
WINCHELSEA MINING

BUILDING FUTURE GROOTE

ANNUAL MINERAL EXPLORATION REPORT

WINCHELSEA (AKWAMBURRKBA) ISLAND PROJECT EL27521

TENEMENT HOLDER: WINCHELSEA MINING PTY LTD

OPERATOR: WINCHELSEA MINING PTY LTD

REPORTING NUMBER: EL27521_2019_A

REPORTING PERIOD: 21 December 2018 to 20 December 2019

1:250,000: GROOTE EYLANDT REGION (PARTS OF SHEETS SD 53-7, 8)

1:100,000:

Commodities: Manganese

This report and its contents are confidential. All rights to the report and its contents (including, without limitation, rights to confidential information and copyright in all works (including photographs, diagrams, charts, maps and graphs) comprised in the report) remain the property of Winchelsea Mining Pty Ltd. No part of this report, or the information contained in it, may be disclosed to any person or be reproduced (including being stored in any form), transmitted, published or used for any purpose without the prior written consent of Winchelsea Mining Pty Ltd or the Geosciences Division, Northern Territory Government.

Distribution: DPIR (Digital)

WM (Hardcopy & Digital)

AMETS (Digital)

Report Number: EL27521_2019_A

Report Date: 17 February 2020

Authors: Bolton, B.R., Pascoe, D., Marden, J.

TITLE PAGE AND BIBLIOGRAPHIC DATA

Project Name: Winchelsea (Akwamburrkba) Island Project
Tenement Numbers: EL27521
Tenement Holder: Winchelsea Mining Pty Ltd
Tenement Operator: Winchelsea Mining Pty Ltd
Report Type: Annual Mineral Exploration
Report Title: Winchelsea (Akwamburrkba) Island Annual Mineral Exploration Report for the Period 21/12/18 to 20/12/19
Report Period: 21 December 2018 to 20 December 2019
Authors: B.R. Bolton, D. Pascoe, J. Marden
Date of Report: 17 February 2020
1:250,000 map sheet: GROOTE EYLANDT REGION (PARTS OF SHEETS SD 53-7, 8)
1:100,000 map sheet: Bickerton (6170), Langdon (6270)
Target Commodity: Manganese
Keywords: Manganese, Winchelsea, exploration
Tenement Manager: Holly Edgar, Senior Tenement Manager/Geologist
Australian Mining & Exploration Title Services (AMETS)
GPO Box 888, Darwin NT 0801 T: (08) 89 411 911, E: holly@amets.com.au

Contact Details: Barrie Bolton, Winchelsea Mining Pty Ltd
T: 0448 667 110, E: barrie.bolton@wmining.com.au
David Pascoe, Winchelsea Mining Pty Ltd
T: 0448 274 917, E: david_pascoe57@yahoo.com
Josh Marden, Winchelsea Mining Pty Ltd
T: 0475 252 375, E: joshmrdrn@gmail.com

Email for expenditure: Holly Edgar, Senior Tenement Manager/Geologist AMETS
E: holly@amets.com.au

Copyright: This report and its contents are confidential. All rights to the report and its contents (including, without limitation, rights to confidential information and copyright in all works (including photographs, diagrams, charts, maps and graphs) comprised in the report) remain the property of Winchelsea Mining Pty Ltd. No part of this report, or the information contained in it, may be disclosed to any person or be reproduced (including being stored in any form), transmitted, published or used for any purpose without the prior consent of Winchelsea Mining Pty Ltd, or the Geosciences Division, Northern Territory Government, until as and when the information becomes open file.

ABSTRACT

This annual report for the period 21 December 2018 to 20 December 2019 covers the mineral exploration completed by Winchelsea Mining Pty Ltd (Winchelsea) on one granted exploration licence located on Winchelsea (Akwamburrkba) Island, Northern Territory. Work completed includes reconnaissance geological mapping, rock chip sampling, a ground-based gravity survey, and reverse circulation drilling.

The Winchelsea (Akwamburrkba) Island Manganese Project, is a joint venture between the Anindilyakwa Advancement Aboriginal Corporation (AAAC)(60%) and Aus-China Pty Ltd (40%). AAAC, the majority partner, consists of the two Traditional Owner clans of Winchelsea Island.

The Project area lies within the Jurassic-Cretaceous intracratonic Carpentaria Basin which in turn overlies the Proterozoic rocks of the McArthur Basin.

During the reporting period, Winchelsea carried out field evaluations, prospect scale geological mapping, geochemical reconnaissance of rock chip samples, gravity survey, and reverse circulation drilling.

CONTENTS

TITLE PAGE AND BIBLIOGRAPHIC DATA.....	2
ABSTRACT	3
CONTENTS.....	4
FILE LISTING	5
LOCATION, ACCESS AND PHYSIOGRAPHY	8
TITLES.....	11
GEOLOGIC SETTING, EXPLORATION HISTORY AND EXPLORATION RATIONALE	12
WORK UNDERTAKEN BY WINCHELSEA MINING PTY LTD	14
PROSPECT INDEX.....	14
OFFICE STUDIES	15
GEOLOGICAL MAPPING	16
Map Rock Units.....	19
Manganese Mineralisation	23
Stratigraphy	25
GEOPHYSICAL ACTIVITIES.....	27
Equipment and Instrumentation	28
Interpretation	28
GRAB SAMPLE GEOCHEMISTRY AND MINERALOGY	34
DRILLING	40
Sample collection, preparation and analysis	42
Mineralisation Modelling.....	43
REFERENCES.....	47
APPENDICES.....	48
Appendix 1 – Sample and observation details (Locations given in WGS 84).....	48
Appendix 2 - Major element geochemistry for surface grab and rock chip samples	53
Appendix 3 – Drill hole coordinates and depths, Phase 1 and Phase 2 Programs.....	56

FILE LISTING

EL27521_2019_A_01_ReportBody.pdf	Group Annual Report Text
EL27521_2019_A_02_DrillCollars.txt	Drill collars text file
EL27521_2019_A_03_Litholog.txt	Geology Log text file
EL27521_2019_A_04_LoggingCodes.txt	Logging Codes text file
EL27521_2019_A_05_DrillGeochemistry.txt	RC drill analyses text file
EL27521_2019_A_06_SurfaceGeology.txt	Surface Geology text file
EL27521_2019_A_07_SurfaceGeochemistry.txt	Surface Geochemistry text file
EL27521_2019_A_08_AtlasGeophysics.pdf	Atlas Geophysics, 2019. Winchelsea Gravity Survey
EL27521_2019_A_09_PGN.pdf	PGN, 2019. Winchelsea Island high sensitivity ground gravity interpretation
<u>DXF's – surface mapping outlines</u>	Tracks Coastline Environmental restricted limit Ferruginous Laterite (FL) Manganiferous laterite (ML) Pisolitic manganese (PM) Ferruginous Grit (FG) Siliceous manganese (SM) Basement quartzite (BQ)

<p>String files (drill sections) String files in Surpac format The string files function on 200m east-west sections eg 77,800N, 80,000N etc</p>	<p>Topo Surface (derived from drill collars) Base of overburden Base of manganiferous laterite (ML) Base of Interburden (IB) Base of pisolitic manganese (PM) Base of siliceous manganese (SM) Top of basement quartzite (BQ)</p>
<p>Wireframes Wireframe files (Based on drill intersections) as DXF's of:</p>	<p>Topo Surface (derived from drill collars) Base of overburden (OB) Base of manganiferous laterite (ML) Base of Interburden (IB) Base of pisolitic manganese (PM) Base of siliceous manganese (SM) Top of basement quartzite (BQ)</p>

Additional Data Folders

Analyses Files ALS Drill Geochemistry

Analyses Files ALS Surface Geochemistry

Atlas Final Grids and Images

Atlas Gravity Database

Atlas Raw Gravity and Positional Data

PGN Deliverables

LOCATION, ACCESS AND PHYSIOGRAPHY

The Project area is located on Winchelsea (Akwamburrkba) Island, about 630 km southeast of Darwin and on the western margin of the Gulf of Carpentaria, in Northern Territory, Australia. Winchelsea Island lies 500 m to the north of Groote Eylandt and approximately 11 km to the northeast of the port township of Alyangula (Figure 1).

Access to the Project area is by air, via the all-weather airstrip on Groote Eylandt, helicopter, or by marine vessel from Groote Eylandt, Darwin or Cairns.

Access for plant and equipment onto Winchelsea Island is via an engineered barge landing ramp constructed of imported crushed rock that provides barge access during high tides. On Winchelsea, cleared unsealed tracks provide all-weather access to most parts of the licence.

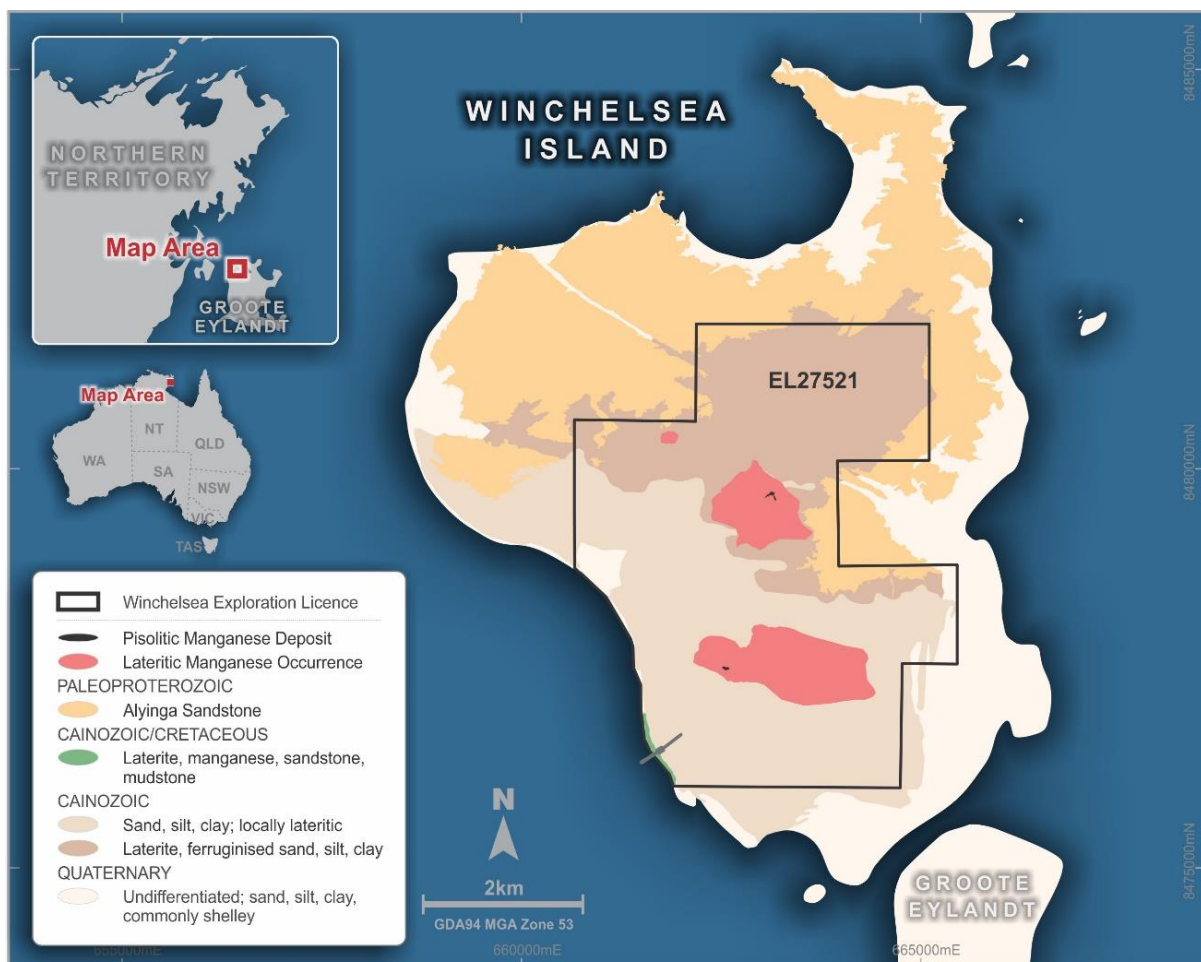


Figure 1. Winchelsea Project Location

Winchelsea Island is part of the Groote Eylandt archipelago located in the west of the Gulf of Carpentaria of which the largest is Groote Eylandt itself. Winchelsea Island covers an area of about 50 km² and is a geological extension of Arnhem Land, with which it shares landscape features as well as faunal and floral assemblages (Pietsch et. al. 1997, Lynch & Wilson 1998).

The physiography of most of the north and east of Winchelsea Island is rugged. Forty percent of the island is dominated by dissected sandstone outcrops. Deeply incised narrow gorges, often filled with dense scrubby vegetation or, in some places, monsoon vine thicket dominate the north east coast. Large areas of the north of the island are dominated by stony plains with monumental outcrops of sandstone up to 10m high. Like the extensive sandstone outcrops on the Groote Eylandt, the formations on Winchelsea exhibit differential weathering of bedding planes, leading to the formation of rock shelters and overhangs. Unlike much of the Dalumbu Sandstone on Groote Eylandt to the south, which is characteristically 'white rock', much of the sedimentary rock of similar age on Winchelsea Island, the Alyinga Sandstone, has a red colouration and in many places is coarse grained.

In the centre and west of Winchelsea the rocky outcrops slope down to form coastal plains with sandy substrates and only rudimentary soil development. The coastal plains extend up to 5 km inland at their widest point, coming to within 1 km of the east coast from which they are separated by the outcrop of Alyinga Sandstone. These plains rarely exceed an altitude of 17m AHD and are dominated by moderately dense Eucalypt, Acacia and Melaleuca woodlands. The western coastal margins of Winchelsea Island are lined by an extensive dune fields, up to 300m wide at its maximum. In some locations the woodlands of the coastal plains are truncated by low cliffs (to 10m high) with a narrow beach and fringing mangrove.

Figure 2 shows a digital elevation model of Winchelsea Island.

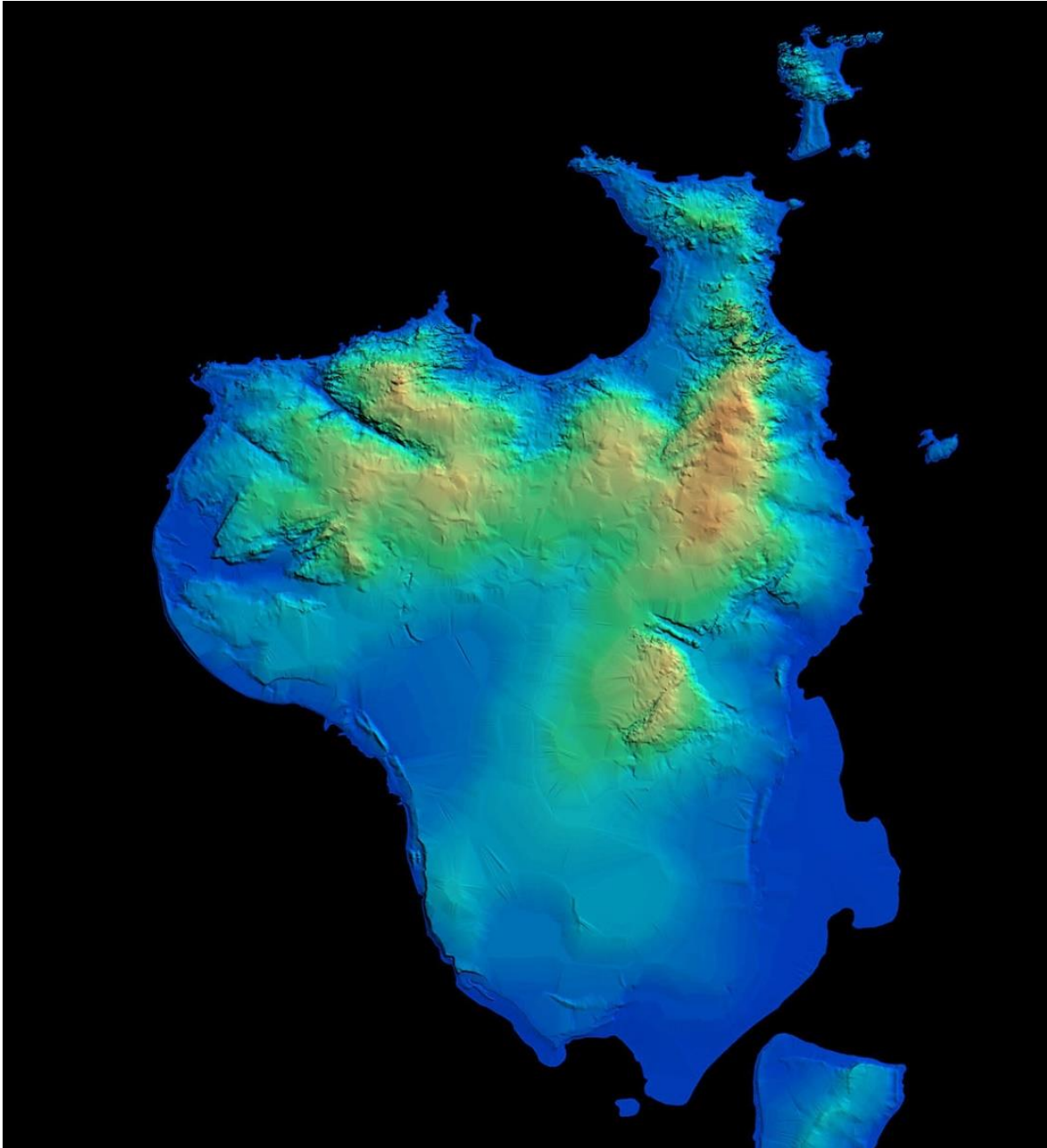


Figure 2. Digital elevation model of Winchelsea Island

TITLES

The Winchelsea (Akwamburrkba) Island Project consists of one granted tenement - EL27521 (Figure 1). Details of the block size, application and grant dates, and tenure for this tenement are shown in Table 1.

All exploration work conducted on the tenement throughout the reporting year was undertaken by Winchelsea Mining Pty Ltd.

Exploration licence EL 27521 is located in NT Portion (000) – Parcel 6823. The tenement is over Aboriginal Freehold Land (under ALRA) held by the Anindilyakwa Land Trust. The Company and the Land Council have agreed upon the terms and conditions of the grant of the licence and the Minister (for Primary Industry and Resources) has given all necessary approvals and consents for the purposes of the ALRA.

Table 1. Winchelsea Island Manganese Project Tenement Status

Lease	Name	Status	Current Area	Area Type	Application	Granted	Expiry	Tenure (yrs)	Area (km2)
EL27521	Winchelsea Island	Granted	11	Blocks	31-Jul-09	21-Dec-18	20-Dec-24	6	20.39

There are no registered and recorded heritage sites identified on plans sourced from the Aboriginal Areas Protection Authority (AAPA) located within EL27521.

There are no recorded places within the tenement area on the World Heritage Register, the Australian National Heritage Register, the NT Heritage Register, the Aboriginal and Macassan Site Database, or the Commonwealth Heritage Register.

GEOLOGIC SETTING, EXPLORATION HISTORY AND EXPLORATION RATIONALE

The geology of the Winchelsea Island region is described in the 1:250 000 Geological Map Series Explanatory Notes for Groote Eylandt Region SD53-7, 8, 11, 12 (Rawlings et al., 1995; Pietsch et al., 1997).

Winchelsea Island, together with its close large neighbour, Groote Eylandt, lies on the eastern margin of the Proterozoic McArthur Basin. On Winchelsea, the geology of the northern part of the island is dominated by the Paleoproterozoic Alyinga Sandstone, which forms a resistant plateau up to 50 m above sea level (Rawlings et al., 1995; Pietsch et al., 1997; Munson et al., 2013). Lowland coastal plains dominate the central southern and southwestern parts of the island, overlying Cretaceous sedimentary rocks (Pietsch et al., 1997; Munson et al. 2013). Quaternary aeolian dunes, beach ridges and mud flats occur on the southern and southwestern coastal fringes. Further details on the geology of Winchelsea are given below.

By comparison, on Groote Eylandt, local basement is dominated by the Paleoproterozoic Dalumbu Sandstone which in turn conformably overlies the Bartalumba Basalt (Pietsch et al., 1997). The Bartalumba Basalt is thought to overlie, via an inferred concordant contact, the Alyinga Sandstone found on Winchelsea Island (Pietsch et al., 1997). Basement rocks on Groote Eylandt are in turn unconformably overlain by a flat-lying Cretaceous sediment which in places exceed 100 m in thickness and comprise the early to middle Cretaceous Walker River Formation (Bolton et al., 1990; Pietsch et al., 1997). These Cretaceous sediments are host to the World-class manganese deposits currently mined on Groote Eylandt and occur in two small local basins located on the western and south-western margins of the island.

The northern basin contains un-fossiliferous quartz sandstones derived from the basement quartzites, overlain by a shallow marine glauconitic claystone, the top of which bears the primary pisolitic and oolitic manganese ores, and which are overlain by the secondary ores, massive and concretionary manganese and weathering products of variable age. The southern basin sequence is dominated by sandy siltstone which is calcareous in part and contains manganese carbonate oolites at a deeper stratigraphic level and minor manganese oxide cemented sandstone near surface.

The orebody on Groote Eylandt comprises mainly primary pisoliths and oololiths which occur as an almost continuous layer some 22 km long, 6 km wide and up to 9 m, but averaging 3 m thick, within the sandy layers of the Walker River Formation. The manganese varies from massive oxides through a mixture of oxides and kaolinitic clays and quartz sands to disseminated oxides in a sandy clay matrix. The lateritic overburden ranges up to 35 m thick but in the mined areas averages 5 m thick. The major ores are found either at a shallow depth or exposed in a series of WNW- or W-trending, joint controlled, partly infilled depressions between elongate inliers of basement quartzite, or they lie directly on broad terraces cut into the basement quartzite, or to the west as an almost continuous sheet that dips at 3 deg W. The ore minerals are mainly pyrolusite and cryptomelane with minor manganite, with minor

to trace amounts of several other manganese minerals. The deposit is thought to have formed as a non-volcanogenic shallow water marine sedimentary deposit on Proterozoic basement. It was subsequently enriched by diagenesis, supergene alteration and late stage pedogenic processes.

The target of interest in this program are economic manganese oxide deposits. The close proximity and geological similarity between Groote Eylandt and nearby Winchelsea Island sequence, that is the main rationale for the exploration program currently underway on Winchelsea Island.

The rocks on Winchelsea, as with those on Groote Eylandt, are unmetamorphosed. Structure is also largely absent from both islands with the dominant structural element present being prominent conjugate joint set trending mainly north-north-east to northwest and east to northeast. No faulting or folding has been observed to date on Winchelsea Island. Magnetic data for the region suggests the basement sandstones are intruded by mafic dykes.

Searches of Northern Territory Government, Commonwealth Government, and other databases were conducted to obtain information on the geology and exploration history of the island. Winchelsea Mining has been unable to find any evidence of mineral exploration on the island prior, to the current program.

WORK UNDERTAKEN BY WINCHELSEA MINING PTY LTD

PROSPECT INDEX

Figure 3 shows the prospect index.

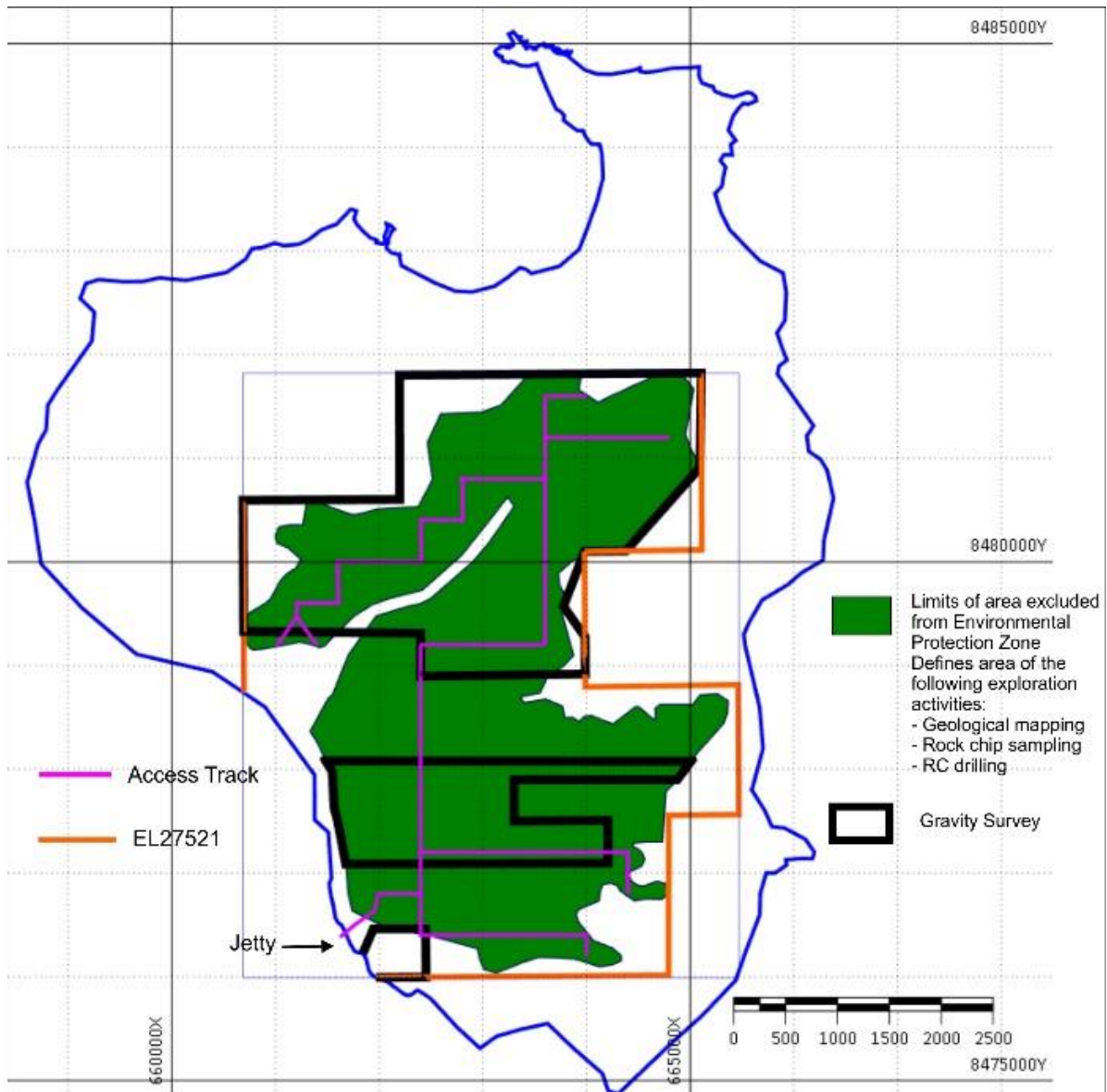


Figure 3. Prospect Index - Exploration activities during the period 21 December 2018 to 20 December 2019.

