6.10 BUSHFIRE PROTECTION ASSESSMENT

BUSHFIRE PROTECTION ASSESSMENT

FOR THE CONSTRUCTION OF THE PROPOSED GRETA TRAIN SUPPORT FACILITY ON LOT 1 in DP 1129191, MANSFIELD STREET, GRETA FOR PACIFIC NATIONAL [NSW] PTY LTD.

October 2010.

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BUSHFIRE PROTECTION ASSESSMENT

FOR THE

CONSTRUCTION OF THE PROPOSED GRETA TRAIN SUPPORT FACILITY ON LOT 1 in DP 1129191, MANSFIELD STREET, GRETA

Assessment Number	Document	Preparation Date	Issue Date	Directors Approval
B101384	Final	1.10.2010	25.10.2010	*G.L.Swain*

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EXECUTIVE SUMMARY

Australian Bushfire Protection Planners Pty Limited, at the request of *Monteath & Powys,* on behalf of *Pacific National [NSW] Pty Ltd,* has undertaken the bushfire consultancy to inform the concept planning process, under Part 3A [State Environmental Planning Policy – Major Development SEPP] of the *Environmental Planning & Assessment Act 1979,* on the bushfire protection measures required for the construction of the proposed Greta Train Support Facility on land within Lot 1 in DP 1129191, Mansfield Street, Greta.

The site on which it is proposed to construct the new Train Support Facility comprises the land located between the existing Main Northern Railway Line and the proposed Hunter Expressway and extending in an arc north from south of the Greta Railway Station.

The proposed facility will contain multiple rail tracks, a Provisioning Shed located at the north-western extremity of the site and a Locomotive/Wagon Wash Bay; Locomotive Maintenance Facility; Road Vehicle/Wagon Maintenance; Fuel Storage and Administrative Buildings located within the central portion of the site.

Vehicular [road] access to the proposed facilities is off Mansfield Street, via an internal access road whilst the railway network on the site connects to the Main Northern Railway Line north of the Greta Station with a secondary connection north of the Provisioning Shed in the north-western corner of the site.

The Director-General's requirements for the Environmental Assessment were issued on the 12th October 2009 under Application Number MP09_0233 and contain, under Key Issues – 'Hazard & Risks' – "assessment of bushfire hazards, including the identification of access and egress from the site and evacuation routes".

In addition, the Cessnock City Council Bushfire Prone Land Map indicates that the site contains Category 1 Bushfire Prone Vegetation.

Therefore this report undertakes an assessment to identify the level of risk to the facility from potential bushfire hazard and determines the deemed-to-satisfy bushfire protection requirements for the proposed development, in accordance with the provisions of *Planning for Bushfire Protection 2006,* and provides recommendations on the provision of Asset Protection Zones [Defendable Spaces]. The report also assesses the adequacy of fire-fighting access and water supplies; construction standards of the buildings, the management of the Asset Protection Zones [Defendable Spaces] and evacuation protocols necessary to address the bushfire risk to the proposed development and to address the aim and objectives of *Planning for Bushfire Protection 2006.*

The report has found that no modifications are required to the development proposal in order to address the provision of a defendable space [Asset Protection Zone] to the buildings; the provision of access and water supplies for fire-fighting operations.

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SECTION 1

INTRODUCTION

1.1 Development Proposal.

Pacific National [NSW] Pty Ltd has submitted an application, under Part 3A [State Environmental Planning Policy – Major Development SEPP] of the *Environmental Planning & Assessment Act 1979,* for the construction of the Greta Train Support Facility on land within Lot 1 in DP 1129191, Mansfield Street, Greta.

The site on which it is proposed to construct the new Train Support Facility comprises the land located between the existing Main Northern Railway Line and the proposed Hunter Expressway, extending in an arc north from south of the Greta Railway Station.

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Vehicular [road] access to the proposed facilities is off Mansfield Street, via an internal access road whilst the railway network on the site connects to the Main Northern Railway Line north of the Greta Station with a secondary connection north of the Provisioning Shed in the north-western corner of the site.

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Figure 1 – Concept Plan of the Greta Train Support Facility and Warehouse development.

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Figure 2 – Extract from Concept Plan showing details of Provisioning Shed.

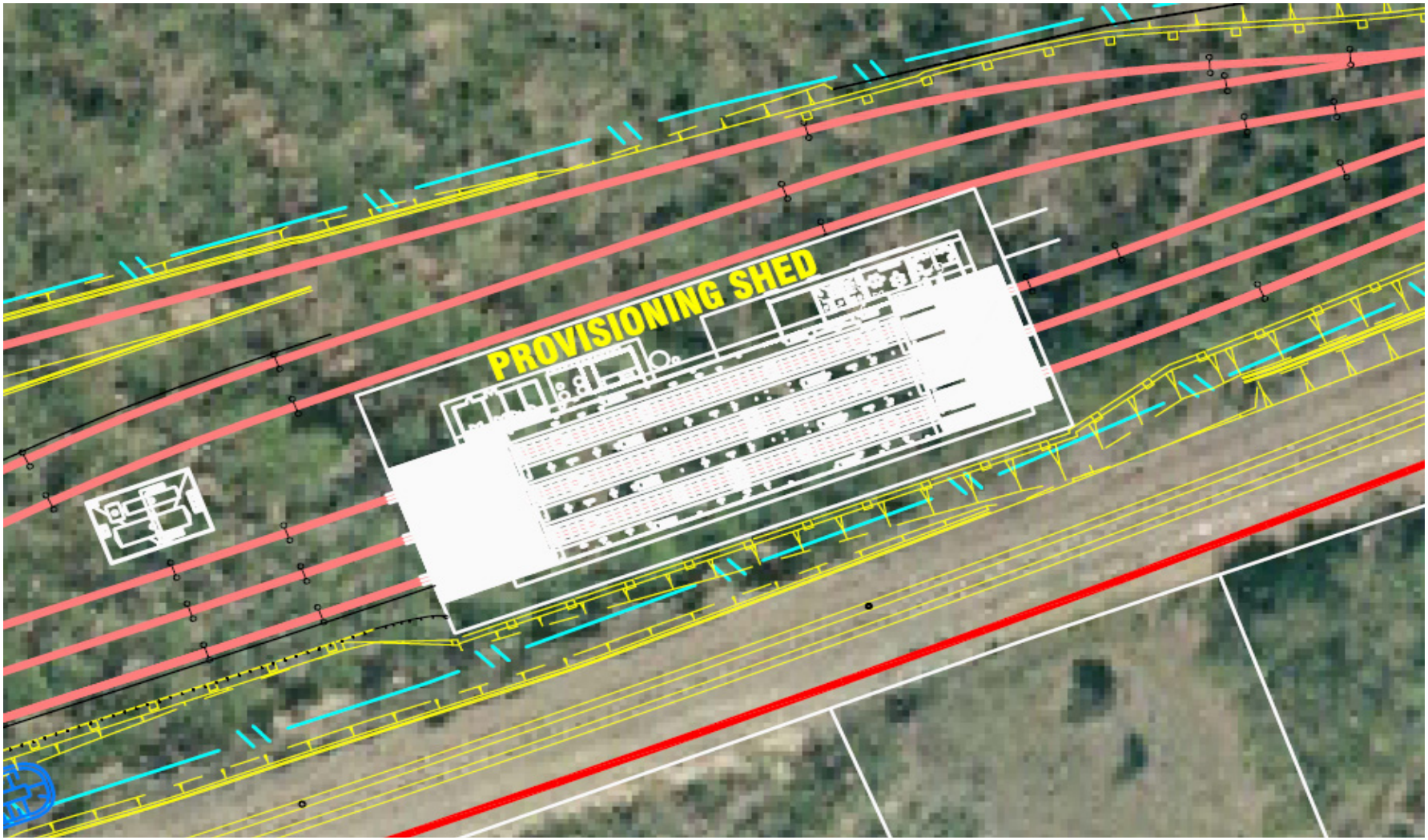

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Figure 3 – Extract from Concept Plan showing location of Locomotive Wash Facility sited against the western boundary, between the Provisioning Shed and the main Facilities Area.

