COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

RECORD No. 1962/116

SAVAGE RIVER GEOPHYSICAL SURVEYS, TASMANIA 1960-61

by

E. N. EADIE

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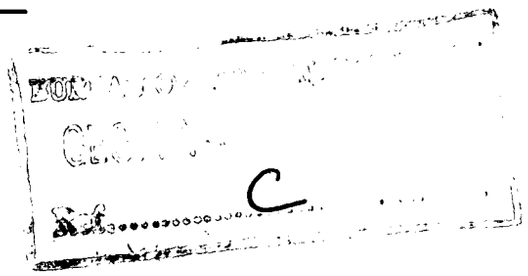

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SUMMARY

At the request of the Tasmanian Department of Mines a geophysical survey of the Savage River iron deposits, north-western Tasmania, was carried out by the Bureau of Mineral Resources during the period from January to June 1961. The survey covered areas north and south of an area (called the Central area) which had been surveyed by the Bureau in 1960. This Record describes the geophysical survey done in 1961, and includes the magnetic results of the 1960 survey.

Detailed magnetic surveys were made in the Northern and Southern areas; a self-potential survey was made of selected traverses in the Northern area. A topographical survey of the 1960 and 1961 areas was made using microbarometers.

In the Northern area the magnetic results indicate that an iron deposit extends through most of the area, and that two regions are of particular economic interest. In the Southern area the magnetic results indicate three iron deposits, which may be of economic interest when considered together with the more important deposits indicated in the Northern and Central areas.

Drilling recommendations have been made on the basis of the magnetic results and the topographical survey.

1. INTRODUCTION

At the request of the Tasmanian Department of Mines a geophysical survey of the Savage River iron deposits, north-western Tasmania, was carried out by the Bureau of Mineral Resources between January and June 1961.

The survey covered areas north and south of the area surveyed during the 1960 survey (Sedmik, 1961). The boundaries of the areas of the 1960 and 1961 geophysical surveys are shown superimposed on the aeromagnetic map of total intensity obtained from the survey done by the Bureau during 1956 (Plate 1).

The area of the 1960 survey is referred to as the Central area; the areas of the 1961 survey are referred to as the Northern and Southe areas. This terminology should not be confused with that used in earlier Records of the Bureau.

The purpose of the detailed magnetic survey in the Northern area was to obtain more detailed information about, and to delineate more accurately, deposits that were located during the Bureau's reconnaissance survey in 1957 (Keunecke, 1958). The purpose of the magnetic survey in the Southern area was to investigate a possible southern extension of the anomaly observed on Traverse 4500S during the 1960 survey, and to locate any further anomalies to as far south as Traverse 10,500S.

In the Northern area, self-potential readings were taken along selected traverses for comparison with the magnetic results, and to determine whether any sulphides, other than those associated with magnetite, were present.

From April to June, 1961, the geophysical party made a topographical survey (using microbarometers) of the areas of the 1960 and 1961 geophysical surveys. The purpose of this survey was to provide surface profiles which are required in selecting drill sites, and a surface contour plan for comparison with the magnetic contours to show the relation of the deposits (indicated by the magnetic results) to the topography, and to assist in planning the further development of the area.

The geophysical party consisted of geophysicists E.N. Eadie (Party Leader) and R.J. Smith (during April and May), assistant geophysicist M.W. Middleton (during January and February), and field assistants B.P. Murray and I.C. Parkinson. A university student J. Haigh employed by the Tasmanian Department of Mines was attached to the party during January and February. The surveying was carried out by surveyor M. Hickey of the Department of the Interior, assisted by two chainmen. The cutting of traverses was done by track-cutters provided by the Tasmanian Department of Mines.

The traverses in the Northern area were pegged and surveyed by the surveyor; the traverses in the southern area were pegged by the geophysical party and subsequently surveyed by the surveyor. Throughout the area, pegs were inserted along the traverses at horizontal intervals of 50 ft. The grid of the 1960 area was also surveyed by the surveyor, as no accurate plan of the traverses in this area had previously been prepared.

The previous history and the geology of the deposits are described in earlier Records of the Bureau (Keunecke, 1958; Sedmik, 1961), and in Technical Reports of the Tasmanian Department of Mines (Hughes, 1958; Tetlow, 1960).

The applicability of the magnetic method depends on the fact that the iron in the Savage River deposits occurs mainly as magnetite, which is highly magnetic.

Diamond-drilling has been carried out and is still in progress on earlier and present recommendations of the Bureau. The first ten drill holes were financed by the Tasmanian Department of Mines; subsequent holes were financed by Industrial and Mining Investigations Pty. Ltd, which has an exploration licence over an area embracing the deposits.

Access roads are being constructed in both the Northern and Southern areas to facilitate further exploration, including diamond-drilling.

2. MAGNETIC SURVEY

Procedure and presentation of results

An ABEM MZ-4 torsion magnetometer was used for the magnetic survey and measurements of the vertical magnetic field were made at horizontal intervals of 25 ft along the traverses.

The vertical magnetic field at each station was obtained relative to the field, taken arbitrarily as zero, at a base station situated outside the magnetically anomalous zone. The base station chosen was that used during the reconnaissance survey in 1957, viz. 700W on Traverse A.

The vertical magnetic profile was plotted for each traverse, and from these profiles a contour plan of the vertical magnetic field was drawn for each area at a scale of 200 ft to 1 in. as well as a composite plan covering the whole area at a scale of 400 ft to 1 in. (Plate 3).

The vertical magnetic profile and the surface profile, with drilling recommendations,are shown for each traverse on which drilling is recommended. The drilling recommendations are discussed below and are summarised in the table at the end of the report.

Interpretation

General The amplitude and form of the magnetic anomaly observed on any traverse is determined by many factors including the shape, size, orientation, depth, and composition of the magnetic body causing the anomaly.

The following general types of anomalies may be observed:

(a) A narrow anomaly with steep gradients due to a magnetic body of small width close to the surface. Although the anomaly may have a large amplitude, its narrowness indicates that the body is of small width, and probably of minor economic significance. An example is the anomaly on Traverse 2500S with peak at 225E (Plate 12).

(b) A broad anomaly of high amplitude and steep gradients due to a wide deposit of magnetic material at, or close to, the surface; such a deposit will in general be of considerable economic interest. The continuation of such a deposit to depth is indicated by a gradual rise in the anomaly before the steep gradients commence. An example is the anomaly on Traverse E2A with peak at 50W (Plate 6).

(c) A broad anomaly of moderate amplitude and low gradients, due to magnetic material at depth, which is likely to be of economic interest. An example is the anomaly on Traverse 9500S with peak at 1375W (Plate 16).

(d) An anomaly with very irregular features indicating a highly disturbed magnetic field. This type of anomaly occurs usually in a region of extensive outcrop. The irregularities tend to mask the contribution to the anomaly of magnetic materials at greater depth. An example is the anomaly of Traverse H1 between 600W and 1200W (Plate 8).

The dip of a magnetic body influences the gradient of the anomaly so that the anomaly due to a dipping body is not symmetrical about the maximum. For instance, for a north-striking body dipping to the east, the gradient to the east of the anomaly maximum will be more gradual than the gradient to the west of the maximum. An example is the anomaly on Traverse 6000S (Plate 15).

It is seen that the amplitude alone of a magnetic anomaly is not of great significance, and that an assessment of the importance of an anomaly depends also on a consideration of its width and gradients.

The above considerations have been taken into account when making drilling recommendations.

The magnetic profile along any traverse shows the integrated effects of all the influencing magnetic materials. For instance, irregularities due to localised near-surface materials may be superimposed on an otherwise smooth profile due to a deposit at depth. However, such effects are often easily recognised and eliminated, so that the more important contribution to the anomaly can be considered. An example is the anomaly on Traverse E2A (Plate 6).

Northern area The magnetic results for the Northern area are shown as vertical magnetic contours on Plate 5. These indicate the occurrence of iron deposits throughout most of the Northern area. The most economically interesting region of the Northern area is that between Traverses D30 and E7.

The anomaly on Traverse D30 indicates that the deposit causing the anomaly is close to the surface, and possibly consists of two lenses separated by a barren or weakly-mineralised zone. Drilling is recommended to test the depth extent and continuity of mineralisation (Plate 6). The anomaly on Traverse D26A indicates that the deposit causing the anomaly is close to the surface.

The anomalies on Traverses D34A, E2A, and E5 are each of similar form, and appear to be made up of a broad component with steep gradients due to the influence of near-surface material, and a broader component of more gradual gradients due to the continuation of the deposit to depth. This indicates that the deposit extends from near the surface to depth. The anomaly on Traverse E7 also indicates that the deposit causing the anomaly for this region extends from near the surface to depth.

Drilling is recommended on Traverse E2A (Plate 6). Drilling has already been carried out on Traverse E5(DDH No. 2), and between Traverses D34a and E2A (DDH No. 1), following the reconnaissance survey by the Bureau in 1957. The drilling results for these two holes are described by Symons (1959), and are in good agreement with the interpretation of the magnetic results.

The anomalies on Traverses F1A to F16A in general have smaller gradients and lower amplitude, indicating that the deposits in this region are mainly at depth. Drilling is recommended on Traverses F1A and F16A.

The anomaly on Traverse F20 is more irregular, and indicates that the deposits in this region occur as narrow near-surface lenses that do not extend to great depth.

No significant magnetic anomaly is observed on Traverses G00, G5, or G8, which are beyond the northern limit of the extensive deposits discussed above.

The anomaly on Traverse D23A is narrower, has smaller gradients, and is of lower amplitude than the anomalies farther north. This indicates that in the vicinity of Traverse D23A the deposit is narrower and deeper than the deposits farther north. Drilling is recommended to investigate this anomaly (Plate 7).

The anomaly on Traverse D18A suggests that the deposit is mainly at, or close to, the surface. A drill hole as recommended on Plate 7, will be necessary to determine the actual depth extent.

A very weak anomaly was observed on Traverse D14A. The anomaly on Traverse D9A has greater amplitude and width, and drilling is recommended (Plate 7).

The magnetic profiles along Traverses D4, D2, and C35 are similar in form and exhibit two peaks, possibly due to two parallel lenses or zones of mineralisation separated by a barren or weakly-mineralised zone. Drilling is recommended on Traverse D4 (Plate 7).

Between Traverses C33 and H1A a very intense anomaly of moderate width and steep gradients is observed, the peak of which corresponds to the crest of a steep ridge. The iron deposit crops out extensively along the ridge from north of H1 to south of H1A, and this probably accounts for some of the irregularities in the profiles along these traverses.

On Traverse H1A an adit has been driven into iron deposits at river level, thus indicating that the deposits extend in depth to at least the level of the Savage River. The elevation of the ridge in the vicinity of Traverses C28A and H1 is about 690 ft and 630 ft respectively, and the level of the Savage River is about 350 ft at H1, indicating that the iron deposits have a depth extent of at least 300 ft in this part of the area.

Drilling is recommended on Traverses C33, C28A, and H1. The drill hole at 425W on H1 with depression 50 degrees is recommended to provide information about the depth extension below the level of the Savage River (Plate 8).

Central Area The magnetic survey of the Central area was made during 1960 and the interpretation of this area has been discussed by Sedmik (1961).

The magnetic results for the Central area are shown as vertical magnetic contours (Plate 10).

Considerable drilling has already been done in this area, and the positions of DDH No. 3 to 11 are shown on Plate 10. The results of drilling are in good agreement with predictions from the magnetic results. The drilling results for DDH No. 3 to 10 are described in detail by Hughes (1961).

Additional drilling in the Central area is recommended on Traverses C3, CoB8, B80, 750A, 2000S, and 2500S, and the recommendations are shown on Plates 11 and 12 together with magnetic and surface profiles.

Southern Area. The magnetic results for the Southern area are shown as vertical magnetic contours (Plate 14).

Three iron deposits are indicated by the magnetic results. Although regular in form and covering a considerable area, the deposits indicated by the anomalies are more isolated than in the Northern and Central areas, and are separated by barren regions.

The most interesting anomaly of the Southern area extends from north of Traverse 4500S to south of Traverse 6500S. The anomaly indicates a deposit that strikes approximately north, is regular in form, and dips towards the east. The deposit is covered by overburden throughout most of its length. The magnetic irregularities in the vicinity of Traverse 5500S are probably due to a fault. Drilling is recommended on Traverses 4500S, 5400S, and 6000S (Plate 15). Inspection of an old shaft near Traverse 6500S at the southern end of the anomaly may give additional information (Plate 14).

The other anomalies occur at the southern end of the area, and may be attributed to two bodies that crop out in the vicinity of Traverse 9000S, and plunge towards the south. These bodies are not indicated on Traverse 8500S (the weak anomalies on Traverses 8500S, 8000S, and 7500S are probably due to basalt). The deposit indicated by the eastern anomaly is wider and of greater economic interest than that indicated by the western anomaly, but plunges to the south more steeply than the western deposit. Drilling is recommended on Traverses 9000S and 9500S to investigate the eastern deposit, and on Traverse 9500S to investigate the western deposit (Plate 16).

Conclusions

Northern Area The magnetic results indicate the occurrence of iron deposits throughout most of the Northern area.

The most important region is that between Traverses D30 and E7 where the magnetic results indicate an extensive iron deposit at, or near, the surface, and extending to considerable depth. The deposit corresponds to the top of a ridge in the vicinity of its maximum elevation.

