Appendix 7
GROUNDWATER DEPENDENT ECOSYSTEM
Conacher Consulting

GROUNDWATER DEPENDANT ECOSYSTEM
2018 ANNUAL MONITORING REPORT

GRANTS ROAD
SAND QUARRY EXTENSION

MARCH 2019
REF: 9012V1

PREFACE

This report has been prepared by *Conacher Consulting* to address the 2018 annual reporting requirements for Groundwater Dependant Ecosystems for the Grants Road Sand Quarry Extension Project at Somersby.

REPORT PREPARED BY:

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SECTION 1

INTRODUCTION & METHODS

1.1 DOCUMENT INTENT

This report has been prepared by *Conacher Consulting* to address the 2018 annual monitoring requirements of Condition 21 "Groundwater Dependant Ecosystem Monitoring and Management Program" of the Schedule 3 Environmental Performance Conditions specified within the Project Approval for the Grants Road Sand Quarry Extension project (Project Approval No. 08_0099 Mod 1).

1.2 PROJECT SITE DETAILS

The site is located within Lots 1 & 2 DP 358717, Grants Road Somersby.

1.3 MONITORING METHODOLOGY

The monitoring program for High Priority Groundwater Dependant Ecosystems (GDEs) consists of a combination of aerial photograph assessment and mapping of GDEs within the predicted drawdown area, floristic plot surveys and field assessment for indicators and signs of potential project related impacts. Monitoring compliance tables are provided in Appendix 1. Due to the large extent of GDE patches and potential access restriction within the predicted drawdown area, a subset of the high priority GDEs was sampled. Four monitoring plots were surveyed for the 2018 monitoring period at the selected locations shown in Figure 1.1. The modelled groundwater drawdown for the Grants Road Sand Quarry (GRSQ) and the Central Coast Sands Quarry (CCS) is shown in Figure 1.1. The following monitoring variables were assessed:

i. Native Plant Composition
The native flora species present and projected foliage cover for each species was recorded for each plot. Comments is provided for the species observed, including GDE species which are reliant on moist soil conditions.

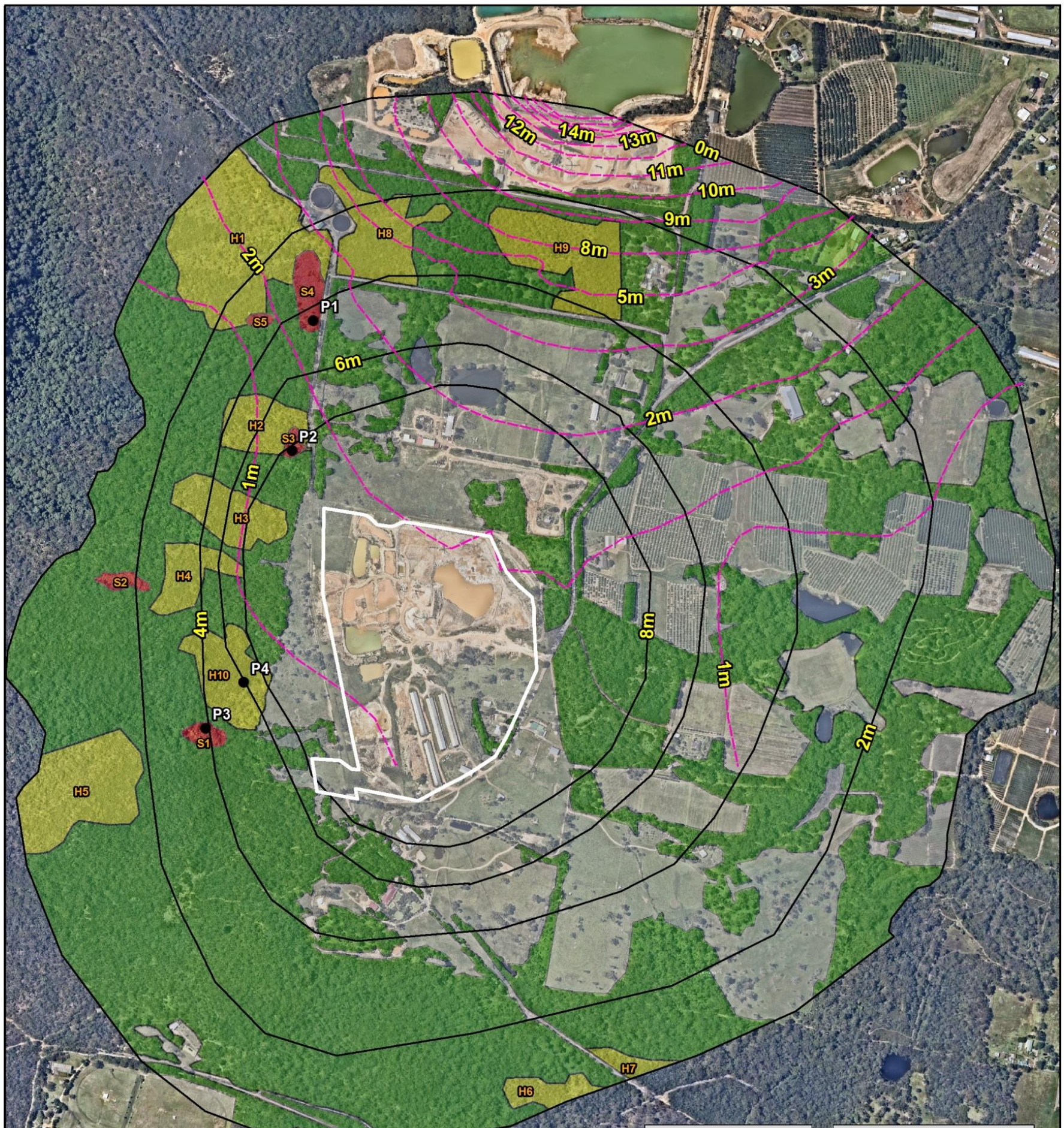
ii. *Exotic Plant Composition*
All exotic flora species and total cover of exotic flora species was recorded for each plot.

iii. *GDE Extent and Distribution*
Previous GDE mapping was revised for the current monitoring period. Mapping of GDE's was informed by additional field inspections and aerial photograph analysis and interpretation.

iv. Vegetation Photo Point Monitoring
Photographs were taken for each monitoring quadrat from each cardinal point.

v. Surface Erosion and Sedimentation Monitoring
A visual inspection of the downstream and downslope GDE patches from the quarry site was undertaken to monitor for any surface erosion or sedimentation impacts from the quarry operations.

vi. Comparison with Groundwater Monitoring Data
The Larry Cook Consulting P/L (2019) results for the groundwater monitoring levels for the current monitoring period were reviewed.



Sandstone Hanging Swamp Patch	Area (ha)
S1	0.4
S2	0.3
S3	0.2
S4	0.8
S5	0.1

Hawkesbury Coastal Bankisa Woodland Patch	Area (ha)
H1	7.4
H2	1.7
H3	2.2
H4	1.5
H5	4.4
H6	0.9
H7	0.5
H8	3.1
H9	4.0
H10	2.5
H11	0.2

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Drawing Version: 1
Drawing No: 9012
Date: 08/01/2019

* Plan for indicative purposes only. Not for detailed measurement.
Source: Aerial © Nearmap (2018) Air Photo Date: 27/12/2018

Figure 1
Ground Dependent Ecosystem Monitoring Details
Grants Road, Somersby

SECTION 2

MONITORING RESULTS

2.1 GROUNDWATER DEPENDANT ECOSYSTEMS WITHIN 1KM

High Priority Groundwater Dependant Ecosystems (GDEs) are defined in the Water Sharing Plan for the Kulnura Mangrove Mountain Groundwater Source (Dept. of Infrastructure, Planning and Natural Resources 2006). The following High Priority GDEs have been identified within 1km of the site:

- Sandstone Hanging Swamp; and
- Hawkesbury Coastal Banksia Woodland.

These map units relate to mapping prepared by House (2003) which has been superseded by Council's current vegetation mapping prepared by Bell (2013). Further updated mapping for the modelled drawdown area has been prepared by *Conacher Consulting* and is provided in Figure 1.1. This mapping provides an estimate of the current extent of High Priority GDEs within the modelled groundwater drawdown area.

No decrease in the extent of this GDE has occurred due to project related impacts since the previous monitoring period.

Sandstone Hanging Swamp
The floristic composition of this vegetation type indicates that it is likely to have high dependence on groundwater and can be considered a high-dependence facultative GDE.

Additional areas of this GDE have both been identified and have regenerated since the previous monitoring period. No decrease in the previously mapped extent of this GDE has occurred since the previous monitoring period.

The current estimated extent of Sandstone Hanging Swamp within the modelled drawdown area is 1.8 hectares. The sizes of individual patches mapped in Figure 1.1 are as follows:

- Patch S1 - 0.4 ha
- Patch S2 - 0.3 ha
- Patch S3 - 0.2 ha
- Patch S4 - 0.8 ha
- Patch S5 - 0.1 ha

Hawkesbury Coastal Banksia Woodland
The floristic composition of this vegetation type indicates that it is likely to be either a low-dependence facultative GDE or not a GDE.

The mapping of this GDE has been refined since the previous monitoring period. Some areas previously considered to comprise this GDE have regenerated as Sandstone Hanging Swamp, a GDE indicative of higher soil moisture levels.

The current estimated extent of Hawkesbury Banksia Scrub Woodland within the modelled drawdown area is 28.6 hectares. The sizes of individual patches mapped in Figure 1.1 are as follows:

- Patch H1 - 7.4 ha
- Patch H2 - 1.7 ha
- Patch H3 - 2.2 ha
- Patch H4 - 1.5 ha
- Patch H5 - 4.4 ha
- Patch H6 - 0.9 ha
- Patch H7 - 0.5 ha
- Patch H8 - 3.1 ha

- Patch H9 - 4.0 ha
- Patch H10 - 2.5 ha
- Patch H11 - 0.2 ha

An area of this vegetation type has been mapped by Bell (2013) to the east of the quarry area adjacent to Grants Road. These areas are considered to constitute Hawkesbury Rock Pavement Heath and not this GDE.

2.2 FLORISTIC MONITORING RESULTS

Full floristic plots were sampled for the current monitoring period, a total of four plots were surveyed. A summary of the floristic plot survey results is provided in Table 2.1 and full floristic plot results are provided in Table 2.2. The species with cover totals shaded in Table 2.2 are the GDE indicator species chosen.

Indicator species were determined from the floristic plot results, these species have an affinity for moist environments such as coastal upland swamps. There are several other species characteristic of Hawkesbury Coastal Banksia Woodland and Sandstone Hanging Swamp within the plots sampled, however these are considered to be not indicative of moist environments and can often be found in adjoining areas which do not contain high priority groundwater dependant ecosystems.

The sandstone hanging swamp plots had an indicator species richness of 9-13 species with and an indicator species cover of 63-84.1%. The indicator species cover for the Hawkesbury Coastal Banksia Woodland plot was 0.75% represented by four species.

