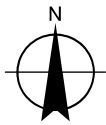




0 10 20 40 60 80
Metres
1:1,500 (at A3)
Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia
Grid: Map Grid of Australia 1994, Zone 56



LEGEND

- Lot
- Contour
- SEPP14
- Approx. Extent of Clearing

- Dry Grassy Blackbutt - Tallowwood (GBT)
- Sedgeland / Rushland - Freshwater Wetland (FW)
- Paperbark - Swamp Sclerophyll Forest (SSF)

- Paperbark - Swamp Sclerophyll Forest (SSF) (dead)
- Cleared / exotic
- Regrowth



CLIENTS | PEOPLE | PERFORMANCE

NSW Catchment and Lands- Crown Lands
Former Antimony Processing Plant, Urunga NSW

**Vegetation Communities
on Site**

Job Number 22-16251
Revision A
Date 25 Jun 2014

Figure 2

3.5.2 Weeds

Areas of high weed density were observed within the study area. Species observed are listed in Table 3. This is not an exhaustive list of weed species but provides an indication of the species present within the study area with their declaration status including NSW Department of Primary Industries (Agriculture) Noxious Weed Listing under the *Noxious Weeds Act 1993*, and inclusion on the list of Weeds of National Significance (WONS).

Table 3 Weed species observed within the study area

Botanical name	Common name	Declaration status*
<i>Ageratina adenophora</i>	Crofton Weed	Class 4
<i>Ageratum houstonianum</i>	Blue Billy Goat Weed	
<i>Andropogon virginicus</i>	Whisky Grass	
<i>Asparagus sp.</i>	Asparagus Fern	
<i>Chrysanthemoides monilifera</i>	Boneseed	Class 4
<i>Bidens pilosa</i>	Farmers' Friends	
<i>Colocasia esculenta</i>	Elephants Ear (Taro)	
<i>Cortaderia sp.</i>	Pampas Grass	Class 4
<i>Cotoneaster glaucophyllus</i>	Cotoneaster	
<i>Desmodium uncinatum</i>	Silver-leaved Desmodium	
<i>Erythrina crista-galli</i>	Coral Tree	
<i>Gymnocoronis spilanthoides</i>	Senegal Tea (unconfirmed)	Class 1
<i>Ipomoea cairica</i>	Morning Glory Vine	
<i>Lantana camara</i>	Lantana	Class 4 & WONS
<i>Monstera deliciosa</i>	Fruit Salad Plant	
<i>Musa sp.</i>	Banana Palms	
<i>Paspalum dilatatum</i>	Paspalum	
<i>Rubus fruticosus sp.</i>	Blackberry	Class 4
<i>Schefflera actinophylla</i>	Umbrella Tree	
<i>Senna pendula var. glabrata</i>	Easter Cassia	
<i>Solanum mauritianum</i>	Wild Tobacco Plant	

*NSW *Noxious Weeds Act 1993* declaration status includes:

- Class 1 The plant must be eradicated from the land and the land must be kept free of the plant;
- Class 2 The plant must be eradicated from the land and the land must be kept free of the plant;
- Class 3 The plant must be fully and continuously suppressed and destroyed; and

Class 4 The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction and the plant must not be sold propagated or knowingly distributed.

3.5.3 Fauna and habitat

Fauna species

Observations of fauna on site included possible bandicoot diggings towards the north, wallaby tracks, and frogs (Eastern Sedge Frog, *Litoria fallax*) were heard calling to the east of the site in a smaller wetland area adjacent to the main water body. Woodland bird species were observed and one snake skeleton was recorded in the cleared part of the study area (indeterminable species). Oyster shells in a pile were observed, however the origin of these is unknown,

Habitats

Fauna habitat within the study area included areas of dense vegetation, wetland, cleared and transitional areas. Habitat types are described in Table 4:

Table 4 Habitat types observed on site

Habitat types	Description and potential fauna type present
Closed forest	Forest with a canopy and dense shrub layer with some emergent trees, reduced light availability, higher humidity than more open areas providing habitat especially for birds, arboreal and ground-dwelling mammals, reptiles, invertebrates.
Paperbark forest	Inundated, partially inundated or periodically inundated, providing habitat for semi-aquatic species or those dependent on aquatic species as a food source such as invertebrates, frogs, reptiles, bats and microbats.
Open forest edges / clearings	Forest edges and cleared areas provide thoroughfares for many species. Partially forest habitat and adjacent open spaces provide an increased diversity in available habitat types allowing larger mammals access, and flight paths for many birds and bats.
Casuarina forest	May be dense or sparse and provides particular habitat for black cockatoos of many species.
Mudflats	Provides forage habitat for many waterbirds, marine and aquatic, at this location.
Sedgeland	Provides aquatic habitat with emergent vegetation particularly beneficial to breeding aquatic species such as dragonflies.
Aquatic	Provides habitat for fish and other aquatic species requiring permanent or semi-permanent fresh to slightly brackish water. Provides forage for bats and microbats above the water's surface.

The transitional zones between each of these habitat types often provide characteristics of each in a combination that supports a greater diversity of organisms.

It is likely that bat, microbat and flying fox activity would be prevalent in association with the wetland because of the likelihood of flying insects as a food source and in association with the surrounding vegetation where flowering plants provide food for nectivorous species. No grey-headed flying fox camp site was observed.

Given the proximity to the coast, to the estuary, to other wetlands and to dense vegetation, there are extensive and diverse habitat types present within and immediately adjacent to the site. Many species of wetland birds, including listed migratory species would be likely occur at least on an occasional basis at the site.

4. Potential impacts

It is proposed that vegetation, soil and surface materials will be removed from the area of the site shown in Figure 2 (as “Extent of clearing”) to a depth of approximately 3 m in the dry areas and approximately 0.5 m of soil and sediment from the wetland area. The extent of clearing and excavation would be limited to the boundary formed by healthy vegetation. The likelihood of an overall positive impact following completion of the remediation works does not form part of this study.

The potential clearing that would result from the proposal would include the following estimates of clearing (refer to Figure 2):

- | | |
|--|---------|
| • Already cleared and exotic dominated | 1.60 ha |
| • Dry grassy blackbutt – Tallowwood GBT | 0.29 ha |
| • Paperbark – Swamp Sclerophyll Forest SSF | 0.64 ha |
| • Regrowth vegetation | 0.33 ha |
| • Freshwater Wetland (FW) | 0.03 ha |

4.1 Summary

Potential impacts from remediation works may include, but not be limited to the following:

- Clearing of terrestrial vegetation - impact on total native vegetation and habitat in the area
- Clearing of aquatic vegetation – impact on adjacent wetland
- Removal of soils – impact on local geomorphology, drainage and soil ecology
- Disturbance of site - potential for runoff, sedimentation and water quality into adjacent wetland
- Impacts from machinery and equipment on local fauna – collision, noise, air, vibration
- Spread of weeds
- Increased edge effects on remnant adjacent vegetation
- Importation of soils from off-site

4.2 Clearing of terrestrial vegetation - impact on total native vegetation and habitat in the area

Clearing of vegetation to enable remediation works is likely to include the native vegetation that has re-established since operations ceased, as well as some native vegetation along the boundaries of the disturbed area. Both the regenerating and boundary vegetation communities are heavily weed infested.



Figure 3 A boundary zone of the Urunga site

4.3 Clearing of aquatic vegetation – impact on adjacent wetland

It is likely that the wetland vegetation including the dead trees will be removed as part of the remediation works. This will result in removal of habitat and potential impacts on water quality associated with erosion and sedimentation.



Figure 4 The wetland within the impact zone of the Urunga site

4.4 Removal of soils – impact on local geomorphology, drainage and soil ecology

Removal of the contaminated soil profile is likely to result in alterations to the local geomorphology and ground structure which will impact on stormwater flows and local conditions including temperature and humidity within the area of disturbance and into adjacent areas. These factors in turn may influence the local flora and fauna by altering the water quality in the adjacent wetland and the associated vegetation communities.

4.5 Disturbance of site - potential for runoff, sedimentation and water quality into adjacent wetland

During the remediation works, there is potential for runoff from the site during heavy rainfall events. Runoff may result in sedimentation in the wetland. Runoff from the site will impact on water quality in the wetland and in the downstream estuary and wetland. These impacts will impact on aquatic fauna and flora.

4.6 Impacts from machinery and equipment on local fauna – collision, noise, air, vibration

The potential impacts from construction machinery on fauna include direct mortality or injury from collision, as well as the impacts of noise, exhaust fumes on air quality and the vibration created by earthmoving equipment.

4.7 Spread of weeds

There are many weed species present within the site. The remediation works have potential spread weed propagules within the site or off-site.



Figure 5 Weeds established at the Urunga site entrance

4.8 Increased edge effects on remnant adjacent vegetation

The current edges of the site are well vegetated and form an informal barrier to weed incursions further into the adjacent vegetation communities. Disturbance to this 'barrier' vegetation is likely to result in the re-establishment of a new 'edge' which may result in a reduction in the condition of the adjacent vegetation patch and a greater weed incursion.

4.9 Importation of soil from off-site

It will be necessary to import soils from off-site in order to restore vegetation onto some parts of the site. While attempts will be made to match the subject site conditions at the site from which the soil will be taken, there is some likelihood that the soil will differ from those in and adjacent to the subject site. A difference in the species present in the imported soil may also occur.

5. Mitigation measures

The following measures may be used to mitigate the potential impacts identified in Section 4 above.

5.1 Clearing of terrestrial vegetation - impact on total native vegetation and habitat in the area

- o Carefully and clearly mark the extent of clearing at every boundary of the site prior to clearing works commencing
- o Erect high visibility mesh fencing protection barriers along the western / south-western boundary to prevent impacts on existing vegetation
- o Adhere to standard construction environmental management plan (CEMP) recommendations for vegetation clearing including avoidance of unnecessary clearing, pre-clearance checking for threatened flora species, progressive clearing approach.

5.2 Clearing of aquatic vegetation – impact on adjacent wetland

- o Undertake the clearing during the dry season
- o Establish sediment barriers to avoid contamination flowing into the downstream wetland areas, monitor and maintain
- o Remove only the wetland vegetation (dead and alive) that is necessary to achieve the remediation outcomes agreed
- o Utilise the weed-seed-free vegetation waste on site to assist with the generation of alternative habitat particularly in cleared and re-soiled areas.

5.3 Removal of soils - impact on local geomorphology

- o Establish soil and sediment control barriers prior to commencement of the remediation earthworks, monitor and maintain
- o Re-create the 'natural' ground structure upon completion of the remediation works by importing certified clean and appropriate soils from a similar location
- o Revegetate to reduce the amount of exposed/bare ground in order to restore similar-to-local conditions.

5.4 Disturbance of site - potential for runoff, sedimentation and water quality into adjacent wetland

- o Implement a water quality monitoring program prior to the commencement of remediation works (parameters will be determined following initial water quality data collection and analysis). Undertake water quality testing weekly during remediation, and for six months after completion (or as directed by the approval authority). Include water monitoring at two other downstream locations, including the estuary and the downstream wetland
- o Visual inspection will be undertaken daily by the site manager during the construction phase in order to quickly remedy any breaches or leaks in sediment and erosion control measures.

5.5 Impacts from machinery and equipment on local fauna – collision, noise, air, vibration

- o Time the remediation works so as to avoid the common fauna breeding season (e.g. Black-necked Stork in Spring) in order to reduce the impact on local fauna
- o Adhere to standard construction environmental management plan recommendations for construction including regularly serviced machinery/equipment, restricted working hours, reduction in amount of machinery/equipment used, pre-commencement fauna checks of vegetation to be cleared, and pre-start fauna checks of machinery.

5.6 Spread of weeds

- o Treat weeds present on site two weeks prior to commencement of the remediation works
- o Complete weed hygiene procedures including machinery washdown prior to plant and machinery entering the site to reduce the risk of new weed species being introduced
- o Raise awareness with machinery/equipment operators of weeds that are likely to spread within the site.

5.7 Increased edge effects on remnant adjacent vegetation

- o Clearly and definitively mark the 'no-go' zone with high visibility mesh temporary fencing such that the adjacent vegetation community is impacted as little as possible by the remediation works.

6. Assessment of significance of the potential impacts

An overview assessment of the significance of the potential impacts identified on threatened biota according to the 7-part test under Section 5A of the EP&A Act is provided below.

Species considered, based upon the likelihood of occurrence are summarised in Section 3.2 and listed in Appendix C. Consideration of the significance of potential impacts has been given in groups of species/communities with similar habitat requirements and includes the following.

6.1 Endangered ecological communities and plant species

The assessment of significance of potential impacts for the following species and communities has been considered together:

- o Leafless Tongue-orchid (*Cryptostylis hunteriana*)
- o Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South Easter Corner Bioregions
- o Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions
- o Swamp Sclerophyll Forest on Coast Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions

- a. **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction**

Due to the degraded nature of the habitats present within the site, it is unlikely that Leafless Tongue-orchid would be solely dependent on the subject site for its lifecycle. Given the availability of adjacent and nearby habitats, it is not considered likely that the proposed action would have an adverse effect on the life cycle of the species considered likely to occur on the site.

- b. **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction**

No endangered population is known to occur within the site.

- c. **In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:**

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

It is not considered likely that the proposed action will adversely affect the extent of the EEC or the plant such that the local occurrence is likely to be placed at risk of extinction. The site and the proposed disturbance footprint represent a small portion of the adjoining Swamp Sclerophyll Forest. The vegetation within or in close proximity to the site has been impacted by the antimony plant in the past and impacts are continuing to spread from the site. The proposed remediation is expected to halt the spread of these impacts and to reinstate, as far as practicable, the site to its pre-disturbed condition.

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Given the degraded and weed infested nature of the subject site, it is not considered likely that the proposed action will modify the composition of the ecological community or the potential habitat for the plant such that its local occurrence would be placed at risk of extinction. At the completion of remediation works, it is expected that there will be an overall improvement in the conditions of the site.

d. **In relation to the habitat of a threatened species, population or ecological community:**

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

The extent of habitat that may be removed as part of the proposed action is limited to highly modified and weed infested vegetation at the edge of communities in better condition, and/or vegetation in poor condition due to the local site conditions within the cleared and regenerating areas, and/or highly disturbed paperbark forest consisting of dead trees and scattered reeds. It is not considered likely that these areas would provide core habitat for any listed threatened species given the poor condition of the areas. It is considered that the extent of habitat to be removed is not significant given the area of adjacent similar ecological community in better condition.

The estimates for area of removal are as follows:

▪ Dry grassy blackbutt – Tallowwood GBT	0.29 ha
▪ Paperbark – Swamp Sclerophyll Forest SSF	0.64 ha
▪ Regrowth vegetation	0.33 ha
▪ Freshwater Wetland (FW)	0.03 ha

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

Habitats on site have predominantly been historically cleared, and it is not considered likely that the proposed action will significantly further fragment or isolate habitats.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

It is not considered that the habitat that will be removed for the remediation works is of importance to threatened species, as it is not likely to be core habitat for listed threatened species, and the wetland has previously been degraded. Given the extent of similar ecological communities in adjacent areas and in the greater region it is not considered that the proposal will impact on the long-term survival of species or ecological communities.

e. **whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),**

No critical habitat is considered likely to occur within the area of the proposed action.

f. **whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,**

Species Action Statements have been prepared under the *Saving our Species* program for all listed threatened species under the TSC Act. Those that have potential to occur on

the site are included under Management Streams. Management actions include control of vegetation clearing and management of national parks and reserves.

The initial action involving clearing of vegetation is not supportive of the recovery, however the final action of remediation is considered to be supportive of recovery and abatement of threat for the site and its associated flora and fauna.

- g. **whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

Whilst vegetation clearing constitutes a key threatening process, the aim of the remediation works is to remove a threat and reduce the level of ongoing impact resulting from past land use practices. Vegetation clearing is necessary to complete the remediation works, however it will only result in a short term impact, with longer term improvement in the site and local/regional ecological conditions expected.

6.2 Endangered and Vulnerable fauna

- o Wallum Froglet (*Crinia tinnula*) - vulnerable
- o Australasian Bittern (*Botaurus poiciloptilus*) - vulnerable
- o Black Bittern (*Ixobrychus flavicollis*) - vulnerable
- o Black-necked Stork (*Ephippiorhynchus asiaticus*) – endangered
- o Brolga (*Grus rubicunda*) – vulnerable
- o Comb-crested Jacana (*Irediparra gallinacea*) – vulnerable
- o Eastern Grass Owl (*Tyto longimembris*) – vulnerable
- o Eastern Osprey (*Pandion cristatus*) - vulnerable
- o Glossy-black Cockatoo (*Calyptorhynchus lathami*) - vulnerable
- o Little Eagle (*Hieraaetus morphnoides*) - vulnerable
- o Mangrove Honeyeater (*Lichenostomus fasciolaris*) – vulnerable
- o Rose-crowned Fruit-dove (*Ptilinopus regina*) – vulnerable
- o Square-tailed Kite (*Lophoictinia isura*) - vulnerable

- h. **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction**

Due to the degraded nature of the habitats present within the site, it is unlikely that the above frog and bird species would be solely dependent on the subject site for their lifecycle. Given the availability of adjacent and nearby habitats, it is not considered likely that the proposed action would have an adverse effect on the life cycle of the species considered likely to occur on the site.

- i. **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction**

No endangered population is known to occur within the site.

- j. **In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:**

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

EECs have been considered separately above.

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

EECs have been considered separately above.

k. **In relation to the habitat of a threatened species, population or ecological community:**

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

The extent of habitat that may be removed as part of the proposed action is limited to highly modified and weed infested vegetation at the edge of communities in better condition, and/or vegetation in poor condition due to the local site conditions within the cleared and regenerating areas, and/or highly disturbed paperbark forest consisting of dead trees and scattered reeds.

It is not considered likely that these areas would provide core habitat for any listed threatened species given the poor condition of the areas. It is considered that the extent of habitat to be removed is not significant given the area of adjacent similar ecological community in better condition.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

Habitats on site have predominantly been historically cleared, and it is not considered likely that the proposed action will significantly further fragment or isolate habitats.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

It is not considered that the habitat that will be removed to facilitate the remediation works is of importance to threatened species, as it is not likely to be core habitat for listed threatened species, and the wetland has previously been degraded. Given the extent of similar ecological communities in adjacent areas and in the greater region it is not considered that the proposal will impact on the long-term survival of species or ecological communities.

l. **whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),**

No critical habitat is considered likely to occur within the area of the proposed action.

m. **whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,**

Species Action Statements have been prepared under the *Saving our Species* program for all listed threatened species under the TSC Act. Those that have potential to occur on the site are included under Management Streams. Management actions include control of vegetation clearing and management of national parks and reserves.

The initial action involving clearing of vegetation is not supportive of the recovery, however the final action of remediation is considered to be supportive of recovery and abatement of threat for the site and its associated flora and fauna.

- n. **whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

Whilst vegetation clearing constitutes a key threatening process, the aim of the remediation works is to remove a threat and reduce the level of ongoing impact resulting from past land use practices. Vegetation clearing is necessary to complete the remediation works, however, it will only result in a short term impact, with longer term improvement in the site and local/regional ecological conditions expected.

6.3 Vulnerable Mammals

- o Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*) – vulnerable
 - o Eastern Freetail-bat (*Mormopterus norfolkensis*) – vulnerable
 - o Eastern Long-eared Bat (*Nyctophilus bifax*) – vulnerable
 - o Greater Broad-nosed Bat (*Scoteanax rueppellii*) – vulnerable
 - o Grey-headed Flying-fox (*Pteropus poliocephalus*) - vulnerable
 - o Little Bent-wing Bat (*Miniopterus australis*) – vulnerable
 - o Southern Myotis (*Myotis macropus*) - vulnerable
- o. **In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction**

It is unlikely that these bats and flying-fox species would be solely dependent on the subject site for their lifecycle. Given the availability of adjacent and nearby habitats, it is not considered likely that the proposed action would have an adverse effect on the life cycle of any of the species considered likely to occur or that may occur on the site.

- p. **In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction**

No endangered population is known to occur within the site.

- q. **In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:**

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

EECs are considered separately above.

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

EECs are considered separately above.

- r. **In relation to the habitat of a threatened species, population or ecological community:**

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

The extent of habitat that may be removed as part of the proposed action is limited to highly modified and weed infested vegetation at the edge of communities in better

condition, and/or vegetation in poor condition due to the local site conditions within the cleared and regenerating areas, and/or highly disturbed paperbark forest consisting of dead trees and scattered reeds. It is not considered likely that these areas would provide core habitat for any listed threatened species given the poor condition of the areas. It is considered that the extent of habitat to be removed is not significant given the area of adjacent similar ecological community in better condition.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

Habitats on site have predominantly been historically cleared, and it is not considered likely that the proposed action will significantly further fragment or isolate habitats.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

It is not considered that the habitat that will be removed for the remediation works is of importance to threatened species, as it is not likely to constitute core habitat for listed threatened species. Similar ecological communities are present in the region and will persist to support threatened species if they occur.

s. **whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),**

No critical habitat is considered likely to occur within the area of the proposed action.

t. **whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,**

Species Action Statements have been prepared under the *Saving our Species* program for all listed threatened species under the TSC Act. Those that have potential to occur on the site are included under the Landscape Species Management Stream. Management actions include control of vegetation clearing and management of national parks and reserves.

