

Ocean Drive Evans Head Revegetation Plan 2015



Executive Summary

EnviTE Environment was contracted by Richmond Valley Council (RVC) to develop a revegetation plan for the Ocean Drive bank stabilisation at Evans Head. This revegetation plan is designed to guide the rehabilitation of the Crown reserve running between the Evans River and Ocean Drive. Littoral rainforest, Callitris Pines and Koala habitat trees were removed as part of major erosion control works associated with this bank stabilisation.

Revegetation will replace plants that were removed during the reconstruction of the riverbank, further stabilising the area from erosion by promoting replacement of Littoral rainforest, Coastal Cypress and other native vegetation communities, improving habitat for threatened species and the general amenity of the area.

Revegetation will include 34 different native plant species totaling 3349 individuals. The majority of plants will be ground covers such as *Lomandra longifolia* (2051) and *Crinum pedunculatum* (511) with changes to the construction design the total could be increased by 5% ~125 plants. A mix of 32 different native coastal tree and shrub species will make up the remainder of the revegetation with 797 individuals. The site has been broken into 17 zones with 69 subzones of which ~0.4 Ha will be revegetated. The planting will occur in stages, initially planting zones 1 to 7 and a follow-up second stage planting zones 8 to 14.

This Revegetation Plan includes consideration of on-going management and maintenance regimes, as well as detailed species selection, density, placement and numbers. This plan has been prepared with a maintenance timeframe of five years.

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Figure 1: Locality Map Ocean Drive Revegetation Project



Figure 2: Project site work zones



Figure 3. Map showing zones 4 - 7, associated subzones, chainage, contours and profile cross section A – B shown in Figure 4. Note green dots previous mapped locations of trees >200mm DBH