TABLE 2.1
FLORISTIC PLOT RESULT SUMMARY

Variables	Plot 1 Sandstone Hanging Swamp	Plot 2 Sandstone Hanging Swamp	Plot 3 Sandstone Hanging Swamp	Plot 4 Hawkesbury Coastal Banksia Woodland
Indicator Species Cover	84.1	63	74.15	0.75
Total Species Cover	140.3	112.55	163.45	137.65
Indicator Species Richness	9	11	13	4
Total Species Richness	39	40	50	35

TABLE 2.2 FLORISTIC MONITORING PLOT RESULTS							
Family	**Scientific Name**	**Common Name**	**Plot 1 Cover %**	**Plot 2 Cover %**	**Plot 3 Cover %**	**Plot 4 Cover %**	**Browning / Dieback Observations**
TREES							
Casuarinaceae	*Allocasuarina littoralis*	Black She-Oak		0.25		1	
Myrtaceae	*Angophora costata*	Sydney Red Gum	0.25		2		
Myrtaceae	*Angophora hispida*	Dwarf Apple				0.5	
Myrtaceae	*Corymbia gummifera*	Red Bloodwood			4		
Myrtaceae	*Eucalyptus haemastoma*	Broad-leaved Scribbly Gum			10		
Myrtaceae	*Eucalyptus piperita*	Sydney Peppermint			15		
Myrtaceae	*Eucalyptus resinifera subsp. resinifera*	Red Mahogany	10			5	
Myrtaceae	*Eucalyptus scias*	Large-fruited Red Mahogany	15				
Myrtaceae	*Eucalyptus sieberi*	Silvertop Ash	0.3	10			
SHRUBS							
Apiaceae	*Platysace linearifolia*			0.5	5		
Araliaceae	*Polyscias sambucifolia subsp. Long Leaflets*	Elderberry Panax	0.2	0.25	0.5		
Cunoniaceae	*Bauera rubioides*	River Rose	1	2	2		
Cunoniaceae	*Callicoma serratifolia*	Black Wattle			0.25		
Dilleniaceae	*Hibbertia procumbens*	Spreading Guinea Flower				0.1	
Ericaceae	*Epacris obtusifolia*	Blunt-leaf Heath	0.25	0.1	0.1		
Ericaceae	*Epacris pulchella*	Wallum Heath				0.2	
Euphorbiaceae	*Amperea xiphoclada*				0.25		
Euphorbiaceae	*Pseudanthus orientalis*			0.1			
Fabaceae (Faboideae)	*Almaleea paludosa*		0.1				

TABLE 2.2 FLORISTIC MONITORING PLOT RESULTS							
Family	**Scientific Name**	**Common Name**	**Plot 1 Cover %**	**Plot 2 Cover %**	**Plot 3 Cover %**	**Plot 4 Cover %**	**Browning / Dieback Observations**
Fabaceae (Faboideae)	*Bossiaea scolopendria*					0.1	
Fabaceae (Faboideae)	*Dillwynia floribunda*				1	0.2	
Fabaceae (Faboideae)	*Pultenaea rosmarinifolia*		2	0.1			
Fabaceae (Faboideae)	*Viminaria juncea*	Native Broom	0.5	0.25	0.25		
Fabaceae (Mimosoideae)	*Acacia linifolia*	White Wattle			0.1		
Fabaceae (Mimosoideae)	*Acacia longifolia subsp. longifolia*	Sydney Golden Wattle	0.5	0.5			
Fabaceae (Mimosoideae)	*Acacia oxycedrus*	Spike Wattle	15		1	0.1	
Fabaceae (Mimosoideae)	*Acacia parvipinnula*	Silver-stemmed Wattle	0.5				
Fabaceae (Mimosoideae)	*Acacia suaveolens*	Sweet Wattle	0.5			0.2	
Fabaceae (Mimosoideae)	*Acacia terminalis subsp. Long inflorescences*	Sunshine Wattle	0.2		0.25		
Myrtaceae	*Callistemon citrinus*	Crimson Bottlebrush	0.1	0.25			
Myrtaceae	*Leptospermum polygalifolium subsp. cismontanum*	Tantoon			20	10	
Myrtaceae	*Leptospermum polygalifolium subsp. polygalifolium*	Tantoon	1	2			
Pittosporaceae	*Pittosporum revolutum*	Rough Fruit Pittosporum				0.1	
Pittosporaceae	*Pittosporum undulatum*	Sweet Pittosporum				0.2	
Proteaceae	*Banksia ericifolia*	Heath-leaved Banksia	5	10	0.5	70	Dieback evident in plots 1 & 2 from previous hazard reduction burn
Proteaceae	*Banksia robur*	Swamp Banksia			0.5		
Proteaceae	*Grevillea sericea subsp. sericea*	Pink Spider Flower			0.25		
Proteaceae	*Grevillea speciosa*	Red Spider Flower	0.3				
Proteaceae	*Hakea teretifolia*	Needlebush	0.2	0.25			

TABLE 2.2 FLORISTIC MONITORING PLOT RESULTS							
Family	**Scientific Name**	**Common Name**	**Plot 1 Cover %**	**Plot 2 Cover %**	**Plot 3 Cover %**	**Plot 4 Cover %**	**Browning / Dieback Observations**
Proteaceae	*Lambertia formosa*	Mountain Devil			0.25		
Proteaceae	*Persoonia isophylla*		0.25				
Proteaceae	*Persoonia lanceolata*	Lance Leaf Geebung	0.3				
Proteaceae	*Persoonia levis*	Broad-leaved Geebung			0.25		
Proteaceae	*Petrophile pulchella*	Conesticks				0.25	
Groundcovers (Forbs)							
Thymelaeaceae	*Pimelea linifolia*	Slender Rice Flower		0.1	0.1		
Anthericaceae	*Thysanotus juncifolius*				0.1		
Apiaceae	*Actinotus minor*	Lesser Flannel Flower		0.5		0.25	
Apiaceae	*Hydrocotyle laxiflora*	Stinking Pennywort		0.1			
Apiaceae	*Xanthosia pilosa*	Woolly Xanthosia	0.1	0.1			
Apiaceae	*Xanthosia tridentata*	Rock Xanthosia		0.1	0.5	0.1	
Droseraceae	*Drosera peltata*	A Sundew		0.1			
Euphorbiaceae	*Monotaxis linifolia*			0.25	0.1		
Goodeniaceae	*Dampiera stricta*			0.2			
Goodeniaceae	*Goodenia paniculata*			0.1			
Haemodoraceae	*Haemodorum corymbosum*		0.1				
Haloragaceae	*Gonocarpus micranthus*			0.1			
Haloragaceae	*Gonocarpus tetragynus*	Poverty Raspwort			0.25		
Haloragaceae	*Gonocarpus teucrioides*	Germander Raspwort	0.1		0.5		
Orchidaceae	*Cryptostylis subulata*	Large Tongue Orchid				0.1	
Phormiaceae	*Dianella caerulea var. producta*	Blue Flax-lily	0.1	0.1		0.25	
Phormiaceae	*Dianella prunina*	Blue Flax-lily				0.25	

TABLE 2.2 FLORISTIC MONITORING PLOT RESULTS							
Family	**Scientific Name**	**Common Name**	**Plot 1 Cover %**	**Plot 2 Cover %**	**Plot 3 Cover %**	**Plot 4 Cover %**	**Browning / Dieback Observations**
Groundcovers (Ferns)							
Dennstaedtiaceae	*Histiopteris incisa*	Bat's Wing Fern		1	0.5	0.2	
Dennstaedtiaceae	*Pteridium esculentum*	Bracken		20	5		
Gleicheniaceae	*Gleichenia microphylla*	Scrambling Coral Fern	80	60	70	0.1	Some undergrowth browning in response to self-shading *G. dicarpa* likely present
Lindsaeaceae	*Lindsaea linearis*	Screw Fern			0.1	0.25	
Selaginellaceae	*Selaginella uliginosa*	Swamp Selaginella		0.1	0.1		
Groundcovers (Monocots)							
Cyperaceae	*Cyathochaeta diandra*					10	
Cyperaceae	*Gahnia clarkei*	Tall Saw-sedge	1	0.5	0.25		
Cyperaceae	*Gahnia sieberiana*	Red-fruit Saw-sedge	2		1		
Cyperaceae	*Gymnoschoenus sphaerocephalus*	Button Grass	0.5	0.5			
Cyperaceae	*Lepidosperma laterale*					5	
Cyperaceae	*Ptilothrix deusta*					20	
Cyperaceae	*Schoenus apogon*	Fluke Bogrush	0.1				
Cyperaceae	*Schoenus brevifolius*	Zig-zag Bog-rush	0.2		0.25		
Cyperaceae	*Schoenus melanostachys*				0.5		
Lomandraceae	*Lomandra gracilis*					10	
Lomandraceae	*Lomandra longifolia*	Spiny-headed Mat-rush			1		
Lomandraceae	*Lomandra multiflora subsp. multiflora*	Many-flowered Mat-rush				0.1	
Lomandraceae	*Lomandra obliqua*					0.1	
Poaceae	*Entolasia marginata*	Bordered Panic			0.25	1	

TABLE 2.2 FLORISTIC MONITORING PLOT RESULTS							
Family	**Scientific Name**	**Common Name**	**Plot 1 Cover %**	**Plot 2 Cover %**	**Plot 3 Cover %**	**Plot 4 Cover %**	**Browning / Dieback Observations**
Poaceae	*Entolasia stricta*	Wiry Panic	1	0.5	5		
Poaceae	*Eragrostis brownii*	Brown's Lovegrass		0.1			
Poaceae	*Microlaena stipoides var. stipoides*	Weeping Grass				1	
Poaceae	*Oplismenus aemulus*	Basket Grass				0.1	
Poaceae	*Plinthanthesis paradoxa*				0.25		
Restionaceae	*Empodisma minus*		1	0.5	2	0.1	
Restionaceae	*Eurychorda complanata*			0.25	0.5		
Xyridaceae	*Xyris gracilis*		0.1				
Groundcovers (Other)							
Apocynaceae	*Parsonsia straminea*	Common Silkpod	0.1		0.1	0.2	
Dicksoniaceae	*Calochlaena dubia*	Rainbow Fern			10		
Dilleniaceae	*Hibbertia scandens*	Climbing Guinea Flower		0.25			
Doryanthaceae	*Doryanthes excelsa*	Gymea Lily			1		
Fabaceae (Faboideae)	*Hardenbergia violacea*	False Sarsaparilla				0.1	
Lauraceae	*Cassytha glabella*		0.1	0.1			
Lauraceae	*Cassytha pubescens*	Downy Dodder-laurel			0.1		
Orchidaceae	*Cymbidium suave*	Snake Orchid			0.1		
Pittosporaceae	*Billardiera scandens*	Hairy Apple Berry	0.1	0.1	0.1		
Rubiaceae	*Gynochthodes jasminoides*	Sweet Morinda		0.1	0.1	0.5	
Vitaceae	*Cissus hypoglauca*	Giant Water Vine			0.25		
Xanthorrhoeaceae	*Xanthorrhoea arborea*		0.25	0.25			
Exotics							
Verbenaceae	*Lantana camara*	Lantana	0.1				

TABLE 2.2 FLORISTIC MONITORING PLOT RESULTS							
Family	**Scientific Name**	**Common Name**	**Plot 1 Cover %**	**Plot 2 Cover %**	**Plot 3 Cover %**	**Plot 4 Cover %**	**Browning / Dieback Observations**
	Ageratina adenophora	Crofton Weed			x		Observed adjacent to Plot 3 / was evident in baseline surveys

2.3 QUALITATIVE MONITORING RESULTS

i. GDE Surface Erosion and Sedimentation

No surface erosion attributable to the quarry operations was observed within any of the GDE areas shown in Figure 1.1 during the monitoring surveys.

ii. Assessment of Groundwater Monitoring Data

The Water Monitoring Report prepared by Larry Cook and Associates (2019) has identified no potential impacts from approved quarrying activities on the aquifer system underlying the site for the 2018 monitoring period.

iii. GDE Photo Point Results

The results of the photo point surveys are provided in Figure 2.1 to 2.4.

