



Note Regarding Airside Access:

- ▶ Defence does not support any increase in direct airside access, except in very limited circumstances. The only circumstance where Defence would consider permitting direct airside access is where such access is granted to a specified contractor, in respect of land abutting RAAF Base Williamtown (on the southern boundary only) and where such access is specifically required in order to fulfil core obligations in Defence contract(s). It is intended that once the contract(s) expires or is otherwise terminated, airside access would be revoked. Separate written approval from Defence would be required for each contractor to Defence, seeking airside access. It is intended that the access requirements would be dealt with within the terms of the contract. Note: It is envisaged that security arrangements for access will be by way of a secured gate that is controlled by Defence. Further detailed requirements and arrangements will be negotiated between the contractor and the Department of Defence; and
- ▶ Indirect access through NAL will be in accordance with NAL's operating agreement with Defence and controlled by NAL.

Medium Proximity Precinct 2 – All lots created for land uses (for moderately correlated businesses) requiring some proximity to be able to directly or indirectly service airport/defence demands. Uses do not insist on immediate apron, terminal or Defence Base proximity – (20 to 30 hectares of land typically subdivided into lots ranging in size from 3 to 5 hectares in area).

Low Proximity Precinct 3 – All remaining land within the estate (available for incidental development) – (40 to 50 hectares of land typically subdivided into lots ranging in size from 5,000 square metres to 2 hectares in area for Defence and airport related industrial development and smaller lots of 3,000 to 5,000 square metres for other land uses).

The proposed staging of the land release has considered the need for proportioning of land use types for various linkage requirements. For this reason, each stage aims to release some land from each precinct to meet the anticipated range of demand. Further discussion in relation to the Precincts and how they relate to the staging of land release and development is provided in Section 5.3.

The precincts outlined above are illustrated in Figure 6.

2.10 Ecology

The DAREZ is an area identified as a special area for defence and airport related employment in the Lower Hunter Regional Plan. The partner document to this is the Draft Lower Hunter Regional Conservation Plan. Together these documents aim to take a realistic approach to the economic and development needs for the support of the projected population for the Region whilst simultaneously recognising and planning for the conservation values of the Region. This regional approach assists in gaining an understanding of the 'bigger picture' and allows for a more strategic approach to the planning process.



2.10.1 Opportunities for Offsetting Potential Biodiversity Impacts

The DAREZ site contains vegetation communities and habitats of significant ecological value. However, it is noted that the Site is not identified as being part of any regional conservation investment priority in the Draft Regional Conservation Strategy. There are opportunities to retain and protect some areas of value within the site while seeking to negotiate offsets for the loss of vegetation and habitat in other locations in accordance with the guidelines provided within the Draft Conservation Plan. The aim is to ensure that there is a net improvement of biodiversity assets in the area generally. These opportunities need to be explored by the developer and landowners in consultation with the Department of Environment and Climate Change (DECC).

A future developer/proponent will need to consult with DECC for advice on any additional ecological survey work that may be required. The developer will be responsible for the commissioning of any additional surveys required.

The following matters will need to be addressed to allow the Draft LEP for the DAREZ to progress:

- ▶ Accurately delineate boundaries between areas to be developed and areas to be protected;
- ▶ Accurately establish the extent and quality of habitat to be lost due to the development (Note: It has been estimated that the loss of vegetation of high and medium ecological value would be approximately 63 hectares in area);
- ▶ Establish the criteria to be used in the assessment of off-sets;
- ▶ Identify and secure appropriate offsets; and
- ▶ Prepare and have adopted detailed management plans to ensure the long term survival of retained habitat.

2.10.2 Biodiversity Certification

Consideration of the Draft Lower Hunter Regional Conservation Plan is the important first step in the path to securing biodiversity certification for new Local Environmental Plans (LEPs). The intent of this Draft Conservation Plan is that the biodiversity certification is to largely 'switch off' the need for consideration of the test of significance, otherwise known as a Section 5A assessment or seven-part test at individual sites.

This has important implications for the development of this employment zone and for the subsequent process and requirements for the consent and determination by authorities in relation to removal of vegetation from the site. The certified LEP is intended to create a high degree of certainty with respect to biodiversity management on a site-by-site basis.

Legislative reforms are also underway to amend the Threatened Species Conservation Act 1995 to implement a Biobanking Scheme in NSW, providing a structure for offsetting biodiversity losses using a market-based mechanism.



2.11 Hydrology, Flooding and Drainage

The initial assessment established the flood characteristics of the Site. Subsequent flood modelling has identified that the limitations placed on the development of the site, in respect of flooding, would be minimal. While the area is currently subjected to regular inundation, the placement of fill required to achieve the desired flood-free floor level, could be done in such a manner as to have minimal impacts on existing flood conditions. Flood modelling of the development of the selected site including the additional lands, demonstrated that the effect of flooding could be minimised through effective drainage and retention techniques. This was considered adequate to demonstrate that a significant effect would not be caused by the development proposed.

The potential for adverse impacts relates to the quality, quantity and velocity of water arriving onto and leaving from a site. The quality of the drainage water leaving a site should be controlled through on-site drainage detention basins. The quantity of water arriving and leaving a site would also be controlled by this method. The common areas of the development site, including road reserves would be treated within a regional facility.

To pursue the proposal further, the following would be required:

- ▶ Once the conceptual lot layout and road layout are agreed, the stormwater layout is to be configured and areas recommended for trunk drainage stormwater treatment;
- ▶ Costs for the provision of trunk drainage facilities are to be apportioned according to percentage of runoff received by these facilities from landholdings within the catchment; and
- ▶ Provide a more detailed hydraulic assessment of the site with final fill levels to provide nil flooding impact on adjacent lands. This would require a detailed site survey with sufficient resolution to generate contours with a 100 mm resolution.

Section 117 of the Environmental Planning and Assessment Act 1979; Ministerial Direction No.4.3 requires that any inconsistency with this Direction be justified to the satisfaction of the Director-General (or an officer of the department nominated by the D-G). It is apparent that, subject to the implementation of appropriate stormwater management initiatives, the development of the northern portion of the site that is the subject of the current rezoning, would have negligible impact on flood levels. In this regard, any inconsistency with the Section 117 Direction is considered to be of minor significance and the proposed rezoning remains consistent with the Objects of the Act pursuant to Section 5 of the EP& A Act 1979.

In relation to the southern more low lying areas of the investigation area, investigations to date also suggest that there are appropriate engineering solutions available to minimise the impacts of filling and development on that land. Inconsistency with the Section 117 and the Objects of the Act would be determined following more detailed investigations into stormwater and flood management requirements in the southern area and justification for any inconsistency with the Direction would need to be provided at the time of making an application to rezone that land.



2.12 Streetscape and Image

The quality of the design of public areas shall acknowledge the importance of the location as a prominent gateway site to Port Stephens and the Hunter and the potential for public space design to influence the economic vitality and performance of the employment centre.

The Site is considered to have gateway significance, as the first and final point of arrival and departure when travelling by plane. It has an important role in forming a positive perception of the region and this opportunity should be capitalised upon through quality design elements of public space, orientation of buildings, street design and lighting.

The Defence and Airport Related Employment Zone is in a unique location and the employment opportunities are significant for both Port Stephens and the Hunter Region generally.

2.13 Quality Built Forms

Built form will adhere to operational requirements of the RAAF Base and NAL. Development in the centre must enhance the scenic quality and create a landmark location by the use of appropriate design, materials and landscape treatments. It is imperative that the built form is also in accordance with the operational requirements detailed in the Land Use and Development Strategy, Land Capability and Suitability Assessment, May 2007 Stage 2. These requirements include various measures to ensure that the on-going operations of the RAAF Base and NAL are not jeopardised. This includes but is not limited to safety and security to the public, protection of airspace and navigational aides, extraneous lighting restrictions, obstacle clearance zones and aircraft noise.



2.14 Hydrology and Flooding Strategy

2.14.1 Drainage Requirements

The site will require significant filling to meet the flooding requirements of Port Stephens Council. To ensure the rate water leaving the site does not increase and the water quality does not decrease, all stormwater needs to be pre-treated on site and contained within grass seepage swales. Pre-treatment shall be in the form of precast underground structures to retain sediment, trash and pollutants.



2.15 Hunter Water Special Area

The land within the Tomago Sandbeds Catchment Area is subject to the Hunter Water Board (Special Areas) Regulations 1989. The land is also subject to a restrictive covenant prohibiting the erection of all buildings without the written consent of the Hunter Water Corporation. Proposed development is therefore required to comply with the requirements of Hunter Water Corporation.

Specific controls on land use and the bringing of potential pollutants within the gazetted Special Area will require measures to ensure groundwater and surface water are not polluted. The soils of this additional area include permeable sands highly vulnerable to contamination of ground waters. On-site treatment of stormwater will be necessary to remove potential pollutants. Stormwater management will also require the inclusion of: source controls within road reserves; controls on the storage and handling of chemicals; and careful management of chemical spills.

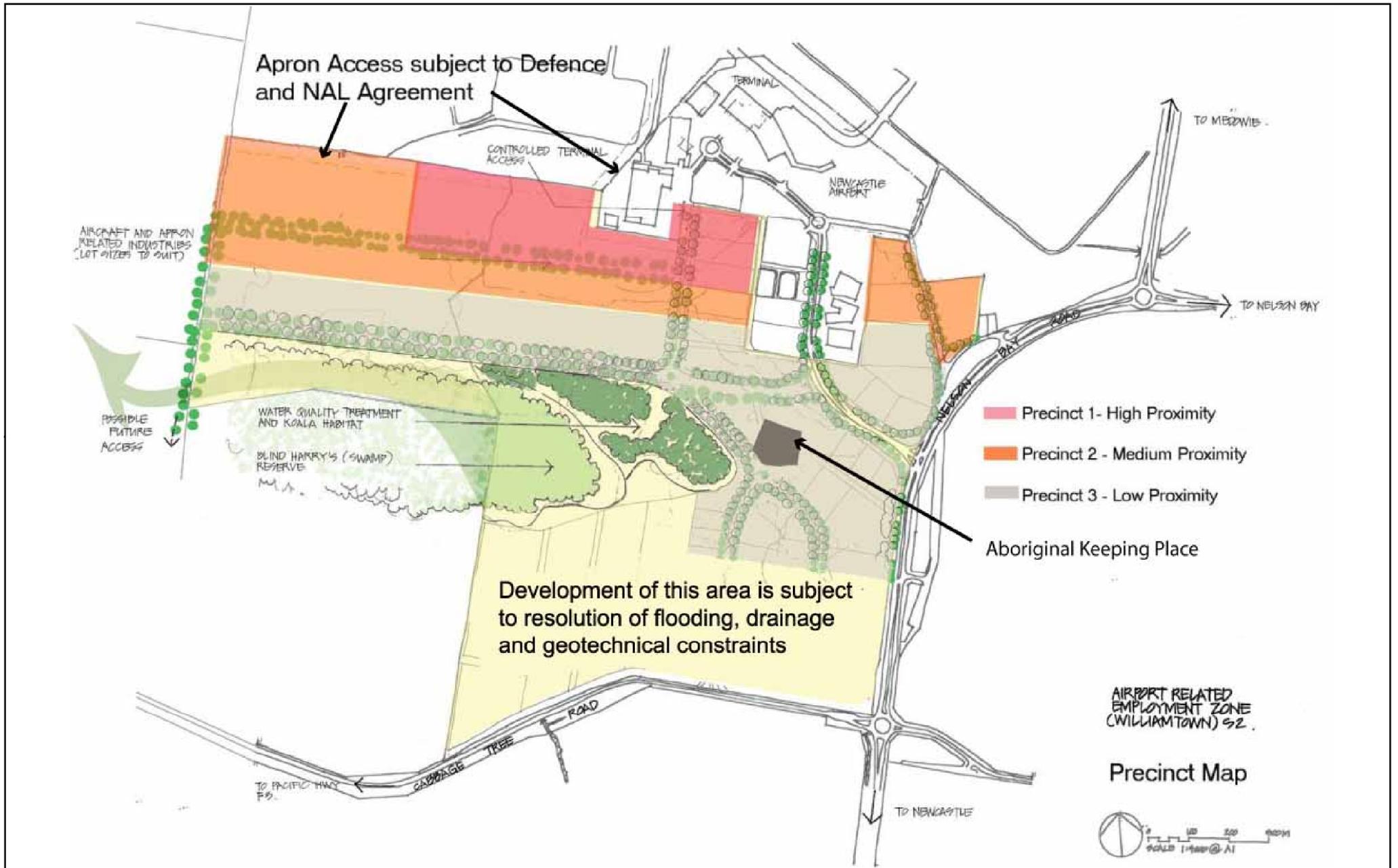
2.16 Bushfire

Due to the proximity of vegetation on adjoining land, a 20m separation of commercial and industrial buildings from bushfire hazard (vegetation) is intended as an Inner Protection Area. The removal of vegetation from the site will have significant impacts on the asset protection zone locations. In addition, the drains and perimeter roads proposed can be used as a means of reducing risks of bushfire. These and further ameliorative measures are to be incorporated into the development control framework in the final page of this report. Remnant patches of vegetation less than 1 hectare in size, or under scrubbed areas with wide crown separations are unlikely to require as much separation. A fire trail should be incorporated into the IPA.

The required APZs may constrain building development close to vegetation. Several of the smaller vegetation patches separated from the larger tracts do not have APZs due to their size and lack of potential intensity. These smaller remnant patches of vegetation are either less than 1 hectare in size, and therefore do not register as fire prone, or are under scrubbed with wide crown separations and are unlikely to require an APZ separation as they are in a condition equal to that prescribed as an Inner Protection Area. Confirmation of this must be obtained from the NSW Rural Fire Service.

2.17 Environmentally Sustainable Development

There is growing community concern and regard for energy efficient development and as such the Williamstown employment centre should adopt planning and design measures that promote the use of localised renewable energy for urban infrastructure, building construction, lighting, air conditioning, computing, telecommunications and transportation systems.





