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Main Roads Western Australia

Report for North West Coastal
Highway SLK 145.6

Targeted Flora and Fauna Survey

February 2012



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Executive Summary

Main Roads Western Australia (Main Roads) has identified a potential material site within Eurardy Station, located along North West Coastal Highway approximately 30 km north of the Murchison River. The proposed material site has been vested to Main Roads through Section 19 approvals for material extraction, in accordance with the *Mining Act 1978*.

A biological survey was previously conducted over the proposed material site and surrounds in 2009, with three Priority Flora species recorded within the vicinity of the material site. A targeted flora survey was required focusing on the populations of *Thryptomene* sp. Wandana (Priority 3) [previously known as *Thryptomene ninghanensis* (Priority 1)], *Philotheca kalbarriensis* (Priority 2) and *Wurmbea murchisoniana* (Priority 4) identified in 2009.

No threatened fauna species were recorded during the biological survey in 2009. However, Main Roads requested a targeted fauna survey focusing on the Malleefowl, Trapdoor Spider and Western Spiny-Tailed Skink to be undertaken at the proposed material site and surrounds.

The targeted flora assessment was undertaken at the start of October 2011. The survey was conducted during the period of the year when the *Thryptomene* sp. Wandana, *Philotheca kalbarriensis* and *Wurmbea murchisoniana* were flowering.

- A total of 45 *Philotheca kalbarriensis* was recorded within the Project Area and surrounds;
- A total of 6,553 *Thryptomene* sp. Wandana was recorded within the Project Area and surrounds, with 4,450 potentially directly impacted by proposed clearing;
- No *Wurmbea murchisoniana* were recorded during this survey, with GHD (2009) recording this species outside the Project Area; and
- The proposed works are considered unlikely to be at variance with Condition (a) of the Ten Clearing Principles. The proposed works will only impact on approximately 4.38% of the total known population that occurs within the preferred habitat within the vicinity of the Project Area.

The targeted fauna assessment was conducted in conjunction with the flora survey at the start of October 2011.

Malleefowl

The woodlands and shrublands are considered a suitable habitat for this species. However, no nest mounds were recorded within the vicinity of the Project Area during 2009 or 2011 field surveys. While this species has been recorded from Eurardy Station in the past, impact on this species from project works is considered to be minimal due to the already disturbed nature of the material pit area.

Western Spiny-tailed Skink

The northern extent of the Project Area comprises of suitable habitat type for the Western Spiny-tailed Skink. This section of the Project Area was characterised by open woodlands comprising of hollow logs and bark.

The Western Spiny-tailed Skink was not recorded in the 2009 and 2011 field surveys. There are no previous known records to suggest that they occur within the Project Area. GHD considers that the



probability of this species occurring within the Project Area is considered unlikely. The closest known record occurs near Bowgada and Perenjori on the Wubin Mullewa Road (>125 km away).

Potential habitat occurs within the Project Area for this species, however due to the relatively disturbed nature of the Project Area GHD considers that the probability of this species occurring within the Project Area is considered unlikely.

Shield-backed Trapdoor Spider

This species was not recorded in 2009 and 2011 field surveys; and the Project Area occurs to the north and east of known distribution records.



1. Introduction

1.1 Background

Main Roads Western Australia (Main Roads) has slowly been exhausting material stockpiles required for road construction and maintenance. Main Roads is currently in the process of developing a region-wide strategic plan to identify potential future material sites. The identification of material sites will help the Mid West region locate required road building material for road construction and maintenance as well as for use during emergency situations that may arise after events such as natural disasters and vehicle accidents.

As part of this region-wide strategic material plan, Main Roads has identified a potential material site within Eurardy Station, located along the North West Coastal Highway approximately 30 km north of the Murchison River (Figure 1). The proposed material site has been vested to Main Roads through Section 19 approvals for material extraction, in accordance with the *Mining Act 1978*.

A biological survey was previously conducted over the proposed material site and surrounds in 2009, with three Priority Flora species recorded within the vicinity of the material site. A targeted flora survey was required, focusing on the populations of *Thryptomene* sp. Wandana (Priority 3) [previously known as *Thryptomene ninghanensis* (Priority 1)], *Philothea kalbarriensis* (Priority 2) and *Wurmbea murchisoniana* (Priority 4) identified in 2009. Main Roads has also requested a targeted fauna survey focusing on the Malleefowl, Trapdoor Spider and Western Spiny-Tailed Skink be conducted within the material site area.

1.2 Scope of Works

Main Roads requested GHD Pty Ltd to complete a targeted flora survey and a targeted fauna survey for the above project.

The purpose of this survey is to provide an appropriate examination and description of the receiving environment to ensure that conservation significant flora and fauna are identified and recorded.



2. Methodology

2.1 Desktop Assessment

A desktop assessment was undertaken prior to the field survey. This included an examination of previous reports and a literature search for information pertaining to project specific conservation significant flora and fauna species.

2.1.1 Field Assessment

The field survey was assessed against the desktop assessment undertaken for the existing environment within the Project Area. The field survey and subsequent report included the following actions and details:

Physical Environment

- A description and summary of climatic data and how it affected the outcomes of the proposed works; and
- Broad soil descriptions, including the presence of acid sulphate soils and their relationship to topography and plant communities.

Flora and Vegetation

- An inventory of the vascular plant species in the Project Area;
- A review of, and search for, native plant species considered to be rare or potentially endangered. Other species of interest, including those of limited distribution or outliers from their known range, were discussed. Locations of Threatened (Declared Rare) or Priority Flora were mapped at a suitable scale and GPS locations presented within an excel spreadsheet;
- An inventory of dominant exotic plants and that included declared noxious plants and environmental weed species;
- An assessment whether weeds were likely to spread to and potential environmental harm to adjacent areas of native vegetation in good or better condition;
- A description and location, included mapping, of plant communities. Communities linkages were made where possible, generally if they were already identified;
- A discussion of the presence, location, extent and impact of any plant pests or diseases. This included *Phytophthora* dieback, Tuart borer or canker;
- A review of the local and regional significance of the plant communities in terms of their intrinsic value, extent, rarity and condition; and
- Assessment undertaken with reference to the Environmental Protection Authority (EPA) Guidance Statement No. 51 (EPA, 2004a).

Fauna

- An inventory of the vertebrate fauna species in the Project Area;
- Targeted fauna survey of species noted in scope;
- A review of the fauna species considered to be rare or in need of special protection; and



- The fauna assessment was undertaken with reference to the EPA Guidance Statement No. 56 (EPA, 2004b).



3. Desktop Assessment

3.1 Project Area

The Project Area is located within Eurardy Station, located along the North West Coastal Highway east of SLK 145.6. Eurardy Station is also located approximately 30 km north of the Murchison River (Figure 1).

3.2 Land Use

The Project Area is situated within a previously disturbed area that has been used extensively for the purpose of material extraction for use in road construction and maintenance. The majority of these excavation works were undertaken during the 1970s, prior to the establishment of current statutory environmental regulations. The proposed material site includes an area not previously disturbed (except for exploration tracks) by historical material extraction activities.

3.3 Results of Previous Surveys

The Project Area has been previously surveyed for vegetation, flora and fauna in October 2009 (GHD, 2009). The results of the previous survey are below.

3.3.1 Vegetation Extent and Status

Native vegetation types represented in the Project Area; their extent and reservation status are drawn from the CAR Reserve Analysis 2009 (Government of Western Australia 2010). Extents at the State, IBRA, Sub-IBRA and the Local Government Area (LGA) (Shire of Northampton) level are shown in Table 1. This Vegetation Association is considered of *Least Concern*.

Table 1 Vegetation Extent and Status

Vegetation Association	Description	Pre-European extent (Ha)	Current Extent (Ha)	% Remaining	Status
365	Shrublands; bowgada and jam scrub with scattered York gum and red mallee	State: 55,983.31 IBRA: 13,700.14 LGA: 12,878	State: 52,131.83 IBRA: 11,673.66 LGA: 12,550.10	State: 93.12 IBRA: 85.21 LGA: 97.45	State: <i>Least Concern</i> IBRA: <i>Least Concern</i> IBRA: <i>Least Concern</i>

3.3.2 Project Area Vegetation Description

A total of eight vegetation types were identified across the Project Area by GHD (2009). These vegetation types are identified in Figure 4 and include:

1. Tall shrubland of *Acacia coolgardiensis*, *A. neurophylla* and *A. rhodophloia* over open heath of *Thryptomene ninghanensis* with *Baeckea pentagonantha* and *Melaleuca cordata*.



2. Open woodland of *Eucalyptus loxophleba* over scattered *Acacia tetragonophylla* over mixed chenopods.
3. Tall shrubland of *Acacia sp. narrow phyllode*, *A. tetragonophylla* and *Hakea recurva* over mixed chenopods.
4. Open tree mallee of *Eucalyptus rigidula* and *E. eudesmioides* with scattered *Melaleuca atroviridis* over mixed shrubs.
5. Tall shrubland of *Acacia tetragonophylla* and *A. sp. narrow phyllode* adjacent to granite outcrop and herbfield.
6. Regrowth/Rehabilitation Areas.
7. Cleared/Degraded Vegetation.
8. Open shrubland of *Acacia tetragonophylla*, *A. sp. narrow phyllode* and *A. ramulosa var. ramulosa* over mixed chenopods.

3.3.3 Project Area Vegetation Condition

Vegetation condition throughout the Project Area ranged from Condition 1 - 2 (*Pristine or Nearly So - Excellent*) to Condition 6 (*Completely Degraded*). The main disturbance factor was historical clearing for the purpose of material extraction.

During the flora survey it was noted that areas of vegetation within the Project Area exhibited signs of fire and drought impact. The most obvious of which was observed in the dominate upper-storey *Acacia* species. These areas were mainly located in the eastern portion of the Project Area and have been given a Condition rating of *Very Good* (Condition 3).

3.3.4 Threatened Ecological Communities

All vegetation units identified during the time of survey are not considered to represent any Threatened or Priority Ecological Community. Therefore GHD does not consider vegetation units within the Project Area to represent any complex of particular conservation significance.

3.3.5 Threatened Flora Species

No *Endangered* or *Vulnerable* species pursuant to Section 178 of the *Environment Protection and Biodiversity Conservation Act 1999* were recorded during the survey.

No plant taxa gazetted as Declared Rare [in 2009 – now Threatened (Declared Rare)] pursuant to subsection 2 of Section 23F of the *Wildlife Conservation Act 1950* (Atkins, 2008) were recorded from the Project Area.

Three Priority Flora species were located in the Project Area, being:

- *Philotheca kalbarriensis* (Priority 2);
- *Thryptomene ninghanensis* [now *Thryptomene sp. Wandana* (M.E. Trudgen 22016)] (Priority 3); and
- *Wurmbea murchisoniana* (Priority 4).



Table 2 Specific Flora Species Survey Recorded by GHD (2009)

Taxon	Conservation Code	Quantity Found	Location*	Comment	Record Inside (√) or Outside (X) Project Area
<i>Thryptomene</i> sp. <i>Wandana</i>	P3		275001 mE 6951000 mN	2% canopy cover in Quadrat 2.	X
<i>Thryptomene</i> sp. <i>Wandana</i>	P3	47	275163 mE 6950973 mN	In a 100m transect, 47 alive (191 dead) were recorded.	X
<i>Thryptomene</i> sp. <i>Wandana</i>	P3	1	275331 mE 6950878 mN	1 plant recorded in a 10m x 10m area.	X
<i>Thryptomene</i> sp. <i>Wandana</i>	P3		275378 mE 6950887 mN	30-70% canopy cover in Quadrat 2, of which 25% were recorded dead.	X
<i>Thryptomene</i> sp. <i>Wandana</i>	P3		275443 mE 6950553 mN	Opportunistic collection.	√
<i>Thryptomene</i> sp. <i>Wandana</i>	P3		275182 mE 6950065 mN	30-70% canopy cover in Quadrat 3 (30% dead).	√
<i>Thryptomene</i> sp. <i>Wandana</i>	P3	1	274771 mE 6949758 mN	Opportunistic collection.	√
<i>Thryptomene</i> sp. <i>Wandana</i>	P3		273845 mE 6950088 mN	Common mid-storey species in Vegetation Type 1 at this location (30-70% canopy cover).	√
<i>Thryptomene</i> sp. <i>Wandana</i>	P3		273714 mE 6950350 mN	Opportunistic collection.	√
<i>Thryptomene</i> sp. <i>Wandana</i>	P3		273778 mE 6950444 mN	Opportunistic collection.	√



Taxon	Conservation Code	Quantity Found	Location*	Comment	Record Inside (√) or Outside (X) Project Area
<i>Thryptomene</i> sp. Wandana	P3		275191 mE 6951577 mN	Opportunistic collection.	X
<i>Philotheca kalbarriensis</i>	P2	2	275321 mE 6950882 mN	Opportunistic collection.	X
<i>Philotheca kalbarriensis</i>	P2	30	274653 mE 6949857 mN	Opportunistic collection.	√
<i>Philotheca kalbarriensis</i>	P2	4	274626 mE 6949893 mN	Opportunistic record.	√
<i>Philotheca kalbarriensis</i>	P2		275378 mE 6950887 mN	2% canopy cover in Quadrat 2.	X
<i>Wurmbea murchisoniana</i>	P4		275509 mE 6950803 mN	Located in micro-habitat outside Project Area, within seasonally inundated clay hollow.	X
<i>Wurmbea murchisoniana</i>	P4		275523 mE 6950747 mN	Located in micro-habitat in the north-east corner of Project Area, in small seasonally inundated clay hollow.	√

(*Australian Geocentric 1994 (GDA94), Zone 50 K)



3.3.6 Fauna Records

A summary of the previous report indicates:

- Eight fauna species (five birds and three mammals) were recorded during the reconnaissance fauna survey. Two introduced species, the European Rabbit and Feral Goat, were recorded in the Project Area;
- No threatened fauna species were recorded in the Project Area during the reconnaissance fauna survey;
- A total of four habitat types were recorded in the Project Area.

