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OCT 2 1 1981

MINING LANDS SECTION

REPORT ON

VLFEM AND MAGNETOMETER SURVEYS

TERNOWSKY-RENTZ PROPERTY

SUMMERS AND EVA TOWNSHIPS

THUNDER BAY DISTRICT

ONTARIO

ΒY

W. PATRICK KNOX

GOLD FIELDS RESOURCES CANADA, LIMITED

MISSISSAUGA, ONTARIO

OCTOBER 1981

INTRODUCTION

The Ternowsky-Rentz property is located along strike from the past producing Northern Empire Mine. Production from the Northern Empire amounted to a total of 153,103 oz. of gold from quartz veins within the altered basaltic metavolcanics. On this basis of lithologic and stratigraphic similarities and assay results, this property was optioned.

The 65 contiguous claims in their respective townships are: The claims within Summers Twp. are:

TB	519491 519492 519493 519494 519780 519781 519782 534841 534842 534843 534856 534857	ΤВ	536026 536027 556627 587201 587202 587203 587204 587205 587206 587207 587208 587208	ТВ	587210 587211 587212 587213 587214 587215 587216 587217 587218 587219 587220 587220	TB	587222 587223 587224 587259 604539 604540 613703 613705 613706 613707 613708
	534857		587209		587221		613704

The claims within Eva Twp. are:

тв	557984	ТВ	557988	тв	557992	тв	557996
	557985		557989		557993		557997
	557986		557990		557994		557998
	557987		557991		557995		557999
							558000

LOCATION AND ACCESS

Located approximately 116 miles northeast of Thunder Bay and 52 miles west of Geraldton, the Ternowsky-Rentz property comes to within one half a mile west of the town of Beardmore and is situated in Summers and Eva townships. Access is by bush road west from Highway 11 just north of Beardmore. This road is driveable for about 2 miles through the center of the property and is connected to a winter road system of limited extent to the south.

TOPOGRAPHY AND VEGETATION

Two ridges of approximately 220 feet relief run northeasternlysouthwesternly along the property boundaries. The southern ridge tends to have steep slopes with cliffs in places on both the north and south faces. The northern ridge has gradually sloping sides. Glaciation has exerted a major influence on the rolling break-valley topography. The lakes are connected to a chain of ponds which vary from open muskeg to cedar and alder swamps. Alder and Black Spruce muskeg are common in the more stagnant areas, while cedar prefer the flowing water. The forest is composed of Black Spruce, Eastern Hemlock, Paper Birch, Balsam Poplar and Red Cedar. Lower ground is generally covered by Black Spruce with Eastern Hemlock being the predominate sub-species. These areas grade uphill into better drained lands which contain birch, poplar and pine.

GENERAL GEOLOGY

The property is situated along a metasediment-metavolcanic contact, with the sediments found to the north of this contact. Silty greywackes predominate with interbedded siltstone and argillite. The greywacke becomes more massive around the lakes along with an increase in guartz vein occurrence. These rocks have undergone chloritic and sericitic alteration which increases along with possible potassic and silicic alteration around the quartz Mineralization, being mainly pyrite and arsenopyrite, is veins. rare and is generally associated with the veining. The units strike predominantly at 069 degrees with 80 degree south dips of veining roughly parallelling bedding; no consistancy is observable. Minor folding along a northeast-southwest axis was noted in some locations. To the south, the metavolcanics are composed of predominantly massive basaltic flows. These flows are sheared, silicified and carbonated to varying extents and pass commonly into tuffaceous units. Toward the metasediments a variolitic pillowed flow was found which passes northward into a tuffaceous unit. It is along the pillow basalt-tuff contact that a sulfide and chert-magnetite facies chemical sediment is found. A sulfide facies, lying to the west, is composed of pyrite, arsenopyrite, minor chalcopyrite and graphite. The chert-magnetite facies, to the east, is composed of alternating chert-carbonate and magnetite-quartz with arsenopyrite occuring mainly in the wall rock. The chemical sediments generally follow the flow bedding but are discontinuous along strike. The metavolcanics have undergone silicious, carbonatious, chloritic and silicic alterations which increases around the few guartz vein occurences. Mineralization consists of arsenopyrite, pyrite and chalcopyrite and is present to some extent thoroughout, although, it is generally less than 1%. These units generally strike at 071 degrees with 80 degrees south dips. Fault activity is thought to have occurred along the lakes due to more massive greywacke, increased quartz veining, minor folding and topographic expression. Faulting is also thought to occur along the metasediment-metavolcanic contact and is expressed by topography and the occurence of a gabbroic unit. This gabbroic unit, observed only in the western section of the map area, is seen in contact with the volcanics, but not the sediments. Faulting has also been mapped at the Northern Empire Mine along strike with this property. The last event was the intrusion of northwest trending diabase dykes. Glaciation left a cover consisting of sand to sandy gravel from what appear to be Lacustrian deposits. The glacial cover increases eastward until bedrock is completely covered and is responsible for the topographic features observed along the lakes.

LINECUTTING

The main base line was turned-off, cut, chained, and picketed

on a 060 degree astronomic bearing from a point 50 feet north of post 1 of claim 519780. Cross lines were cut at 400 foot intervals along this base line, with pickets indicating stations chained at 100 foot points along the lines. Two short sub-base lines at a 060 degree astronomic bearing were cut at the extreme east and west ends of the property to provide additional control.

A total of 47.36 miles of line were cut, with the picket lines extending to the claim boundaries.

MAGNETIC SURVEYING TECHNIQUE

A proton procession magnetometer may be used to measure the strength of the total magnetic field in gamma units. The magnetic field at any particular station will consist of the vectoral sum of the earth's magnetic field and the magnetic field of any anomalous body. The latter is caused by mineralization that is either naturally magnetic or is capable of exhibiting a secondary field induced by the earth's primary field.

Time variations of the earth's magnetic field naturally occur during the course of a magnetic survey. These variations must be removed so that the final magnetic survey results reflect spatial variations only. Two techniques employed to aid the removal of time variations are: (1) frequent visits to a base station with the survey magnetometer, to provide data for a linear or near-linear correction curve, or (2) near-continuous recording of magnetic variations at a base station with a fixed magnetometer, to provide coincident measurement correction of field data.

The final corrected magnetic results, normally presented in profile or plan form, may aid the mineral exploration program in qualitative and quantitative ways. For example, qualitatively, magnetic trends may identify geologic structural trends in areas of limited rock exposure. Quantitatively, magnetic features may be interpreted for depth, dimensions, orientation and magnetization details of causative bodies. Association, directly or indirectly, of magnetic earth materials with economic mineral occurrences is a recognized possibility.

VLFEM SURVEYING TECHNIQUE

The VLFEM (VLF electromagnetic) technique utilizes the "VLF" (very low frequency) military stations. Distortion of the local electric fields of these stations can indicate metallic mineralization. These stations are low in frequency for radio stations, and are somewhat high in frequency for exploration purposes. However, for shallow exploration, the VLFEM technique is quite useful since only a receiver is needed, and therefore a one man operation is possible. The higher frequency tends to favor search for targets somewhere between the massive-continuous conductors sought by standard electromagnetic techniques, and disseminated mineralization sought by IP techniques. In actuality, the technique can be quite responsive to conductive soils and topographic conditions, so that genuine anomalies due to mineralization often have to be sorted out.

Quantities measured are dip-angle and signal amplitude of the radio field. Ideally, these two quantities will mutually confirm an anomalous response. The dip-angle data mathematically are reduced to "Fraser Filter" data to permit contour data to correspond in plan to actual **res**ponse zones.