2.18 Key Elements of the Structure Plan

The main elements of the structure plan (illustrated in Figure 5) are outlined below:

- ▶ No new, direct access points onto Nelson Bay Road;
- ▶ Good internal connectivity, including a possible secure controlled link for airside/terminal access;
- ▶ Three precincts that present a hierarchy of links to the Airport. These are of high, medium and low level links that reflect the Economic Investigation Analysis and anticipated locational needs;
- ▶ Boulevard treatment of the main access points to the airport recognise the gateway position of the Site;
- ▶ Landscape buffers screen development and soften the effect on the rural character of surrounding land from main roads and from Williamtown Drive (the access point to the airport);
- ▶ Swales on main thoroughfares to improve water quality from runoff through retardation and infiltration, particularly of road water;
- ▶ On site drainage detention ensures water quality is not compromised and flow is not increased;
- ▶ Provision for a potential link to the adjoining land to the south and west of the site should it be considered appropriate to expand the specialised centre in that direction in the future;
- ▶ Provision of a good variety of proposed lot sizes;
- ▶ Perimeter roads around retained vegetation that will act as both a bushfire protection measure and a buffer to protect the ecological value of the area;
- ▶ There are two options for additional controlled access to the DAREZ from Cabbage Tree Road in the future;
- ▶ Extensive use of open drains to control runoff will improve the current issues of inundation and ponding in an area that does not have clearly defined water courses and is flood prone; and
- ▶ A range of proposed lot sizes which reflect the findings of the economic investigations.



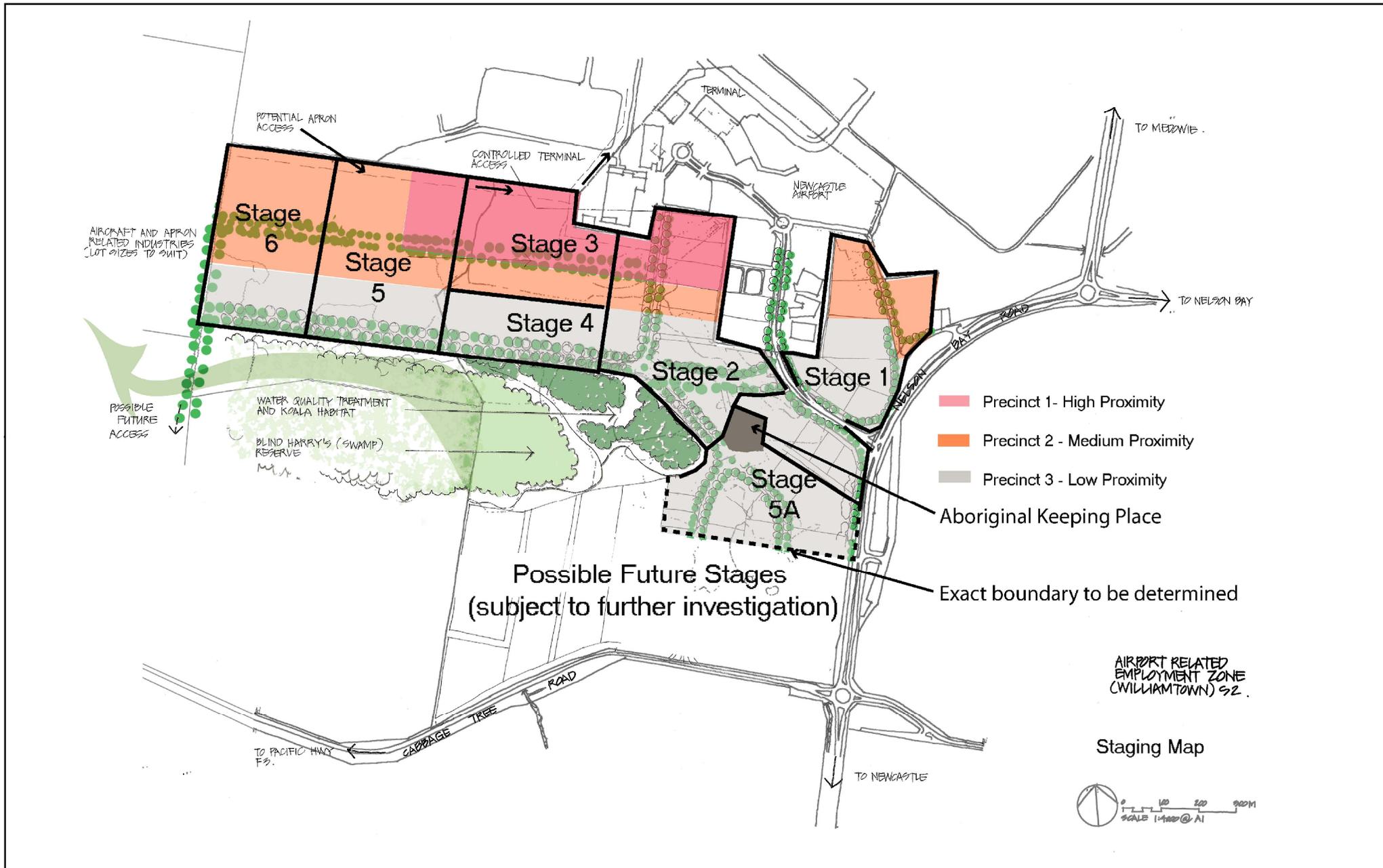
2.18.1 Comments on the Structure Plan

The Structure Plan has the same positive implications in relation to:

- ▶ Consistency with the applicable regional planning policies;
- ▶ It offers the most effective solution in terms of addressing flooding and drainage issues (higher land requiring less fill and leaving options for stormwater management initiatives both within and to the south of the development area);
- ▶ Sharing of servicing costs and reduced development costs per square metre;
- ▶ The more stable soil landscapes are likely to offer fewer implications for construction of future development on the lots created;
- ▶ The majority of the land is owned by one landholder that has indicated an immediate interest in the defence and airport employment centre. This is likely to reduce the complexities of staging and development compared to a number of land holders (as illustrated in Figure 7);
- ▶ An area of approximately 90 hectares gross (57 hectares net) generating employment opportunities for up to 5,500 people (excludes the area to the south which may be feasible for development at a later time); and
- ▶ Provides for greater synergies with the RAAF Base and Newcastle Airport operations due to the developable land being in closer proximity. It offers land with a common boundary with the RAAF Base and therefore potential opportunity for runway apron access should it be justified.

The negative implications primarily relate to:

- ▶ The loss of vegetated land identified as being of high conservation value. Loss of vegetation of high and medium ecological value would be approximately 63 hectares in area; and
- ▶ The upfront infrastructure costs will remain high. However, the more stable soils will reduce construction costs.





3. Local Environmental Plan Amendments

A number of approaches were considered in relation to the appropriate zone designation and the land uses permitted, with or without consent, in the proposed Defence and airport related employment area. Following further discussions between the Department of Planning, Port Stephens Council and the Department of Defence, a zone table in the format of the proposed Standard Instrument was considered the most appropriate option. A locality specific clause is also proposed, with provisions included requiring: consideration of appropriate acoustic treatment for all buildings; ensuring that the continued operation of aircraft is not compromised; and, limiting the location and type of development to those that will support Defence and airport related activities.

The importance of proximity to the airport and surrounding facilities has influenced the proposed location and type of land uses and activities encouraged in the employment centre, which are to support and not compromise the airport and RAAF Base operations.

3.1 Amendment to Zone Tables

It is understood that the revision and conversion of the Council's LEP to the Standard Instrument format is scheduled for 2011. In the interim to the revision, it has been agreed that a new zone consistent with the proposed Standard Instrument could operate within the existing instrument subject to appropriate notations stating that the definitions, terms and expressions used are taken from the Standard Instrument. In this regard, the proposed "Zone No SP1 - Special Activities - Defence and airport related employment development", as reproduced below, should be inserted in Clause 26 of Port Stephens LEP 2000.



Zone SP1 Special Activities – Defence and Airport Related Employment Development

1 Definitions

A word or expression used in this division has the same meaning as it has in the standard instrument prescribed by the *Standard Instrument (Local Environmental Plans) Order 2006* unless it is otherwise defined in this division.

2 Description of Zone

The Williamstown Defence and Airport Related Development area identifies land in close proximity to the RAAF Base Williamstown and Newcastle Airport that will cater for a range of employment activities associated with these employment nodes. Priority will be given to land uses requiring direct access to the Base, proximity and direct access to the Airport Terminal and direct and indirect uses servicing defence and airport demands. Port Stephens Development Control Plan 2007 provides further detail on the relationship of land uses near the RAAF Base and Newcastle Airport.

3 Objectives of the Zone

- ▶ To provide for special land uses that are not provided for in other zones;
- ▶ To facilitate development that is in keeping with the special characteristics of the site or its existing or intended special use, and which minimises any adverse impacts on surrounding land;
- ▶ To provide opportunities for the establishment of employment generating activities specifically supporting the ongoing operation of RAAF Base Williamstown and Newcastle Airport;
- ▶ To permit development that is appropriate and supportive to the continued operation of RAAF Base Williamstown and Newcastle Airport in terms of its land use type and location within the employment zone;
- ▶ To prevent development that is not compatible with or that may compromise the continued operation of RAAF Base Williamstown or Newcastle Airport;
- ▶ To minimise any adverse impacts on the surrounding land while protecting the inherent natural qualities and ground water recharge areas;
- ▶ To minimise the impact of the particular characteristics of the site including flooding constraints, ground water quality and surface drainage; and
- ▶ To prevent urban encroachment to airfield operations.



4 Permitted without Consent

Environmental protection works.

5 Permitted with Consent

Airport; Business premises; Educational establishment; Freight transport facility; Heliport; Hotel accommodation; Industry; Neighbourhood shop; Office premises; Public administration building; Recreational facility (indoor); Recreational facility (outdoor); Service station; Vehicle repair station; Warehouse or distribution centre

Note: These terms have the same meaning as those defined by the Standard Instrument – Principal Local Environmental Plan.

6 Prohibited

Any other development not otherwise specified in Item 3 or 4.

3.2 Additional Locality Specific Clause

It is recommended that the following local clause be inserted as a special provision within Port Stephens LEP 2000 and carried over to the revised principal planning instrument when introduced:

Development in the vicinity of RAAF Base Williamtown / Newcastle Airport

1. This clause applies to land shown within SP1 Special Activities and marked “Defence and airport related employment development” on the Land Zoning Map;
2. Notwithstanding any other provisions of this plan consent to any development on land to which this clause applies must not be granted unless the consent authority is satisfied that:
 - It complies with the relevant provisions of Australian Standard 2021-2000, Acoustics – Aircraft noise intrusion – Building siting and construction as applicable;
 - It will not compromise the continued operation of RAAF Base Williamtown and/or Newcastle Airport; and
 - The location and type of development supports a focussed Defence and airport related employment area.

The land use table for the SP1 - Special Activities – Defence and Airport Related Development zone contains the following permitted uses with the consent of Council:

Airport; Business premises; Educational establishment; Freight transport facility; Heliport; Hotel accommodation; Industry; Neighbourhood shop; Office premises; Public administration building; Recreational facility (indoor); Recreational facility (outdoor); Service station; Vehicle repair station; Warehouse or distribution centre.

These terms are taken from the Standard Instrument – Local Environmental Plan provided by the NSW Department of Planning as the model for all future LEP’s. The definitions for these terms are also contained in the standard instrument and are provided below.

Airport means a place used for the landing, taking-off or parking of aeroplanes (including terminals, buildings for the parking or maintenance of aeroplanes, associated installations and movement areas), and includes heliports.

Business premises means a building or place at which an occupation, profession or trade (other than an industry) is carried on for the provision of services directly to members of the public on a regular basis.



Educational establishment means a building or place used for education (including teaching), being:

- (a) A school, or
- (b) A tertiary institution, including a university or a TAFE college, that provides formal education and is constituted by or under an Act.

Freight transport facility means a facility used principally for the bulk handling of goods for transport by road, rail, air or sea, including any facility for the loading and unloading of vehicles, aircraft, vessels or containers used to transport those goods and for the parking, holding, servicing or repair of those vehicles, aircraft or vessels or for the engines or carriages involved.

Heliport means a place open to the public used for the taking off and landing of helicopters whether or not it includes:

- (a) A terminal building, or
- (b) Facilities for the parking, storage or repair of helicopters.

Hotel accommodation means a building (whether or not a hotel within the meaning of the *Liquor Act 1982*) that provides tourist and visitor accommodation consisting of rooms or self-contained suites, but does not include backpackers' accommodation, a boarding house or bed and breakfast accommodation.

Industry means the manufacturing, production, assembling, altering, formulating, repairing, renovating, ornamenting, finishing, cleaning, washing, dismantling, transforming, processing or adapting, or the research and development of any goods, chemical substances, food, agricultural or beverage products, or articles for commercial purposes, but does not include extractive industry or a mine.

Neighbourhood shop means retail premises used for the purpose of selling foodstuffs, personal care products, and other small daily convenience goods for the day-to-day needs of people who live or work in the local area, and may include ancillary services such as a post office, bank, newsagency or dry cleaning.

Office premises means a building or place used for the purpose of administrative, clerical, technical, professional or similar activities that do not include dealing with members of the public at the building or place on a direct and regular basis, except where such dealing is a minor activity (by appointment) that is ancillary to the main purpose for which the building or place is used.

Public administration building means a building used as offices or for administrative or other like purposes by the Crown, a statutory body, a council or an organisation established for public purposes.

Recreation facility (indoor) means a building or place used predominantly for indoor recreation, whether or not operated for the purposes of gain, including a squash court, indoor swimming pool, gymnasium, table tennis centre, health studio, bowling alley, ice rink or any other building or place of a like character used for indoor recreation, but does not include an entertainment facility, a recreation facility (major) or a registered club.

Recreation facility (outdoor) means a building or place (other than a recreation area) used predominantly for outdoor recreation, whether or not operated for the purposes of gain, including a golf course, golf driving range, mini-golf centre, tennis court, paint-ball centre, lawn bowling green, outdoor swimming pool, equestrian centre, skate board ramp, go-kart track, rifle range, water-ski centre or any other building or place of a like character used for outdoor recreation (including any ancillary buildings), but does not include an entertainment facility or a recreation facility (major).



Service station means a building or place used for the sale by retail of fuels and lubricants for motor vehicles, whether or not the building or place is also used for any one or more of the following:

- (a) The ancillary sale by retail of spare parts and accessories for motor vehicles;
- (b) The cleaning of motor vehicles;
- (c) Installation of accessories;
- (d) Inspecting, repairing and servicing of motor vehicles (other than body building, panel beating, spray painting, or chassis restoration); and
- (e) The ancillary retail selling or hiring of general merchandise or services or both.