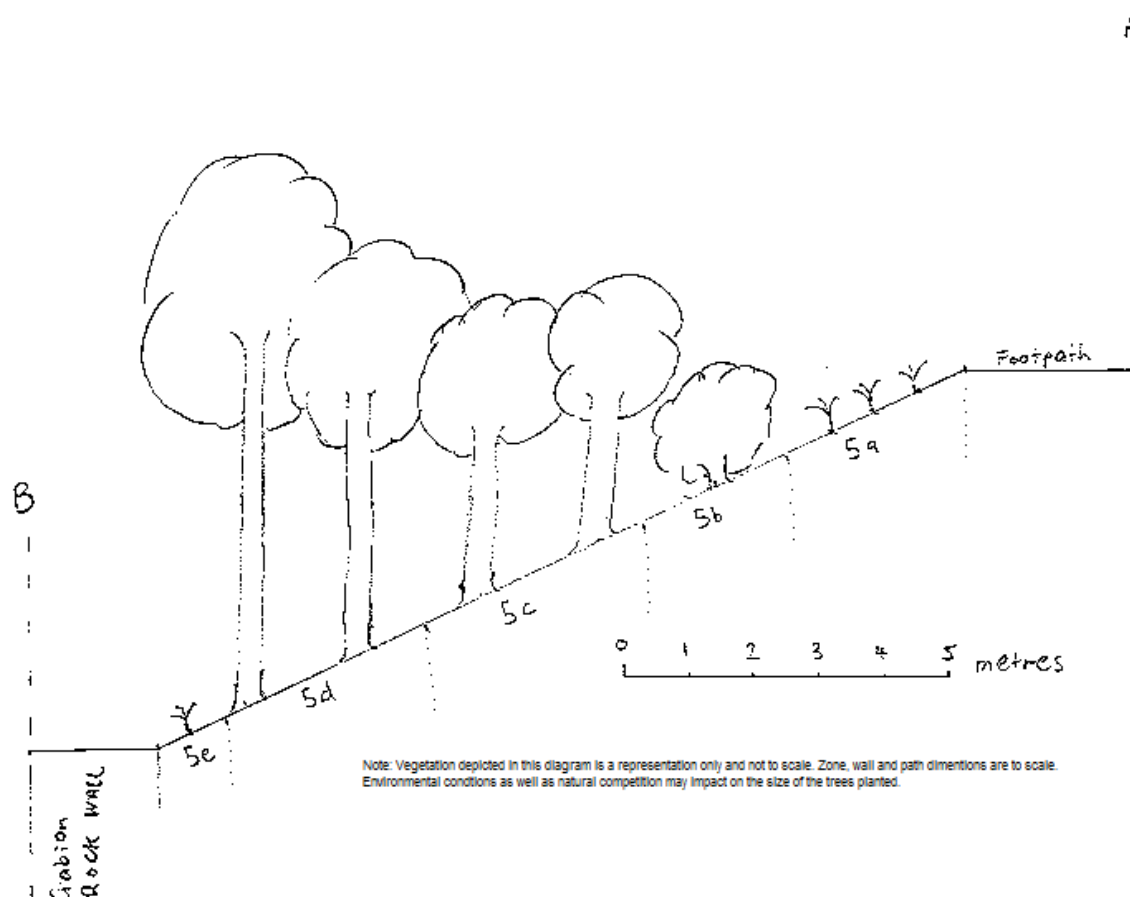


Figure 4. Cross section A – B showing location of native plants within subzones 5a – 5d

2.1 Site Access

The site can be accessed from the western end of the site beside Kalimna Park Reserve. As the work site is located beside Ocean Drive traffic control will be required to undertake the revegetation. Current control measures such as stop go lights with barriers to close the northern lane would be recommended.

The site is very steep with gabion walls elevated as high as 3 metres above the river bank below. Movement around the site should be evaluated carefully through hazard and risk assessment procedures.

3. Plant selection

Endemic littoral rainforest, Coastal Callitris, and wet sclerophyll species will be used in this planting as recommended in **Appendix 1**.

To ensure the protection and conservation of the genetic diversity of nearby areas it is recommended that only plants with local provenance sourced from local nurseries should be used. **Appendix 1** provides a recommended planting species list. To achieve this aim, plants should be selected to replicate the vegetation communities naturally occurring on site such as Littoral Rainforest, Callitris and Wet sclerophyll. A graphical representation can be seen in **Figure 6**.

During previous survey undertaken by EnviTE Environment all trees with a DBH of 200mm or greater were mapped and recorded across the site. Through this process the dominant native canopy trees and associated vegetation communities have been documented. A table representing this data can be found in **Table 1**. This data has been used to guide species mixes across the work area so the revegetation of the site will match vegetation communities found on the site prior to disturbance.

It is recommended a small % of the planting be made of semi advanced stock for aesthetics and assist with sheltering other young plants. It is recommended that all 25 *Banksia aemula* planted on the upper banks are semi advanced as well as 15 Littoral Rainforest trees such as Tuckeroo (*Cupaniopsis anarcardiodes*) and others throughout the middle slopes. It is also recommended that semi advanced stock are in pots no larger than 15L to ensure that extensive excavation or staking is not required.

Due to the limited time available to source trees it is recommended that species numbers are used as a guide and if one species is not able to be sourced others of similar type (Littoral rainforest / Wet Sclerophyll forest) should replace it.

Changes to the construction plan have occurred since the initial planning of the erosion control works and as a result areas for planting have changed slightly. This has mainly occurred in response to changes in the pedestrian path location. Further changes may occur as construction continues to adapt to on-ground conditions and constraints. For this reason it should be noted that planting numbers associated with the upper bank and upper edge could increase by up to 5% (i.e. ~ 125 plants comprised mainly of *Lomandra* and *Crinum* lily).

Table 1. Dominance of native trees >200mm DBH located onsite (EnviTE Environment 2013)