The VLFEM data were obtained using a Phoenix VLF-2 receiver. The signal amplitude data were taken utilizing a base station, similar to the magnetic surveying procedure, to provide corrections for diurnal variations of the radio field. For this survey, the Seattle, Washington VLF station was used. This station lies in the general strike direction of the principal rock units in the area, to provide adequate electromagnetic coupling to conductors having this general strike.

The combined magnetic-VLFEM survey of this property was done in part by Northwest Geophysics of Thunder Bay, Ontario, and in part by personnel of Gold Fields Resources Canada.

RESULTS AND INTERPRETATION

VLFEM

Prominent VLFEM response zones traverse the claims. For the most part, they have the same general 69 to 73 degree trend as the general geological units. In the metasediments of the northern claims, the principal VLFEM response zone generally coincides with a prominent chain of lakes. This response zone could relate to water, topography, and the principal fault system that formed the Data could not be obtained over some lake portions during lakes. the summer survey, but it is probable that the principal VLFEM response zone is more or less continuous along the lakes. In addition, glaciation may have produced water-filled sand channels elsewhere in the metasediments to produce observed VLFEM responses parallel The possibility of massive metallic conductors to the lakes. associated with the chain of lakes axis and fault zones in the metasediments cannot be ruled out, but generally the geology suggests such to be of low order.

To the south, the metasediment-metavolcanic contact generally gives an excellent VLFEM response; the VLFEM response does much to pinpoint the contact. The anomaly seems to be a combination of response to the contact itself, which may be a faulted and mineralized zone, plus a response to topography along the contact. Some graphite may be present along the contact.

South of the contact, by about 500 to 800 feet, is another well-developed VLFEM response zone. Much of this zone relates directly to an alteration zone which traverses the area. The alteration zone contains significant amounts of graphite, and is considered a likely zone for massive sulfide mineralization in addition.

Near the central part of VLFEM Map 2, the more southerly VLFEM response zone displays a deviation from the general strike. This probably has structural implications which could have exploration value. Adding to this, the chain of lakes within the metasediments shows a deviation from the general on-strike trend of the geological structure in the same area, with the chain swinging closer to the metasediment-metavolcanic boundary.

MAGNETICS

The magnetics in the metavolcanics are generally more disturbed than those over the metasediments, as expected. The higher magnetic responses in the metavolcanics generally coincide with the VLFEM response zones, but are less continuous than them. In particular, the alteration zone 500 to 800 feet south of the contact gives higher level but laterally sporadic magnetic responses; iron formation is noted in this zone, to account for these responses.

In the central part of Magnetic Map 2, some locally moderate magnetic responses are observed within the metasediments. These could relate to structural features striking across the general 70 degree trend of the principal geologic units, and may have exploration value.

Ontario GSC Aeromagnetic Maps 2135G (Beardmore) and 2128G (Shakespeare Island) cover the claims area treated in this report. These surveys were flown at 1000 feet m.t.c. Approximately one mile north of the claims group is a prominent iron formation which runs parallel to the general 70 degree geologic strike of the area. The iron formation and its magnetic response persists for a strike length in excess of 50 miles east-west. The southern flank of this magnetic anomaly extends across the claims group but does not notably detect the magnetic zones identified on the ground. This indicates a lack of strong lateral and depth continuity of individual or collective magnetic zones within the metavolcanics, which in turn might relate to general alteration of this rock unit.

Patrick Knox

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TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Surv	vey(s) <u>Ge</u>	<u>ophysical</u> :	Magnetics, EM-V	LF	<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>	
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Claim Holder	r(s) <u>Gold</u>	Fields Re	List num			
#335-230	Lakeshor	re Rd. Eas	t, Mississauga, Or	nt. L5G 1G8		
Survey Comp	pany <u>Nor</u>	thwest Geo	ophysics & Gold Fi	elds		
Author of Re	eport <u>W. P</u>	atrick Kno	ЭХ	<u></u>	(prefix)	(number)
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GEOPHYSICAL TECHNICAL DATA

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ELECTROMAGNETIC	Instrument Phoenix VLF-2 Coil configuration N.A. Coil separation N.A Accuracy N.A. Method: X Fixed transmitter Frequency 18.6 Khz. (Seattle, Washingto (sp) Parameters measured Horizontal Field Str	Shoot back In line On, U.S.A.) ecify V.L.F. station)	Parallel line
<u>GRAVITY</u>	Instrument Scale constant Corrections made Base station value and location Elevation accuracy		· · · · · · · · · · · · · · · · · · ·
RESISTIVITY	Instrument	Frequency Domain Frequency Range	