Vehicle repair station means a building or place used for the purpose of carrying out repairs or the selling of, and fitting of accessories to, vehicles or agricultural machinery, but does not include a vehicle body repair workshop.

Warehouse or distribution centre means a building or place used mainly or exclusively for storing or handling items (whether goods or materials) pending their sale, but from which no retail sales are made.

Some of the definitions will allow applications to be lodged and considered that, for one reason or another, are not necessarily desirable in this location. Examples of this potential problem include:

Example 1: Where an “educational establishment” such as a TAFE or university campus teaching aeronautical engineering or aircraft engine maintenance would be considered quite appropriate, other teaching facilities such as a school would not be appropriate due to the noise impacts; and

Example 2: Where a “vehicle repair station” associated with a car rental business would be acceptable, a car sales yard or farm machinery repair business, which also fall within that definition, would be an inappropriate activity as it would be an under-utilisation of the land in this locality.

The objectives of the zone can be relied upon to deter inappropriate development. However, it would be prudent to include a statement within the DCP to reinforce the intent of the objectives of the zone.



4. Further Controls on Development

To support the proposed planning amendments to Port Stephens LEP 2000 (refer to previous Chapter), locality specific controls on development will be needed. To give the controls legal effect, a separate Chapter must be inserted into Port Stephens Development Control Plan (DCP) 2007.

The purpose of the DCP Chapter will be to provide greater detail in relation to the use of the land and the issues needing to be considered and addressed by anyone seeking to development within the estate.

4.1 Generic Provisions Applicable to Development in the SP1 Zone

Port Stephens Development Control Plan 2007 contains generic planning controls that will be applicable to the types of development likely to be constructed within the SP1 Zone.

Those generic provisions from DCP 2007 that will apply to development in the DAREZ and their relevant clause references are listed in the table below. Also identified is whether there are additional locality specific provisions to be applied. The additional provisions are included in the following sections:

Applicable Sections of DCP 2007	Relevant Clauses and Issues	Additional Specific Controls
B1 – Subdivision and Streets	B1.2 – Types of Subdivision	Yes
	B1.3 – Site Analysis	No
	B1.4 – Topography and Views	No
	B1.6 – Footpaths and Cycleways	No
	B1.8 – Lot Layout	No
	B1.9 – Street Trees	No
	B1.10 – Infrastructure	Yes
B2 – Environmental and Construction Management	B2.2 – General Standards	No
	B2.3 – Water Quality Management	Yes
	B2.4 – Acid Sulphate Soils	No
	B2.5 – Landfill	No
	B2.7 – Vegetation Management	No
	B2.8 – Koala Management	No
	B2.9 – Mosquito Management	No
	B2.10 – Weed Control	No
	B2.11 – Tree Management	No
	B2.13 – Aircraft Noise	No
	B2.14 – Erosion and Sediment Control	No
	B2.15 – Construction Waste	No



Applicable Sections of DCP 2007	Relevant Clauses and Issues	Additional Specific Controls
B3 – Parking and Traffic Management	B3.2 – Public Transport	No
	B3.3 – Parking Requirements	No
	B3.4 – Access Requirements	No
	B3.5 – Site Distance at Driveway Exits	No
	B3.6 – Design Requirements	No
	B3.7 – Construction Requirements	No
	B3.8 – Schedule of Parking Requirements	No
B4 – Commercial and Mixed Use Development	B4.3 – Uses	Yes
	B4.4 – Street Character and Front Setback	No
	B4.5 – Scale and Bulk	Yes
	B4.6 – Building Height	Yes
	B4.7 – Side and Rear Setback	No
	B4.8 – Building Design Elements	Yes
	B4.9 – External Lighting	Yes
	B4.10 – Energy Efficiency	No
	B4.11 – Landscape	No
	B4.12 – Public Domain Improvements	No
B4.13 – Access, Parking and Servicing	No	
B5 – Industrial Development	B5.3 – Street Character	No
	B5.5 – Floor Space Ratio	No
	B5.6 – Building Height	Yes
	B5.7 – Side and Rear Setback	No
	B5.8 – Building Design Elements	Yes
	B5.9 – Vehicle Parking and Access	No
B12 – Advertising Signs	B12.3 – SEPP 64 Advertising and Signage	No
	B12.4 – Business Identification Signs	No
	B12.5 to B12.19 – Sign Types	No

As can be seen from the above table, a significant number of issues relevant to development on the subject land are addressed by the generic clauses already existing in DCP 2007. The Williamstown DCP Chapter will need to contain cross-references to applicable generic provisions elsewhere in Port Stephens Council's consolidated Development Control Plan 2007 and also provide guidance for developers and Council assessors in relation to those locality specific issues that must also be addressed in the design of any development. It is envisaged that the Williamstown specific controls will be inserted as a separate Chapter in *Part C- Locality Controls of DCP 2007*.

Those issues that are specific to the location are described below together with the proposed development controls to be applied.



It is important to note that the following sections provide only a framework for the formulation of detailed development controls. Details such as compliance standards and procedures will be added by Council during the drafting of the required amendments to the consolidated DCP.

4.2 Land Use

4.2.1 Proposed Development Controls

To reinforce the LEP provisions, it is recommended that a statement be included to the effect that Council will only consider favourably those uses that are directly related to defence and airport related activities. The following table provides an indication of the types and location of uses considered appropriate to the employment zone.

Table 4-1 Preferred Land Use Hierarchy

Linkage to Airport/Base	Use	Characteristics/Types
High (requiring direct access to the apron)	Airport and Department of Defence related activities requiring runway apron access including: <ul style="list-style-type: none"> ▶ Aircraft refuelling, maintenance, manufacture and assembly; and ▶ Freight handling and forwarding. 	<ul style="list-style-type: none"> ▶ Requirement for runway and apron access; and ▶ Defence and civil related.
High (requiring runway proximity and direct access to the terminal)	Airport and Department of Defence related activities requiring proximity to the runway apron and/or terminal access including: <ul style="list-style-type: none"> ▶ Aircraft refuelling, maintenance, manufacture and assembly; ▶ Freight handling and forwarding; ▶ Aerospace industry; ▶ Defence support (non-secure); ▶ fixed base operations; ▶ Airport terminal related services; and ▶ Customs and other regulatory services. 	<ul style="list-style-type: none"> ▶ Goods in bond and storage; ▶ Catering, baggage; ▶ Possible links to education/government institutions; ▶ Defence and civil related; ▶ Off base services in supply, repair and maintenance equipment support; ▶ Facilities management, car hire, transport services and logistics, passenger services (including convenience retail); and ▶ Airport services and administration.



Linkage to Airport/Base	Use	Characteristics/Types
<p>Medium (indirect)</p> <p>Direct and indirect uses servicing both direct (high correlated business) and air force/defence demands. Uses do not insist on immediate apron, terminal or Defence Base proximity.</p>	<p>Any of the above and including:</p> <ul style="list-style-type: none"> ▶ Aero training (precludes training flights); ▶ Transport and Storage; ▶ Motor vehicle services; ▶ Defence and Airport related Commercial/Offices and Support Services; ▶ Manufacturing; and ▶ Education/training. 	<ul style="list-style-type: none"> ▶ Warehousing, goods in bond; ▶ Mechanical, fuel and supplies, tyres, detailing; ▶ National HQ's desirous of airport nexus; ▶ Technical equipment components and assembly; ▶ Primary product handling/Rural industry (excluding putrescible waste generating activities); ▶ Service providers and agencies; and ▶ Hotels, convention and meeting.
<p>Low (incidental)</p>	<p>Any of the above and including:</p> <ul style="list-style-type: none"> ▶ Defence and Airport related Convenience Retail/General Store; ▶ Hotel/Motel; ▶ Defence and Airport related Industrial Facilities; and ▶ Fitness and health. 	<ul style="list-style-type: none"> ▶ Cafés (excluding fast-food/take-away food stores on large scale-floor space cap to be considered for retail); ▶ Petrol and mechanical service; and ▶ Business equipment, supply and servicing.

4.3 Subdivision Lot Size and Road Layout

4.3.1 Description of Issue

The Structure Plan together with the findings of the economic demand analysis provide an indication of an acceptable road layout (refer to Chapter 3) and distribution of lot sizes anticipated to meet demand (discussed in Section 2.4 and 2.5 above). While this information is indicative only, any substantial variation from that originally indicated will need to be fully justified to Council's satisfaction.

4.3.2 Proposed Development Controls

- ▶ Include in the DCP a Development Control Plan Map for the subdivision of the land within the Williamtown DAREZ estate and a lot distribution table together with appropriate clauses related to the need to provide written justification for any substantial variation to the indicative layout and mix of lots.



4.4 Geotechnical

4.4.1 Description of Issue

The initial geotechnical assessment found soft soils evident for a large proportion of the Site with moderate, high or severe limitations on urban / industrial development. Limited testing identified that these softer soils are generally within the lower lying land to the south. However, the preliminary geotechnical investigations were limited in their scope and the findings suggest that soft soils may also occur within the proposed area for development.

4.4.2 Proposed Development Controls

To progress the proposed rezoning and development of the land, the following would be necessary:

- ▶ Detailed geotechnical investigations across the area to determine the nature of the subsurface conditions at greater depths and spread of locations to assess the method of treatment for the different soil profiles across the Site. This will assist in determining the appropriate methodology for site filling and stormwater management initiatives; and
- ▶ Preparation of a detailed geotechnical risk register to advise of the likelihood and severity of each hazard, and to determine the necessary controls to reduce risks and associated constraints that may apply to certain developments.

While it is preferable to require the additional geotechnical investigations to be undertaken prior to the rezoning of the land, the additional investigations should at least be undertaken prior to the preparation of a development application for the subdivision of the land.

The geotechnical risk register should be prepared by the developer and submitted with the development application for the subdivision of the land.

4.5 Acid Sulfate Soils (ASS)

4.5.1 Description of Issue

The Acid Sulfate Soil Risk Map for Williamstown indicates that there is a low probability of occurrence of ASS at a depth of greater than 3m below the existing surface in the more elevated area (above RL 4m AHD). If present, ASS's are expected to be sporadic and buried by alluvium and/or Aeolian sediments.

4.5.2 Proposed Development Controls

- ▶ Notwithstanding the low likelihood of occurrence of ASS, appropriate pre-testing and management plans will be required for those locations where disturbance of the existing substrata is proposed (eg. provision of services, trunk drainage, pile supported footings); and
- ▶ Pre-testing and preparation of management plans should be undertaken prior to commencement of any substantial earthworks involving disturbance of locations containing potential ASS's.



4.6 Water Quality Management

4.6.1 Description of Issue

Council's consolidated DCP requires that developments comply with Council's Urban Stormwater and Rural Water Quality Management Plan. In addition, the drainage and hydrology plan that form part of this DCP must apply conceptually in relation to water quality management in Part B2 Environmental and Construction Management.

Flood Management – As part of the State Governments Flood Policy there will be a requirement to demonstrate that the intended use will not exacerbate local flooding and that the proposed development will be designed in expectation of flooding.

Groundwater Management – The proposal should provide the following details with respect to groundwater management:

- ▶ A description of the existing groundwater system and include geologic details and aquifer systems;
- ▶ Identification of any potential changes to the existing groundwater source and any dependant users including the environment;
- ▶ Management of potential impacts and preparation of contingency measures. Management may include remediation, reduction and management of the groundwater resource with respect to all the users of the resource;
- ▶ Identification of any potential groundwater works including bores, geotechnical testing or monitoring; and
- ▶ Addressing the principals outlined in the NSW State Groundwater Policy Framework.

Where there is a lack of scientific certainty on the impacts of development on the groundwater regime, Department of Water and Energy (DWE) will adopt a precautionary approach.

The HWC requires stormwater and surface runoff from any proposed development be managed in such a way as to ensure it does not impact on the quality of the groundwater. This would include the appropriate interception and treatment of stormwater, including the first flush containment. HWC advise that they would like an opportunity to comment on the Stormwater Management Plan for the proposed employment zone. On-site disposal of effluent within the gazetted Special Areas is prohibited.

4.6.2 Proposed Development Controls

- ▶ Undertake a site specific flood investigation that augments the regional flood study performed by WBM. It would be expected that this flood investigation should address:
 - The existing flood conditions for the site and adjacent properties;
 - The proposed flood conditions for the developed site and the potential impacts to the adjacent properties; and
 - The required pad levels and finished floor levels for the development based on PSC's development requirements and the flood study.



- ▶ Develop a Stormwater Management Plan that complies with PSC's stormwater code and addresses the requirements of the Department of Water and Energy (DWE) as defined under its jurisdiction;
- ▶ Allotment stormwater is to be treated on site to achieve discharge criteria set by DWE and HWC. Each lot is to provide structures to remove and collect litter, sediments, nutrients and hydrocarbons. Road reserve stormwater quality measures to treat road pollutants to be provided eg. gross pollutant traps, swales, bio-retention and sand filters;
- ▶ A Contingency Response Plan (CRP) is to be prepared and approved for the storage and handling of chemical spills during the construction and operational phases of any development. The CRP is to identify any construction or operational activities that involve the potential interference or polluting of the ground water aquifer. Appropriate mitigative and regulatory initiatives are to be detailed for consideration (NB. Approval from DWE would be required under the Water Management Act 2000);
- ▶ Storage and handling of chemicals is to be in accordance with AS 1940-1993 Flammable and Combustible Liquids and AS/NZ 4452-1997 – Toxic Substances; and
- ▶ All developments are to be connected to sewer mains of the HWC and on-site disposal of effluent of any kind within the gazetted Special Area is prohibited.

4.7 Stormwater Quantity Requirements

4.7.1 Description of Issue

To minimise the impacts of the proposed development on adjacent lands, it is important that the:

- ▶ Annual stormwater volume discharged from the site is comparable to the equivalent existing values; and
- ▶ Peak flow rate for all peak ARI storm events is comparable to the equivalent existing flows from the site.

On this basis, the allotment strategy should involve two separate components; one to maintain the volume of stormwater and one to reduce the peak flows from the site.

HWC expects that appropriate stormwater planning measures will be undertaken to ensure any runoff into the surrounding sandbeds does not impact upon the quality of the groundwater. This would include appropriate interception and treatment of stormwater, including first flush containment. Any release of stormwater into the sandbeds should be treated to meet the protected waters criteria identified in clause 8 of the *NSW Clean Waters Regulation 1972*. In the event that these regulations are repealed the appropriate water quality criteria shall be identified in the ANZECC water quality guidelines for fresh and marine waters.



