ASX Announcement **9th March 2021**

Magnetic (SAM) Survey Highlights New Targets at Devon – Lake Carey Gold Project

Highlights

- 38 structural targets identified by a recent Sub-Audio Magnetic (SAM) Survey at Devon provides new drilling targets
- The survey was designed to cover a structurally complex and strongly gold mineralised area SE of Devon, including Hill East. Previously reported drilling results intersected mineralisation at shallow depth including[1]:
  - 5m @ 4.01 g/t Au from 6m (20HERC001)
  - 9m @ 3.04 g/t Au from surface (20HERC002)
  - 6m @ 3.43 g/t Au from 15m (20HERC005)
  - 27m @ 2.04 g/t Au from 2m (20HERC032)
  - 4m @ 6.3 g/t Au from 13m (20LBRC003)
  - 13m @ 1.86 g/t Au from surface (20LBRC004)
- Matsa has selected 3 targets which have been prioritised for immediate follow up drilling:
  - **EM_LIN1** - a strong electromagnetic anomaly coincident with a zone of extensively developed stockwork quartz veining in sheared and brecciated metasediments 300m SE of the Devon pit. No previous drilling has been recorded on this target which is covered by a soil gold anomaly >1km long
  - **MMC_HE1** - an ESE trending strong magnetometric conductivity zone linking the HE1 and HE2 prospects at Hill East, where Matsa announced strong drilling results in early 2020
  - **MMC_HE5** - an ESE trending strong magnetometric conductivity zone, which is adjacent to Hill East Target HE5 where high grade gold mineralisation was intersected by Matsa at shallow depth in early 2020
- Further targets identified in the survey are currently being evaluated and will continue to be refined over the coming months through follow up field inspection, sampling and drilling

CORPORATE SUMMARY

Executive Chairman

Paul Poli

Directors

Frank Sibbel

Pascal Blampain

Director & Company Secretary

Andrew Chapman

Shares on Issue

271.14 million

Unlisted Options

77.48 million @ $0.17 - $0.35

Top 20 shareholders

Hold 56.86%

Share Price on 8th March 2021

8.5 cents

Market Capitalisation

$23.05 million

[1] ASX Announcement 28 April 2020 - Further High Grade Gold near Devon Hill East - Lake Carey Gold Project

Matsa Resources Limited ("Matsa" or "the Company" ASX: MAT) is pleased to announce that the Sub-Audio Magnetic (SAM) survey completed at Devon has produced 38 targets favourable for gold mineralisation of which 3 have been selected for immediate drill testing.

Devon, within the Lake Carey Gold project (Figure 1), is located 7km south of Matsa's Red October Mine and contains a significant number of historic gold workings. Recent successful drilling by Matsa has been focused on the Devon pit, Olympic, and Hill East prospects. Geological and resource models for Devon pit and Olympic are currently being updated based on the most recent drilling.

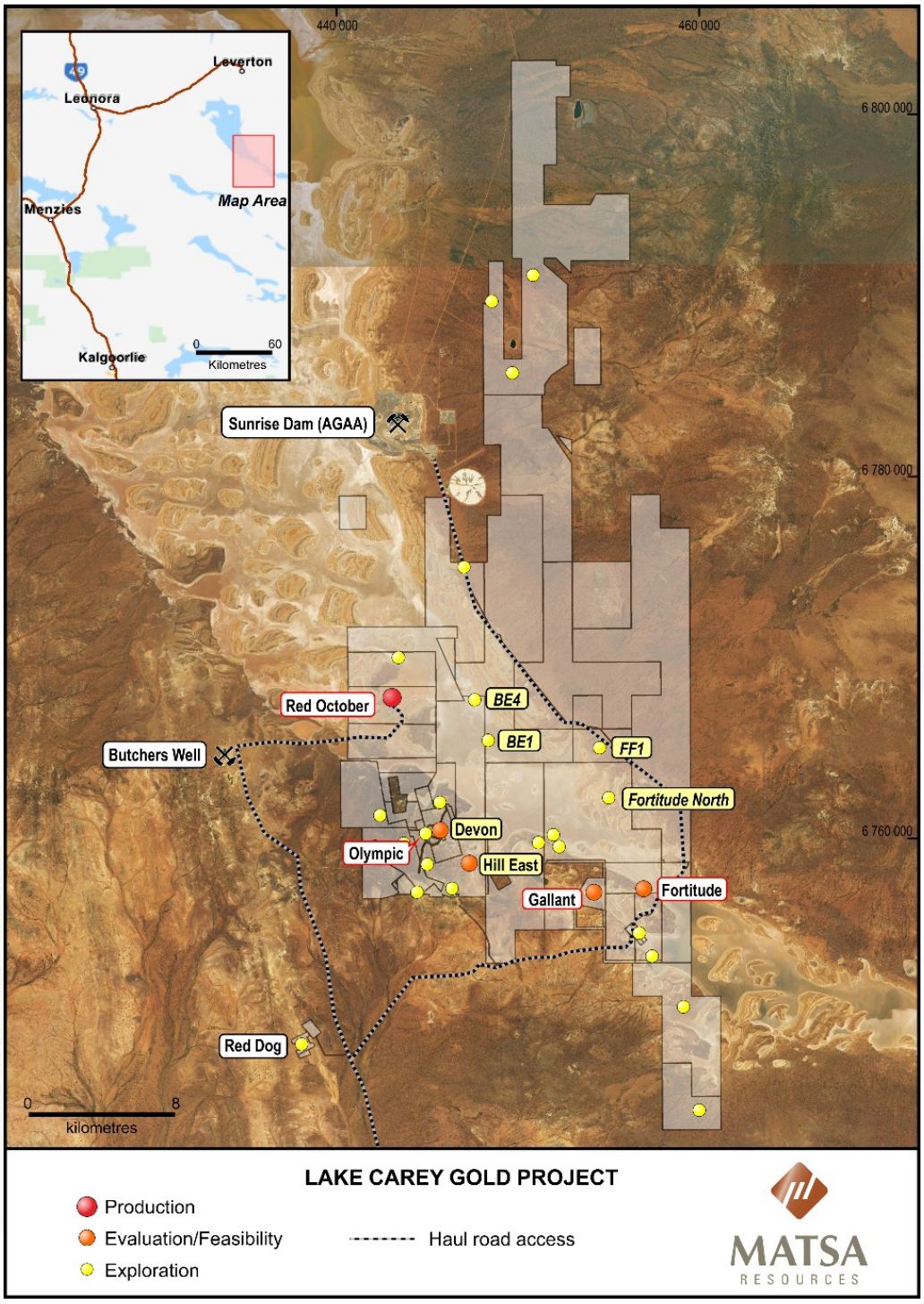

***Figure 1:** Lake Carey Gold Project*

SAM Survey Devon Area

The SAM survey was designed to cover Hill East, directly south of the Devon pit, where drilling by Matsa has identified significant gold at shallow depth at several prospects including HE1 – HE7 and new 1.1km soil gold anomaly LIN1 (Figure 2) [2].

Hill East mineralisation is typically associated with high grade quartz veins which based on past drilling are mineralised over a strike extent of <200m and commonly associated with historic gold workings. Several workings on the eastern side of Hill East are closely associated with a 1.5km long NS trending soil gold anomaly defined by soil gold values >50 ppb Au.

The survey was intended to provide an improved structural framework for gold mineralisation at Hill East to guide further drilling expected to commence in April 2021. SAM has the potential to directly detect mineralised veins/faults, and to map fault intersections as possible off-sets or as vectors for deeper drilling.

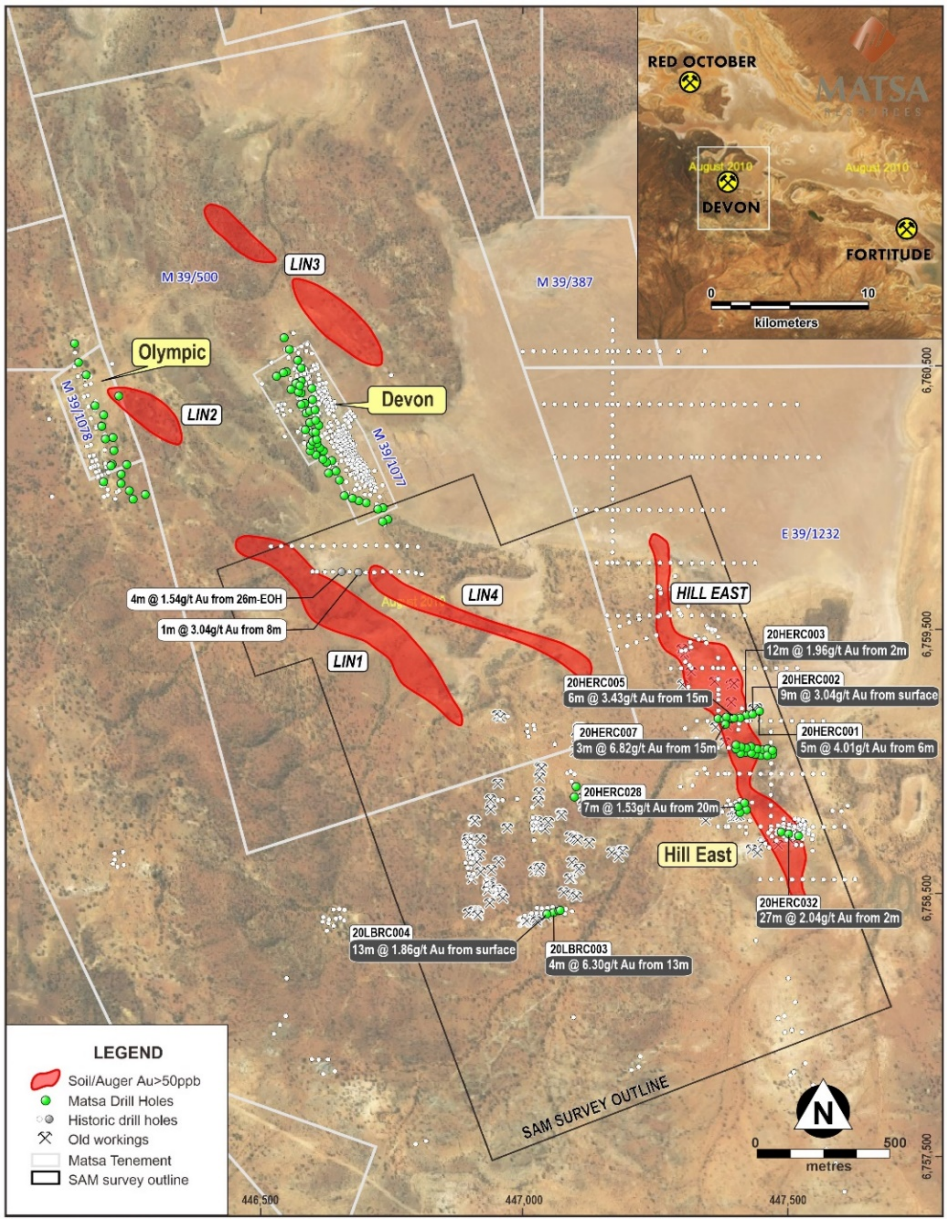

***Figure 2:* Devon area location of SAM Survey, soil gold anomalies**

[2] ASX Announcement 28 April 2020 - Further High Grade Gold near Devon Hill East - Lake Carey Gold Project

LIN1 Target Enhanced by SAM Survey

The LIN1 prospect is characterised by a 1.1km long soil gold anomaly associated with strongly anomalous pathfinder elements Tellurium and Arsenic. LIN1 also coincides with a strong late channel EM anomaly EM_LIN1, which was detected by the SAM survey (Figure 3).

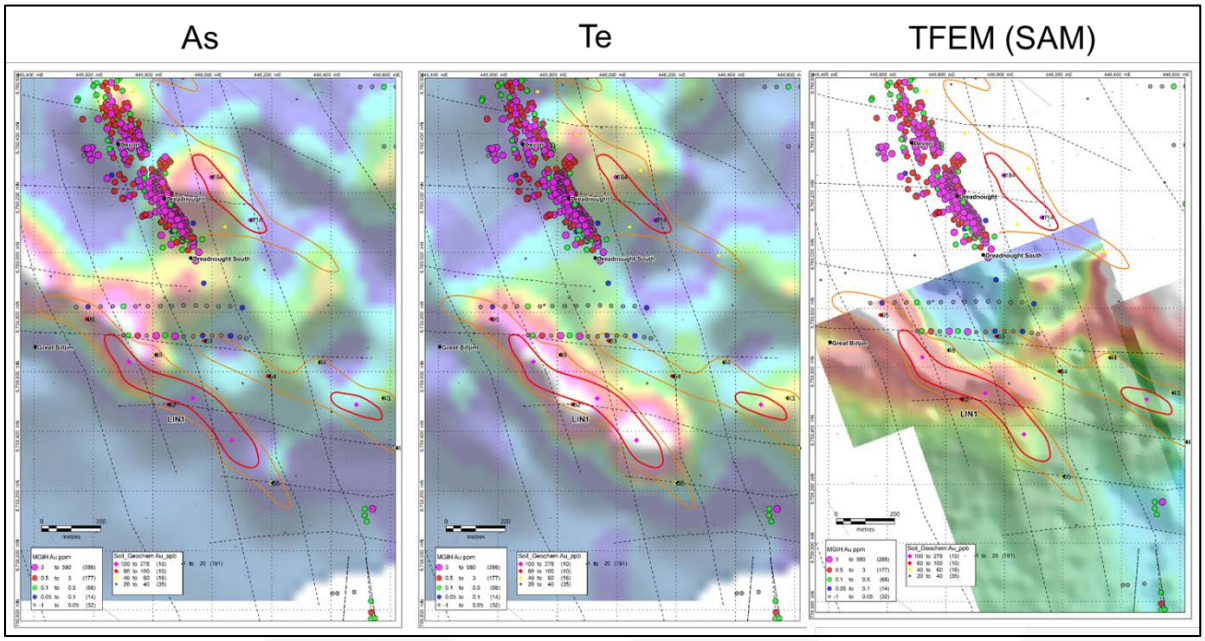

***Figure 3:* LIN1 prospect highlighting coincident gold soil (orange and red contours), Arsenic, Tellurium and TFEM anomaly**

The LIN1 TFEM anomaly (Total Field Electromagnetic) is underlain by strongly sheared and brecciated metasediments at its northern end which passes under colluvium cover to the south. The sheared and brecciated metasediments at LIN1 form outcrops up to 30m wide with strongly developed stockwork quartz veining, brecciation and secondary iron oxides probably after pyrite (Figure 5). LIN1 is interpreted to be an interflow sedimentary horizon within a basaltic volcanic sequence and appears to dip moderately towards the NE at an angle of ~60° (Figure 4). Textural features at LIN1 are strongly suggestive of extensive hydrothermal alteration.

Two lines of historical aircore drilling immediately east of LIN1 include two holes which intersected significant gold mineralisation at shallow depth - **4m at 1.54 g/t Au** from 26m to EOH (EXAC047) and **1m of 3.04 g/t Au** from 8m (EXAC049)[3]. All drill holes were angled towards the east and Matsa considers this drilling unlikely to have tested LIN1. As such the LIN 1 anomaly represents a high priority drilling target.

Rock chip sampling of LIN1 has been completed and assays are awaited.