SCHEDULE OF CLAIMS

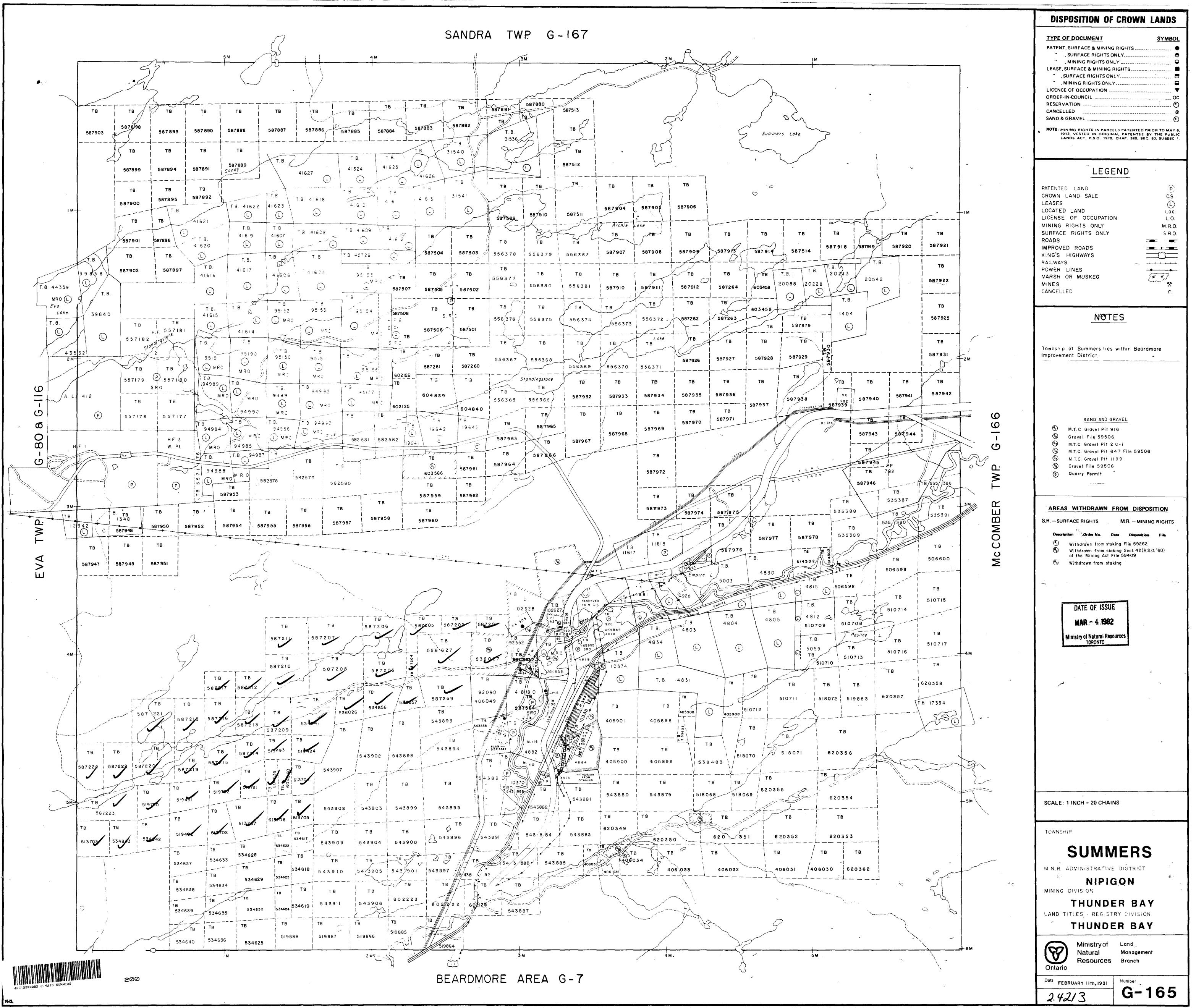
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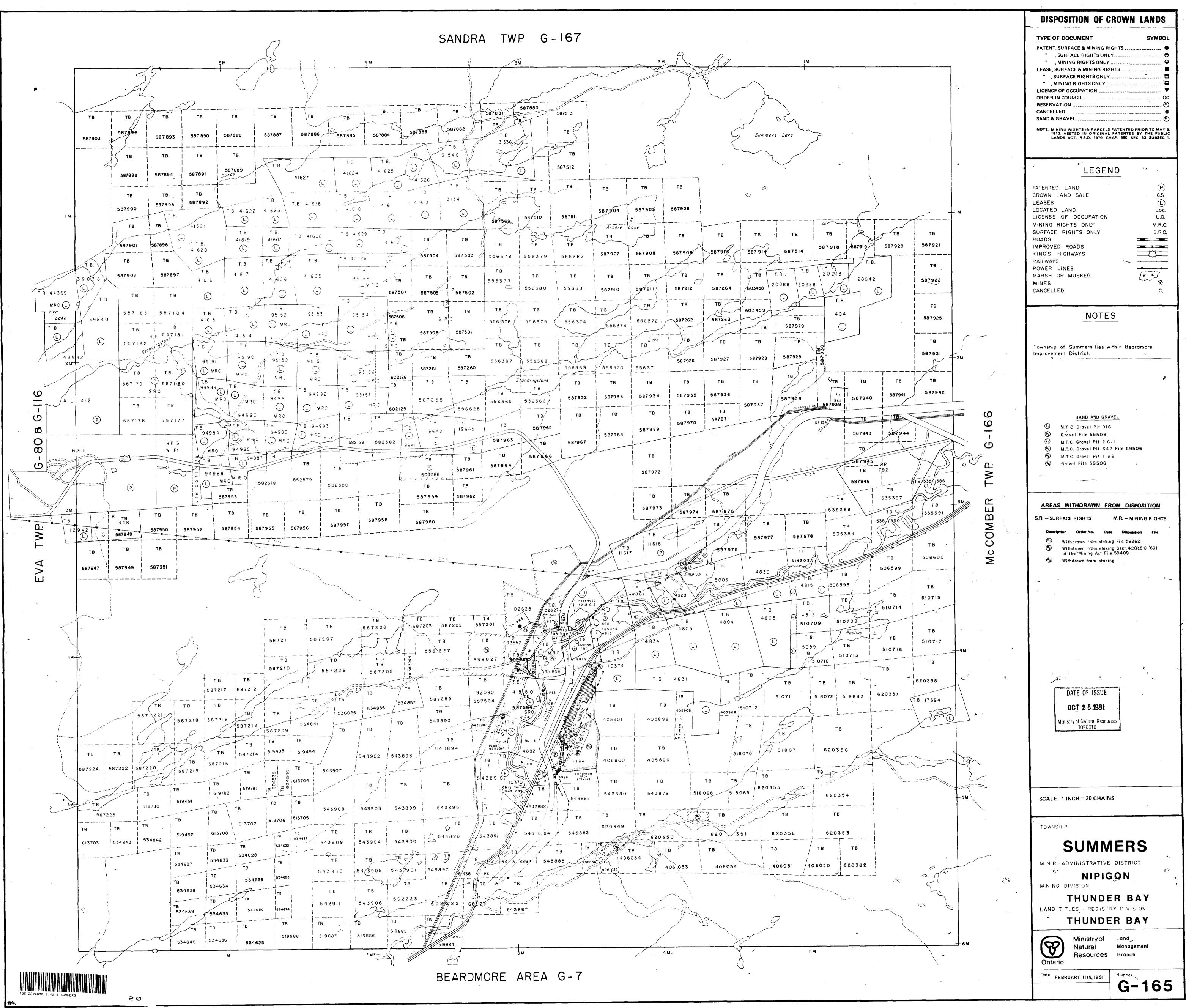
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519780	587202	587214	604539
519781	587203	587215	604540
519782	587204	587216	613703
534841	587205	587217	613704
534842	587206	587218	613705
534843	587207	587219	613706
534856	587208	587220	613707
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Eva Twp:

