

# AIRBORNE ELECTROMAGNETIC SURVEY

### Robb - Jamieson Area

List of unpatented mining claims located in Godfrey and Jamieson Townships on which airborne electromagnetic survey, performed by Canadian Aero Mineral Surveys Limited, is to apply as 20 days' assessment credit on each claim.

# Godfrey Township

- P-51893 and P-51894
- P-51928
- P-52339

√ P-51462 to P-51470 inclusive.

# Jamieson Township

- P-36997 to P-37001 inclusive
- ... P-37003 to P-37005 inclusive.

There are approximately 10 1/2 miles of recordings flown over these claims with one instrument for which we wish assessment credit.

### AIRBORNE ELECTROMAGNETIC SURVEY

# Godfrey Area

List of unpatented mining claims located in Robb, Turnbull and Jamieson Townships on which airborne electromagnetic survey, performed by Canadian Aero Mineral Surveys Limited, is to apply as 20 days' assessment credit on each claim.

### Robb Township

is constituted

P-52172 to P-52175 inclusive

√P-52177

/P-52738 to P-52741 inclusive

# Turnbull Township

/ P-52219 to P-52223 inclusive

/ P-52225 to P-52233 inclusive

# Jamieson Township

√ P-53059 to P-53063 inclusive

√ P-53065 to P-53068 inclusive

√ P-53077 to P-53085 inclusive

 $_{V}$  P-51868 to P-51873 inclusive

V; P-52168

7 P-52176

√· P-52713

V · P-51239 to P-51242 inclusive

√ P-52261 to P-52265 inclusive

P-52717

√P-36997 to P-37001 inclusive

√ P-37003 to P-37009 inclusive

P-37012 and P-37013

μ P-51638 to P-51643 inclusive

57

# Godfrey Township

/ P-51862 to P-51864 inclusive

/ P-51893 to P-51897 inclusive

√ P-51927 and P-51928

/ P-52248 to P-52250 inclusive

P-52339

√ P-51462 to P-51470 inclusive

There are approximately 51 1/2 miles of recordings flown over these claims with one instrument for which we wish assessment credit.

### AIRBORNE ELECTROMAGNETIC SURVEY

### Kamiskotia Area

List of unpatented mining claims located in Robb, Turnbull and Jamieson Townships on which airborne electromagnetic survey performed by Canadian Aero Mineral Surveys Limited is to apply as 20 days' assessment credit on each claim.

### Robb Township

P-52172 to P-52175 inclusive

P-52177

√ P-52738 to P-52741 inclusive

# Turnbull Township

V P-52225 to P-52228 inclusive

# Jamieson Township

P-51868 to P-51873 inclusive

P-52261 to P-52265 inclusive

, P-52717

There are approximately 12 1/2 miles of recordings flown over these claims with one instrument for which we wish assessment work credit.

AIRBORNE GEOPHYSICAL SURVEY OF THE KANISKOTIA LAKE AREA, COCHRANE DISTRICT, NORTHERN ONTARIO, FOR B. W. LANG

#### INTRODUCTION

During the period March 3rd and 4th and March 19th and 20th,
1963, Canadian Aero Mineral Surveys Limited, conducted an Airborne Geophysical
Survey for B. W. Lang over certain areas of Robb, Jamieson and Godfrey
Townships in the Cochrane District of Morthern Ontario. The survey was performed
with C.A.M.S. geophysically equipped Otter Aircraft utilizing the Rio In-Phase
and Out of Phase Electromagnetic System, with Elliott Magnetometer, and a
Nuclear Enterprises Scintillometer. This equipment is further described in
Appendix II of this report.

The areas surveyed comprise three separate projects as follows:

a) The Robb-Jamieson Area, in which 50 line miles was flown with lines in a

North-East, South-West direction, spaced at one-eighth mile intervals.

b) Kamiskotia Area, covering a part of the four corners of Turnbull, Godfrey,
Robb and Jamieson Townships. This section was flown in a Morth-South direction
and comprised 82 line miles with lines spaced at one-eighth mile intervals;

c) Godfrey Township Area, covering parts of Robb, Jamieson and Godfrey
Townships. Lines were flown in a Morth-Mast, South-West direction, spaced at
one-eighth mile intervals, and covered some 205 line miles.

Electromagnetic anomalies have been plotted on individual base maps with a scale of 1" = 1320°. These anomalies are listed in Appendix I to this report and description of anomaly selection and grading is included in Appendix III of this report.

#### PERSONNEL

The personnel employed in this survey were as follows:

Pilot:
Mechanic:
Navigator:
Operator:
Data Reduction:
Drafting:
Drafting:
Geophysicists:

Mr. K. Atkins, Ottawa, Ontario.
Mr. R. Sarsfield, Ottawa, Ontario.
Mr. K. McLeod, Toronto, Ontario.
Mr. G. Curtis, Ottawa, Ontario.
Mr. D. Graham, Ottawa, Ontario.
Mr. P. Tallyhoe, Ottawa, Ontario.
Mr. J. Priest, Toronto, Ontario.
Mr. D. Wagg, Toronto, Ontario.
Mr. A. R. Rattew, Ottawa, Ontario.

#### GEOLOGY

The geology of the major part of the surveys is covered by map No. 53-C, "Robb-Jamieson Area" by Berry and Ferguson, in the Ontario Department of Mines Annual Report for 1944.

Considerable overburden exists, but mapping shows Keewatim lavas, intermixed with gabbros and horneblendes, the complex cut by numerous N. N. W. trending diabase dykes. Some acidic intrusives are also noted.

ELECTROMAGNETIC RESULTS

No anomalies were recorded in the Robb-Jamieson Area flying. In the other areas several conducting zones have been detected, most of which are relatively weak. In addition, a number of isolated anomalies are noted, and where these are not otherwise discussed, their importance would depend more on known favorable geologic or other conditions.

The zones identified are numbered in sequence with lettered prefixes to denote the project area on which they were detected. A discussion of these conductive systems follows:

### System K - 1 Anomalies 1-B and 2-B

This zone lies on the South shore of Kamiskotia Lake and shows weak quadrature anomalies with possible weak magnetic correlation. The zone is considered geophysically poor and would be followed up only if other interest in the area developed.

CANADIAN AERO Mineral Surveys

# System K - 2 Anomalies 15-A and 16-A (Kamiskotia)

# G - 2 Anomalies 41-B and 42-A (Godfrey)

This short zone is confirmed on both surveys, and shows anomalies of poor to fair conductivity, but lacking direct magnetic correlation. It is understood that this zone represents known sulphides, and its strike extent is limited to the area shown. No further action would therefore be required.

### System G - 3 Anomalies 37-A, 38-B, 39-A, 40-A and 41-A

This group of anomalies lies on the East shore of Kamiskotia

Lake. They show fair apparent conductivity, and sporadic magnetic correlation.

The film shows a road and cottages along this section, and it is therefore possible that the anomalies are due to a power line or telephone line. If this should not be found, then the system would be worth ground investigation, since it appears also to be in a favorable geologic setting.

# Bystem G - 4 Anomaly 34-A

This anomaly, appearing on one line, seems to be confirmed by a minor indication on line 35. The anomaly appears real and shows low order magnetic correlation. Anomaly 33-A, adjacent to the South, shows different magnetic character than 34-A, but could be investigated at the same time. Some possibility of strike extension from System G - 2 exists.

### System G - 5 Anomalies 28-A, B and 29-A

These anomalies show primarily in-phase response, and 29-A shows a weak but direct magnetic correlation. The zone could be checked with low priority.

