THREE PROPERTIES ROSEBURN ROAD, ROSEVALE

BOTANICAL & FAUNA HABITAT SURVEY

For ABX4 PTY LTD

13th July 2012

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1.0 Introduction:

ABX4 Pty Ltd, a wholly owned subsidiary of Australian Bauxite Ltd is undertaking an exploratory program over three properties located off Roseburn Road at Rosevale between Launceston and Westbury. Two of the properties are owned by Gunns Ltd and one by Mr Tim Eddington.

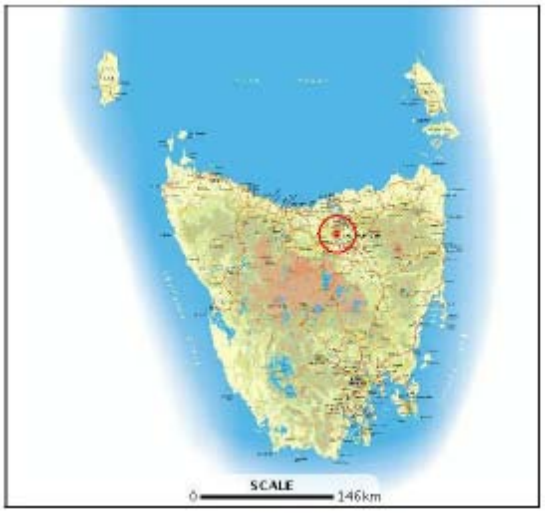
The exploration program will involve numerous shallow drill holes which will not require the clearing and/or leveling of drill pad sites and so is expected to have a minimal impact on the ground surface and adjacent vegetation. It is proposed to locate drill sites along and adjacent to existing vehicular tracks and along previously cleared property boundaries.

A botanical and fauna habitat survey is required as part of the MRT licence conditions to determine any likely impacts on threatened species or threatened vegetation communities.

1.1 Objectives: The objectives of this survey were to;

- Undertake a desktop survey to confirm the known biological records and the natural values present in the exploration target areas and in the vicinity.
- Undertake a field survey of the exploration target areas to observe and record the natural values present including the vegetation types and plant communities, the flora and in particular any threatened species and potential habitat for species of threatened fauna.
- Determine the possible impacts of the proposed exploration program on the natural values present and make recommendations on how those impacts can be minimised.

1.2 Location of Study Area:



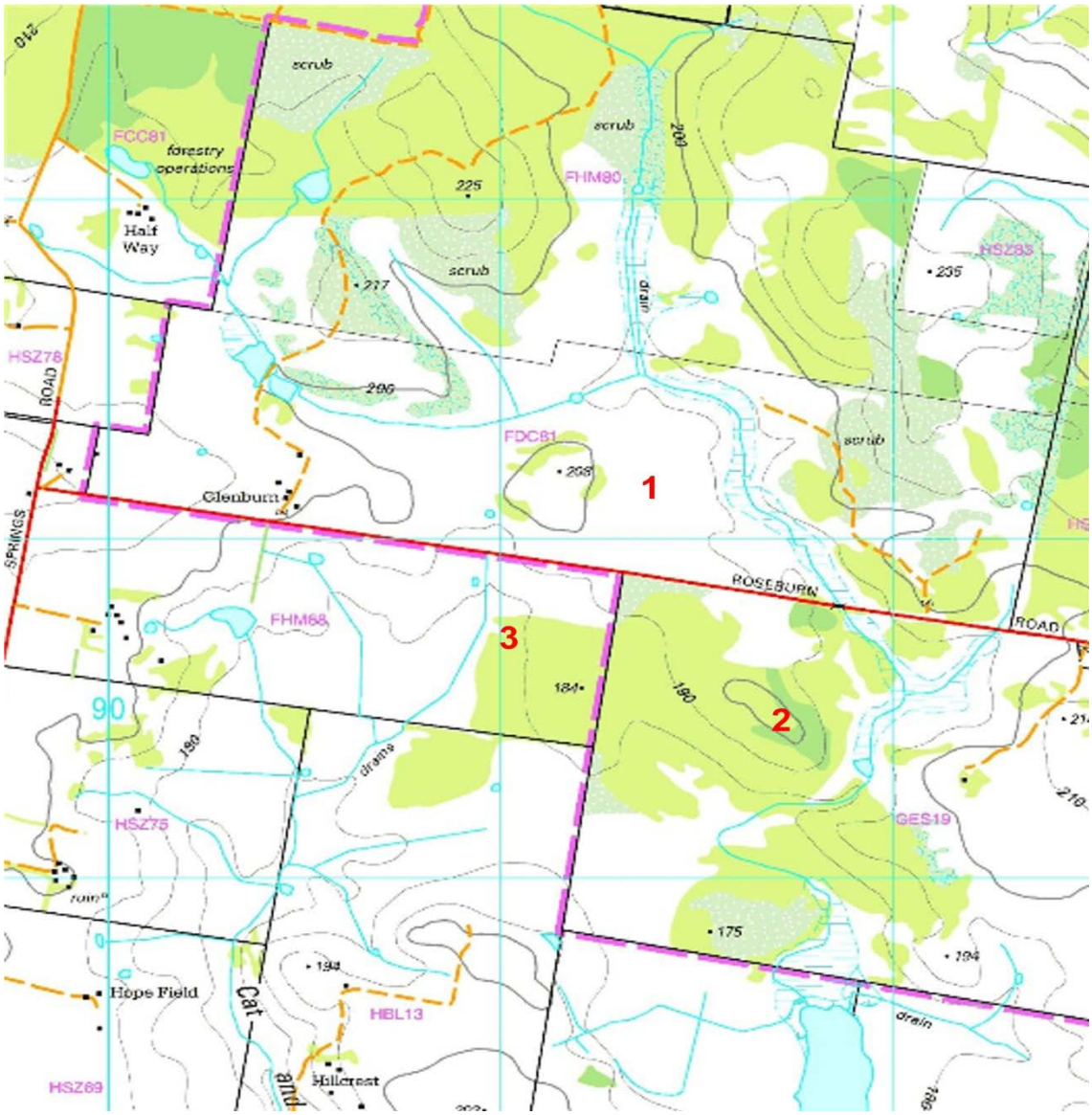
MAP REF: Tasmap 1:25,000, Sheet No. 4841, Bridgenorth