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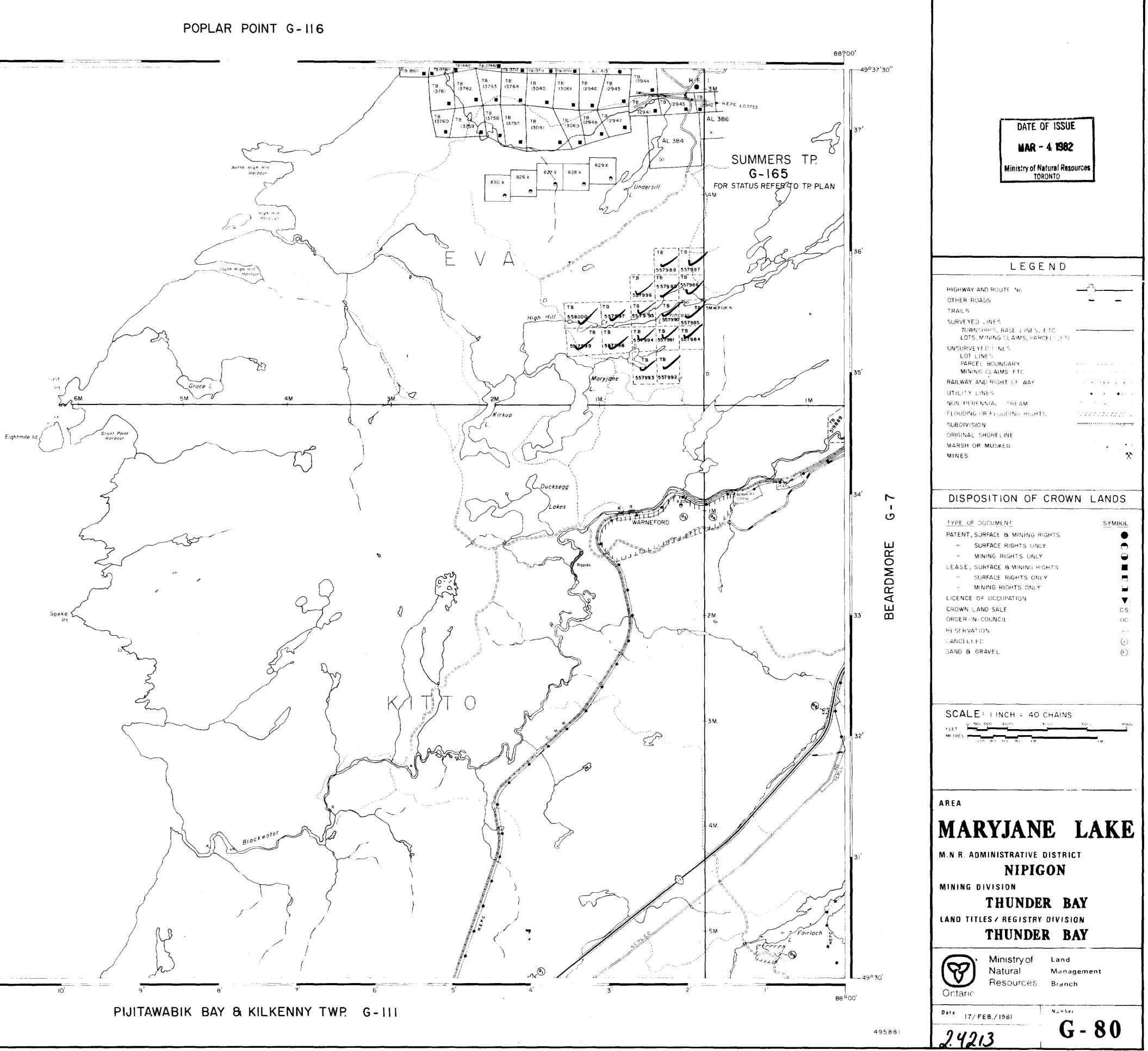
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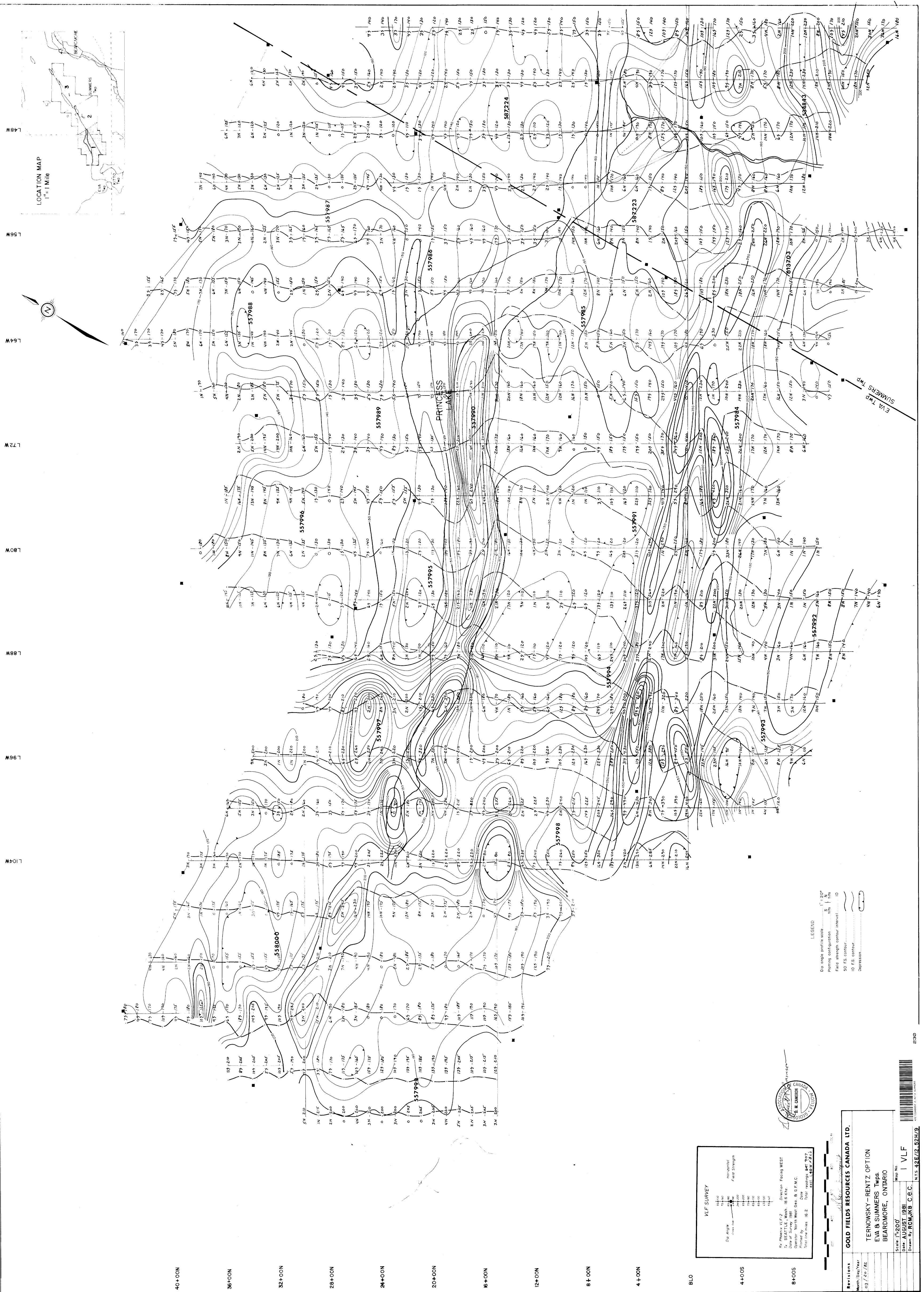