4.7.2 Proposed Development Controls

- ▶ Increased impervious areas reduce the infiltration capacity of the area, increasing the amount of rainfall that would run off the site. To prevent this increase in volume, allotment strategies shall be introduced to control runoff from each site. This should include capture and on-site reuse in accordance with the Department of Environment and Climate Change (DECC) stormwater reuse guidelines or infiltration back into the groundwater after suitable treatment. The sizing of such structures will be strongly dependant on the type of development and the area of imperviousness for each site and would be subject to individual allotment assessments;
- ▶ The development of each lot will be required to maintain the effective 10 to 100 year ARI peak flow rates on the site. This should be achieved through an underground or aboveground detention system that limits flow off the site. The configuration of this system would be subject to the lot size and the percentage of imperviousness of each lot; and
- ▶ The road reserve stormwater quantity should be attenuated through roadside infiltration tanks and end of line structures where the waterways discharge from the estate. These structures should act as both an infiltration area and a means for peak flow detention. This would treat both the annual quantity and peak flow rates from the road reserve. The general size of these devices could be minimised and located within the road reserve reducing land take, as it would be treating only a minor portion of the catchment.

4.8 Scale, Bulk and Height of Buildings

4.8.1 Description of Issue

Council's consolidated DCP Section B5.5 addresses Floor Space Ratio setting a maximum ratio of the gross floor area of the building to the area of the site at 1:1 for industrial development. Given the constraints of the site such as setbacks, height restrictions, geotechnical and flooding issues it may not be possible to achieve the maximum ratio on a particular site.

Operational airspace is protected from transient intrusion by height restrictions for structures. All structures must be within the requirements of the Council and the Obstruction Clearance Surfaces (OCS) and Defence (Areas Control) Regulations (D(Areas Control)Rs) for the safe operation of aircraft and navigational aids.

No obstacles are to pose a hazard to aircraft in flight. Clearance surfaces range from ground level to requirements as mapped that relate to take-off, approach and operational requirements.

The D(Areas Control)Rs for RAAF Base Williamtown are supported by the Obstacle Clearance Surfaces thus ensuring a limit to height of new structures, additions to existing structures or ground level (i.e. no structures permitted) or to heights of 7.5, 15, 45, or 90m, potentially limiting the height of structures closer to the runway.



4.8.2 Proposed Development Controls

As a guide, a maximum height of 4 storeys or 12 metres from natural ground level to the upper floor ceiling height should apply to all buildings and structures. Variations to this height may be considered where it can be demonstrated that an increase in height has a minimal effect on the view shed and visual amenity of the area viewed from the Airport, Williamtown Drive and Slades Road and providing that the building or structure complies with the requirements of the D(Areas Control)Rs and OCS. The Department of Defence approval is required for any building or structure that exceeds the OCS or Defence Area Control Regulations.

4.9 Orientation, Design and Appearance of Buildings

4.9.1 Description of Issue

Newcastle Airport is a gateway for residents and visitors arriving and leaving the region. It is important to ensure development is well designed and makes a positive contribution to the amenity of the area. Loading docks and bays should be located at the rear of buildings or suitably screened with quality landscaping and/or design elements.

Setbacks for industrial development are addressed in Council's consolidated DCP, Section B5.7. The front boundary setback is generally 6m with certain structures encouraged within the setback to provide articulation and interest where the development can still meet requirements for adequate sightlines for pedestrian and vehicle movement and any streetscape controls.

In addition to these requirements, new development will have to consider existing development and the rural character and nature of that development where it is applicable.

4.9.2 Proposed Development Controls

Buildings design elements; façade treatments, landscaped areas, feature colour treatments and materials should be used to create interesting built form outcomes. To maintain aircraft safety, building materials should minimise glare and reflective surfaces.

4.10 Aircraft Operational Requirements

4.10.1 Description of Issue

The primacy of the airport and Defence operations is of the utmost importance. Only compatible land uses should be considered in the vicinity of the airfield. The developer is to ensure that light from development and public lighting does not result in obtrusive light, glare and/or reflection. The specification covering extraneous lighting in the vicinity of aerodromes is given in ADFP 602.

Land use types that increase the likelihood of bird or wildlife hazard are to be avoided. Developments considered incompatible are those that generate putrescible waste, particularly large amounts of waste, not wholly contained/dealt with indoors such as drive-in restaurants, food processing plants and food garbage disposal, and development types that create exhaust plumes. Restrictions on such uses are necessary, including those that may pose a risk by expelling gaseous emissions.



The location of new development must also consider the operational integrity of existing navigational markers within Defence land.

4.10.2 Proposed Development Controls

Development within the area will need to take into account the limitations and design criteria associated with the operational needs of military and civil aircraft. Development Applications for land within the DAREZ that are outside the proposed DCP requirements and that will potentially impact on the Williamtown RAAF Base or NAL Airport operational requirements are to be referred to the Department of Defence for consideration prior to Council approval. In the interim until the DCP provisions are in place, any DAs within the DAREZ that could potentially impact on the operational requirements of the Base/ Airport will be referred to Defence. The issues that need to be considered in the location, design, construction and operation of a development will include:

- ▶ Protection of the airspace on the airfield and in the immediate vicinity of the airfield is important to ensure the safe operation of aircraft, navigational aids, ATC communications and Defence radars by eliminating obstacles from the airspace that may pose a hazard to aircraft in flight. The Defence Obstruction Clearance Surfaces (OCS) and the civilian Obstacle Limitation Surfaces (OLS) set height limitations on obstacles (trees, buildings, structures) and regulate other functions or facilities which may effect aircraft safety such as electromagnetic emissions, extraneous lights, cranes and land uses which may attract birds or plumes;
- ▶ Proponents of facilities that generate exhaust plumes will need to consult with the airfield operator to determine if the plume will be classified as a “hazardous object”;
- ▶ Any development or structure in the proximity of a navigational aid which has the potential to impact on the performance of an aid(s) will need to be assessed;
- ▶ AS 2021-2000 Acoustics – Aircraft Noise Intrusion – Building Siting and Construction provides guidance on the siting and construction of new buildings against aircraft noise intrusion;
- ▶ The Department of Defence controls land uses in the vicinity of the airfield to ensure that facilities and activities do not attract birds eg. the dumping and storage of rubbish and the creation and management of water bodies;
- ▶ Extraneous lights may cause confusion or distraction to pilots by reason of their colour, position, pattern or intensity of light emission above the horizontal plane. The specification covering extraneous lighting in the vicinity of aerodromes is given in ADFP 602; and
- ▶ Assessment of developments should include public safety in relation to direct impacts to people in the aircraft and on the ground as well as secondary incidents arising from damage to ground facilities such as storage facilities for explosives, flammable or other hazardous materials.



4.11 Aboriginal Heritage

4.11.1 Description of Issue

A Cultural Heritage Assessment (Aug 2007) was completed by Harper Somers O'Sullivan. The assessment has identified a location to be preserved as a Conservation Area/Keeping Place. A person must not knowingly destroy, deface or damage, or cause or permit the defacement of or damage to, an object or Aboriginal place without first obtaining consent of the NSW National Parks and Wildlife Service. It is the responsibility of the developer to ensure all staff, workers and contractors are aware of this statutory responsibility. If any cultural materials are uncovered, all work in the immediate area should stop, NSW NPWS or an archaeologist should be informed for identification of the object and appropriate measures taken including consultation with the local Aboriginal community.

4.11.2 Proposed Development Controls

- ▶ A Conservation Area / Keeping Place is to be established on the identified site (refer to DCP Map) to accommodate the burial site, the recorded associated artifact scatter, and the landform setting within which these important features lie;
- ▶ A Conservation Plan of Management (CPOM) is to be developed in partnership with Worimi Local Aboriginal Land Council (WLALC) and Mur-roo-ma Incorporated (MI) for the establishment of the Conservation Area / Keeping Place within the subject area. Such a CPOM will define the boundaries of the Conservation Area / Keeping Place, and outline the procedures to follow with regards to the removal and relocation of any Indigenous Cultural Heritage Material recovered within the remainder of the subject area throughout the development; and
- ▶ Such a CPOM would delineate the following:
 1. Objectives and purpose of the Conservation Area / Keeping Place;
 2. Legal Obligations;
 3. Community Consultation and Partnership with WLALC and MI;
 4. Boundaries of the Conservation Area / Keeping Place;
 5. Pre, Present & Post (Ongoing Protection) Land Management;
 6. Measures to Protect Aboriginal Cultural Heritage;
 7. Artifact Identification and Relocation Protocols; and
 8. Aboriginal Community Access Protocols.
- ▶ The area of the proposed Conservation Area / Keeping Place is to be excluded from development. Vegetation and sand dunes in this area are not to be disturbed. During primary earthworks in the proposed development area, this section should be cordoned off and sites officers from WLALC and MI, as well as an archaeologist, be present at all times to appropriately log and deal with any cultural material uncovered;



- ▶ A Cultural Heritage site induction for all workers that will be operating within the subject area is to be conducted prior to any work commencing. Such an induction will outline the nature of the archaeology of the subject area, as well as outlining the procedures to follow in the event of any additional cultural heritage material being recovered. Local indigenous representatives should be involved in this induction process; and
- ▶ Prior to any work taking place, an application is to be made to DECC under Section 90 of the *National Parks and Wildlife Act 1974* for the proposed development. The Section 90 is required for the salvage of any Aboriginal cultural heritage material in the proposed development area, and subsequent relocation into the Conservation Area / Keeping Place by the nominated Indigenous Stakeholders from WLALC and MI. Salvage work should be conducted by the Aboriginal community during earthworks as material is encountered. Aboriginal burial, open camp sites, artifact scatters and middens have previously been uncovered in dune areas. Adequate notification of the proposed work should be provided to WLALC and MI.

4.12 Scenic Quality/Streetscape

4.12.1 Description of Issue

Newcastle Airport is an important arrival and departure point from the region. As a gateway location, only good impressions should be left in the minds of visitors to the area. Proposed landscape treatment, using local indigenous species wherever possible, is to be appropriate to the nature and scale of the development proposed. All landscaping is to be consistent with the requirements of the approved Landscape Master Plan.

4.12.2 Proposed Development Controls

- ▶ A landscape Master Plan, utilizing local indigenous species, is to be submitted with any application for the subdivision of the land;
- ▶ New development within the DAREZ area should be designed to complement rather than detract from the quality of the estate; and
- ▶ The impact of any development on the rural character of the area should be minimized by choosing appropriate materials and colours and through the use of appropriate landscape treatments.



4.13 Bushfire Risk

4.13.1 Description of Issue

The Site is predominantly classified as bushfire prone land. To protect people, property and the environment from bushfire hazards, the risk of damage and/or injury from bushfire is to be mitigated against within the estate.

The NSW guideline *Planning for Bushfire Protection 2006* does not specify a standard of building construction for commercial or industrial buildings within bushfire prone lands. The standards established within the guidelines for residential developments incorporate a building standard equivalent to Level 3 construction (AS 3959) which is linked to the Building Code of Australia (BCA). It is likely that a commercial building will equate to or exceed a Level 3 construction standard for residential buildings. It is possible that the NSW Rural Fire Service will stipulate a Level 3 construction standard for a commercial building at this Site.

4.13.2 Proposed Development Controls

- ▶ Development within 100 metres of any substantial vegetation may require an assessment of bushfire risk in accordance with the Rural Fire Service guidelines;
- ▶ When planning building envelopes, parking, roads and open spaces at the site, consideration should be given to placing buildings away from the retained vegetation, bushfire hazard, as far as practicable or minimising the perimeter of the development exposed on the bushfire hazard sides of the site. This can be achieved through steps including planning open space adjacent to the vegetation, car parks between the vegetation and buildings and perimeter road design;
- ▶ The Inner Protection Area should be kept free of fuel through regular mowing with less than three tonnes per hectare of fine fuel present at any time;
- ▶ The access surrounding and between the buildings should be developed as two way and accessible for heavy vehicle use and be connected to form a circular or through road route leading to and from public roads; and
- ▶ A perimeter fire trail or suitable vehicle access around the building envelopes or site boundary should be established and maintained. This would need to be located entirely within the Site and include the following attributes:
 - A minimum trafficable width of 4m with an additional 1m wide strip on each side of the road kept clear of bushes and long grass;
 - The road should have a passing bay about every 200m where possible, which should be 20m long by 3m wide, making a minimum trafficable width of 7m at the passing bay;
 - The capacity of the roads should be sufficient to carry fully loaded firefighting vehicles (approximately 28 tonnes or 9 tonnes per axle);
 - A minimum vertical clearance of 6 m to overhanging obstructions, including tree branches;
 - Curves should have a minimum inner radius of 6 m and be minimal in number to allow for rapid access and escape;
 - The minimum distance between inner and outer curves should be 6m;



- Maximum grades should not exceed 15° and preferably not more than 10°; and
- Roads should provide sufficient width to allow firefighting vehicle crews to work with firefighting equipment around the vehicle.
- ▶ The proposed development is to have access to mains water supply. Fire hydrant and water supply should be included in accordance with AS 2419.1 – 1994; and
- ▶ Any fire trail will need to be constructed in accordance with design criteria outlined in the *Planning for Bushfire Protection 2006 guidelines*.

4.14 Special Provisions for Local Employment Generation

To assist in the support of employment generating development in the new employment centre, it may be appropriate to adopt a Council Policy and procedure for the expedition of proposals defined as “Employment Generating Development” as follows. These could be defined as:

Employment Generating Development *means development that after construction stage, would employ 10 or more persons on a full time or equivalent basis, or has a capital investment value of \$5 million or more.*

(NOTE: Council will seek to give priority to the processing of employment generating development applications. A streamlined approach would depend upon the applicant’s submission being accompanied by the information required by Council and that all issues outlined in pre-application consultation are properly addressed).



5. Implementation Strategy

The Stage 2 - Land Capability and Suitability Assessment (Revised October 2007) examined the physical and man-made constraints applying to the site that are influencing, to varying degrees, the development potential of the land.