The action of remediation is considered to be supportive of recovery and abatement of threat for the site and its associated flora and fauna.

u. **whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**

Vegetation clearing constitutes a key threatening process. Mitigation measures will be taken during the works phase and revegetation comprises the major component of the final project. The impact is considered to be short term, with a longer term improvement in the site and local/regional ecological conditions expected.

The likely significance of impacts of the proposal on the above threatened species and communities has been assessed in accordance with DECC's *Threatened species assessment guidelines* (DECC 2007). The assessments of likelihood of occurrence are presented in Appendix B.

It is considered that no significant impact on threatened species or endangered ecological communities would result from the proposal at the site, given the condition of the vegetation and habitat to be removed and the availability of adjacent communities.

7. Conclusion

Based on this assessment and the overview 7-part test and given the intent of the proposed works to remediate the site, in conjunction with the implementation of an environmental management plan during the works phase, it is considered that the proposed remediation works would be unlikely to significantly impact on threatened species, populations or ecological communities. A more detailed survey is not expected to be required.

References

Atlas of NSW Wildlife (BioNet) database search

Australian Government, Department of the Environment, Protected Matters Search Tool Report

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NSW Department of Primary Industries (Agriculture) Noxious Weed Listing under the *Noxious Weeds Act 1993*

NSW Department of Primary Industries (Fisheries and Aquaculture), Threatened & protected species – records viewer

NSW Office of Environment and Heritage, threatened species database

Protected Matters Search Tool (PMST) under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999.

Redpath, P. and Body, M., 2003. *Flora and Fauna Evaluation for the Urunga Antimony Contaminated Site: An inventory assessment for an EIS.*

Appendices

Appendix A – BioNet Atlas Search Results

Data from the BioNet Atlas of NSW Wildlife website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions.

Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°; ^^ rounded to 0.01°).

Copyright the State of NSW through the Office of Environment and Heritage.

Search criteria : Public Report of all Valid Records of Entities in selected area [North: -30.45 West: 152.95 East: 153.06 South: -30.55] returned a total of 6,282 records of 802 species.

Report generated on 23/06/2014 3:09 PM

Scientific Name	Common Name	NSW status	Comm. status
FROGS			
<i>Crinia tinnula</i>	Wallum Froglet	V,P	
<i>Mixophyes iteratus</i>	Giant Barred Frog	E1,P,2	E
BIRDS			
<i>Oxyura australis</i>	Blue-billed Duck	V,P	
<i>Anthochaera phrygia</i>	Regent Honeyeater	E4A,P	E
<i>Botaurus poeciloptilus</i>	Australasian Bittern	E1,P	E
<i>Calyptorhynchus lathamii</i>	Glossy Black-Cockatoo	V,P,2	
<i>Charadrius leschenaultii</i>	Greater Sand-plover	V,P	C,J,K
<i>Coracina lineata</i>	Barred Cuckoo-shrike	V,P	
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V,P	
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E1,P	
<i>Glossopsitta pusilla</i>	Little Lorikeet	V,P	
<i>Grus rubicunda</i>	Brolga	V,P	
<i>Hieraaetus morphnoides</i>	Little Eagle	V,P	
<i>Irediparra gallinacea</i>	Comb-crested Jacana	V,P	
<i>Ixobrychus flavicollis</i>	Black Bittern	V,P	
<i>Lichenostomus fasciocularis</i>	Mangrove Honeyeater	V,P	
<i>Lophoictinia isura</i>	Square-tailed Kite	V,P,3	
<i>Ninox strenua</i>	Powerful Owl	V,P,3	
<i>Pandion cristatus</i>	Eastern Osprey	V,P,3	
<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	V,P	
<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove	V,P	
<i>Ptilinopus regina</i>	Rose-crowned Fruit-Dove	V,P	
<i>Stagonopleura guttata</i>	Diamond Firetail	V,P	
<i>Tyto longimembris</i>	Eastern Grass Owl	V,P,3	
<i>Tyto novaehollandiae</i>	Masked Owl	V,P,3	
<i>Tyto tenebricosa</i>	Sooty Owl	V,P,3	
MAMMALS			
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V,P	E
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V,P	
<i>Phascolarctos cinereus</i>	Koala	V,P	V

<i>Petaurus australis</i>	Yellow-bellied Glider	V,P	
<i>Petaurus norfolcensis</i>	Squirrel Glider	V,P	
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V,P	V
<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	V,P	
<i>Miniopterus australis</i>	Little Bentwing-bat	V,P	
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	V,P	
<i>Myotis macropus</i>	Southern Myotis	V,P	
<i>Nyctophilus bifax</i>	Eastern Long-eared Bat	V,P	
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V,P	
PLANTS			
<i>Marsdenia longiloba</i>	Slender Marsdenia	E1,P	V
<i>Parsonsia dorrigoensis</i>	Milky Silkpod	V,P	E
<i>Acacia chrysotricha</i>	Newry Golden Wattle	E1,P	
<i>Dendrobium melaleucaphilum</i>	Spider orchid	E1,P,2	
<i>Hicksbeachia pinnatifolia</i>	Red Boppel Nut	V,P	V
<i>Acronychia littoralis</i>	Scented Acronychia	E1,P	E
<i>Niemeyera whitei</i>	Rusty Plum, Plum Boxwood	V,P	
ECOLOGICAL COMMUNITIES			
<i>Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i>	Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	V
<i>Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i>	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	
<i>Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i>	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	CE
<i>Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions</i>	Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions	E3	CE
<i>Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion</i>	Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion	E3	CE
<i>Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions</i>	Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions	E3	E
<i>Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion</i>	Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion	E3	

<i>Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i>	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	
<i>Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i>	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	
<i>Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions</i>	Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions	E3	
<i>White Box Yellow Box Blakely's Red Gum Woodland</i>	White Box Yellow Box Blakely's Red Gum Woodland	E3	CE
<i>White Gum Moist Forest in the NSW North Coast Bioregion</i>	White Gum Moist Forest in the NSW North Coast Bioregion	E3	

Appendix B – Likelihood of Occurrence Tables

Assessment of the Likelihood of Occurrence of Threatened Ecological Communities and Flora Species

The likelihood of occurrence assessment conducted by GHD ecologists determines the likelihood of conservation significant species, or species' habitat, occurring within the Study Area. The assessment involved a review of the desktop survey results (i.e. EPBC Act Protected Matters Report, BioNet extracts); relevant literature (e.g. Commonwealth Species Profile and Threats Database (SPRAT), and field guides).

A likelihood of occurrence ranking was attributed to each conservation significant species/community, based on the following framework:

- ▶ **Unlikely to occur:** species has not been recorded in the area (no records from desktop search extent **AND/OR** current known distribution does not encompass Study Area **AND/OR** suitable habitat is generally lacking from Study Area;
- ▶ **May occur:** species has not been recorded in the desktop search extent although species' distribution incorporates Study Area **AND** potentially suitable habitat occurs at the Study Area;
- ▶ **Likely to occur:** species has been recorded in the desktop search extent **AND** potentially suitable habitat is present at the Study Area; and
- ▶ **Confirmed present:** species recorded during field surveys.

Common Name Scientific Name	EPBC Act Status	TSC Act Status	Species Distribution and Habitat	Likelihood of Occurrence Within Study Area
<i>Ecological communities</i>				
Lowland Rainforest of Subtropical Australia	CE	EEC	This community is known as the Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions. Undisturbed, this community has a closed canopy, with a high diversity of trees and includes palms, vines and vascular epiphytes. This community is known to occur on the Clarence lowlands within the Northern Rivers Catchment Management Authority area.	Unlikely based on the species observed within the study area. No rainforest was noted.
Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South Easter Corner Bioregions		EEC	This community is recorded within the project area. It is associated with coastal areas subject to periodic flooding and in which standing fresh water persists for at least part of the year in most years. This community is dominated by herbaceous plants and has very few woody species.	Likely in certain parts of the site.
Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions		EEC	This community is recorded within the project area. It is typified by a dense to sparse tree layer of swamp oak (<i>Casuarina glauca</i>) with other trees including lilly pilly (<i>Acmena smithii</i>), cheese trees (<i>Glochidion spp.</i>) and paperbarks (<i>Melaleuca spp.</i>) present as subordinate species.	Likely in certain parts of the site.
Swamp Sclerophyll Forest on Coast Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions		EEC	This community is recorded within the project area. It typically consists of an open to dense layer of <i>Eucalypts</i> and paperbarks. The most widespread and abundant dominant trees include swamp mahogany (<i>Eucalyptus robusta</i>) and paperbark (<i>Melaleuca quinquenervia</i>) in the subject region. Shrubs include <i>Leptospermum polygalifolium</i> subsp. <i>Polygalifolium</i> and <i>Melaleuca spp.</i> , while groundcover is composed of abundant sedges, ferns, forbs and grasses including <i>Gahnia clarkei</i> , <i>Pteridium esculentum</i> , <i>Dianella caerulea</i> , <i>Viola hederacea</i> and	Confirmed Present.

Common Name Scientific Name	EPBC Act Status	TSC Act Status	Species Distribution and Habitat	Likelihood of Occurrence Within Study Area
			<i>Lomandra longifolia</i> .	
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregion	En	EEC	Coastal Saltmarsh occurs in the intertidal zone on the shores of estuaries and lagoons that are permanently or intermittently open to the sea. It is frequently found as a zone on the landward side of mangrove stands. Characteristic plants include <i>Baumea juncea</i> , Sea Rush (<i>Juncus kraussii</i> subsp. <i>australiensis</i>), Samphire (<i>Sarcocornia quinqueflora</i> subsp. <i>quinqueflora</i>), Marine Couch (<i>Sporobolus virginicus</i>), Streaked Arrowgrass (<i>Triglochin striata</i>), Knobby Club-rush (<i>Ficinia nodosa</i>), Creeping Brookweed (<i>Samolus repens</i>), Swamp Weed (<i>Selliera radicans</i>), Seablite (<i>Suaeda australis</i>) and Prickly Couch (<i>Zoysia macrantha</i>). Occasionally mangroves are scattered through the saltmarsh. Tall reeds may also occur, as well as salt pans (OEH 2014).	Unlikely.
Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	CE	EEC	Littoral Rainforest is generally a closed forest, the structure and composition of which is strongly influenced by its proximity to the ocean. The plant species of this community are predominantly rainforest species. Several species have compound leaves, and vines may be a major component of the canopy. These features differentiate littoral rainforest from forest or scrub, but while the canopy is dominated by rainforest species, scattered emergent individuals of sclerophyll species, such as <i>Angophora costata</i> , <i>Banksia integrifolia</i> , <i>Eucalyptus botryoides</i> and <i>Eucalyptus tereticornis</i> occur in many stands. It occurs on sand dunes and on soil derived from underlying rocks. Stands occur on headlands within 2 km of the sea (OEH 2014).	Unlikely.
Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion	CE	EEC	Lowland Rainforest on Floodplain is a rainforest community which now occurs only as small remnants in scattered localities on the NSW north coast, with less than 1000 ha in total thought to remain. Larger stands of the community typically have a dense canopy, which blocks most light from reaching the ground, creating cool, moist conditions within. Lowland Rainforest on Floodplain supports a rich diversity of plants and animals. Typical tree species in the community include figs (<i>Ficus macrophylla</i> , <i>F. obliqua</i> and <i>F. watkinsiana</i>), palms (<i>Archontophoenix cunninghamiana</i> and <i>Livistona australis</i>), Silky Oak (<i>Grevillea robusta</i>), Black Bean (<i>Castanospermum australe</i>) and Brush Cherry (<i>Syzygium australe</i>). Animals present include fruit-eating rainforest pigeons, Noisy Pitta, Brush-turkey, pademelons, flying foxes, the Land Mullet skink and rainforest snails (OEH 2014).	Unlikely.
Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion		EEC	This subtropical forest occurs on the coastal floodplains of the North Coast of NSW. It has a tall open tree layer of eucalypts, angophoras, melaleucas and bloodwoods, which may exceed 40 m in height, but can be considerably shorter in regrowth stands or under conditions of lower site quality.	Unlikely.

Common Name Scientific Name	EPBC Act Status	TSC Act Status	Species Distribution and Habitat	Likelihood of Occurrence Within Study Area
			It occupies central or marginal parts of floodplains and sandy flats, including Pleistocene back-barrier flats; habitats where flooding is periodic and soils are rich in silt and sand, sometimes humic, and show little influence of saline ground water (OEH 2014).	
Listed threatened flora species				
Austral Toadflax (<i>Thesium australe</i>)	Vu		Austral Toadflax is a herb to 40 cm tall that occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. It is often found in association with Kangaroo Grass (<i>Themeda australis</i>). This species is predicted to occur within the locality (OEH 2013).	Unlikely as no grasslands occur within the proposed footprint.
Clear Milkvine (<i>Marsdenia longiloba</i>)	Vu	En	Slender Marsdenia is a slender climber of the milk vine group, with pairs of very finely pointed leaves and 5-6 tiny glands at the base of the leaves. The stems of Slender Marsdenia exude clear, watery sap when cut, unlike most of the milk vines which have milky sap. Clusters of small white star-shaped flowers are produced in summer and are followed by long, narrow seed-capsules that split to release many seeds with tufts of long silky hair (OEH 2014).	Unlikely as no rainforest is present within the footprint.
Cryptic Forest Twiner (<i>Tylophora woollsii</i>)	En	En	This species grows in moist eucalypt forest, moist sites in dry eucalypt forest and rainforest margins. It flowers in summer and autumn. It is found from the New England Tablelands to southern Queensland but is not common (AoA 2014).	Unlikely. Moist sites do not contain eucalypt or rainforest species.
Dwarf Heath Casuarina (<i>Allocasuarina defungens</i>)	En		Dwarf Heath Casuarina is found only in NSW from Nabiac to Byron Bay. This species grows mainly in tall heath on sand, but can also occur on clay soils and sandstone. It is predicted to occur within the study area. No records within study area (OEH 2013).	Unlikely. No tall heath within the proposed footprint.
Hairy-joint Grass (<i>Arthraxon hispidus</i>)	Vu		Hairy-joint Grass is moisture and shade-loving, found in or on the edges of rainforest and in wet <i>Eucalypt</i> forest, often near creeks or swamps. It has been recorded within the locality (OEH 2013).	Possible.
Leafless Tongue-orchid (<i>Cryptostylis hunteriana</i>)	Vu	Vu	Habitat preferences are not clearly defined for this species. It is known from a range of communities including swamp-heath and woodland. It has not been recorded in the locality (OEH 2014).	Possible.
Lesser Swamp-orchid (<i>Phaius australis</i>)	En		The Lesser Swamp-orchid is commonly associated with coastal wet heath/sedgeland wetlands, swampy grassland or swampy forest and often where Broad-leaved Paperbark or Swamp Mahogany are found. Typically, the Lesser Swamp-orchid is restricted to the swamp-forest margins, where it occurs in swamp sclerophyll forest (Broad-leaved Paperbark/Swamp	Likely.

Common Name Scientific Name	EPBC Act Status	TSC Act Status	Species Distribution and Habitat	Likelihood of Occurrence Within Study Area
			Mahogany/Swamp Box (<i>Lophostemon suaveolens</i>), swampy rainforest (often with sclerophyll emergents), or fringing open forest. It is often associated with rainforest elements such as Bangalow Palm (<i>Archontophoenix cunninghamiana</i>) or Cabbage Tree Palm (<i>Livistona australis</i>) (OEH 2014).	
Milky Silkpod (<i>Parsonsia dorrigensis</i>)	En	Vu	Milky Silkpod is a slender climber found in subtropical and warm-temperate rainforest, on rainforest margins, and in moist <i>Eucalypt</i> forest up to 800 m on brown clay soils. This species is known to occur within the locality (OEH 2013).	Unlikely as moist <i>Eucalypt</i> forest and rainforest not present within the site.
Newry Golden Wattle (<i>Acacia chrysotricha</i>)		En	This tree grows up to 15 m. It is restricted to an area south of Bellingen on NSW north coast. It occurs as an understorey species on rainforest edges, in steep narrow gullies on quartzite soils. It is recorded within the locality (OEH 2013).	Unlikely as no rainforest or steep narrow gully occurs on site.
Red Boppel Nut (<i>Hicksbeachia pinnatifolia</i>)	Vu	Vu	This small tree grows to 10 m in subtropical rainforest, moist <i>Eucalypt</i> forest and brush box forest. It is recorded within the locality (OEH 2013).	Unlikely as suitable habitat does not occur within the site.
Rusty Plum (<i>Niemeyera whitei</i>)		Vu	The Rusty Plum is a tree to 20 m high that occurs in rainforest and adjacent understorey of moist <i>Eucalypt</i> forest. It is location north from Macleay and around Coffs Harbour in NSW. This species is known to occur within the locality (OEH 2013).	Unlikely as no rainforest occurs within the proposed footprint.
Scented Acronychia (<i>Acronychia littoralis</i>)	En	En	Scented Acronychia is a small tree to 6 m high found between Fraser Island in Queensland and Port Macquarie in NSW. It grows in littoral rainforest on sand. This species is known to occur within the locality (OEH 2013).	Unlikely as no littoral rainforest occurs within the proposed footprint.
Siah's Backbone (<i>Streblus pendulinus</i>)	En		Siah's Backbone is found in warmer rainforests, mainly along watercourses, growing in well-developed rainforest and gallery forest and drier seasonal rainforest (OEH 2014).	Unlikely.
Slender Marsdenia (<i>Marsdenia longiloba</i>)	Vu	En	Slender Marsdenia is a climber found in subtropical and warm temperate rainforest, lowland moist <i>Eucalypt</i> forest adjoining rainforest and sometimes in areas with rock outcrops. This species is predicted to occur within the locality (OEH 2013).	Unlikely as no rainforest forms part of the proposed footprint.
Spider Orchid (<i>Dendrobium melaleucaphilum</i>)		En	This Orchid grows on other plants and sometimes on rocks occurring in coastal districts and nearby ranges. It frequently grows on <i>Melaleuca styphelioides</i> and less commonly on rainforest trees or on rocks in coastal districts. This species is known to occur within the locality (OEH 2013).	Unlikely as <i>Melaleuca styphelioides</i> not present on site.

Common Name Scientific Name	EPBC Act Status	TSC Act Status	Species Distribution and Habitat	Likelihood of Occurrence Within Study Area
White-flowered Wax Plant <i>(Cynanchum elegans)</i>	En	En	The White-flowered Wax Plant is a climber or twiner with a highly variable form. Mature stems have fissured corky bark and can grow to 10 m long. It usually occurs on the edge of dry rainforest vegetation including littoral rainforest, Coastal Tea-tree, Coastal Banksia, coastal scrub, Forest Red Gum open forest and woodland, Spotted Gum open forest and woodland and Bracelet Honeymyrtle scrub to open scrub. This species is predicted to occur in the locality (OEH 2013).	Unlikely as appropriate vegetation types not present within the site.

Assessment of the Likelihood of Occurrence of Threatened and / or Migratory Fauna

The likelihood of occurrence assessment conducted by GHD ecologists determines the likelihood of conservation significant species, or species' habitat, occurring within the Study Area. The assessment involved a review of the desktop survey results (i.e. EPBC Act Protected Matters Report, BioNet extracts); relevant literature (e.g. Commonwealth Species Profile and Threats Database (SPRAT), and field guides).

A likelihood of occurrence ranking was attributed to each conservation significant species/community, based on the following framework:

- ▶ **Unlikely to occur:** species has not been recorded in the area (no records from desktop search extent **AND/OR** current known distribution does not encompass Study Area **AND/OR** suitable habitat is generally lacking from Study Area;
- ▶ **May occur:** species has not been recorded in the desktop search extent although species' distribution incorporates Study Area **AND** potentially suitable habitat occurs at the Study Area;
- ▶ **Likely to occur:** species has been recorded in the desktop search extent **AND** potentially suitable habitat is present at the Study Area; and
- ▶ **Confirmed present:** species recorded during field surveys.

