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Airborne Field Exploration

SINOSTEEL AUSTRALIA

Carpentaria Manganese Project – Field Reconnaissance

ELs 26557, 26539, 26556, 26535

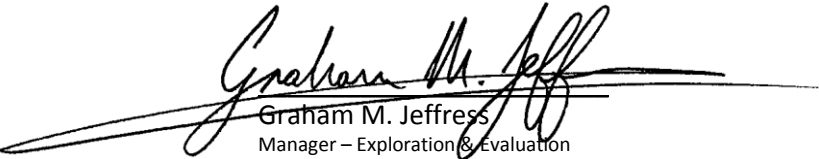
Northern Territory

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Executive Summary

A two day, helicopter-assisted, reconnaissance trip was made to assess the validity of 26 groups of VTEM anomalies in the Gulf of Carpentaria region. The field team was based in Borroloola.

The results of the field reconnaissance were generally disappointing, with most of the VTEM anomalies attributed to cultural features (buildings, vehicles, borrow pits, etc.) and natural ponds or swamps.

It was observed that although several of the VTEM anomalies coincided with natural ponds, there are numerous ponds present in the survey area that did not give a response. Thus it is impossible to categorically say the anomalies are caused by variations in moisture or ponds.

Three of the VTEM anomalies were considered to lie in the most prospective position from a geological perspective. Detailed examination of these areas failed to find a ready explanation for the anomalism and additional work on these targets is warranted.

Four rock chip samples were collected during the field visit. Two of these were taken from identically looking rocks. The first came from a laterite developed over a magnetic anomaly which is also a topographic low. The second came from a laterite developed over haematitic sandstone. Comparison of the assay results suggest the former is derived from a magnetite-bearing felspathic intrusive.

Contents

Executive Summary	II
Contents	III
1 Introduction	1
2 Work Undertaken.....	3
2.1 Pre field trip	3
3 Field Observations.....	5
3.1 Landform.....	5
3.2 Robinson River Manganese.....	8
3.2.1 Anomalies 20 to 26	10
3.2.2 Anomaly 8.....	11
3.2.3 Anomalies 1 to 18	12
3.2.4 Magnetic Anomaly 1.....	12
3.2.5 Hill at 673744 8206462	13
4 Assay Results.....	15
5 Conclusions	16

Figures

Figure 1. Carpentaria Manganese Project Location Map	2
Figure 2. Location Map of the VTEM anomalies, Northern Territory	4

Photographs

Photo 1. Topography at the western end of the project area	5
Photo 2. Typical vegetation cover on western project area	6
Photo 3. Water pond – typical landscape feature in the project area	6
Photo 4. Typical water pond feature in project area – November, 2011	7
Photo 5. Manganese mineralisation at Robinson River.....	8
Photo 6. Galvanised iron lean-too	9
Photo 7. Pandanus vegetation.....	9
Photo 8. Robinson River bed	10
Photo 9. Silcrete.....	11
Photo 10. Silcrete rubble at Anomaly 8	12
Photo 11. Rubbly iron rich laterite amongst Paperbark vegetation	13
Photo 12. Haematitic sandstone	14
Photo 13. Haematite pissolite laterite forming over the haematite sandstone.....	14

Appendices

Appendix 1.....	17
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This report also refers to “Attachment 1 - Carpentaria Mn 2011 Assay Results” and this is submitted as an attachment in Microsoft Excel 2010 digital form along with this document.

1 Introduction

In November 2011 a helicopter-assisted reconnaissance trip was made by Karl Lindsay-Park (Associate Senior Geologist, CSA Global) and Nigel Cantwell (Geophysicist, Resource Potentials) to four exploration licences (ELs 26557, 26539, 26556, 26535) owned by Sinosteel Australia.

The exploration licences are located east of Borroloola near the Gulf of Carpentaria in the Northern Territory (Figure 1).

The purpose of the trip was to ground-truth several VTEM anomalies defined by Resource Potentials.

It was anticipated that some of the VTEM anomalies would be related to manganese mineralisation and validation of the model would assist in determining a work program for 2012.

