F. Deacon, O. Eliason, A. Harri and P. Carr. The concession lines between V and VI and V and IV were found and re-opened. Picket lines at 400 foot intervals were driven across the claims using the first concession line just noted above as a base and the latter concession line as a tie-line.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The claims are underlain by quartz-felspar-biotite and felspar-hornblende gneisses trending from northeast to north and dipping to the west. There is minor evidence of alkalic alteration, basic alkalic dikes and quartz-orthoclase pegmatite dikes.

No evidence of economic mineralization was noted although a relatively small portion of the rock surface is exposed.

TOPOGRAPHY

This is illustrated on the attached map by hachuring. The west half of Concession V is largely swamp, while the east part is occupied by elongated ridges and valleys trending with the strike of the gneisses. These have a maximum elevation of about 50 feet above the swamp.

The two claims on Concession VI are occupied largely by boulder ground moraine.

The dry ground is forested with poplar, birch and jack pine. The low ground by spruce and cedar.

GEOLOGY

(a) General

The claims lie off the eastern flank of a syenite stock and its associated metasomatic aureole. The gneisses strike with the general direction of the magnetic horizon in the aureole. It is not known whether their strike is a regional or local feature or a combination of both.

(b) Description of Formations

Outcrops are exceedingly scarce in the north and west part of the group and more plentiful in the south-east part. The exposures vary from relatively large well defined masses to rather obscure occurrences.

Except for very narrow and minor dikes of biotite and pegmatites, all the exposed rocks are gneisses. These rocks consist of varying proportions of quartz plagioclase, biotite and/or hornblende and/or pyroxene. It is impossible in hand specimen to distinguish between hornblende and pyroxene, due to the gneissic nature of the crystals. Ill-defined red garnets are locally visible. For the most part these rocks have a fine gneissic texture although ferromagnesian-rich bands alternating with quartz-felspar-rich bands are not uncommon. The quartz grains have a tendency to coalesce into thin laminae.

(c) Structure

The gneissosity which is well developed, curves from a northeast strike in the south part of the group through a more northerly strike in the centre of the group to a slightly west of north strike in the north part of the group. The dip in all cases is to the west at angles varying from 30 to 70 degrees and may average about 50 degrees.

The northeasterly trending depression occupied by the stream in the southeast part of claim S-90696 is believed to represent a cross-fault.

(d) Metamorphism

Locally green sodic pyroxene and/or amphibole is developed uniformly throughout the gneiss and especially along fine cracks. Some reddening of the felspar is also encountered.

(e) Mineralization

No economic mineralization was encountered. A carbonate vein with minor apatite and aegerite was found in claim S-90699.

G. E. Parsons and A. Stucken.

ATTACHMENTS

Dominion Gulf Company - Geology Map - Claims S-90694 - 99 inclusive, Chewett Township, scale 1 inch = 200 feet, by A. Stucken and G. E. Parsons. August 1, 1956.



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DOMINION GULF COMPANY

GEOLOGICAL ASSESSMENT REPORT

Claims 8-90694-99

CHEWETT TOWNSHIP SUDBURY MINING DIVISION

A. Stucken & G. E. Parsons August 1, 1956.



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INTRODUCTION

This report covers two claims in Collins Twp. These claims are part of the main block of claims held by Dominion Gulf Company. The claim numbers are S-90702 and S-90703, Sudbury Mining Division. They were staked in the fall of 1956.

The claims are some 20 air miles from the town of Chapleau which is on the C. P. R. transcontinental line. No evidence of previous prospecting or staking was noted in the area of the claims.

The present geological and geophysical investigation was done by the writers, W. Gannon, F. Deacon, O. Eliason and A. Harri.

In claim S-90702, the concession I-II line and lot 8-9 line was re-opened and surveyed by A. Lonergan, O. L. S. The concession line was used as a base line for the land portion.

In claim S-90703, the picket lines were extended north from a trial township line by A. Lonergan. 0+00E on this base line is the lot post for lots 8-9, Collins Twp.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Claim S-90703 is underlain by quartz-felspar-biotite-hornblende gneisses trending 115° to 130° and dipping 30 to 85° west. There is locally more evidence of alkalic alteration than normal for the distance from the syenite plug. This alteration is in the form of sodic amphibole and reddening of the felspars.

No evidence of economic mineralization was noted, although some might be expected. In claim S-90702, no rock was found although similar types to that in S-90703 might be expected.

TOPOGRAPHY

The topography in claim S-90703 is for the most part relatively flat with a gentle slope to the northeast. The outcrop areas rise as distinct knolls and hills above this terrain.

In claim S-90703 the terrain sloped to the lake.

The claims are forested with types common to the area, namely poplar, birch, spruce, pine, balsam and cedar.

GEOLOGY

(a) Regional

The claims lie off the northeast flank of a mineralized metasomatic aureole associated with a syenite plug. The gneiss strike parallel to contact of the syenite plug. It is not known whether this trend has been imposed on the gneisses by the intrusive or is a trend related to regional structure.

(b) Description of Formations

No outcrops were found in S-90702 and possibly constitute 5% of claim S-90703. Except for very minor and narrow orthoclase-quartz, pegmatite dikes, the exposed rocks are all gneisses. These gneisses are normally finely lined. They vary from quartz-plagioclase to quartz-plagioclase-biotite to hornblende-rich varieties. The various types are interbanded with the former types predominating. The quartz grains have a tendency to coalesce into thin laminae.

(c) Structure

The gneissosity which is well developed strikes from 115° to 130° and dips in at angles 30° to 85° . This strike parallels the intrusive contact. It is not known whether this trend is imposed on the gneisses by the syenite plug or is a feature related to the regional structure of the gneisses.

(d) Metamorphism

The two outcrops in the vicinity of 26+00N, L 8E show considerable alteration. The felspar base is pink to completely reddened. There is also evidence of sodic alteration in the form of riebeckite.

(e) Mineralization

The only mineralization noted in outcrops was that just mentioned under metamorphism, although carbonate boulders exist in the general area. It is possible some rare-earth mineralization may be present with such carbonate zones.

ATTACHMENTS

- (1) Dominion Gulf Company - Geology - Claim S-90703 Collins Township, Scale 1 inch = 200 feet by A. Stucken and G. E. Parsons, August 1, 1956.
- (2) Dominion Gulf Company - Geology - Claim S-90702 Collins Township, Scale 1 inch = 200 feet by A. Stucken, August 1, 1956.



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DOMINION GULF COMPANY

GEOLOGICAL ASSESSMENT REPORT

CLAIMS S-90702 and S-90703

COLLINS TWP.

SUBBURY MINING DIV.

A. Stucken and G. E. Parsons.

August 1, 1956.



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DOMINION GULF COMPANY

INTERPRETATION OF GROUND MAGNETOMETER DATA

CHEWETT I

BASE MAPS 410/14N, 42B/3S

Sudbury Mining Division

Ontario.

C. W. Faessler

June 27, 1956.



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INTRODUCTION

The ground magnetometer survey, subject of this report, covers 172 claims of the Chewett I claim group held by Dominion Gulf Company. The numbers and the recording dates of these claims are:

- (1) S-82902, S-82903, S-82906 to S-82919 incl., S-82921; Feb. 28, 1955.
- (2) S-85644 to S-85661 incl.; June 14, 1955.
- (3) S-86949 to S-87037 incl.; July 6, 1955.
- (4) S-88749 to S-88756 incl.; August 26, 1955.
- (5) S-89619 to S-89624 incl.; October 12, 1955. ✓
- (6) S-90677 to S-90703 incl.; November 15, 1955.
- (7) S-91701 to S-91707 incl.; December 29, 1955.

These contiguous claims include the greater part of Nemegosenda Lake, and some land sections, in the townships of Chewett, Collins, McGee and Pattinson, Sudbury Mining Division, Province of Ontario. More specifically, the claims cover the following sections;

(1) in Chewett Township: all the lake sections in Concession III, IV and V; the southeast quarter of the south half of Lot 12 and the greater part of the south half of Lot 11, Concession III; the southwest and northwest quarters of Lot 8, and the south half of Lot 9 and of Lot 10, Concession IV; the northwest and southwest quarters of the north and south halves of Lot 7, and all of Lot 8 and Lot 9 in Concession V; the northwest and southwest quarters of the south half of Lot 7, and all of Lot 8, Lot 9 and Lot 10, in Concession VI.

(2) in McGee Township: all of the lake section in Concession IV, V and VI, except an area of four claims occupying the equivalent of the eastern half of Lot 1, Concession VI.

(3) in Collins Township: in Concession I, the northwest and southwest quarters of the south half of Lot 8, all of Lot 9 and Lot 10, the northwest and northeast quarters of the south half and all of the north half in Lot 11 and Lot 12; in Concession II, the southeast, southwest and northwest quarters of the south half of Lot 9, the south halves of Lot 10 and Lot 11, the southwest, southeast and northeast quarters of the south half of Lot 12.

(4) in Pattinson Township: the equivalent of the northeast, southeast and southwest quarters of the north half and all of the south half of Lot 1, and the northeast, southeast and southwest quarters of the south half of Lot 2, all in Concession I.

Lot 11 and Lot 12, Concession II, Chowett Township, the eastern half of Lot 1, Concession I, McGee Township, and the southernmost quarters of Lot 11 and Lot 12, Concession I, Collins Township, are also held by Dominion Gulf Company, but were previously covered by a ground magnetometer survey and report.

Staking was initiated in the area in February, 1955, on the evidence from an aeromagnetic survey, and further groups of claims were added at various later dates. Line cutting, chaining, and a ground magnetometer survey were started immediately after staking.

The basic coverage of the ground magnetometer survey consists of 100 foot stations on picket lines 400 feet apart. Over anomalous areas the spacing was reduced to 50 foot stations on 200 and 100 foot lines.

Wherever possible on the lake section, a rectangular grid was set-up. This grid was permanently marked on shore by hubs at the end of the main lines, such as base-lines and tie-lines. The magnetic data obtained along these lines are presented on nine maps at a scale of 200 feet to 1 inch, with contour intervals of 100 gammas, the area having been arbitrarily subdivided along the concession lines for ease in handling. A total of 12,287 stations were recorded along 188.12 miles of chained picket lines.

A small area was surveyed in greater detail. Covering portions of claims S-82910, S-85645 to S-85647 incl., S-86990 and S-86991, in Lot 8 and Lot 9, Concession V and VI, Chewett Township, this detail survey consisted of a grid system of 25 foot stations on paced traverses at 50 foot intervals perpendicular to regular 100 foot lines. The data obtained on this detail survey are not shown on the 200 feet to 1 inch maps, but are presented on four special grid maps at a scale of 40 feet to 1 inch with contour intervals of 200 gammas. A few 100 foot lines were cut, chained and magged especially for this detailed survey, so that 194 stations were read on 11,870 feet of cut and chained picket lines, and 1039 stations were read on 33,430 feet of traverses, or a total of 1233 new stations over 8.58 line-miles. The grand total for the 172 claims is therefore 13,520 stations over 196.70 line-miles, of which 6.33 miles are pace and compass traverses.

Askania vertical magnetic balances, with sensitivities of roughly twenty gammas per scale division, were used throughout the above surveys by Company personnel. The magnetic data were reduced and plotted in the field. They were checked, re-plotted, and interpreted in the Company's Toronto office.

The claims so surveyed cover the greater portion of an alkaline intrusive and the surrounding metasomatically altered country rocks.

The intruded rocks appear to be gneisses for the most part striking northeast and dipping northwest, their composition varying from quartz-rich to gabbroic and hornblende-rich. The rocks of the area are divided into four main divisions by Company geologists:

- (1) Alkaline Intrusives
- (2) Contact Rocks
- (3) Fenites
- (4) Country Rocks, mostly gneisses.

This subdivision of the rocks of the area into four groups is relatively arbitrary as the change from one type to the next appears to be gradational. The magnetite that has been directly observed so far, appears to be of a metasomatic replacement type, occurring chiefly as dense bands replacing to various degrees the contact rocks and, to a smaller extent, some of the fenites.

SUMMARY

A circular structure produced by an alkaline intrusive is recognized. This structure is magnetically defined by a number of circular, more or less concentric anomalous zones. Geologically, the rocks of this area can be divided into four groups:- intrusive, contact, fenitic and gneissic country rocks. Reported outcrops suggest that at least some parts of each of these rock types are magnetic to some degree. The zones labelled 1-a, 1-b, 1-c, 1-d, 1-e, 1-f, parts of 5, 6, and/or 7, parts of 8-a and 8-b, 12 (and possibly 10), locate at least part of the zone of contact rocks. Portions of the fenitic rocks are indicated by zones 2-a, 2-b, 3-a, 3-b, 3-c, part of 5,6, parts of 8-a and 8-b, and finally 12. A third general but much more discontinuous zone is formed by 4-a, 4-b, 4-c, possibly by the western section of 1-a and 8-b, and finally by 9 and 13. This zone is thought to be related to intrusive rocks.

In the land portion of Concession IV, V and VI of Chewett Township, the three zones appear contiguous and even interlayered to some degree. To the west, over the lake section, these zones diverge and then converge again. The area of low magnetic values between them can be assumed to be underlain by the same rock type as one or the other, or both, of the adjacent magnetic zones.

The gneissic country rocks show little or no magnetic relief over the lake section, and weak, except for Zone 14, linear anomalies over the land portions. Zone 14 is directly related to magnetic gabbroic gneissos.

A number of faults have been interpreted. Faults, F-2, F-3, F-4, F-7, F-8 and F-9 are thought to have produced mainly vertical movement to explain the change in characteristics of the magnetic zones they cut, and have little or no apparent horizontal movement. Fault F-5 produces an apparent right-hand horizontal displacement of 1000 feet of Zone 1-d to Zone 1-e, and of 2000 feet of Zone 8-b to the combined zones 9, 10, 11 and 12. Fault F-6 suggests an apparent horizontal displacement of some 2000 feet of Zone 6 and Zone 7 to Zone 3-a. However the interpretation of this particular area is not very conclusive due to the too wide spacing of the magnetic data.

INTERPRETATION

A study of the overall picture presented by the data indicates two characteristics on which the interpretation must be based:

- (1) The magnetic susceptibility (or magnetite content) of a given rock unit may vary greatly along the lateral extent of that unit.
- (2) Certain portions of the rock units have a tendency to be characterized by a greater magnetic susceptibility than others, that is, to contain greater concentrations of magnetite.

The latter is exemplified by the pattern or zones of anomalies observed especially over the lake section. The other characteristic is indicated by the large number of individual anomalies which produce that pattern. This renders a complete interpretation of each individual anomaly very difficult and unnecessary. But the various anomalous zones, with their trends and discontinuities, will be used to show the location, trends and structural deformations of certain portions of rock units.

The dot-dash symbol used to delineate the magnetic zones is not considered to indicate an interpreted geological contact. This symbol is meant to outline an area where a certain rock type may be found, without implying any limit to the extent of that rock. Other rock types may also be present in the same zone. Such a situation is best seen in the southern parts of Lot 8 and Lot 9, Concession VI, where detailed geology revealed that the greater part of the anomalous zone is underlain by interlayered intrusive, contact and fenitic rocks.

Two anomalous zones are readily recognizable to be related to specific rock types. Zone 1 can be traced almost continuously from known contact rocks in Lot 10, Concession VI, westward, then southward and finally eastward in a half circle over the lake, to the eastern shore in Concession IV. Zone 2 is seen in two segments: Zone 2-a along the western shore in Concession V, McGee Township, and Zone 2-b in Concession I and II, Collins and Pattinson Township. Both are related to known outcrops of fenitic rocks.

A more detailed description of the individual map sheets is given in the following paragraphs.

Concession III, Chewett Twp:

The lake section reveals little or no magnetic relief, while, over the land section, a number of elongated anomalies appear to trend in a southeasterly to easterly direction. Outcrops along the lake shore indicate that this area is underlain by gneissic country rocks with a somewhat more easterly trend than that indicated magnetically. This apparent discrepancy is caused by the lack of uniqueness in the contouring of the magnetic data, and cannot be considered of any interest. Enough information is available to show that there is no important structural feature in this area.

Concession IV, McGee and Chewett Twps:

Three anomalous zones are apparent over the lake section. Zone 1, composed of segments 1-a, 1-b and 1-c, is interpreted as underlain by contact rocks, as previously stated. Segments 3-a, 3-b and 3-c, forming Zone 3, are not known geologically. However, the spatial relations between Zone 3, and Zone 1, are quite similar to those of Zone 2 and Zone 1 in Concession V. It is suggested that Zone 3 may be the continuation of Zone 2 and therefore be underlain mostly by fenitic rocks. The gneissic country rocks can be expected to lie a short distance, or immediately south of Zone 3, while the area between Zone 3 and Zone 1 is underlain by fenitic and/or contact rocks. Zone 4, composed of segments 4-a, and 4-b, is not known geologically. The position inside the contact rocks of Zone 1 would suggest that it is related to a ring-like feature of the intrusive rocks.

Two faults, F-2 and F-3, are interpreted to strike north-north-easterly, on the basis of the apparent weak horizontal displacements of the anomalous zones. The change in the magnetic characteristics from one segment to the other in each zone, suggest definite but undetermined vertical displacement.

The land section of this concession is quite different from the lake section. Coinciding with the shore, there is a drop of some 200 gammas in the peak intensity of the anomalies of Zone 1-a and Zone 3-a, accompanied by a general flattening and widening of the flanks. One quarter of a mile inland, these anomalies are not recognizable as separate entities but merge into Zone 5. The magnetic base level of Zone 5 decreases gradually from about 1800 gammas in Claim S-87031 to about 1600 in Claim S-87033, where it is 200 to 300 gammas higher than the base level of the area to the south. A number of very local disturbances, usually observable on one station only, are imposed on the base level of Zone 5 and on the land portion of Zone 1-a and Zone 3-a. One anomaly, 5-a, is observed in the east end of Zone 5, centered on L 44 E, with a peak intensity of about 700 gammas above base level.

The area to the south of Zone 5 contains a number of long narrow anomalies quite similar to those encountered over the gneissic country rocks of the land portion of Concession III. An outcrop of gneissic country rocks on the Nemegosenda River in Claim S-91706 confirms a similar cause for these linear anomalies. Zone 5 is therefore expected to be underlain by rocks more closely associated with the alkaline intrusive, that is, by the fenitic and contact rocks of Zone 1 and Zone 3.

Rough calculations have been made to determine the order of magnitude of the depth to, and magnetic susceptibility of, some of the causative bodies. The results are helpful in interpreting the change in the magnetics of the lake and land portions of the fenitic and contact zones. These calculations show that an increase in depth of some 250 feet would produce a decrease of 260 gammas in the peak intensity of anomaly 1-a. It is suggested that the steep banks of glacial material observed to be 200 to 250 feet high, provide the necessary change in depth to the magnetic body, to cause the observed

drop of 200 gammas of the peak intensities. This, then, implies a depth of overburden, just inland, of some 500 feet.

Calculations made on Anomaly 5-a indicate a depth and a susceptibility in the order of 50 feet and 0.004 cgs. The depth agrees quite well with that of the gneisses to the south. Its susceptibility is in the same order of magnitude as that determined for Zone 1-a (0.005) and for Zone 3-a (0.0024). If Anomaly 5-a was produced by a hill of the same material as the rest of Zone 5, it is calculated that the depth of overburden over Zone 5 would have to be in the order of 5,000 feet to produce the difference in its base level and that of the neighbouring gneisses. As this can hardly be expected to be the case, it is concluded that Anomaly 5-a is caused by a concentration of magnetite similar to those producing Zone 1-a and Zone 3-a. The change in base level between Zone 5 and the gneisses, assuming a depth of overburden of 50 feet, indicates a susceptibility for Zone 5, of 0.0005 cgs, which would increase to 0.0008 cgs, if the depth were 500 feet. The following conclusions are reached:

(1) Zone 1-a and Zone 3-a stop a short distance inland, merging into Zone 5, with a depth of overburden in the order of 500 feet. The limited extent of Anomaly 5 suggests that this ending and merging is not necessarily related to faulting.

(2) The bedrock of Zone 5 rises from about 500 feet below land surface near the lake to about 50 feet below surface in the vicinity of Anomaly 5-a.

(3) A gradual decrease from west to east in the susceptibility of the rock (approximately from 0.0008 to 0.0005 cgs) slightly overcompensates the effect of the gradual rise of the rock surface. The total effect of these variations is the gradual decrease of the base level of Zone 5.

(4) The local disturbances are produced by boulders or concentrations of magnetic material in the deep cover of glacial detritus.

Lake Section, Concession V, McGee and Chewett Tracts

The contact rocks of Zone 1 extend through Concession V, as segments 1-c, 1-d and 1-e. The unknown feature to which Zone 4 is attributed, is indicated by segments 4-b and 4-c. The separation between 4-b and 4-c indicates the possible extension of fault F-3 interpreted in Concession IV, or that of fault F-4. Fault F-4 is suggested by the sudden widening of Zone 1 from 1-c to 1-d. The large apparent horizontal displacement between 1-d and 1-e and the marked change in the magnetic characteristics of these segments is correlated with a similar change in Lot 8 and Lot 9 of Concession VI. The extension southwestward of this fault F-5 just misses the southern observed extent of segment 2-a. Zone 2 is directly associated with known fenitic outcrops along the shore. Its narrow width is limited eastward by the absence of magnetic anomalies, and westward by the presence of reported gneissic outcrops. The difference in the widths of Zone 2 and Zone 3 does not deter their tentative correlation due to their separation by fault F-5.

Land Section, Concession V, Chewett Tract

The interpretation of the magnetic data, as shown on the accompanying map of this section, is based on extrapolation from geological data from Concession VI, and on additional magnetic data presented on Grid Maps 15N/25E and 13N/25E attached to this report. Comparing the 200 foot to the inch basic map with the 40 foot to the inch grid maps, it is immediately apparent that data based on 100-foot lines are completely inadequate to properly define the intensely anomalous Zone 8. This is particularly apparent in the northeastern corner of claim S-86990. A northeasterly trending magnetic low is indicated there, by the 200 foot to the inch map.

The grid map, although incomplete in this area, shows that a strong anomaly exists right in the middle of the magnetic low, thereby proving the non-existence of an otherwise conspicuous magnetic feature. Because of the incompleteness of the detailed survey, a discussion of Zone 8 must perforce remain general. It is known however, that the eastern part of 8-b in Concession VI, is underlain by interlayered intrusive, contact and fenitic rocks, the last two being roughly equally predominant over the first. This interlayering produces parallel to sub-parallel magnetic trends within the zone. The abrupt ending of these trends in 8-b, the presence of a narrow area of low magnetic values, and the presence in 8-a of magnetic trends which cannot be directly correlated to those of 8-b, indicate the presence of faulting. Since no great horizontal displacement of the zone itself is indicated, it is suggested that this fault F-7 produced mainly vertical movement.

The southern end of 8-a appears somewhat less magnetic although it is quite possible that other local anomalies have been overlooked by the wide spacing of the picket lines. The eastern limit of this zone is located to include an outcrop mapped as fenitic rocks, just north of the concession line V-VI near picket line 124E. East of Zone 8-a, the underlying rocks are expected to be gneissic country rocks.

The abrupt end of Zone 8-a southward, and of Zone 6 and Zone 7 northward, suggest the presence of fault F-6. The triangular area between F-6 and Zone 6 reveals northerly trending linear anomalies quite similar to those underlain by gneissic country rocks in Concession IV. This similarity is confirmed by two outcrops of gneissic country rocks in the eastern halves of claims S-86984 and S-86988.

The northwesterly apparent trend of Zone 6 and Zone 7, suggest that they are produced by rocks related to the intrusive rather than to the country rocks. The area between Zone 7 and Zone 6, and the area to the east of Zone 6 to the dot-dash symbol shown on the map, show a base level 400 to 500 gammas higher than the base level over the definite gneisses farther east. Zone 6 indicates a depth of 50 to 75 feet and a susceptibility in the same order as Anomaly 5 and Zone 1-a in Concession IV. The change in base level could be produced by a susceptibility contrast of the order of 0.001 ogs. It is therefore suggested that Zone 5 of Concession IV curves sharply, or is faulted off, to join the anomalous zone as indicated on the attached map. The main objection to this interpretation is the presence of northerly magnetic trends in that part of the suggested extension of Zone 5 which lies to the east of Zone 6. However, these trends are based on data which cannot be uniquely contoured and could well be changed by further detailed survey. A similar comment must be made about several other anomalies in the southern part of this map area. There is therefore the possibility that detailed survey may produce data which would permit a completely different interpretation

Land Section, Concession VI, Chewett Twp.

