8 Environmental Impacts

This section provides an assessment of the environmental impacts associated with the development of the *CENTRAL Concept Plan* and the *DHL Project*. The environmental assessment is based on a number of specialist studies undertaken for the *Draft ESTATE Concept Plan*, as well as additional project-specific studies where required.

8.1 Soil and Water

8.1.1 Overview

A number of specialist soil and water assessments have been undertaken for the *Draft ESTATE Concept Plan*, including:

- *Geotechnical and Hydrogeological Assessment*, prepared by Douglas Partners Pty Limited, to investigate geology, soils and groundwater conditions on the Oakdale land, and to assess the potential for erosion and sedimentation, salinity and acid sulfate soils;
- *Phase 1 Contamination Assessment*, prepared by HLA ENSR Pty Limited, to investigate the potential for soil and groundwater contamination across the site;
- *Limited Phase 2 Contamination Assessment*, prepared by HLA ENSR Pty Limited, to further assess the potential for contamination on Lot 2 DP120673 (*Oakdale CENTRAL*);
- *Riparian Areas Assessment*, prepared by GHD Pty Limited, to classify and assess riparian areas and waterbodies on the site;
- *Water Balance Report*, prepared by GHD Pty Limited, to investigate and assess the most sustainable means of servicing the project for potable water and sewer;
- *Sewer Servicing Strategy*, prepared by GHD Pty Limited, to provide a sustainable solution for sewage management for the project; and
- *Water Sensitive Urban Design Strategy*, prepared by GHD Pty Limited, to provide a sustainable solution for stormwater drainage from the project. The strategy also includes an assessment of flood levels across the site.

These assessments accompany this Environmental Assessment (see accompanying *Oakdale ESTATE* Specialist Studies Volume).

Additional specific assessments have been undertaken for the *CENTRAL Concept Plan* and *DHL Project*, as described in the following sections.

8.1.2 Erosion and Sedimentation

Overview

The Oakdale ESTATE Geotechnical Assessment indicates that the soils of the site (apart from the very western area adjacent Ropes Creek) belong to the Blacktown Soil Landscape, which are residual soils with moderate erodibility.

It is noted that the approved Bedford Quarry (see Section 2.3.1) is currently modifying the natural soil landscape of much of the site, removing much of the clay resource on site and forming a final landform that is consistent with the required building levels required for the project.

Erosion and sedimentation risks associated with the *CENTRAL Concept Plan* and *DHL Project* are able to be effectively managed using standard best practice control measures, including:

- minimising disturbance areas;
- diverting ‘clean’ run-on water around disturbance areas;
- controlling ‘dirty’ run-off water from within the disturbance area via various controls such as sediment fencing and sediment basins; and

- rehabilitating disturbed areas as quickly as possible following disturbance.

CENTRAL Concept Plan
To manage erosion and sedimentation risks associated with the development of the *CENTRAL Concept Plan*, Goodman has committed to preparing Erosion and Sediment Control Plans / Soil and Water Management Plans to accompany each project/development application involving ground disturbance.

DHL Project
In accordance with the *CENTRAL Concept Plan* commitments, a Soil and Water Management Plan has been prepared for the DHL facilities, and is attached as **Appendix B**.

The Soil and Water Management Plan has been prepared in accordance with the above principles and the Department of Housing's *Soil and Water Management for Urban Development* manual. The plan has also been prepared in a manner that integrates with the continued operation of the Bedford Quarry to the west of the development site.

Additional Erosion and Sediment Control Plans / Soil and Water Management Plans would be prepared for the other estate works (including bulk earthworks on other development lots, and estate roadworks), prior to the commencement of construction of these works, to the satisfaction of the Director-General.

It is noted that the estate works involve a bridge crossing for the Link Road (Option A) over the tributary to Ropes Creek in the middle of the *Oakdale CENTRAL* site. This bridge would be designed and constructed in accordance with a specific Watercourse Crossing Management Plan. This plan would be prepared in consultation with the DWE and in accordance with applicable guidelines, including DWE's *Watercourse Crossing Design & Construction Guideline* (Draft, 2007) and *Works and Watercourse Design Guideline* (Draft, 2007).

8.1.3 Site Contamination

Overview
The potential for site contamination has been assessed as part of the *Draft ESTATE Concept Plan*. The assessment includes a Phase 1 Site Contamination Assessment over the entire *Oakdale ESTATE*, and a detailed Phase 2 Site Contamination Assessment over *Oakdale CENTRAL*.

The Phase 1 Assessment found that the Oakdale land has not been subject to significant development in the past and there is no evidence of significant contamination-related constraint to future industrial development of the land.

The assessment identified a number of relatively small potentially contaminated areas, as shown on Figure 2.7. Areas identified within *Oakdale CENTRAL* include:

- portions of the precinct where application of 'enviro-soil' has occurred. Enviro-soil is a fertiliser sourced from Sydney Water Corporation, and comprises recycled waste from sewage treatment plants;
- the visual bunds on the eastern and southern boundaries; and
- areas where water from Austral Bricks' settling ponds may have been pumped over parts of the precinct.

The Phase 1 Assessment recommended additional investigation of these contamination sources, in line with applicable project/development applications.

The subsequent Phase 2 Site Contamination Assessment further assessed the identified contamination sources within *Oakdale CENTRAL*.

The Phase 2 Assessment was undertaken in accordance with applicable DECC and National Environment Protection Measure (NEPM) guidelines, and included analysis of 37 primary soil samples from 25 test pit locations.

The assessment noted that:

- whilst enviro-soil has been applied to pasture lands at the site, the application (after tilling) has reportedly only occurred to shallow depth;
- potential impacts, if any, associated with the pumping of settlement pond waters could be expected to be of limited vertical extent; and
- no obvious indications of contamination to surface soils in the vicinity of the visual bunds were observed. It is also noted that review of documentation provided by Austral indicates that the bunds are predominantly VENM sourced from various Sydney metropolitan sites.

The soil samples were analysed for a range of potential contaminants, including:

- heavy metals, including arsenic (As), barium (Ba), cadmium (Cd), chromium (Cr), copper (Cu), manganese (Mn), mercury (Hg), nickel (Ni), lead (Pb) and zinc (Zn): potentially associated with enviro-soil and settlement pond water;
- total petroleum hydrocarbons (TPH): potentially associated with enviro-soil;
- polycyclic aromatic hydrocarbons (PAH): potentially associated with envirosoil;
- organochlorine pesticides (OCP) and organophosphorus pesticides (OPP): potentially associated with enviro-soil and to a lesser extent, with previous rural activities; and
- phenoxy acid herbicides: associated with weed control.