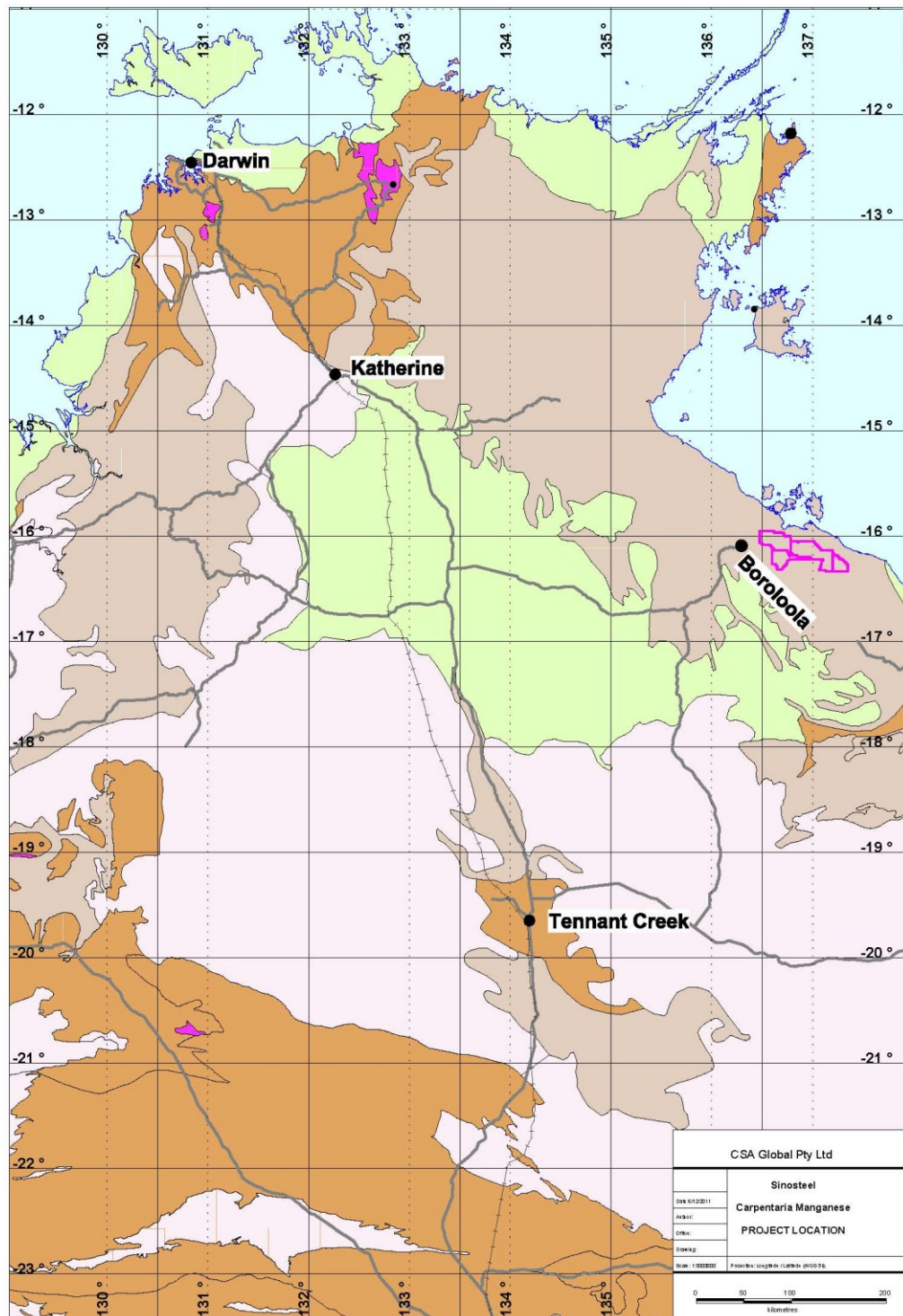


Figure 1. Carpentaria Manganese Project Location Map

2 Work Undertaken

2.1 Pre field trip

Prior to departing for the field, the geophysical data presented to CSA Global by Resource Potential was added to CSA's NT-wide GIS and a plan showing the locations of the VTEM anomalies was prepared as shown in Figure 2.

Each of the VTEM anomalies or groups of anomalies, depending on geographic distribution, was assigned a number as shown on the plan. As part of the preparation each of the anomalous areas was examined in GoogleEarth™, as well as overlain on the regional geology and total magnetic intensity imagery.

Nigel Cantwell suggested that additional refinement of the interpretation of the VTEM data was possible and this might provide more information about the nature of the responses.

The results of the examination of the anomalies superimposed on the GoogleEarth™ imagery are tabulated in Appendix 1. The table presents the Anomaly ID as shown on the location plan, the location of each anomaly in latitude/longitude and MGA co-ordinates and a comment on the probable cause of the anomaly.