Common Name Scientific Name	EPBC Act Status	TSC Act Status	Species Distribution and Habitat	Likelihood of occurrence
Frogs				
Wallum Froglet (<i>Crinia tinnula</i>)		Vu	Wallum Froglets are found in a wide range of habitats, usually associated with acidic swamps on coastal sand plains. They typically occur in sedgelands and wet heathlands. They can also be found along drainage lines within other vegetation communities and disturbed areas, and occasionally in swamp sclerophyll forests (OEH 2014).	Possible.
Giant Barred Frog (<i>Mixophyes iteratus</i>)	En	En	Giant Barred Frogs are found along freshwater streams with permanent or semi-permanent water, generally (but not always) at lower elevation. Moist riparian habitats such as rainforest or wet sclerophyll forest are favoured for the deep leaf litter that they provide for shelter and foraging, as well as open perching sites on the forest floor. However, Giant Barred Frogs will also sometimes occur in other riparian habitats, such as those in drier forest or degraded riparian remnants, and even occasionally around dams (OEH 2014).	Unlikely.
Birds				
Australasian Bittern (<i>Botaurus poiciloptilus</i>)	En	En	This species favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (<i>Typha</i> spp.) and spikerushes (<i>Eleocharis</i> spp.). Known to occur within the locality (OEH 2014).	Possible.
Barred Cuckoo-shrike (<i>Coracina lineata</i>)		Vu	Rainforest, eucalypt forests and woodlands, clearings in secondary growth, swamp woodlands and timber along watercourses. They are usually seen in pairs or small flocks foraging among foliage of	Unlikely.

Common Name Scientific Name	EPBC Act Status	TSC Act Status	Species Distribution and Habitat	Likelihood of occurrence
			trees for insects and fruit. They are active birds, frequently moving from tree to tree (OEH 2014).	
Black Bittern (<i>Ixobrychus flavicollis</i>)		Vu	This species inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves (OEH 2014).	Possible.
Black-necked Stork (<i>Ephippiorhynchus asiaticus</i>)		En	Black-necked Storks are mainly found in shallow, permanent, freshwater terrestrial wetlands and surrounding marginal vegetation including swamps, floodplains, watercourses and billabongs. They are also known to forage around estuaries and along intertidal shorelines. They prefer open wetlands with shallow still water. This species is recorded within the locality (OEH 2013; Redpath & Body 2003).	Possible.
Blue-billed Duck (<i>Oxyura australis</i>)		Vu	The Blue-billed Duck is a stiff-tailed diving duck that is endemic to south-eastern and south-western Australia. It prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. It is completely aquatic. This species has been recorded within the locality (OEH 2013).	Unlikely.
Brolga (<i>Grus rubicunda</i>)		Vu	Though Brolgas often feed in dry grassland or ploughed paddocks or even desert claypans, they are dependent on wetlands too, especially shallow swamps, where they will forage with their head entirely submerged. The Brolga was formerly found across Australia, except for the south-east corner, Tasmania and the south-western third of the country. It is still abundant in the northern tropics, but very sparse across the southern part of its range (OEH 2014).	Possible.
Comb-crested Jacana (<i>Irediparra gallinacea</i>)		Vu	This species inhabits permanent freshwater wetlands, either still or slow-flowing, with a good surface cover of floating vegetation, especially water-lilies, or fringing and aquatic vegetation (OEH 2014).	Possible.
Diamond Firetail (<i>Stagonopleura guttata</i>)		Vu	Diamond Firetails are found in grassy <i>Eucalypt</i> woodlands as well as open forest and grasslands, often in riparian areas. Feed exclusively on the ground. This species is known to occur within the locality (OEH 2013).	Unlikely
Eastern Grass Owl (<i>Tyto longimembris</i>)		Vu	Eastern Grass Owls are found in areas of tall grass, including grass tussocks, in swampy areas, grassy plains, swampy heath, and in cane grass or sedges on flood plains (OEH 2014).	Possible.
Eastern Osprey (<i>Pandion cristatus</i>)		Vu	The Eastern Osprey favours coastal areas, especially the mouths of rivers lagoons and lakes. They feed on fish over clear open water. This species is known to occur within the locality (OEH 2013).	Possible.

Common Name Scientific Name	EPBC Act Status	TSC Act Status	Species Distribution and Habitat	Likelihood of occurrence
Glossy Black-Cockatoo (<i>Calyptorhynchus lathamii</i>)		Vu	The Glossy Black-Cockatoo inhabits open forest and woodlands on the coast and the Great Dividing Range up to 1000 m in which stands of she-oak species, particularly Black She-oak (<i>Allocasuarina littoralis</i>), Forest She-oak (<i>A. torulosa</i>) or Drooping She-oak (<i>A. verticillata</i>) occur. They feed almost exclusively on the seeds on <i>Casuarina</i> and <i>Allocasuarina</i> species. This species is known to occur within the locality (OEH 2013).	Possible.
Greater Sand-plover (<i>Charadrius leschenaultii</i>)	CJK	Vu	The Greater Sand-plover is almost entirely restricted to coastal areas in NSW, occurring mainly on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks (OEH 2014).	Unlikely.
Grey-crowned Babbler (eastern subspecies) (<i>Pomatostomus temporalis temporalis</i>)		Vu	The Grey-crowned Babbler inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains (OEH 2014).	Unlikely.
Little Eagle (<i>Hieraaetus morphnoides</i>)		Vu	The Little Eagle occupies open <i>Eucalypt</i> forest, woodland or open woodland. It nests in tall living trees within a remnant patch. This species is known to occur within the locality (OEH 2013).	Possible.
Little Lorikeet (<i>Glossopsitta pusilla</i>)		Vu	The Little Lorikeet forages mainly in the canopy of open <i>Eucalypt</i> forest and woodland on nectar and pollen. This species is known to occur within the locality (OEH 2013).	Unlikely.
Mangrove Honeyeater (<i>Lichenostomus fasciocularis</i>)		Vu	The primary habitat of the species is mangrove woodlands and shrublands but Mangrove Honeyeaters also range into adjacent forests, woodlands and shrublands, including casuarina and paperbark swamp forests and associations dominated by eucalypts or banksias (OEH 2014).	Possible.
Masked Owl (<i>Tyto novaehollandiae</i>)		Vu	Masked Owls live in dry <i>Eucalypt</i> forest and woodland often hunting along the edges of forests including roadsides. Diet consists of tree-dwelling and ground mammals, especially rats. This species is known to occur within the locality (OEH 2013).	Unlikely.
Powerful Owl (<i>Ninox strenua</i>)		Vu	The Powerful Owl inhabits a range of vegetation types from woodland to rainforest. It requires large tracts of vegetation. Preferred roost trees include Turpentine, Black She-Oak, Cherry Ballart and a number of <i>Eucalypt</i> species. They mainly prey on medium sized arboreal marsupials. This species is known to occur within the locality (OEH 2013).	Unlikely.

Common Name Scientific Name	EPBC Act Status	TSC Act Status	Species Distribution and Habitat	Likelihood of occurrence
Regent Honeyeater (<i>Anthochaera phrygia</i>)	En/Mi	CE	Patchy distribution, mainly confined to two main breeding areas in NSW (Capertee Valley and Bundarra-Barraba the locality) and surrounding fragmented woodlands. The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River She-Oak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. This species is known to occur within the locality (OEH 2013).	Unlikely.
Rose-crowned Fruit-Dove (<i>Ptilinopus regina</i>)		Vu	Rose-crowned Fruit-doves occur mainly in sub-tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful. They feed entirely on fruit from vines, shrubs, large trees and palms, and are thought to be locally nomadic as they follow the ripening of fruits (OEH 2014).	Possible.
Sooty Owl (<i>Tyto tenebricosa</i>)		Vu	Sooty Owls occur in rainforest and temperate rainforest as well as moist <i>Eucalypt</i> forest. Require large tree hollows for roosting and nesting. This species is known to occur within the locality (OEH 2013).	Unlikely.
Square-tailed Kite (<i>Lophoictinia isura</i>)		Vu	The Square-tailed Kite is found in a variety of timbered habitats including dry woodlands and open forests. It prefers timbered watercourses. It is a specialist hunter of honeyeaters. This species is known to occur within the locality (OEH 2013).	Possible.
Varied Sittella (<i>Daphoenositta chrysoptera</i>)		Vu	Varied Sittellas inhabit <i>Eucalypt</i> forests and woodlands, especially with rough-barked species and smooth barked species with dead branches. This species is known to occur within the locality (OEH 2013).	Unlikely.
Wompoo Fruit-Dove (<i>Ptilinopus magnificus</i>)		Vu	This species occurs in or near rainforest. Most often seen in mature rainforest. This species is known to occur within the study area (OEH 2013).	Unlikely.
Mammals				
Brush-tailed Phascogale (<i>Phascogale tapoatafa</i>)		Vu	Brush-tailed Phascogales prefer dry sclerophyll open forest with sparse groundcover of herbs grasses shrubs or leaf litter. They also inhabit swamps, heath, rainforest and wet sclerophyll forest. This species is known to occur within the locality (OEH 2013).	Unlikely.
Eastern Bentwing-bat (<i>Miniopterus schreibersii oceanensis</i>)		Vu	The Eastern Bentwing-bat roost primarily in caves, although they do use old mines, stormwater tunnels, buildings and other man-made structures. They hunt in forested areas, catching moths and other flying insects above tree tops. This species has been recorded within the locality (OEH 2013).	Possible.

Common Name Scientific Name	EPBC Act Status	TSC Act Status	Species Distribution and Habitat	Likelihood of occurrence
Eastern Freetail-bat (<i>Mormopterus norfolkensis</i>)		Vu	This species occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range (OEH 2014).	Likely.
Eastern Long-eared Bat (<i>Nyctophilus bifax</i>)		Vu	This species is known to occupy lowland subtropical rainforest and wet and swamp eucalypt forest, extending into adjacent moist eucalypt forest. Coastal rainforest and patches of coastal scrub are particularly favoured. They roost in tree hollows, hanging foliage of palms, dense clumps of foliage of rainforest trees under bark and in shallow depressions on trunks and branches, among epiphytes, in the roots of strangler figs, among dead fronds of tree ferns and less often in buildings (OEH 2014).	Possible for foraging.
Greater Broad-nosed Bat (<i>Scoteanax rueppellii</i>)		Vu	This species utilises a variety of habitats from woodland to rainforest, but most common in tall wet forest. It is found mainly on the New England Tablelands in NSW, but not above 500 m altitude. This species is known to occur within the locality (OEH 2013).	Possible for foraging.
Grey-headed Flying-fox (<i>Pteropus poliocephalus</i>)	Vu	Vu	This species is found within 200 km of the eastern coast of Australia. It occurs in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps generally located within 20 km of a regular food source and are commonly found in gullies, close to water and in vegetation with a dense canopy. Travel up to 50 km to forage and feed on the nectar and pollen of <i>Eucalyptus</i> , <i>Melaleuca</i> and <i>Banksia</i> , and fruits of rainforest trees and vines (OEH 2014).	Possible.
Koala (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW & the ACT)	Vu	Vu	Has a fragmented distribution throughout eastern Australia. Limited to areas of preferred feed trees in <i>Eucalypt</i> woodlands and forests. Home range varies depending on the quality of habitat, ranging from less than 2 ha to several hundred hectares in size. This species is known to occur within the locality (OEH 2013).	Unlikely.
Little Bentwing-bat (<i>Miniopterus schreibersii oceanensis</i>)		Vu	This species prefers moist <i>Eucalypt</i> forest, rainforest, vine thicket, wet and dry sclerophyll forest, <i>Melaleuca</i> swamp, dense coastal forest and banksia scrub. Generally found in well-timbered areas. This species is known to occur within the locality (OEH 2013).	Likely.
Southern Myotis (<i>Myotis macropus</i>)		Vu	This species generally roosts in groups of 10-15 close to water in caves, mine shafts, hollow bearing trees and buildings as well as in dense foliage. They forage over streams and pools. This species is known to occur within the locality (OEH 2013).	Likely.
Squirrel Glider (<i>Petaurus norfolcensis</i>)		Vu	This species inhabits Blackbutt-Bloodwood forest with heath understorey in coastal areas. It prefers a mix of canopy species with a shrub or acacia midstorey.	Unlikely.

Common Name Scientific Name	EPBC Act Status	TSC Act Status	Species Distribution and Habitat	Likelihood of occurrence
			This species is known to occur within the locality (OEH 2013).	
Yellow-bellied Glider (<i>Petaurus australis</i>)		Vu	Yellow-bellied Gliders occur in tall mature <i>Eucalypt</i> forest generally in areas with high rainfall and nutrient rich soil. Mixed coastal forests are one preferred habitat type. This species is known to occur within the locality (OEH 2013).	Unlikely.
Insects				
Pink Underwing Moth (<i>Phyllodes imperialis smithersi</i>)	En	En	The Southern Pink Underwing Moth is found in subtropical rainforest below about 600 m elevation. Potential breeding habitat is restricted to areas where the caterpillar's food plant, a native rainforest vine, <i>Carronia multisepalea</i> , occurs in subtropical rainforest (OEH 2014).	Unlikely.
Listed Migratory Marine Species (excluding marine-dependent species eg albatross and whale)				
Black-faced Monarch (<i>Monarcha melanopsis</i>)	Mi/Ma	-	The Black-faced Monarch is found in rainforests, <i>Eucalypt</i> woodlands, coastal scrub and damp gullies. It may be found in more open woodland when migrating.	Possible.
Fork-tailed Swift (<i>Apus pacificus</i>)	Mi/Ma		The Fork-tailed Swift is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher (OEH 2014).	Possible.
Rainbow Bee-eater (<i>Merops ornatus</i>)	Mi/Ma	-	The Rainbow Bee-eater occurs in mainly open forests and woodlands, shrublands and in various cleared and semi-cleared habitats, including farmland. It usually occurs in open cleared or lightly timbered areas, often close to permanent water. It is often associated with mangroves.	Possible.
Rufous Fantail (<i>Rhipidura rufifrons</i>)	Mi/Ma	-	The Rufous Fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by <i>Eucalypts</i> such as Tallowwood (<i>Eucalyptus microcorys</i>) and Blackbutt (<i>E. pilularis</i>) and other species, usually with a dense shrubby understorey often including ferns.	Possible.
Satin Flycatcher (<i>Myiagra cyanoleuca</i>)	Mi/Ma	-	Satin Flycatchers inhabit heavily vegetated gullies in <i>Eucalypt</i> -dominated forests and taller woodlands, and on migration occur in coastal forests, woodlands, mangroves and drier woodlands and open forests. They often prefer to be near wetlands or watercourses.	Unlikely.

Common Name Scientific Name	EPBC Act Status	TSC Act Status	Species Distribution and Habitat	Likelihood of occurrence
Spectacled Monarch (<i>Monarcha trivirgatus</i>)	Mi/Ma/ MiW	-	The Spectacled Monarch prefers dense rainforest and moist <i>Eucalypt</i> forest, sometimes utilising mangroves and other densely vegetated habitats.	Unlikely.
White-bellied Sea-Eagle (<i>Haliaeetus leucogaster</i>)	Mi/Ma	-	The White-bellied Sea-Eagle is found in coastal habitats especially close to the sea shore and around terrestrial wetlands in tropical and temperate regions. Their habitat is characterised by large areas of open water as a food source.	Possible.
White-throated Needletail (<i>Hirundapus caudacutus</i>)	Mi/Ma	-	This species is almost exclusively aerial. Although they occur over most types of habitat, they are most often recorded above wooded areas including open forest and rainforest, less commonly above woodland.	Possible.
Listed Migratory Wetland Species				
Cattle Egret (<i>Ardea ibis</i>)	MiW/ Ma	-	The Cattle Egret occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands. Commonly associated with the habitats of farm animals. Recorded in earthen dam walls and ploughed fields. Prefers high grasses (OEH 2014).	Possible.
Great Egret (<i>Ardea alba</i>)	MiW/ Ma	-	The Great Egret occurs in a wide range of wetland habitats, usually in shallow waters (OEH 2014).	Possible.
Latham's Snipe (<i>Gallinago hardwickii</i>)	MiW/ Ma	-	Latham's Snipe occurs in wetlands usually in open freshwater wetlands with low dense vegetation. It usually occurs in temperate and tropical regions (OEH 2014).	Unlikely.
Little Curlew (<i>Numenius minutus</i>)	MiW/ Ma	-	The Little Curlew congregates around pools, river beds and water-filled tidal channels, and shallow water at edges of billabongs when resting during the day. The species prefers pools with bare dry mud (including mudbanks in shallow water) and they do not use pools if they are totally dry, flooded or heavily vegetated (Higgins & Davies 1996).	Unlikely.
Painted Snipe (<i>Rostratula benghalensis (sensu lato)</i>)	MiW/ Ma En	-	The Painted Snipe generally inhabits shallow terrestrial freshwater wetlands, inundated or waterlogged grasslands (OEH 2014).	Unlikely.

Note: All species distribution and habitat information was adapted from the Department of Environment and Climate Change webpage - Threatened Species, Species Populations and Ecological Communities of NSW, URL: http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/home_species.aspx, and from the Commonwealth Department of Sustainability, Environment, Water, Population and Communities, unless referenced otherwise.

Key – Vu = Vulnerable, En = Endangered, CE = Critically Endangered, Mi = Migratory, Ma = Marine, MiW = Migratory Wetland.

Appendix C – Protected Matters Search Tool results



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 23/06/14 15:52:54

[Summary](#)

[Details](#)

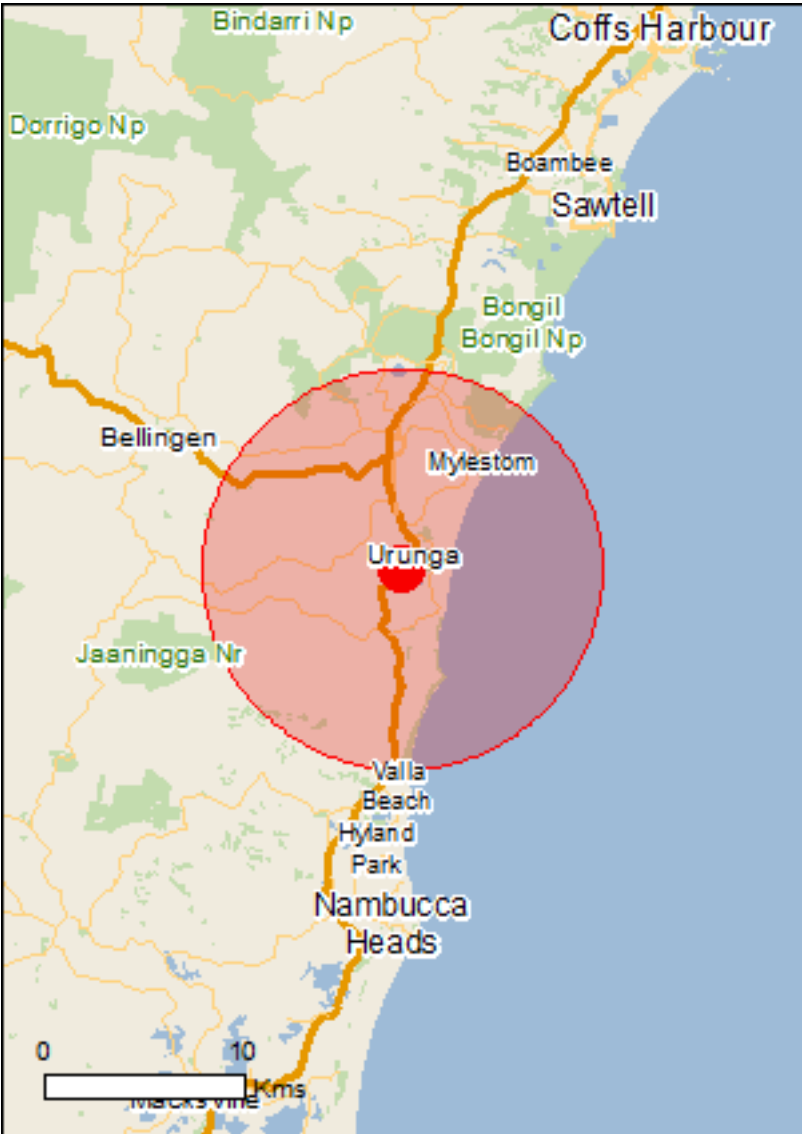
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

[Coordinates](#)

[Buffer: 10.0Km](#)



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	1
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	61
Listed Migratory Species:	49

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As [heritage values](#) of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate.

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	63
Whales and Other Cetaceans:	14
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

Place on the RNE:	3
State and Territory Reserves:	6
Regional Forest Agreements:	1
Invasive Species:	41
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Commonwealth Marine Areas [Resource Information]

Approval may be required for a proposed activity that is likely to have a significant impact on the environment in a Commonwealth Marine Area, when the action is outside the Commonwealth Marine Area, or the environment anywhere when the action is taken within the Commonwealth Marine Area. Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

Name
EEZ and Territorial Sea

Marine Regions [Resource Information]

If you are planning to undertake action in an area in or close to a Commonwealth Marine Area, and a marine bioregional plan has been prepared for the Commonwealth Marine Area in that area, the marine bioregional plan may inform your decision as to whether to refer your proposed action under the EPBC Act.