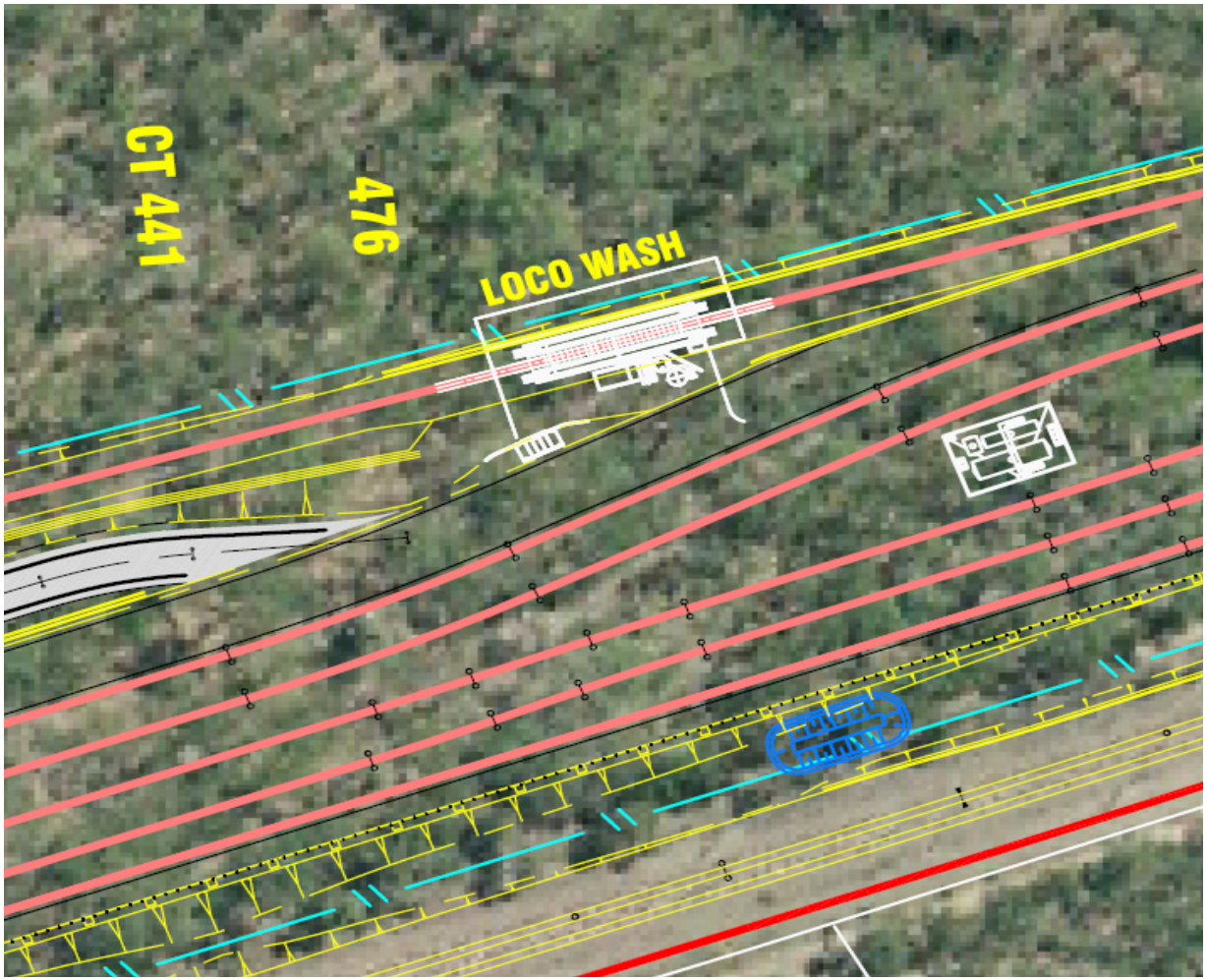

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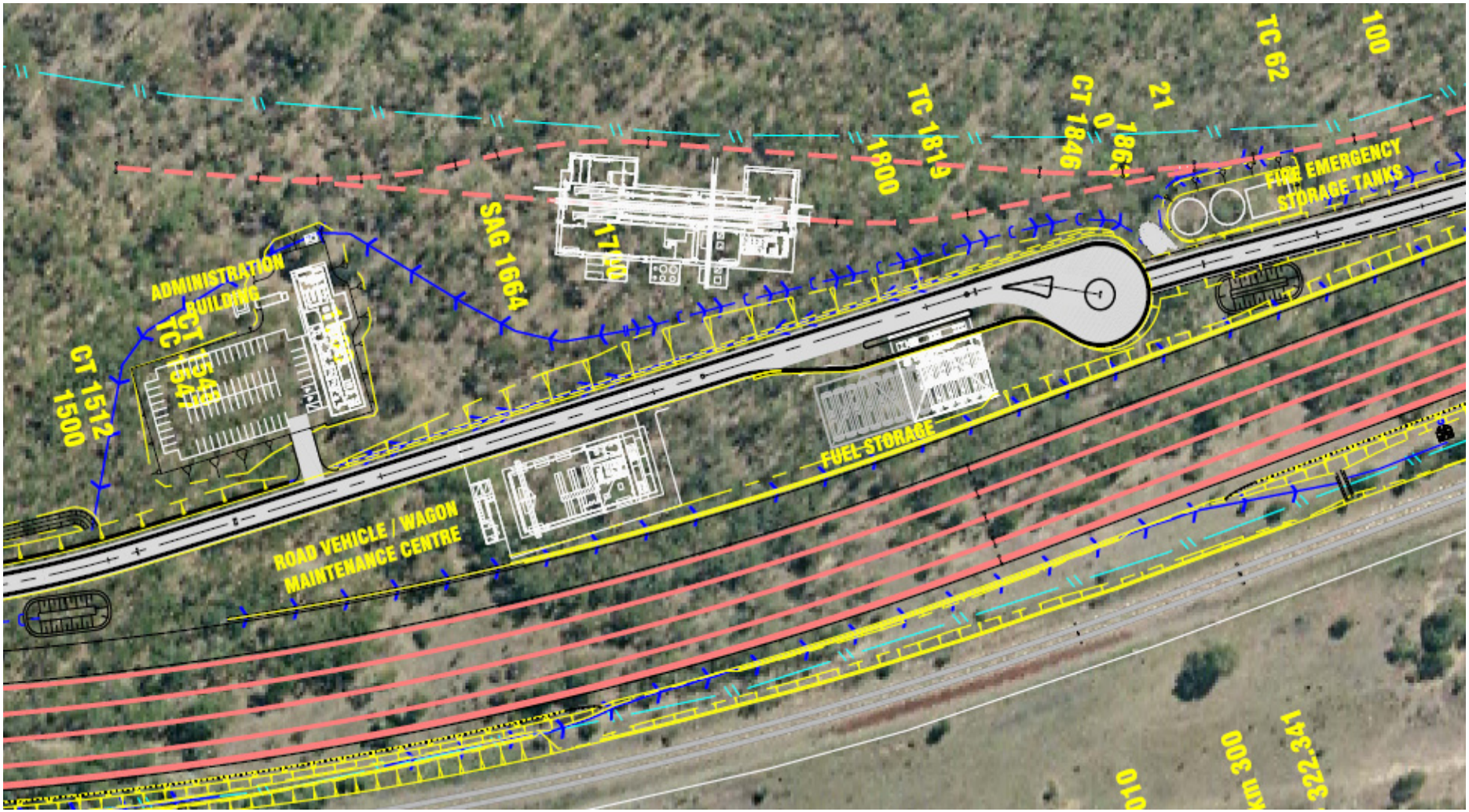
Figure 4 – Extract from the Concept Plan showing the layout of the Main Facilities Area, including the Locomotive Maintenance, Road Vehicle/Wagon Maintenance Centre, Fuel Storage, Administration Building & Carpark.



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1.2 Aim of this Report.

The aim of this report is to address the Director General's Requirements [DGRs] and to provide a bushfire protection assessment of the project in accordance with the aim and objectives of *Planning for Bushfire Protection 2006*.

1.3 Statutory Requirements.

This report has been prepared having regard to the following legislative and planning requirements:

1.3.1 Legislation.

Environmental Planning and Assessment Act - 1979 **(EPA Act)**

Planning and development within NSW is regulated by the *Environmental Planning & Assessment Act, 1979* (EPA Act). Part 3A [Major Projects] of the Act commenced on the 1st August 2005 and consolidated the assessment and approval regime for all major projects previously addressed under Part 4 [Development Assessment] or Part 5 [Environmental Assessment] of the Act.

1.3.2 Planning Policies.

Planning for Bushfire Protection – 2006. **[Rural Fire Service]**

This document provides guidance on the planning and development control processes in relation to bushfire protection measures for rural residential and residential subdivision, *"Special Fire Protection"* and Class 5 – 8 and 10 buildings in bushfire prone areas.

The document provides deemed-to-satisfy specifications on the provision of Asset Protection Zones to residential and *"Special Fire Protection"* developments; defendable space requirements to Class 5 – 8 & 10 developments and access/water supply provisions for developments in bushfire prone areas.

Provision for the assessment of construction standards to buildings and management / maintenance of the Asset Protection Zones/defendable space to buildings is also provided.

1.4 Documentation reviewed in this Assessment.

To achieve the aim of this report, a review of information relevant to the property and proposed development was undertaken. Information sources reviewed included the following documents:

- Site Master Plan prepared by SKM – GTSF – SK – SID – TK – 0004 - B;
- Plan showing design features, proposed site layout & Hunter Expressway ARTC Third Road, Greta prepared by Monteath & Powys;
- *Planning for Bushfire Protection 2006* prepared by the NSW Rural Fire Service;

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- Australian Standard AS3959 *Construction of Buildings in Bushfire Prone Areas*;
- *Rural Fires Regulation 2008;*
- Cessnock City Council *Certified Bushfire Prone Land Map.*

1.5 Site Inspection.

Graham Swain of ***Australian Bushfire Protection Planners Pty Limited*** inspected the site and surrounding areas on the 17th March 2008 to assess the topography, slopes and vegetation classification within and adjoining the development site and to validate the proposed development's compliance with the requisite deemed-to-satisfy Asset Protection Zones [Defendable Spaces] and access provisions. Adjoining properties were also inspected to determine the surrounding land use / vegetation communities land management and the extent of bushfire prone vegetation.

1.6 Authority Consultation.

The Director Generals Requirements [DGRs] specifically require an appropriate and justified level of consultation with the NSW Rural Fire Service in order to obtain advice on bushfire protection measures to the development.

Graham Swain discussed the project with Mr Mark Hawkins, Development Assessment & Planning Officer with the NSW Rural Fire Service. Mr Hawkins was provided a copy of this report and details of the proposed project.

On the 4th March 2010 Mr Hawkins provided an email response to this review of the documentation which states that 'all sounds fine'.

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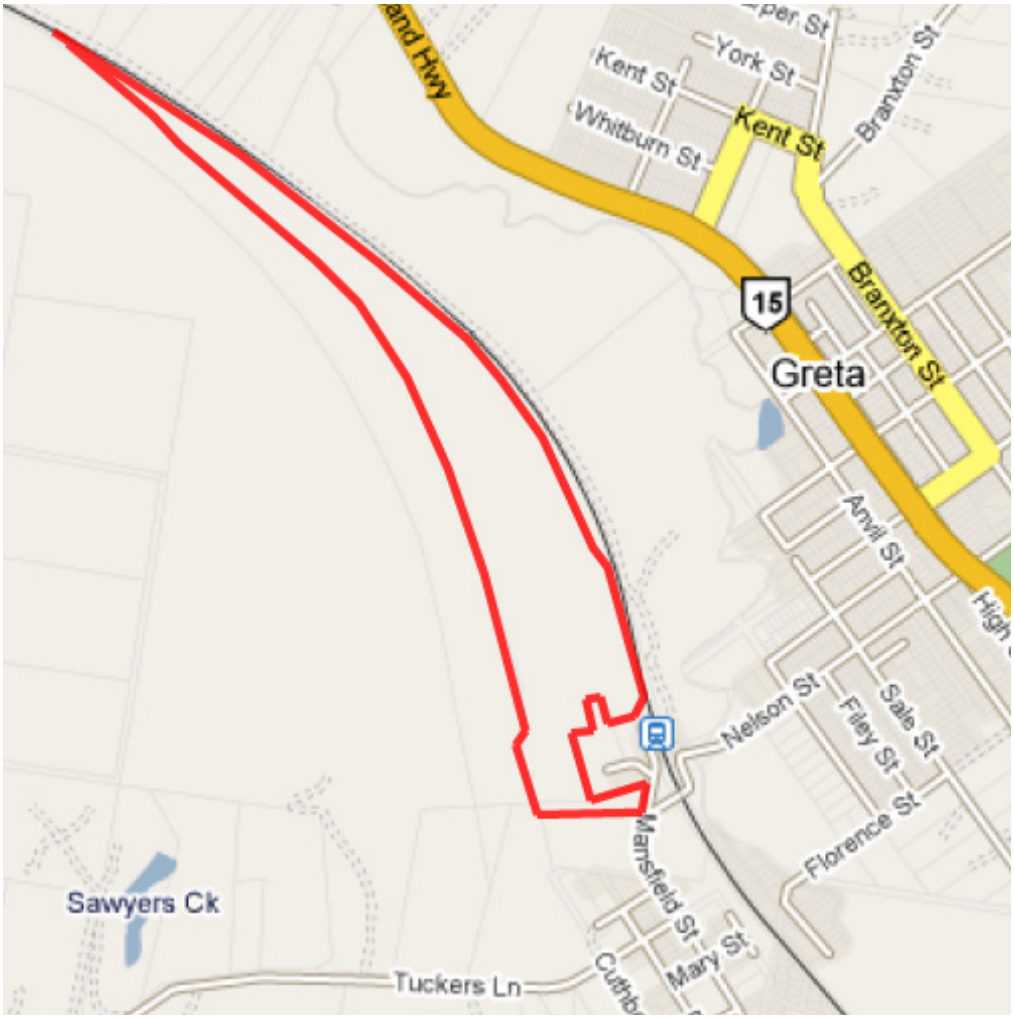
SECTION 2

PROPERTY DESCRIPTION

2.1 Location.

The development site occupies 49.3 hectares of land within Lot 1 in DP 1129191 and is located between the Main Northern Railway Line and the future Hunter Expressway [F3 extension], extending in an arc north from south of the Greta Railway Station.