In many cases the anomalies appeared to be related to buildings, borrow pits, the main road and ponds or swampy areas. However, the GoogleEarth™ imagery shows numerous ponds or swamps, borrow pits and roads that do not present as VTEM anomalies and as such the geographic features and VTEM anomaly position may be just coincidence.

The examination of the VTEM anomaly positions with respect to the mapped geology indicated that the anomalies numbered 19 to 26 and 8 are located in the most prospective areas when considering a Groote Eylandt style of mineralisation. The VTEM anomalies are more linear than elsewhere suggesting a strike extent more probably related to mineralisation than a semi-circular feature. The anomalies also occur reasonably close to outcropping Proterozoic Sandstone and Quartzite where buried mineralisation may have developed on the Proterozoic, Cretaceous unconformity.

It was also noted that the VTEM anomaly identified as 19 corresponds to the mapped position of the Robinson River 1 and 2 manganese occurrences.

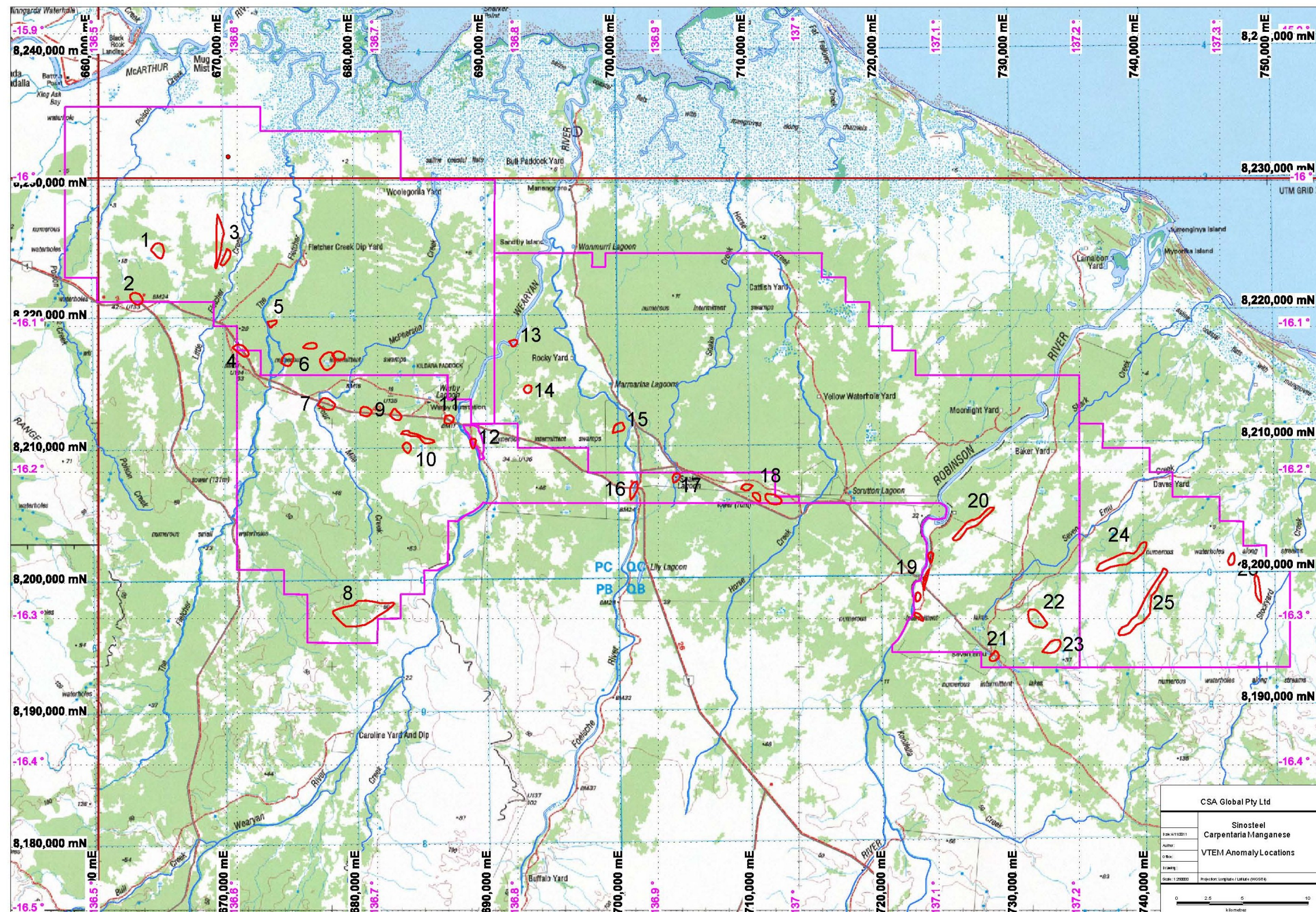


Figure 2. Location Map of the VTEM anomalies, Northern Territory

3 Field Observations

3.1 Landform

The first and most striking observation that can be made about the project area is how flat it is. Photo 1 was taken from the western end of the project area looking towards the east. The apparent variations in topography are the result of cloud shadows and fire scars.