OFFICE STUDIES

As noted above and prior to the commencement of field activities, Winchelsea conducted an extensive literature search of government and other public databases in search of any information on the geology and mineral resource potential on Winchelsea Island. The main source of geological information on Winchelsea Island was work conducted by Australian Geological Survey Organisation and Northern Territory Geological Survey (Pietsch et al., 1997). The extensive literature on the geology and manganese deposits of Groote Eylandt were compiled and reviewed as part of office-based studies.

Also prior to the exploration activities, digital orthophotography was completed over Winchelsea Island in July 2018. The resulting 10cm resolution RGB 3-band wavelet 8-bit ortho-rectified mosaic has provided a high-resolution base image for environmental studies, infrastructure planning, geological mapping as well as exploration planning. Figure 4 shows the Winchelsea Island mosaic produced.



Figure 4. High-resolution ortho-rectified mosaic image of Winchelsea Island taken on 16th July 2018.

GEOLOGICAL MAPPING

Following the granting of the exploration licence in January 2019, field work on Winchelsea Island involved early stage reconnaissance investigations including geological mapping and the completion of a micro-gravity survey.

Initial mapping was conducted over a 14-day period from the 19th February to 4th March 2019. Work consisted of geological mapping at a regional scale of 1:60,000 to larger-scale maps around prospective manganese mineralisation at 1:6,000.

A reconnaissance scale map of the island is shown in Figure 5. This map shows the licence area is largely composed of either sand, of Cainozoic age, particularly in southern parts, and laterite and lateritic gravels and soils, in northern parts, where the latter onlap the well cemented sandstones of the Paleoproterozoic Alyinga Sandstone. Several areas, shown on the map in light pink colour, comprise widespread laterite with varying amounts of hard, dense manganese oxide clasts, some up to boulder size. In at least two areas, shown in this map in black, are located pavements of hard, dense and high-grade manganese oxides, many of which show evidence of primary manganese oxide pisolitic and oolitic texture.

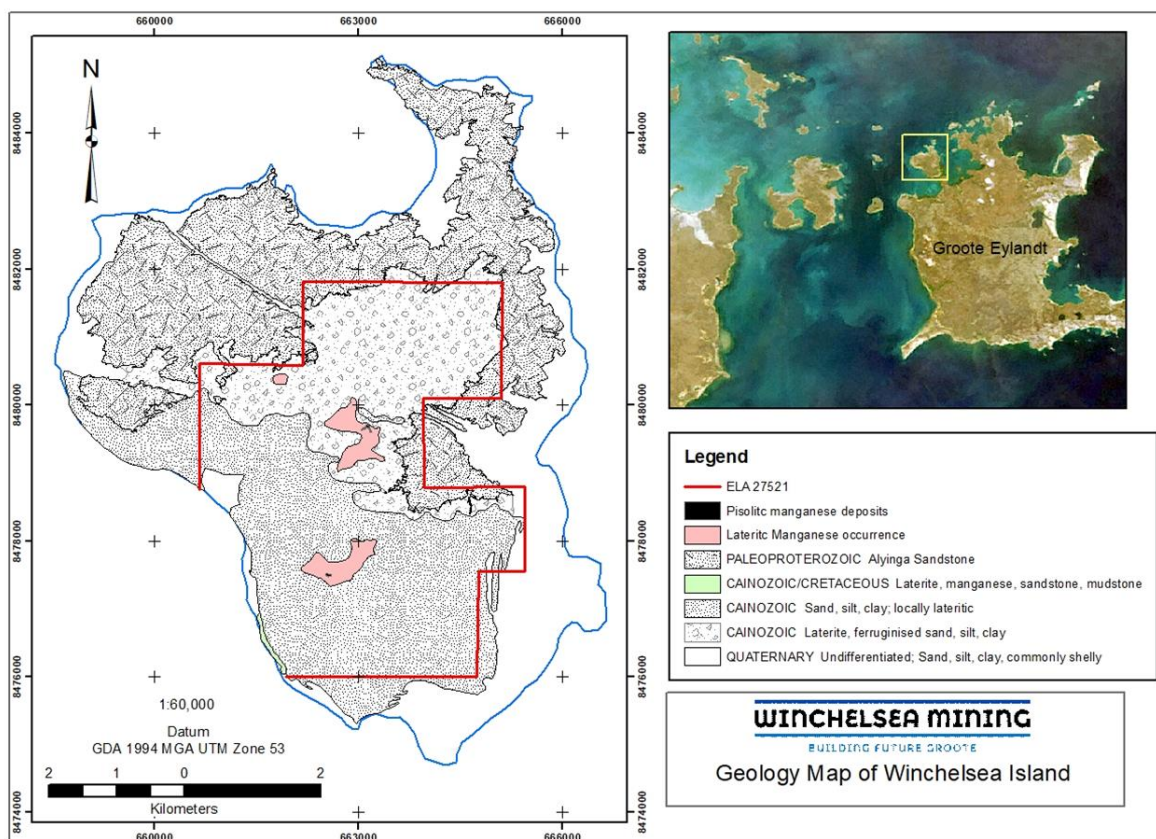


Figure 5. Reconnaissance geology map of Winchelsea Island, N.T.

Reconnaissance geological mapping confirmed the presence of high-grade massive (lump) manganese oxide mineralisation, similar to that currently mined on Groote Eylandt. Mapping also revealed the distribution of key geological units exposed at the surface and most importantly, the widespread distribution of manganese-bearing rocks over large parts of the licence area. Geologic mapping of the tenement continued through the period following the clearing of access tracks and pads for the RC drilling campaign. Appendix 1 provides details of geological observations made during mapping.

Surface (fact) and interpreted geology maps resulting from this work are presented in Figures 6 and 7.

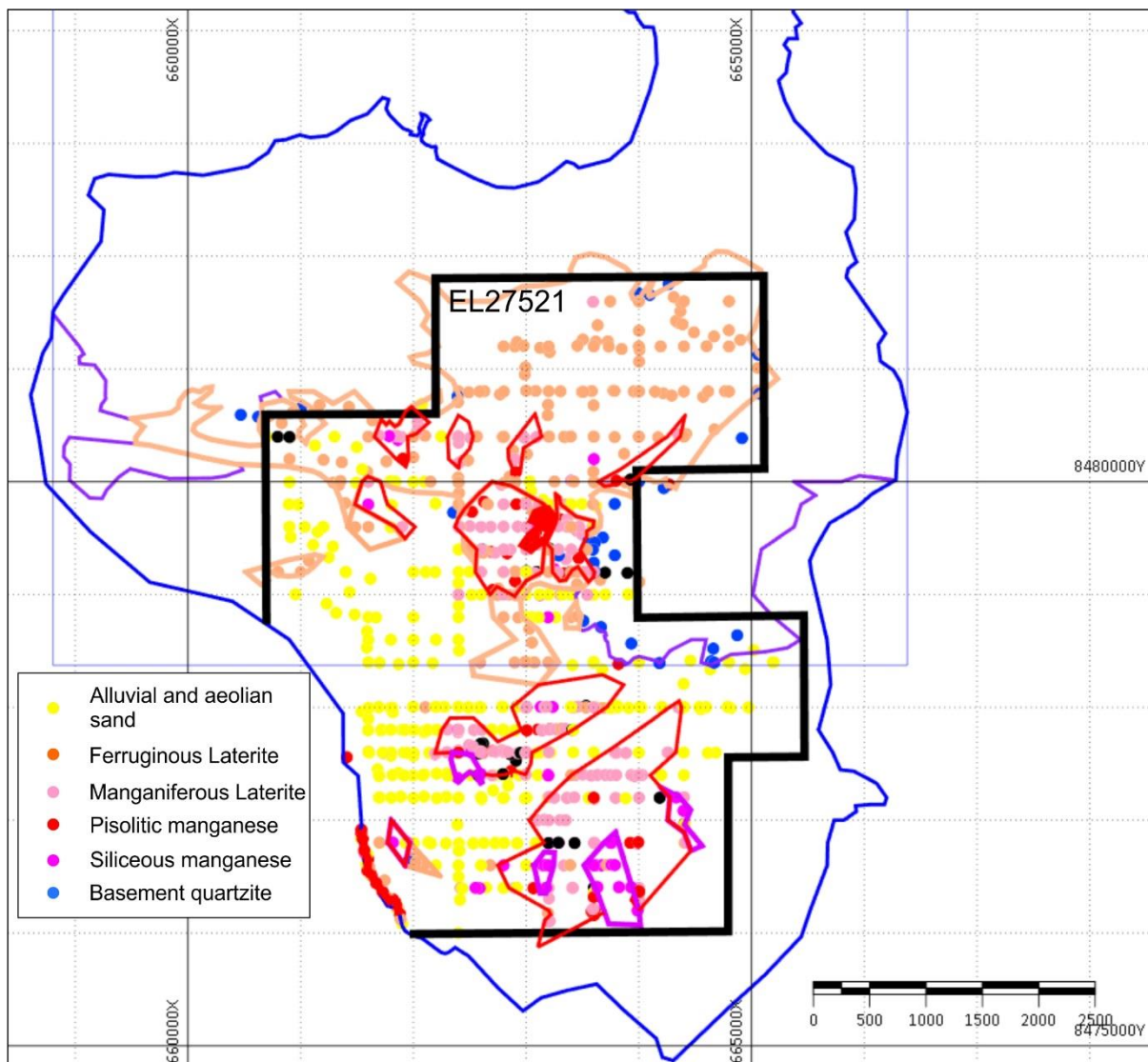


Figure 6. Geology field mapping – fact map

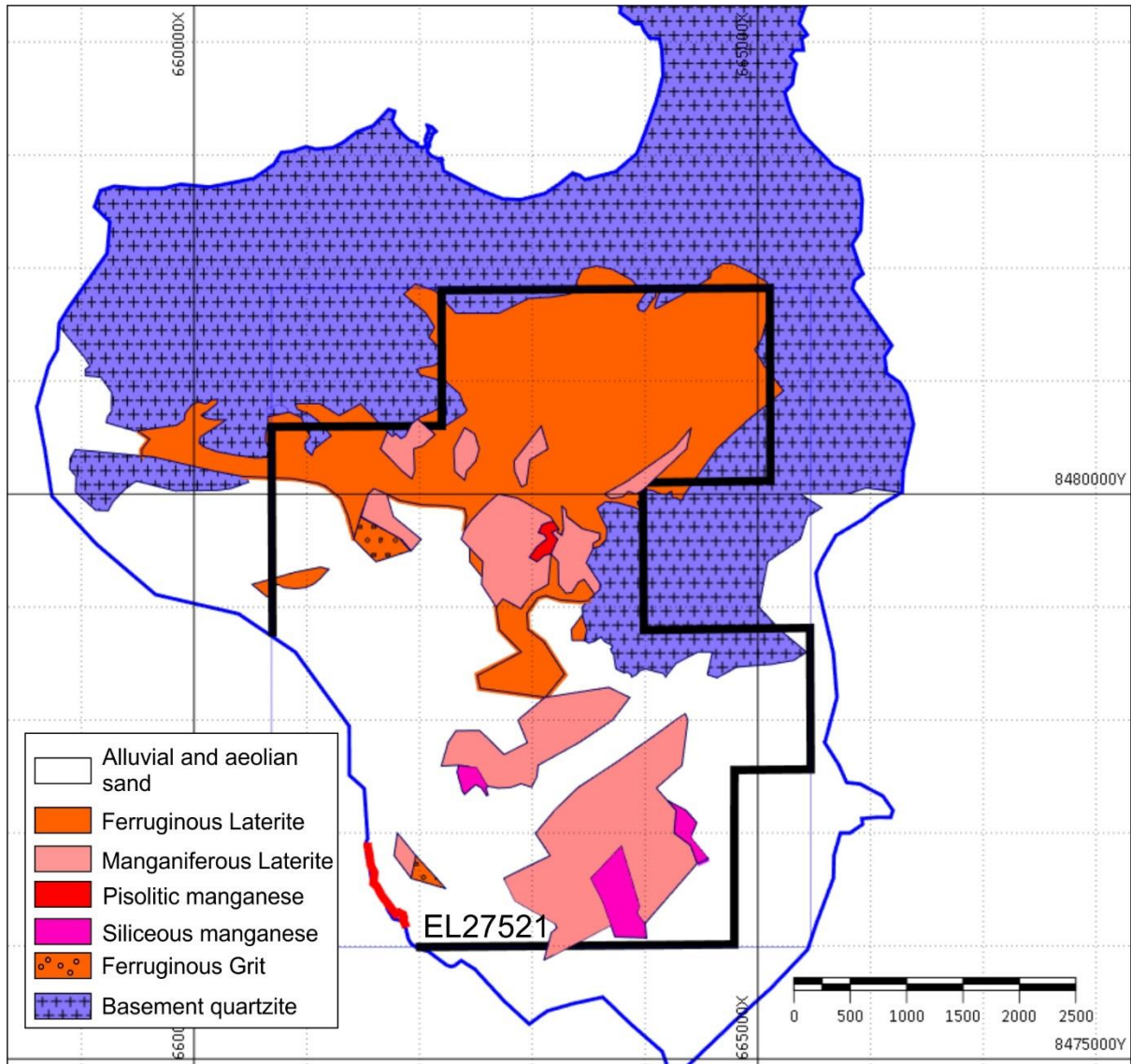


Figure 7. Interpreted geology of Winchelsea Island based on float and outcrop mapping along drill access tracks

Detailed descriptions of geologic units identified are given below.

Map Rock Units

Palaeoproterozoic

Alyinga Sandstone

As noted above the north-western, northern, and central-eastern margins of Winchelsea are composed mainly of white to reddish coloured, medium-grained quartz sandstone which forms rugged, sparsely vegetated, joint controlled outcrops.

This unit, known as the Alyinga Sandstone (Pietsch et al., 1997), is Palaeoproterozoic in age (1600-1800Ma) and forms local basement to the overlying cover sequence which contains the manganese mineralisation.

The sandstone occurs in almost flat-lying beds that in places form very large trough cross-beds, often tens of metres across. It is further characterised by the presence of prominent large-scale joints which control the topography.

Mapping shows sandstone occurrences are mainly located in the northern and central eastern parts of the licence area with most occurring in a 500-m wide zone downslope of the cover/Alyinga Sandstone contact. Notably, while Alyinga Sandstone borders the eastern margin of the area of widespread lateritic manganese occurrence in the east-central part of the licence, evidence of basement rocks is so far absent from the area of lateritic manganese mapped in the south-central part of the licence. This indicates the contact is at greater depth in this area or the Alyinga Sandstone is absent.

While the Alyinga Sandstone itself contains little or no manganese its competent nature (i.e. more resistant to erosion), together with its strongly jointed nature, has resulted in a highly irregular contact geometry with a deeply embayed rectilinear outline oriented mainly northwest-southeast or northeast, southwest, reflecting the dominant orientation of the joints that dissect the sandstone (Fig. 1, 2, 4 & 5). In places deep weathering and erosion of these joints has led to the development of deeply incised straight, chasm-like depressions, that extend for up to several kilometres and are now host to dense vegetation and partly filled with younger sediment and overlying soils.

Similar joint-controlled “paleovalleys” are also present on Groote Eylandt where they are oriented predominantly northwest/southeast and extend for over 20 km and are filled Cretaceous and younger sediment. Along the western side of Groote Eylandt, the thickness of the Cretaceous strata exceeds 100 m (Page, 1994) and contain the manganese mineralisation presently mined by South32. These sediments and their stratiform manganese mineralisation horizons frequently infill these paleovalleys.

The contact between the Alyinga Sandstone basement and typically unconsolidated overlying cover was mapped in detail during ground traverses and readily identified in the high-resolution imagery used in this survey.

Immediately downslope from the sandstone/cover contact, large blocks of sandstone of boulder size (>256mm), frequently occur as float on younger material. Elsewhere within the

licence area sandstone float, typically up to cobble size (64-256 mm) lies scattered on the surface, particularly in northern parts. With little evidence of channelized or sheet water flow across most of this area the presence of such material suggests basement rocks occur at relatively shallow depth.

Cretaceous

Walker River Formation

Exposed along the beach in the southwestern part of the licence area are gently dipping strata comprising mainly sandstones, siltstones, and claystone (Fig. 1, 5, 6 & 7). While no age determinations have been made during the present study these rocks are like rocks found on Groote Eylandt, and elsewhere in Arnhem Land, that have been assigned a Cretaceous age and mapped as the Walker River Formation – a unit comprising moderately to well sorted, typically cross-bedded, fossiliferous, fine- to coarse-grained quartz sandstone interbedded with laminated clayey siltstone and chert granule and pebble conglomerate (Krassay, 1994). This unit elsewhere appears to occur as erosional remnants that form outliers resting directly on the deeply dissected rocks of the Proterozoic Groote Eylandt Group. On Winchelsea Island the Groote Eylandt Group is represented by the Alyinga Sandstone.

As noted above, rocks of Cretaceous age mainly outcrop in a narrow coastal belt that extends for approximately 1km, in a N-NW direction and is up to 20 m wide (Fig. 1, 5, 6, 7 & 8). This outcrop forms a near-continuous beach platform and adjacent coastal cliff that in places may be up to 5m or more in height (Fig. 8).

The beach section comprises flat-lying, interbedded sandstone, siltstone and mudstone. These beds dip a low angle towards the south and southeast. The basal siltstone/mudstone is recessive, weakly bedded, pale brown to light grey in colour and characterised by scattered, irregularly shaped clay-filled cavities and vugs that may represent infilled burrows.



Figure 8. Gently dipping (left to right towards the south), interbedded Cretaceous sandstones, siltstones and mudstones below re-brown laterite exposed in coastal section in southwestern Winchelsea Island.

This unit is in turn overlain, via an undulating but conformable contact, by a red-brown-grey, mottled, medium to very coarse grained and quartz rich sandstone, with a variable amount of matrix-forming silt and clay. Claystone intraclasts are common and quartz and sandstone pebble- and cobble-rich beds are locally developed in both the basal mudstone and overlying sandstone units.

In sandstone units, coarse grits and quartz-granule lenses define bedding including both cm- to m-scale trough cross-beds showing a northerly paleo-current flow direction.

Updip, towards the northern end of the beach, the Cretaceous section thickens to about 5m. At this site the lower 1-2 m of the profile comprises pale olive green to grey, massive to finely laminated to thickly bedded siltstone which is overlain by up to a 1 m thick, highly altered pseudo-conglomerate where a white clay progressively appears to infiltrate and replace underlying siltstones along fine fractures to form granule- to boulder-sized clasts with well rounded margins.

Significantly, manganese was exposed at the base of this beach section in a lens, measuring about 110cm x 15cm, and oriented approximately parallel to bedding in the surrounding siltstones. This material was sampled (WMN018) and results indicate manganese concentration at >47% (see discussion below).

The laterite profile exposed at the top of the beach section appears to be developed on Cretaceous rocks. The laterite here is generally poorly consolidated and is probably better classified as a ferruginous soil that is characterised, by a distinctive network of vertical to sub-horizontal clay-filled cavities that extend from close to the land surface well down into the underlying Cretaceous (?) sedimentary units described above.

Cainozoic-Quaternary

As shown in Figures 1, 5, 6 & 7, sediments of suspected Cainozoic age are widespread across the licence area. They overlie suspected Cretaceous sediments outcropping along the coast in the SW part of the licence and cover much of the ground downslope of the more resistant and elevated Proterozoic sandstone that fringes the licence to the north and east.

Cainozoic deposits have been subdivided into two main units – laterites, consisting of ferruginous gravels, sands and clays (ferricrete), and sands, silts and clays; the former dominating in the northern half of the licence and the latter, the southern and western margins.

The Quaternary on Winchelsea is represented mainly by coastal dune fields and chenier deposits, particularly around the southern coastal fringe of the island, and in several areas, intertidal and supratidal sediments.

Laterite/Ferricrete

As noted above, lateritic or ferruginous gravels are widespread particularly in the northern half of the licence (Fig. 1, 5 & 6). Gravels are typically of granule to cobble in size, reddish brown to yellowish orange in colour and form an unconsolidated lag deposit on finer-grained, quartz sands and clays. Gravel particles are sub-angular to well-rounded in shape and mainly composed of clays and quartz-rich sands cemented and to a variable degree, replaced by iron oxides and oxyhydroxides to form hard, compact particles. A crude internal lamination characterises many of these particles which resemble the spherulitic textures seen in similar

material associated with the manganese deposits further south on Groote Eylandt (Pracejus et al, 1988; Pracejus, 1989).

In many locations these gravel deposits are further characterised by the presence of often irregularly shaped granule- to boulder-sized clasts of high grade, strongly lithified, manganese oxides. In several places spherulitic laterite particles are cemented to form loosely to strongly indurated duricrust that was observed up to at least 0.5m in thickness.

Elsewhere extensive ferricretes were observed. Here a hard, erosion-resistant layer of sedimentary rock, usually a conglomerate or breccia, forms a duricrust through cementation by iron oxides and oxyhydroxides. In places these ferricretes were observed extending for many hundreds of meters and varied from a few mm to over 1 m in thickness.

Most significantly, many of the ferricretes observed in these areas were conglomerates and breccias in which many of the constituent clasts (up to boulder-sized) were comprised of high grade, dense, hard, manganese oxides. Where such was extensive, they are shown on Figure 1 as “Lateritic Manganese”.

Present also across this northern part of the licence were particles from granules to boulders, comprised of manganese-cemented laterite as well as variably indurated sands and clays. In places manganese also cements moderate to coarse-grained quartz sandstone.

Sand Plains

Across much of the southern half of the licence area the land surface is covered by unconsolidated quartz sand with variable but generally minor amounts of concretionary laterite (Fig. 1, 5, 6 & 7). Sands vary in colour from pale yellowish orange to moderate reddish orange, reflecting the increasing content of Fe oxides and oxyhydroxides.

Manganese Mineralisation

Manganese oxides are widespread on the surface across much of the licence area (Fig. 1, 5, 6 & 7). Most of these sightings occur in the central parts of the licence with clusters around two areas; both of which are characterised by the presence of high-grade manganese oxide clasts either bound within conglomeratic to breccoid ferricrete, or as high-grade float resting on concretionary to spherulitic laterite. Of most interest in both areas are laterally continuous pavements of hard, well indurated high-grade manganese oxide (Fig. 9). The pavements here are composed of massive mangcrete¹ grading to cemented mangan-pisolite², in many places. Other common rock types in these areas include siliceous mangite, where manganese oxides cement disseminated, moderate- to coarse-grained, sub-angular to sub-rounded quartz sands, and cemented pisolite in which primary manganese oxides have largely been replaced by iron oxides and oxyhydroxides.

Where manganese pavements, such as those described above occur, they are often visible in aerial photographs and satellite imagery due to their distinctive dark colour and absence of all but a minor scattering of low scrubs (Fig. 10).

¹ Massive, textureless manganese oxide usually occurring as a thin layer capping the orebody on Groote Eylandt. It is thought to have formed by secondary recrystallisation and cementation of primary pisolitic/oolitic deposits.

² Primary pisolitic manganese oxide; strongly cemented by a matrix of secondary manganese oxides; usually occurring in the upper part of the Groote Eylandt orebody where it is the principal source of metallurgical lump ore.



Figure 9. Manganese pavement with scattered float of high-grade manganese oxide clasts (53L 663113mE/8479690mN; Photo: B. Bolton)



Figure 10. Aerial photograph of manganese oxide pavement (53L 663157mE/8479693mN; Photo B. Bolton)

Mainly loose clean sand (thought to be aeolian or wind-blown in origin) covers much of the southern part of the tenement while laterite dominates across the northern parts of the licence.

Stratigraphy

The stratigraphic sequence as seen on Winchelsea Island is presented in Figure 11.

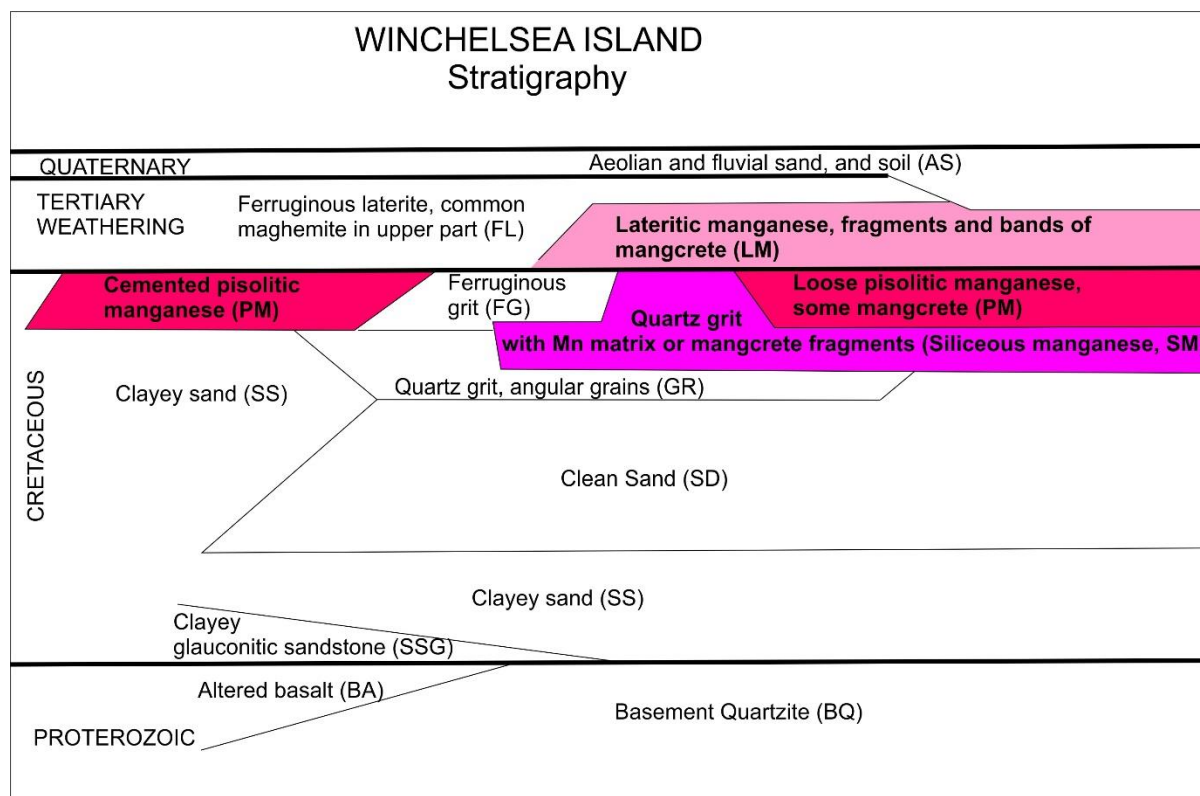


Figure 11. Stratigraphy of Winchelsea Island based on surface mapping and drilling.