Name
Temperate East

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within

Name	Status	Type of Presence
Diomedea epomophora epomophora Southern Royal Albatross [25996]	Vulnerable	area Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora sanfordi Northern Royal Albatross [82331]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans antipodensis Antipodean Albatross [82269]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans exulans Tristan Albatross [82337]	Endangered	Species or species habitat may occur within area
Diomedea exulans gibsoni Gibson's Albatross [82271]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Pterodroma leucoptera leucoptera Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta cauta Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta salvini Salvin's Albatross [82343]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Name	Status	Type of Presence
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris impavida Campbell Albatross [82449]	Vulnerable	Species or species habitat may occur within area
Fish		
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area
Litoria booroolongensis Booroolong Frog [1844]	Endangered	Species or species habitat may occur within area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat likely to occur within area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species habitat likely to occur within area
Insects		
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	Endangered	Species or species habitat likely to occur within area
Mammals		
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Plants		
Acronychia littoralis Scented Acronychia [8582]	Endangered	Species or species habitat likely to occur within area
Allocasuarina defungens Dwarf Heath Casuarina [21924]	Endangered	Species or species habitat likely to occur within area
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area
Hicksbeachia pinnatifolia Monkey Nut, Bopple Nut, Red Bopple, Red Bopple Nut, Red Nut, Beef Nut, Red Apple Nut, Red Boppel Nut, Ivory Silky Oak [21189]	Vulnerable	Species or species habitat likely to occur within area
Marsdenia longiloba Clear Milkvine [2794]	Vulnerable	Species or species habitat likely to occur within area
Parsonsia dorrigoensis Milky Silkpod [64684]	Endangered	Species or species habitat likely to occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat likely to occur within area
Streblus pendulinus Siah's Backbone, Sia's Backbone, Isaac Wood [21618]	Endangered	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area
Tylophora woollsii [20503]	Endangered	Species or species habitat likely to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Name	Status	Type of Presence
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
Sharks		
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat likely to occur within area
Carcharodon carcharias Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea dabbenena Tristan Albatross [66471]	Endangered*	Species or species habitat may occur within area
Diomedea epomophora (sensu stricto) Southern Royal Albatross [1072]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered*	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour likely to occur within area
Puffinus leucomelas Streaked Shearwater [66541]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Sterna albifrons Little Tern [813]		Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta (sensu stricto) Shy Albatross, Tasmanian Shy Albatross [64697]	Vulnerable*	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross [64459]	Vulnerable*	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area
Carcharodon carcharias Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Breeding likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Foraging, feeding or related behaviour may occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species

Name	Threatened	Type of Presence
------	------------	------------------

habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land	[Resource Information]
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The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name

Commonwealth Land - Australian Telecommunications Corporation

Listed Marine Species	[Resource Information]
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* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
------	------------	------------------

Birds

[Apus pacificus](#)

Fork-tailed Swift [678]	Species or species habitat likely to occur within area
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[Ardea alba](#)

Great Egret, White Egret [59541]	Breeding known to occur within area
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[Ardea ibis](#)

Cattle Egret [59542]	Breeding likely to occur within area
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[Calonectris leucomelas](#)

Streaked Shearwater [1077]	Species or species habitat may occur within area
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[Catharacta skua](#)

Great Skua [59472]	Species or species habitat may occur within area
--------------------	--

[Diomedea antipodensis](#)

Antipodean Albatross [64458]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
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[Diomedea dabbenena](#)

Tristan Albatross [66471]	Endangered*	Species or species habitat may occur within area
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[Diomedea epomophora \(sensu stricto\)](#)

Southern Royal Albatross [1072]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
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[Diomedea exulans \(sensu lato\)](#)

Wandering Albatross [1073]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
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Name	Threatened	Type of Presence
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered*	Foraging, feeding or related behaviour likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Foraging, feeding or related behaviour may occur within area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour likely to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species

Name	Threatened	Type of Presence
Sterna albifrons Little Tern [813]		habitat may occur within area Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta (sensu stricto) Shy Albatross, Tasmanian Shy Albatross [64697]	Vulnerable*	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross [64459]	Vulnerable*	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Fish		
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species

Name	Threatened	Type of Presence
Solegnathus dunckeri Duncker's Pipehorse [66271]		habitat may occur within area Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Solenostomus paegnius Rough-snout Ghost Pipefish [68425]		Species or species habitat may occur within area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area
Whales and other Cetaceans		[Resource Information]
Name	Status	Type of Presence

Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]	Endangered	Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]	Endangered	Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]		Species or species habitat likely to occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

Places on the RNE [Resource Information]

Note that not all Indigenous sites may be listed.

Name	State	Status
Natural		
Wenonah Ornithological Area	NSW	Indicative Place
Bongil Bongil Area	NSW	Registered
Historic		
Bellingen River (North Arm) Valley	NSW	Indicative Place

State and Territory Reserves [Resource Information]

Name	State
Bongil Bongil	NSW
Jaanningga	NSW
Jagun	NSW
Nunguu Mirral	NSW
Unnamed FMZ2	NSW
Valla	NSW

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
North East NSW RFA	New South Wales

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Pycnonotus jocosus Red-whiskered Bulbul [631]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Frogs		
Bufo marinus Cane Toad [1772]		Species or species habitat likely to occur within area
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]		Species or species habitat likely to occur within area
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Protasparagus plumosus Climbing Asparagus-fern, Ferny Asparagus [11747]		Species or species habitat likely to occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Coordinates

-30.50515 153.00878

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [Department of Environment, Climate Change and Water, New South Wales](#)
- [Department of Sustainability and Environment, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment and Natural Resources, South Australia](#)
- [Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts](#)
- [Environmental and Resource Management, Queensland](#)
- [Department of Environment and Conservation, Western Australia](#)
- [Department of the Environment, Climate Change, Energy and Water](#)
- [Birds Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [Museum Victoria](#)
- [Australian Museum](#)
- [SA Museum](#)
- [Queensland Museum](#)
- [Online Zoological Collections of Australian Museums](#)
- [Queensland Herbarium](#)
- [National Herbarium of NSW](#)
- [Royal Botanic Gardens and National Herbarium of Victoria](#)
- [Tasmanian Herbarium](#)
- [State Herbarium of South Australia](#)
- [Northern Territory Herbarium](#)
- [Western Australian Herbarium](#)
- [Australian National Herbarium, Atherton and Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence](#)
- [State Forests of NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

Appendix D – Aerial Photography Comparison



25 June 2004



15 August 2010



15 January 2013

GHD

230 Harbour Drive

Coffs Harbour NSW 2450

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Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	T Chadwick	E Cornelius		I Gregson		25/6/14

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Appendix I Stakeholder Consultation

Ms Deana Burn
Mining and Industry Projects
Department of Planning
GPO Box 39
Sydney NSW 2001

Dear Ms Burn

Re: Urunga Antimony Plant Remediation (SSD 5357)

I refer to your letter of 21st June 2012 requesting the Environmental Protection Authority (EPA) review the project application and provide our requirements for the preparation of the Environmental Impact Statement (EIS) for potential inclusion in the Department of Planning's Director General's Requirements (DGRs) for the proposed remediation of the above site.

The EPA considers that the key environmental issues that Crown Lands need to address in the Environmental Impact Statement (EIS) for the Urunga Remediation Project are:

- Contaminated Sites Assessment and Remediation
- Air quality (dust management)
- Noise impacts
- Waste (including soil treatment by immobilisation of contaminants in waste)
- Soil and Sediment (including the assessment and management of Acid Sulfate Soil)
- Water Quality (groundwater and surface water)
- Threatened Species (Flora and Fauna including SEPP 14 wetland)

Other issues which should be considered are:

- Cultural heritage (Aboriginal and non-Aboriginal)
- Occupational Health and Safety (including traffic management)

Further detail on these issues is detailed in attachment 1a and 1b.

Currently the site is regulated under the *Contaminated Land Management Act, 1997* and is subject to a Management Order (20111405) for the remediation of the site. Given the contamination present at the site (associated with the former minerals processing) and the proposed use of the site as public open space, the Management Order obligates Crown Lands to the following:

- The proponent will engage a suitably qualified, experienced and reputable environmental consultant to undertake a contaminated land assessment at the site, including further investigation of the contamination of soil, sediment and groundwater due to the use of part of the site as a mineral processing plant. The investigation must be conducted and reported in

accordance with all relevant guidance, including the EPA publication titled *Guidelines for Consultants Reporting on Contaminated Sites*, September 2000.

- The proponent will prepare a remedial action plan (RAP) and submit the RAP to the EPA. Upon approval of the RAP by the EPA the proponent must implement the RAP. Following the remedial action the proponent will submit a validation report to the EPA for review.

We recommend that the DGRs are concurrent with the obligations of the Management Order.

Further, we have provided two documents:

- The **Key Environmental Issues**, Attachment 1a, provides a summary of potential environmental impacts. We recommend these issues be considered as potential DGRs.
- The **Environmental Impact Statement (EIS) requirements**, Attachment 1b, have been provided as additional guidance for the proponent for matters that the EIS should address.

Additionally, we recommend that a Construction Environmental Management Plan be provided to address the Key Environmental Issues. The plan must provide mitigation and management options describing measures to prevent, control, abate or minimise the identified environmental impacts of the project and to reduce and/or manage the risks to the environment and human health.

In our review of the Project Application we identified five major points which need clarification and/or revision by Soil Conservation on behalf of Crown Lands. Our review is provided in Attachment 2.

If you have any queries regarding the matters discussed in this letter please contact John Coffey on (02) 9995 5621 or Matthew James on (02) 9995 5707.

Yours sincerely

NJL 3/7/2012

NIALL JOHNSTON
Manager Contaminated Sites
Environment Protection Authority

Attachment 1a:**KEY ENVIRONMENTAL ISSUES**

- **Contaminated Sites Assessment and Remediation**

Compliance with the existing Management Order (20111405) on the site under the Contaminated Land Management Act, 1997

- **Air Quality** (dust management)

Assess the risk of dust emissions and monitor dust levels during project works. Report on the measures to prevent dust emissions from the project site.

- **Noise impacts**

Identify the source, nature and scope of possible noise impacts and detail feasible and reasonable noise mitigation measures.

- **Waste**

Provide classification of all potential sources of liquid and non-liquid wastes that will be taken off site for disposal. Describe quantities, storage, treatment (including immobilisation of contaminants) and disposal or re-use of all waste generated.

- **Soil and Sediments**

Provide an assessment and details of the management of Acid Sulfate Soil. Detail the erosion and sediment controls during excavation, stockpiling, treatment and backfilling.

- **Water Quality** (groundwater and surface water)

Detail the existing background and pre-remediation water quality. Provide an impact assessment and details of monitoring over time.

- **Threatened Species** (Flora and Fauna including SEPP 14 wetland)

Detail the existing environment including discussion on flora and fauna characteristics. Provide a description of the measures proposed to mitigate and / or ameliorate the impact of the development on the flora and fauna species identified. As the project encroaches across a State Environmental Planning Policy No 14 (SEPP 14) Coastal Wetland, a specific assessment of the potential impacts on the wetland and the measures proposed to minimise those impacts must be presented.

Other Issues Summary

- **Cultural heritage** (Aboriginal and non-Aboriginal)

Assess the potential impacts of the remediation and operational phase of the project on sites and places of aboriginal and non-aboriginal cultural heritage, including areas of archaeological potential.

- **Occupational Health and Safety** (including traffic management)

Identify the risks associated with the remediation works and prepare an OH&S Plan which describes what mitigation and management measures are proposed to be used to eliminate, prevent, control, abate or minimize the identified OH&S risks. Include a Traffic Management Plan in the OH&S plan.

Impacts should be assessed in accordance with relevant guidelines.

Attachment 1b:**ENVIRONMENT IMPACT STATEMENT REQUIREMENTS****Contaminated Sites Assessment and Remediation**

The EIS should:

1. Include an assessment of the contaminated site that is conducted in accordance with the guidelines made or approved under section 105 of the Contaminated Land Management Act 1997.
2. Provide the details on how the site contamination will be remediated and/or managed to the site is, or can be, made suitable for the proposed use.

All reports should be prepared in accordance with the Guidelines for Consultants Reporting on Contaminated Sites (2000).

Air Quality (dust management)

The EIS should assess and report on the risk of dust emissions during project construction / remediation works and the measures to prevent dust emissions from the project site, including how real time monitoring of local meteorological conditions might be used as:

1. An indicator of the risk of dust emissions from the project site; and
2. The trigger for implementing dust control measures, including the cessation of certain work during unfavourable meteorological conditions.

Noise impacts

The EIS should:

1. Identify the source, nature and scope of possible noise impacts.
2. Identify the project duration and normal operational hours.
3. Identify feasible and reasonable noise mitigation measures.

Waste

The EIS should include:

1. Details of the quantity and type of liquid and/or non-liquid waste(s) generated, handled, treated or disposed of at the site. Waste to be removed from the site must be classified according to the EPA's *Waste Classification Guidelines 2008*.
2. Details of liquid waste and non-liquid waste management at the site, including:
 - a. The assessment, handling, treatment and transportation of waste generated at the site;
 - b. Any stockpiling of wastes or recovered materials and procedures to prevent cross-contamination at the site;
 - c. And waste processing related to the project, including reuse, recycling, reprocessing or treatment (including immobilisation) both on and off site;
 - d. The method for disposing of all wastes or recovered materials generated by the project; and
 - e. The proposed controls for managing the environmental impacts of these activities.
3. Details of procedures for the assessment, handling, storage, transport and disposal of all hazardous materials used, stored, processed or disposed of at the site, in addition to the requirements for liquid and non-liquid wastes.

4. Details of the type and quantity of any chemical substances to be used or stored and a describe arrangements for their safe use and storage.

Soil and Sediment (including the assessment and management of Acid Sulfate Soil)

The EIS should include:

1. Erosion and sediment controls during excavation, stockpiling, treatment and backfilling. Particular attention should be given to soil erosion and sediment transport – in accordance with *Managing urban stormwater: soils and construction*, vol. 1 (Landcom 2004) and vol. 2 (DECCW 2008)

Acid Sulfate Soil

If the proposed development (or part thereof) is located on land marked Class 1, 2, 3 or 4 on the relevant Acid Sulfate Soil Planning Map, or within 500 metres of adjacent Class 2, 3 or 4 land that is below 5 metres Australian Height Datum (AHD), The EIS should:

2. Assess the potential impacts of the development on acid sulfate soils in accordance with the relevant guidelines in the Acid Sulfate Soils Manual (Stone et al. 1998) and the Acid Sulfate Soils Laboratory Methods Guidelines (Ahern et al. 2004).
3. Describe mitigation and management options that will be used to prevent, control, abate or minimise potential impacts from the disturbance of acid sulfate soils associated with the project and to reduce risks to human health and prevent the degradation of the environment. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.

Water Quality (groundwater and surface water)

Background Conditions

The EIS should include:

1. Describe existing surface and groundwater quality prior to remediation works. An assessment needs to be undertaken for any water resource likely to be affected by the proposal.
2. Provide an outline of baseline surface and groundwater information, including, for example, depth to water table, flow direction and gradient, groundwater quality, reliance on groundwater by surrounding users and by the environment, tidal levels, flood levels, connectivity of local creeks, stormwater systems, wetlands and receiving waters.
3. State the Water Quality Objectives for the receiving waters relevant to the proposal. These refer to the community's agreed environmental values and human uses endorsed by the NSW Government as goals for ambient waters (<http://www.environment.nsw.gov.au/ieo/index.htm>). Where groundwater may be impacted the assessment should identify appropriate groundwater environmental values.
4. State the indicators and associated trigger values or criteria for the identified environmental values. This information should be sourced from the ANZECC (2000) Guidelines for Fresh and Marine Water Quality (http://www.daff.gov.au/oldmincos/publications/australian_and_new_zealand_guidelines_for_fresh_and_marine_water_quality).
5. State any locally specific objectives, criteria or targets which have been endorsed but the NSW Government.

Impact Assessment

6. Describe the nature and degree of impact that any proposed discharges will have on the receiving environment.
7. Assess impacts against the relevant ambient water quality outcomes. Demonstrating how the proposal will be designed and operated to:
 - a. Protect the Water Quality Objectives for receiving waters where they are currently being achieved; and
 - b. Contribute towards achievement of the Water Quality Objectives over time where they are not currently being achieved.
8. Assess impacts on groundwater and groundwater dependant ecosystems.
9. Describe how stormwater will be managed both during and after the project.
10. Provide an assessment of flooding frequency, levels and what impact a major flooding event may have on the site. Include details of contingency measures that will be adopted if a major flooding event occurs during and following the remediation works.

Monitoring

11. Describe how the predicted impacts will be monitored and assessed over time.

Threatened Species (Flora, Fauna and SEPP 14 wetlands)

Detail the existing environment including discussion on flora and fauna characteristics. Make use of previous investigations and complete further desktop evaluations. Provide a description of the measures proposed to mitigate and / or ameliorate the impact of the development on the flora and fauna species identified. As the project encroaches across a State Environmental Planning Policy No 14 (SEPP 14) Coastal Wetland, a specific assessment of the potential impacts on the wetland and the measures proposed to minimise those impacts must be presented.

OTHER ISSUES

Cultural heritage (Aboriginal and non-Aboriginal)

The EIS should:

1. Identify the nature and extent of impacts on cultural heritage values across the project area.
2. Describe the actions that will be taken to avoid or mitigate impacts or compensate to prevent unavoidable impacts of the project on cultural heritage values. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.
3. If items of Aboriginal cultural heritage are identified, clearly demonstrate and document that effective community consultation with Aboriginal communities has been undertaken in determining and assessing impacts, developing options and making final recommendations.

Occupational Health and Safety (including traffic management)

The EIS should:

1. Identify the risks associated with the remediation works such as; exposure to contaminated media and increase in heavy vehicles; to:
 - a. Workers onsite;
 - b. Off site residents;
 - c. Local community members; and
 - d. Pacific Highway users.
2. Prepare an Occupational Health and Safety Management Plan which describes what mitigation and management measures are proposed to be used to eliminate, prevent, control, abate or minimize the identified OH&S risks.
3. Include a Traffic Management Plan in the OH&S plan.

Attachment 2:

EPA Review of the Project Application

The EPA is generally satisfied with the Project Application (PA) document;

Urunga Antimony Processing Plant Contaminated Site – Project Application & Preliminary Environmental Assessment, prepared by Department of Primary Industries, Soil Conservation Service, June 2012.

We have 5 major points which need clarification and/or revision:

- **Section 2.1 Location and Land Titles & Section 4.5 Post Remediation Landuse**

Figure 4 includes the north-west corner of the site as part of the remediation site. We note that this part of the site is not currently regulated as a declared area of significant contamination under the existing Management Order. The PA should note that this part of the site is not regulated and describe the area as potentially being utilised as part of the remediation process. The north-west corner of the site may be proposed as the location of a containment cell. This should be clearly presented in the PA so that the Planning Approval allows for utilisation of this area as part of the remediation of the site.

- **Section 4.6 Validation**

The EPA will not be requiring a NSW EPA accredited Site Auditor to review the remediation works nor to provide a Site Audit Statement/Report for the site.

The proponent will submit a Validation report to the EPA following the remediation works.

Note: The EPA understands that the Post Remediation land use of the entire site, including the former residential areas in the north-west corner of the site will become Public Open Space.

- **Section 5.2 State Legislation, Protection of the Environment Operations Act 1997**

It is our understanding that the remediation works will **not** require an Environment Protection Licence as the PA suggests. The PA quotes Clause 15 (2) (a) which refers to treatment of contaminated soil received from 'off site'. As the site will not be receiving or treating any soil from 'off site' this section of the Act is not applicable.

With regard to Section (2) (b); contaminated soil originating exclusively from on site sources may potentially be treated however the treatment will **not** involve:

- Incineration (i);
- Treatment or storage of over 30,000m³ of contaminated soil (ii); or
- Disturbing more than an aggregate area of 3 hectares of contaminated soil (iii).

- **Section 6.1 Environmental Factors**

The PA mentions in section 3.3 'Contamination', that acid sulphate soil has the potential when disturbed and exposed to oxygen to generate acid. The acid could potentially exacerbate the mobilisation of metal contaminants from the tailings or contaminated soil.

Thus, we request that Acid Sulfate Soil / Potential Acid Sulfate Soil (ASS/PASS) is addressed as an individual key environmental factor and removal from the Waste section. Mitigation strategies are to be employed to ensure that the ASS/PASS are handled and treated appropriately during excavation works.