As explained in the interpretation of Lots 8 and 9, Concession V, Chewett Twp., to completely define the internal structure of Zone 8, a very detailed survey would be required. This has been done over only part of this zone, as shown on the accompanying grid maps 15N/25E, 16N/25E, and 15N/23E.

The eastern two-thirds of Zone 8-b is known to be underlain by interlayered intrusive, contact and fenitic rocks. The westernmost of these observed rocks are contact rocks, while those of the western third of the zone are not known. The magnetic anomaly along the western limit

of the zone diverges somewhat from the rest of the zone and is separated from it by a definite but narrow magnetically low area. A second possible interpretation is that, instead of belonging to Zone 8-b, this anomaly is a separate zone similar to Zone 4 interpreted in the lake section of Concession IV and Concession V, and therefore could be related to intrusive rocks.

Zone 8-b is separated from Zone 8-a by fault F-7 as already described in the previous sub-chapter. To the north, Zone 8-b again ends abruptly against a northeasterly trending area of low magnetic values. This fault is thought to be the extension of fault F-5 interpreted in the lake section of Concession V, because it is on strike, with a similar trend and apparent right-hand displacement.

To the north of F-5, four distinct zones are recognized. Zone 12 is known geologically to be underlain, at least in part, by fenitic rocks. Its eastern limit corresponds to the geologically indicated contact between the fenitic and the gneissic country rocks. Zone 12 is composed of weak anomalies with poorly defined trends due to the wide spacing between picket lines. Zone 11 is formed by a complex anomaly which is much more intense than those of the adjacent Zone 12. This suggests that Zone 11 is caused by rocks different from those of Zone 12. Since Zone 12 is known to be underlain at least in part, by fenitic rocks, it is logical to assume that Zone 11 is related to contact rocks. Zone 9 and 10 are quite similar as they are composed of a few, almost circular, weak anomalies. The narrow width of Zone 11 suggests the possibility that Zone 10 and 11, and possibly Zone 9, should have been combined into one zone, similar to Zone 8-b, but weaker magnetically. However, the possibility exists that Zone 9 may be related to a feature of the intrusive rocks similar to Zone 4 in the lake portion of Concession IV and V. If this is so, it would also substantiate the

similar alternative for the westernmost anomaly of Zone 8-b, as described in the second paragraph of this sub-chapter.

Zone 1-f and 13 are separated from Zone 9, 10, 11 and 12 by the northeasterly striking fault F-8. Zone 13 is thought to be similar to Zone 4 and related to intrusive rocks. It would be a possible extension of Zone 9 under the second alternative mentioned above. The northern half of Zone 1-f is known geologically to be underlain by contact rocks bounded to the south by intrusive rocks observed over a narrow section only. On the basis of the magnetic data it is suggested that all of Zone 1-f is underlain mainly by contact rocks interlayered with some intrusive rocks.

The magnetic data from the lake section, Concession VI, Chewett Township were subjected to a residual analysis as described in a previous report. There, a "Contact Zone" is interpreted to extend in an arcuate form from Zone 1-e (Lake Section, Concession V) across this area. Its eastern end is on strike with Zone 1-f but does not quite join it. This gap is considered to be weak evidence for fault F-9 which is substantiated to some degree by the remarkably straight shore line to the north.

Concession VI, McCoe Twp.

The magnetic data of this part of the claim group show a small extent of Zone 2-a in the southwestern corner of the map. The rest of the area merely shows a marked magnetic gradient, decreasing westward, produced by the strong anomaly immediately to the east. The few irregularities in the otherwise smooth gradient are ascribed to minor topographic features of the rock surface.

Pattinson Twp. Section and Concession I, Collins Twp. Section.

A crescent shaped weakly anomalous zone is labelled 2-b. Its outer limit on the western shore, is clearly marked by linear anomalies which are directly correlated to outcrops of fenitic rocks. The eastern part of the outer limit, and all of the inner limit, are rather vague. They have been located on the accompanying maps to include a few semi-circular and weak anomalies. Zone 2-b is suggested to delineate an area where fenitic rocks can be expected. The geological information on the eastern land section of this area substantiates this interpretation.

The northern limit of Zone 1-f, previously discussed, corresponds to the geologically indicated contact between the contact rocks and the fenites. The anomalous area labelled Zone 15 is therefore underlain by the fenitic rocks mainly. Its northern limit corresponds to the fenite-gneiss contact as indicated by outcrops near the shore. A similar remark applies to Zone 12.

The northern limits of Zone 12 and Zone 13 are located by a change in the characteristics of the magnetic anomalies encountered in this area; the gneissic country rocks produce long, narrow anomalies, while those produced by the fenites show a tendency to be more oval or circular in shape.

The fact that Zone 15 cannot be divided into two zones corresponding to 11 and 12 suggests the action of fault F-8. The lack of non-anomalous areas between Zone 1-f and Zone 15 indicates fault F-9. Both these faults are believed to have produced mainly vertical movement.

Concession II, Collins Twp.

At the western shore of the lake, near the southern concession line, a small portion of Zone 2-b is visible. The northern limit of this zone has been shown to correspond roughly to the contact between fenitic and gneissic country rocks.

Zone 14 outlines an area of closely packed linear, intense anomalies, their trend curving around the bulge of Zone 2-b a short distance to the south. Outcrops of magnetic gabbroic gneisses have been reported in Zone 14. The lack of connection between Zone 14 and Zone 2-b, suggests that these gabbroic gneisses are inherent to the country rock and are not related to the alkaline intrusive. The composition of these rocks, and their magnetic trends parallel to that expected of the country rock, indicate the presence of a gabbroic sill-like intrusive which was submitted to the same regional metamorphism which produced the gneissosity of the country rocks.

The change in aspect of Zone 14 over land and over lake, is attributed solely to the depth of the water. This view is supported by the lack of magnetic relief over the rest of the lake section underlain by gneissic country rocks.



C. W. Faessler.

ATTACHMENTS

Basic Maps:

- Dominion Gulf Company - Ground Magnetometer Survey, Chewett I;
Chewett Twp., Con. III, scale 1" to 200ft. March 26, 1956.
- Dominion Gulf Company - Ground Magnetometer Survey, Chewett I;
Con. IV, scale 1" to 200 ft. February 28, 1956.
- Dominion Gulf Company - Ground Magnetometer Survey, Chewett I;
Water Portion - Con. V, scale 1" to 200 ft. March 8, 1956.
- Dominion Gulf Company - Ground Magnetometer Survey, Chewett I;
Land Section; Con. V, scale 1" to 200 ft. August 9, 1956.
- Dominion Gulf Company - Ground Magnetometer Survey, Chewett I;
Land Section; Con. VI, scale 1" to 200 ft. August 11, 1956.
- Dominion Gulf Company - Ground Magnetometer Survey, Chewett I;
McGee Twp. Con. VI, scale 1" to 200 ft. March 5, 1956.
- Dominion Gulf Company - Ground Magnetometer Survey, Chewett I;
Pattinson Twp. Section, scale 1" to 200 ft. February 29, 1956.
- Dominion Gulf Company - Ground Magnetometer Survey, Chewett I;
Collins Twp. Section, Con. I, scale 1" to 200 ft. April 5, 1956.
- Dominion Gulf Company - Ground Magnetometer Survey, Chewett I;
Collins Twp. Section, Con. II, scale 1" to 200 ft. April 10, 1956.

Grid Maps

- Dominion Gulf Company - Ground Magnetometer Survey, Chewett I;
Grid Map 13N/25E, scale 1" to 40 ft. January 4, 1956.
- Dominion Gulf Company - Ground Magnetometer Survey, Chewett I;
Grid Map 15N/25E, scale 1" to 40 ft. December 29, 1955.
- Dominion Gulf Company - Ground Magnetometer Survey, Chewett I;
Grid Map 16N/25E, scale 1" to 40 ft. December 30, 1955.
- Dominion Gulf Company - Ground Magnetometer Survey, Chewett I;
Grid Map 15N/23E, scale 1" to 40 ft. December 30, 1955.

REFERENCES

Reports:

- Dominion Gulf Company - Residual Analysis of Ground Magnetometer Data, Chewett I - Lake Portion (24 Claims), By C. W. Faessler and J. H. Ratcliffe, February 23, 1956.
- Dominion Gulf Company - Geology, Chewett I (Pattinson Twp. Section) by R. B. Elver, August 11, 1955.
- Dominion Gulf Company - Geology of Chewett I, Lots 8 and 9, Con. V, by K. A. Sargent, September 1, 1955.
- Dominion Gulf Company - Geology of Chewett I - Collins Twp. Section, Lots 8, 9 and 10, Con. I, by A. Stucken and G. E. Parsons, September 10, 1955.
- Dominion Gulf Company - Geological Report, Con. VI, Chewett Twp., by G. E. Parsons, January 16, 1956.

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DOMINION GULF COMPANY

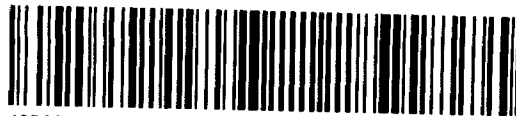
DETAILED GEOLOGY

CHEWETT I - BORDEN RIVER HYDRO RESERVE

LOTS 11 and 12, Concession III, Chewett Twp.

A. K. TEMPLE
A. STUCKEN

AUGUST 4, 1956.



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SUMMARY

The five claims covered in this report, numbered 8-89623, 90890-93, are located at the south end of Nemegosenda Lake. They are easily accessible from the lake.

The claims largely occupy a plateau some 150 to 175 feet above the lake. The plateau is sharply dissected by streams flowing into the lake. The chief stream is the Borden River. Outcrop is fairly plentiful on the claim group, occupying approximately 15 to 20% of the area.

The claims are situated in the gneissic country rock to the south of the Nemegosenda alkaline intrusive. Alkalic rocks (basic dykes, carbonate and riebeckite) were observed on the property during reconnaissance by G. E. Parsons. The present detailed work extended the number of occurrences of these alkalic types; they comprise approximately 2% of the outcropping rock.

The basic alkalic dykes and carbonate dykes probably represent "magnetic" types developed in the Nemegosenda alkaline intrusive whilst the riebeckite appears to be the result of the alteration of favourable gneiss horizons by agents accompanying the intrusive types.

The carbonates occur as narrow rusty weathering dykes. They are generally radioactive, varying between 30-80 c.p.s., though 150 c.p.s. was recorded in one case and G. E. Parsons reports 700 c.p.s. on 1 ft. dolomite; this latter rock assayed .03 U_2O_5 , CeO_2 .5-7%, La_2O_3 .05-7%.

RECOMMENDATIONS

The feature of interest in the claim group is the occurrence of radioactive carbonate dykes, one of which gave high Cerium and rare earth values on assay. The large preponderance of gneiss on the property indicates that the claims are not underlain by alkaline rocks but that the carbonate and other alkalic rocks originated from the alkaline intrusive to the north.

Mapping revealed eight carbonate occurrences, all of which were narrow dykes. When the amount of outcrop on the claims is considered the likelihood of numerous carbonate dykes, or a large body of carbonate seems remote.

The assayed carbonate was strongly radioactive; all the other carbonates were comparatively weakly radioactive. If the concentration of cerium and rare earths is proportional to the radioactivity, values in the majority of the dykes will be low. This supposition will be tested by further assay.

In view of the limited amount of carbonate and the possible low values of cerium and rare earths it is concluded that the claims have low priority for retention.

INTRODUCTION

Five claims, numbered B-89632, 90690-93, are covered in this report. The claims form part of the Borden River Hydro Reserve which became open for staking.

The claims are situated at the south end of Nemegosenda Lake and are easily accessible by boat from the Dominion Gulf base camp on Nemegosenda Lake; the lake is some 20 air miles northeast of Chapleau.

The picket lines were laid out by D. Sprague. The base line was surveyed in from a north-south line turned off the Concession III/IV

line on the lake during the winter. The base line was tied in at the east end by opening up the line between lots 10 and 11 south of the Concession III/IV line.

A magnetometer survey of the claim group was carried out by W. Gannon and F. Deacon. The present investigation was carried out by A. Stucken and A. K. Temple, assisted by P. Carr, O. Klason and A. Harri.

TOPOGRAPHY

The claim group is situated at the south end of Nemegosenda Lake. The country rises steeply from the lake to a plateau elevated 150-175 feet above lake level; 125 foot cliffs occur in the northwest of the claims fronting the lake. The plateau is very steeply dissected by streams flowing into the lake. The chief stream is the Borden River which falls 75 feet in almost continuous rapids through the claim group.

Outcrop is plentiful on the claim group, occupying approximately 15% to 20% of the total area.

The high ground is covered by poplar and balsam windfall with some maple and scattered pine, spruce and birch. Cedar with scattered spruce and balsam occupies the low ground.

GEOLOGY

General

The claims are situated in the gneissic country rock surrounding the Nemegosenda alkaline intrusive.

In reconnaissance work along the Borden River G. E. Parsons noted radioactive carbonate, riebeckite and alkalic dykes. As a result the present detailed mapping was carried out.

Rock Types

(a) Country Rock; 95% of the outcrop on the claim group is gneissic country rock. The predominant rock type is hornblende and plagioclase gneiss with minor garnetiferous hornblende plagioclase gneiss and quartz hornblende gneiss. These types are cut by intrusive quartz-feldspar-biotite stringers and segregation pegmatites. The average radioactivity was 20 c.p.s.

(b) Basic alkalic dykes; dense, fine grained, massive, black alkalic dykes up to 6 feet in width intrude the gneiss. Small clots of pink orthoclase feldspar may be present in the dykes. The dyke rocks are weakly radioactive, averaging 30 c.p.s., with a maximum reading of 45 c.p.s.

(c) Carbonate dykes; Eight occurrences of narrow rusty weathering carbonate dykes were mapped. The carbonate varies from brown granular dolomite to a white, partially reddened, calcite. Both calcite and dolomite veins cut the basic alkalic dyke at 23+50 W. on the base line; the dolomite appears to be later than calcite.

The carbonate is radioactive. The maximum radioactivity observed in the present investigation was 150 c.p.s. on a reddened calcite vein with minor fluorite, whilst the remaining occurrences vary from 30 to 80 c.p.s. G. E. Parsons reports 700 c.p.s. on a 1 foot dolomite dyke (G.P. 85); the location of this dyke was covered with water during the present investigation.

(d) Riebeckite rock; several occurrences of riebeckite were noted chief of which is a 140 foot long, lense shaped, mass, of maximum width 10 feet, situated between lines 20 and 24 at approximately 650 S. The rock strikes parallel to the gneiss, and exhibits some lineation marked by biotite seams and occasional quartz seams. The rock is blue in colour. Radioactivity is very low (10 c.p.s.). At the contact with country rock, hornblende-plagioclase gneiss, is a 6 inch wide rusty zone composed of

recognizable gneiss in which blue riebeckite is developing at the expense of the hornblende of the gneiss.

Minor riebeckite is developed in coarse quartz feldspar-biotite gneiss at the contact of a basic dyke at 23+50 W. on the base line. The most advanced stage in the riebeckite development is a rock composed of riebeckite with inclusions of red orthoclase feldspar, remnants of original gneiss. Minor green aegerine is associated with the development of the riebeckite.

(e) Alkalic boulders; Several juvite boulders were encountered along the ridge at the north of the claim group. On Line 20 W., 80 feet north of the base line, two boulders of malignite were found; the rock consists of coarse grained aegerine and orthoclase with visible pyrochlore and gives 300 c.p.s. on the scintillometer. Prospecting with scintillometer was carried out over the ridge to the north of the boulder but no other boulders, or outcrop, of the malignite were found.

Structure

The principal strike of the gneiss is within a few degrees of east-west and the dominant dip is to the north. Minor fluctuations in the strike are due to local folds and contortions in the gneiss. The principal joint direction of the gneiss is slightly west of north, with a subordinate direction east of north.

Both the basic alkalic dykes and carbonate veins vary in strike, following either the strike or principal joint direction of the gneiss or cross-cutting the gneiss and striking in a northeasterly direction.

The riebeckite rock strikes parallel to the gneiss.

Relation of the Alkalic Rocks

The alkalic rock types on the property include the basic dykes, carbonates and riebeckite rock. The carbonates and basic dykes are def -

inite intrusive types following similar structural features but apparently the carbonate was later than the basic dykes. The riebeckite rock is not intrusive; it strikes parallel to the country rock and a transitional development of riebeckite in the country rock may be observed. Riebeckite is developed at the margin of one basic dyke.

It is suggested that the basic dykes and carbonates represent "magnetic" types developed in the Nemegosenda alkaline complex whilst the riebeckite is a result of the alteration of favourable gneiss horizons (probably quartz rich) by agents accompanying the intrusive types.

Mineralization

A specimen (G.P. 85) of dolomite collected by G. E. Parsons from the Borden River showed the following semi-quantitative spectrographic analysis results;

Cb_2O_5		.03
CoO_2	L-M	. 5-5%
La_2O_3	TL	.05-.5%

A sample of this rock gives 60 c.p.s. on the scintillation counter, whilst G. E. Parsons reports readings of up to 700 c.p. s. on the outcrop.

Several other carbonate dykes of weaker radioactivity occur on the property. It is to be expected that these would carry low cerium and rare earth values.

GEOPHYSICS

A ground magnetometer survey showed local magnetic highs which generally trend parallel to the strike of the gneisses and may be correlated with local magnetic horizons in the gneiss or with magnetic basic dykes (as Specimen 208-AKT-31).

ATTACHEMENTS

1. Dominion Gulf Company Map - Detailed Geology, Chewett I,
Borden River Hydro Reserve - Scale 1" = 200'.
2. Sample Record Sheet.

DOMINION GULF COMPANY
Rock Specimen Record Sheet

Property or Twp. CHEWETT I Base Map No. Prov. To accompany memo, progress report, geology report or map, drill hole log, ENTITLED CHEWETT I, GOLLINS TWP., CONCESSION II By A.K. TEMPLE Dated AUGUST 1/56 (stroke out reports not applicable; state reasons for any lab. work at bottom of sheet)

Received in Central File by Date Stored at Lab. Reports by (1) Dated (2) Dated

O.F. No.	Field No.	Location	Field Name	Misc. Notes, Assay No., Results, Purpose, c/s, etc.	
	208-AKT				
14784	1				
85	2				
86	3				
87	4				
88	5				
89	6				
90	7				
91	8			fenite-rich carbonate vein in country rock	
92	9	}		As 10 but assimilation advanced to give pyroxene-nepheline rock	
93	10		Strong alteration of gabbro fragment		
94	11		Pyroxenite 3695		
95	12		Radioactive vein cutting pyroxenite		
96	13		Orthoclase-pyroxene T. S. rocks formed by "reomorphic"		
97	14		of 3696		
98	15		Syenite fenite by pyroxenite		
99	16		--	Gabbro	
14800	17		}		Syenite fenite cut by pyroxene vein
01	18			T. S.	Syenite fenite fragment partly ? by pyroxene
02	19	T. S.		"Country Rock"	
03	20	}		" " "	

DOMINION GULF COMPANY
Rock Specimen Record Sheet

Property or Twp. ... CHEWETT I Base Map No. Prov.
To accompany memo, progress report, geology report or map, drill hole log, ENTITLED
.....
..... By Dated

Received in Central File by Date Stored at
Lab. Reports by (1) Dated
(2) Dated

C.F. No.	Field No.	Location	Field Name	Misc. Notes, Assay No., Results, Purpose, c/s, etc.
14804	21			Dyke T. S.
05	22	}		Orthoclase - pyroxene rock T. S.
06	23			fg alteration (?) along cracks T. S.
07	24			fg orthoclase rock, similar to above
08	25			alteration of gabbro
09	26			fg aegerite-nepheline rock
10	27			? altered gabbro
11	28			Hornblende plagioclase gneiss
12	29			? altered gabbro
13	30			Orthoclase rich ? intrusive T. S.
14	31			Orthoclase-rich gneiss

DOMINION GULF COMPANY
Rock Specimen Record Sheet

Property or Twp. CHEWETT I Base Map No. Prov.
 To accompany ~~none, progress report~~, geology report or map, drill hole log, ENTITLED
 DETAILED GEOLOGY CHEWETT I BORDEN RIVER HYDRO RESERVE
 By A. K. T. & A. S. Dated AUG. 4/56
 (stroke out reports not applicable; state reasons for any lab. work at bottom of sheet)

Received in Central File by Date Stored at
 Lab. Reports by (1) Dated
 (2) Dated

C.F. No.	Field No.	Location	Field Name	Misc. Notes, Assay No., Results, Purpose, c/s, etc.
14834	208 ANT 30	BORDEN RIVER HYDRO RESERVE	Basic dyke	
35	31	"	"	
36	32	"	Carbonate	
37	34	"	Basic dyke, Carbonate, contact rocks	
38	35	"	Basic dyke	
39	36	"	Alkorthoritic gneiss (altered rock)	
40	37	"	Basic dyke	
41	38	"	Carbonate	
42	39	"	Riebeckite	
43	40	"	"	
44	41	"	Contact riebeckite with hornblende gneiss	
45	42	"	Hornblende gneiss	
46	43	"	Dolomite, calcite, basic dyke and asgerine	
47	44	"	Basic dyke	<u>Thin Section</u>
48	45	"	Riebeckite rock	
49	46	"	Riebeckite developing in gneiss	<u>Thin Section</u>
50	47	"	Feldspar quartz hornblende gneiss	



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DOMINION GULF COMPANY

DETAILED GEOLOGY * CHEWETT I

(COLLINS TWP., CONCESSION II, LOTS 11 and 12)

A. STUCKEN
A.K. TEMPLE

AUGUST 1, 1956.



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SUMMARY

This report covers ten claims, S-88754-55, S-90677-80, S-90684-7, located in lots 11 and 12, Concessions I and II Collins Township, part of the Chewett I property of Dominion Gulf Company.

The claim group is situated on the northwest shore of Lake Nemegosenda, some 16 air miles northeast of Chapleau.

Geological mapping shows the centre of the group to be occupied by a gneissic gabbro intrusive with quartz-feldspar and hornblende gneisses. The rocks strike east-north-east. Considerable metasomatic activity around the gabbro margin, but particularly at the south contact, has resulted in a complex including ultra-fenites, rheomorphics, breccia rock, and pyroxenites. The metasomatic rocks are related to the Chewett I alkaline intrusive but represent a local high metasomatic grade when compared with alkaline fenites on the same strike outcropping to the south; this high metasomatic grade is considered to be due to build up of metasomatising solutions behind the structural and compositional barrier presented by the gneissic gabbro.

RECOMMENDATIONS

Geological interpretation of the claim group suggests a build up of metasomatising solutions on the south side of a gneissic gabbro. Scintillometer readings show highest radioactivity on the south side of the gneissic gabbro. Two grab samples taken near the south margin of the gabbro assayed CeO_2 with rare earth, thorium and uranium, but no columbium values. It is considered that the gneissic gabbro would also act

as a barrier to the Ce etc. bearing solutions which may normally largely dissipate themselves in the country rock. Columbium most probably would not have reached the distance from the alkaline centre.

The margins, particularly the southern margin, of the gneissic gabbro are considered a probable trap for Ce and rare earth mineralization. Additional grab samples will be assayed and the results taken into consideration when available.

It is recommended that the claims be held and that reconnaissance geology coverage be given to the claim west of S-90684.

INTRODUCTION

The area covered in this report comprises ¹⁰nine claims in Concession II, Collins Township, numbered S-90684-7, S-90677-80, and two claims, S-88754, 55, in Concession I, Collins Township.

The claim group is situated on the northwest segment of Lake Nemegosenda and is accessible by boat from the Dominion Gulf Company base camp on Lake Nemegosenda. Lake Nemegosenda is some sixteen air miles northeast of Chapleau.

No work had been done on the claim group prior to staking by Dominion Gulf Company.

The Concession I-II line was re-opened in early 1956 by A. Lonergan, O.L.S. The present picket line system was laid out by D. Sprague and tied in to his survey of the Lake.

The present investigation was carried out by A.K. Temple and A. Stucken assisted by P. Carr, O.E. Parsons and miscellaneous Gulf personnel prospected over the claims.

TOPOGRAPHY

The claim group is situated on the north west shore of Lake Nemegosenda. The ground rises steeply from the lake to a plateau dissected by streams draining into the lake. The predominant vegetation is poplar with some spruce.

Outcrop occupies approximately 3% of the area of the claim group; in most cases stripping was necessary to determine the character of the outcropping rock.

Boulders are numerous throughout the claim group and include types both outcropping in the claims and foreign to the claims. Two north to northeast trending boulder ridges occur in the west of the claim group.