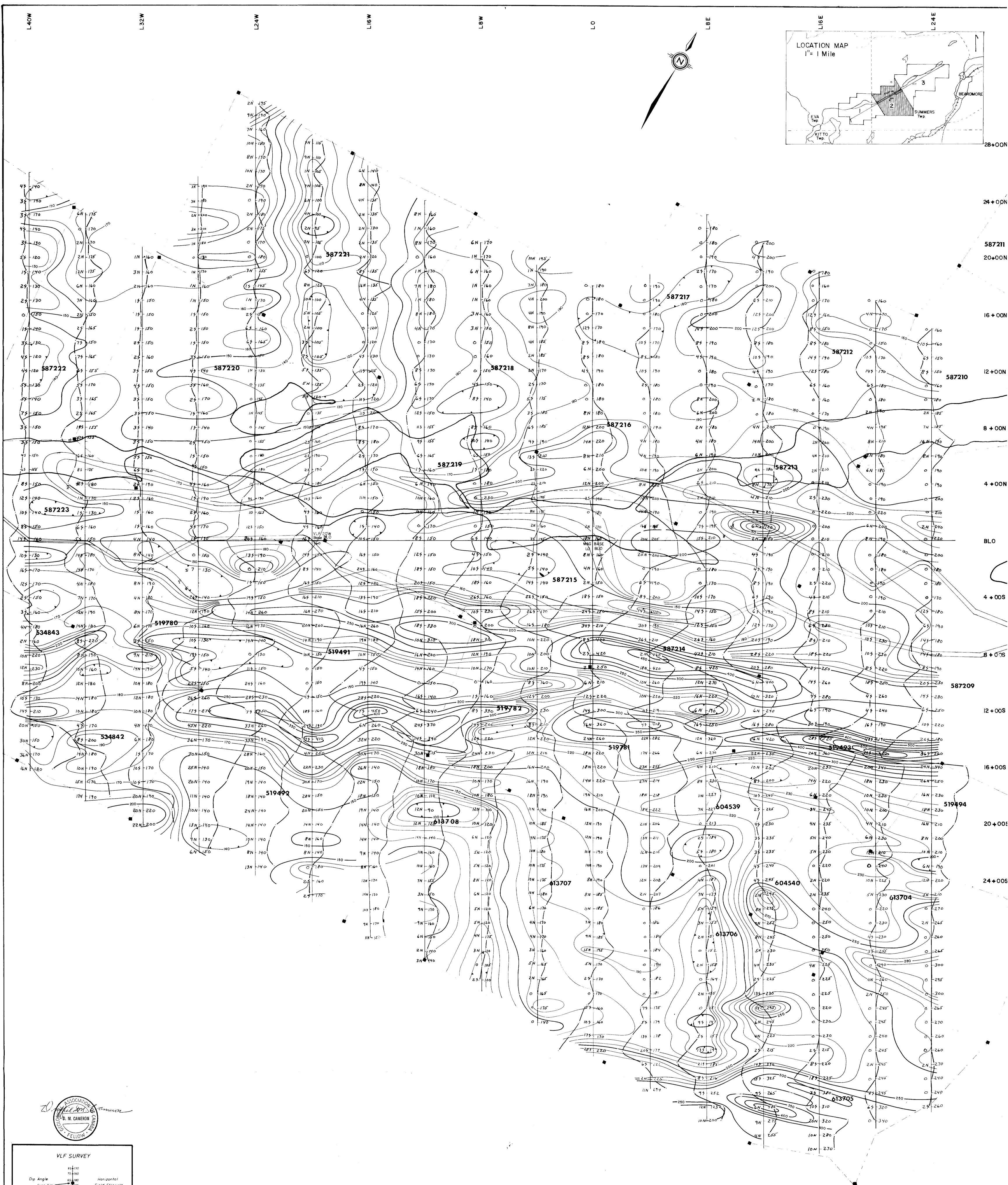


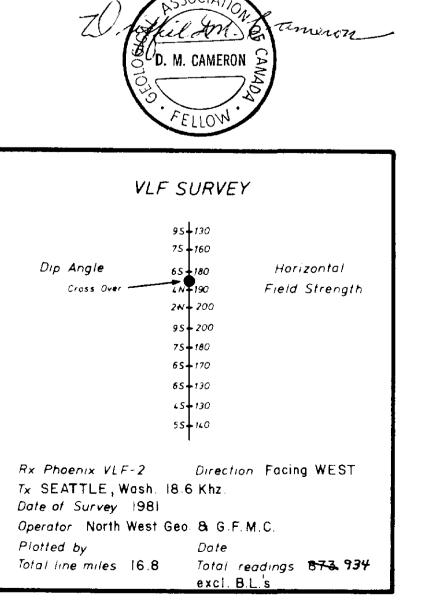
NOTES	
Reserve FLOODING RIGHTS on Lake Nipigon to contour elev. 855 [°] to H.E.P.C. O.C. dated 25th April 1930. File 12198. Also reserve 66 [°] from 855 [°] contour to H.E.P.C.	88°15'
SAND & GRAVEL	49°37′30''
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© GRAVEL FILE: 187827	