Also of interest is the region between Traverses C33 and H1A where an iron deposit is indicated at, or near, the surface along the crest of a ridge, and extending to depth. However, the elevation of the crest is lower than in the former region.

In general, the anomalies in the Northern area indicate deposits that coincide with a ridge. This would reduce the amount of overburden to be removed in open-cut mining, and any mining to the level of the Savage River could be done with the assistance of gravity.

Central Area The magnetic results indicate the occurrence of iron deposits throughout most of the Central area. These deposits have now been confirmed by drilling. As in the Northern area, the deposits of the Central area would be suitable for open-cut mining.

Southern Area The magnetic results in the Southern area indicate iron deposits that are regular in form and cover a considerable area, but that these are more widely separated than in the Northern and Central areas, and are mostly covered by overburden.

Although mot of great interest by themselves, the deposits indicated in the Southern area may be of economic interest when considered together with the more important deposits indicated in the Northern and Central areas.

3. SELF-POTENTIAL SURVEY

A self-potential survey was carried out on selected traverses in the Northern area for comparison with the magnetic results, and to locate the presence of any sulphides other than those associated with magnetite.

The survey was made with a transistorised S-P meter designed and built by the Bureau. Readings were taken at horizontal intervals of 25 ft along the traverses.

The results of the survey are shown in Plate 17, where the self-potential, magnetic, and surface profiles are given for Traverses H1A, C28D, D34A, and G00.

A comparison between self-potential and magnetic results shows that the self-potential anomalies coincide with the magnetic anomalies. These self-potential anomalies are probably caused by pyrite interspersed with the magnetite. Assays of drill cores have shown relatively high precentages of sulphur (Hughes, 1961). No evidence of sulphides other than those associated with magnetite was found on the selected traverses.

4. LEVEL SURVEY

The known elevation above mean sea level of the Long Plains Trig. Station (S.P.M. 2843) was used as the basis of the determination of the elevation of a main base station (not the magnetic base station) located in the Central area near the huts (Plate 2). The Long Plains Trig. Station is situated near the turn-off to the Savage River deposits from the Waratah-Corinna Highway at about 21 miles from Waratah. The elevation of the main base station was determined by means of micro-barometer traverses using the 'leap-frog method' between the Long Plains Trig. Station and the main base station, a distance of about 5 miles.

The elevation of a sub-base (usually the zero peg) for each traverse was determined relative to the main base using the 'leap-frog method' and hence relative to mean sea level. By using the 'leap-frog method' pressure variations with time (pressure drifts) were taken into account, and errors due to these drifts were minimised; thus the elevation of each sub-base was determined accurately.

Readings were taken at each peg (horizontal intervals of 50 ft) along the traverses except where there were abrupt changes in slope; in these places additional readings were made. The pressure drift during the period between successive readings at a sub-base was assumed to be linear in determining the elevation of each station relative to that sub-base. The elevation above mean sea level was then obtained for each station using the previously determined elevation of the sub-base.

A surface profile was plotted for each traverse with all elevations referred to mean sea level. These profiles were required in making drilling recommendations. On the basis of the profiles, topographical contour plans have been drawn with a contour interval of 25 ft for each of the Northern, Central, and Southern areas at a scale of 200 ft to 1 in. (Plates 4, 9, and 13 respectively), as well as a composite plan for the whole area at a scale of 400 ft to 1 in. (Plate 2).

As the contour plans have been based only on levels along the traverses, abrupt changes and irregularities in topography between traverses have not been taken into account. However, the approximate courses of most creeks have been shown, and the contours in their vicinities have been inferred.

A comparison of the magnetic and topographical contours shows the relation of the deposits (indicated by the magnetic survey) to the topography, including the level of the Savage River, and should be of assistance in connexion with further development of the area.

5. REFERENCES

HUGHES, T.D.	1958	Savage River iron ore deposits. Tasmania Department of Mines, Technical Reports No. 2, 1957.
HUGHES, T.D.	1961	Savage River iron deposits - progress report. Tasmania Department of Mines, Technical Reports No. 5, 1960.
KEUNECKE, O.	1958	Magnetic survey at the Savage River iron-ore deposits, north-western Tasmania. Bur. Min. Resour. Aust. Rec. 1958/39.
SEDMIK, E.	1961	Savage River magnetic survey, Tasmania 1960. Bur. Min. Resour. Aust. Rec. 1961/138.
SYMONS, J.G.	1959	Progress report on exploration of the Savage River iron ore deposits. Tasmania Department of Mines, Technical Reports No. 3 1958.
TETLOW, P.	1960	Savage River iron. Tasmania Department of Mines, Technical Reports No. 4, 1959.

TABLE

Summary of drilling recommendations

Plate	Traverse	Site	Direction	Depression (degrees)	Length (ft)
6	F16A	400E	West along traverse	45	700
	F1A	400E	" " "	45	1400
	E2A	300E	" " "	30	650
		300E	" " "	55	950
	D30	350E	" " "	30	650
		450E	" " "	45	900
7	D23A	200E	West along traverse	50	500
	D18A	550E	" " "	30	550
	D9A	450E	" " "	30	550
	D4	250E	" " "	45	500
8	C33	350E	" " "	45	700
		100E	" " "	45	400
	C28A	200W	" " "	30	550
		200W	" " "	55	850
	H1	550W	" " "	30	550
		425W	" " "	50	800
11	C3	50W	West along traverse	45	1000
	CoB8	500E	" " "	45	900
	B80	250E	" " "	45	900
12	750S	200W	West along traverse	45	550
	2000S	100E	" " "	50	800
	2500S	50W	" " "	45	450 (extend to 700 if desirable).
		50W	" " "	70	650
15	4500S	300E	20 to 25 degrees south-west of traverse direction	55	500
	5400S	200E	15 degrees north-west of traverse direction	55	600
	6000S	100E	West along traverse	55	500
16	9000S	1100W	West along traverse	45	600
	9500S	1100W	" " "	55	700
		1750W	" " "	55	450

PLATE I

145°15' APPROX.

NORTHERN AREA, 1961

CENTRAL AREA, 1960

SOUTHERN AREA 1961

41°30' APPROX. MAGNET CORINNA

41°45' APPROX. CORINNA ZEEHAN

145°00' APPROX.

RIVER

DONALDSON RIVER

PIEMAN RIVER

SAVAGE RIVER

WHYTE RIVER

ROCKY RIVER

STANLEY RIVER

YELLOWBAND CREEK

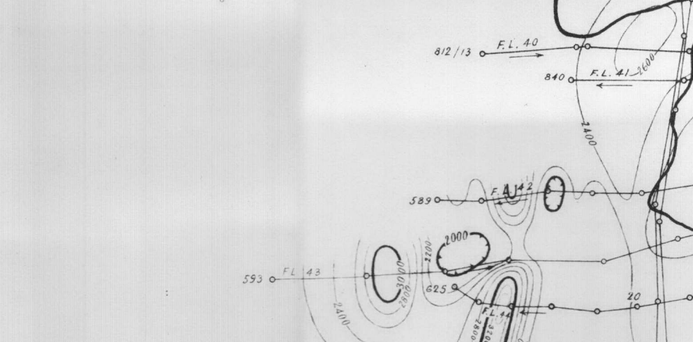
WARATAH HIGHWAY

HEAZLEWOOD

CORINNA

To Waratah 12 M.

LOCATION DIAGRAM



LEGEND

MAGNETIC CONTOURS 1000 200

MAGNETIC LOW

FLIGHT LINE

FLIGHT LINE (INTERPOLATED)

ROAD

TRACK

RIVER

APPROXIMATE SCALE IN MILES

1 0 1 2 3 4 5

CONTOUR INTERVAL 200 GAMMAS

SAVAGE RIVER, IRON DEPOSITS

AEROMAGNETIC MAP OF TOTAL INTENSITY

SHOWING AREA OF GROUND MAGNETIC SURVEYS 1960 AND 1961

EXPLANATION

This map was compiled from the results of an airborne magnetometer survey of selected areas in the Rocky River - Rio Tinto district, Tasmania, conducted by the Bureau of Mineral Resources in May, 1956. The object of the survey was to delineate magnetic anomalies showing the extent and distribution of probable iron ore deposits.

The data remain uncorrected for regional gradient in total field intensity of 5·6 γ per mile in a direction of S 19° W

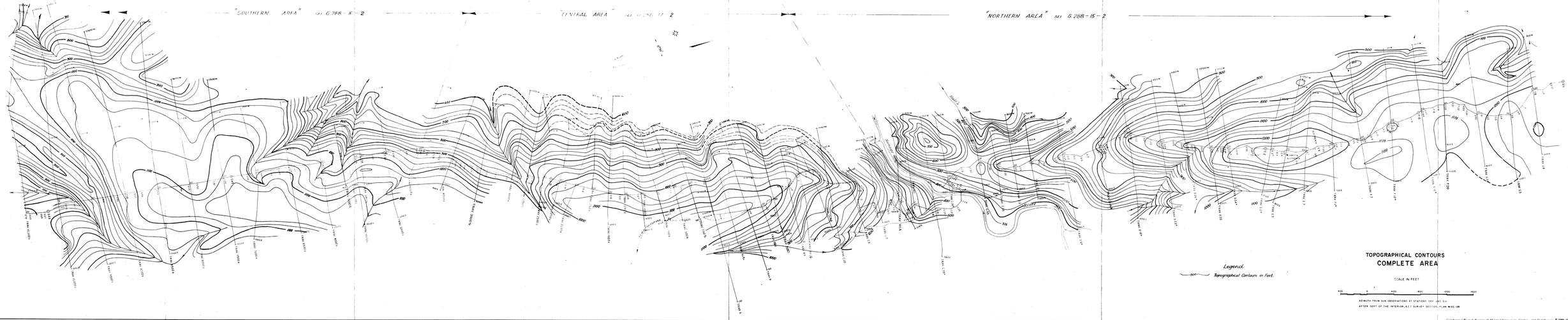
The total intensity was continuously recorded by an airborne magnetometer. The survey was made at an altitude of 500 feet above ground level along lines spaced one half-mile apart.

Photo mosaic assemblies were used as a visual aid to navigation. The actual flight path of the aircraft was plotted from 35 mm. continuous strip photography of the ground taken during flight.

GEOPHYSICAL SECTION, BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS

To Accompany Record No 1962/116

G 288–19



TOPOGRAPHICAL CONTOURS
COMPLETE AREA

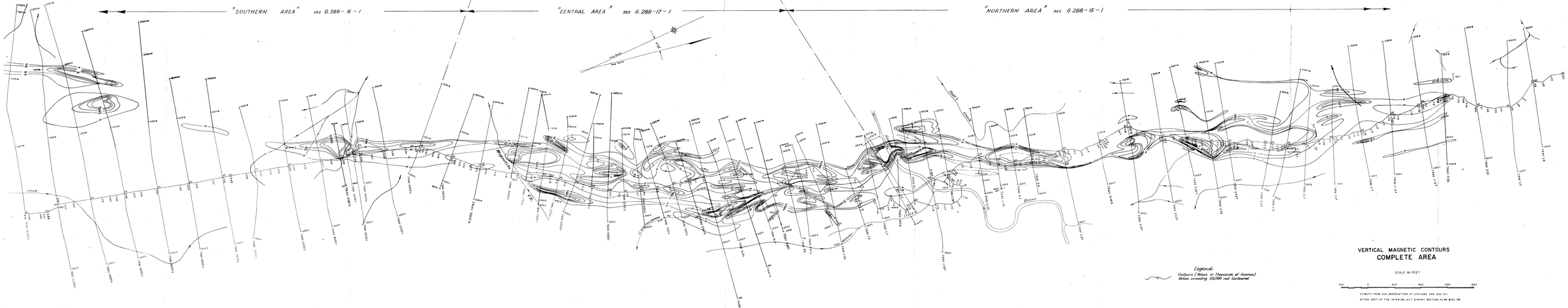
Legend:
Topographical Contours in Feet.

SCALE IN FEET

400 0 400 800 1200 1600

AZIMUTH FROM SUN OBSERVATIONS AT STATIONS SEE G 288-15-2.
AFTER DEPT OF THE INTERIOR, A.C.T. SURVEY SECTION, PLAN W.S.C.-128

Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics. G 288-15-2
To Accompany Record No. 1957/114



Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics. G288-14-1
To Accompany Records No. 1962/14

Savage Riv. Tas. Iron Ore Deposit.
Geophysical Survey, 1961

To Accompany Record No. 1962/116


True North
Magnetic North
Halls Creek
Savage River
Webster Ck.
LEGEND
Greater than 50,000 gammas
40,000 - 50,000 gammas
30,000 - 40,000 gammas
20,000 - 30,000 gammas
10,000 - 20,000 gammas
Less than 10,000 gammas
Baseline with Surveyors Stations
Surveyors Reference Tree
Traverse
Contours (Values in Thousands of Gammas)
(Values exceeding 50,000 not contoured)
Creek
Completed Drill Hole
Recommended Drill Hole
Vehicle Track
TRAV H1
TRAV C28A
TRAV C35
TRAV D2
TRAV D4
TRAV D9A
TRAV D14A
TRAV D18A
TRAV D23A
TRAV D26A
TRAV D30
TRAV D34A
TRAV E2A
TRAV E5
TRAV E7
TRAV F1A
TRAV F7
TRAV F12A
TRAV F16A
TRAV F20
TRAV G00
TRAV G5
TRAV G8
DEPRESSION 30° LENGTH 550 FT.
DEPRESSION 45° LENGTH 700 FT.
Adit
Old Trench

VERTICAL MAGNETIC CONTOURS
NORTHERN AREA

SCALE IN FEET
200 0 200 400 600 800

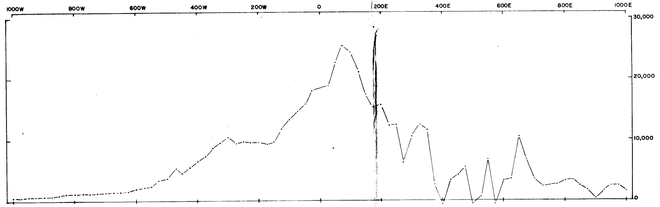
BASED ON DEPT OF INTERIOR, ACT SURVEY SECTION, PLAN MISC 129 SHEET 3.