Concentrations of contaminants were found to be below the applicable site assessment criteria in all of the soil samples.

The assessment included a review of letter reports regarding the source of imported soil materials used to create the visual bunds. The assessment found that, based on the documentation reviewed, the visual bunds comprise virgin excavated natural material (VENM). The assessment notes that relatively minor amounts of construction debris (eg. concrete, blue metal gravel and crushed brick) have been incorporated into the bunds.

The Phase 2 Assessment concludes that the *Oakdale CENTRAL* precinct is suitable for commercial/industrial landuse without further assessment or remediation, and that soils on the site could be beneficially re-used on the site.

CENTRAL Concept Plan and DHL Project

Given the above, it is considered that the *Oakdale CENTRAL* precinct is suitable for the proposed landuse without further assessment or remediation.

8.1.4 Salinity

Overview

The Oakdale ESTATE Geotechnical Assessment indicates that the soils of the majority of the site have a low to moderate salinity risk, however some areas close to the tributary of Ropes Creek have a high salinity risk potential (see Figure 2.6).

The Oakdale ESTATE Geotechnical Assessment includes a detailed consideration of the salinity risk and strategies for minimising the salinity risk associated with the development of Oakdale. These strategies include:

- maintaining the natural water balance;
- maintaining good drainage;
- avoiding disturbance or exposure of sensitive soils;
- retaining or increasing appropriate native vegetation in strategic areas; and
- implementing building controls and engineering responses where appropriate.

CENTRAL Concept Plan

With the implementation of the above strategies, it is considered that salinity risk associated with the development of *Oakdale CENTRAL* is able to be effectively minimised and/or managed.

The *CENTRAL Concept Plan* includes a commitment to preparing Salinity Assessment and Management Plans as part of detailed geotechnical investigations for the development of *Oakdale CENTRAL*, to the satisfaction of the approval authority. The plans would:

(a) be prepared in consultation with Council, prior to the commencement of construction of any project involving ground disturbance;
(b) be prepared in accordance with applicable guidelines, including the *Western Sydney Salinity Code of Practice* (2003) and *Site Investigations for Urban Salinity* (2002);
(c) assess salinity risk on the site, based on soil and (where applicable) groundwater testing and investigation;
(d) where applicable, describe the measures that would be implemented to minimise and manage salinity risk; and
(e) describe the measures that would be implemented to monitor salinity risk during construction and operation of the project/development.

DHL Project

In accordance with the above commitment, Goodman has committed to preparing a Salinity Assessment and Management Plan for the *DHL Project*, in consultation with Fairfield Council, and to the satisfaction of the Director-General.

With the adoption of these measures, and prudent erosion and sediment control measures, it is considered that salinity risk is able to be effectively managed for the *DHL Project*.

8.1.5 Stormwater Management

Overview

A comprehensive Water Sensitive Urban Design (WSUD) Strategy for the *Oakdale ESTATE* has been prepared for the *Draft ESTATE Concept Plan*. A plan outlining the key elements of the strategy is presented on Figure 8.1.

The key features of the Oakdale WSUD Strategy include:

- suitable riparian zones to maintain and enhance the ecological value of the existing watercourses;
- bio-retention swales at major overland flow routes and bio-retention basins or wetlands to remove pollutants from the stormwater runoff;
- on-lot stormwater treatment facilities including vegetated systems, infiltration systems and structural facilities (gross-pollution traps);
- either precinct style stormwater detention facilities or OSD provided for each precinct/lot before discharge to the receiving waters; and
- where possible, separation of road and lot drainage systems until stormwater runoff from both areas has been treated.

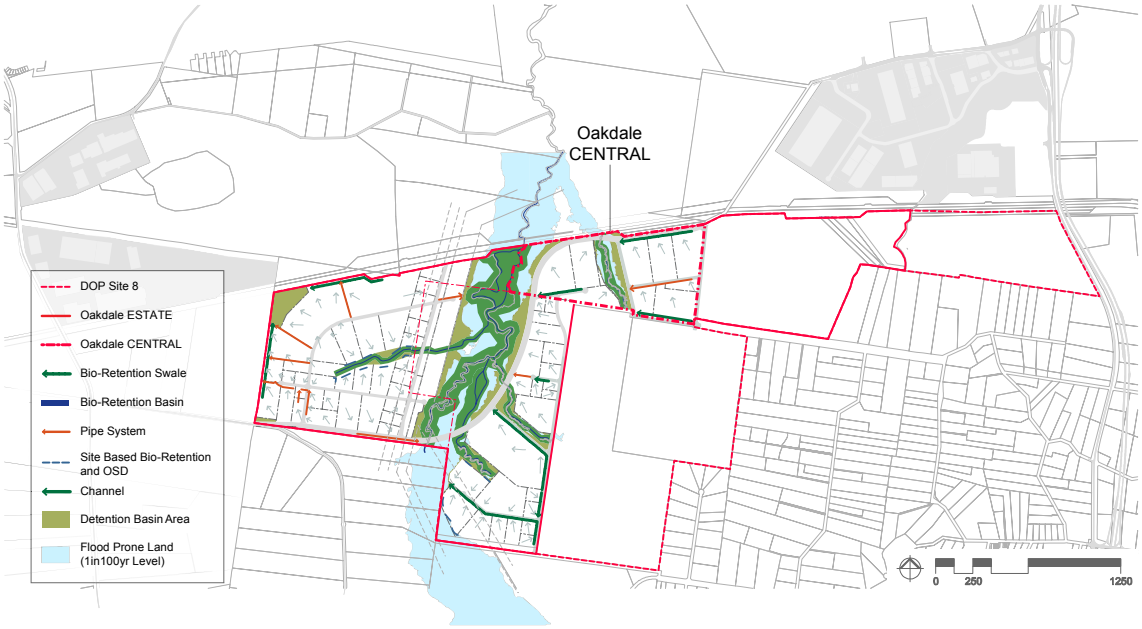

Figure 8.1: *Oakdale ESTATE Water Sensitive Urban Design Strategy*

All stormwater drainage development on *Oakdale CENTRAL* would be undertaken in a manner that is generally consistent with the Oakdale ESTATE WSUD Strategy.

