# ANNUAL REPORT

# FOR

E63/0952, over the period 5th October 2008 to 4th October 2009

&

E63/0953 - 955, over the period 1st November 2008 to 31st October 2009

(Group Report # C122/2009)

&

**E63/0956 & 957, over the period 1st November 2008 to 31st October 2009**

**(Group Report # C171/2005)**

# TO THE

# DEPARTMENT OF INDUSTRY AND RESOURCES

**Compiled By:** **Exploration Department**

**Date:** **5th February 2010**

**Copies:** **Norseman Gold (1)**
**Department of Mines & Petroleum (1)**

## SUMMARY

This report details exploration conducted over E63/952, 953, 954, 956 & 957 (The tenements). E63/956 & 957 are constituents of Group Report C171/2005 and E63/0953, 954 & 955 are constituents of Group Report C122/2009.

During the report periods a desktop study was completed, a site visit was undertaken, a aeromagnetic interpretation was done and 2 heritage surveys completed.

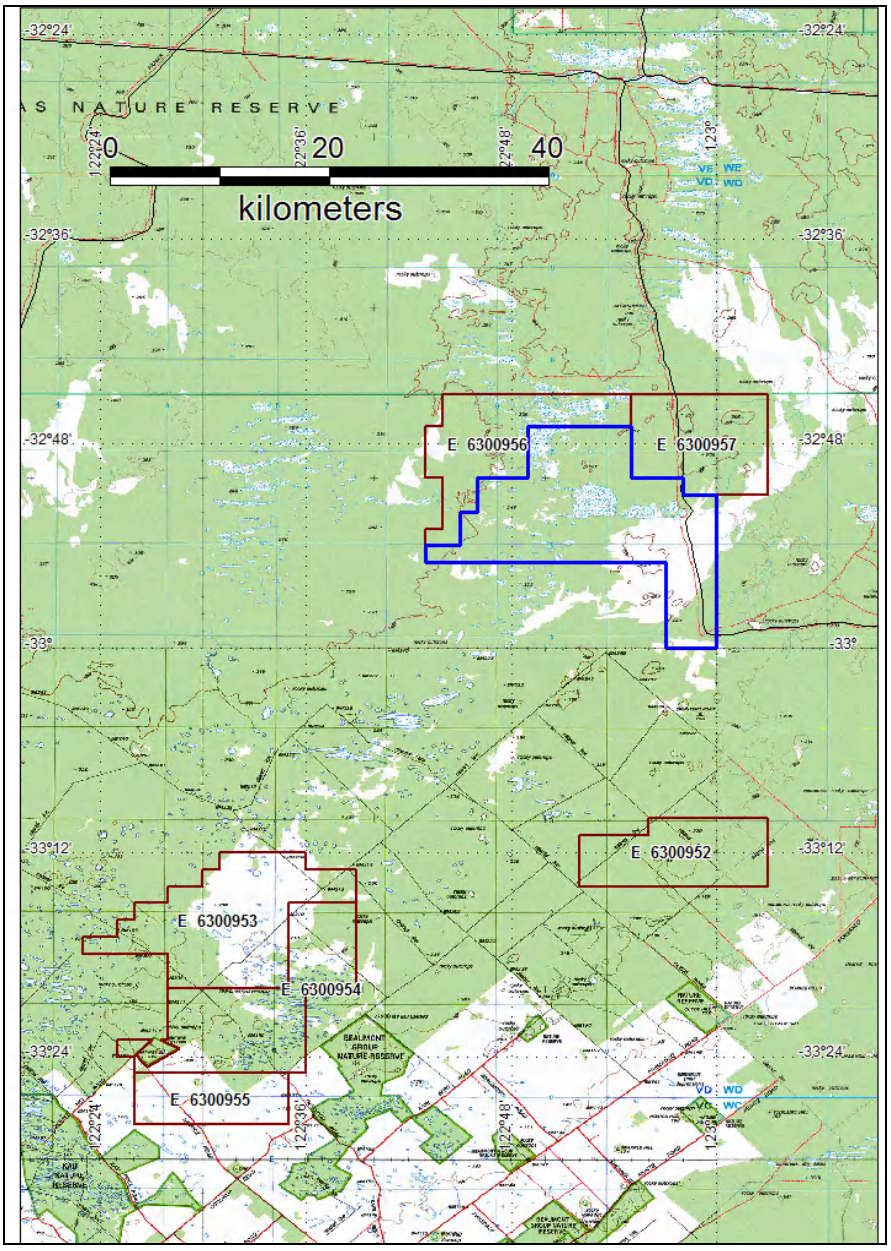


Figure 1: Exploration Index Map
(Projection Longitude / Latitude (NAD 83)