LIN1 represents an exciting walk-up target and initial drill testing has been designed and planned to commence in the coming weeks.

[3] Announcement to ASX "High Grade Results from Resampling confirms Potential New Near-Surface Gold Discovery at Linden Anova Metals Ltd (AVW, formerly Exterra Resources Ltd EXC) 20th October 2015

Figure 4: ***LIN 1 prospect view along strike towards SE, strongly sheared and brecciated metasediment with stockwork quartz veining. Contrasting vegetation types between LIN1 and enclosing basaltic volcanics***

Hill East prospects

The Hill East prospects are partly contained within a strong 1.5km long soil/auger gold geochemical anomaly with values up to 0.35 g/t Au. In April 2020, Matsa conducted an initial drilling campaign at Hill East that returned excellent results[4] (Figure 5). Drilling to date has been focused on mineralisation at shallow depth, in and adjacent to, high grade quartz veins mostly with associated historic workings. Individual targets appeared to be discrete ~EW trending veins with limited strike extent and with no clear common link between individual prospects and the NS trending soil gold anomaly.

Recent fieldwork has identified a pattern of consistent NW and ESE quartz lode trends which are apparent at a number of the Hill East prospects. These lode trend directions can also be observed regionally with key gold deposits such as at Red October, Gallant, LIN 1 and Olympic located along similar structural trends.

An examination of results of the recent SAM survey identified two well-defined ESE trending structural features named MMC_HE1 and MMC-HE5:

- Target MMC_HE1 appears to link previously isolated HE1 and HE2 prospects
- Target MMC_HE5 may be an ESE extension of HE5 (target corresponds with SGC Target 38 – Figure 6).

[4] ASX Announcement 28 April 2020 – Further High Grade Gold near Devon, Hill East - Lake Carey Gold Project

These two SAM targets significantly increase the exploration space associated with HE1 and HE5. Importantly the ESE strike direction of these two SAM targets mimics the strike of LIN1.

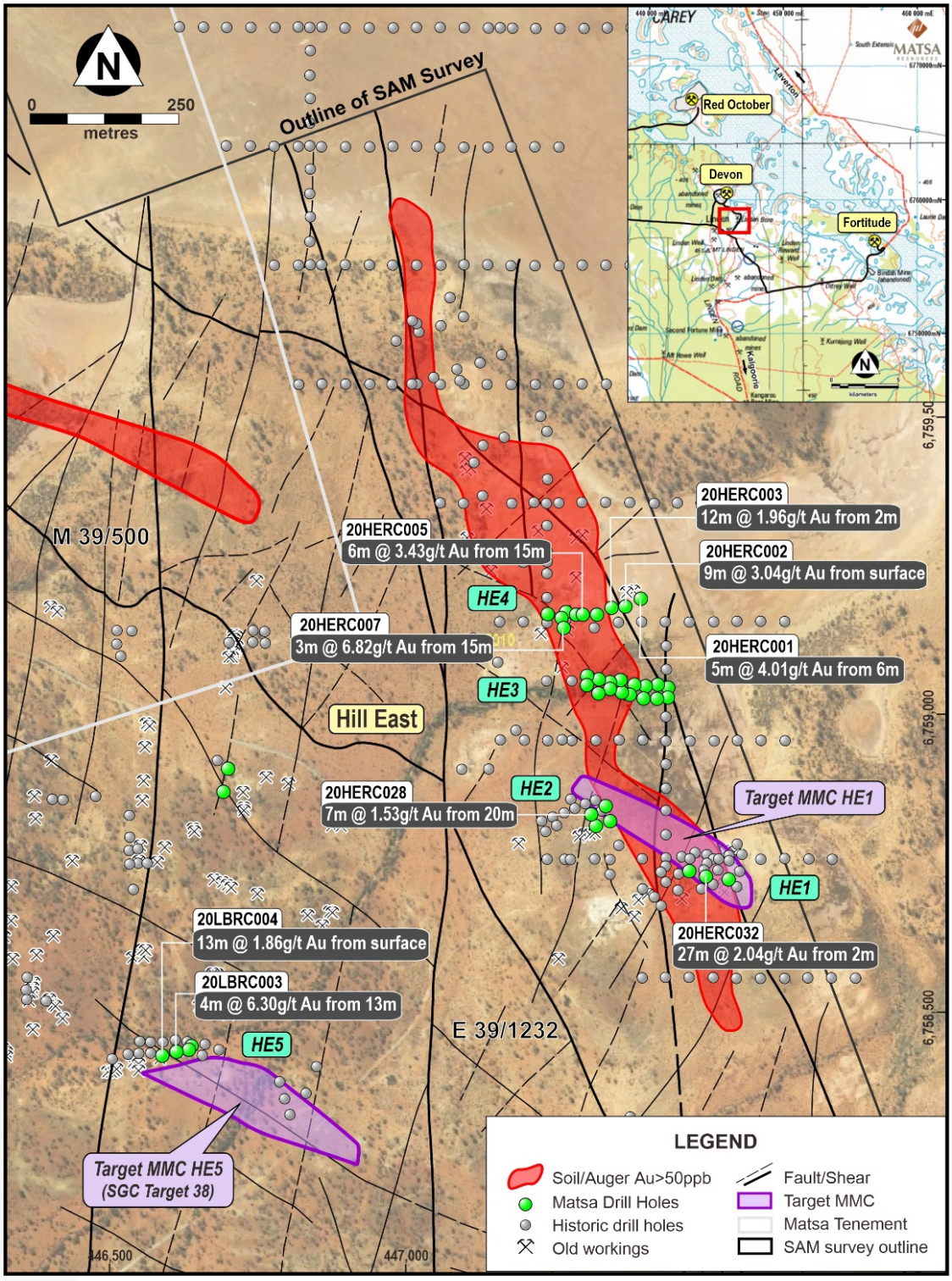

***Figure 5:** Hill East with distribution of historical workings, recent Matsa drilling, regional rock chip sampling and priority SAM geophysical targets (purple outline)*

Near HE5 and HE6, another strong geophysical response with a similar orientation has been identified in an area characterised by numerous historical workings (refer Figure 6).

Devon SAM Survey

Southern Geoscience Consultants (SGC) were commissioned to process, interpret and report on the SAM survey results and selected targets are Tabulated in Appendix 2. The survey was carried out by Gap Geophysics in October 2021, the survey operations report which provides background on the SAM technique, survey details and results is included as Appendix 3.

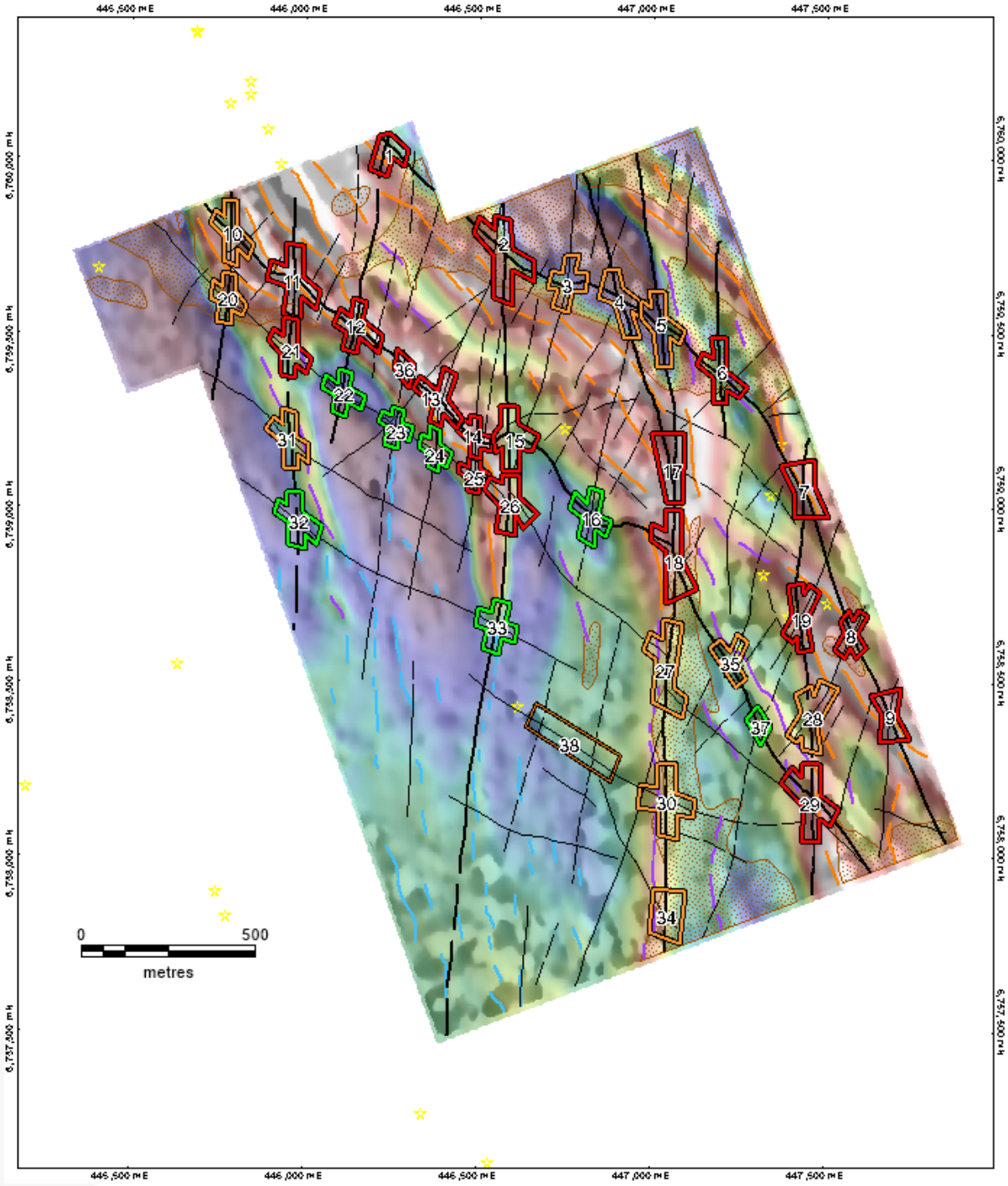

***Figure 6:** SGC Target areas labelled with target ID's (numbers) and priority (red-high, orange-moderate and green-low) overlaying MMC and RTP1VD greyscale image.*

The interpretation by SGC, returned 19 high priority structural targets, mostly structural intersections, from a total of 38 targets identified (refer Appendix 2).

Matsa is continuing to refine and follow up SAM targets in conjunction with sampling and drilling data. It is expected that drill testing of the geophysical anomalies at LIN1. MMC_HE1 and MMC_HE5 will provide data that will assist in prioritising follow up of the remaining SAM targets and potentially identifying new SAM targets.

Positive drilling results are expected to warrant further SAM surveys to cover areas of significant gold mineralisation elsewhere in Matsa's Lake Carey project. There is excellent potential to develop additional new targets for future drilling using this technique.

This ASX announcement is authorised for release by the Board of Matsa Resources Limited.

For further information please contact:

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Executive Chairman
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Competent Person

The information in this report that relates to Exploration results, is based on information compiled by David Fielding, who is a Fellow of the Australasian Institute of Mining and Metallurgy. David Fielding is a full time employee of Matsa Resources Limited. David Fielding has sufficient experience which is relevant to the style of mineralisation and the type of ore deposit under consideration and the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. David Fielding consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

Appendix 1 ***- Matsa Resources Limited – Devon***

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.* • *Measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	Reference cited for quoted Hill East drilling (MAT Announcement to ASX 28th April 2020 Further High Grade Gold near Devon, Hill East - Lake Carey Gold Project) includes details of sampling techniques
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).*	Reference cited for quoted Hill East drilling (MAT Announcement to ASX 28th April 2020 Further High Grade Gold near Devon, Hill East - Lake Carey Gold Project) includes details of Drilling techniques
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.*	Reference cited for quoted Hill East drilling (MAT Announcement to ASX 28th April 2020 Further High Grade Gold near Devon, Hill East - Lake Carey Gold Project) includes details of Drill Sample recovery
	• *Measures taken to maximise sample recovery and ensure representative nature of the samples.*	
	• *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	

Criteria	JORC Code explanation	Commentary
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.* • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.* • *The total length and percentage of the relevant intersections logged.*	Reference cited for quoted Hill East drilling (MAT Announcement to ASX 28th April 2020 Further High Grade Gold near Devon, Hill East - Lake Carey Gold Project) includes details of Logging procedures
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples* • *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	Reference cited for quoted Hill East drilling (MAT Announcement to ASX 28th April 2020 Further High Grade Gold near Devon, Hill East - Lake Carey Gold Project) includes details of sub sampling techniques/sample preparation on RC drilling.
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.*	Reference cited for quoted Hill East drilling (MAT Announcement to ASX 28th April 2020 Further High Grade Gold near Devon, Hill East - Lake Carey Gold Project) includes commentary on assay data quality and laboratory tests

Criteria	JORC Code explanation	Commentary
	• *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie. lack of bias) and precision have been established.*	
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	Reference cited for quoted Hill East drilling (MAT Announcement to ASX 28th April 2020 Further High Grade Gold near Devon, Hill East - Lake Carey Gold Project) includes details of Verification of sampling and assaying
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	Reference cited for quoted Hill East drilling (MAT Announcement to ASX 28th April 2020 Further High Grade Gold near Devon, Hill East - Lake Carey Gold Project) includes details drill hole locations and data points
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.*	Reference cited for quoted Hill East drilling (MAT Announcement to ASX 28th April 2020 Further High Grade Gold near Devon, Hill East - Lake Carey Gold Project) includes comments on Data spacing and distribution
	• *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* • *Whether sample compositing has been applied.*	
Orientation of data in relation	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.*	Reference cited for quoted Hill East drilling (MAT Announcement to ASX 28th April 2020 Further High Grade Gold near Devon, Hill East - Lake Carey Gold Project) includes description of drill hole orientations in respect to mineralisation

Criteria	JORC Code explanation	Commentary
to geological structure	• *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	
Sample security	• *The measures taken to ensure sample security.*	Reference cited for quoted Hill East drilling (MAT Announcement to ASX 28th April 2020 Further High Grade Gold near Devon, Hill East - Lake Carey Gold Project) includes details of sample security
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	No audit carried out yet.