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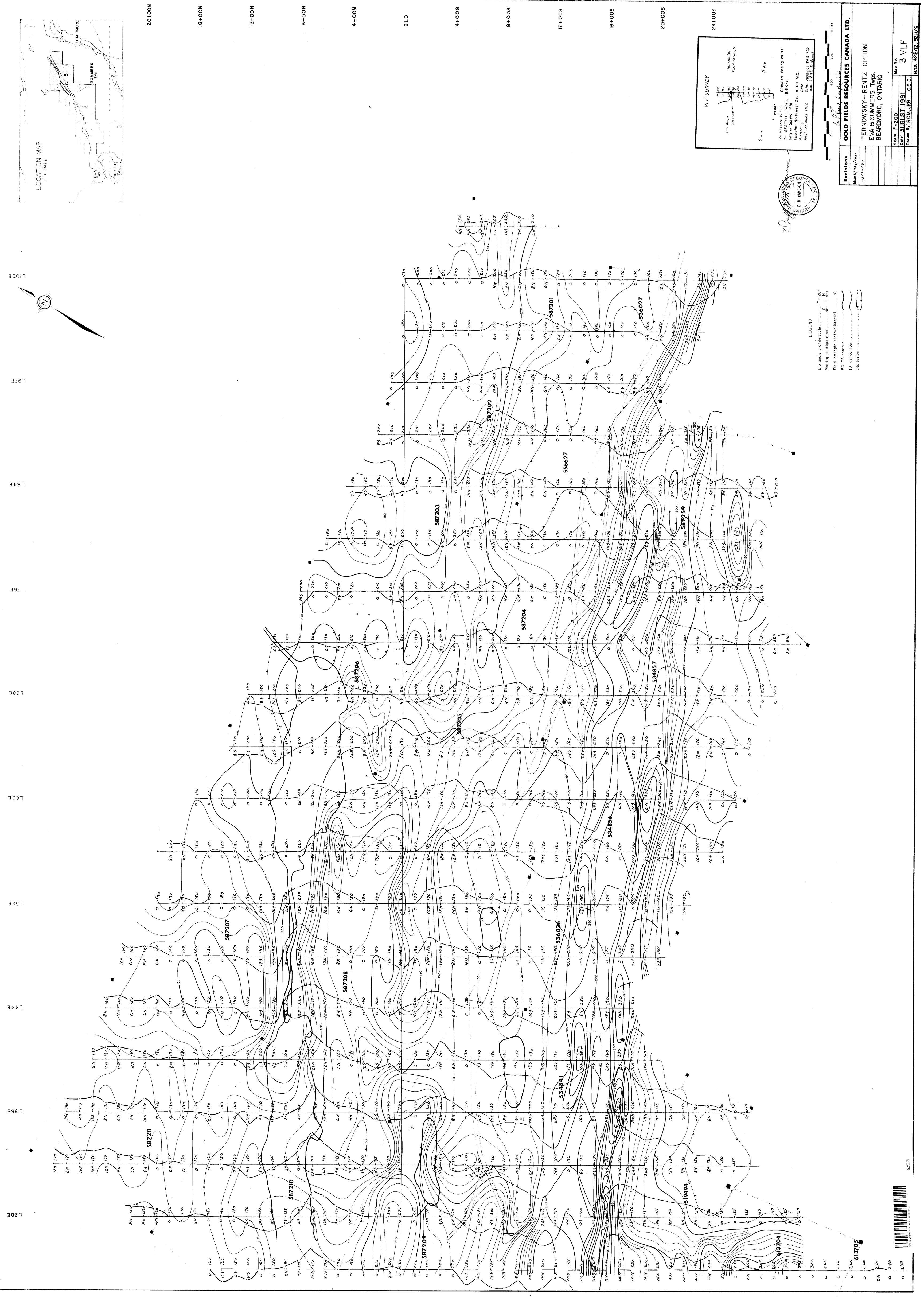
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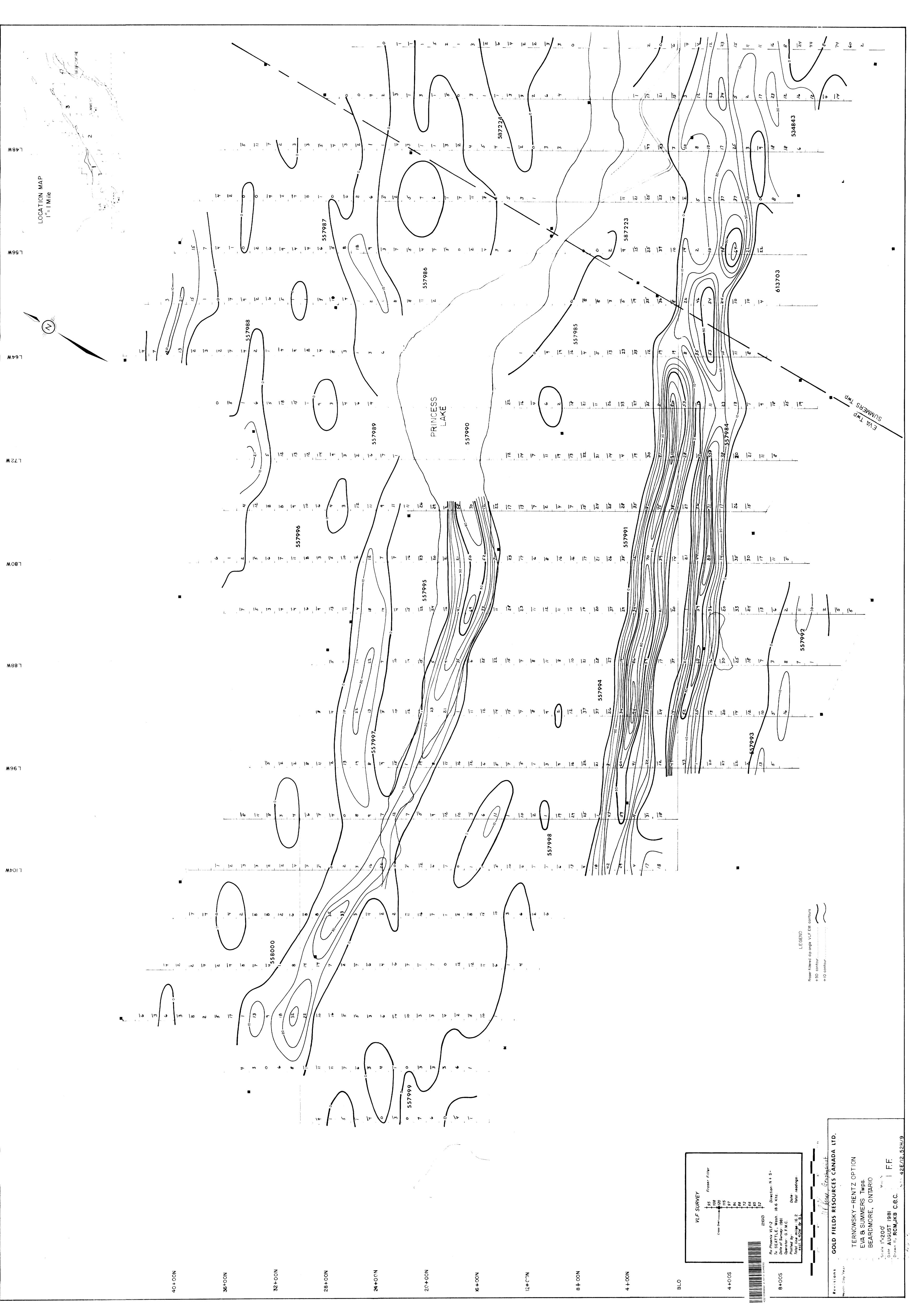
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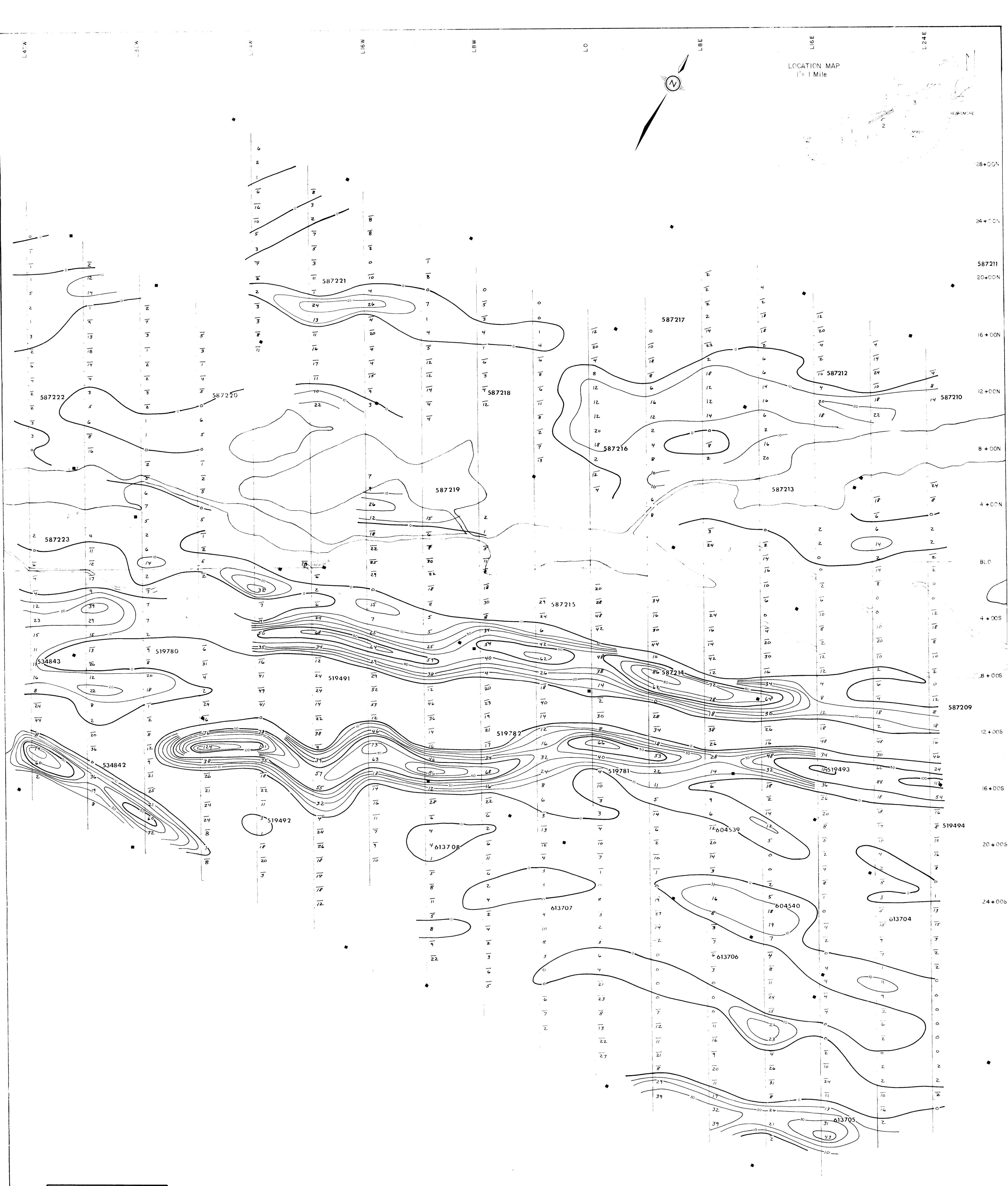
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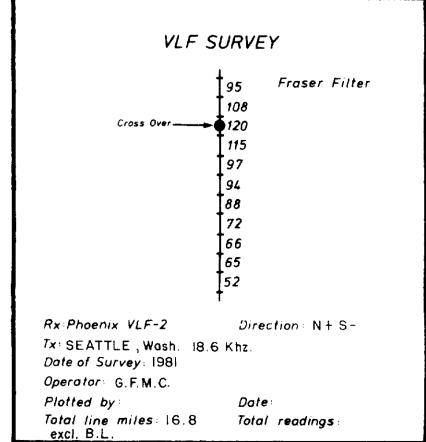
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 TERNOWSKY-RENTZ OPTION