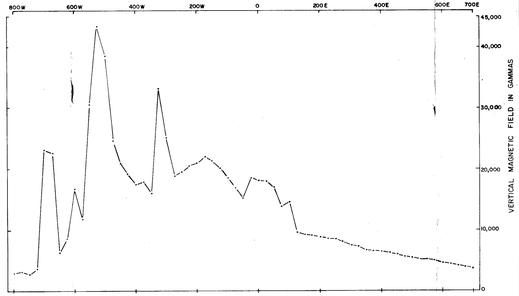
Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics

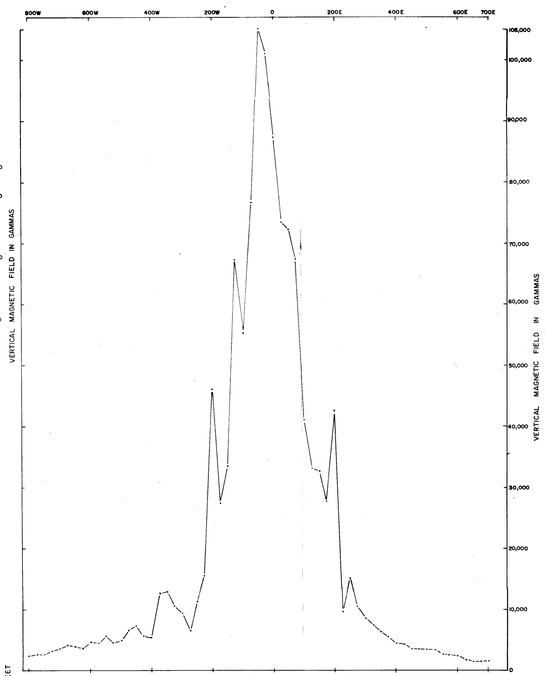
G.288-15-1

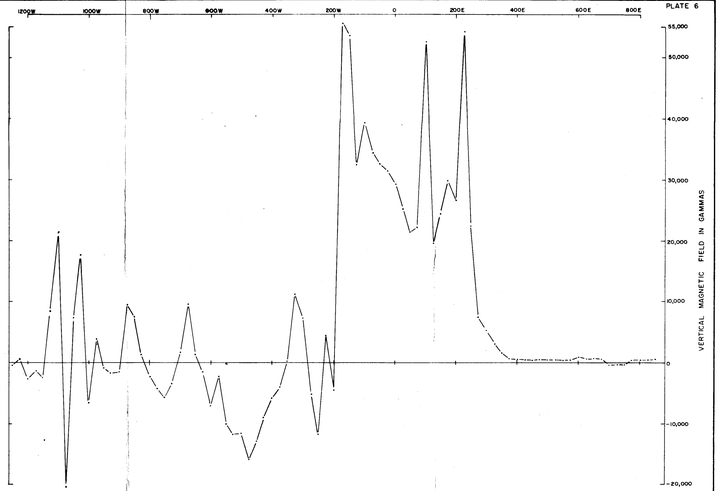
To Accompany Record No. 1962/116

PLATE 6

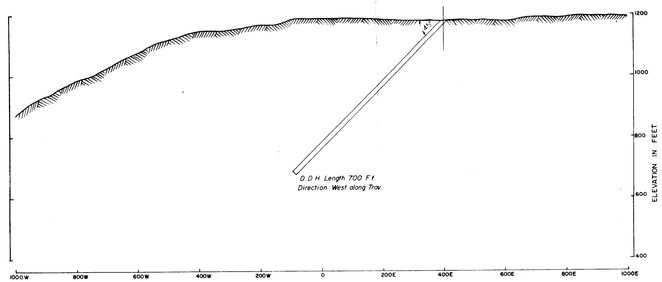




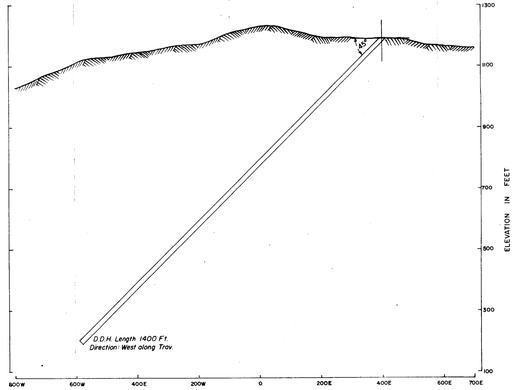




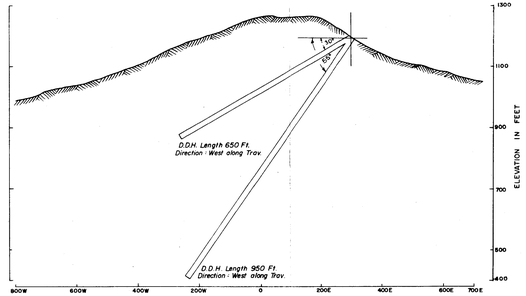
TRAVERSE F16A



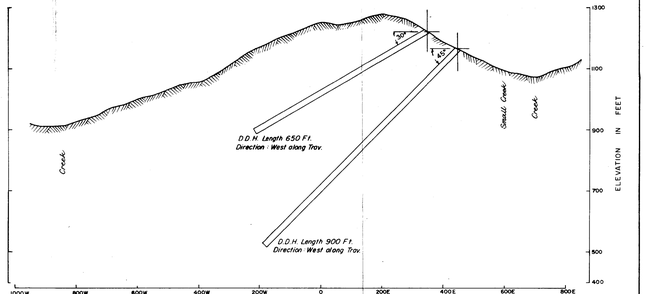
TRAVERSE F1A



TRAVERSE E 2A



TRAVERSE D 30



TRAVERSE	SITE	DIRECTION	DEPRESSION	LENGTH
F16A	400E	West along Traverse	45°	700'
F1A	400E	" " "	45°	1400'
E2A	300E	" " "	30°	650'
	300E	" " "	58°	950'
D30	350E	" " "	30°	650'
	450E	" " "	45°	900'

NORTHERN AREA

TRAVERSES F16A, F1A, E2A, D30

RECOMMENDED DRILL SITES

SCALE IN FEET

200 0 200 400 600 800

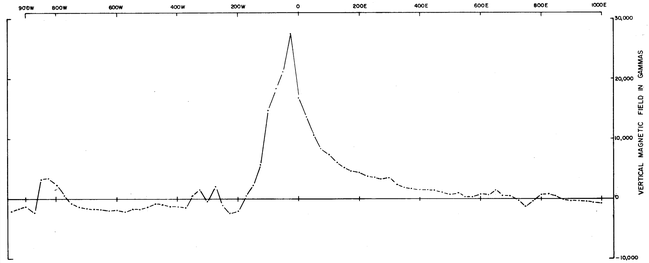
ELEVATION DATUM MEAN SEA LEVEL

Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics G 288 - 22

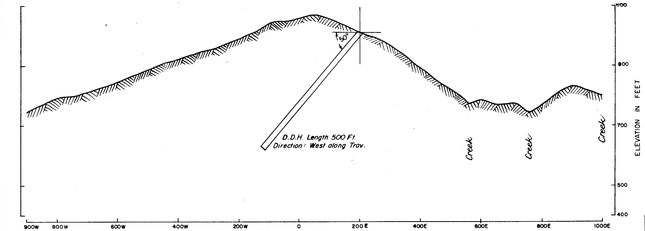
To Accompany Record No. 1962/116

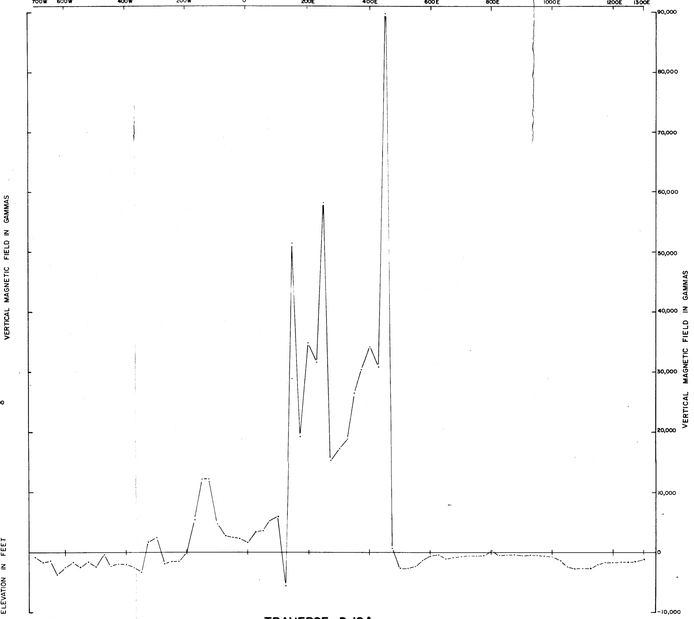
SAVAGE RIVER IRON ORE DEPOSITS TAS. 1962/61

PLATE 7

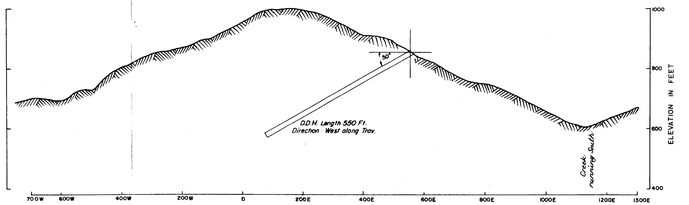


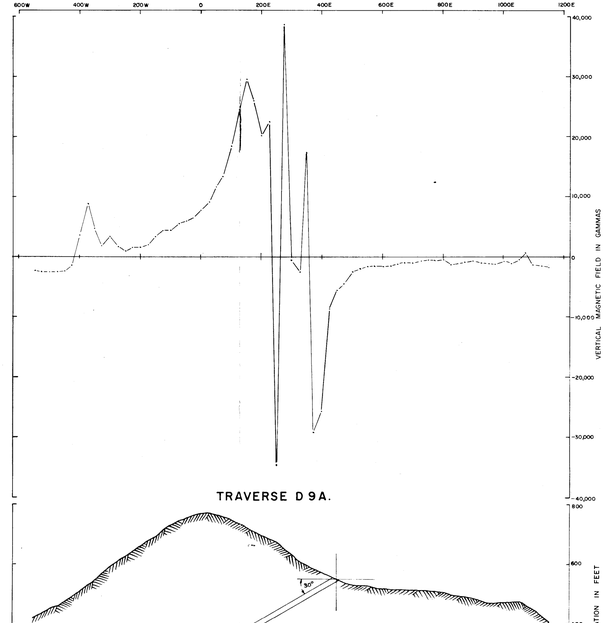
TRAVERSE D 23A.





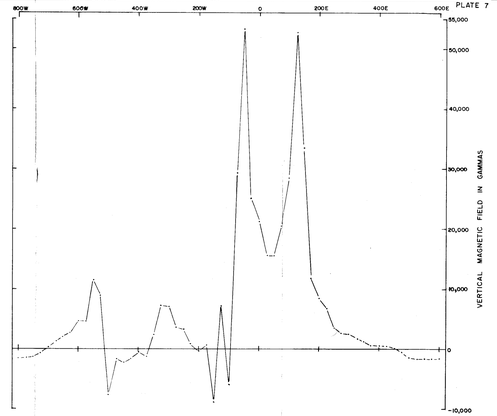
TRAVERSE D 18A.



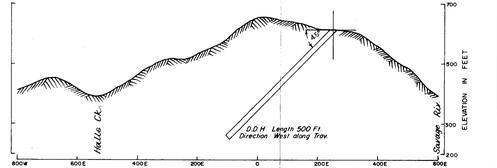


TRAVERSE D 9A.

TRAVERSE	SITE	DIRECTION	DEPRESSION	LENGTH
D23A	200E	West along Trav.	50°	500'
D.18A	550E	" " "	50°	550'
D. 9A	450E	" " "	50°	550'
D. 4	250E	" " "	45°	500'



TRAVERSE D 4.