The assessment identified a number of issues that are yet to be resolved. The following issues will need to be addressed prior to the preparation of an amending plan:

5.1 Infrastructure

5.1.1 Transport and Traffic Infrastructure

Development of the site as a specialised employment centre is likely to require potential infrastructure upgrades in the future. The potential infrastructure upgrades are as follows:

- ▶ Upgrading Nelson Bay Road south of Cabbage Tree Road to a four lane dual carriage way road and provision of a four lane dual carriage way road from Newcastle to the AREZ for the 50% upgrade scenario;
- ▶ Inclusion of a new intersection on Cabbage Tree Road to service the AREZ;
- ▶ Upgrade of the intersection of Nelson Bay Road and Williamstown Drive to a signalised intersection;
- ▶ Upgrading of Tomago Road for the 100% upgrade scenario; and
- ▶ Upgrading of the intersection of Tomago Road and the Pacific Highway.

The degree of upgrading necessary to the above road corridors and intersections would need to be determined in the development application phase of the project when more detailed information about the land uses and traffic generation at the site are known.

5.1.2 Water Supply

The developer of the employment centre site will determine, fund and design reticulated water in accordance with Hunter Water's design standards. For the purposes of this report, indicative water reticulation for the employment zone development was estimated to be 1 km of 150 mm diameter mains and 2.3 km of 200 mm diameter mains at a estimated capital cost of \$850,000. Actual requirements and capital cost need further investigation and confirmation by the developer further down the track once the development configuration is better defined.



5.1.3 Wastewater Services

Wastewater reticulation requirements for the employment centre would need to be designed in accordance with Hunter Water’s design standards. Two local pump stations (in addition to a transfer pump station) are assumed due to the relatively flat nature of the Site. Real costs need to be confirmed by the developer once the development configuration is better defined. The closest wastewater treatment plant to the Williamtown area is at Raymond Terrace. The three transfer options investigated to pump flows to this plant are as follows:

- ▶ **Option 1:** Construct a series Transfer Pump Station at Williamtown and a 13.5km long 450mm diameter rising main to Raymond Terrace Waste Water Treatment Works (WWTW);
- ▶ **Option 2:** Construct a series Transfer Pump Station at Williamtown and a 13.5km long 375mm diameter rising main to Raymond Terrace WWTW. Construct a series booster pump station approximately mid way along the rising main route once flows exceed 157L/s. A pump upgrade will also be required at the Transfer Pump Station at this time; and
- ▶ **Option 3:** Construct a series Transfer Pump Station at Williamtown and a 13.5km long 375mm diameter rising main to Raymond Terrace WWTW. Construct a parallel 13.5km 300mm diameter rising main once flows exceed 157L/s. A pump upgrade will also be required at the Transfer Pump Station at this time.

Funding and procurement arrangements of the Transfer System would need to be the subject of further consultation between Hunter Water and the main parties that would be serviced including the landowners and developers of the airport related employment zone, the Department of Defence and the NAL. A summary of the capital costs for the preferred Transfer System (Option 1 above) and including the costs to meet the reticulation requirements in the employment zone site are presented in Table below.

Table 5-1 Capital Cost Estimates - Transfer System & Employment Zone Reticulation

	Capital Costs
1 Transfer System to Raymond Terrace WWTW	\$15m
2 Employment Zone Development Reticulation	\$9 4m
TOTAL	\$24,301,000 as \$24.3m

1. Costs to be shared on a user pays basis; and
2. Costs to be met by the Developer(s) of the Employment Zone.

Actual requirements and capital costs will need to be further investigated and confirmed by the developer once the development configuration becomes better defined.



5.2 Infrastructure Funding Options

The funding of infrastructure was not established at the time of this report. However, it is known that the development of the Site will necessitate:

- ▶ Augmentation of the existing water supply system to increase capacity; and
- ▶ Connection to the wastewater treatment plant at Raymond Terrace.

(Note: There are three options to connect the Site for wastewater treatment, all follow Cabbage Tree Road to the intersection with Masonite Road and then follow Masonite Road to Raymond Terrace.)

- ▶ Connection of power, gas and communications as required;
- ▶ Intersection upgrades; and
- ▶ Trunk drainage construction.

Funding options will be largely influenced by the potential roles that the private landowner, developers, service providers and government may take.

Infrastructure needs could be funded through planning agreements. This might include monies spent upfront by the developer or possibly by government funding (reimbursed by the developer). These options may effect the staging options of the proposal. This will include further liaison with HWC regarding the timing and costing options to provide a reticulated sewerage system to the study area.

Section 94 of the Environmental Planning and Assessment Act 1979 enables Councils to require a contribution from developers towards the provision, extension or augmentation of public amenities and services that will, or are likely to be required as a consequence of development in an area, or that have been provided in anticipation of or to facilitate such development.

A site specific plan for Section 94 contributions is likely to be a requirement of PSC due to the need for the establishment of new and significantly improved infrastructure.

5.3 Proposed Land Use Types

The land use objectives are based on the aims of the Lower Hunter Regional Strategy and the Project Brief Objectives for the employment centre. These define the area as a specialised centre providing employment opportunities for airport related development. Land uses are categorised in relation to their linkage characteristics, the resultant hierarchy of uses is proposed to inform the land use planning strategy.

The land use types must be considered to ensure the appropriate and successful development of the proposed specialised centre for airport related employment, at the location selected. The land use recommendations have regard for the detailed investigations carried out during this investigative stage of the project. Table 5-2 below categorises the hierarchy of land uses in relation to linkage requirements and lists the land uses likely to be attracted to an employment zone close to, or at the airport. This table also takes into consideration the objectives of the centre and the demand expected for the various land use types.



Table 5-2 Preferred Land Use Hierarchy

Linkage to Airport/Base	Use	Characteristics/Types
High (requiring direct access to the apron)	Airport and Department of Defence related activities requiring runway apron access including: <ul style="list-style-type: none"> ▶ Aircraft refuelling, maintenance, manufacture and assembly; and ▶ Freight handling and forwarding. 	<ul style="list-style-type: none"> ▶ Requirement for runway and apron access; and ▶ Defence and civil related.
High (requiring runway proximity and direct access to the terminal)	Airport and Department of Defence related activities requiring proximity to the runway apron and/or terminal access including: <ul style="list-style-type: none"> ▶ Aircraft refuelling, maintenance, manufacture and assembly; ▶ Freight handling and forwarding; ▶ Aerospace industry; ▶ Defence support (non-secure); ▶ fixed base operations; ▶ Airport terminal related services; and ▶ Customs and other regulatory services. 	<ul style="list-style-type: none"> ▶ Goods in bond and storage; ▶ Catering, baggage; ▶ Possible links to education/government institutions; ▶ Defence and civil related; ▶ Off base services in supply, repair and maintenance equipment support; ▶ Facilities management, car hire, transport services and logistics, passenger services (including convenience retail); and ▶ Airport services and administration.



Linkage to Airport/Base	Use	Characteristics/Types
<p>Medium (indirect)</p> <p>Direct and indirect uses servicing both direct (high correlated business) and air force/defence demands. Uses do not insist on immediate apron, terminal or Defence Base proximity.</p>	<p>Any of the above and including:</p> <ul style="list-style-type: none"> ▶ Aero training (precludes training flights); ▶ Transport and Storage; ▶ Motor vehicle services; ▶ Defence and Airport related Commercial/Offices and Support Services; ▶ Manufacturing; ▶ Hotel/Motel; and ▶ Education/training. 	<ul style="list-style-type: none"> ▶ Warehousing, goods in bond; ▶ Mechanical, fuel and supplies, tyres, detailing; ▶ National HQ's desirous of airport nexus; ▶ Technical equipment components and assembly; ▶ Primary product handling/Rural industry (excluding putrescible waste generating activities); ▶ Service providers and agencies; and ▶ Hotels, convention and meeting.
<p>Low (incidental)</p>	<p>Any of the above and including:</p> <ul style="list-style-type: none"> ▶ Defence and Airport related Convenience Retail/General Store; ▶ Defence and Airport related Industrial Facilities; and ▶ Fitness and health. 	<ul style="list-style-type: none"> ▶ Cafés (excluding fast-food/take-away food stores on large scale- floor space cap to be considered for retail); ▶ Petrol and mechanical service; and ▶ Business equipment, supply and servicing.

5.4 Staging of Development

The DAREZ will be staged affecting the timing and supply of infrastructure such as roads, traffic devices, waste water capacity and treatment, drainage, utilities, opens space and communications.

Significant areas of land within the defence and airport related employment zone are physically constrained by flooding, geotechnical issues and ecologically significant environment. A significant area of land is excluded and protected from the impacts of development and environmental enhancement implemented in accordance with the principles of environmental sustainability.



An indicative staging plan is shown in Figure 7. The staging strategy aims to firstly utilise and then build upon the existing road network. Thus the early stages of development (Stages 1 and 2) would include the land to the north of Slades Road and that land that will be a core area of airport related employment with strong synergies with the airport facilities. Future stages (3 to 6) would extend progressively west at a rate dictated by demand. All stages offer a range of lot sizes and varying degrees of proximity to the Base and airport.

Stage 5A includes the land in the south-eastern part of the site that is likely to require preloading of land to address the presence of compressible soils and greater depth of filling.

It should be noted that the Staging Plan is indicative only. A more detailed staging plan will be formulated once the conservation outcomes have been finalised, further geotechnical investigations have been completed and staging costs more closely analysed.

5.5 Where to from Here?

It is intended that the project will follow the following processes through to completion (ie. to gain a resolution of Port Stephens Council to commence the rezoning process):

1. Consultation with Government Authorities (in particular the NSW Roads and Traffic Authority and the NSW Department of Environment and Climate Change (DECC));
2. Consultation with landowners and developers;
3. Undertake a formal briefing of and receive feedback from the Project Control Group (PCG) on the Stage 3 Report;
4. Refinement and finalisation of the Stage 3 Report and receive endorsement from the PCG;
5. Preparation of the Draft *Consolidated Airport Employment Zone – Land Use and Development Strategy*;
6. Presentation of the Draft Strategy to the PCG for endorsement prior to finalisation. (NB. The Strategy is to be prepared in the form of a Local Environment Study (LES)); and
7. Presentation of the Final Strategy to Port Stephens Council to initiate the rezoning process pursuant to Section 54(1) of the Environmental Planning and Assessment Act 1979.



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Draft	K Blackmore	A Brownlie	<i>A Brownlie</i>	A Brownlie		05/11/07
0	K Blackmore	A Brownlie	<i>Max Brownlie</i>	G Collins	<i>for G. Collins</i>	03/12/07



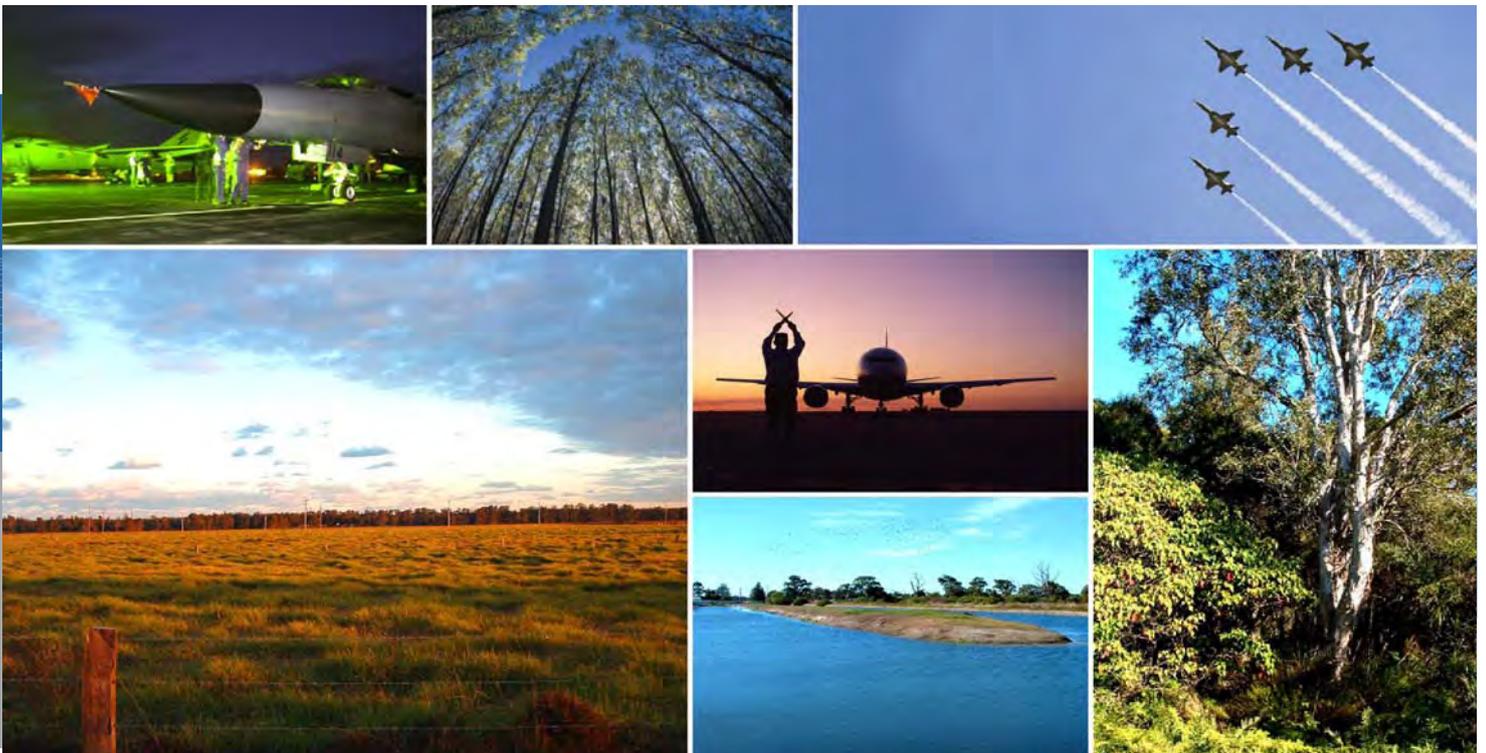
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Williamstown Defence and Airport Related Employment Zone (DAREZ)

Land Use and Development Strategy

Stage 2 - Land Capability and Suitability Assessment

Final Report December 2007





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C	Acid Sulphate Soil Study
D	Hydrology, Flooding and Drainage Assessment
E	Water and Wastewater Strategy
F	Bushfire Constraints Assessment November 2006
G	Ecology Report January 2007 and the Report for Supplementary Ecological Investigations October 2007
H	Traffic and Transport Report
I	Economic Analysis
J	Cultural Heritage Assessment