In particular, stormwater infrastructure would be designed to meet the following criteria:

- stormwater quantity:
  - post development flows to match pre-development flows;
  - on-lot or precinct level detention systems to achieve:
    - on-site detention of 250 m^3/hectare; and
    - permissible site discharge of 140 l/s/hectare;
- stormwater quality:
  - total suspended solids: 85 % reduction;
  - total phosphorus: 65% reduction;
  - total nitrogen: 45% reduction; and
  - gross pollutants: 90% reduction.

Modelling undertaken for the WSUD Strategy indicates that the development of Oakdale would comfortably meet these criteria.

CENTRAL Concept Plan

To effectively plan and manage the implementation of the WSUD Strategy for *Oakdale CENTRAL*, the *CENTRAL Concept Plan* includes commitments to preparing:

- Stormwater Management Strategies to accompany applicable project/development applications, which:
  - outline the proposed stormwater management scheme for the proposal; and
  - assess the proposal against the stormwater quantity and quality criteria of the Oakdale WSUD Strategy, and relevant NSW Government and Council guidelines; and
- detailed Stormwater Management Plans to be prepared prior to construction for applicable projects/developments applications. The plans would be prepared in consultation with the applicable Council, and:
  - be consistent with the Oakdale ESTATE WSUD Strategy and the project-specific Stormwater Management Strategy;

- include detailed plans showing the proposed stormwater management scheme for the site, including any rainwater harvesting infrastructure;
- fully detail measures to incorporate the Category 3 streams into the stormwater scheme, in accordance with DWE's *Watercourse and Riparian Area Planning, Assessment and Works Design Guideline* (Draft Version 1: January 2007);
- demonstrate that the proposed stormwater scheme would comply with the performance criteria in the *CENTRAL Concept Plan*; and
- describe how the efficiency and effectiveness of the proposed scheme would be monitored and maintained over time.

DHL Project

Stormwater management for the *DHL Project* has been designed in a manner that is consistent with the overall Oakdale ESTATE WSUD Strategy. In this regard, and consistent with the *CENTRAL Concept Plan* commitments, a Stormwater Management Strategy for the DHL facilities has been prepared by GHD Pty Limited, and is attached as **Appendix C**.

A plan outlining the stormwater management strategy for the DHL facilities is shown on Figure 8.2, and the key elements of the drainage system include:

- a vegetated swale along the northern boundary, draining to a precinct bioretention basin (Basin 1);
- formalisation of the drainage channel on the southern boundary into a vegetated swale, draining to the Ropes Creek tributary; and
- on-site detention provided to each of the proposed facilities.

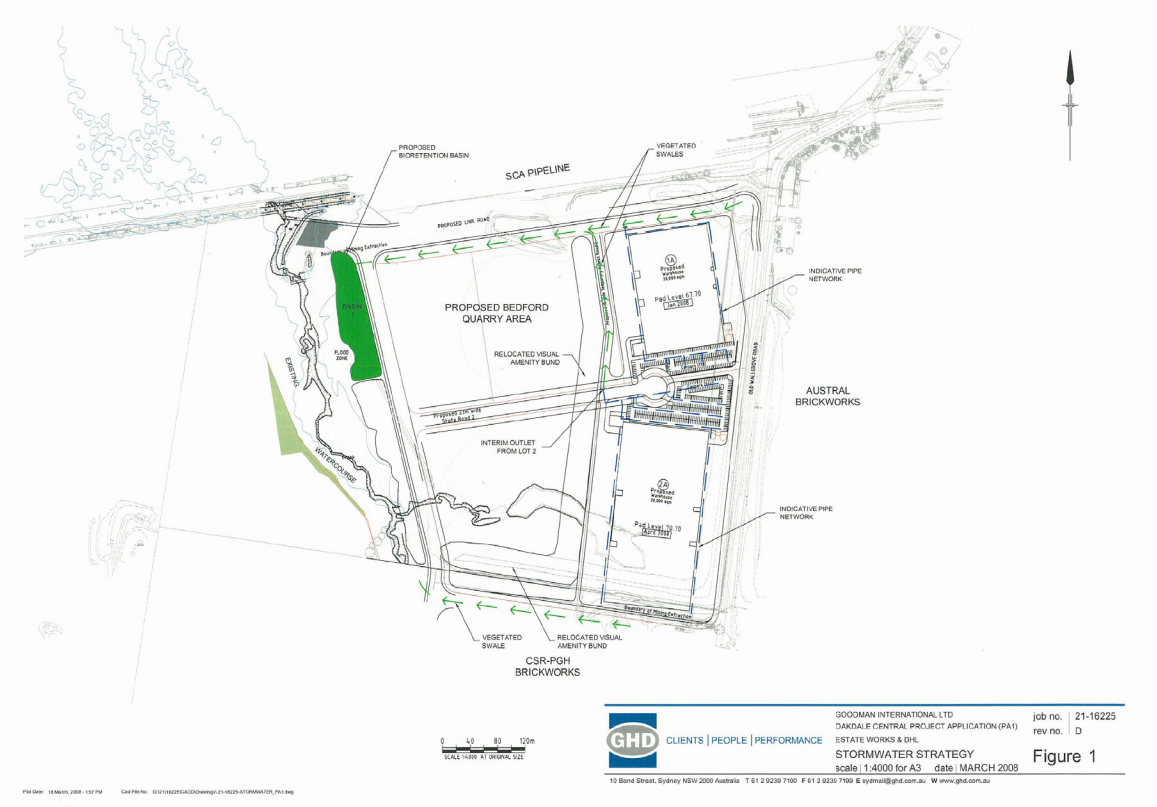

Figure 8.2: *DHL Facilities Stormwater Management Strategy Plan*

It is noted that the drainage channel along the southern boundary of the site is identified as a Category 3 stream in the Oakdale ESTATE Riparian Areas Assessment. Flows in this ephemeral stream are largely curtailed at present as most of its catchment forms part of the upstream

CSR/PGH quarry/brickmaking plant, with water captured and retained as part of that quarry's dirty water management system. As the CSR quarry is likely to eventually be rehabilitated, the channel sizing and design for the project is based on pre-existing flow volumes (ie. in the absence of the CSR quarry).

It is also noted that this channel has been relocated from its 'natural' position as part of the existing Bedford Quarry operations on the site. In accordance with the quarry plans, the channel now runs along the southern boundary of the site, on a similar alignment to the proposed channel location under the *DHL Project*.

With regard to stormwater quantity, the DHL facilities provide for on-site (ie. on-lot) detention, with tank sizing in accordance with the parameters evaluated in the Oakdale ESTATE WSUD Strategy (ie. 250 m^3/ha for detention with a permissible site discharge of 140 L/s/ha). This would ensure that post-development flows mimic pre-development flows.