- **Section 6.6 Air Quality & Section 6.11 OH&S**

In Section 6.6 Air Quality, the **Risk** section part (ii) needs clarification and further information. Specifically what “inorganic toxic gases” are being referred to as a potential exposure risk upon “exposure to oxygen”?

In Section 6.11 OH&S, the **Risk** section part (i) needs clarification and further information. Specifically what risk of infection is posed from tailings contaminated with heavy metals and what gases are being referred to.

Note: the word “plume” refers to water and air bodies only. Hence, we would consider replacing ‘tailings plume’ with ‘tailings’ or ‘tailing material’ throughout the document.

Additionally, we have these **minor comments regarding the Application.**

Page 2: The report has not been signed by the report reviewer.

Page 13: Source Zone, paragraph 3: typographical error for mercury.



NTH12/00063, CR2012/006515
Your ref: SSD 5357

The Director
Mining & Infrastructure Projects
NSW Planning & Infrastructure
GPO Box 39
SYDNEY NSW 2001

Attn: Deana Burn

Dear Sir/Madam,

Urunga Antimony Plant Remediation (SSD 5357), Lot 1 DP 874874, Hillside Drive, Urunga

I refer to your letter of 21 June 2012 seeking comment on the abovementioned state significant development proposal.

The key concern for Roads and Maritime Services (RMS) is the safety and efficiency of the state classified road network, in particular the Pacific Highway (HW10), which connects with Hillside Drive.

RMS requests that the DGRs include the following issues to be addressed by any Environmental Impact Statement (EIS).

A detailed traffic study should be undertaken that takes into account the key issues relevant to the scale of this proposal as set out in Table 2.1 of the Roads and Traffic Authority's current 'Guide to Traffic Generating Developments' (copy attached). The traffic study should include information relating to:

- An assessment of the potential traffic impacts on the capacity, efficiency and safety of the state classified road network, particularly the impacts of heavy vehicles.
- The number and type of vehicle trips to be generated by the proposed development.
- Existing and proposed access conditions.
- Intersection sight distances of connections with the Pacific Highway including;
 - Safe Intersection Sight Distance (SISD),
 - Approach Sight Distance (ASD),
 - Truck Safe Sight Distance (TSSD).
- Improvements for roads, junctions / intersections.
- Proposed Haulage routes for removed materials
- Detail of servicing and parking arrangements
- Connectivity to existing developments
- Impact on Transport (Public and School Bus Routes)
- Provisions for pedestrians, alternative transport modes such as bicycles
- Road Traffic Noise

Roads & Maritime Services

To ensure that haulage routes do not adversely impact on the safety of the road network adjoining these proposals, RMS recommends that the traffic study be supported by a Road Safety Audit, undertaken by a suitably qualified person.

Current AUSTROADS standards should be adopted for any necessary upgrading of the surrounding road infrastructure.

To fulfil legislative, construction and environmental requirements, RMS will require the developer to enter into a Works Authorisation Deed (WAD) to carry out any works on the Pacific Highway. Prior to any construction activities on a state road, a number of prescribed requirements and conditions will need to be undertaken, including the process for geometric and pavement design approval, project management arrangements, insurances, WHS and environmental management during construction, construction specifications and the process for approval of road occupancies. All works will need to be undertaken by an RMS approved Contractor and be at no cost to RMS. Additionally, RMS will require payment of costs for the administration of the WAD.

Should you have any further questions please contact Matt Adams of RMS Development Northern on (02) 6640 1300 or via email at: development.northern@rms.nsw.gov.au

Yours faithfully,



10 JUL 2012



David Bell
Regional Manager, Northern



BELLINGEN SHIRE COUNCIL

33-39 Hyde Street, Bellingen NSW

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L10011
my
Anthony Brandie
Direct Line: (02) 66 557 326

3 July 2012

Deana Burn
NSW Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Dear Madam

URUNGA ANTIMONY PLANT REMEDIATION (SSD 5357)

I refer to your correspondence dated 21 June 2012 requesting Council's requirements for the preparation of the Environmental Impact Statement (EIS) for the referenced project. The Project Application and Preliminary Environmental Assessment documents prepared by Clayton Colmer of the Soil Conservation Service have been reviewed and Council hereby requests that the following matters be given consideration in the preparation of the EIS for the subject project;

- *Local traffic impacts and potential conflict with the existing vehicular access to the site being adjacent to the Pacific Highway.*
- *Potential conflicts with downstream users of the watercourse during the remediation phase ie. fishing and other recreational activities.*
- *Management of public perception and community expectations during the remediation phase (pollution management) and post remediation (future land use).*
- *The potential for remediation works to adversely impact on Aboriginal objects and/or Aboriginal places of heritage significance and the limitation to desktop investigations to identify this potential.*
- *Contemporary legislative provisions, noting that the preliminary report references repealed material.*

Thank you for the opportunity to comment on this project.

Should you have any further enquiries contact the undersigned between 8.30am –10.30 am. **NB:** The Division of Environmental Health and Planning Office hours are Monday to Friday 8.30am to 4.30pm.

Yours faithfully

Anthony Brandie
Environmental Health and Building Surveyor

From: Chris Ritchie
To: Deana Burn
Date: 7/5/2012 12:29 pm
Subject: Fwd: 6/22 Urunga Antimony Processing Plan - DGRs

>>> "Lawrence, Kerryn" <Kerryn.Lawrence@ncahs.health.nsw.gov.au> 7/5/2012 12:28 pm
>>>
Hi Chris,

Please find below two recommendations from NSW Ministry of Health for inclusions in the DGRs for application 6/22, remediation of the contaminated site at the old Antimony processing plant in Urunga.

Thank you for this opportunity.

Regards,
Kerryn

1. A comprehensive Communication and Community Consultation Strategy should be undertaken in Stage 1 of the project. This should include but not be limited to the residents in the neighbourhood, the nearby Child Care Centre management and the parents of children attending the Centre, concerned citizens of the area and the Coffs Harbour Local Aboriginal Land Council.

2. An assessment of public health risk should be undertaken. This should include but not be limited to fugitive dust emissions from the site and public access to the site.

Kerryn Lawrence

Senior Environmental Health Officer (Tue-Fri) | **Public Health**
PO Box 126 Port Macquarie NSW 2444
Tel. 02 6588 2792 | Fax. 02 6588 2837 | Mob. 0418 112 248 |
Kerryn.Lawrence@ncahs.health.nsw.gov.au
www.ncahs.nsw.gov.au/public-health

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Department of Primary Industries

OUT12/15878

16 JUL 2012

Ms Deana Burn
Mining & Industry Projects
NSW Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Email: Deana.Burn@planning.nsw.gov.au

Dear Ms Burn

Re: Urunga antimony plant remediation (SSD 5357) - input into Director-General's requirements for the environmental assessment.

Reference is made to your letter to the NSW Office of Water, which is now an agency within the Department of Primary Industries (DPI), in respect to this matter.

The Office of Water advises that the environmental assessment should demonstrate consideration of the following points, and address the expanded list of assessment requirements detailed in Attachment A.

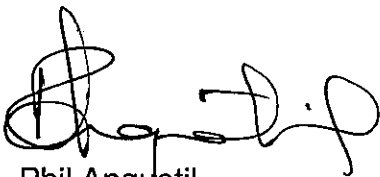
1. An adequate and secure water supply for the proposal.
2. Existing and proposed water licensing requirements in accordance with the *Water Act 1912* and the *Water Management Act 2000*.
3. All proposed groundwater works, including bores for the purpose of investigation, extraction, dewatering, incidental pit water, testing or monitoring must be identified in the proposal.
4. An assessment of impact of the remediation works on adjacent licensed water users, basic landholder rights or groundwater-dependent ecosystems (GDEs).
5. Requirements to intercept groundwater and predicted dewatering volumes, water quality and disposal/retention methods of contaminated water.
6. An assessment of the associated impacts on the local and regional groundwater system due to the proposed remediation works.
7. An assessment of the potential impact on groundwater and surface water due to the potential on-site disposal/containment of contaminated material.
8. A detailed monitoring program and mitigation plan to address surface and groundwater impacts on and off-site.
9. Identification and assessment of any impacts on watercourses and drainage lines on site and adjacent to the site and the future management of these areas, in particular the adjacent SEPP 14 wetland, Station Creek and Urunga Lagoon.

10. An assessment of the occurrence of Acid Sulfate Soils on the site and the management of these soils during the remediation of the site, including the development of an Acid Sulfate Management Plan.

For further information please contact Christie Jackson, Planning and Assessment Coordinator (Tamworth office) on 6701 9652 or at: christie.jackson@water.nsw.gov.au.

Discussion with your office on 11 July 2012 advised that there was no other referral to DPI generally. A perusal of the application suggests that the matter may be of interest to Fisheries NSW, also an agency within DPI. An internal referral to Fisheries NSW has now been made. However, in the meantime it is suggested that direct consultation with Fisheries NSW by the proponent be a further requirement by the Director-General. For further information please contact Greg Paine, Senior Policy Officer (Planning), Business Services Department of Primary Industries on 8289 3951 or by email at: greg.paine@industry.nsw.gov.au.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Phil Anquetil', with a stylized flourish at the end.

Phil Anquetil
Executive Director Business Services

**NSW Office of Water Environmental Assessment Requirements
Urunga Antimony Plant Remediation (SSD 5357) [Our Ref: ER21925]**

1. Legislation

The assessment is required to take into account the objects and water management principles of the *Water Management Act 2000* (WMA 2000) and statutory requirements of the *Water Act 1912*, as applicable.

2. Water Sharing Plans

Gazetted Water Sharing Plans (WSPs) prepared under the provisions of the WMA 2000 establish rules for access to, and the sharing of water between the environmental needs of the surface or groundwater source and water users. As such the assessment is required to demonstrate consistency with the rules of the WSP. The remediation site is located within the *Water Sharing Plan for the Bellinger River Area Unregulated and Alluvial Water Sources 2008*.

Refer to: <http://www.water.nsw.gov.au/Water-Management/Water-sharing/default.aspx>

3. State Government technical and policy documents

The assessment is required to take into account the following NSW Government policies, as applicable:

- *NSW Groundwater Policy Framework Document - General*
- *NSW Groundwater Quality Protection Policy*
- *NSW State Groundwater Dependent Ecosystem Policy*
- *NSW State Rivers and Estuaries Policy*
- *NSW Wetlands Policy*
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*
- *Australian and New Zealand Guidelines for Water Quality Monitoring and Reporting*
- *Guidelines for the Assessment and Management of Groundwater Contamination*
- *Guidelines for Groundwater Protection in Australia*

4. Controlled Activity Guidelines

The assessment is required to take into account the NSW Office of Water Guidelines for Controlled Activities, as applicable, for all activities to occur on *waterfront land*, as defined in the WMA 2000. Refer to:

<http://www.water.nsw.gov.au/Water-Licensing/Approvals/Controlled-activities/default.aspx>

5. Groundwater**a) Licensing**

All proposed groundwater works, including bores for the purpose of investigation, extraction, dewatering, testing or monitoring must be identified in the proposal and an approval obtained from the NSW Office of Water prior to their installation.

b) Groundwater source

The assessment is required to identify groundwater issues and potential degradation to the groundwater source and provide the following:

- Details of any works likely to intercept, connect with or infiltrate the groundwater sources.
- Details of any proposed groundwater extraction, including purpose, location and construction details of all proposed bores and expected annual extraction volumes.

- Describe the flow directions and rates and the physical and chemical characteristics of the groundwater source.
- Details of the predicted impacts of any final landform on the groundwater regime.
- Details of the existing groundwater users within the area (including the environment) and include details of any potential impacts on these users.
- Assessment of the quality of the groundwater for the local groundwater catchment.
- Details of how the proposed development will not potentially diminish the current quality of groundwater, both in the short and long term.
- Details on preventing groundwater pollution.
- Details on protective measures for any groundwater dependent ecosystems (GDEs).
- Details of proposed methods of the disposal of waste water and approval from the relevant authority.
- Assessment of the need for an Acid Sulfate Management Plan (prepared in accordance with ASSMAC guidelines).
- Assessment of the potential for saline intrusion of the groundwater and measures to prevent such intrusion into the groundwater aquifer.
- Details of the results of any models or predictive tools used.

c) Groundwater dependent ecosystems (GDEs)

The assessment is required to identify any impacts on GDEs and address the following:

- Identification of potential GDEs within the development site and adjacent area.
- Current GDEs condition, water quantity and quality required by the ecosystems (minimum 2 year fortnightly baseline data).
- Flora and fauna assessment for all ecosystems which includes macro invertebrate and macrophyte diversity and abundance assessments within all watercourses within and adjacent to the development site.
- Determine critical thresholds for negligible impacts.
- Manage groundwater extraction within defined limits thereby providing flow sufficient to sustain ecological processes and maintain biodiversity.
- Ensure sufficient groundwater of suitable quality is available to ecosystems when needed.
- Ensure the precautionary principle is applied to protect GDEs, particularly the dynamics of flow and availability and the species reliant on these attributes.
- Details on protective measures to minimise any impacts on GDEs and any potential offset areas which will be monitored and protected.

d) Contingency measures

Where potential impacts are identified the assessment will need to identify limits to the level of impact and contingency measures that would remediate, reduce or manage potential impacts to the existing groundwater resource and any dependent groundwater environment or water users, including information on:

- Details of proposed monitoring programs, including water levels and quality data.
- Reporting procedures monitoring programs including mechanism for transfer of information to the Office of Water.
- An assessment of any groundwater source that may be sterilised as a consequence of the proposal.
- Identification of any nominal thresholds as to the level of impact beyond which remedial measures or contingency plans would be initiated (this may entail water level triggers or a beneficial use category).
- Description of the remedial measures or contingency plans proposed.
- Any funding assurances covering the anticipated post development maintenance cost, for example on-going groundwater monitoring for the nominated period.

6. Surface water and riparian protection

The assessment is required to consider the impact of the proposal on watercourses and associated riparian vegetation within the site and provide the following (where applicable):

- Identify the sources of surface water.
- Details of stream order (using the Strahler System).
- Details of any proposed surface water extraction, including purpose, location of existing pumps, dams, diversions, cuttings and levees.
- Detailed description of any proposed development or diversion works including all construction, clearing, draining, excavation and filling.
- An evaluation of the proposed methods of excavation, construction and material placement.
- A detailed description of all potential environmental impacts of any proposed development in terms of vegetation, sediment movement, water quality and hydraulic regime.
- A description of the design features and measures to be incorporated into any proposed development to guard against long term actual and potential environmental disturbances, particularly in respect of maintaining the natural hydrological regime and sediment movement patterns and the identification of riparian buffers.
- Details of the impact on water quality and remedial measures proposed to address any possible adverse effects.

7. Rehabilitation, final landform and final void management

The assessment must include:

- Justification of the proposed final landform with regards to its impact on local and regional groundwater systems and surface water systems.
- A detailed description of how the site will be progressively rehabilitated and integrated into the surrounding landscape.
- Detailed modelling of potential groundwater volume, flow and quality impacts of the presence of an inundated final void on identified receptors, specifically considering those environmental systems likely to be groundwater dependent.
- A detailed description of the measures to be put in place to ensure that sufficient resources are available to implement the proposed rehabilitation.
- The measures that would be established for the long-term protection of local and regional aquifer and surface water systems and for the ongoing management of the site following the cessation of the project.

End Attachment A

From: Matthew James [<mailto:Matthew.James@epa.nsw.gov.au>]
Sent: Tuesday, 10 June 2014 12:47 PM
To: Brian Cork
Cc: Ben Luffman; Arminda Ryan; Clayton Colmer
Subject: RE: Urunga antimony site remediation EIS

Hi Brian,

As discussed, the EPA Contaminated Sites section provides the following comments based on internal discussions with the EPA North Branch. We recommend that a qualitative approach to the assessment of likely impacts is appropriate, however a quantitative approach for monitoring of dust is required. Further:

- A noise assessment should be done in accordance with the *Interim Construction Noise Guidelines*, and adopt the 'Qualitative Assessment Method'. The CEMP should then detail a response plan to excessive noise levels and/or noise complaints.
- Dust management and controls on site will be critical as will ongoing air quality monitoring (dust) for the duration of the project. Please detail an appropriate plan which includes conservative criteria for dust levels based on the contaminants of concern identified previously.

Regards,

Matthew James

Senior Operations Officer | Contaminated Sites | **NSW Environment Protection Authority** |

☎: (02) 9995 5707 | 📠: (02) 9995 5930 | ✉: Matthew.James@epa.nsw.gov.au | P.O. Box A290 Sydney South NSW 1232 |

Brian Cork

From: Denique Littler (InTouch)
Sent: Friday, 13 June 2014 10:20 AM
To: Brian Cork
Subject: RE: Urunga antimony site remediation

Hi Brian, as discussed unless anything has changed significantly since Anthony's input I am not sure what value there would be in providing comment at this stage. If however there has been a significant change and you consider it beneficial for Council to again provide input please let me know and provide relevant documentation and I will allocated it accordingly noting that we are in the middle of a recruitment process to replace staff vacancies.

Thanks, Denique



Denique Littler
Manager Land Use Services
Administrative Centre | Hyde Street | PO Box 117 | Bellingen NSW 2454
Ph: +61 2 6655 7335 | Fax +61 2 66552310

www.bellingen.nsw.gov.au

Think of the environment, please don't print this e-mail unless you really need to.

From: Brian Cork [<mailto:Brian.Cork@ghd.com>]
Sent: Wednesday, 4 June 2014 10:02 AM
To: Denique Littler
Cc: Ben Luffman
Subject: Urunga antimony site remediation

Hi Denique,

I understand you are the new BSC contact for the Urunga antimony site remediation project. As part of the EIS for the project we have included feedback from Anthony Brandie (former BSC) but I thought I would give you the opportunity to provide any additional feedback on the project prior to finalisation of the draft EIS.

Would you mind giving me a call to discuss it when you get back? I am on leave from Friday 13 June so there is a small window where we overlap. If you could call in that window that would be great.

Regards

Brian Cork
Senior Environmental Engineer

GHD

T: +61 2 6650 5666 | V: 225666 | M: +61 43903 7488 | E: brian.cork@ghd.com
230 Harbour Drive, Coffs Harbour, NSW, 2450, Australia | <http://www.ghd.com/>
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Trade & Investment,
Regional Infrastructure
& Services



Risk Identification & Assessment Workshop

Urunga Remediation Project

Risk Assessment Study

20th December 2011

Draft Report

Prepared by NSW Public Works

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Summary Report

Executive Summary

The remediation of the former Antimony processing plant in Urunga contains a number of risks associated with the site location, remediation area, quantity of contaminated material, planning pathway, and budget.

Scope creep is a significant risk, as the extent of remediation boundary is yet to be defined. A GAP analysis will assist in defining project scope and boundary.

The scope and complexity of the project planning phase, will be determined by the Director General Requirements, community interest and expectations. Department of Lands will need to develop a communication strategy to engage with adjoining residents and local community.

Risks associated with the current funding shortfall will require close management to target funds for the remediation of high risk areas. Department of Lands will need to liaise closely with regulatory authorities to confirm draft Director General Requirements (DGR's), and scope of works for budget estimating.

The contractor will determine remediation work methods for excavations, location of dust suppression equipment, sediment and erosion control, water treatment etc. A high level Remediation Action Plan completed by a consultant may not provide sufficient work method details to meet the DGR's, increasing risk for delays in planning approval.

The final remediation contract value will reflect the level of project risk and uncertainty. The contractor will need to design work methods that manage risks including a high watertable, dewatering, water treatment, acid sulphate soils, treatment of contaminated soil, site access restricted by the Pacific Highway. Generally lower tender prices are gained when sufficient details are provided to contractors to reduce uncertainty and risks.

Early Tenderer Involvement (ETI) has been successful in managing the contractors understanding of project risks and define the tender document prior to tender.

As the site contains building debris and rubbish, an early works site clean up would reduce risk associated with unidentified contaminants such as asbestos containing material.

The workshop did not identify any risks that cannot be managed or mitigated. The careful management of risks will be required to ensure funds are not exhausted in the early site investigation and planning phase.

1. Introduction & Risk Study Context

The site is located on vacant undeveloped land adjacent to a SEPP 14 wetland, located on both private and crown land. The private land is currently being acquired by the government. Broken Hill Antimony Pty Ltd operated on the site between 1969 to 1974, the operations included processing stibnite ore for the removal of the mineral Antimony. The waste produced was discharged as a slurry into the wetland area.

EPA-Ordered Site Remediation triggered the site works being classified as State Significant Development planning assessment pathway which includes an Environmental Impact Assessment and community consultation.