Figure 5 – Location Plan of Development Site.



2.2 Existing Land Use.

The development site contains vacant land.

2.3 Surrounding Land Use.

The landuse adjoining the boundaries of the development site is as follows:

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(a) Northeast

The Main Northern Railway Line forms the existing landuse adjacent to the north-eastern boundary of the proposed Greta Train Support Facility. Agricultural landuse extends to the northeast, beyond the Main Northern Railway Line.

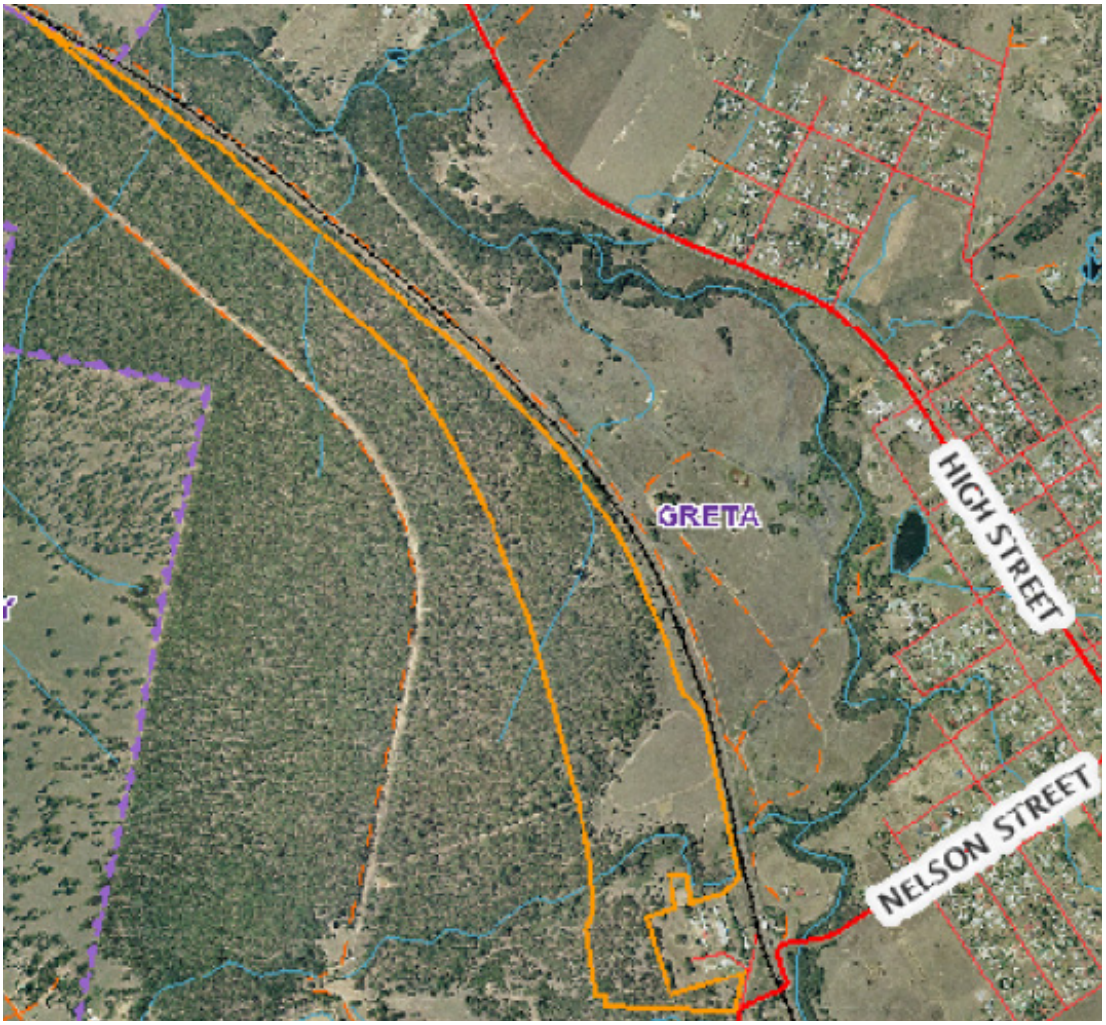
(b) Southeast

The land adjoining the south-eastern boundary of the development site consists of vacant, partially managed rural land having frontage to Mansfield Street and extending to the west to the future expressway boundary. A small residential precinct adjoins the southern corner of the development site, occupying the land to the west of Greta Railway Station.

(c) Southwest

The land to the southwest of the Greta Train Support Facility consists of vacant land within the future F3 Expressway extension. The land beyond the new road corridor consists of vacant bushland.

Figure 6 – Aerial Photograph of Development Site.



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2.4 Topography.

Appendix 2 of *Planning for Bushfire Protection 2006* states that slopes should be assessed, over a distance of at least 100m from a development site and that the gradient of the land should be determined which will most significantly influence the fire behaviour on the site.

i) Within the Development Site.

The topography within the central and north-western portions of the development site falls to the northeast towards Anvil Creek which is located to the northeast of the Main Northern Railway Line. The southern portion of the site contains Sawyers Creek which flows to the northeast, exiting the site approximately 500 metres to the northwest of the Greta Railway Station and flowing to the northeast to junction with Anvil Creek.

The landform and this part of the site falls to the southeast into the creek corridor and falls from the southern portion of the site, northwest towards Sawyers Creek.

ii) Beyond the Development Site.

(a) Northeast & East.

The land to the northeast and east of the Main Northern Railway Line continues to fall towards Anvil Creek at less than 5 degrees.

(*b) Southeast.*

The land to the southeast of the development site falls at less than 2 degrees to the northwest, towards Sawyers Creek.

(c) Southwest.

The land to the southwest of the development site, beyond the F3 Expressway Extension, rises to the southwest to form a low ridgeline which falls to the northeast to Anvil Creek; falls to the south into Sawyers Creek and to the northwest into the upper reaches of the southern arm of Anvil Creek.

The effective slope of the land which contains the bushfire prone vegetation to the southwest of the development site is < 5 degrees upslope.

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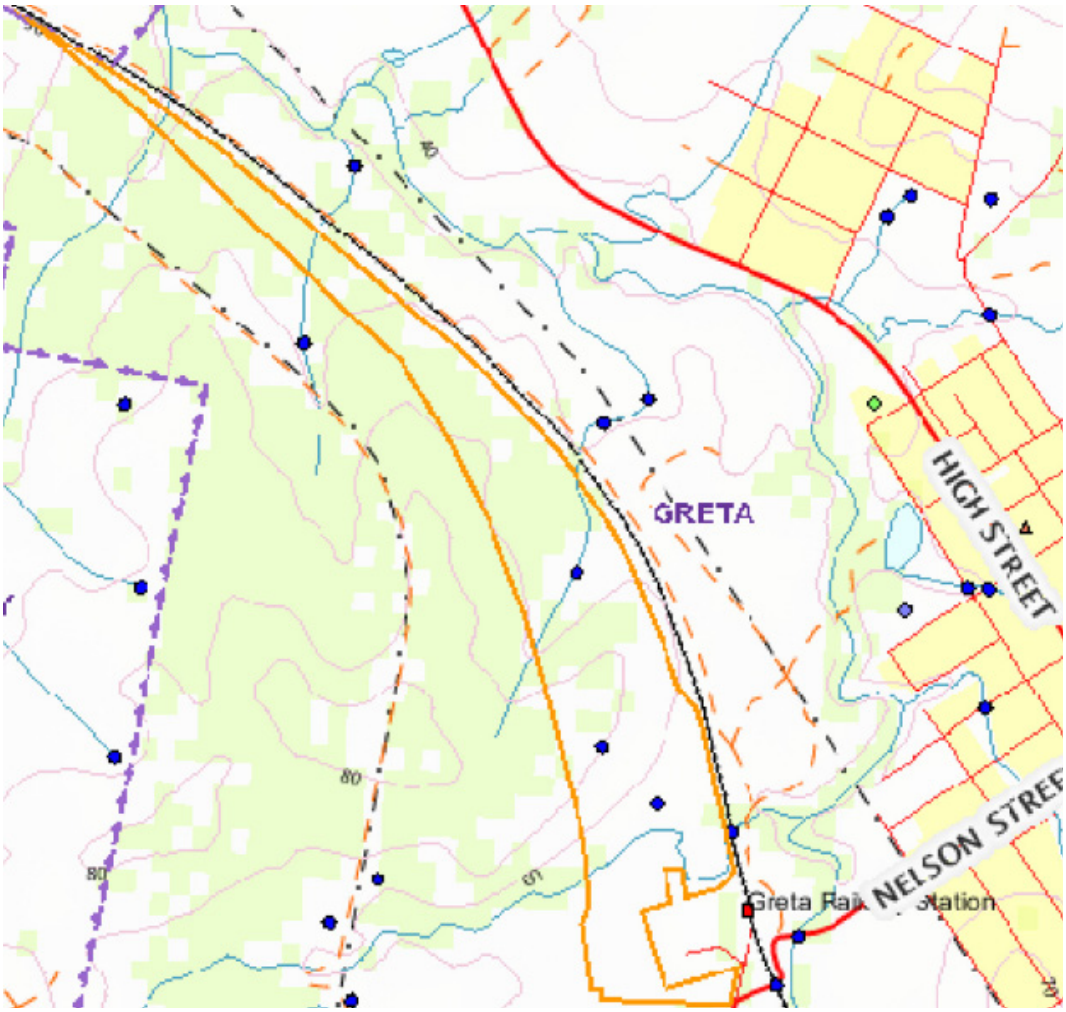
Figure 7 – Topographic Map of Development Site and adjoining lands.



2.5 Vegetation within the Development Site.

Appendix A2.3 of *Planning for Bushfire Protection 2006* provides a methodology for determining the predominant bushfire prone vegetation for at least 140 metres in all directions from the buildings. Vegetation is classified using Table A2.1 of *Planning for Bushfire Protection 2006,* which classifies vegetation types into the following groups:

(a) Forests [wet & dry sclerophyll forests];
(b) Woodlands;
(c) Plantations – being pine plantations not native plantations;
(d) Forested Wetlands;
(e) Tall Heaths;
(f) Freshwater Heaths;
(g) Short Heaths;
(h) Alpine Complex;
(i) Semi – arid Woodlands;
(j) Arid Woodlands; and
(k) Rainforests.

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Except for the cleared land within the south-eastern portion of the development site, north from Swayers Creek, the remainder of the development site contains Lower Hunter Spotted Gum Iron Bark Forest [EEC] that contains a fully structured under-storey.

Site Photograph No. 1 – Taken looking to the southeast across the cleared area on the development site with Greta Railway Station behind the trees in the centre of the photograph.

Photograph No. 2 – Looking southwest across cleared area on the development site.

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Photograph No. 3 – Looking northwest from Greta Railway Station, across Sawyers Creek to cleared area on the development site.

2.6 Significant Environmental Features within the Development Site.

The land within the development site does not contain significant environmental features such as SEPP 14 Wetland; SEPP 44 Koala Habitat; SEPP 26 Littoral Rainforests; Land slip areas or National Parks Estate; Areas of Geological interest or Steep Lands [>18 degrees].