 EVA & SUMMERS Twps.
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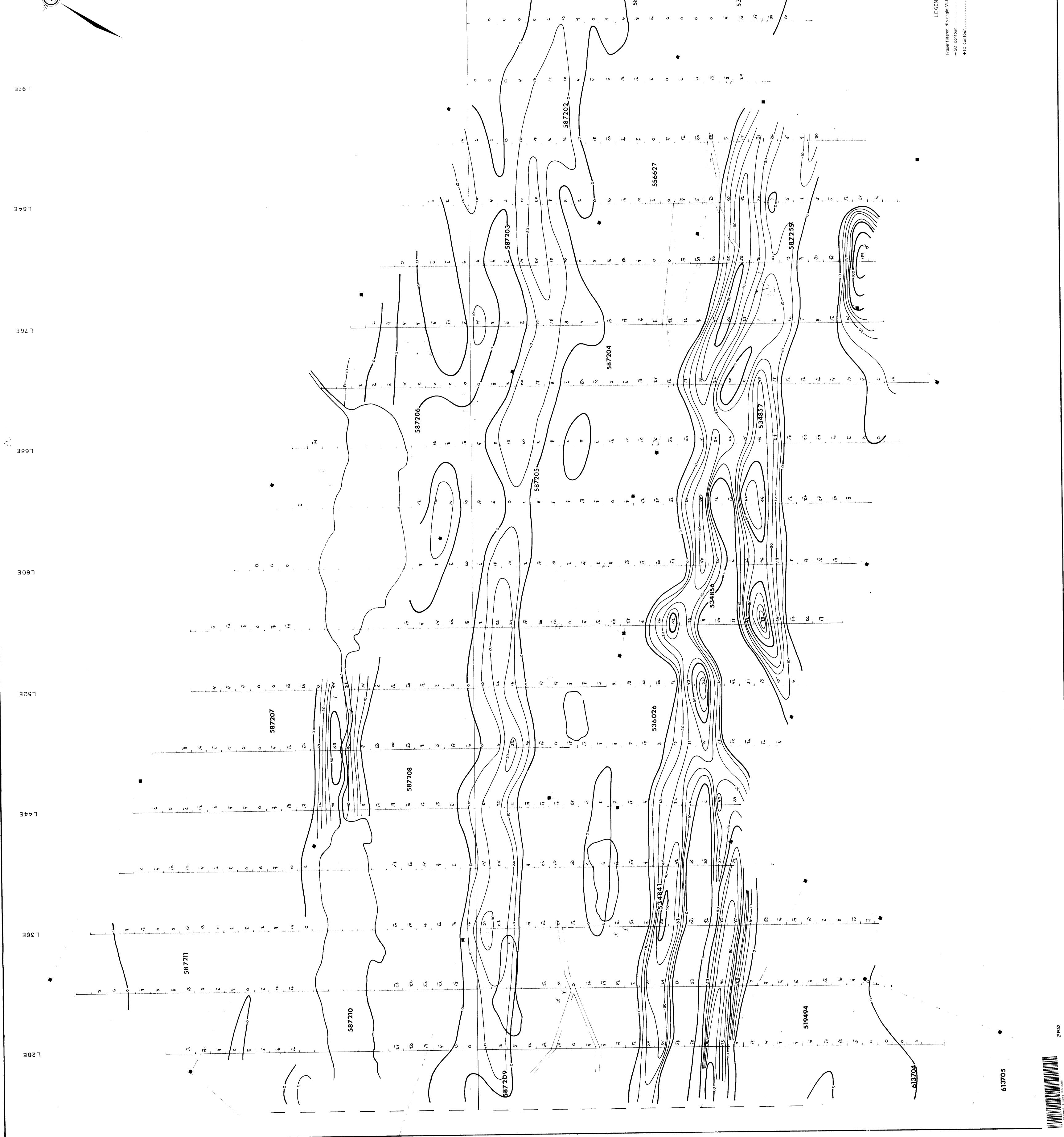
Fraser filtered dip angle VLF EM contours