NORTHERN AREA
TRAVERSES D 23A, D 18A, D 9A, AND D 4
RECOMMENDED DRILL SITES

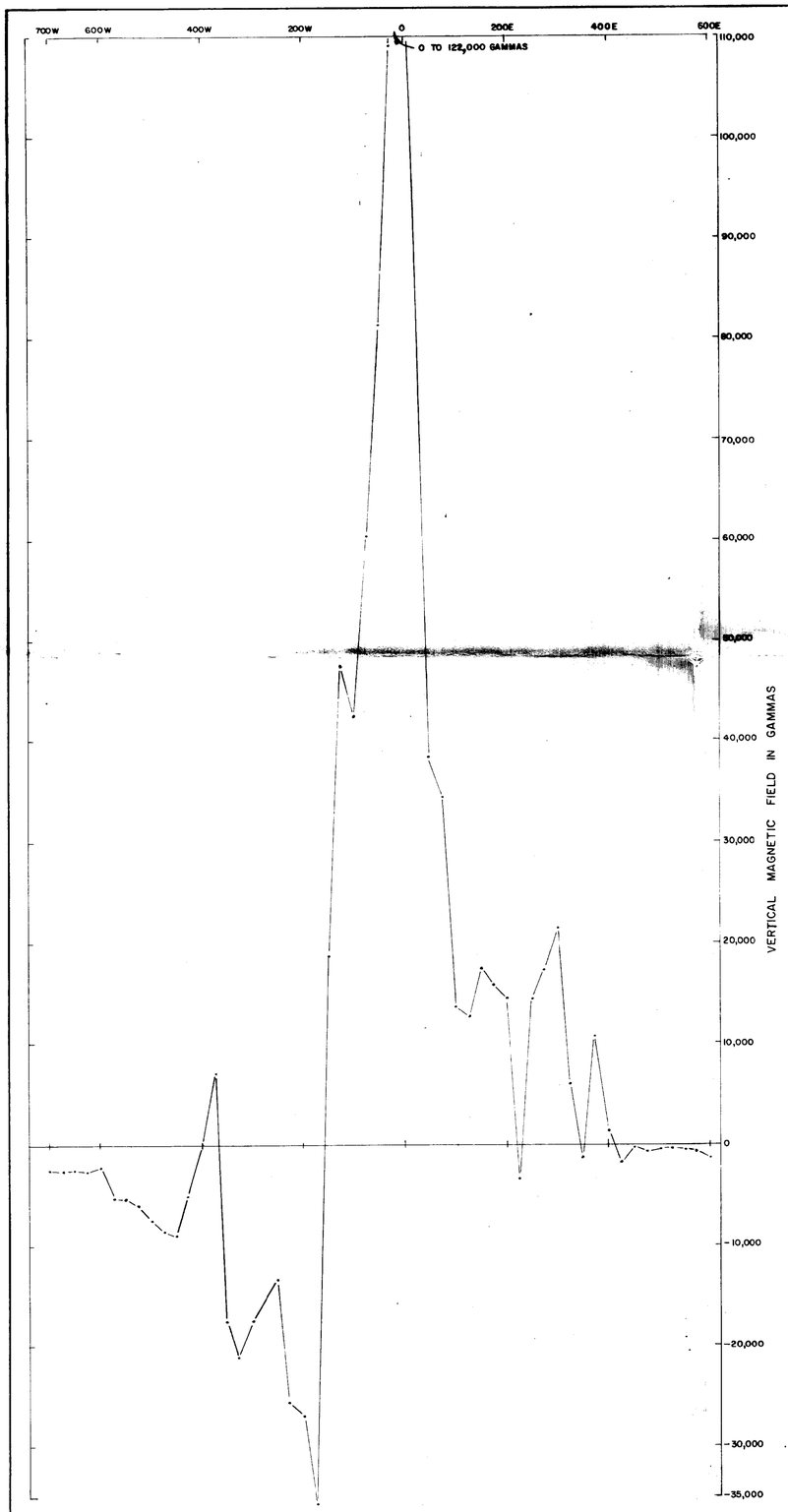
SCALE IN FEET

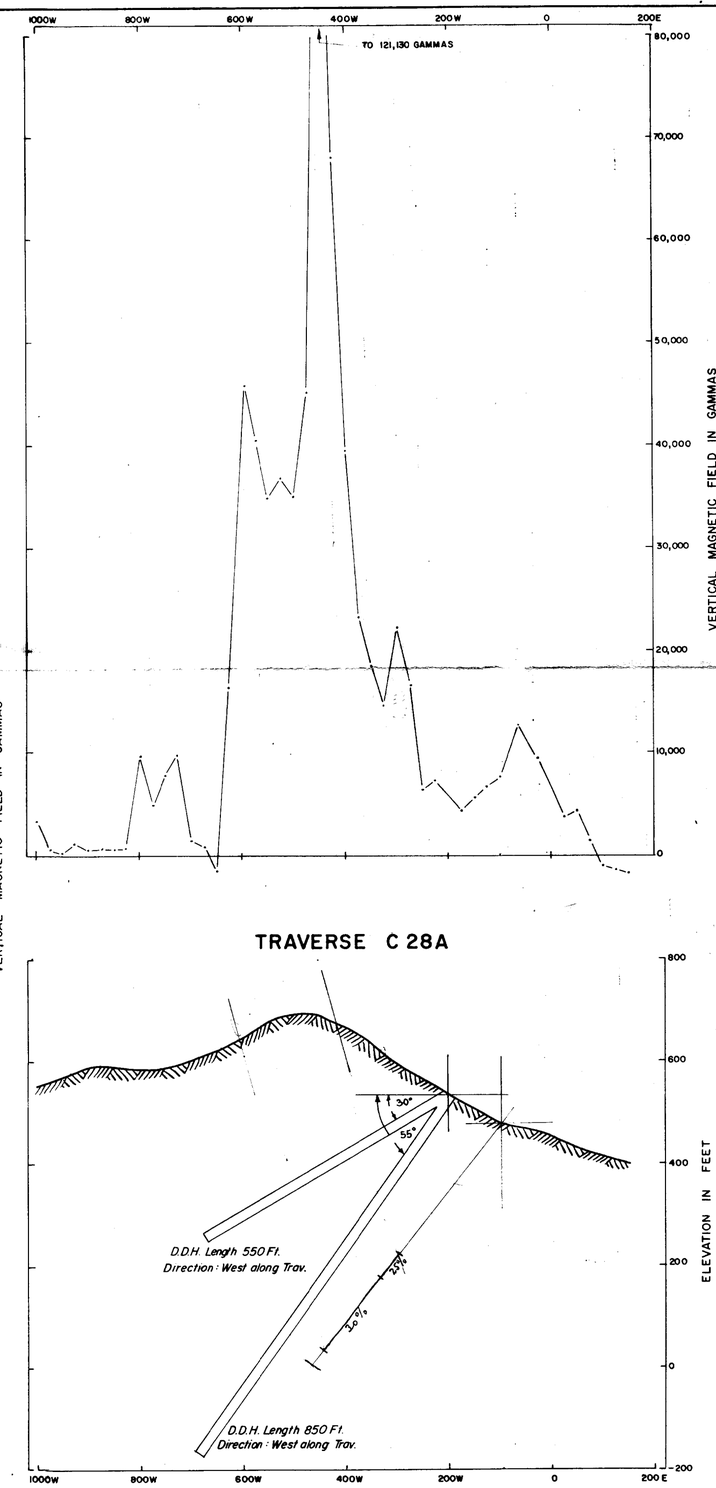
400 200 0 200 400 600 800

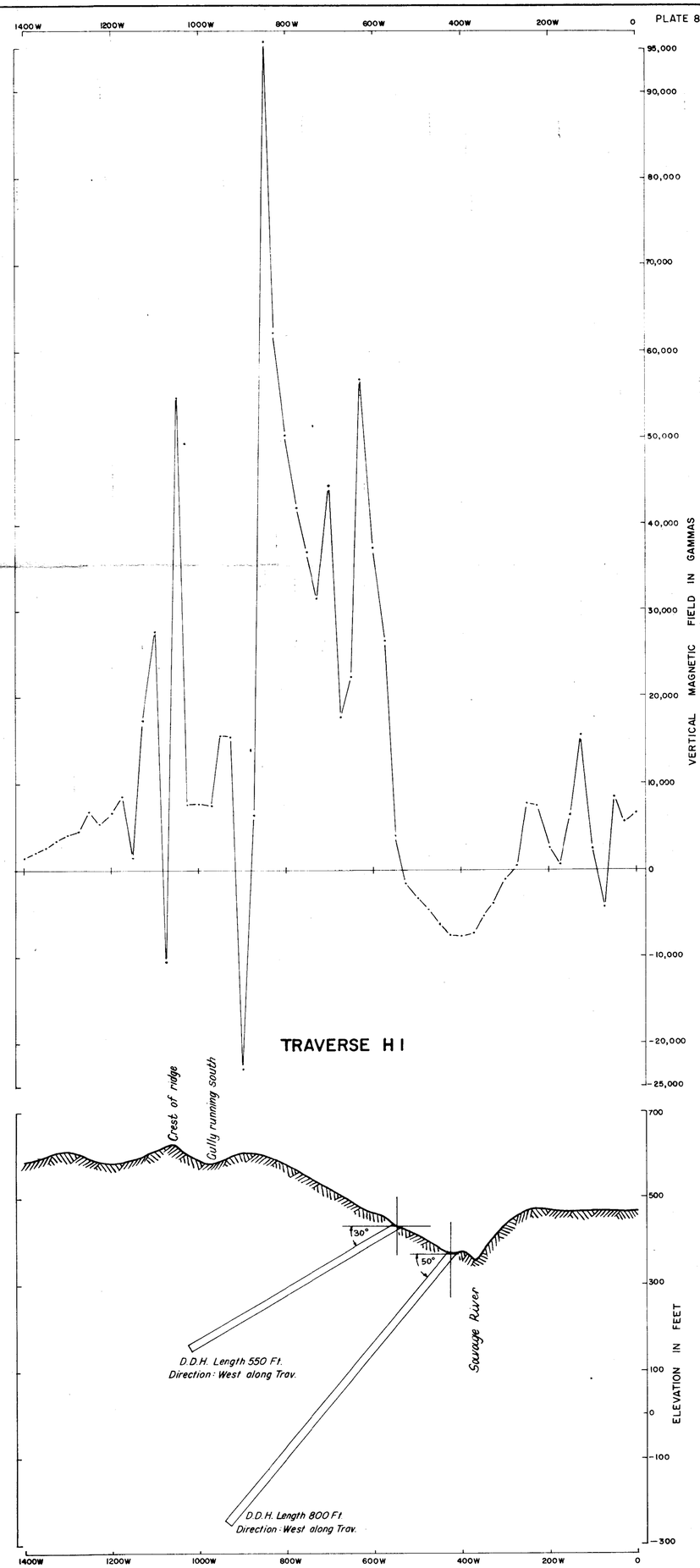
ELEVATION DATUM MEAN SEA LEVEL

Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics G 288 – 23
To Accompany Record No. 1962/116

SAVAGE RIVER IRON ORE DEPOSITS TAS.



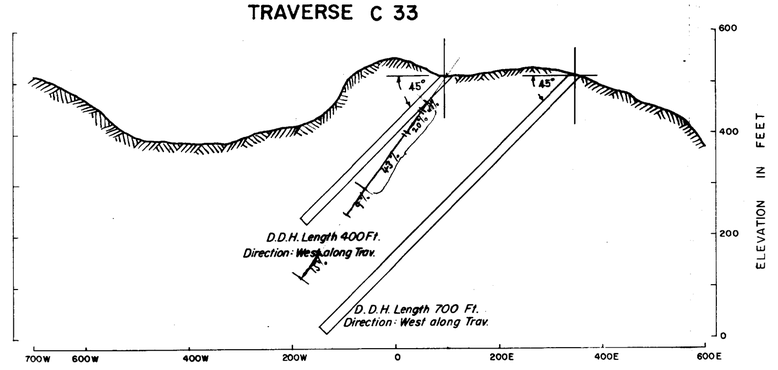




TRAVERSE C 28A

TRAVERSE H I

TRAVERSE C 33



TRAVERSE	SITE	DIRECTION	DEPRESSION	LENGTH
C 33	350E	West along Trav.	45°	700'
	100E	" " "	45°	400'
C 28 A	200W	" " "	30°	550'
	200W	" " "	55°	850'
H I	550W	" " "	30°	550'
	425W	" " "	50°	800'