With regard to stormwater quality, the proposed stormwater scheme for the DHL facilities has been modelled in the DHL Stormwater Management Strategy using MUSIC software. The results of the analysis are summarised in the following table, and indicate that the DHL facilities would comfortably comply with the stormwater quality criteria in the *Draft ESTATE Concept Plan*.

Table 8.1: *Water Quality Modelling Results*

Pollutant	***Sources***	***Residual Load***	***Reduction***	***Reduction Criteria***
Total Suspended Solids (kg/yr)	16,800	471	97.2 %	85 %
Total Phosphorus (kg/yr)	27.5	5.35	80.5 %	65 %
Total Nitrogen (kg/yr)	188	85.8	54.2 %	45 %
Gross Pollutants (kg/yr)	2,930	0 (approx)	99 % (approx)	90 %

In accordance with the commitments made in the *CENTRAL Concept Plan*, and following on from the DHL Stormwater Management Strategy, Goodman would prepare a detailed Stormwater Management Plan for the DHL facilities, in consultation with Fairfield Council, and to the satisfaction of the Director-General.

Additional Stormwater Management Plan/s would be prepared for the other estate works (ie. estate roadworks), prior to the commencement of construction of these works, to the satisfaction of the Director-General.

8.1.6 Flooding

The Stormwater Management Strategy undertaken for the *DHL Project* includes a review and update of the 1 in 100 year flood levels identified in the *Draft ESTATE Concept Plan*, based on detailed field survey. The updated flood levels – which include only minor differences to the flood extent defined for the *Draft ESTATE Concept Plan* (see Figure 2.8) – are shown on Figure 8.2.

CENTRAL Concept Plan

The *CENTRAL Concept Plan* would generally avoid employment related development of the flood affected area. This area is proposed to be used for environmental conservation and recreational landuse. Flood assessments would be undertaken for any development (apart from minor works) within the 1 in 100 year flood level. In addition, a Flood Evacuation Strategy would be prepared for any applicable developments below the Probable Maximum Flood level.

DHL Project

The DHL facilities do not involve any development within the flood affected area, with the proposed buildings located well above the 1 in 100 year flood level. The project's stormwater

bioretention basin (see Figure 8.2) would also be located wholly above the 1 in 100 year flood level.

The wider estate works involve a bridge crossing for the link road over the Ropes Creek tributary in the middle of the *Oakdale CENTRAL* site. This bridge would be constructed above the 1 in 100 year flood level, with a nominal freeboard of 0.5 metres. The bridge crossing would be undertaken in accordance with a detailed Watercourse Crossing Management Plan (as discussed in Section 8.1.2). This plan would include demonstration that the proposed bridge would not have a detrimental impact on surface water flows and flooding.

8.1.7 Soil and Water Pollution

Apart from the general stormwater runoff quality (as discussed in Section 8.1.5), development of *Oakdale CENTRAL* has the potential to pollute soil and water through:

- potentially contaminating operations of the proposed industrial facilities; and
- on-site sewage treatment and disposal.

Facility Pollution Risk

Pollution risks associated with proposed industrial facilities within *Oakdale CENTRAL* would be assessed on a project-by-project basis.

With regard to the DHL facilities, it is noted that the proposed facilities do not involve processes that entail a significant risk of soil or water pollution. The facilities would be involved in standard warehousing and distribution activities, and are not expected to present a significant risk of pollution. The proposed facilities do not involve the storage of significant amounts of dangerous goods or hazardous materials.

Notwithstanding, the potential for soil and water pollution associated with the operation of the *DHL Project* would be mitigated by:

- implementation of the stormwater management strategy outlined above; and
- storage of all dangerous goods and hazardous materials in accordance with the Dangerous Goods Code and *AS 1940-2004: The storage and handling of flammable and combustible liquids*.

Sewage Management Risk

As outlined in Section 3.2.3, the *Draft ESTATE Concept Plan* proposes an innovative self-contained sewage management system to service the Oakdale lands. The Oakdale ESTATE Sewer Servicing Strategy (as part of the Oakdale ESTATE Infrastructure Concept Plan) is based on comprehensive water balance assessment and analysis. *Oakdale CENTRAL* would be serviced in accordance with this strategy.

Sewage from each allotment within *Oakdale CENTRAL* would be collected, treated to recycled water standards as defined by the *NSW Guidelines for Urban and Residential Use of Reclaimed Water* (1993), and recycled for non-potable uses including toilet flushing, air conditioning cooling, truck washing and garden watering.

Any surplus recycled water (the amounts of which are not predicted to be significant) would be disposed of by irrigation in an area allocated on each lot or precinct, in accordance with DECC's *Environmental Guidelines for the Use of Effluent by Irrigation* (2004) and Fairfield City Council's *On Site Sewage Management Strategy* (2002).

The dedicated sewage treatment plants would be provided on either a lot by lot basis (for large lots), or to service a cluster of lots. Detailed multi-criteria analysis indicates that these options

provide a more sustainable solution than a centralised treatment plant (see water balance assessments in the Oakdale ESTATE Infrastructure Concept Plan).

A collection system and emergency / buffer storage system would be provided for each system, to be located either on each lot (for on-site systems) or adjacent to the cluster treatment plant (for cluster systems).

Soil and water pollution risks associated with the sewage treatment systems would be minimised and managed through:

- **Treatment Type** – Sewage treatment would involve tertiary treatment with disinfection (ie. to recycled water standards as defined by the *NSW Guidelines for Urban and Residential Use of Reclaimed Water* (1993)). The relevant effluent criteria are presented in Table 8.2 below;
- **Emergency Storage** – Emergency storage would be provided for the containment of untreated sewage in the event of a system malfunction. A volume equivalent to 3 days design wet weather flow is proposed. This would allow sufficient time for repairs to be undertaken or pump-out by tanker to occur; and
- **Recycled Water Irrigation Area Design** – The proposed recycled water irrigation areas would be designed in accordance with relevant guidelines, including the DECC's *Environmental Guidelines for the Use of Effluent by Irrigation* (2004) and applicable Council codes, including Fairfield City Council's *On Site Sewage Management Strategy* (2002) and include adequate buffers to sensitive landuses and appropriate irrigation areas to prevent soil and water degradation.