Scientific Name	Common Name	Number Recorded	% of Total
<i>Acacia disparrima</i>	Hickory Wattle	19	6.8%
<i>Alphitonia excelsa</i>	Red Ash	3	1.1%
<i>Avicennia marina</i>	Grey Mangrove	11	4.0%
<i>Banksia aemula</i>	Wallum Banksia	1	0.4%
<i>Banksia integrifolia</i>	Coast Banksia	10	3.6%
<i>Callitris columellaris</i>	Coastal Cypress Pine	61	21.9%
<i>Casuarina glauca</i>	Swamp Oak	26	9.4%
<i>Corymbia intermedia</i>	Pink Bloodwood	52	18.7%
<i>Cupaniopsis anarcardioides</i>	Tuckeroo	1	0.4%
<i>Elaeocarpus reticulatus</i>	Blueberry Ash	1	0.4%
<i>Endiandra sieberi</i>	Hard Corkwood	4	1.4%
<i>Eucalyptus robusta</i>	Swamp Mahogany	17	6.1%
<i>Eucalyptus tereticornis</i>	Forest Red Gum	1	0.4%
<i>Euroschinus falcatus</i>	Ribbonwood	10	3.6%
<i>Ficus fraseri</i>	Sandpaper Fig	3	1.1%
<i>Ficus sp</i>	Unidentified Fig	1	0.4%
<i>Ficus watkinsiana</i>	Strangling Fig	7	2.5%
<i>Glochidion ferdinandi</i>	Cheese Tree	4	1.4%
<i>Litsea australis</i>	Brown Bolly Gum	13	4.7%
<i>Lophostemon suaveolens</i>	Swamp Box	1	0.4%
<i>Macaranga tanarius</i>	Macaranaga	1	0.4%
<i>Melaleuca quinquenervia</i>	Broad-leaved Paperbark	14	5.0%
<i>Notelaea longifolia var longifolia</i>	Large Mock Olive	2	0.7%
<i>Pandanus tectorius</i>	Screw Pine	1	0.4%
<i>Polyscias elegans</i>	Celerywood	5	1.8%
<i>Pouteria chartacea</i>	Thin leaved Coondoo	1	0.4%
<i>Syzygium oleosum</i>	Blue Lilly Pilly	8	2.9%
Total		278	100.00%

APPENDIX 1: Native Plant Selection List

Scientific Name	Common Name	Total
<i>Acacia disparrima</i>	Hickory Wattle	13
<i>Acacia longifolia sub sophorae</i>	Coastal Wattle	222
<i>Acronychia imperforata</i>	Beach Acronychia	16
<i>Alphitonia excelsa</i>	Red Ash	16
<i>Archontopheonix cunninghamiana</i>	Bangalow Palm	21
<i>Banksia integrifolia</i>	Coastal Banksia	38
<i>Banksia aemula</i>	Wallum Banksia	25
<i>Breynia oblongifolia</i>	Coffee Bush	24
<i>Callitris columellaris</i>	Coastal Cypress Pine	34
<i>Casuarina glauca</i>	Swamp Oak	21
<i>Corymbia intermedia</i>	Pink Bloodwood	25
<i>Crinum pedunculatum</i>	River Lily	511
<i>Cryptocaria triplinervis var triplinervis</i>	Three Veined Laurel	16
<i>Cupaniopsis anacardioides</i>	Tuckeroo	16
<i>Duboisia myoporoides</i>	Corkwood	16
<i>Eleocarpus reticulatus</i>	Blueberry Ash	16
<i>Endiandra sieberi</i>	Hard Corkwood	10
<i>Eucalyptus robusta</i>	Swamp Mahogany	13
<i>Eucalyptus teriticornis</i>	Forest Red Gum	2
<i>Euroschinus falcatus</i>	Ribbonwood	49
<i>Ficus fraseri</i>	Forest Sandpaper Fig	16
<i>Ficus watkinsiana</i>	Strangler Fig	2
<i>Glochidion ferdinandi</i>	Cheese Tree	16
<i>Hibiscus tiliaceus</i>	Cottonwood	4
<i>Litsea australis</i>	Brown Bollygum	46
<i>Lomandra longifolia</i>	Spiny Matrush	2051
<i>Macaranga tanarius</i>	Macaranga	20
<i>Melaleuca quinquinervia</i>	Broad Leaved Paperbark	8
<i>Myoporum acuminatum</i>	Boobialla	16
<i>Notelaea longifolia var longifolia</i>	Large Leaved Mock Olive	8
<i>Pandanus tectorius</i>	Pandanus	8
<i>Planchonella chartacea</i>	Thin leaved Coondoo	2
<i>Polycias elegans</i>	Celerywood	22
<i>Syzygium oleosum</i>	Blue Lillypilly	36

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APPENDIX 2: Edge species planting numbers for relevant subzones