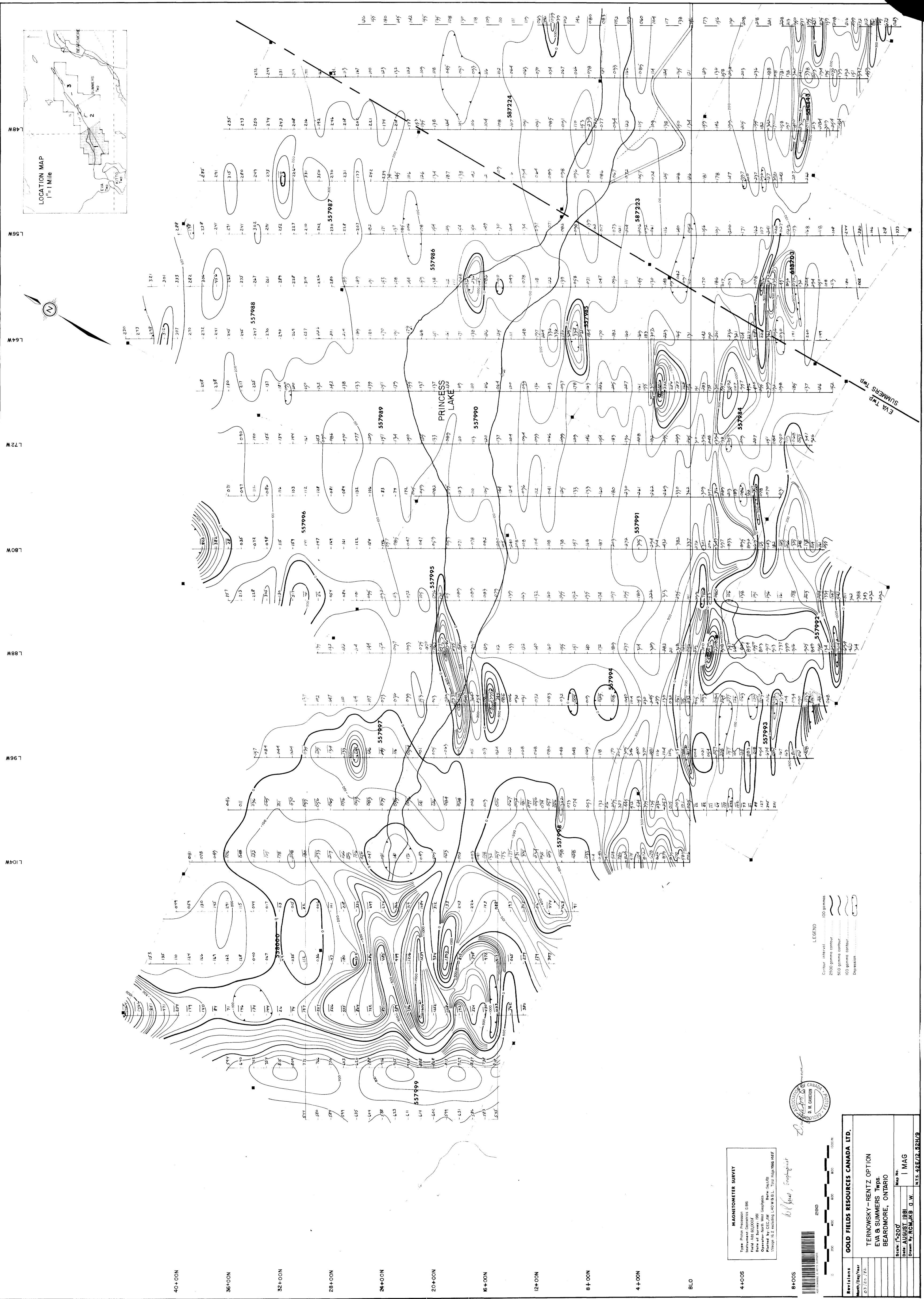
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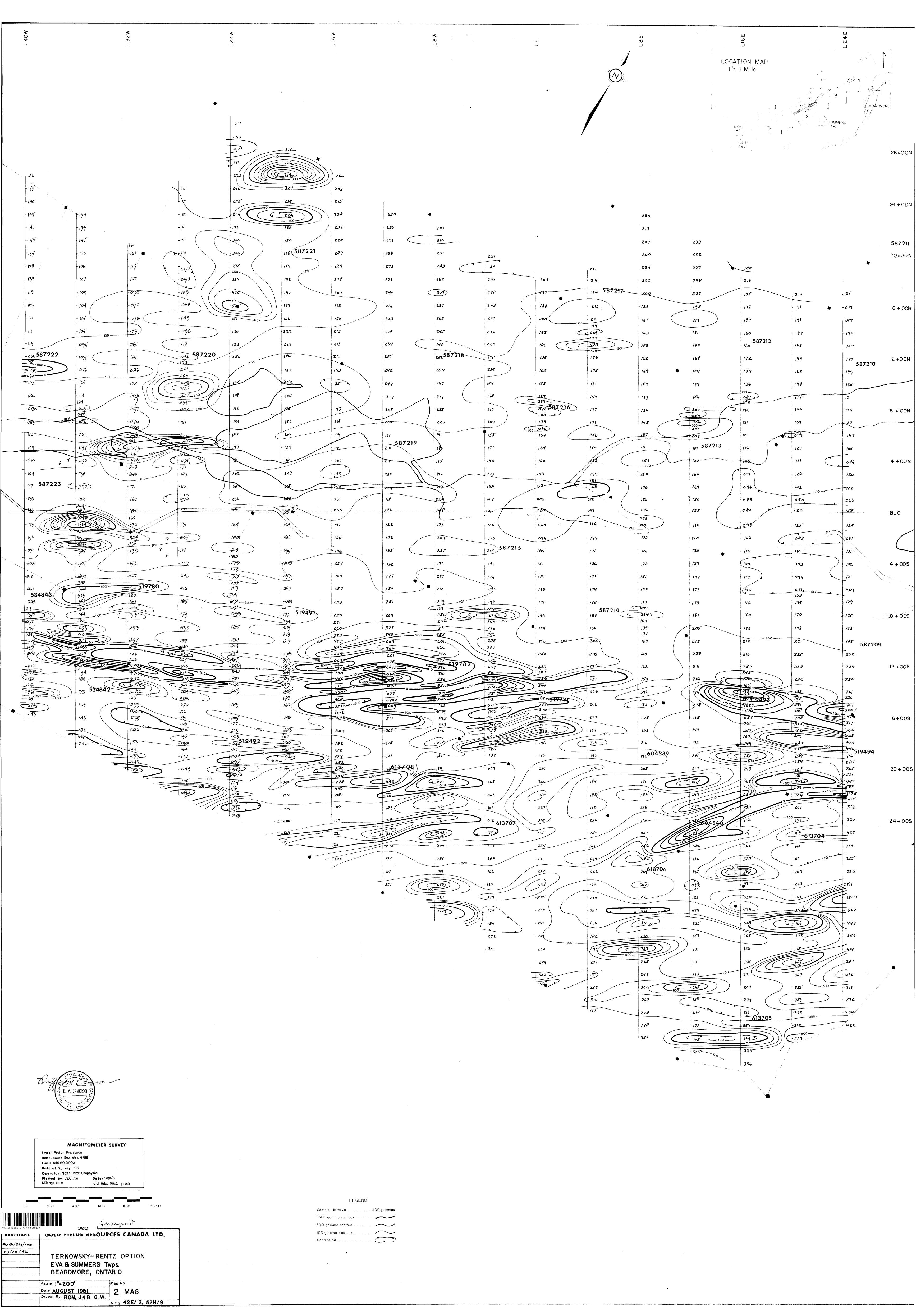
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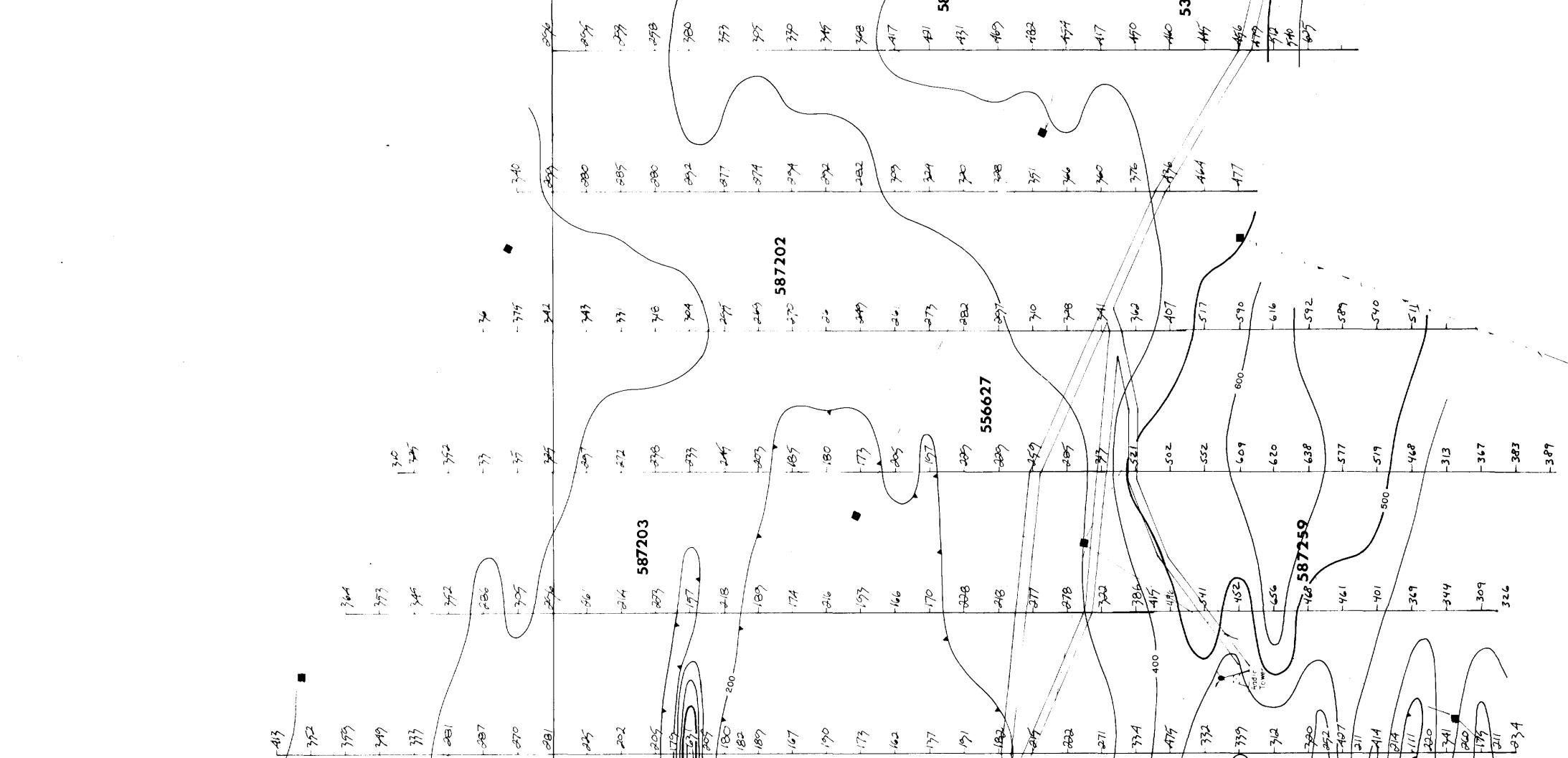
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