Table 8.2: *Effluent Criteria for Irrigation*

Parameter	***Level / Criteria***
Level of Treatment	Tertiary
BOD	<20 mg/L (secondary treatment)
SS (NFR)	<30 mg/L (secondary treatment)
Coliforms	<10 in 100ml (<2.5 in 100ml geometric mean at point of use)
Faecal Coliforms	<1 in 100ml
Turbidity	<2 NTU (geometric mean) <5 NTU (95^{th} percentile)
PH	6.5 – 8 (allowable range) 7 – 7.5 (desirable range)

The Oakdale ESTATE Sewer Servicing Strategy includes an assessment of the required irrigation areas to meet the above criteria. The assessment was undertaken using the recycled water generation rates (as determined in the Oakdale ESTATE Water Balance assessments) and assuming that:

- recycled water would be irrigated to pasture;
- the geology of the land consists of medium to heavy clay soils; and
- evaporation rates are based on average monthly data from Prospect Reservoir.

The irrigation areas (and associated storage volume) required to manage the surplus recycled water were modelled based on irrigation potential (ie. water balance) and an indicative nutrient balance (total nitrogen and total phosphorous).

The irrigation area requirements based on the indicative nutrient balance were found to be lower than the irrigation areas based on the water balance. As such, adopting the indicative irrigation areas based on irrigation potential alone would be sufficient to ensure that both:

- surplus recycled water does not cause detriment to the soil, surface water or groundwater; and
- sufficient irrigation area (and associated storage volume) is available.

A summary of the adopted irrigation areas and associated storage results, for the various sewage treatment plant options and scenarios (ie. lot system, cluster system or centralised plant system), is presented in the following table.

Table 8.3: *Required Irrigation Areas and Storages (entire Oakdale ESTATE)*

Option / Scenario	***Lot System 27 EP[1], 0% inflow***	***Lot System 55 EP[1], 1.3% inflow***	***Cluster System 27 EP[1], 1.3% inflow***	***Central System 27 EP[1], 2.5% inflow***
Surplus recycled water requiring management (ML/yr, approx.)	0	31	19	40
Required irrigation area (m^2)	0	350m^2 (x132 lots) = Total 50,000m^2	2,700m^2 (x6 clusters) = Total 16,000m^2	80,000m^2 (x1) = Total 80,000m^2
Required storage size buffer for surplus (m^3)	0	40 m^3 (x132 lots) = Total 5,300m^2	1,290m^3 (x6 clusters) = Total 7,700m^2	9,900m^3 (x1) = Total 9,900m^2

1 EP refers to equivalent persons per generic facility. Inflow relates to infiltration/leakage during wet weather.

These irrigation area requirements are considered to be reasonable and can readily be accommodated in the *Draft ESTATE Concept Plan*.

With regard to maintaining soil quality and water quality, it is noted that a properly designed and maintained onsite treatment and recycled water irrigation / disposal system should not result in any adverse impacts on the receiving environment. Only water of a NSW Guidelines recycled water standard would be applied to nominated (surplus recycled water) irrigation areas and gardens, significantly reducing risks of soil and water degradation. Provision of suitable buffer distances and emergency storage would further serve to protect adjacent waterways.

CENTRAL Concept Plan

Oakdale CENTRAL is proposed to be serviced in accordance with the Oakdale ESTATE Sewer Servicing Strategy. In this regard, the *CENTRAL Concept Plan* includes a commitment to preparing project-specific Sewage Management Strategies for applicable projects/developments (ie. those proposing to develop key sewage infrastructure). These strategies would:

- outline the proposed sewage management scheme for the proposal; and
- assess the proposed scheme against the Oakdale ESTATE Sewer Servicing Strategy and applicable NSW Government and Council codes.

To ensure that the sewage management systems are effectively managed, the *CENTRAL Concept Plan* also includes a commitment to the preparation of detailed Recycled Water Irrigation Management Plans for applicable projects. The plans would:

(a) be prepared by suitably qualified expert/s in consultation with the applicable Council/s;
(b) be submitted to the approval authority for approval prior to the commencement of operation of applicable projects;
(c) be consistent with the DECC's *Environmental Guidelines: Use of Effluent by Irrigation*; and
(d) fully describe:
    - the effluent irrigation site selection process;
    - site access arrangements;
    - effluent transport and storage arrangements;
    - maximum loading rates;
    - the irrigation system, its management and operation of its control system;

- soil erosion control;
- stormwater control arrangements; and
- monitoring, reporting and control systems.

With the implementation of these measures, it is considered that the soil and water pollution risks associated with the onsite sewage management systems on *Oakdale CENTRAL* are able to be effectively managed.

DHL Project

In accordance with the above commitments, Goodman has prepared a detailed Sewage Management Strategy for the DHL facilities, which is attached as **Appendix D**.

As detailed in the DHL Sewage Management Strategy, it is proposed to service Buildings 1A and 2A on an interim basis by installing individual proprietary sewage treatment systems for each building, located in the vicinity of each building. The treatment systems would treat all sewage to recycled water standards as defined by the *NSW Guidelines for Urban and Residential Use of Reclaimed Water* (1993). The recycled water would be used within the development lots to service non-potable water end-uses (including toilet flushing, air conditioning and garden watering). Any recycled water that may become surplus to the non-potable water demands would be disposed of by irrigation in a dedicated area allocated within the lots and in vacant land within *Oakdale CENTRAL*.

Ultimately, Buildings 1A and 2A would be connected to a 'precinct' scale treatment and recycled water system which services the entire *Oakdale CENTRAL* precinct. The location of the precinct system treatment plant is planned to the west of the unnamed tributary to Ropes Creek. As indicated in Section 5.3, the *DHL Project* includes subdivision of a parcel of land to accommodate this future sewage treatment plant. Subdivision of this parcel will allow planning to commence for the future development of the precinct system (subject to separate approval).

The DHL Sewage Management Strategy includes modelling of the required irrigation area for the proposed interim scheme. As for the *Oakdale ESTATE* assessment, the modelling found that the required irrigation area is defined by the water balance, rather than the nutrient balance. Adopting the irrigation areas predicted by the water balance modelling was hence determined to be sufficient to ensure that:

- the surplus recycled water does not cause detriment to the soil, surface water or groundwater; and
- sufficient irrigation area (and associated storage volume) is available.

It is proposed to minimise the buffer storage requirement for the *DHL Project*, and provide a larger irrigation area, given that:

- there is a large quantity of vacant land within *Oakdale CENTRAL* that can be utilised as an irrigation area for surplus recycled water should it be required;
- the treatment systems to serve each of Buildings 1A and 2A would eventually be de-commissioned with sewage from Buildings 1A and 2A conveyed to a treatment system that serves the entire *Oakdale CENTRAL* precinct; and
- there is limited space for the treatment plants and associated buffer storage within the general vicinity of Buildings 1A and 2A.