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* • *The security of the tenure held at the time of reporting along with any known impediments to obtaining a license to operate in the area.*	Exploration was carried out over the following tenements: Tenement / Status / Holder / Expiry / Area / Units E39/11232 / LIVE / Matsa Gold Ltd / 8/12/2021 / 6 / BL M39/500* / Live / Matsa Gold Pty Ltd / 19th Dec 2034 / 420.31 / HA
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	Drill Hole intercepts quoted in EXAC047 and EXAC048 were included in release by Anova Metals (AVW) Formerly Exterra Resources (EXC) to ASX - High Grade Results from Resampling confirms Potential New Near-Surface Gold Discovery at Linden (AVW, formerly Exterra Resources Ltd EXC) 20th October 2015

Criteria	JORC Code explanation	Commentary
Geology	• *Deposit type, geological setting and style of mineralisation.*	Targets which are the subject of this announcement, are located in a sequence of basaltic volcanics separated by siliceous interflow sedimentary units up to 30 metres wide. Gold mineralisation principally in quartz veins appears to be controlled and focused by faulting, typically ENE, NS and WNW trending faults.
Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all material drill holes:* o *easting and northing of the drill hole collar* o *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar* o *dip and azimuth of the hole* o *down hole length and interception depth* o *hole length.* • *If the exclusion of this information is justified on the basis that the information is not material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*	Reference cited for quoted Hill East drilling (MAT Announcement to ASX 28th April 2020 Further High Grade Gold near Devon, Hill East - Lake Carey Gold Project) includes a tabulation of drill collar locations and key assay data at Hill east
Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg. cutting of high grades) and cut-off grades are usually material and should be stated.* • *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	Reference cited for quoted Hill East drilling (MAT Announcement to ASX 28th April 2020 Further High Grade Gold near Devon, Hill East - Lake Carey Gold Project) includes details data aggregation methods.
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').*	All intercepts quoted are downhole widths, there has been no attempt to convert these to true width of mineralisation

Criteria	JORC Code explanation	Commentary
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	Summary plans are shown in the report,
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	All available drilling information from the area under review was used.
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	Targets quoted were determined from a recently completed SAM geophysical survey with Targets selected by Southern Geoscience Consultants included as Appendix 2., The Survey Operations report by GAP Geophysics who carried out data acquisition provides details about the SAM technique and specific survey details is included as Appendix 3.
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	Drill testing of selected targets will be followed by a review of the final list of 38 targets from the Southern Geoscience Consultants, in the light of drilling results. Further drilling is proposed.

Appendix 2: SGC Target Table for Hill East SAM Survey

SUMMARY TABLE OF TARGETS

Target ID	Priority	Description
1	1	Intersecting major structures associated with mod-high conductivity (MMC) trend
2	1	Intersecting major structures adjacent to mod-high conductivity (MMC) trend and late-time (Ch10-14) conductive zone (TFEM)
3	2	Intersecting major and minor structures associated with late-time (Ch10-14) conductive zone (TFEM)
4	2	Intersecting major and minor structures associated with late-time (Ch10-14) conductive zone (TFEM)
5	2	Intersecting major and minor structures associated with late-time (Ch10-14) conductive zone (TFEM)
6	1	Intersecting major structures adjacent to mod-high conductivity (MMC) trend and associated with late-time (Ch10-14) conductive zone (TFEM)
7	1	Intersecting major structures associated with high conductivity (MMC) trend
8	1	Intersecting major structures adjacent to mod-high conductivity (MMC) trend and late-time (Ch10-14) conductive zone (TFEM)
9	1	Intersecting major structures associated with mod-high conductivity (MMC) trend
10	2	Intersecting major structures adjacent to mod-high conductivity (MMC) trend.
11	1	Intersecting major structures associated with very high conductivity (MMC) trend
12	1	Intersecting major structures associated with very high conductivity (MMC) trend
13	1	Intersecting major and minor structures associated with very high conductivity (MMC) trend
14	1	Intersecting major and minor structures associated with mod-high conductivity (MMC) trend
15	1	Intersecting major structures with possible dilation and zone of alteration (demagnetisation response)
16	1	Intersecting major and minor structures.
17	1	Intersection of major faults with dextral strike-slip. Potential alteration zone (demagnetised response)
18	1	Intersection of major faults with dextral strike-slip. Associated with mod-high conductivity (MMC) N-S trend and late-time (Ch10-14) conductive zone (TFEM)
19	1	Intersecting major and minor structures near to mod-high conductivity (MMC) trends.
20	2	Intersecting major and minor structures near to mod-high conductivity (MMC) trends and associated with late-time (Ch10-14) conductive zone (TFEM)
21	1	Intersecting major and minor structures associated with mod conductivity (MMC) trend
22	3	Intersecting major and minor structures
23	3	Intersecting major and minor structures
24	3	Intersecting major and minor structures
25	1	Intersecting major and minor structures associated with mod-high conductivity (MMC) trend
26	1	Intersecting major and minor structures associated with mod-high conductivity (MMC) trend
27	2	Intersecting major and minor structures associated with mod conductivity (MMC) trend and late-time (Ch10-14) conductive zone (TFEM)
28	2	Intersecting major and minor structures. Close to mod conductivity (MMC) trend.

Target ID	Priority	Description
29	1	Intersecting major and minor structures associated with mod-high conductivity (MMC) N-S trend
30	2	Intersecting major and minor structures associated with low-mod conductivity (MMC) N-S trend
31	2	Intersecting major and minor structures associated with mod conductivity (MMC) N-S trend
32	3	Intersecting major and minor structures adjacent to low-mod conductivity (MMC) trend
33	3	Intersecting major and minor structures adjacent to low-mod conductivity (MMC) trend
34	2	Intersecting major and minor structures associated with mod conductivity (MMC) N-S trend
35	2	Intersecting major and minor structures associated with mod conductivity (MMC) trend. Contains known Au zone Au mineralisation within.
36	1	Intersecting major and minor structures associated with very high conductivity (MMC) trend
37	3	Intersecting major and minor structures.
38	2	Intersecting minor structure associated with mod conductivity (MMC) trend, along strike from known Au mineralisation.

Gap GeoPhysics
Exploration Services

OPERATIONS REPORT

Project 20071MAT
Sub-Audio Magnetics Survey

Lake Carey, Western Australia

Project reference:	20071MAT
Survey type:	Sub-Audio Magnetics (SAM)
Survey configuration:	Galvanic
Prospect(s):	Hill East
Location:	Lake Carey, Western Australia
Client:	Matsa Resources Limited
Conducted by:	Gap Geophysics Australia Pty Limited
Issuing office:	Brisbane
Date of issue:	December 2020

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Purpose of This Report

The surveys described in this report were commissioned for the purpose of assisting sub-surface geophysical investigation to map geological structure.

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2	Southern Geoscience Consultants

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Sub-Audio Magnetics Survey

Hill East, Lake Carey, Western Australia

Introduction

Gap Geophysics Australia Pty Limited (Gap) was commissioned by Matsa Resources Limited to conduct Sub-Audio Magnetics (SAM) surveys at their Hill East prospect, near Lake Carey, 120 kilometres southeast of Leonora, Western Australia.

The objective of the survey was to map geological structures associated with mineralisation. The surveys were conducted in the period 1st to 14th November 2020.

Project Personnel

Key personnel associated with the survey described in this report are listed in Table 1.

Table 1: Key Personnel.

Role	Personnel	Organisation
Client representatives	Dave Fielding Russell Mortimer	Matsa Resources Southern Geoscience Consultants
Crew leader	Stefan Offhaus	Gap Geophysics Australia
Field crew	Alexia Vlahos Andrew Hall	
Quality control manager	Mark Donaldson	
Final data processing, reporting	Mark Donaldson	

Scope

The survey area was defined by one polygon totalling approximately 4 square kilometres. The traverse line spacing was 50 m. Due to the proximity to Lake Carey and its highly conductive overburden, the area was split into 4 sub-blocks to minimise electromagnetic coupling. An extension to the northwest block was requested at the beginning of the field deployment. The total distance to be surveyed was nominally 91 line-kilometres using four energising dipoles.

Table 2: SAM Survey Summary.

Prospect	Grid Name	Current Source	Dipole Separation	Line Direction	Line Spacing	Area
Hill East	HE01	Galvanic	1.9 km	69°	50 m	1.3 km^2
Hill East	HE02	Galvanic	1.9 km	69°	50 m	0.9 km^2
Hill East	HE03	Galvanic	1.9 km	69°	50 m	0.9 km^2
Hill East	HE04	Galvanic	1.9 km	69°	50 m	0.9 km^2

Survey Technique

The SAM technique, instrumentation, operating procedures, data processing strategies and data formats are described in detail in the attached document:

Gap Technical Reference Manual SAM Total B-Field Technologies_v1.2.pdf

SAM Receiver

The acquisition system and survey parameters are summarised in Table 3. Data processing parameters are shown in Table 4.

Table 3: Survey Instrument Parameters.

Roving Magnetometer Acquisition System	
Instrument	Gap Geophysics TM-7B SAM receiver
Sensor	Geometrics G-822 Cs vapour
Software	SAMui v20.6
Sample rate	2400 Hz
Components	Total B-field
Powerline frequency	50 Hz
Magnetometer Base Station	
Magnetometer	Geometrics G857
Sample rate	0.1 Hz
Sample resolution	0.1 nT
Navigation and Positioning	
GPS	Trimble Ag114
Corrections	Differential – VBS
Sample rate	1 Hz
Datum, co-ordinate system	GDA94, MGA zone 51

Table 4: Data Processing Parameters.

Data Processing Parameters	
TMI sample interval	~0.75 m after stacking
TFMMC sample interval	~1.5 m after stacking
TFEM sample interval	~3.0 m after stacking
Gridding	Minimum curvature
Grid cell size	3.125 m
TFMMC / TFEM filtering	Combination of non-linear and low pass filtering.
TMI filtering	Diurnal corrections applied.
Magnetic inclination	-62.6°
Magnetic declination	1.4°

SAM Transmitter

The full range of Gap GeoPak transmitters, wire specifications, loop deployment techniques and electrode preparation are described in the attached document:

Gap Technical Reference Manual Gap GeoPak Transmitters_v1.5.pdf

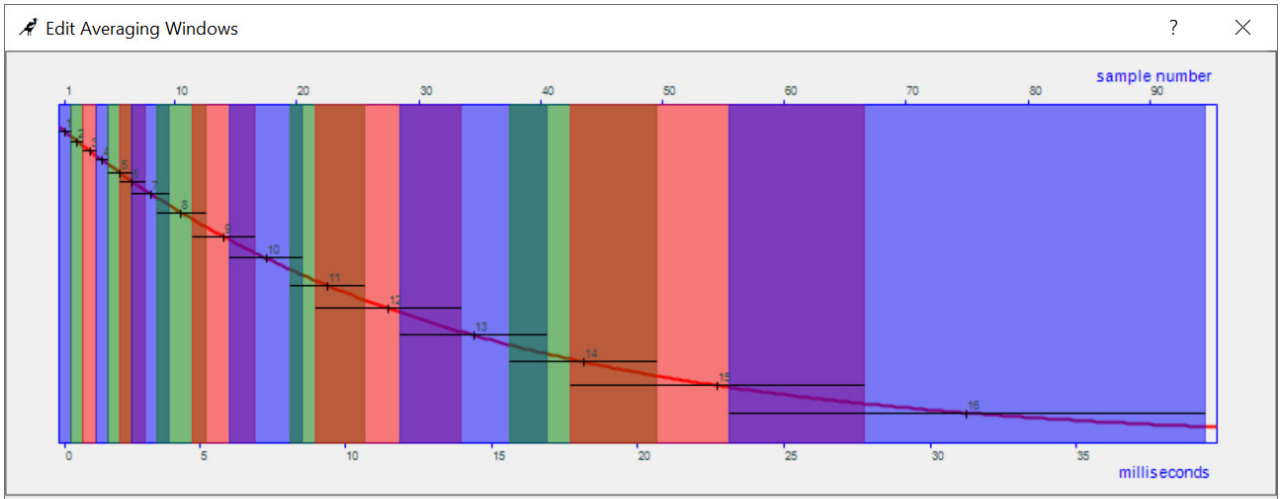
The transmitter and operating specifications used for this survey are listed below.

Table 5: Transmitter System Specifications.

Transmitter System	
Transmitter	Gap GeoPak IPTX-2500
Controller	Internal
Power supply	Gap GeoPak DC14-HV
Timing	GPS synchronisation
Current	HE01: 12.0 A HE02: 13.0 A HE03: 9.0 A HE04: 12.5 A
Transmit frequency	6.25 Hz
Duty cycle	50 %

Total Field Electromagnetics (TFEM)

Discrete channels of TFEM were extracted from the data during processing. A description of the integration windows used are shown in Figure 1. Integration times used are from the top of the ramp, so channel 1 could include some ramp response. Colour images of representative TFEM channels were generated for each grid and are shown in the results section.



Channel	Centre (ms)	Start (ms)	End (ms)	Width (ms)	Power Freq. Cycles	Start #	End #	Start Tapered #	End Tapered #	Start Tapered (ms)	End Tapered (ms)
1	0.417	0.208	0.625	0.417	0.021	1	1	1	1	0.208	0.625
2	0.833	0.625	1.042	0.417	0.021	2	2	2	2	0.625	1.042
3	1.250	1.042	1.458	0.417	0.021	3	3	3	3	1.042	1.458
4	1.667	1.458	1.875	0.417	0.021	4	4	4	4	1.458	1.875
5	2.292	1.875	2.708	0.833	0.042	5	6	5	6	1.875	2.708
6	2.708	2.292	3.125	0.833	0.042	6	7	6	7	2.292	3.125
7	3.333	2.708	3.958	1.250	0.063	7	9	7	9	2.708	3.958
8	4.375	3.542	5.208	1.667	0.083	9	12	9	12	3.542	5.208
9	5.833	4.792	6.875	2.083	0.104	12	16	12	16	4.792	6.875
10	7.292	6.042	8.542	2.500	0.125	15	20	15	20	6.042	8.542
11	9.375	8.125	10.625	2.500	0.125	20	25	20	25	8.125	10.625
12	11.458	8.958	13.958	5.000	0.250	22	33	21	33	8.542	13.958
13	14.375	11.875	16.875	5.000	0.250	29	40	28	40	11.458	16.875
14	18.125	15.625	20.625	5.000	0.250	38	49	37	49	15.208	20.625
15	22.708	17.708	27.708	10.000	0.500	43	66	42	67	17.292	28.125
16	31.250	23.125	39.375	16.250	0.813	56	94	54	95	22.292	39.792

Figure 1 Description of TFEM integration windows used in processing.

Final Comments

- The tilt derivative (TDR) of the magnetometric conductivity has been included both as a sharpening filter as would a first vertical derivative, but also for its function as an automatic gain correction filter to promote the relative amplitude of weaker, more subtle linear features. It promotes noise equally so should be interpreted with care.
- The overburden allowed a higher transmit frequency to be used than usual near salt lakes, without suffering significant electromagnetic coupling. This indicates the on-shore ground is relatively resistive compared, say, to the eastern shore of Lake Carey. This frequency provided improved spectral separation of the SAM components where intense, near-surface magnetic minerals existed, as well as a greater number of readings per metre that aided signal strength through stacking.