The stratigraphic sequence given in Figure 11 is based in part on surface mapping as well as the RC drilling program conducted through the reporting period and detailed below. Additional comments on the main rock units, from oldest to youngest, are:

Proterozoic basement quartzite – course grained quartzite, well bedded, consistent dips of 3deg to the south with a strike of around 100deg. The air photo image available (Fig. 4) shows major lineaments (no faulted displacement). The unconformable surface appears to form a broad depression in which the Cretaceous sediments are deposited. Basalt was intersected in drill hole WM092, and probably overlies the basement quartzite.

Cretaceous sediments – the Proterozoic unconformity is overlain by clay and glauconitic clayey sand up to 30m thick overlain by weakly manganiferous ferruginous laterite on section 76,800N. This is overlain by unconsolidated, clean medium grained sand with sub-angular

grains, which can be over 60m thick (WM088 and 095). Outcrop is limited to the central part of the island and along part of the coast close to the newly constructed barge landing ramp.

Grit, Ferruginous Grit and Siliceous Manganese – this is a distinctive unit up to 4m thick marking the commencement of manganese mineralisation. The unmineralised grit consists of angular and sub-angular grit and sand sized quartz grains in a clay or fine sandy matrix. In ferruginous grit the matrix largely consists of iron oxides (goethite?), and in siliceous manganese the matrix is formed of manganese oxides. The siliceous manganese can be unconsolidated, moderately cemented with manganese oxides, or form mangcrete with remnant angular quartz grains. The unit can be overlain by interbeds of clay or clayey sand, pisolitic manganese or laterite.

Pisolitic manganese – either unconsolidated pisoliths with a clay matrix, or cemented pisolite beds up to 2m thick. Mangcrete forms locally within the unit. There are two main areas of pisolite, the southern one of loose pisoliths (about 1km²) which reflects the distribution of the best manganiferous mineralisation (visual estimate) including the overlying manganiferous laterite and underlying siliceous manganese.

The northern area of loose pisoliths of about 0.75km² is thin, deeper (about 20m) and of 0.5 to 1m thickness. There is no associated siliceous manganese or manganiferous laterite. There are patches of cemented pisolitic manganese along the west coast of Winchelsea Island, including outcrops north and south of the ramp. They are thin and again are not associated with the siliceous manganese or manganiferous laterite.

Laterite – the lateritisation process is regarded as being of Tertiary age. Ferruginous laterite consists of ferruginous residual laterite and breccias, some of which appear transported (i.e. ferricrete) with rounded pebbles. Maghemite is common, particularly in the upper meter of the laterite.

Manganiferous laterite is described where the manganese oxide content appears to be >10%. The manganese content consists of spheruliths, concretions, disseminations and mangcrete fragments. Lenses of mangcrete commonly form near the base of the manganiferous laterite.

The lateritic sequence and manganese mineralised horizons either outcrop or are locally covered with clayey sand, sandy soil or Quaternary red-brown sand thought to be of aeolian origin. The surface sand over manganese mineralised areas can be dark brown/ black and dusty.

The process of mangcretisation manifest as hard, dense lenses, pods and concretions on Winchelsea, while significant in upgrading the manganese grade, appears to be only partial, and has not formed continuous thick layers as seen in places on Groote Eylandt.

GEOPHYSICAL ACTIVITIES

A micro-gravity survey was conducted on exploration licence EL27521 as part of reconnaissance phase activities on Winchelsea Island. Atlas Geophysics, a Perth-based firm, was commissioned to conduct the survey. Acquisition of data commenced on 20th February and was completed on the 14th March 2019, with the final data delivered shortly thereafter.

During the survey data was acquired from 560 gravity stations on Winchelsea (Fig. 12). This represents about 60% of the total number originally planned (961 stations) as difficulties in accessing many of the sites, particularly in the south-eastern part of the EL, resulted in a shortening the program.

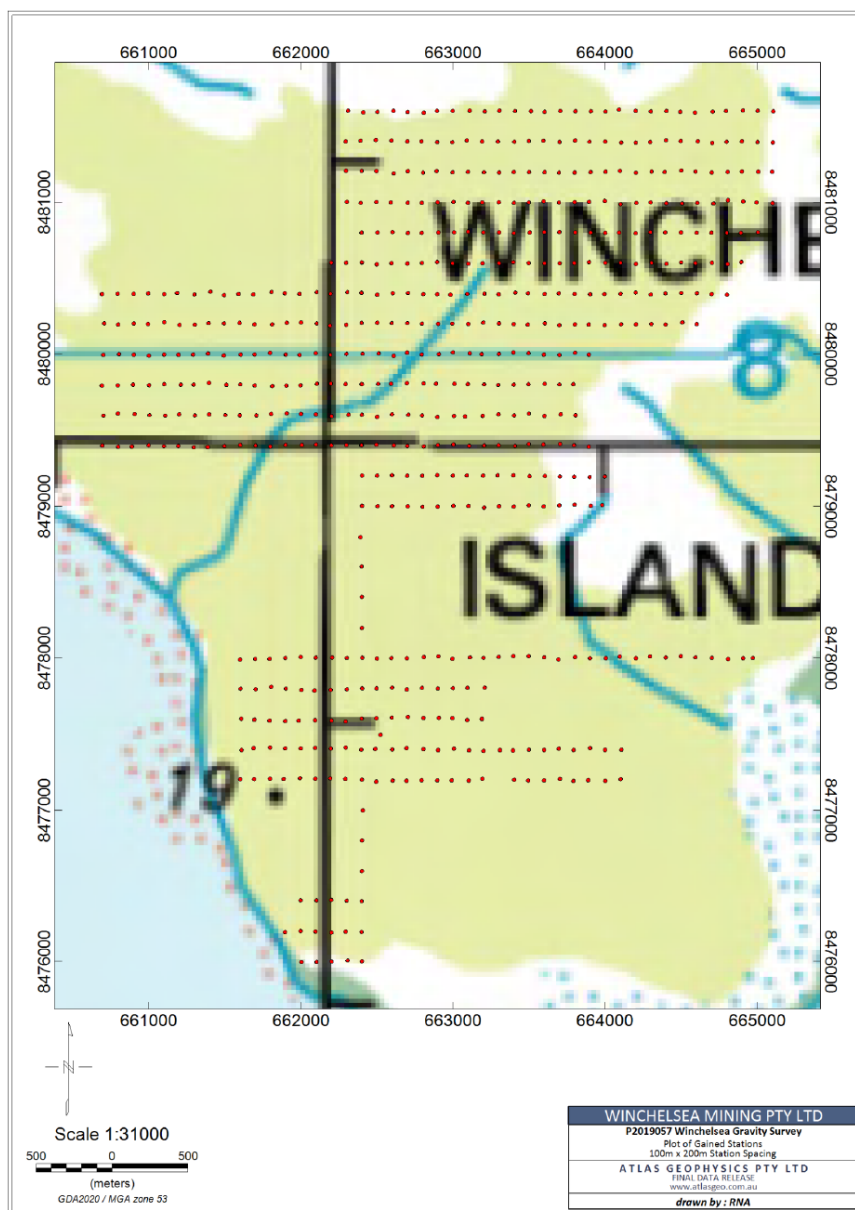


Figure 12. Map showing the location of gravity survey stations established on Winchelsea Island during February-March 2019 (from Atlas Geophysics, 2019)

The task involved the conduct of a ground-based, GPS-supported gravity survey aimed at: 1) the direct identification of massive manganese deposits; and 2) determining the depth and configuration of Palaeoproterozoic sandstone basement, where covered by prospective Cretaceous and younger sediments and soils.

Gravity data were acquired using a 100m station spacing with 200 m line spacing (EW lines; Fig. 12).

Equipment and Instrumentation

The following instrumentation was used for acquisition of the gravity data:

- One CG-5 Autograv Gravity Meter (Serial Number: 40269; SF 1.00000)
- One CHC-Nav i70 GNSS Rover Receiver
- One CHC-Nav i70 GNSS Base Receiver

Interpretation

Further information on the calibration, data acquisition, processing and QC protocols adopted can be found in Atlas (2019).

Melbourne-based consultancy, PGN Pty Ltd, were commissioned by Winchelsea Mining Pty Ltd to perform a quality check on the gravity data acquired and to complete an interpretation of the survey data.

The PGN review of the survey found no issue with the quality of the gravity data obtained (PGN, 2019).

The PGN study indicated a minimum curvature gridded (50 m grid resolution) of Spherical Cap Bouguer Anomaly (2670 kg/m³) values with a distinct E-W regional gradient (Fig. 13). Values from 34.02 to 38.31 mGals.

PGN (2019) interpret this anomaly as representing the dip of the basement in the region as it corresponds well to a large E-W trending gravity gradient described in Geoscience Australia data from the region (Fig. 14).

After correcting the raw data for regional gravity response and assessing the data for the possible impact of topography on gravity signal (none detected), PGN further processed the survey results through creating what are essentially depth slices through the cover sequence on Winchelsea by filtering gravity data by wavelength.

As stated above, the gravity survey aimed to provide direct evidence for the presence of manganese oxide mineralisation as well as an indication of the topography of the pre-Cretaceous cover sequence that is host to the mineralisation.

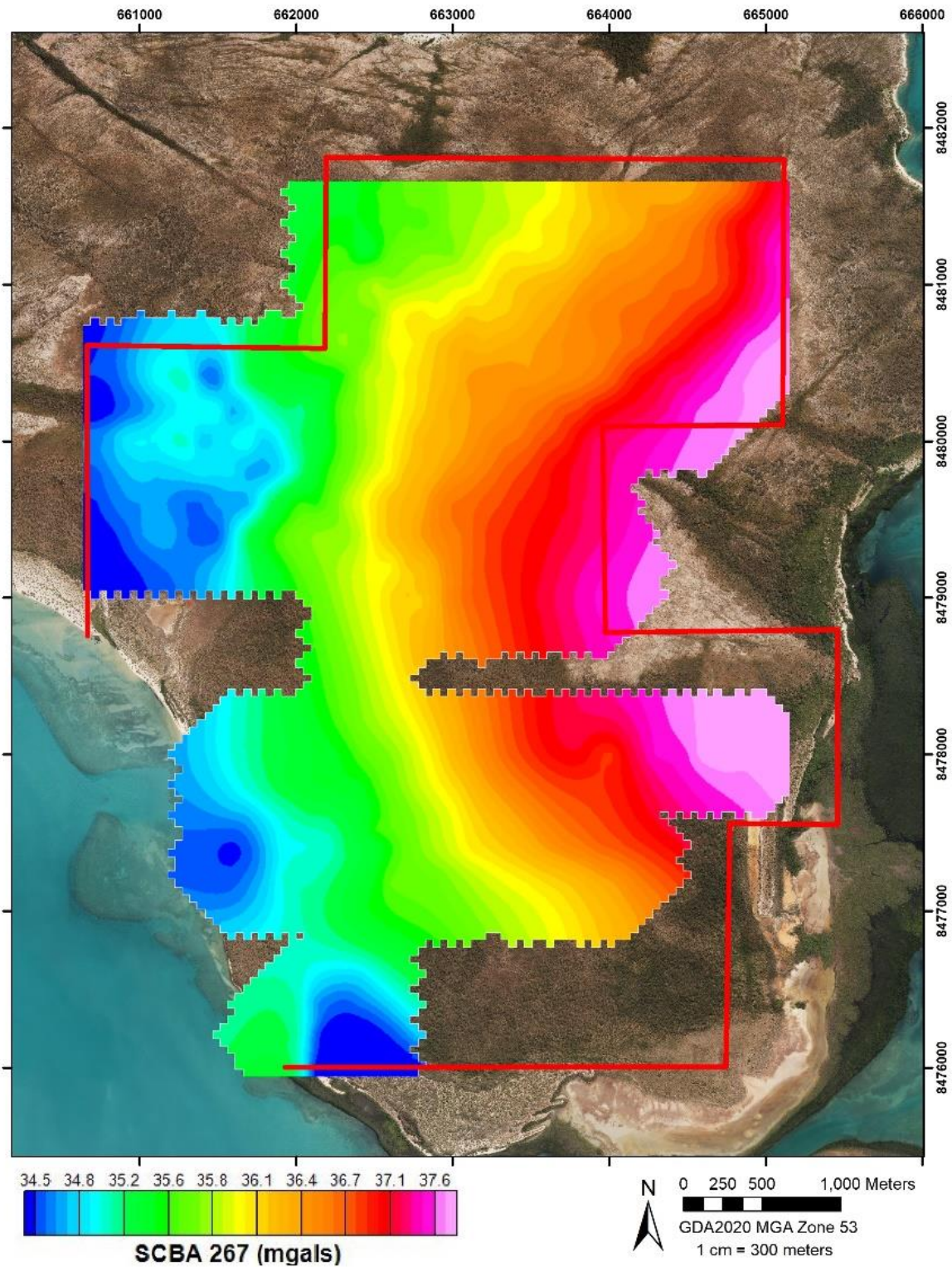


Figure 13. Map shows Spherical Cap Bouguer Anomaly (SCBA) with pronounced E-W gradient over EL27521 (from PGN, 2019)

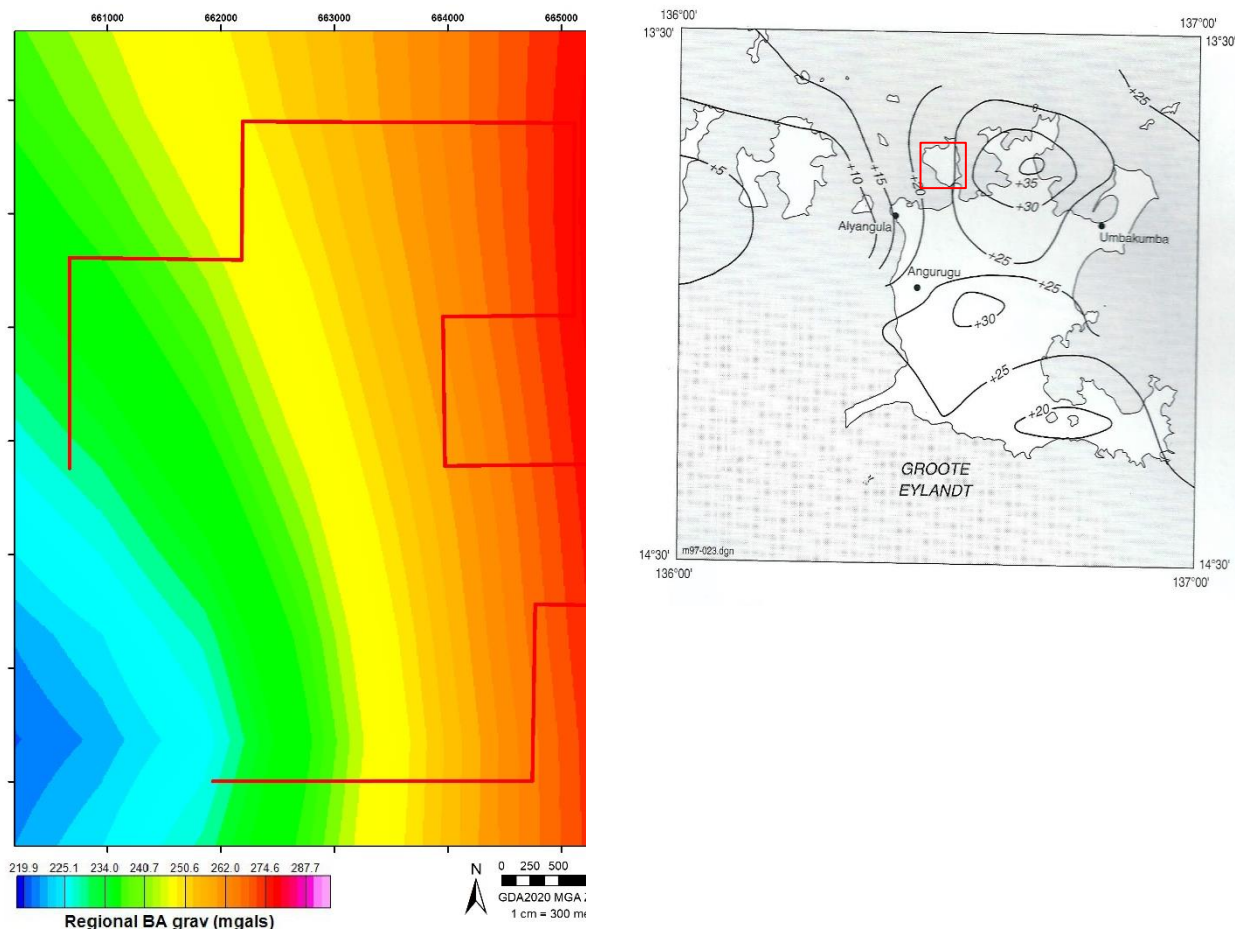


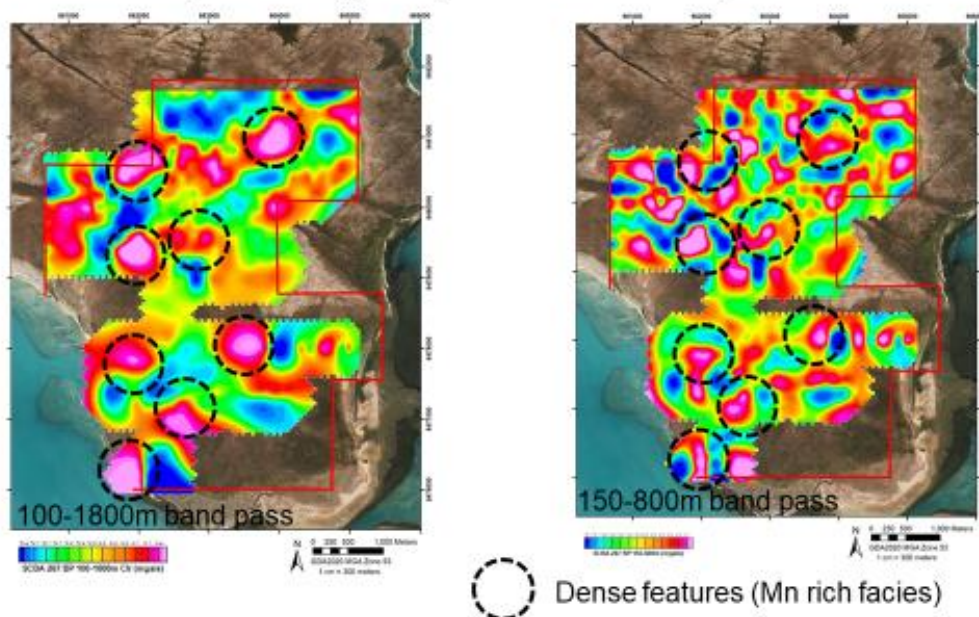
Figure 14. Map on left shows regional gravity anomaly over EL27521 and on right, the Bouguer anomaly contours from Pietsch et al (1997)

As for the first objective, the PGN study records at least 8 discrete gravity anomalies across the two wavelength band passes selected (Fig. 15). The persistence of these anomalies through what might be viewed as depth slices within the Cretaceous cover sediments is interpreted by PGN to suggest the presence of a dense Mn-rich facies or rocks.

Figure 15 also shows, on the right-hand side, the location of gravity anomalies of interest in relation to mapped areas of surface manganese mineralisation (“Dense features”). Figure 15 examines this relationship in more detail with the black circles denoting the location of all manganese occurrences observed during recent mapping.

Interpretation – direct targeting of Mn rich facies

Correlative positive gravity anomalies in processed rasters



invest in people, software & technology

Winchelsea Island gravity interpretation

www.pgn.com.au

Figure 15. Maps showing location of gravity anomalies (circled) within the Winchelsea Island EL based on the 100-1800m and 150-800m band passes, interpreted to be evidence of Mn-rich rocks in the Cretaceous cover sequence (from PGN, 2019).

As a general observation the distribution of manganese occurrence across the licence appears to correspond with gravity “highs” and in many instances, the edges of gravity highs. This appears to be true for both the northern and southern areas of special interest where high-grade manganese oxide “pavements” are well developed. This observation is consistent with expectations of a gravity high (a positive anomaly) where a dense, hard substance like the high-grade manganese oxide observed at these sites, and thereby enhance the gravity field in these locations. This effect may be further enhanced where a significant density contrast might be expected where a dense body, such as a stratiform (tabular, bed-like geometry similar to that found in manganese ores on Groote) manganese deposit is present over a steep gradient in the underlying basement topography.

The regions circled in Figure 15 conform to this pattern and are also of interest as the anomalies depicted are present through a wide range of band passes that would ordinarily disappear if due to either an artefact of the data quality or density.

On the basis of the current interpretation there appears to be some basis for direct detection of high-grade manganese across a large area of the licence.

Another important observation that can be made from Figure 16 is the almost rectilinear pattern that emerges in the gravity data. PGN (2019) have defined a conjugate NW and NE-trending series of anomalies that align closely with joint sets which form a distinctive feature across the exposed areas of Proterozoic Alyinga Sandstone basement, on Winchelsea, and the basement rocks expose on Groote Eylandt to the south.

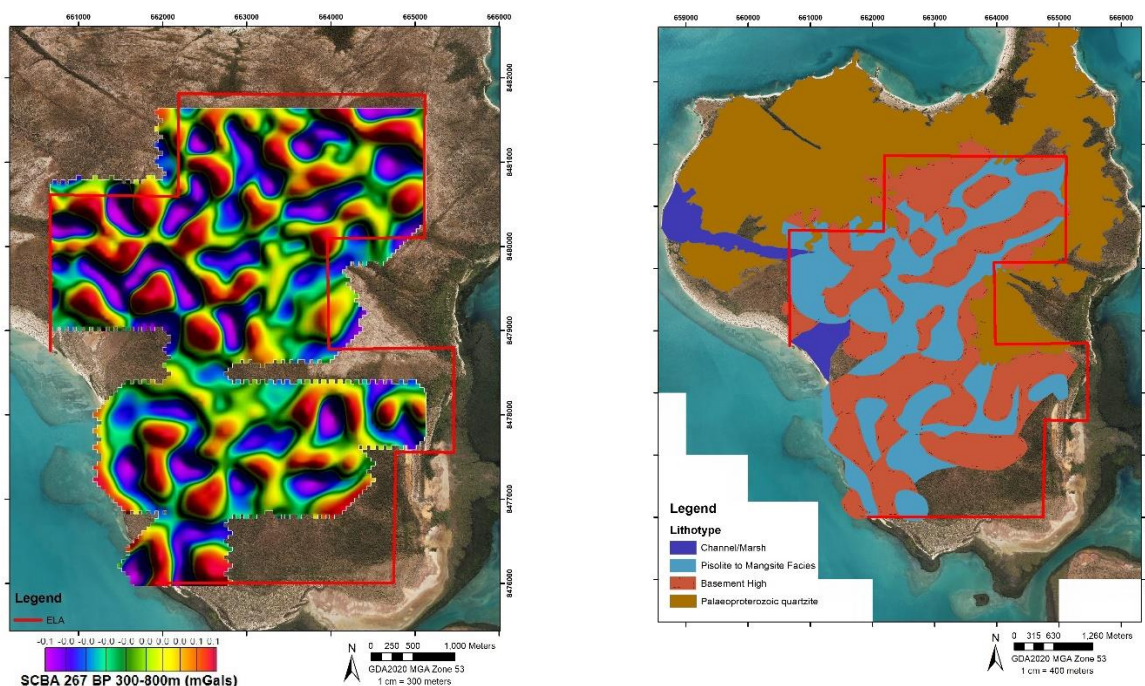


Figure 16. Litho-structural interpretation of Winchelsea Island micro-gravity data. Left hand side map shows bouguer anomalies for the 300-800m (mGals) band pass; the map on the right hand shows the litho-structural interpretation with white lines denoting prominent joints in Proterozoic basement and black lines faults (from PGN, 2019).

In Figures 15 and 16, the anomalies shown in cold colours (purple and blue) are likely to represent basement topographic highs while warmer colours are interpreted to result from material of greater density including stratiform manganese oxide mineralisation within Cretaceous and Tertiary cover. The interpretative map on the right-hand side in Figure 16 shows these different rock types in brown and blue, respectively. This pattern whereby younger sediment is deposited within a series of narrow, presumably joint- or fault-controlled erosional gullies cut down through the underlying Proterozoic basement sandstones, is, as noted above, highly reminiscent of the relationship seen on the western part of Groote Eylandt where the manganese-bearing Cretaceous sediments currently being mined are located in a deeply dissected basement topography controlled by joints.

On Groote Eylandt, manganese ore bodies are commonly developed around and on top of basement “highs” or ridges. Determining the location, depth and orientation of any basement highs present on Winchelsea underlying more recent cover material, will provide essential information in the search for economic manganese deposits. A typical cross-section drawn from the F deposit on Groote Eylandt is given in Figure 17. The key relationship shown in this figure is between the relatively thin, tabular ore body and the underlying, deeply incised basement topography.