### System G - 6 Anomalies 14-A and 15-A

These weak anomalies show apparently fair conductivity and weak magnetic correlation. They could be ground checked with low priority.

# System G - 7 Anomalies 9-A and 10-A

This system seems genuine with weak anomalies indicating fair conductivity. Possible magnetic correlation exists and a ground check is warranted.

### System G - 8 Anomalies 7-A and 8-A

This zone is characterized by quadrature anomalies indicating poor conductivity, but with apparently correlating magnetic anomalies. Since the zone lies in close proximity to System # 7, it should also be ground checked at the same time.

### System G - 9 Anomaly 1-A

This zone, represented by only one anomaly intercept, shows fair conductivity and good correlating magnetics. Although the zone is apparently short, it should be investigated with fair priority.

### System G - 10 Anomalies 4-A and 5-A

These weak e.m. indications lie on a prominent magnetic feature, possibly a dyke. They should be ground checked for indication of their source.

System K - 11 Anomalies 1-A and 2-A (Kamiskotia)

These anomalies show fair conductivity, but little or no magnetic correlation. They indicate a possible East-West strike direction, lying on the West side of Christmas Lake. System K - 12, discussed below, might thus be related. Followup is warranted on a low priority basis.

# System K - 12 Anomalies 7-A, 8-A, B and 9-A

This zone is of indeterminate strike direction, but is characterized by weak e.m. indications showing fair conductivity, and by sporadic but weak magnetic correlation. The zone is worth ground checking, possibly in conjunction with System K - 11.

### SUMMARY

Twelve conducting zones have been indicated, most of them showing weak electromagnetic indications. Practically all zones warrant at least cursory investigation, with importance resting largely with their local environment.

Respectfully Submitted,

A. R. Rattew, Prof. Eng., (Ontario).

# APPENDIX I

Project 3003 (6)		B. W. LANG			KAMISKOTIA GODFREY AREA		
Anomaly	Fiducials	In-Phase Quad	Altitude	Magnetics	Rate	Comments	
1-A	89 <b>3</b> 2/35	60/40	130'	N11	3	Sharp.	
-B	8873/77	-/30	120	Dir. 15g	x	Quad and Weak Mag.	
2-A	8952/54	30/9	130	Nil	×	Quad missing - Weak.	
-B	9004/07	-/40	115	Poss Slight	×	Quad.	
7 <b>-</b> A	6712/15	20/40	135	Poss 15g	x	Poor.	
8 <b></b> A	6859/62	15/40	130	Dir? 30g	x	Poor Correlation.	
-B	6863/66	40/20	135	Poss 40g	×		
9 <b>-</b> A	7113/16	40/40	130	Poss Slight	x	Dual-Turbulence?	
15-A	8116/19	30/40	140	Poss Slight	3	Weak.	
16-A	8332/35	50/10	140	Nil	3	Weak.	

# APPENDIX I Page 2.

Project 3003 (14)		B. W. LANG			KAMISKOTIA AREA	
Anomaly	Fiducials	In-Phase Quad	Altitude	Magnetics	Rate	Comments
1-A	4130/33	80/80	120'	Dir.100g	3 +	Weak but good.
-B	4135/38	30/10	135	Dir? 20g	x	Poor correlation.
-C	4226/29	40/15	130	W. edge 300g	x	Poor correlation.
3 <b>-</b> A	3757/59	30/10	125	N11	×	Weak, poor.
4-A	3592/96	20/15	135	Dir.230g	3	Very poor e.m.
-B	3559/63	40/20	150	Dir?20g	3	Poor 3.
5-A	3368/71	15/10	135	Dir.150g	x	Very weak e.m.
7-A	2892/98	<b>-/</b> 30	125	Dir? 80g	×	Weak quad., with mag?
A-8	2856/60	-/20	130	Dir?80g	x	Poss quad and mag.
9 <b>-</b> A	2483/86	30/70	130	Poss Slight	3	
10-A	2461/64	40/15	135	Dir? 15g	3	Part of anomaly - off area.
14-A	1610/12	40/30	130	No ?	×	Narrow - poor.
15-A	1370/74	50\50	135	Poss Slight	×	Broad, weak.
20-A	222/26	40/30	135	Nil	x	Broad - poor.
25 <b>-</b> A	9277/80	40/30	130	Poss 15 g	x	Poor Correlation.
28-A	8833/36	80/?	135*	Ast	×	Poor character - Turbulence?
-B	8836/40	60/15	130	Poss Slight	x	Poor character - Turbulence?
29-A	8659/62	60/20	130	Dir? 50g	×	Weak, poor character.
33 <b>-</b> A	8007/10	80/-	130	N11	3	Poss Turbulence?

CANADIAN AERO Mineral Surveys 63.1310

# APPENDIX I Page 3.

Project 3003 (14)

B. W. LANG

KAMISKOTIA AREA

Anomaly	Fiducials	In-Phase Quad	Altitude	Magnetics	Rate	Comments
34-A	7966/69	60/15	130'	Dir. 40g	3	Probably ok.
37-A	7526/28	50/90	130	Slight?	3	Marked P.L.
38-A	7322/28	30/50	130	75g on part	x	Poor correlation - Broad.
<b>-</b> B	7344/46	60/80	130	Om Mag high	3	Power Line?
39 <b>-</b> A	7248/51	80/40	135	Dir? 15g	3	Power Line?
40-A	7041/44	60/40	130	Slight?	3	Power Line?
41-A	6923/26	40/20	135	On 300g	×	Poss. Tel. Line.
-B	6868/71	30/80	130	Nil	3	
42-A	6799/803	15/80	135	E. side 100g	3	Quad anomaly.
46-A	4853/58	20/40	130	Poss 100g	x	Poor correlation.
47-A	4725/27	40/20	140	Poss 15g	x	Poor.

#### APPENDIX II

#### DESCRIPTION OF OTTER AIRBORNE GEOPHYSICAL SYSTEM.

#### SURVEY BASIS

The basis of surveys with this equipment is electromagnetic and magnetic results obtained from units installed in a deHavilland Otter aircraft. In addition results are available on a Scintillation record which gives a rough indication of overburden conditions traversed in addition to its normal function.

Traverses of a survey area are made at an appropriate elevation (usually 100' to 200' above terrain,) on parallel lines spaced from one-quarter to one-eighth mile apart, and crossing the implied regional strike at right angles. Continuous photographic record is made of the ground passing below the aircraft, and this is correlated by time markers with the geophysical equipment records.

In the electromagnetic unit a low frequency (320 cycles per second) field is produced by a 'transmitter' mounted on the starboard wingtip, and the resultant field is measured at the 'receive' coil on the port wingtip. Separation of these coils is 61 feet. An electronic null device is adjusted so that in the absence of a conductor within range of the system, no signal is recorded. The presence of a conductor distorts the received field, producing an anomalous signal which is recorded. The anomalous signal is divided into two components, one which has the same phase as the transmitted field, termed the 'in-phase' component, and the other whose phase is at right angles to the transmitted field, termed the 'quadrature' component. These are recorded on two channels of a six channel recorder, and the ratio of the in-phase to the quadrature components gives a measure of the conductivity of the disturbing body. Intensity of response depends on proximity to the body, conductivity of the body, and to its geometric configuration. In general, a body which bears dimensions and conductivity to be of interest will produce an anomalous signal larger than the background noise if the aircraft is within 300' to 400' of it.

The magnetometer installed in the aircraft measures short term variations in the total intensity of the earth's magnetic field. These short term variations are recorded simultaneously on the six channel recorder with the e.m. results. In addition, all variations in this total field are recorded on a Rectalinear recorder for possible subsequent magnetic contouring when required.