BIOREGION: Northern Midlands

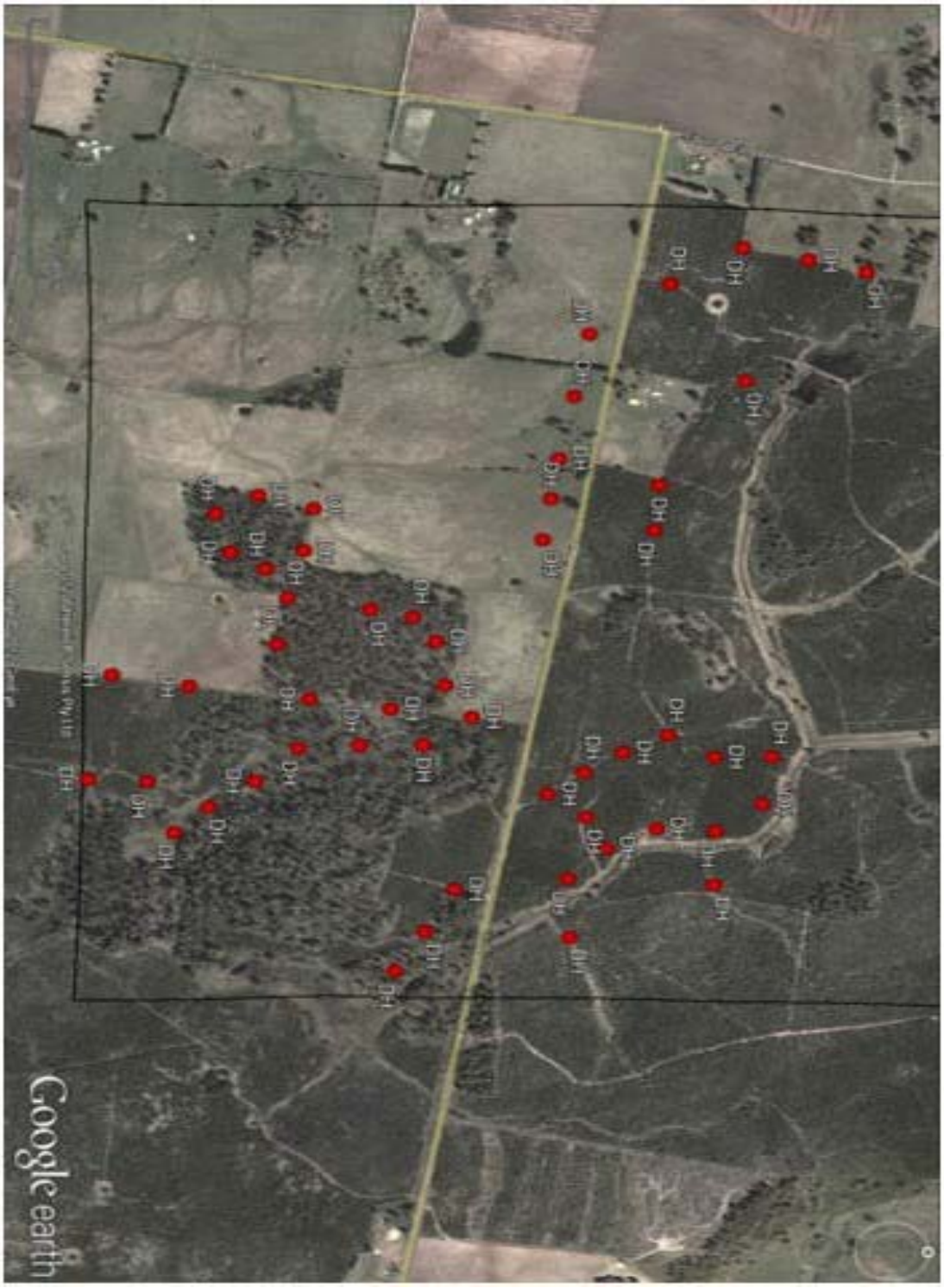
GRID REF: 491400E – 5412755N
(All Grid References MGA Zone 55 GDA94)

1.3 Site Description:

The target area on the property to the north of Roseburn Road (Area No.1) between the road and the creek-line was originally agricultural land with pasture but has been converted to Eucalypt plantation within the last 5 years. Two small pockets of natural vegetation remain on a rocky outcrop near the highest point. A creek-line extends through this property and Area No.2.
The Gunns property to the south of Roseburn Road (Area No.2) was originally composed of areas previously cleared for agriculture, native grasslands and remnant native forest. The native grasslands and pasture have since been converted to Eucalypt plantation and most of the native forest has been selectively logged and is in a relatively early stage of regeneration.
The area of the adjoining property owned by Mr Eddington (Area No.3) and subject to this survey is a remnant patch of native forest surrounded by established pasture.



MAP 1: Location of Properties at Rosevale and Field Survey Areas No.1, No.2 and No.3.



MAP 2: GoogleEarth Image of properties detailing proposed exploratory drill holes and extent of plantations.

2.0 Desktop Survey of Natural Values:

The DPIW database "The Natural Values Atlas" was accessed for the known biological records of the locality and environs. Records of threatened species of flora and fauna known to occur within a 5,000 metre radius of the location were also accessed. Data sourced included the vegetation types and plant communities, the occurrence of any threatened vegetation communities, the recorded locations of any threatened species of plants and threatened fauna known or expected to occur in the vicinity.
REFERENCE POINT for the locality: 491400E – 5412755N

2.1 Desktop Survey Results:

VEGETATION COMMUNITIES:
The following vegetation communities are mapped under the TasVeg mapping program as occurring within 1,000 metres of the three study area reference points.

VEGETATION COMMUNITY	TasVeg Code / Map colour	EXTENT IN STUDY AREA
Eucalyptus amygdalina Inland Forest & Woodland on Cainozoic Deposits	DAZ / bright green with "x"	Area 1: patches east of creek only. Area 2: Most of the remnant forest. Area 3: All of the remnant forest
Eucalyptus amygdalina Forest & Woodland on Dolerite	DAD / Bright green with horizontal lines	Area 1: 3 small patches. Area 2: One large patch, 2 small patches in south-east half of the property.
Bursaria – Acacia Woodland & Scrub	NBA / Olive Green	4 small patches in Area 1.
Lowland Grassland Complex	GCL / bright yellow	East of creek in Area 1. North-eastern half of Area 2.
Agricultural Land	FAG / cream	Area 1: west of creek-line. Area 2: SW 20% and in east of property. Area 3: balance of property.

TABLE 1: Vegetation Communities and extent within the study area as per TasVeg mapping program.