Figure 2.1a – Plot 1 Photo-monitoring point north aspect

Figure 2.1b - Plot 1 Photo-monitoring point east aspect

Figure 2.1c - Plot 1 Photo-monitoring point south aspect

Figure 2.1d - Plot 1 Photo-monitoring point west aspect

Figure 2.2a – Plot 2 Photo-monitoring point north aspect

Figure 2.2b - Plot 2 Photo-monitoring point east aspect

Figure 2.2c - Plot 2 Photo-monitoring point south aspect

Figure 2.2d - Plot 2 Photo-monitoring point west aspect

Figure 2.3a – Plot 3 Photo-monitoring point north aspect

Figure 2.3b - Plot 3 Photo-monitoring point east aspect

Figure 2.3c - Plot 3 Photo-monitoring point south aspect

Figure 2.3d - Plot 3 Photo-monitoring point west aspect

Figure 2.4a – Plot 4 Photo-monitoring point north aspect

Figure 2.4b - Plot 4 Photo-monitoring point east aspect

Figure 2.4c - Plot 4 Photo-monitoring point south aspect

Figure 2.4d - Plot 4 Photo-monitoring point west aspect

SECTION 3

COMPLIANCE WITH PERFORMANCE MEASURES

3.1 EROSION

The performance target for erosion is that negligible erosion of the surface within the GDEs occurs as a result of adverse impacts attributable to the quarry operations authorised under the project approval. The trigger level for management intervention is observable erosion of the surface within the GDEs, directly attributable to the quarry operations authorised under the project approval.

No surface erosion within GDE areas attributable to the quarry operations was observed and no management intervention is required.

3.2 SEDIMENTATION

The performance target for sedimentation is that negligible sedimentation within the GDEs occurs as a result of adverse impact attributable to the quarry operations authorised under the project approval.

The trigger level for management intervention is observable sedimentation within the GDEs, attributable to the quarry operations authorised under the project approval.

No sedimentation within GDE areas attributable to the quarry operations was observed and no management intervention is required.

3.3 HIGH PRIORITY GROUND WATER DEPENDANT ECOSYSTEM EXTENT

The performance target for High Priority GDE size is for only minor changes in the sizes of the GDEs as a result of adverse impact attributable to the quarry operations authorised under the project approval.

The high priority GDEs within 1km of the site are likely to form a continuum across the landscape in response to fire and soil moisture availability (Bell 2013).

The trigger level for management intervention is adverse change in size of the GDEs of greater than 20% mappable extent, directly attributable to the quarry operations authorised under the project approval.

In order to determine that a reduction in the extent of a High Priority GDE was attributable to the quarry operations a correlation with reduced GDE patch size or dieback and groundwater levels would be required. No reduction in GDE patch size or groundwater levels has been determined for the current monitoring period.

3.4 GROUND WATER DEPENDANT ECOSYSTEM SPECIES COMPOSITION & DISTRIBUTION

The performance target for species composition and distribution is for no significant change to the composition or distribution of species within the GDEs as a result of adverse impact attributable to the quarry operations authorised under the project approval.

The trigger level for management intervention is adverse change in composition or distribution of the dominant species, directly attributable to the quarry operations authorised under the project approval.

The GDE areas were burnt prior to site inspections undertaken in 2015 and are currently regenerating. Further changes between monitoring events are expected within monitoring plots 1 & 2 as these areas continue to regenerate, these changes should not be related to the quarry operations at the subject site.

The current monitoring period is the first event to include full floristic plots as part of the monitoring data. This was undertaken to improve monitoring program and will allow for more detailed comparison of flora species composition and distribution between monitoring events.

3.5 MITIGATION AND RESPONSE MEASURES

Monitoring has identified that all performance targets have been met for GDEs and requirement for mitigation or response measures has not been triggered in relation to 2018 site operations.

SECTION 4

CONCLUSIONS & RECOMMENDATIONS

4.1 CONCLUSIONS

The quarry operations for the 2018 monitoring period have not exceeded the compliance and performance measures for High Priority Groundwater Dependant Ecosystems.

4.2 RECOMMENDATIONS

The implementation of mitigation and response measures in relation to the 2018 quarry operations is considered not necessary.

5. REFERENCES

Bell (2007) *Review of Flora and Fauna Information for Grants Road Sands*, Gosford LGA.

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APPENDIX 1
ENVIRONMENTAL PERFORMANCE & COMPLIANCE STATUS SUMMARY

Details on the Environmental Performance and Compliance Status in relation to GDE Monitoring have been requested for the Annual Reporting. This information is provided in Tables A1.1 and A1.2.

TABLE A1.1
ENVIRONMENTAL PERFORMANCE TABLE

Environmental Aspect	Approval Criteria	Summary of Monitoring Results in the Previous Monitoring Period	Summary of Monitoring Results in this Monitoring Period	Improvement Measures to be Implemented
High Priority Groundwater Dependant Ecosystems	Description of the nature and extent of groundwater reliance for each GDE	NA	Revised and increased in the current Monitoring Report	NA
	Long-term monitoring of the condition of the GDEs	No adverse impacts	No adverse impacts	NA
	Performance indicators for project-related environmental consequences on GDEs and trigger levels to initiate mitigation/response measures	No adverse impacts detected / no trigger levels initiated	No adverse impacts detected / no trigger levels initiated	NA
	Mitigation/response measures to ensure minor environmental consequences on the GDEs	No mitigation or response measures necessary	No mitigation or response measures necessary	NA

TABLE A1.2 COMPLIANCE STATUS TABLE				
Unique ID	**Compliance Requirement**	**Development Phase**	**Monitoring Methodology**	**Evidence & Comments**
Schedule 3 Condition 19.	Negligible erosion of the surface of the GDEs	Operations	Annual monitoring inspections / photos	Annual Monitoring Reports
	Negligible sedimentation within the GDEs	Operations	Annual monitoring inspections / photos	Annual Monitoring Reports
	Minor changes to the size of the GDEs	Operations	Mapping updated at least every 5 years	Annual Monitoring Reports
	No significant change to the composition or distribution of species within the GDEs	Operations	Annual Plot surveys / photos	Plot survey data in annual monitoring reports

Appendix 8
SOMERSBY MINTBUSH
Conacher Consulting

SOMERSBY MINTBUSH
2018 ANNUAL MONITORING REPORT

GRANTS ROAD
SAND QUARRY EXTENSION

MARCH 2019
REF: 9012V1

PREFACE

This report has been prepared by *Conacher Consulting* to address the 2018 annual monitoring and reporting requirements for Somersby Mintbush for the Grants Road Sand Quarry Extension Project at Somersby.

REPORT PREPARED BY:

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SECTION 1

INTRODUCTION

1.1 DOCUMENT INTENT

This report has been prepared by *Conacher Consulting* to address the monitoring requirements of Condition 22 "Somersby Mintbush Monitoring and Management Program" of the Schedule 3 Environmental Performance Conditions specified within the Project Approval for the Grants Road Sand Quarry Extension project (Project Approval No. 08_0099 Mod 1).

1.2 PROJECT SITE DETAILS

The site is located within Lots 1 & 2 DP 358717, Grants Road Somersby.

1.3 PREVIOUS MONITORING RESULTS

2015 Monitoring Surveys
These surveys included a baseline assessment of the Somersby Mintbush (*Prostanthera junonis*) locations previously identified adjacent to the site and described as Population 7 Reservoir Road Brisbane Water National Park. They were undertaken on 23 October 2015 and 7 November 2015.

No specimens of *P. junonis* were observed during the baseline surveys as the locations where this species was previously identified had been subject to a controlled burn undertaken by NPWS.

During the baseline surveys, the previous location of *P. junonis* identified along the Great North Walk track showed noticeable signs of erosion caused by poor track maintenance and design.

2016 Monitoring Surveys
Regrowth of *P. junonis* was observed at subpopulations 3 and 4. Two flowering plants were detected at sub-population 3 where none were detected in recent years, the presence of several juvenile non-flowering plants were also noted.

No flowering plants and several juvenile non-flowering plants were observed at the location of sub-population 4.

The low numbers of flowering plants detected and evidence of regrowth plants was considered to be a result of the NPWS hazard reduction burn undertaken during October 2015.

2017 Monitoring Surveys
Regrowth of *P. junonis* was observed at subpopulations 3 and 4. Flowering plants were detected at sub-population 4 which were not detected in recent years.

The increasing numbers of flowering plants detected and evidence of several regrowth non-flowering plants was considered to be a result of regeneration following the NPWS hazard reduction burn undertaken during October 2015 and the reduced shade from tall shrub cover.

SECTION 2

2018 MONITORING RESULTS

2.1 SOMERSBY MINTBUSH 2018 COUNT RESULTS

Counts of flowering *P. junonis* plants were undertaken on 23 November 2018 and 21 December 2018 at each of the Somersby Mintbush subpopulation locations adjacent to the quarry allotment identified by NSW NPWS (2000).

Plant clumps were identified and counted. Plant clumps were defined as any flowering *P. junonis* plants in a patch with a separation distance of ≥30cm from the nearest *P. junonis* plant.

The results of the counts are provided in Table 2.1 and the locations of the sub-populations are shown in Figure 2.1. An Environmental Performance Table is provided in Appendix 1.

TABLE 2.1
SOMERSBY MINT BUSH ANNUAL MONITORING COUNT RESULTS

Sub-Population Number	2015 Count Results	2016 Count Results	2017 Count Results	2018 Count Results
3	0	2 flowering plants (several non-flowering juvenile regrowth plants observed)	3 clumps containing 18 flowering plants	24 clumps containing 42 flowering plants
4	0	No flowering plants several non-flowering juvenile plants observed	12 clumps containing 34 flowering plants	24 clumps containing 394 flowering plants

2.2 QUALITATIVE MONITORING RESULTS

Photographs of the habitats at subpopulations 3 and 4 for the current monitoring period are provided in Figures 2.2 and 2.3.

2.2.1 Signs of Surface Erosion

No signs of surface erosion attributable to the project were observed.

Erosion of the track through subpopulation 4 was observed, as was in previous years. This is attributable to poor track maintenance and natural surface flows not attributable to the project. No noticeable NPWS maintenance of this track within the Brisbane Water National Park has occurred since the commencement of monitoring.

2.2.2 Signs of Sedimentation

No signs of sedimentation attributable to the project were observed.

2.2.3 Density of Surrounding Vegetation

The density of the surrounding vegetation at both sub-populations had been reduced the previous NPWS hazard reduction burn. Dieback and decomposition of the *Banksia ericifolia* was evident particularly for Sub-population 4. Vigorous regrowth of the heathy shrub cover was observed at sub-population 3. The following estimates of the vegetation density for both sub-populations is provided:

Sub-population 3

Tree Cover:	Approximately 5% to 10m tall
Shrub Cover:	Open with approximately 30% cover to 2m tall with vigorously regenerating heath.
Groundlayer:	Approximately 50% cover to 1m.

Sub-population 4

Tree Cover:	Approximately 20% to 8m tall
Shrub Cover:	Approximately 40% cover to 4m tall with dieback and decomposition of the *Banksia ericifolia* component due to previous fire. Minimal regeneration observed.
Groundlayer:	Approximately 30-40% cover to 1m.

It is considered that the current reduced density of surrounding vegetation has provided favourable conditions for Somersby Mintbush growth of both sub-populations.

2.2.4 Fire Disturbance

No signs of fire disturbance attributable to the project were observed. No fire disturbance within the current monitoring period was observed.

2.2.5 Herbivory

No signs of herbivory were observed.

2.2.6 Trampling

No signs of trampling attributable to the project were observed.