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# 1. INTRODUCTION

This report details exploration conducted over E63/952, 953, 954, 956 & 957 (The tenements). E63/956 & 957 are constituents of Group Report C171/2005 and E63/0953, 954 & 955 are constituents of Group Report C122/2009.

Report period for each tenement is listed in Table 1

| Tenement | Report Period From | Report Period To |
|---|---|---|
| E63/0952 | 05-Oct-08 | 04-Oct-09 |
| E63/0953 | 01-Nov-08 | 31-Oct-09 |
| E63/0954 | 01-Nov-08 | 31-Oct-09 |
| E63/0955 | 01-Nov-08 | 31-Oct-09 |
| E63/0956 | 01-Nov-08 | 31-Oct-09 |
| E63/0957 | 01-Nov-08 | 31-Oct-09 |

Table 1, Tenement report periods.

The tenements are centred approximately 130km southeast of the township of Norseman and are accessed via dirt roads and tracks (Figure 2).

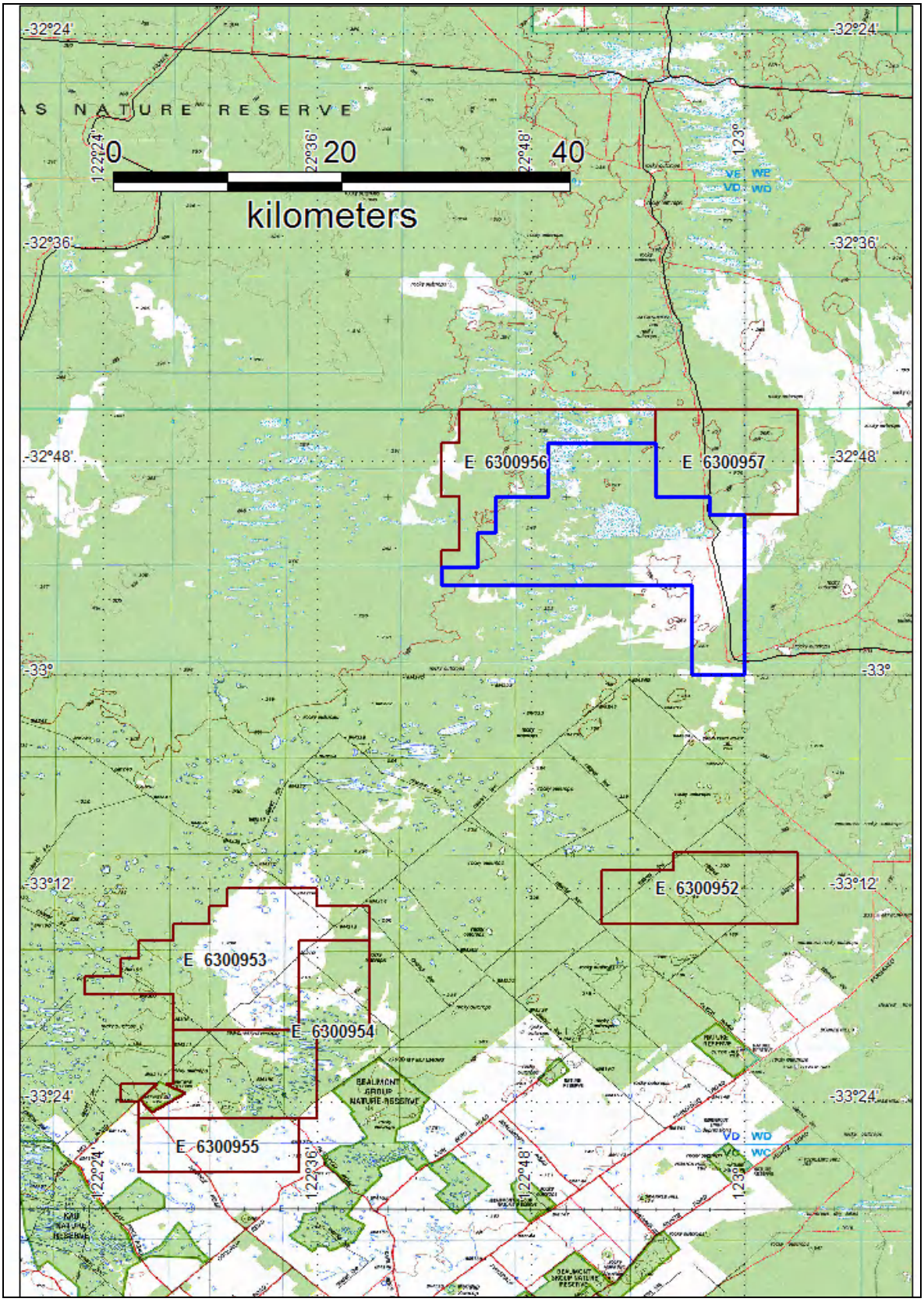


Figure 2, Tenement locations and access.

(Projection Longitude / Latitude (NAD 83)

## 2. TENURE

The tenements are held in the name of Ambassador Resources Ltd, which is a wholly owned subsidiary of Norseman Gold Plc. Table 2 lists for each tenement the area, grant date, rent and the minimum expenditure commitment.

Table 2, Tenement Schedule

| Tenement | Area | Area Unit | Grant Date | Rent | Expenditure Commitment |
|---|---|---|---|---|---|
| E63/0952 | 40 | Sub block | 05-Oct-05 | $7,084.00 | $40,000.00 |
| E63/0953 | 70 | Sub block | 08-Feb-07 | $7,969.50 | $70,000.00 |
| E63/0954 | 65 | Sub block | 08-Feb-07 | $7,400.25 | $65,000.00 |
| E63/0955 | 27 | Sub block | 08-Feb-07 | $3,073.95 | $27,000.00 |
| E63/0956 | 47 | Sub block | 05-Oct-05 | $8,323.70 | $47,000.00 |
| E63/0957 | 45 | Sub block | 05-Oct-05 | $7,969.50 | $45,000.00 |