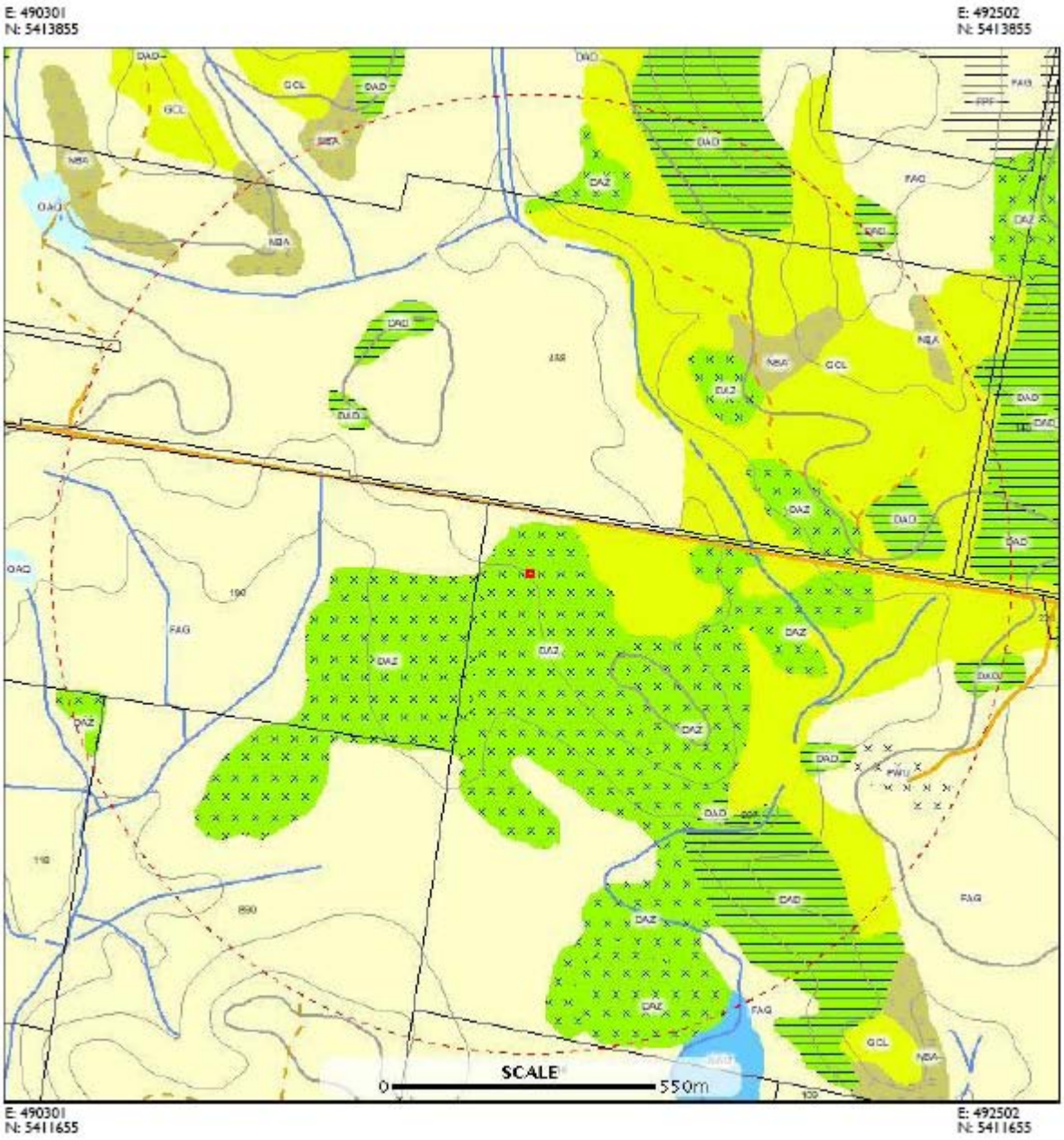


FIGURE 1: Vegetation communities as per TasVeg mapping program within 1,000 metres of reference point: GRID REF: 491400E – 5412755N. (Prior to the establishment of Eucalypt plantations)

CODE: DAZ ……...*Eucalyptus amygdalina* Inland Forest & Woodland on Cainozoic Deposits,
DAD ……*Eucalyptus amygdalina* Forest & Woodland on Dolerite
NBA …….. *Bursaria – Acacia* Woodland & Scrub
FAG …….. Agricultural Land
GCL …….. Lowland Grassland Complex

VEGETATION COMMUNITIES:

DAZ *Eucalyptus amygdalina* Inland Forest and Woodland on Cainozoic Deposits is a community usually dominated by the Black Peppermint *Eucalyptus amygdalina* although other species such as *Eucalyptus viminalis, E. pauciflora* or occasionally *E. ovata* may be present and can sometime form the dominant canopy species. Dry sclerophyll shrubs, often low or prostrate species, Bracken *Pteridium esculentum* or grasses and graminoids with forb species can dominate the ground stratum depending on the soil type, fertility and depth and the drainage conditions, as well as the additional historical factors of firing and land use. There can be a high diversity of species in the ground layer vegetation although many of the remnants are now degraded.

This community is strongly associated with lateritic sediments in the northern Midlands and its main area of distribution is in the northern Midlands with outlying localities include the Fingal Valley, West Tamar, Bridgenorth and Westbury, between Cranbrook and Swansea on the east coast and in the Cressy – Blackwood Creek area.

The community was much more extensive in the northern Midlands at the time of white settlement however much of it has been cleared for agriculture. Large areas on the less fertile soils in the northern Midlands areas were cleared in the 1960's following the introduction and widespread use of superphosphate.

The community is of high conservation value and is listed as a threatened native vegetation community under the Tasmanian *Nature Conservation Act 2002.*

DAD *Eucalyptus amygdalina* Forest and Woodland on Dolerite is more widespread than the former community and is often located on rocky sites in low rainfall areas. The community typically is dominated by uneven aged Black Peppermint less than 25metres in height and with a variable understorey ranging from grassy to shrubby. The two Eucalypt communities occur side by side on the second property and each has a similar structure with the dominant trees and a similar composition of species in the ground stratum. It is principally the underlying geology which separates them.

NBA *Bursaria – Acacia* Woodland and Scrub occurs on basalt or dolerite and its presence is usually the result of past clearing or degradation of Eucalypt forest. The floristic complexity can vary greatly with some sites being depauperate and infested with weeds and others reflecting a degraded phase of *Eucalyptus viminalis* woodland which have a high degree of species diversity in the ground stratum, and often including threatened species.

GCL Lowland Grassland Complex. Most of the native and semi-improved pastures throughout the midlands are mapped as this community but is distinguished from the mapping unit Regenerating Cleared Land (FRG) by having more than 25% of native species. Many areas which were originally this community have been ploughed and converted to improved pasture dominated by exotic pasture grasses.

The species composition of GCL varies greatly depending on location and disturbance history. Lowland grassland communities are of high conservation value where they are in good condition but are becoming increasingly rare due to conversion to improved pasture and increased cultivation of crops such as canola and poppies. Lowland grasslands are considered to be a threatened vegetation community under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*

THREATENED VEGETATION COMMUNITIES:

- One natural vegetation communitiy mapped within the study area is listed as threatened under the Tasmanian *Nature Conservation Act 2002. Eucalyptus amygdalina* Inland Forest & Woodland on Cainozoic Deposits (DAZ) is listed as a vulnerable community under the Act as it has been subject to extensive clearing and fragmentation throughout the northern midlands and in particular since the 1960's.
- Native grassland communities such as the Lowland Grassland Complex (GCL) which is mapped as occurring in the study area is recognized as a threatened vegetation community under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*

VEGETATION COMMUNITIES OF CONSERVATION SIGNIFICANCE

- Although the community *Eucalyptus amygdalina* Forest and Woodland on Dolerite is relatively widespread it mainly occurs on freehold land and is considered to be under-reserved in the state and particularly so in its old-growth condition.

THREATENED FLORA:

One species of threatened flora listed under the Tasmanian *Threatened Species Protection Act 1995* and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* is recorded on the "Natural Values Atlas" database as occurring within 3,000 metres of the study area reference point.

No species of threatened flora is recorded on the database from within 2,000 metres of the study area reference point.