GEOLOGY

General

The claim group is situated on the northwest flank of the Chewett I alkaline area. The outcropping rocks include little to unaltered country rock together with a complex of metasomatic types related to the alkaline intrusive.

Description of Rock Types

(a) Country Rock

(1) Gneisses; Quartz feldspar-biotite, and plagioclase-hornblende gneisses outcrop in the east, north and west of the claim group. The rocks are frequently well linedated, though strong contortions tend to give erroneous strikes and dips. In general the rocks strike east-north east.

(ii) Gneissic gabbro; This rock is composed of plagioclase and pyroxene in equal amounts and represents a gabbroic body intruded into original country rock before gneissosity was imposed. The rock is gneissic, but has a clotty appearance. Magnetite in the rock may be partly replaced by hematite. The rock occupies the centre of the claim group.

(b) Rocks Related to the Alkaline Intrusive

(i) Ultra-fenite; a coarse grained, well lineated gneissic rock composed of fresh orthoclase, pyroxene, biotite and minor nepheline. The rock occurs on the south margin of the gneissic gabbro.

(ii) Rheomorphic; orthoclase rich types with local development of igneous texture. These rocks occur on the east, south and west sides of the gabbro intrusive but attain their maximum development on the south, particularly well exposed west of L 28 E. On the west side of the outcrop west of L 28 E a coarse grained igneous textured rock is developed with orthoclase phenocrysts up to 3 inches long and abundant nepheline. This rock passes east into an orthoclase rich type with a brecciated appearance due to clots of pyroxene enclosed in the orthoclase. A transition into the ultra-fenite rock type is indicated.

(iii) Pyroxenite; a coarse grained rock composed of dark green pyroxene with minor apatite, carbonate, biotite and magnetite. This rock is very common, occurring as a joint filling in almost all the outcrops on the claim group. The greatest volume observed was on the south side of the gabbro mass. The reactions of this rock with above described types are of a similar character as pyroxenite veins cutting both gneissic gabbro and ultra-fenite having a selvage of fine grained pyroxene and red nepheline. In the core of the gabbroic gneiss the feldspars in proximity to the pyroxenite veins are altered to green epidote.

(iv) Breccia of gneissic gabbro in melteigite (fine grained pyroxene and red nepheline with some biotite.) This rock varies in character from early recognizable gabbroic fragments in melteigite to epidotized fragments in melteigite to a final "ghost like" breccia of rounded nepheline rich areas in the melteigite. The rock is common on the south margin of the gneissic gabbro.

(v) Breccia of ultra-fenite in melteigite (fine grained pyroxene and red nepheline with some biotite.) The rock occurs on the south side of the gabbro intrusive. The rock varies from early recognizable ultra-fenite in melteigite to a mass of orthoclase crystals in the melteigite.

(vi) Orthoclase-nepheline-minor pyroxene and biotite dyke.

Two cases were noted of joint fillings of orthoclase-nepheline rock in both gneissic gabbro and ultra-fenite. The rock may be related to the rheomorphic orthoclase-rich type.

(vii) Carbonate dyke; a narrow rusty weathering carbonate dyke was noted cutting quartz feldspar gneiss in the north-east of the claim group. The carbonate is probably ankeritic; patches of purple fluorite were scattered through the carbonate.

(viii) Basic alkalic dyke; two outcrops of fine grained, dense, black alkalic dykes were recorded in the northwest of the property.

STRUCTURE

(a) General

It was found difficult to get reliable dips and strikes on the exposed rock, either because of contortion or limited area of lineated rock. However, the general strike through the claim group appears to be east-north-east. The gneisses appear to dip generally southwards but dips on the other rock types were variable.

A general east-north-east strike conforms with the position of

the rocks in the alkaline complex.

(b) Development of the Breccias

Numerous examples (eg. 50' W of L 8 E @ 6+50 N) demonstrate that the development of breccias in this claim group is related to jointing. Lineated breccia fragments can be seen to possess original lineation, direction indicating that the fragments have not suffered any movement.

The dominant joint directions are 350° and 80°. Material passing along joints attacked the country rock and the varying degrees of absorption are reflected in the varying types of breccias; the range of "breccia" would strictly include everything from joint filling to rounded breccia fragments.

No force or movement beyond that necessary for the formation of a normal joint pattern is envisaged in the production of breccias; rather the breccia may be considered of metasomatic origin.

GNEISSES OF THE ROCKS RELATED TO THE ALKALINE INTRUSIVE

Prior to the alkaline intrusive the rocks in the claim group consisted of gneissic gabbro and other gneisses. The postulated original contact of these rocks is shown on the attached map.

It is considered that metasomatic alteration of the normal gneiss has given rise to the ultra-fenites, whereas the gneissic gabbro suffered relatively little alteration. The locus of intense metasomatism was the gabbro contact, particularly that facing the alkaline intrusive centre. The channels followed by metasomatising solutions are considered to have been the joint directions, the intensity of the jointing influencing the metasomatic grade.

The course of metasomatism in the original gneiss may have followed the following patterns:-

- (1) dominant addition of K_2O , shown by growth of orthoclase porphy-

roblasts in gneissic types. This would give rise to the ultra-fenite type and in extreme conditions to the rheomorphic.

(2) movement of the pyroxene constituent together with extraction of SiO_2 allowing crystallization of nepheline. This phase results in the breccia type rock. Again in extreme conditions a resultant orthoclase-nepheline rock may appear as igneous textured rheomorphic, separated from its original pyroxenitic phase.

In the gneissic gabbro metasomatism may have followed a similar source. Addition of some K_2O is reflected in biotite-rich phases. The original plagioclase lost Na_2O and SiO_2 allowing epidote to crystallize, the latter mineral later losing its identity in probably giving up CaO to allow formation of apatite and carbonate.

Thus the metasomatism may have been affected solely by the introduction of some K_2O with CO_2 and P_2O_5 and all the rocks present, except unaltered country rock, be metasomatic types.

In the regional picture the ultra and rheomorphic fenites of the claim group present a local discrepancy in metasomatic grade, which at this point should be in the syenitic fenite grade. It is considered that the local high metasomatic grade is due to build up of metasomatising agents behind the structural and compositional barrier presented by the gneissic gabbro.

MINERALIZATION

Semi-quantitative spectographic analyses were made of two rocks, apatite-carbonate-pyroxenite (2790) and orthoclase nepheline dyke (2791).

Both rocks showed 1% CaO_2 and other values of interest were as follows;

	2790	2791
ThO_2	.04	.02
U_3O_8	Pt.	.02
Nd_2O_3	.8	.8
La_2O_3	.5	.5

No Cb_2O_5 was detected. In outcrop, 2790 gave 30 c.p.s. and 2791 gave 120 c.p.s. with scintillometer. Further sampling is planned.

GEOPHYSICS

(a) Scintillometer; the majority of the outcrops were examined with the scintillometer and several generalizations may be drawn as follows;

(1) the general level of radioactivity is highest on the claim group on the south margin of the gabbro.

(2) it is possible to distinguish metasomatic rocks of gabbroic origin from those of gneissic origin as gabbroic types generally run 16-22 c.p.s., and the ultra-fenites 28-40 c.p.s.

(3) the unaltered country rock is lower in radioactivity than the metasomatic types.

(b) Magnetometer Survey; ground magnetometer survey shows a general high area in the centre of the claim group which may be correlated with the gneissic/gabbro. Local highs superimposed on the general high may probably be due to the magnetite-rich pyroxenite (of metasomatic origin.)

ATTACHMENTS

(1) Dominion Gulf Company Detailed Geology, Chewett I, Collins Twp.,
Concession II. Scale 1" = 200'.

(2) Rock Specimen Record Sheets.

File 63-681(4)



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DOMINION GULF COMPANY

GEOLOGY OF CHEWETT I - LOTS 8 & 9, CONCESSION V

BASE MAP 410/14N

NEMEGOSENDA LAKE

ONTARIO

K. A. Sargent

September 1, 1955



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SUMMARY & CONCLUSIONS

The claim block consists of Lots 8 and 9, Concession V, Chewett Township, some 18 air miles northeast of the Town of Chapleau, which is on the CPR Transcontinental line.

Geological mapping by the writer and party during the summer months of 1955 located only four outcrops. These, however, revealed that the contact zone between alkaline intrusives and quartz-biotite gneissos exists on the group. This contact zone is known to carry columbium, rare earth minerals, uranium and thorium, as in the area to the north of this claim block. A scintillometer was carried during the mapping, but no anomalous areas were located. The lack of radioactive anomalies is likely due to excess overburden.

Ground magnetics indicate the contact zone passes through the group, the detailed interpretation of which will be dealt with in the report on this work.

The value of the claims will be indicated largely by work in the outcrop area immediately to the north and/or by diamond drilling.

RECOMMENDATIONS

Further surface investigation will likely yield very little additional information.

Diamond drilling will have to be resorted to to get the final answer. Magnetics will likely give the only clues as to the location of the favourable contact zone.

INTRODUCTION

Chewett I, Concession V, Lots 8 and 9, makes up a claim block of 16 claims (85646-47 incl., and 86981-94 incl.). The area is some

18 air miles northeast of the Town of Chapleau, which is on the CPR Transcontinental line, and some two miles north of Bigelow Lumber Camp roads. No previous work has been done in the area. The present investigation includes geological mapping, line cutting, chaining, dip needle survey, scintillometer survey, ground magnetometer survey and topographical mapping. Personnel chiefly consisted of K. Sargent and R. Savage, who covered all mapping, scintillometer and dip needle work, while O. Eliason, W. J. Gannon and F. Faulkner cut lines.

TOPOGRAPHY

Drainage is relatively poor in the area, the southern portion being cut by an east to west running stream, in which are two beaver dams, at least one of which is still active. The relief is low, with some rolling hills. However, most of the area is flat. Vegetation offers the typical northland types, poplar, birch, cedar and spruce appear to be most prevalent. There are occasional swamps.

Four areas of outcrop were found. Mapping of boulders was done in hope of leading to some clue to help in the geology. There seems to be a general scattering of quartz-biotite gneiss boulders and gabbro boulders in like amounts. One area was noted to have an abundance of pulaskite (A_2b) boulders; this grouping is suspected to be due to frost heaving, and therefore the concentration of boulders was mapped as probable outcrop.

GEOLOGY

Table of Formations

Pulaskite

Quartz-biotite gneiss.

Description of Formations

Four outcrops were found, all of which were badly broken up, probably by frost heaving.

Quartz-biotite Gneiss

This rock type outcrops on the eastern edge of the property. Two outcrops of this type were found:

1) The northern outcrop - L22N, 23E, 2/50N. This type appears to have a strike of $40^{\circ}E$, dip $40^{\circ}S$. The fresh surface has a lineated grey appearance; occasionally metacrysts of hornblende or pyroxene are found fairly well developed and elongated in direction of gneissosity. Mineral constituents are:

Quartz 25%	Biotite 15%
Orthoclase 30%	Pyroxenes (?) 10%
Plagioclase 20%	

2) The southern outcrop - L12N, 22E, 1/00N. This outcrop is so badly broken that strike and dip were not attempted.

The fresh surface of this rock type has an overall dark lineated appearance. Biotite and dark minerals do not appear as uniformly distributed as in the northern outcrop of this gneissic type, but rather occur in elongated clots running parallel to elongated light coloured quartz-feldspar clots.

Pulaskite

This rock type outcrops in the northwestern corner of the property. Two outcrops of this type were found:

1) One outcrop is located at L88E, 2S, 1/50W; on the fresh surface the outcrop has a flesh-coloured to pink appearance speckled with dark crystals. The rock type is medium to coarse grained and massive. Mineral constituents are:

Orthoclase 80-85%

Aegirine 15%

Nepheline 0-5%

2) The second pulaskite outcrop occurs slightly to the west of the property, L26W, 50N, 1/50W, and has the same characteristics as the number (1) pulaskite outcrop, except for the addition of some fluorite which is purple and, with maximum size 1 mm., it makes up less than .05% of the rock.

SCINTILLOMETER SURVEY

Readings up to 40 c/s were recorded during line traversing. Such low readings are probably due to excessive overburden. One known boulder of red fenite gave readings up to 150 c/s. This boulder was located in a mixed boulder bed, located at 16/50N, 23W, as shown on the accompanying map.

What is believed to be outcrop occurring on patented ground to the west of the property, L26W, 17N, 5/50W, was recorded to have 100 c/s in the area; the outcrop may be malignite. Since the outcrop was out of the property, further investigation was not carried out on it (see Specimen 208-KS-19).

K. A. Sargent

KAS:bh
Duplicate - Mr. Wyckoff

ATTACHMENTS

1. DGC Map - Geology - Chewett I, Lots 8 & 9, Con. V - 410/14N - Ontario - Scale 1" = 200' - August 9, 1955, September 6, 1955.
2. DGC Sample Record Sheet.

DOMINION GULF COMPANY

SAMPLE RECORD

Property Name **Lots 8 & 9, Con. V, Chewett I**
 Area **Chewett I - 410**
 Collected By **K. Sargent**
 Submitted By **K. Sargent**
 Date **September 6, 1955**
 Property No.
 Map No. **410/14N**

State reason(s) for
 any special laboratory
 work requested at bottom
 of last page.

Central File No.	Field No.	Location	Rock Type (Field)	Sample Purpose	Lab Work (Assay etc)
12896	208-KS-16	L22N, 23E, 2/50N	Qtz.-bio.gneiss	Rock type of area	
97	17	L12N, 22E, 1/00N	"	" " " "	
98	18	L88E, 2S, 1/50W	Pulaskite	" " " "	
99	19	Patented ground, L26W, 17N, 5/50W	Malignite (?), 100 c/s in area.	Identification	
900	20	Boulder bed, L26W, 16/50N, 3/00E	Red fonite, 150 c/s.		
01	21	L26W, 50N, 1/50W	Pulaskite	Rock type of area.	



42B03SE0002 63.681 COLLINS

120

D O M I N I O N G U L F C O M P A N Y

RESIDUAL ANALYSIS OF GROUND MAGNETOMETER DATA

Chewett I - Lake Portion (24 Claims)

Base Map 42B/3S

Province of Ontario

C.W.Faessler

J.H.Ratcliffe

23rd February, 1956.



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Section B - Grid Residuals	4
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INTRODUCTION

A ground magnetometer survey was carried out over the lake portion (24 claims) of Dominion Gulf Company's Chewett I property in March and April, 1955. An Askania vertical magnetic balance was used, with a sensitivity of roughly 20 gammas per scale division. Stations were read, generally, at 50 ft. intervals on lines 400 ft. apart. In the vicinity of the anomalies additional lines were surveyed 200 ft. apart. In the extreme southern portion some stations were placed at 100 ft. intervals. A total of 3062 stations were read over 166,650 feet of picket-line. The magnetic data were reduced and plotted in the field. They were checked and re-plotted in the Company's Toronto office. ^{31.56 MILES}

Interpretation was carried out in stages from May 1955 through January 1956. A preliminary interpretation was made of the basic data in May 1955. Residual calculations and interpretation were made in October, November and December, 1955. A final interpretation was made in January 1956.

The results of this survey and the interpretation thereof are contained in this report and on the accompanying map.

Three different grids were employed in the analyses of the magnetic data. The first had a radius of 200 ft., the second a radius of 283 ft., and the third a radius of 447 ft. A line residual using a spacing of 400 ft. was computed for the southwestern block, the lines being taken in an east-west direction, at right angles to the regional strike. A line graphical residual was calculated for one profile, and found to correspond roughly with the

other methods. Further calculations by this method were curtailed due to the lack of magnetic control at right angles to strike in this section.

Finally an attempt was made to match the magnetic anomaly on Tie Line 26+00S. A fair match was obtained, suggesting a body lying at a depth of about 200 ft., having a width of 1400 ft., and a susceptibility of 0.0044 c.g.s. units (2% contained magnetite).

SUMMARY

Three grid residuals, one line grid residual and one line graphical residual, have been calculated for portions of the Chewett I claim group underlying Nemegosenda Lake. The pictures obtained are essentially the same and tend to eliminate the larger magnetic masses, and amplify the smaller anomalies which may be due to jacupirangite. It is believed that the residual data are sufficiently precise to permit diamond drilling of the more promising locations as soon as ice conditions permit. A depth estimate of the southwestern anomaly zone suggests that the depth to the contact zone is about 200 ft. subsurface, while the zone itself is about 1400 ft. wide. It is believed that over all the average magnetite content is about 2%, the susceptibility being in the order of 0.0044 c.g.s. units.

INTERPRETATIONSection A - Line Residual, Line Graphical Residual,
Curve Matching

An attempt was made to calculate a magnetic anomaly to match that measured on Tie Line 26+OOS near its western end. A reasonable match was obtained using a body striking north 45° East, dipping vertically, having a width of 1400 ft., and lying 200 ft. below the plane of measurement. Possibly a better fit would have been obtained with a body dipping slightly southeasterly. In any event, two residual anomalies remain, one near the peak of the anomaly, and one on the western flank.

The measured anomaly was then examined and a graphical residual calculated. The smooth nature of the measured anomaly suggested that only one anomaly was superimposed upon the major feature, and after removing the major anomaly, the residual appeared as a symmetrical anomaly having a width of about 300 ft.

The grid line residual was calculated by selecting a centre point and subtracting from it the average of the values 400 ft. immediately east and west of the point. This scheme tends to amplify features trending northerly, at right angles to the line of profile. Since the residual data apply to the east-west profile only, profiles of the residuals thus calculated were plotted at 200 ft. intervals. The profiles thus obtained were compared from line to line, and an attempt at correlation was made.

The geological interpretation made as a result of the processes described in this section is thought to add very little to the interpretation made from areal residuals. This process and the interpretation made from it are discussed in Section B below.

Section B - Grid Residuals

Three grid residuals were calculated using radii of 200 ft., 283 ft., and 447 ft. For the first two calculations, four stations were averaged and the average subtracted from the centre point. In the last calculation, eight stations were used to obtain the average.

Comparison of the three maps showed that as the grid radius was increased the size of the residual anomaly increased and there was a smoothing out of minor irregularities.

The same interpretation is shown by the three calculations. It was arrived at by simultaneously studying the three sets of residual data and the basic data. Two types of lines are shown. The dot-dash-dot line is a rough average of the zero-contour lines of each residual plot. The dashed line traces the approximate locus of the inflection points of the residual anomalies. In the few cases where discrepancies were encountered from one plot to another, the largest possible area was enclosed by the dashed line, which then usually corresponded to the locus of inflection points of the larger grid.

It is immediately evident on the ground magnetometer survey map that the zero-contour lines of the residual outline quite closely the whole of the anomalous zone. This is as would be expected as the grids used are relatively small compared to the dimensions of the anomalous zone. In the centre of the southern lake anomaly, a completely closed zero-contour line is produced by the great width of the main anomaly, and its assumed flat peak.

Only seven residual anomalies are considered to be definitely significant. These are numbered,- R-1, R-6, and

R-7 on the northern anomaly, and R-15, R-17, R-18, and R-20 on the southern anomaly. Five other anomalies,- AR-11, AR-12, AR-13, AR-14, and AR-16, are interpreted to be composed partly of residual effects of the main anomaly, and partly to true residual anomalies. This is based on the sharpness of the peaks of the magnetic data associated with these residual anomalies. These peaks are too sharp to be part of the main anomaly over such a wide body. This was seen especially in the attempt at curve-matching mentioned in Section A of this report. The other anomalies,- A-2, A-3, A-4, A-5, A-8, A-9, A-10, and A-19 are so situated that they could be caused solely by the shape of the main anomaly, and there is no indication whatsoever to the contrary.

In the following detailed discussion of the individual residual anomaly, certain terms will be used and should be clarified. An "apparent residual anomaly", is a residual anomaly produced by the shape of the main magnetic anomaly, and implies no change in susceptibility or geometry of the main causative body. A "true residual anomaly", is that caused by a secondary magnetic anomaly imposed on the main anomaly, and, therefore, implies a secondary causative body. The secondary causative body may be formed by an increase in susceptibility over a small volume of the main causative body. The location of these is the purpose of this residual analysis, as the mineralisation in this property is sometimes associated with a concentration of magnetite. However, the secondary body may also be formed by a submerged hill of the same material as the main body, without any change in susceptibility. At the present time, there is no practical way in which the two

possibilities can be immediately investigated by means of the available data. The only feasible way would be by lake bottom sounding, if the unconsolidated lake sediments are not too thick.

R-1:

Weak residual anomaly seen on the 200 ft. and 283 ft. grids. Its intensity of 20 gammas or less suggests the possibility that it represents an area of concentrated error in the original survey. If not so, it is a true residual anomaly.

A-2:

Apparent residual anomaly produced by the curved change in trend of the anomaly flank from W to SSW. No indication is found that it is in part composed of a true residual.

A-3:

Apparent residual anomaly produced by the curved change in trend of the anomaly flank from SSW to ENE. No indication is found that it is in part composed of a true residual.

A-4 and A-5:

Apparent residual anomalies produced by the peak of the main anomaly, and its single curved eastern end. No indication is found that they are composed in part of true residual anomalies.

R-6:

True residual anomaly trending N-S, with a relatively weak intensity (20 to 40 gammas) increasing with grid size. The trend, almost at right angles to the main zone, suggests that it is independent of it. It may, therefore, be due to lake bottom topography, a weakly magnetic dyke-like feature, or weak alteration along a fault or shear-zone.

R-7:

True residual anomaly, with intensity of 35 to 80 gammas increasing with grid size. It may be the only clearly indicated magnetic concentration in the northern lake anomaly, although the possibility of a lake bottom topographical effect cannot be denied. Its apparent northeasterly trend suggests also the possibility that it is the continuation of the feature indicated by R-6.

A-8:

Apparent residual anomaly produced by the eastern end of the northern lake anomaly.

A-9:

Apparent residual anomaly due to northeastern extension of southern lake anomaly. This residual anomaly increases greatly with grid radius and its zero-contour lines are well out from the inflection point locus of main anomaly, thereby suggesting that the grid radius is approaching the minimum radius which would repeat the basic anomaly.

A-10:

Apparent residual anomaly produced by the curved change in trend from N-S to E-W, of the steep flank of the main anomaly. A-10 is expected to extend eastward and southward, but with diminishing intensity, because of the large width to depth ratio of main body.

AR-11 and AR-12:

Residual anomalies composed in part of a true, and of an apparent, residual anomaly. As stated in the last paragraph, AR-11 and AR-12 are composed of the weaker extension of A-10. As both AR-11 and AR-12 show a greater intensity than A-10, the difference must be a minimum true residual at these localities.

AR-13 and AR-14:

Residual anomalies composed in part of a true, and of an apparent, residual anomaly. The presence of apparent residual anomalies here is based on two considerations: firstly, an apparent residual is expected due to the large width to depth ratio of main body, and secondly, such a body, if homogeneous, could not produce the sharp peaks in the magnetic data associated with AR-13 and AR-14.

R-15:

True residual anomaly located inside the border apparent residuals. Its small extent suggests that it has reached its maximum intensity and extent. The secondary causative body is not greater than the dashed outline of R-15.

AR-16:

Considerations of the sharpness of the peak in the basic magnetic data, plus the width to depth ratio of main body, strongly suggest that AR-16 is partly composed of a true, and of an apparent, residual anomaly.

R-17:

True residual anomaly located outside the outline of the main causative body. Its small extent suggests that it has reached its maximum intensity and extent. The data outline this anomaly very poorly, and it is thought that the dashed outline of R-17 indicates the maximum possible extent of the causative body.

R-18:

Small true residual anomaly located on the flank of A-19. These anomalies are separated because of the different ways in which they react to an increase in grid radius, A-19 increasing more

rapid than R-18. This would be expected of two true anomalies of different size.

A-19:

Apparent residual anomaly produced by the sharp curvatures at the southern end of the main anomaly.

R-20:

Largest true residual anomaly observed. It is situated outside the main body. Strictly speaking, the limits of the causative body are somewhere inside the dot-dashed line. They could be inside the dashed line. However, from the evidence of the 447 ft. grid calculation, it appears that the causative body is fairly well outlined by the dashed-line of R-20.

In broad terms, the following general picture is obtained. A wide contact zone surrounds the syenitic intrusive. This zone shows concentrations of magnetite over fairly large areas, but they are discontinuous. Two such areas are evidenced by the northern and southern lake anomalies. Certain formations contain patches of greater concentration of magnetite as evidenced by the true residual anomalies if they are not caused by lake bottom topography. These show a weak tendency to form trends at least in the southern lake anomaly, as evidenced by AR-13, AR-14, and R-18, forming one trend, and possibly a second by AR-11, R-15, and AR-16. No trends could be detected in the northern lake anomaly.