Survey Results

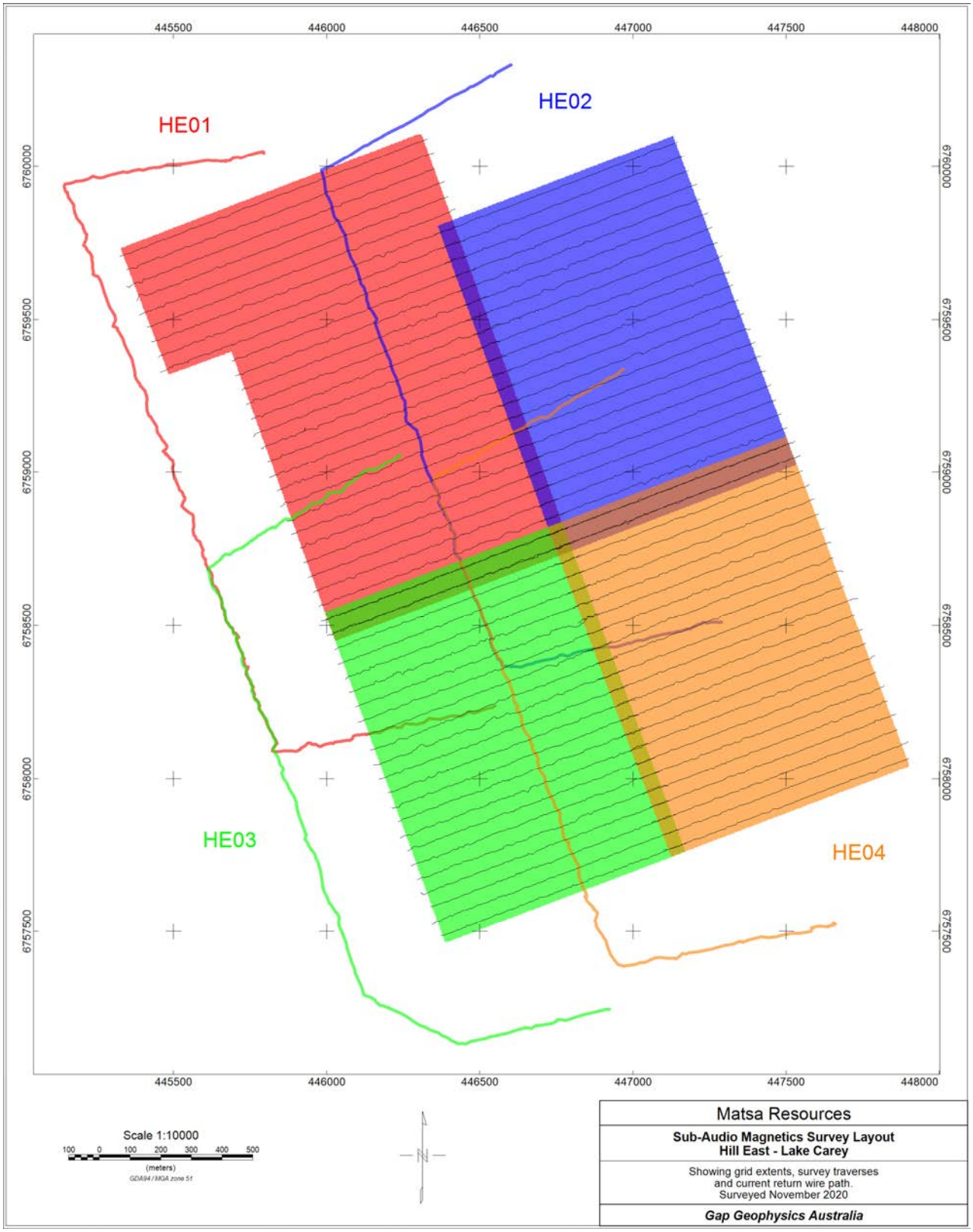


Figure 2 Hill East survey area – SAM survey layout showing the grid extents, survey traverses and current return wire path.

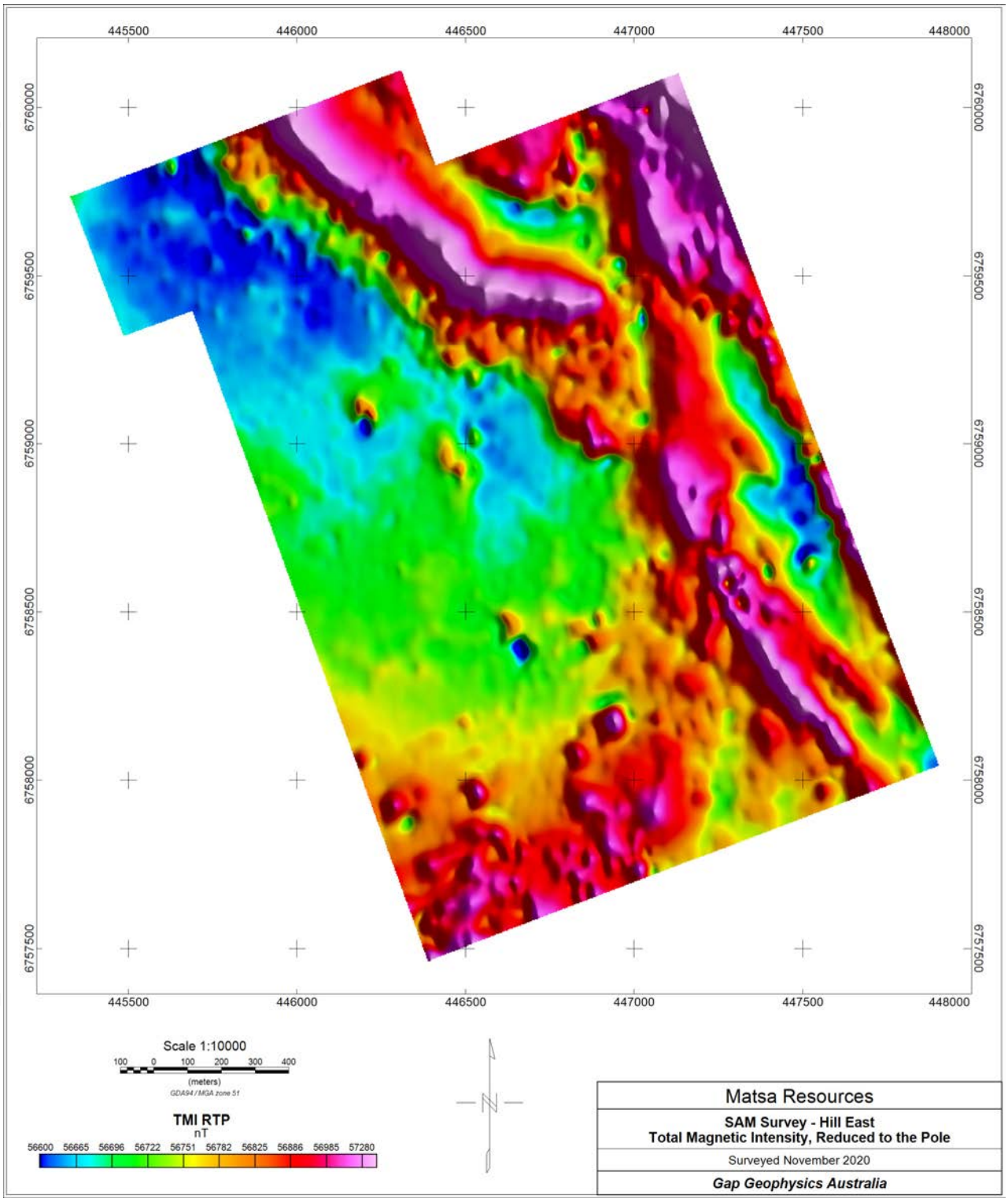


Figure 3 Hill East – total magnetic intensity, reduced to the pole, collated data.

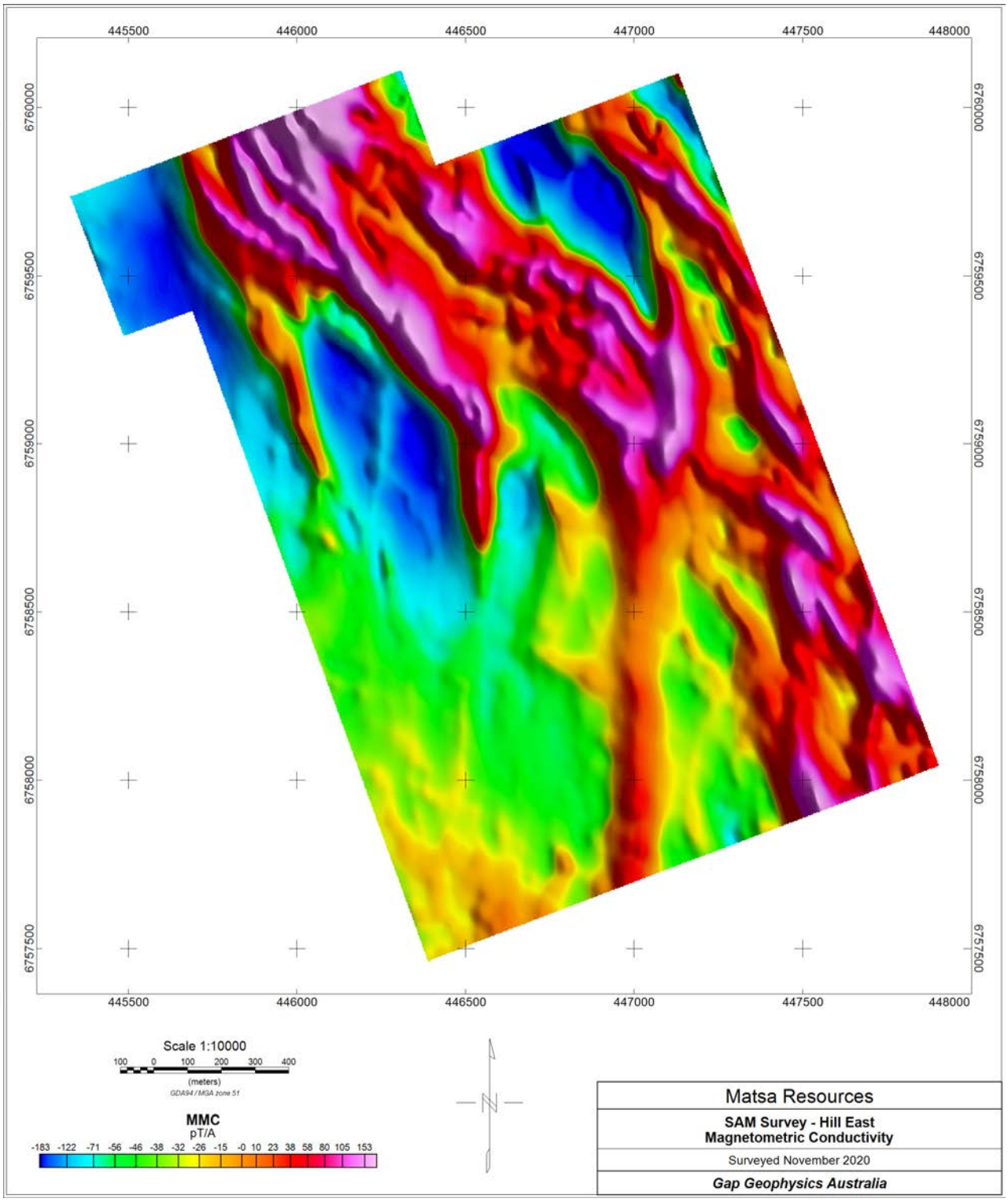


Figure 4 Hill East – magnetometric conductivity, stitched grids.

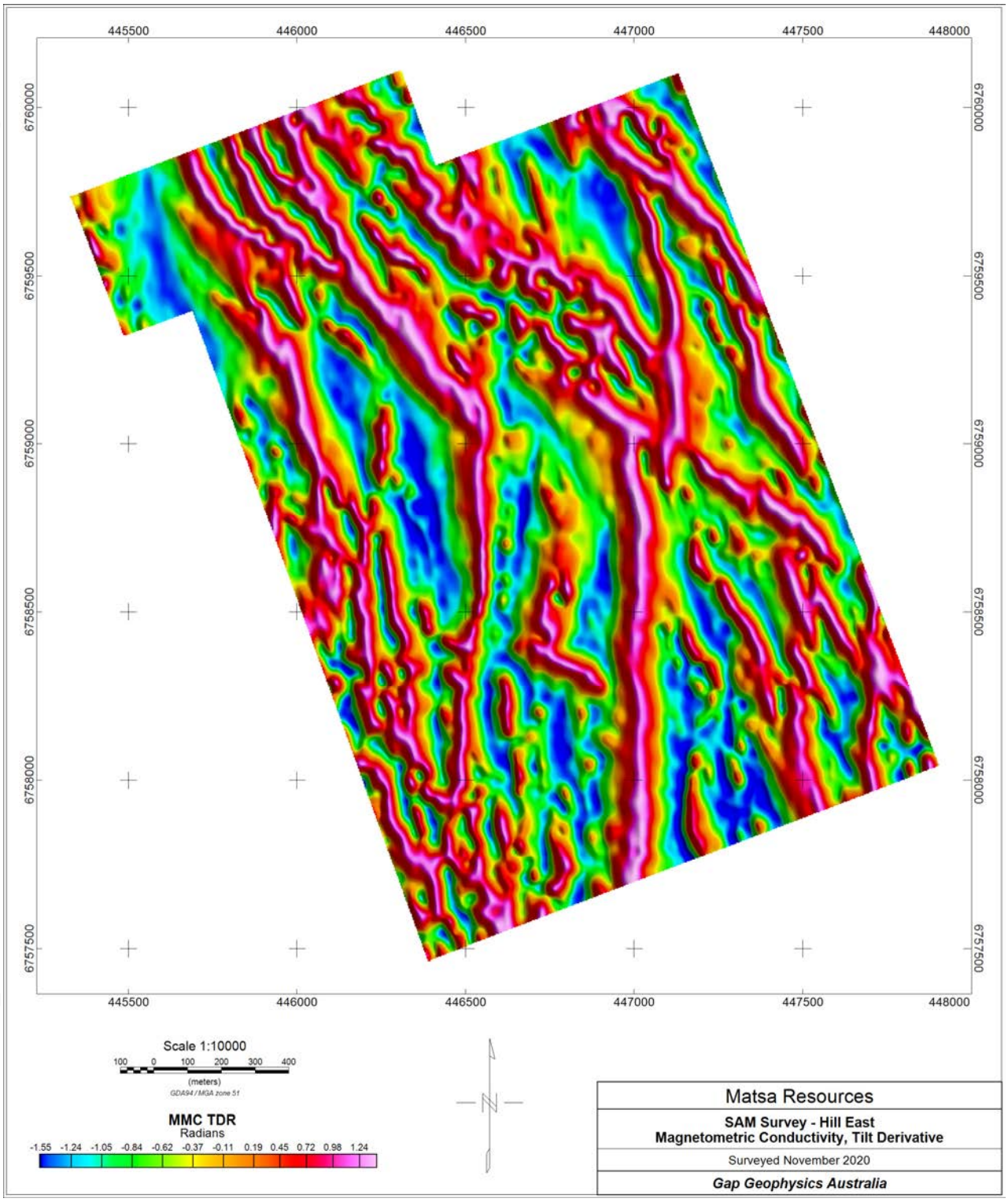


Figure 5 Hill East – magnetometric conductivity, tilt derivative, stitched grids.