- *Thelymitra holmesii,* the Bluestar Sunorchid is listed as being rare under the State Act. There are two early sight records about 3,000 metres to the northeast of the study area reference point from 1948 and 1956 with no recent observations or confirmations from the locality.

The following species of threatened flora are recorded on the database as occurring from between 3,000 and 5,000 metres of the study area reference point.

- *Amphibromus neesii* Southern Swampgrass (r) 2 records
- *Brunonia australis* Blue Pincushion (r) 11 records
- *Caladenia filamentosa* Daddy Long Legs (r) one record from 1934
- *Juncus amabilis* Gentle Rush (r) one record
- *Lythrum salicaria* Purple Loosetrife (v) one record

THREATENED FAUNA:

One species of threatened fauna listed under the above Acts is recorded on the database as occurring within 600 metres of the study area reference point.

- The Tasmanian subspecies of Wedge-tailed Eagle *Aquila audax* subsp *fleayi.* The bird is listed as being endangered under both State and Commonwealth Acts and requires large trees within tracts of old-growth forest for nesting. The birds are extremely sensitive to disturbance during the nesting season. There a single known nest tree site recorded within the study area and about 600 metres to the south-east of the reference point. The nest was

first recorded in July 2011 however the database does not indicate if the nest was active during the past nesting season. GRID REF: 491690E – 5412210N (100m +/-)
There are also three sighting records on the database from within 5,000 metres.

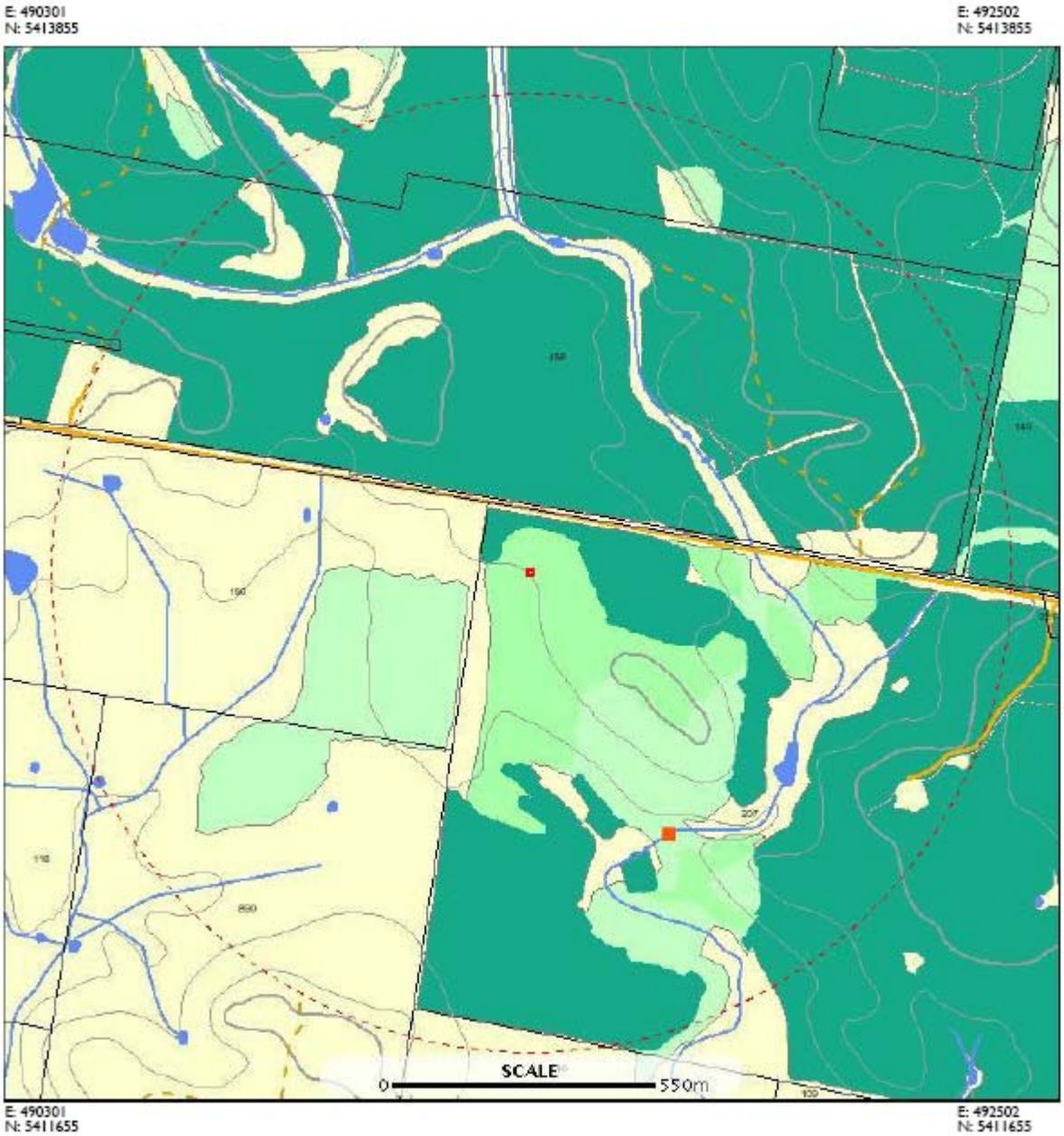


FIGURE 2:Plotted location of nest tree of Wedge-tailed Eagle, *Aquila audax* subsp *fleayi* on Property No.2.

A further three species have been recorded from within 3,000 metres of the study area reference points.

- The Tasmanian subspecies of the Masked Owl *Tyoto novaehollandiae* subsp *castinops* is listed as being endangered in Tasmania and considered to be vulnerable under the Commonwealth Act. There is one sight record from 1978 but no more recent observations. This bird requires large tree hollows for nesting, usually in White Gums and prefers mature forest as habitat.
- The Australasian Bittern *Botaurus poiciloptilus* is now listed as being endangered under the Commonwealth *EPBC Act.* There is one sight record from 2004. It is a secretive bird which inhabits reed beds surrounding wetlands and is seldom observed.
- The Tasmanian Devil *Sarcophilus harrisii* is listed as being endangered under both State and Commonwealth Acts. There are 7 sight records on the database from within 3,000 metres, all dated in late June 2004 from the same grid reference location. The records most likely relate to the official monitoring program and would not necessarily indicate the recording of 7 individual devils.

The following five species have been recorded from between 3,000 and 5,000 metres of the study area reference point.

- White-bellied Sea-eagle *Halieetus leucogaster* is listed as being vulnerable under the Tasmanian Act. It inhabits the coast and larger water bodies inland. There are three known nest trees recorded in the wider area, one from the 1980's and 2 from 2008.
- The Spotted-tailed Quoll, *Dasyurus maculatus* subsp *maculatus* is listed as a rare species under the Tasmanian Act and vulnerable under the Commonwealth Act. It inhabits a range of forest types and will hunt and forage on farmland and pasture, travelling up to 20km at night. The animal will shelter in dens located in rocks, logs or thick vegetation. There is a single 1989 record of this species.
- The Tasmanian Devil *Sarcophilus harrisii* There are a further 94 records of the Devil on the database in the wider district, the majority as a result of targeted surveys undertaken in June 2004.
- Eastern-barred Bandicoot *Parameles gunnii* is relatively widespread in Tasmania but is rare on the mainland and is listed as being vulnerable under the Commonwealth Act. There is one record on the database from 2009.
- Glossy Grass Skink *Pseudomoia rawlinsii* is listed as being rare under the Tasmanian Act. There are two records on the database dated 2009.