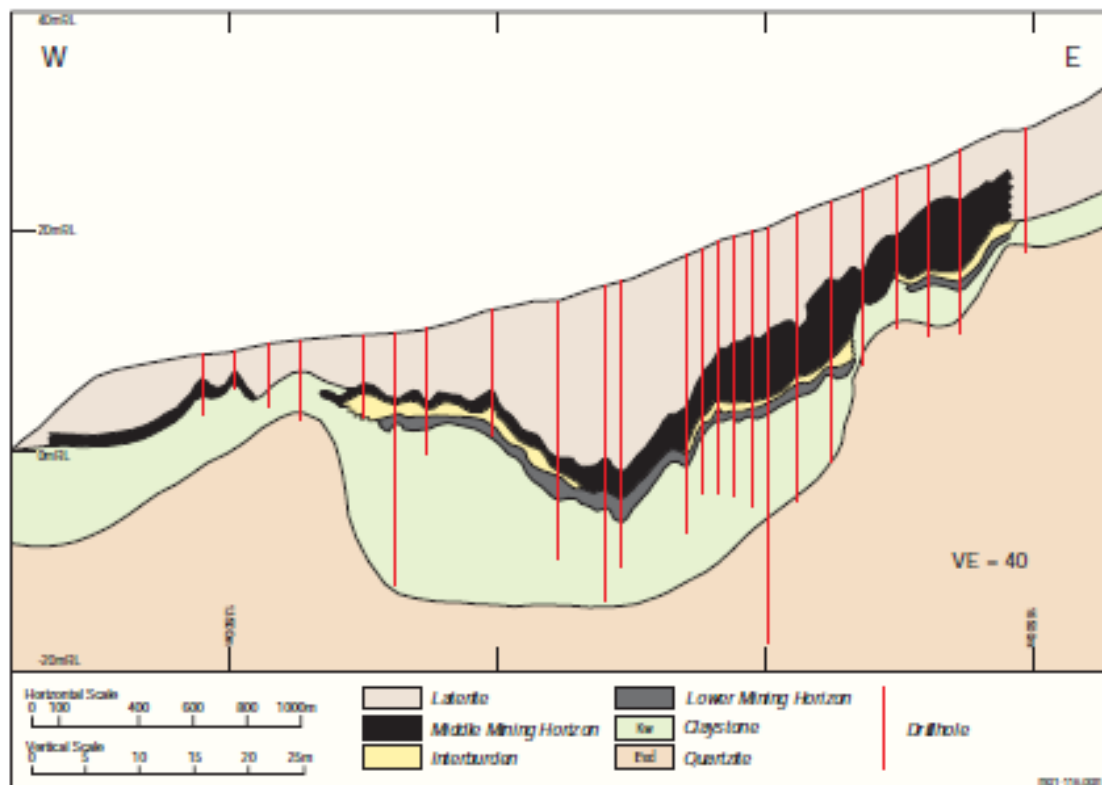


Figure 17. W-E cross-section through the main ore body on the western coastal plain of Groote Eylandt. Note the stratiform geometry of the manganese ores and their location with respect to the underlying basement topography (from Ferenczi, 2001).

In summary, the micro-gravity survey conducted on Winchelsea:

- Indicated at least 8 high-priority targets for follow-up drill testing for high grade, dense manganese oxide mineralisation;
- The potential for deeply incised and embayed basement topography similar to that thought to influence the distribution of manganese deposits on Groote Eylandt;
- The location of gravity anomalies coincides, in at least 5 instances with areas of recently mapped surface occurrence of high-grade manganese oxide mineralisation;

While drilling has been conducted over much of the tenement area no follow up study has as yet been undertaken to reevaluate the results of this work with the results of the micro-gravity survey.

GRAB SAMPLE GEOCHEMISTRY AND MINERALOGY

During reconnaissance mapping of the tenement conducted on 7th December 2018 and a longer campaign extending from 19th February to 4th March 2019, 7 and 45 rock chip samples were taken respectively, for geochemical analysis and mineralogy. The location of these samples is given in Figure 18 and partial results for major, minor and trace elements presented in Table 2. A complete compilation of results together with sample details, can be found in Appendices 1 & 2.

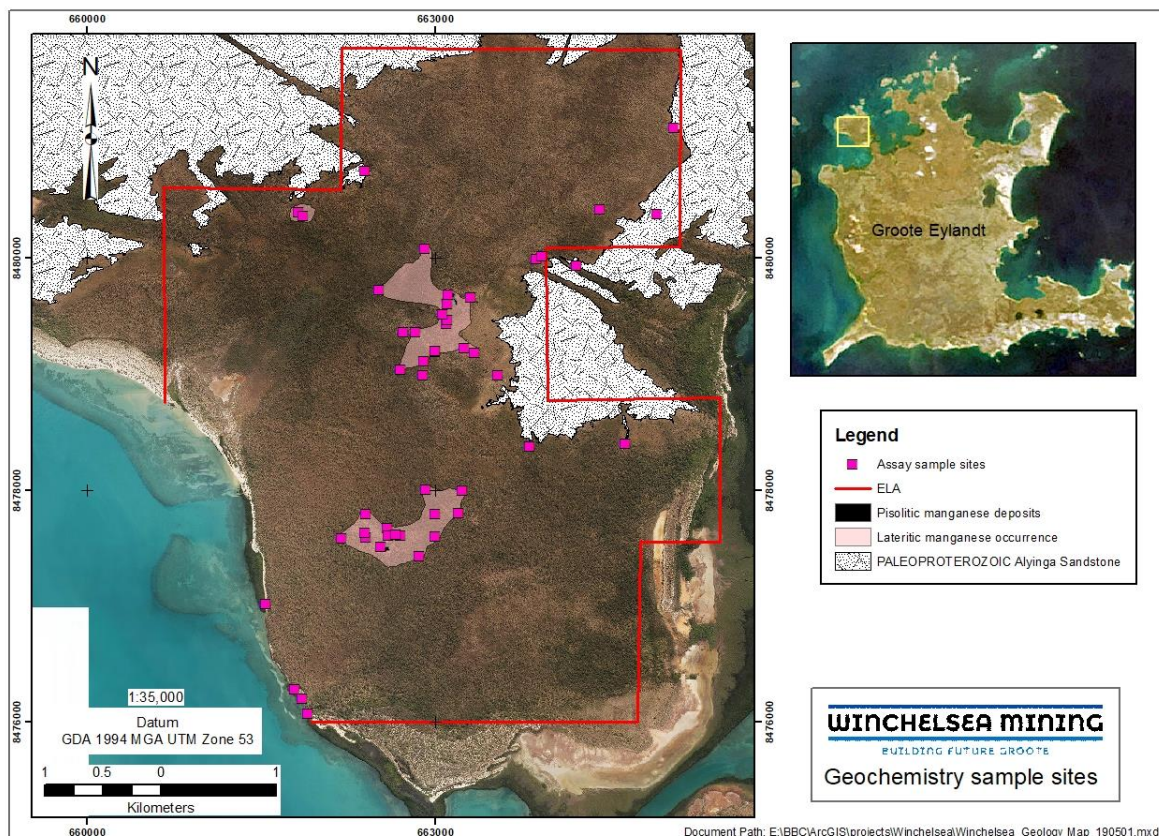


Figure 18. Map showing the location of assay rock chip samples collected during reconnaissance mapping.

Not surprisingly, the samples collected for analysis are largely restricted to those areas where manganese mineralisation was observed at or near the surface and particularly around manganese pavements and their surrounding areas of laterite and ferruginous duricrust where high-grade manganese clasts are incorporated in these alteration units. Elsewhere, samples collected for analysis were in minor drainage channels which cut down through manganese-bearing units, from along the Cretaceous sections above the beach in the southwestern corner of the licence, or where manganese clasts were found as a lag deposit directly overlying Proterozoic basement.

As noted above, the widespread distribution of manganese-bearing materials suitable for assay across the licence provides added confidence in the potential for discovery of economic deposits of manganese on Winchelsea.

Table 2 shows assay results for selected grab and rock chip samples collected over the two sampling campaigns. The results shown are highly selective in that they show element abundance only for those samples with manganese content greater than 40%, the value usually employed to indicate the cut-off grade of washed product. As none of the samples were washed prior to analysis so it might be expected that the element abundances given under-estimates concentrations due to dilution by waste materials.

Of the 7 samples collected during December and the 45 collected during this recent survey, a total of 35 samples (67%) returned Mn concentrations greater than the nominal cut-off of 40% Mn.

Table 2 shows that manganese concentrations in the samples from Winchelsea range up to 58.1%Mn and have a median value of 49.8%Mn. The Mn/Fe ratio ranges from 2.6 to 42.1 (median: 14.1). The median values for Al, Si, P and S, at 1.7%, 2.0%, 0.07% and 0.1%, respectively. Comparison of Winchelsea sample geochemistry with data for metallurgical lump product from three of the World's most important mining districts - Groote Eylandt, Brazil and South Africa - indicates that at least in terms of major elements, any likely product from Winchelsea will be directly comparable.

There is little published information available on minor element concentrations to allow comparisons, however, unpublished data from Groote suggests that Winchelsea material will be similar (Pracejus & Bolton, 1992).

Figures 19 and 20 show how the concentration of MnO and P, respectively, vary between sample sites. Figures 19 appears to indicate relatively higher grades of MnO samples collected from the northern parts of the licence and decrease slightly towards the south and southwest. The sample with the highest manganese grade (~75% MnO) was located on a manganese pavement in the north.

Figure 20 shows phosphorous (P) concentrations are generally lowest in areas where manganese pavements (cemented mangan-pisolite and massive mangcrete) are developed (particularly in the north) and increase towards the outer margins of those areas mapped as lateritic and ferruginous duricrusts. P concentrations are also relatively high in the beach section in the southwest and in those samples collected from around the margins of the cover/Proterozoic contact.

Along with P, other elements of interest for a marketable manganese product include Si and Al. Silica in samples is relatively low in manganese associated with the southern pavement (with one exception) compared to the northern area of manganese pavement development. Silica is generally relatively high in samples collected from manganese rich samples from along the coastal section in the southwest (Fig. 21). Aluminium (Al) concentrations (Fig. 22) display no clear pattern although those samples collected from around the southern manganese pavement appear to have slightly lower values than elsewhere.

Table 2. Geochemistry of selected grab samples collected on Winchelsea Island. Concentrations are given in wt% unless otherwise indicated. Only those samples with >40%Mn are shown (see Appendix 2 for complete assay data).

Sample ID	Mn	Fe	Mn/Fe	Al	Si	P	S	As (ppm)	Co (ppm)	Cu (ppm)	Ni (ppm)	Pb (ppm)	Zn (ppm)
WMN001	43.7	12.9	3.4	1.2	2.8	0.10	0.00	15	217	167	43	32	209
WMN002	47.3	10.1	4.7	1.3	1.1	0.25	0.01	45	322	114	30	87	219
WMN003	53.9	2.1	25.3	1.3	1.6	0.03	0.00	4	325	96	38	8	200
WMN007	54.4	2.9	18.6	1.3	1.1	0.05	0.00	37	322	160	52	42	288
WMN009	52.6	1.7	31.1	3.3	2.7	0.07	0.11	48	145	85	60	56	64
WMN010	50.7	1.5	34.5	3.5	3.3	0.04	0.10	19	287	102	69	18	283
WMN011	50.3	2.3	21.7	3.3	3.0	0.07	0.10	42	115	84	87	47	114
WMN012	58.1	1.4	42.1	1.1	1.0	0.07	0.12	34	318	148	113	29	453
WMN014	57.2	1.4	41.7	1.6	0.8	0.07	0.12	16	352	69	70	12	550
WMN020	49.8	1.7	28.6	2.6	3.7	0.04	0.10	28	277	65	29	52	433
WMN022	54.8	1.5	36.6	0.9	1.7	0.02	0.11	2	470	54	104	27	340
WMN026	52.6	2.8	19.1	2.2	2.1	0.04	0.11	40	274	46	81	31	480
WMN028	51.6	3.8	13.4	1.1	1.7	0.07	0.11	9	313	40	37	78	402
WMN029	46.4	7.3	6.4	2.3	2.9	0.07	0.10	26	254	40	58	264	301
WMN033	49.2	4.6	10.6	1.6	1.9	0.08	0.10	24	436	72	33	105	369
WMN034	42.2	8.9	4.7	2.5	4.1	0.06	0.10	35	408	127	26	51	279
WMN036	40.9	15.5	2.6	1.2	2.0	0.10	0.09	15	263	78	117	61	405
WMN038	49.5	1.8	27.8	2.6	4.2	0.04	0.11	26	363	52	59	227	697
WMN039	50.8	3.6	14.2	1.7	3.0	0.05	0.11	25	271	48	80	32	571
WMN041	41.4	8.3	5.0	4.2	3.8	0.09	0.09	45	167	85	79	60	185
WMN043	54.4	2.7	20.0	1.8	1.0	0.08	0.12	13	575	111	40	14	505
WMN046	47.7	10.5	4.6	1.0	1.8	0.07	0.10	9	272	64	83	47	376
WMN051	45.1	9.9	4.5	1.7	1.6	0.22	0.10	46	300	91	19	70	181
WMN053	48.0	6.8	7.0	1.3	2.5	0.12	0.11	10	282	136	39	62	228
WMN054	49.8	3.6	14.0	1.9	3.7	0.04	0.11	29	292	33	72	69	494
WMN057	47.5	8.1	5.8	1.2	1.6	0.26	0.11	29	318	109	25	68	222
min	40.9	1.4	2.6	0.9	0.8	0.02	0.00	2	115	33	19	8	64
max	58.1	15.5	42.1	4.2	4.2	0.26	0.12	48	575	167	117	264	697
median	49.8	3.6	14.1	1.7	2.0	0.07	0.10	26	296	84	58	52	321

Brazil	45.00	3.70	12.16	5.18	1.68	0.02	0.25						
Groote	49.00	3.30	14.85	2.12	2.80	0.09	0.01						
South Africa	48.00	12.50	3.84	0.16	3.04	0.05	0.02						

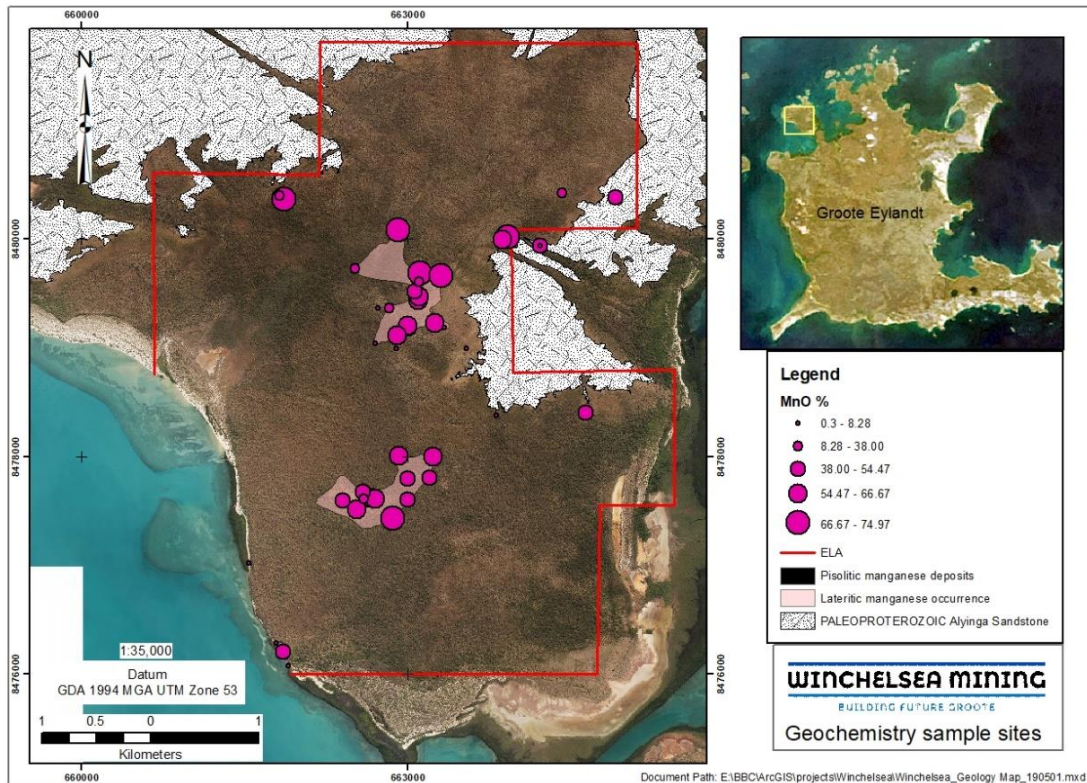


Figure 19. Map showing the variation in MnO (%) concentration in samples collected.

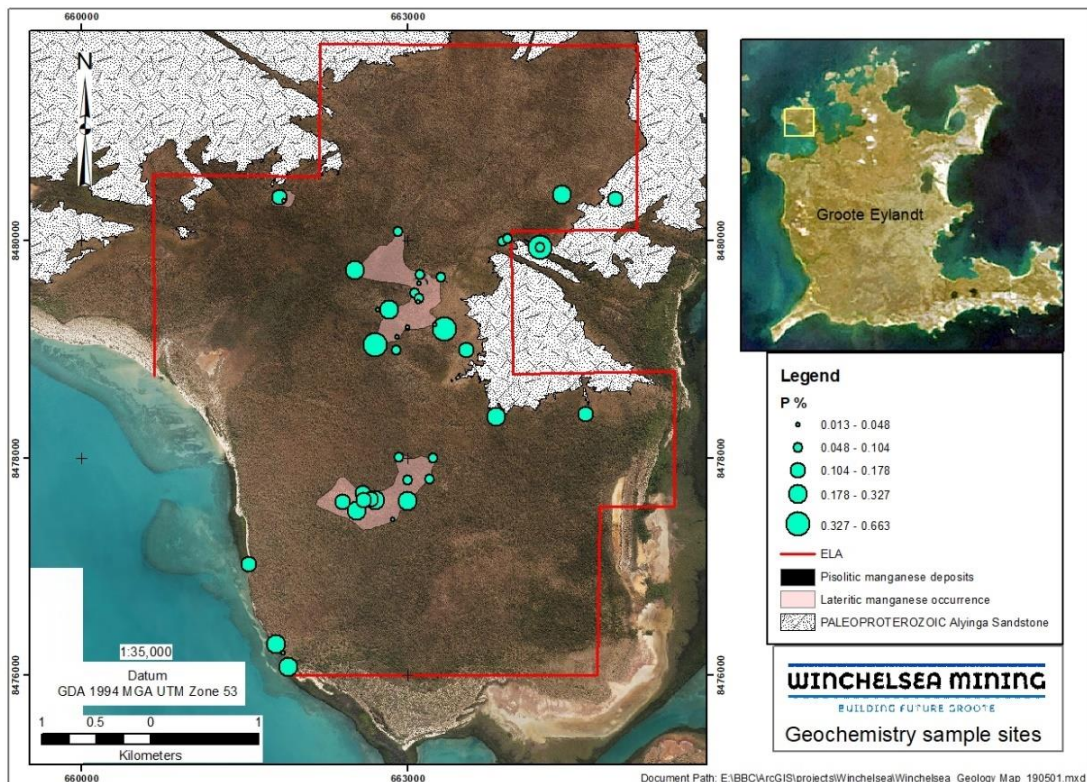


Figure 10. Map showing the variation in P (%) concentration in samples collected.

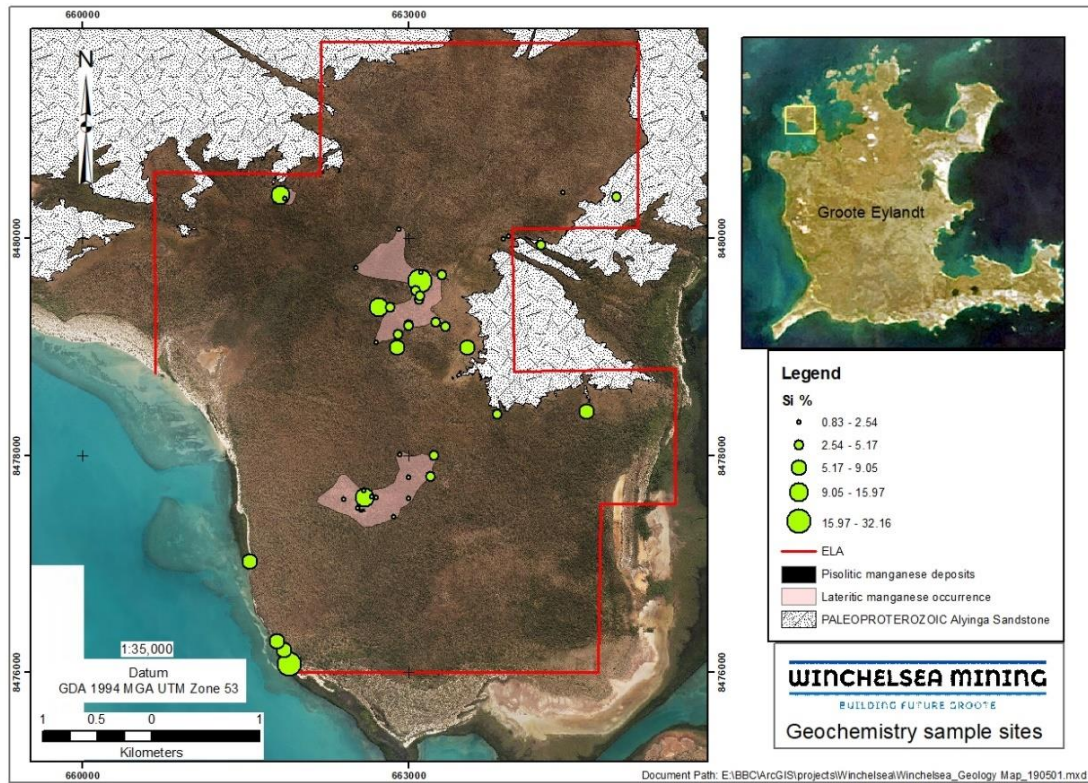


Figure 21. Map showing variation in Si (%) concentration in samples collected.

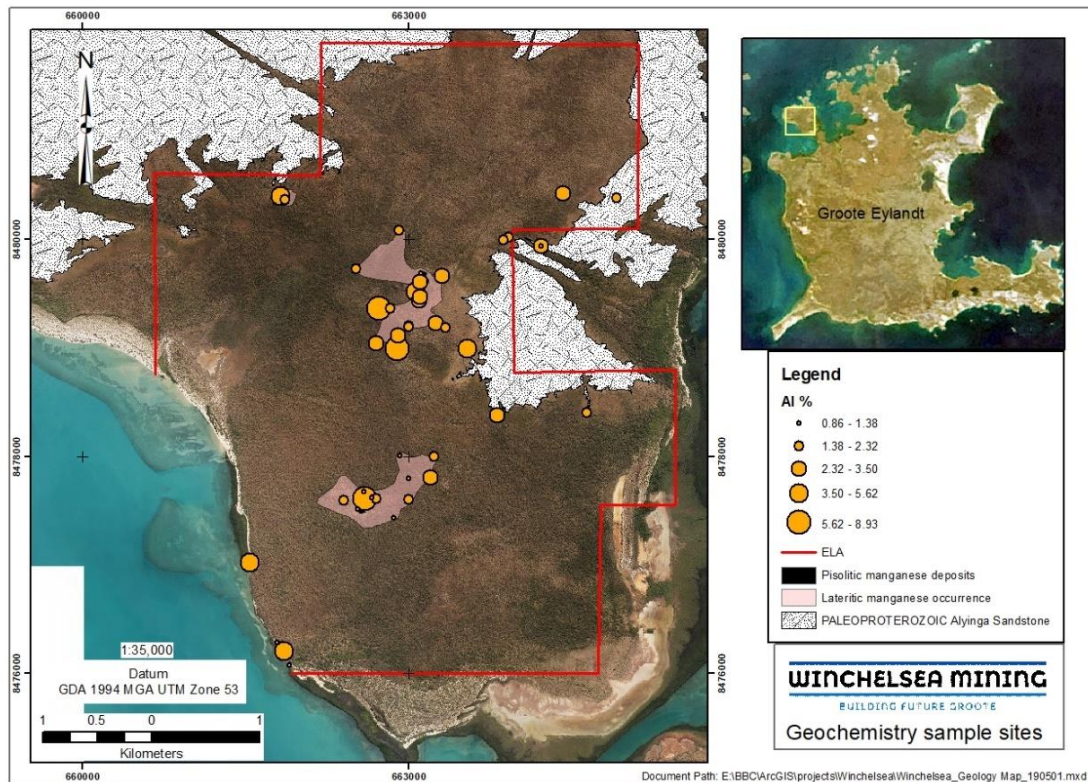


Figure 22. Map showing the variation in Al (%) concentration in samples collected.

The factors influencing the abundance and spatial variation of elements such as Mn, P, Al and Si as presented by these samples awaits further investigation, but it is likely they are related to sample mineralogy which in turn reflects primary as well as secondary (supergene) processes. Mineralogical and petrological analysis of samples collected from Winchelsea and which is currently underway, will provide further information necessary for this interpretation.

DRILLING

Drilling for the Phase 1 and Phase II drilling programs was undertaken by Mount Magnet Drilling, using an RCD300 track mounted RC rig, for Winchelsea Mining Pty Ltd, with the intended purpose of establishing manganese resources on Winchelsea (Akwamburrkba) Island. In total 282 holes have now been completed, including 2 redrilled holes (but not including the water test hole next to WM106) for a total of 3865.5m to complete Phase I and Phase II of the planned drill program. All holes were RC and drilled vertically. Average hole depth is 14m.

Pads and drill access sites were cleared in August 2019.

The Phase I RC drilling program started on the 30th September 2019 and was completed on 14 November 2019. The program comprised 154 holes (2449m) completed at 400m and 200m spacing.

The Phase II RC drilling program started 15 November 2019 and was completed 6 December 2019. The program consisted of 126 drill holes at mostly 200m spacing.