Most of the project area has been burnt off and now consists of open Eucalypt forest with local patches of Cyprus Pines. A closer examination of the general area, Photo 2, shows the effect of the early season burn which has removed almost all of the undergrowth. The absence of undergrowth made observation of the ground easy and effective from the helicopter. Inspection of photo 2 shows how easily car tracks, termite mounds, tree bases and scattered (white) sub crop can be seen. It was concluded that conducting the examination of the VTEM target areas at a flight height of between 160-230m could not fail to locate outcrops if they were as large as a fallen tree, approximately 30cm diameter and about 5m long.



Photo 1. Topography at the western end of the project area

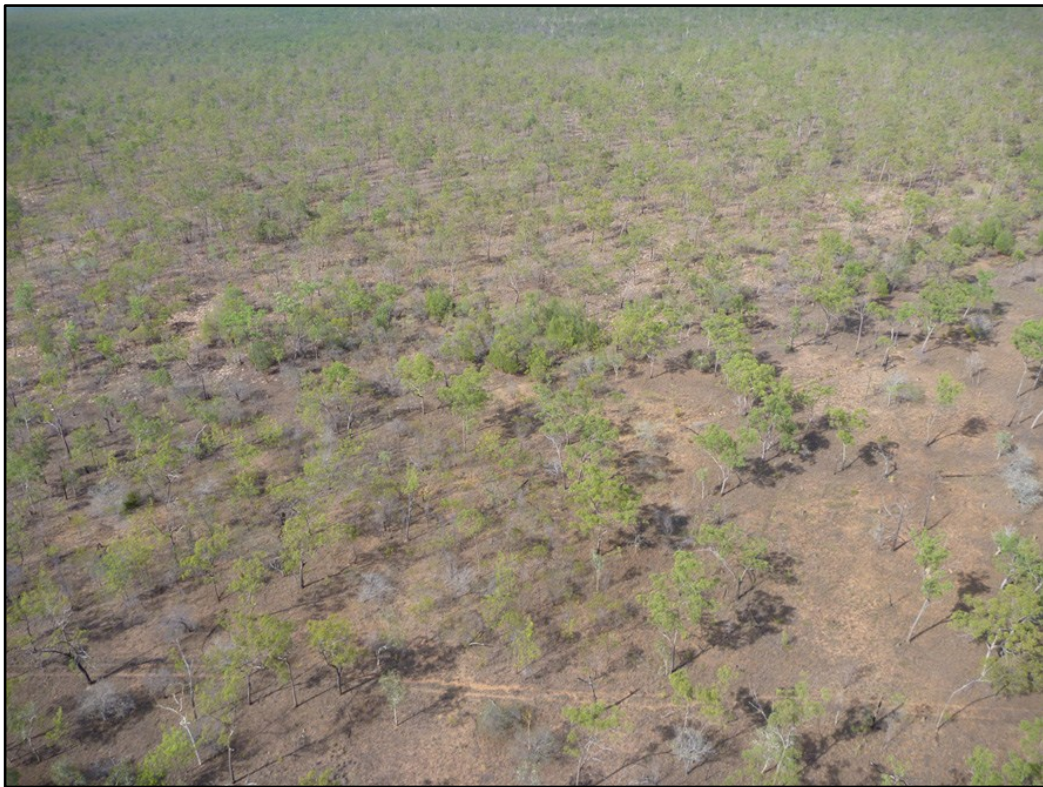


Photo 2. Typical vegetation cover on western project area



Photo 3. Water pond – typical landscape feature in the project area



Photo 4. Typical water pond feature in project area – November, 2011

The second most dominant feature of the landscape is the large number of shallow (<1m deep) natural lakes of various size present. Photos 3 and 4 show two of the typical sorts of ponds that occur. It is important to note that in November most of the ponds are dry but when the VTEM survey was flown in late April or early May many would have still held water, some would have been damp and only a few would have been dry.