Sub-Zone	Number of Plants	<i>Crinum pedunculatum</i>	<i>Lomandra longifolia</i>
1a	174	35	139
1c	47	9	38
2a	157	31	126
2c	47	9	38
3a	159	32	127
3d	47	9	38
4a	133	27	106
4e	47	9	38
4f	29	6	23
5a	129	26	103
5e	47	9	38
6a	163	33	130
6e	51	10	41
7a	110	22	88
7e	53	11	42
7f	49	10	39
8a	116	23	93
8e	49	10	39
9a	106	21	85
10a	121	24	97
10e	53	11	42
10f	25	5	20
11a	119	24	95
11e	45	9	36
11f	22	4	18
12a	131	26	105
12e	47	9	38
12f	16	3	13
13a	184	37	147
13e	41	8	33
14a	31	6	25
14e	14	3	11
	2562*	511*	2051*

*Note that these totals may increase due to changes in construction details. It is estimated that ~25 *Crinum pedunculatum* and ~100 *Lomandra longifolia* will be required to fill the extra area created by the changed planting area.

APPENDIX 3: Upper slope species and planting numbers for relevant subzones

Zone	Sub-Zone	Number of Plants	<i>Acacia longifolia subsp sophorae</i>	<i>Banksia aemula</i>	<i>Breynia oblongifolia</i>
1	1b	59	47	6	6
2	2b	58	47	6	5
3	3b	19	15	2	2
4	4b	14	12	1	1
5	5b	13	11	1	1
6	6b	13	11	1	1
7	7b	8	6	1	1
8	8b	13	11	1	1
9	9b	17	14	2	1
10	10b	16	13	1	2
11	11b	11	9	1	1
12	12b	15	13	1	1
13	13b	11	9	1	1
14	14b	4	4	0	0
		271	222	25	24

APPENDIX 4: Mid slope species and planting numbers for relevant subzones

Scientific Name	Common Name	Sub-Zone												
		3c	4c	5c	6c	7c	8c	9c	10c	11c	12c	13c	14c	
<i>Acronychia imperforata</i>	Beach Acronychia	2	1	1	1	1	1	1	1	1	1	1	0	12
<i>Alphitonia excelsa</i>	Red Ash	2	1	1	1	1	1	1	1	1	1	1	0	12
<i>Archontopheonix cunninghamiana</i>	Bangalow Palm	2	1	1	2	1	2	1	1	1	2	2	1	17
<i>Banksia integrifolia</i>	Coastal Banksia	3	2	2	3	0	3	2	2	2	3	2	1	25
<i>Cryptocaria triplinervis var triplinervis</i>	Three Veined Laurel	2	1	1	1	0	1	1	1	1	2	1	0	12
<i>Cupaniopsis anacardiodes</i>	Tuckeroo	2	0	1	1	1	2	0	1	1	2	1	0	12
<i>Duboisia myoporoides</i>	Corkwood	1	1	1	1	1	2	0	1	1	2	1	0	12
<i>Eleocarpus reticulatus</i>	Blueberry Ash	2	0	1	1	0	2	1	1	1	2	1	0	12
<i>Endiandra sieberi</i>	Hard Corkwood	1	0	0	1	0	1	0	0	1	1	0	1	6
<i>Euroschinus falcata</i>	Ribbonwood	3	2	3	3	2	4	2	2	3	4	3	1	32
<i>Ficus fraseri</i>	Forest Sandpaper Fig	2	1	0	1	0	2	1	1	1	2	1	0	12
<i>Glochidion ferdinandi</i>	Cheese Tree	1	0	1	1	1	2	1	1	1	2	1	0	12
<i>Litsea australis</i>	Brown Bollygum	5	2	3	3	2	4	1	2	3	3	3	1	32
<i>Macaranga tanarius</i>	Macaranga	1	1	1	1	0	2	1	1	1	2	1	0	12
<i>Myoporum acuminatum</i>	Boobialla	1	1	1	1	0	2	1	1	1	2	1	0	12
<i>Notelaea longifolia var longifolia</i>	Large Leaved Mock Olive	1	0	0	1	0	1	0	0	0	1	0	0	4
<i>Pandanus tectorius</i>	Pandanus	1	0	1	1	0	1	0	0	0	1	0	0	5
<i>Polycias elgans</i>	Celerywood	2	1	1	3	1	2	1	1	1	2	2	0	17
<i>Syzygium oleosum</i>	Blue Lillypilly	3	1	2	2	1	3	1	2	2	3	2	1	23
Total		37	16	22	29	12	38	16	20	23	38	24	6	281