On 22 November an addendum to the MMP was submitted to DPIR seeking approvals for Phase III to drill a further 226 vertical RC drill holes, mainly on a 100m x 100m grid (200 holes). The Phase III RC program concentrates over areas of mineralisation intersected in Phases I and II will commence in early 2020 .

Drill hole collars were surveyed during site preparation using dGPS by the earthmoving contractors prior to pad clearing and drilling. The actual drill collars were picked up in mid-December by a qualified surveyor LandSurveys using method GNSS RTK from a control established at WCI-1.

The holes were not surveyed downhole. Most mineralisation falls in the top 5m of the holes, so potential deviation is insignificant.

The location of holes drilled to date are shown in Figure 23 while the coordinates for all drill holes in this program are given in Appendix 3.

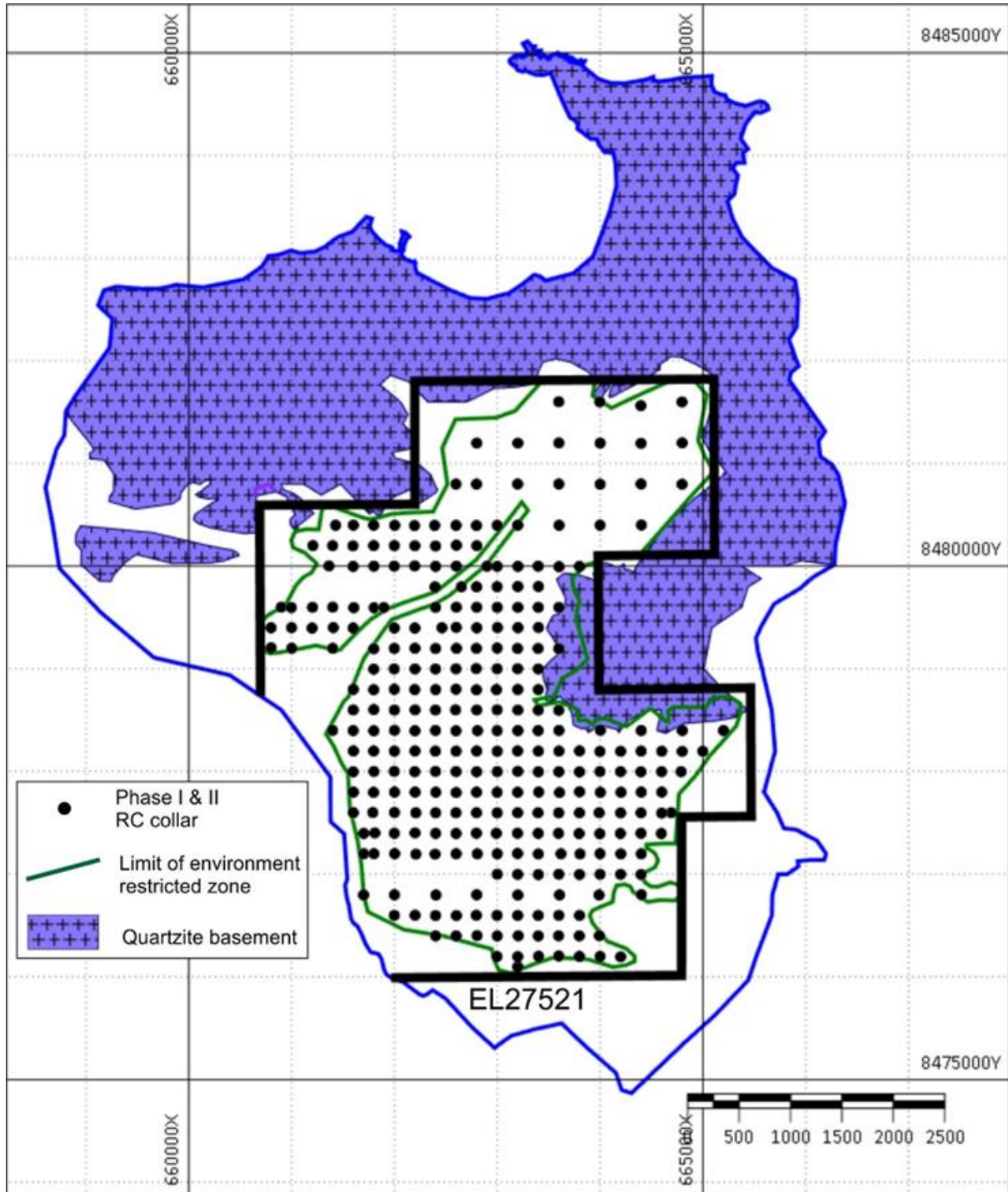


Figure 23. Map shows the location of Phase I and II drill hole collars

Sample collection, preparation and analysis

Half meter RC samples were split on the drill rig with a cone-splitter and 2 kg samples were collected in calico bags. The selected RC intervals were given sample numbers and bagged, duplicate 2 kg samples were collected for a 'head' sample and for a washed 'met' sample.

Some samples in the early part of Phase I were collected by rig mounted cone splitter, but most have been collected by pipe splitting from 0.5m interval (total sample) bags. Much of the mineralisation was contained in the top 3m of the holes, where samples return by circulation is usually poor and the sample from the cone splitter was considered unrepresentative (a significant proportion of the sample was coming up outside the drill rods, and not through the cyclone).

The samples were taken from the total cyclone material. Recoveries were acceptable. Both the drillers and geologist on site monitored the samples for contamination. Some useful indications that gave us confidence that the contamination was under control were the limitation of maghemite (easily identifiable) to the top of the ferruginous laterite layer, and the very sharp change without contamination from manganese mineralisation to the underlying completely unmineralised sands and clays. Also, manganese pisolites outside the expected horizon, when observed were regarded as suspect. If recoveries were poor or contamination appeared high the hole was recollared and recommenced, or subsequently redrilled (WM153A and WM105A).

Samples to be sent for lab analysis were selected on the basis of observed manganese.

RC samples (head and met) were delivered daily to Groote and stored securely in bulky bags. From there they were shipped to Darwin, then put on a truck and taken to ALS Brisbane.

At ALS the 'Head' samples were crushed, pulverised and split and analysed by method ME-XRF26s for MnO, Fe₂O₃, Al₂O₃, BaO, CaO, Cr₂O₃, K₂O, MgO, Na₂O, P₂O₅, SO₃, SiO₂, TiO₂ and LOI (ME-GRA05).

The 'met' samples were wet screened to 0.5mm (preparation method SCR-37). The +0.5mm fraction was dried and weighed and the % recovery of +0.5mm reported (yield). The +0.5mm fraction was then pulverised and analysed as for the 'Head' samples.

Analyses results are included in the data files but were received after the end of the reporting period and will be discussed together with the QAQC in next year's Annual Report.

For the RC drilling every tenth sample sent for analysis consisted of either a CRM standard, field blank or field duplicate sample. Blanks comprised cleaned and bagged white quartz sand from a hardware store and were considered appropriate for the lower level of detection required. Field duplicates from the RC drilling were pipe split from the (green) drill sample collection bags. Standards cover a range of Mn values.

Mineralisation Modelling

Appendix 3 lists all the holes drilled from 1 October to 6 December 2019 which comprise the Phase I and Phase II drill programs.

For provisional modelling of the mineralisation a manganese intersection is defined where the logged visually estimated grade is >10% Mn. The average intersection thickness (excluding unmineralised holes) is 1.75m. If intersections less than 1m are excluded the average thickness is 2.0m.

The average depth to top of mineralisation (all intersections) is 1.65m and varies from 0 to 9m. Not all the mineralised units are always present. The manganiferous laterite is the most extensive, while pisolitic and siliceous manganese occur over discrete areas.

- Overburden 0 to 10m, average 1.5m
- Manganiferous Laterite 0 to 3m, average 1.2m
- Mangcrete 0 to 1.5m, average 0.6m (discontinuous and is modelled as included in Manganiferous Laterite)
- Interburden 0 to 6.5m, only affects a few holes
- Manganese pisolites, usually loose, 0 to 2m, average 0.8m over the east-central area only
- Siliceous manganese 0 to 2.5m average 1m, forms coherent areas
- Underlain by barren sand and clay

Figure 24 shows the extent of visually estimated manganese mineralisation based on the visual geology logs to the end of Phase I & II. This map indicates that manganese is concentrated mainly in two locations; the first over much of the southern half of the tenement and a second, smaller area, to the north. The far northern and central western, and south-eastern parts of the tenement are largely barren of mineralisation. The southern zone lies over unconsolidated clean sand. The northern zone lies over clayey sands and is associated with more ferruginous laterite containing common maghemite.

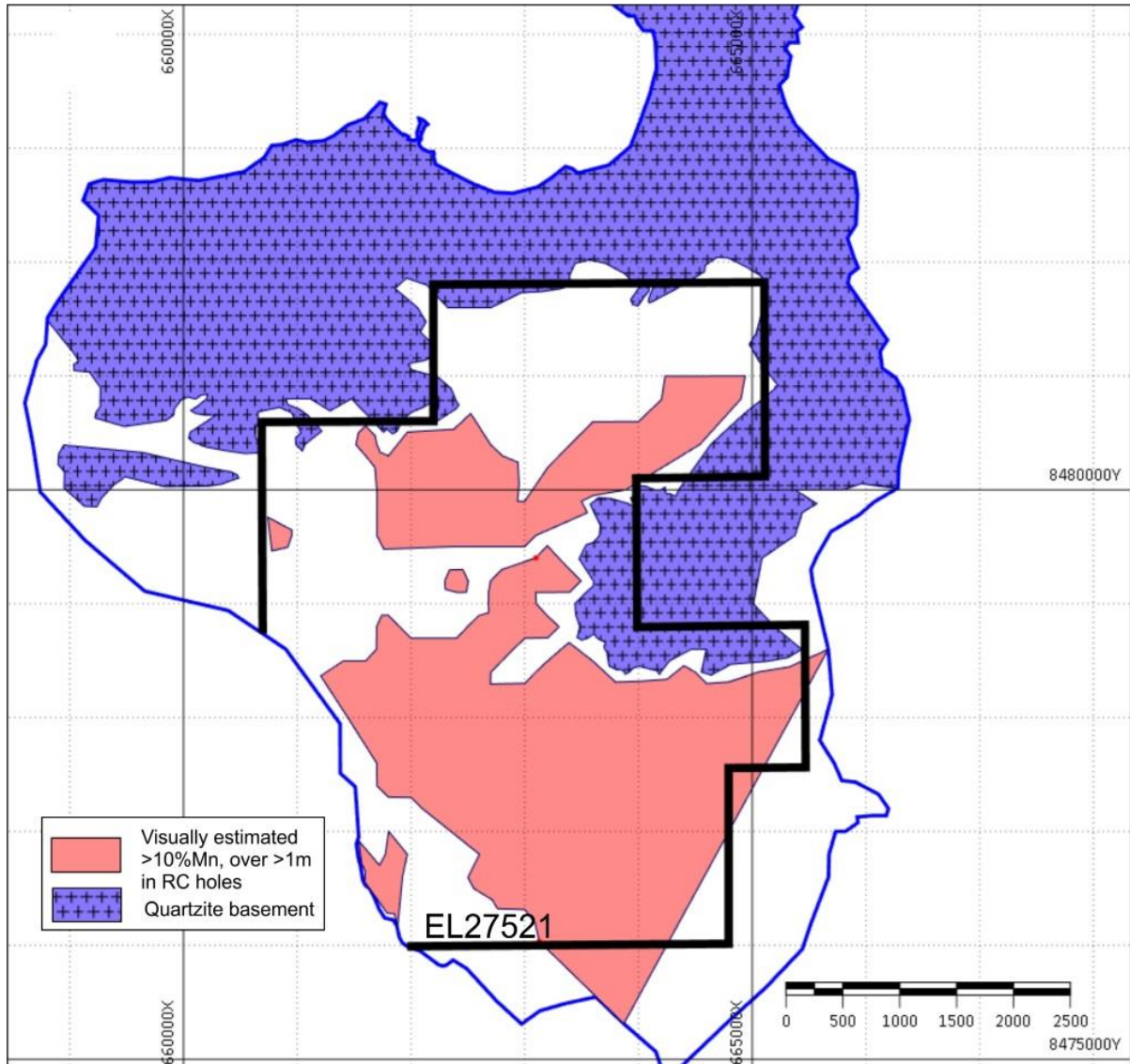


Figure 24. Map shows extent of significant manganese mineralisation (visually estimated >10%Mn over 1m) intersected in Phase I & Phase II drilling.

Figures 25 to 29 show representative cross sections along E-W oriented drill hole transects over areas of mineralisation.

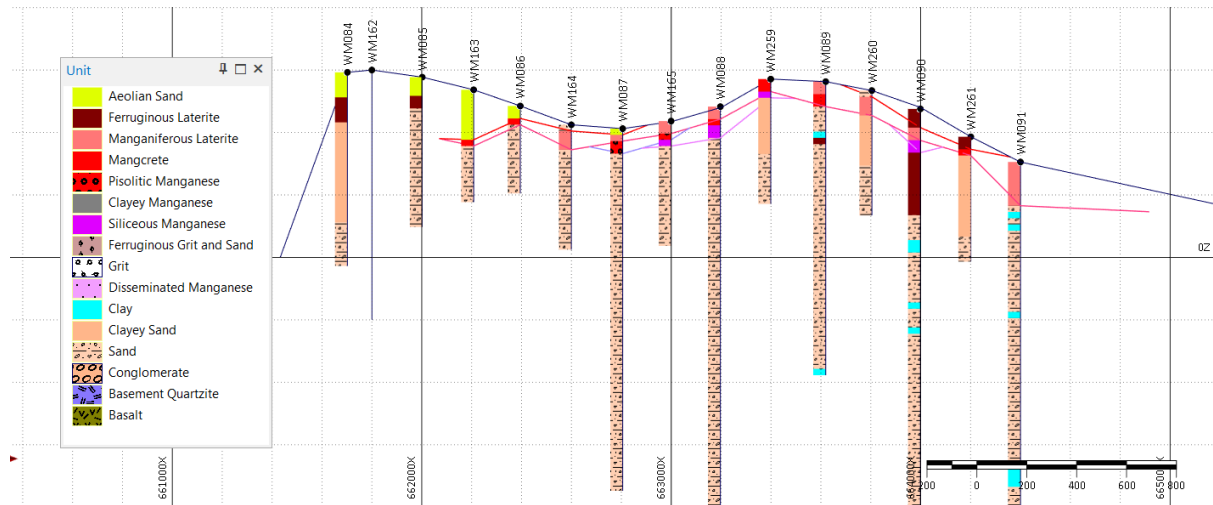


Figure 25. Cross section along Section 77,200N (Note: x50 vertical exaggeration)

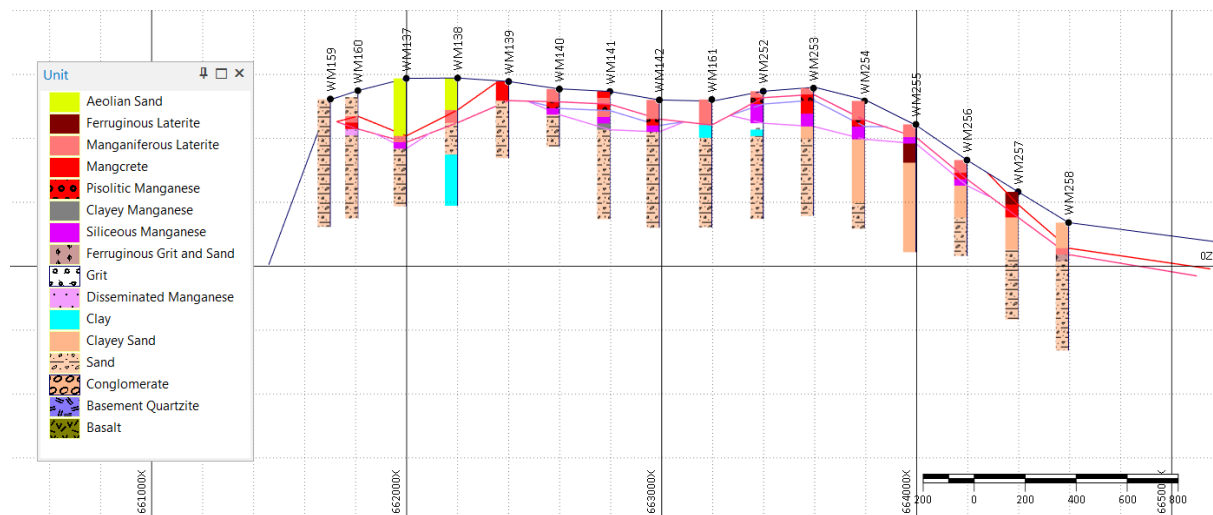


Figure 26. Cross section along Section 77,400N (Note: x50 vertical exaggeration)

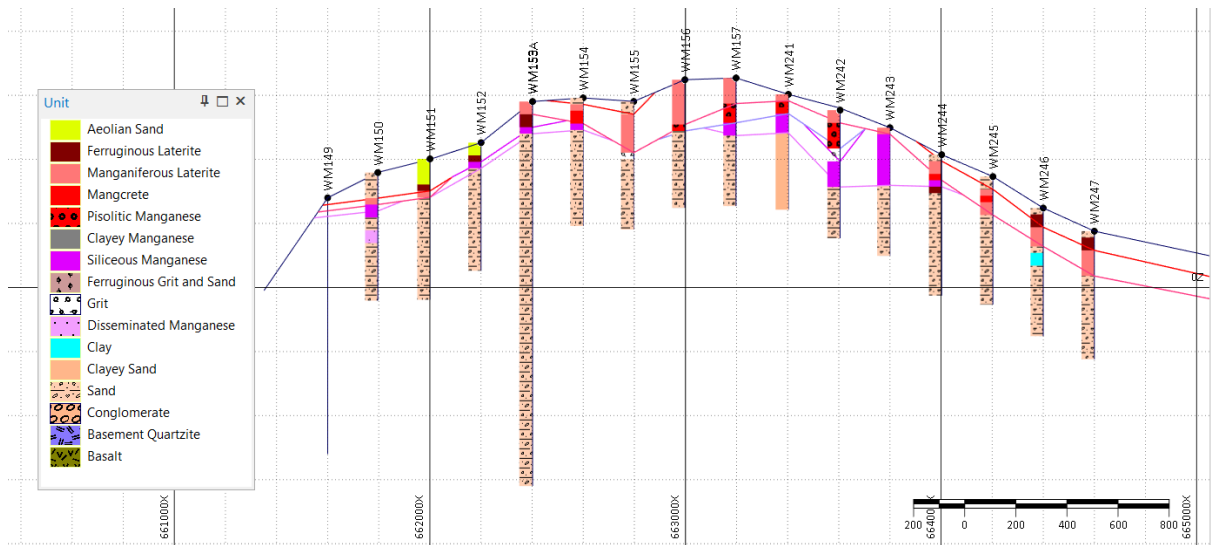


Figure 27. Cross section along Section 77,800N (Note: x50 vertical exaggeration)

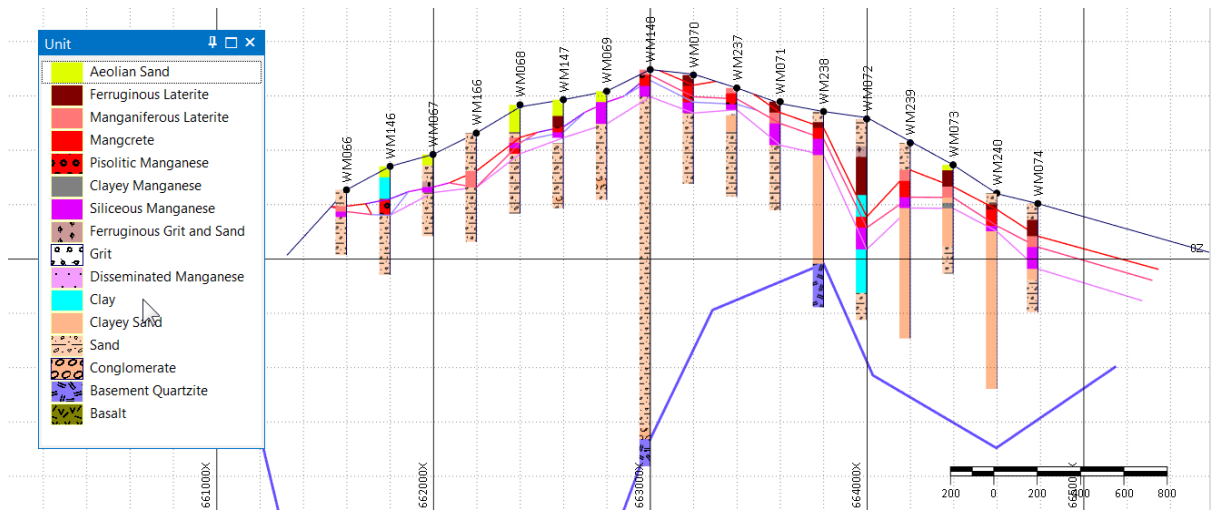


Figure 28. Cross section along Section 78,000N (Note: x50 vertical exaggeration)

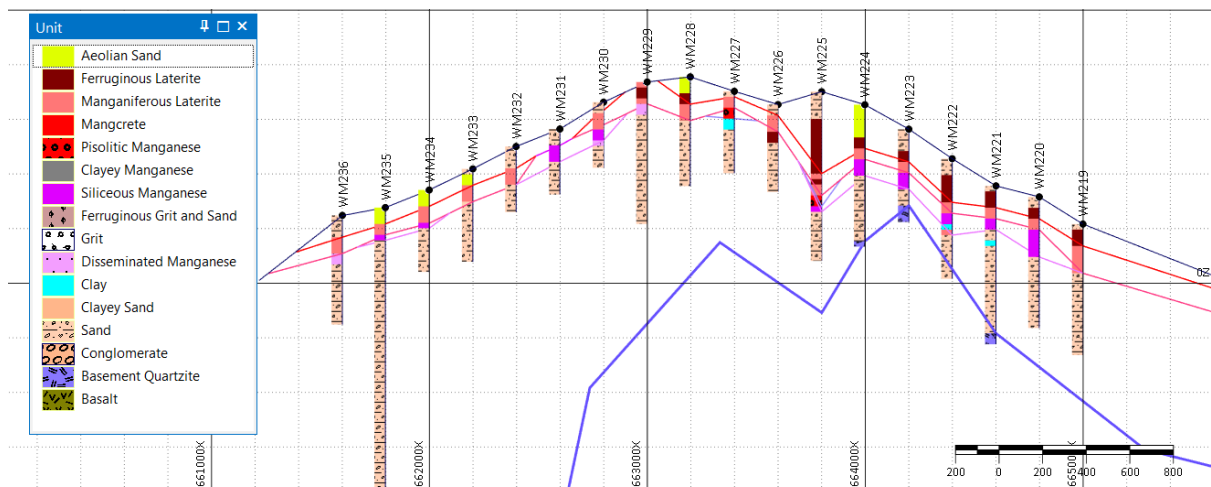


Figure 29. Cross section along Section 78,200N (Note: x50 vertical exaggeration)

REFERENCES

- Atlas Geophysics, 2019. Winchelsea Gravity Survey. Unpublished report to Winchelsea Mining Pty Ltd dated 19th March 2019. 27pp.
- Allpike, R., (2019) Winchelsea Gravity Survey for Winchelsea Mining Pty Ltd. Atlas Geophysics Memorandum M2019057. p.1-27.
- Bolton, B.R., Berents, H.W. and Frakes, L.A., 1990. Groote Eylandt manganese deposit: in Hughes, F.E. (editor) *Geology of Mineral Deposits of Australia and Papua New Guinea*, Australasian Institute of Mining and Metallurgy, Melbourne, 1575-1579.
- Ferenczi, P. 2001. Iron ore, manganese and bauxite deposits of the Northern Territory. Northern Territory Geological Survey Report 13.
- Krassay, A.A., (1994) The Cretaceous stratigraphy and palaeogeography of the western and southwestern margins of the Gulf of Carpentaria, Northern Territory. Unpublished PhD Thesis, University of Adelaide, 480pp.
- Munson TJ, Ahmad M and Dunster JN, (2013). Chapter 39: Carpentaria Basin: in Ahmad M and Munson TJ (compilers). 'Geology and mineral resources of the Northern Territory'. Northern Territory Geological Survey, Special Publication 5.
- Page, M., 1994. Groote Eylandt, 1:250,000 sheet, data record. Northern Territory Department of Mines and Energy (unpublished).
- PGN, 2019. Winchelsea Island high sensitivity ground gravity interpretation – Stage 1. Unpublished report to Winchelsea Mining ty Ltd dated April 2019, 25pp.
- Pietsch, B.A., Rawlings, D.J., Haines, P.W. and Page, M., 1997. Groote Eylandt Region, Northern Territory - 1:250 000 Geological Map Series. Northern Territory Geological Survey, Explanatory Notes SD 53-7, 8, 11, 12.
- Pracejus, B., 1989. Nature and formation of supergene manganese oxide deposits on Groote Eylandt, Northern Territory, Australia. PhD thesis, The University of Adelaide, Adelaide (unpublished).
- Pracejus, B., Bolton, B. R. and Frakes, L.A., (1988) Nature and development of supergene manganese deposits, Groote Eylandt, Northern Territory, Australia. *Ore Geology Reviews*, 4, 71-98.
- Pracejus, B. and Bolton, B. R., 1992. Geochemistry of supergene manganese deposits, Groote Eylandt, Australia. *Economic Geology* 87, 1310-1335.
- Rawlings, D., Pietsch, B. and Haines, P., 1995. Groote Eylandt Special 1:250 000, data record. Northern Territory Geological Survey, Technical Report GS95/7 (unpublished).