Previous investigations undertaken by the Department of Lands have indicated that tailings and sediments containing significant levels of heavy metal and metalloid are present as an exposed surface layer across the processing site and adjoining Crown Land. The Environmental Protection Authority (EPA) has determined that the contamination is considered significant contamination under the Contaminated Land Management Act 1997, and consequently the site has been declared a remediation site due to the presence of metals (antimony, arsenic, copper, lead and mercury) in soil and sediments. The issues of concern were: the potential for human exposure through dusts; the degradation of groundwater and the nearby Station Creek, and; observed dieback of Melaleuca trees and other vegetation.

The current estimate of contaminated soil onsite is 15,000 tonnes, the remediation area is yet to be defined, and may extend into the Melaleuca tree wetland area. A significant area of the excavation will be below the high tide mark, in an area known to have acid sulphate soils.

A site inspection followed by Risk Management Workshop was held on 20th December 2011 at the Urunga Golf Club, attended by Bellingen Council, NSW Health, NSW EPA, Department of Lands, and Public Works as representatives of the community.

NSW Public Works facilitated the workshop and this report summarises the findings of the workshop. The participants for the on-site inspection and the workshop are listed in [Appendix 1](#).

2. Purpose

The purpose of the Risk Management Workshop was:

- To seek a range of perspectives on potential risks and possible risk mitigation strategies for the proposed remediation of the Urunga Processing Site.
- Document the results of the workshop, using the documentation as a planning and monitoring instrument for the documentation and construction phases of the remediation works.

3. Key Outcomes

The key outcomes expected from the workshop were to:

- Identify significant risks related to Planning, State Significant Development and Director General's Requirements (DGR's)
- Discuss strategy to engage with the local community prior to planning exhibition.
- Define risks with project scope, Gap analysis, remediation boundaries;
- Adequacy of budget, including a contingency for risks;
- Risks associated with Remediation Action Plan and work methods.
- Identify the risks and suitable mitigation strategies for the construction phase.

As a result of the inspection and risk assessment workshop the participants were able to:-

- Confirm that the risks to the project are seen as manageable provided a competent project manager and contractor is engaged to ensure reliable performance; and
- Agree on a range of actions and risk management measures that enable Department of Lands to structure and procure the works, develop contract documentation, as well as provide a reliable budget.

These outcomes were reached through:-

- Sharing of specialist knowledge and understanding about the site, its current condition and hazard features and its remediation requirements;
- Considering the community and environmental significance in achieving prompt and safe successful remediation;
- Clarifying the issues that must be addressed in successful procurement and completion of the works;
- Appreciating the significance to Lands in complying with EPA order in a timely, effective and cost efficient manner; and

4. Key Risks

The Workshop identified a range of hazards/risks for the project. These risks are tabulated in Risk Register format and are included in Appendix 2. The Risk Register details the various risks and their categories, and the proposed risk mitigation measures.

The risks that have been identified can be broadly into the following categories: -

- Community perception/concerns of the proposal;
- Planning and Approval processes;
- Management of excavations below water, and acid sulphate soils;
- Remediation adjacent to sensitive wetland;
- Dusts;
- Management and disposal of contaminated sediments; and
- Project budget.

4.1 Occupational Health & Safety Issues

These risks relate to the safety of both workers and the public associated with remediation works. The risk mitigation strategies would include (but not necessarily limited to) the following: -

- During the planning phase the onus will be on the Department of Lands to provide security to the site to prevent illegal entry to the site.
- Early contractor involvement will be sought to formulate the methodologies and processes for remediation with due consideration given to safety and environmental issues. These methodologies/processes will be incorporated in the tender documents to yield desirable outcomes.
- Specific requirements of EPA with respect to safety and environment will be included in the tender documents (dust suppression, stoppage of site activities during high wind conditions etc).
- Management of Dusts;

4.2 Community concerns/perception

This risk largely relates to the perception that the Community is affected by the contaminants on site (transported through air or other means) and its lack of understanding or the acceptance of the project.

An appropriate mitigation strategy is for Department of Lands to undertake consultation to inform the community of the project, for example media release, information sessions, news letters/letterbox drops/web site updates (e.g. FAQ) and meeting the residents directly adjacent to the site. The NSW State Property Authority website shows a similar example for the remediation of Nelson Parade Hunters Hill see;

http://www.lpma.nsw.gov.au/spa/our_business/current_projects

NSW Health are to provide Lands a list of residents that have previously contacted Health regarding site matters.

Water Tanks may also contains heavy metal contamination from past mining in the area.

Residents may be interested in final visual aesthetics of the site.

The DGR's may require a Human Health Risk Assessment including dust modelling to assess quantitative risk to residents, and fugitive dust monitoring during site works.

An interagency task force has previously been used to manage communications within government.

4.3 Planning and Approval Process

The complexity of the project planning phase will be determined by the Director Generals Requirements, community interest and community expectations. A high level Remediation Action Plan may not meet the specific requirements for a State Significant Environmental Assessment.

This risk largely relates to potential project delays arising from: -

- the required approval processes not being clear, and
- Remediation Action Plan not describing work methods for remediation, or sufficient details for Environmental Impact Statement.

- A Remediation Action Plan completed by a consultant will not describe the work methods utilised by the successful contractor. The contractors work methods need to be outlined in the Remediation Action Plan. A high level RAP that does not include work methods may fail to provide sufficient information.
- RTA are likely to require significant conditions regarding access to the Pacific Highway. A detailed traffic management plan, and truck movements are likely requirements in DGR's.
- The appropriate mitigation strategy is to seek clarification and formal confirmation of planning requirements in Draft Director General Requirements via consultation with the Department of Planning. This will enable formulation of the approvals processes for the works.

The Department of Planning require fees (based on project value) for the assessment of the Environmental Impact Assessments.

4.4 Remediation and Management

The value of antimony metals on site should be assessed prior to defining a remediation option. The processing of ore and tailings on site may be included in the Planning Approval process. The extractive metallurgical processing of antimony may be classified as waste treatment and provide needed capital for remediation works.

The project budget may not be sufficient to remediate entire site, Lands may consider remediation of only high risk areas, with some un-remediated areas managed in the Site Management Plan.

An early works package to remove building waste would reduce the risk of asbestos or other unidentified materials onsite.

The extractive metallurgy option is largely driven by commercial requirements– the feasibility of such re-use will need to be assessed as part of the GAP analysis and early contractor involvement process. There are at least four options and a number of combinations for the disposal of the heavy metal tailings and sediments. They are: -

- Immobilisation and onsite encapsulation;
- Onsite processing treatment (soil washing) with partial disposal off-site and partial onsite encapsulation (Council Tip,);
- Immobilisation and onsite encapsulation;
- Capping Site, and
- On site treatment including immobilisation and off site disposal to Council Tip (In situ Waste Classification).

After defining the project scope these options have to be investigated further to determine the most suitable option. The option will need to be cost effective and the most appropriate option for the following reasons:

- High water level and dewatering of the excavations will be very costly and certain heavy machinery may not be effective.
- Unknown geotechnical conditions required for construction of containment cell.
- Management of Acid Sulphate soils, and risks of discharge into wetland;
- Risks associated with the transportation on and offsite (instability of the soft sediments onsite and Pacific Highway access);
- The proposed construction of access pathway from the Pacific Highway to wetland area will require ground stabilisation works;

- Council Tip will not accept restricted industrial waste.
- Burial of the waste onsite would require hydro-geological investigations to confirm the buried material will not contaminate ground water in the longer term;
- Design of onsite encapsulation including, geotechnical information prior to excavation;
- Water management including diversion of water from entering site, and treatment of water before discharge to wetlands.

4.5 Project Budget

The project budget clearly relates to the final scope of the remediation works. The additional investigations as outlined above (Gap analysis, Geotechnical, Planning/Approval process, hydrogeological investigation etc) would assist in defining the scope of works and also address any latent conditions on the site. Satisfactorily addressing these issues would greatly contribute to the development of the budget estimate.

Early involvement of the remediation contractor would assist in defining a reliable pre-tender estimate for the remediation works. Should the tender prices exceed the budget allocation there should be a mechanism in place for early submission to seek extra funding or a prioritized list of works developed so that the scope of works could be amended to suit the budget.

The project scope may need to be adjusted to meet the project budget, with only high risk contamination being remediated.

5. Conclusions

The workshop did not identify any risks that cannot be managed or mitigated. The scope and commencement of the work is depended on the availability of funds.

The current lack of funds will require the project scope to be carefully managed, and include close liaison with the EPA to agree on a targeted remediation scope that removes the high risk areas. After the GAP analysis and site investigations the scope of works will need to be refined to meet budget.

The planning requirements for State Significant Development require Director Generals Requirements and an Environmental Impact Statement. Preparing a high level Remediation Action Plan that does not outline the work methods may not provide sufficient details to meet the DGR's and delay gain planning approval.

The following actions may be initiated:

- Liaise with Planning regarding Draft Director General Comments
- Commission a suitably qualified and experienced consultant to undertake a "GAP Analysis" for additional investigations.
- Soil analysis to confirm feasibility of treatment of soil including removal of minerals, soil washing, and onsite immobilisation.
- Commencement of community consultation to make local residents aware of the project.
- Early Tenderer involvement process to assist with the formulation of methodologies and processes for remediation and preparation of a pre-tender estimate for the works.
- Once the scope of works is finalised. Prepare an Environmental Impact Statement based on approved remediation method.

DRAFT

Appendix 1. List of Participants

NSW Department of Industry & Investment

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Appendix 2. Hazard Identification & Risk Assessment

Step 1 – Identify the Hazards

The site inspection commenced at 10:30 am and it covered Urunga Crown Land and private land area. Following the site visit the participants gathered at Urunga Golf Club for the Risk Management Workshop.

Then, working as a whole group they stated their potential hazards, which were recorded by the facilitator.

Step 2 – Assess the Risk

The NSW Public Works rated the consequences, using a qualitative framework (See overleaf) and the likelihood of its occurrence for this project. Again some further hazards emerged during this process.

Step 3 – Risk Ranking

Those with the higher risk rating (colour highlighted in the risk register) were then confirmed. The opportunity was taken to add further hazards as they came to mind.

Step 4 – Risk Management

Only the higher ranked risks were looked at as to how these should be managed – to either reduce the likelihood of its occurrence or to mitigate if not eliminate the consequences if it was to occur.

The outputs of this process are included in the following schedules.

14 May 2012

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URUNGA ANTIMONY CONTAMINATED SITE INCEPTION MEETING MINUTES

Attendees: Regulator: NSW EPA (Sydney) - Matthew James
Specialist Consultant: GHD - Ben Luffman/Brian Cork/Ian Gregson
Local Authority: Bellingen Shire Council (BSC) - Anthony Brandy/Garry Hankinson
Land Owner: Crown Lands - Richard Chewings
Project Manager: Soil Conservation Service (SCS) - Clayton Colmer

Apologies: Regulator: NSW EPA (Sydney) - John Coffey
Project Manager: Soil Conservation Service - David Howley
Local Authority: Bellingen Shire Council - Liz Jeremy/Charlie Hannavy
Land Owner: Crown Lands - David McPherson

Time: 10:00 am Meet at Hillside Drive, Urunga. Walk the site from 10:45am. Left site at 12:45pm to return to GHD Office at 230 Harbour Drive, Coffs Harbour for lunch and to discuss meeting agenda items. Finished 3:30 pm.

Facilitator Clayton Colmer, Senior Environmental Officer, SCS
 Mobile 0437 013 126

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1 Project Objectives

- a. Achieve compliance with the EPA Management Order 20111405.
- b. Outcome of remediation to be commensurate with possible future uses which may include passive recreation.
- c. Council to consider appropriate zoning post remediation works.
- d. Improve the visual amenity of the site, however inert elements will be retained for education purposes with interpretative signage (eg dead trees).

Note that the revised management order includes all of Lot 1 of Tickners property and hence nullifies the End of Remediation Declaration. Seek to have this declaration referenced in the Management Order and hence lessening the contaminated area. This will allow GHD to lessen the sampling area and focus on more meaningful areas.

Action: CROWN

2 Scope of Work

2.1 Project Brief:

The following broad tasks will be completed as part of Stage 1 of the project.

1. Desktop Investigation: Background data, Contaminants of Concern, data gaps, CSM, SAQP, Preliminary Report.
2. Detailed Investigation: Fieldwork sampling, broadscale rapid and detailed at boundary using pushcore, XRF and lab testing, update CSM, provide min, 2 viable remediation options. Consider ASS and resource recovery in options. Groundwater, sediment and surface water sampling requirements. Prepare Investigation Report.
3. Remedial Action Plan (RAP): Consider EPA recommendations, select preferred and prepare RAP, provide sufficient detail to allow remediation work to be procured.

2.2 Consultant Submission

The detailed methodology and strategy has been provided initially in the successful proposal and refined following discussions on-site and at the table.

- Essentially divides site into 3 zones: (i) Source Zone, (ii) Impact Zone and (iii) Receptor Zone.
 - Source Zone - Detailed investigation of tailings material but focus at the perimeter of tailings body rather than the central obvious area. Perimeter will involve sampling into the wetland from waterborne craft or waders. Investigations across main central tailings body to be limited to the minimum required to complete any gaps from the 1997 report and to better estimate the volume of source material (nominal +/- 10% accuracy).

EPA would encourage re-sampling some of the DLWC 1997 locations which had very high metals concentrations in the tailings, to see whether these are isolated anomalies in the material (eg. a small particle of ore), or larger hot spot. GHD propose to accommodate this in the methodology by doing a few

replicates of samples (eg. by multiple XRF and possibly lab analysis of subsamples) where very high concentrations are found. Groundwater monitoring in existing bores not critical for certain remediation options but may be useful for In-situ Containment option.

- Impact Zone.- Detailed investigation of sediments beyond the tailings derived source zone. Essentially sediment sampling from benthic layer of wetland, prioritising the 'L shaped' trench and if required, beyond into the wetland further. Where contaminant thresholds in the Impact Zone (including the 'L shaped' trench) exceed thresholds, additional studies may be required to determine if this material is to remain or be removed. This includes ecotoxicology tests (test impact on simple aquatic organisms) and geochemical testing (measure changes to the chemistry of the sediment with disturbance/exposure). The need for these additional studies would be deferred until results of sediment sampling have been assessed. These detailed studies will enable a decision to be made on whether to remove and treat this material, or manage the site to lessen human risk (eg no fishing, but boating OK).
- Receptor Zone - No detailed investigation of the receptor zone is commissioned at this stage, however EPA has requested to undertake surface water quality sampling for background data purposes.

2.3 Sampling Methodology

- Develop a relationship between the XRF and lab testing to allow extrapolation of quick XRF analysis and avoid large number of lab tests but still covering a large area of the site.
- GHD recommend drawing in specialist remediation company Entec, to conduct specific trials on various grades of tailings from the site to determine best formula for stabilisation. Best to engage Entec during preparation of the RAP once it has been determined that on-site treatment is preferred option (ie once off-site reprocessing is ruled out). The decision to bring in Entech would be made once it is clear that reprocessing is not an option. If so, then GHD recommend engaging Entech to conduct trials as part of Milestone 2.
- Initial proposal is 80 sampling locations, collect 320 samples using 4WD mounted rig or hand push tubes. The number of sampling locations will be refined during preparation of the SAQP, based on the inspection and discussions. The type and quantity of sampling (surface water, sediment, groundwater) will be quantified on completion of the SAQP. GHD will shift samples from the tailings area where possible to minimise costs.
- Push tubes to be used in soft tailings and underlying sediments, jaret auger for compacted firm soils. SCS to assist in arranging access through or to vegetated areas;
- Undertake field XRF, and laboratory testing (Al, As, S, Hg, Pb, CN, Metals, TCLP, pH, ASS(field), ASS (lab-SPOCAS);
- No sampling of bricks on-site which were suggested as being manufactured on-site but appear to be propriety products. Since the Inception Meeting, documents show

that Tickner had brick making machinery and intended to process material from site into bricks. Need to determine whether this material is written off as contaminated and include in bulk disposal option or run tests on brick fragments for leachable metals and if clear dispose as lesser waste. Seek EPA advice.

Action: EPA

- Not discussed during meeting but there is no allowance for testing of other potential contaminants such as asbestos or petroleum based products. This may be appropriate as they are relatively minor compared to the greater contamination risk of the tailings plume. They will also be incorporated into the larger remediation option of containment (be in on-site or off-site) regardless of their character. Seek comment from other stakeholders.

Action: ALL: CROWN/GHD/EPA/BSC

3 Remediation

3.1 Remediation Options

The preferred general remediation options are in order of preference/priority:

1. Off-site Reprocessing: Removal of source material, long haul transport, and off-site reprocessing at an appropriate ore processing facility;
2. Off-site Disposal: Removal of source material, treatment on-site, long haul transport, and disposal to a licensed facility with possible containment cell;
3. On-site Disposal: Removal of source material, treatment on-site, short haul transport for disposal to a containment cell on-site;
4. In-situ Containment: Leave source material in place, and construct containment system in-situ.

The remediation options are to be selected based on the budgeted remediation cost (~\$1M) and reducing the environmental risk to an acceptable level by EPA.

Options 1,2 & 3 will leave a void requiring suitable Virgin Excavated Natural Material (VENM) to backfill and shape. With the Urunga bypass commencing early in 2013, there may be an opportunity to be supplied with such material free of charge. Preference would be for non-ASS swamp clays capped with clay loam which may be deemed 'unsuitable' by engineers for Pac Hwy construction.

Option 1 requires liaison with local mining facilities such as Hillgrove. Reprocessing will be based on mineralogy of the tailings/ore and the total quantities. GHD has a relationship established with Emu Resources and an office near their headquarters in Perth. GHD will make initial contact with Emu Resources and brief investigation of other possibilities for reprocessing. GHD requests that SCS assist with ongoing negotiations with such companies if required.

Action: GHD then SCS

Option 2 requires consideration by regional or local landfill facilities. Coffs Harbour is the closest regional facility which can accept certain classifications of contaminated waste. Bellingen Shire Council has a facility at Raleigh which is in a sunset state which may provide an opportunity or a hindrance to possible disposal. The Raleigh site is also subject

to environmental constraints which is presumably why it is being progressed towards shut down.

EPA regional office in Grafton has Landfill specialist. SCS has relationship with officer and will contact.

Action: SCS

Any disposal at a licensed facility will attract a landfill levy and will represent an uneconomic cost to the remediation (stage 2) works. Hence an application for exemption should be investigated on the basis of 'Public Interest'.

Action: EPA

Option 3 will require preliminary investigation of the upper portion of the Tickner land to assess suitability for a containment cell. It needs to make allowance for climate change predictions on sea level rise in regards to positioning. Detailed investigations (eg. geotech, groundwater) would be deferred until it is apparent whether this option of on-site containment is preferred.

Action: GHD

Serious consideration of Option 4 is likely to require a detailed hydrogeological investigation to determine the groundwater flux and connectivity with the lagoon and surface waters. This study could be avoided if certain assumptions are made (eg underlying grey clays are impermeable, groundwater is highly connected to wetland surface levels). If in-situ containment looks like being a preferred option, the detailed hydrogeological investigations would be required to verify these assumptions as valid. The decision to undertake further groundwater investigations would be deferred until Milestone 2.

Option 4 may also be able to take advantage of the Pac Hwy upgrade and import of suitable clay capping material.

3.2 General Remediation Considerations

Regardless of the selected option, the RAP and remediation needs to allow for the removal of the solid waste material scattered around the site presumably by a licensed contractor.

GHD recommend that all relevant stakeholders should be involved in agreeing on preferred remediation options at completion of Milestone 2, prior to preparation of the RAP.

4 Program

Timeframe for delivery of Milestones and opportunities for creating more space to delivery better quality outcome.

Milestone 1 - CSM & SAQP	17 th May 2012 extended to 24 th May 2012
Milestone 2 – Investigation Report	14 August 2012 need review.
Milestone 3 – Submit RAP	10 th December 2012

Need to request EPA to extend the Milestone 2 deadline.

Action: CROWN

5 Existing Data

Need to find the survey data for the sampling points in the 1997 DLWC report. SCS to review file or speak with authors.

Action: SCS

NSW Health has conducted WQ testing in Urunga Lagoon which is to be provided by EPA. Note that this information/reference is from the Urunga Lagoon area, remote from the site, and would not be directly incorporated in GHD's assessment under the current scope.

Action: EPA

Andrew Mitchell has conducted XRF sampling. Data to be provided to GHD.

Action: EPA

A university of NSW PhD student monitored water quality below the Urunga STP in the lagoon. May be useful. BSC to investigate.

Action: BSC

An EIS was prepared and submitted to BSC for Wild Cattle Creek antimony mine which may have some useful data relating to the source material and history of both sites.

Action: BSC

Old B&W Ortho photos held by BSC.

Action: BSC

GHD has already received the ended a remediation declaration for a parcel of land in Lot 1, DP 874874 (north east corner).