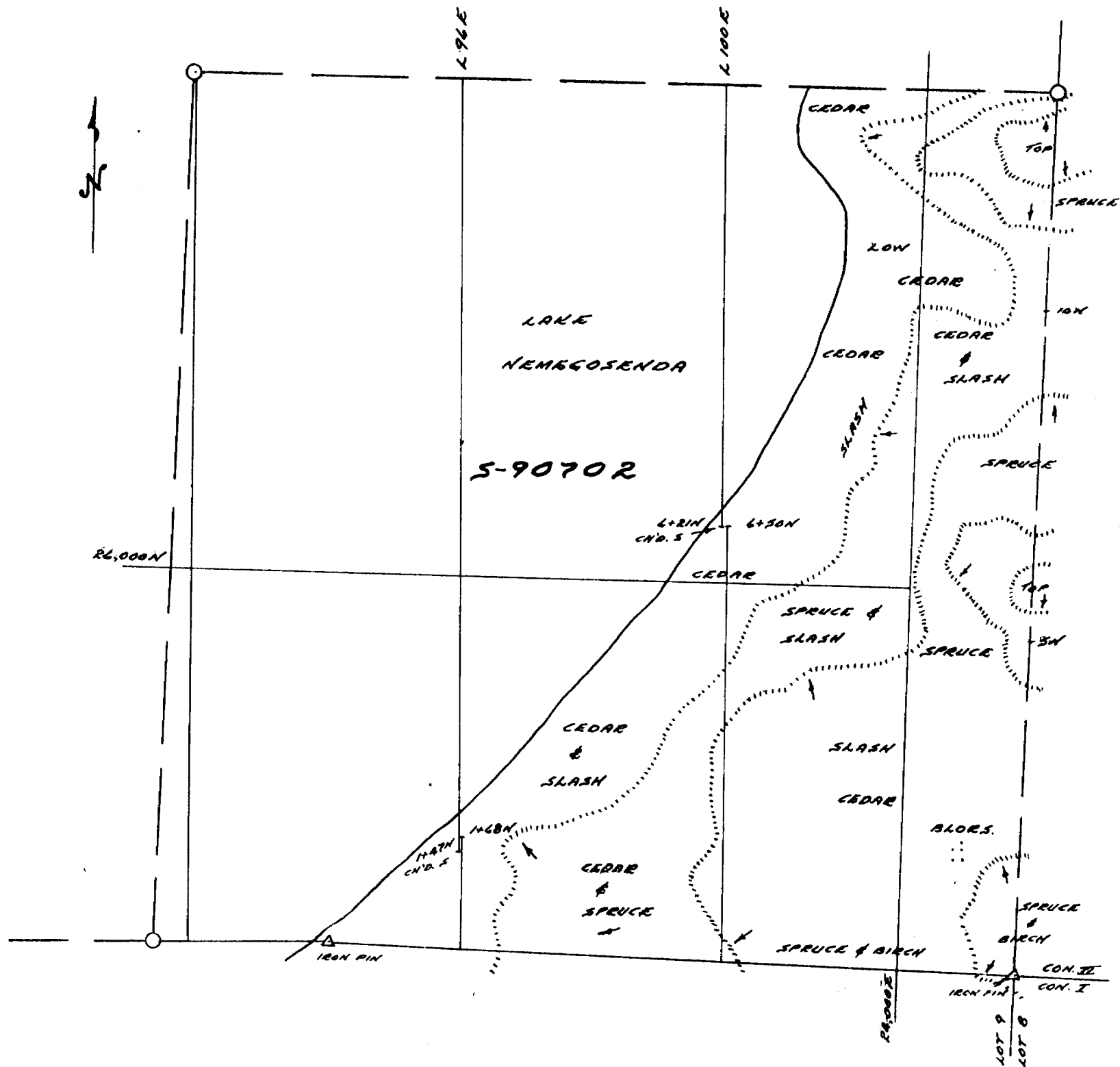
RECOMMENDATIONS

Some internal detail has been brought out in the southern anomaly, but very little, or none, in the northern one. It is recommended that complete sections be drilled through both zones in their widest part. One section should be located through A-2, in a SSE direction, and the other through R-17, in a NW direction. The limits of the sections to be drilled are indicated by the dot-dashed line.

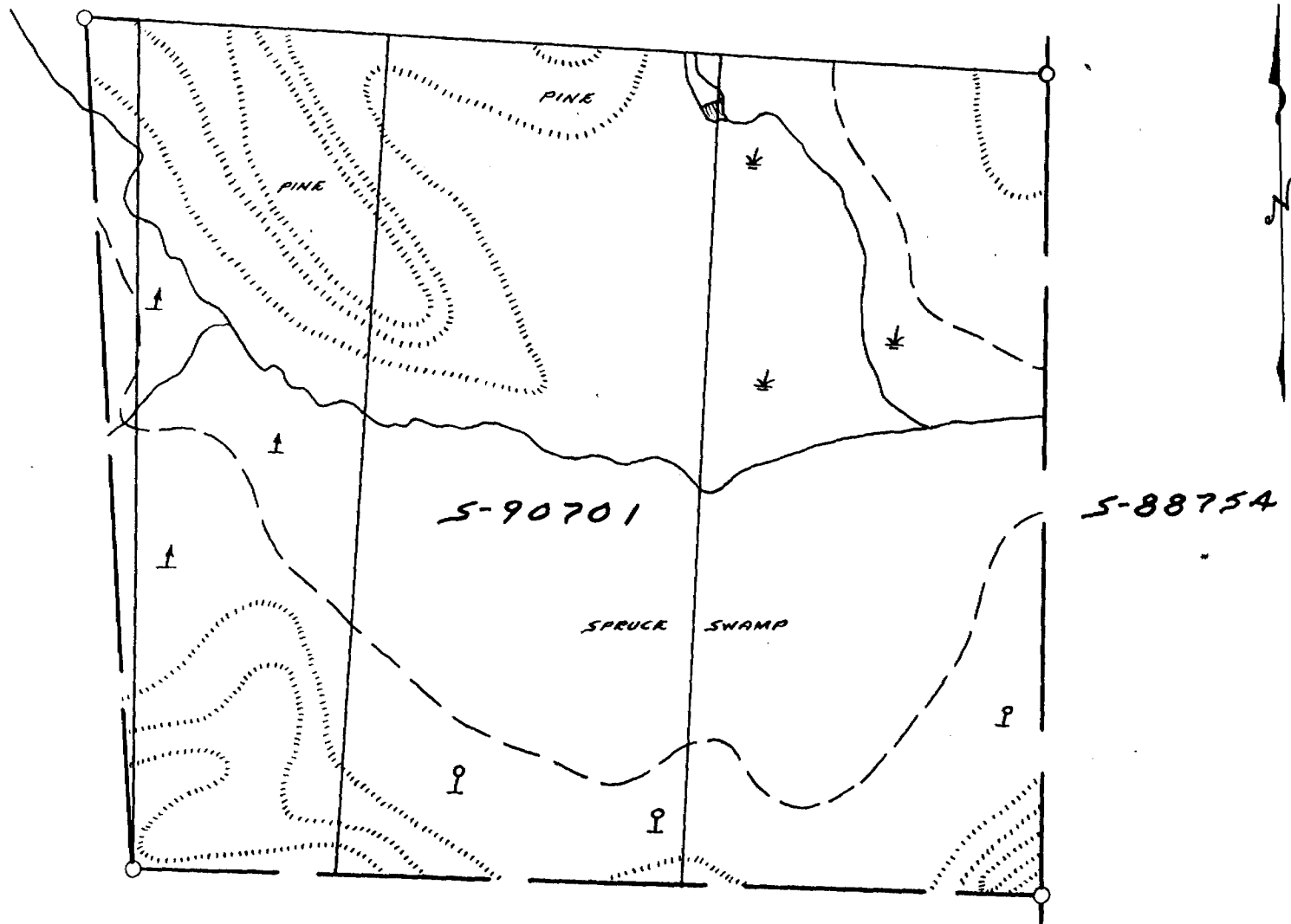
J. H. Ratcliffe
C. W. Faessler.

Attachment:

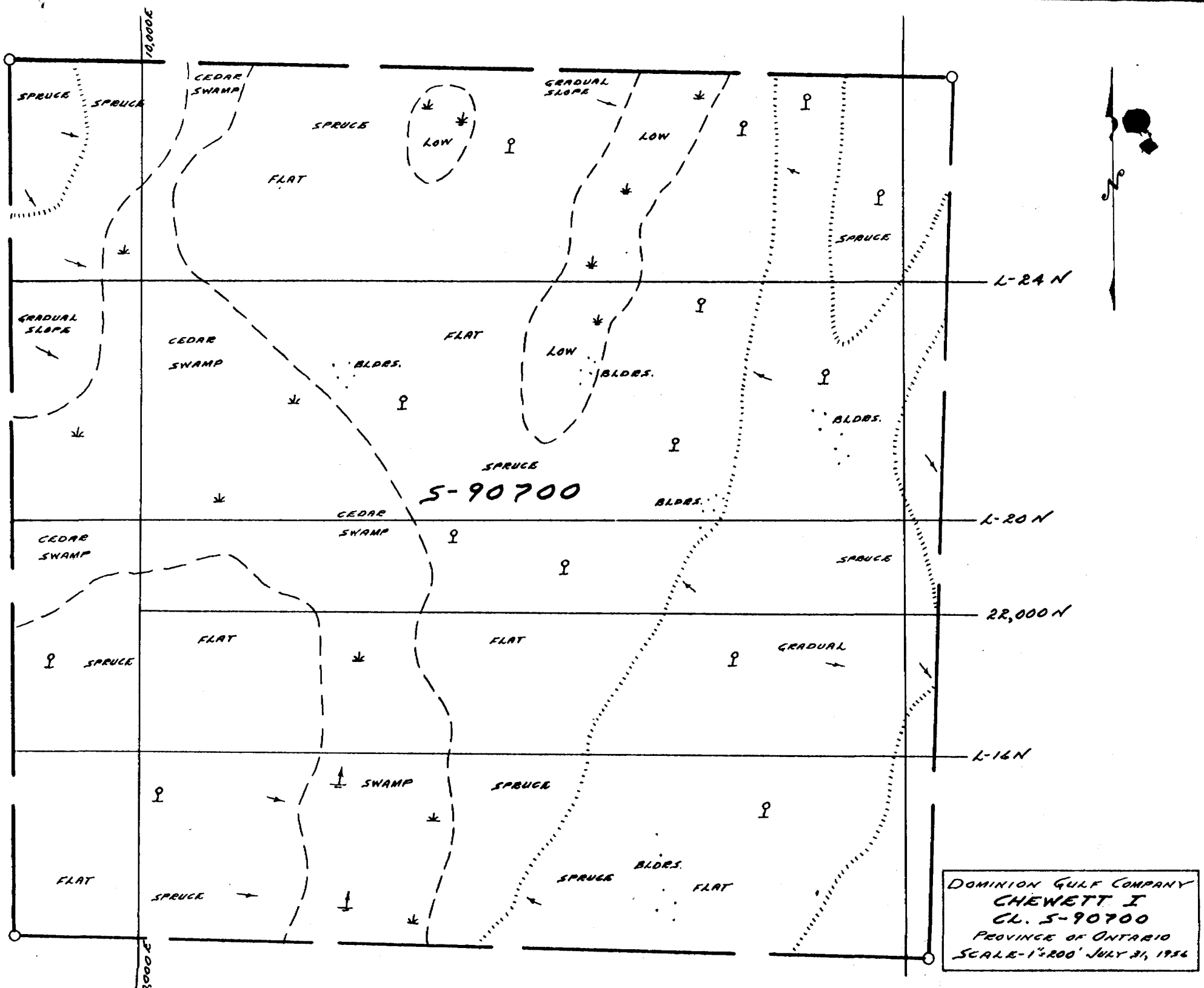
Dominion Gulf Company map - Ground Magnetometer
Survey, Chewett I; Water Portion,
Concession VI, showing Residual Analysis
Interpretation; 41 O/14N, Ontario.
Scale 1" = 200'. February 16, 1956.

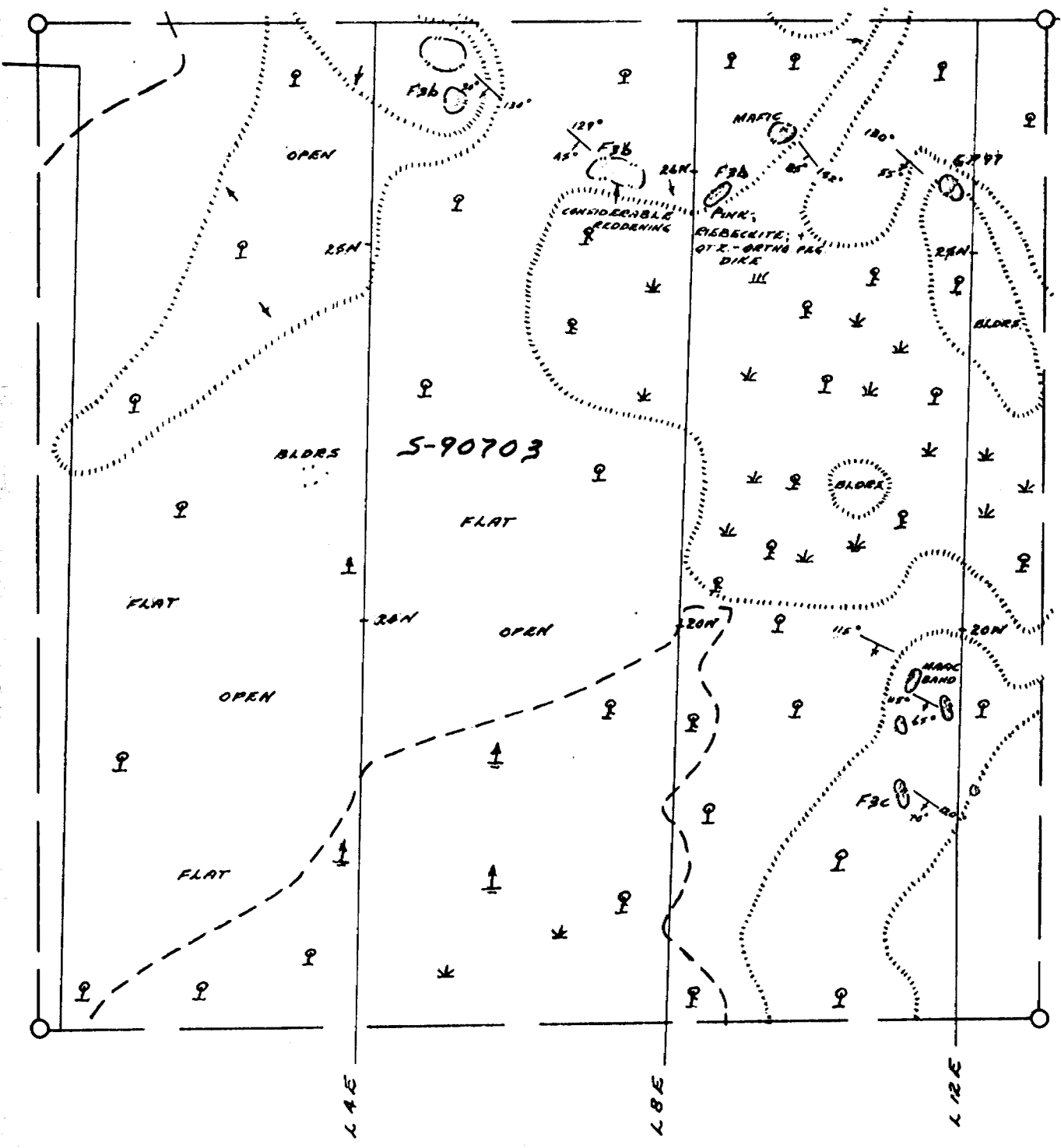


DOMINION GULF CO.
 GEOLOGY
 CHEWETT I
 COLLINS TWP. SECTION
 LOT 9 CON. II
 CL. No. S-90702
 1 AUG. 1956
 SCALE - 1" = 200'



DOMINION GULF COMPANY
CHEWETT I
CL. S-90701
PROVINCE OF ONTARIO
SCALE: 1"=200' JULY 31, 1956





DOMINION GULF CO.
GEOLOGY
CHEWETT I
COLLINS TRACT SEC.
LOT 8 CON. I
CL. No. 5-90703
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SCALE - 1" = 200'

Numbers of Claims shown on
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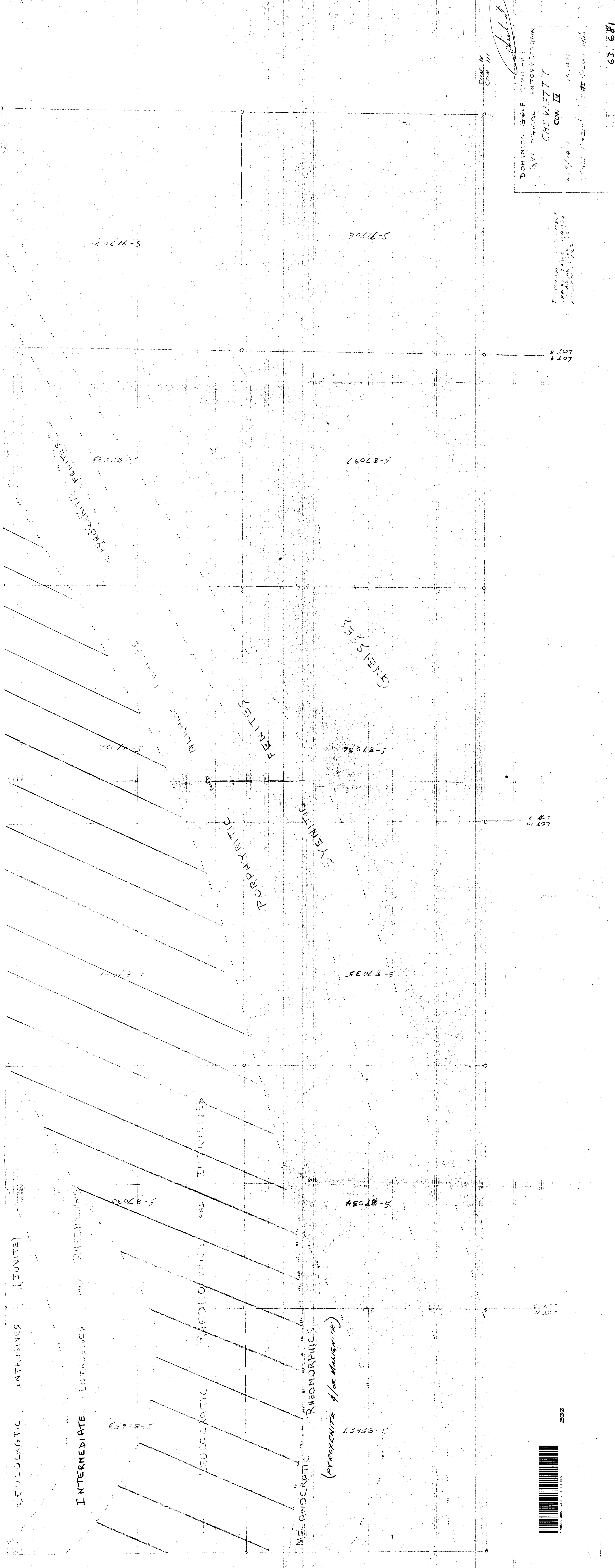
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86959-60-61-62

86968 to 80 incl

88751 to 56 incl

Geophysical
Survey



200

48888888 81 8181 8181

CON. IV
CON. III

Checked

DOMINION GULF DEVELOPMENT
GEOLOGICAL INTERPRETATION

CHEWETT I
CON. IX

419/411
27811/280
DATE: AUGUST 1964

T. CHEWETT
GEOLOGICAL INTERPRETATION
419/411
27811/280

LOT 9
LOT 8

LOT 7
LOT 6

LOT 5
LOT 4

NEMEGOSJENKA
LAKE

BASE LINE "A"

Pottinson TWP
McGee TWP

TIE LINE 26+00.5

BASE LINE "B" 33+00.5

Pottinson TWP
Collins TWP

L-0+00

L-4 E

L-8 E

L-4 W

S-82924

S-82884

S-82885

S-82889

S-82890

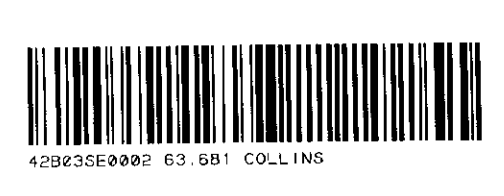
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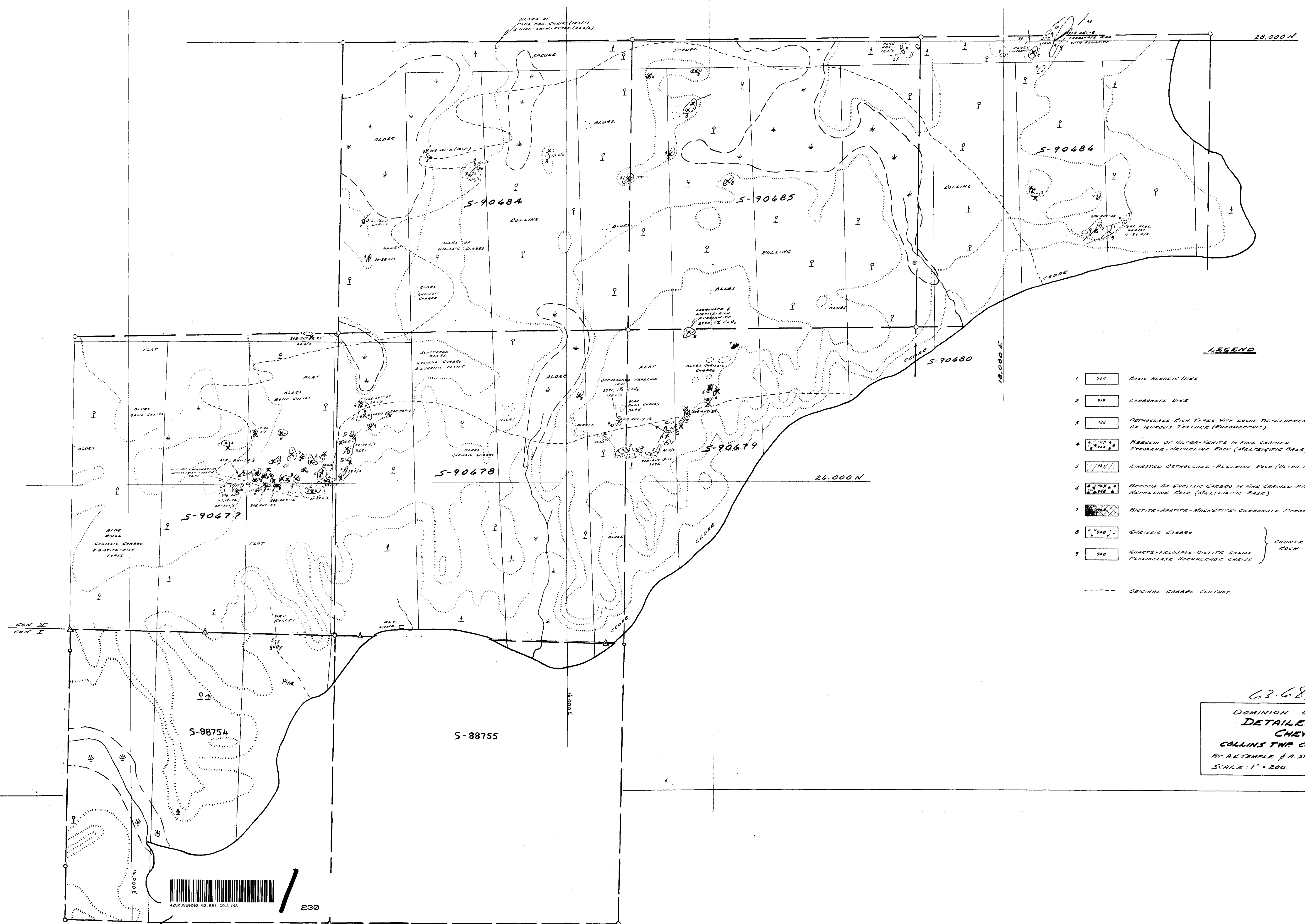
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S-82899