APPENDICES

Appendix 1 – Sample and observation details (Locations given in WGS 84)

Wpt	Eastng	Northing	Type	Code	Sample	Description
286	663151	8479667	outcrop/rock chip	Cpis	WMN007	cemented mangan-pisolite
287	663184	8479613	outcrop/rock chip	Cpis	WMN008	cemented mangan-pisolite (located in MH office)
288	663196	8479652	float	Mn-lat		loose lateritic grav. With rare Mn-stained cbl, bld lat float
289	663245	8479669	float	Latgrav		loose lateritic grav. No Mn observed
290	663306	8479668	float/grab	Cpis-Lat	WMN009	loose lateritic grav. on light coloured sand, occ. cbl laterite-hosted dense cemented mangan-pisolite (sampled); also rare float of cbl sized qzite
291	663364	8479665	float	Mn-lat		loose lateritic grav. with occ. cbl-sized qzite & Mn-stained cemented lat bld
292	663367	8479612	float	Mn-lat		loose lateritic grav with cbl & bld of Mn-stained cemented lat
293	663450	8479564	float	Mn-lat		loose lateritic grav (cse) with cbl & bld of ferruginised cemented mangan-pisolite (highly altered). Also cbl of Fe-cemented coarsegrained sst (photo), and siliceous pisolitic laterite
294	663497	8479532	float	Mn-lat		loose lateritic grav with ab cbl & bld of pisolitic/siliceous laterite and Fe-cemented sst. 5m to east outcropping qzite
295	663554	8479479	outcrop	Qtzite		outcrop of quartzite
296	663681	8479505	outcrop	Qtzite		quartzite/cover contact
297	663557	8479414	outcrop	Qtzite		quartzite/cover contact
298	663467	8479323	outcrop	Qtzite/Cpis		quartzite/cover contact. Also float of cbl-sized dense cemented mangan-pisolite & high grade siliceous & massive mangite
299	663353	8479313	float	Mn-lat		loose lateritic grav with cbl & bld of well cemented, Mn-stained and enriched concretionary laterite
300	663288	8479346	outcrop	Qtzite		quartzite underlying extensive loose lateritic grav & bld of cemented laterite
301	663102	8479441	float/grab	Mn-lat	WMN010	loose lateritic grav with rare float of dense high grade massive mangite
302	663110	8479470	float/grab	Cpis-Lat	WMN011	loose lateritic grav with float of cemented mangan-pisolite
303	663086	8479550	float	Cpis-Lat		loose lateritic grav with float of cemented mangan-pisolite
304	663108	8479612	outcrop	Qtzite/MassM		outcrop of quartzite with onlapping float of massive mangite
305	663227	8479788	float	Sand		light brown sandy soil with no Mn evident
306	663151	8479839	float	Sand		light brown sandy soil with minor lat grav; no Mn evident
307	663044	8479920	float	Sand		light brown sandy soil; no Mn evident
308	662994	8479814	float	Latgrav		loose lateritic grav; no Mn evident
309	663054	8479745	float	Latgrav		loose lateritic grav with rare float of cemented laterite with Mn-staining & cbl qzite
310	663122	8479710	outcrop	Cpis		outer NW edge of cemented mangan-pisolite pavement
311	663113	8479690	outcrop/rock chip	Cpis	WMN012	outcropping cemented mangan-pisolite
314	662459	8479749	float	Mn-Lat		loose lateritic grav on sandy soil with rare float of Mn-stained cemented laterite cbl
315	662520	8479733	float/grab	Cpis-Lat	WMN013	loose lateritic grav with cbl & bld of massive and cemented mangan-pisolite clasts in lateritic conglomerate
316	662626	8479823	outcrop	Cpis-Lat		almost continuous pavement outcrop of laterite containing cbl & bld Fe-rich cemented mangan-pisolite
317	662781	8479974	float	Mn-Lat		cemented laterite with Mn-staining and impregnations
318	662809	8479992	outcrop	Lat		horizontally layered, well cemented profile of laterite. No Mn evident
319	662852	8480044	outcrop	Lat		cemented laterite pavement. No Mn evident
320	662910	8480086	outcrop	Cpis-Lat	WMN014	cemented laterite pavement with rare cbl float of cemented mangan-pisolite (sampled)
321	663007	8480245	float	Latgrav		loose lateritic soil with float of cemented lat. No Mn evident
322	662884	8480280	float	Sand/Latgrav		loose sandy soil with loose lateritic grav and rare float of cemented laterite
323	662485	8480190	float	Sand/Latgrav		Sandy soil with loose lateritic grav. No Mn evident
324	662421	8480178	float	Sand/Latgrav		Sandy soil with loose lateritic grav. No Mn evident
325	662397	8480038	float	Latgrav		loose lateritic grav with ab cbl & bld of cemented laterite. No Mn evident
334	662681	8479381	outcrop	Cpis-Lat		hard extensive outcrop of laterite pavement containing rare clasts of massive mangite and cemented mangan-pisolite

Wpt	Eastng	Northing	Type	Code	Sample	Description
337	662400	8480802	float	Latgrav/sand		loose lat grav (cse); no Mn evident
338	662393	8480757	outcrop	Qtzite/Latgrav	WMN015	outcrop of qzite (sampled) with overlying cemented laterite; no Mn evident
339	662492	8480793	float	Latgrav		loose lat grav (cse); occ cbl & bld of cemented lat with rare qzite clasts; no Mn evident
340	662630	8480803	float	Latgrav/Lat		loose lat grav over cemented laterite; Mn staining in places
341	662769	8480775	float	Latgrav/qtzite		loose lat grav over qzite; no Mn evident
342	663085	8480805	float	Latgrav/Lat		loose lat grav over cemented lat; no Mn evident
343	663305	8480802	float	Latgrav		loose lat grav over light sandy soil; no Mn evident
344	663495	8480797	float	Latgrav		loose lat grav with bld of cemented laterite and lat breccia; no Mn evident
345	663583	8480804	float	Latgrav		loose lat grav with cbl & bld of cemented laterite with occ float of qzite
346	663774	8480808	float	Latgrav		loose lat grav with blocks and bld of cemented lat.
347	663955	8480801	float	Latgrav		loose lat grav with occ float of cbl & bld lat and qzite
348	664002	8480803	float	Latgrav		loose lat grav with float of cemented lat; no Mn evident
349	664002	8481065	float	Latgrav		loose lat grav with cbl & bld of cemented laterite ome with Mn-staining with occ float of qzite
350	664006	8481170	float	Latgrav		loose lat grav (cse) with cbl & bld of cemented laterite float; no Mn evident
351	664001	8481339	float	Latgrav		loose lat grav with occ cbl & bld of cemented lat; no Mn evident
352	663984	8481635	float/outcrop	Latgrav/Qtzite		loose lat grav with occ cbl & bld of cemented lat; no Mn evident; outcropping qzite
353	663985	8481679	float/outcrop	Latgrav/Qtzite		outcropping quartzite with loose lat grav; no Mn evident
356	664217	8480785	float	Latgrav		loose lat grav with float and outcrop of cemented lat; no Mn evident
357	664292	8480764	float	Latgrav		loose lat grav with float of occ qzite and cemented lat; no Mn evident
358	664571	8480754	float	Latgrav		loose lat grav with cbl of cemented lat; no Mn evident
359	664765	8480802	float	Latgrav		loose lat grav with cbl qzite & cemented lat; no Mn evident
360	665048	8480808	float	Latgrav		loose lat grav with occ float of qzite and cemented lat; no Mn evident
361	665070	8480781	outcrop/float	Qtzite/Latgrav		outcrop/contact with qzite; overlying cover of laterite to west; no Mn evident
362	665056	8481009	float	Latgrav/sand		loose lat grav and sand with occ float of cbl qzite; no Mn evident
363	665060	8481127	outcrop	Qtzite	WMN016	outcropping quartzite (sampled) with loose lat grav; no Mn evident
364	664901	8481257	float	Latgrav/sand		loose lat grav with float of cemented lat; no Mn evident
365	664667	8481288	float	Latgrav		loose lat grav with cemented lat float; no Mn evident
366	664489	8481324	float	Latgrav		loose lat grav with cemented lat float; no Mn evident
367	664352	8481408	float	Latgrav		loose lat grav with cemented lat float; no Mn evident
368	664330	8481425	outcrop	Lat		thin cemented lat horizon exposed in gully; no Mn evident
369	664001	8481598	float	Latgrav		loose lat grav with cemented lat float; no Mn evident
370	661901	8476082	outcrop	Sandstone/Qtzite	WMN017	outcrop of x-bedded sandstone on beach; no Mn evident
371	661880	8476162	outcrop	Sst/Cpis		outcrop/section, massive mangite and cemented mangan-pisolite cbl clast at base of section
372	661858	8476209	outcrop	Slst/Mmm	WMN018	outcrop/section, massive mangite in lens at base of section in pale siltstone
373	661790	8476287	float/grab	Cpis-Lat	WMN019	on beach, ab cemented mangan-pisolite cbl and bld
374	661820	8476298	outcrop	Cpis-Lat		behind beach in gully armoured with ab cbl & bld of Fe-altered cemented mangan-pisolite + cemented laterite
375	661723	8476372	outcrop	Cpis-Lat		on beach, Fe-altered cemented mangan-pisolite clasts incorporated in Fe-rich sandy beach rock
376	661565	8476716	float	Cpis-Lat		on beach ab bld and cbl of eroded beach rock containing Fe-cemented cemented mangan-pisolite
377	661409	8477558	float	Cpis-Lat		on beach are scattered cbl & bld of altered cemented mangan-pisolite , qzite and laterite

Wpt	Easting	Northing	Type	Code	Sample	Description
379	662510	8479376	float	Latgrav		in creek bed, loose lat grav with occ large float of cemented lat. No Mn evident
380	662546	8479375	outcrop	Lat		in creek bed, with occ clasts of cemented laterite, cbl of cemented mangan-pisolite and ab Fe
381	662903	8479118	outcrop/rock chip	Cpis-Lat	WMN020	laterite pavement forming creek bed with large bld clasts of massive mangite and cemented mangan-pisolite (also wpt 334)
382	662956	8479033	float	Lat		laterite pavement with ab cbl & bld of cemented laterite. No Mn evident
383	662754	8479054	float	Latgrav		loose lat grav on sand soil. No Mn evident
384	662703	8479041	float/grab	Cpis-Lat	WMN021	loose lat grav over sandy soil with occ float of cemented mangan-pisolite
385	662587	8477385	float	Si-Mn/sand		loose sandy soil with float of cbl & bld of mainly siliceous mangite
386	662707	8477264	float	sand		loose sandy soil with no float or evident Mn
387	662841	8477306	float	sand		loose sandy soil with no float or evident Mn
388	662845	8477401	float	sand		loose sandy soil with no float or evident Mn
389	662866	8477435	float	Cpis-sand	WMN022	loose sandy soil with ab slabs and bld of cemented mangan-pisolite and massive mangite (sampled)
390	662911	8477528	float	sand/Mmn		loose sandy soil with float of cbl & bld massive Fe-Mn and occ silica
391	662859	8477586	float	Sand/Mmn		loose sandy soil with float of ab cbl and bld of massive siliceous and massive mangite and occ cemented mangan-pisolite . Ab Mn-stained laterite
392	662786	8477615	float	Sand/Mmn		loose sandy soil with lat grav with float of cemented laterite to concretionary/pisolitic Mn and Fe
393	662619	8477681	float	Sand/Mmn		loose sandy soil with large bld of lateritic breccia containing cbl of massive mangite
394	662594	8477675	float	Sand/Mmn	WMN023	loose sandy soil with ab cbl & bld of cemented lat and lat breccia with Mn clasts and bld of massive/cemented Mn
395	662392	8477376	float	Sand-Mn		loose sandy soil with rare bld of siliceous manganiferous laterite
396	662392	8476961	float	Sand		loose sandy soil. No lat or Mn
397	662401	8476499	float	Sand		loose sandy soil. No lat or Mn
398	662399	8475999	float	Sand		loose sandy soil. No lat or Mn
399	662403	8477600	float	Sand/Mmn	WMN024	loose sandy soil with cbl & bld float of laterite containing low grade siliceous mangite . Also ab large bld of lat breccia containing cbl of massive mangite (sampled)
400	662397	8477778	float	Sand		loose sandy soil with large bld of laterite. Manganiferous but no clasts
401	662406	8478503	float	Sand		loose sandy soil; no laterite or Mn
402	662402	8478902	float	Sand		loose sandy soil; no laterite but friable sandy Mn in places
403	662400	8479101	float	Sand		loose sandy soil; no laterite or Mn
404	662405	8479900	float	Sand/Latgrav		loose sandy soil with lat grav; no Mn evident
405	662404	8479993	float	Sand/Latgrav		loose sandy soil with float of bld of Mn-stained concretionary and cemented laterite
406	662900	8481200	float	Sand/Latgrav		loose sandy soil with ab large blocks of Mn-stained laterite float
407	662396	8480706	outcrop	Qtzite/Latgrav		contact of outcropping quartzite and overlying loose lat grav; no Mn evident
409	662988	8480951	float	Sand/Latgrav		loose sandy soil with lat grav; no Mn evident
410	662993	8481016	float	Sand/Latgrav		loose sandy soil with lat grav containing occ quartzite float; no Mn evident
411	662919	8481239	float	Sand/Latgrav		loose sandy soil with lat grav; no Mn evident
412	663124	8481187	float	Sand/Latgrav		loose sandy soil with lat grav and occ quartzite clast float; no Mn evident
413	663209	8481149	float	Sand/Latgrav		loose sandy soil with lat grav and ab cbl & bld of cemented laterite; no Mn evident
414	663504	8481261	float	Sand/Latgrav		loose sandy soil with lat grav and ab cbl & bld of cemented laterite; no Mn evident
415	663618	8481243	float	Sand/Latgrav		loose sandy soil with lat grav and occ quartzite clast float; no Mn evident
416	663726	8481244	float	Sand/Latgrav		loose sandy soil with lat grav with float of cbl & bld of cemented laterite; no Mn evident
417	663847	8481177	float	Sand/Latgrav		loose sandy soil with lat grav with float of cbl & bld of cemented laterite; no Mn evident
418	662105	8478002	float	Sand/Latgrav		loose sandy soil with lat grav with float of cbl & bld of cemented laterite; no Mn evident

Wpt	Easting	Northing	Type	Code	Sample	Description
419	662599	8477998	float	Sand		loose sandy soil; no laterite or Mn
420	662787	8478007	float	Sand		loose sandy soil; no laterite or Mn
422	663933	8478566	outcrop	Qtzite		on outcropping quartzite, just to west of wpt 421
423	663787	8479349	outcrop	Qtzite		on outcropping quartzite; no Mn evident
424	660468	8480593	outcrop	Qtzite		on outcropping quartzite; with overlying cbl & bld of siliceous and cemented laterite; no Mn evident
425	660624	8480575	outcrop	Qtzite/Latgrav		on outcropping quartzite with overlying lat grav with clasts of Mn-impregnated and Fe-cemented lat
426	660720	8480581	float	Latgrav		loose lat grav on sand soil. No Mn evident
427	660930	8480617	float	Lat		cemented laterite clasts; no Mn evident
428	661001	8480654	outcrop	Qtzite/Latgrav		outcropping quartzite with overlying lat grav; No evident Mn
429	661167	8480680	outcrop	Lat		outcrop in shallow creek showing cemented laterite; no Mn evident
430	661428	8480665	float	Latgrav		loose sandy soil with lat grav; no Mn evident
431	661637	8480543	float	Latgrav		loose sandy soil with lat grav and cbl & bld of cemented laterite; no Mn evident
432	661823	8480404	float	Latgrav/sil Mn	WMN025	loose sandy soil with lat grav and cbl & bld of cemented laterite; weak Mn imregnations and cbl of siliceous mangite (sampled)
433	661862	8480371	float	Latgrav/sil Mn	WMN026	loose sandy soil with cbl float of cemented laterite and siliceous, high grade mangite (sampled)
434	662000	8480217	float	Sand/Latgrav		loose sandy soil with lat grav; no Mn evident
436	661761	8480180	float	Sand/Latgrav		loose sandy soil with minor lat grav; no Mn evident
437	661590	8480088	float	Sand/latgrav		loose sandy soil with lat grav; no Mn evident
438	661545	8480110	float	Sandstone/Lat		Sandstone with minor Mn oxide staining and ab cbl and bld of cemented, silica sand
439	661365	8480173	outcrop	Lat		creek bed with exposed section of cemented laterite and sandstone; no Mn evident
440	661127	8480322	float	Sand		loose sandy soil; no Mn evident
441	660908	8480394	float	Sand/Latgrav		loose sandy soil with cbl of cemented lat; no Mn evident
442	660832	8480519	float	lat grav		lat grav with ab cbl of cemented lat with Mn staining and ab Fe
443	665200	8478400	float	Sand		loose sandy soil. No lat or Mn
444	664800	8478400	float	Sand		loose sandy soil. No lat or Mn
445	664800	8478000	float	Sand		loose sandy soil. No lat or Mn
446	664400	8478000	float	Sand		loose sandy soil, no lat or Mn
452	664873	8478639	outcrop	Qtzite/sand		outcrop of quartzite with overlying loose sandy soil; no Mn evident
453	665020	8478508	float	Sand		loose sandy soil; no lat or Mn evident
454	664943	8478340	float	Sand		loose sandy soil; no lat or Mn evident
455	664549	8477983	float	Sand		loose sandy soil; rare sandy lateritic clast; no Mn evident
456	664397	8478209	float	Sand		loose sandy soil; no lat or Mn evident
458	664458	8478414	float	Sand		loose sandy soil; no lat or Mn evident
459	664634	8478337	float	Sand		loose sandy soil; no lat or Mn evident
460	664641	8478408	outcrop	Qtzite/MassM	WMN027	contact of quartzite and overlying cover of laterite including siliceous and massive mangite clasts
461	664661	8478521	float	Qtzite/Si-Mn		creek bed with quartzite overlain by ab clasts of cbl and bld of lat breccia containing siliceous mangite
462	661540	8477964	float	Sand		loose sandy soil; no lat or Mn evident
463	661818	8477957	float	Sand		loose sandy soil; no lat or Mn evident
464	662920	8478008	float	Sand/Mmn	WMN028	loose sandy soil with cbl & bld of cemented lat breccia containing clasts of high grade massive mangite (sampled)
465	663001	8478006	float	Sand/Mmn		loose sandy soil with cbl & bld of cemented lat breccia containing clasts of high grade massive mangite (sampled)

Wpt	Easting	Northing	Type	Code	Sample	Description
466	663130	8478005	float	Sand/Mmn		loose sandy soil with cbl & bid of cemented lat breccia containing clasts of high grade massive & siliceous mangite (sampled)
467	663235	8478003	float	Sand/Mmn	WMN029	loose sandy soil with cbl & bid of cemented lat breccia containing clasts of high grade massive & siliceous mangite (sampled)
468	663430	8477998	float	Sand		loose sandy soil; no lat or Mn evident
469	663532	8478014	float	Sand/Mn Lat		loose sandy soil with rare bid of cemented lat breccia with clasts of high grade massive mangite
470	663616	8478001	float	Sand/Mn Lat		loose sandy soil with rare bid of cemented lat breccia with clasts of siliceous Mn disseminations
471	663907	8477997	float	Sand		loose sandy soil; no lat or Mn
472	663400	8478800	float	Latgrav		loose lat grav with cbl & bid of cemented, Mn-stained lat
473	663050	8478800	float	Sand		loose sandy soil with no lat or Mn
474	663050	8478400	float	Sand		loose sandy soil with rare pbl of cemented lat; no Mn
475	664000	8478400	float	Sand		loose sandy soil with no lat or Mn
476	663664	8478712	outcrop	Qtzite		outcrop of quartzite; no lat or Mn evident
477	663508	8478768	outcrop	Qtzite		outcrop of quartzite with overlying loose sandy soil with scattered cbl & bid of cemented lat with Mn staining
478	663459	8478809	float	Latgrav		loose lat grav with cbl & bid of cemented lat; some Mn staining
479	663262	8478799	float	Sand		loose sandy soil; no lat or Mn
480	663028	8478696	float	Sand/Latgrav		loose sandy soil; with pbl & cbl of cemented lat; no Mn evident
481	663051	8478575	float	Sand/Latgrav		loose sandy soil; with pbl & cbl of cemented lat; no Mn evident
482	663224	8478372	float	Sand/Latgrav		loose sandy soil; with pbl & cbl of cemented lat; no Mn evident
483	663411	8478374	float	Sand		loose sandy soil; no lat or Mn
484	663676	8478337	float	Sand		loose sandy soil; no lat or Mn
485	663819	8478384	outcrop	Lat/Cpis	WMN030	outcrop of cemented lat (no Mn) in shallow gully; 20 m downstream is bid of cemented laterite with clasts of altered cemented mangan-pisolite and nearby, quartzite outcrop
488	664000	8480400	float	Latgrav		loose lat grav with cbl of lat and qtzite
489	663600	8480000	float	latgrav		loose lat grav with cbl of qtzite and Mn staining
490	664000	8480000	outcrop	Qtzite/Latgrav		outcrop of quartzite with overlying float of lat and Fe-Mn Ox clasts
492	664914	8480386	outcrop	Qtzite/Mmn	WMN031	outcrop of quartzite and scattered cbl of massive mangite (sampled). Mn here sitting on quartzite along with cbl of cemented lat
493	664670	8480464	float	Latgrav		loose lat grav with pbl of Mn Ox (friable)
494	664421	8480424	float	Latgrav	WMN032	loose lat grav with pbl of massive Mn-Fe laterite and Mn Ox; occ qtzite clast
495	664347	8480424	float	Latgrav/Mmn		loose lat grav with bpl of massive mangite
496	663869	8480248	float	Latgrav		loose lat grav with occ cbl of cemented lat and qtzite
497	663877	8479998	float	Latgrav	WMN033	loose lat grav with occ cbl of massive mangite and Fe-Mn impregnated lat (sampled)
498	663951	8479964	float	Latgrav		loose lat grav with cbl of high grade massive mangite float
499	664221	8479944	outcrop	Qtzite	WMN034	outcrop of quartzite with overlying float of massive mangite clasts
501	662000	8478400	float	Latgrav		loose sandy soil; no lat or Mn
502	661600	8478400	float	Latgrav		loose sandy soil; no lat or Mn
503	661600	8478800	float	Latgrav		loose sandy soil; no lat or Mn
504	662000	8478800	float	Sand		loose sandy soil; no lat or Mn
506	662171	8478393	float	Sand		loose sandy soil; no lat or Mn
507	661869	8478383	float	Sand		loose sandy soil; no lat or Mn
508	661700	8478396	float	Sand		loose sandy soil; no lat or Mn
509	661587	8478531	float	Sand		loose sandy soil; no lat or Mn

Wpt	Easting	Northing	Type	Code	Sample	Description
510	661589	8478675	float	Sand		loose sandy soil; no lat or Mn
511	661479	8478823	float	Sand		loose sandy soil; no lat or Mn
512	661314	8478837	float	Sand		loose sandy soil; no lat or Mn
513	661231	8478919	float	Sand		loose sandy soil; no lat or Mn
515	663200	8480400	float	Latgrav		Loose lat grav with cbl & pbl of cemented lat; no Mn evident
516	663600	8480400	float	Latgrav		Loose lat grav with cbl & pbl of cemented lat; no Mn evident
518	663195	8480683	float	Latgrav		loose lat grav with occ float of cbl & pbl cemented lat
519	663192	8480590	float	Sand/latgrav		loose sandy soil with ab pbl, cbl & bid of cemented lat and dense Fe-stone; No Mn; occ float of qtzite clasts
520	663344	8480395	float	Latgrav		loose lat grav with occ rare float of cemented lat; no Mn evident
521	663599	8480678	float	Latgrav		loose lat grav with ab float of cemented lat; no Mn evident
522	660954	8479003	float	Sand		white loose sand with no lat or Mn.
523	660800	8479200	float/outcrop	Sand/Qtzite		loose sand with no lat or Mn. Also bid of sst/qtzite and outcrops of Fe-cemented cse qtz sandstone; massive.
524	660900	8479600	float	Sand		loose sandy soil; No lat or Mn
525	661200	8479600	float	Sand		loose sandy soil; No lat or Mn
526	661400	8479200	float	Sand		loose muddy sand; no lat or Mn
527	661434	8479022	float	sand		loose clayey sandy soil; no lat or Mn
529	660912	8479510	float	Sand		loose sandy soil; No lat or Mn
530	661151	8479557	float	Sand		loose sandy soil; No lat or Mn
531	661249	8479330	float	Sand		loose sandy soil; No lat or Mn
534	661619	8479140	float	Sand		loose sandy soil; No lat or Mn
535	661683	8477452	float	Sand		loose sandy soil; No lat or Mn
536	662571	8477997	float	Sand		loose sandy soil; No lat or Mn
537	662785	8478007	float	Sand		loose sandy soil; No lat or Mn
538	662926	8478008	float	Sand	WMN028	loose sandy soil with rare bid of Fe-Mn impregnated lat; No Mn
539	662693	8477791	float	Sand		loose sandy soil; No lat or Mn
540	663005	8477798	float	Sand/latgrav	WMN036	loose sandy soil with rare bid of Fe-Mn impregnated lat; No Mn
541	663135	8477798	float	Sand/Latgrav		loose sandy soil with bid of manganese-cemented laterite
542	663217	8477809	float	Sand/Latgrav		loose sandy soil with bid of manganese-cemented laterite
543	663451	8479092	float	Latgrav		loose lat grav with pbl & cbl of concretionary and massive lat; no Mn evident
544	663451	8479200	float	Latgrav		loose lat grav with pbl & cbl of concretionary and massive lat; some minor Mn staining evident
545	663000	8479200	outcrop	Lat/SiMn	WMN039	outcrop of laterite pavement with cbl & bid float of siliceous mangite
546	662832	8479366	outcrop	Lat/Cpis	WMN040	outcrop of laterite pavement with rare float of siliceous mangite and massive mangite and cemented mangan-pisolite
547	664005	8479112	float	Latgrav		loose lat grav with ab cbl & pbl of lat breccia and concretionary lat, some with Mn Ox impregnation and qtz sst
548	663658	8479131	float	Latgrav		lat grav over Qtzite; ab pbl & cbl of concretionary lat, some with Mn staining and qtzite float
549	663343	8479190	float	Latgrav/Cpis	WMN037	loose lat grav with ab pbl & cbl of massive mangite after cemented mangan-pisolite
550	663250	8479226	float	Latgrav/SiMn	WMN038	loose lat grav with ab pbl & cbl of siliceous mangite
551	663029	8479427	float	Latgrav/Cpis		loose lat grav with occ float of concretionary lat with minor cemented mangan-oolite
552	663069	8479517	float	Latgrav/Cpis	WMN041	loose lat grav with mod to ab float of cemented mangan-pisolite/oolite. Also bid of siliceous mangite with cse qtz grains in Mn Ox matrix
553	663107	8479609	float	Latgrav/SiMn	WMN042	loose lat grav with ab bid of manganese-impregnated qtz sst