The following eight species of threatened fauna could occur in the locality based on habitat mapping and on the known geographical range of each.

- The White (Grey) Goshawk *Accipiter novaehollandiae* is endangered in Tasmania. The species requires mature wet forest with Blackwoods as habitat and old-growth trees for nesting.
- The Swift Parrot *Lathamus discolor* is listed as endangered both in Tasmania and nationally and inhabits mature Blue Gum forests (*Eucalyptus globulus*) and *Eucalyptus ovata* Forest and requires tree hollows for nesting.
- The Tussock Skink *Pseudemoia pagenstecheri* is a grassland species which is considered to be vulnerable in Tasmania. It inhabits some types of native grasslands.

- The Swan Galaxia *Galaxias fontanus* is a small native fish considered to be endangered in Tasmania and nationally, and is found only within the catchments of the Esk Rivers. The species is endemic to Tasmania.
- Australian Grayling *Prototroctes mareana* is a fish which moves between fresh and salt water localities. The species is listed as being vulnerable both in Tasmania and nationally.
- The Green and Gold Frog *Litoria raniformis* is considered to be vulnerable in Tasmania and Nationally. It is found mainly in the north of the state.
- The Cataract Gorge Snail *Pasmaditta jungermanniae* is restricted to the catchments of the two Esk rivers and is considered to be vulnerable under the Tasmanian Act.
- The Green-lined Ground Beetle *Catadromus lacordairei* is listed as being vulnerable in Tasmania.

3.0 Field Survey:

The field survey was undertaken on Tuesday the 3rd July 2012.

Methodology: The survey area was divided into three sections based on property boundaries and roadways.
Area1: Property owned by Gunns Ltd to the north of Roseburn Road
Area 2: Property owned by Gunns Ltd to the south of Roseburn Road
Area 3: Property owned by T Eddington to the south of Roseburn Road and adjacent to Area 2.
REF: Map No.1
Each of the three target areas was surveyed on foot, and included any remnant vegetation which was present in the vicinity of each site.
Vascular plant species were recorded, vegetation communities were observed and cross-referenced with the TasVeg map sourced from the Natural Values Atlas database.

Limitations: This survey was conducted in winter when many species are dormant and not flowering, particularly ground layer flora within grasslands. No botanical survey can guarantee that all flora will be observed and recorded in a single survey in one year due to seasonal and annual variation in abundance and the possible absence of flowers and fertile material for identification. Ephemeral species which may have been present includes species of orchids, lilies, herbs, grasses and other graminoids. However all significant species known to occur in the study areas and their environs have been considered in this report.

3.1 Field Survey Results:

AREA No.1 Property owned by Gunns Ltd to the north of Roseburn Road
The area of this property subject to the exploration program is located to the west and south of the main creek-line which extends through the property. Roseburn Road forms the southern boundary of the property and the survey area. This area was originally established pasture but has been planted with a Eucalypt plantation within the last 5 years. The creek-line itself and the adjacent flood plain is clear of plantation trees and although the vegetation in this riparian zone is composed mainly of exotic grasses there are some patches of Rushes *(Juncus spp), Gahnia grandis* and other streamside species. There were no retained trees along this section of creek-

line. As the area has been recently grazed by sheep most of the grassy and herbaceous species were not discernable. There would be some potential for the threatened riparian species such as *Amphibromus neesii, Juncus amabilis* and *Lythrum salicaria* to be present however they were not observed during the survey. The proposed drilling program will not impact on the stream-side vegetation. The low hill in the centre of this survey area is a dolerite outcrop with two small patches of the community *Eucalyptus amygdalina* on Dolerite. GRID REF: 491004E – 5413137N. The retained trees were of mixed ages although no old-growth trees with significant hollows were observed. White Gum *Eucalyptus viminalis* and Swamp Gum *Eucalyptus ovata* were also present. The ground layer was composed of native grasses such as *Poa labillardierei* however the area had been recently grazed by sheep and being the winter dormant season few herbs and forbs were evident. The drilling program will not be targeting this area of dolerite and there will be no disturbance of the location.
The proposed drilling program within Area No.1 will not impact on any threatened vegetation community, any threatened species of flora or on any potential habitat for threatened species of fauna.

AREA No.2 Property owned by Gunns to the south of Roseburn Road.
This property is located to the south of Roseburn Road and directly opposite part of the first property and survey area.
The creek which flows through area No.1 also extends through this property but has a wider flood plain and a low lying and poorly drained area adjacent to it. The balance of the property is gently undulating except for a single low profile hill in the centre and around which the creek flows.
According to the vegetation community map included with this report Figure 1. this property consisted of established pasture and native grasslands between remnant forest dominated by *Eucalyptus amygdalina.* The established pastures and most of the native grasslands have since been planted to Eucalypt plantations. The low lying area along the creek and its adjacent flood plain has been retained as native grassland and this area may provide suitable habitat for three threatened plant species, *Amphibromus neesii, Juncus amabilis* and *Lythrum salicaria* although they were not observed during this survey. The damp grasslands and floodplain may also be suitable habitat for the Green and Golden Bell Frog *Litoria raniformis* and the Tussock Skink *Pseudemoia pagenstecheri* and the creek itself potential habitat for the two threatened fish species. Some small patches of retained woodland along the creek-line are localized occurrences of the threatened vegetation community *Eucalyptus ovata* Forest and Woodland. The understorey of this community included the Paperbark *Melaleuca ericifolia* and shrubby forms of Blackwood *Acacia melanoxylon.* The area of grassland and floodplain along the creek will not be affected by the proposed drilling program. Most of the remnant native forest on the property has been selectively but extensively logged and is in an early phase of natural regeneration. The vegetation on the rises and small hills comprises *Eucalyptus amygdalina* Forest on Dolerite and the vegetation on the lower undulations is *Eucalyptus amygdalina* on Cainozoic Deposits which is the underlying geology targeted by the exploration program. The understorey and groundlayer vegetation varied across the site from grassy to shrubby, with most in the regeneration phase following past disturbances. The area of forest located on the small hill has been retained intact as a buffer to the known Wedge-tailed Eagle's nest tree. A possible den site for Spotted-tailed Quoll was observed in a basal hollow of a mature Eucalypt at GRID REF: 491404E – 5412743N.