## 3. EXPLORATION HISTORY

### 3.1 1996, Pecan Resources

Loam samples to the south of Fraser Range were found to contain gahnites in 30% of the samples collected. There has also been significant mineral sands, bauxite, and coal exploration in the general area.

### 3.2 1998, Pan Australian E63 / 453

Pan Australian exploration tested the southern extension of the Archaean Yilgarn Craton into the formerly interpreted Albany-Fraser Province.

World Geoscience completed an aeromagnetic survey over the area on 400m spaced E-W orientated lines at a flight height of 60m. 45 magnetic target areas were identified.

Local rock types include Meso-Proterozoic Coramup Gneiss, in faulted contact with Palaeo-Proterozoic Dalyup complex. Both units consist of para and orthogneisses. Weak, magnetic anomalies in the layered and faulted Proterozoic lithologies were not considered to be worthy of follow up.

### 3.3 BHP– Billiton – Discovery Nickel

BHP– Billiton applied the Broken Hill type Ag-Pb-Zn Exploration model for the search for polymetallic VMS type mineralisation.

Calcrete geochemical sampling highlighted an area of Cu-Au-Zn-Ni anomalism, called Zone B, measuring 3km x 1km, centre on the contact between Archaean and Palaeo-Meso Proterozoic Frazer Mobile belt followed by the drilling of 39 RAB holes drilled along two lines to blade refusal. Depth of drilling ranged from 9 – 56m, for a total of 1,219m. Collar spacing generally 50m, though up to 100m when depth to basement reached +50m. Holes were orientated 60 degrees towards 90 magnetic.

A total of 218 composite samples were taken. Six metre composite samples were taken from the overlying cover sequence and 4m composite samples from cover sequence/saprolite

interface. These samples were analysed for Au, Ag, As, Bi, Co, Cu, Mo, Ni, Pb, S, Sb and Zn by ALS-Chemex Kalgoorlie.