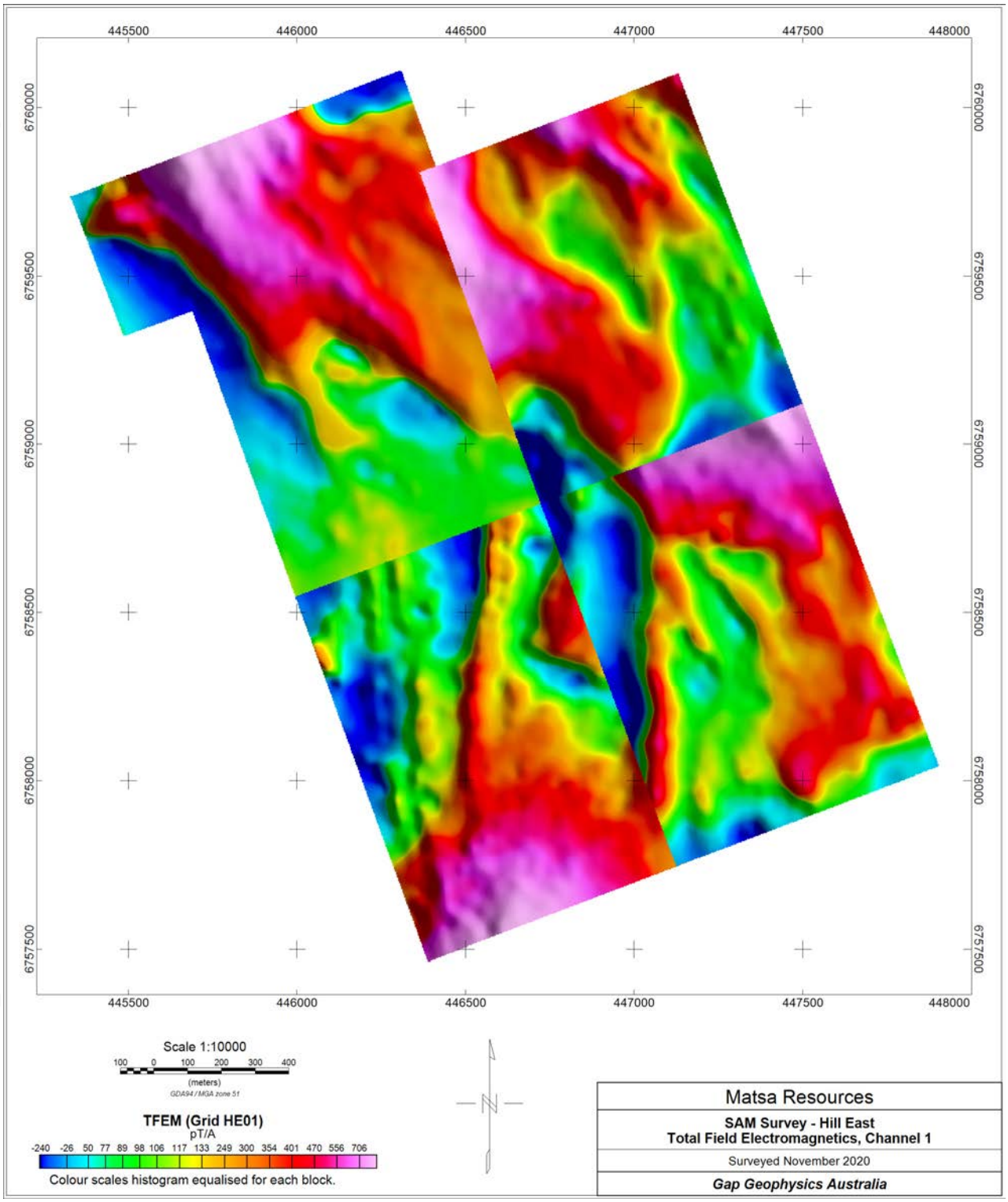


Figure 6 Hill East – total field electromagnetics, channel 1, mosaic.

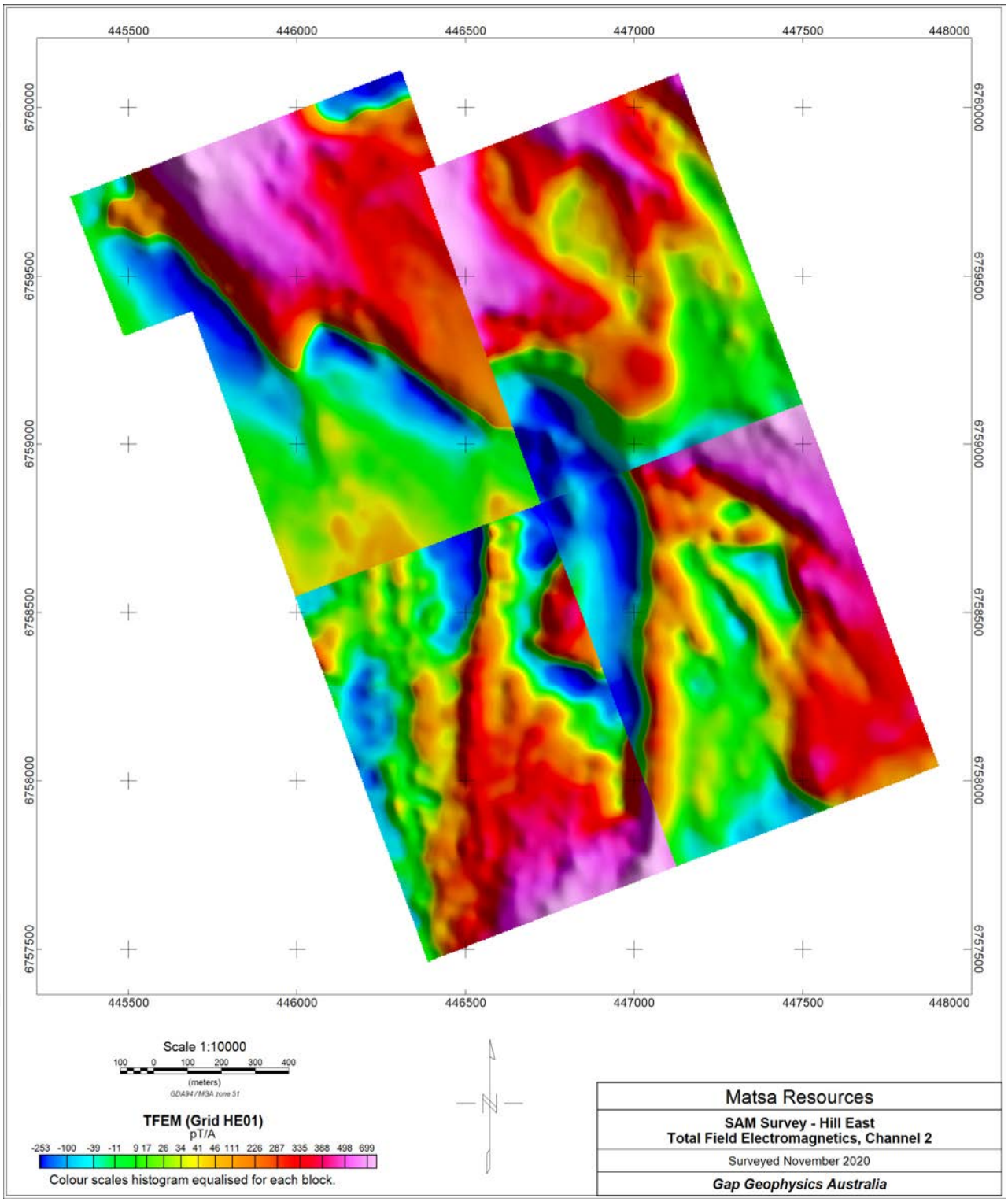


Figure 7 Hill East – total field electromagnetics, channel 2, mosaic.

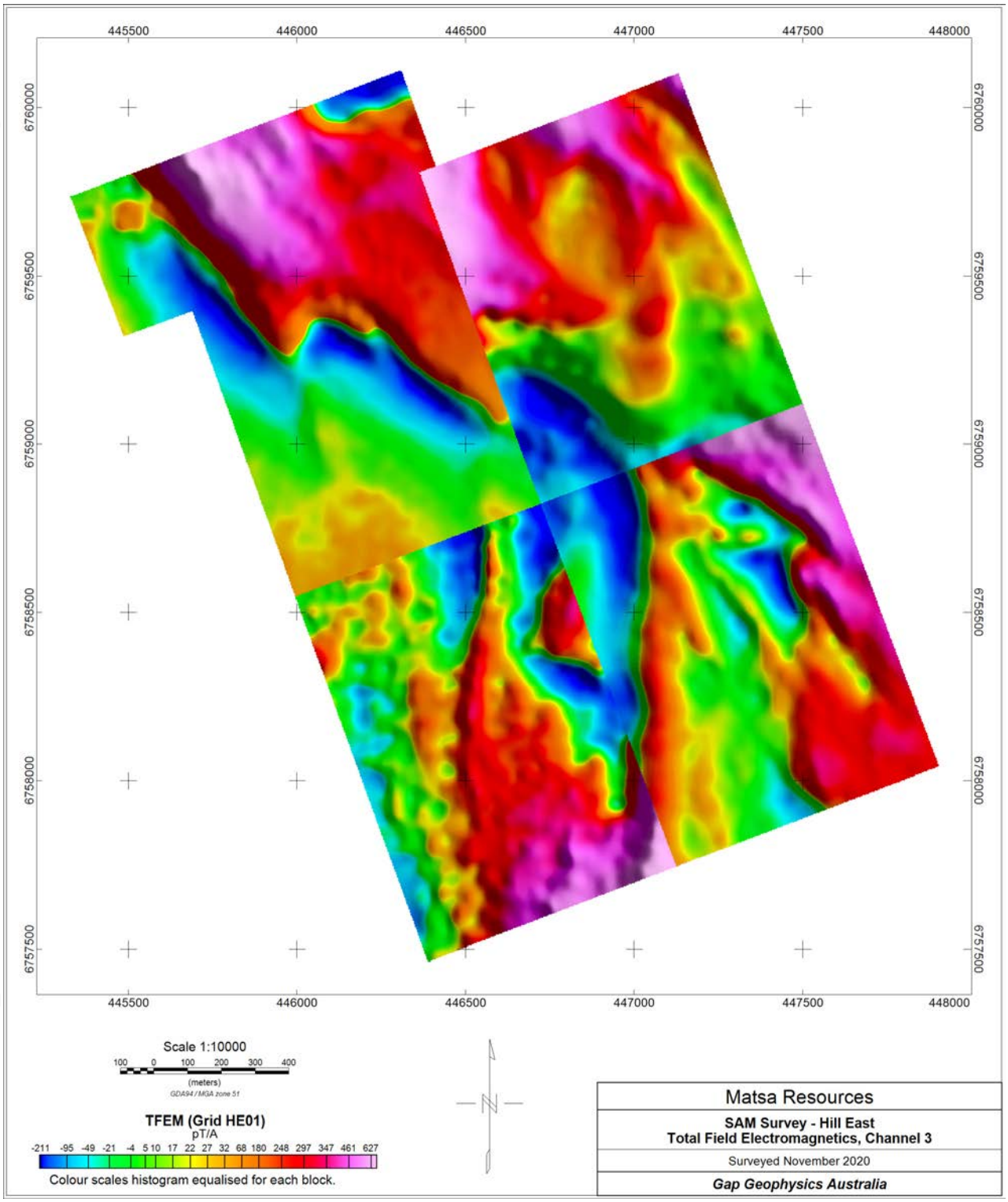


Figure 8 Hill East – total field electromagnetics, channel 3, mosaic.

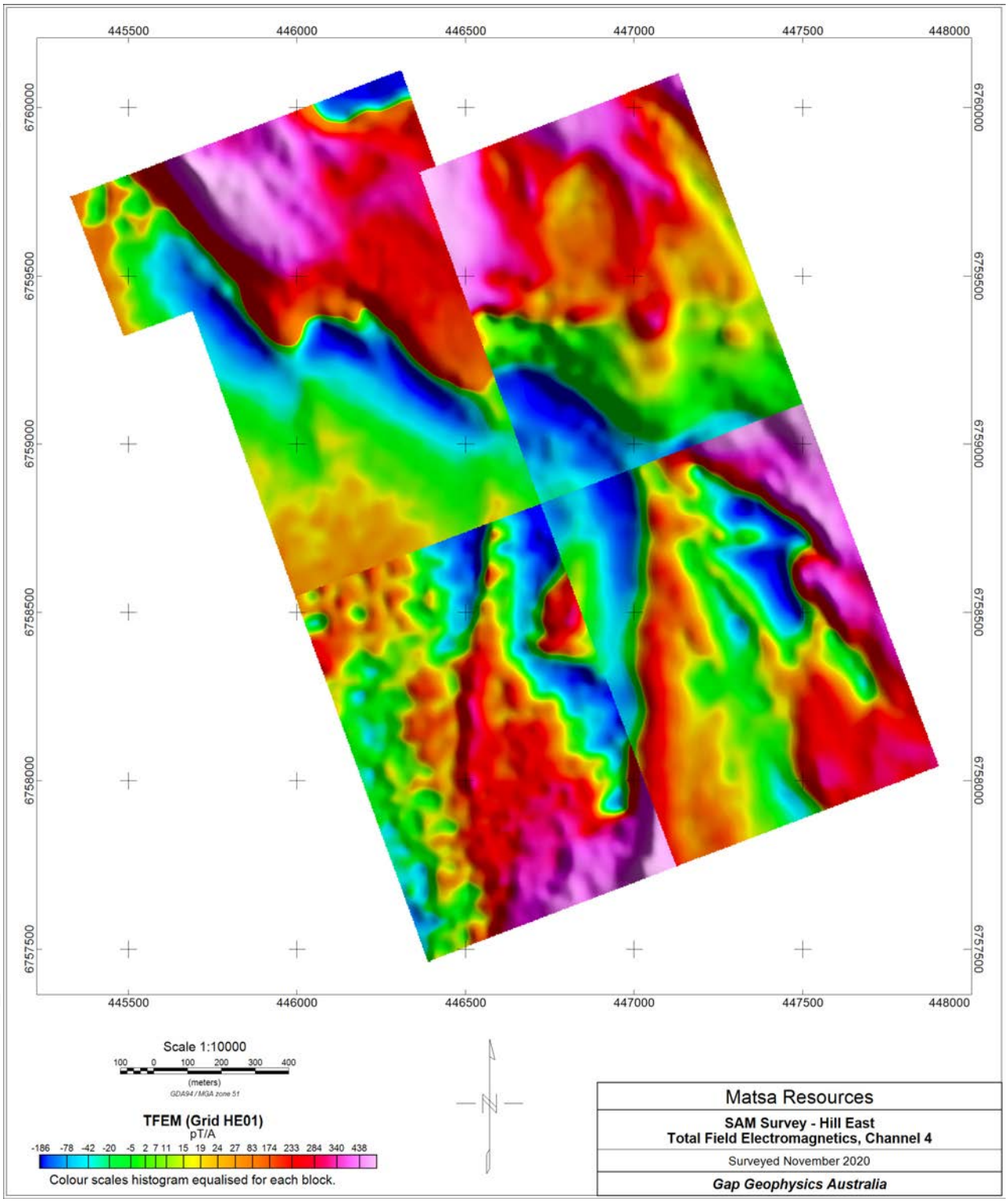


Figure 9 Hill East – total field electromagnetics, channel 4, mosaic.