NSW State Government - SCS currently sourcing govt spatial data on the site:

- LiDAR 1m DEM
- ADS40 50 cm res aerial photo
- Flood photo (10cm – 20 cm res)
- Spot 5 spectral
- All historic aerial and flood photo's

Local consultants Coffey Geotechnics have undertaken studies in the area previously to clear a site of contamination for a proposed development project. Report is in the public domain.

Straits Hillgrove has conducted investigations previously with a view to reprocess the tailings. Matt O'Neil (caretaker) has a copy which is to be sought during interview and site visit week commencing 14 May 2012.

Action: SCS

Individuals with knowledge of the site to be interviewed by GHD and arranged by SCS so far are:

1. Colin George (worked at the site as a young fella)
2. Matthew O'Neil (caretaker for Tickner property in recent times)

Action: GHD/SCS

The SEPP 14 Wetland boundary needs to be defined. BSC can provide the plan although it may also exist on the NSW Lands tool SIX viewer.

Action: BSC

6 Planning & Approvals

The SCS is currently preparing the PEA and Project Application to NSW Planning. NSW Planning to issue DGR's which will include requirement for an EIS.

Will need approvals to conduct work in a SEPP 14 wetland. Needs to be investigated.

Action: SCS

Drilling holes into groundwater for the investigation is deemed to not require approval as it is in response to an EPA Order.

Changing access to the Tickner property requires council road opening permit. Need ASAP to enable regular unimpeded access.

Action: BSC

7 OH&S & Access

Risks related to accessing the site, drilling for sampling, machinery entering and exiting, etc. eg gas release, dust, contaminants on soil, etc.

The investigation works needs to be supported with a Safe Work Method Statement (SWMS) which addresses the safety risks and documents required controls to mitigate risk to an acceptable level. Eg carrying contaminated soil off-site ---washdown procedures on-site, contact with contaminated material – use of protective clothing. The SWMS needs to be approved by NSW Crown Lands who are effectively engaging the consultant.

The tenants are being evicted to allow 'vacant possession' of the site as part of the land transfer. This is reducing their co-operation in accessing the site. They have validly expressed concerned about use of machinery and request that all machinery that contacts the tailings be washed before passing through the house yard. The tenants have also stated that due to the inconvenience of locking up their dog, they can no longer cooperate before 1:00pm weekdays to assist with access through their yard.

Hence it is decided to install a second two leaf gate lower down Hillside Drive, away from the junction with the Pac Hwy. It is recommended to get the tenant to provide a quote to make the gate and install it. A small track will then need to be slashed from the gate to the old mill site.

Action: SCS

Access from the road to the gate may be provided by BSC but isn't required at this stage for the small number of 4WD required to enter the site.

Action: BSC

8 Contract

The SCS will be engaging GHD through their IMS system and hence be contractually bound to SCS. SCS will finalise the contract ASAP for execution.

Action: SCS

The contract needs to include milestone payments once provided by GHD.

Action: GHD

Investigation of the impact zone to fine the most appropriate 'boundary' requires a variation to the conforming tender. Seek approval from Crown Lands.

Action: SCS

EPA's requirement to take snap shot of surface waters requires a variation to the conforming tender.

Action: SCS

Sampling of groundwater bores requires a variation to the conforming tender. Seek approval from Crown Lands.

Action: SCS

9 Public Relations/Community Management

Crown Lands have a draft community relations plan for the project which needs to be finalised. The plan should include media releases to demonstrate to the public the positive benefits of the project and hence lessen any negative public action.

A steering committee consisting of EPA, SCS, Crown Lands and BSC has been suggested to deal with Community Management and media interaction/releases. NSW Health may also be an important organisation for public relations issues. The steering committee is to conference in every 4 weeks or so. Facilitated by Crown Lands preferably or SCS.

Action: CROWN or SCS

Bellingen Shire Council is the usual target for enquiries or complaints and hence Anthony Brandy has volunteered to be the single point of contact to accept public calls and provide direction in accordance with steering committee outcomes.

GHD will refer any enquiries that may be encountered during investigation works, to Anthony Brandy.

It may be useful to provide a media release prior to drilling activities (4 weeks) informing the public that a reputable and local environmental consultant has been engaged to undertake a detailed investigation and to prepare a practical and effective remediation plan, etc.

END OF MINUTES

23 November 2012

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**Re: Urunga Antimony Processing Site
Agenda (Draft)**

Hey guys,

Rough format for next Tuesday is as follows:

Location: Urunga Golf Club (Morgo Street)

5:30pm

I'll be there from 5:30pm to setup and chat with other attendees. There is a chinese restaurant there which may be convenient.

I'll have a projector for my presentation. I am thinking we'll arrange the chairs at the front so official staff can address the public at question time.

6:30pm

Liz Jeremy (Bello Council) can welcome/thank the community to the public meeting and introduce either myself or all the stakeholders. We'll need name tags.

Attendance

Name	Organisation	Title	S
Symone Williams	Bellingen Shire Council	Personal Assistant	A
Anthony Brandie	Bellingen Shire Council	Planning Officer	A
Richard Chewings	Crown Lands	Landowner & Funding Body	A
John Coffey	EPA	Contamin. Sites Manager	A
Matthew James	EPA	Regional Operations Officer	A
Catherine Karpel	Mineral Resources	Derelict Mines Coordinator	A
Clayton Colmer	Soil Conservation Service	Project Manager	A
Lorraine Gordon	Urunga Chamber of Commerce	Representative	A
Lawrence Orel	EPA		A
Lawrence, Kerry	Public Health	Sen. Env. Health Officer	A
Liz Jeremy	Bellingen Shire Council	BSC General Manager	T
Ben Luffman	GHD Pty Ltd	Contamination Specialist	T
Brian Cork	GHD Pty Ltd	Contamination Specialist	T
Corben, Paul	Public Health		T
David McPherson	Crown Lands	Regional Manager	D
Marcus Riches	NSW Fisheries	Habitat Officer	D
David Howley	Soil Conservation Service	SCS General Manager	D
Colin Matthews	Bellingen Landcare	Manager	D

S= Status, A=Accepted, T = Tentative, D = Declined

We need someone to walk around and handout a proforma for input. I am also thinking of providing 1 double sided handout with the contamination summary map and executive summary on back.

6:40pm

I'll run through the presentation which should be about 30 mins and may put them to sleep...still finalising the slides but it is looking like containing the following points:

Introduction

- Project Team
- Location
- Land Ownership

Community

- Media
- Public Inclusion

Site History

- Source Ore
- Processing
- Antimony
- Abandonment
- Site Aerials

Health

- Contaminants of Concern
- Health risks

Previous Investigations

- Summary of Scope/Results

Current Investigation

- Sampling Locations
- Methodology
- Laboratory Testing
- XRF

Investigation Results

- Tailings Deposit
- Sediment Deposits
- Surface Water (Wetland)
- Groundwater
- Unknown areas

Contamination

- Summary of Assessment

Remediation

- Budget
- Broad (4) Options
- Remediation Issues/Risks
- Environmental Impact Assessment

Community Input

- Questions
- Feedback Form including:
 - Any Anecdotal/Scientific Information
 - Remediation Preference
 - Specific Issues

7:10 pm

Take questions from community. We'll need someone to take notes.

Likely questions from discussions with locals and Urunga Chamber of commerce:

1. Is it safe to swim in Urunga Lagoon?
2. Is it safe to eat seafood caught in Urunga Lagoon?
3. Is it safe to dredge or reconstruct the sea-lido at mouth of Urunga Lagoon?
4. Are children at risk who are known to have played in the site?
5. Are children/adults at risk who currently neighbour the property or live in Hillside Drive?
6. Will the remediation itself cause new human health/environmental risks?
7. How do we know the thresholds are safe?
8. Is the investigation comprehensive enough to identify the true extent of contamination?
9. Feedback suggests the community don't want any on-site disposal options (even if moved up hill) adopted.
10. May be general concern regarding the impact of flooding and sea level rise at the site.
11. How much will it cost?
12. Is there enough funding to cover the cost?

We may need to discuss these questions before hand to get consensus, or perhaps put together an answer 'cheat sheet' as our investigation has addressed a lot of the above.

7:50 pm

Direct community to the handouts to be filled in and posted or emailed to a project specific temporary email address: antimony@scs.nsw.gov.au

8:00 pm

Meeting closed (hopefully).

Urunga Contamination - Community Meeting

The second Community meeting date has been set in regards to the Antimony Processing Plant contamination remediation. It is at:

Location: Urunga Golf Club (Morgo Street)

Date: Thursday 29th May 2014

Time: 6.00pm – 7:30pm

An advert in the local papers will go out next week to invite the larger community.

This second community meeting aims to inform the Urunga residents of the recommended option and to invite comment/input regarding any possible concerns or local requirements.

The meeting is again being facilitated by Bellingen Shire Council and presented by the Soil Conservation Service (myself). I will do a 30 min presentation covering:

- * Background
- * Recommended Option
- * Remediation Methodology (broad terms)
- * Environmental Mitigation Measures (broad terms)
- * Community Input

Do not hesitate to call myself or Richard Chewings (Crown Lands) to discuss.

Regards,

CLAYTON COLMER | Senior Environmental Officer
SOIL CONSERVATION

SERVICE

Suite 5 Level 1 City Square 76 Harbour Drive | PO Box 530 |

Coffs Harbour NSW 2450

M: 0437 013 126 | F: 02 6650 3143 | E: clayton.colmer@scs.nsw.gov.au

W: www.scs.nsw.gov.au

When Thu 29 May 2014 18:00 – 19:30 Eastern Time - Melbourne, Sydney

Where Urunga Golf Club ([map](#))

Who

- Clayton Colmer - creator
- 'lorraine@moffatfalls.com.au'
- Matthew James
- David Howley
- John Coffey
- belland
- Ben Luffman
- 'catherine.karpiel@industry.nsw.gov.au'
- 'Brian Cork'
- 'marcus.riches@dpi.nsw.gov.au'
- 'Liz Jeremy'
- 'Symone Williams'
- 'Lawrence, Kerry'
- Richard Chewings
- Nick Stahayeff
- mayor@bellingen.nsw.gov.au
- property@coffsharbouralc.com.au
- Peter Menzies
- gfarrell@bellingen.nsw.gov.au
- 'Lawrence Orel' - optional



19 June 2012

Clean up process begins on Contaminated Urunga Site

The NSW Government has begun planning the remediation work on the Urunga antimony contaminated site on the mid-north coast of NSW.

General Manager of Crown Lands, Graham Harding, said the site, adjacent to the Pacific Highway 1.5km from the centre of Urunga, was significantly contaminated by historical activities including antimony ore crushing and processing.

"While the processing activities occurred on private land many years ago, the waste material spread over time and has impacted on an adjoining wetland, which is Crown land," Mr Harding said.

"Detailed investigations into the extent and nature of contamination were undertaken by the then Department of Land and Water Conservation.

"These investigations showed the estimated 9000m³ of tailings, which cover over a hectare of the site, contained high levels of contaminants including antimony, arsenic, copper, lead, zinc, chromium and mercury," he said.

Mr Harding said officers from the Soil Conservation Service have been engaged to manage Stage 1 of the project, which is developing the remediation action plan.

They will be on site over the coming weeks carrying out investigation work.

In 2011, the Environment Protection Authority (EPA) sought to place a remediation order upon the private owner of the site, which resulted in an agreement to transfer the ownership of the land to the State to enable remediation to occur.

The Department of Primary Industries Catchments and Lands Division is responsible for the remediation, in collaboration with the EPA, Bellingen Shire Council and other government agencies, and will identify the most cost effective and efficient remediation program for the site.

A process is also being developed to assist in keeping the community informed of the progress of the project.

The Environmental Trust and the NSW Trade and Investment Derelict Mines Program have each given conditional agreement to fund up to \$700,000 towards the remediation project, with investigation and planning activities now underway and on-site remediation works are expected to start in 2013.

Media contact: Craig Vaughan 9527 8597 or 0488 196 594



Follow us: <http://twitter.com/#!/nswdpi>

21 May 2014

Suite 5, Level 1, City Square
76 Harbour Drive

Coffs Harbour NSW 2450

P: 02 6650 3143

clayton.colmer@scs.nsw.gov.au

To the Resident,

**Re: Antimony Processing Plant – Remediation
Hillside Drive Residents Information Leaflet**

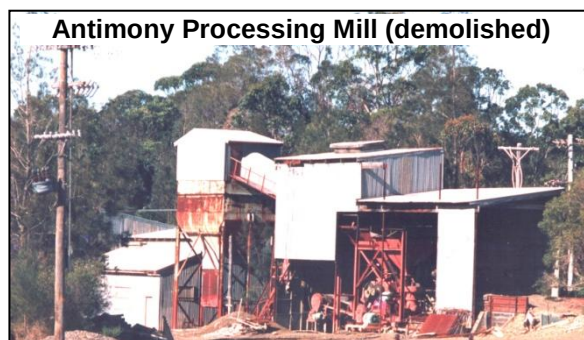
The Soil Conservation Service (SCS) on behalf of NSW Trade & Investment (Crown Lands) is project managing the remediation of the disused Antimony Processing Plant at the top of Hillside Drive.

This leaflet is intended to provide a summary of the project to date and to invite all residents from the western end of Hillside Drive to a public meeting to be held:

Venue: Urunga Gold Club
Date: Thursday 29th May 2014
Time: 6:00pm – 7:30pm

Site History

Antimony ore (stibnite) was mined from Wild Cattle Creek, Dorrigo (1969-1974), and around 10,500 tonnes was transported to the Hillside Drive address for processing. In late 1970, a private developer purchased the land and made application to recommence operations but was refused by Bellingen Shire Council. Later the applicant intended to redevelop the property for residential uses but was thwarted by the increasing awareness of the contamination.



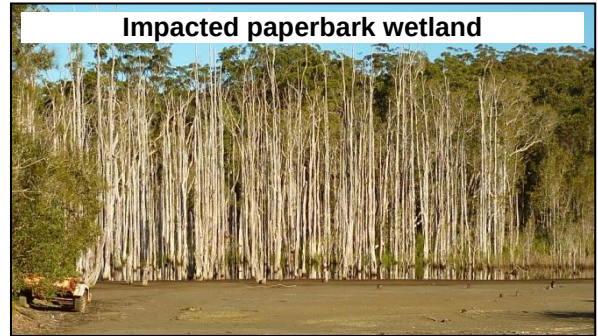
Contamination

The source of the contamination was through the crushing of the antimony ore which contains not only antimony, but impurities such as arsenic (as arsenopyrite) and mercury (as cinnabar). The crushings were destabilised using Soda ash to make the metals leachable (soluble) which allowed extraction. Once the target metals were removed, the waste tailings were then pumped to the adjoining SEPP14 wetland, and subject to periodic flooding, run-on and groundwater flushing. It is this combination of factors that has led to the widespread contamination of the wetland over the last 40 years.

Investigations

A series of investigations were conducted by government departments, mainly during the 1990's however funding for remediation at that time was not forthcoming. In 2011, the EPA placed a Remediation Management Order (No. 20111405) across the site, forcing the landowner to handover to the Crown. Funding was secured through the Environmental Trust and the DPI Derelict Mines Committee each contributing \$700,000 (\$1.4M total) for the remediation.

This funding enabled a detailed investigation of the site to be completed by GHD Pty Ltd (2012) and more recently, preparation of a Remediation Action Plan (RAP) which sets out the remediation strategy and preferred option. The results of the investigation are shown graphically as Appendix A (attached).



Remediation Options

The RAP identified four major strategies to isolate the contamination from the sensitive wetland:

Option 1 Off-site reprocessing and disposal

Involves removal of contaminated material, long haul transport off-site for reprocessing, or disposal at a mining (Hillgrove) or hazardous waste management facility (Ipswich, Qld).

Option 2 Off-site disposal

Involves removal of contaminated material, treatment on-site or off-site, long haul transport, and disposal to a licensed general waste facility (Grafton Landfill) within a containment cell or isolated (segregated) portion of the landfill.

Option 3 - On-site disposal

Involves the removal of contaminated material, optional treatment, and placement within a specially constructed containment cell (Monocell) upslope of wetland.

Option 4 - In-situ containment

Involves leaving the contaminated material within the wetland, optional treatment, and construction of a barrier containment system in-situ and capped.

Recommended Option

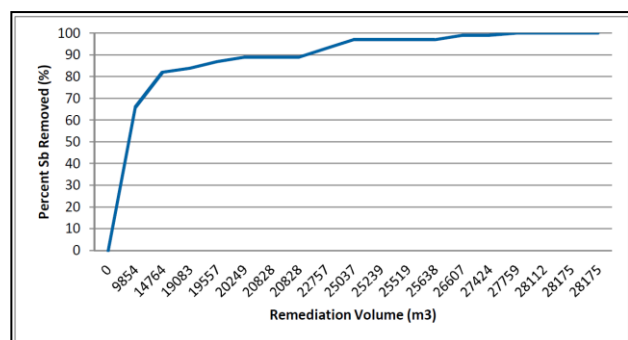
The recommended option was determined by considering the following criteria:

- Recovery of Wetland
- Health & Safety of local communities
- Long term durability of option
- Cost
- Technical feasibility
- Legislative requirements

It was determined that Option 3 – On-site Disposal best met the criteria. This involves excavation of the contaminated soils and sediments, treatment to buffer acidity and reduce leachability of the material, construct an engineered containment cell ('monocell') above the flood level, and cap the surface. The monocell would then be revegetated to blend with the native vegetation for use as passive recreation – public open space.

Remediation Area

Around 6 ha of land is contaminated, the condition of which varies according to metals concentration, depth, vegetation cover and inundation by the wetland. Hence a rationalisation of what areas (and hence volume) of contamination to remove was conducted based on these conditions. The site was divided into 'zones' from A to O, each with an estimated volume of contaminated soil or sediment (Appendix A). The chart opposite shows graphically the asymptotic relationship between volume of material to excavate verses Antimony removed from the environment.



It was determined that areas A, B, C, D, E, G, H, I, & M were the only practical zones to remediate which equates to 97% removal. Removing 97% of contaminants equates to around 190 – 280 tonnes¹ of antimony and requires excavation of up to 26,000m³ of soils and sediments.

Remediation Cost Estimate

The cost of the recommended option is larger than the initial budget, however additional funding is being made available through NSW Crown Lands to meet the shortfall.

Environmental Impact Assessment

An assessment of the environmental impacts associated with the preferred option will be prepared and approved by all relevant agencies before remediation commences. The assessment will consider all expected impacts including:

- Soil, sediment and water
- Air quality (including dust)
- Noise and vibration
- Biodiversity
- Heritage (Aboriginal & Non-Aboriginal)
- Traffic
- Visual amenity & Socio-economic
- Waste management

The EIS will also address mitigation measures for reducing the impact on local residents and the wetland which must be incorporated into the remediation works under what is called the Construction Environmental Management Plan (CEMP).

Commencement

Works will commence after determination of the DA and supporting EIS by NSW Planning as a State Significant Development (SSD). The determination is expected to occur after August 2014 to coincide with the seasonally dry period. An “Early Works” package will also be submitted to Bellingen Shire Council for approval to undertake low risk tasks such as demolition of structures and removal of general waste from the site.

Residents Feedback

If you wish to know more about this project, please fill in the attached Feedback Form or contact me as below.

Post: Urunga Antimony Contamination
Soil Conservation Service
PO Box 530 Coffs Harbour NSW 2450
Email: scs.antimony@scs.nsw.gov.au
Landline: 02 6650 3143

Thankyou for your time.