Abbreviations

ADFP	Australian Defence Force Publication
AEW&C	Airborne Early Warning and Control
AOS	Airport Opportunity Study
ASS	Acid Sulphate Soils
CBD	Central Business District
CKPoM	Port Stephens Council Comprehensive Koala Plan of Management
DAREZ	Defence and Airport Related Employment Zone
DCP	Development Control Plan
DECC	Department of Environmental Climate Change
DEWR	Department of Environment and Water Resources
DoD	Department of Defence
DoP	Department of Planning
EECs	Endangered Ecological Communities
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
GPS	Global Positioning System
Ha	Hectare
HWC	Hunter Water Corporation
Km	Kilometre
LEP	Local Environmental Plan
LGA	Local Government Area
LHCCREMS	Lower Hunter & Central Coast Regional Environmental Management Strategy
LHRS	Lower Hunter Regional Strategy
M	Metre
MOS	Manual of Standards
NAL	Newcastle Airport Limited
NES	National Environmental Significance



NSW	New South Wales
NPWS	National Parks and Wildlife Service
OLAs	Ordinance Loading Aprons
PCG	Project Control Group
PSC	Port Stephens Council
RAAF	Royal Australian Air Force
SEPP	State Environmental Planning Policy
SEPP 44	State Environmental Planning Policy No. 44 – Koala Habitat
Sp	Species (singular)
Spp	Species (plural)
TSC Act	Threatened Species Conservation Act 1995
WWTW	Waste Water Treatment Works



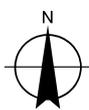
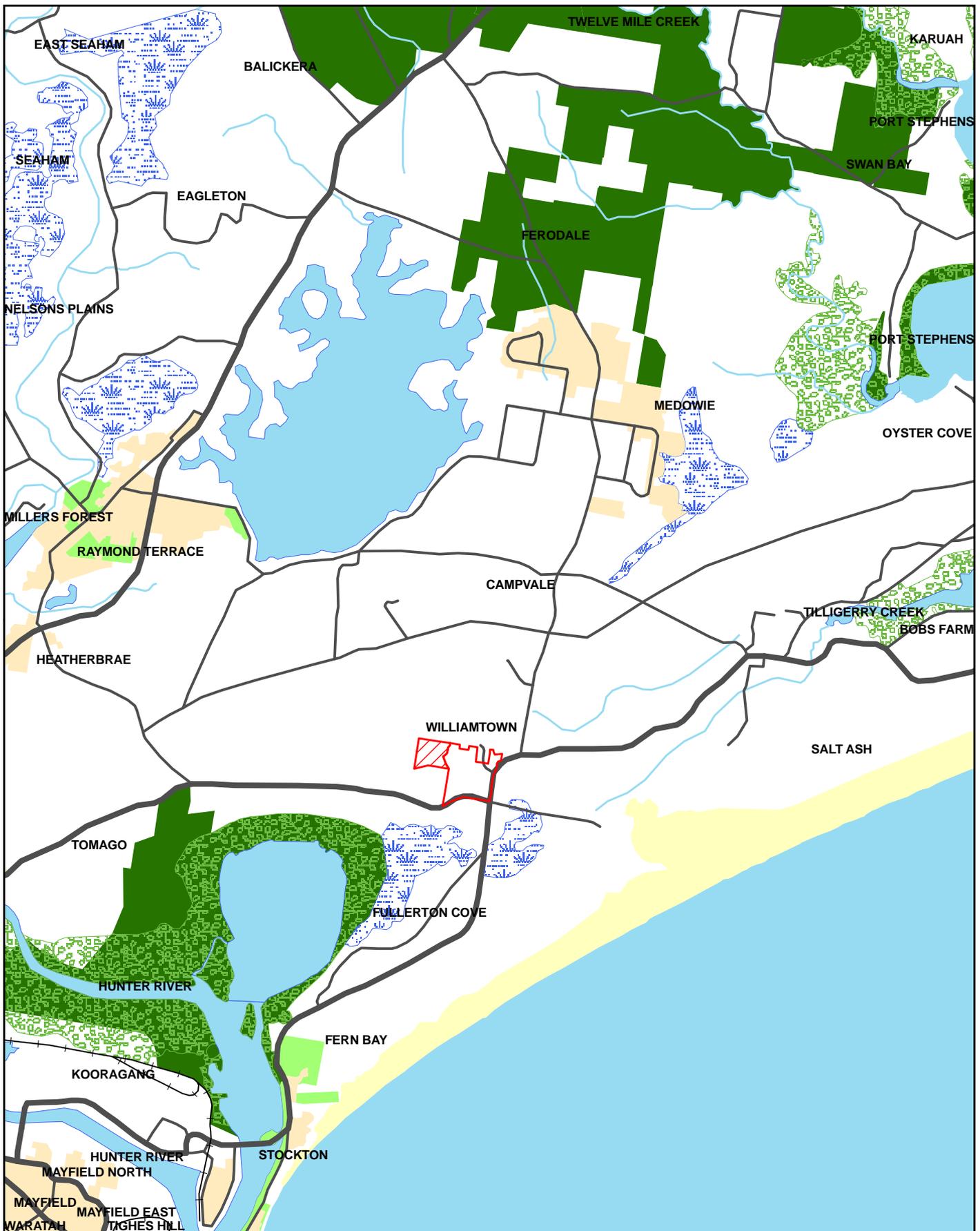
1. Introduction

Stage 2 of the Williamtown Defence and Airport Related Employment Zone (DAREZ) - Land Use and Development Strategy (Revised October 2007) undertakes a land capability and suitability assessment. This revised Land Capability and Suitability Assessment examines the physical and man-made constraints applying to the site that will influence, to varying degrees, the development potential of the land. The revised subject site, was originally defined through the preliminary investigations of Stage 1, now includes additional land. See Figure 1.

It then analyses a range of development options before recommending a preferred option in the form of a conceptual layout for discussion purposes. The concluding sections discuss the necessary controls on development, staging of land release, and the implications for the provision of infrastructure and for the conservation of environmentally sensitive areas in the site.

As required by the project brief, the following objectives and tasks are addressed:

1. *Assess the environmental and existing infrastructure constraints of the selected site and land surrounding to identify opportunities/constraints to the site development and associated growth of RAAF Base Williamtown and Newcastle Airport Limited (NAL) operations.*
2. *Assess the current and potential future operational requirements of the RAAF and the NAL against the possible land use options for the employment zone, including also the possibility to expand commercial airport activities (notably air freight movements) outside core RAAF hours of operation.*
3. *Consider the land, zoning and development control requirements to permit appropriate commercial and industrial development in the vicinity of the RAAF Base Williamtown and NAL with regard to:*
 - *Identifying and minimising land use conflicts and adverse environmental impact. Land uses surrounding the base and airport facilities must be compatible with and supportive of continued Defence activities. Protection of airspace, public safety, base security, local amenity and the primacy of the Defence activities are key considerations in the expansion of any aviation industry employment zone on lands in the vicinity of the Base;*
 - *Protecting inherent natural qualities e.g. natural / cultural conservation and ground water recharge areas;*
 - *Preventing urban encroachment to airfield operations and in so doing protecting the existing and future surrounding community of any adverse environmental impacts; and*
 - *Flooding constraints, ground water and surface drainage.*
4. *Identify and assess both the positive and negative externalities that may arise from increased aviation related activity.*
5. *Investigate and assess future infrastructure and transport requirements and provide indicative costing, funding and staging options consistent with final recommendations regarding the short to medium term and long term development opportunities.*
6. *Identify desired development options, land uses and staging in terms of land release, infrastructure provision and conservation works.*



LEGEND

- Additional Land for Investigation
- Study Area

- Rail
- Main Road
- Road

- Drainage
- Water
- Mangrove
- Wetland

- Reserves
- Sand dunes, beach

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 0 500 1,000 2,000 3,000 4,000
 Metres

Map Projection: Universal Transverse Mercator
 Horizontal Datum: Geodetic Datum of Australia 1994
 Grid: Map Grid of Australia, Zone 56



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NSW Department of Planning job no. | 22-128008
 Airport Related Employment Zone (Williamstown) rev no. | A
Site Location

29 | October 2007

Figure 01



2. Constraints and Limitations

2.1 Climatic Influences

Meteorological data has been recorded at the RAAF Base Williamtown since 1942. Mean daily temperatures range from 27.7°C in January to a low of 16°C in July. July also recorded the lowest recorded temperature of -3.9°C whilst January recorded the highest maximum temperature of 44.1°C.

September has the lowest mean monthly rainfall (58.7mm) while the wettest month is June with a mean monthly average of 120.8mm. The mean annual rainfall is 1109.4mm with the mean annual pan evaporation of 1715.5mm.

The four seasons have distinctive characteristic wind patterns. During autumn, winter and spring, winds are usually from the north-west, with a change to winds from the south-east to north-east in the autumn afternoon periods. Summer winds are predominantly from the north-east to south-east with southerly busters every three to five days (Source: RAAF Base Williamtown – Facilities Master Plan Report by GHD 1999).

The above climatic characteristics do not present any particular extremes that would constrain the use of the subject land for the purposes being considered. The exception being the impacts of flooding and slow stormwater runoff due to the low lying nature of the land, an issue that will require specifically designed engineering solutions as discussed below.

2.2 Physical Characteristics

The site is predominantly flat with substantial areas of lower lying wetlands and a smaller area of coastal sand dune rising and falling sharply over short distances within the flatter landscape. The landscape surrounding the site is of similar character. The 1: 100,000 Soil Landscape Sheet indicates that the Site falls on estuarine landscapes with deep, poorly drained Humic Clay soils. The area is defined as having limitations relating to permanently high water tables with seasonal waterlogging, foundation hazard, flooding hazard and potential acid sulfate soils (Matthei 1995).

Vegetation within the study area has largely been cleared, some remnant patches remain as is evident in the aerial photograph (Figure 2), cleared areas have some sparsely scattered overstorey trees. Remnant vegetation has the understorey removed in areas, generally those areas not inundated by water. The larger patches of remnant vegetation have a denser more intact understorey and tend to coincide with the 'Blind Harry Swamp Soil Landscape', detailed further in the following section.

The site is primarily rural in character. The area immediately south and in the vicinity of the civil airport and RAAF Base facilities is used for grazing purposes on an intermittent basis.

Residential and rural residential properties and the local primary school have frontages to Cabbage Tree Road along the southern extremity of the site and two services stations gain access to the Main Road (Nelson Bay Road) via side roads (Lavis Lane and Williamtown Drive).



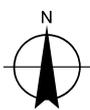
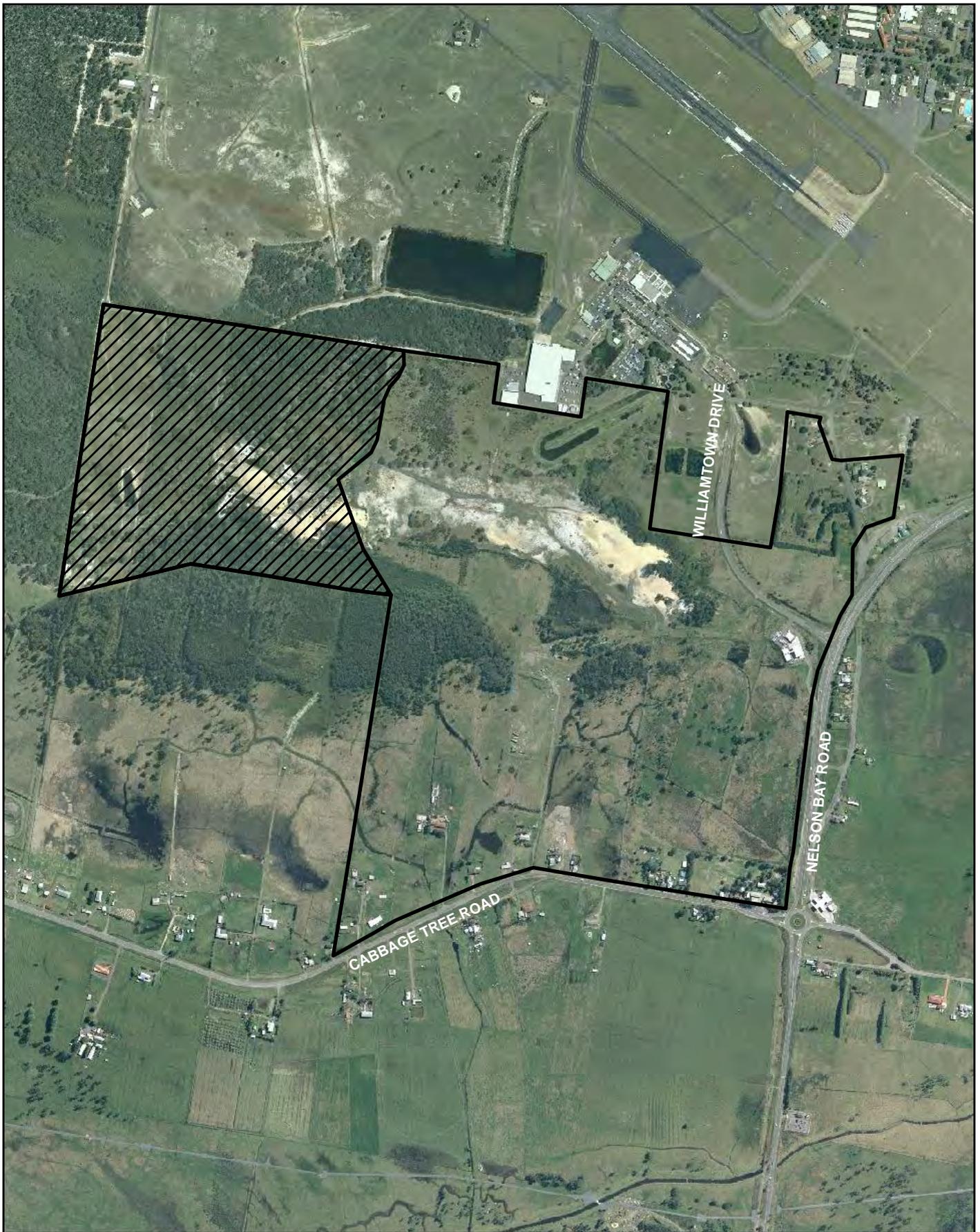
2.2.1 Additional Land Investigated

The investigative assessment of the Selected Site identified constraints to development in the southern more low lying land along Cabbage Tree Road. Subsequent analysis of the impacts of development on flood levels and the economic implications of the presence of compressible soils in this area, resulted in a decision by the Project Control Group (PCG) to include for investigation, additional land to the north west of the previously selected site. As a consequence of this decision, further technical investigations were required and several of the technical reports have had to be revised.