APPENDIX 5: Lower slope species and planting numbers for relevant subzones

Scientific Name	Common Name	Sub Zone											
		4d	5d	6d	7d	8d	9d	10d	11d	12d	13d	14d	
<i>Acacia disparrima</i>	Hickory Wattle	2	2	1	1	1	2	1	2	0	1	0	13
<i>Acronychia imperforata</i>	Beach Acronychia	1	0	0	0	0	1	0	1	1	0	0	4
<i>Alphitonia excelsa</i>	Red Ash	0	0	1	0	1	1	0	1	0	0	0	4
<i>Archontopheonix cunninghamiana</i>	Bangalow Palm	1	0	0	0	0	1	0	1	1	0	0	4
<i>Banksia integrifolia</i>	Coastal Banksia	1	1	1	1	1	2	1	2	2	1	0	13
<i>Callitris columellaris</i>	Coastal Cypress Pine	3	3	3	4	4	3	3	4	3	3	1	34
<i>Casuarina glauca</i>	Swamp Oak	2	2	2	2	2	2	1	2	3	2	1	21
<i>Corymbia intermedia</i>	Pink Bloodwood	2	2	2	3	3	2	2	2	3	3	1	25
<i>Cryptocaria triplinervis var triplinervis</i>	Three Veined Laurel	0	0	1	0	1	0	0	1	1	0	0	4
<i>Cupaniopsis anacardioides</i>	Tuckeroo	1	0	0	1	0	0	0	1	1	0	0	4
<i>Duboisia myoporoides</i>	Corkwood	1	0	0	0	1	0	0	1	1	0	0	4
<i>Eleocarpus reticulatus</i>	Blueberry Ash	0	1	0	1	0	0	0	1	1	0	0	4
<i>Endiandra sieberi</i>	Hard Corkwood	1	0	0	0	1	0	0	1	1	0	0	4
<i>Eucalyptus robusta</i>	Swamp Mahogany	1	1	1	1	1	1	1	2	2	2	0	13
<i>Eucalyptus teriticornis</i>	Forest Red Gum	0	0	0	0	0	0	1	0	0	1	0	2
<i>Euroschinus falcata</i>	Ribbonwood	1	2	1	2	2	2	1	2	1	2	1	17
<i>Ficus fraseri</i>	Forest Sandpaper Fig	0	0	0	1	0	0	0	1	1	1	0	4
<i>Ficus watkinsiana</i>	Strangler Fig	0	0	0	0	0	0	1	0	0	1	0	4
<i>Glochidion ferdinandi</i>	Cheese Tree	0	0	1	0	0	0	1	1	1	0	0	4
<i>Hibiscus tiliaceus</i>	Cottonwood	1	0	0	0	0	0	0	1	1	1	0	4
<i>Litsea australis</i>	Brown Bollygum	1	1	1	2	2	2	1	2	1	1	0	14
<i>Macaranga tanarius</i>	Macaranga	1	0	1	1	1	0	1	1	1	1	0	8
<i>Melaleuca quinquinervia</i>	Broad Leaved Paperbark	0	1	1	1	1	0	1	1	1	1	0	8
<i>Myoporum acuminatum</i>	Boobialla	0	1	0	1	0	1	0	0	0	1	0	4

Scientific Name	Common Name	Sub Zone											
		4d	5d	6d	7d	8d	9d	10d	11d	12d	13d	14d	
<i>Notelaea longifolia var longifolia</i>	Large Leaved Mock Olive	0	1	0	0	0	1	0	1	1	0	0	4
<i>Pandanus tectorius</i>	Pandanus	0	0	0	1	1	0	0	0	0	1	0	3
<i>Planchonella chartacea</i>	Thin Leaved Coondoo	0	0	0	0	1	0	0	0	1	0	0	2
<i>Polycias elgans</i>	Celerywood	0	0	0	1	1	0	0	1	1	1	0	5
<i>Syzygium oleosum</i>	Blue Lillypilly	1	2	1	1	1	2	1	1	1	1	1	13
	Total	21	20	18	25	26	23	17	34	31	25	5	245