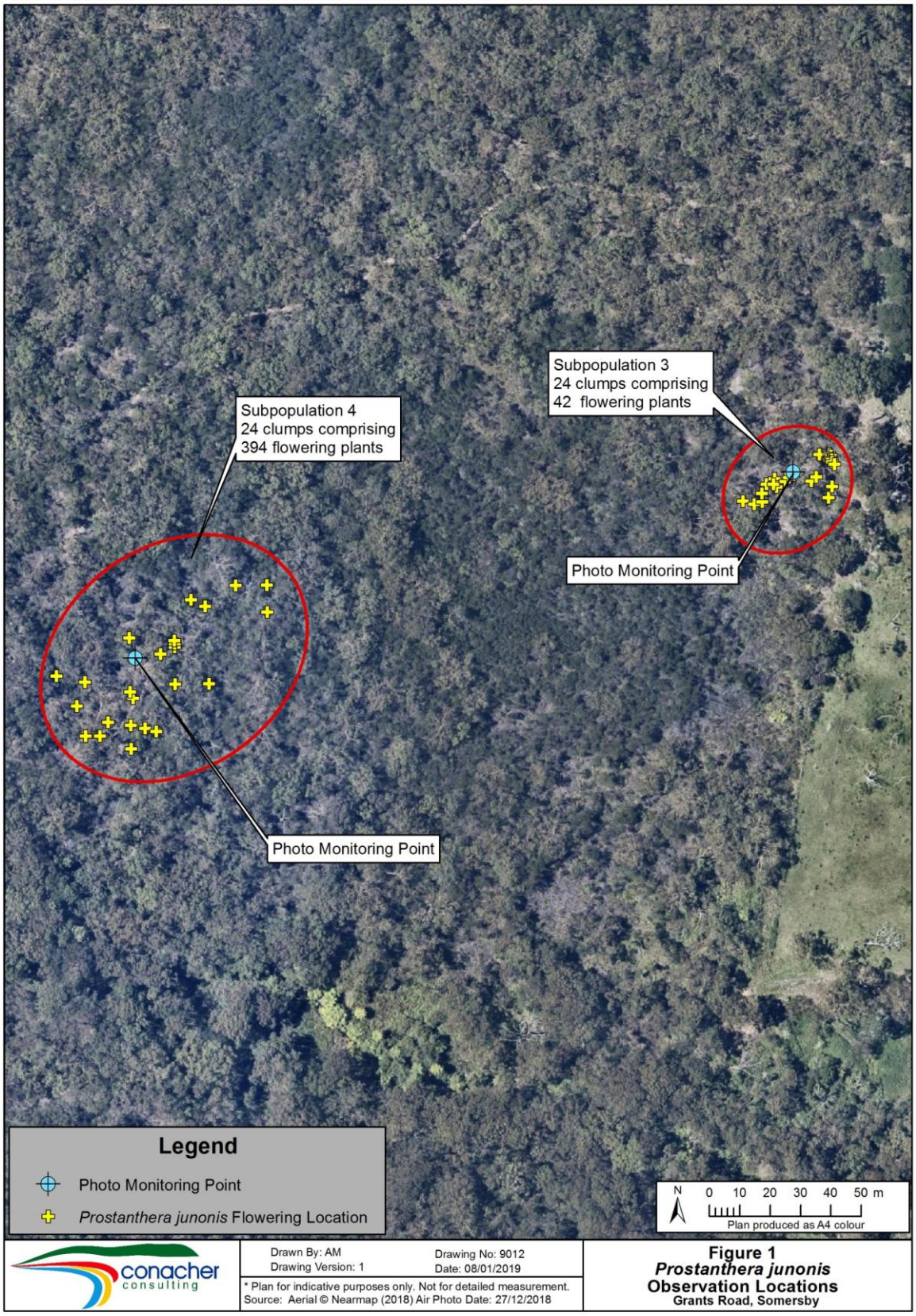
Subpopulation 3
24 clumps comprising
42 flowering plants
Subpopulation 4
24 clumps comprising
394 flowering plants
Photo Monitoring Point
Photo Monitoring Point
Legend
Photo Monitoring Point
Prostanthera junonis Flowering Location
N
0 10 20 30 40 50 m
Plan produced as A4 colour
conacher consulting
Drawn By: AM
Drawing Version: 1
Drawing No: 9012
Date: 08/01/2019
* Plan for indicative purposes only. Not for detailed measurement.
Source: Aerial © Nearmap (2018) Air Photo Date: 27/12/2018
Figure 1
Prostanthera junonis
Observation Locations
Grants Road, Somersby

Figure 2.2a – Sub-population 3 photo monitoring point north aspect

Figure 2.2b – Sub-population 3 photo monitoring point east aspect

Figure 2.2c – Sub-population 3 photo monitoring point south aspect

Figure 2.2d – Sub-population 3 photo monitoring point west aspect

Figure 2.3a – Sub-population 4 photo monitoring point north aspect

Figure 2.3b – Sub-population 4 photo monitoring point east aspect

Figure 2.3c – Sub-population 4 photo monitoring point south aspect

Figure 2.3d – Sub-population 4 photo monitoring point west aspect

2.3 DETAILS OF NON-COMPLIANCE MATTERS

The following performance indicators for *P. junonis* are relevant to this project:

- Prevention of any erosion of the surface of areas containing Somersby Mintbush as a result of actions associated with the approved extraction operations
- Prevention of sedimentation within areas containing Somersby Mintbush as a result of actions associated with the approved extraction operations
- Prevention of reduction in the area of the sites containing Somersby Mintbush as a result of actions associated with the approved extraction operations.

No non-compliance matters were observed with regard to Somersby Mintbush. A Compliance Status Table is provided in Appendix 1.

2.4 MONITORING TRENDS

Continuing regrowth of *P. junonis* was observed at subpopulations 3 and 4. The increased numbers of flowering plants detected compared to previous surveys is considered to be a result of regeneration following the NPWS hazard reduction burn undertaken during October 2015.

2.5 PROJECT IMPACT DISCREPANCIES

No discrepancies between the predicted and actual impacts of the project were observed with regard to Somersby Mintbush.

2.6 MEASURES TO IMPROVE PROJECT PERFORMANCE

The trigger levels provided in Table 2.2 will be utilised in future monitoring to improve and assess performance for the Project in relation to Somersby Mintbush. Additional monitoring items should be added to the list in the future if deemed necessary. None of these identified triggers have occurred during the current monitoring period.

TABLE 2.1
SOMERSBY MINTBUSH MONITORING TRIGGER LEVELS

Trigger Levels	Erosion and Sedimentation		Fire Impacts		Stock Herbivory		Trampling / Compaction		Population Decline	
	Trigger	**Response**	**Trigger**	**Response**	**Trigger**	**Response**	**Trigger**	**Response**	**Trigger**	**Response**
Low Impact	Sediment / erosion event offsite within 5m of Somersby Mintbush Population	-Report to GRSQ -Include in Annual Report -Immediately correct /improve erosion and sediment control - Consult with OEH to rehabilitate area	Fire outbreak on quarry site within vicinity of Somersby Mintbush Population	-Report to GRSQ -Include in Annual Report -Extinguish fire and improve controls to present reoccurrence.	One-off herbivory event from stock on site resulting in minor grazing on Somersby Mintbush Habitat	-Report to GRSQ -Include in Annual Report -Immediately repair / improve fences - Remove any manure	NA	NA	Somersby Mintbush dieback in excess of 10%	-Report to GRSQ -Include in Annual Report - Assess whether natural shading has reduced population - Identify whether attributable to the project -Provide offsets if attributable to the project and recovery does not occur
Moderate	Sediment / erosion event which directly impacts on Somersby Mintbush Population but does not result in population dieback	-Immediately Report to GRSQ - Immediately Report to DPE -Include in Annual Report -Immediately correct /improve erosion and sediment controls - Consult with OEH to rehabilitate area	Fire outbreak from quarry site which impacts habitats of Somersby Mintbush Population but does not result in Somersby Mintbush dieback	-Immediately Report to GRSQ & DPE -Include in Annual Report -Extinguish fire and improve controls to prevent reoccurrence. - Monitor and provide offsets if recovery does not occur	Repeat herbivory events from stock on site resulting in grazing on Somersby Mintbush Habitat	-Report to GRSQ -Include in Annual Report -Immediately repair / improve fences -Remove any manure - Report to DPE	NA	NA	Somersby Mintbush dieback in excess of 25%	-Report to GRSQ -Include in Annual Report - Assess whether natural shading has reduced population - Identify whether attributable to the project -Consult with DPE/OEH -Provide offsets if attributable to the project and recovery does not occur

TABLE 2.1
SOMERSBY MINTBUSH MONITORING TRIGGER LEVELS

Trigger Levels	Erosion and Sedimentation		Fire Impacts		Stock Herbivory		Trampling / Compaction		Population Decline	
	Trigger	**Response**	**Trigger**	**Response**	**Trigger**	**Response**	**Trigger**	**Response**	**Trigger**	**Response**
High Impact	Sediment / erosion event which directly impacts on Somersby Mintbush Population resulting in population dieback	-Immediately Report to GRSQ - Immediately Report to DPE -Include in Annual Report -Immediately correct /improve erosion and sediment control - Consult with OEH to rehabilitate area	Fire outbreak from quarry site which impacts habitats of Somersby Mintbush Population & results in Somersby Mintbush dieback	-Immediately Report to GRSQ & DPE -Include in Annual Report -Extinguish fire and improve controls to prevent reoccurrence. - Monitor and provide offsets if recovery does not occur	Repeat herbivory events from stock on site resulting in grazing on Somersby Mintbush Habitat and noticeable physical habitat damage	-Report to GRSQ -Include in Annual Report -Immediately repair / improve fences - Remove any manure - Report to DPE	Compaction event from quarry operations associated with machinery or soil movements	-Report to GRSQ - Report to DPE -Include in Annual Report -Improve operational procedures - Provide offsets if attributable to the project and recovery does not occur	Somersby Mintbush dieback in excess of 50%	-Report to GRSQ -Include in Annual Report - Identify whether attributable to the project -Consult with DPE - Assess whether natural shading has reduced population -Provide offsets if attributable to the project and recovery does not occur

SECTION 3

CONCLUDING COMMENTS

3.1 CONCLUDING COMMENTS

The following concluding comments are provided:

i. An increase in the population of Somersby Mintbush was recorded compared to the previous monitoring period.

ii. The Somersby Mintbush population increase recorded is likely a result of reduced shading and regeneration following the 2015 hazard reduction burning operations of the NPWS.

iii. No impacts as a result of the site operations were observed during the current monitoring period;

iv. Suitable environmental controls should continue to be maintained for the Project.

REFERENCES

Conacher Consulting (2016) Somersby Mintbush 2015 Monitoring Report, Grants Road Sand Quarry Extension Lot 1 DP 358717 270 Grants Road Somersby.

Conacher Consulting (2017) Somersby Mintbush 2016 Monitoring Report, Grants Road Sand Quarry Extension Lot 1 DP 358717 270 Grants Road Somersby.

Conacher Consulting (2018) Somersby Mintbush 2017 Monitoring Report, Grants Road Sand Quarry Extension Lot 1 DP 358717 270 Grants Road Somersby.

NSW National Parks and Wildlife Service (2000) Somersby Mintbush *Prostanthera junonis* Recovery Plan. NSW NPWS. Hurstville NSW.

APPENDIX 1
ENVIRONMENTAL PERFORMANCE & COMPLIANCE STATUS SUMMARY

Details on the Environmental Performance and Compliance Status in relation to Somersby Mintbush have been requested for the Annual Reporting. This information is provided in Tables A1.1 and A1.2.