3.3.7 Threatened Fauna Assessment

The results from the Field Assessment (GHD 2009) indicated that the following:

Malleefowl

- That the Project Area comprised of a suitable habitat, this being woodlands and shrublands. However, no nest mounds were recorded in the Project Area by GHD (2009).

Spiny Tailed Skink

- That the Project Area contains optimal habitat for this species, an absence of refuge sites (due to the lack of hollow logs) is present in the Project Area. This species may occur in the vicinity of the Project Area as determined by GHD (2009).

Shielded Backed Trapdoor Spider

- Based on the disturbed nature of much of the Project Area, this species was considered unlikely to occur with this area. Please note that the GHD (2009) reconnaissance fauna survey did not include an assessment of invertebrate species.

3.4 2011 Desktop Threatened Fauna Assessment

A *NatureMap* search was undertaken (11/10/2011) to determine the most recent recorded locations of Malleefowl, Western Spiny-tailed Skink and Shielded-backed Trapdoor Spider closest to the Project Area. A summary their known locations are shown in Table 3.

Table 3 Nature Map Assessment of Threatened Fauna

Species	SLK 145.6	
	Nearest	Likelihood of Occurrence in survey area
Malleefowl	5 km SW 5 km W	Possible – records south of the Project Area along the North West Coastal Highway west of the Project Area.
Western Spiny-tailed Skink	>125 km N or S	Unlikely – records near Bowgada and Perenjori on Wubin - Mullewa Road
Shield-backed Trapdoor Spider	10 km W	Possible- records near the Kalbarri National Park, North West Coastal Highway.



3.4.1 Habitat Requirements for Targeted Fauna

This project also includes a literature review of the three known threatened fauna occurring within the Project Area.

Malleefowl

Conservation Status- Vulnerable, Listed Migratory [EPBC Act 1999] and Schedule 1 [WC Act 1950].

The Malleefowl is a large and distinctive ground-dwelling bird that grows up to 60 cm in length and can weigh up to 2.5 kg. The Malleefowl occurs in semi-arid and arid zones of temperate Australia, where it occupies shrublands and low woodlands that are dominated by mallee vegetation. In Western Australia the Malleefowl is mostly located to the south and west of a line extending from Cape Farquhar, which lies north of Carnarvon, to the Eyre Bird Observatory in the south-east of Western Australia (DSEWPC, 2009).

Western Spiny-tailed Skink

Conservation Status – Schedule 1 [WC Act, 1950]; Vulnerable [DEC, 2010]; Endangered [EPBC Act].

The Western Spiny-tailed Skink (*Egernia stokesii* subsp. *badia*) (the Skink) occurs in the southern Murchison and in the northern Wheatbelt from Mullewa south to Kellerberrin and east of the Wheatbelt in the Yalgoo region (Karara Mining Ltd, 2009; Department of Environment, Water, Heritage and the Arts (DEWHA, 2009).

Suitable habitat for this species is usually within eucalypt woodland where refuge sites occur in and around trees such as York Gum (*Eucalyptus loxophleba*), Salmon Gum (*E. salmonophloia*) and Gimlet (*E. salubris*) under bark, in root hollows, fallen logs, crevices and rocky areas (Karara Mining Ltd, 2009; DSEWPC, 2009). However, it has also been found to opportunistically utilise the habitat afforded by sheets of corrugated iron left lying on the ground or piles of cleared or fallen logs, rocks and soil beside roadworks or abandoned buildings.

Populations inhabit woodland patches as small as one hectare and completely surrounded by wheat fields (DSEWPC, 2009). Specimens have also been found under limestone slabs in low, open heath and under corrugated iron (DoEWPnC, 2009).

The Skink lives in spatially and temporally stable groups of up to 17 members and diet is not known, though the species *Egernia stokesii* is known to be omnivorous (Department of Sustainability, Environment, Water, Population and Community (DSEWPaC, 2011).

The major threat to the Skink is considered to be the clearing of habitat (DEHWA, 2009).

Shielded-backed Trapdoor Spider

Conservation Status – Schedule 1 [WC Act 1950]

The Shield-backed Trapdoor Spider (*Idiosoma nigrum*) is in decline in its patchy distribution through the northern and central Wheatbelt and coastal plain. It is a long-lived species that is very sensitive to disturbance. The species burrows in heavy clay soil of York Gum (*Eucalyptus loxophleba*) and Jam (*Acacia acuminata*) forests. Their burrows comprise of a thin trapdoor made up of a fan of twiglines in litter (DSEWPaC, 2009).



4. 2011 Field Assessment

4.1 Results of Flora Investigation

The targeted flora assessment was undertaken at the start of October 2011. The survey was conducted during the period of the year when the *Thryptomene* sp. Wandana, *Philotheca kalbarriensis* and *Wurmbea murchisoniana* were flowering (Figure 7).

The Project Area was surveyed using a grid sampling pattern, with walking transects sampled in an east-west pattern across the material site. Due to the high numbers of plants observed, GPS data points represent the centre of a five to 15 metre radius where plants were counted.

A total of two conservation significant flora taxa were recorded during the 2011 field survey (*Thryptomene* sp. Wandana and *Philotheca kalbarriensis*). *Wurmbea murchisoniana* was not recorded within the Project Area. GHD (2009) previously recorded this species outside Project Area.

4.1.1 Priority Flora Species Records

Philotheca kalbarriensis

Philotheca kalbarriensis (Priority 2) is a shrub to one metre high, with white flowers present in August (Plate 1). It prefers yellow sandy clay and is usually found associated with *Acacia acuminata* scrub. Its known distribution includes the Geraldton Sandplains bioregion (DEC, 2009a). According to the Australia's Virtual Herbarium (2009) there are six records of the species, *Philotheca kalbarriensis*, mapped from approximately 30 km north-west of Mullewa to approximately 20 km north-east of Eurardy, within WA.



Plate 1: *Philotheca kalbarriensis* (P2)

Philotheca kalbarriensis (Priority 2) was recorded in two different locations by GHD (2009). In the 2011 field survey a total 45 individual plants were recorded in the Project Area (Figure 8). Refer to Table 6 for location of these plants. Habitat for this species that was recorded in 2009 indicated that it occurs both inside and outside of the Project Area. The 2009 estimated survey extent is considered to be an under-representation in the local and regional area. The 2011 survey indicates that this species is more widely spread than previously thought. As such, GHD considers it unlikely for the proposed works to significantly impact on the species in the local and regional area, as the population within the Project Area only represents a small percentage of plants found within the region.

***Thryptomene* sp. Wandana (Priority 3)**

Thryptomene sp. Wandana (M.E. Trudgen 22016) (Priority 3) was formerly known as *Thryptomene ninghanensis* (Priority 1) in the 2009 survey. The name change reflects an update to the taxonomic and nomenclatural processes applied throughout the Western Australian Herbarium collection. This taxon is a shrub that grows to 0.75 to 1.5 metres high with pink, white and red flowers occurring from July to September (Plate 2). It prefers a habitat of yellow sand, red clay and sand dunes. Its known distribution includes the Yalgoo and Geraldton Sandplains bioregions (DEC, 2009a). According to the Australia's Virtual Herbarium (2009) there are 15 records of the taxon *Thryptomene* sp. Wandana (Priority 3) with the majority of these records occurring between Eurardy in the north and East Yuna Nature Reserve in the south, with a disjunct record south-west of Paynes Find.



Plate 2: *Thryptomene* sp. Wandana (Priority 3)

During the field survey *Thryptomene* sp. Wandana (Priority 3) was observed in the same area and habitat that was previously recorded by GHD (2009). A total of 6,553 plants were recorded during the field survey, of which 4,229 were recorded from the proposed material extraction area and 221 plants recorded in areas proposed for rehabilitation Figure 2. This species was also recorded outside the vicinity of the Project Area. A number of plants occurring within the Project Area were considered to be in juvenile form. Within and adjacent to the Project Area *Thryptomene* sp. Wandana was recorded on pale sandy soils. This species was also recorded in areas subjected to historical disturbance and in areas of rehabilitation. An average of 508 plants were recorded per hectare within the Project Area.

GHD considers this species population within the regional area to be unlikely impacted by the proposed works. The population only represents 4.38% of the total population occurring within and surrounding the Project Area. Refer to Figure 6 for the likely habitat of *Thryptomene* sp. Wandana within the surveyed area. Figure 8 provides individual locations of plants recorded during the 2011 survey occurring within the Project Area.

***Wurmbea murchisoniana* (Priority 4)**

Wurmbea murchisoniana (Priority 4) is a cormous, hermaphroditic, perennial herb, growing 0.1 to 0.26 m high and flowering white in July through to September. It prefers a habitat of clay, sandy clay and loam in seasonally inundated clay hollows and rock pools (DEC, 2009a). According to Australia's Virtual Herbarium (2009) there are 25 records of the species, *Wurmbea murchisoniana*, mapped from approximately 150 km east of Norseman in the south to Eurardy Station in the north, within WA.



Wurmbea murchisoniana was not recorded in the Project Area during the October 2011 survey. However, GHD (2009) recorded two locations of this species one inside and one outside the Project Area. The first location recorded was observed to be a monoculture of *Wurmbea murchisoniana* within an area of approximately 500 m². The second location recorded inside the Project Area and was observed to be growing in a small inundated clay hollow on the north eastern edge of the Project Area boundary.

GHD considers that this species will not be impacted by the proposed works, because it was recorded in locations outside the proposed pit expansion (Figure 7).

4.2 Fauna Investigation

An assessment of the factors that were likely to influence the survey design were assessed at the EPA (2004b) factors (Table 4).

Table 4 Factors Likely to Influence the Survey Design from EPA (2004b)

Factor	Relevance	Assessment
Degree of habitat degradation or clearing within region	The Project Area contains Local Government Authority (LGA) 98.85% of the pre-European vegetation extent remaining.	Indicates that potential impact for the proposed project is considered to be Low.
Size/scale of proposal/impact	Clearing will be minimised where possible. Likely impact will be a maximum of 4.45 hectares.	Indicates that potential impact for the proposed project is considered to be Low.
Rarity of vegetation and landforms	The Project Area contains LGA 98.85% of the pre-European vegetation extent remaining.	Indicates that potential impact for the proposed project is considered to be Low.
Significant habitats	The vegetation and area characteristic indicates that significant habitats are likely to occur.	Indicates that potential impact for the proposed project is considered to be Moderate.
Refugia	GHD (2009) indicated that the characteristics of the area could serve as refugia for Western Spiny-tailed Skink, Malleefowl and Shielded-back Trapdoor Spider.	Indicates be minor loss of refugia vegetation and associated foraging resources. No threatened species were recorded in the Project Area. This is considered to be Moderate.
Fauna protected under International agreements or treaties, Specially Protected or Priority Fauna	Threatened fauna known to occur within vicinity of Project Area. Reconnaissance surveys (GHD, 2009) did not record the presence of threatened fauna.	Indicates that potential impact for the proposed project is considered to be Low.
Other significant fauna or fauna	Reconnaissance surveys (GHD, 2009) did not record the presence of	Indicates that potential impact for the proposed project is considered to be



Factor	Relevance	Assessment
assemblages	otherwise significant fauna.	Low.
Size of remnant and condition / intactness of habitat and faunal assemblage	Area is a relatively small remnant in a fragmented landscape.	Indicates that potential impact for the proposed project is considered to be Low.
Ecological Linkage	The Project Area is not directly connected to adjoining areas, but forms part of a minor ecological linkage with the Kalbarri National Park and surrounding reserves.	Indicates that potential impact for the proposed project is considered to be Low.
Heterogeneity or complexity of the habitat and faunal assemblage	The Project area and/or its immediate surrounds are less complex and relevant to the characteristics of the local and regional scale.	Indicates that potential impact for the proposed project is considered to be Low.

The assessments made against the EPA 2004b guidance for the Assessment of Environment factors indicates that the impact of the project was mainly low.

4.2.1 Field Survey Methodology

Non-systematic Sampling Methods

Rare and threatened species may have a patchy, disparate distribution through landscapes. To provide the best opportunity to determine the presence and relative prevalence of these species in small survey areas the use of non-systematic targeted approaches is optimal.

Non-systematic sampling was undertaken at each of the Project Area habitat types noted in 2009 and comprised of diurnal searches for amphibians, reptiles and mammals. Surveys comprised of searching ground layer (overturning logs, rocks and leaf litter) and low vegetation (under bark and in tree stumps) and recording all individuals observed. Species presence was determined via secondary evidence, in the form of scats, tracks, burrows, nests and remains.

Wherever possible numbers of individuals, habitat use and other relevant information was recorded. This is in line with the Department of Environment and Conservation (*DEC*) *Standard Operating Procedure – Observing animals from secondary signs* (2009). The Project Area was surveyed on foot.

Table 5 Threatened Targeted Survey Focus

Species	Habitat	Forage/Food Sources
Malleefowl	Low woodlands Mallee vegetation	Seeds Invertebrates Lerps
Western Spiny-tailed Skink	Fallen timber, man-made debris, hollow logs Latrine piles	Insects Spiders

Species	Habitat	Forage/Food Sources
Shield-backed Trapdoor Spider	Relatively undisturbed woodlands with Acacia shrublands on heavy clay soils. Permanents layer of leaf litter. Burrows with twiglines.	Ants

4.2.2 Taxonomy and Nomenclature

Nomenclature used in this report follows that used by the Western Australia Museum *NatureMap* program, as it is deemed to contain the most up-to-date species information for Western Australia for groups Reptiles, Amphibians and Mammals.

