Internal memo

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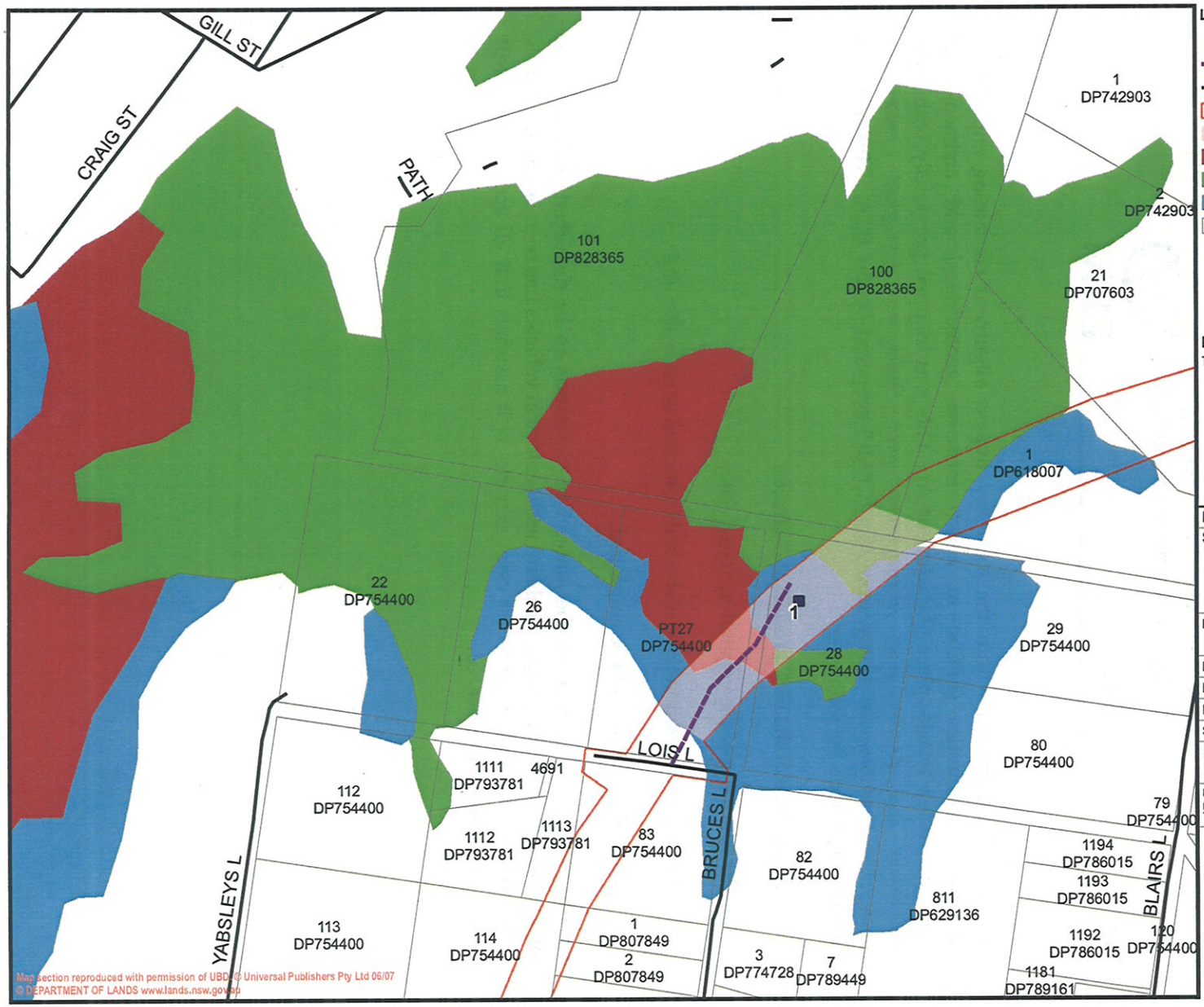
To	Andrew Cook
Copied to	Al McKinnon
From	Toby Nugent
Ref/Job Number	0101243
Subject	Kempsey Bypass - Endangered Ecological Community Clearing
Date	3/02/10

There are five locations within the Kempsey Bypass alignment containing endangered ecological communities (EEC's) in which intrusive geotechnical and archaeological investigations are to take place (Attachment A). This was mapped previously within the *Geotechincal and Archaeological Investigations with Endangered Ecological Communities Construction Environmental Management Plan* (CEMP) prepared by the RTA. This memo is intended to provide the following:

- description of the EEC present at each site;
- the condition of the vegetation at each site;
- amount of vegetation to be disturbed/removed at each site; and
- mitigation measures to be employed.