NORTHERN AREA
TRAVERSES C33, C 28A, AND H I.
RECOMMENDED DRILL SITES

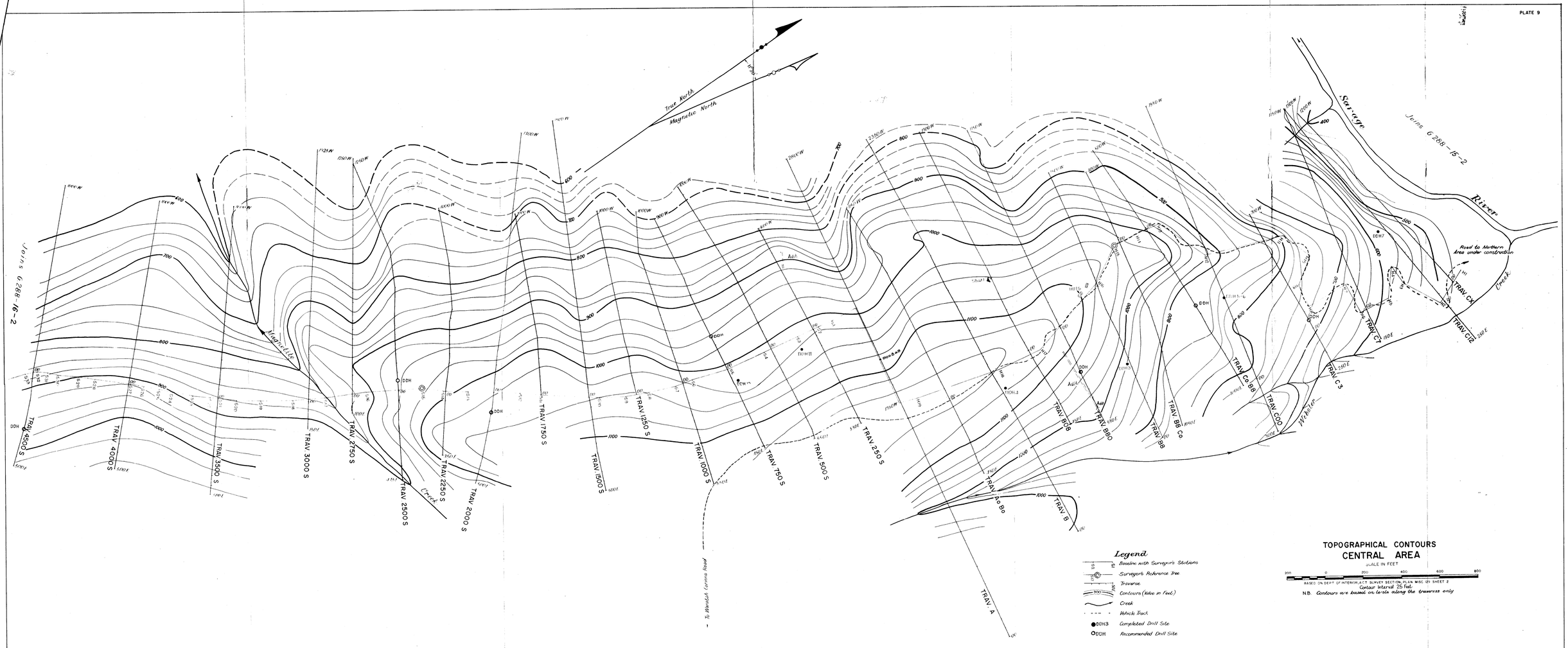
SCALE IN FEET

200 0 200 400 600 800 1000

ELEVATION DATUM MEAN SEA LEVEL

Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics. G.288-24
To Accompany Record No. 1962/116

PLATE 9



Savage River Iron Ore Deposits.

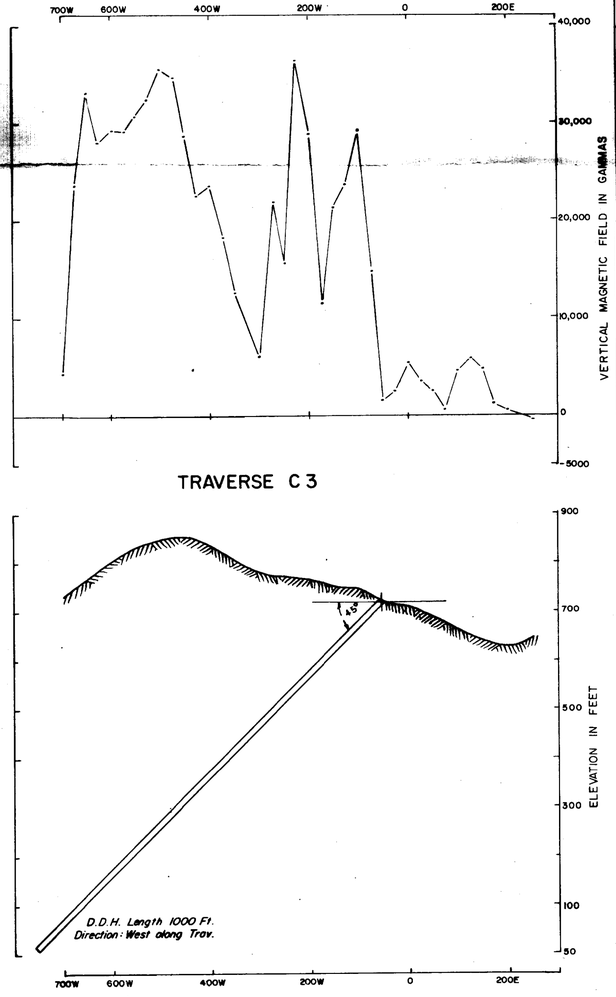
Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics
To Accompany Record No. 1962/116

G 28R - 17 - 2

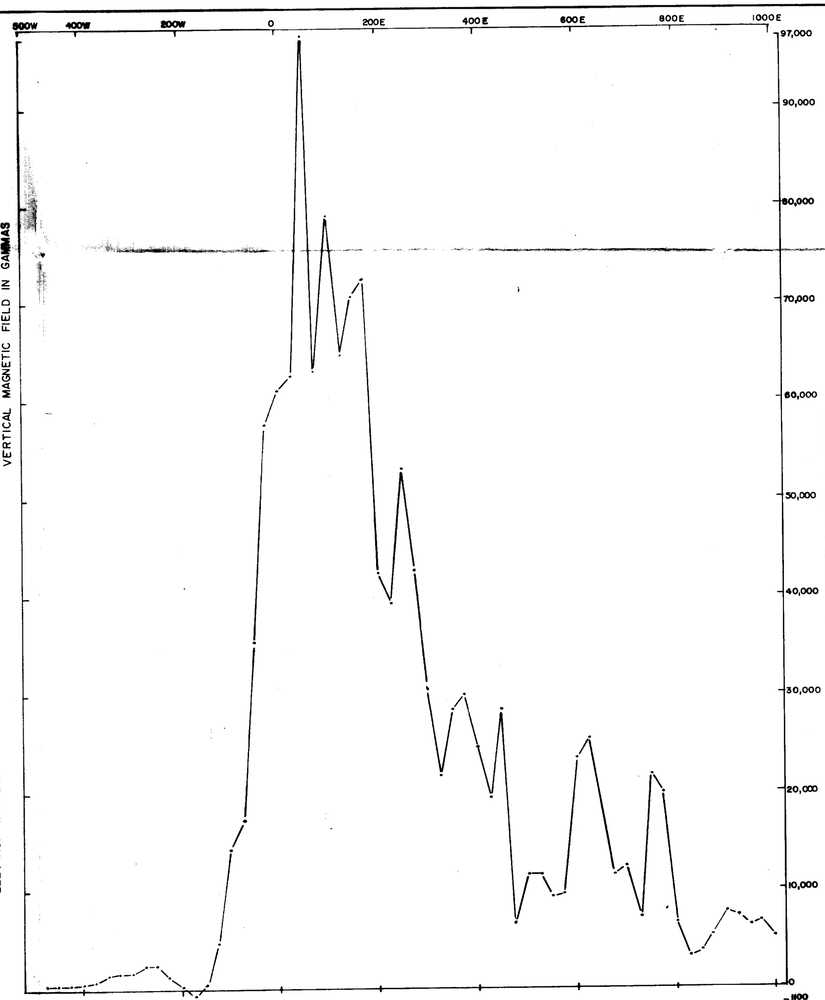
Savage River Tas. Iron Ore Deposits.