4.2.3 2011 Targeted Fauna Assessment

A targeted fauna survey was undertaken in conjunction with the targeted flora survey. It was undertaken on a dry and moderately hot day in October 2011. There was no conservation significant fauna or evidence of their existence recorded in both 2009 and 2011 field assessments. The northern extent of the Project Area comprises of suitable habitat type for the Western Spiny-tailed Skink. This section of the Project Area was characterised by open woodlands containing hollow logs bark, as shown in Plate 3. However, there was no evidence to suggest that the Western Spiny-tailed Skink occurred within the Project Area.



Plate 3: Potential Western Spiny-tailed Skink Habitat (Loc. 274578, 6950717).

No nesting mounds or scratchings of the Malleefowl were recorded in the Project Area.

No twiglines, trapdoor holes or holes in tree trunks (e.g. *Aganippe* spp.) were recorded from the Project Area.



4.2.4 2011 Opportunistic Fauna Survey Records

A total of 12 birds, three mammals and two reptiles were recorded at SLK 145.6 survey in 2009 and 2011 field assessments. One Migratory Listed EPBC Act species was recorded in the Project Area. The Black-faced Cuckoo-shrike is considered common in Australia and is not considered threatened. Three introduced species were recorded in the Project Area:

- *Felis catus* Cat
- *Capra hircus* Goat
- *Oryctolagus cuniculus* **Rabbit**



5. Clearing of Native Vegetation

5.1 Vegetation Clearing

Clearing applications are assessed against ten principles outlined in Schedule 5 of the *Environmental Protection Amendment Act 2003*. These principles aim to ensure that all potential impacts resulting from removal of native vegetation can be assessed in an integrated way. The principles address three main environmental areas:

- Biodiversity significance;
- Land degradation; and
- Ground and surface water quality.

These principles apply to all lands throughout Western Australia. If the project involves significant impacts other than on native vegetation, or the clearing is exempt under Section 51C but is considered likely to have a significant impact it should be referred to the EPA for consideration.

Any clearing of native vegetation requires a permit under Part V of the *Environmental Protection Act 1986* except where exemptions apply under Schedule 6 of the *Act* or are prescribed in the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. These exemptions do not apply in Environmentally Sensitive Areas (ESAs).

5.1.1 Assessment Against the Ten Clearing Principle

The Project was assessed against the Ten Clearing Principles (Appendix D) and found to be not at variance with any of the principles.

Clearing Principle (a) states “*Native vegetation should not be cleared if it comprises of a high level of biodiversity.*” This principle includes an examination of plant species. Three Priority Flora taxa were identified by GHD (2009): *Philotheca kalbarriensis* (Priority 2); *Thryptomene ninghanensis* (Priority 1); and *Wurmbea murchisoniana* (Priority 4).

Thryptomene sp. Wandana was recorded in the 2011 survey in the preferred habitat area as identified in by GHD (2009). The survey conducted in October 2011 recorded a total of 4,450 plants within the Project Area at a density of 508 plants per hectare within the proposed pit expansion of the Project Area. The highest density was recorded in the eastern Area of Interest, at a density of 944.58 plants per hectare.

Thryptomene sp. Wandana was recorded in the Project Area are likely to be under threat by the proposed works. However, the population recorded in the Project Area for proposed works is only 4.37% of the total recorded plants occurring within the study boundary. This is based on the total area of 200 hectares, *T. sp.* Wandana preferred habitat (Figure 5) and based on the average population of 508.38 plants/ha, totally 101,673 plants.

In addition, this is the most known northern extent for this species to occur, as this species has been recorded in Wandana Nature Reserve, Dartmore Road, Bulla, McGauran Nature Reserve, Mount Singleton, Ninghan district, Coolcalalaya Station and the Murchison River.



Philotheca kalbarriensis was recorded in low numbers in the area and surroundings. GHD considers that this species will not be impacted by the proposed works as they occur in greater numbers outside the Project Area. This Project is considered to be unlikely at variance with the clearing principle.



6. Requirement for Referral or Other Clearances

The results of the targeted fauna and flora survey indicate that the project is considered not likely to require referral to the Environmental Protection Authority (EPA) or Department of the Sustainability, Environment, Water, Heritage and the Arts (DSEWHA), based on the clearing of native vegetation and flora within the Project Area.

GHD considers that the clearing of vegetation for this project should be granted under the current Main Roads clearing permit.

7. Conclusion and Recommendations

7.1 Conclusion

Based on the outcome of the desktop and field assessments, the following conclusions are made:

- The vegetation of the Project Area is identified by Beard (1976) as likely to contain Vegetation Association 365, which is described as 'Shrublands; bowgada and jam scrub with scattered York gum and red mallee;
- This Vegetation Association is considered to be of Least Concern, with 97.4% (12,550 ha) of the pre-European extent remaining at the Local Government Area (LGA) level (Shire of Northampton). At a State, IBRA and Sub-IBRA this vegetation type is considered of *Least Concern*;
- Vegetation condition throughout the Project Area ranged from Condition 1 - 2 (*Pristine or Nearly So - Excellent*) to Condition 6 (*Completely Degraded*). The main disturbance factor was from historical clearing for the purpose of material extraction. During the flora survey it was noted that areas of vegetation within the Project Area exhibited signs of fire and drought disturbance;
- No Threatened (Declared Rare) Flora species were recorded during the 2011 field survey. However, two Priority Flora taxa were recorded in the 2011 field survey: *Thryptomene* sp. Wandana (Priority 3) and *Philotheca kalbarriensis* (Priority 2);
- **GHD (2009) recorded location of *Wurmbea murchisoniana* (Priority 4), outside the area of impact;** and
- The proposed works are unlikely to be at variance with Condition (a) of the Ten Clearing Principles, which states that, "*Native vegetation should not be cleared if it comprises of a high level of biological diversity.*" The proposed works will only impact on 4.38% of the total known population that occurs within the Project Area and preferred habitat.

The woodlands and shrublands are considered a suitable habitat for Malleefowl. However, no nest mounds were recorded within the vicinity of the Project Area during 2009 and 2011 field survey. The probability of this species occurring within the Project Area is considered unlikely.

- The northern extent of the Project Area comprised of suitable habitat type for the Western Spiny-tailed Skink. This section of the Project Area was characterized by tall shrublands comprising of hollow logs and under bark, as shown in Plate 3;
- Western Spiny-tailed Skink was not recorded in 2009 and 2011 field surveys;
- There are no previous known records to suggest that they occur within the Project Area. The closest known record occurs near Bowgada and Perenjori on Wubin Mullewa Road (>125 km);
- GHD considers that the probability of this species occurring within the Project Area is considered unlikely; and
- Potential habitat occurs within the Project Area for this species, however, due to the disturbed nature of the Project Area GHD considers that the probability of this species occurring within the Project Area is considered unlikely. This species was not recorded in 2009 and 2011 field surveys;



7.2 Recommendations

GHD recommends that where any standing vegetation is removed in the proposed pit expansion area, this is spread over areas proposed to be rehabilitated to enhance to regrowth of Priority Flora from seed stock. The use of mulching removed vegetation and respreads topsoil in areas to be rehabilitated is suggested.



8. Limitations

8.1 Survey Limitations

The GHD field survey was carried out during only one season, and in one year. Some flora species, such as annuals, are only available for collection at certain times of the year, and others are only identifiable at certain times (such as when they are flowering). Additionally, climatic and stochastic events (such as fire) may affect the presence of plant species. Species that have a very low abundance in the area are more difficult to locate, due to above factors. The survey was limited to the Project Area and the plants were only observed within the area. Areas of the Project Area were targeted on the basis of pre-existing habitat location identified from aerial photography and location of these species.

8.2 Report Limitations

This report presents the results of a targeted flora and fauna survey, and desktop findings, prepared for the purpose of this commission. The data and advice provided herein relate only to the project described herein and must be reviewed by a competent scientist before being used for any other purpose. GHD accepts no responsibility for other use of the data.

Where reports, searches, any third party information and similar work have been performed and recorded by others the data is included and used in the form provided by others. The responsibility for the accuracy of such data remains with the issuing authority, not with GHD.

For these investigations GHD has conducted desktop data searches and a field survey. The conclusions of this report were based on the information gathered during these investigations and thus reflect the environment of the survey area at the time of survey.



9. References

- Australian Government: Department of Sustainability, Water, Population and Communities (DSEWPaC, 2009). *EPBC Act List of Threatened Fauna*. <http://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=fauna>
- Department of Environment and Conservation (DEC) (2009) *Standard Operating Procedure – Observing animals from secondary signs – version 1.0 (May 2009)*
- Environmental Protection Authority (2000). Environmental Protection of Native Vegetation in Western Australia: Clearing of Native Vegetation, with Particular Reference to the Agricultural Area. Government of Western Australia, December 2000.
- Environmental Protection Authority (EPA)(2004a) Guidance for the Assessment of Environmental Factors (in accordance with the Environmental Protection Act 1986). Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia. Guidance Statement No.51. June 2004. Western Australia
- Environmental Protection Authority (EPA) (2004b) Guidance for the Assessment of Environmental Factors (in accordance with the Environmental Protection Act 1986). Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia. Guidance Statement No.56. June 2004. Western Australia
- GHD (2009) Unpublished Report: *Main Roads Western Australia Strategic Material Area North West Coastal Highway SLK 145.6 Flora and Fauna Survey*.
- Government of Western Australia. (2010). *CAR Analysis Report 2009*. Accessed [February 2012]. WA Department of Environment and Conservation, Perth, <https://www2.landgate.wa.gov.au/slip/portal/services/files/carreserveanalysis2009.xls>



Appendix A

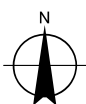
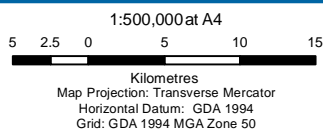
Figures



LEGEND



Project Area



Main Roads Western Australia
North West Coastal Highway SLK 145.6
Targeted Flora and Fauna Survey

Job Number 61-27517
Revision 0
Date 12 Mar 2012

Locality Map

Figure 1

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Data Source: GHD: Project Area - 20090822; Landgate: 250k Mosaic - 2004; GA: Topo 250k Series 3 - 2006. Created by: mlogue, vdiinh

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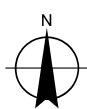
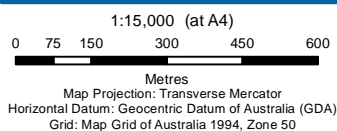
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LEGEND

-  Area of Interest
-  Project Area



Main Roads Western Australia
North West Coastal Highway SLK 145.6
Targeted Flora and Fauna Survey

Job Number	61-27517
Revision	0
Date	12 Mar 2012

Project Area

Figure 2

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
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Vegetation Type

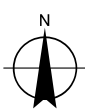
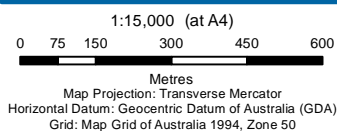
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|--|---|
| <p> 1 - Tall shrubland of <i>Acacia coolgardiensis</i>, <i>A. neurophylla</i> and <i>A. rhodophloia</i> over open heath of <i>Thryptomene ninghanensis</i> with <i>Baeckea pentagonantha</i> and <i>Melaleuca cordata</i></p> <p> 2 - Open woodland of <i>Eucalyptus loxophleba</i> over scattered <i>Acacia tetragonophylla</i> over mixed chenopods</p> <p> 3 - Tall shrubland of <i>Acacia</i> sp. narrow phyllode, <i>A. tetragonophylla</i> and <i>Hakea recurva</i> over mixed chenopods</p> <p> 4 - Open tree mallee of <i>Eucalyptus rigidula</i> and <i>E. eudesmioides</i> with scattered <i>Melaleuca atroviridis</i> over mixed shrubs</p> | <p> 5 - Tall shrubland of <i>Acacia tetragonophylla</i> and <i>A. sp.</i> narrow phyllode adjacent to granite outcrop and herbfield</p> <p> 6 - Regrowth / Rehabilitation Areas</p> <p> 7 - Cleared / Degraded Vegetation</p> <p> 8 - Open shrubland of <i>Acacia tetragonophylla</i>, <i>A. sp.</i> narrow phyllode and <i>A. ramulosa</i> var. <i>ramulosa</i> over mixed chenopods</p> |
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LEGEND

 Project Area



Main Roads Western Australia
North West Coastal Highway SLK 145.6
Targeted Flora and Fauna Survey