This geochemical exploration identified a large 3km x 1km Cu + Au +/- Zn & Ni anomalism on the contact between the Archaean domain and Palaeo-Meso Proterozoic Fraser Mobile Belt.

Last year CSA Global was commissioned to undertake a desktop review of the tenements and identified gold, base metal, mineral sand and uranium potential (Mattinson, P., 2008).

## 4. GEOLOGY

### 4.1 Regional Geology

The Albany-Fraser Terrane consists of two Proterozoic mobile belts that flank the southern margins of the Archaean Southwest Gneiss Terrane and southern and eastern margins of the Yilgarn block. The two Proterozoic mobile belts are Palaeo-Meso Proterozoic in age and are characterised by high-grade gneisses and granulites, granitoid intrusions and polyphase deformation.

Myers 1990, divided the Albany-Fraser Terrain into the Biranup Complex and Nornalup Complex.

The Project lies in the Biranup Complex (1600-1700Ma) of the Fraser Mobile Belt and is composed of strongly deformed Palaeo-Meso Proterozoic high-grade quartzo-feldspathic and basic gneisses (para and orthogneisses) with localized granitoids and gneisses of 1130-1350Ma.

The Biranup Complex is divided into two domains; the Western Fraser Domain and Dalyup Domain. The Dalyup Domain is interpreted to sit stratigraphically below the Western Fraser Domain and is believed to consist of early rift fill (as evident from the abundant felsic gneisses and widespread amphibolites. The Western Fraser Domain has a higher meta-sedimentary component (psammites and psammo-pelits) with only minor-moderate amphibolites and this might reflect gradual cooling of the basin/rift.

The Nornalup Complex (1100-1300Ma) is less intensely deformed high-grade orthogneisses and paragneisses intruded by sheets of granite-diorite.

### 4.2 Regolith Geology

The Fraser Project contains sub-cropping Proterozoic rocks occurring beneath a stripped insitu laterite profile and overlying Tertiary sediments.

The regolith sequence consists of a truncated Proterozoic saprolite (formed in the Mesozoic), which is variably overlain by sediments of post-Eocene age. These overlying Cainozoic

sediments have been modified by lateritic weathering processes during the Oligocene and locally partially stripped due to uplift.

The soil profile reflects the relatively recent onset of aridity (Late Miocene) and formation of an alkaline upper regolith.

The Fraser EL's are deeply weathered much like the Yilgarn Craton, and is covered by a veneer of Eocene terrestrial marine sediments. Pedogenic carbonate is extensively developed in soils overlying both Archaean and Proterozoic basement and Tertiary sediments.

### 4.3 Style of Mineralisation

Possible mineral styles include:

- Yilgarn greenstone gold, nickel mineralisation
- Broken Hill Type lead-zinc, VMS polymetallic
- Tropicana style gold mineralisation

## 5. EXPLORATION COMPLETED DURING THE REPORT PERIOD

During the report period CSA Australia Pty Ltd undertook an additional desk top study and Southern Geoscience Consultants (SGC) undertook an aeromagnetic interpretation.

### 5.1 CSA Desktop Study

With regard to work conducted by CSA, Jeffress, September, 2009 reports:

- *The project area is covered by a complex regolith with multiple episodes of lateritisation and stripping of saprolite profiles that have developed on both the Pre-Cambrian rocks as well as Tertiary sediments.*
- *Palæoshoreline/s and inset palæovalleys eroded during regressions complicate the regolith story but also provide opportunities for mineral sands, sandstone hosted uranium and possibly lignite. The potential is greatest in the southern licences.*
- *There is the possibility of gold in the palæochannels, either placer or chemically transported.*
- *The regolith developed on the Pre-Cambrian basement is reportedly up to 20m thick, and partially stripped leaving depleted saprolite and saprock. Bedrock drilling to sample this material should attempt to reach fresh rock. Sampling should comprise composites downhole as well as selective sampling of redox fronts and the bottom of hole material.*
- *A reasonably ubiquitous pedogenic calcrete is reported by past explorers developed at around 0.5-1.5m depth in the surficial sandy soils (æolian). This material is considered to be the best surface geochemical sampling medium in those areas where the cover sequence is thin enough.*
    - *Mallee is the predominant flora in the region – the root systems of mallee reportedly extend to 10-20m depth, so that calcrete is likely to have captured metals transported by the plants from this depth range.*
    - *Any cover >15m likely precludes the use of surface geochemical sampling.*
- *The southern licence group is less prospective for gold in the basement and has thicker regolith. Surface sampling is suggested for the lower priority lithomagnetic zones that lie in the interpreted shallow basement areas.*
- *The thickness of cover and therefore effectiveness of historic calcrete sampling in E63/956 is ambiguous. The DEM and radiometrics suggest the presence of a palæovalley system but two historic drill holes intersected granite a shallow depths (5m & 8m) – this may reflect local highs, as seen on traverses further south at the Splinter project, or it may reflect generally shallower basement.*
- *Complete a series of aircore traverses across the interpreted palaeodrainages to assess the location and thickness of the drainages, observe the redox state of the sediments and the amount of sands present, test for mineral sands, lignite and uranium (on site checks with scintillometer and handheld XRF are recommended). Any basal sands/gravels should also be assayed for gold.*

## 5.2 Field Inspection

As reported in Jeffress, November, 2009:

*CSA Global undertook a rapid reconnaissance trip to Norseman Gold's Fraser Range Project tenements to:*

1. *Reconnoitre access routes to various parts of the project area;*
2. *Assess the ease of access of the country;*
3. *Visit the areas of interest identified from the geophysical and geochemical reviews completed by CSA Global;*
4. *Repeat, and if possible, collect infill sites, for areas with anomalous gold in calcrete (originally collected by BHP in the early 1990s); and,*
5. *Ground truth the desktop regolith interpretation completed by CSA Global.*

## 5.3 Magnetic Interpretation

As noted in Isles, 2009:

*SGC was engaged by CSA to provide an interpretation of newly released WA government aeromagnetics covering tenements held by CSA's client, Norseman Gold Limited (NGX), in the southern part of the Albany Fraser province. The exercise was limited by time available ahead of decision points on these tenements, but included a regional conceptual view of the locations of known mineralisation north east of NGX's tenements (especially 'Tropicana') as well as a 1:250,000 scale interpretation over the tenements themselves.*

*The principal conclusion is that northern block of EL's lies in a quite compelling tectonic setting within likely deformed Archaean rocks, and has some similarities with the settings of the known gold occurrences to the NE. Within these EL's, areas of greater and lesser exploration interest have been inferred and portions which could be relinquished are identified. The southern ELs occur in much more highly deformed and (following the recent GSWA work) likely much younger rocks. There are features of interest in the aeromagnetics within the southern EL's which are worthy of further investigation, but overall these would rank lower than the areas of interest identified on the northern EL's.*

## 5.4 Heritage Surveys

The Goldfields Land and Sea Council arranged the completion of 2 heritage surveys over the tenements. One heritage survey was with the Ngadju people over E63/592 (part), 956 & 957. The second survey was with the Esperance Nyungar people over E63/592 (part), 953 – 955.

Both report contain information of a confidential nature that has been provided by the Aboriginal Heritage Consultants for the production of the reports for Norseman Gold.

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## 6. RECOMMENDATIONS

Jeffress, September, 2009 recommends that:

- *The following work programmes are recommended:*

- *Infill and repeat calcrete sampling should be undertaken around the anomalous samples collected by BHP. The initial 1km spaced samples should be infilled with 200m spaced samples around the anomalous samples with two repeats taken at and near the original anomalous samples.*
- *This orientation work is designed to check the reliability of the calcrete sampling in this area and provide confidence in the suitability of this approach.*
- *If the follow-up samples repeat the anomalous results then calcrete sampling should be completed on 800m x 200m lines across the areas interpreted as shallow basement in E63/956 and E63/957.*
- *Complete a series of aircore traverses across the prospective units identified on the lithomagnetic interpretation – this will provide basement samples, information on lithologies to truth the interpretation and also geochemical samples and material for hyperspectrally assessing alteration assemblages present. Additionally, this approach will provide unequivocal evidence on the regolith upon which to base exploration decisions elsewhere in this area.*