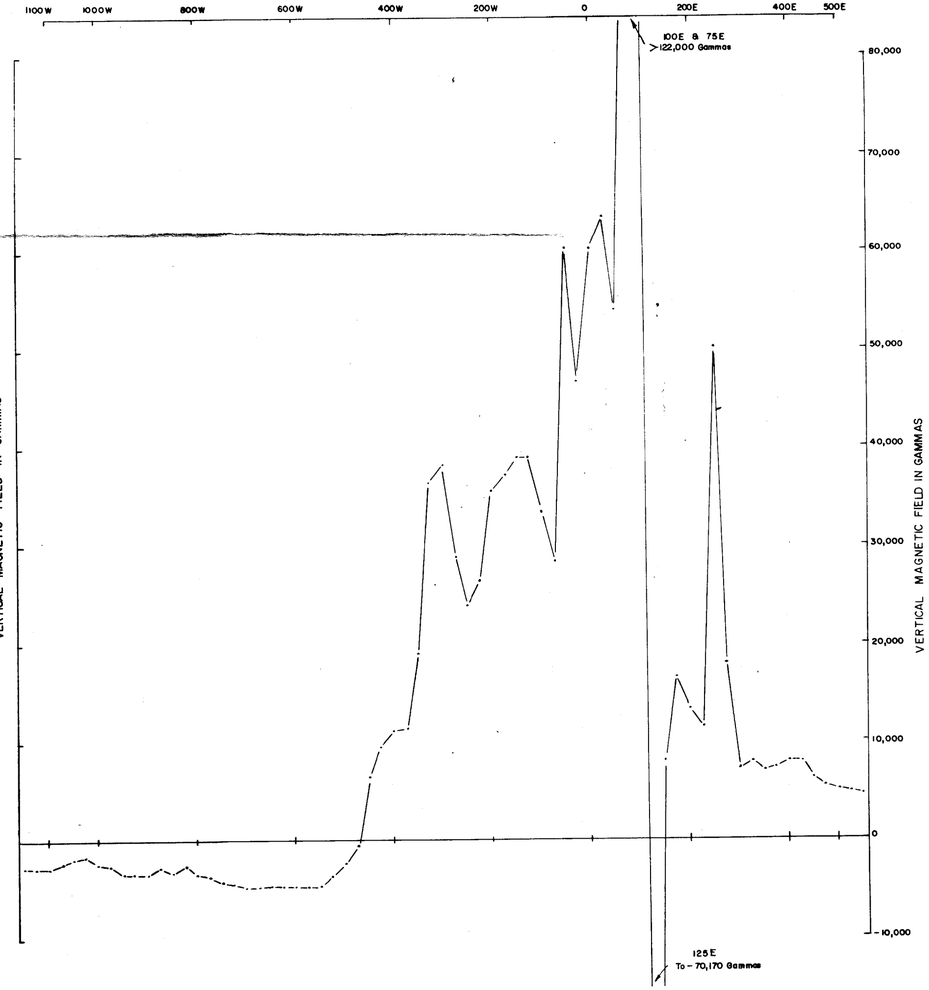
To Accompany Record No 1962/116

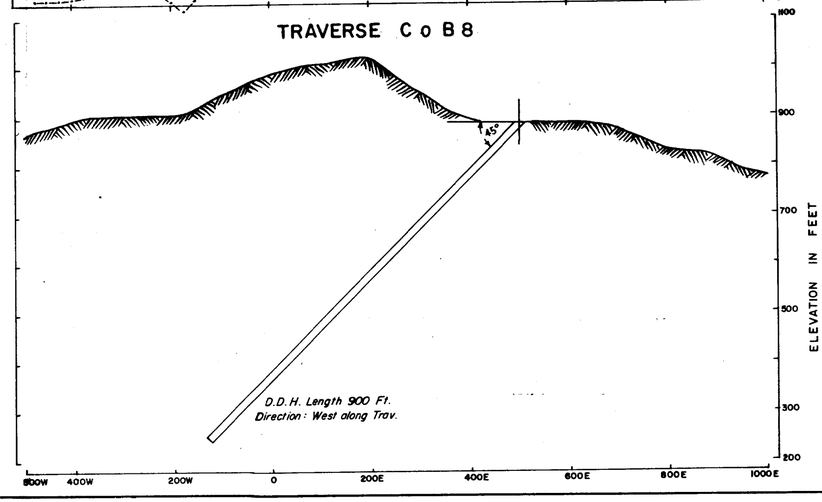
PLATE II

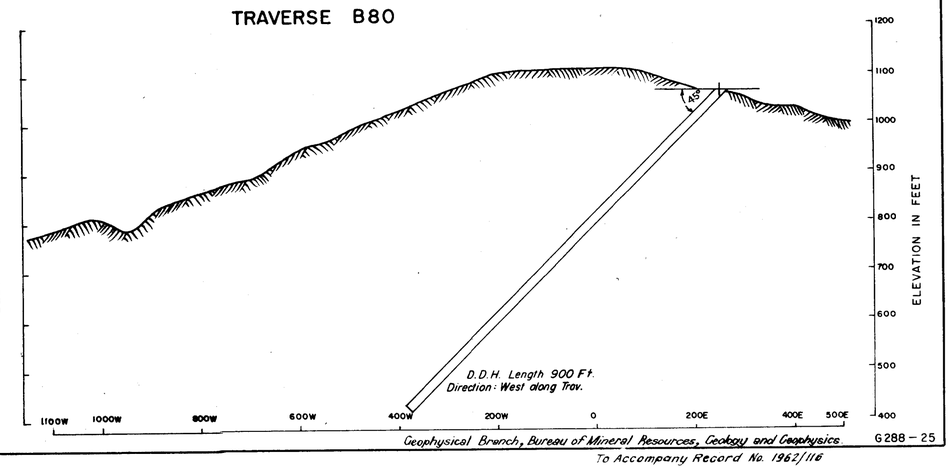


TRAVERSE C 3









CENTRAL AREA
TRAVERSES C3, CoB8, AND B80
RECOMMENDED DRILL SITES

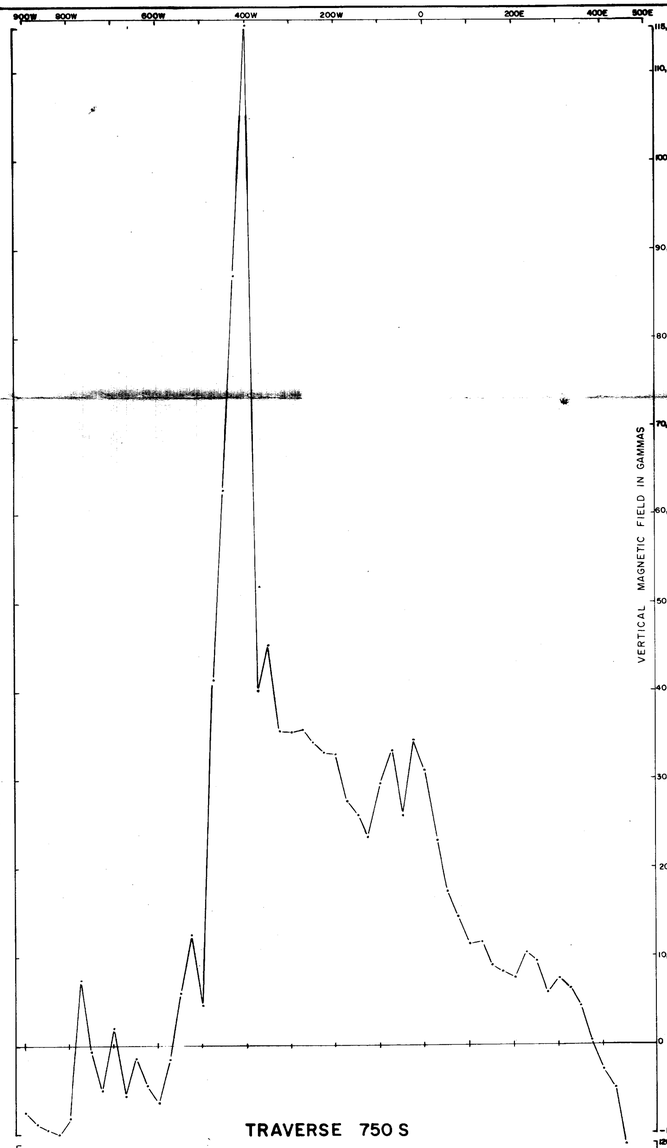
SCALE IN FEET
200 0 200 400 600 800 1000
ELEVATION DATUM MEAN SEA LEVEL

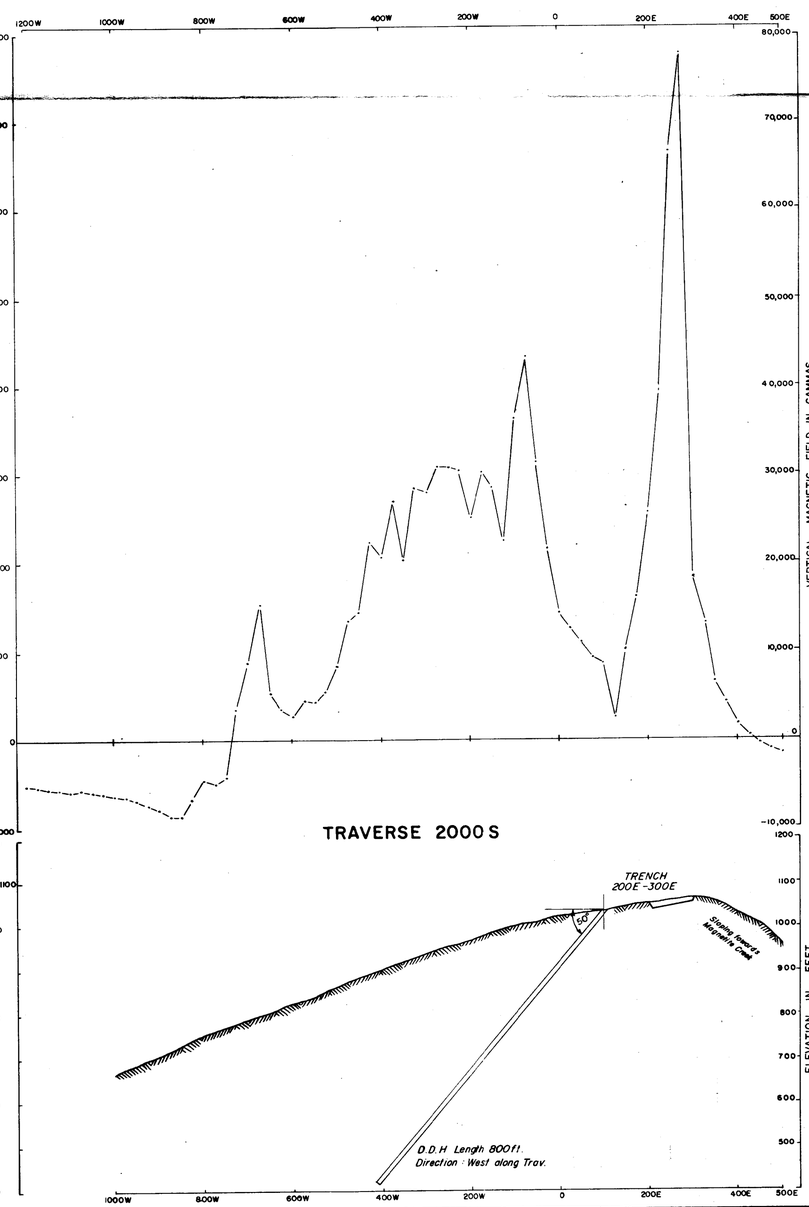
TRAVERSE	SITE	DIRECTION	DEPRESSION	LENGTH
C3	50W	West along Trav.	45°	1000'
CoB8	500E	" " "	45°	900'
B80	250E	" " "	45°	900'

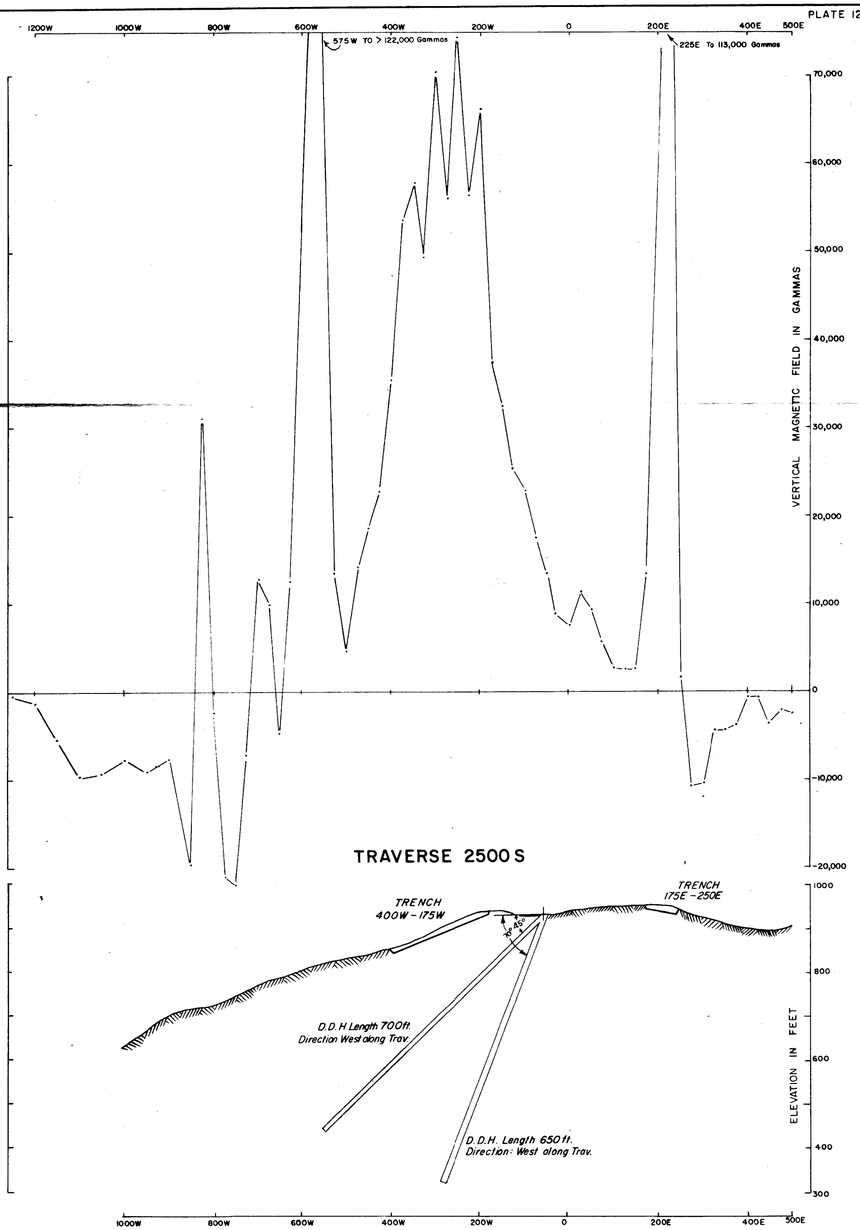
Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics
G288 – 25
To Accompany Record No. 1962/116

SAVAGE RIVER IRON ORE DEPOSITS TAS.

PLATE 12







CENTRAL AREA

TRAVERSES 750 S, 2000S, AND 2500S

RECOMMENDED DRILL SITES AND TRENCHES

SCALE IN FEET

200 0 200 400 600

ELEVATION DATUM MEAN SEA LEVEL

TRAVERSE	SITE	DIRECTION	DEPRESSION	LENGTH
750 S	200W	West along Traverse	45°	550'
2000 S	100 E	" " "	50°	800'
2500 S	50W	" " "	45°	700'
2500 S	50W	" " "	70°	650'

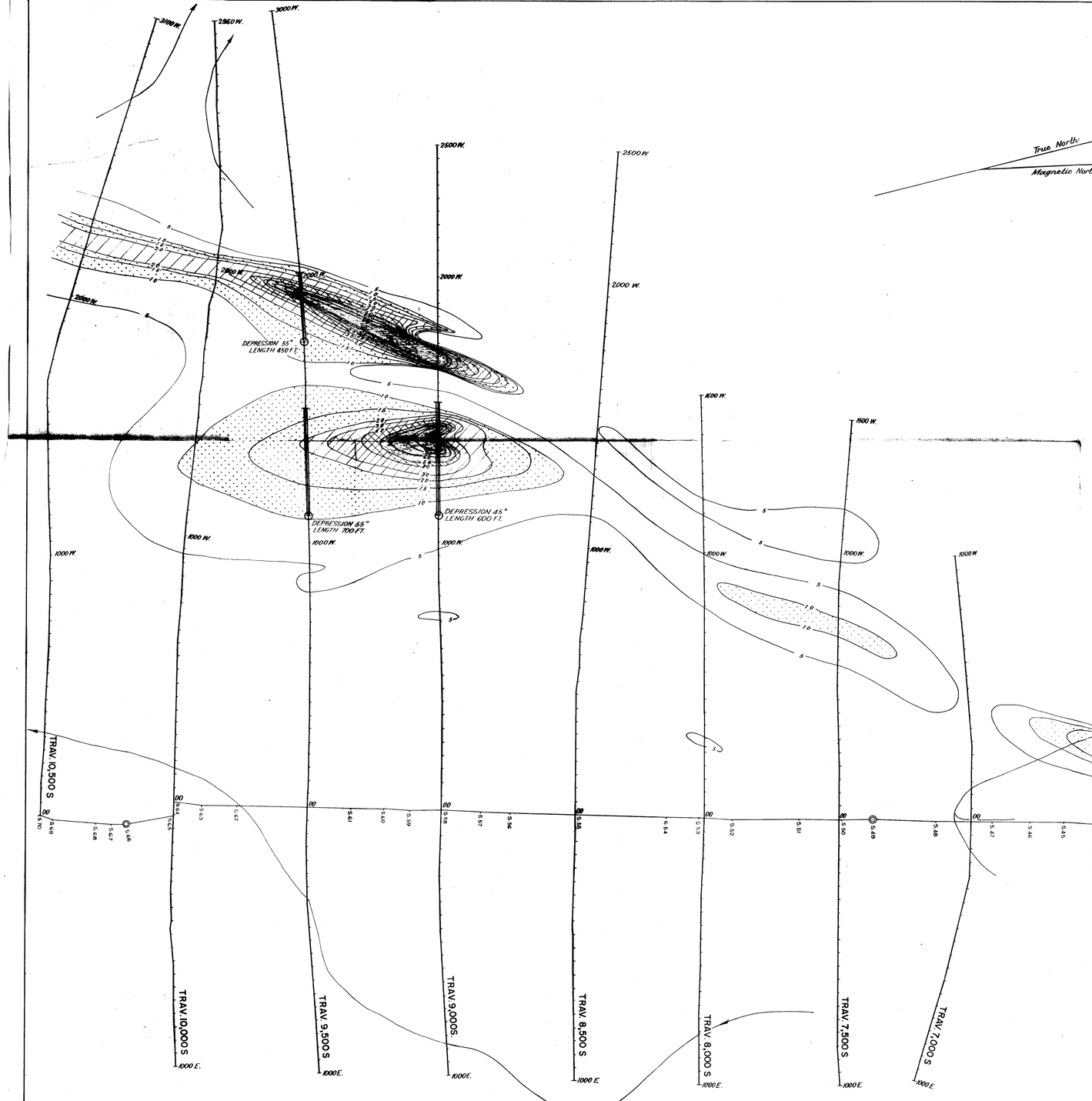
Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics. G 288-18-2

To Accompany Record No 1962/116

SAVAGE RIVER IRON ORE DEPOSITS TAS.