Location and Extent of
Vegetation Communities

Job Number 61-27517
Revision 0
Date 12 Mar 2012

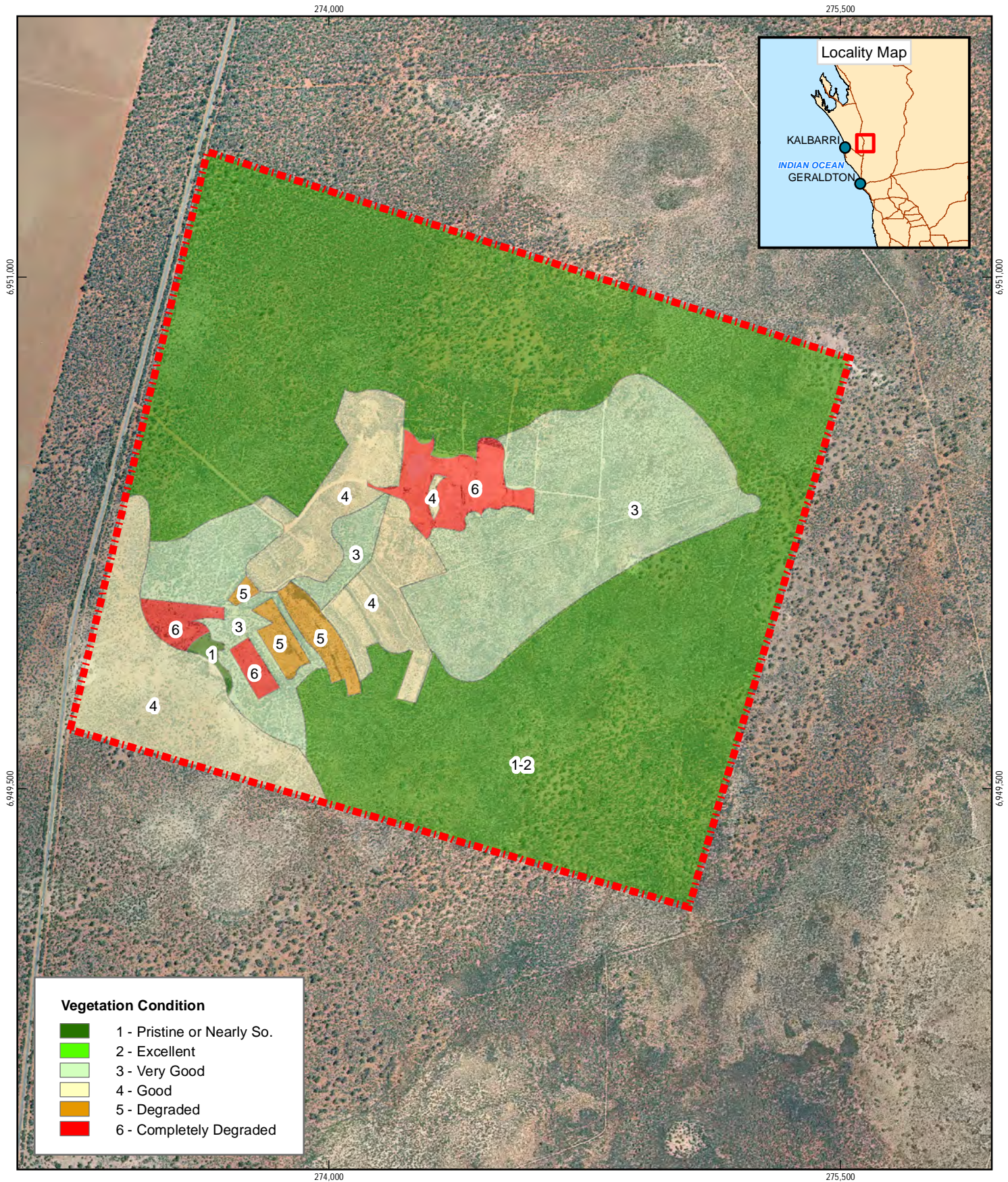
Figure 3

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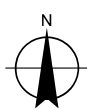
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LEGEND

Project Area

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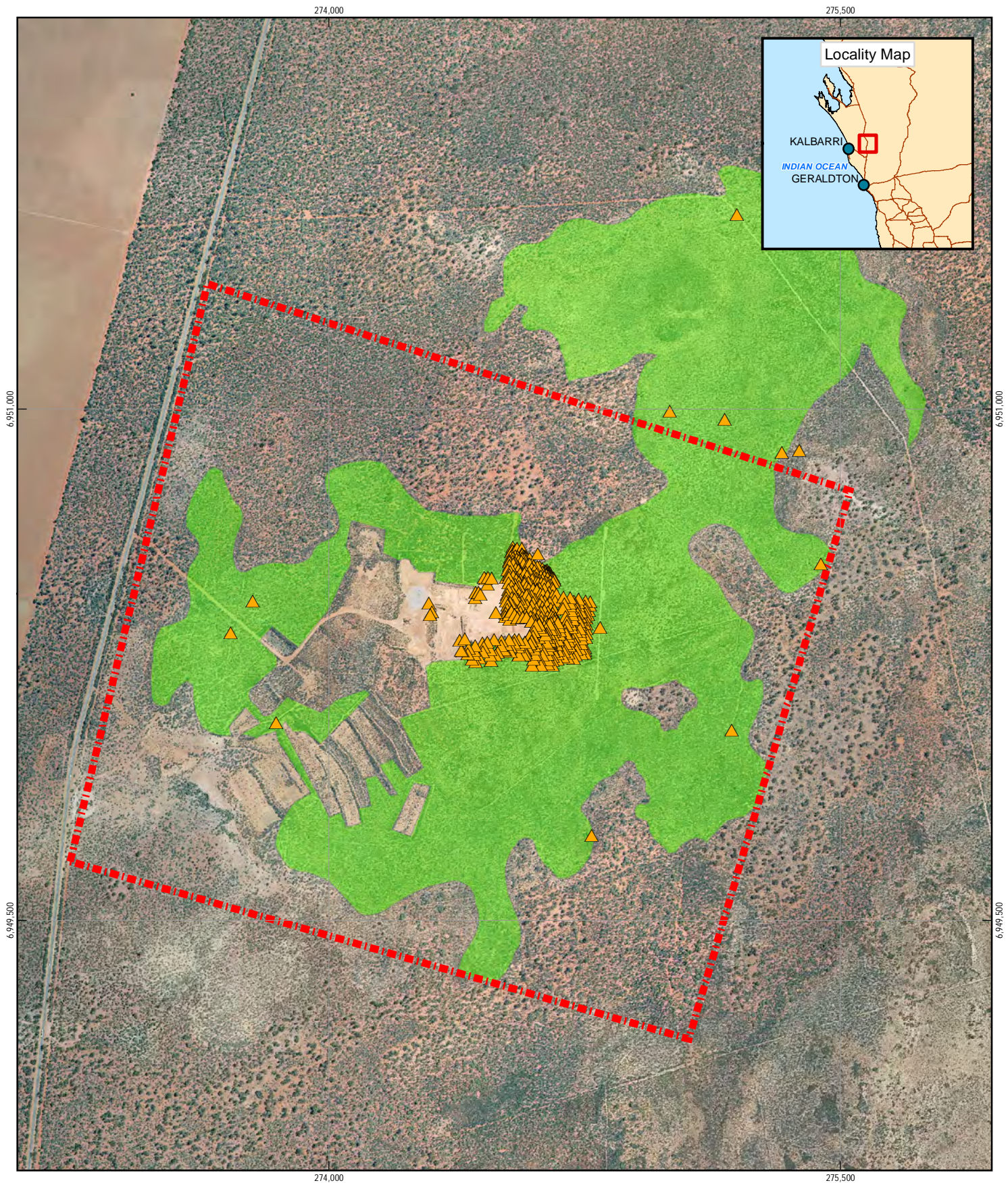


Main Roads Western Australia
North West Coastal Highway SLK 145.6
Targeted Flora and Fauna Survey




Job Number	61-27517
Revision	0
Date	12 Mar 2012

Vegetation Condition

Figure 4



LEGEND

-  *Thryptomene* sp. Wandana
-  *Thryptomene* sp. Wandana habitat
-  Project Area

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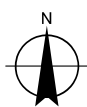
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Main Roads Western Australia
North West Coastal Highway SLK 145.6
Targeted Flora and Fauna Survey

Job Number	61-27517
Revision	0
Date	12 Mar 2012

Thryptomene sp. Wandana

Figure 5

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Data Source: Landgate: Anja Mosaic - Oct 2006; GHD: Project Area - 20090822, T. Wandana habitat - 20090730, T. Wandana (P3) - 20090730; GA: Topo 250k Series 3 - 2006. Created by: mlogue, vdin

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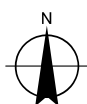
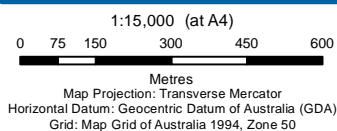
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LEGEND



Project Area

*Philotheca kalbarriensis* (P2)*Philotheca kalbarriensis* habitat

Main Roads Western Australia
North West Coastal Highway SLK 145.6
Targeted Flora and Fauna Survey

Job Number 61-27517
Revision 0
Date 12 Mar 2012

Habitat of
Philotheca kalbarriensis

Figure 6

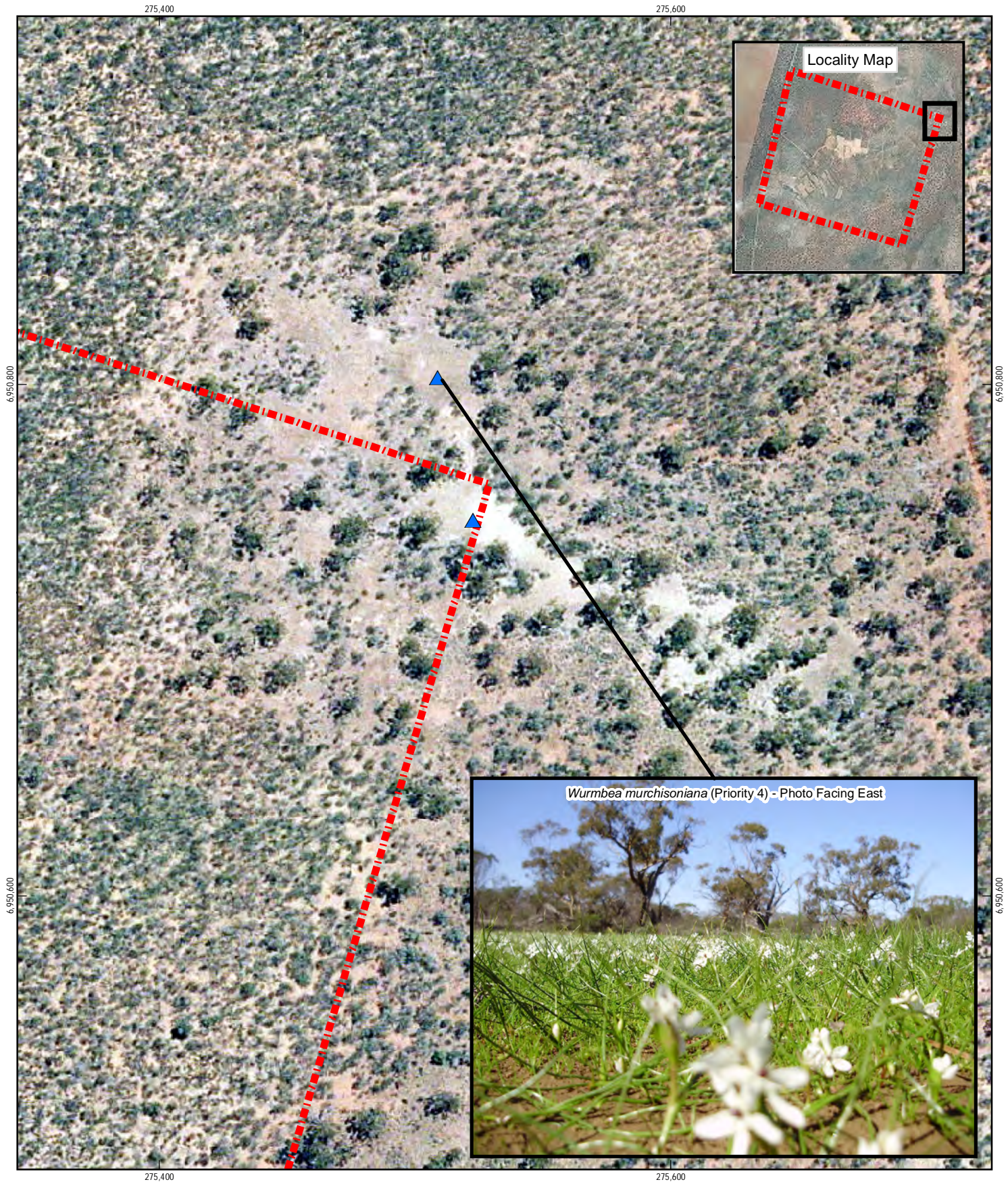
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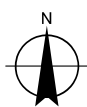
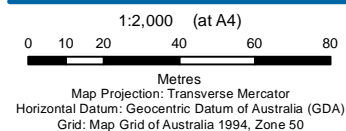
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Data Source: Landgate: Anja Mosaic - Oct 2006; GHD: Project Area - 20090822, *Philotheca kalbarriensis* (P2) - 20090730, *Philotheca kalbarriensis* Habitat - 20090730. GA: Topo 250k Series 3 - 2006. Created by: mlogue, vdmh