For the purposes of calculating the amount of vegetation to be disturbed, a 3.5m access corridor requirement for geotechnical and archaeological vehicles has been assumed. This is considered to be an absolute worst case scenario as it assumes that all access tracks will require vegetation to be cleared.



Legend

- Proposed CPT Locations
- Proposed Access Track
- NSW Roadways
- Project Area
- CEMP Sites
- Freshwater Wetland - Lepironia Sedgelands (EEC)
- Freshwater Wetland - Wet Meadow (EEC)
- Swamp Oak Floodplain Forest (EEC)
- Cadastral Boundaries

Notes:

This CEMP site does not contain any PAD sites.

Figure 2.1

Site One and Associated Tracks

Project:	Kempsey Bypass Pacific Highway Upgrade	
Drawing No:	0101243pm_GIS05_V1	
Date:	19/11/2009	Drawing size: A4
Drawn by:	TH	Reviewed by: RTA
Scale:	Refer to Scale Bar	

N

0 90 180 270m

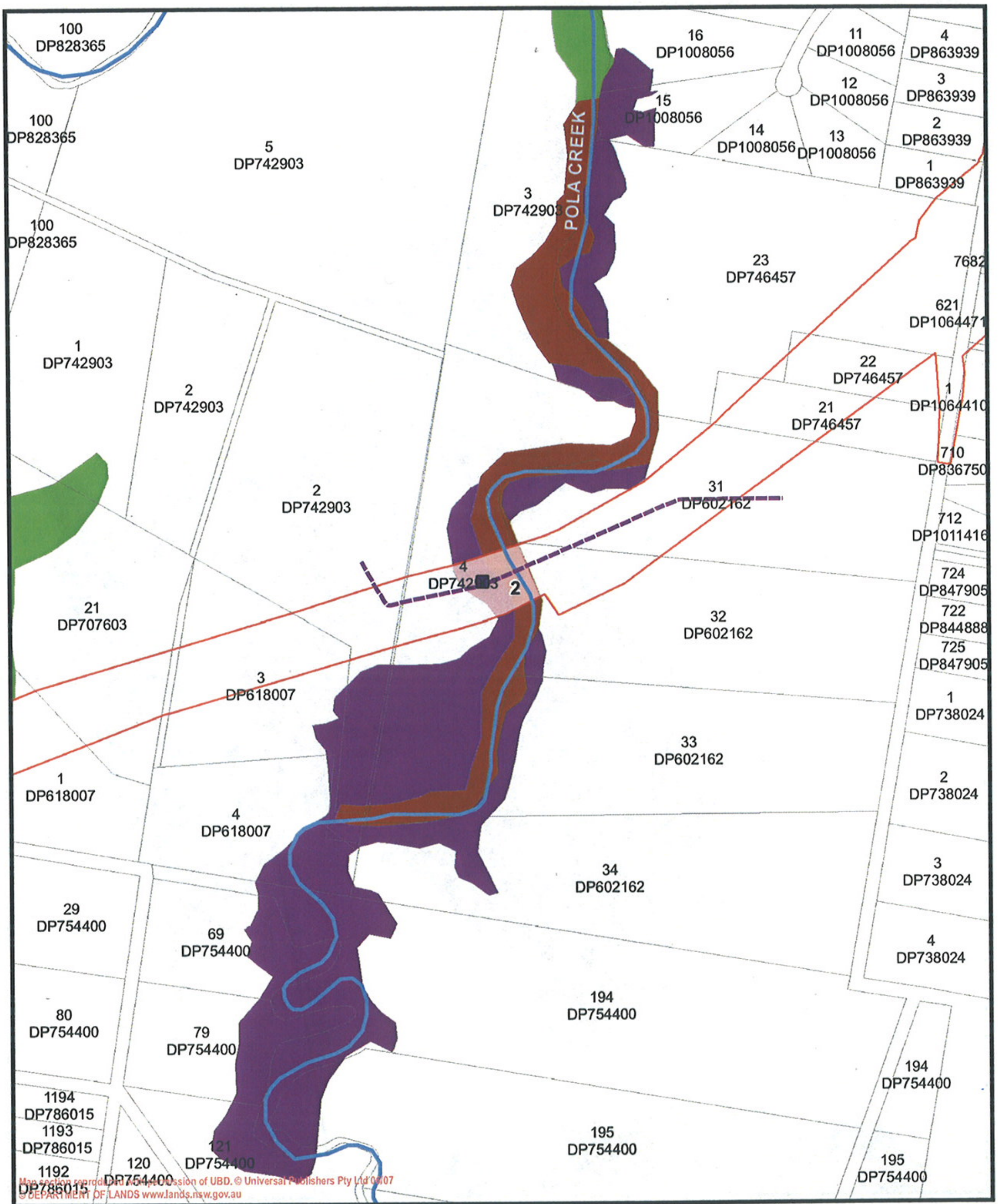


Figure 2.2
Site Two and Associated Tracks

Legend

- Proposed CPT Locations
- access track
- Drainage