The riparian corridor of Sawyers Creek extends from the south-western corner of the site and crosses in a north-easterly direction, exiting the eastern boundary approximately 500 metres to the north of Greta Railway Station. No impact will occur on the creek corridor, except for the construction of a bridge on the main entry road to the facilities.

2.7 Known Threatened Species, Population or Ecological Community within the Development Site.

The uncleared portions of the site contain Lower Hunter Spotted Gum Iron bark Forest which is listed as an Endangered Ecological Community. The location of the facility, adjacent to the north-eastern boundary, adjoining the Main Northern Railway Line, minimises disturbance to this vegetation community and large tracts of the EEC vegetation are retained undisturbed.

2.8 Details and location of Aboriginal Relics or Aboriginal Place.

An Indigenous Heritage Report has been prepared for the project and confirms that the field survey identified 151 flaked stone artifacts and two Potential Archaeological Deposits [PADs] No Aboriginal relics or Aboriginal places are known to be located within the development site.

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SECTION 3
FIRE MANAGEMENT RESPONSIBILITIES

Fire management within the development site is the responsibility of:

3.1 Cessnock City Council.

Cessnock City Council has responsibility, under Section 66 of the *Rural Fires Act*, to issue a notice in writing requiring an owner / occupier of any land within the LGA to carry out bushfire hazard reduction works on that land. Section 100E of the *Rural Fires Act* requires Council to issue bushfire hazard Reduction certificates for hazard reduction to be undertaken on private lands.

3.2 New South Wales Rural Fire Service.

The NSW Rural Fire Service (RFS) has the responsibility for undertaking fire suppression activities, hazard management activities and other functions relative to emergency management, within its areas of operation. *Section 73* of the *Rural Fires Act (1997)* enables the Commissioner to carry out bush fire hazard reduction works on any land as required by a bush fire risk management plan if the work has not been carried out satisfactorily. Incurred costs can be recovered as a debt owed to the Crown.

3.3 New South Wales Fire Brigade.

The NSW Fire Brigade has the responsibility for undertaking fire suppression activities, and other functions relative to emergency management, within its area of operation and through Mutual Aid Agreements, provide assistance to the NSW Rural Fire Service, particularly for structural fire operations within the NSW Rural Fire Brigade Districts. Hazmat management within New South Wales is the responsibility of the NSW Fire Brigade.

3.4 Cessnock Bush Fire Management Committee.

The Cessnock Bushfire Management Committee has the responsibility for planning for co-ordinated fire fighting activities / hazard management activities on a local government level. It is not an operational organization, a fire fighting organization or a funding source for fire management activities.

The Bush Fire Management Committee is supported by the following provisions of the *Rural Fires Act 1997*:

- ***Section 52*** *requires each Bush Fire Management Committee to prepare a draft bush fire management plan for their local areas which includes a plan of operations and a bush fire risk management plan.*
- ***Section 54*** *of the Act specifies that a draft bush fire risk management plan is to 'set out schemes for the reduction of bush fire hazards in the rural fire district or other part of the State'.*

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A draft bush fire risk management plan may also restrict or prohibit the use of fire or other fire hazard reduction activities in all or specified circumstances or places to which the plan applies.

3.5 Public Authorities & owners/occupiers of land.

The Rural Fires Act, 1997 provides several legislative opportunities to require Public Authorities, land owners and occupiers to manage hazardous fuels. These are listed below:

- ***Section 63(1)*** states that it is the duty of a public authority to take any practicable steps to prevent the occurrence of bushfires on, and to minimise the danger of the spread of a bushfire on or from:

  (a) any land vested in or under its control or management, or

  (b) any highway, road, street, land or thoroughfare, the maintenance of which is charged on the authority.

- ***Section 63(2)*** states that *'it is the duty of the owner or occupier of land to take the notified steps (if any) and any other practicable steps to prevent the occurrence of fires on, and to minimise the danger of the spread of fires on or from that land'.*

- ***Section 65A*** states that the *'Commissioner may nominate a member of the Service as a hazard management officer'.*

- ***Section 65(2)*** states that *'an authorised person may, with the permission of the fire fighting authority or other authority responsible for unoccupied Crown land or managed land or a person nominated by the authority to give such permission, enter the land and carry out bushfire hazard reduction work with the assistance of such other persons as the authorised person considers to be necessary for the purpose'.*

- ***Section 65(3)*** states that *'the authority responsible for unoccupied Crown land or managed land is to be taken to have given the permission under this section to the extent necessary to give effect to a bushfire risk management plan'.*

- ***Section 65(4)*** states that *'if permission under this section is given subject to conditions, the conditions must be complied with'.*

- ***Section 66(1)*** states that *'a hazard management officer may, by notice in writing, require the owner or occupier [not being a public authority] of any land to carry out bushfire hazard reduction work specified in the notice on the land'.*

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- ***Section 66(2)*** states that *'a hazard management officer must serve a notice under this section if required to do so by a bushfire risk management plan applicable to the land that is in force'.*

- ***Section 66(3)*** states that *'a hazard management officer must issue a bushfire hazard reduction certificate in respect of any bushfire hazard reduction work required by a notice issued in accordance within section (2)'.*

- ***Section 66(6)*** states that *'the requirements and conditions so specified must include any requirements in a bushfire risk management plan that is applicable to the land and is in force and may include a requirement or condition that the burning of fire breaks or of combustible material;*

  (a) *must in fire district constituted under the Fire Brigades Act 1989 be carried out by or under the supervision of the fire brigade or an officer in charge of the fire brigade;*

  (b) *must outside a fire district, be carried out by or under the supervision of the rural fire brigade specified in the notice or an appropriate officer of the rural fire brigade or any hazard management officer.*

- ***Section 66(7)*** states that *'a notice requiring the establishment of a firebreak cannot require an occupier or owner to kill or remove any trees that are reasonably necessary for shade, shelter, windbreak or fodder purposes or the protection of threatened species, populations, ecological communities or critical habitats within the meaning of the 'Threatened Species Conservation Act 1995'.*

- ***Section 66(8)*** states that *'an occupier or owner to whom a bushfire hazard reduction notice is given must, despite the fact that a fire permit has not been granted under Division 5, comply with the requirements specified in the notice'.*

- ***Section 70(2)*** states that *'if within the time specified in the relevant notice the owner or occupier to whom it is given fails to comply with any requirement of the notice, the Commissioner may, without prejudice to liability of the owner or occupier, enter on the land and carry out the bushfire hazard reduction work the owner or occupier was required to do under the notice'.*

- ***Section 70(3)*** states that *'any costs incurred by the Commissioner in carrying out such work may be recovered from the owner or occupier of the land as a debt due to the Crown in a court of competent jurisdiction'.*

- ***Section 87*** allows the removal of hazards in the bush fire danger period by the provision of a permit system. The permits are valid for 21 days, excluding TOBAN days.

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Section 10 permits are not required to adhere to *Part V* provisions of the EPA Act 1979 in the assessment of impact, except for public authorities. An owner/occupier of private land must obtain from the NSW Rural Fire Service, a bushfire hazard reduction certificate before undertaking hazard reduction works on that land (Section 100E of the *Rural Fires Act 1997*).

3.6 Bushfire Hazard Management within the Greta Train Support Facility.

The management of the defendable spaces to the proposed buildings and the bushfire fuel management of the retained vegetation on the development site will remain the responsibility of the property owner, Pacific National or its successors.

A Bushfire Management Plan shall be prepared for the site, and shall include the provision to manage the combustible fuel loads on the land adjacent to the entry/exit road to the facility and the defendable spaces to the assets on the site.

A Positive Covenant, created under the provisions of the *Conveyancing Act of 1919*, shall be placed on the title of the land to ensure compliance with the prescriptions of the Bushfire Management Plan.

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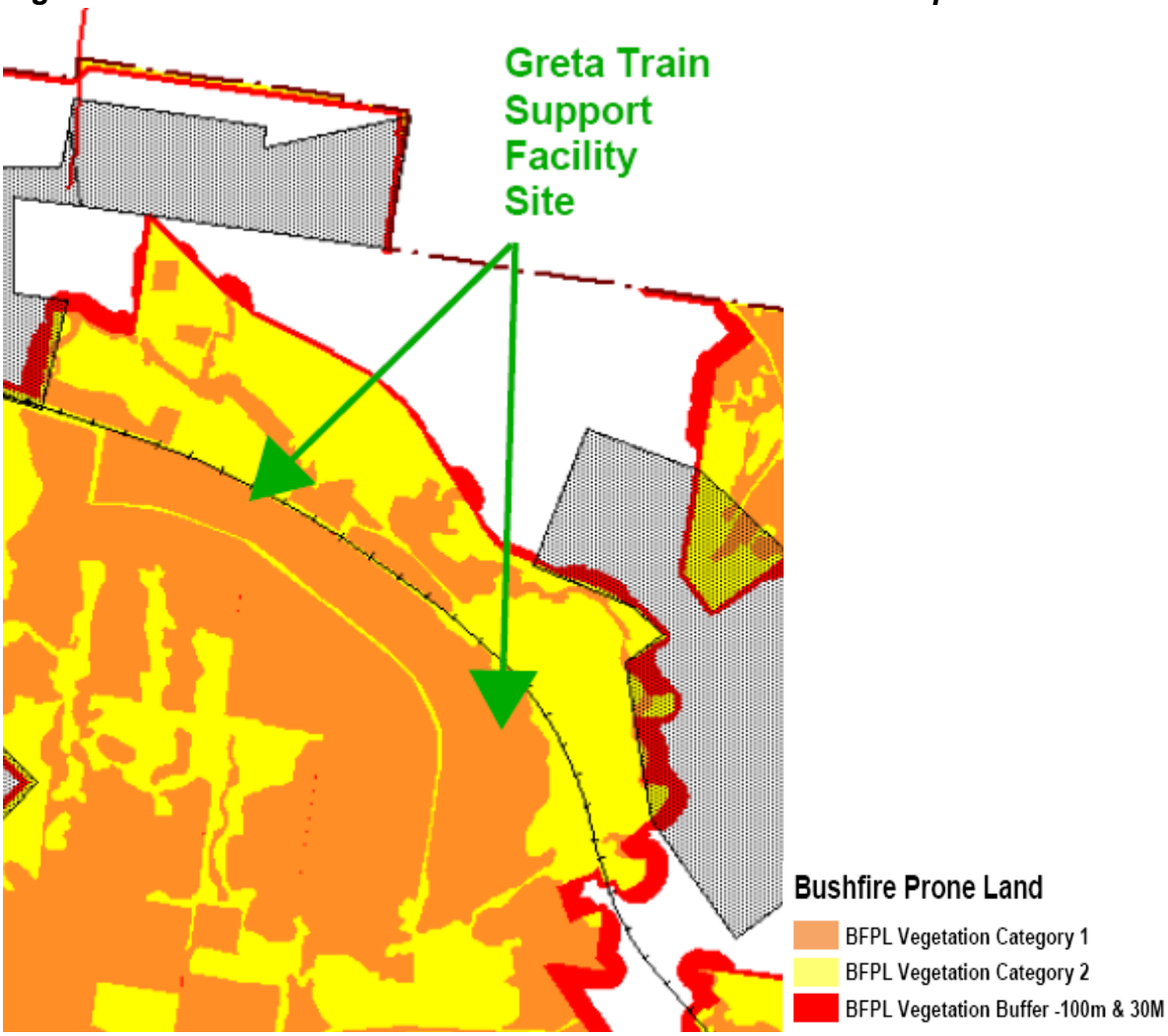
SECTION 4

PRECINCT LEVEL ASSESSMENT

4.1 Certified Bushfire Prone Land Map.

Section 146 of the *Environmental Planning & Assessment Act 1979* requires councils, where a Bushfire Risk Management Plan applies, to prepare a Bushfire Prone Land Map in consultation with the Commissioner of the NSW Rural Fire Service. The Commissioner will designate lands to be Bushfire Prone within an area and, when satisfied that the lands have been recorded on a map, will certify the map as a Bushfire Prone Land Map for the purposes of this or any other Act.