LEGEND

-  Wurmbea murchisoniana (P4)
-  Project Area

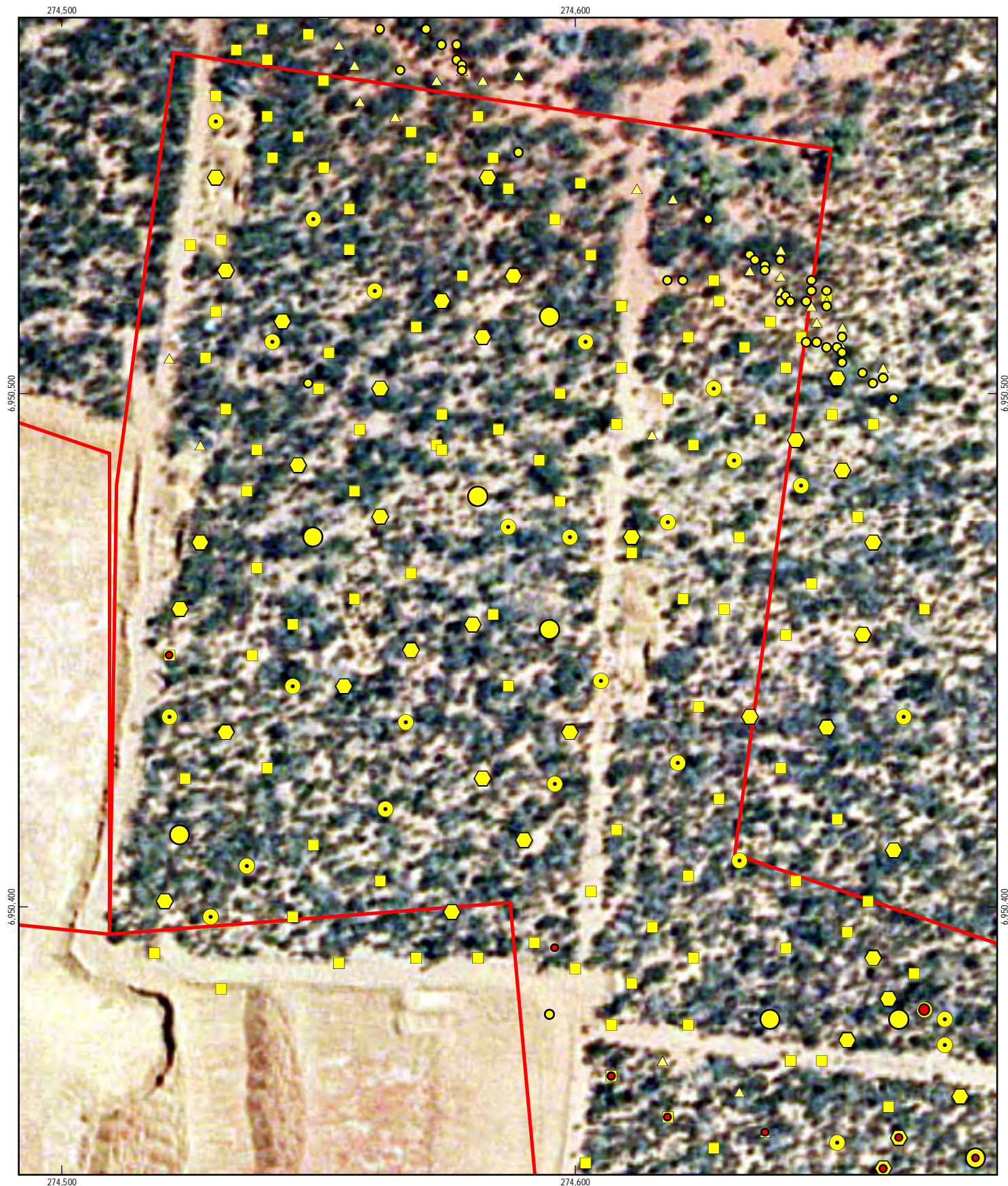


Main Roads Western Australia
North West Coastal Highway SLK 145.6
Targeted Flora and Fauna Survey

Job Number	61-23875
Revision	0
Date	12 Mar 2012

Habitat of
Wurmbea murchisoniana

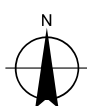
Figure 7



LEGEND

<i>Philothea kalbarriensis</i>	<i>Thryptomene sp. Wandana</i>	Count : 5 - 15	Count : 20 - 30	Area of interest
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Count : 1 - 5	Count : 1 - 5			

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Horizontal Datum: Geocentric Datum of Australia (GDA)
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Main Roads Western Australia
North West Coastal Highway SLK 145.6
Targeted Flora and Fauna Survey

Area of Interest
Pit expansion

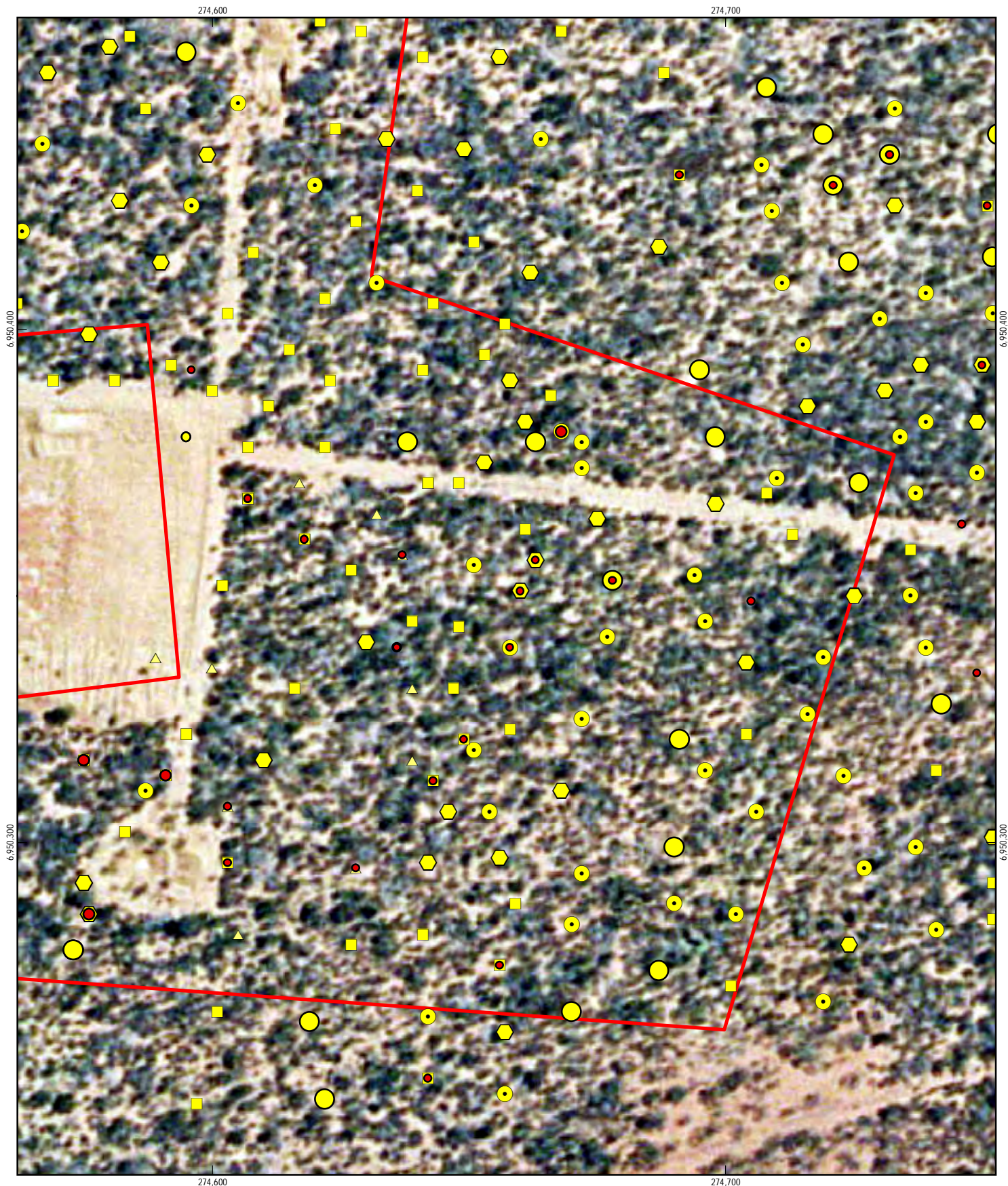
Job Number 61-27517
Revision 0
Date 12 Mar 2012

Map 1 of 9
Figure 8

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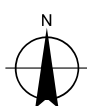
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Data Source: Landgate: Anja Mosaic - Oct 2006; GHD: Area of Interest - 20111019, Priority Species - 20111019. Created by: vdmh



LEGEND

<i>Philothea kalbarriensis</i>	<i>Thryptomene sp. Wandana</i>	Count : 5 - 15	Count : 20 - 30	Area of interest
Count : 1	Count : 1	Count : 15 - 20	Count : 30 - 46	
Count : 1 - 5	Count : 1 - 5			

1:1,000 (at A4)
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Metres
Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 50



Main Roads Western Australia
North West Coastal Highway SLK 145.6
Targeted Flora and Fauna Survey

Area of Interest
Pit expansion

Job Number 61-27517
Revision 0
Date 12 Mar 2012

Map 2 of 9
Figure 8

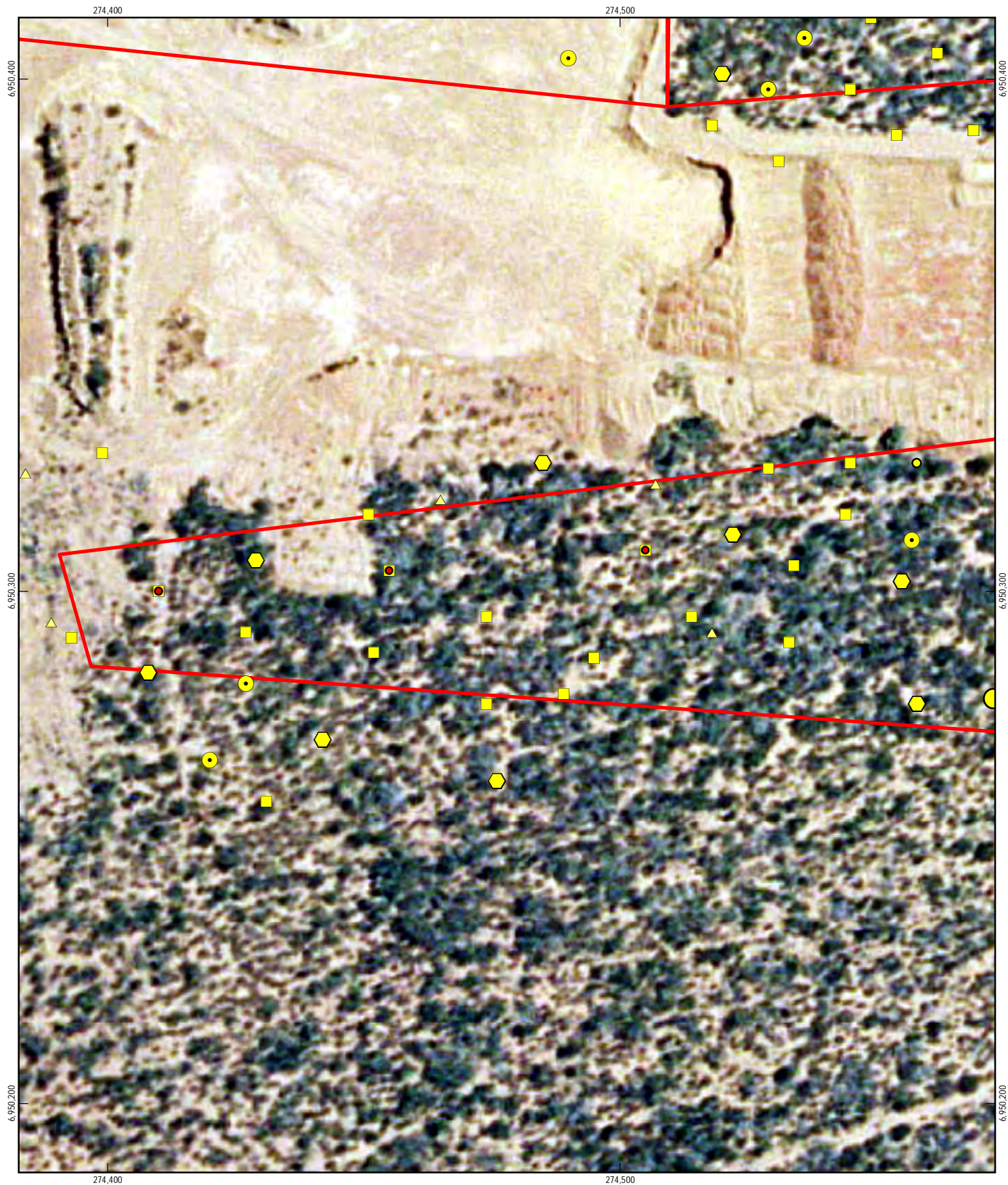
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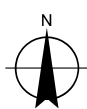
Data Source: Landgate: Anja Mosaic - Oct 2006; GHD: Area of Interest - 20111019, Priority Species - 20111019. Created by: vdiuh



LEGEND

<i>Philothea kalbarriensis</i>	<i>Thryptomene sp. Wandana</i>	Count : 5 - 15	Count : 20 - 30	Area of interest
Count : 1	Count : 1	Count : 15 - 20	Count : 30 - 46	
	Count : 1 - 5			

1:1,000 (at A4)
0 5 10 20 30 40
Metres
Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 50



Main Roads Western Australia
North West Coastal Highway SLK 145.6
Targeted Flora and Fauna Survey