McGee TWP
Crawell TWP



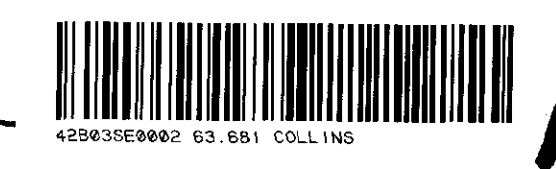




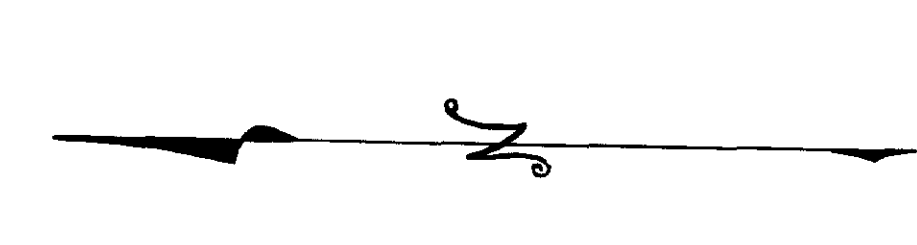
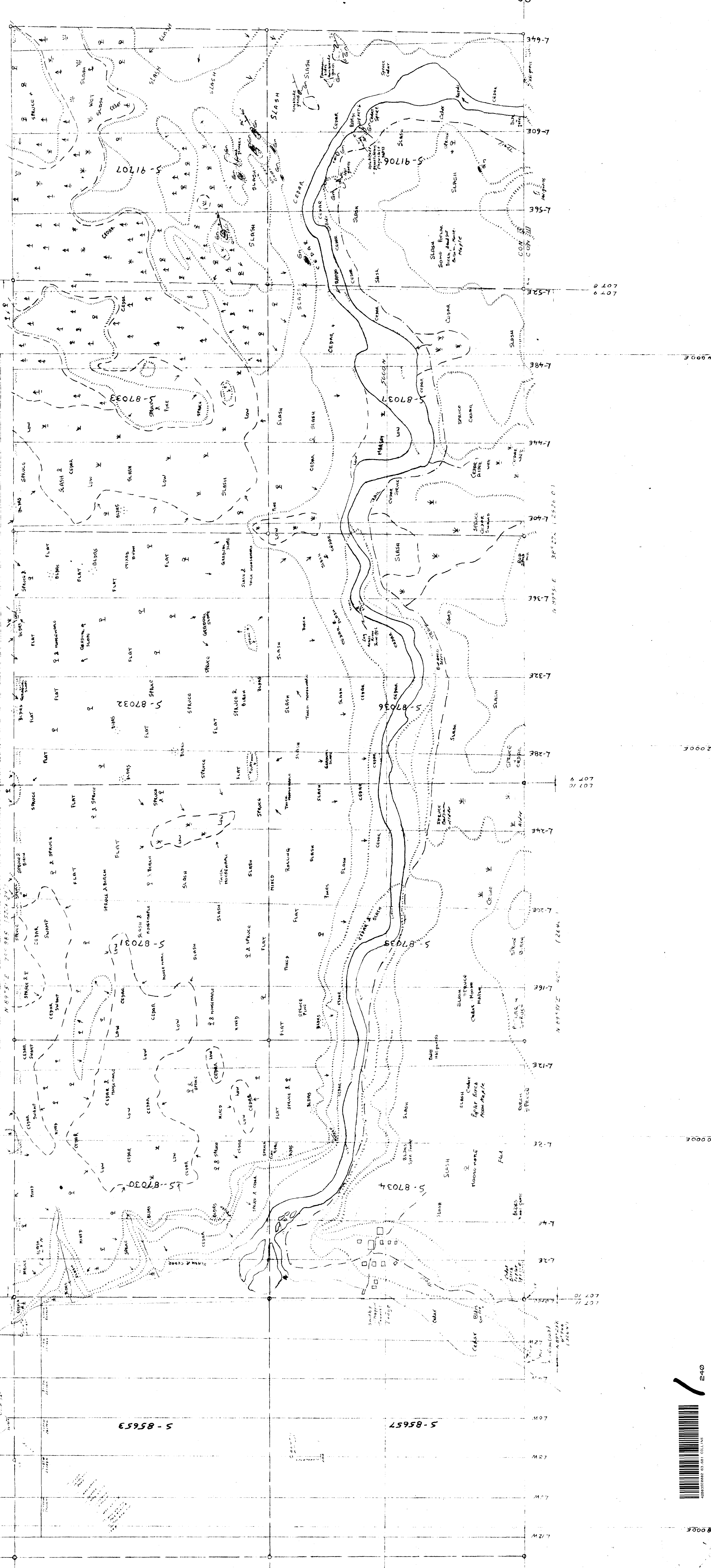
LEGEND

- 1 702 BASIC ALKALIC DIKE
 - 2 719 CARBONATE DIKE
 - 3 766 ORTHOCLASE RICH TYPES WITH LOCAL DEVELOPMENT OF IGNEOUS TEXTURE (RHEOMORPHIC)
 - 4 703 BRECCIA OF ULTRA-FENITE IN FINE GRAINED PYROXENE-NEPHELINE ROCK (MELTICITIC BASE)
 - 5 767 LINEATED ORTHOCLASE-ANORTHITE ROCK (ULTRA-FENITE)
 - 6 704 BRECCIA OF GNEISSIC GABBRO IN FINE GRAINED PYROXENE-NEPHELINE ROCK (MELTICITIC BASE)
 - 7 705 BIOTITE-AMPHIBOLE-MAGNETITE-CARBONATE PYROXENITE (MASSIVE & IN VEINS)
 - 8 708 GNEISSIC GABBRO
 - 9 709 QUARTZ-FELDSPAR-BIOTITE GNEISS
PLAGIOCLASE-NEPHELINE GNEISS
- ORIGINAL GABBRO CONTACT
- } COUNTRY ROCK

63-681
 DOMINION GULF COMPANY
 DETAILED GEOLOGY
 CHEWETT I
 COLLINS TWP CONS. II LOTS 11 & 12
 BY A. TEMPLE & A. STUCKEN
 SCALE: 1" = 200' AUG. 2, 1956

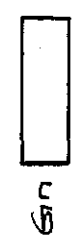


TIE LINE 2640 N



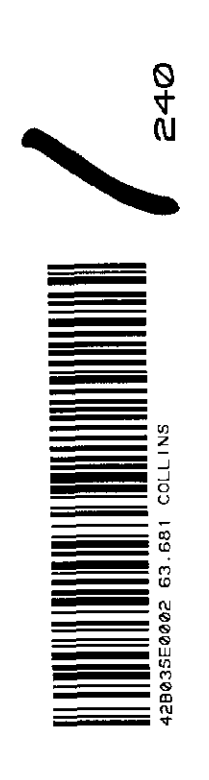
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SWELLES
 INTERMEDIATE QUARTZ - SILICONE - QUARTZ
 MASSIVE - MASSIVE WITH MINOR QUARTZ

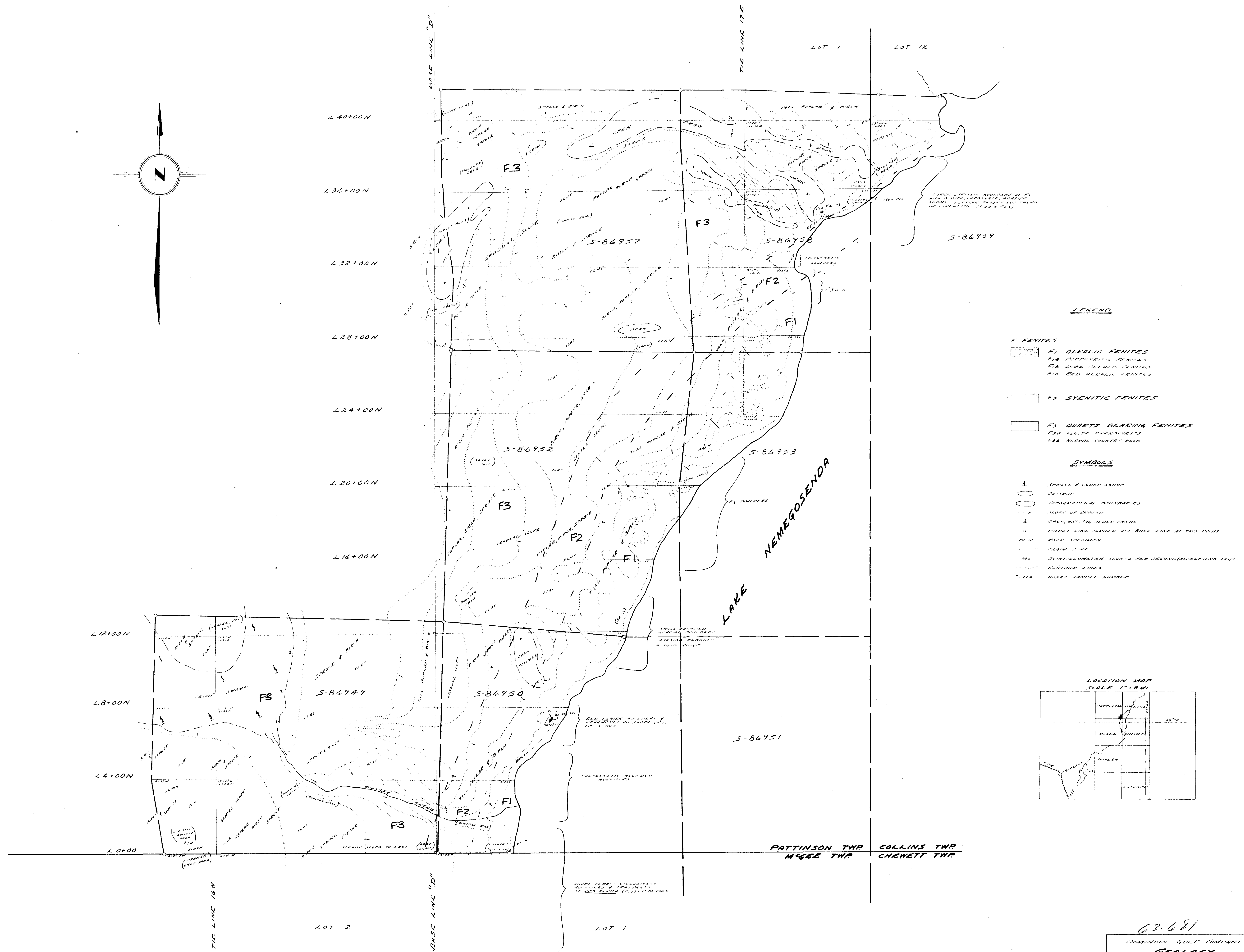
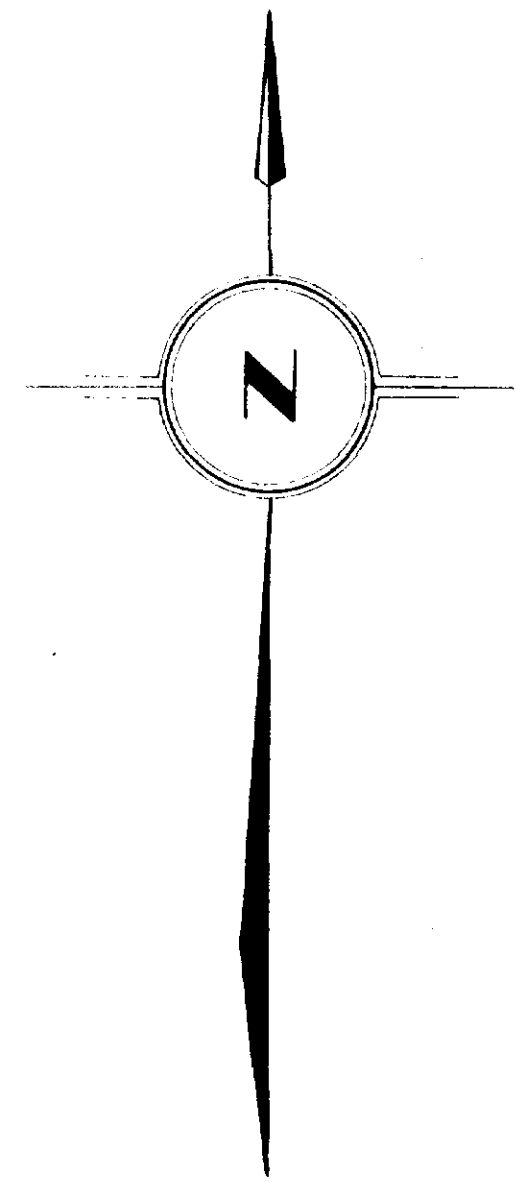


63.681
 ACCOUNTING DEPARTMENT
 20100 AVE. 1, 1984, ST. CATHERINES, ONT.
 AS ORDERED

DOMINION GULF COMPANY
 GEOLOGY
CHEWETT I
 CON. II
 41° 14' N
 SCALE 1" = 200'



240

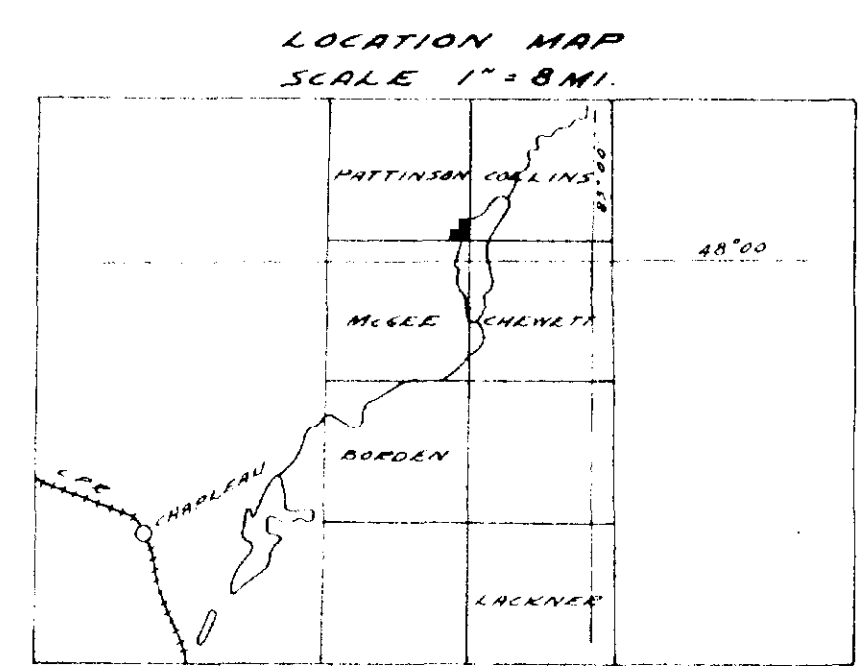


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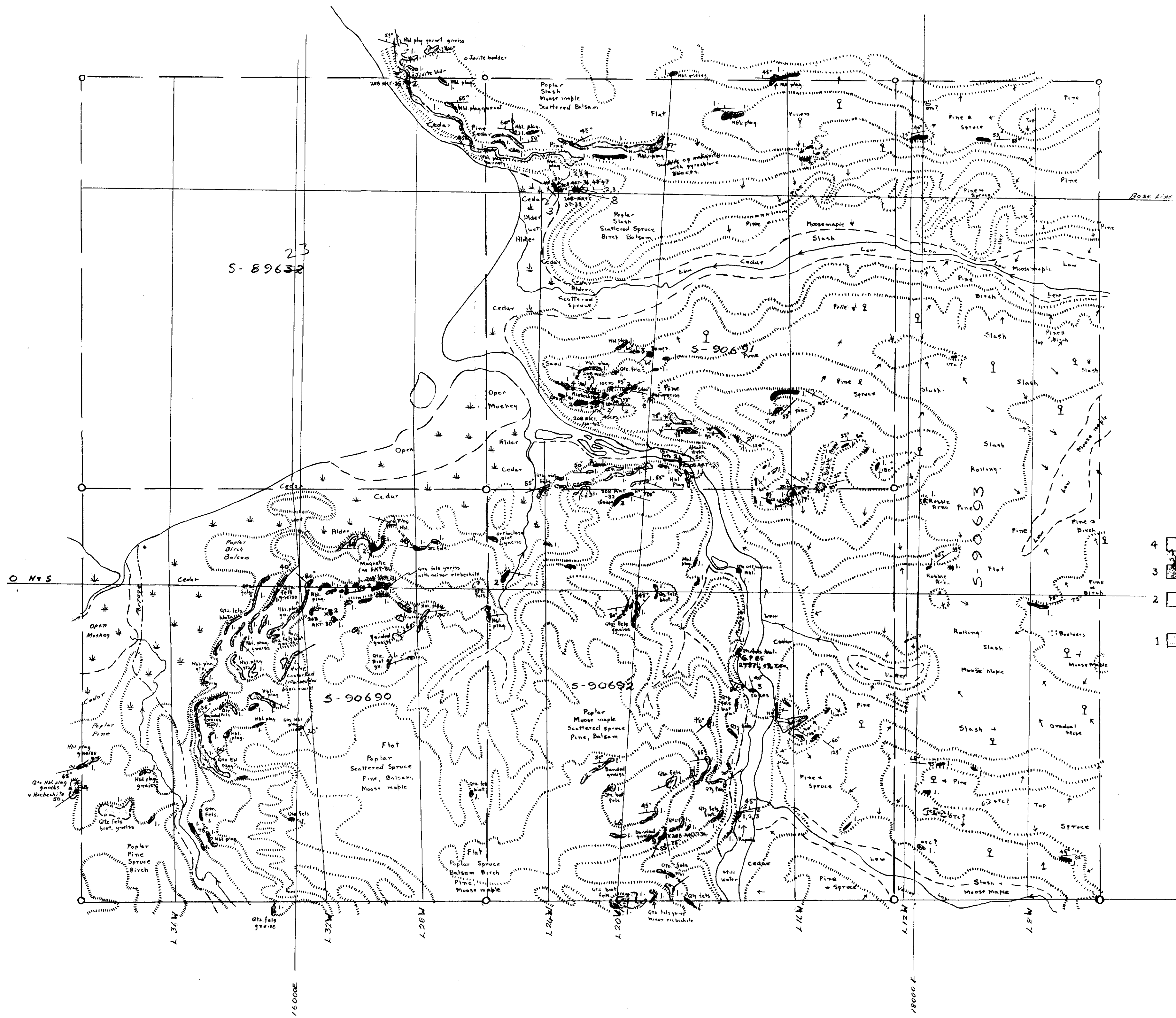
- F FENITES**
- F1 ALLELIC FENITES
 - F1A PORPHYRITIC FENITES
 - F1B DARK ALLELIC FENITES
 - F1C RED ALLELIC FENITES
- F2 SYENITIC FENITES**
- F3 QUARTZ BEARING FENITES**
- F3A QUARTZ PHENOCRYSTS
 - F3B NORMAL COUNTRY ROCK

SYMBOLS

- SPRUCE & CEDAR SWAMP
- OUTCROP
- TOPOGRAPHICAL BOUNDARIES
- SLOPE OF GROUND
- OPEN WATER IN OLDER AREAS
- FIRST LINE LEVELED OFF BASE LINE AT THIS POINT
- ROCK SPECIMEN
- CREEK LINE
- SCALE BAR
- CONTOUR LINES
- ASSAY SAMPLE NUMBER



63-681
 DOMINION GULF COMPANY
GEOLOGY
CHEWETT I
 (PATTINSON TWP SECTION)
 42 B/35 ONTARIO
 SCALE - 1" = 200' SEPT 16, 1955.



S-89632

S-90691

S-90693

S-90690

S-90692

LEGEND

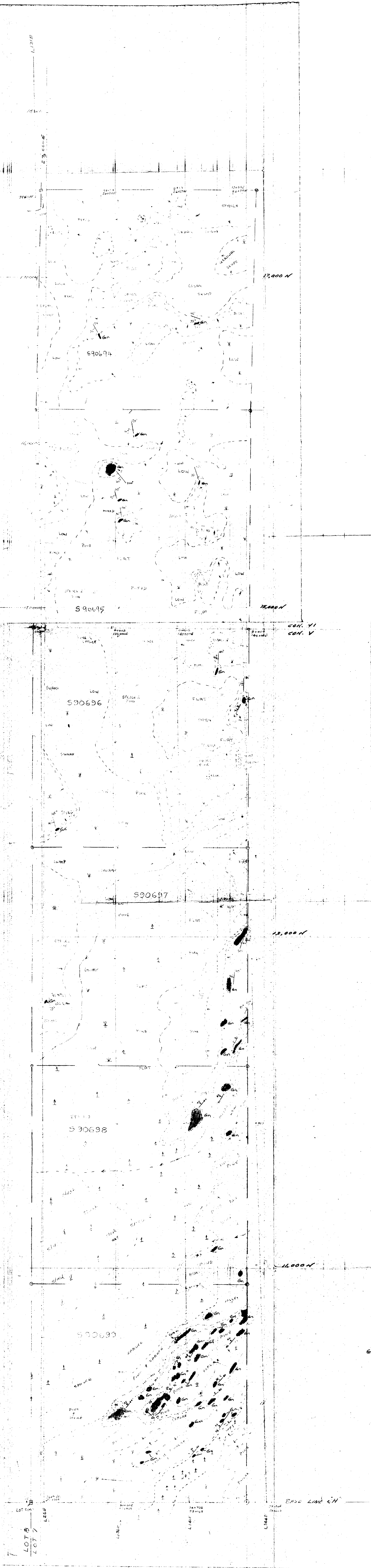
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- 3 CARBONATES
- 2 BASIC ALKALIC DYKES
- 1 GNEISS
 - Hornblende-plagioclase
 - Quartz-hornblende-plagioclase
 - Garnet-hornblende-plagioclase
 - Quartz-feldspar-biotite



63.681

DOMINION GULF COMPANY
 DETAILED GEOLOGY
 CHEWETT I - BORDEN RIVER HYDRO RESERVE
 LOTS 11 & 12 CONCESSION III
 CHEWETT TWP.
 A.K. TEMPLE
 R. STUCKEN