A radio altimeter within the aircraft measures and records continuously the height of the aircraft above ground. This information is subsequently used to relate geophysical anomalies at varying altitudes.

The scintillation counter results are also recorded on the six channel recorder. These results are frequently useful in estimating conditions of overburden thickness, where other means may not be available. It may also be useful in dividing broad geologic divisions within a survey area.

An indication of the air turbulence is also recorded on the six channel record, and spurious anomalies which may be due to an aircraft 'bump' may be eliminated.

#### Appendix II - continued

The Aeropath camera continuously records the ground passing below the aircraft, and numbered fiducials are impressed on this same film at intervals usually of 10 seconds. These same fiducials are recorded on the six channel recorder and the rectalinear recorder, thus correlating all recorded information with accurate ground positions.

#### RECORDER TRACKS

In studying results from the six channel recorder, the following are the scales, reading from bottom to top of the chart, with increasing fiducial numbers to your left:

- 1) Fiducial marks are noted, with a time separation of 1500 feet approximately. Numbering from right to left, this being the 'forward' direction of flight.
- 2) Magnetometer; Each 5 mm. represents approximately 80 gammas. When the units 'steps' approximately 320 gammas change is indicated. This applies to the 300-0-300 scale which is normal unless otherwise noted. Ten steps are available, beyond which, unless the range is advanced, the unit goes 'off scale'. It should be noted that this record is a differential record, with a time constant of some 4 seconds. The net result of this is to wipe out long term variations, but to leave short term changes relatively unaltered. Thus the magnetometer record in this case is useful largely for 'correlating' magnetic features associated with the electromagnetic results.
- 3) In-Phase e.m. Each 5 mm. represents approximately 100 parts per million referred to the primary field at the receive coil. Noise level should not exceed 50 parts per million, although records are still considered useable until the noise level reaches 100 p.p.m. Intensity is linear until 600 p.p.m. is reached, after which compression occurs to a level of 1200 p.p.m., beyond which the value is 'off-scale'.
- 4) Quadrature e.m. Exactly the same scale values and comments apply to this trace as to the in-phase above.
- 5) Altimeter trace: The center of this trace represents approx. 150' above ground; the bottom, approx. 100', and the top approx. 300'. Response on this trace is non-linear.
- 6) Accelerometer trace; One-third "G" force is indicated by 5 mm. deflection from the central point. Bumps of greater than one-half "G" can cause spurious responses on the e.m. charts.
- 7) Scintillation trace; 5 mm. represents an increase of 0.06 mr/hr.

The Rectalinear record charts produce absolute magnetic field results with scale of 300-0-300 covering the full paper width.

#### APPENDIX III

#### SURVEY PROCEDURES AND RESULTS

#### PROCEDURE

Having laid out a proposed survey on a photomosaic at the required scale, the aircraft is navigated along the proposed flight lines at altitudes of 100' to 250' depending on topography. This is designed so that detection of bodies of interest to a depth of not less than 150' below surface should be accomplished. Actual flight paths are tracked from the recording camera, to the photo-mosaic, and thence to the base map, which is plotted directly from the mosaic. The control fiducials are plotted directly on the base map as well as the photo-mosaic.

Anomalies are numbered according to the line on which they fall, and a sequence letter; lettering from South to North, or from East to West. They are assigned fiducial numbers from the charts, and transferred to the base map by means of proportional devices. The overall grade of the anomaly is indicated by the manner in which it is plotted, as indicated on the base map. Where a magnetic contour map, or red-ball magnetic map has not been specified, the intensity of directly correlating magnetics is indicated opposite the appropriate anomaly.

#### ANOMALY RATINGS

With due regard to the confusion which would arise from too large a number of grade symbols appearing on the base map, we recognize 6 grades of anomalies. The following factors are utilized in arriving at an anomaly rating;

- A) Magnitude of the in-phase component of the e.m. response, related to a given altitude.
- B) Ratio of in-phase to quadrature responses.
- C) Shape, magnitude, and degree of magnetic correlation, if any.
- D) Character and shape of e.m. curves, with due regard to altitude and ambient noise level.

Anomaly listings are compiled and included as Appendix I of this report. Ultimate rating is a reflection of the above factors, with the immediate objective being the localizing of ground anomalous zones of sufficient interest to warrant further investigation on the ground.

#### ANOMALY LISTING

The anomaly listing (Appendix I) shows all the pertinent data concerning each anomaly recorded during the survey. From left to right the columns indicate:

1) The anomaly appelation; the line number, followed by a letter, where the sequence is from South to North, or East to West.