The modeling indicates that the DHL facilities would generate between 0 and 0.9 ML/year of surplus recycled water that would be required to be irrigated, which equates to an irrigation area of between 0 to 2 hectares.

This surplus water would be irrigated in the landscaped area of each building and/or in vacant areas of the *Oakdale CENTRAL* site, in accordance with the buffer distance requirements in the DHL Sewage Management Strategy (as a greenfields site, there is ample room to satisfy this irrigation area requirement on site whilst the bulk of *Oakdale CENTRAL* remains undeveloped).

In accordance with the *CENTRAL Concept Plan* commitments, and following on from the DHL Sewage Management Strategy, Goodman would prepare a detailed Recycled Water Irrigation Management Plan for the *DHL Project*, in consultation with the DECC and Fairfield Council, and to the satisfaction of the Director-General.

It is considered that, with the implementation of these measures, the soil and water pollution risks associated with the *DHL Project* are able to be appropriately minimised and/or managed.

8.2 Noise

8.2.1 Overview

A detailed Noise Assessment has been undertaken for the *Draft ESTATE Concept Plan* by specialist acoustics consultants Wilkinson Murray Pty Limited (see accompanying *Oakdale ESTATE* Specialist Studies Volume). The assessment was undertaken in accordance with applicable DECC guidelines, including the:

- *Industrial Noise Policy (INP)*;
- *Environmental Noise Control Manual*; and
- *Environmental Criteria for Road Traffic Noise*.

An additional project-specific noise assessment has been undertaken for the DHL facilities. The project-specific noise assessment was also undertaken by Wilkinson Murray Pty Limited, and is attached in **Appendix E**.

The Oakdale ESTATE Noise Assessment includes an assessment of background noise levels in the area, establishes noise 'zones' (see Section 8.2.4 below) and applicable noise criteria, and assesses the indicative construction, operational and traffic related noise impacts associated with the Oakdale project. (The noise impacts associated with the full development of *Oakdale CENTRAL* are able to be derived from this assessment). The assessment indicates that, subject to some noise controls in certain areas of the Oakdale land (principally for development in Oakdale's WEST precinct), the development of Oakdale is able to be conducted in a manner which would not result in significant noise impacts on the surrounding area, as detailed below.

8.2.2 Sensitive Receivers and Background Noise Levels

Sensitive receivers in the vicinity of Oakdale are shown on Figure 2.9. Background noise levels at these receivers are presented in the following table.

Table 8.4: *Background Noise Levels*

Receiver	***Rating Background Level (dBA)***			***$L_{Aeq(period)}$ (dBA)***		
	Day	***Evening***	***Night***	***Day***	***Evening***	***Night***
A Shaula Place, Erskine Park	34	39	40	50	54	55
B Emmaus College and Retirement Village	34	34	34	48	54	45
C Bakers Lane, Kemps Creek	34	35	33	51	50	45
D Greenway Place, Horsley Park	34	38	38	50	48	45
E Burley Road, Horsley Park	34	34	34	48	54	45

Notes:

- *With regard to time periods:*
  - *Day is the period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and public holidays;*

- *Evening is the period from 6pm to 10pm; and*
- *Night is the period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and public holidays;*

- *Specific background monitoring was not carried out at Location E. Background noise levels are based on Location B.*

It is noted that the Bakers Lane rural-residential area (Location C) has been identified as a potential future employment area by the Department of Planning (see Figure 1.1). Goodman understands that another developer has negotiated options to purchase the properties closest to the Oakdale site in the event that the land is officially released as employment land.

It is also noted that at some locations, noise levels increased during the evening and night periods. The noise assessments report that this is contrary to what might be expected for such locations and is likely to be due to sources such crickets. Therefore, for the purposes of noise assessment these levels have been discounted and the lower daytime noise levels have been conservatively adopted for the evening and night time periods.

Further, as the background noise levels at Locations B, C and D are similar, the results for Location B have been adopted for these locations (including Location E).

Accordingly, the Rating Background Level for all receivers is conservatively based on a noise level of 34 dBA, for all time periods.

8.2.3 Construction Noise

Overview

Construction activities associated with the development of Oakdale (including *Oakdale CENTRAL*) would include:

- construction of the required traffic facilities;
- upgrade of existing roads and construction of new roads and bridges in the vicinity of the site;
- construction (and use) of utility connections to the site;
- demolition, relocation or removal of existing structures on the site;
- sub-division of the site and associated sub-division works including construction of roads, stormwater drainage systems, sewerage and water works, utilities and services, landscaping and earthworks;
- works for the site water management strategy;
- remediation of the riparian corridor on site; and
- construction and use of buildings and associated works.

The loudest construction period is expected to be the earthmoving phase. Therefore, this activity has been used to assess potential construction noise related impacts associated with the development of the *Oakdale ESTATE*. The following table presents initial calculations at surrounding receivers based on distance attenuation alone, along with applicable construction noise criteria.

Table 8.5: *Predicted Construction Noise Levels, dBA (exceedances marked as per criteria colour)*

Noise Zone	***Receiver Location***					***Construction Noise Criteria***		
	A	***B***	***C***	***D***	***E***	***< 4 weeks***	***4 – 26 weeks***	***> 26 weeks***
1	43	35	33	36	40	54	44	39
2	40	35	38	46	35			
3	41	50	52	41	35			
4	41	58	53	39	34			

Note: See Section 8.2.4 for location of each noise zone.

The initial assessment indicates that, during the development of the *Oakdale ESTATE*, the applicable construction criteria are likely to be exceeded at the schools and retirement village to the west of the site (ie. Location B) and the rural-residential areas to the south of the site (ie. Locations C and D). Residents of Erskine Park (ie. Location A) and rural-residential properties to the east of the site (ie. Location E) would be marginally impacted during extended construction activities (ie. those greater than 26 weeks).

The Oakdale ESTATE Noise Assessment outlines a number of reasonable and feasible mitigation measures that could be adopted to reduce construction related noise impact, including:

- restriction of construction activities to the hours stipulated in the DECC's *Environmental Noise Control Manual*, namely:
  - 7:00am to 6:00pm Monday to Friday;
  - 8:00am to 1:00pm Saturdays; and
  - no work on Sundays or public holidays.
- careful planning of construction programs, with avoidance of noisy activities during early mornings and Saturdays, where practical;
- installation of noise barriers;
- careful consideration of cut and fill to avoid excessive truck movements associated with spoil import/export;
- careful management and maintenance of site equipment and machinery;
- effective complaint management systems; and
- control of reversing alarms.