True North
Magnetic North
LEGEND
BASELINE WITH SURVEYORS STATIONS
SURVEYORS REFERENCE TREE
TRAVERSE
900
CONTOURS (VALUES IN FEET)
CREEK
DDH
RECOMMENDED DRILL SITE
DDH
TOPOGRAPHICAL CONTOURS
SOUTHERN AREA
SCALE IN FEET
BASED ON DEPT OF INTERIOR R.P.R. SURVEY SECTION, PLAN MISC 29 SHEETS 1&2
Contour Interval 25 Feet.
N.B. Contours are based on levels along the traverses only
Savage River Iron Ore Deposits
Joins G288 17-2
GEOPHYSICAL BRANCH, BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS G288-16-2
To Accompany Record No 1962/116

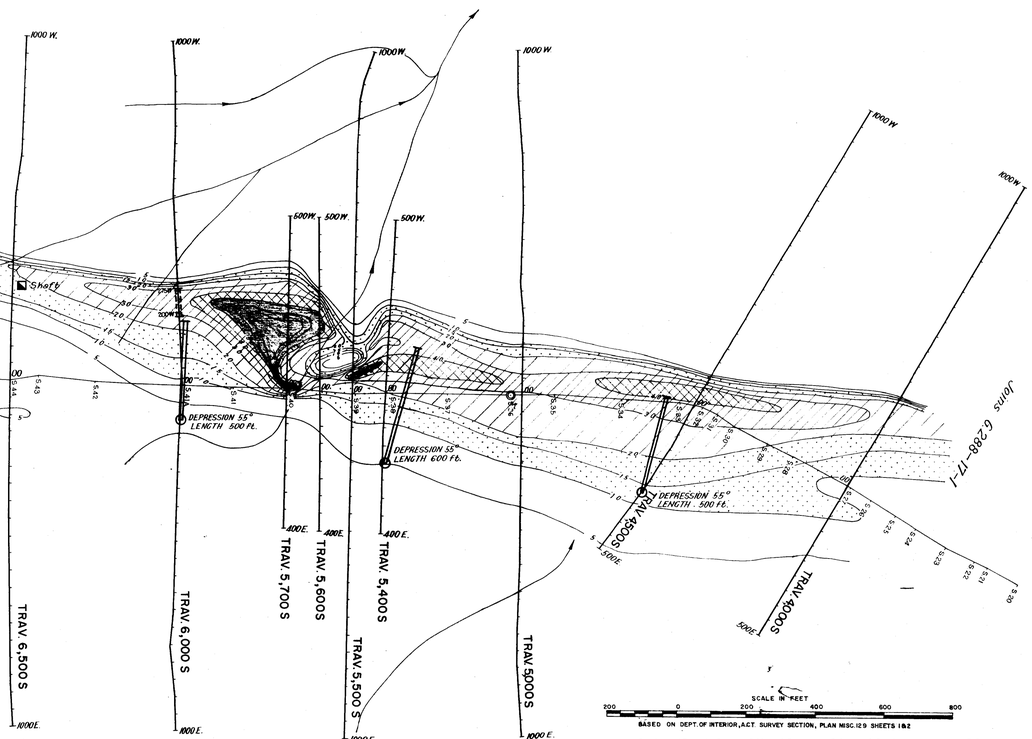
PLATE 14



LEGEND

- GREATER THAN 50,000 GAMMAS
- 40,000 - 50,000 GAMMAS
- 30,000 - 40,000 GAMMAS
- 20,000 - 30,000 GAMMAS
- 10,000 - 20,000 GAMMAS
- LESS THAN 10,000 GAMMAS
- BASELINE WITH SURVEYORS STATIONS
- SURVEYORS REFERENCE TREE
- TRAVERSE
- CONTOURS (Values in Thousands of Gammas)
- CREEK
- RECOMMENDED DRILL HOLE
- RECOMMENDED TRENCH

VERTICAL MAGNETIC CONTOURS
SOUTHERN AREA

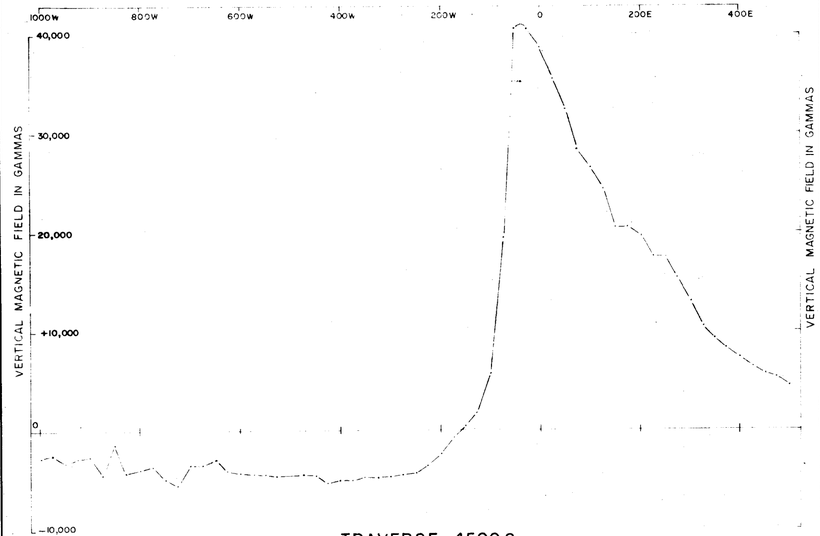


Johns 6.288-17-1

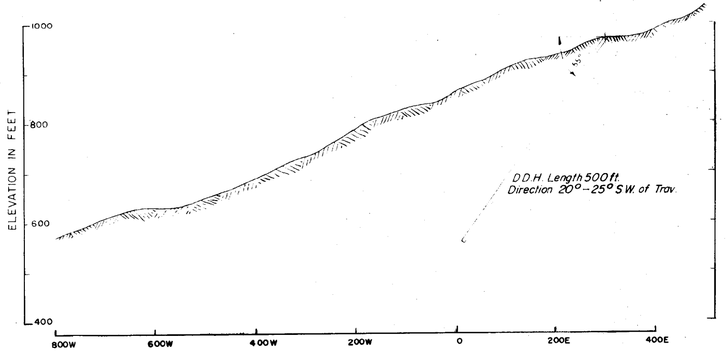
Savage River Tas. Iron Ore Deposits

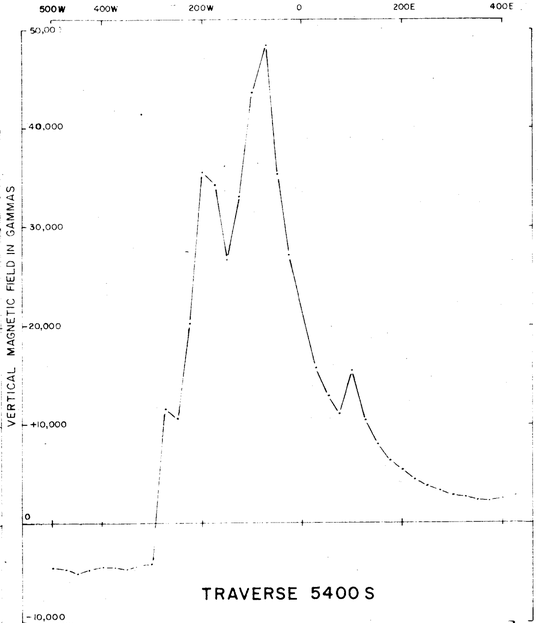
Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics. G 288 – 16 – 1

To Accompany Record No. 1962/116

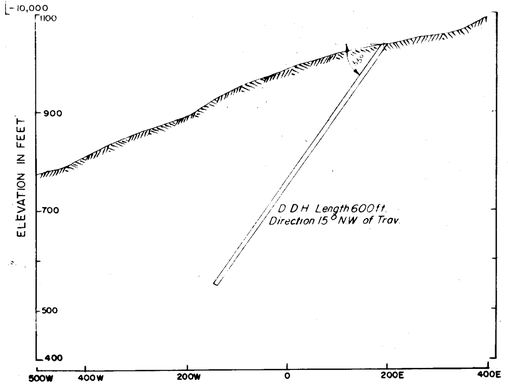


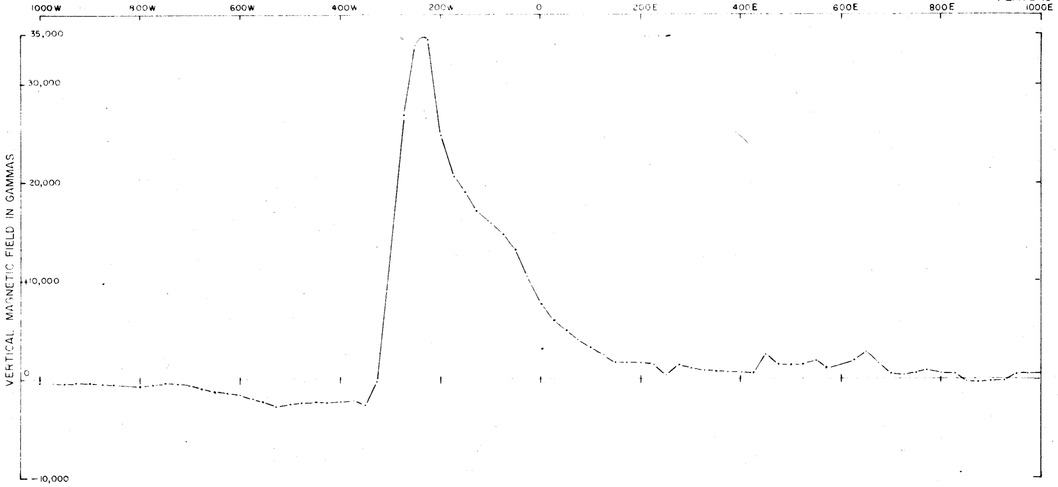
TRAVERSE 4500 S



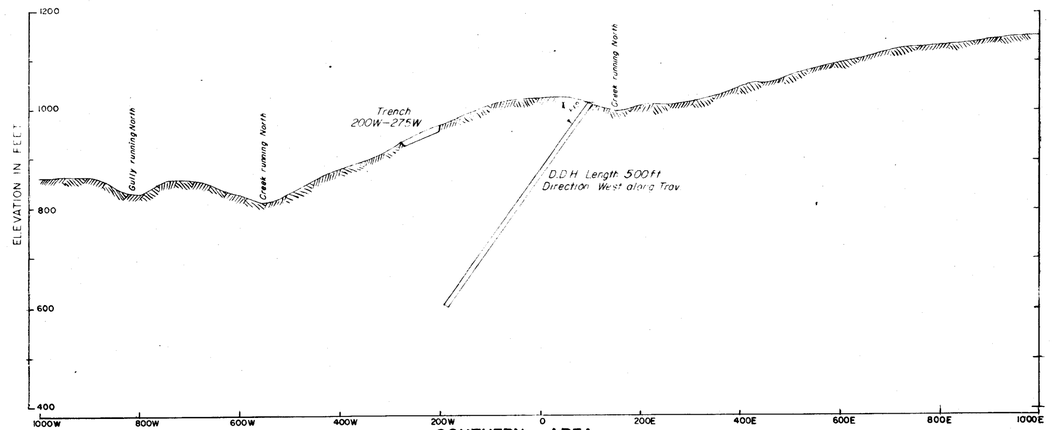


TRAVERSE 5400 S





TRAVERSE 6000 S



TRAVERSE	SITE	DIRECTION	DEPRESSION	LENGTH
4500S	300E	20°-25° S.W. of Trav. direction	55°	500'
5400S	200E	15° N.W. of Trav. direction	55°	600'
6000S	100E	West along Traverse	55°	500'