Area of Interest
Pit expansion

Job Number 61-27517
Revision 0
Date 12 Mar 2012

Map 3 of 9
Figure 8

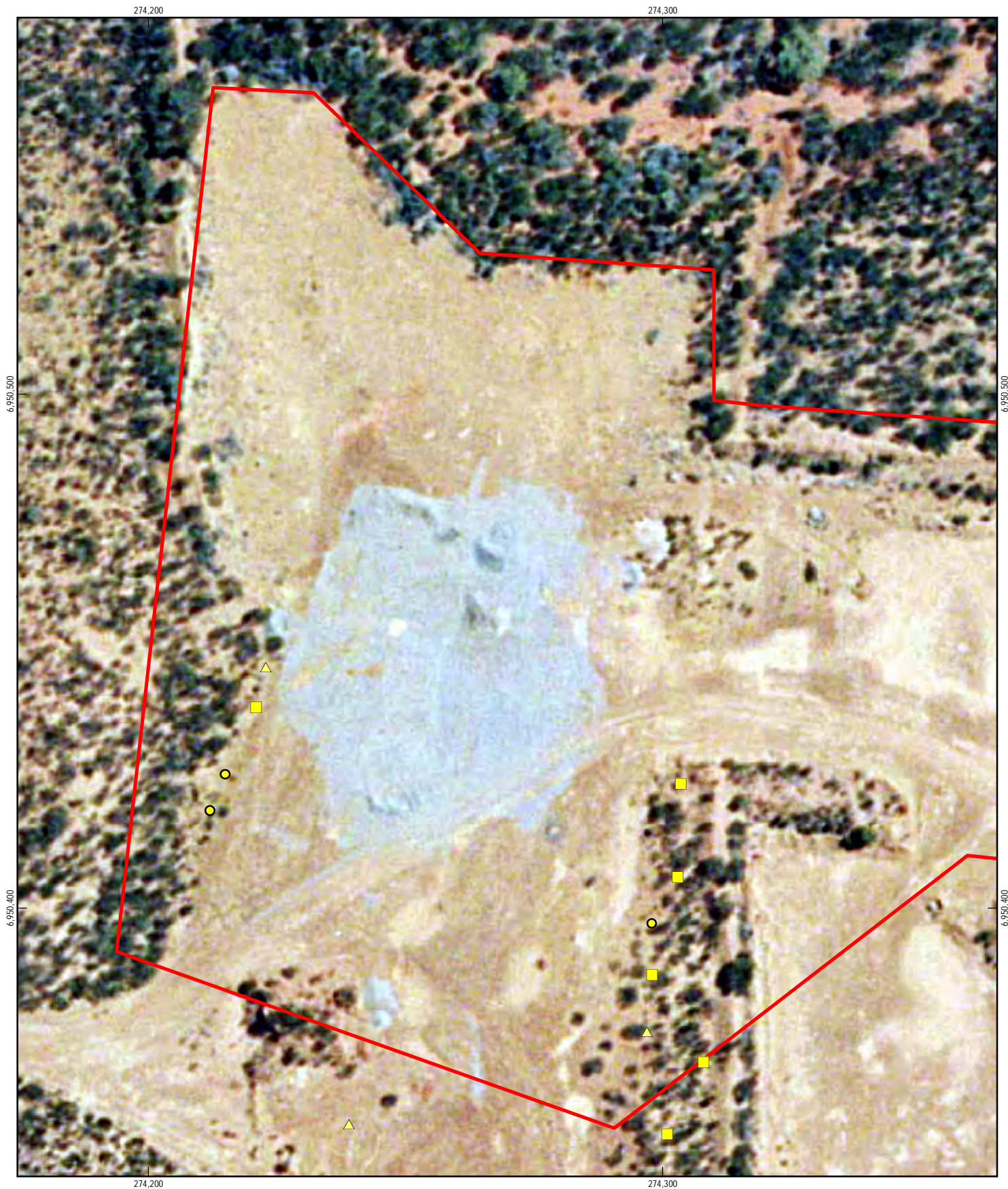
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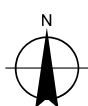
Data Source: Landgate: Anja Mosaic - Oct 2006; GHD: Area of Interest - 20111019, Priority Species - 20111019. Created by: vdinh



LEGEND

Thryptomene sp. Wandana ▲ Count : 1 - 5 Area of interest
● Count : 1 ■ Count : 5 - 15

1:1,000 (at A4)
0 5 10 20 30 40
Metres
Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 50



Main Roads Western Australia
North West Coastal Highway SLK 145.6
Targeted Flora and Fauna Survey

Job Number 61-27517
Revision 0
Date 12 Mar 2012

Area of Interest
Area to be rehabilitated near pit expansion

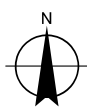
Map 4 of 9
Figure 8



LEGEND

Thryptomene sp. Wandana
 ▲ Count : 1 - 5 ● Count : 15 - 20 □ Area of interest
 ● Count : 1 ■ Count : 5 - 15 ● Count : 20 - 30

1:1,000 (at A4)
 0 5 10 20 30 40
 Metres
 Map Projection: Transverse Mercator
 Horizontal Datum: Geocentric Datum of Australia (GDA)
 Grid: Map Grid of Australia 1994, Zone 50



Main Roads Western Australia
 North West Coastal Highway SLK 145.6
 Targeted Flora and Fauna Survey

Job Number 61-27517
 Revision 0
 Date 12 Mar 2012

Area of Interest
 Area to be rehabilitated near pit expansion

Map 5 of 9
Figure 8

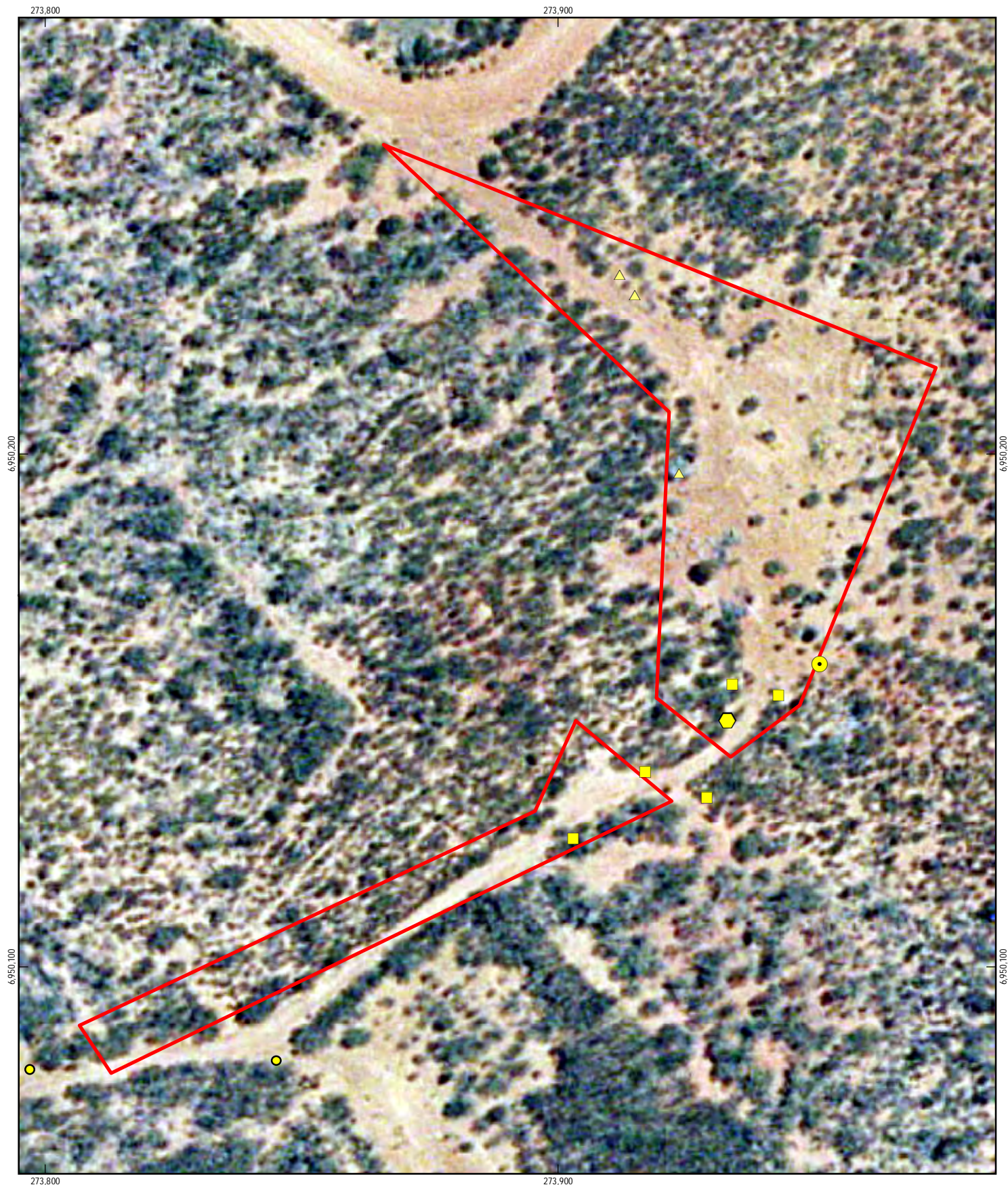
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LEGEND

Thryptomene sp. Wandana

Count : 1 - 5	Count : 15 - 20	Area of interest
Count : 1	Count : 5 - 15	Count : 20 - 30

1:1,000 (at A4)

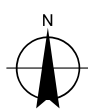
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Metres

Map Projection: Transverse Mercator

Horizontal Datum: Geocentric Datum of Australia (GDA)

Grid: Map Grid of Australia 1994, Zone 50



Main Roads Western Australia
North West Coastal Highway SLK 145.6
Targeted Flora and Fauna Survey

Area of Interest
Area to be rehabilitated near access road

Job Number	61-27517
Revision	0
Date	12 Mar 2012

Map 6 of 9

Figure 8

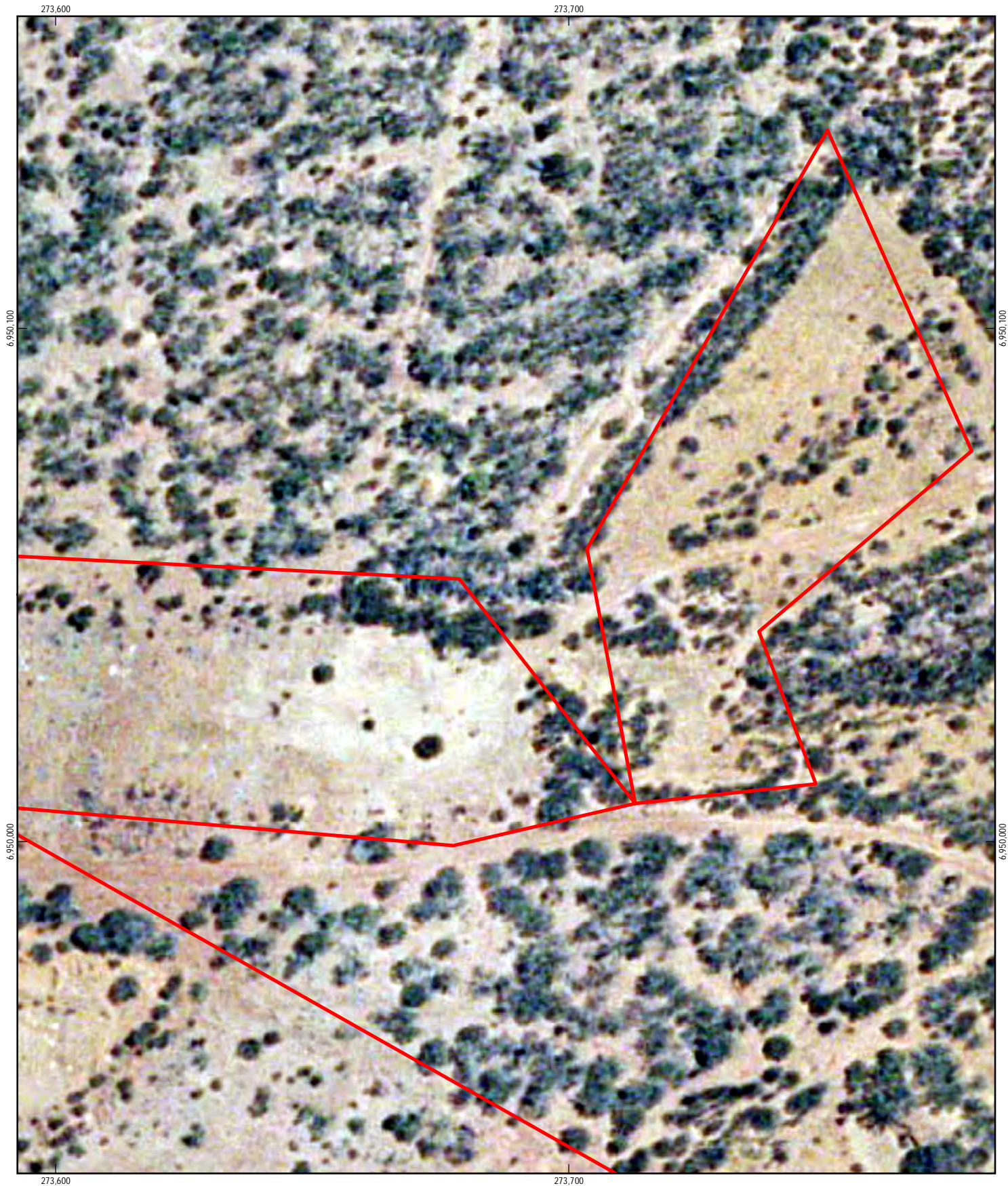
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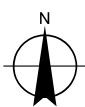
Data Source: Landgate: Anja Mosaic - Oct 2006; GHD: Area of Interest - 20111019, Priority Species - 20111019. Created by: vdinh



LEGEND

Area of interest

1:1,000 (at A4)
 0 5 10 20 30 40
 Metres
 Map Projection: Transverse Mercator
 Horizontal Datum: Geocentric Datum of Australia (GDA)
 Grid: Map Grid of Australia 1994, Zone 50