With the implementation of these measures (as required) it is considered that the construction noise emissions associated with the development of Oakdale are able to be effectively managed.

CENTRAL Concept Plan

Oakdale CENTRAL corresponds to Noise Zone 1 in Table 8.5 above. As indicated in the table, the development of *Oakdale CENTRAL* (ie. Noise Zone 1) is unlikely to result in significant construction noise impacts. Moderate exceedances (up to 4 dBA) are predicted at Erskine Park residences and some Horsley Park residences, where construction activities extend beyond 26 weeks. These exceedances are expected to be able to be effectively managed, subject to implementation of measures such as those described above.

To ensure that construction noise is appropriately assessed and managed during the development of *Oakdale CENTRAL*, all applications involving significant noise generation will be accompanied by a project-specific noise assessment, which includes consideration of construction noise.

DHL Project

It is anticipated that construction of each of the proposed DHL facilities would take less than 26 weeks. However, the total construction period associated with both of the DHL facilities, together with the other estate works, is expected to extend beyond 26 weeks. The main noise-generating construction works would include detailed earthworks, and to a lesser extent building construction.

Predicted construction noise levels at the sensitive receivers have been assessed in the DHL Noise Assessment, and are presented in the following table, along with the applicable criteria.

Table 8.6: *DHL Project Construction Noise Predictions dB(A) $L_{A10(15\ mins)}$* (exceedances in bold)

Receiver	***Construction criterion***		***Predicted Noise Level***
	4-26 weeks	***>26 weeks***	
A Shaula Place, Erskine Park	44	39	43
B Emmaus College and Retirement Village	44	39	25
C Bakers Lane, Kemps Creek	44	39	23
D Greenway Place, Horsley Park	44	39	26
E Burley Road, Horsley Park	44	39	30

The noise predictions indicate that the *DHL Project* would marginally exceed construction criteria (for construction works in excess of 26 weeks) at Erskine Park residences (Location A). The project would comply at all other sensitive receivers. These predicted exceedances are consistent with *Oakdale CENTRAL* modelling undertaken for the Oakdale ESTATE Noise Assessment.

The predicted noise exceedances are unlikely to result in a significant impact to Erskine Park residences, given:

- the relatively minor noise exceedances (up to 4 dBA);
- the intermittent nature of construction noise emissions; and
- that the construction works would be limited to daytime periods.

Notwithstanding, to mitigate the predicted impacts Goodman has committed to preparing a construction noise management plan as part of the Environmental Management Strategy for the *Oakdale CENTRAL* project.

8.2.4 Operational Noise

Operational Noise Criteria

The Oakdale ESTATE Noise Assessment has established two sets of operational noise criteria. The first set is the project specific noise level criteria determined in accordance with the methods in the INP.

The second set of noise criteria are based on noise 'zones', which have been established for the purposes of prudent noise planning for the development of Oakdale. These noise zones are shown on Figure 8.3.

The purpose of the noise zones is to enable the sharing of noise emissions associated with the Oakdale project, and ensure that the entire project does not exceed the relevant project specific noise criteria at surrounding residences.

Without such an approach, it is possible that early 'noisy' developments on the *Oakdale ESTATE* could 'use up' all of the established noise criteria allowance, thereby placing a greater impost on other future developments to control noise. The establishment of noise zones (or a noise budget), ensures that an early 'noisy' development includes appropriate noise mitigation measures.

As noted above, the *Oakdale CENTRAL* precinct is identified as Noise Zone No.1 in the Oakdale ESTATE Noise Assessment.

It is noted that the East Precinct has not been included in the noise zones, as the existing Austral Bricks quarry and brickmaking plant on this precinct is expected to continue operating in accordance with existing approvals for the foreseeable future. This precinct would require additional noise assessment following the cessation of quarrying, brickmaking and rehabilitation of the site, and prior to subsequent development of the precinct.

The noise zone criteria have been applied to the *DHL Project* (see below).

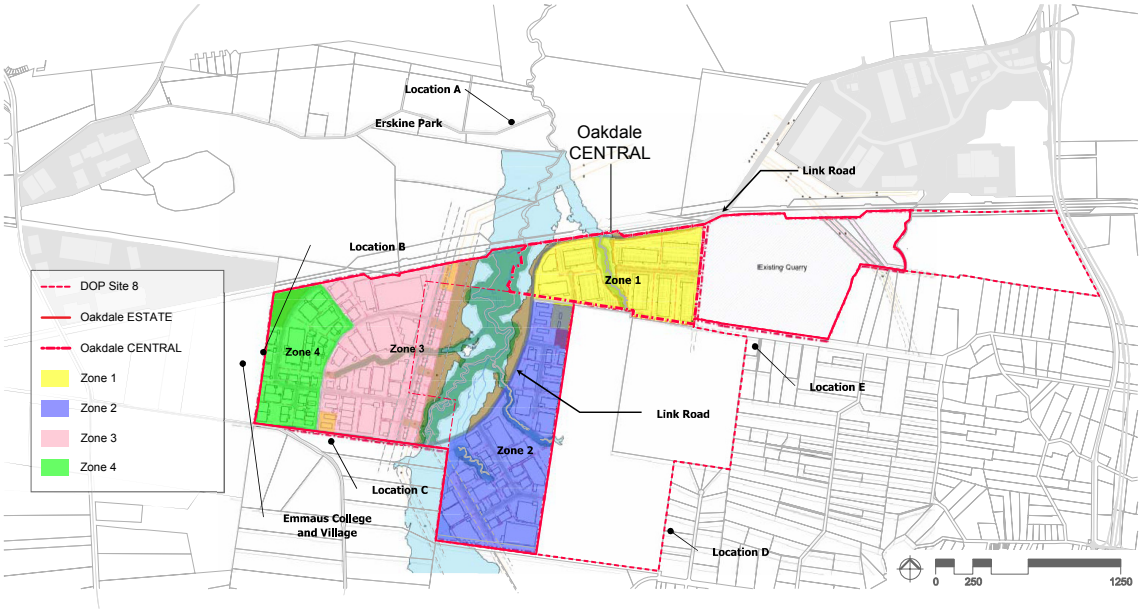

Figure 8.3: *Oakdale ESTATE Noise Zones*

Operational Noise Emissions – CENTRAL Concept Plan

Operational noise emissions associated with the development of *Oakdale CENTRAL* would be typical of warehousing and distribution / light industrial estates, and would include:

- on site truck and car movements;
- stationary plant (eg. air conditioning systems and fans); and
- mobile plant (eg. forklifts);
- loading and unloading emissions; and
- employee emissions.