TABLE A1.1
ENVIRONMENTAL PERFORMANCE TABLE

Environmental Aspect	Approval Criteria	Summary of Monitoring Results in the Previous Monitoring Period	Summary of Monitoring Results in this Monitoring Period	Improvement Measures to be Implemented
Somersby Mintbush	Negligible Environmental Consequences	**Sub Pop 3.** 3 clumps with 18 plants **Sub Pop 4** 12 clumps with 34 plants No erosion, sedimentation or reduction in area attributable to the project observed.	**Sub Pop 3.** 24 clumps with 42 plants **Sub Pop 4** 24 clumps with 394 plants No erosion, sedimentation or reduction in area attributable to the project observed.	Trigger levels revised for future monitoring

A compliance status table is provided in Table A1.2.

TABLE A1.2
COMPLIANCE STATUS TABLE

Unique ID	Compliance Requirement	Development Phase	Monitoring Methodology	Evidence & Comments
Condition 19.	Negligible environmental consequences	Operations	Direct population counts and qualitative observation of impacts	Annual Monitoring Reports

Appendix 9
LANDSCAPE & REHABILITATION MONITORING
Conacher Consulting

LANDSCAPE REHABILITATION
&
BIODIVERSITY OFFSET AREA

2018 ANNUAL MONITORING REPORT

GRANTS ROAD
SAND QUARRY EXTENSION

MARCH 2019
REF: 9012

PREFACE

This Report has been prepared by *Conacher Consulting* to address the 2018 annual monitoring and reporting requirements under the Landscape & Rehabilitation Management Plan and Biodiversity Offset Management & Habitat Rehabilitation Plan for the Grants Road Sand Quarry Extension Project at Somersby.

REPORT PREPARED BY:

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SECTION 1

INTRODUCTION & BACKGROUND

1.1 INTRODUCTION

This Landscape Rehabilitation & Biodiversity Offset Area 2018 Annual Monitoring Report has been prepared by *Conacher Consulting* for the Grants Road Sand Quarry Extension (Application No. 08-0099 / Mod 1).

This Report provides details on the compliance with the Landscape & Rehabilitation Management and Biodiversity Offset Management requriements for the Grants Road Sand Quarry Extension Project at Somersby.

1.2 DETAILS ON CURRENT MANAGEMENT PLANS

An initial Landscape and Rehabilitation Management Plan (LRMP) was prepared by Conacher Consulting and approved by the Department of Planning and Environment in 2015.

Since the preparation of the 2015 LRMP the Biodiversity Offset Areas and Landscape Buffer Areas for the project have been revised through an approved Modification Application (No.1).

A revised LRMP (Conacher Consulting Version 2 - 2019) and a new Biodiversity Offset Management & Habitat Rehabilitation Plan (Conacher Consulting 2019) have been prepared to meet the current project approval and commitment requirements. These new documents will be forwarded to the Department of Planning and the Environment for review and approval.

This Report provides details on the works and performance of the Project in relation to these documents and the following Project Approval Conditions and Commitments:

i. Schedule 2 Environmental Performance Conditions

- Condition 23 Biodiversity Offset Strategy
- Condition 24 Long Term Security of Offset
- Condition 25 Landscape Rehabilitation Objectives
- Condition 26 Progressive Rehabilitation
- Condition 27 Landscape & Rehabilitation Management Plan
- Condition 28 Conservation & Rehabilitation Bond

ii. Statement of Commitments

- No. 6 Soils and Land Capability
- No. 9 Biodiversity & Environmental Management

SECTION 2

BIODIVERSITY OFFSET STRATEGY ANNUAL REPORTING

2.1 BACKGROUND

Details on the implementation of the current approved Biodiversity Offset Strategy is outlined within the Biodiversity Offset Management & Habitat Rehabilitation Plan (BOMHRP) (Conacher Consulting 2019). The annual monitoring and compliance requirements and results are addressed in Table 2.1.

2.2 BIODIVERSITY OFFSET AREA WORKS COMPLETED

The following works have been completed in accordance with the Biodiversity Offset Strategy requirements for the Project:

i. Installation of Fauna Nest Boxes

The nest box locations are shown in Figure 2.1 (Appendix 1). The results of the nest box monitoring are provided in Appendix 2. Fauna nest boxes were installed within the Biodiversity Offset Areas in 2015. The nest box locations are shown in Figure 2.1. Several of the nest boxes were installed in parts of the site which are now designated as a Landscape Buffer Area. All boxes within the site are to continue to be maintained, however where nest box maintenance is required, some nest boxes may be relocated to the current Biodiversity Offset Areas of the site.

During the current monitoring period nest box Numbers 10, 20 & 25 required maintenance and relocation. This is to be undertaken during the 2019 operational period.

ii. Fencing of Biodiversity Offset Areas

The Biodiversity Offset Areas A & B are required to be protected with deer and livestock proof fencing. These works have been completed and the fencing is now required to be maintained. The location of new fencing installed and existing fences is shown in Figure 2.1.

iii. Collection of Initial Baseline Floristic Monitoring Data

The collection of baseline floristic monitoring data within plots established within each of the Biodiversity Offset Areas has been undertaken. This data is provided in Appendix 3 of this Report. The data is to be utilised for management planning and future monitoring purposes.

2.3 LONG TERM SECURITY OF OFFSET (CONDITION 24)

This condition is currently being addressed by Stephen Thorne and Associates Surveyors who have provided the Department of Planning and the Environment with the following documents:

- Plan of Positive Covenants and Restrictions on the use of Land within Lots 1 and 2 DP 358717
- Draft Section 88B Covenant
- Draft Deposited Plan Administration Sheet

The finalisation of this matter is currently pending due to the requirement to submit a Revised Landscape and Rehabilitation Management Plan and Biodiversity Offset Area and Habitat Rehabilitation Plan to reflect the modified Biodiversity Offset Strategy. These plans have now been finalised by *Conacher Consulting* and will be forwarded to the Department of Planning and Environment for review and comment in order to resolve this matter.

TABLE 2.1 BIODIVERSITY OFFSET STRATEGY MONITORING COMPLIANCE DETAILS							
Unique ID	**Compliance Requirement**		**Development Phase**	**Monitoring Methodology**	**Evidence Required**	**Monitoring Results**	**Improvement Measures Required**
	Task	**Description**					
Condition 27 (f) Commitment 9 BOMHRP-1	Soil Management	Install erosion and sediment controls to protect offset areas and prevent soil loss during weed control and rehabilitation activities	Operation 1-3 years	Project ecologist inspection Works records	Annual Monitoring Report -Photographs	Not required during 2018 monitoring period due to Management Plan Revisions and Offset Area modification. To be completed during the 2019-2021 period.	None required.
Condition 27 (f) Commitment 9 BOMHRP-2	Soil Management	Undertake soil and landform remediation and stabilisation works for heavily disturbed areas	Operation 1-3 years	Project ecologist inspection works records	Annual Monitoring Report -Photographs -Mapping	As above.	None required.
Condition 27 (f) Commitment 9 BOMHRP-3	Weed Management	Undertake Primary Weed Control Works	Operation 1-3 years	Project ecologist inspection Works records	Annual Monitoring Report -Monitoring Plot Data -Mapping	As above.	None required.
Condition 27 (f) Commitment 9 BOMHRP-4	Weed Management	Undertake Secondary Weed Control Works	Operation 4-10 years	Project ecologist inspection Works records	Annual Monitoring Report -Monitoring Plot Data -Mapping	As above.	None required.

TABLE 2.1
BIODIVERSITY OFFSET STRATEGY MONITORING COMPLIANCE DETAILS

Unique ID	Compliance Requirement		Development Phase	Monitoring Methodology	Evidence Required	Monitoring Results	Improvement Measures Required
	Task	Description					
Condition 27 (f) Commitment 9 BOMHRP-5	Revegetation	Obtain planting material (seeds / plant stock)	Operation 1-6 years	Tax invoice records	Annual Monitoring Report -Tax Invoices	As above.	None required.
Condition 27 (f) Commitment 9 BOMHRP-6	Revegetation	Undertake seeding and planting works	Operation 1-6 years	Project ecologist inspection Works records	Annual Monitoring Report -Plot data -Photos -Mapping	As above.	None required.
Condition 27 (f) Commitment 9 BOMHRP-7	Revegetation	Maintain plantings	Operation 1-6 years	Project ecologist inspection Works records	Plot data -Photos -Mapping	As above.	None required.
Condition 27 (f) Commitment 9 BOMHRP-8	Access Control	Install fencing to exclude livestock and deer from Offset Areas A & B	Operation 1-3 years	Project ecologist inspection	Annual Monitoring Report -Fence mapping -Photos	Completed during 2018 period. See Figure 2.1.	None required.
Condition 27 (f) Commitment 9 BOMHRP-9	Access Control	Maintain fencing to exclude livestock from Offset Area C	Operation 1-26 years	Project ecologist inspection	Annual Monitoring Report	Completed during 2018 period. See Figure 2.1.	None required.
Condition 27 (f) Commitment 9 BOMHRP-10	Access Control	Maintain all exclusion fencing in working condition	Operation 1-26 years	Project ecologist inspection	Annual Monitoring Report	Compliance achieved for 2018 period. See Figure 2.1.	None required.

TABLE 2.1 BIODIVERSITY OFFSET STRATEGY MONITORING COMPLIANCE DETAILS							
Unique ID	**Compliance Requirement**		**Development Phase**	**Monitoring Methodology**	**Evidence Required**	**Monitoring Results**	**Improvement Measures Required**
	Task	**Description**					
Condition 27 (f) Commitment 9 BOMHRP-11	Habitat Enhancement	Install nest boxes and hollow logs to meet hollow tree offset requirement as clearing occurs	Operation 1-6 years	Project ecologist inspection	Annual Monitoring Report	Initial nest boxes installed, refer to Figure 2.2 for locations. Some maintenance works required. Further nest box installation required only when hollow trees within footprint are cleared	Complete maintenance works for existing nest boxes during 2019 period.
Condition 27 (f) Commitment 9 BOMHRP-12	Habitat Enhancement	Salvage environmental/habitat resources where available from quarry footprint and transfer to Offset Areas A & B	Operation 1-10 years	Project ecologist inspection Works records	Annual Monitoring Report -Photos	Not required during 2018. Undertake progressively as footprint clearing is undertaken.	None required.
Condition 27 (f) Commitment 9 BOMHRP-13	Bushfire Management	Protect non-established plantings from bushfire	Operation 1-6 years	Project ecologist inspection	Annual Monitoring Report	No applicable during 2018 period.	None required.
Condition 27 (f) Commitment 9 BOMHRP-14	Bushfire Management	Allow natural bushfire disturbance and revegetation for areas containing established vegetation	Operation 1-26 years	Project ecologist inspection	Annual Monitoring Report -Monitoring Plot data -Photographs	No fire events detected during 2018	None required.

TABLE 2.1 BIODIVERSITY OFFSET STRATEGY MONITORING COMPLIANCE DETAILS							
Unique ID	**Compliance Requirement**		**Development Phase**	**Monitoring Methodology**	**Evidence Required**	**Monitoring Results**	**Improvement Measures Required**
	Task	**Description**					
Condition 27 (f) Commitment 9 BOMHRP-15	Bushfire Management	Protect nest boxes from fire and/or replace if burnt out	Operation 1-10 years	Project ecologist inspection	Annual Monitoring Report	No fire events detected during 2018	None required.
Condition 27 (f) Commitment 9 BOMHRP-16	Monitoring Evaluation & Reporting	Undertake Annual Monitoring as per the Monitoring Strategy	Operation 1-26 years	Project ecologist inspection	Annual Monitoring Report	This report has been prepared to address this requirement.	None required.
Condition 27 (f) Commitment 9 BOMHRP-17	Monitoring Evaluation & Reporting	Re-assess risks to implementation of actions	Operation 1-10 years	NA	Annual Monitoring Report	No risks identified	None required.
Condition 27 (f) Commitment 9 BOMHRP-18	Monitoring Evaluation & Reporting	Implement adaptive response strategies	Operation 1-10 years	NA	Annual Monitoring Report	Non applicable	None required.
Condition 27 (f) Commitment 9 BOMHRP-19	Monitoring Evaluation & Reporting	Prepare annual monitoring reports	Operation 1-26 years	Project ecologist reporting	Annual Monitoring Report	This report has been prepared to address this requirement.	None required.