SCALE: 1"=200'
 DATE: APR 4, 1954

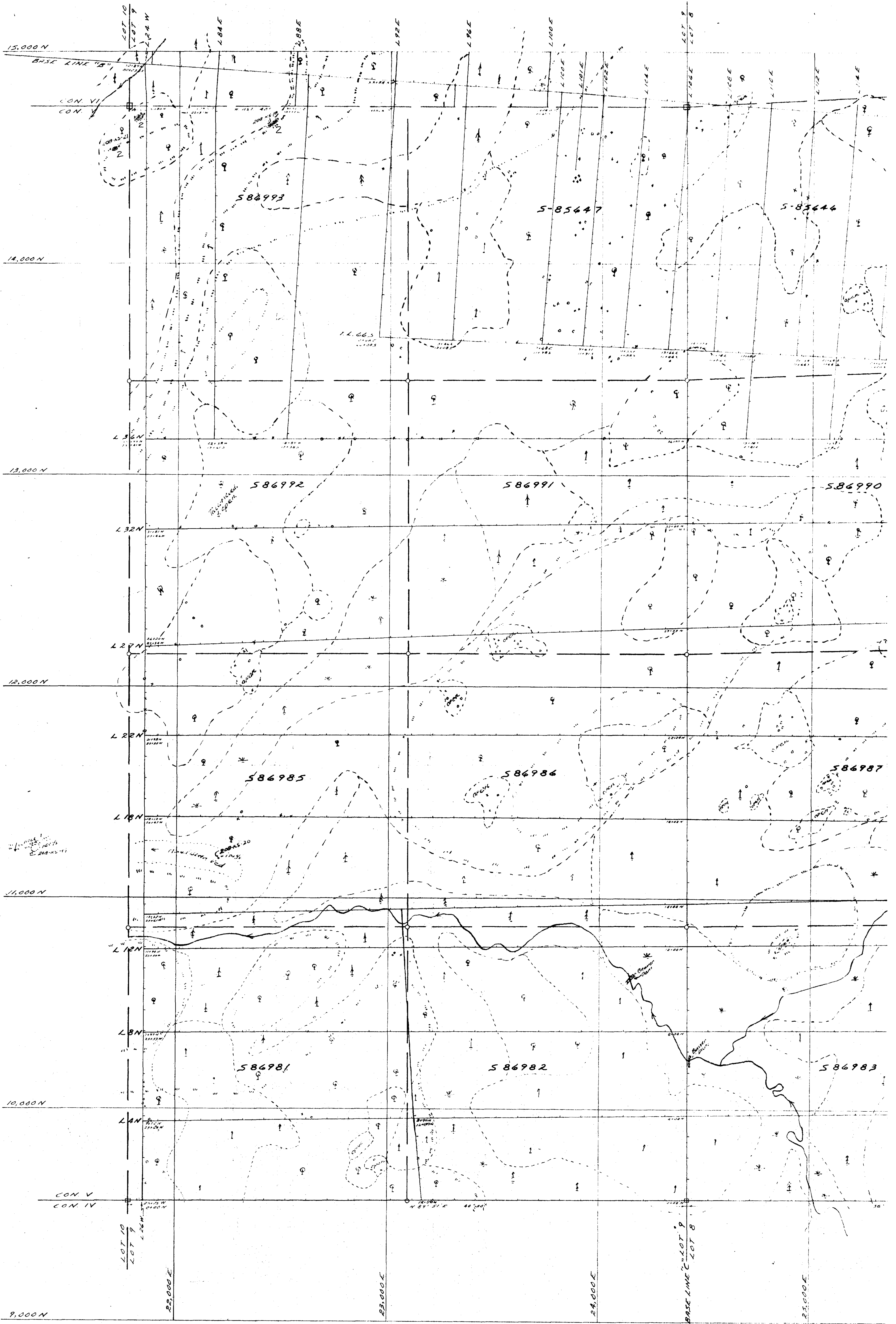


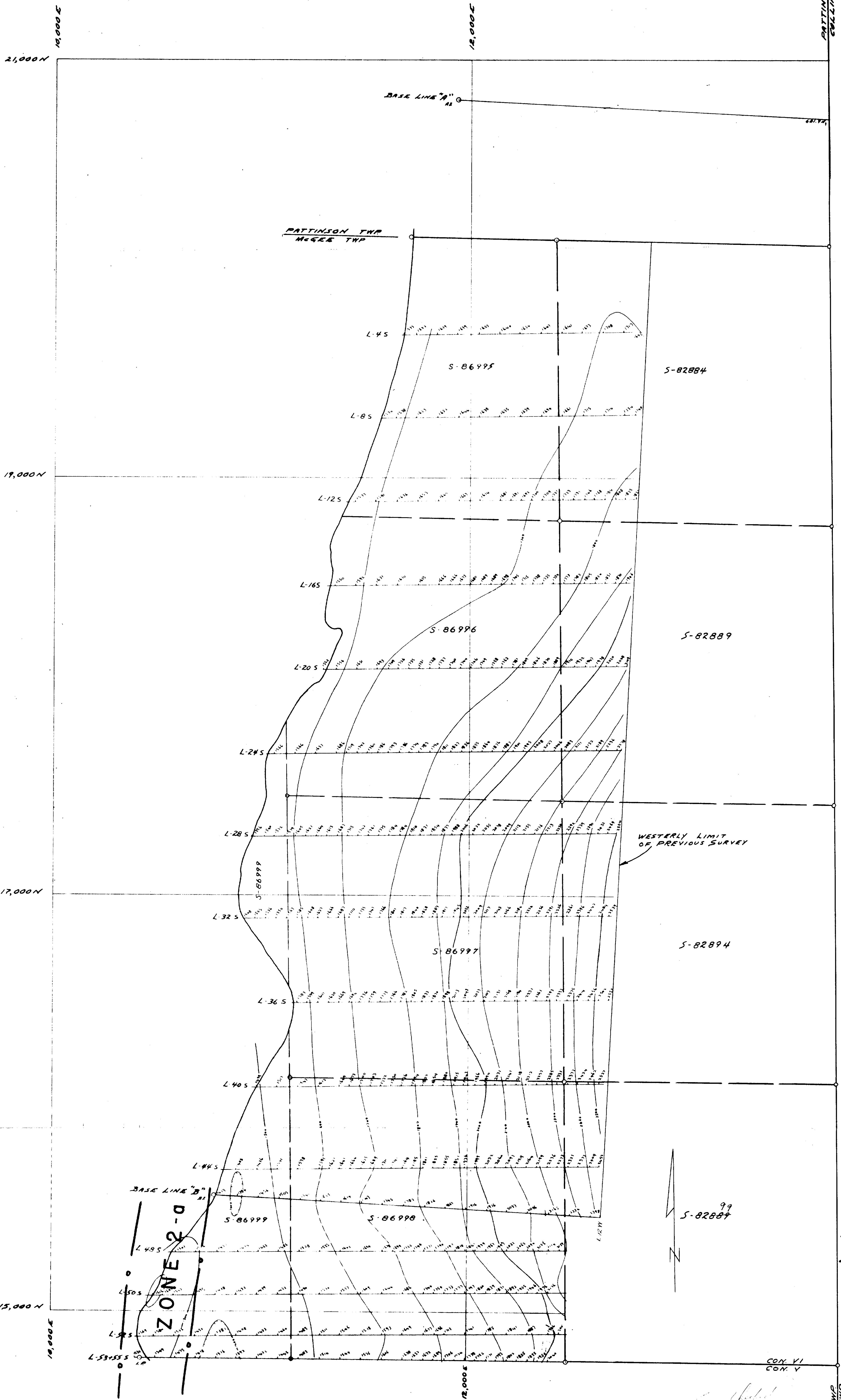
LEGEND

GN GNEISS
 Qtz - FELSPAR - BIOTITE & PLAGIOCLASE
 INTERBEDDED GNEISSES IN PART
 THICKLY INTERBEDDED.


63.681

(Checked)





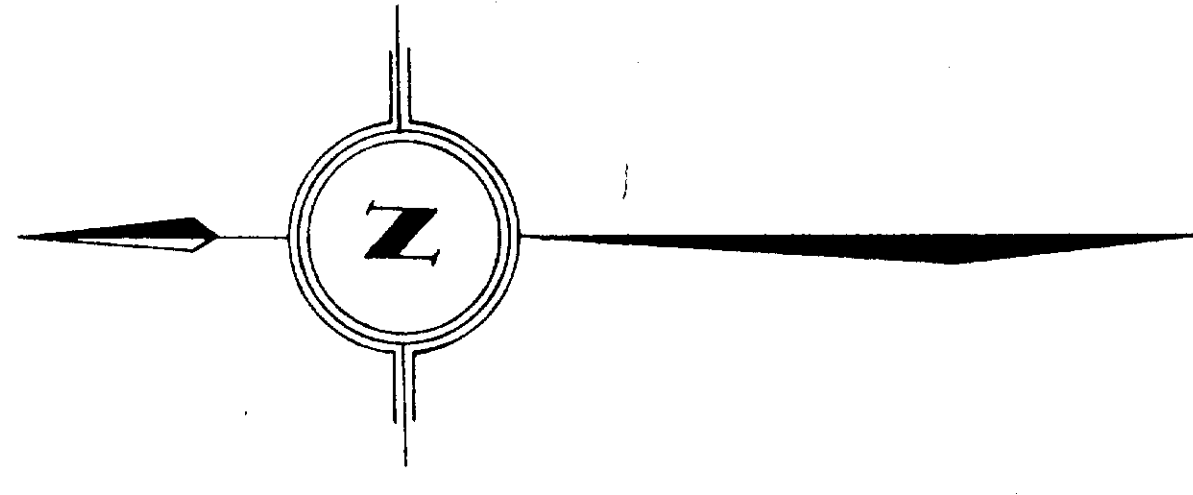
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 ZONE B-b
 Outline of anomalous zone
 labelled B-b in accompanying
 report.

DOMINION GULF COMPANY
 GROUND MAGNETOMETER SURVEY
 CHEWETT I
 MCGEE TWP. CON. VI
 ALIQUAN ONTARIO
 SCALE = 1" = 200' FEB 16, 1956

To accompany interpretation report
 by C.W.F., dated June 27, 1956.





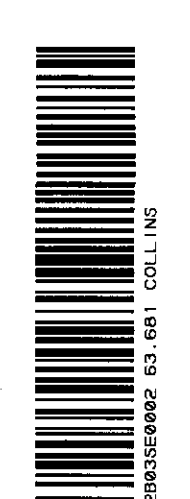
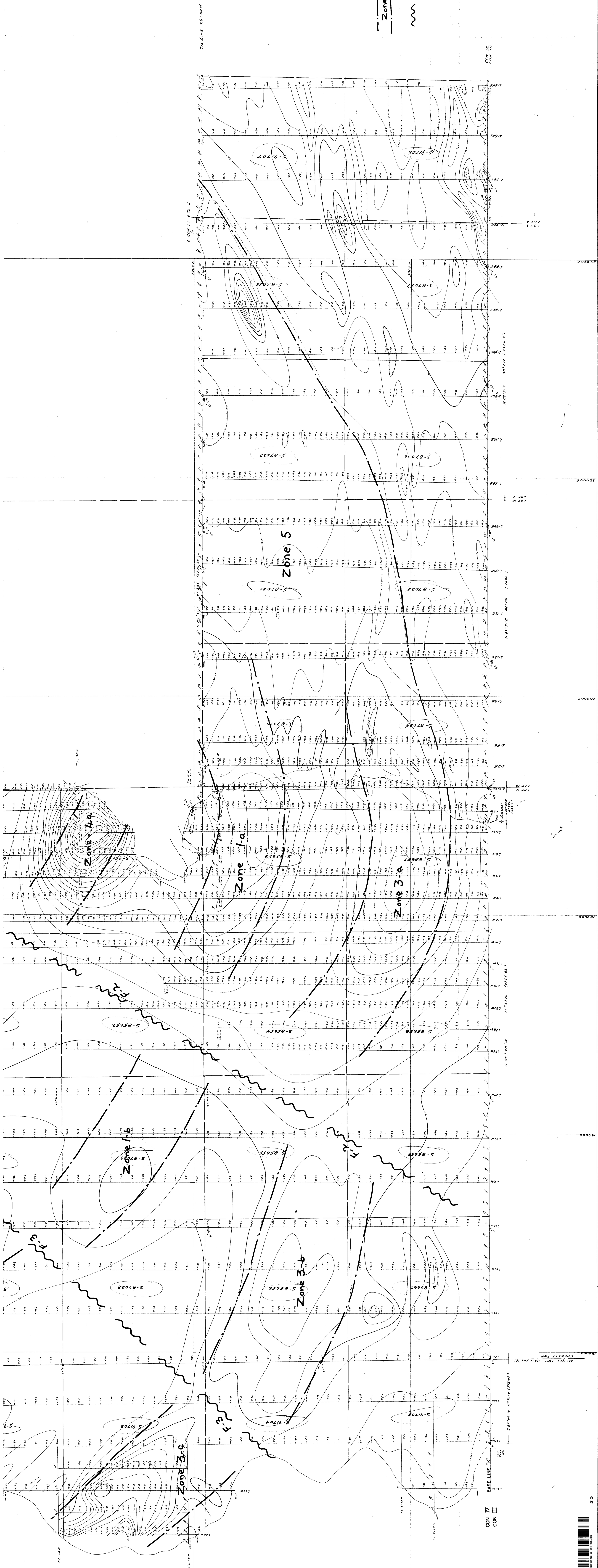
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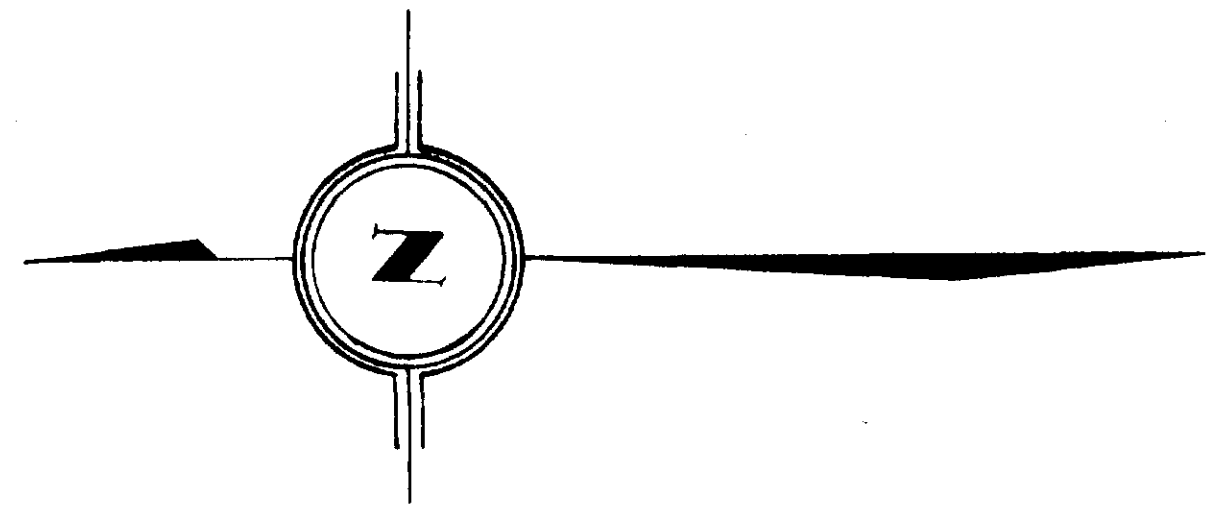
— Zone 8-b
— Zone 8-b
— Zone 8-b

Outline of Anomalous Zone
labelled B8 in accompanying report

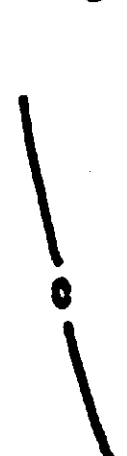
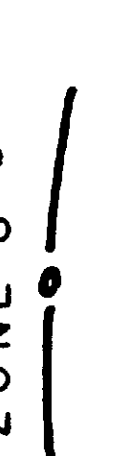

~ ~ ~ ~ ~
Interpreted Fault

CONTOUR INTERVAL - 100 gamma
DOMINION GULF COMPANY
Geophys. Planning Section
CHEWETT I
CON II
4/1/64
ONTARIO
SCALE - 1" = 500'
MAG. 2424/64

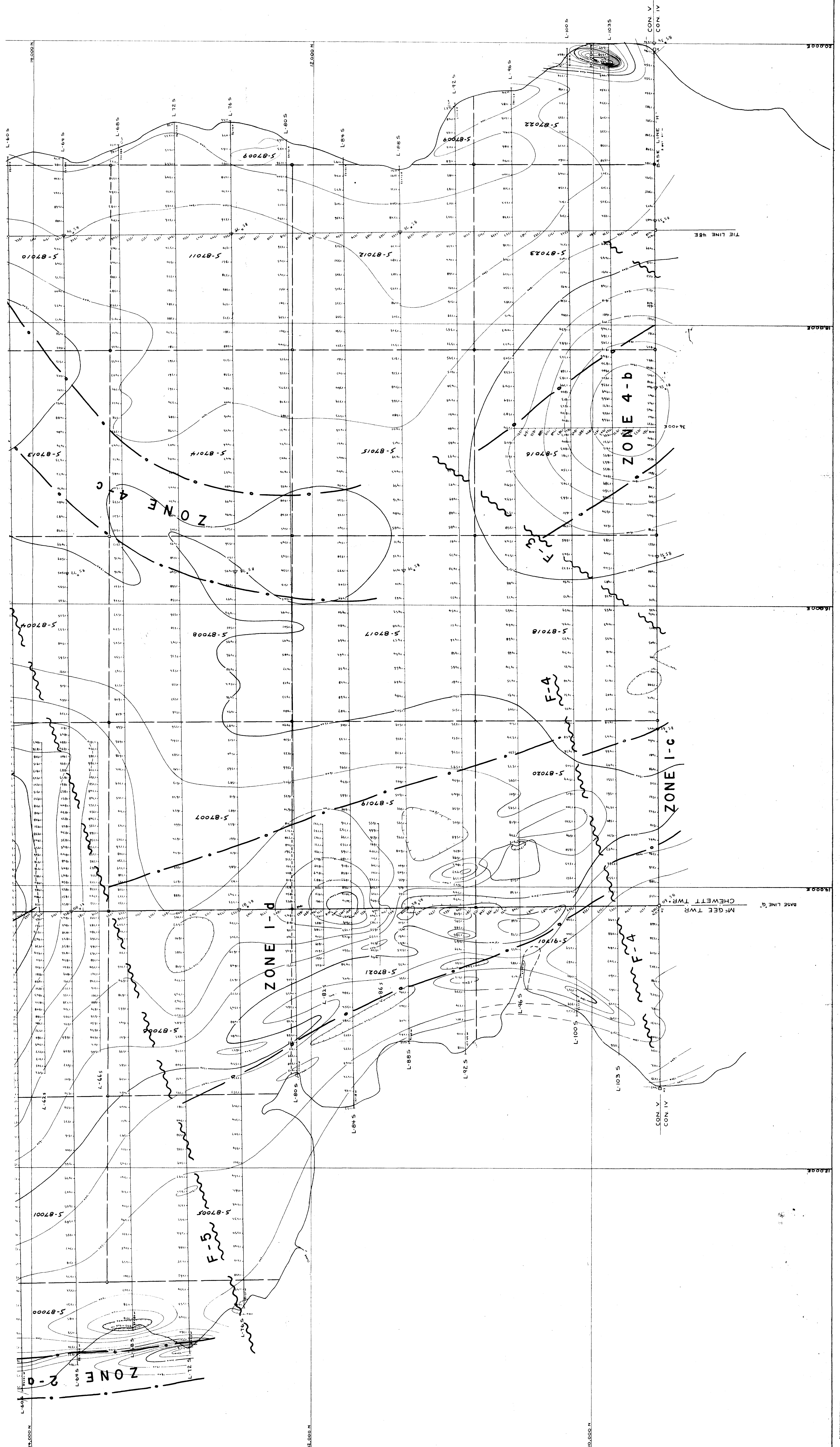


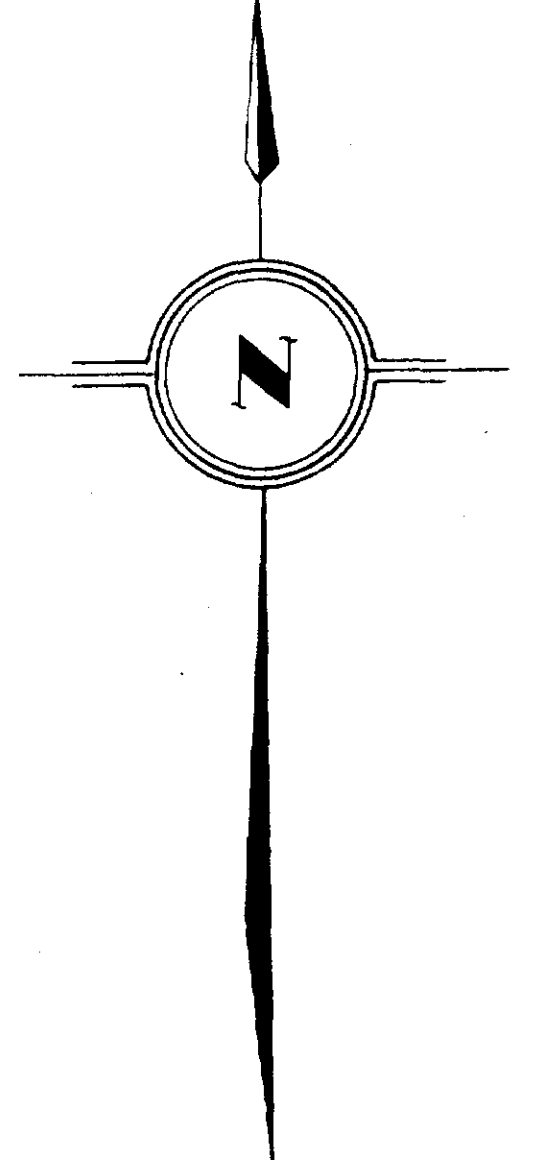


LEGEND

-  ZONE 8-b
-  Boundary
-  Interpreted fault

Contour Interval: 100 feet
 Dominion State Government
 GEODETIC SURVEY
 MAGNETOMETER SURVEY
 WATER PARTITION - CON V
 10/1/44
 CHICAGO
 Scale: 1" = 200'
 Approved: 1/25/56
 TO ACCOMPANY INTERPRETATION REPORT BY C.W.F.
 DATE: June 22, 1956

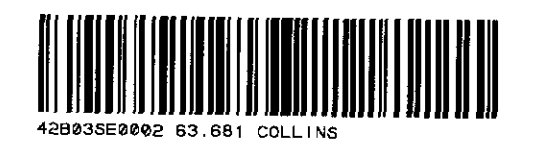


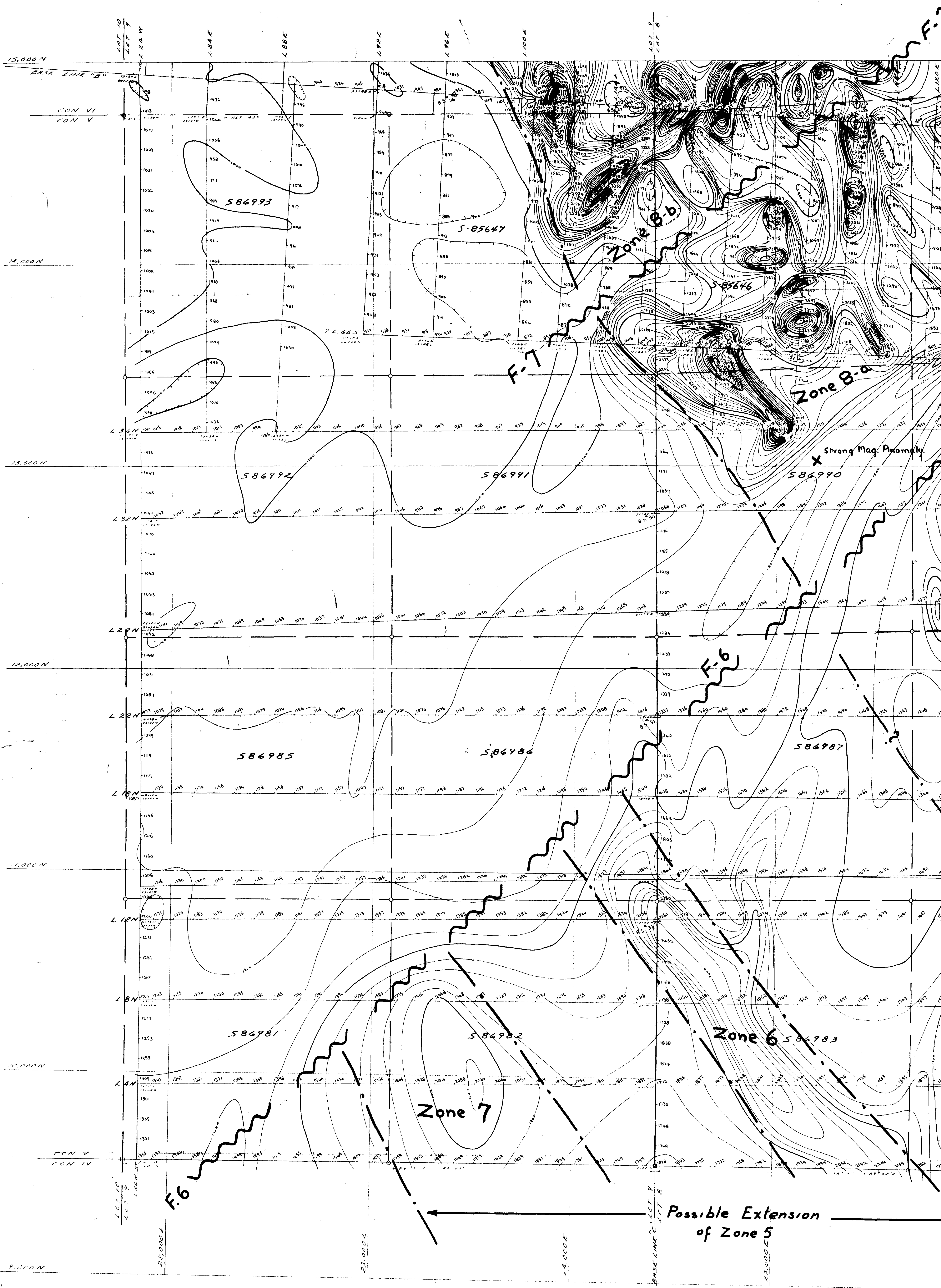


LEGEND

ZONE 2-b
 Outline of anomalous zone labelled 2-b in accompanying report.

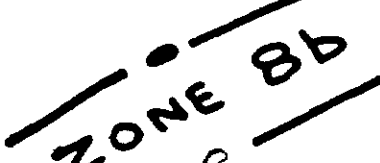

DOMINION GULF COMPANY
GROUND MAGNETOMETER SURVEY
CHEWETT I
 PATTINSON TWP SECTION
 PATTINSON TWP PROV. OF ONTARIO
 BASE MAP 427/S-5
 SCALE 1:100,000 DATE FEB. 22, 1956.
 CONTOUR INTERVAL 100 GAMMAS
 To accompany Interpretation Report by C. W. F., dated June 27/56.