Figure 8 – Extract from the Cessnock Bushfire Prone Land Map



The BFPLM map shows that the site contains Category 1 [Orange colour] and Category 2 [Yellow colour] Bushfire Prone Vegetation. Category 1 Bushfire Prone Vegetation extends to the west and southwest across the adjoining F3 Expressway road corridor and the adjoining private land.

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SECTION 5

BUSHFIRE PROTECTION ASSESSMENT

5.1 Introduction.

Planning for Bushfire Protection 2006 provides deemed-to-satisfy fire protection measures for residential development [Class 1, 2 & 3 buildings]; *"Special Fire Protection Purpose"* developments [Hospitals, Nursing Homes / Retirement Villages / Schools / Childcare Centres & Tourist Accommodation]; Industrial / Commercial Development and residential and *"Special Fire Protection infill"* development.

In reference to the construction of the Greta Train Support Facility, the proposed Administration building is classified as a Class 5 building and the train servicing facility buildings are classified as Class 8 buildings, as defined by the Building Code of Australia [BCA].

Chapter 1, Section 1.3 of *Planning for Bushfire Protection 2006* states that the construction of Class 5 – 10 buildings on bushfire prone land, or land impacted by bushfire prone vegetation, must meet the aim and objectives of the document.

Chapter 4, Section 4.3.6(f) discusses the bushfire protection to buildings of Class 5 to 8 and 10b of the Building Code of Australia and states:

"The Building Code of Australia does not provide for any bushfire specific performance requirements and as such AS 3959 -2009 does not apply as a set of "deemed-to-satisfy" provisions.

The general fire safety construction provisions [of the BCA] are taken as acceptable solutions, but the aim and objectives of Planning for Bushfire Protection 2006 apply in relation to other matters such as access, water and services, emergency planning and landscaping/vegetation management".

"Where the aim and objectives of PfPFP [Section 1.1] are not met, then the construction requirements for bushfire protection will need to be considered on a case-by-case basis".

"In many cases, these types of developments will require on-site parking and loading areas. In such cases, it is prudent to place these facilities in the most appropriate location in order to establish defendable space for fire-fighting purpose".

The objectives of *Planning for Bushfire Protection 2006* are:

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(i) Afford occupants of any building adequate protection from exposure to a bushfire;

(ii) Provide for a defendable space to be located around buildings;

(iii) Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;

(iv) Ensure that safe operational access and egress for emergency service personnel and residents is available;

(v) Provide for ongoing management and maintenance of bushfire protection measures, including fuel loads in the asset protection zones;

and

(vi) Ensure that utility services are adequate to meet the needs of fire-fighters and others assisting in bushfire fighting.

The document identifies six core bushfire protection requirements. These are:

- Provision of Asset Protection Zones / Defendable Spaces in accordance with the specific landuse, the predominant bushfire prone vegetation type within 140 metres of the development and the topography of the land containing the bushfire prone vegetation;
- Access for fire fighting operations;
- Water Supplies for fire fighting operations;
- Construction standards of buildings located within 100 metres of the bushfire hazard interface, dependant on specification landuse, the predominant bushfire prone vegetation type within 140 metres of the development and the topography of the land containing the bushfire prone vegetation;
- Emergency Planning;
- Landscape Management – in particular the management of the Asset Protection Zones / Defendable Spaces and residual bushfire prone vegetation.

Planning for Bushfire Protection 2006 provides a methodology to determine the Asset Protection Zones [defendable space] and Bushfire Attack [Construction Standards] required for **habitable buildings** in development for **residential purposes** that are designated as bushfire prone.

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The document does not provide deemed-to-satisfy solutions for Class 5 – 10 buildings constructed in bushfire prone areas but states that where the aim and objectives of the document are not met, then the construction requirements for bushfire protection will need to be considered on a case by case basis.

Sections 5.2 and 5.3 of this report examine the layout of the development in relation to the provision of a suitable "defendable space" between the bushfire hazard and the new buildings and the protection against the potential impacts of a future fire occurrence in the retained bushfire prone vegetation adjoining the buildings and provides recommendations on the bushfire protection measures required to be implemented to the mitigate the potential bushfire threat.

The provision of access and water supplies for fire-fighting operations; management of the defendable spaces [Asset Protection Zones] and evacuation planning are examined in Sections 5.4 – 5.9 of this report.

5.2 The provision of Defendable Space/s [Asset Protection Zones].

Appendix 2 of *Planning for Bushfire Protection 2006* provides the following procedure for determining setback distances (Asset Protection Zones) for **residential development** in bushfire prone areas:

(a) Determine vegetation formations as follows:

- Identify vegetation in all directions from the site for a distance of 140 metres;
- Consult Table A2.1 to determine the predominant vegetation type; and
- Select the predominant vegetation formation as described in Table A2.1.

(b) Determine the effective slope of the land under the predominant vegetation Class.

(c) Determine the appropriate fire [weather] area in Table A2.2.

(d) Consult Table A2.3 and determine the appropriate setback [APZ] for the assessed land use, vegetation formation and slope range.

The methodology does not determine the requisite Defendable Space requirements for Class 5 – 10 developments as defined by the Building Code of Australia [BCA].

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Table 1 examines the defendable space requirements based on the widths required to provide a separation distance which is sufficient to minimise flame contact with the building/s and to provide a fire-fighting platform wide enough to permit the safe extinguishment of a bushfire, after the fire front has passed.

The layout of the facility 'clusters' the Locomotive Maintenance; Road Vehicle Service Centre/Wagon Maintenance; Fuel Storage and Administration in the central part of the site, adjacent to the Main Northern Railway Line. This location therefore limits the exposure of this part of the facility to fires which may occur in the retained vegetation on the land to the southwest, except for the Locomotive Maintenance facility within is located adjacent to exposure to the impact of bushfires which may occur in the future F3/Hunter Expressway road corridor.

The Locomotive Wash Facility is located to the northwest of the central complex of buildings/facilities, adjacent to the south-western boundary where it will be exposed to the impacts of bushfires occurring in the retained vegetation within the future F3/Hunter Expressway road corridor. The Provisioning Shed is located in the north-western corner of the development site, adjacent to the Main Northern Railway Line and will also the exposed to the impact of bushfires which may occur in the future F3/Hunter Expressway road corridor.

Therefore, Table 1 examines the defendable space requirements to the buildings/facilities from the south-western aspect as it is assumed that all other aspects will be developed/maintained as part of the facility and will therefore not contain bushfire prone vegetation. The exception to this assumption is the bushfire risk to the Administration Building and Locomotive Maintenance building from the south and south-east and to the northwest of the Provisioning Shed.

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Table 1. Determination of Defendable Space to the proposed Greta Train Support Facility. Fire Danger Index for the site is 100

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Class *[Table A2.1 Planning for Bushfire Protection 2006]*	Effective slope of land for 100 metres from building	Flame Zone width determined by calculation	Minimum width of Defendable Space to the proposed buildings
Southwest of the facilities on the site	Lower Hunter Spotted Gum – Ironbark Forest	Forest	3 degrees upslope to the southwest	19 metres flame length for Forest vegetation on 3^0 upslope to the southwest	Defendable Space of minimum width 19 metres to be provided to the southwest of the Locomotive Wash Facility; Locomotive Maintenance Facility; Administration Building and Provisioning Shed.
South of Administration Building & Locomotive Maintenance Building	Lower Hunter Spotted Gum – Ironbark Forest	Forest	3 degrees upslope to the south	19 metres flame length for Forest vegetation on 3^0 upslope to the south	Defendable Space of minimum width 19 metres to be provided to the south of the Locomotive Maintenance & Administration Building
Southeast of Administration Building & Locomotive Maintenance Building	Lower Hunter Spotted Gum – Ironbark Forest	Forest	3 degrees down slope to the south east	32 metres flame length for Forest vegetation on 3 degrees downslope land to the southeast of the Administration & Locomotive Maintenance building	Defendable Space of minimum width 32 metres to be provided to the southeast of the Administration Building and Locomotive Maintenance Building
Northwest of Provisioning Shed	Lower Hunter Spotted Gum – Ironbark Forest	Forest	3 degrees down slope to the northwest	32 metres flame length for Forest vegetation on 3 degrees downslope land to the northwest of the Provisioning Shed	Defendable Space of minimum width 32 metres to be provided to the northwest of the Provisioning Shed

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Examination of Assessment Results:
The assessment to determine the minimum defendable space requirements to the proposed facilities within the Greta Train Support Facility has found that a minimum width of 19 metres is required to the southwest of the Locomotive Wash Facility; Locomotive Maintenance Facility; Provisioning Shed and to the southwest of the Administration building.

The assessment also identifies that a 32 metre defendable space is required to the southeast of the Administration and Locomotive Maintenance buildings.

These defendable space widths are required to minimise actual flame contact on the structures and in the case of Provisioning Shed and Locomotive Maintenance Facility is provided by rail track and access roads.

The defendable space to the southwest of the Locomotive Wash Facility and to the Administration Building and Locomotive Maintenance Building will need to be implemented and maintained to the prescriptions of an Inner Protection Area as defined by Appendix 5 of 'Planning for Bushfire Protection 2006' and the NSW Rural Faire Service's 'Specifications for Asset Protection Zones'.

5.3 Construction Measures to Buildings.

The assessment provided in Table 1 identifies that the minimum Defendable Space widths required to be provided between the proposed buildings and the adjoining bushfire prone vegetation is required to minimise flame contact on the structures and to reduce the level of radiant heat exposure on the buildings.

However, the buildings shall be constructed to comply with BAL 29 specifications as defined by Australian Standard A.S.3959 – 2009 – *'Construction of Buildings in Bushfire Prone Areas'.*

There is also the possibility that burning embers from a bushfire event in the bushfire prone vegetation may impact upon the buildings. The following construction standards, to that part of the building/s located within 100 metres of the bushfire hazard interface, are therefore recommended, in addition to the prescribed BAL 29 construction:

- Access doors [PA and Vehicle] to the buildings shall be fitted with seals that seal the bottom, stiles and head of the door against the opening/frame to prevent the entry of embers into the building. Particular attention shall be paid to the gap at the head of the curtain of the roller doors, where mohair type seals can be used;

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- Any external vents, grilles and ventilation louvres shall have stainless steel mesh with a maximum aperture of 2mm square fitted to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm;

- Roof ventilators shall be fitted with stainless steel flymesh [2mm aperture] to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm;

- The Fuel Storage and Trade Waste/Recycle facilities shall be constructed/managed in order prevent ignition of fuel and combustible materials [e.g. fluid spills] by burning embers;

5.4 Access Standards for Firefighting Operations.

Chapter 4, Section 4.2 "Access" of *Planning for Bushfire Protection 2006* provides specifications on the access provisions for fire-fighting operations within developments which are subject to bushfire attack.