Photo 3 is a typical pond that forms for no obvious reason other than it is a depression. These ponds, up to a few kilometres in diameter are very common and clearly recognisable due to the variation in vegetation from open Eucalypt forest to green grass and Melaleuca trees. Photo 4 shows another style of pond that is fairly common. In this case the water is in a small, deep pit which has developed in a laterite layer. Overlying the laterite is a white silcrete. The vegetation density developed over areas of silcrete exposure is much less than developed in areas of sand or laterite cover.

A general observation made while flying between VTEM target areas, at some targets and particularly in the creek bank at MGA Z53 741580mE 8194705mN is that the land surface is comprised of unconsolidated white sand, laterite or silcrete. In fact, the creek bank at the quoted co-ordinate consist of a flat lying stratigraphy of (from top to bottom) 20cm of white sand, 50cm of welded pissolite iron laterite, 50cm of cross-bedded sandstone, 30cm of laterite as above, 50cm of massive sandstone followed by a finely bedded interval of sandstone and siltstone layers.

The presence of several sandstone and laterite layers in the creek bank and the evidence of laterite overlying silcrete and elsewhere silcrete overlying laterite suggest a history of multiple land surfaces that have been preserved. Added to the complexity is the possibility of

rivers meandering across the region and numerous point-bars, palaeo-channels and like features being present beneath the sand cover.

3.2 Robinson River Manganese

The geological map of the region indicates the presence of two manganese occurrences that correspond to the VTEM Anomaly 19 area which is made up of four individual VTEM targets.

The known mineralisation provided an ideal place to start the prospecting work. One occurrence (MGA Z53 723213mE 8199948mN) is located in the bank of the Robinson River.

The mineralisation appears as thin stringers and surface coatings in and on sandstone beds, (see Photo 5). The mineralisation shows some lateral variation and in places beds of massive mineralisation to 5cm occur. Sample RR1001 was taken at this locality. The outcrop is poor and the vegetation is very thick which prevented an estimate of the distribution of mineralisation being made. The northern two of the four VTEM targets that make up anomaly 19 appear to be related to the known mineralisation. The southern most of the four targets corresponds to the location of the abandoned Seven Emu homestead.



Photo 5. Manganese mineralisation at Robinson River.

The third (from the north) VTEM target at anomaly 19 is the largest in the group and given the proximity to mineralisation some effort was made to examine the area. Disappointingly, no mineralisation was discovered. The centre of the VTEM response appears to be related to a galvanised iron lean-to (photo 6) and possibly to a stand of Pandanus (photo 7). Pandanus only grows near water and is common on the river banks. A stand of Pandanus away from the river suggests the presence of a spring or similar water source.



Photo 6. Galvanised iron lean-to



Photo 7. Pandanus vegetation, a sure sign of water

To further assess the possibilities at Anomaly 19 an examination of the rivers bed-load was made. Photo 8 shows the size of and the extent of the material present. Most of the rock present is quartzite and sandstone with much less siltstone and silcrete. No manganese was located.



Photo 8. Robinson River bed

The examination of Anomaly 19 was disappointing in the sense that no major outcrops of manganese were located. However, the known mineralisation has clearly produced an EM response and this suggests that unexplained VTEM anomalies need further work.

3.2.1 *Anomalies 20 to 26*

Anomalies 20 to 26 are located in the east of the tenements, and based on a Groote Eylandt target style were considered to be the most prospective targets.

Examination of these areas and the zone between the anomalies and the outcropping Proterozoic from the air and also by a short field traverse failed to find any manganese occurrences. With the exception of anomaly 26 no obvious explanation for any of the responses was forthcoming. Anomaly 26 appears to be associated with a small round pond and a linear outwash zone with a distinct change in vegetation.

The absence of any direct evidence for the cause of this group of VTEM anomalies, their implied position with respect to the unconformity, the location of known mineralisation and their linear nature suggest anomalies 20, 24, 25, 22 and 23 remain the most prospective.

Anomaly 21 is the Seven Emu Station house.

3.2.2 Anomaly 8

VTEM anomaly 8 was also considered to be a “good” target based on its size and position near the Proterozoic quartzite outcrop. Examination of the area from the air failed to locate any significant outcrops but the anomaly appears to be related to a broad depression surrounded by silcrete. Photo 9 shows the edge of the silcrete layer and the step-down to the next topographic level. Several VTEM anomalies were located in similar geographic positions. It is thought that increased run-off from the silcrete into the lower area and the associated change in moisture content may be responsible for the anomalism.