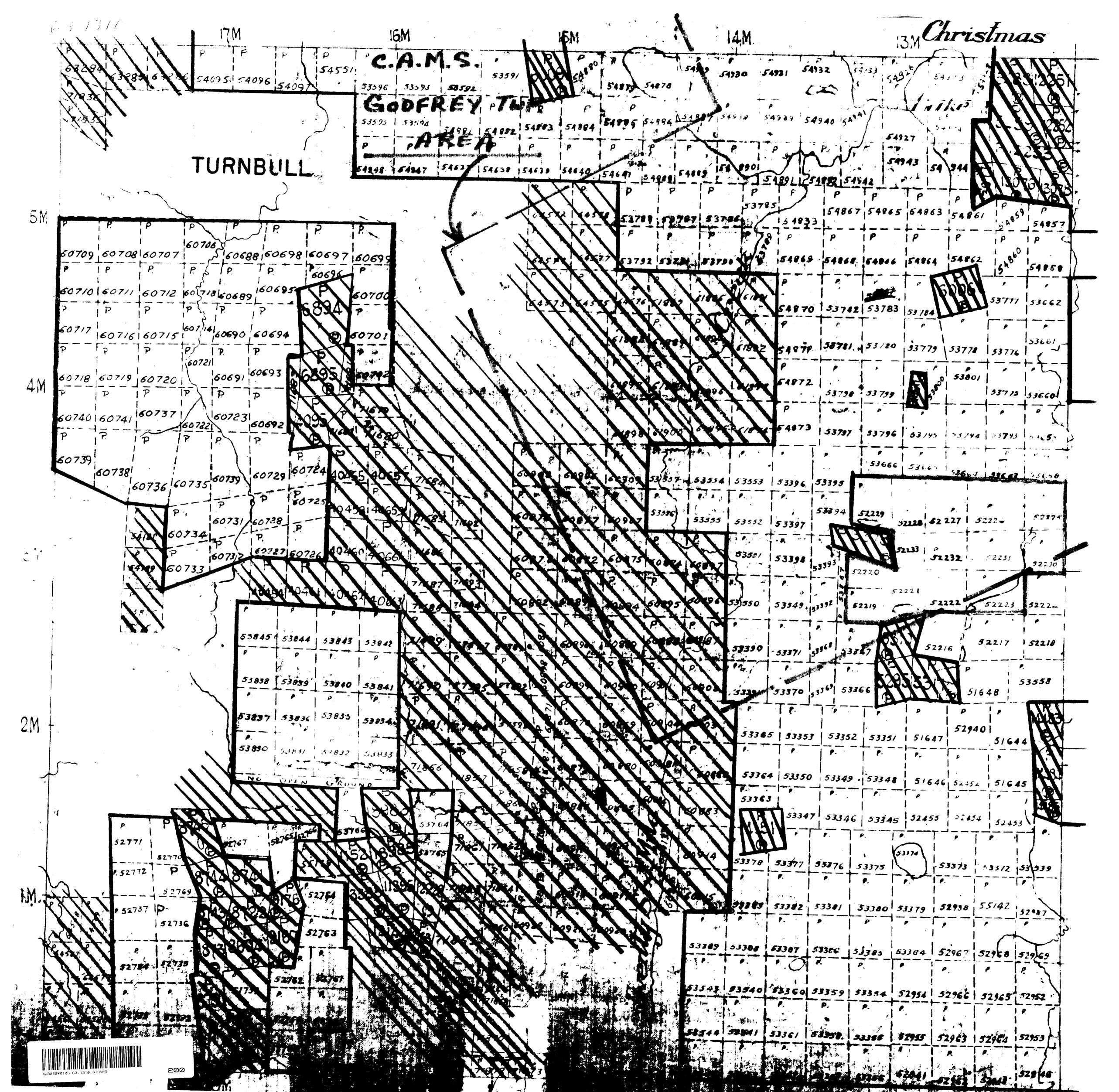
#### Appendix III - continued

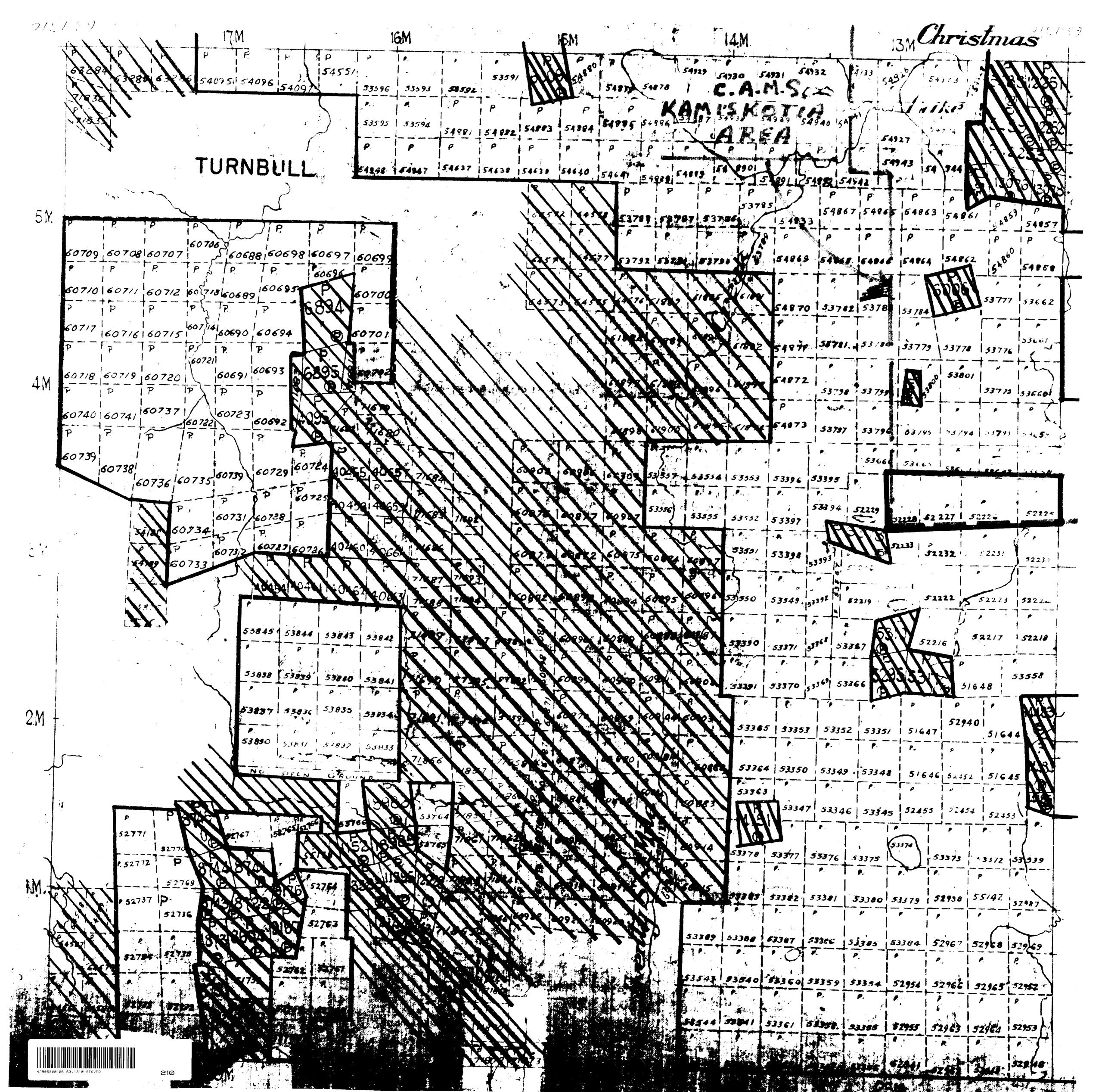
- 2) The fiducial limits of the anomaly. These are taken for all intents as the full base-width of the e.m. response. Dula, or double anomalies are grouped within one set of limits where the interpreter feels that their characteristics are similar, or where two zones lie within approximately 300 feet of each other. In this connection, resolution is such that conductive zones separated by only 100' should be distinguishable.
- 3) Electromagnetic (component) responses are recorded, in-phase first, followed by the quadrature. Response intensity is taken from the assigned base of the anomaly in each case.
- 4) Altitude above ground is recorded to the nearest 5 feet.
- 5) Magnetic phenomena associated with e.m. anomalies is noted. A consistent pattern is used here, whereby the indication of direct correlation followed by magnetic intensity, is just that. Curve shapes must coincide, as well as peak positions. An indication of the e.m. position relative to a magnetic feature which does not correlate directly is shown. Direction is indicated, and relative distance is indicated according to the words 'edge', 'flank', or 'side', and also the intensity of the magnetic disturbance involved.
- 6) Comments are given applying to an anomaly where conditions are not what might be called standard. In the case of multiple anomalies, the number of peaks are indicated. When the anomaly is broad, but does not reflect a wide zone, an indication of depth to disturbing body may be made. Possibilities of spurious anomalies are noted (these are confined to atmospherics and turbulence effects). When the interpreter finds a rating near a boundary, a comment may be made as to 'strong' or 'weak' referring to the rating category in which the anomaly has been placed. Topographic features, or manmade disturbances will also be noted in this column. Indications of body dip or odd strike will be noted where applicable.