SECTION 3

LANDSCAPE & REHABILITATION MANAGEMENT PLAN ANNUAL REPORTING

The details of the results of annual monitoring for the Landscape & Rehabilitation Management Plan (LRMP) are provided in Table 3.1. Details on the compliance with specific approval conditions are documented as follows.

3.1 LANDSCAPE REHABILITATION OBJECTIVES (CONDITION 25)

A requirement for rehabilitation works has not been triggered during the 2018 monitoring period.

3.2 PROGRESSIVE REHABILITATION (CONDITION 26)

A requirement for rehabilitation works has not been triggered during the 2018 monitoring period.

3.3 LANDSCAPE & REHABILITATION MANAGEMENT PLAN (CONDITION 27)

A Revised Landscape and Rehabilitation Management Plan has been prepared to address this condition of the current project approval under Modification 1. The implementation of the Biodiversity Offset Strategy Component is addressed in Section 2.1 and 2.1. The requirement for physical Landscape Rehabilitation works was not triggered during the 2018 monitoring period.

3.4 CONSERVATION & REHABILITATION BOND (CONDITION 28)

The Conservation and Rehabilitation Bond Calculation Report (Conacher Consulting December 2016 Ref: 4143/6) was prepared to address Condition No. 28 of Schedule 3 of the approval. This Report calculated that the Conservation and Rehabilitation Bond be set at $306,000.00. This figure has been accepted by the Department of Planning and Environment. The financial arrangements for the rehabilitation bond have been finalised.

TABLE 3.1 LANDSCAPE REHABILITATION MANAGEMENT PLAN COMPLIANCE DETAILS							
Unique ID	**Compliance Requirement**		**Development Phase**	**Monitoring Methodology**	**Evidence Required**	**Monitoring Results**	**Improvement Measures Required**
	Task	**Description**					
LRMP (v2 - 2019) Landscape Buffer Area Management Actions No.1-4	Earth Mound & Bund Construction & Management	1.Progressively construct bund and earth mound around quarry pit	Operational / progressive as quarrying occurs	Visual site inspection and aerial photograph inspection	Annual mapping of bund and earth mound locations	Initial mound construction has occurred (Figure 3.1)	None required.
		2.Vegetate bund and mound areas with Kikuyu Grass or other suitable species	Operational / progressive as bunds and mounds are constructed	Visual inspection by Project Environmental Consultant	Documentation in monitoring reports	Revegetation commenced & ongoing (Figure 3.1)	Control weeds on mounds to assist further revegetation
		3.Construct and maintain sandstone block bund around Aboriginal archaeological site RE1	Prior to operation	Subject to monitoring by the project Archaeologist.	Refer to Environmental Plan of Management & Aboriginal Cultural Heritage Management Plan	NA	NA
		4.Implement downslope sediment controls for bunds and mounds until they are vegetated	Operational / progressive as bunds and mounds are constructed	Visual inspection	Annual monitoring reporting	None required as existing mound is upslope and adjoining quarry pit	None required
LRMP (v2 - 2019) Landscape Buffer Area Management Action No. 5-6	Tree Protection	5.Survey trees to be retained within the Landscape Buffer Area in close proximity to earth mounds	Operational / Years 4-6	Initial survey and further visual inspection	Initial mapping of tree locations and monitoring reporting	New requirement added to Revised LRMP. To be reported for 2019 period	None required.

TABLE 3.1 LANDSCAPE REHABILITATION MANAGEMENT PLAN COMPLIANCE DETAILS							
Unique ID	**Compliance Requirement**		**Development Phase**	**Monitoring Methodology**	**Evidence Required**	**Monitoring Results**	**Improvement Measures Required**
	Task	**Description**					
		6.Provide protection for trees to be retained in the landscape buffer during bund construction	Operational / for life of the quarry	Visual inspection by Project Environmental Consultant	Annual Reporting	New requirement added to Revised LRMP. To be reported for 2019 period	None required.
LRMP (v2 - 2019) Landscape Buffer Area Management Actions No. 7-9	Aboriginal Archaeological Site Management	7.Maintain fencing and sandstone bund around Aboriginal archaeological site RE1	Operational / for the life of the quarry	Subject to monitoring by the project Archaeologist.	Refer to Environmental Plan of Management & Aboriginal Cultural Heritage Management Plan	NA	NA
		8.Maintain vehicle access diversion around Aboriginal archaeological site RE2	Operational / for the life of the quarry	As above.	As above.	NA	NA
		9.Implement Aboriginal Cultural Heritage Program	Operational / for the life of the quarry	As above.	As above.	NA	NA

TABLE 3.1 LANDSCAPE REHABILITATION MANAGEMENT PLAN COMPLIANCE DETAILS							
Unique ID	**Compliance Requirement**		**Development Phase**	**Monitoring Methodology**	**Evidence Required**	**Monitoring Results**	**Improvement Measures Required**
	Task	**Description**					
LRMP (v2 - 2019) Landscape Buffer Area Management Action No. 10	Access Management	10.Ensure that common boundary fencing adjoining the Biodiversity Offset Areas and Aboriginal archaeological heritage sites is maintained	Operational for the life of the quarry	Project Ecologist inspection and annual monitoring reporting	Annual reporting	Compliant for Biodiversity Offset Areas. Refer to separate monitoring by Project Archaeologist for protection of Aboriginal Heritage Sites	None required
LRMP (v2 - 2019) Landscape Buffer Area Management Action No. 11	Bushfire Hazard Reduction & Weed Management	11. Undertake bushfire hazard reduction and weed management through grazing and slashing of the landscape buffer.	Operational for the life of the quarry	Project Ecologist inspection and annual monitoring reporting	Annual reporting	Generally compliant / further ongoing management required	Continue ongoing grazing and slashing
LRMP (v2 - 2019) Landscape Buffer Area Management Action No. 12	Rubbish Management	12.Monitor for rubbish accumulations and remove as necessary	Operational for the life of the quarry	Visual inspection by Project Environmental Consultant	Annual reporting	Compliant	None required
LRMP (v2 - 2019) Quarry Area Biodiversity Management Plan Actions.	Habitat Clearing Management	Implement pre-clearing, clearing and reporting requirements	Operational prior to and during clearing works	Project Ecologist Reporting	Annual reporting	Compliant / no habitat tree clearing undertaken within Quarry Footprint	None required

TABLE 3.1 LANDSCAPE REHABILITATION MANAGEMENT PLAN COMPLIANCE DETAILS							
Unique ID	**Compliance Requirement**		**Development Phase**	**Monitoring Methodology**	**Evidence Required**	**Monitoring Results**	**Improvement Measures Required**
	Task	**Description**					
Quarry Area Rehabilitation Plan Actions 1-4	Site	-Safe, stable and non-polluting -Minimise the visual impact of the final landforms as far as is reasonable and feasible	Operation / progressive and post operation	-Land survey -Observation by suitably qualified Environmental Consultant	Record within quarry operation procedures and annual monitoring reports	Rehabilitation not required during current monitoring period	None required.
	Surface Infrastructure	To be decommissioned and removed unless the Secretary agrees otherwise	Post operation	-Observation by suitably qualified Environmental Consultant	As above	As above	None required.
	Quarry Benches	Suitably landscaped and revegetated using native species	Operation / progressive and post operation	-Observation by suitably qualified Environmental Consultant	As above	As above	None required.
	Quarry Pit Floor	Establish land with a level floor of at least Class 4 agricultural suitability over 80% of the quarry floor	Operation / progressive and post operation	-Observation by suitably qualified Environmental Consultant	As above	As above	None required.

SECTION 4

CONCLUSIONS & RECOMMENDATIONS

4.1 CONCLUDING COMMENTS

The Project is compliant with the requirements of the current Landscape and Rehabilitation Management Plan and Biodiversity Offset Management & Habitat Rehabilitation Plan prepared in compliance with the Conditions for Mod 1 of the Project Approval.

The progressive implementation of these plans is being undertaken as required.

The current Landscape and Rehabilitation Management Plan and Biodiversity Offset Management & Habitat Rehabilitation Plan documents have only recently been revised and no revisions are recommended this stage. Any revisions required as a result of the Department of Planning and Environment's initial review of these documents can be completed separately to the annual review process.

.

REFERENCES

Conacher Consulting (2019) Biodiversity Offset Management & Habitat Rehabilitation Plan, Grants Road Sand Quarry Extension. Unpublished Report.

Conacher Consulting (2019) Landscape and Rehabilitation Management Plan Version 2 Grants Road Sand Quarry Extension. Unpublished Report.

APPENDIX 1
FIGURES

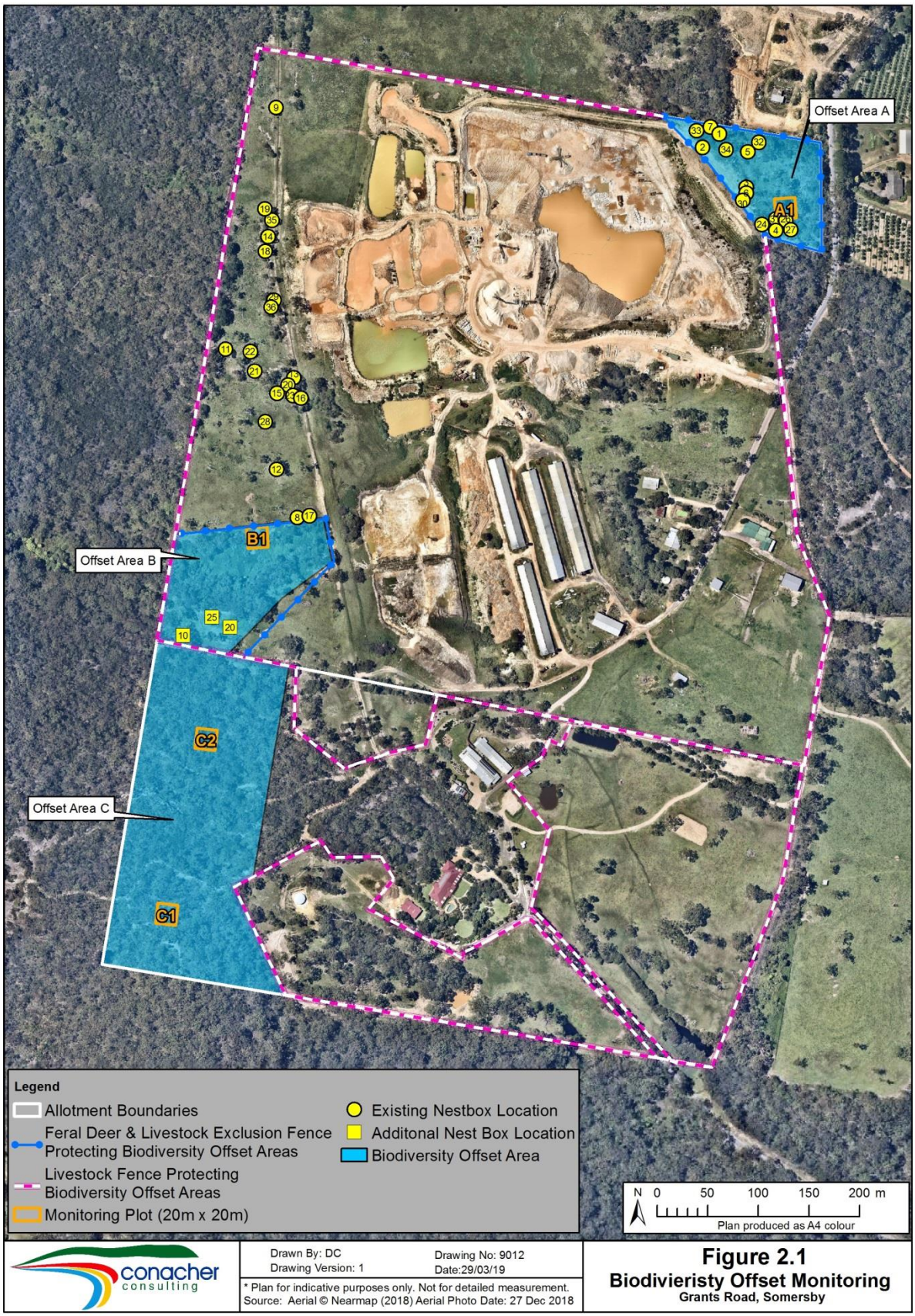

Figure 2.1
Biodivieristy Offset Monitoring
Grants Road, Somersby

Figure 2.2 Photograph of Biodiversity Offset Area Exclusion Fencing

Figure 3.1 Photograph of Revegetated Bund in Landscape Buffer Area

APPENDIX 2
NEST BOX ANNUAL MONITORING RESULTS

Fauna nest box monitoring data is provided in Table A2.1.