Vehicular access to the proposed complex is from Mansfield Street via a new private access road which crosses Sawyers Creek then turns to the north to run along the south-western side of the new rail tracks, terminating in a cul-de-sac head to the northwest of the Fuel Storage Facilities.

An extension of this road provides access to the Locomotive Wash Facility and Provisioning Shed, in the north-western corner of the site.

This private access road will be designed to accommodate heavy rigid and articulated vehicles, therefore also providing suitable access for fire-fighting appliances similar to NSW Rural Fire Service Category 1 Tankers and NSW FB Composite and Aerial Appliances.

Access to the bushfire prone vegetation on site is available via the service roads to the facilities on the site.

5.5 Water Supplies for Firefighting Operations.

A reticulated water supply for potable water supply and fire hydrants is to be extended into the site from mains located in Mary Street, Greta. The layout of the facility provides for the installation of onsite static water supply tanks for fire-fighting operations.

The fire-fighting water supply to the new buildings, including the provision of fire-fighting hydrants, shall comply with the Building Code of Australia [BCA] and A.S. 2419.1 – 2005.

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5.6 Emergency Management for Fire Protection / Evacuation.

The new buildings may be exposed to radiant heat levels which necessitate the evacuation of the buildings during bushfire events in the forest vegetation retained on the site and from the vegetation within the adjoining freeway corridor.

An Evacuation Plan shall be prepared for the facility which addresses the protocols necessary to protect the occupants of the facility against the defined emergencies which may impact upon the site, including bushfire.

A Plan of Management shall also be prepared to address the likely impact, from the identified emergencies, on the assets on the site so as to minimise loss/damage to the infrastructure and movable assets.

A Bushfire Management Plan shall also be prepared for the site which provides the protocols for the management of combustible fuels in the retained Lower Hunter Spotted Gum-Ironbark Forest. In order to address the DGRs requirement to identify access/egress and evacuation the FMP shall also provide fuel management protocols for the vegetation to each side of the private access road where it passes through retained vegetation and on the south-western side when it runs along the rail track in order to reduce the bushfire behaviour and the bushfire impact on this road so as to provide safe access / egress for staff, visitors from the site during bushfire events and safe access/egress for fire-fighters.

5.7 Bushfire Hazard Management.

The intention of bushfire hazard management is to prevent flame contact with a structure, reduce radiant heat to below the ignition thresholds for various elements of a building, to minimize the potential for wind driven embers to cause ignition and to reduce the effects of smoke on occupants and fire-fighters.

The management of the Defendable Spaces shall comply with the recommendations of Appendix A5.4 & Appendix A5.5 of *Planning for Bushfire Protection 2006* and *Standards for Asset Protection Zones*.

Management of the Defendable Spaces within the development shall comply with the following:

- Maintain a clear area of low cut lawn or pavement [paths/carparking/roads etc] adjacent to the buildings; Utilise non-flammable materials such as Scoria, pebbles and recycled crushed bricks as ground cover to landscaped gardens in close proximity to building;

- Keep areas under shrubs and trees raked and clear of combustible fuels;

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- Trees and shrubs should be maintained in such a manner that tree canopies are separated by 2 metres and understorey vegetation is not continuous [retained as clumps].

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SECTION 6
BUSHFIRE MANAGEMENT STRATEGIES

Strategies to mitigate the potential bushfire risk to the proposed Greta Train Support Facility are as follows:

6.1 Strategy 1 – Provision of Defendable Spaces to the proposed Buildings

Table 2. Minimum Defendable Spaces to the proposed Greta Train Support Facility. Fire Danger Index for the site is 100

Aspect	Predominant Vegetation Formation Class	Effective slope of land for 100 metres from building	Minimum width of Defendable Space to the proposed buildings
Southwest of the facilities on the site	Forest	3 degrees upslope to the southwest	Defendable Space of minimum width 19 metres to be provided to the southwest of the Locomotive Wash Facility; Locomotive Maintenance Facility; Administration Building and Provisioning Shed.
South of the Administration Building & Locomotive Maintenance Building	Forest	3 degrees upslope to the south	Defendable Space of minimum width 19 metres to be provided to the south of the Locomotive Maintenance & Administration Building
Southeast of the Administration Building & Locomotive Maintenance Building	Forest	< 3 degrees downslope to the southeast	Defendable Space of minimum width 32 metres to be provided to the south of the Administration Building and Locomotive Maintenance Building
Northwest of the Provisioning Shed	Forest	3 degrees downslope to the northwest	Defendable Space of minimum width 32 metres to be provided to the northwest of the Provisioning Shed
Access Road	Forest	N.A.	Fuel manage 20m wide corridor to both sides of the access road where it passes through vegetation and to the southwest where it runs adjacent to the rail track

6.2 Strategy 2 – Management of Defendable Space/Landscape Management:

Management of the defendable spaces/landscaped areas within the development site shall comply with the following:

- Maintain a clear area of low cut lawn or pavement adjacent to the building;
- Keep areas under shrubs and trees raked and clear of combustible fuels;

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- Utilise non-flammable materials such as Scoria, pebbles and recycled crushed bricks as ground cover to landscaped gardens in close proximity to building;

- Trees and shrubs should be maintained in such a manner that tree canopies are separated by 2 metres and understorey vegetation is not continuous [retained as clumps];

6.3 Strategy 3 – Construction Standards to the Buildings:

The following bushfire construction standards shall be applied to the proposed buildings:

- Buildings shall be constructed to comply with BAL 29 specifications as defined by Australian Standard A.S.3959 – 2009 – *'Construction of Buildings in Bushfire Prone Areas'.*

- Access doors [PA and Vehicle] to the buildings shall be fitted with seals that seal the bottom, stiles and head of the door against the opening/frame to prevent the entry of embers into the building. Particular attention shall be paid to the gap at the head of the curtain of the roller doors, where mohair type seals can be used;

- Any external vents, grilles and ventilation louvres shall have stainless steel mesh with a maximum aperture of 2mm square fitted to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm.

- Roof ventilators shall be fitted with stainless steel flymesh [2mm aperture] to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm.

- The Fuel Storage and Trade Waste/Recycle facilities shall be constructed and managed in order prevent ignition of fuel and combustible materials by burning embers.

6.4 Strategy 4 – Water Supplies for Firefighting Operations:

The fire-fighting water supply to the proposed facility shall comply with the Building Code of Australian [BCA] and Australian Standard A.S. 2419.1 – 2005.

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6.5 Strategy 5 – Plans of Management:

The following Plans of Management shall be prepared:

- An Evacuation Plan which addresses the protocols necessary to protect the occupants of the facility against the defined emergencies which may impact upon the site, including bushfire;

- A Plan of Management to address the likely impact, from the identified emergencies, on the assets on the site so as to minimise loss/damage to the infrastructure and movable assets;

- A Bushfire Management Plan which provides the protocols for the management of combustible fuels in the retained Lower Hunter Spotted Gum-Ironbark Forest. The FMP shall also provide management protocols for the vegetation adjacent to the private access road in order to minimise the bushfire behaviour in the adjoining vegetation and to reduce the bushfire impact on this road in order to provide a safe egress for staff, visitors and safe operational access/egress for fire-fighters.

6.6 Strategy 6 – Access for Fire-fighting Operations:

The private access road/s within the facility shall be constructed, as a minimum, to the deemed-to-satisfy provisions of Section 4.1.3(2) of *Planning for Bushfire Protection 2006.*

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SECTION 7

CONCLUSION

A Project approval is being sought, under Part 3A [Major Projects] of the *Environmental Planning & Assessment Act 1979,* for the construction of the Greta Train Support Facility on land within Lot 1 in DP 1129191, Mansfield Street, Greta.

The Director General's Requirements [DGRs] for the preparation of the Environmental Assessment for the project include a requirement that an assessment of bushfire hazards, including the identification of access and egress from the site and evacuation routes be undertaken and consultation with relevant parties during preparation of the Environmental Assessment.

This report has examined the bushfire hazard on the site and has found that the retained forest vegetation on the site and the forest vegetation in the F3/Hunter Expressway road corridor, prior to and after the construction of the new Hunter Expressway, will pose a hazard to the occupants; fixed and movable assets.

Due to the nature of the proposed landuse [i.e. non-residential or non-Special Fire Protection Purpose development], the proposed development has been assessed under the provisions of Section 4.3.6(f) of *Planning for Bushfire Protection 2006.*

This assessment has determined that, in order to reduce the bushfire hazard on the proposed facility, defendable spaces [Asset Protection Zones] are required to be provided and maintained so as to reduce the potential for flame contact on the structures. Furthermore, management plans have been recommended so that emergencies [evacuation] are managed; management of the fixed and movable assets can be established during bushfire and other emergency events and the retained vegetation is fuel managed in order to reduce the bushfire hazard to the facility and to provide a safe access/egress route to/from Mansfield Street, via the proposed access road, for staff and visitors and which provides safe access/egress for fire-fighters/fire appliances.

Table 3 summarises the extent to which the Concept Plan conforms to the deemed-to-satisfy specifications of *Planning for Bushfire Protection 2006.*

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Table 3. Compliance with the deemed-to-satisfy provisions of *Planning for Bushfire Protection 2006.*

Bushfire Protection Measure	**Compliance with deemed-to-satisfy provisions of *Planning for Bushfire Protection 2006.***
Asset Protection Zone/Defendable Space setbacks	YES – widths of the Defendable Spaces to the proposed buildings comply with the minimum 'flame zone' setback width required by the NSW Rural Fire Service. Fuel managed corridor of 20m width to both sides of Main Access Road from Mansfield Road and to south-western side of access road where it runs adjacent to the rail track.
The siting and adequacy of water supplies for fire fighting	YES – Hydrant supply to be installed in accordance with AS 2419.1 - 2005 – additional on site static fire-fighting water supply provided in accordance with BCA requirements.
Design of Public Roads	YES – Existing and proposed Public Roads and proposed internal access roads comply with the specifications of Section 4.1.3(1) & (2) of *Planning for Bushfire Protection 2006* and provide satisfactory emergency access for fire-fighting appliances.
Design of Fire Trail network	No fire trail network required
Adequacy of emergency response access and egress	YES – Proposed internal road network provides safe, two-way access/egress for staff/visitors and emergency service vehicles with the bushfire risk reduced to the proposed access road through the implementation of fuel management protocols in accordance with the Bushfire Management Plan.
Adequacy of bushfire maintenance plans and fire emergency procedures	YES – A Bushfire Management Plan; Plan of Management and Emergency Evacuation Plan shall be prepared.
Building construction standards	YES – Construction standards recommended in order to minimise radiant heat impact and ember entry into the buildings.
Adequacy of sprinkler systems and other fire protection measures to be incorporated into the development	Bushfire Sprinkler Systems not applicable. BCA fire protection measures to be implemented including hydrant supply, booster system and static water supply for fire-fighting operations.
Emergency Management	An Evacuation Plan shall be prepared