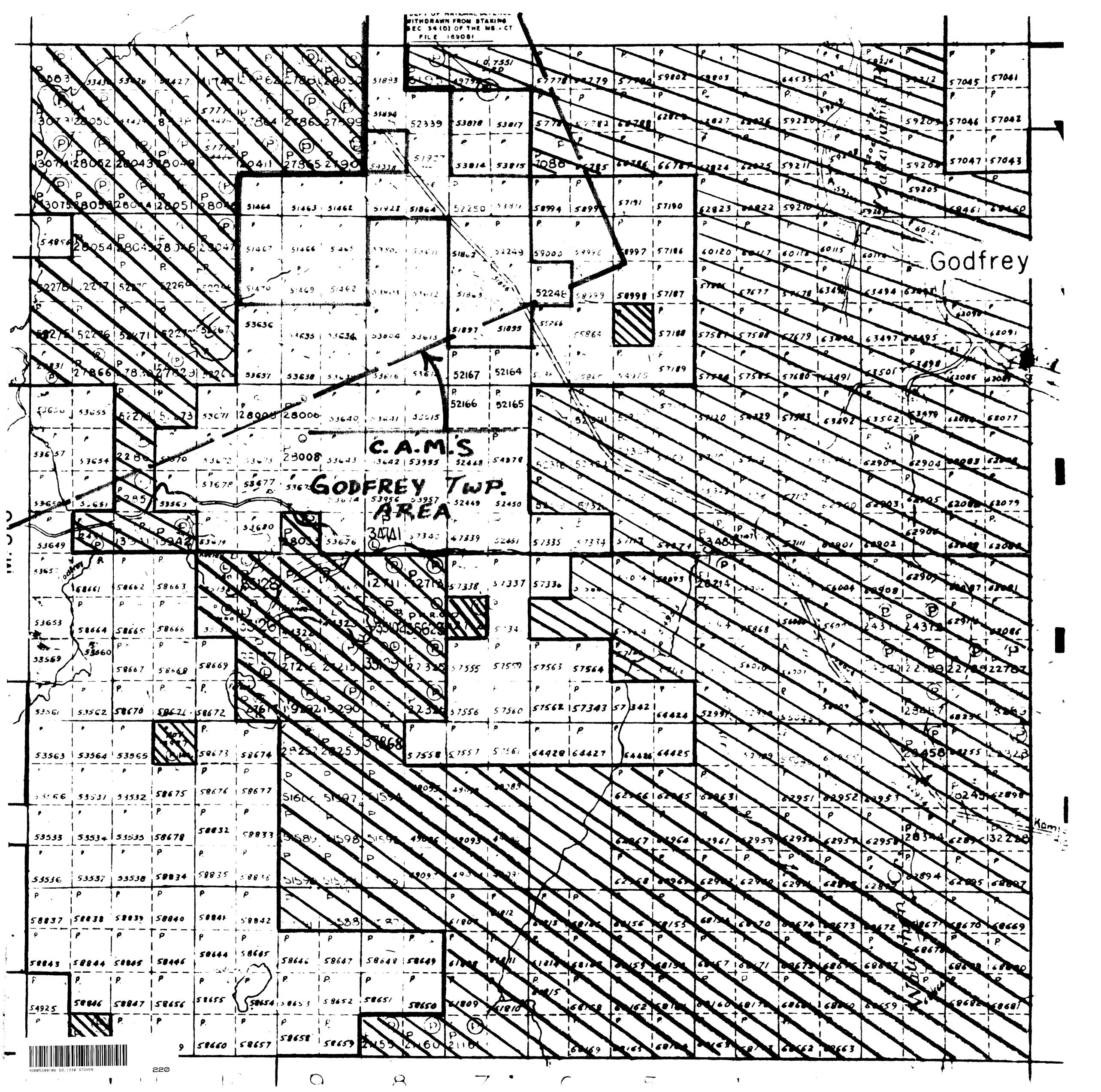
#### GENERAL

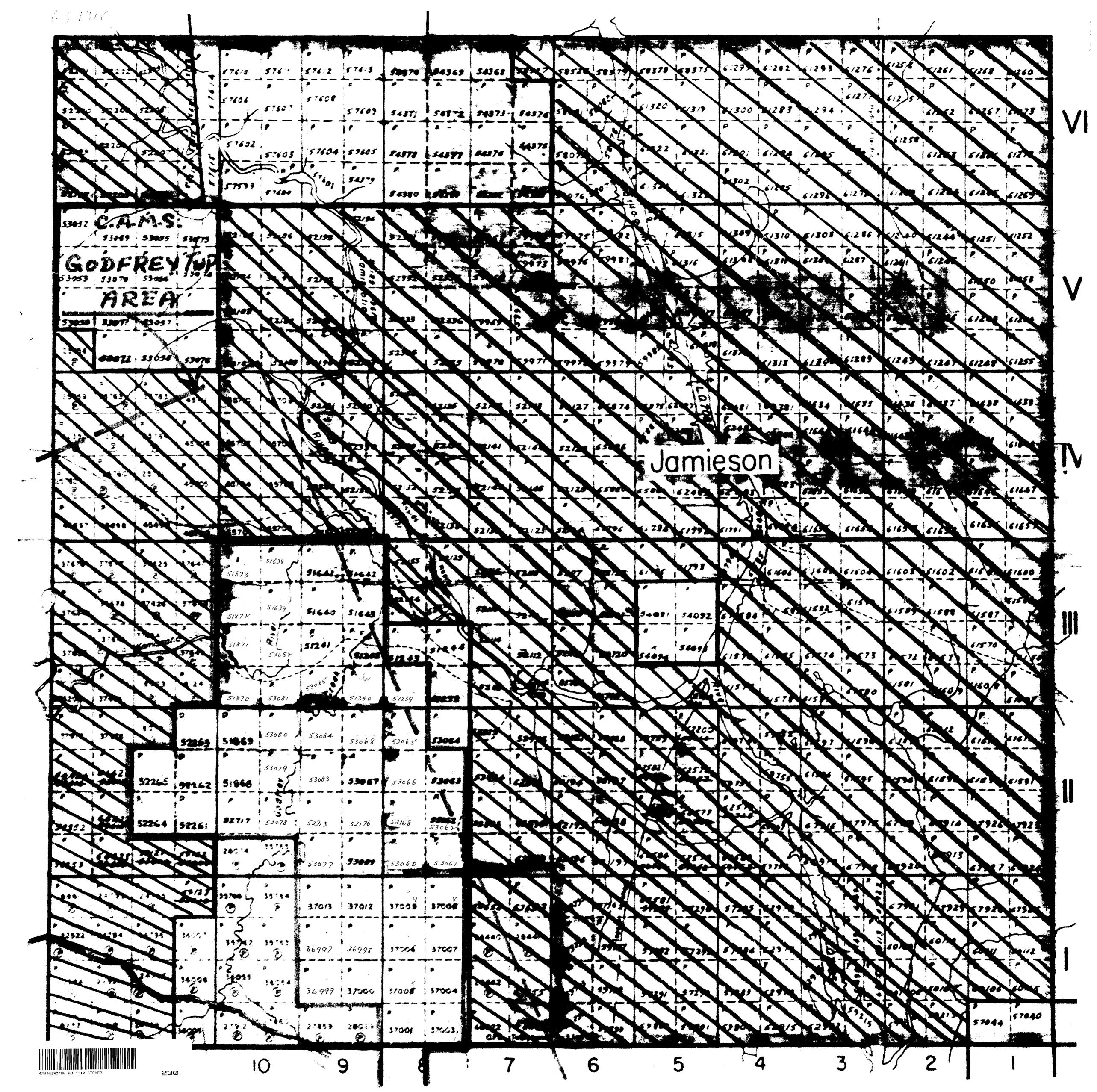
It is manifestly impossible to place all pertinent information on the base map, and although a boiling down of information is included, the base map should always be examined in conjunction with the anomaly listing for full appreciation of the assessment of the results made by the interpreter.