TABLE A2.1 NEST BOX MONITORING RESULTS					
Nest Box Number	**Type**	**Monitoring Observation**	**Actions Required Prior to 2019 Monitoring Period**	**Easting**	**Northing**
1	Side Entry Very Small Bird / Mammal	Intact	None	338720	6304269
2	Side Entry Very Small Bird / Mammal	Intact	None	338704	6304256
3	Side Entry Small Bird / Mammal (narrow box)	Intact / minor timber shrinkage detected	Monitor and fill gaps if further separation detected	338747	6304216
4	Side Entry Small Bird / Mammal	Intact / minor timber shrinkage detected	Monitor and fill gaps if further separation detected	338780	6304176
5	Front Entry Small Bird / Mammal (short box)	Intact / minor crack in front panel	Monitor and fill gaps if further separation detected	338746	6304252
6	Front Entry Small Bird / Mammal (short box)	Intact / minor cracking	Monitor and fill gaps if further separation detected	338747	6304211
7	Front Entry Small Bird / Mammal (short box)	Intact / timber shrinkage detected	Monitor and fill gaps if further separation detected	338711	6304276
8	Front Entry Small Bird / Mammal (short box)	Intact / small split above front entry	Monitor and fill gaps if further separation detected	338303	6303890
9	Front Entry Small Bird / Mammal	Intact	None	338282	6304295
10		Box failure	Replace box		
11	Front Entry Small Bird / Mammal	Intact	None	338232	6304056
12	Front Entry Small Bird / Mammal	Intact	None	338283	6303937
13	Front Entry Small Bird / Mammal	Intact	None	338300	6304028

TABLE A2.1 NEST BOX MONITORING RESULTS					
Nest Box Number	**Type**	**Monitoring Observation**	**Actions Required Prior to 2019 Monitoring Period**	**Easting**	**Northing**
14	Front Entry Small Bird / Mammal	Intact / timber shrinkage detected	Monitor and fill gaps if further separation detected	338274	6304168
15	Front Entry Small Bird / Mammal	Intact	None	338294	6304021
16	Front Entry Small Bird / Mammal	Intact	None	338307	6304008
17	Front Entry Small Bird / Mammal	Intact	None	338303	6303890
18	Side Entry Small Bird / Mammal	Intact / timber shrinkage detected	Monitor and fill gaps if further separation detected	338272	6304153
19	Side Entry Small Bird / Mammal	Intact	None	338278	6304184
20	Side Entry Small Bird / Mammal	Box failure	Replace box	338294	6304021
21	Side Entry Small Bird / Mammal	Intact / timber shrinkage detected	None	338261	6304035
22	Side Entry Small Bird / Mammal	Intact	None	338257	6304054
23	Side Entry Small Bird / Mammal	Intact	None	338299	6304011
24	Side Entry Very Small Bird / Mammal	Intact / timber shrinkage detected	Monitor and fill gaps if further separation detected	338769	6304184
25		Box failure	Replace box		
26	Side Entry Very Small Bird / Mammal	Intact / timber shrinkage detected	Monitor and fill gaps if further separation detected	338786	6304184
27	Front Entry Small Bird / Mammal	Intact	None	338786	6304184

TABLE A2.1 NEST BOX MONITORING RESULTS					
Nest Box Number	**Type**	**Monitoring Observation**	**Actions Required Prior to 2019 Monitoring Period**	**Easting**	**Northing**
28	Side Entry Small Bird / Mammal	Intact / timber shrinkage detected	Monitor and fill gaps if further separation detected	338272	6303985
29	Side Entry Small Bird / Mammal	Intact / timber shrinkage detected	Monitor and fill gaps if further separation detected	338280	6304105
30	Front Entry Small Bird / Mammal	Intact / timber shrinkage detected	Monitor and fill gaps if further separation detected	338743	6304203
31	Side Entry Very Small Bird / Mammal (Horizontal mount)	Intact	None	338776	6304185
32	Side Entry Very Small Bird / Mammal (Horizontal mount)	Intact	None	338759	6304261
33	Side Entry Very Small Bird / Mammal (Horizontal mount)	Intact	None	338697	6304272
34	Side Entry Very Small Bird / Mammal (Horizontal mount)	Intact	None	338727	6304253
35	Natural Log Rear Entry Bat box	Intact	None	338278	6304184
36	Natural Log Rear Entry Bat box	Intact	None	338277	6304098

APPENDIX 3
BIODIVERSITY OFFSET BASELINE FLORISTIC PLOT DATA

The baseline floristic plot data for each of the Biodiversity Offset Areas (A-C) is provided in Table A3.1 (Areas A & B) and Table A3.2 (Area C).

TABLE A3.1
BASELINE FLORISTIC DATA FOR BIODIVERSITY OFFSET AREAS A & B

Family	Scientific Name	Common Name	Plot A1 Cover	Plot B1 Cover
Trees				
Myrtaceae	*Corymbia gummifera*	Red Bloodwood	3.00	
Myrtaceae	*Eucalyptus capitellata*	Brown Stringybark	5.00	
Myrtaceae	*Eucalyptus haemastoma*	Broad-leaved Scribbly Gum		2.00
Myrtaceae	*Eucalyptus sieberi*	Silvertop Ash	2.00	
Proteaceae	*Banksia serrata*	Old-man Banksia	3.00	
Shrubs				
Araliaceae	*Polyscias sambucifolia* subsp. *Long Leaflets*	Elderberry Panax	0.10	
Asteraceae	*Ozothamnus diosmifolius*	White Dogwood	10.00	
Dilleniaceae	*Hibbertia linearis*		0.10	
Fabaceae (Faboideae)	*Bossiaea heterophylla*	Variable Bossiaea	0.10	
Fabaceae (Faboideae)	*Bossiaea obcordata*	Spiny Bossiaea	0.10	
Fabaceae (Mimosoideae)	*Acacia fimbriata*	Fringed Wattle	0.50	
Fabaceae (Mimosoideae)	*Acacia floribunda*	White Sally	0.25	
Myrtaceae	*Kunzea ambigua*	Tick Bush	0.25	
Myrtaceae	*Leptospermum polygalifolium* subsp. *polygalifolium*	Tantoon		1.00
Phyllanthaceae	*Breynia oblongifolia*	Coffee Bush	0.10	
Proteaceae	*Banksia ericifolia*	Heath-leaved Banksia		1.00
Proteaceae	*Banksia oblongifolia*	Fern-leaved Banksia		0.50
Proteaceae	*Lomatia silaifolia*	Crinkle Bush	0.10	
Thymelaeaceae	*Pimelea linifolia*	Slender Rice Flower	0.10	
Forbs				
Amaranthaceae	*Alternanthera denticulata*	Lesser Joyweed		0.20
Apiaceae	*Hydrocotyle laxiflora*	Stinking Pennywort	0.10	
Asteraceae	*Euchiton sphaericus*	Star Cudweed	0.10	
Commelinaceae	*Commelina cyanea*	Native Wandering Jew	0.10	
Convolvulaceae	*Dichondra repens*	Kidney Weed	0.10	
Orchidaceae	*Cryptostylis subulata*	Large Tongue Orchid	0.10	
Plantaginaceae	*Veronica plebeia*	Trailing Speedwell	0.10	
Polygonaceae	*Persicaria lapathifolia*	Pale Knotweed		20.00
Dennstaedtiaceae	*Hypolepis muelleri*	Harsh Ground Fern	0.50	0.25
Dennstaedtiaceae	*Pteridium esculentum*	Bracken	0.25	
Monocots				
Cyperaceae	*Cyathochaeta diandra*		0.25	
Cyperaceae	*Cyperus polystachyos*		1.00	2.00
Cyperaceae	*Gahnia clarkei*	Tall Saw-sedge	0.10	
Juncaceae	*Juncus usitatus*		0.20	
Lomandraceae	*Lomandra gracilis*		0.10	

TABLE A3.1 BASELINE FLORISTIC DATA FOR BIODIVERSITY OFFSET AREAS A & B				
Family	**Scientific Name**	**Common Name**	**Plot A1 Cover**	**Plot B1 Cover**
Poaceae	*Cynodon dactylon*	Common Couch	20.00	
Poaceae	*Echinopogon caespitosus*	Bushy Hedgehog-grass	0.25	
Poaceae	*Entolasia marginata*	Bordered Panic	0.10	1.00
Poaceae	*Entolasia stricta*	Wiry Panic	2.00	
Poaceae	*Eragrostis brownii*	Brown's Lovegrass	10.00	
Poaceae	*Microlaena stipoides var. stipoides*	Weeping Grass	10.00	
Poaceae	*Oplismenus imbecillis*	Creeping Beard Grass	0.20	
Poaceae	*Sacciolepis indica*	Indian Cupscale Grass		0.50
Other Native Plants				
Rubiaceae	*Gynochthodes jasminoides*	Sweet Morinda		0.25
Vitaceae	*Cissus hypoglauca*	Giant Water Vine		0.25
Exotic Plants				
Araceae	*Zantedeschia aethiopica*	Arum Lily		5.00
Asteraceae	*Ageratina adenophora*	Crofton Weed	2.00	30.00
Asteraceae	*Bidens pilosa*	Cobbler's Pegs	0.10	
Asteraceae	*Cirsium vulgare*	Spear Thistle	0.10	0.20
Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane	0.10	
Asteraceae	*Conyza sumatrensis*	Tall fleabane	1.00	0.50
Asteraceae	*Gamochaeta americana*	Cudweed	0.10	
Asteraceae	*Hypochaeris radicata*	Catsear	0.10	
Asteraceae	*Senecio madagascariensis*	Fireweed	0.25	0.10
Asteraceae	*Sonchus asper*	Prickly Sowthistle		0.10
Brassicaceae	*Rorippa microphylla*	One-rowed Watercress		0.10
Cyperaceae	*Cyperus aggregatus*		0.10	
Cyperaceae	*Cyperus congestus*		0.10	1.00
Poaceae	*Andropogon virginicus*	Whiskey Grass	20.00	
Poaceae	*Axonopus fissifolius*	Narrow-leafed Carpet Grass	20.00	
Poaceae	*Cenchrus clandestinus*	Kikuyu Grass	5.00	
Poaceae	*Cortaderia jubata*	Pink Pampas Grass		40.00
Poaceae	*Digitaria sanguinalis*	Crab Grass	0.10	0.25
Poaceae	*Echinochloa crus-galli*	Barnyard Grass		0.20
Poaceae	*Paspalum dilatatum*	Paspalum	5.00	
Poaceae	*Paspalum notatum*	Bahia Grass	1.00	
Poaceae	*Setaria parviflora*	Pigeon Grass	0.10	
Poaceae	*Setaria pumila*	Pale Pigeon Grass		1.00
Polygonaceae	*Acetosella vulgaris*	Sheep Sorrel	0.10	
Rosaceae	*Rubus fruticosus* sp. agg.	Blackberry complex	10.00	
Solanaceae	*Solanum mauritianum*	Wild Tobacco Bush	1.00	0.50
Solanaceae	*Solanum nigrum*	Black-berry Nightshade	0.10	0.10