AREA No.3 Property owned by Mr Tim Eddington to the south of Roseburn Road and adjacent to area No.2.
The target area is a patch of native forest adjacent to the property boundary of Area No.2 and is surrounded on the other three sides by established pasture. The vegetation in the location is *Eucalyptus amygdalina* Forest over Cainozoic Deposits which is a relatively even aged and intact stand of trees although only a single significant old-growth tree was observed, a *Eucalyptus viminalis* at the south-eastern corner of the property. This was a very large remnant tree which possessed a number of significant hollow branches, although it was not possible to confirm their use as nesting sites at this time of year.
This patch of forest is regularly grazed by cattle so there were few understorey trees or Eucalypt saplings present. The ground layer was in quite good condition and had a combination of *Lomandra longifolia, Poa labillardierei* with some low shrubs and other grasses and it is likely that species of orchids, lilies and other herbs and forbs would be present during the spring and early summer. No threatened species of flora were observed during the survey and no potential habitat for threatened species of fauna was observed within the remnant patch of forest.
The proposed survey lines are to follow the southern boundary of this property and will not have a significant impact on the vegetation community. The survey line and drill sites should however avoid the root zone/drip line of the single old-growth Eucalypt previously discussed which is located in the south-east corner of the property.
A second survey line on the property extends across established pasture adjacent to and parallel with Roseburn Road and will have no impact on the natural values in the locality.

VEGETATION COMMUNITIES:
The following vegetation communities were observed during the field survey.

- *Eucalyptus amygdalina* Forest on Cainozoic Deposits (DAZ) in survey areas 2 and 3.
- *Eucalyptus amygdalina* Forest on Dolerite (DAD) in survey areas 1 (localized) and 2.
- Floodplain Grasslands which is included within the Lowland Grassland Complex (GCL) vegetation type. Observed along the creek-line in areas 1 (marginal condition) and 2 (good condition).
- *Eucalyptus ovata* Forest and Woodland (DOV) was observed as small localized occurrences on the flood plain of the creek which flows through Survey Area No.2.

THREATENED VEGETATION COMMUNITIES:
Two vegetation communities listed under the Tasmanian *Nature Conservation Act 2002* were observed during the field survey.
DAZ *Eucalyptus amygdalina* Inland Forest on Cainozoic Deposits was present within Survey Area No.2 although the majority has been selectively but fairly extensively logged. The vegetation map Figure 1. is relatively accurate although this community is not present on the small hill top which comprise dolerite outcrops so the vegetation is actually *Eucalyptus amygdalina* on Dolerite in this location.
Eucalyptus amygdalina Forest on Cainozoic deposits also comprises the remnant patch of forest on Survey Area No.3. Although the canopy is relatively intact there is little understorey and the community has been modified by periodic firing and cattle grazing. The ground layer

grassy/shrubby vegetation is however in relatively good condition and should have a reasonable diversity of herbs and forbs during the spring and summer growing seasons.
The proposed drilling program is to follow existing vehicular tracks and property boundary lines and will have minimal impact on this community.
DOV *Eucalyptus ovata* Forest and Woodland was present as small localized occurrences on the poorly drained floodplain of the creek which flows through Survey Area No.2. Although it is listed as a threatened community its occurrence within the poorly drained floodplain means that it will not be affected by the proposed exploration program.

GCL The area of native grassland along the flood plain of the creek-line in Survey Area 2 defined as Lowland Grassland Complex is of high conservation value. All native grasslands are considered to be threatened vegetation communities under the Commonwealth EPBC Act. The drilling program as proposed is to follow existing vehicular tracks and should not extend into this area.

THREATENED FLORA:
No plant species listed under the Tasmanian *Threatened Species Conservation Act 1995* and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* was observed and recorded during the field survey.
Potential habitat was observed along the creek-line which passess through Survey Areas No. 1 and the creek and poorly drained floodplain in Area No.2 for riparian and wetland species such as *Amphibromus neesii, Juncus amabilis* and *Lythrum salicaria,* however the drilling program will not impact on these locations.
No other threatened species of plants which have been previously recorded within 5,000 metres of the target area reference points, and referred to in the desktop survey section of this report was observed during the field survey. The Bluestar Sunorchid *Thelymitra holmesii* flowers in November/December and would not be evident at this time of the year.

THREATENED FAUNA:
One species of fauna listed under the above Acts was observed during the field survey.

- The Spotted-tailed Quoll *Dasyurus maculatus* subsp *maculatus* is listed as being rare under the Tasmanian Act and vulnerable under the Commonwealth Act. A road-kill animal was observed on Roseburn Road adjacent to the property on the day of the field survey.
  GRID REF: 491317E – 5412906N 3m+/- This record demonstrates the species presence in the locality. The exploration program as proposed however will not impact on the species or its habitat in the locality, however the drilling operation should avoid the possible den site in the basal hollow of the Eucalypt at GRID REF: 491404E – 5412743N (3m +/-) on Survey Area No.2.

THREATENED FAUNA HABITAT:
Critical habitat for one species of threatened fauna was present in Survey Area No.2.

- The presence of the previously discussed nest tree of the Wedge-tailed Eagle *Aquila audax* subsp *fleayi* was confirmed during the field survey.

GRID REF: 491687E – 5412233N (30m+/-) The nest was not in use at the time of the survey as it is before the onset of the breeding season. An area of forest has been retained intact around the tree site, however the tree is within 500 metres and within sight distance of some of the proposed drill lines. The tree which hosts the nest is not as large as one would expect and may well be indicative of a shortage of suitable nest trees within the pair's territory.

The following restrictions apply in the vicinity of Wedge-tailed Eagle nest trees as the species is highly sensitive to disturbance during the breeding season, and particularly so early in the season.

- No activity to occur within 500 metres or 1 km line of sight of an active nest during the breeding season.
- The breeding season occurs between August and January inclusive.
- Active nests require a 10 hectare buffer at all times.

Nests are traditional, with some having been used for at least 50 years. More than one nest can be present within a pair's territory but only one is used in any one year.

PHOTO No.1: Wedge-tailed Eagle's Nest located in Survey Area No.2.

Potential habitat for other threatened species of fauna which are known or expected to occur in the locality was observed within the three survey areas but none of this habitat will be affected by the proposed drilling program.

The Lowland Grassland which is present on the floodplain of the creek, particularly in Survey Area No.2 may be suitable habitat for the Tussock Skink *Pseudemoia pagenstecheri* , or the Green and Golden Frog *Litoria raniformis*, and the creek itself the Grayling *Prototroctes mareana* and Swan Galaxia *Galaxia fontana.*

No field evidence was observed of the presence of Eastern-barred Bandicoots *Parameles gunnii* or Tasmanian Devils *Sarcophilus harrisii* during the survey of the three areas although the grassland and grassy groundlayer vegetation in some locations would be suitable habitat for the Bandicoot.
A very large old-growth *Eucalyptus viminalis* with numerous hollow branches was present in the southeast corner of property and Survey Area No.3, GRID REF: 491200E- 5412430N (10m +/-). Such hollows would provide shelter and/or nesting sites for numerous species, and possibly large enough for the Masked Owl *Tyto novaehollandea* subsp *castinops.*
Old-growth trees with hollows may be present elsewhere on property and within survey areas 2 and 3 however no other significant trees with hollows were observed during the field survey.

ENVIRONMENTAL WEEDS:
Four species of environmental weeds were observed during the field survey.