Photo 9. Silcrete to a large extent controls the topography. Several VTEM anomalies were situated where the Silcrete steps- down to the next topographic level.

Photo 10 was taken on the site of anomaly 18 and shows the typically rubbly edge of the silcrete as it descends to the next layer down. In the case of Anomaly 8 the next level down appears to be just grey or black soil.



Photo 10. Silcrete rubble at Anomaly 8

3.2.3 *Anomalies 1 to 18*

Examination of the remaining anomalies was completed mainly from the air and occasionally on the ground. Overwhelmingly this group appears to be related to depressions with distinctive vegetation changes (ponds and swamps), houses, buildings, radio masts, abandoned machinery, borrow pits and the Savannah Highway itself. Most have no outcrop or sub crop.

3.2.4 *Magnetic Anomaly 1*

One discrete magnetic anomaly was identified from the recently captured airborne data and selected for inspection. Unfortunately, none of the magnetic line data was available for examination and as such no feel for the depth or orientation of the causative body could be inferred. The magnetic anomaly, centred at Z53 683150mE 8214980mN coincides with a topographic low with a distinctive vegetation anomaly.

Photo 11 was taken near the centre of the magnetic anomaly. The area consists of very thick melaleuca trees (paperbarks) and discontinuous but large patches of rubbly laterite. Sample MH001 (683150 8214980) was collected as small bits from several areas of rubble. The staining on the tree trunks indicates the area is submerged by about 50 to 60cm each year.



Photo 11. Rubbly iron rich laterite amongst Paperbark vegetation

The coincidence of a magnetic high and topographic low is considered to be interesting. If magnetic modelling suggests the body may be caused by an intrusive pipe a drilling program will be needed to test the area. The possibility for diamondiferous pipes should not be overlooked given the proximity to the Merlin group of pipes.

3.2.5 Hill at 673744 8206462

One additional hill not associated with a VTEM or magnetic anomaly was visited during the field work. The hill was recognised as different due to the presence of dark coloured outcrop which from the air was thought to be manganese. Unfortunately inspection on the ground showed the black rocks to be haematitic sandstone. The rock is a medium to coarse-grained sandstone with a black fine-grained matrix. Overlying the haematite sandstone is a haematite laterite which forms the hill top.

Photo 12 shows the haematitic sandstone which streaks to the expected red-ochre colour. The sandstone forms a hill approximately 5m high. Photo 13 shows the haematite pissolite laterite forming over the haematite sandstone. The lateritic layer is up to 50cm thick. Very similar haematite rich sandstone forms a flat layer of Cretaceous aged sediment over the Proterozoic Moondogie Sandstone near the Frances Creek Iron ore mines in Pine Creek. Two samples were collected from the area.

Sample MH002 consists of the hill top laterite and sample MH003 consists of the haematite sandstone. The samples were not collected with the thought of iron ore as a possible target but rather to see if the similar looking material from the site of the magnetic high is geochemically different.



Photo 12. Haematitic sandstone



Photo 13. Haematite pisolitic laterite forming over the haematite sandstone

4 Assay Results

As mentioned previously four rockchip samples were collected from the field. The assay results are presented in digital form along with this report as “Attachment 1 - Carpentaria Mn 2011 Assay Results”.

Sample RR1001 was collected at the Robinson River Manganese outcrop. As expected the sample contains elevated levels of manganese and iron and little of anything else. Sample MH003 was taken from a conspicuous black hill which was identified as haematitic sandstone of probable Cretaceous age. The assay results for MH003 do not appear to be significantly different from those expected for this type of rock.

Samples MH001 (Section 3.2.4) and MH002 (Section 3.2.5) were collected to provide a comparison for each other. Both samples consist of haematite-goethite-limonite pisolitic laterite. MH001 was sampled from outcrop developed over a discreet magnetic high which is also a topographic low, whilst MH002 was taken from the laterite developed over the MH001 sandstone which is a hill. The assay results for the two samples have been simply analysed in the comparison table in Attachment 1 (see Attachment 1 - Carpentaria Mn 2011 Assay Results).