Main Roads Western Australia
 North West Coastal Highway SLK 145.6
 Targeted Flora and Fauna Survey

Area of Interest
 Area to be rehabilitated at southern end

Job Number	61-27517
Revision	0
Date	12 Mar 2012

Map 8 of 9
Figure 8

273,500

6,950,100

6,950,100

6,950,000

6,950,000

273,500

LEGEND

Area of interest

1:1,000 (at A4)

0

5

10

20

30

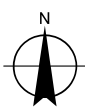
40

Metres

Map Projection: Transverse Mercator

Horizontal Datum: Geocentric Datum of Australia (GDA)

Grid: Map Grid of Australia 1994, Zone 50



Main Roads Western Australia
North West Coastal Highway SLK 145.6
Targeted Flora and Fauna Survey

Job Number	61-27517
Revision	0
Date	12 Mar 2012

Area of Interest
Area to be rehabilitated at southern end

Map 9 of 9
Figure 8

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Appendix B

Flora



Table 6 Eurardy Station North West Coastal Highway 145.6 Location of Conservation Significant Flora

Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	5	274521	6950507
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274548	6950502
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	21	274540	6950596
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274536	6950583
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274539	6950585
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274548	6950583
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274548	6950585
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274545	6950583
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274543	6950583
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274544	6950583
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274544	6950582
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274548	6950575
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	3	274550	6950577
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274550	6950576
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	274550	6950576
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274550	6950578
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274549	6950581
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274549	6950580
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274549	6950578
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	274551	6950574
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274556	6950575



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274556	6950575
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274558	6950575
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274562	6950571
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274552	6950593
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274567	6950593
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274567	6950577
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274568	6950574
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274571	6950571
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274574	6950568
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274577	6950568
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274577	6950565
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274578	6950564
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274578	6950563
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	274578	6950563
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	4	274582	6950561
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	4	274589	6950562
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	274619	6950538
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274626	6950534
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274634	6950527
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	274634	6950524
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274635	6950526
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274637	6950525



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274640	6950526
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	274640	6950528
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274637	6950524
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	274640	6950523
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	274640	6950520
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274640	6950518
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274641	6950519
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274642	6950518
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	274642	6950519
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274645	6950518
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274646	6950520
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274646	6950522
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274649	6950520
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274649	6950519
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274649	6950517
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	274649	6950518
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274645	6950518
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	274646	6950517
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	4	274647	6950514
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274645	6950510
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274647	6950510
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	274652	6950513



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274649	6950509
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274651	6950509
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274652	6950511
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	4	274652	6950509
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274652	6950508
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274652	6950506
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274656	6950504
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	4	274660	6950505
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274660	6950503
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274658	6950502
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274662	6950499
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274651	6950503
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274644	6950511
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274638	6950514
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	9	274628	6950518
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	274627	6950522
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274621	6950522
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274618	6950522
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	274612	6950540
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	274601	6950541
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274581	6950554
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274584	6950546



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274568	6950551
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	274573	6950561
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274566	6950563
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	5	274557	6950564
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	5	274554	6950568
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274548	6950570
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	9	274539	6950571
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	9	274534	6950567
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274540	6950565
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274551	6950561
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	5	274558	6950557
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	3	274565	6950554
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	9	274572	6950546
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	19	274583	6950542
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274587	6950540
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274589	6950547
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274596	6950534
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	274603	6950527
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274609	6950517
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274614	6950577
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	9	274622	6950511
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274633	6950509



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274641	6950505
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274650	6950496
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274658	6950494
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	16	274652	6950485
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	19	274643	6950491
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	9	274636	6950495
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	27	274627	6950501
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274618	6950499
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	274609	6950505
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	22	274602	6950510
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	37	274595	6950515
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	20	274588	6950523
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274578	6950523
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274569	6950513
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274556	6950536
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274551	6950544
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274546	6950550
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274540	6950554
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274530	6950558
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	25	274530	6950553
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274541	6950546
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	28	274549	6950534



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274556	6950528
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	30	274561	6950520
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274574	6950518
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	18	274582	6950511
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274597	6950500
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274608	6950494
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	5	274615	6950492
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274623	6950490
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	24	274631	6950487
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	23	274644	6950482
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	274655	6950476
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	18	274658	6950471
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274646	6950463
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274632	6950472
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	21	274618	6950475
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274611	6950472
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274597	6950479
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274593	6950487
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274585	6950493
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274574	6950496
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	19	274562	6950501
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274552	6950508



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	18	274543	6950514
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274531	6950530
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274530	6950542
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	9	274525	6950529
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	16	274532	6950524
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	9	274530	6950516
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	27	274541	6950510
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274550	6950501
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274558	6950493
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274573	6950490
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	9	274574	6950489
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	46	274581	6950480
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	25	274587	6950474
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	24	274599	6950472
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	274611	6950469
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	274621	6950460
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274629	6950458
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274641	6950453
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274656	6950453
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274668	6950458
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	23	274664	6950437
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	20	274649	6950435



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	16	274634	6950437
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274624	6950439
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	29	274605	6950444
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	36	274595	6950454
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274584	6950457
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274568	6950465
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274562	6950476
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274557	6950481
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	18	274546	6950486
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274538	6950489
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274532	6950497
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274528	6950507
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274528	6950497
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	3	274527	6950490
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274536	6950481
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	38	274549	6950472
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274557	6950460
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	16	274568	6950450
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274580	6950455
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274587	6950443
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	16	274599	6950434
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	21	274620	6950428



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274628	6950421
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274640	6950427
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274651	6950417
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	16	274662	6950411
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274657	6950401
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274643	6950405
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	21	274632	6950409
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274622	6950406
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274608	6950415
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	29	274596	6950424
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274582	6950425
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	22	274567	6950436
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	18	274555	6950443
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	274545	6950455
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274538	6950466
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274527	6950471
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	18	274523	6950458
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274521	6950449
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274537	6950449
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	24	274545	6950443
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	21	274563	6950419
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	18	274590	6950413



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274603	6950403
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274615	6950396
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274623	6950390
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274641	6950392
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	9	274653	6950395
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	19	274658	6950390
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274666	6950387
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274661	6950382
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	25	274672	6950378
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	23	274668	6950380
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	33	274663	6950378
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	20	274653	6950374
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	31	274638	6950378
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274622	6950377
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274611	6950385
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	274607	6950377
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274600	6950388
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274592	6950393
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274576	6950399
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274562	6950405
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	9	274549	6950412
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274540	6950427



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	18	274532	6950434
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	21	274521	6950437
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274524	6950425
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	35	274523	6950414
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274520	6950401
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274518	6950391
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274531	6950384
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	29	274529	6950398
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	26	274536	6950408
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274545	6950398
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274554	6950389
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	9	274569	6950390
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274581	6950390
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274595	6950379
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274642	6950370
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	29	274529	6950398
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	26	274536	6950408
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274545	6950398
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274554	6950389
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	9	274569	6950390
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274581	6950390
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274595	6950379



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274642	6950370
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274796	6950359
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274756	6950356
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	43	274755	6950370
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	18	274755	6950387
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	21	274761	6950397
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274763	6950410
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	25	274766	6950425
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274767	6950436
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	37	274753	6950438
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274751	6950424
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	46	274752	6950414
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	28	274752	6950403
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	20	274750	6950393
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	20	274749	6950382
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	28	274749	6950372
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	24	274756	6950343
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	21	274754	6950330
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274451	6950315
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	18	274752	6950301
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274752	6950292
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274752	6950285



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	22	274741	6950283
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	25	274737	6950299
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274741	6950314
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	31	274742	6950327
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	27	274739	6950338
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	29	274736	6950348
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	24	274737	6950368
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	25	274739	6950382
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274738	6950393
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	27	274739	6950407
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	20	274733	6950424
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	33	274732	6950434
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	27	274733	6950443
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	38	274719	6950438
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	32	274721	6950428
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	33	274724	6950413
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	26	274730	6950402
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	20	274731	6950388
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	27	274734	6950379
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	36	274726	6950370
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274736	6950357
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	20	274725	6950348



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	29	274719	6950336
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	21	274716	6950325
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	24	274723	6950313
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	24	274727	6950295
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274724	6950280
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	21	274719	6950269
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274701	6950272
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	30	274702	6950286
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	22	274706	6950306
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274704	6950321
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	19	274704	6950335
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274708	6950368
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274713	6950360
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	25	274710	6950371
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	19	274716	6950385
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	29	274715	6950397
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	22	274711	6950409
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	28	274709	6950423
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	25	274707	6950432
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	41	274708	6950447
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	274688	6950450
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274691	6950430



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	18	274687	6950416
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	26	274490	6950404
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	36	274695	6950392
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	45	274698	6950379
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274698	6950366
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	22	274694	6950352
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	23	274696	6950343
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	45	274691	6950320
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	23	274696	6950314
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	43	274690	6950299
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	21	274690	6950288
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	32	274687	6950275
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	39	274670	6950267
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	30	274670	6950284
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	21	274672	6950294
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274668	6950310
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	22	274672	6950324
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	24	274677	6950340
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	37	274678	6950351
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	18	274675	6950363
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	28	274672	6950373
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274661	6950361



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	16	274663	6950355
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	16	274660	6950349
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	26	274658	6950338
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274658	6950322
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	24	274651	6950318
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	24	274654	6950306
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	16	274656	6950297
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274659	6950288
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274656	6950276
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	20	274657	6950263
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	24	274657	6950251
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274642	6950254
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	26	274642	6950266
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274641	6950282
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	20	274642	6950296
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	19	274646	6950306
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274643	6950312
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	274649	6950320
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	274647	6950330
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274648	6950342
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	26	274651	6950354
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274648	6950370



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	5	274632	6950364
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	5	274637	6950356
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	274639	6950343
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	4	274639	6950330
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	5	274639	6950316
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274633	6956307
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	5	274628	6950295
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274627	6950280
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	35	274619	6950265
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	37	274622	6950250
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274597	6950249
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274601	6950267
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	3	274605	6950282
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	9	274603	6950296
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	274603	6950307
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274610	6950316
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274616	6950330
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	18	274630	6950339
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274636	6950338
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274627	6950353
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	274618	6950359
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	4	274617	6950370



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274607	6950367
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274602	6950350
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	3	274600	6950334
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	5	274589	6950336
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274595	6950321
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274591	6950313
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274583	6950302
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274575	6950292
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	16	274576	6950286
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	36	274573	6950279
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	18	274558	6950278
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	20	274555	6950302
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	30	274587	6950310
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274575	6950316
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274602	6950350
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	274618	6950359
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	4	274617	6950370
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274607	6950367
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274602	6950350
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	3	274600	6950334
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	5	274589	6950336
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274595	6950321



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274591	6950313
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274583	6950302
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274575	6950292
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	16	274576	6950286
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	36	274573	6950279
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	18	274558	6950278
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	20	274555	6950302
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	30	274557	6950310
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274575	6950316
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274558	6950325
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274545	6950325
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274544	6950315
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274534	6950305
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274533	6950290
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	5	274518	6950292
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274514	6950295
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	18	274522	6950311
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274529	6950324
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	5	274507	6950321
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274505	6950308
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274495	6950287
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	274489	6950280



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	16	274476	6950263
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274474	6950278
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	9	274474	6950295
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	16	274485	6950325
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	3	274465	6950318
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274455	6950304
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274452	6950288
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	19	274442	6950271
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274431	6950259
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	25	274420	6950267
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	29	274427	6950282
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	11	274427	6950292
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	20	274429	6950306
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	274410	6950300
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	16	274408	6950284
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	274393	6950291
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	5	274389	6950294
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	3	274384	6950323
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274399	6950327
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	3	274429	6950447
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P2	1	274426	6950457
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	17	274431	6950464



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	3	274438	6950462
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274440	6950464
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	4	274444	6950459
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	274466	6950486
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274460	6950503
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274456	6950508
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	274468	6950508
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274477	6950504
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	274294	6950432
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274303	6950406
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274298	6950397
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274298	6950387
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	4	274297	6950376
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	14	274308	6950370
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	274301	6950356
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	7	274303	6950340
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	5	274298	6950313
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	3	274239	6950358
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	273912	6950235
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	3	273915	6950231
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	2	273933	6950194
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	30	273951	6950159



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	8	273943	6950153
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	12	273934	6950155
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	16	273933	6950148
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	13	273929	6950133
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	15	273917	6950138
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	6	273903	6950125
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	273797	6950080
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274212	6950419
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	1	274215	6950426
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	10	274221	6950439
Myrtaceae	Thryptomene	sp. Wandana (M.E. Trudgen MET 22016)		P3	3	274227	6950444
Rutaceae	Philotheca	kalbarriensis		P2	1	274521	6950449
Rutaceae	Philotheca	kalbarriensis		P2	2	274668	6950380
Rutaceae	Philotheca	kalbarriensis		P2	1	274596	6950392
Rutaceae	Philotheca	kalbarriensis		P2	1	274763	6950410
Rutaceae	Philotheca	kalbarriensis		P2	1	274751	6950424
Rutaceae	Philotheca	kalbarriensis		P2	1	274750	6950393
Rutaceae	Philotheca	kalbarriensis		P2	1	274746	6950362
Rutaceae	Philotheca	kalbarriensis		P2	1	274749	6950333
Rutaceae	Philotheca	kalbarriensis		P2	1	274732	6950434
Rutaceae	Philotheca	kalbarriensis		P2	1	274721	6950428
Rutaceae	Philotheca	kalbarriensis		P2	1	274705	6950347