The additional land is approximately 40 ha in area and crosses three additional land parcels, approximately 900m north of Cabbage Tree Road. The two most western properties have frontage to Cabbage Tree Road however the additional land incorporates only the rear part of these lots. At this point in time, it is intended that all road access to the additional area would be internal and via Williamtown Drive and Nelson Bay Road. However, in the future additional access could be obtained from Cabbage Tree Road.

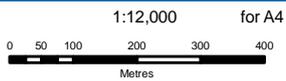
The land adjoins the Selected Site extending to the west (see Figure 2). It is generally more densely vegetated with a range of vegetation types including a tall eucalypt forest with dense undergrowth of long grasses, reeds, bracken and low shrubs.

To the south of this additional land, on the southern side of the dune formation is an uncleared swamp forest, defining the northern margin of the Blind Harry Swamp soil landscape group. Further west is denser undergrowth comprising long grasses, bracken and low shrubs, with extensive areas of small to medium sized paperbark trees and scattered tall eucalypts. The land is also flood prone.



LEGEND

-  Investigation Area
-  Additional Land for Investigation



Map Projection: Universal Transverse Mercator
 Horizontal Datum: Geodetic Datum of Australia 1994
 Grid: Map Grid of Australia, Zone 56



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NSW Department of Planning
 Airport Related Employment Zone (Williamstown)
**Areas Selected for
 Detailed Investigation**
 29 | October 2007

job no. | 22-12808
 rev no. | A

Figure 02



2.3 Soils and Geotechnical

2.3.1 Existing Drainage, Groundwater and Acid Sulfate Soils

Two major drains pass through the site, Moors Drain in the eastern half of the site and Dawsons Drain in the western half of the site. Moors Drain carries the majority of the stormwater from the Newcastle Airport land and surrounding land, as well as some of the runoff from the south-eastern end of the aircraft runway. Stormwater runoff from the northern catchment flows via a series of channels and pipes to Medowie Rd, into a culvert under Medowie Rd that flows to Tilligerry Creek. The remainder of the runoff from the RAAF Base flows to the south-western corner of the Base and is collected and discharged into the open detention channel known as Lake Cochran, which flows into Dawson's Drain and then to Fullerton Cove. It is considered that both drains intercept groundwater during a number of months of the year.

Defence have been undertaking monthly water quality testing in Dawsons Drain since 2003 as part of the Surface Water Monitoring Program. Groundwater levels at the site are expected to range between 0 and 3 m AHD, with the highest groundwater levels coinciding with the highest period of rainfall between the months of January and June (Wooley et al., 1995; GHD, 2006). Some lowering of the groundwater via drainage channels located within the site is expected to occur. However the degree to which this occurs has not been determined.

Groundwater flow directions from the site are to the south-east to south-west towards the lowlands of the Tilligerry Valley (Woolley et al., 1995). The closest Hunter Water Corporation Pump Stations, PS5, PS7, PS9 and PS23, are located a few kilometres to the north of the study site. Pumping at these stations is not expected to effect groundwater levels in the study area given the distance of these bores from the site.

The soils in the northern part of the site are dominated by permeable sands, which are highly vulnerable to contamination. This part of the site falls within a gazetted HWC Special Area, representing the catchment area of Hunter Water's drinking water sources. The Hunter Water (Special Areas) Regulation 2003 imposes controls on intensive agriculture, sewage disposal, and the bringing of potential pollutants within the gazetted Special Area. Measures are required to ensure groundwater and surface water are not polluted.

The Department of Defence have been monitoring groundwater quality within the northern part of the site in the vicinity of their Sewage Treatment Facility since 1999. Groundwater in this portion of the site is fresh (TDS < 500 mg/L) and moderately acidic.

The southern half of the site contains poorly-drained waterlogged soils and dark muds with potential Acid Sulphate Soils (ASS). This site is part of a remnant tidal waterway that once extended along the Stockton Dune Ridge from Fullerton Cove to Tilligerry Creek (Woolley et al., 1995). Unlike the more northern portions of the site and the rest of the Tomago sandbeds, soils along the Tilligerry Valley are expected to have low infiltration rates.



Groundwater this valley is known to be highly saline (TDS > 5,000 mg/L), unlike the drinking water resources of the Tomago aquifer and the northern sections of the study Site (DLWC, 1996). The lowering of water tables, drainage or excavation of potential ASSs within the southern part of the site is highly unlikely to have any significant impact on the drinking water resources of the Tomago Sandbeds. However, disturbance of these soils could impact upon surface water quality, with potentially serious ecological implications for the receiving waters of Fullerton Cove.

2.3.2 Additional Land Investigated

Due to the geotechnical issues raised in the first draft of this report, supplementary geotechnical investigations were recommended by GHD. The subsequent report "Preliminary Geotechnical Investigation Proposed Newcastle Airport Business Park in May 2007" by Douglas Partners raised concerns in relation to soft soils in the lower lying land. The report found soft compressible soils in the lower portion of Lot 11 and concludes that this land would still be feasible to develop but at a much greater cost. The report found that preloading and filling of the ground would be required to consolidate this soft soil and to make the site flood free. This filling may cause flooding issues to nearby properties. The PCG therefore resolved to investigate the suitability of additional land to the north west.

The additional land also falls within the gazetted HWC Special Area, and the Hunter Water (Special Areas) Regulation 2003 imposes specific controls on land uses and the bringing of potential pollutants within the gazetted Special Area. Measures would be required to ensure groundwater and surface water are not polluted. The soils of this additional area include permeable sands highly vulnerable to contamination of ground waters.

Mapping indicates that the additional area is not likely to contain potential acid sulfate soils (ASS) but if so they will be at greater depths (> 3metres depth). Disturbance of ASS's during development is much less likely than for the areas to the south.

2.3.3 Geotechnical and Geological Issues

The Stage 2: Preliminary Geotechnical Assessment by GHD, dated November 2006 (revised 17 August 2007) is enclosed as Appendix A of the Appendices Volume to this Report. The soil landscapes present on the site (including the additional land area) and their characteristics are discussed below. Approximate boundaries of each of the soil landscape units are shown in Figure 3

- ▶ The 'Bobs Farm' Soil Landscape Group presents generally high limitations for urban / industrial development in the central and southern portions of the site, including flooding, waterlogging and high foundation hazards. Organic clays of high plasticity do not generally provide a suitable foundation material due to the potential for compressibility of the organic matter and the high potential for differential settlement as a result of shrink/swell movements within the soil profile. Within this soil landscape group, estuarine and alluvial soil profiles are expected to be variable in extent, soil type and thickness, and both actual and potential ASSs are expected at shallow depth. The high limitations to development also extend to earthworks within this unit, which would be affected by high water tables, high plasticity (and potentially reactive and acidic) subsoils;



- ▶ The 'Tea Gardens' Soil Landscape Group presents moderate limitations for urban / industrial development in the northern margin of the site, including high foundation hazards in waterlogged swales, strongly linked to extremely acid soils and high wind erosion hazard. The sandy soils could present difficulties for earthwork operations, particularly in the silty strata;
- ▶ The 'Shoal Bay' Soil Landscape Group presents moderate limitations to urban/industrial development in the central northern portion of the site, similar to those of the Tea Gardens unit; and
- ▶ The 'Blind Harry's Swamp' Soil Landscape Group (identified as a submerged swamp forest) presents a severe limitation to urban or industrial development on the central western margin of the site. Soils within this area are generally waterlogged, strongly acidic, highly organic and possess a low wet bearing strength, resulting in obvious constraints to foundations and earthworks.

2.3.4 Additional Land Investigated

The Tea Gardens Soil Landscape dominates the area of additional land. The land also includes the Shoal Bay Soil Landscape across the central portion of the site and the lower portion includes the Blind Harry's Swamp Soil Landscape. See Figure 3.

Table 2-1 presents a summary of the potential geotechnical / geological constraints and the associated risks to future development within the study area. It also outlines possible control measures to reduce these identified risks.

Table 2-1 Summary of Potential Geotechnical / Geological Constraints to Development

Geotechnical Issue / Hazard	Potential Risk / Consequence	Possible Controls to Reduce Risk
Consolidation / differential settlement of loose or compressible soil layers	Settlement issues for flexible structures, loss of serviceability	Use of geotextiles and bridging layers; Use of preload to induce settlement prior to development.
Building footings on soft ground	Low or variable bearing capacity; Differential settlement due to the presence of soft estuarine clay and loose sands; Potential lateral discontinuity of foundation materials and layers.	Preload site using vertical drainage systems (eg, wick drains) if necessary to hasten consolidation; Reduce bearing pressures or design for higher settlements; Deepen foundations, selecting appropriate combinations of pile size, length and spacing; Use of piled raft slab.



Geotechnical Issue / Hazard	Potential Risk / Consequence	Possible Controls to Reduce Risk
Pavement construction on soft ground	Pavement failure due to poor subgrade; Differential settlement leading to loss of shape.	Raise subgrade level, improve subgrade; Provide appropriate pavement and subsoil drainage; Reinforce with geotextiles.
Placement of filling over soft ground to raise the site above the flood level	Potential bearing capacity failures and slope instability at the edges of the fill platform; Magnitude and rate of total and differential settlements.	Staged construction to allow for strength gain over time; Use of bridging layers and geotextiles; Use of light weight fill materials in embankment construction.
Availability of suitable resources required to construct embankments	Expense, and environmental factors may make sourcing of large quantities of fill impractical.	Minimise excavation of unsuitable on-site materials to reduce fill requirements (eg. Use bridging layers and preload rather than stripping excess quantities of soft soils).
Acid Sulfate Soils (ASS)	Possible environmental impacts of disturbance, including damage to aquatic ecosystems; Aggressivity of the soil and groundwater to buried structural elements.	Reduce excavation quantities; Treat spoil with lime, as per detailed ASS Management Plan (to be developed); Use of timber driven piles.
Erosion	Localised instability of dune slopes; Potential scouring of channels / environmental degradation.	Regrading of over-steepened scarps; Protect against erosion by revegetation.
High watertable / poor drainage (Grading of development area may be required to provide drainage for subdivision and minimize flooding)	Dewatering for construction requires the drawdown of the groundwater table which may lead to consolidation and may induce settlement of surrounding structures. Dewatering will expose / oxidise potential ASS.	Minimise disturbance to natural soils where possible. Detailed hydraulic assessment of the site to be undertaken to determine fill levels and potential impacts of flooding onto adjacent land.
Contamination	Potentially contaminating activities from past land use or nearby land use may impact on proposed development of the land.	Undertake contamination assessment including site history review to identify areas of potential contamination.



In summary, the geotechnical issues relevant to the proposed land development include (but are not necessarily limited to):

- ▶ Presence of soft ground, low bearing capacity compressible soils and unsuitable founding conditions;
- ▶ Magnitudes and rates of expected total and potential differential settlements;
- ▶ Fill platform/embankment foundation strength and likely impacts on batters and slope stability;
- ▶ High water table and waterlogged soils presenting a foundation hazard;
- ▶ Localised instability and/or erosion of dune slopes in the central portion of the site;
- ▶ Sources of available fill material to raise site levels above the 1:100 flood level;
- ▶ Potential disturbance of acid sulfate soils; and
- ▶ Potential disturbance of contaminated soil.

Generally these constraints or hazards are expected to be more prevalent across the low lying central and southern portions of the site, typically presenting high (to severe) limitations to development. However, moderate limitations may be evident for the development of the northern half of the site.

The possible consequences of these hazards may vary depending on the nature of the proposed development. While engineering solutions to the problems are identified above, the feasibility and the financial consequences of resolving the identified hazards will need further investigation. The preliminary geotechnical assessment found soft soils evident for a large proportion of the Site with potentially high or severe limitations for urban / industrial development. Testing presented these softer soils generally in the low lying land in the southern half of the site. To address this issue, deeper bore holes would be required to establish the depth of these soft soils. To progress the concept, the following would be necessary:

- ▶ Detailed geotechnical investigations to determine the nature of the subsurface conditions at greater depth and to assess the method of treatment for the Site, including the methodology for extensive site filling and on-site stormwater management initiatives;
- ▶ Investigation of the feasibility and financial consequences of resolving the identified hazards and the engineering solutions identified; and
- ▶ Detailed geotechnical risk register to advise of the likelihood and severity of each hazard, and to determine the necessary controls to reduce risks and associated constraints that may apply to certain developments.

Of the points listed above, the first and second dot points would generally need to be addressed prior to changing the land use zone to enable an employment zone. The third dot point, the geotechnical risk register, could be addressed by the developer prior to development approval.

In summary, an appropriate engineering solution can be employed to address the geotechnical constraints of the softer soils in the lower lying parts of the site to the south. Subsequent investigations by Douglass Partners found this unlikely to be economically feasible in the short term. However, it may well become more economically feasible in the longer term.



The “appropriate engineering solution” will depend on the particular circumstances applying to any site, together with the construction materials and techniques used in the structures to occupy the land. Consequently, the cost of the land preparation and management of settlement will vary accordingly. For example, a location with 5-6 metres of compressible clays would necessitate, at least, specific drainage treatment and pre-loading with fill to initiate primary settlement. Then, depending on the design of the structure may require anything from a simple raft slab under a light structure to pile supported footings of increased size and strength for a heavier structure. Until such time as more detailed investigations are undertaken to determine the severity of the constraints, the actual financial implications are unknown.