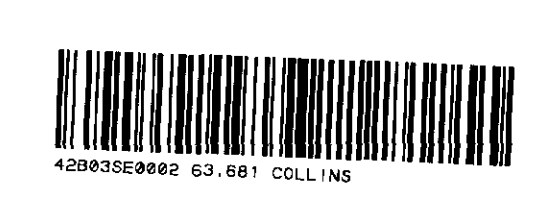


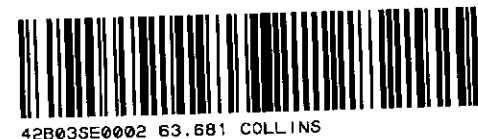
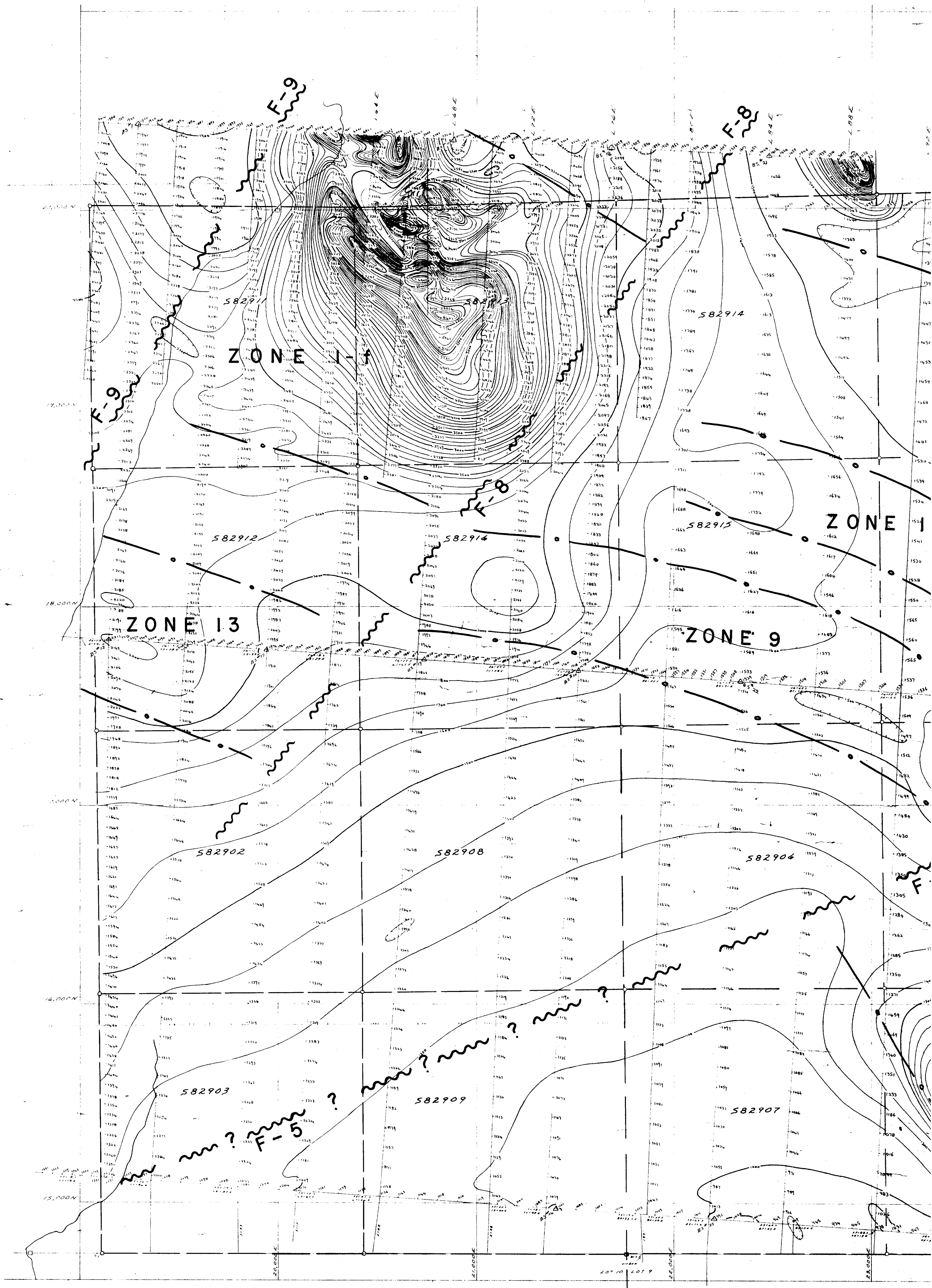


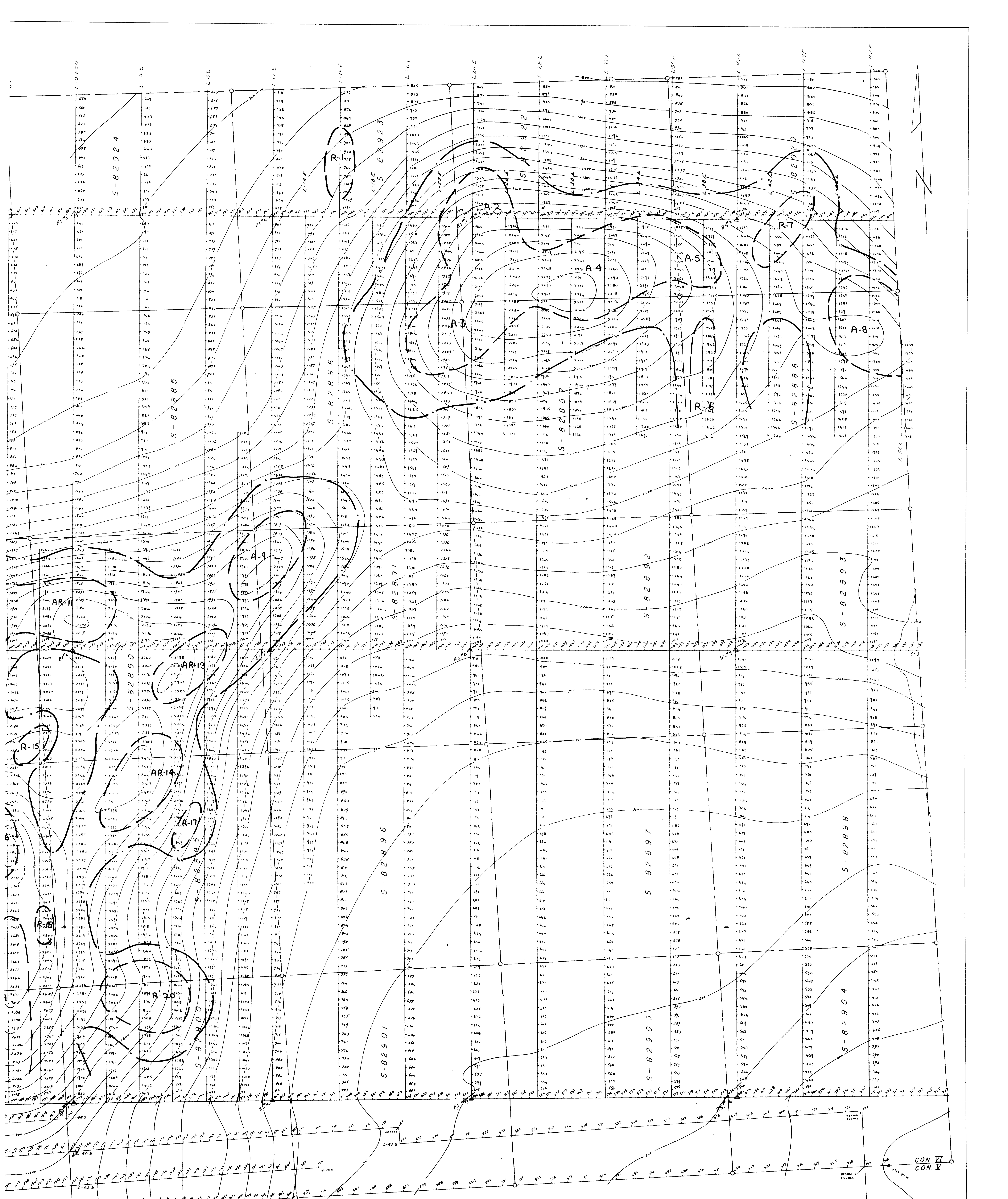
Possible Extension
of Zone 5

LEGEND

-  Zone Bb
Outline of anomalous zone, labelled Bb in accompanying report.
-  Interpreted Fault







LEGEND

Lines on which basic data was interpolated

Residual zero-contour line which outlines main anomalous body

Locus of residual inflexion points which outlines approximate limits of secondary anomalous body

Numbered "Apparent" residual anomaly

Numbered True residual anomaly

Numbered residual anomaly composed in part of "True" and "Apparent" residual anomalies

NOTE: BASE MAP CONSTRUCTION

1. All lines west of L-44E are perfect grid

2. Base Line "B" is assumed to be a straight line

3. NS change on L-40E was assumed to be correct and this line was used as a key line to locate the position of other Base B Tie Lines north of Base Line "A" and east of L-44E.

DOMINION GULF COMPANY
 GROUND MAGNETOMETER SURVEY
 CHEWETT I
 Showing Residual Analysis Interpretation
 Water Portion - Con. VI
 410/14N ONTARIO
 Scale: 1" = 200' Feb. 16, 1955
 CONTOUR INTERVAL - 300 GAMMAS
 To Geophysical Report No. 5, H.R.C.W.F. Feb. 23, 55

MAGNETIC BASE LINE "B" CHEWETT I

A. ALKALINE INTRUSIVES

- A1 SOVITES (intrusive type) carbonates
- A2 LEUCOCRATIC ALKALINE ROCKS - less than 30% ferromagnesian
 - A2a Juvite - nepheline - rich syenite
 - A2b Pulaskite - orthoclase - rich syenite, 10-30% ferromagnesian
 - A2c Foyaitite - 1/3 orthoclase or soda plagioclase, 1/3 nepheline, 1/3 ferromagnesian.
- A3 MESOCRATIC ALKALINE ROCKS - 30-75% ferromagnesian
 - A3a Nalignite
 - A3
- A4 MELACRATIC ALKALINE ROCKS - more than 75% ferromagnesian; biotite, pyroxenite
- A5 JACUPIRANGITES (intrusive type) - apatite, biotite, pyroxene, magnetite.

C. CONTACT ZONE

- REOMORPHIC, IGNEOUS & REPLACEMENT ROCKS (igneous-like texture)
- C1 JACUPIRANGITE (replacement type) - apatite, biotite, pyroxene, magnetite.
 - C2 SOVITE (replacement type) - carbonates
 - C3 BIOTITE-ORTHOCLASE PEGMATITE
 - C4 MELFRIGITE - nepheline and aegerite
 - C5 NALIGNITE - orthoclase and aegerite
 - C6 ACID REOMORPHICS - orthoclase-rich, pulaskite, foyaitite

BRECCIAS

- B1 CONTACT IGNEOUS BRECCIA - reomorphitic fenite fragments in an igneous base
- B2 REOMORPHIC BRECCIA - fenite fragments in a reomorphitic fenite base
- B3 SOVITE BRECCIA - fenite fragments in a carbonate base
- B4 JACUPIRANGITIC BRECCIA - fenite fragments in a jacupirangitic base
- B5 BIOTITE-ORTHOCLASE PEGMATITE BRECCIA - fenite fragments in biotite-orthoclase pegmatite
- B6 Above type with red feldspathized fragments

ULTRA-FELITES (inner fenite zone; lined)

- UF1 PYROXENITIC (MAFIC) FENITE (calcic-iron zone) - pyroxene rich, magnetite, minor red hydrated feldspar, melunite, wollastonite, quite radioactive.
- UF2 INTERMEDIATE FELITE - above type with more than 15% red hydrated feldspars
- UF3 PYROXENITIC (MAFIC) FENITE - pyroxene rich, no or insignificant magnetite and red hydrated feldspar, weakly radioactive, soda-orthoclase microcrysts
- UF4 UNCLASSIFIED ULTRA FELITES
- UF5 Fragmental Types

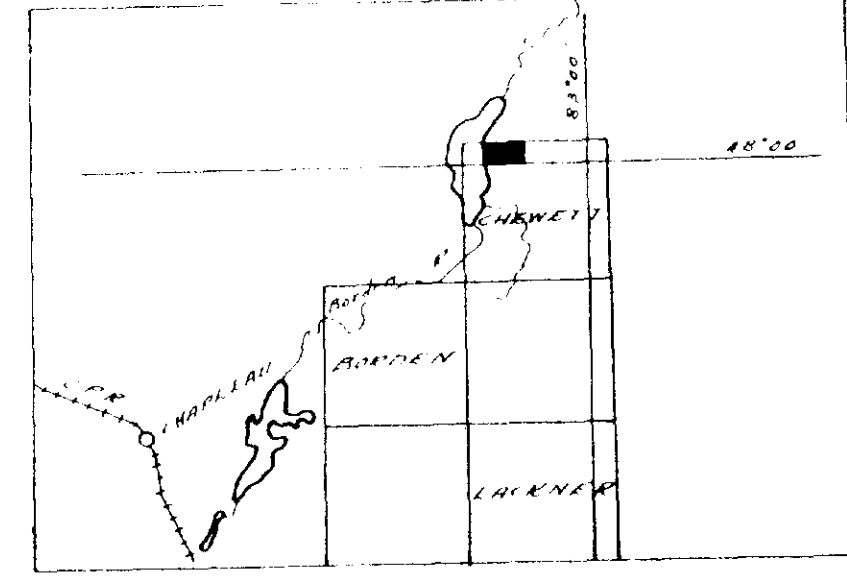
Note: alteration superimposed on above types as shown by diagonal lines - red for potassic, brown for sodic, purple for jacupirangitic and grey for carbonates.

F. FELITES & GNEISSES (outer fenite zone - lined or gneissic)

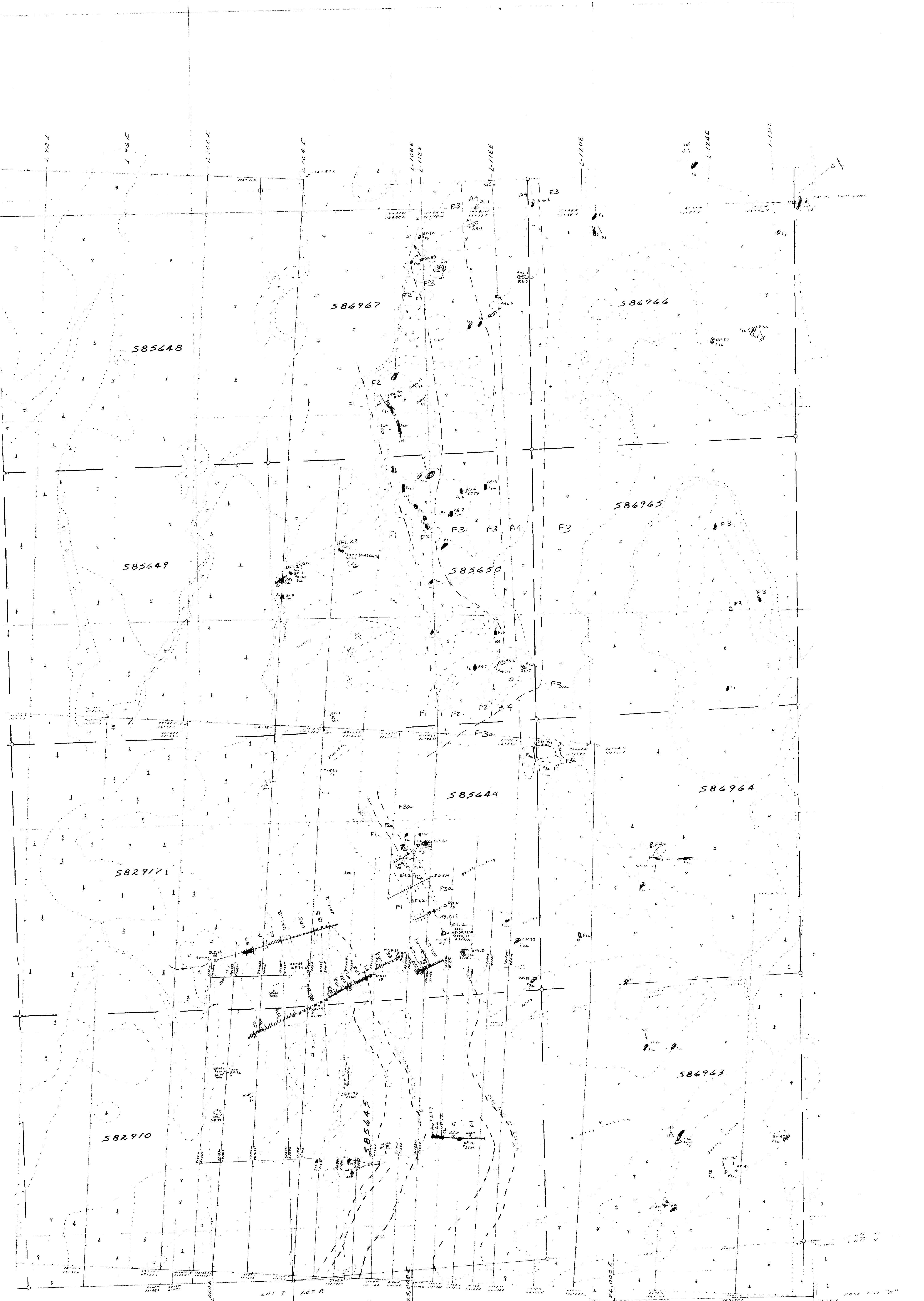
- F1 ALKALIC FELITES - lined, nepheline-bearing, minerals of gneisses completely destroyed
 - F1a PORPHYRYTIC FELITE - transparent soda-orthoclase microcrysts
 - F1b DARK ALKALIC FELITE - rich in ferromagnesian
 - F1c RED ALKALIC FELITE - brick red rock
- F2 SYENITIC FELITES - gneissic, no quartz, augite microcrysts, red hydrated feldspars
 - F2a base all red or pink hydrated feldspars
 - F2b base with " " " "
- F3 FELITIC GNEISSES AND GNEISSES
 - F3a augite microcrysts, minor quartz
 - F3b no or very few aegerite-augite microcrysts but definite sodic alteration
 - F3c gneisses little or unaffected by alkalic metasomatism

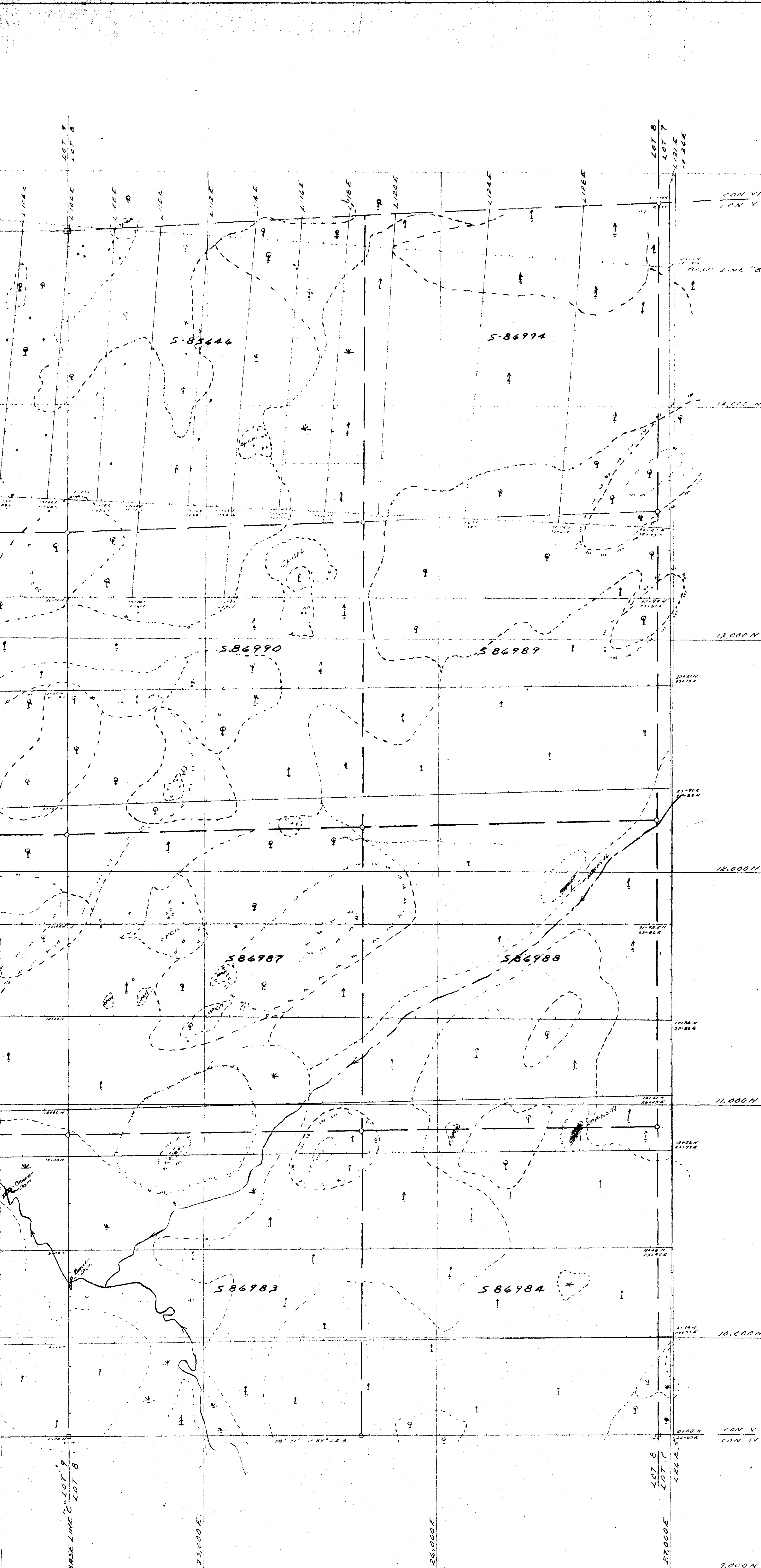
- hills
- topographical boundaries
- shrub & tag alder areas
- spruce & balsam
- cedar
- spruce & cedar
- spruce & tamarack
- poplar & birch
- mixed bush
- boulders
- outcrops
- geological boundaries
- axis of linear magnetic zones
- faults
- GP.20 rock specimen numbers
- 2732 assay numbers
- mcps scintillometer counts per second
- lot post
- survey station
- D.D.H.

LOCATION MAP SCALE 1"=8 MILES



63681
 DOMINION GULF COMPANY
GEOLOGY
CHEWETT I
 LOTS 8, 9 & 10 CON. VI
 4/10/44 ONTARIO
 SCALE: 1" = 200' JAN 12, 1944

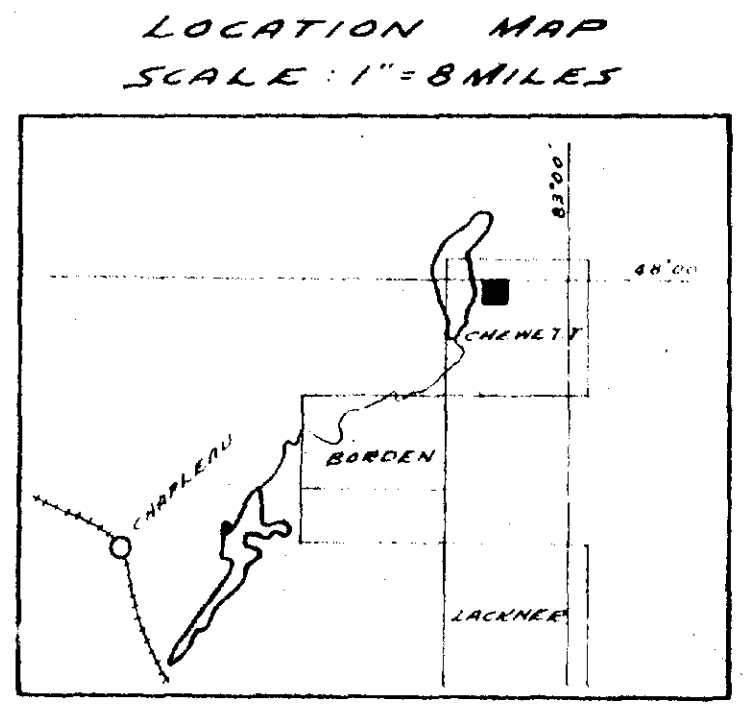




- Legend**
- 2. Pulaskite
 - 1. Quartz-Biotite Gneiss
- Symbols**
- Outcrop
 - Gneissic Boulders
 - Quartzite Boulders
 - Specimen No. & Location
 - Contours
 - Lot Posts (A. Longman, U.S., 1925)
 - Topographical Boundaries
 - Spruce
 - Cedar
 - Poplar & Birch
 - Mixed
 - Shrub & Tall Alders
 - Wet Swamp
 - Cedar Swamp
 - Spruce & Cedar Swamp

ALL ELEVATIONS SHOWN ARE BASED ON MEAN SEA LEVEL AND NOT ON THE SURFACE OF LAKE.