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Rutaceae	Philotheca	kalbarriensis		P2	1	274691	6950430
Rutaceae	Philotheca	kalbarriensis		P2	1	274678	6950351
Rutaceae	Philotheca	kalbarriensis		P2	1	274663	6950355
Rutaceae	Philotheca	kalbarriensis		P2	1	274660	6950349
Rutaceae	Philotheca	kalbarriensis		P2	1	274658	6950338
Rutaceae	Philotheca	kalbarriensis		P2	1	274656	6950276
Rutaceae	Philotheca	kalbarriensis		P2	1	274642	6950254
Rutaceae	Philotheca	kalbarriensis		P2	1	274643	6950312
Rutaceae	Philotheca	kalbarriensis		P2	1	274649	6950320
Rutaceae	Philotheca	kalbarriensis		P2	1	274637	6950356
Rutaceae	Philotheca	kalbarriensis		P2	1	274628	6950295
Rutaceae	Philotheca	kalbarriensis		P2	1	274603	6950296
Rutaceae	Philotheca	kalbarriensis		P2	1	274603	6950307
Rutaceae	Philotheca	kalbarriensis		P2	1	274636	6950338
Rutaceae	Philotheca	kalbarriensis		P2	1	274618	6950359
Rutaceae	Philotheca	kalbarriensis		P2	1	274607	6950367
Rutaceae	Philotheca	kalbarriensis		P2	2	274591	6950313
Rutaceae	Philotheca	kalbarriensis		P2	2	274576	6950286
Rutaceae	Philotheca	kalbarriensis		P2	2	274575	6950316
Rutaceae	Philotheca	kalbarriensis		P2	1	274618	6950359
Rutaceae	Philotheca	kalbarriensis		P2	1	274607	6950367
Rutaceae	Philotheca	kalbarriensis		P2	2	274591	6950313



Family	Genus	Species	Common Name	Status	Plant Count	Easting	Northing
Rutaceae	Philotheca	kalbarriensis		P2	2	274576	6950286
Rutaceae	Philotheca	kalbarriensis		P2	2	274575	6950316
Rutaceae	Philotheca	kalbarriensis		P2	1	274505	6950308
Rutaceae	Philotheca	kalbarriensis		P2	1	274455	6950304
Rutaceae	Philotheca	kalbarriensis		P2	1	274410	6950300



Appendix C

Fauna



Table 7 NWCH SLK 145.6 Survey Areas Fauna Records

Type	Family	Genus	Species	Common Name	EPBC	WC	DEC	Exotic	Record	2011	2009
Birds	Psittacidae	<i>Melopsittacus</i>	<i>undulatus</i>	Budgerigar							x
Birds	Casuariidae	<i>Dromaius</i>	<i>novaehollandiae</i>	Emu						x	x
Birds	Cacatuidae	<i>Nymphicus</i>	<i>hollandicus</i>	Cockatiel							x
Birds	Campephagidae	<i>Coracina</i>	<i>novaehollandiae</i>	Black-faced Cuckoo-Shrike	Ma					x	x
Birds	Accipitridae	<i>Aquila</i>	<i>audax</i>	Wedge-tailed eagle							x
Birds	Pomatostomidae	<i>Pomatostomus</i>		Babbler							x
Birds	Columbidae	<i>Ocyphaps</i>	<i>lophotes</i>	Crested Pigeon							x
Birds	Cactuidae	<i>Eolophus</i>	<i>roseicapilla</i>	Galah							x
Birds	Accipitridae	<i>Accipiter</i>	<i>cirrocephalus</i>	Collared Sparrowhawk							x
Birds	Dicruridae	<i>Grallina</i>	<i>cyanoleuca</i>	Magpie-lark						x	
Birds	Hirundinidae	<i>Hirundo</i>	<i>neoxena</i>	Welcome Swallow						x	
Birds	Dicruridae	<i>Rhipidura</i>	<i>fuliginosa</i>	Grey-Fantail						x	
Mammals	Leporidae	<i>Oryctolagus</i>	<i>cuniculus</i>	Rabbits	*					x	x
Mammals	Felidae	<i>Felis</i>	<i>catus</i>	Cat	*						x
Mammals	Bovidae	<i>Capra</i>	<i>hircus</i>	Goats	*					x	
Reptiles	Agamidae	<i>Pogona</i>	<i>minor</i> subsp. <i>minor</i>	Bearded Dragon							x
Reptiles	Agamidae	<i>Ctenophorus</i>	<i>scutulatus</i>	Lozenge-marked Dragon							x



Appendix D

Assessment Against the Ten Clearing Principles



(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Methodology	Desktop assessment of available information and field survey results
Survey Results	<p>Plant Species</p> <ul style="list-style-type: none"> Total Vascular Plant Taxa GHD (2009) recorded a total of 72 flora taxa from 53 genera and 31 families in the Project Area, representing a moderate level of diversity, with two introduced species. This total is considered to be similar to that found in the local and regional area. Vascular Plant Taxa Diversity Diversity in the Project Area is considered to be comparable to that found in the local area; in similar habitats around Eurardy Station. <p>Significant Plant Species</p> <ul style="list-style-type: none"> Three priority species were identified by GHD (2009) these were <i>Philotheca kalbarriensis</i> (Priority 2), <i>Thryptomene</i> sp. <i>Wandana</i> (Priority 3) and <i>Wurmbea murchisoniana</i> (Priority 4). <i>T. sp. Wandana</i> occurred in the preferred habitat area as identified in by GHD (2009). The survey conducted in October 2011, indicated a total of 4450 plants and a density of 508 plants per hectare within the proposed disturbance areas of the Project Area. The highest density was recorded in the NW Area of Interest, with a density of 944.58 plants per hectare. These species were recorded in the Project Area are likely to be under threat by the proposed works. However, the population recorded in the Project Area for proposed works is only 4.37% of the total recorded plants occurring within the study boundary. This is based on the total area of 200 hectares, <i>T. sp. Wandana</i> preferred habitat (Figure X) and based on the average population of 508.38 plants/ha, totally 101,673 plants. In addition this is the most known northern extent for this species to occur, as this species has been recorded in Wandana Nature Reserve, Dartmore Road, Bulla, Mc Gauran Nature Reserve, Mount Singleton, Ninghan district, Coolcalalaya Station and the Murchison River. <i>P.kalbarriensis</i> was recorded in low numbers in the area and surroundings. GHD considers that this species will not be impacted by the proposed works, as they occur in greater numbers outside the Project Area. <p>Fauna Species</p> <ul style="list-style-type: none"> Total Fauna Taxa The reconnaissance fauna survey recorded seven bird taxa and one mammal taxa from the Project Area. The survey result was considered to be a relatively good reflection of fauna species present, considered the high level of disturbance. <p>Ecosystem Diversity</p> <ul style="list-style-type: none"> Number of Ecological Communities (Plant, Fauna) GHD (2009) identified a total of eight vegetation types and three fauna habitats were recorded from the Project Area. This includes a cleared/degraded vegetation type. Habitat Diversity Habitats (macro- and microhabitats) found in the Project Area are also present in the local area in similar or better condition. Variety of Soil Types/Geological Formations Soil types or geological formations in the Project Area are also present in the local and regional area.
Assessment	Due to the low percentage of individual plants being impacted in the local area, the proposed works are considered unlikely to be at variance with clearing principle.



- b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Methodology	Desktop assessment of available information and field survey results
Survey Results	<p>Significant Fauna</p> <ul style="list-style-type: none"> Threatened Fauna <p>The desktop assessment indicated that threatened fauna may potentially utilise the Project Area.</p> <p>A potential habitat for the Western Spiny-tailed Skink was recorded within the northern extent of the Project Area. However, the desktop assessment indicated that it is not likely for the Western Spiny-tailed Skink to occur within the Project Area, because the closest known location was recorded at Bowgada and Perenjori on Wubin Mullewa Road. This habitat type is considered to be common in the local and regional area. No Threatened Fauna taxa were recorded from the Project Area.</p> <p>The Project Area comprised of a habitat area suitable for Malleefowl, however no nest mounds were recorded in 2009 and 2011 surveys.</p> <p>The Project Area also comprised of a potential habitat suitable for the Shielded Backed Trapdoor Spider, however no burrows recorded by GHD in 2009 and 2011 surveys.</p> Priority Fauna <p>The desktop assessment indicated the presence of priority fauna may potentially utilise the Project Area</p> Other Significant Fauna <p>The desktop assessment indicated that significant fauna may occur in the Project Area. Five EPBC Act Marine and/or Migratory Listed species were recorded from the Project Area. These species are considered common in Western Australia and are not under threat.</p> <p>Habitat</p> <ul style="list-style-type: none"> Significant Habitat / Habitats of Significance <p>No habitat deemed to be significant occurs in the Project Area. Habitat in the Project Area also occurs in the local area in similar or better condition. The habitat in the Project Area is disturbed by road maintenance, urban development and agricultural activities.</p> Habitat Extent and Retention <p>Habitats recorded in the Project Area are also found in the local area in similar or better condition. The proposed Project will not significantly diminish the extent of these habitats.</p> Ecological Corridors <p>The habitat in the Project Area occurs in a region with relatively disturbed ecological corridors, as a result of existing Material Pits. Therefore due to the disturbed nature, these corridors are not considered to be impacted by the proposed project.</p>
Assessment	The Project Area does not comprise of the potential habitat for the Western Spiny-tailed Skink. However their potential habitat occurs in outside the proposed area of works. Therefore the proposed works is not considered to be at variance with this clearing principle.



(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Methodology	Desktop assessment of available information and field survey results
Survey Results	<p>Rare Flora</p> <ul style="list-style-type: none"> • Presence No Threatened (Declared Rare) Flora taxa were indicated to occur within the vicinity of the Project Area as a result of database searches. No Threatened (Declared Rare) Flora taxa were recorded in the Project Area during the field survey. • Habitat No habitat considered to be required for the continued existence of Threatened Flora is considered to be present in the Project Area.
Assessment	Not considered to be at variance with clearing principle.

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Methodology	Desktop assessment of available information and field survey results
Survey Results	<p>Vegetation</p> <ul style="list-style-type: none"> • Extent and Status Vegetation Associations within the vicinity of the Project Area are considered to Vulnerable with 10% remaining. Vegetation types recorded in the Project Area are considered to be equivalent to the Vegetation Associations indicated by Beard. • Communities No Threatened or Priority Ecological Communities were recorded from the Project Area. • Areas No Environmentally Sensitive Areas occur within or immediately adjacent to the Project Area.
Assessment	Not considered to be at variance within clearing principle.



(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Methodology	Desktop assessment of available information and field survey results
Survey Results	<p>Vegetation</p> <ul style="list-style-type: none"> Extent and Status Vegetation Associations within the vicinity of the Project Area is considered Least Concern, with 81.1% (11,128.9 ha) of the pre-European extent considered to be remaining in the Geraldton Sandplains. Vegetation types recorded in the Project Area are considered to be equivalent to the Vegetation Associations indicated by Beard. Regionally Significant Areas Vegetation within the Project Area is not considered to contain communities required to maintain ecosystem services (e.g. hydrological processes).
Assessment	Not considered to be at variance with clearing principle.

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Methodology	Desktop assessment of available information and field survey results
Survey Results	<p>Watercourses and Wetlands</p> <ul style="list-style-type: none"> Vegetation There are no water courses or wetlands within the Project Area. No groundwater dependent ecosystems occur within or adjacent to the Project Area.
Assessment	Not considered to be at variance with clearing principle.



(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Methodology	Desktop assessment of available information and field survey results
Survey Results	<p>Land Degradation</p> <ul style="list-style-type: none"> • Soil Erosion <p>The Project proposes to clear vegetation to allow for the material pit investigation. Short-term soil erosion may occur at the Project site due to excavation requirements. However, any long-term soil erosion can be mitigated by use of appropriate design and site management measures.</p> <ul style="list-style-type: none"> • Soil Acidity <p>The clearing of vegetation is not considered negligible, as there is an extremely low probability for ASS to occur within the Project Area.</p>
Assessment	Not considered to be at variance with clearing principle.

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Methodology	Desktop assessment of available information and field survey results
Survey Results	<p>Conservation Areas</p> <ul style="list-style-type: none"> • Protected Areas <p>Kalbarri National Park and Toolonga Nature Reserve are located approximately 5 km to the south-west and 50 km to the north-east of the Project Area respectively. These conservation areas are a significant distance from the Project Area. Clearing of vegetation within the Project Area is not likely to have an impact on the environmental values of these conservation areas.</p> <ul style="list-style-type: none"> • Ecological Linkages <p>The Project Area occurs in a region where the vegetation where ecological linkages remain mostly intact. Existing ecological linkages are not considered to be impacted by the proposed works.</p>
Assessment	Not considered to be at variance with clearing principle.



(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Methodology	Desktop assessment of available information and field survey results
Survey Results	<p>Water Quality</p> <ul style="list-style-type: none"> Catchment Areas No proclaimed Public Drinking Water Supply Catchment occurs within the Project Area. Groundwater The clearing of vegetation is not considered to cause an alteration to the quality of groundwater in or adjacent to the Project Area. No groundwater dependent ecosystems occur in or adjacent to the Project Area. Surface Water No surface water occurs in or adjacent to the Project Area.
Assessment	Not considered to be at variance with clearing principle.

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Methodology	Desktop assessment of available information and field survey results
Survey Results	<p>Water Quantity</p> <ul style="list-style-type: none"> Flooding The clearing of vegetation in the Project Area is not considered to alter the frequency or intensity of flood events. Runoff coefficients in the Project Area are not likely to be significantly altered by the clearing of native vegetation.
Assessment	Not considered to be at variance with clearing principle.



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Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	S. Petts	J. Foster		J. Foster		13/03/12