SOUTHERN AREA
TRAVERSES 4500S, 5400S, AND 6000S.
RECOMMENDED DRILL SITES AND TRENCHES

SCALE IN FEET

200 0 200 400 600 800 1000

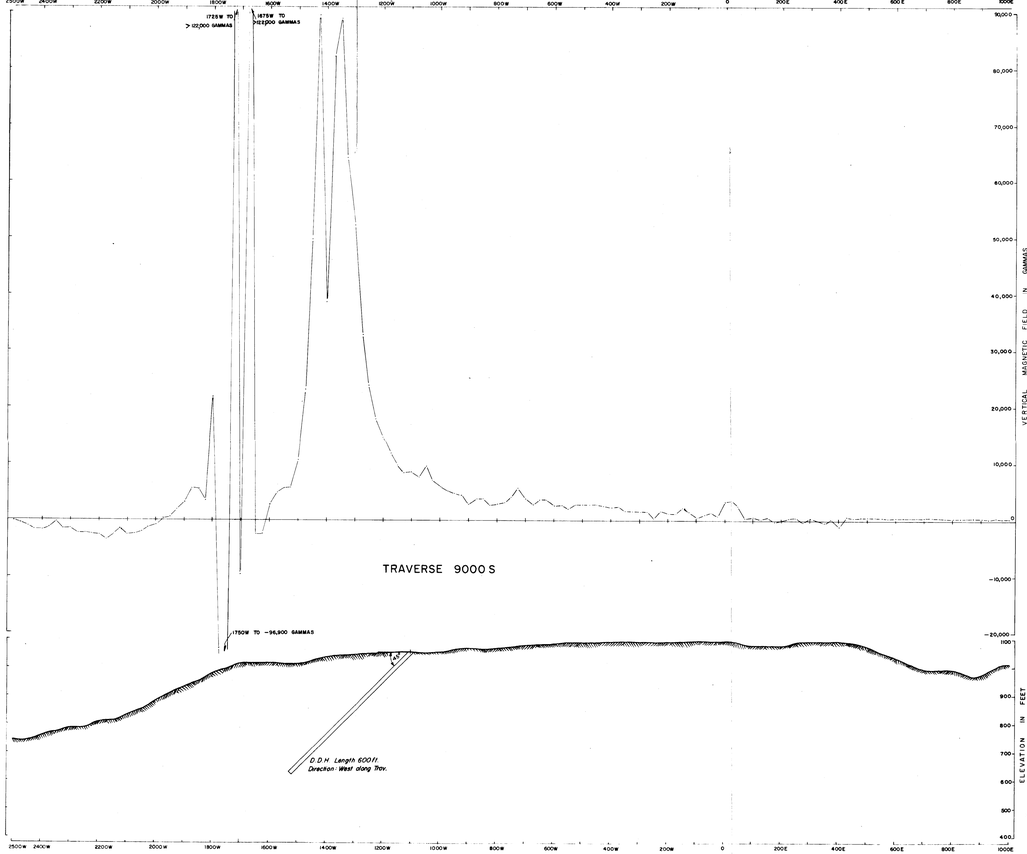
ELEVATION DATUM MEAN SEA LEVEL

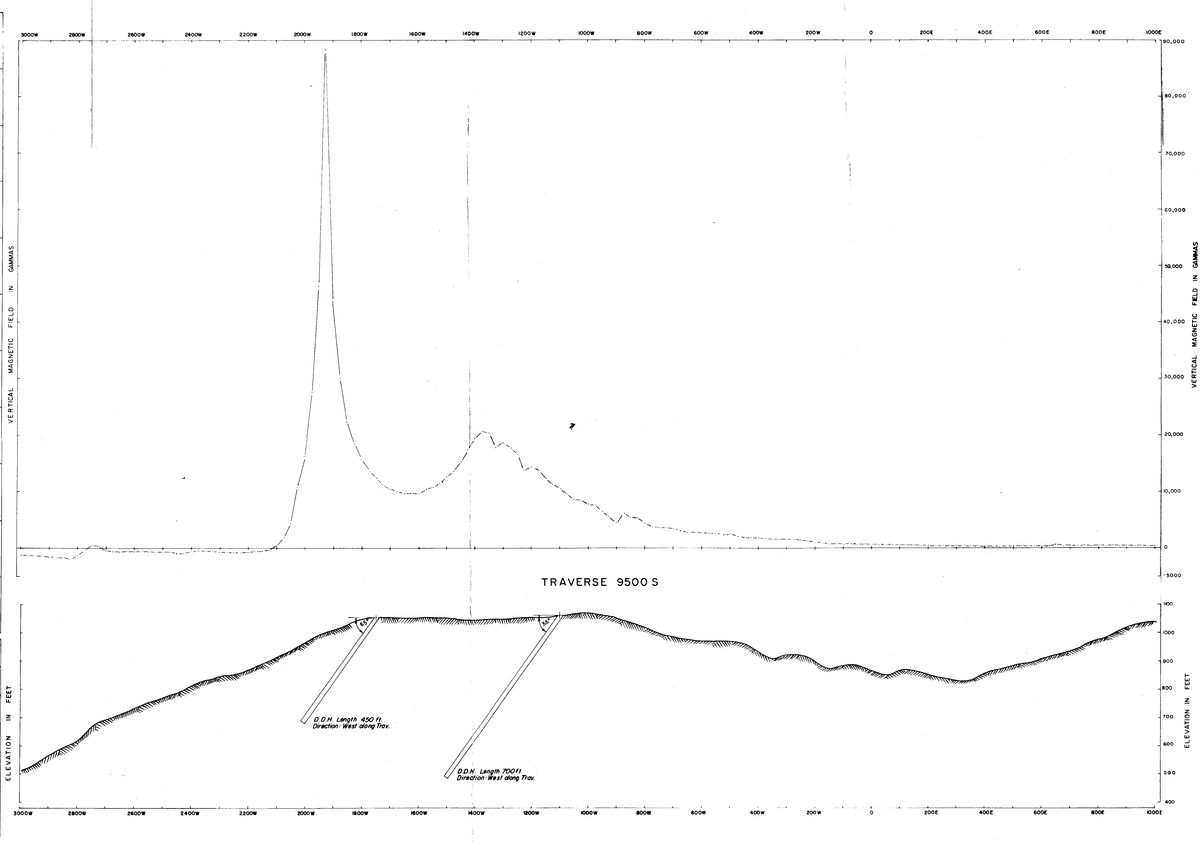
Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics G 288 – 18 – 1

To Accompany Record No. 1962/116

Savage River Tas. Iron Ore Deposits

PLATE 16





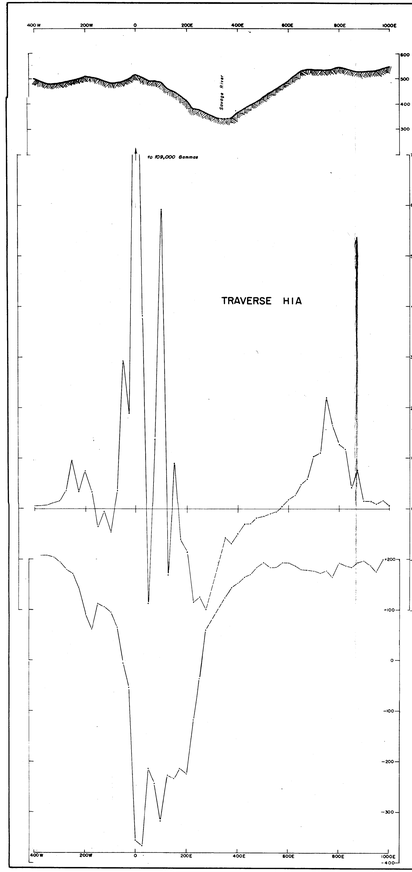
TRAVERSE	SITE	DIRECTION	DEPRESSION	LENGTH
9000 S	1100 W	West along Trav.	45°	600'
9500 S	1100W	" " "	55°	700'
	1750W	" " "	85°	490'

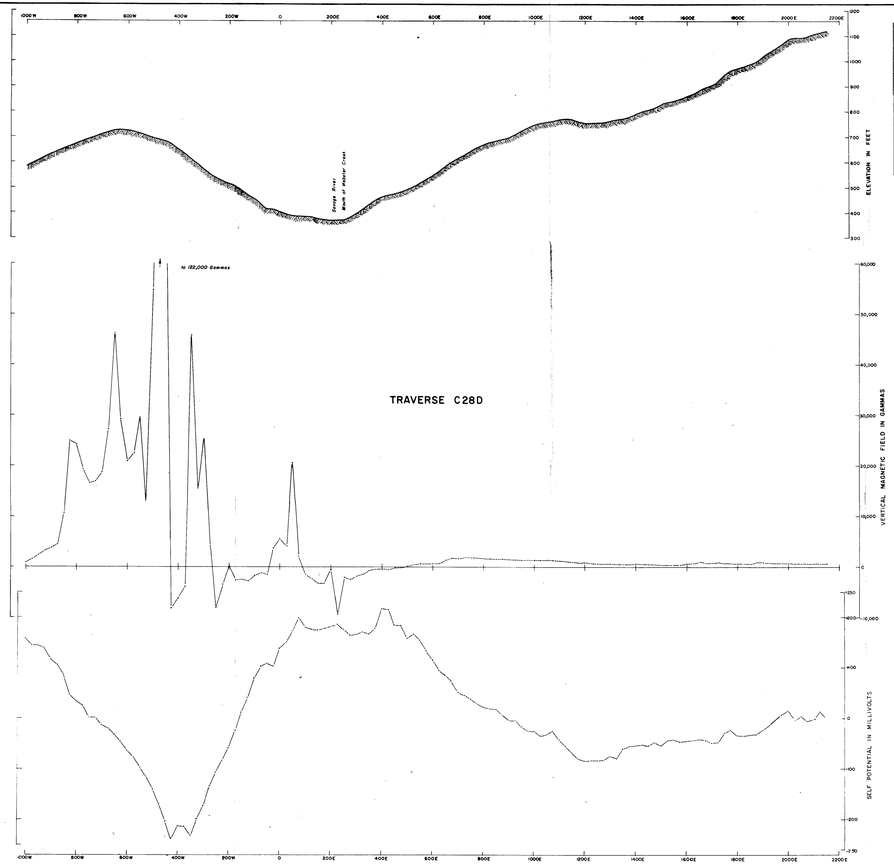
SOUTHERN AREA
TRAVERSES 9000S AND 9500S
RECOMMENDED DRILL SITES

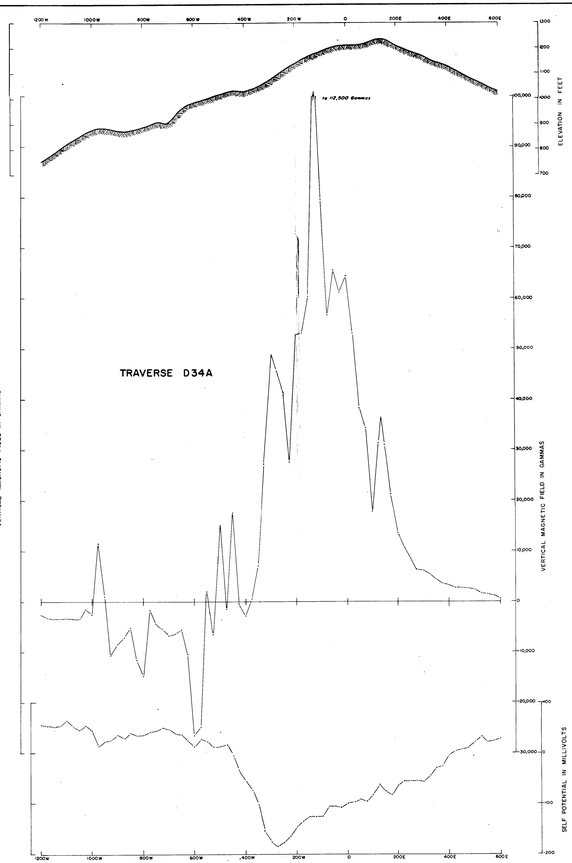
SCALE IN FEET
200 0 200 400 600
ELEVATION DATUM MEAN SEA LEVEL

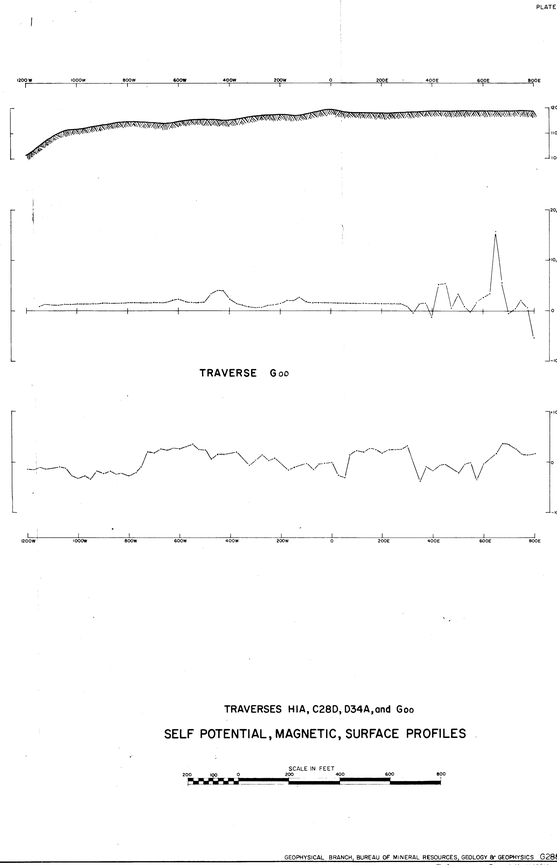
SAVAGE RIVER IRON ORE DEPOSITS TAS

Geological Branch, Bureau of Mineral Resources, Geology and Geophysics G288-21
To Accompany Record No 1967/116









TRAVERSES H1A, C28D, D34A, and G00

SELF POTENTIAL, MAGNETIC, SURFACE PROFILES

SCALE IN FEET

200 100 0 200 400 600 800

GEOPHYSICAL BRANCH, BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS G288-27

To Accompany Record No 1962/14

Savage River Tas Iron Ore Deposits