- Project Area
- CEMP Sites
- Freshwater Wetland - Lepironia Sedgelands (EEC)
- Freshwater Wetland - Wet Meadow (EEC)
- Swamp Sclerophyll Forest (EEC)
- Cadastral Boundaries

Notes:
Part of KEPAD1 contained within CEMP Site

Project:	Kempsey Bypass Pacific Highway Upgrade
Drawing No:	0101243pm_GIS06_V2
Date:	19/11/2009 Drawing size: A4
Drawn by:	TH Reviewed by: RTA
Scale:	Refer to Scale Bar

0 50 100 150m

N

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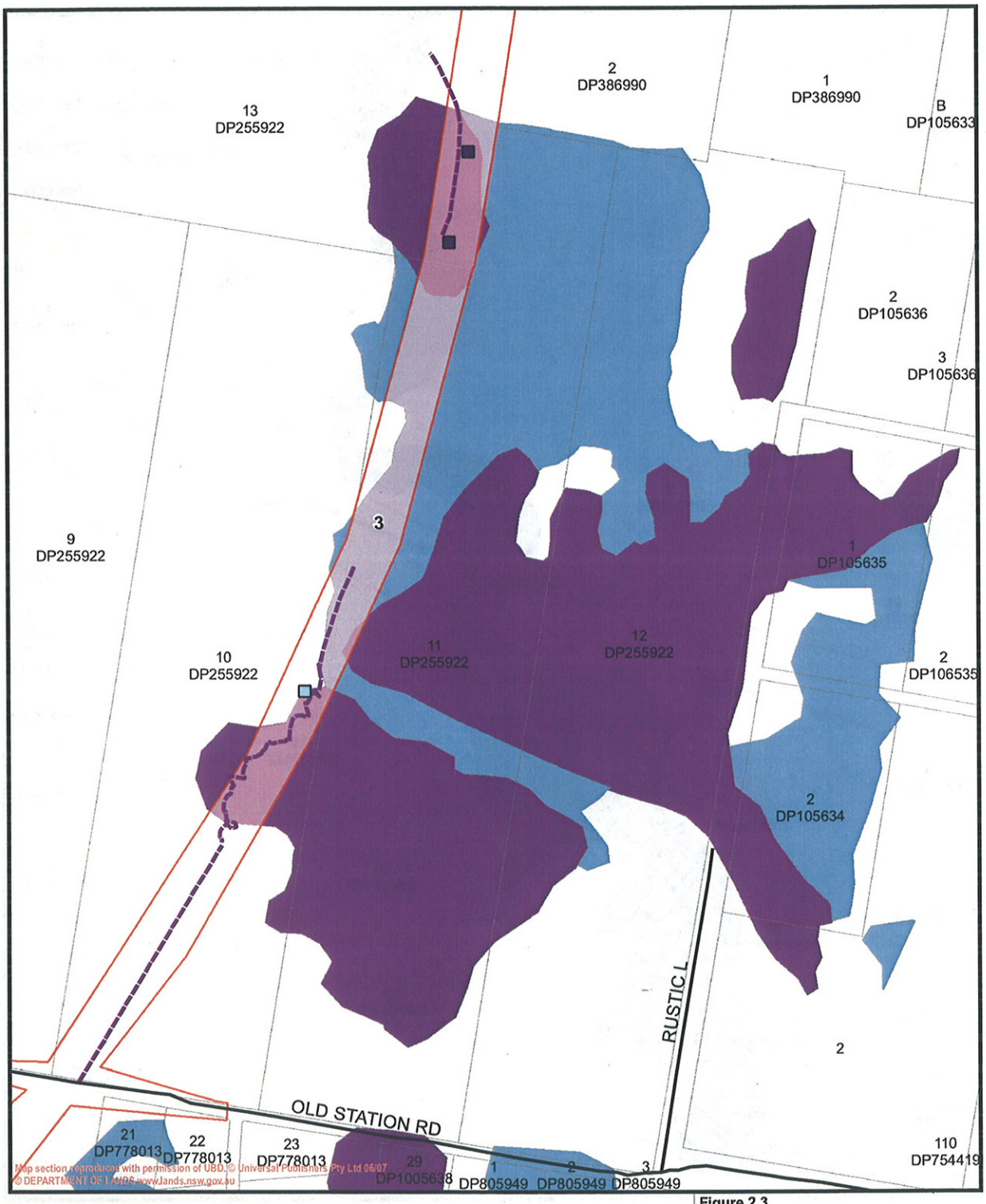