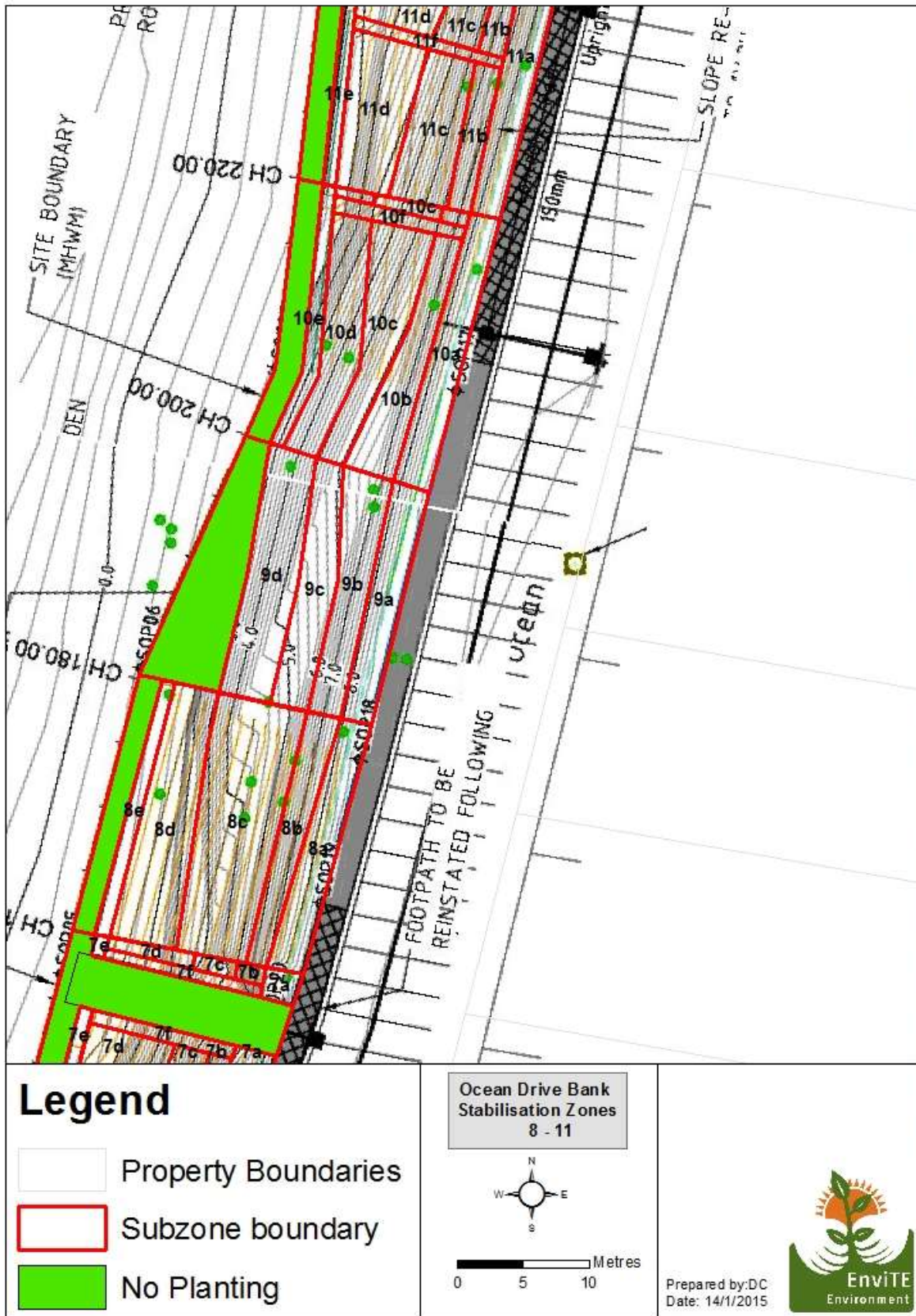
APPENDIX 6: Map showing zones 0 - 3, associated subzones, chainage and contours. Note green dots previous mapped locations of trees >200mm DBH



APPENDIX 7: Map showing zones 4 - 7, associated subzones, chainage and contours. Note green dots previous mapped locations of trees >200mm DBH



APPENDIX 8: Map showing zones 8 - 11, associated subzones, chainage and contours. Note green dots previous mapped locations of trees >200mm DBH



APPENDIX 9: Map showing zones 12 - 16, associated subzones, chainage and contours. Note green dots previous mapped locations of trees >200mm DBH