TABLE A3.1 BASELINE FLORISTIC DATA FOR BIODIVERSITY OFFSET AREAS A & B				
Family	**Scientific Name**	**Common Name**	**Plot A1 Cover**	**Plot B1 Cover**
Verbenaceae	*Lantana camara*	Lantana	0.50	1.00
Verbenaceae	*Verbena bonariensis*	Purpletop	0.10	0.10

TABLE A3.2 BASELINE FLORISTIC DATA FOR BIODIVERSITY OFFSET AREA C				
Family	**Scientific Name**	**Common Name**	**Plot C1 Cover**	**Plot C2 Cover**
Canopy				
Myrtaceae	*Corymbia gummifera*	Red Bloodwood	4	10
Myrtaceae	*Eucalyptus haemastoma*	Scribbly Gum	104	
Myrtaceae	*Eucalyptus piperita*	Sydney Peppermint		15
Myrtaceae	*Eucalyptus sieberi*	Silvertop Ash	10	5
Sub-canopy				
Myrtaceae	*Angophora costata*	Smooth-barked Apple	3	1
Myrtaceae	*Corymbia gummifera*	Red Bloodwood	0.5	
Myrtaceae	*Eucalyptus sieberi*	Silvertop Ash	5	4
Proteaceae	*Banksia ericifolia subsp. ericifolia*	Heath-leaved Banksia	3	2
Proteaceae	*Banksia serrata*	Old Man Banksia	1	
Shrubs				
Apiaceae	*Platysace linearifolia*		5	2
Apiaceae	*Xanthosia pilosa*	Woolly Xanthosia		0.3
Apiaceae	*Xanthosia tridentata*	Rock Xanthosia		1
Dilleniaceae	*Hibbertia bracteata*			1
Dilleniaceae	*Hibbertia empetrifolia subsp. empetrifolia*			0.2
Dilleniaceae	*Hibbertia linearis*		5	
Dilleniaceae	*Hibbertia procumbens*			0.2
Euphorbiaceae	*Amperea xiphoclada* var. *xiphoclada*	Broom Spurge	1	0.5
Ericaceae	*Leucopogon ericoides*	Pink Beard-heath	2	
Ericaceae	*Woollsia pungens*			3
Fabaceae (Faboideae)	*Bossiaea heterophylla*	Variable Bossiaea	2	0.5
Fabaceae (Faboideae)	*Bossiaea obcordata*	Spiny Bossiaea	0.25	0.5
Fabaceae (Faboideae)	*Bossiaea scolopendria*		0.1	
Fabaceae (Faboideae)	*Dillwynia rudis*		3	4
Fabaceae (Faboideae)	*Hovea linearis*			0.1
Fabaceae (Faboideae)	*Pultenaea rosmarinifolia*	Rosemary Bush-pea		2
Fabaceae (Mimosoideae)	*Acacia linifolia*	White Wattle	3	3
Fabaceae (Mimosoideae)	*Acacia myrtifolia*	Myrtle Wattle		0.2
Fabaceae (Mimosoideae)	*Acacia oxycedrus*	Spike Wattle	0.1	0.25
Fabaceae (Mimosoideae)	*Acacia suaveolens*	Sweet Wattle	0.2	1

TABLE A3.2 BASELINE FLORISTIC DATA FOR BIODIVERSITY OFFSET AREA C				
Family	**Scientific Name**	**Common Name**	**Plot C1 Cover**	**Plot C2 Cover**
Fabaceae (Mimosoideae)	*Acacia terminalis* subsp. *Bright yellow flower*	Sunshine Wattle		0.25
Lamiaceae	*Hemigenia purpurea*		0.25	
Myrtaceae	*Corymbia gummifera*	Red Bloodwood	1	1
Myrtaceae	*Eucalyptus sieberi*	Silvertop Ash	1	
Myrtaceae	*Leptospermum parvifolium*			1
Myrtaceae	*Leptospermum polygalifolium* subsp. *cismontanum*	Tantoon		5
Myrtaceae	*Leptospermum trinervium*	Flaky-barked Tea-tree	10	10
Phyllanthaceae	*Phyllanthus hirtellus*	Thyme Spurge	0.3	0.2
Proteaceae	*Banksia ericifolia subsp. ericifolia*	Heath-leaved Banksia	1	5
Proteaceae	*Banksia oblongifolia*	Fern-leaved Banksia		0.5
Proteaceae	*Banksia serrata*	Old Man Banksia	2	
Proteaceae	*Conospermum longifolium* subsp. *longifolium*	Long Leaf Smoke Bush	2	2
Proteaceae	*Grevillea buxifolia subsp. buxifolia*	Grey Spider Flower	5	1
Proteaceae	*Grevillea sericea subsp. sericea*	Pink Spider Flower	5	10
Proteaceae	*Hakea sericea*	Needlebush		3
Proteaceae	*Isopogon anemonifolius*	Broad-leaf Drumsticks	0.5	0.25
Proteaceae	*Lambertia formosa*	Mountain Devil		0.5
Proteaceae	*Lomatia silaifolia*	Crinkle Bush		0.25
Proteaceae	*Persoonia isophylla*	Pine-leaved Geebung	0.1	1
Proteaceae	*Persoonia levis*	Broad-leaved Geebung	0.5	1
Proteaceae	*Petrophile pulchella*		0.25	0.25
Rutaceae	*Boronia ledifolia*	Showy Boronia	0.5	4
Rutaceae	*Boronia pinnata*			0.2
Rutaceae	*Philotheca hispidula*		0.5	0.25
Santalaceae	*Leptomeria acida*	Sour Currant Bush		1
Thymelaeaceae	*Pimelea linifolia* subsp. *linifolia*	Slender Rice Flower	5	2
Ground Layer				
Ferns and Allies				
Schizaeacea	*Schizaea bifida*	Comb Fern		0.1
Lindsaeaceae	*Lindsaea linearis*	Screw Fern		0.1
Herbs - Climbers				
Smilacaceae	*Smilax australis*	Native Sarsparilla		0.2
Dicots (Herbs)				
Apiaceae	*Actinotus helianthi*	Flannel Flower	5	
Apiaceae	*Actinotus minor*	Lesser Flanner Flower	0.2	10
Goodeniaceae	*Dampiera stricta*			0.2
Goodeniaceae	*Scaevola ramosissima*	Snake Flower	0.2	
Rubiaceae	*Pomax umbellata*		0.2	

TABLE A3.2 BASELINE FLORISTIC DATA FOR BIODIVERSITY OFFSET AREA C				
Family	**Scientific Name**	**Common Name**	**Plot C1 Cover**	**Plot C2 Cover**
Monocots (Grasses)				
Poaceae	*Anisopogon avenaceus*	Oat Speargrass	5	20
Poaceae	*Entolasia stricta*	Wiry Panic	15	15
Poaceae	*Eragrostis brownii*	Brown's Lovegrass		0.2
Monocots (Others)				
Anthericaceae	*Caesia parviflora*	Pale Grass-lily	0.1	
Cyperaceae	*Caustis flexuosa*	Curly Wig	0.2	1
Cyperaceae	*Caustis pentandra*	Thick Twist Rush		0.2
Cyperaceae	*Cyathochaeta diandra*		1	10
Cyperaceae	*Lepidosperma laterale*			0.1
Cyperaceae	*Schoenus melanostachys*	Black Bog-rush		5
Doryanthaceae	*Doryanthes excelsa*	Gymea Lily		5
Haemodoraceae	*Haemodorum planifolium*		1	0.4
Iridaceae	*Patersonia sericea*	Silky Purple-flag	0.1	
Lomandraceae	*Lomandra glauca*	Pale Mat-rush	0.1	
Lomandraceae	*Lomandra obliqua*		0.1	0.1
Phormiaceae	*Dianella prunina*		0.1	0.1
Restionaceae	*Empodisma minus*	Wire Rush		0.3
Restionaceae	*Lepyrodia scariosa*		0.1	1
Xanthorrhoeaceae	*Xanthorrhoea media*		4	0.4
Xyridaceae	*Xyris gracilis*			0.3
Exotics				
Poaceae	*Andropogon virginicus**	Whisky Grass		0.1

Appendix 10
COMMUNITY CONSULTATION
The Department of Planning and Environment

Grants Rd Sand Community Consultative Committee

Correspondence to:
The Chair
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LAKE MUNMORAH NSW 2259

Email: lisaandrews.ic@gmail.com
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2 April 2019

Ms Carolyn McNally
Secretary
GPO Box 39
SYDNEY NSW 2001

Dear Ms McNally

Grants Rd Sand Community Consultative Committee (CCC) – Activities for 2018

In accordance with the Department's Community Consultative Committee Guidelines – State Significant Projects (January 2019), below is a brief summary of the operation of the Grants Rd CCC for 2018.

Grants Rd Sand is a family owned and run sandstone quarry located on the Central Coast of New South Wales that supplies sand, sandstone and sandstone products for domestic and commercial projects.

The project operates in accordance with its approval (No. 080099 25 July 2014, which was modified in April 2018 to provide more improved biodiversity outcomes).

In October 2018, a Community Consultative Committee was established as per Schedule 5, Environmental Management Reporting & Auditing, condition 6 of the development consent:

> ***Community Consultative Committee***
>
> *6. If directed by the Secretary, the Proponent must establish and operate a Community Consultative Committee (CCC) for the project to the satisfaction of the Secretary. Any such CCC must be operated in general accordance with the Community Consultative Committee Guidelines: State Significant Projects (2016).*

The CCC operates in accordance with the guidelines. The membership consisted of:

- Three local community representatives
- One Central Coast Council delegate
- Two company representatives and
- One Independent Chairperson.

The meetings are held bi-annually and to date, two meetings have occurred.

As is often the case with sand mines and aggregate quarries; the main issue for the community is traffic movements, safety and dust.

The Grants Rd Quarry is located in a rural area at the end of a dead-end road and therefore, only one way in and out. This combined with Hanson's Central Coast Sands Quarry off Grants Road (Reservoir Rd) provides cumulative impacts for local residents.

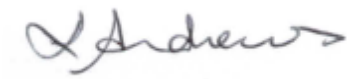
The proponent has shown its willingness to work with the community and has recorded no complaints since the CCC's establishment.

The committee receives information from the project operators regarding its compliance with the conditions of consent including the monitoring of environmental, air, noise and water management on the quarry site.

I am also pleased to report that Central Coast Council has listened to the concerns of the community and provided additional signage on Grants Road, indicating speed limits, stop signs, parking signs, etc. Road maintenance works are also planned to mitigate safety concerns.

Should you require any further information, please do not hesitate to contact me.

Yours faithfully



Lisa Andrews
INDEPENDENT CHAIRPERSON