Legend

- Proposed CPT Locations
- Proposed Test Pit Locations
- Proposed Access Location
- NSW Roadways
- Project Area
- CEMP Sites
- Swamp Oak Floodplain Forest (EEC)
- Swamp Sclerophyll Forest (EEC)
- Cadastral Boundaries

Notes:
Part of KEPAD2 contained within CEMP Site

Project:	Kempsey Bypass Pacific Highway Upgrade
Drawing No:	0101243pm_GIS07_V1
Date:	19/11/2009 — Drawing size: A4
Drawn by:	TH — Reviewed by: RTA
Scale:	Refer to Scale Bar

N

0 80 160 240m

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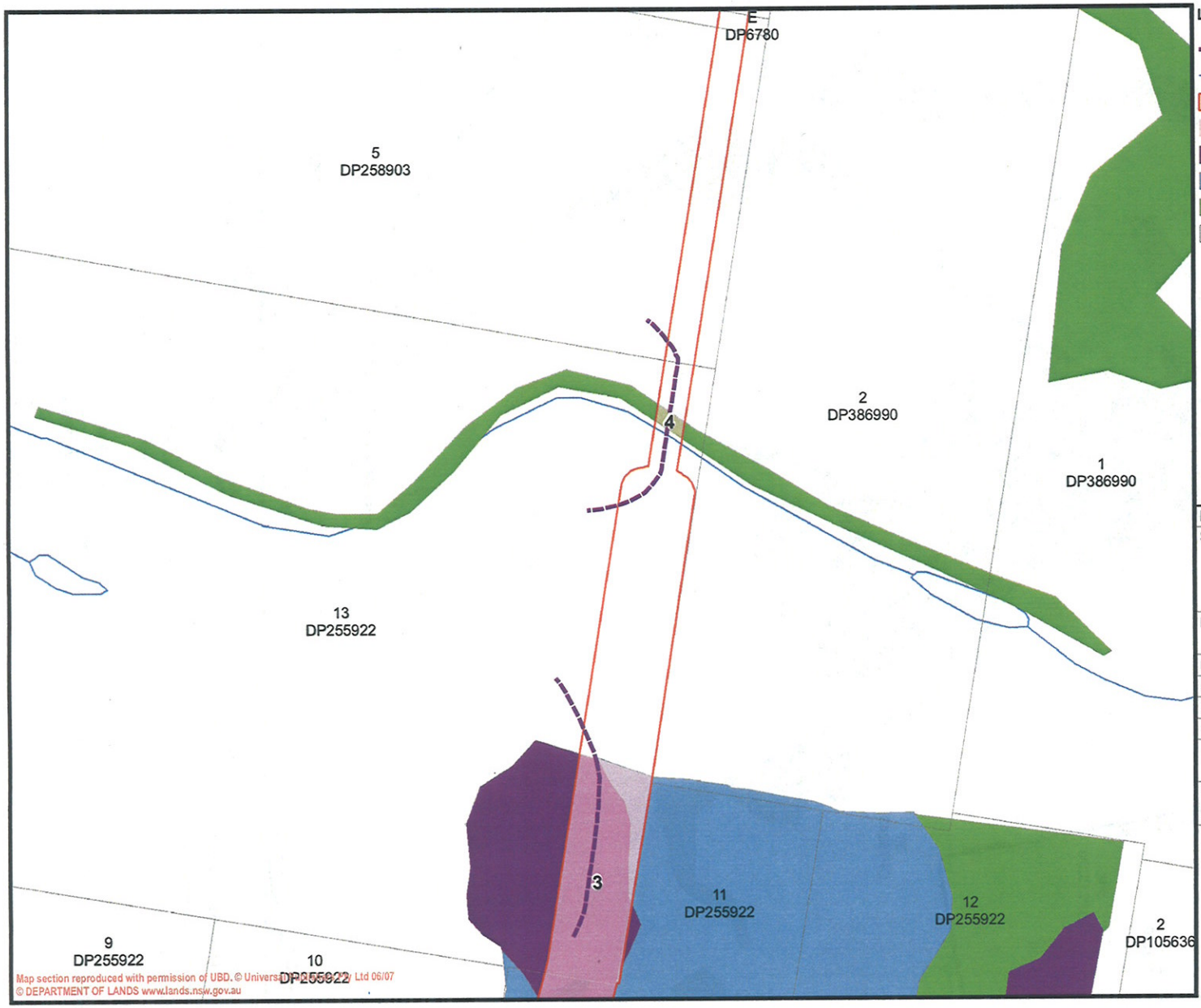
Figure 2.3
Site Three and Associated Tracks



Legend

- Proposed Access Track
- Drainage
- Project Area
- CEMP Sites
- Swamp Sclerophyll Forest (EEC)
- Swamp Oak Floodplain Forest (EEC)
- Freshwater Wetland - Wet Meadow (EEC)
- Cadastral Boundaries

Figure 2.4
Site Four and Asociated Tracks

Project:	Kempsey Bypass Pacific Highway Upgrade	
Drawing No:	0101243pm_GIS08_V1	
Date:	19/11/2009	Drawing size: A4
Drawn by:	TH	Reviewed by: RTA
Scale:	Refer to Scale Bar	