Wpt	Easting	Northing	Type	Code	Sample	Description
554	663145	8479621	float	Latgrav/Cpis		loose lat grav with ab bld of high grade cemented mangan-pisolite
555	663786	8479804	outcrop	Qtzite		outcropping quartzite
556	663371	8479803	float	Sand		loose sand with minor pbl of lat; no Mn evident
557	663621	8479784	float	Sand		loose sandy soil; no lat or Mn
558	663230	8479712	float	Latgrav		loose lat grav with pbl & cbl of lat; no Mn evident
559	663219	8479704	float	Latgrav/Cpis		loose lat grav with pbl and cbl of lat and rare cobbles of cemented mangan-pisolite
1729	662902	8480200	float	Mnn		Minor amounts of mangnite float. Small (1-3cm) manganese fragments present within the large (<40cm) lateritic conglomerate float.
1733	663601	8480201	float	Si-Mn		Silicic, massive mangite float
1734	663187	847999	float	Mnn		mangite float
1668	663495	8479803	float	Lat		Fine lateritic soil
Between 1704-1705			float	Mnn		Massive mangite float and Cemented Pisolitic float
1705	663926	8480020	outcrop	Mnn	WMN043	15m x 8m outcrop of massive mangite. Manganese pisoliths could be seen in places but were rare. mangite float also present.
1703	663700	8479995	float	Latgrav		Manganese mineral present within lateritic conglomerate float
1706	663397	8480011	float	Latgrav		Manganese mineral present within lateritic conglomerate float
1771	663092	8480396	float	Latgrav		Manganese mineral present within lateritic conglomerate float
1770	662983	8480392	float	Mn-Lat		Manganese richly present within a lateritic conglomerate float. Manganese ranged in size from (1cm-3cm)
1768	662803	8480396	float	Mn-Lat		Small amounts of manganese mineral present within lateritic conglomerate float
1765	662502	8480391	float	Latgrav		Manganese richly present within a lateritic conglomerate float. Manganese ranged in size from (1cm-3cm)
1719	661907	8480205	float	Latgrav		Cemented ooliths present within manganese float
1759	661892	8480399	float	Latgrav		Manganese mineral present within lateritic conglomerate float
1761	662103	8480408	float	Lat		Fine lateritic soil
1764	662397	8480402	float	Cpis		Moderately well cemented pisolitic mangite float present
1758	661809	8480408	float	Latgrav		mangite float and Lateritic conglomerate float containing manganese minerals present. Large, expansive, open area present (5m x 20m). Limited vegetation.
1757	601687	8480392	float	Latgrav		Manganese richly present within lateritic conglomerate float
1753	661497	8480307	float	Sand/Lat		Coarse grained lateritic red sand
1749	660900	8480397	float	Mnn		mangite float abundantly present in large, expansive open area, which contains limited vegetation.
1748	660796	8480399	float	Mnn		mangite float abundantly present in large, expansive open area, which contains limited vegetation.
1747	660700	8480400	float	Qtz sst		Quartz sandstone float abundant
1709	660901	8480202	float	Sand/Lat		Fine lateritic yellow soil
1712	661202	8480194	float	Sand/Lat		Fine lateritic yellow soil
1714	601390	8480124	float	Latgrav		35m West - 2m x 6m outcrop of laterite conglomerate. Mangite present
1687	662099	8480000	float	Sand/Lat		Fine, red, lateritic soil
1684	661798	8480006	float	Sand/Lat		Fine, red, lateritic soil
1681	661493	8479991	float	Sand/Lat		Fine, red, lateritic soil. Large (30cm), singular, float of quartzite present 45m West.
1679	661290	8479993	float	Sand/Lat		Fine, red, lateritic soil. Outcrop (4m x 2m) of laterite conglomerate (1cm clasts within red sand matrix) present within small valley
1675	660901	8479997	float	Sand		Fine, yellow sand present
1641	660978	8479796	float	Sand		Fine, red, lateritic soil. Opened ground of clearer vegetation.
1642	660896	8479800	float	Sand		Fine, red, lateritic soil
1647	661395	8479811	outcrop	Lat		Outcrop (3m x 2m) of laterite conglomerate (1cm clasts within red sand matrix) present within small valley 10m west.

Wpt	Easting	Northing	Type	Code	Sample	Description
1651	661808	8479793	float	Sand		Fine, red, lateritic soil
1655	662196	8479807	float	Sand		Fine, red, lateritic soil
1593	662610	8479400	float	Mnn		mangite float present
1594	662725	8479370	outcrop	Con-mn		Large (4m x 50m) outcrop of weathered, heaving oxidised and Fe stained Concretionary Manganese . Runs roughly E-W.
1325	661600	8477900	float	Sand		Red lateritic soil
1327	661794	8477995	float	Sand		Red lateritic soil
1329	661998	8478007	float	Sand		Red lateritic soil
1331	662204	8478005	float	Sand		Red lateritic soil
1333	662401	8478004	float	Sand		Red lateritic soil
1335	662594	8478002	float	Sand		Red lateritic soil
1337	662806	8378007	float	Sand		Red lateritic soil
1338-1339			float	Latgrav		Laterite conglomerate float with manganese clasts up to 3cm in size. Manganese minerals are largest clasts within conglomerate.
1339	662995	8477997	float	Sand		Red lateritic soil
1297	662403	8477801	float	Con Mn		Large (<50cm), float outcrops of concretionary manganese . Shows a manganese matrix, where pisoliths can be observed. Matrix also contains fine quartz grains, which are moderately abundant. (Also sampled on 11/03)
1299	662600	8477806	float	sand		Red lateritic soil
1301	662796	8477805	float	sand		Red lateritic soil
1303	663000	8473803	float	Cpis		Large (up to 50cm) mangite, silica rich float. On lower parts of samples, pisoliths (2cm can be observed). Can pick out boundary of where pisolitic, 'silvery' cryptomelane grades into massive, darker mangite (see photo)
1304	663105	8477804	float	Cpis		Cemented pisolitic mangite float
1305	663207	8477807	float	Cpis		Large (up to 50cm) massive mangite & cemented mangan-pisolite float present. Small pisoliths can be observed. mangite is heavily Fe stained. Laterite conglomerate float (up to 40cm) containing manganese clasts (<5cm) also present.
	662396	8477639	float	Latgrav/Mnn		Massive mangite/Fe in concretionary laterite float. Samples are quartz (fine in size) rich and heavily Fe stained. Samples are less dense than a true mangite. Interpreted to mangite which has undergone supergene/pedogenic processes - concretionary manganese.
1296	662094	8477790	float	Sand		Red lateritic soil
1294	662094	8477778	float	Sand		Red lateritic soil
1292	661899	8477801	float	Sand		Red lateritic soil
1290	661712	8477794	float	Sand		Red lateritic soil
1257	662192	8477586	float	Latgrav/S+Mn		Siliceous massive mangite in concretionary laterite float (<25cm) laying on red lateritic soil
1255	662000	8477569	float	Sand		Red lateritic soil
1253	661801	8477571	float	Sand		Red lateritic soil
1251	661609	8477598	float	Sand		Red lateritic soil
1260	662498	8477602	float	Latgrav/Mnn		Area with low vegetation density and numerous 'open patches' littered with manganese clasts (<5cm). Large (<40cm) float of lateritic concretionary manganese present, the float is heavily Fe stained, where samples are less dense than a true mangite. Interpreted to mangite which has undergone supergene/pedogenic processes - concretionary manganese. Massive mangite samples also present.
1261	662597	8477610	float	Latgrav/Mnn		Large 'open' land, vegetation density further decreases. Littered with small (<5cm) manganese clasts. Manganese rich, conglomerate float (<30cm), which has a poorly cemented manganese matrix and is less dense than a true mangite. Interpreted to mangite which has undergone supergene/pedogenic processes - concretionary manganese.
1262	662703	8477614	float	Cpis		Cryptomelane float (<30cm), containing rare pisoliths
1263	662802	8477616	float	Latgrav/Mnn		Area with low vegetation density and numerous 'open patches' littered with manganese clasts (<5cm). Large (<60cm) float of lateritic concretionary manganese present.
1265	662999	8477607	float	Con Mn/Mnn		Mainly concretionary manganese. Massive mangite float (<60cm) also present
1266	663096	8477596	float	Sand		Red lateritic soil
1267	663194	8477600	float	Sand		Red lateritic soil
	662661	8477625	float	Mnn		Quartz rich, massive mananite float (<70cm) containing rare pisoliths.
1193	662402	8477200	float	Sand		Red lateritic soil
1201	663191	8477201	float	Sand		Red lateritic soil
1999	662989	8477193	float	Sand		Red lateritic soil

Wpt	Easting	Northing	Type	Code	Sample	Description
1997	662794	8477196	float	Sand		Red lateritic soil
1995	662605	8477188	float	Sand		Red lateritic soil
1992	662292	8477207	float	Sand		Red lateritic soil
1190	662095	8477210	float	Sand		Red lateritic soil
1188	661888	8477209	float	Sand		Red lateritic soil
1286	661692	8477202	float	Sand		Red lateritic soil
1225	662296	8477413	float	Sand		Red lateritic soil
1223	662095	8477409	float	Sand		Red lateritic soil
1221	661869	8477419	float	Sand		Red lateritic soil
1219	661692	8477403	float	Sand		Red lateritic soil
1359	664972	8478000	float	Sand		Red lateritic soil
1357	664815	8477993	float	Sand		Red lateritic soil
1355	664597	8478002	float	Sand		Red lateritic soil
1353	664406	4878003	float	Sand		Red lateritic soil
1351	664208	8477998	float	Sand		Red lateritic soil
1349	664012	8478002	float	Sand		Red lateritic soil
1347	663808	8478006	float	Sand		Red lateritic soil
1345	663604	8478004	float	Sand		Red lateritic soil
1343	663399	8478004	float	Sand		Red lateritic soil
1558	662498	8479201	float	Sand		Red Lateritic Soil
1651	662796	8479199	float	Sand		Red Lateritic Soil containing small (<3cm) clasts, some of which are manganese.
1563	663001	8479207	outcrop	Mmn		Extensive, NW-SE running outcrop of massive mangite present. Large amount of mangite float (<75cm) and concretionary manganese float (<75cm). Limited vegetation present
1564	663092	8479201	float	Mmn		mangite float abundantly present (<40cm)
1567	663397	8479203	float	Mmn		mangite float and Concretionary manganese float abundantly present (<7cm)
1569	663605	8479198	float	Mmn		mangite float and Concretionary manganese float abundantly present (<7cm)
1570	663701	8479195	float	Sst/Mmn		Sandstone, mangite float above
1604	663205	8479409	outcrop	Sst/Mmn		Manganese clasts above sandstone
1572	663899	8479192	outcrop	Sst/Mmn		Manganese clasts above sandstone
1538	663905	8479002	outcrop	Sst/Mmn		Dalumbu sandstone, manganese float (<5cm) present
1535	663596	8478997	outcrop	Sst/Mmn		Dalumbu sandstone, manganese float (<5cm) present
1534 - 3	663543	8478997	outcrop	Mmn		Ravine exposes outcrop of massive mangite/Fe in concretionary laterite, manganese rich
1532	663302	8478999	float	Con Mn		Concretionary manganese float (<40cm)
1530	663702	8479001	float	Sand		Red Lateritic Soil
	662965	8478990	float	Con Mn		Concretionary manganese float (<50cm)
1528 S	662900	8478996	float	Con Mn		Concretionary manganese float (<25cm)
	662531	8477518	outcrop	Mmn		Outcrop of massive mangite present, siliceous 'clusters' present in parts. Further North (10m), outcrop exhibits concretionary manganese. float (<70cm) of massive mangite in concretionary laterite can also be observed
	661549	8476976	float	Mmn		Massive mangite/Fe in concretionary laterite float (<25cm)
	661543	8477027	float	Mmn		Massive mangite/Fe in concretionary laterite float (<35cm), mangite rich
	662588	8477362	float	Mmn		Concretionary manganese float (<80cm) with a manganese matrix. Silica rich.

Appendix 2 - Major element geochemistry for surface grab and rock chip samples

All samples were collected during mapping (where concentrations are reported below the detection limit, shown in red, they have been replaced by values calculated at DL/2)

	Unit	LOD	WMN009	WMN010	WMN011	WMN012	WMN013	WMN014	WMN017	WMN018	WMN019	WMN020	WMN021	WMN022	WMN023	WMN024	WMN025	WMN026	WMN027	WMN028	WMN029	WMN030	WMN031	WMN032	WMN033
SiO2	%	0.05	5.77	7.16	6.46	2.05	2.25	1.79	68.80	15.88	12.78	7.83	4.49	3.69	4.27	4.22	28.87	4.46	19.36	3.72	6.17	10.86	6.30	4.50	4.08
TiO2	%	0.01	0.14	0.09	0.18	0.07	0.11	0.12	0.07	1.08	0.07	0.16	0.16	0.06	0.14	0.19	0.29	0.11	0.16	0.13	0.20	0.21	0.16	0.25	0.22
Al2O3	%	0.01	6.09	6.70	6.32	2.05	3.52	2.94	2.40	10.30	2.29	5.07	4.57	1.55	2.67	3.48	7.93	4.19	3.96	2.14	4.34	5.08	4.19	5.50	3.25
Fe2O3	%	0.01	2.44	2.14	3.24	1.96	41.61	1.91	21.48	3.69	70.04	2.51	78.38	2.08	23.44	27.91	28.88	3.99	10.28	5.74	10.54	63.05	18.93	50.62	7.19
Cr2O3	%	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.03	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
BaO	%	0.01	0.78	0.46	0.51	0.13	0.33	0.22	0.02	1.65	0.02	0.75	0.01	0.03	0.60	0.48	0.30	0.45	0.40	0.71	0.99	0.09	0.44	0.82	1.12
MnO	%	0.01	67.87	65.48	64.96	74.97	38.00	73.79	1.51	47.64	0.84	64.25	0.58	70.79	51.42	47.20	23.71	67.94	48.94	66.67	59.88	8.28	51.35	26.58	63.50
MgO	%	0.01	0.08	0.04	0.07	0.06	0.01	0.01	0.23	0.75	1.05	0.01	0.01	0.01	0.03	0.01	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01
CaO	%	0.01	0.07	0.14	0.07	0.07	0.02	0.07	0.03	0.29	0.44	0.07	0.01	0.09	0.08	0.05	0.07	0.11	0.06	0.06	0.08	0.01	0.03	0.05	0.06
Na2O	%	0.01	0.24	0.20	0.24	0.12	0.05	0.18	0.16	0.67	0.20	0.13	0.01	0.20	0.08	0.10	0.10	0.07	0.07	0.13	0.07	0.03	0.11	0.10	0.12
K2O	%	0.01	0.80	1.60	0.96	1.17	0.63	2.84	0.05	2.73	0.03	1.79	0.02	4.51	1.72	1.82	0.55	0.89	3.31	3.11	1.82	0.36	2.37	1.17	3.76
P2O5	%	0.01	0.16	0.09	0.15	0.16	0.64	0.16	0.47	0.03	0.53	0.09	0.94	0.04	0.31	0.28	0.29	0.10	0.27	0.16	0.17	0.75	0.36	0.58	0.19
SO3	%	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.08	0.08	0.09	0.01	0.05	0.01	0.02	0.03	0.02	0.01	0.01	0.01	0.01	0.06	0.07	0.03	0.01
LOI	%	0.01	12.95	12.66	12.96	12.46	12.47	10.39	4.19	12.74	10.58	12.82	9.79	11.37	12.56	11.62	8.53	11.69	10.17	12.01	11.81	10.26	12.15	9.14	11.43
Total	%	0.01	102.60	101.80	101.10	101.00	102.75	100.10	99.99	101.80	99.52	100.45	99.33	99.88	101.35	101.10	101.50	99.25	100.85	99.73	100.70	99.94	100.60	101.55	99.85

	Unit	LOD	WMN035	WMN036	WMN037	WMN038	WMN039	WMN040	WMN041	WMN042	WMN043	WMN044	WMN046	WMN047	WMN050	WMN051	WMN052	WMN053	WMN054	WMN055	WMN056	WMN057	WMN058
SiO2	%	0.05	7.17	4.25	5.68	9.03	6.45	11.06	8.05	50.55	2.23	34.17	3.87	6.41	23.53	3.32	3.51	5.44	7.96	13.46	14.90	3.36	17.22
TiO2	%	0.01	0.08	0.12	0.14	0.11	0.09	0.14	0.27	0.17	0.24	0.93	0.11	0.24	0.58	0.18	0.17	0.14	0.10	0.60	0.79	0.15	0.36
Al2O3	%	0.01	2.51	2.08	3.51	4.78	3.05	3.68	7.78	5.86	3.28	23.99	1.83	4.62	15.37	3.21	2.98	2.32	3.55	10.62	13.83	2.10	9.21
Fe2O3	%	0.01	70.76	21.83	76.46	2.39	5.03	37.36	11.88	4.03	3.85	28.09	15.48	32.07	24.99	14.37	36.85	9.90	5.02	63.17	61.88	11.65	61.06
Cr2O3	%	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.02	0.02	0.04	0.03	0.02	0.02	0.02	0.04	0.04	0.02	0.03
BaO	%	0.01	0.06	0.69	0.04	0.54	0.35	0.25	0.47	0.34	0.99	0.02	0.62	0.57	0.53	1.46	0.83	0.97	0.42	0.01	0.01	1.12	0.01
MnO	%	0.01	5.99	52.76	1.83	63.95	65.59	34.07	53.51	29.05	70.19	1.50	61.65	40.78	21.83	58.21	39.83	61.99	64.31	0.67	0.30	61.39	0.56
MgO	%	0.01	0.01	0.01	0.05	0.01	0.01	0.06	0.03	0.01	0.11	0.02	0.02	0.13	0.03	0.04	0.02	0.01	0.07	0.08	0.02	0.03	
CaO	%	0.01	0.02	0.07	0.03	0.09	0.07	0.04	0.07	0.04	0.06	0.03	0.07	0.05	0.04	0.08	0.07	0.06	0.04	0.01	0.01	0.03	0.07
Na2O	%	0.01	0.02	0.10	0.01	0.16	0.10	0.06	0.16	0.13	0.13	0.04	0.08	0.08	0.05	0.13	0.07	0.10	0.09	0.02	0.03	0.14	0.02
K2O	%	0.01	0.31	1.90	0.08	1.77	1.09	0.65	0.86	1.11	4.18	0.15	1.96	1.99	0.54	3.15	1.62	2.35	0.95	0.10	0.06	3.22	0.05
P2O5	%	0.01	1.52	0.22	0.96	0.09	0.11	0.54	0.20	0.07	0.18	0.07	0.16	0.24	0.25	0.50	0.51	0.27	0.09	0.36	0.19	0.60	0.41
SO3	%	0.01	0.05	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.01	0.03	0.01	0.01	0.04	0.02	0.03	0.02	0.01	0.12	0.08	0.03	0.03
LOI	%	0.01	10.81	12.30	10.20	11.68	12.20	10.92	12.85	7.32	11.56	10.82	12.37	11.97	12.13	12.52	11.80	12.24	12.45	9.78	6.86	12.02	10.03
Total	%	0.01	100.05	100.55	99.40	99.58	99.20	101.55	100.30	101.00	102.35	100.3	103	102.3	101.85	101.7	101.45	100.6	99.98	99.52	99.29	100.6	99.37

Appendix 2 cont. Minor element geochemistry for surface grab and rock chip samples collected during mapping (where concentrations are reported below the detection limit, shown in red, they have been replaced by values calculated at DL/2)

	Unit	LOD	WMN009	WMN010	WMN011	WMN012	WMN013	WMN014	WMN018	WMN020	WMN022	WMN023	WMN024	WMN026	WMN027	WMN028	WMN029	WMN031	WMN033
Ag	ppm	0.01	0.08	0.12	0.14	0.01	0.09	0.03	0.34	0.04	0.02	0.08	0.05	0.03	0.11	0.07	0.05	0.06	0.04
As	ppm	0.2	47.8	18.5	41.5	33.7	119	15.9	3.2	27.8	2.1	24.9	52.7	40.4	17.3	9.1	25.9	87.4	24.4
Ba	ppm	10	7550	4420	4770	1250	3070	2110	16500	6970	260	5720	4540	4240	3910	6340	9320	4240	9850
Be	ppm	0.05	2.17	6.06	2.8	13.2	14.75	11.9	5.27	8.51	2.48	2.75	2.17	10.8	2.35	1.38	2	32.5	12.75
Bi	ppm	0.01	0.39	0.11	0.34	0.31	0.32	0.12	0.06	0.24	0.12	0.19	0.17	0.2	0.12	0.15	0.16	0.23	0.24
Cd	ppm	0.02	1.61	1.62	0.57	0.94	2.09	1.11	3.82	1.38	1.54	0.63	0.77	1.48	0.49	1.17	1.01	3.3	3.56
Ce	ppm	0.01	500	500	493	57.6	99.8	137.5	154	231	58.8	180.5	184	206	95.1	70.7	89.2	56.8	112
Co	ppm	0.1	144.5	287	114.5	318	219	352	517	277	470	247	258	274	614	313	254	570	436
Cr	ppm	1	0.5	0.5	0.5	0.5	0.5	0.5	51	0.5	0.5	0.5	7	0.5	0.5	0.5	7	5	0.5
Cs	ppm	0.05	0.22	0.73	0.16	0.56	0.43	0.52	0.16	0.43	0.7	0.49	0.45	0.37	0.4	0.29	0.31	0.54	0.47
Cu	ppm	0.2	85	102	83.8	148	195	69	384	64.7	54.3	171.5	56.3	45.6	70.2	39.6	39.6	67.6	71.7
Ga	ppm	0.05	16.8	14.8	15.55	12.25	9.33	11.8	22.3	13.45	9.2	10.5	12.3	11.75	10.6	10	13.8	11	11.75
Ge	ppm	0.05	0.38	0.34	0.29	0.24	0.49	0.3	0.1	0.23	0.12	0.2	0.22	0.2	0.13	0.1	0.1	0.13	0.18
Hf	ppm	0.1	1	0.7	1.1	0.6	0.8	0.8	3.4	1	0.5	0.8	1	0.7	1.3	0.8	1.2	1.9	1.3
In	ppm	0.005	0.017	0.016	0.025	0.01	0.016	0.013	0.075	0.224	0.006	0.087	0.248	0.065	0.02	0.088	0.144	0.083	0.088
La	ppm	0.5	109	108.5	90.8	30.9	26.6	45.5	25.5	45.8	17.6	28	57.6	47.3	17.1	20.1	22.9	19	54.3
Li	ppm	0.2	1.8	5.3	2.1	4.1	2	6.7	13.6	6	10.3	8.1	7.6	1.9	13	9.6	8.6	5.7	5.3
Mn	ppm	5	525653	507143	503115	580643	294310	571504	368972	497616	548269	398248	365564	526195	379040	516359	463771	397706	491807
Mo	ppm	0.05	19.1	1.76	34.8	21.6	63.7	5.57	2.1	4.8	0.36	4.78	6.84	7.17	1.95	1.12	3.36	12.4	3.19
Nb	ppm	0.1	1.7	1.1	1.9	0.9	1.4	1.1	8.1	1.7	0.7	1.6	1.8	1.2	1.8	1.4	2	1.8	2.1
Ni	ppm	0.2	59.9	69.1	87.2	112.5	188.5	69.5	51.1	29.4	103.5	66.5	29.6	81.3	167	37	58.1	117	33.2
P	ppm	10	670	380	640	680	2640	680	120	390	160	1260	1170	410	1160	650	720	1580	780
Pb	ppm	0.5	55.7	17.9	46.9	29.2	64	12.2	2160	51.9	26.5	41.4	75	31	20.2	78.4	264	61.8	104.5
Rb	ppm	0.1	10.6	25.4	10	24.9	13	45.7	29.4	29.2	91.4	27.8	28.5	19.7	55.6	42.7	26.9	44.5	53.2
Re	ppm	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
S	ppm	100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
Sb	ppm	0.05	2.76	3.29	3.07	2.5	2.59	0.82	0.22	0.34	0.15	0.68	0.78	2.25	0.66	0.42	0.53	2.06	0.55
Sc	ppm	0.1	28.2	33.6	27.4	5.4	28.2	8.6	24.1	14	2	28.7	33.1	10.1	16.4	7.6	11.1	24.2	8.9
Se	ppm	1	0.5	0.5	1	1	1	0.5	1	1	0.5	0.5	1	1	0.5	0.5	0.5	1	0.5
Sn	ppm	0.2	0.5	0.3	0.5	0.3	0.3	0.3	1.6	0.5	0.2	0.4	0.4	0.3	0.5	0.4	0.6	0.4	0.5
Sr	ppm	0.2	348	406	368	148.5	156	180	155.5	218	202	116.5	119	236	125.5	107	172.5	175	190.5
Ta	ppm	0.05	0.1	0.07	0.11	0.05	0.08	0.08	0.56	0.1	0.025	0.09	0.12	0.07	0.12	0.08	0.13	0.11	0.14
Te	ppm	0.05	0.77	0.34	0.63	0.53	0.57	0.19	0.025	0.38	0.22	0.35	0.39	0.3	0.18	0.22	0.26	0.34	0.31
Th	ppm	0.01	2.4	1.52	2.31	1.02	1.72	1.22	9.13	2.5	0.8	1.99	3.33	1.66	2.71	1.87	3.07	4.03	3.24
Tl	ppm	0.02	2.9	2.01	4.12	0.14	4.19	0.53	62.7	13.65	0.77	14.15	19.95	5.37	5.16	18.15	27.2	37	11.25
U	ppm	0.1	1.7	1.5	1.4	1.5	2.6	1.4	1.7	1.4	0.7	2.4	1.3	1.7	2.1	0.8	0.7	1.4	0.7
V	ppm	1	205	209	212	138	455	130	303	417	106	279	478	323	149	204	233	320	160
W	ppm	0.1	12.7	3	8.6	9.9	7.7	1.6	1.1	0.8	0.3	0.8	0.7	0.9	0.6	0.5	0.8	3.6	1.3
Y	ppm	0.1	36.7	52	32.1	98.9	67.1	88.3	10.2	72.8	55.6	15.6	12.2	47.6	17	8.3	10.5	27.8	13.2
Zn	ppm	2	64	283	114	453	732	550	289	433	340	317	257	480	473	402	301	891	369
Zr	ppm	0.5	36.3	21.5	42.5	20.6	29.5	22.6	120.5	34.4	15.3	30.8	37.2	25.9	41.9	27.6	43.3	66.6	47