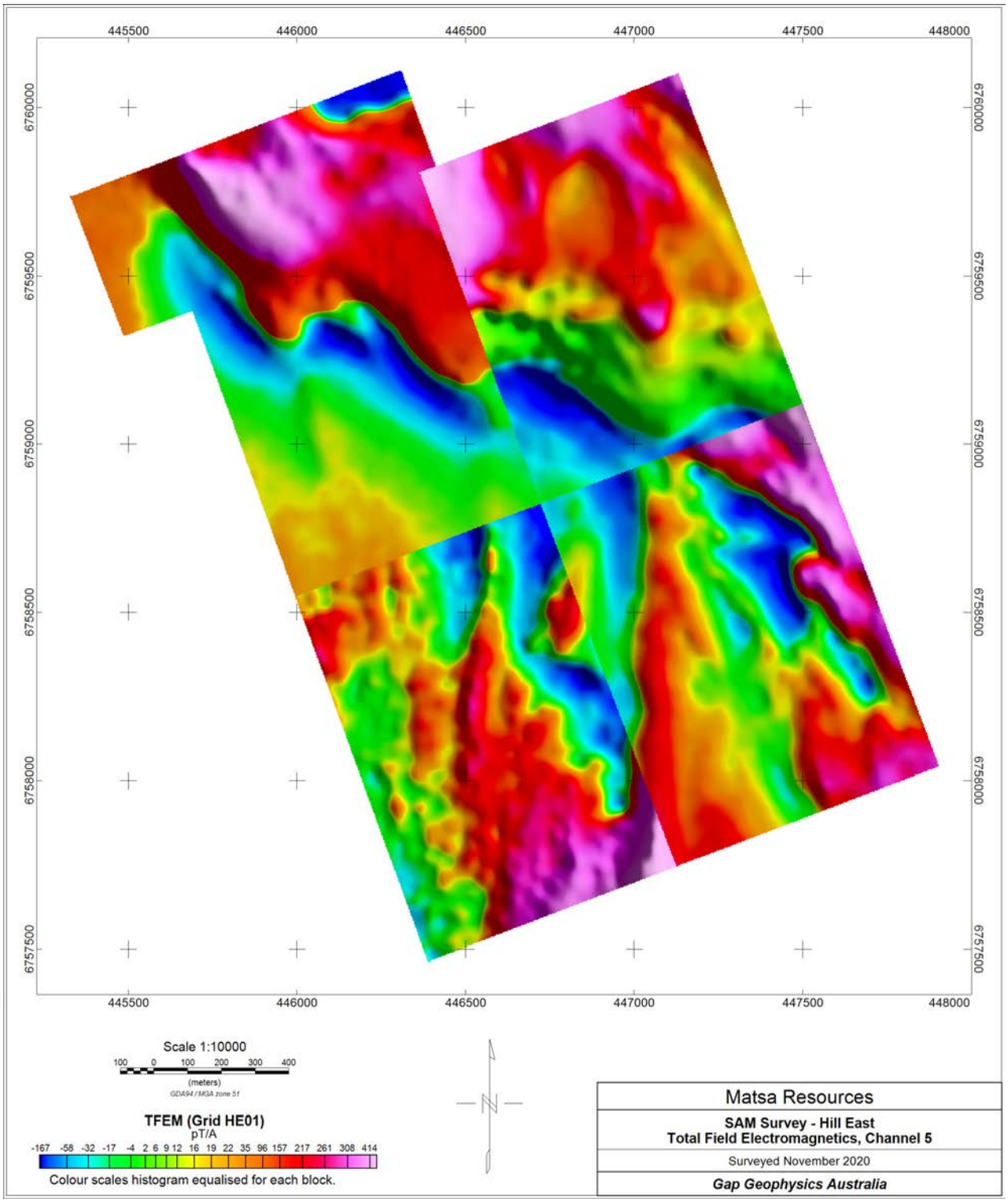


Figure 10 Hill East – total field electromagnetics, channel 5, mosaic.

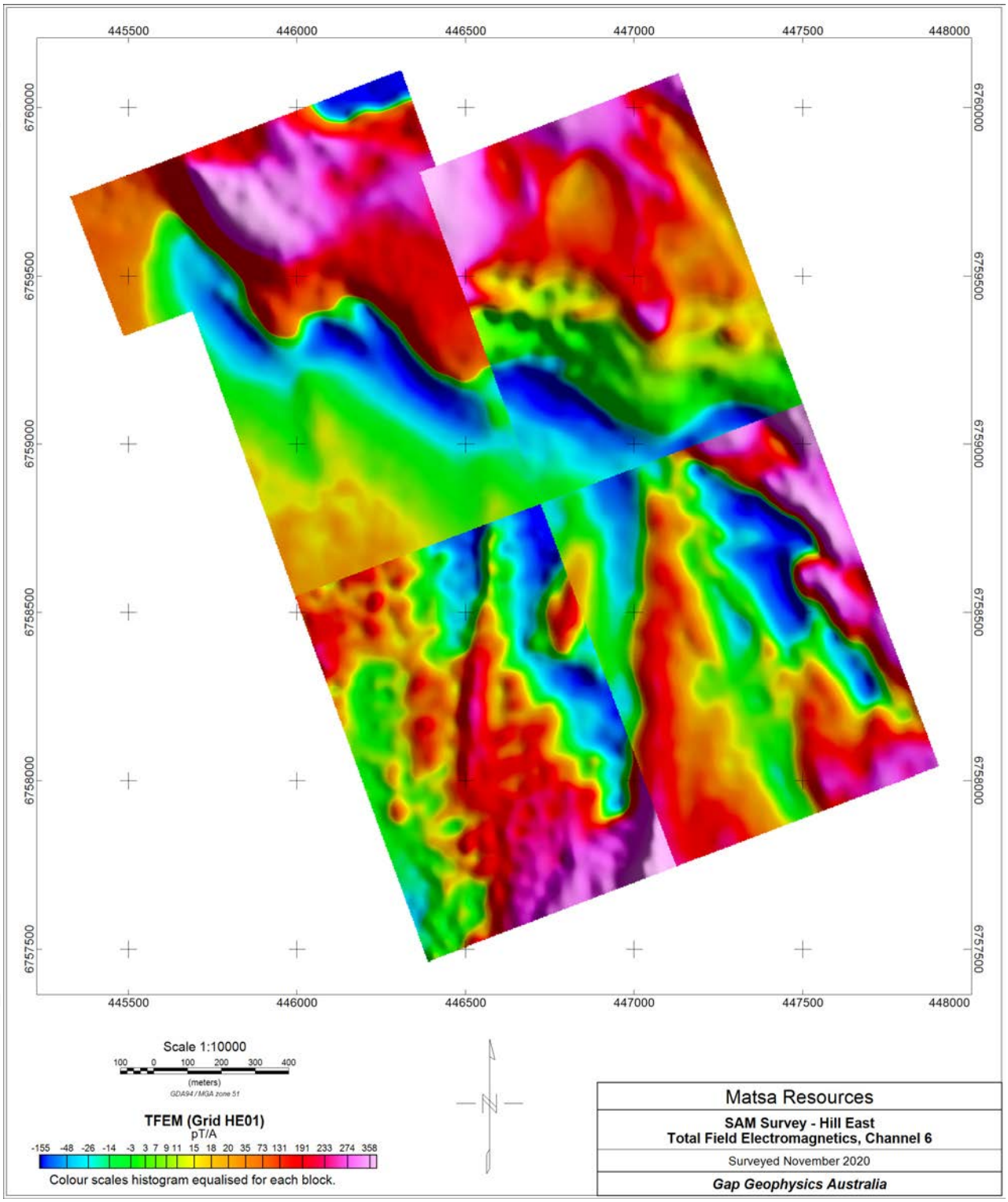


Figure 11 Hill East – total field electromagnetics, channel 6, mosaic.

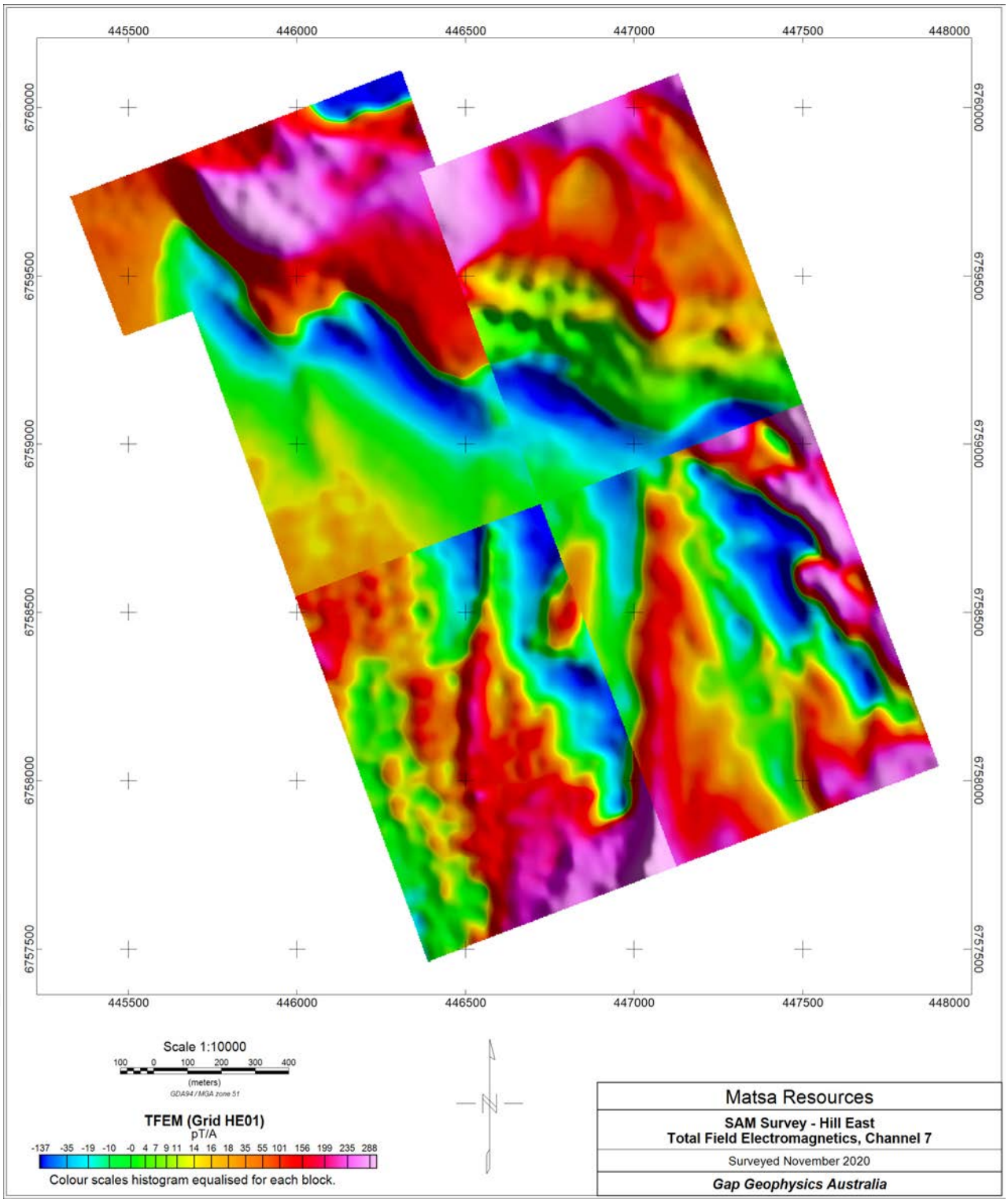


Figure 12 Hill East – total field electromagnetics, channel 7, mosaic.

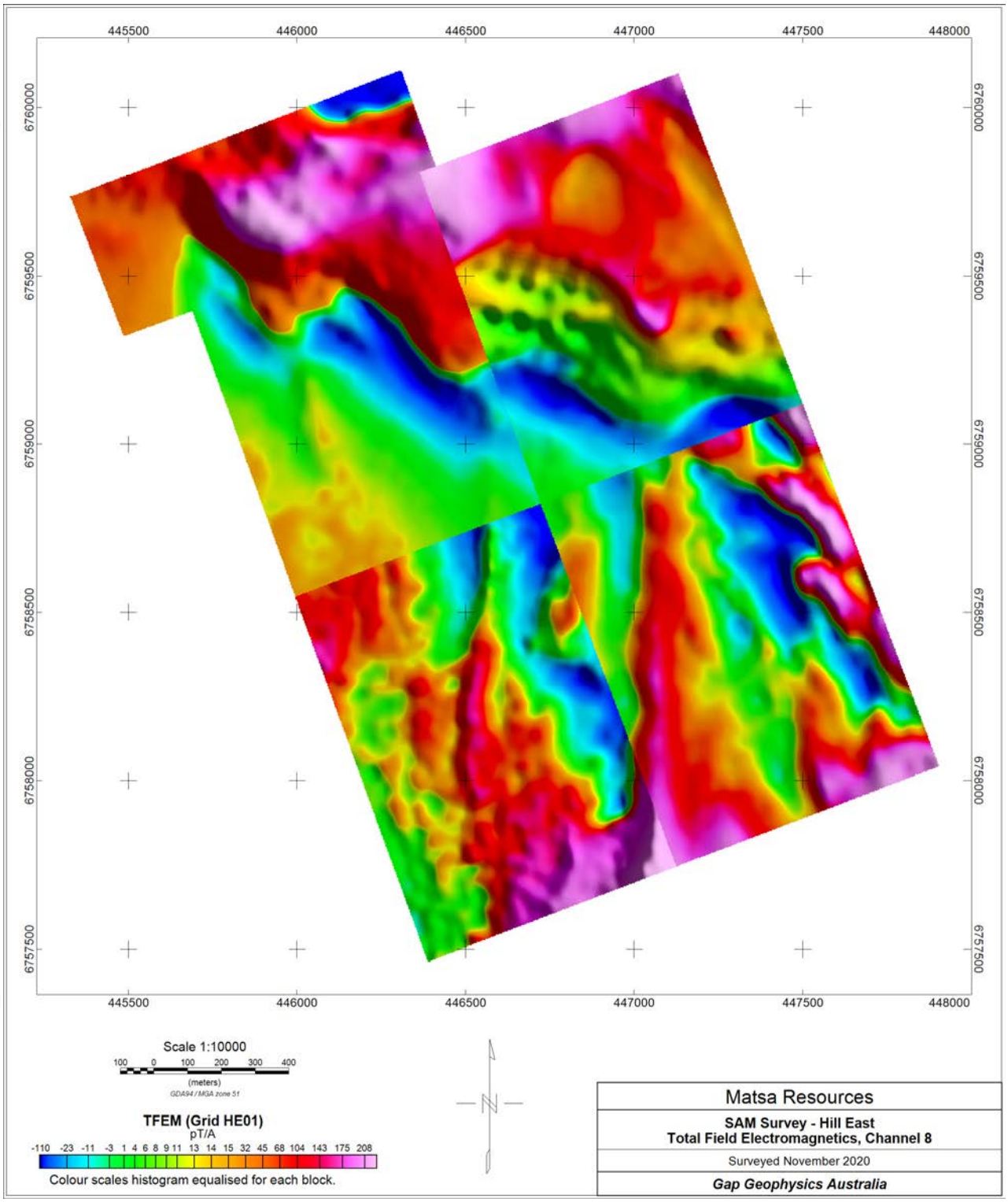


Figure 13 Hill East – total field electromagnetics, channel 8, mosaic.