REFERENCES:

- N.S.W Rural Fire Service – *Planning for Bushfire Protection 2006*;
- *Environmental Planning & Assessment Act – 1979;*
- *Rural Fires Act – 1997;*
- *Rural Fires Regulation 2008;*
- NSW Rural Fire Service – *Guideline for Bushfire Prone Land Mapping 2002;*
- *Bushfire Environmental Assessment Code 2003;*
- Building Code of Australia;
- Australian Standard A.S 3959-2009 "*Construction of Buildings in Bushfire Prone Areas";*
- *Cessnock City Council Bushfire Prone Land Map.*

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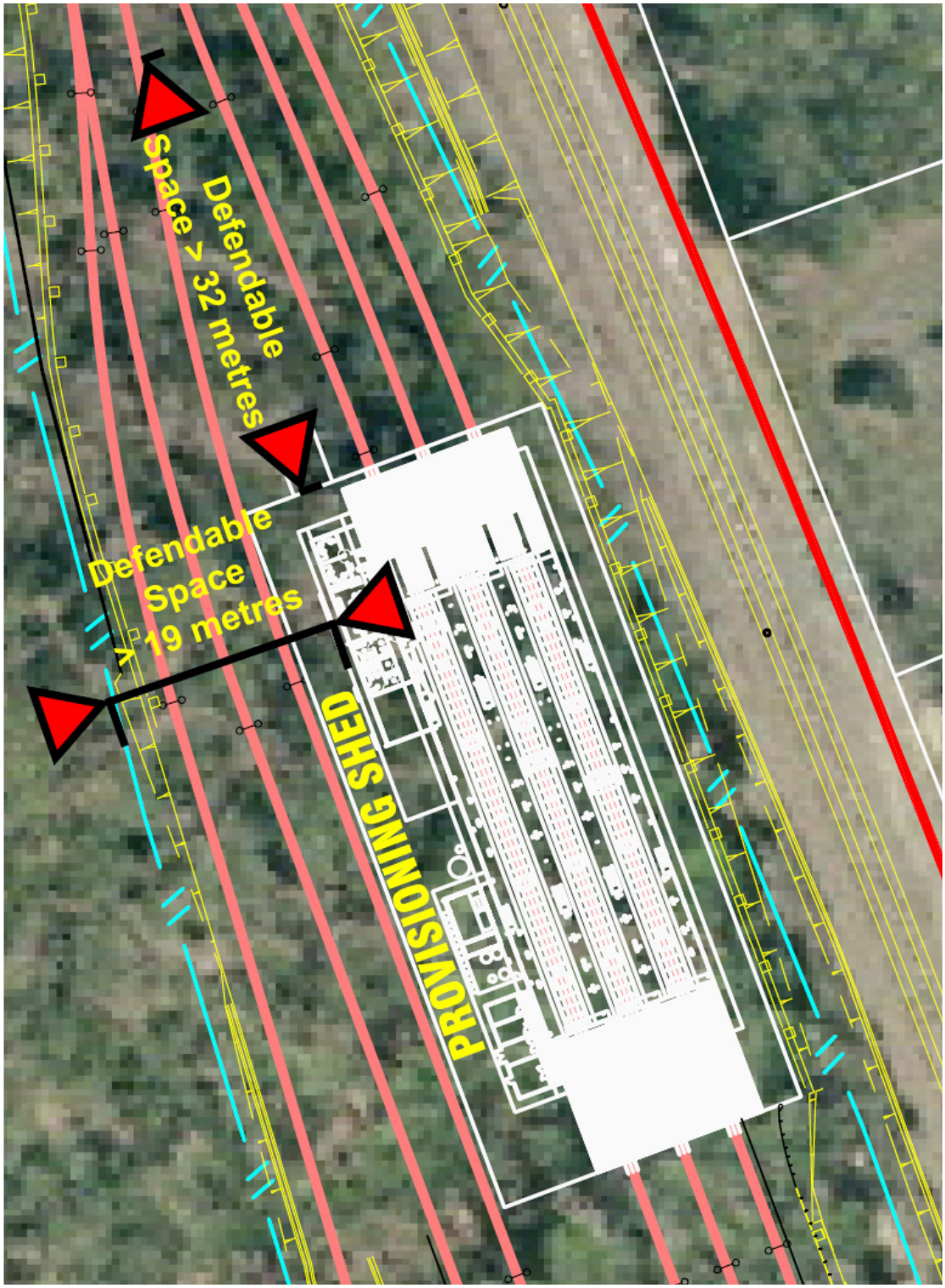
ATTACHMENT A – Concept Masterplan showing Defendable Space widths – Greta Train Support Facility.

Locomotive Provisioning Shed



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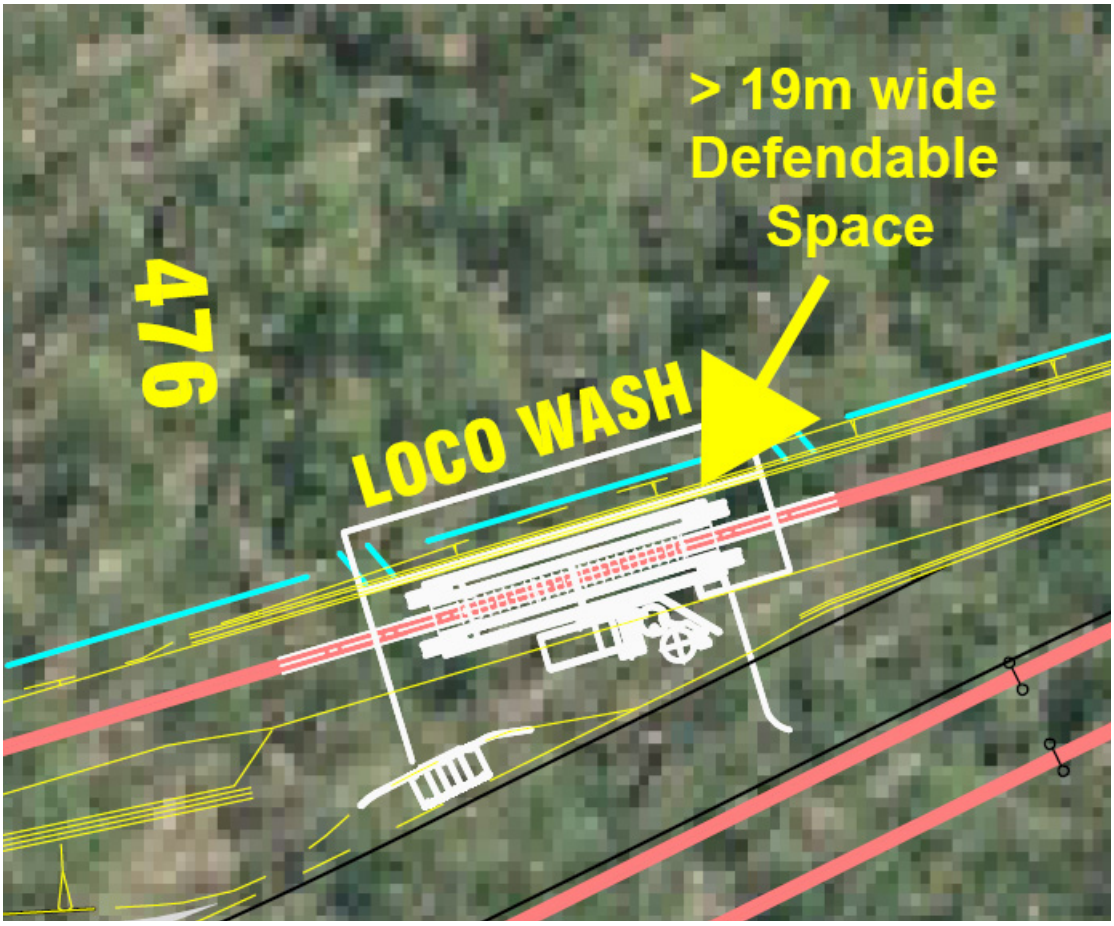
Locomotive/Wagon Wash Facility



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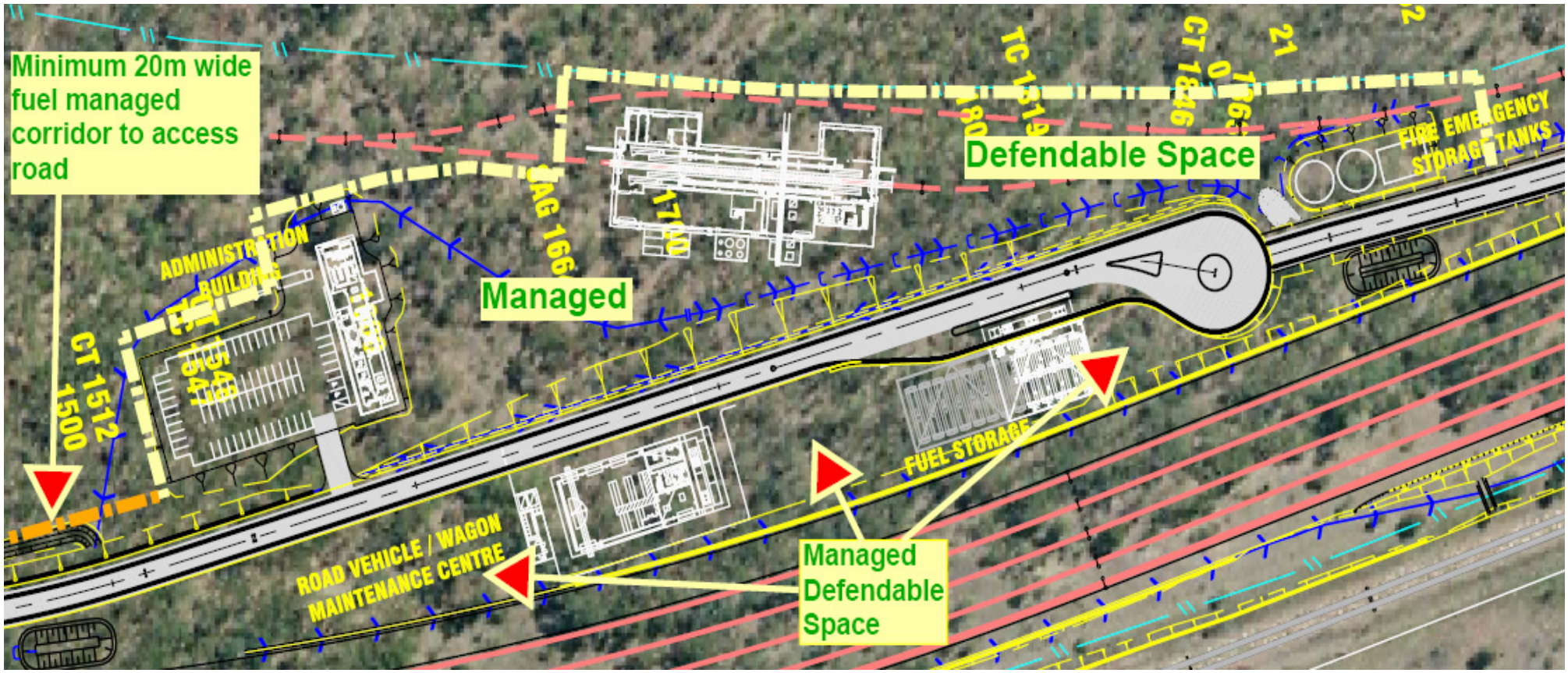
Administration/Amenities Building, Locomotive Maintenance Facility, Road Vehicle / Wagon Maintenance Centre, Fuel Storage and Fire Emergency Storage Tanks