2.4 Acid Sulfate Soils

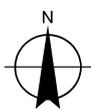
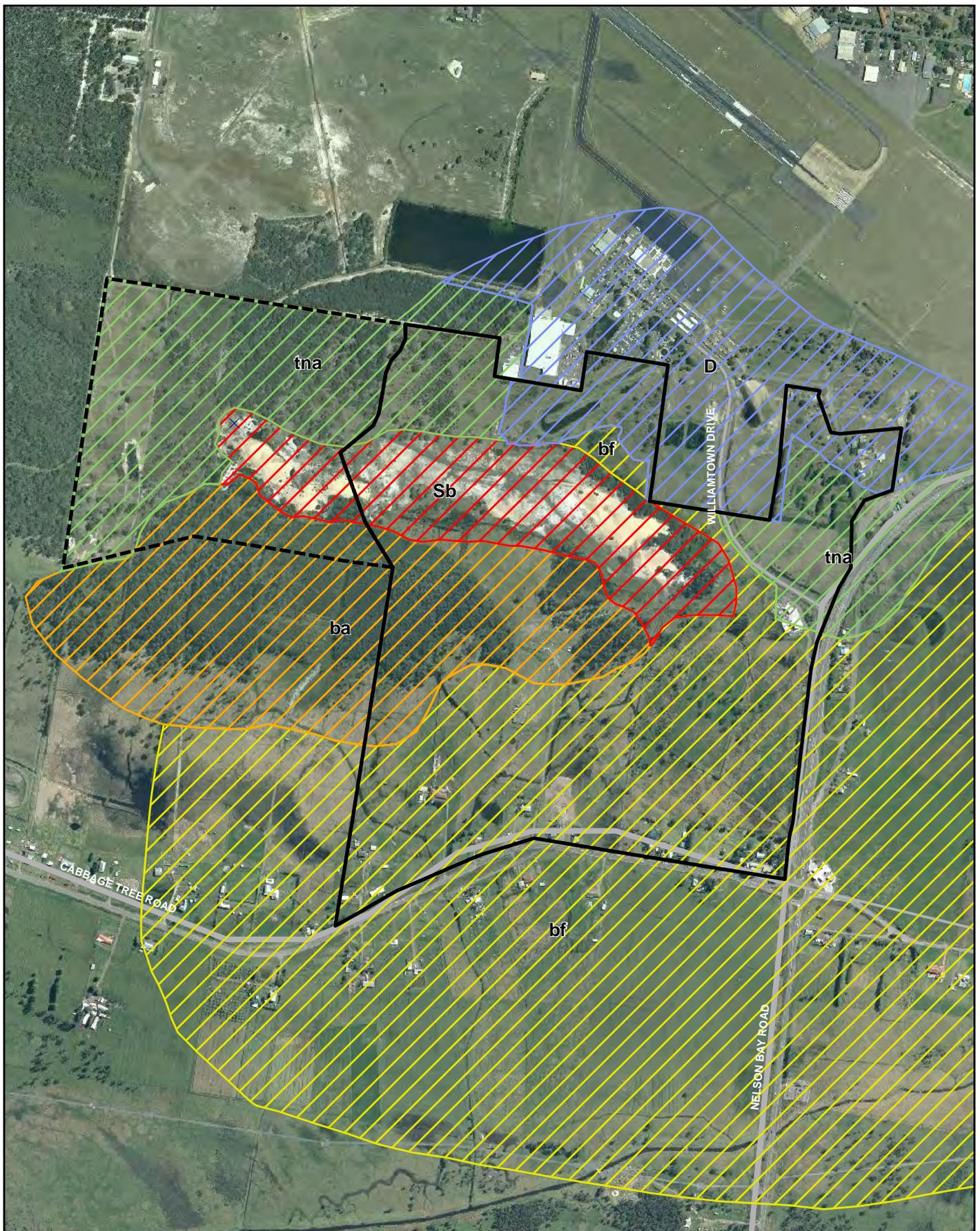
The Acid Sulfate Soil (ASS) Assessment (Revised August 2007) forms Appendix C to this report. This assessment was carried out in accordance with the relevant sections of the NSW ASS Manual, the ASS Planning Guidelines, ASS Assessment Guidelines and ASS Management Guidelines. Based on the results of this investigation, it is considered that the soils in the northern portion of the site (Low Probability ASS Map Class area) are unlikely to present a major ASS risk if disturbed. Soils located within the High Probability ASS Map Class are however, likely to present an ASS risk if excavated, drained or dewatered, thus triggering the need for a treatment regime and management plan if these soils are to be disturbed. Any such disturbances are unlikely to impact Tomago Drinking Water resources as water from this area is expected to discharge to the low-lying Tilligerry Valley. Water from soil disturbed in this area could, however, impact upon run-off surface water quality, which is of concern given the presence of major drainage systems within the site that discharge into Tilligerry Creek and Fullerton Cove.

2.4.1 Additional Land Investigated

The additional land area includes an extension of soils with a low Probability ASS Map Class. The Acid Sulfate Soil Risk Map for Williamstown indicates that there is a low probability of occurrence of ASS at a depth of greater than 3m below the existing surface in this slightly elevated area (above RL 4m AHD). This elevated area is described by the Risk Map as a Pleistocene Aeolian Sandplain/Dune and, if present, ASS within this area are expected to be sporadic and buried by alluvium and/ or Aeolian sediments.

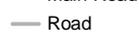
2.4.2 Section 117 Ministerial Direction No. 4.1

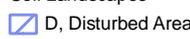
The requirements of Section 117 of the Environmental Planning and Assessment Act 1979, Ministerial Direction No. 4.1 relate to ASSs and have been addressed by this assessment. In accordance with Port Stephens LEP 2000, Port Stephens Council's ASS Policy and the ASS Model LEP, development consent will be required for works undertaken more than 1 m below the natural ground surface, and works likely to lower the water table to a depth of more than 1 m below the natural ground surface within the High Probability ASS Map Class area. These works will require an ASS Assessment and/or an Acid Sulfate Soils Management Plan (ASSMP) to be lodged with the development application. It is advisable that the landuses permitted within the High Probability ASS Map Class area of the site have well managed temporary or minimal to no disturbances to the soil or groundwater.

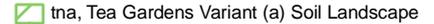


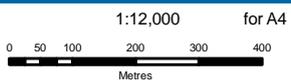
LEGEND

-  Initial Area
-  Additional Land for Investigation

-  Main Road
-  Road

- Soil Landscapes
-  D, Disturbed Area
 -  Sb, Shoal Bay Soil Landscape

-  ba, Blind Harry Swamp Soil Landscape
-  bf, Bobs Farm Soil Landscape
-  tna, Tea Gardens Variant (a) Soil Landscape



Map Projection: Universal Transverse Mercator
 Horizontal Datum: Geodetic Datum of Australia 1994
 Grid: Map Grid of Australia, Zone 56



CLIENTS | PEOPLE | PERFORMANCE

NSW Department of Planning
 Airport Related Employment Zone (Williamtown)
**Soil Landscape Groups
 within the Study Area**
 29 | October 2007

job no. | 22-12808
 rev no. | A

Figure 03



2.5 Hydrology, Flooding and Drainage

GHD has undertaken a preliminary assessment of the hydrology of the area including the current impacts of flooding and the management of stormwater runoff. The assessment forms Appendix C Hydrology, Flooding and Drainage Assessment (Revised October 2007). The subject site, including the additional lands are flood prone with flood depths for a 1 in 100 year event of up to 0.75m. A number of poorly defined drainage paths exist on the site. The requirements for flooding are to minimise potential adverse flooding upstream and downstream of the development. Existing drainage paths across the site need to be maintained realigned and modified to accommodate development on the site and to minimise adverse flooding impacts.

The drainage lines identified for realignment include the two drainage lines from the airport's water bodies located at the northern boundary connecting into the vegetated area in the central west of the site. It is also recommended to realign the existing drainage paths from the west boundaries and from the vegetated area to connect into the existing culvert crossing Cabbage Tree Road. Additional drainage on the eastern portion of the property is also recommended to minimise the volume of fill in this area to achieve required grades for surface runoff.

2.5.1 Fill Requirements

Filling of the development pad to RL 2.50m AHD is recommended to allow sufficient height after settlement for the construction of floor levels of at least 500mm above the assumed 100-year ARI flood level of 1.9m AHD. Finished Floor Levels (FFLs) should be constructed at a minimum of RL 2.4m AHD to the required level. The development area would need to be graded to provide drainage for the subdivision, to minimise nuisance flooding and prevent property damage in major flood events.

Based on the preliminary design requirements detailed, the estimated quantity of fill is 1,065,000m³. This estimate excludes geotechnical constraints, topsoil removal and consolidation. Estimated fill quantities will rely upon verified survey levels of the site, a lot layout and detailed flood study would be needed to refine this preliminary estimate. Additional drainage lines through the site could reduce the volume of fill required, though this would diminish the net developable area.

Flood characteristics for the Site and adjoining land post filling are to be assessed in more detail in the next stage of this project, once a draft structure plan containing a conceptual lot layout has been adopted. The accuracy of the assessment will depend upon the resolution of survey data available for the flood modelling. It is anticipated that the filling of the land together with the construction of formal drainage channels and detention systems, will limit flood impacts on developed areas to localised short term nuisance flooding associated with minimum grades and slow runoff. Given the extensive area of the flood plain within the catchment and the anticipated improvements to drainage flows from the site, there will be no noticeable increase in flood levels on surrounding properties.



2.5.2 Stormwater Quantity Requirements

Port Stephens Council generally requires industrial developments within the Tomago Aquifer to provide on-lot water quantity management. The common areas of the development, including the road reserves would be treated within a regional facility. To minimise the impacts of the proposal on adjacent lands, it is important that the:

- ▶ Annual stormwater volume discharged from the site is comparable to the equivalent existing values; and
- ▶ Peak flow rate for all peak ARI storm events is comparable to the equivalent existing flows from the site.

Two separate components require assessment, one to maintain the volume of stormwater and one to reduce the peak flows from the site.

2.5.3 Maintain Annual Volume

Development within the area would increase the area of imperviousness of the existing catchment. This increase subsequently reduces the infiltration capacity of the area, increasing the amount of rainfall that would run off the site. To prevent this increase in volume, allotment strategies could include capture and on-site reuse in accordance with the Department of Water and Energy stormwater harvesting and reuse guidelines or infiltration back into the groundwater after suitable treatment.

The sizing of such structures will be strongly dependant on the type of development and the area of imperviousness for each site and would be subject to individual allotment assessments.

2.5.4 Maintain Peak Flows

The development of each lot would be required to maintain the effective 10 to 100 year ARI peak flow rates from the site. This could be achieved through an underground or above ground detention system that limits flows off the site. The configuration of this system would be subject to the lot size and the percentage of imperviousness of each lot.

2.5.5 Road Reserve Stormwater Quantity Requirements

The road reserve stormwater quantity could be attenuated through roadside infiltration tanks and end of line structures where the waterways from the site cross Cabbage Tree Road. These structures could act as both an infiltration area and a means for peak flow detention. This would treat both the annual quantity and peak flow rates from the road reserve. The general size of these devices could be minimised and located within the road reserve reducing land take, as it would be treating only a minor portion of the catchment.



2.6 Stormwater Quality Requirements

2.6.1 Allotment Stormwater Quality Requirements

It is assumed that each allotment would be required to treat stormwater so that it does not adversely impact on the quality of the groundwater and it achieves the discharge criteria set out by the Department of Water and Energy (DWE) and Hunter Water. This could involve each lot providing structures to remove and collect litter, sediments, nutrients and hydrocarbons.

2.6.2 Road Reserve Stormwater Quality Requirements

The road reserve stormwater quality measures would be of a similar fashion to that of the allotment strategy with the road reserve treatment consisting of measures to remove common road pollutants. These measures could include source controls like swales and bioretention running parallel with the road or end of line controls including gross pollutant traps, bioretention areas and sand filters. The final configuration of the stormwater quality measures would be determined on the development of a road and lot layout.

2.6.3 Stormwater Management

Based on the stormwater and flooding requirements of the site, the following is required to advance future development:

- ▶ Detailed hydraulic assessment of the site to determine the fill levels and the potential impacts of flooding on adjacent lands. A detailed site survey with sufficient resolution to generate contours with a 100 mm resolution will be required;
- ▶ Geotechnical investigation to determine the ground conditions and the suitability of the site for filling; and
- ▶ Lot and road layout to determine the configuration of the stormwater system and the areas recommended for trunk drainage stormwater treatment.

2.6.4 Additional Land Investigated

The site selected in the first stage of this project proposed development of the site that would require a significant amount of fill and the realignment and better definition of the existing drainage paths. This area may still be developed in the future, however the additional lands are not anticipated to require fill to such a significant extent. Consequently, to assist in the management of stormwater quality and quantity from future development, it will be necessary to ensure that runoff from each development lot is controlled through detention, infiltration and re-use. The Development Control Framework will need to specify the stormwater management requirements. This is to be carried out in the subsequent stage of the project relating to Structure Planning and Development Control Framework.



2.6.5 Section 117 Ministerial Direction No. 4.3 – Flood Prone Land

Section 117 Direction No 4.3 seeks to ensure that any draft LEP is consistent with the NSW Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005 (including the Guideline on Development Controls on Low Flood Risk Areas). This Ministerial Direction also requires that any provisions of an LEP be commensurate with requirements relating to flood hazards and potential impacts both on and off the subject land. In relation to the proposed rezoning of flood prone land for development purposes, the Directive states that a draft LEP may be inconsistent only if Council can satisfy the Director-General (or an officer of the Department nominated by the Director-General) that:

- (a) The draft LEP is in accordance with a floodplain risk management plan prepared in accordance with the principles and guidelines of the Floodplain Development Manual 2005, or
- (b) The provisions of the draft LEP that are inconsistent are of minor significance.

The next phase of the hydrological assessment (as part of Stage 3) is to ascertain the likely impacts arising from the filling and development of the land. Once the impacts are known, a judgement will be made as to whether an inconsistency of the draft LEP with the Directive can be argued on the basis of the rezoning being of minor significance in terms of the resulting impacts.

If it is determined that a floodplain risk management plan is required for the rezoning to proceed, discussions with land owners will be required in relation to funding to undertake the work.

2.7 Water Quality Management

2.7.1 Water Quality

Tomago Sandbeds Special Area: The site is partly within the Tomago Sandbeds Special Area, which supplies 20 to 25% of drinking water to the Lower Hunter and also plays a central strategic function in HWC's Drought Management Plan and source substitution capabilities. The ongoing ecological health of this resource is of paramount importance to the HWC in accordance with their role within the Hunter Water (Special Areas) Regulations (HWC, 2006).

Aquifer Interference: HWC advise they would be concerned about construction or operational activities with the potential to interfere with the aquifer. Such activities would need to be approved by the DWE under the provisions of the Water Management Act, 2000 and would be best regulated via the inclusion of provisions in the development control framework and through conditions of consent.

Safe Storage and Handling of Fuels/Chemicals: To avoid chemical spills and contamination of the groundwater HWC stipulate that any storage or handling of chemicals and fuels must be done in accordance with the appropriate Australian Standards. Contingency response plans for emergency procedures for chemical spills should be a requirement for such developments, outlined in the Development Control Plan for the area.