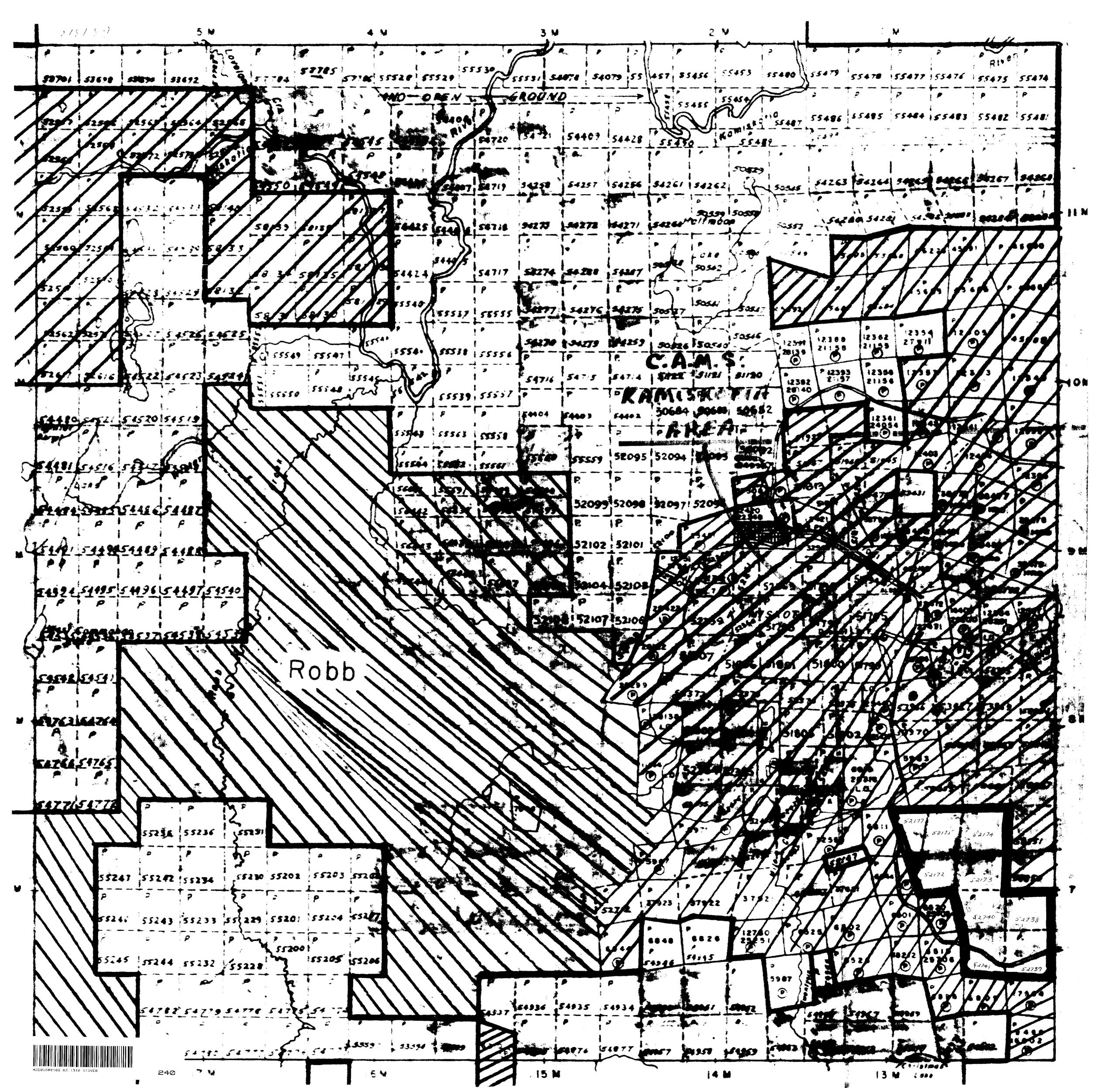
The purpose of a survey of this type is not to outline orebodies from the air, but to economically pin point those targets on the ground which warrant further expenditure as good bets in the exploration for orebodies.