MAP BASED ON SURVEY BY CONFESSION, O.A.S., OF CON. IV CON. V LINE, CON. V CON. VI LINE & LOTS 8 & 9 LINE.

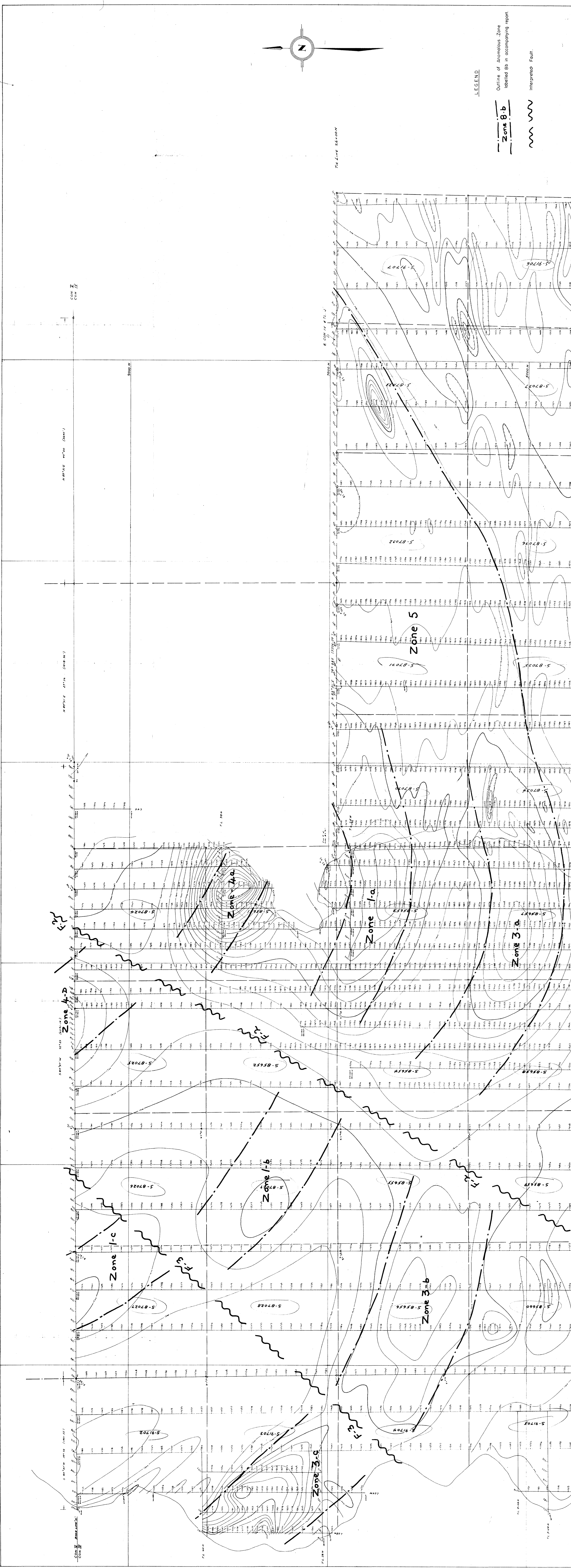


63-681

DOMINION GULF COMPANY
GEOLOGY
CHEWETT I
LOTS 8 & 9 CON. V

ALGONQUIN ONTARIO

SCALE: 1" = 200' AUG. 9, 1955
K. SARGENT Sept. 6, 1959

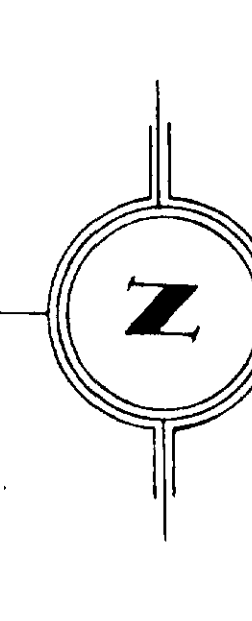


LEGEND

— Zone 8-b

Outline of Anomalous Zone labelled Bb in accompanying report.

Interpret. Fault



Ta Line 36-000

CON I

CON II

CON III

CON IV

CON V

CON VI

CON VII

CON VIII

CON IX

CON X

CON XI

CON XII

CON XIII

CON XIV

CON XV

CON XVI

CON XVII

CON XVIII

CON XIX

CON XX

CON XXI

CON XXII

CON XXIII

CON XXIV

CON XXV

CON XXVI

CON XXVII

CON XXVIII

CON XXIX

CON XXX

CON XXXI

CON XXXII

CON XXXIII

CON XXXIV

CON XXXV

CON XXXVI

CON XXXVII

CON XXXVIII

CON XXXIX

CON XL

CON XLI

CON XLII

CON XLIII

CON XLIV

CON XLV

CON XLVI

CON XLVII

CON XLVIII

CON XLIX

CON L

CON LI

CON LII

CON LIII

CON LIV

CON LV

CON LVI

CON LVII

CON LVIII

CON LIX

CON LX

CON LXI

CON LXII

CON LXIII

CON LXIV

CON LXV

CON LXVI

CON LXVII

CON LXVIII

CON LXIX

CON LXX

CON LXXI

CON LXXII

CON LXXIII

CON LXXIV

CON LXXV

CON LXXVI

CON LXXVII

CON LXXVIII

CON LXXIX

CON LXXX

CON LXXXI

CON LXXXII

CON LXXXIII

CON LXXXIV

CON LXXXV

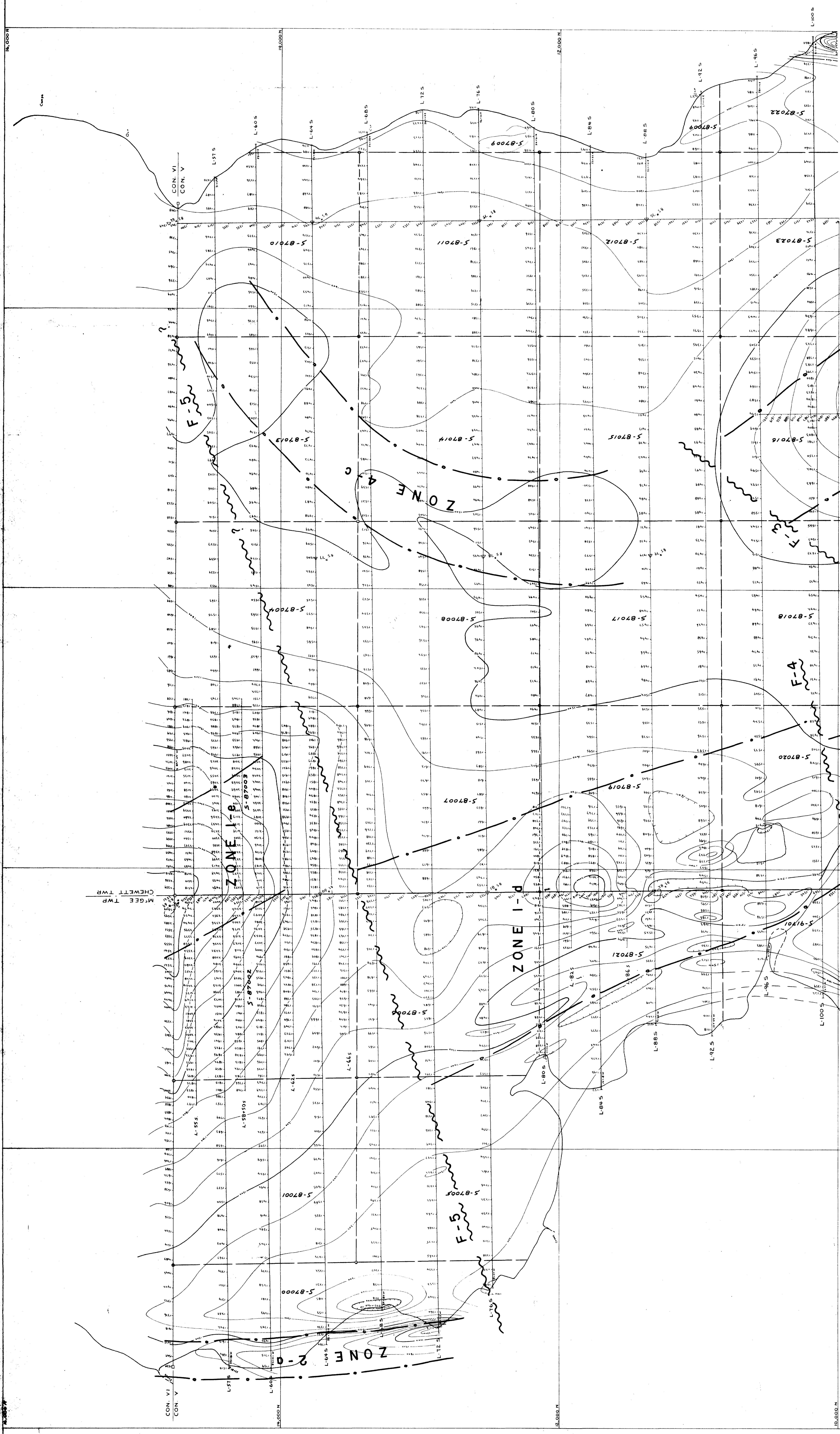
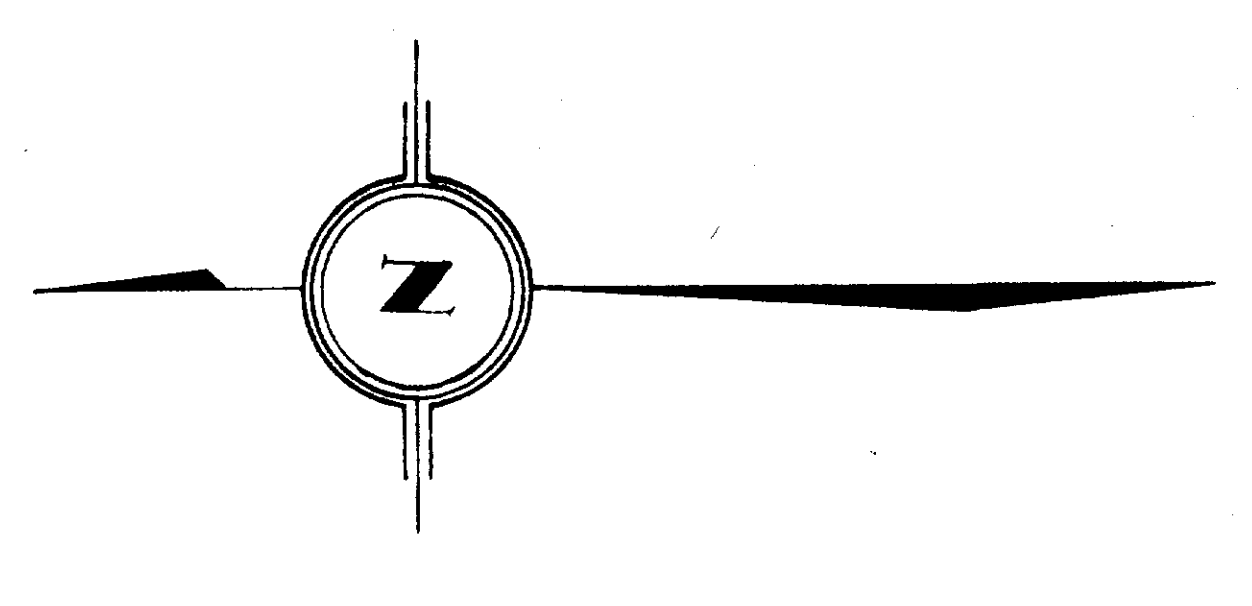
CON LXXXVI

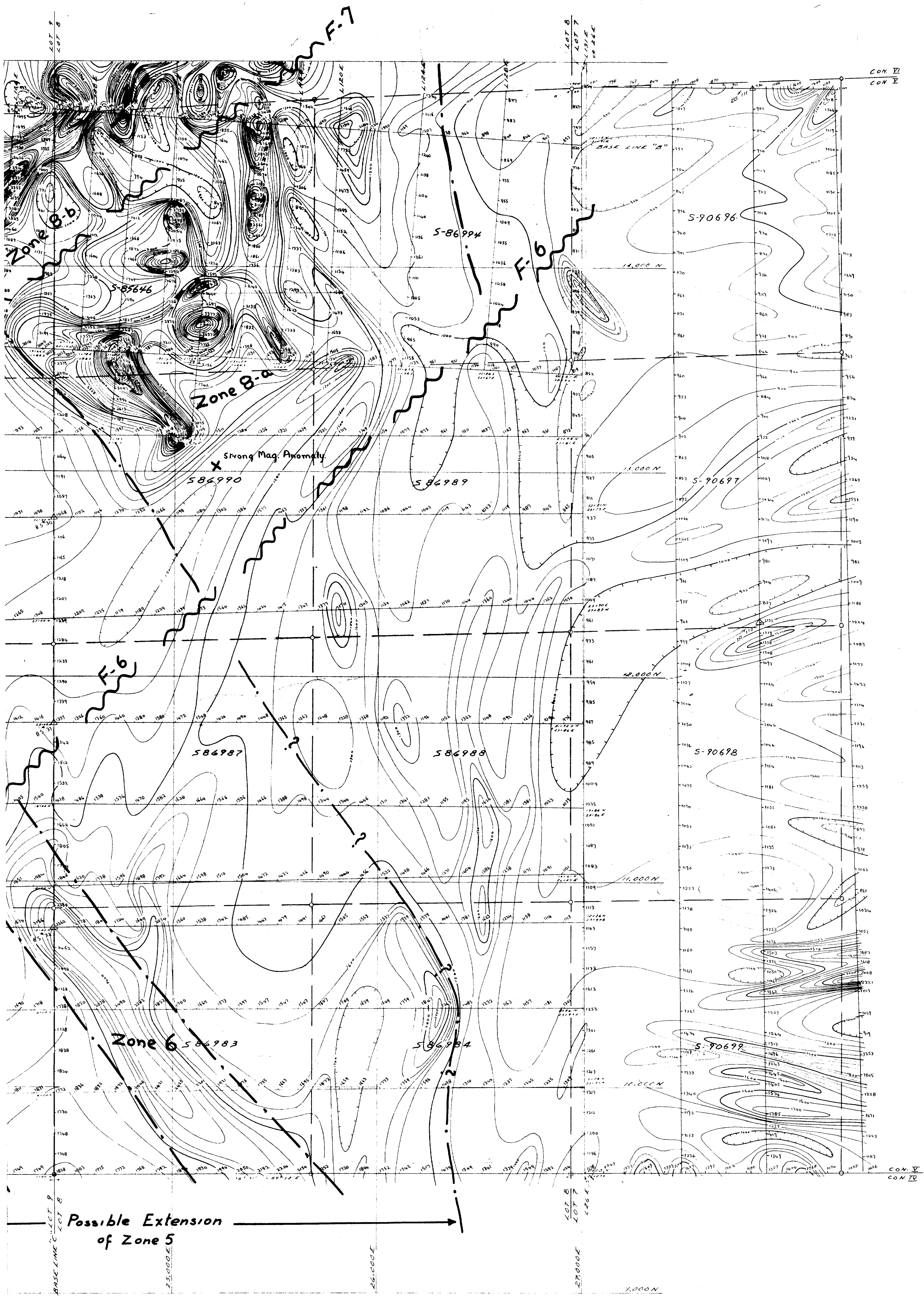
CON LXXXVII

CON LXXXVIII

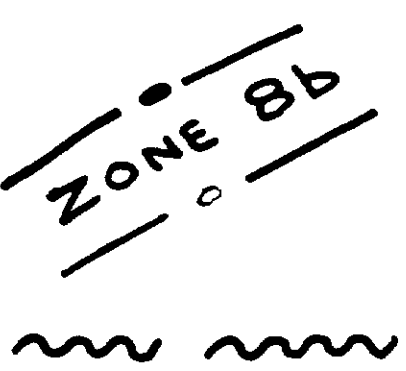
CON LXXXIX

CON XLXXX





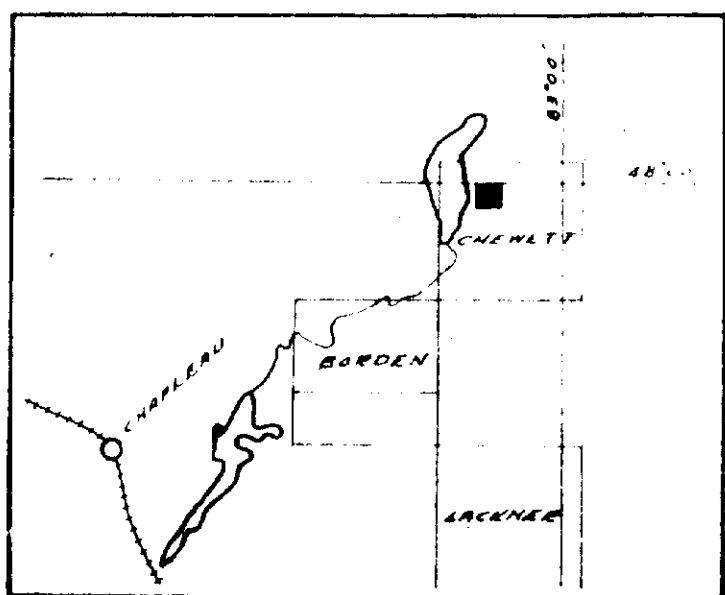
LEGEND



Outline of anomalous zone, labelled
Bb in accompanying report.

Interpreted Fault

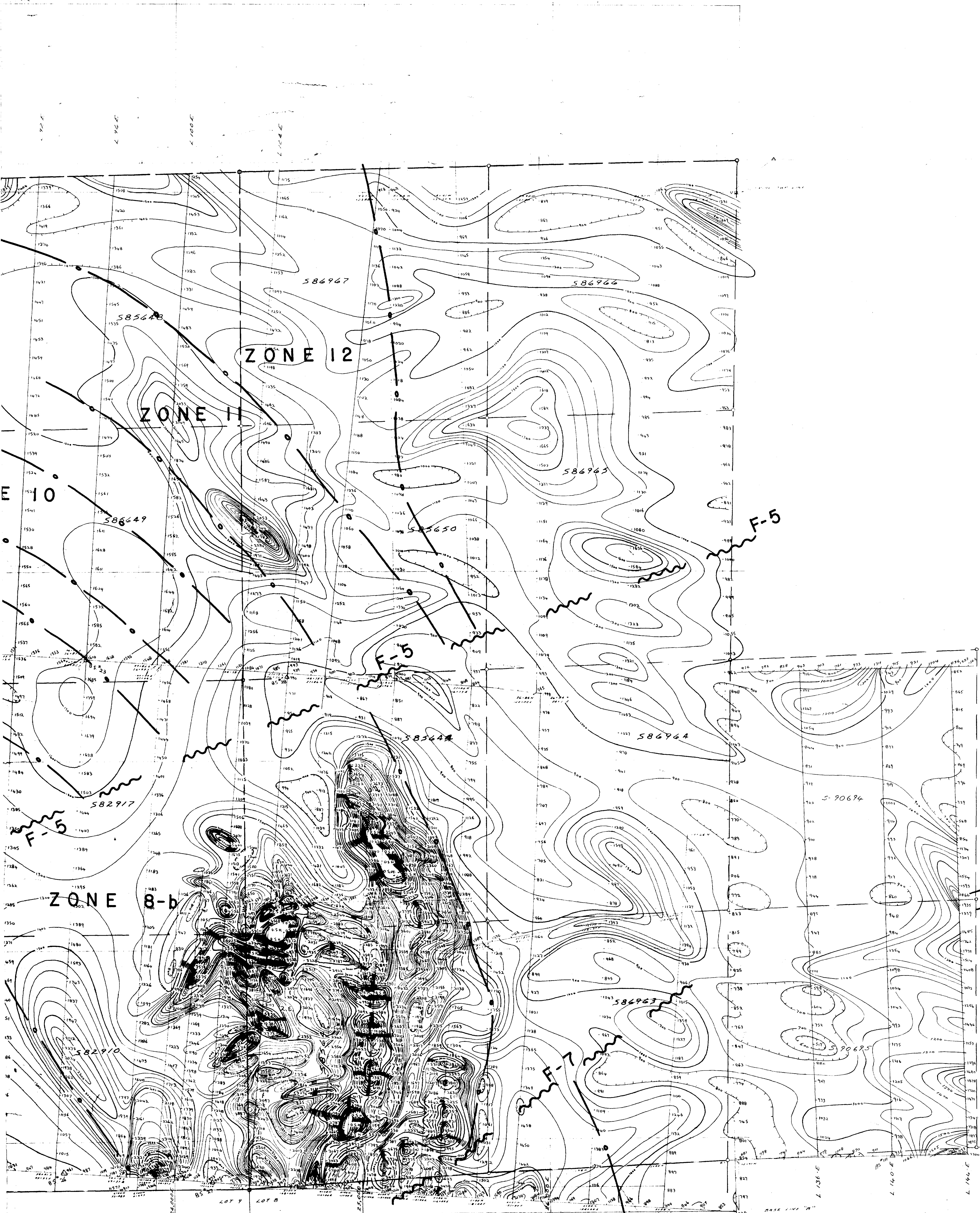
LOCATION MAP
SCALE 1"=8 MILES



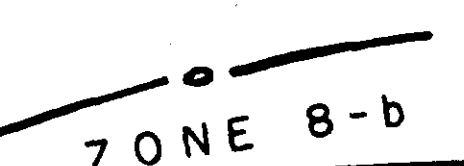

MAP BASED ON SURVEY BY LORRYMAN, O.L.S., OF CON. V
CON. V LINE, CON. V, CON. VI LINE & LOTS 8-9 LINE

DOMINION GULF COMPANY
GROUND MAGNETOMETER SURVEY
CHEWETT I
LAND PORTION CON. V
ALBANY ONTARIO
SCALE 1"=200' AUG. 9, 1955
Contour Interval 100 gammas

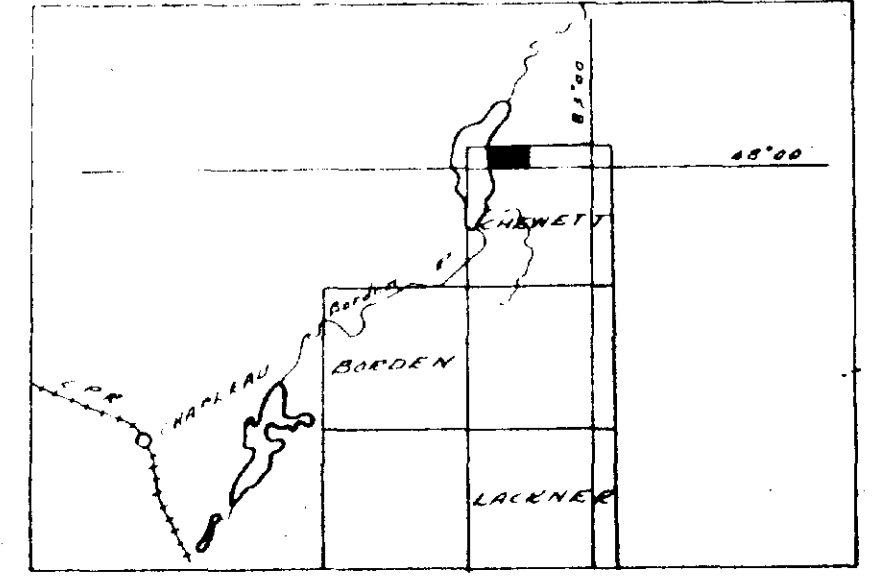
To accompany interpretation report by C.W.F. Dated June 27, 1956



LEGEND

-  ZONE B-b Outline of anomalous zone labelled B-b in accompanying report.
-  Interpreted fault.

LOCATION MAP
SCALE 1"=8 MILES



DOMINION GULF COMPANY
GROUND MAGNETOMETER SURVEY
CHEWETT I
LAND PORTION CON. VI
410/11/AN ONTARIO
SCALE: 1"=200' AUG 11, 1955
Contour Interval - 100 gammas
To accompany interpretation report by C.W.I.
dated June 27, 1956.