N

0 75 150 225m

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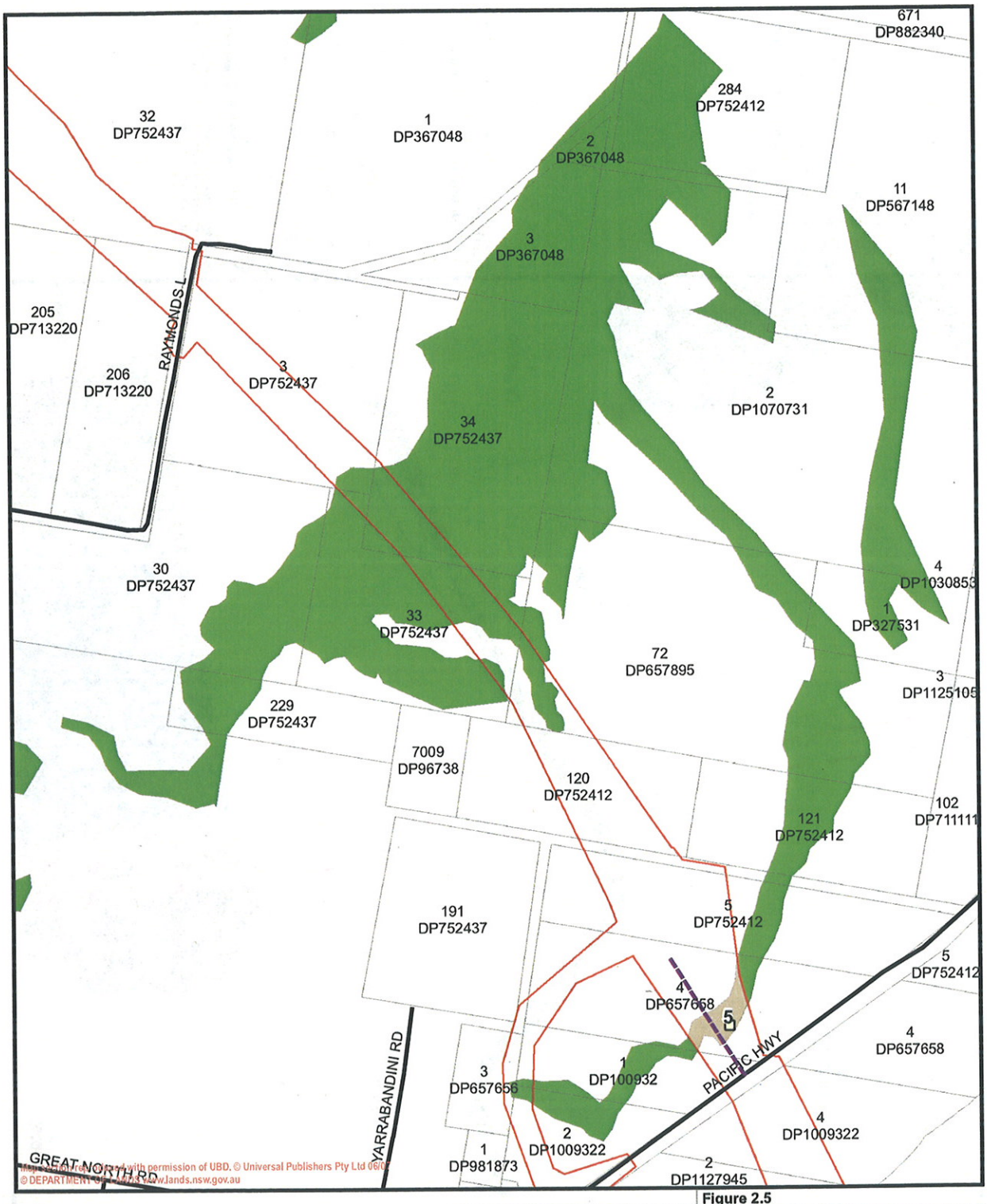

Legend

- Proposed Borehole Locations
- Proposed Access Locations
- NSW Roadways
- Project Area
- CEMP Sites
- Freshwater Wetland - Wet Meadow (EEC)
- Cadastral Boundaries

Notes:
Part of KEPAD5 contained within CEMP Site

Project:	Kempsey Bypass Pacific Highway Upgrade	
Drawing No:	0101243pm_GIS09_V1	
Date:	19/11/2009	Drawing size: A4
Drawn by:	TH	Reviewed by: RTA
Scale:	Refer to Scale Bar	

N

0 75 150 225m

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Figure 2.5
Site Five and Associated Tracks

Table 1 SITE ONE

EEC Type	Condition	Amount to be Cleared/Disturbed
Freshwater Wetland – Lepironia Sedgelands	This specific community in this locality was observed to be in generally good condition[1]	158m²
Swamp Oak Floodplain Forest	All sites along the route have a low to moderate level of weed invasion and were observed to be in average to good condition.	735m²

Notes: *1.Kempsey to Eungai – Upgrading the Pacific Highway Project Application Report (Supplementary Information) Ecological Assessment, Parsons Brinkerhoff 2006*