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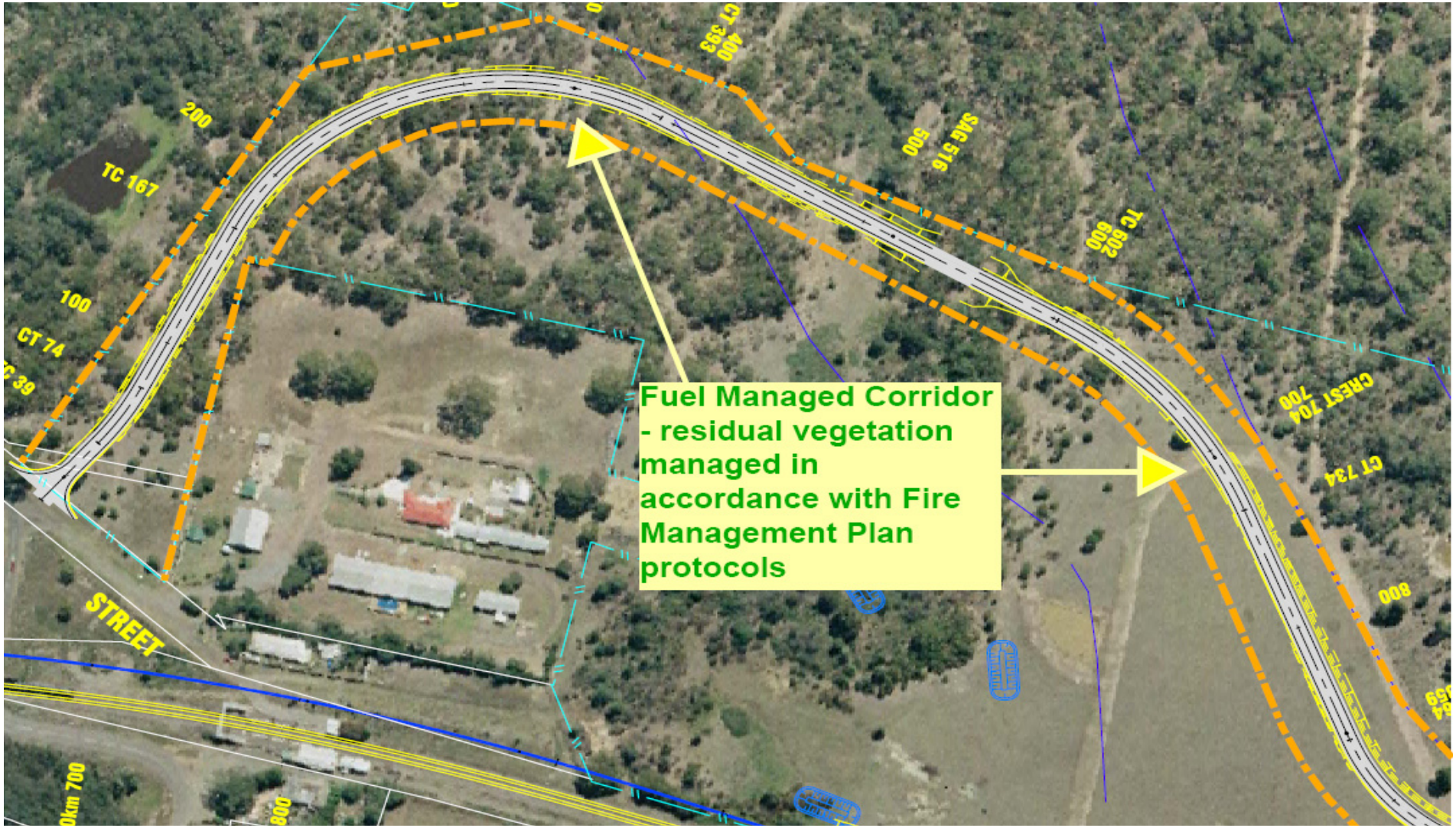
Access Road – South-eastern section



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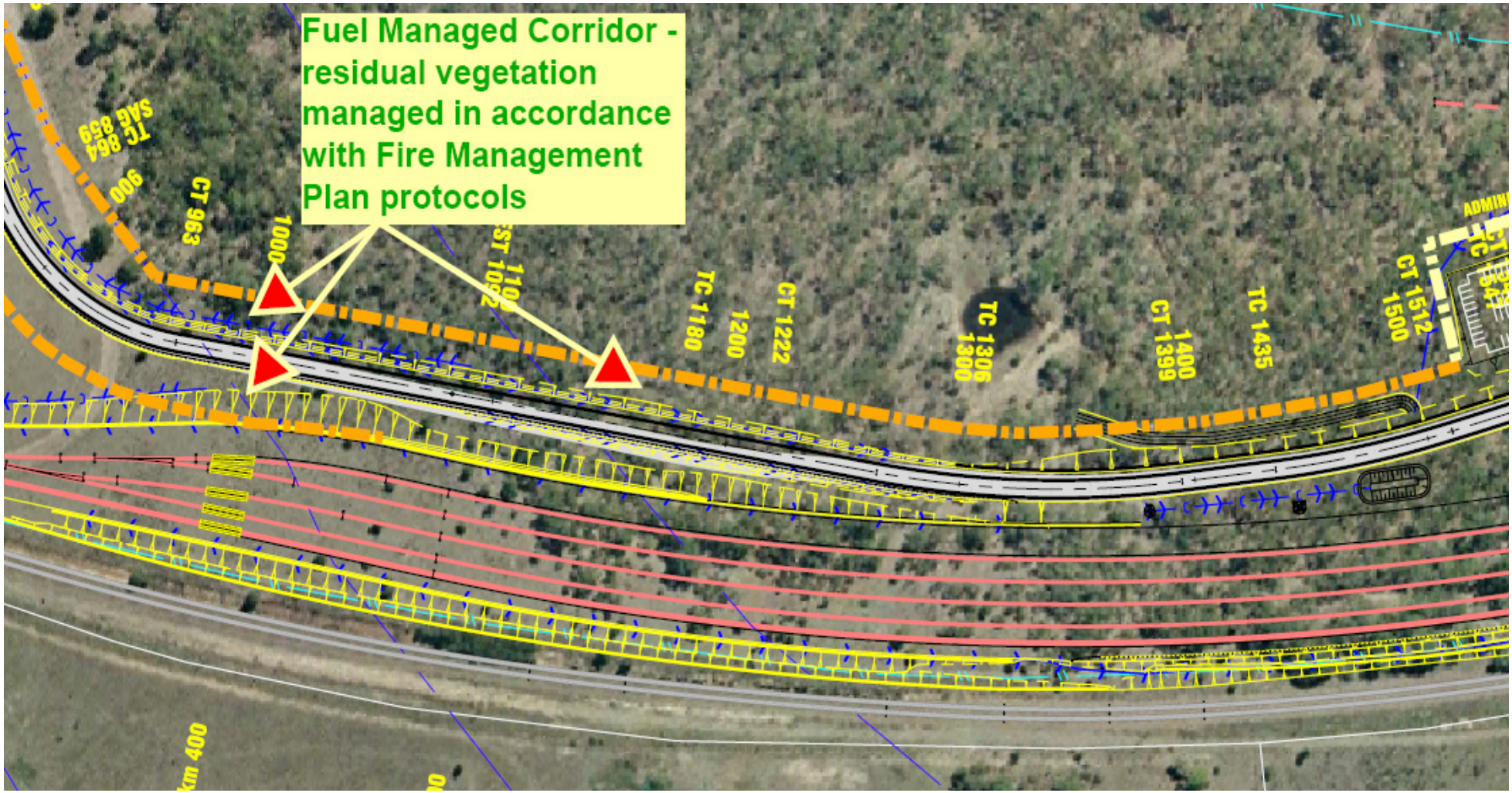
Access Road – Central section



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Graham Swain,
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Australian Bushfire Protection Planners Pty Limited.

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APPENDIX A – HEAVY VEHICLE LETTER

CESSNOCK
CITY COUNCIL

Pacific National
P.O.Box 2298 DANDAR NSW 2309
Project Engineer
Attn: Kirrily Hayes

Contact: Peter Jennings
Our Ref: ID 10/068
Your Ref: B-Double Application - RTA

Dear Kirrily

SUBJECT Proposed B-Double Route Link to Pacific
Link to Pacific National 'Train Support Facility' at Greta.

An application has been received from Pacific National to assess and comment on the application for a proposed 25m B-Double Route to link with a Proposed Train Support Facility Development to be located at Greta.

Council has examined the Application submitted by Pacific National, the outcomes of which are outlined below :-

1. Examination of both routes available a) via Nelson Street at Greta and Allandale Road, Camp Rd and Mansfield Road (local roads) were assessed as not constructed to convey large 25m B-Double movements. Assessment with council's Asset Group verified the road condition to be sub-standard for the 25m B-Double use, ware and tare would be dramatically increased by movements of these vehicles, assessed by council's Road Asset Management System, presented condition of pavement subgrade as poor condition.
2. Carriageway width (existing narrow) in sections of Camp Road, particularly where large trees intrude into the 'clear zone' and pavement cross-fall is greater than normal standards, a number of utilites have very shallow clearance in certain sections of the Camp Road.
3. Council has been in ongoing correspondence with 'Hunter 8 Alliance' (H8A) regarding details on the upgrade of the Nelson Street Bridge over the Northern Railway at Greta. Council has just received confirmation within the last week of the postponement of the Greta Rail Bridge upgrade by H8A, with design of this bridge section of the third rail link to Newcastle on hold - indefinately. This decision has a significant effect on the outcome of future vehicle movements on council's local road infrastructure which involves Camp Road and Mansfield Street at Greta.
4. The proposal has been listed with Council's Traffic Committee for comments and response to the application by Pacific National, the comments received from the Local Traffic Committee meeting held on 20 September 2010 are listed below :-

    a) Existing carriageway is narrow for 25m B-Double use.
    b) Localised sections of road pavement has restricted clear zones and road form is not to design standards.
    c) Council's Traffic Committee determined not to approve the proposed 25m B-double application based on asset condition and design of road pavement for these traffic types.

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Council based from its investigations, has determined not to give approval for the B-Double Application submitted by Pacific National, due to the above issues higlighted from council's investigation of the proposed sections of road, listed in the application, involving Camp Road and Mansfield Street at Greta, Allandale Road is already a designated 19m B-double by the RTA.

Until such time as the existing pavements are widened and subgrade improved to a standard suitable to support larger 25m B-Double vehicles, the application for a 25m B-Double Route operation is not approved.

The present conditions of these roads designated as Camp Road and Mansfield Street, 19m/50 tonne B-Doubles do however remain legally permitted to use these roads at Greta.

Yours faithfully

Peter Jennings
Infrastructure Planning Engineer

29 October 2010