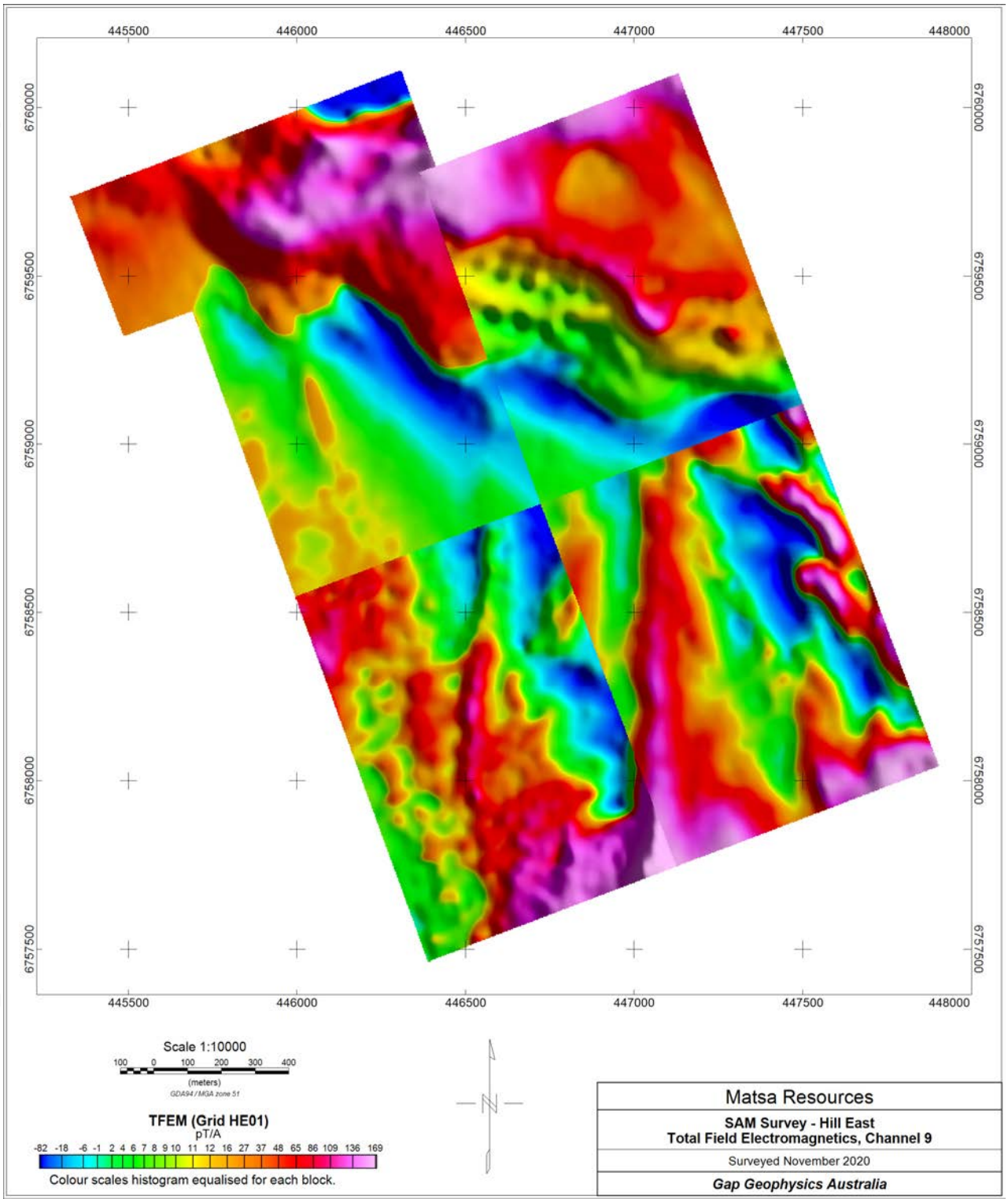


Figure 14 Hill East – total field electromagnetics, channel 9, mosaic.

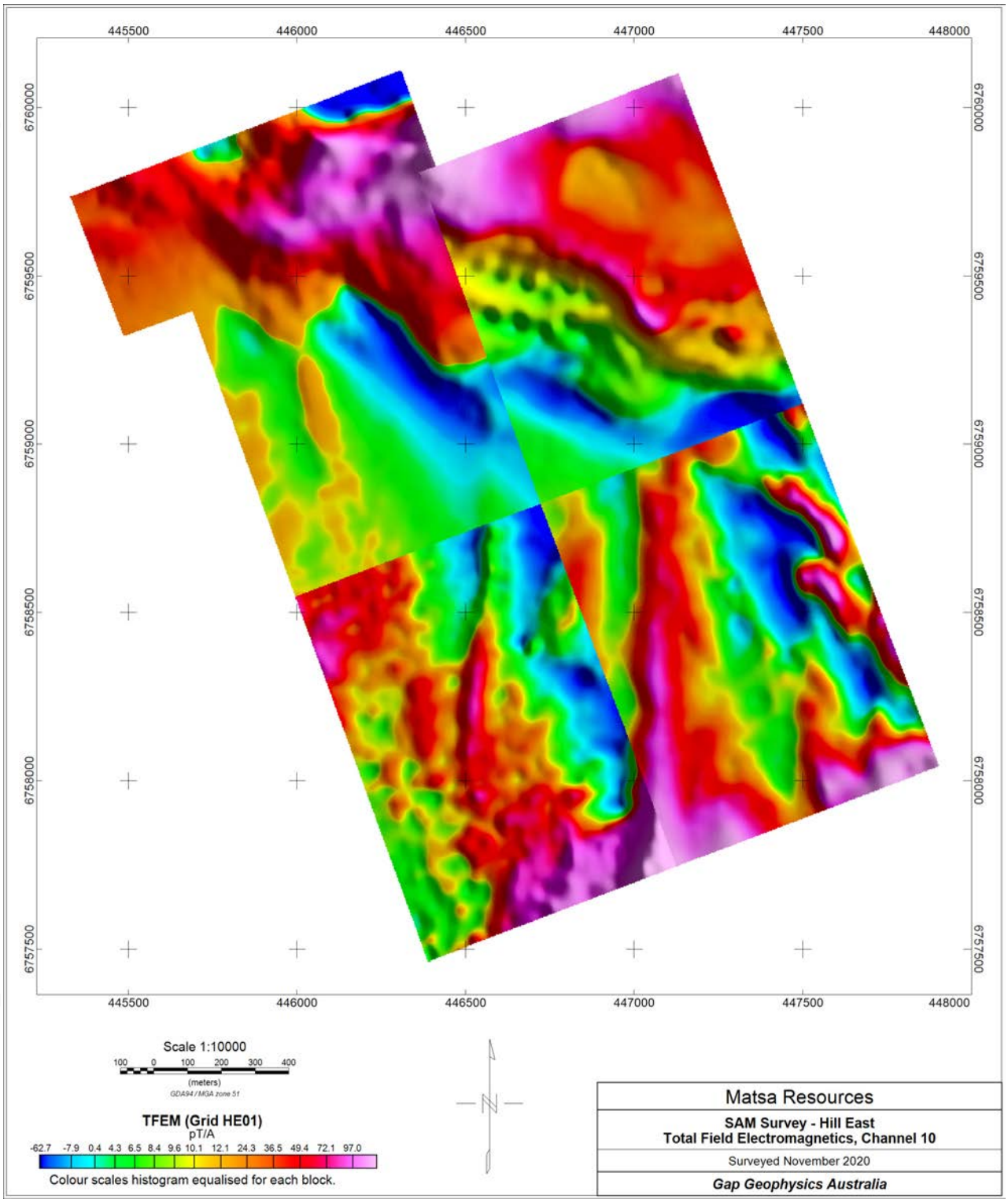


Figure 15 Hill East – total field electromagnetics, channel 10, mosaic.

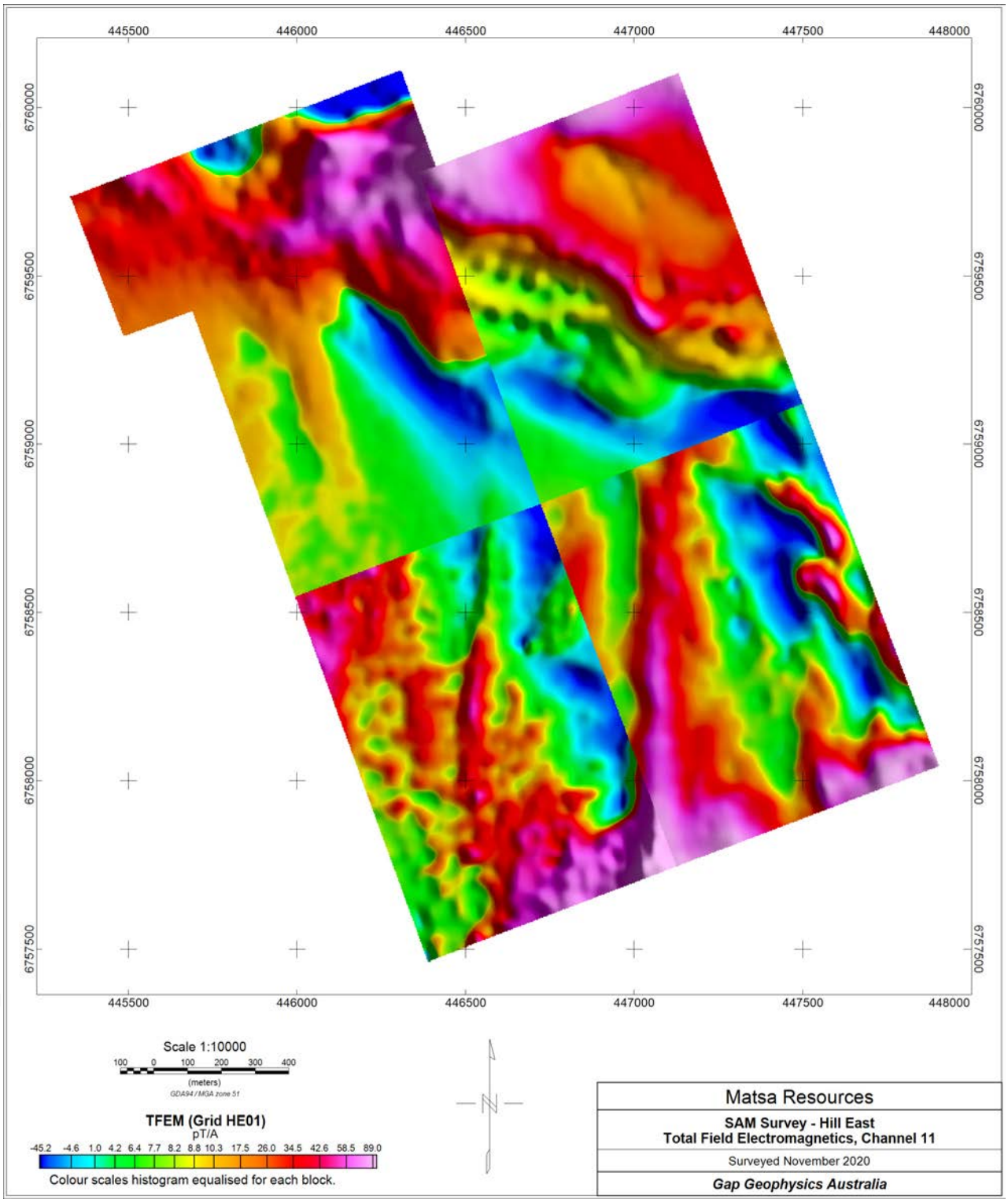


Figure 16 Hill East – total field electromagnetics, channel 11, mosaic.

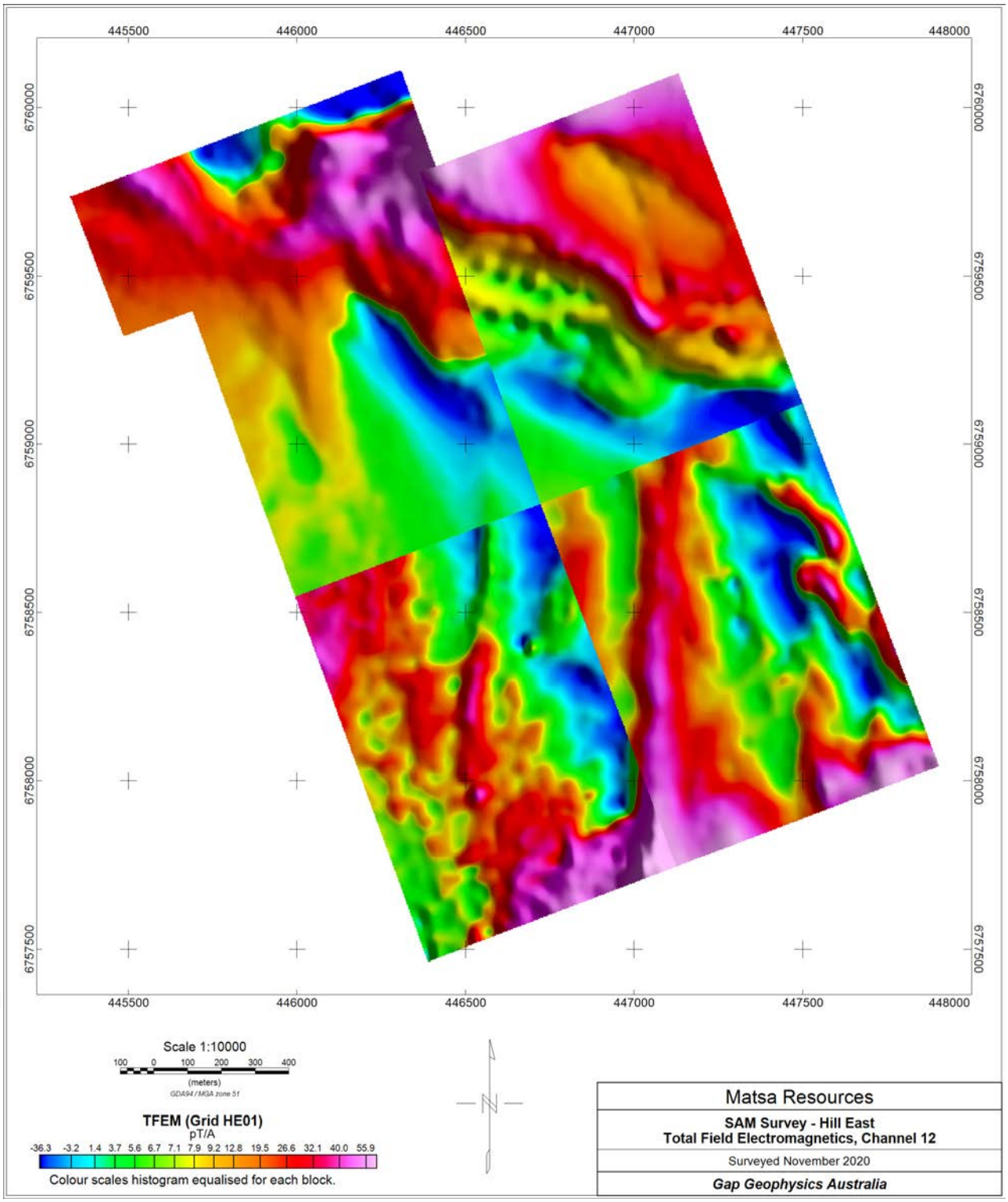


Figure 17 Hill East – total field electromagnetics, channel 12, mosaic.