Table 2 SITE TWO

EEC Type	Condition	Amount to be Cleared/Disturbed
Freshwater Wetland – Lepironia Sedgelands	This specific community in this locality was observed to be in generally good condition[1]	140m²
Swamp Sclerophyll Forest	The swamp sclerophyll forests within the bypass corridor were generally observed to have a low level of grazing and weed invasion and are in average condition.	195m²

Notes: *1. Kempsey to Eungai – Upgrading the Pacific Highway Project Application Report (Supplementary Information) Ecological Assessment, Parsons Brinkerhoff 2006.*

Table 3 SITE THREE

EEC Type	Condition	Amount to be Cleared/Disturbed
Swamp Oak Floodplain Forest	This community displayed a moderate level of weed invasion (grasses and lantana) in the lower to middle stratum. It is considered to be in average to good condition.	3150m²
Swamp Sclerophyll Forest	The northern portion of this EEC was subject to cattle grazing. Both southern and northern areas displayed a moderate level of weed	2130m²

	invasion and are in average condition.	

Table 4 SITE FOUR

EEC Type	Condition	Amount to be Cleared/Disturbed
Freshwater Wetland – Wet Meadow	This community generally displays a moderate level of weed invasion and is in poor condition[1]	70m²

Notes: *1. .Kempsey to Eungai – Upgrading the Pacific Highway Project Application Report (Supplementary Information) Ecological Assessment, Parsons Brinkerhoff 2006*

Table 5 SITE FIVE

EEC Type	Condition	Amount to be Cleared/Disturbed
Freshwater Wetland – Wet Meadow	This community generally displays a moderate level of weed invasion and is in poor condition	245m²

Notes: *1. Kempsey to Eungai – Upgrading the Pacific Highway Project Application Report (Supplementary Information) Ecological Assessment, Parsons Brinkerhoff 2006*

The total amount of EEC potentially disturbed during pre-construction works is 6,823m², as detailed within Table Six below.

Table 6

EEC Type	Total Amount to be Cleared/Disturbed
Freshwater Wetland – Lepironia Sedgelands	298m²
Freshwater Wetland – Wet Meadow	315m²
Swamp Oak Floodplain Forest	3,885m²
Swamp Sclerophyll Forest	2,325m²
Total	6,823m²

In order to minimise the amount of vegetation required to be cleared/disturbed during pre construction works, the following mitigation measures have been developed within the scope of the previously developed CEMP and will be implemented.

- Pre-clear the disturbance areas prior to activities commencing, using a trained ecologist to:
  - Identify a vehicle access path through the area which requires the least amount of disturbance/clearing to the EEC;
  - Clearing is to be limited to that which is required for the Kempsey Bypass project;
  - mark the limits of clearing and install temporary fencing in sensitive areas particularly where endangered ecological communities exist and as required to avoid unnecessary vegetation and habitat removal;
  - collect native seed for use in the revegetation of disturbed areas;
  - identify and place transportable habitat features such as large logs and boulders in adjacent retained areas to allow their continuation as potential fauna refuge sites.

- One week prior to clearing or earlier if possible, implement pre-clearing surveys for fauna including:

  - identifying (by survey) and marking all habitat trees in the area to be cleared.
  - leaving marked habitat trees and corridors of retained trees linking marked habitat trees with the nearest uncleared (secure) habitat areas standing after initial vegetation clearing for a period of at least 48 hours (to encourage animals to disperse into adjacent uncleared habitat).
  - after the 48 hour waiting period, fell standing habitat trees and corridors, commencing with the most distant trees from secure habitat.
  - where possible, clearing should be undertaken in the spring to autumn period to facilitate survival of displaced animals.
  - if habitat trees are in short supply (<4 suitable trees per hectare) artificial nest sites (nest boxes) should be installed in adjacent (secure) habitat before clearing.

- Workers would be trained to identify threatened species that potentially occur at the site.
- Minimise vegetation removed by trimming limbs rather than removing entire trees or bushes where possible.
- Where possible, leave root stock in the ground to stabilize the soil.