Jeffress, November, 2009 recommends that:

- *The desktop regolith interpretation is still considered to be valid.*
- *The underlying gold prospectivity of the project area (the northern ELs in particular) is considered to warrant evaluation.*
- *The access, whilst difficult, is not significantly more problematic that other regions were exploration is successfully undertaken, for example the tropical savannah woodlands of the Northern Territory or the jungles of Indonesia and PNG.*
- *Grid access using a front end loader is recommended – a loader is capable of fast traversing (compared to a dozer), enables a good view of the terrain, can "float" the bucket above the ground surface, removing stakes but leaving roots intact and the bucket can also deal with overhanging branches and trees above 2m, as well as clearing a vehicle track, and additionally, loaders are commonly available on farms reducing the potential mobilisation and operating costs.*
- *This approach is environmentally friendly and likely to facilitate POW approval compared to more "robust" approaches.*
- *Alternatively if you have a mechanically sound vehicle with body work that can be further damaged it could be fitted with solid tyres and maybe some additional scrub bars and used to undertake the sampling without requiring extensive track clearing.*
- *Tracks to areas of interest and "grid trees" in those areas can be cleared using this approach – either calcrete sampling or aircore drilling can use these access tracks – with only a minimal initial environmental 'footprint".*
- *The repeat and infill calcrete sampling around the BHP Au anomalous calcrete samples should be completed.*

- *Reconnaissance lines of aircore over prospective geology should also be planned together with calcrete sampling, as discussed in CSA's previous memorandum.*
- *Geochemical sampling contractors such as Pathfinder or AusEx Exploration Services should be contacted for quotes on collecting calcrete samples.*
- *Possible contractors, including local farmers, Esperance based contractors or the contractors working on the Parmango road, able to clear the main access routes into the areas of interest should be identified and their rates and availability determined.*
- *The possible access routes should be planned and an estimate of the likely costs calculated.*
- *DMP's environment group should be contacted to flag any issues that will need to be addressed by successful POW applications.*
- *Review of the BHP work suggests that the BHT potential of the Norseman ground has only been poorly tested by their work. Whilst an airborne EM survey would be a good tool to use to specifically target the massive sulphides of BHT systems, calcrete and aircore drilling are equally effective.*

## 7. REFERENCES


Jeffress, G. M., September 2009, Memorandum to David Thomas dated 25/9/2009, Re: Fraser Range Project – Regolith/Landform interpretation and geochemical strategy.

Jeffress, G. M., November 2009, Memorandum to David Thomas dated November 4, 2009, Re: Fraser Range South Project – Reconnaissance Visit Report.

Isles, D., 2009, Technical Memorandum to CSA dated 22 September 2009.

Mattinson, P., 2008 Exploration Potential, Norseman Gold Plc, Fraser Province, Albany, Western Australia, ELS63/952 – 957. Unpublished company report.

Read J. 2004 Exploration Licences E63/706-746, Southern Fraser Project, Western Australia; Combined Final Report For The Period Ended 29th January 2004,
Discovery Nickel Ltd

Robinson P. 1998 Yilgarn Extension Project, E63/453 Surrender Report; Pan Australian Exploration P/L. DOIR Reference M9749/4, Item 10624A 54560

White M 2004 Exploration Licences E63/706-746, Southern Fraser Project, Western Australia; Combined Final Report For The Period Ended 29th January 2003, Combined Reporting number C33/2003, BHP Billiton Minerals P/L, DOIR Reference CR10650, A66276

White M., 2004 Exploration Licences E63/706-746, Southern Fraser Project, Western Australia; Combined Final Report for the Period Ended 20th December 2004, Combined Reporting number C33/2003, BHP Billiton Minerals P/L, DOIR Reference CR10864.

## 8. RELATED REPORTS

The following reports were submitted to DMP using the DMP reporting template and file verification set up:

Jeffress, G. M., 2009, Memorandum to David Thomas dated 25/9/2009, Re: Fraser Range Project – Regolith/Landform interpretation and geochemical strategy.

Isles, D., 2009, Technical Memorandum to CSA dated 22 September 2009.