- Blackberry *Rubus fruticosus* was common and widespread around the area of plantation in survey Area No.1 but was less frequent in Survey Area Nos 2 & 3 with few plants observed in areas of natural vegetation.
- Briar Rose *Rosa rubiginosa* was observed as occasional plants across all three survey areas.
- Gorse *Ulex europeaus*, the only Gorse observed during the survey was a few dead plants in Area No.3 so the weed is being well managed in the locality. Gorse is listed as a weed of national significance.
- Spear Thistle *Cirsium vulgare* is a widespread weed of pasture and disturbed ground throughout Tasmania and was present in each survey area where there had been localized ground disturbance.

PHYTOPTHORA: There was no symptomatic field evidence observed of the root pathogen *Phytophthora cinnamomi* during this field survey.

4.0 Recommendations:

VEGETATION COMMUNITIES:

- The proposed drilling program within Survey Areas No.1 is located along vehicular tracks and along cleared property boundarys within existing Eucalypt plantations so will not impact on any areas of native vegetation.
- No drilling activity or disturbance should occur in the grassy areas adjacent to the creek in Area No.1.
- All drill sites should be located along existing vehicular tracks or previously cleared property boundary lines in Areas 2 and 3 in order to limit impacts on the natural vegetation in the locations.
- No trees will need to be felled to accommodate any of the drill sites.
- Ensure the adequate containment within each drill site of all silt, dust, sediment and other contaminants resulting from the drilling program to avoid impacting on adjacent soils and ground stratum vegetation.

THREATENED VEGETATION COMMUNITIES:

- The threatened vegetation community, *Eucalyptus amygdalina* Inland Forest & Woodland on Cainozoic Deposits (DAZ) is widespread in Survey Areas 2 and 3, but is in an early regrowth stage following selective and extensive logging in Area 2. There will be minimal impact on the community from the proposed drilling program. No specific action is required in addition to the recommendations made under vegetation communities (above).
- *Eucalyptus ovata* Forest and Woodland (DOV) was present as localized occurrences along the flood-plain of the creek in Area 2. No drilling activity or disturbance should occur within the flood-plain and along-side the creek-line.
- The retained remnant native grassland along the flood-plain of the creek is considered to be significant vegetation. No drilling or disturbance should occur within the flood-plain of the creek.

THREATENED FLORA:

- No threatened species of plants were observed during the survey however potential habitat was present with the grassy vegetation along the creek banks in Area 1 and within the wider flood-plain of the creek in Area 2. No drilling or disturbance should occur along the creek and within the flood-plain in Area 2.
- As the field survey was undertaken out of season there is some potential for species of orchids, lilies and grasses to be present within the groundlayer of the native forest areas in Areas 2 and 3. Possible impacts will be minimized by undertaking the drilling program only along existing vehicular tracks and along previously cleared property boundaries.

THREATENED FAUNA:

- One species of threatened fauna a road-kill Spotted-tailed Quoll was observed and recorded during the field survey. Refer to recommendation below for specific action required.

THREATENED FAUNA HABITAT:

- Wedge-tailed Eagle nest at GRID REF: 491687E – 5412233N (30m +/-). Comply with the restrictions and limitations of disturbance within proximity to an Eagle's nest during the breeding season August to January as detailed in this report.
- Avoid disturbance near possible den site of Spotted-tailed Quoll in basal hollow of tree at GRID REF: 491404E – 5412743N (5m +/-).
- No drilling or disturbance to be undertaken alongside the creek in Area 1 and within the flood-plain of the creek in Area 2 as those locations are potential habitat for the Green and Golden Frog and the Tussock Skink.
- No drilling or ground disturbance to be undertaken within the root zone/ drip line of the very large old-growth tree located near the south-eastern corner of property and Area No.3. GRID REF: 491200E – 5412430N (10m +/-). The tree possesses numerous hollows which are potential habitat for numerous species of fauna, and possibly large enough for the Masked Owl.

ENVIRONMENTAL WEEDS:

- Blackberry was the most prevalent environmental weed across the survey areas but particularly within the plantations in Area 1. Sequence the drilling program as much as possible to drill the natural weed free areas first and areas with Blackberry infestations last.
- As a precautionary measure and in order to prevent the introduction of weeds into weed free areas all equipment and machinery should be subject to a wash-down procedure to remove any soil or mud which could contain weed seeds before being transported between each property.

PHYTOPHTHORA:

- Accepted protocols in regard to hygiene and wash-down procedures for all machinery and equipment, including the drill rig itself should be followed, to ensure that the pathogen is not inadvertently introduced into disease free locations by way of extraneous soil, mud and gravel adhered to tyres, work-boots and equipment.

Philip Milner

Vegetation Consultant

APPENDIX 1:
Vegetation Communities and Species Recorded

1. *Eucalyptus amygdalina* Inland Forest and Woodland on Cainozoic Deposits (TasVeg Code DAZ)

This community was present in Survey Areas 2 and 3. The community Area 2 has been selectively but heavily logged in the recent past and is in an early regrowth phase. The canopy of the community in Area 3 is largely intact although the understorey has been modified by firing frequency and cattle grazing. The groundlayer vegetation varied from grassy and sedgy to shrubby depending on the disturbance history of each location. This community is listed as a threatened native vegetation community under the *Nature Conservation Act 2002.*

DOMINANT TREES	COMMON NAME	FREQUENCY
Eucalyptus amygdalina	Black Peppermint	common
Eucalyptus viminalis	White-gum	common
SECONDARY TREES		
Eucalyptus ovata	Swamp Gum	occasional
UNDERSTOREY TREES AND TALL SHRUBS		
Acacia dealbata	Silver wattle	occasional
Banksia marginata	Silver Banksia	uncommon
Bursaria spinosa	Prickly Box	occasional
Exocarpus cupressiformis	Native Cherry	common
Pomaderris apetala	Dogwood	uncommon
MEDIUM SHRUBS		
Cassinia aculeata	Dollybush	occasional
Davesia latifolia	Hop Bitterpea	uncommon
Lomatia tinctoria	Guitar Plant	occasional
Melicytus dentatus	Tree Violet	occasional
Olearia sp.	A Daisybush	Area 3 only
Pultenaea juniperina	Prickly Beauty	uncommon
SMALL SHRUBS		
Acrotriche serrulata	Ant's Delight	occasional
Astroloma humifusa	Cranberry Heath	occasional
Bossiae prostrata	Creeping Bossia	occasional
Epacris impressa	Common Heath	common
Gonocarpus tetragynus	Comon Raspwort	occasional
Pimelea humilis	Dwarf Riceflower	occasional
Tetratheca pilosa	Lilac Bells	Area 3 only
CLIMBERS		
Billardiera mutabilis	Green Appleberry	occasional

APPENDIX 1 (cont)
Eucalyptus amygdalina Forest and Woodland on Cainozoic Deposits (cont)