Appendix 2 cont. Minor element geochemistry for surface grab and rock chip samples collected during mapping (where concentrations are reported below the detection limit, shown in red, they have been replaced by values calculated at DL/2)

	Unit	LOD	WMN034	WMN036	WMN038	WMN039	WMN040	WMN041	WMN043	WMN046	WMN047	WMN051	WMN052	WMN053	WMN054	WMN057
Ag	ppm	0.01	0.06	0.05	0.09	0.03	0.04	0.08	0.02	0.04	0.08	0.12	0.05	0.1	0.04	0.07
As	ppm	0.2	34.8	15.4	25.7	25	90	45	12.6	9.4	52.6	45.6	57.5	9.7	28.9	28.7
Ba	ppm	10	6240	6640	5220	3450	2380	4490	9340	5610	5270	13072	7680	8990	4090	10028
Be	ppm	0.05	4.95	1.71	10.05	7.07	4.43	3.25	18.7	1.36	1.62	2.62	2.76	2.36	6.61	2.53
Bi	ppm	0.01	0.24	0.19	0.22	0.17	0.26	0.4	0.14	0.19	0.23	0.15	0.12	0.19	0.17	0.13
Cd	ppm	0.02	2	0.97	1.65	1.15	0.62	0.62	8.32	1.24	0.95	1.04	0.26	0.81	1.1	1.43
Ce	ppm	0.01	65.5	102.5	179	200	100.5	297	90.7	106	154	133.5	186	247	197	169
Co	ppm	0.1	408	263	363	271	158	166.5	575	272	221	300	221	282	292	318
Cr	ppm	1	0.5	0.5	0.5	0.5	9	4	3	2	56	16	29	0.5	0.5	0.5
Cs	ppm	0.05	0.98	0.25	0.45	0.42	0.33	0.38	0.61	0.24	0.39	0.73	0.37	0.58	0.37	0.92
Cu	ppm	0.2	127	77.9	51.6	47.8	45.2	84.9	110.5	63.8	57.9	91.4	60.9	135.5	33.4	109
Ga	ppm	0.05	21.5	9.78	12.35	11.3	9.48	15.5	59.2	35	29.2	43.4	29.5	47.1	50.3	48.3
Ge	ppm	0.05	0.025	0.06	0.08	0.12	0.27	0.16	0.025	0.025	0.025	0.025	0.06	0.025	0.025	0.025
Hf	ppm	0.1	3	0.6	0.9	0.7	0.8	1.5	1.3	0.6	1.1	0.9	0.9	0.8	0.8	0.8
In	ppm	0.005	0.125	0.179	0.143	0.061	0.088	0.049	0.083	0.131	0.199	0.186	0.293	0.05	0.077	0.08
La	ppm	0.5	13.7	21.3	25.2	31.4	21.3	88.8	9.9	22.2	25.9	21.8	51.5	68.1	32.5	65.9
Li	ppm	0.2	12	4.8	8.3	4.5	3.3	5.5	5.1	3.8	5.3	8.5	7.8	4.3	2.5	5.6
Mn	ppm	5	421870	408626	495293	507995	263872	414435	543622	477479	315841	450836	308483	480113	498081	475466
Mo	ppm	0.05	6.96	1.57	6.65	5.77	20.5	24.6	4.65	1.21	2.02	3.68	5.01	0.99	5.26	4.45
Nb	ppm	0.1	5.8	1.4	1.4	1.2	1.6	2.9	2.1	1.1	2.2	1.6	1.6	1.5	1.1	1.2
Ni	ppm	0.2	26.2	117	58.8	79.6	197.5	78.8	39.5	82.5	74.7	19.2	45.6	38.6	71.5	24.6
P	ppm	10	600	960	390	480	2380	910	750	650	1010	2170	2140	1180	400	2620
Pb	ppm	0.5	51.3	60.7	227	32.2	67.5	59.9	13.6	47	70.9	70.4	72.2	62.1	69	68.3
Rb	ppm	0.1	49.4	28.4	30.7	19.4	11.9	15.9	61.1	26.3	22.5	46.1	21.8	35.7	16.1	49.4
Re	ppm	0.002	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001
S	ppm	100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
Sb	ppm	0.05	0.56	1.01	0.5	0.8	3.56	2.94	0.36	0.75	1.34	0.61	0.71	0.23	1.73	0.54
Sc	ppm	0.1	17	31	7.1	8.8	17.9	25.2	9.3	24.4	29.3	25.5	20.3	13.7	9.3	19.1
Se	ppm	1	1	0.5	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5
Sn	ppm	0.2	1.4	0.3	0.3	0.3	0.4	0.7	0.8	0.4	0.6	0.5	0.5	0.4	0.4	0.4
Sr	ppm	0.2	148.5	139	340	217	131	223	209	125	115	182	189.5	172	137.5	251
Ta	ppm	0.05	0.4	0.09	0.1	0.08	0.13	0.2	0.11	0.08	0.16	0.12	0.12	0.1	0.09	0.1
Te	ppm	0.05	0.17	0.38	0.37	0.3	0.52	0.69	0.12	0.3	0.39	0.29	0.23	0.33	0.21	0.22
Th	ppm	0.01	6.61	1.71	2.96	1.66	2.28	4.27	3.4	1.35	3.1	3.26	3.92	1.88	2.07	2.07
Tl	ppm	0.02	17.6	18.55	10.3	4.7	4.32	3.01	3.5	13.35	23.8	31.2	21.3	11.85	4.46	18.9
U	ppm	0.1	1.4	1.3	1.2	1.6	1.7	2	0.8	1.2	2	1.9	2.8	1.9	1	1.8
V	ppm	1	212	282	273	250	305	306	124	238	441	316	410	272	266	200
W	ppm	0.1	1.2	0.5	0.9	1.1	7.3	13.1	0.7	0.5	0.8	0.7	0.7	0.6	1.6	0.5
Y	ppm	0.1	12.6	10.6	80.9	96.8	53.6	32.1	17.4	9.8	7.9	10.7	18.2	22	94.9	18.9
Zn	ppm	2	279	405	697	571	438	185	505	376	262	181	204	228	494	222
Zr	ppm	0.5	112.5	27.7	29.9	24	32.1	61.3	41.5	22.8	44.7	32.5	29.1	31	25	26.7

Appendix 3 – Drill hole coordinates and depths, Phase 1 and Phase 2 Programs

Hole ID	Easting	Northing	Z	Depth	Az	Dip
WM001	663597.735	8481602.002	33.815	18.5	0	-90
WM002	663997.101	8481600.527	28.265	9.5	0	-90
WM003	664396.475	8481564.185	37.794	20.0	0	-90
WM004	664796.881	8481600.119	42.712	18.0	0	-90
WM005	662800.010	8481199.575	25.561	4.5	0	-90
WM006	663199.870	8481199.062	27.385	18.0	0	-90
WM007	663598.794	8481200.971	28.978	18.0	0	-90
WM008	664000.510	8481199.551	31.509	18.0	0	-90
WM009	664398.025	8481196.924	39.770	18.5	0	-90
WM010	664798.398	8481201.600	40.383	16.0	0	-90
WM011	662597.542	8480799.987	22.871	4.0	0	-90
WM012	662797.879	8480799.780	24.039	5.5	0	-90
WM013	663198.104	8480800.842	20.634	17.5	0	-90
WM014	663598.859	8480800.859	23.336	16.5	0	-90
WM015	664000.250	8480798.879	28.316	22.5	0	-90
WM016	664398.068	8480801.359	36.550	28.0	0	-90
WM017	664797.320	8480798.479	33.980	16.5	0	-90
WM018	661427.166	8480399.196	18.023	28.0	0	-90
WM019	661599.715	8480400.237	18.752	12.0	0	-90
WM020	662001.902	8480398.564	19.049	12.0	0	-90
WM021	662390.723	8480397.641	16.912	12.0	0	-90
WM022	662797.381	8480396.452	18.510	10.5	0	-90
WM023	663199.165	8480400.065	17.853	11.0	0	-90
WM024	663600.933	8480398.936	24.384	24.0	0	-90
WM025	663999.425	8480399.941	29.528	25.0	0	-90
WM026	664401.521	8480401.633	28.951	8.5	0	-90
WM027	661362.364	8480003.005	13.479	12.0	0	-90
WM028	661597.785	8479998.641	11.832	8.0	0	-90
WM029	661997.415	8480001.127	10.757	6.0	0	-90
WM030	662399.394	8479998.729	11.739	8.5	0	-90
WM031	662899.444	8479999.982	14.657	19.5	0	-90
WM032	663200.755	8479998.709	18.418	12.0	0	-90
WM033	663600.435	8479995.294	24.497	10.0	0	-90
WM034	660898.482	8479601.317	7.930	15.5	0	-90
WM035	661202.655	8479600.375	6.976	10.0	0	-90
WM036	661603.684	8479596.608	5.647	12.0	0	-90
WM037	661896.049	8479597.705	5.516	18.0	0	-90
WM038	662399.188	8479599.275	9.280	24.0	0	-90
WM039	662799.639	8479600.275	14.509	8.5	0	-90
WM040	663200.027	8479599.542	21.233	5.5	0	-90
WM041	663598.944	8479599.203	25.627	2.0	0	-90
WM042	660800.030	8479205.818	3.509	24.0	0	-90
WM043	660999.977	8479201.300	1.833	12.0	0	-90
WM044	661398.608	8479200.660	2.350	12.0	0	-90
WM045	661998.053	8479199.296	5.420	11.0	0	-90

Hole ID	Easting	Northing	Z	Depth	Az	Dip
WM047	662796.441	8479199.513	16.356	10.0	0	-90
WM048	663196.607	8479199.272	22.029	6.5	0	-90
WM050	661599.547	8478800.961	2.844	20.0	0	-90
WM051	661998.533	8478801.390	6.437	10.0	0	-90
WM052	662400.028	8478798.534	12.459	10.0	0	-90
WM053	662797.172	8478796.673	19.031	10.0	0	-90
WM054	663199.221	8478799.577	21.860	8.0	0	-90
WM055	661397.921	8478401.375	3.015	10.0	0	-90
WM056	661597.752	8478399.212	5.817	10.0	0	-90
WM057	661999.966	8478401.790	7.339	10.0	0	-90
WM058	662398.730	8478400.728	11.793	48.5	0	-90
WM059	662807.382	8478398.900	17.164	20.0	0	-90
WM060	663199.719	8478398.932	22.234	10.0	0	-90
WM061	663599.791	8478400.910	20.499	15.0	0	-90
WM062	664002.848	8478401.947	19.735	6.5	0	-90
WM066	661598.240	8477998.270	6.356	6.0	0	-90
WM067	661997.389	8478001.850	9.613	7.5	0	-90
WM068	662398.897	8478001.341	14.178	10.0	0	-90
WM069	662798.931	8477998.430	15.431	10.0	0	-90
WM070	663198.864	8478002.009	16.924	10.0	0	-90
WM071	663599.070	8477998.354	14.470	10.0	0	-90
WM072	663998.444	8478000.038	12.881	18.5	0	-90
WM073	664396.853	8477997.705	8.654	10.0	0	-90
WM074	664787.733	8477998.828	5.094	10.0	0	-90
WM075	661599.215	8477600.016	9.092	21.5	0	-90
WM076	661999.980	8477601.990	12.752	12.0	0	-90
WM077	662400.036	8477598.965	14.875	20.0	0	-90
WM078	662798.061	8477599.411	15.497	10.0	0	-90
WM079	663197.859	8477599.464	14.482	6.5	0	-90
WM080	663597.564	8477597.946	13.487	11.0	0	-90
WM081	663990.486	8477599.349	10.566	12.5	0	-90
WM082	664397.969	8477598.365	5.340	82.0	0	-90
WM083	664691.466	8477599.143	3.655	23.0	0	-90
WM084	661701.929	8477199.511	14.817	15.5	0	-90
WM085	662001.933	8477200.828	14.429	12.0	0	-90
WM086	662394.890	8477196.115	12.123	7.0	0	-90
WM087	662805.584	8477198.996	10.310	29.0	0	-90
WM088	663197.075	8477202.044	12.071	60.0	0	-90
WM089	663619.352	8477199.382	14.071	23.5	0	-90
WM090	663999.083	8477200.773	11.887	40.0	0	-90
WM091	664400.185	8477199.353	7.636	30.0	0	-90
WM092	661699.431	8476798.139	11.167	57.0	0	-90
WM093	661999.426	8476799.498	13.443	88.0	0	-90
WM094	662403.069	8476797.705	6.977	70.0	0	-90
WM095	662799.706	8476800.267	5.585	64.5	0	-90
WM096	663200.145	8476797.469	12.524	17.5	0	-90
WM097	663605.175	8476798.386	14.336	16.0	0	-90

Hole ID	Easting	Northing	Z	Depth	Az	Dip
WM099	664401.387	8476800.863	6.607	24.0	0	-90
WM101	662400.031	8476399.593	2.890	22.0	0	-90
WM102	662803.152	8476402.127	3.010	30.0	0	-90
WM103	663203.825	8476400.150	7.855	30.0	0	-90
WM104	663596.326	8476400.351	7.818	30.0	0	-90
WM105A	663992.804	8476401.461	7.233	18.0	0	-90
WM105	664000.000	8476400.000	7.000	30.0	0	-90
WM106	663199.393	8476099.504	3.891	18.0	0	-90
WM107	663598.114	8476203.964	5.123	29.5	0	-90
WM108	663999.647	8476199.322	4.528	20.0	0	-90
WM109	663001.432	8479402.321	18.483	6.5	0	-90
WM110	663201.019	8479401.303	21.978	1.5	0	-90
WM111	663400.023	8479403.346	25.785	1.5	0	-90
WM112	662601.147	8479601.118	11.832	17.0	0	-90
WM113	662999.337	8479599.295	17.226	3.0	0	-90
WM114	663398.466	8479599.869	23.504	3.5	0	-90
WM115	662798.672	8479798.886	13.958	11.0	0	-90
WM116	663199.863	8479802.208	19.373	12.0	0	-90
WM117	663399.652	8479802.367	22.155	6.0	0	-90
WM118	662998.247	8479799.841	17.226	6.5	0	-90
WM119	662393.959	8479798.901	9.354	12.0	0	-90
WM121	662650.284	8479799.758	11.503	10.0	0	-90
WM122	662461.717	8479400.991	10.694	18.0	0	-90
WM123	662600.203	8479404.184	12.415	18.0	0	-90
WM124	662800.289	8479400.411	15.196	14.0	0	-90
WM125	662602.439	8479199.812	13.209	10.0	0	-90
WM126	662998.546	8479202.856	18.465	10.0	0	-90
WM127	663397.005	8479199.011	25.697	4.0	0	-90
WM128	662398.745	8478999.841	12.239	18.0	0	-90
WM129	662598.011	8479001.178	15.209	12.0	0	-90
WM130	662794.898	8479003.316	19.582	10.5	0	-90
WM131	662998.207	8479001.333	19.482	13.0	0	-90
WM132	663197.778	8479001.831	22.094	10.5	0	-90
WM133	663398.164	8478999.594	24.657	4.5	0	-90
WM134	662597.955	8478802.164	14.909	12.0	0	-90
WM135	662991.591	8478798.105	20.817	10.0	0	-90
WM136	663398.642	8478798.867	23.730	2.0	0	-90
WM137	661998.449	8477399.256	14.696	10.0	0	-90
WM138	662199.746	8477402.843	14.725	10.0	0	-90
WM139	662399.966	8477398.403	14.452	6.0	0	-90
WM140	662598.758	8477397.152	13.859	4.5	0	-90
WM141	662796.847	8477400.060	13.673	10.0	0	-90
WM142	662990.518	8477398.939	13.010	10.0	0	-90
WM143	662207.676	8477598.856	13.905	3.0	0	-90
WM144	662597.637	8477598.939	15.380	8.5	0	-90
WM145	662998.842	8477598.282	15.867	10.0	0	-90
WM146	661799.597	8478000.618	8.521	10.0	0	-90

Hole ID	Easting	Northing	Z	Depth	Az	Dip
WM148	662999.617	8477999.702	17.424	36.5	0	-90
WM150	661796.311	8477797.561	8.972	10.0	0	-90
WM151	662000.597	8477799.970	10.042	11.0	0	-90
WM152	662200.286	8477800.207	11.309	10.0	0	-90
WM153A	662401.780	8477798.906	14.517	6.5	0	-90
WM153	662400.000	8477800.000	14.500	30.0	0	-90
WM154	662599.610	8477795.768	14.797	10.0	0	-90
WM155	662797.790	8477799.374	14.523	10.0	0	-90
WM156	662997.820	8477798.218	16.219	10.0	0	-90
WM157	663198.007	8477798.681	16.356	10.0	0	-90
WM158	661789.239	8477601.344	11.019	10.0	0	-90
WM159	661700.672	8477397.659	13.080	10.0	0	-90
WM160	661808.695	8477402.621	13.737	10.0	0	-90
WM161	663196.411	8477399.487	13.046	10.0	0	-90
WM163	662208.099	8477196.108	13.419	9.0	0	-90
WM164	662599.525	8477199.365	10.616	10.0	0	-90
WM165	662999.641	8477199.522	10.914	10.0	0	-90
WM166	662197.166	8477998.842	11.578	10.0	0	-90
WM167	661797.455	8480399.992	20.184	7.5	0	-90
WM168	662194.621	8480395.921	17.378	18.0	0	-90
WM169	662598.721	8480398.071	16.972	6.0	0	-90
WM170	662998.825	8480398.188	17.265	12.0	0	-90
WM171	661206.080	8480201.065	16.096	10.0	0	-90
WM172	661398.520	8480200.761	15.860	12.0	0	-90
WM173	661596.066	8480198.763	15.552	15.0	0	-90
WM174	661797.700	8480200.935	14.859	12.0	0	-90
WM175	661998.356	8480200.858	15.208	12.0	0	-90
WM176	662197.743	8480199.587	14.251	15.0	0	-90
WM177	662398.945	8480197.151	14.182	12.0	0	-90
WM178	662602.261	8480204.645	14.918	14.5	0	-90
WM179	662800.933	8480199.891	15.356	13.5	0	-90
WM180	661799.246	8480000.885	10.817	8.0	0	-90
WM181	662196.542	8480003.276	10.933	10.0	0	-90
WM182	662601.673	8480000.575	13.241	10.0	0	-90
WM183	662999.240	8479999.034	15.986	18.0	0	-90
WM184	663397.362	8480000.269	22.313	15.0	0	-90
WM185	663799.391	8479998.765	24.670	13.0	0	-90
WM186	660996.511	8479598.041	8.184	10.0	0	-90
WM187	661399.099	8479601.563	6.554	10.0	0	-90
WM188	661801.672	8479595.912	5.380	10.0	0	-90
WM189	660798.825	8479401.015	6.151	15.0	0	-90
WM190	660998.609	8479401.914	5.147	10.0	0	-90
WM191	661198.393	8479397.569	3.862	7.5	0	-90
WM192	661404.755	8479402.422	3.797	7.0	0	-90
WM193	661597.801	8479398.341	3.952	12.5	0	-90
WM194	661998.542	8479398.432	5.622	10.0	0	-90
WM195	662198.045	8479397.792	8.299	10.0	0	-90

Hole ID	Easting	Northing	Z	Depth	Az	Dip
WM197	662198.958	8479200.722	7.643	10.0	0	-90
WM198	661797.761	8478998.178	3.843	10.0	0	-90
WM199	661996.853	8479000.053	5.834	10.0	0	-90
WM200	662199.164	8478999.735	8.939	10.0	0	-90
WM201	661797.730	8478797.157	4.518	10.0	0	-90
WM202	662196.636	8478798.668	9.567	10.0	0	-90
WM203	661598.715	8478600.247	4.277	10.0	0	-90
WM204	661798.636	8478603.616	5.379	10.0	0	-90
WM205	661999.044	8478599.257	7.432	10.0	0	-90
WM206	662199.768	8478600.973	9.270	10.0	0	-90
WM207	662398.375	8478599.559	11.333	10.0	0	-90
WM208	662593.649	8478601.041	14.119	10.0	0	-90
WM209	662799.796	8478599.829	17.467	10.0	0	-90
WM210	662998.208	8478601.257	21.848	10.0	0	-90
WM211	663199.923	8478599.421	23.330	10.0	0	-90
WM212	663398.373	8478597.683	23.144	10.0	0	-90
WM213	663598.071	8478597.071	24.126	6.0	0	-90
WM214	661798.597	8478397.478	6.446	10.0	0	-90
WM215	662198.729	8478397.810	9.530	10.0	0	-90
WM216	662597.949	8478397.175	14.053	10.0	0	-90
WM217	662998.206	8478398.694	20.881	10.0	0	-90
WM218	663397.450	8478399.164	20.532	10.0	0	-90
WM219	664999.020	8478198.058	5.410	12.0	0	-90
WM220	664798.369	8478196.391	7.898	12.0	0	-90
WM221	664599.794	8478198.323	8.908	14.5	0	-90
WM222	664399.012	8478199.426	11.399	11.0	0	-90
WM223	664200.021	8478197.756	14.100	8.5	0	-90
WM224	663998.107	8478196.351	16.340	13.0	0	-90
WM225	663799.973	8478201.155	17.531	15.5	0	-90
WM226	663599.751	8478199.716	16.355	8.0	0	-90
WM227	663399.267	8478199.351	17.565	7.5	0	-90
WM228	663197.151	8478200.933	18.890	10.0	0	-90
WM229	662999.426	8478197.940	18.417	13.0	0	-90
WM230	662799.087	8478199.743	16.570	6.0	0	-90
WM231	662598.873	8478198.727	14.115	6.0	0	-90
WM232	662397.809	8478199.412	12.512	6.0	0	-90
WM233	662199.206	8478200.829	10.462	8.5	0	-90
WM234	661999.092	8478199.294	8.529	7.5	0	-90
WM235	661797.752	8478199.958	6.921	54.5	0	-90
WM236	661600.440	8478200.866	6.207	10.0	0	-90
WM237	663399.037	8477997.675	15.730	10.0	0	-90
WM238	663799.208	8477997.013	13.562	18.0	0	-90
WM239	664199.209	8477999.306	10.684	18.0	0	-90
WM240	664598.476	8477999.299	6.047	18.0	0	-90
WM241	663402.545	8477800.708	15.074	9.0	0	-90
WM242	663605.226	8477796.040	13.845	10.0	0	-90
WM243	663800.078	8477803.360	12.473	10.0	0	-90

Hole ID	Easting	Northing	Z	Depth	Az	Dip
WM245	664203.051	8477798.640	8.660	10.0	0	-90
WM246	664399.913	8477800.144	6.205	10.0	0	-90
WM247	664599.854	8477800.385	4.396	10.0	0	-90
WM248	663396.163	8477599.020	13.808	10.0	0	-90
WM249	663799.124	8477598.407	12.539	10.0	0	-90
WM250	664199.540	8477597.862	7.565	10.0	0	-90
WM251	664598.633	8477596.110	3.746	12.0	0	-90
WM252	663398.196	8477398.295	13.687	10.0	0	-90
WM253	663595.475	8477398.757	13.934	10.0	0	-90
WM254	663795.467	8477396.371	12.931	10.0	0	-90
WM255	663996.839	8477394.855	11.098	10.0	0	-90
WM256	664197.162	8477397.070	8.305	7.5	0	-90
WM257	664397.599	8477399.110	5.821	10.0	0	-90
WM258	664595.451	8477396.852	3.410	10.0	0	-90
WM259	663399.044	8477197.842	14.275	10.0	0	-90
WM260	663804.543	8477198.133	13.357	10.0	0	-90
WM261	664201.118	8477198.327	9.655	10.0	0	-90
WM262	662999.753	8477000.379	9.140	10.0	0	-90
WM263	663198.472	8476998.411	12.781	10.0	0	-90
WM264	663399.021	8476996.859	14.940	10.0	0	-90
WM265	663598.810	8476999.998	15.108	10.0	0	-90
WM266	663799.424	8476997.741	13.672	10.0	0	-90
WM267	663999.410	8476999.449	11.903	10.0	0	-90
WM268	664199.316	8476999.080	9.572	10.0	0	-90
WM269	664398.228	8476997.488	7.311	10.0	0	-90
WM270	661997.996	8476599.468	12.596	18.0	0	-90
WM271	662200.035	8476601.026	7.471	10.0	0	-90
WM272	662399.750	8476597.872	4.806	10.0	0	-90
WM273	662601.735	8476597.650	4.157	10.0	0	-90
WM274	662795.940	8476600.104	4.018	10.0	0	-90
WM275	662997.507	8476599.303	5.396	10.0	0	-90
WM276	663198.448	8476598.586	10.406	10.0	0	-90
WM277	663398.057	8476598.959	11.690	10.0	0	-90
WM278	663598.396	8476599.319	11.549	10.0	0	-90
WM279	663799.841	8476598.928	10.421	10.0	0	-90
WM280	662599.421	8476399.549	2.789	10.0	0	-90
WM281	662999.173	8476398.979	6.080	10.0	0	-90
WM282	663398.794	8476398.863	7.978	10.0	0	-90
WM283	663797.484	8476400.084	7.515	10.0	0	-90
WM284	662996.842	8476198.796	4.748	7.5	0	-90
WM285	663198.775	8476197.671	5.174	10.0	0	-90
WM286	663401.566	8476200.651	4.521	10.0	0	-90
WM287	663798.246	8476199.276	4.669	10.0	0	-90
WM288	664199.885	8476195.894	3.544	10.0	0	-90