Given that there are only two samples available the analysis has been restricted to roughly quantifying the magnitude of the differences between the assay results. For example: in the table the difference between the chromium content of the two samples is 70ppm which is expressed as -25% of the chromium content of sample MH001. The colour coding is an attempt to group the elements into broader groups that may have significance. The following general comments are appropriate:

- The iron content of the two samples is the same, element scavenging by iron is unlikely to be the cause of the differences between the samples
- The Kimberlite indicator elements (coloured yellow) are inconclusive. Ni, Ce and La appear to be elevated in MH001 but Cr, Ti, V and Nb are the same.
- The alkali metals (grey) are all significantly elevated in sample MH001.
- The metals Mn, Co and Mo show considerable differences but most of the transition metals are the same. No obvious base metal anomalism is present.
- Virtually all of the lanthanide metals are much higher in sample MH001 than in sample MH002.

The amount of data available is very limited but the simplest explanation for the geophysical and geochemical differences between the two samples and sites is that MH001 has been derived from a magnetite-bearing felspathic intrusive. The lanthanide content suggests a reasonably deep source for the intrusive.

From an exploration perspective an intrusive of the postulated type has the potential to host a rare earth element mineralisation consisting of both light and heavy REEs.

5 Conclusions

The geological reconnaissance of 26 VTEM anomalies in the Gulf of Carpentaria region was completed with three days of helicopter assistance.

The results of the work were disappointing in that no obvious signs of manganese mineralisation were located. In fact, for most of the VTEM anomalies a spatial coincidence between ponds, swamps, changes in geological cover, buildings, miscellaneous scrap metal, abandoned vehicles, borrow pits and roads became evident. It was also noted that numerous features similar to those listed exist but do not appear as VTEM anomalies. In these cases it is thought that the variations in ground moisture content when the survey was flown may have played an important part in controlling the EM features detected.

Notwithstanding the apparent failure of the airborne prospecting, several of the VTEM anomalies do not appear to be related to any of the above listed features. In particular, anomalies 20, 24 and 25 are considered to lie in a geologically favourable position, are near known mineralisation and have no obvious cause.

At a minimum the VTEM data needs to be fully processed to obtain as much information about anomalies 20, 24 and 25 as possible. The aeromagnetic data needs to be more closely examined and the line data used to model the isolated high visited on this trip. If no more data is available it would be prudent to drill test the known mineralisation at anomaly 19. Also a line of shallow RC holes starting near the Proterozoic outcrop to the south of anomaly 25 and extending at least to the VTEM anomaly is warranted.

If a drilling rig is available to do the work a hole or two into the magnetic anomaly would also be prudent.

Appendix 1.

Sinosteel-Carpentaria Manganese Project

VTEM Anomaly Locations (Lat + Longs in WGS 84) (MGA in GDA 94)

Anomaly ID	No of Parts	East Decimal	North Decimal	East deg,min,sec	North deg,min,sec	East MGA 53	North MGA 53	Plan No	Comments
1		136.5426	-16.0480	136 32 33.3	-16 02 52.8	665100	8225100	1	Anomaly covers a small rise and a drainage area. No obvious cause.
2		136.5281	-16.0812	136 31 41.2	-16 04 52.3	663400	8221500	1	Lies over a borrow pit and the C Highway. Probable laterite
3	A	136.5872	-16.0417	136 35 13.9	-16 02 30.1	669800	8226000	1	A well treed area. No obvious cause, no outcrop.
	B	136.5920	-16.0530	136 35 31.2	-16 03 10.8	670300	8224600	1	
4		136.6035	-16.1160	136 36 12.6	-16 06 57.6	671400	8217500	1	Overlies the C Highway. Well treed. Purple / black area in the SE of the anomaly.
5		136.6242	-16.0981	136 37 27.1	-16 05 53.2	673700	8219600	1	Lies next to a major creek. A distinct white otc area in the east. No obvious cause.
6	A	136.6353	-16.1230	136 38 07.1	-16 07 22.8	674900	8216800	1	Four areas on a very flat plain. Some ponds and drainages. Nothing obvious.
	B	136.6519	-16.1137	136 39 06.8	-16 06 49.3	676700	8217800	1	
	C	136.6647	-16.1233	136 39 52.9	-16 07 23.9	677900	8216700	1	
	D	136.6726	-16.1200	136 40 21.4	-16 07 12.0	678900	8217000	1	
7		136.6636	-16.1528	136 39 48.9	-16 09 10.1	677900	8213500	1	Overlies a borrow pit and the C Highway. Distinct geology change in the S ½ of the area.
8		136.6916	-16.2959	136 41 29.8	-16 17 45.2	680500	8197500	5	Lies on a breakaway in the cover material next to Proterozoic outcrop. Several purple / black areas
9	A	136.6906	-16.1578	136 41 26.2	-16 09 27.9	680800	8212800	1	Two anomalies that lie on the C highway, borrow pits. Nothing obvious, road fill?
	B	136.7131	-16.1618	136 42 47.2	-16 09 42.5	683100	8212500	1	
10	A	136.7293	-16.1751	136 43 45.5	-16 10 30.4	684800	8210900	2	A long anomaly associated with an orange (laterite) area.