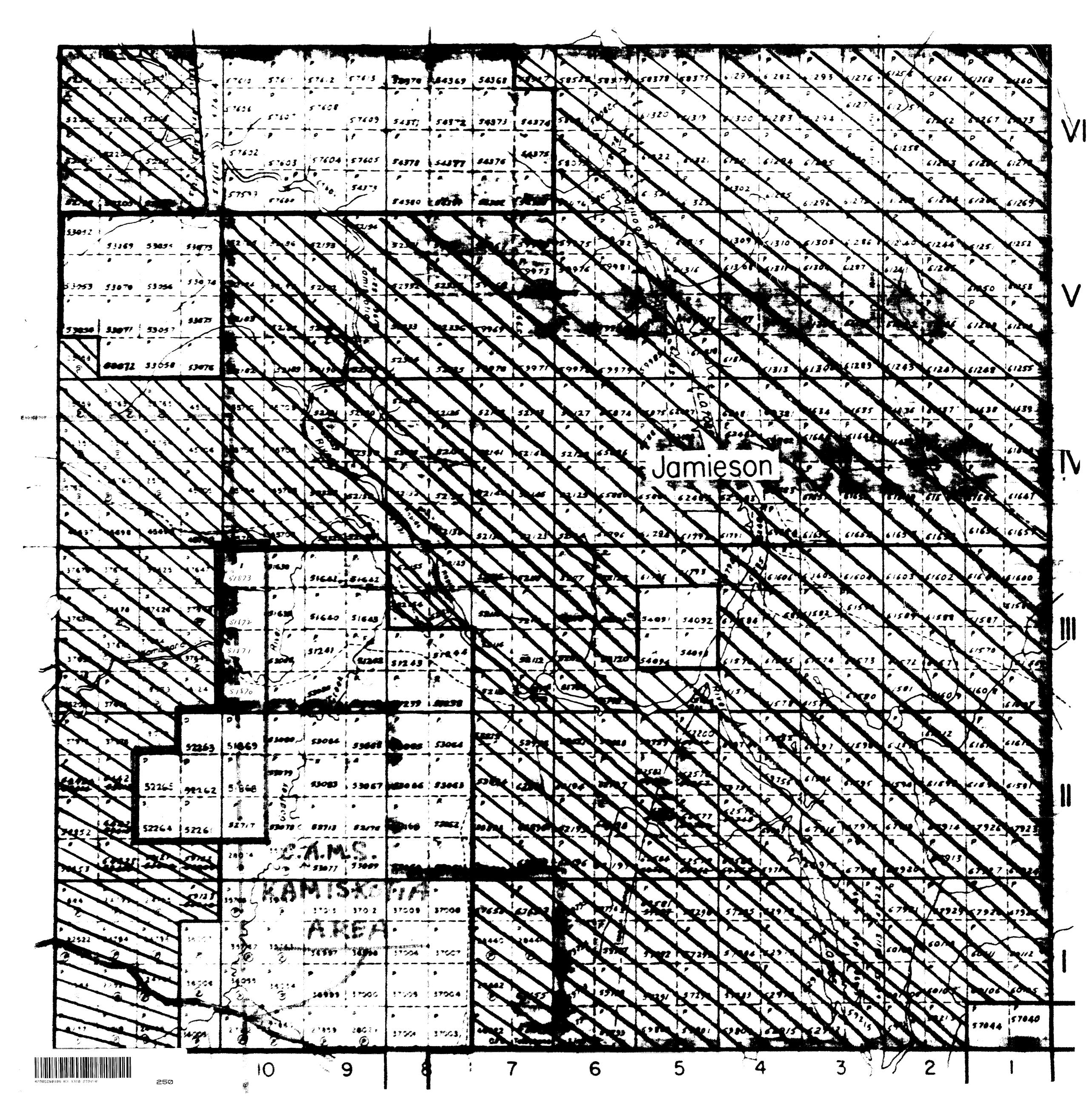


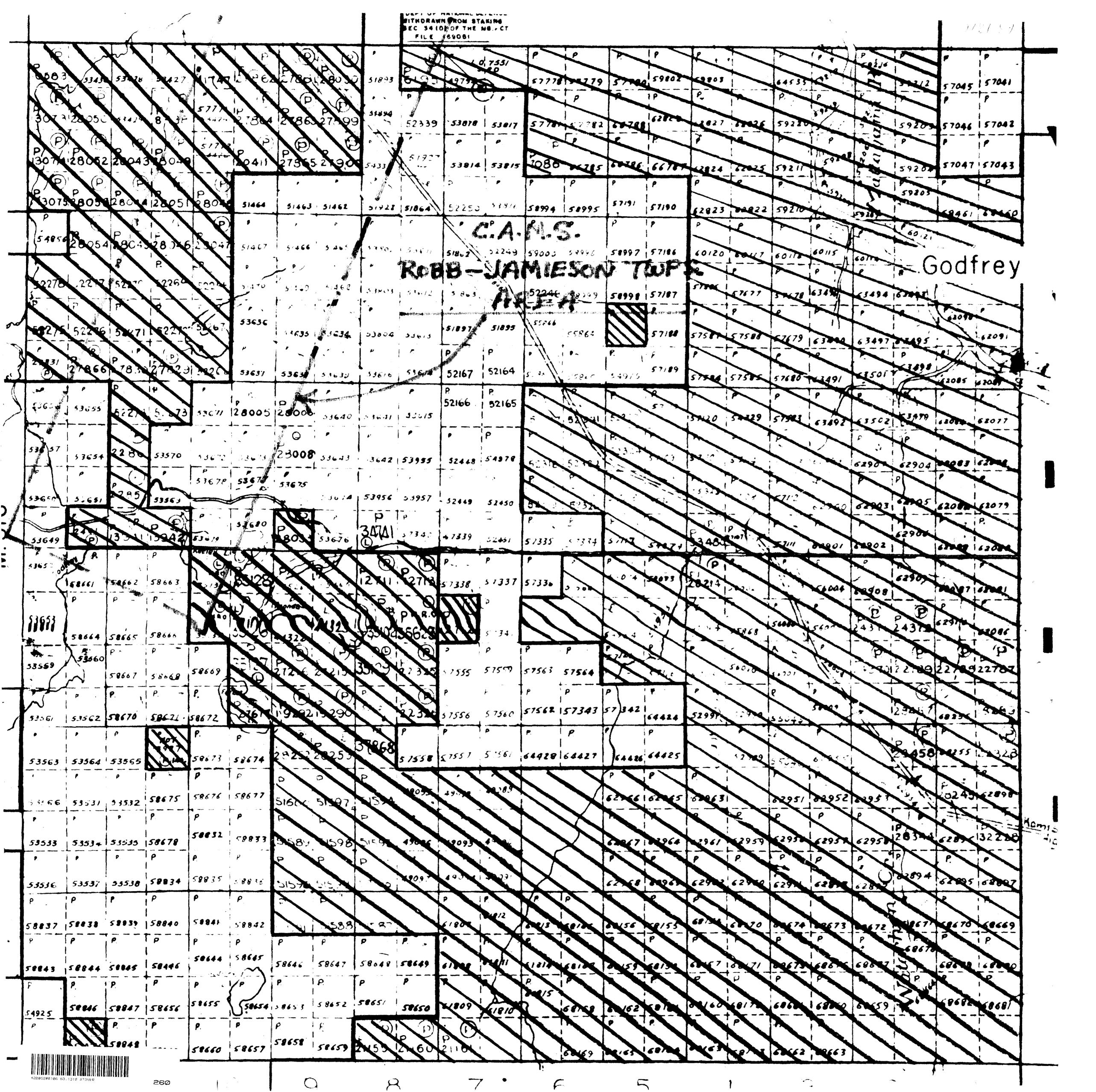


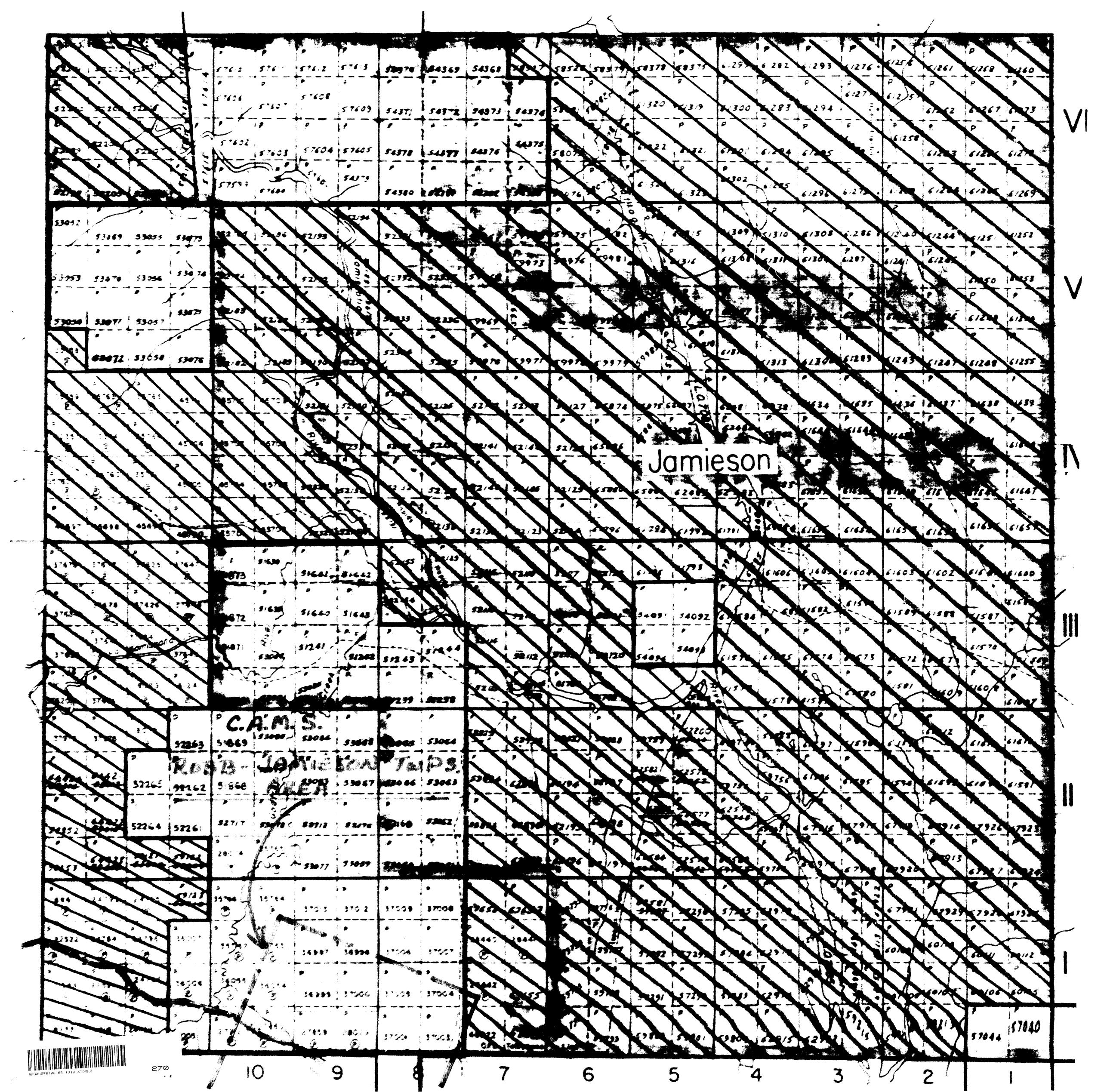