CLIMBERS (cont)		
Clematis aristata	Southern Clematis	occasional
HERBS & HERB-LIKE PLANTS		
Acaena echinata	Sheeps Burr	uncommon
Acaena novaezelandiae	Buzzy	common
Dichondra repens	Kidneyweed	occasional
Geranium potentillioides	Mountain Geranium	occasional
Hydrocotyle hirta	Hairy Pennywort	occasional
Lagenophora stipitata	Bluebottle Daisy	occasional
Linum marginale	Native Flax	Area 3 only
Oxalis perennans	Grassland Woodsorrel	common
Ranunculus lappaceus	Woodland Buttercup	occasional
Stackhousia monogyna	Grassland Candles	Area 3 only
Viola hederaceae	Ivy-leafed Violet	common
GRASSES & GRAMINOIDS		
Dianella revolute	Spreading Flaxlily	Area 3 only
Diplarrena moraea	White Flag-iris	common
Poa labillardierei	Silver Tussockgrass	common
Lepidosperma laterale	Variable Swordsedge	occasional
Lomandra longifolia	Mat-rush	very common
Themeda triandra	Kangaroo Grass	occasional
FERNS & ALLIED PLANTS		
Pteridium esculentum	Bracken	very common
ENVIRONMENTAL WEEDS		
Cirsium vulgare	Spear Thistle	common
Rosa rubiginosa	Briar Rose	occasional
Rubus fruticosus	Blackberry	occasional

2. *Eucalyptus amygdalina* Forest & Woodland on Dolerite (TasVeg Code DAD)

The main occurrence of this community in the areas surveyed was in the Area No.2. where it was present on the rises and small hills where the dolerite substrate was exposed. Some of the community has been subject to selective logging but the area on the main hill has been retained intact as a buffer to the known Wedge-tailed Eagle nest near the creek. The understorey and ground layer vegetation varied from shrubby to grassy.
Two very small patches of the community occurred on a dolerite outcrop in survey area No.1 which is surrounded by Eucalypt plantation. The groundlayer in this location is grassy with very few shrubs.

DOMINANT TREES	COMMON NAME	FREQUENCY
Eucalyptus amygdalina	Black Peppermint	common
CO-DOMINANT TREES		
Eucalyptus viminalis	White Gum	common
UNDERSTOREY TREES & LARGE SHRUBS		
Acacia dealbata	Silver Wattle	occasional
Acacia melanoxylon	Blackwood	uncommon
Bursaria spinosa	Prickly Box	occasional
Exocarpus cupressiformis	Native Cherry	occasional
MEDIUM SHRUBS		
Lomatia tinctoria	Guitarplant	occasional
Melicytus dentatus	Tree Violet	uncommon
SMALL SHRUBS		
Acrotriche serrulata	Ant's Delight	occasional
Bossiae prostrata	Creeping Bossia	occasional
HERBS & HERB-LIKE PLANTS		
Acaena echinata	Sheeps Burr	uncommon
Acaena novaezelandiae	Buzzy	common
Dichondra repens	Kidney Weed	common
Gonocarpus tetragynus	Common Raspwort	occasional
Oxalis perennans	Grassland Woodsorrel	common
Viola hederaceae	Ivy-leafed Violet	occasional
GRASSES & GRAMINOIDS		
Diplarrena moreae	White Flag-iris	common
Poa labillardierei	Silver Tussockgrass	common
Lepidosperma laterale	Variable Swordsedge	occasional
Lomandra longifolia	Mat-rush	common

APPENDIX 1 (cont)
Eucalyptus amygdalina Forest & Woodland on Dolerite (cont)

FERNS & ALLIED PLANTS		
Pteridium esculentum	Bracken	common
ENVIRONMENTAL WEEDS		
Centaurium erythraea	Common Centaury	common
Cirsium vulgare	Spear Thistle	occasional
Rosa rubiginosa	Briar Rose	occasional
Rubus fruticosus	Blackberry	occasional

3. Lowland Grassland Complex (TasVeg Code GCL)

Remaining native grassland in the locality is mainly along the floodplain of the creek where it flows through Survey Areas No.1 and No.2. The community is in better condition in Survey Area No.2 where the flood plain is wider and there has been less disturbance and habitat modification. There are occasional trees of *Eucalyptus ovata* (Swamp Gum) and occasional clumps of Swamp Paperbark *Melaleuca ericifolia.* Native Grasslands are considered to be threatened communities under the Commonwealth EPBC Act.

EMERGENT TREES	COMMON NAME	FREQUENCY
Eucalyptus ovata	Swamp Gum	occasional
LARGE SHRUBS		
Acacia verticillata	Prickly Moses	uncommon
Melaleuca ericifolia	Swamp Paperbark	occasional
SMALL SHRUBS		
Bossiae cordigera	Wiry Bossia	localised
GRASSES & GRAMINOIDS		
Carex appressa	Long-leaf Sedge	common
Gahnia grandis	Cutting Grass	occasional
Lomandra longifolia	Mat-rush	occasional
Poa labillardierei	Silver Tussockgrass	common
Juncus spp.	Reeds	common
Lepidosperma longitinale	Spreading Swordsedge	occasional
ENVIRONMENTAL WEEDS		
Cirsium vulgare	Spear thistle	occasional
Rubus fruticosus	Blackberry	occasional

4. *Eucalyptus ovata* Forest and Woodland (TasVeg Code DOV)

Small localized patches of this community was present within the flood-plain of the main creek and in other low lying and poorly drained depressions in Survey Area 2. It is listed as a threatened community under the Tasmanian Act.

DOMINANT TREE	COMMON NAME	FREQUENCY
Eucalyptus ovata	Swamp Gum	common
UNDERSTOREY TREES & LARGE SHRUBS		
Acacia melanoxylon	Blackwood	occasional
Acacia verticillata	Prickly Moses	uncommon
Melaleuca ericifolia	Swamp Paperbark	occasional
MEDIUM SHRUBS		
Leptospermum lanigerum	Woolly Teatree	uncommon
GRASSES & GRAMINOIDS		
Carex appressa	Longleaf Sedge	occasional
Gahnia grandis	Cutting Grass	occasional
Lepidosperma longitudinal	Spreading Swordsedge	occasional
Lomandra longifolia	Mat-rush	occasional
Poa labillardierei	Silver Tussockgrass	occasional
FERNS & ALLIED PLANTS		
Pteridium esculentum	Bracken	occasional

PHOTO 2: Survey Area 1. Remnant area of *Eucalyptus amygdalina* Forest on Dolerite (DAD). with *Eucalyptus viminalis* and a grassy ground layer. Plantation in background

PHOTO 3: Survey Area No.2 . Retained Lowland Grassland across floodplain of creek.

PHOTO 4: Survey Area No. 2. *Eucalyptus amygdalina* Forest on Cainozoic Deposits (DAZ) post selective logging with small regrowth trees in understorey.

PHOTO 5: Survey Area No.2. *Eucalyptus amygdalina* on Dolerite (DAD) with co-dominant *Eucalyptus viminalis* on the low hill.

PHOTO 6: SurveyArea No.2. Localised patch of *Eucalypts ovata* Forest (DOV) with understorey of *Melaleuca ericifolia.*

PHOTO 7: Survey Area No.3: *Eucalyptus amygdalina* Forest on Cainozoic Deposits (DAZ) with Co-dominant *Eucalyptus viminalis* and *Lomandra longifolia* dominated ground layer.