Anomaly ID	No of Parts	East Decimal	North Decimal	East deg,min,sec	North deg,min,sec	East MGA 53	North MGA 53	Plan No	Comments
	B	136.7207	-16.1824	136 43 14.5	-16 10 56.6	684000	8210000	2	A pond and drainage zone. Nothing obvious
11		136.7508	-16.1635	136 45 02.9	-16 09 48.6	687200	8212100	2	Lies over the C highway and borrow pits.
12		136.7677	-16.1797	136 46 03.7	-16 10 46.9	689000	8210300	2	Lies over station buildings, generator and river
13		136.7964	-16.1110	136 47 47.0	-16 06 39.6	692200	8217900	2	Lies over point-bar on major river bend
14		136.8064	-16.1432	136 48 23.0	-16 08 35.5	693200	8214400	2	A well treed rise. No obvious cause.
15		136.8721	-16.1688	136 52 19.6	-16 10 07.0	700100	8211400	2	Centred on a small lake. Why this lake and not others??
16		136.8822	-16.2119	136 52 56.1	-16 12 42.8	701200	8206700	2	Contains highway, river and lakes. On a flood plain. Nothing obvious. Some sheds
17		136.9126	-16.2033	136 54 45.4	-16 12 11.9	704500	8207600	2	Centred on sheds and billabong. Floodplain nothing obvious.
18	A	136.9631	-16.2095	136 5747.2	-16 12 34.2	709800	8206800	3	3 anomalies on a small rise. Distinct white zones. Nothing obvious.
	B	136.9696	-16.2169	136 58 10.6	-16 13 00.8	710600	8206100	3	
	C	136.9824	-16.2189	136 58 56.6	-16 13 08.0	711800	8205900	3	
19	A	137.0941	-16.2577	137 05 38.8	-16 15 27.7	723800	8201400	3	4 anomalies along the E side of Robinson River. 2 Mn prospects located in the area.
	B	137.0903	-16.2720	137 05 25.1	-16 16 19.2	723400	8199800	3	Nothing obvious
	C	137.0848	-16.2849	137 05 05.3	-16 17 05.6	722800	8918300	3	
	D	137.0855	-16.2982	137 05 07.8	-16 17 53.5	722800	8196900	3	Contains station buildings
Robinson 1		137.0896	-16.2727	137 05 22.6	-16 16 21.7	723400	8199800	3	Not obvious on Google earth
20		137.1239	-16.2348	137 07 26.0	-16 14 05.3	707100	8204000	3	Long anomaly orientated para to geographic features like drainage and tree lines. Geology?? Nothing obvious. Possibly along strike of Robinson R mineralisation.

Anomaly ID	No of Parts	East Decimal	North Decimal	East deg,min,sec	North deg,min,sec	East MGA 53	North MGA 53	Plan No	Comments
21		137.1391	-16.3258	137 08 20.8	-16 19 32.9	728500	8193800	4	Covers river, flood plain and low hills. One old house. No obvious cause
22		137.1688	-16.3005	137 10 07.7	-16 18 01.8	731800	8196500	4	Contains two small lakes. No obvious cause. Proterozoic otc to the south. Rock has fabric
23		137.1816	-16.3195	137 10 53.8	-16 19 10.2	733000	8914500	4	As for 22, good location but nothing obvious
24		137.2324	-16.2594	137 13 56.6	-16 15 33.8	738500	8201100	4	Nothing obvious, good location. Where rivers end on costal floodplain.
25		137.2480	-16.2906	137 14 52.8	-16 17 26.2	740100	8197400	4	Best position wrt geology. Nothing obvious. Check river float.
26	A	137.3089	-16.2594	137 18 32.0	-16 15 33.8	746700	8200900	4	On coastal floodplain. Contain lakes and forest. Nothing obvious
	B	137.3272	-16.2800	137 19 37.9	-16 16 48.0	748700	8198700	4	