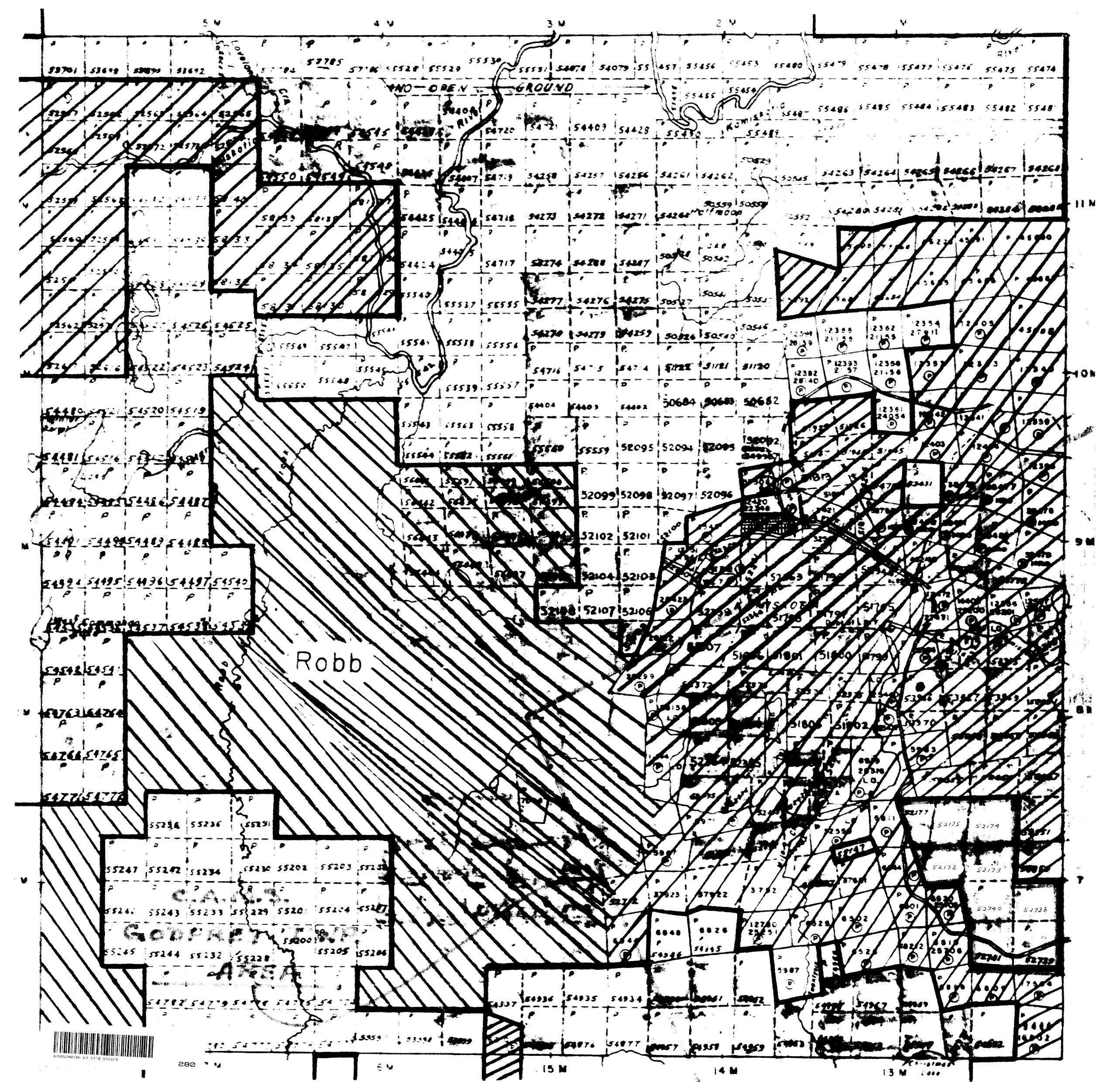


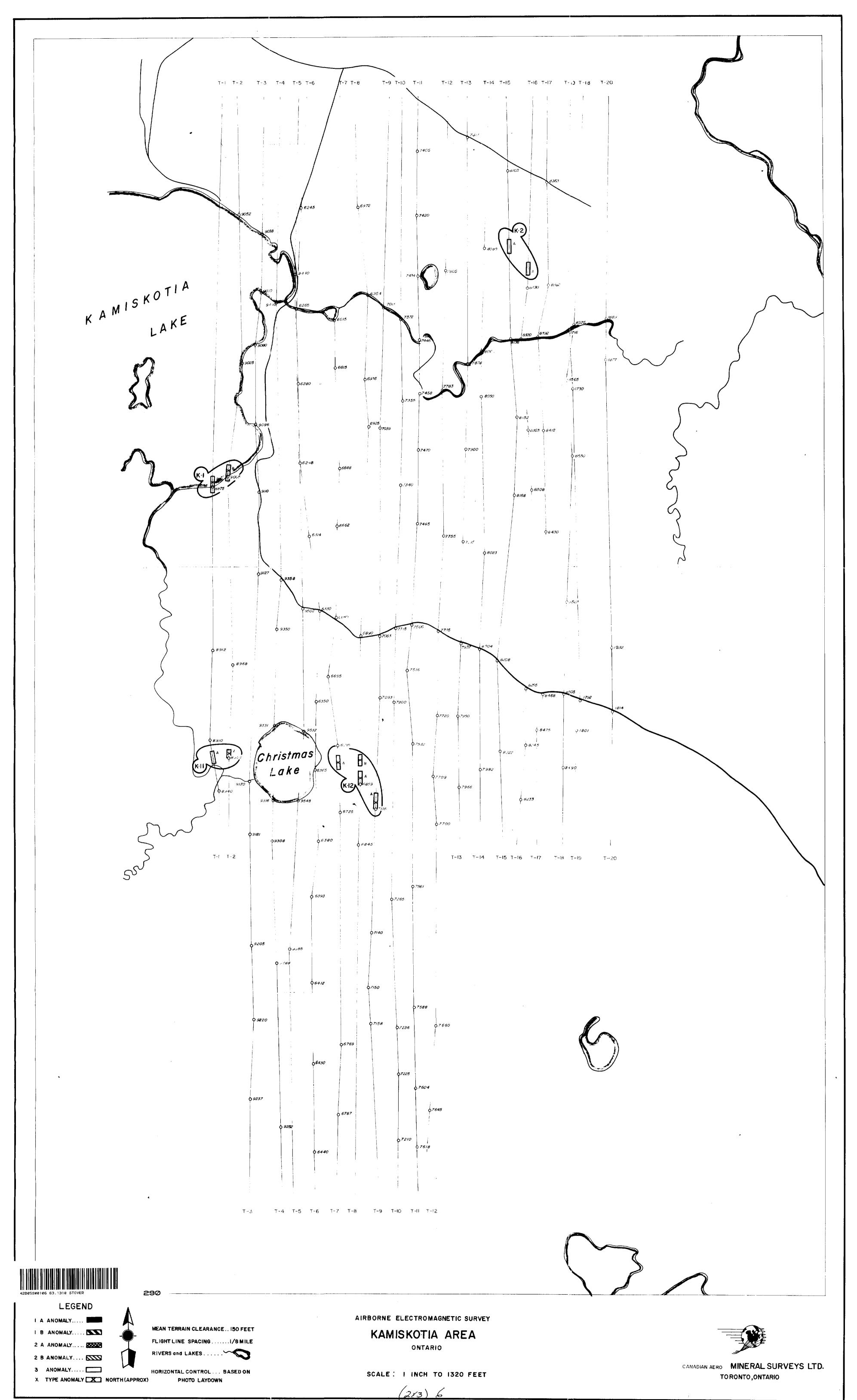












63.1310

63.1310