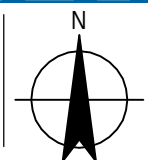
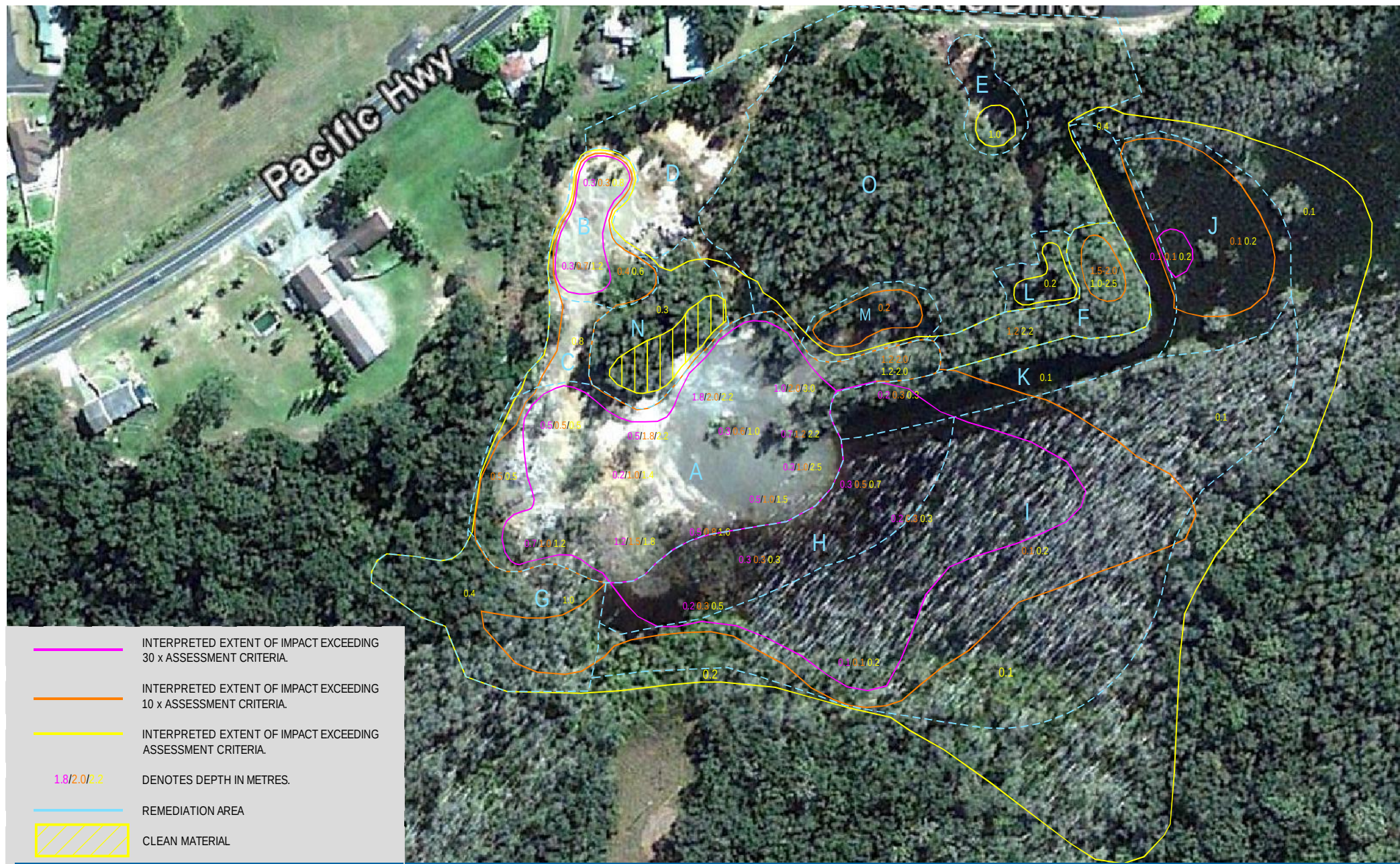
Yours sincerely



Clayton Colmer
Senior Environmental Officer

¹ Can only estimate range based on nature of soil sampling techniques.

APPENDIX A



NSW Catchment & Lands - Crown Lands
Former Antimony Processing Plant - Urunga
Detailed Investigation Report
REMEDIATION AREAS

Job Number | 22-16251
Revision | A
Date | Oct 2012

Figure 7



**URUNGA ANTIMONY CONTAMINATED SITE
COMMUNITY CONSULTATION – FEEDBACK FORM**

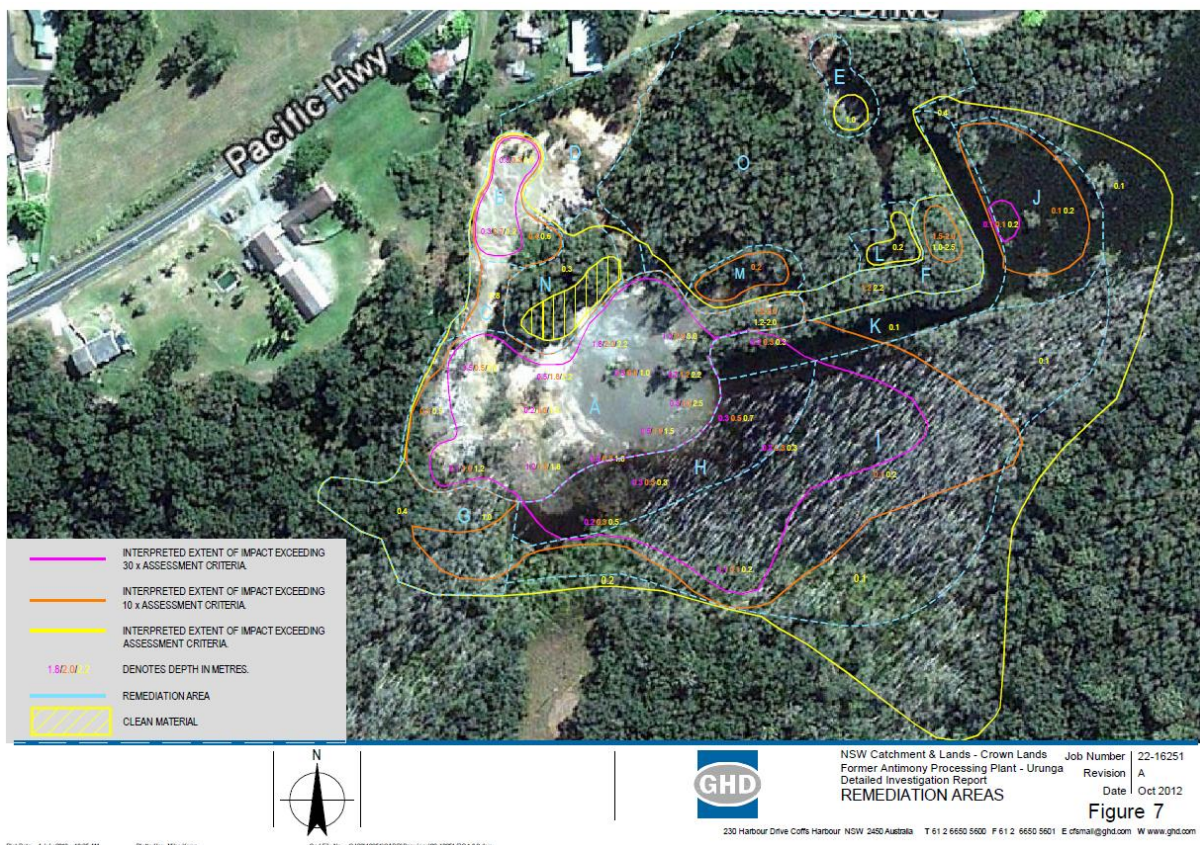
Use this form if you wish to submit your information relating to the site in writing.

Post to: PO Box 530 Coffs Harbour NSW 2454

Email to: scs.antimony@scs.nsw.gov.au

Site	Antimony Processing Plant – Contaminated Site in Hillside Drive Urunga	
Name (Optional)		
Address (Optional)		
Phone (Optional)		
Questions <i>(If you want a particular question answered list it here)</i>		
Local Knowledge <i>(List here anything you think may be relevant to the site in terms of, contamination, remediation, access along Hillside Drive. Can be anecdotal or scientific data/reports etc)</i>		
Remediation Option		
Are you satisfied with the recommended option?		Yes ☐ No ☐
If not, what Option do you prefer?		
Option 1a: Off-site Disposal in Mine Facility (Hillgrove)		☐
Option 1b: Off-site Disposal in Hazardous Waste Facility (Ipswich Qld)		☐
Option 2: Off-site Disposal in General Waste Facility		☐
Option 3a: On-site Disposal in Monocell (Treated)		☐
Option 3b: On-site Disposal in Monocell (No Treatment)		☐
Option 4a: In-situ Containment in Wetland (No Treatment)		☐
Option 4b: In-situ Containment in Wetland (Treatment)		☐
Other (You to provide details below)		☐
Details:		

Environmental Risks <i>(List here any issues/concerns/or comments you have in relation to the environmental impact of the remediation – Note that an opportunity to review the EIS will be made during the planning process)</i>	
Mitigation Measures <i>(List any mitigation measures or environmental protection measures you would like to see implemented during the remediation works)</i>	
Other <i>(List anything else you think is relevant to tonight's meeting or the remediation in general)</i>	



Please use the above map as reference if you need it.



URUNGA ANTIMONY CONTAMINATED SITE COMMUNITY CONSULTATION – FEEDBACK FORM

Use this form if you wish to submit your information relating to the site in writing.

Post to: PO Box 530 Coffs Harbour NSW 2454

Email to: scs.antimony@scs.nsw.gov.au

Site	Antimony Processing Plant – Contaminated Site in Hillside Drive Urunga
Name (Optional)	
Address (Optional)	
Phone (Optional)	
Questions <i>(If you want a particular question answered list it here)</i>	
Local Knowledge <i>(List here anything you think may be relevant to the site in terms of, contamination, remediation, access along Hillside Drive. Can be anecdotal or scientific data/reports etc)</i>	
Remediation Option <i>(List here any issues/concerns/or comments you have in relation to the recommended remediation option)</i>	
Environmental Assessment <i>(List here any issues/concerns/or comments you have in relation to the environmental impact of the remediation – Note that an opportunity to review the EIS will be made during the planning process)</i>	

Date	Stakeholders	Forum	Notes	Attachment
			1.	
19 June 2012	BSC Shire Community	Newspaper	2. Article in paper informing community that investigations are commencing - "Clean up process begins on contaminated Urunga site"	
31 Oct 2012	Urunga Chamber of Commerce	Private Presentation	1. SCS presented to the Chamber with a view of getting preferred option from Chamber 2. Chamber responded by email stating preferred option is 2 – offsite burial.	
15 Nov 2012	Community Groups	Private Letter	1. Inviting community groups to attend Investigation results meeting	
19 Nov 2012	Local Community	Media release	1. Discussing project and inviting community to meeting - "Antimony clean-up underway"	
27 Nov 2012	Local Community Fisheries EPA NSW Health Office of Water Derelict Mines	Public Meeting	1. See GHD Minutes	
27 Nov 2012	Meeting Attendees	Feedback Form	1. Provided forms for community feedback – nil received. No submissions detailing preferred option. 2. However extensive email feedback all regarding protest to using Hillgrove mine for disposal (approx 50 emails) 3. Extensive media coverage against the use of Hillgrove in Jan 2013	
30 Nov 2012	BSC Shire Community	Media release – Local Paper	1. Documented results of public meeting – no feedback – "Remediation plan for contaminated site"	
5 March 2014	Bronwyn Shipp (Westrella Motel)	Email & Phone Correspondence	1. SCS requested permission to enter property for further investigations	

	Owner)		2. Requesting investigation results from her land. 3. Supplementary report provided 4. No discussion on preferred option as yet	
26 Feb 2014	Bellingen Shire Council Senior Staff & Councillors	Private Meeting	1. SCS & Crown Lands & EPA presented option selection presentation. 2. Some councillors expressed concern that the waste would be kept on-site 3. No motions were passed (not determining authority) to accept the option but generally it was accepted	
26 Feb 2014	Terry Wall Coffs Harbour Land Council	Private Meeting	4. SCS & Crown Lands & EPA presented option selection presentation. 5. SCS provided follow-up email summarising the option for CHALC formal review. 6. SCS explained that CHALC have 2 options for land title transfer in regards to contamination: a. Excise the SEPP 14 wetland boundary in contamination zone plus 20m buffer from title b. Retain SEPP 14 wetland boundary in contamination zone but accept receiving contaminated sediments. 7. CHALC had no issue with a monocell at Hillside Drive	
6 Mar 2014	Chris Phillips (neighbour)	Private Meeting	1. No problem with a monocell downslope of the current security fence 2. Requested a grassed finish to monocell to match existing 3. Enjoys the vegetated outlook and will be disappointed if cleared. SCS confirmed it will be cleared. Insisted on a landscape plan to revegetate for the purposed of screening the site	
6 Mar 2014	Urunga Chamber of	Private Presentation	1. SCS gave option presentation.	

	Commerce		2. Chamber recommended notifying residents along Hillside Drive ahead of public meeting 3. Recommended to focus on detail of preferred option rather than other redundant options 4. Need to cover issues regarding environmental impacts	
26 Mar 2014	Bellinghen Environment Centre	Members AGM Meeting	1. SCS asked to update the group on the project 2. SCS presented the options report presentation 3. Concern raised over design life of monocell 4. Concern raised over earthquake robustness of monocell 5. Concern raised on whether it will be safe for children to swim in the Lagoon afterwards	Presentation
21 May 2014	Hillside Drive Residents & Neighbours (Stepping Stones to Highway)	Mail Drop & Face to Face Discussion	1. Only half residents home so leaflet left in letterbox (See attached) 2. SCS explained the project and potential impacts 3. No. 12 - Stepping Stones was unaware of the site when the business commenced in 2005. 4. Concerned about truck movements in front of the long day care centre 5. Concerned about dust generation, with many kids having asthma 6. SCS informed Stepping Stones that mitigation measures will be implemented to address such concerns. 7. No. 10 – expressed concern over losing fence. 8. SCS explained that discussions on fence retention can be decided during project. 9. No. 97 Pac Hwy asked if the contaminated site could be responsible for developing heart conditions. 10. SCS stated that the contaminants are known to affect soft tissues but it is impossible for SCS to	Community Feedback Form 2

			know if that would cause disease in any one individual. 11. Westella Motel – no comment. 12. No. 131 Pac Hwy do not consider themselves affected by the site.	
20 th May 2014		Media Release	13. Media release discussing RAP and public meeting - “Plan to fix poisoned land”	
20 th May 2014	Mid North Coast Community	Radio coverage	14. News article based on Media Release	
27 May 2014	Community Groups	Email Mail Out	15. Invited community groups in Bellingen Shire to attend proposed 29 th May 2014 meeting	Community Group – Meeting 2 - Email advert
29 th May 2014	Local Community EPA NSW Health	Public Meeting	16. Presentation of recommended option to approximately 20 community members and representatives of environmental groups. 17. Provided question & answer time 18. Provided forms for submitting a written response if preferred. 19. Concern over effect of sea level rise on monocell 20. Concern over durability & design life of monocell 21. Show of hands demonstrated most attendees are satisfied that on-site option the best way forward	Community Feedback Form 2b & Presentation
30 May 2014	Mid North Coast Community	Radio Interview	22. Summary of presentation in news grab for radio.	

27 May 2014

Suite 5 Level 1 City Square
76 Harbour Drive
PO Box 530
Coffs Harbour NSW 2450
P: 02 6650 3143
M: 0437 013 126

**NOTICE: URUNGA ANTIMONY CONTAMINATED SITE
RECOMMENDED OPTION**

The Soil Conservation Service (SCS) has been engaged by NSW Trade & Investment (Crown Lands) to project manage the remediation of the Antimony Processing Plant Contaminated Site at Hillside Drive, Urunga.

As part of the project, local relevant community groups are being invited to a public meeting to discuss the recommended option as developed in the Remediation Action Plan (RAP). The meeting will include a presentation explaining who the project stakeholders are, a quick history snap shot, the final investigation results, the remediation options, the environmental impact assessment, the remediation methodology, and to seek community feedback community on issues relating to the remediation.

The information gathered at the meeting in relation to the recommended option will be considered by the agencies, and issues regarding environmental impact will be included in the preparation of the Environmental Impact Statement.

The meeting is being facilitated by Bellingen Shire Council and presented by Clayton Colmer from the Soil Conservation Service.

Date: Thursday 29th May 2014

Time: 6.00pm – 7:30pm

Location: Urunga Golf Club (Morgo Street)

If you wish to attend please RSVP to swilliams@bellingen.nsw.gov.au or phone 6655 7315.

Yours sincerely



Clayton Colmer
Senior Environmental Officer





Draft Communications Plan – May 2012

Wasteland to Wetland - Urunga Antimony Contaminated Site Rehabilitation Project

Background:

The subject site is located adjacent to the Pacific Highway, approximately 1.5km from the town of Urunga on the mid-north coast of NSW. The site was significantly contaminated by historical activities including antimony ore crushing and processing. Whilst the processing activities occurred on freehold land, the associated tailings spread over time to impact on an adjoining SEPP14 wetland, which is Crown land.

Crown Lands became aware of the site in 1995 when a subsequent freehold owner reported the issue following Council refusing a development application for a retirement village due to the contamination. Crown Lands immediately took action to protect the public by erecting fencing and warning signs.

Detailed investigations into the extent and nature of contamination of the site were undertaken by the then Department of Land and Water Conservation (DLWC) in 1995 and 1997. These investigations showed the estimated 9000m³ of tailings, which cover over a hectare of the site, were actively eroding and high levels of contaminants including antimony, arsenic, copper, lead, zinc, chromium and mercury had been detected. Wastewater and tailings had spread downstream contaminating the freshwater and brackish wetland.

Insert health issues discussion.

The DLWC considered several options for the remediation of the site, including: doing nothing; on-site burial of the tailings beneath the watertable or water surfaces; excavating, relocating and burying the tailings off-site; further processing of the tailings to remove contaminants; vertical mixing. The option recommended by DLWC however, was to contain the tailings to prevent further erosion and oxidation.

The site has a very high public profile and there has been growing community pressure to see the site rehabilitated. Crown Lands has been seeking funding to remediate the site from numerous sources since 1997. In 2011, the Environment Protection Authority (EPA) sought to place a remediation order upon the freehold owner of the site. This resulted in an agreement to transfer the ownership of the freehold land to Crown Lands to enable remediation to

occur. The EPA is revising the order to cover the whole site and is collaborating with Crown Lands which is now responsible for the remediation.

In late 2011, it was announced that the Environmental Trust had allocated \$700,000 towards the project. Also, despite not being a mine site, the DPI Derelict Mines Committee has indicated an allocation of a further \$700,000 towards the project in the public interest. Project planning is now underway with on-ground remediation works expected to occur in 2013.

The Soil Conservation Service (SCS) has been engaged to manage Stage 1 of the project, namely developing the remedial action plan. SCS will be utilising the services of GHD Pty Ltd to provide specialist expertise in the development of the plan.

Key messages:

The following messages are designed to be delivered through briefings, public awareness campaigns, publications, media and/or public enquiries as required:

- The Urunga site was significantly contaminated by historical activities including antimony ore crushing and processing.
- Whilst the processing activities occurred on freehold land, the associated tailings spread over time to impact on an adjoining SEPP14 wetland, which is Crown land.
- Upon becoming aware of the site in 1995, Crown Lands immediately took action to protect the public by erecting fencing and warning signs.
- Detailed investigations into the extent and nature of contamination of the site were undertaken by the then Department of Land and Water Conservation (DLWC) in 1995 and 1997.
- The DLWC investigations showed the estimated 9000m³ of tailings, which cover over a hectare of the site, were actively eroding and high levels of contaminants including antimony, arsenic, copper, lead, zinc, chromium and mercury had been detected.
- Wastewater and tailings had spread downstream contaminating the freshwater and brackish wetland.
- The DLWC considered several options for the remediation of the site, including:
 - doing nothing;
 - on-site burial of the tailings beneath the watertable or water surfaces;
 - excavating, relocating and burying the tailings off-site;
 - further processing of the tailings to remove contaminants;
 - vertical mixing.
- The option recommended by DLWC however, was to contain the tailings to prevent further erosion and oxidation.
- Crown Lands has been seeking funding to remediate the site from numerous sources since 1997.
- In 2011, the Environment Protection Authority (EPA) sought to place a remediation order upon the freehold owner of the site.

- The proposed order resulted in an agreement to transfer the ownership of the freehold land to Crown Lands to enable remediation to occur.
- The EPA is revising the order to cover the whole site and is collaborating with Crown Lands which is now responsible for the remediation.
- The Environmental Trust has allocated \$700,000 towards the project, with the DPI Derelict Mines Committee also allocating of a further \$700,000 towards the project in the public interest.
- Crown Lands is liaising with the EPA to identify any data deficiencies in the 1997 DLWC study and to determine the most cost-effective remediation plan.
- It is anticipated that remediation works will be undertaken in 2013.
- **Health issues**
- The Soil Conservation Service (SCS) has been engaged to manage Stage 1 of the project, namely developing the remedial action plan.
- SCS will be utilising the services of GHD Pty Ltd to provide specialist expertise in the development of the plan.

Project Co-operators

DPI Catchment and Lands
 DPI Derelict Mines
 EPA
 Environmental Trust
 Bellingen Shire Council
 Department of Health

Project Steering Committee (suggested nominees/alternates)

DPI Catchment and Lands – Richard Chewings/Adrian Harte/David McPherson
 EPA – John Coffey/Matthew James
 Bellingen Shire Council – Liz Jeremy/Anthony Brandy
 Department of Health – Kerry Lawrence/David Basso
 SCS – Clayton Colmer/David Howley

Target Stakeholders

Local residents
 Community groups (environmental, fishing etc.)
 Day care centre
 Agency staff
 Relevant executive and ministers