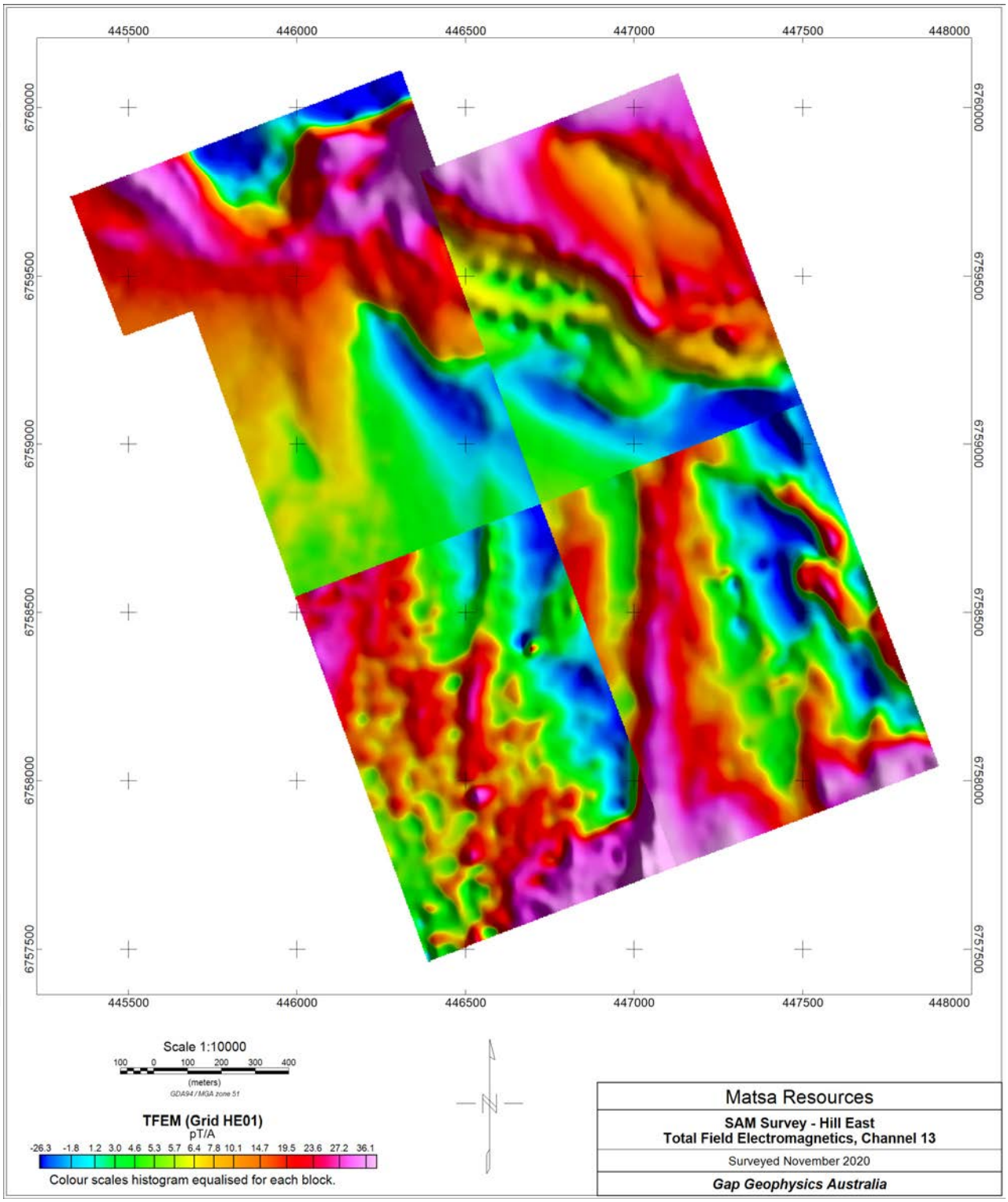


Figure 18 Hill East – total field electromagnetics, channel 13, mosaic.

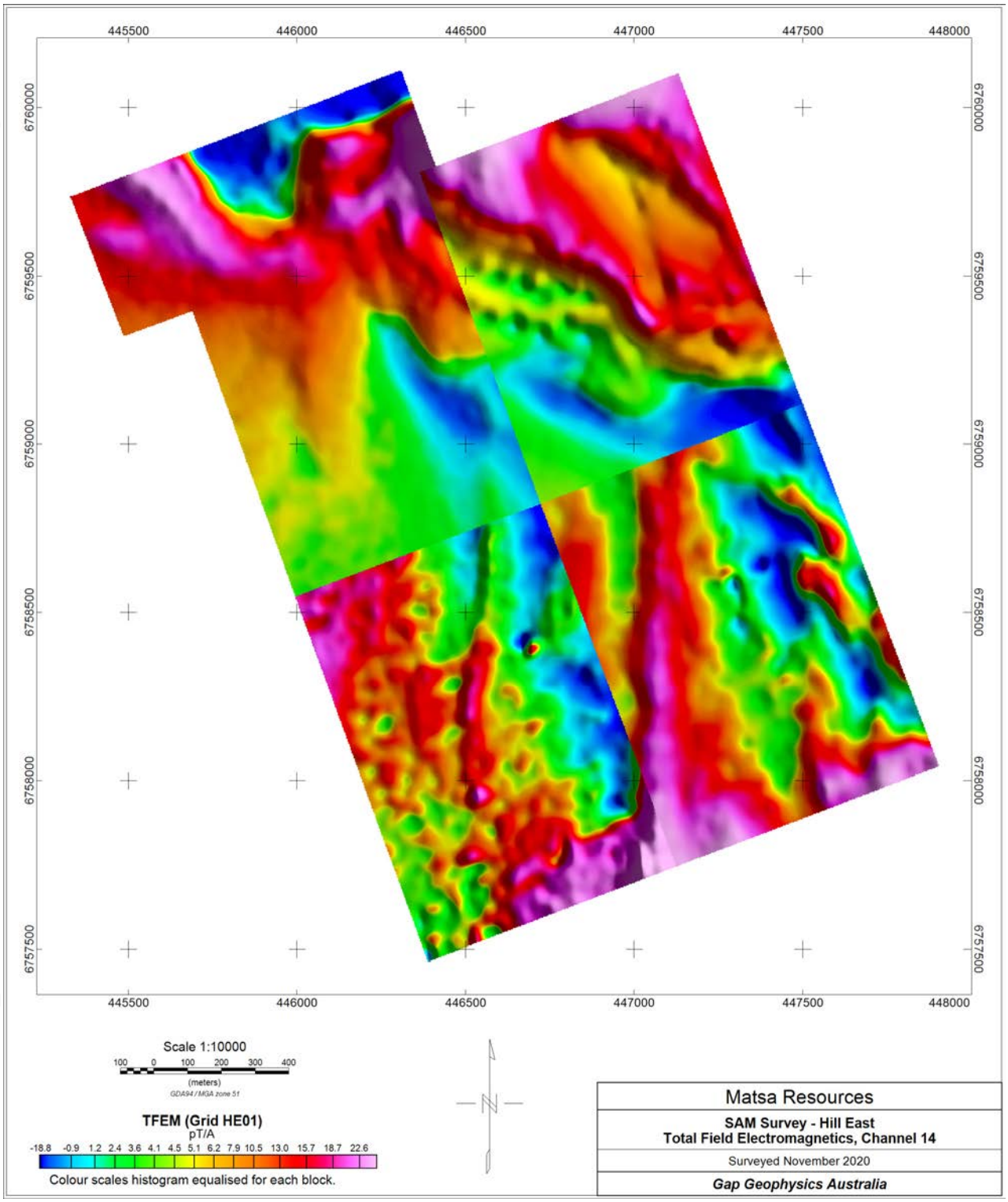


Figure 19 Hill East – total field electromagnetics, channel 14, mosaic.

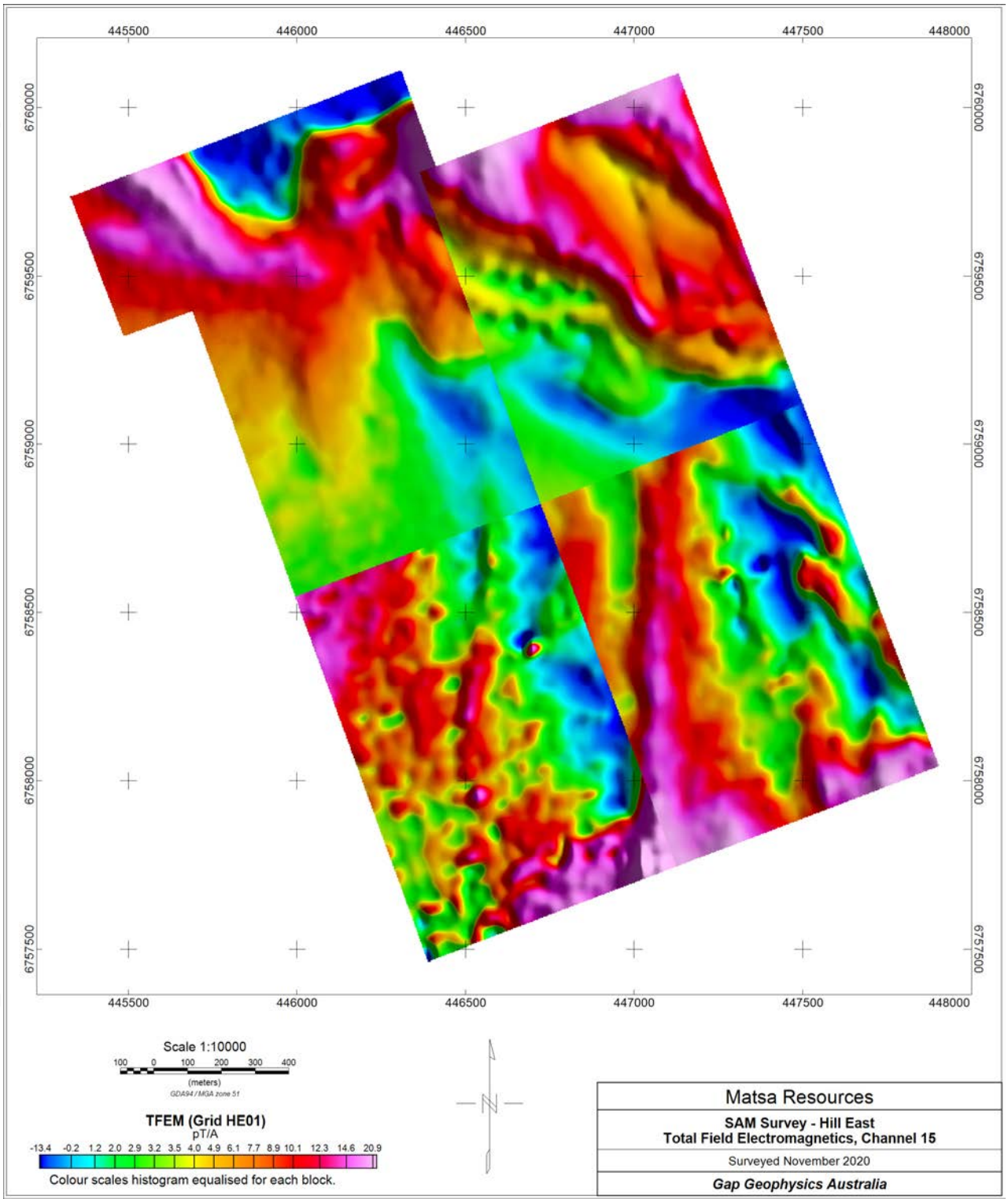


Figure 20 Hill East – total field electromagnetics, channel 15, mosaic.

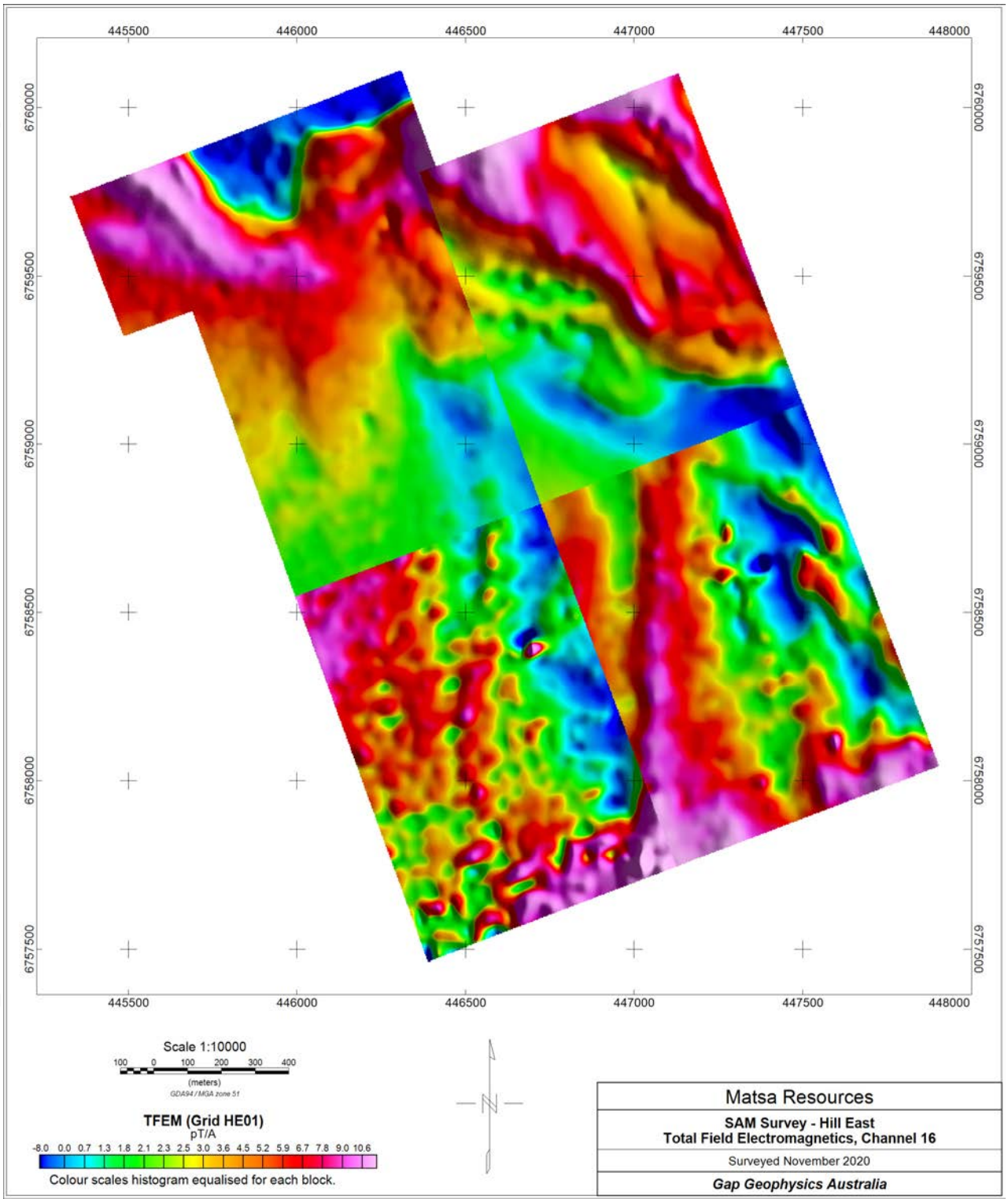


Figure 21 Hill East – total field electromagnetics, channel 16, mosaic.