The Oakdale ESTATE Noise Assessment includes an indicative operational noise assessment for the *Oakdale ESTATE* project at full development, based on a 'worst-case no controls' scenario, namely:

- major buildings operating 24-hours, i.e. night operation;
- 10 trucks manoeuvring on site simultaneously;
- no shielding from surrounding buildings or barriers; and
- average distances have been estimated from the acoustic centre of the each noise zone (ie. 1 to 4).

The operational noise levels associated with *Oakdale CENTRAL* (at full development) can be derived from the Oakdale ESTATE Noise Assessment. The predicted 'worst case' operational noise levels at full development of *Oakdale CENTRAL* are presented in the following table.

Table 8.7: *Oakdale CENTRAL Operational Noise Predictions dB(A) $L_{Aeq\ (15\ mins)}$*

Receiver Location	***Predicted Noise Level (no noise controls)***	***Criteria (Day/Evening/Night)***
A Shaula Place, Erskine Park	36	39
B Emmaus College and Retirement Village	33	39
C Bakers Lane, Kemps Creek	31	39
D Greenway Place, Horsley Park	34	39
E Burley Road, Horsley Park	38	39

Notes:
- *Day is the period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and public holidays;*
- *Evening is the period from 6pm to 10pm; and*
- *Night is the period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and public holidays.*

The modelling indicates that the development of *Oakdale CENTRAL* would comfortably comply with the applicable operational noise criteria during all time periods.

It is noted that the indicative operational noise assessment undertaken for the *Draft ESTATE Concept Plan* indicates that the development of the whole of Oakdale would result in some significant exceedances (up to 18 dBA), however it is noted that in reality noise emissions would be largely mitigated by intervening structures (especially buildings) and by topographic shielding. Nevertheless, the indicative assessment indicates that noise will need to be carefully considered during the development of the wider *Oakdale ESTATE*, particularly in relation to the Emmaus School and Retirement Village to the west of the site, and the rural-residential area to the south.

The Oakdale ESTATE Noise Assessment considers that these noise exceedances are able to be effectively managed by prudent design incorporating building orientation and, if necessary, noise barriers. Noise mitigation measures could include:
- orientate yard and dock areas away from residences so that the building shields noise from these activities;
- utilise mass elements on the facility walls to contain noise. Where ventilation is required on walls facing a residence, acoustic louvers should be installed;
- install acoustic barriers/berms in the areas between residences and precincts where there is potential for disturbance, particularly prior to any barrier being achieved by smaller buildings on the perimeter lots; and
- the provision of recessed loading docks would also contribute to the minimisation of noise emission by eliminating any requirement for external loading/unloading using forklifts, etc.

As discussed above, to ensure that operational noise impacts are effectively assessed and managed during the project/development application stages of *Oakdale CENTRAL*, Goodman would undertake project-specific operational noise assessments for applicable projects. These assessments would be undertaken with reference to both the project-specific operational noise criteria as well as the zone-specific noise planning criteria.

Operational Noise Emissions – DHL Project

Operational noise emissions associated with the *DHL Project* have been modelled based on worst case noise emissions under calm and adverse wind conditions, as:
- INP assessable winds (slight, stable winds), which tend to increase noise impact, are a feature of the area; and
- temperature inversions, which also tend to increase noise impact, are not a feature of the area.

Predicted operational noise levels at the nearest residential areas are provided in the following table, along with the applicable criteria.

Table 8.8: *DHL Project Operational Noise Predictions dB(A)* $L_{Aeq\ (15\ mins)}$

Receiver Location		***Predicted Noise Level***		***Criteria (Day/Evening/Night)***	
		Calm Weather	***Adverse Winds***	***Intrusive Criteria***	***Zone 1 Criteria***
A	Shaula Place, Erskine Park	10	8	39	35
B	Emmaus College and Retirement Village	<10	<10	39	20

Receiver Location	Predicted Noise Level		Criteria (Day/Evening/Night)	
	Calm Weather	Adverse Winds	Intrusive Criteria	Zone 1 Criteria
C Bakers Lane, Kemps Creek	<10	<10	39	24
D Greenway Place, Horsley Park	11	11	39	34
E Burley Road, Horsley Park	14	18	39	34

Notes:

- *Day is the period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and public holidays;*
- *Evening is the period from 6pm to 10pm; and*
- *Night is the period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and public holidays.*

The modelling indicates that the DHL facilities would comfortably comply with the applicable operational noise criteria during all time periods and weather conditions.

Sleep Disturbance

In addition to the operational noise emissions, which are based on average noise levels over a 15 minute period, sudden or short-lived noise emissions at night have the potential to result in sleep disturbance. Such sudden noise emissions associated with the *CENTRAL Concept Plan* and the *DHL Project* typically include truck reversing alarms. Predicted impacts are presented in the following table.

Table 8.9: *Predicted Truck Reversing Alarm Noise Levels dB(A) $L_{A1(1\ min)}$*

Receiver Location	Predicted Noise Level			Sleep Disturbance Criteria
	Oakdale CENTRAL	DHL Project		
		Calm Weather	Adverse Winds	
A Shaula Place, Erskine Park	37	15	12	49
B Emmaus College and Retirement Village	29	<10	<10	49
C Bakers Lane, Kemps Creek	27	10	<10	49
D Greenway Place, Horsley Park	30	20	20	49
E Burley Road, Horsley Park	34	29	34	49

The modelling indicates that the *CENTRAL Concept Plan* and the *DHL Project* would comfortably comply with the applicable sleep disturbance criteria.

Cumulative Impacts – CENTRAL Concept Plan

The INP has been designed to provide the means to manage noise from multiple developments with the object of attaining the best possible balance between noise and other relevant socio-economic factors. Applying the principles of the INP at the planning stage can avoid future land use conflicts over noise.

As the number of residences potentially affected by noise from the operation of Oakdale are relatively few, the Oakdale ESTATE Noise Assessment has recommended adoption of the 'Greystanes' approach. The approach that was adopted to deal with noise control for the industrial component at the Greystanes site can be summarised as follows:

1. Appropriate amenity noise levels are determined for the residences surrounding the various precincts. The INP's "rural" amenity area category noise levels of 50dB(A), 45dB(A) and 40dB(A) levels for daytime, evening and night time respectively are adopted;
2. The industrial land was divided into four zones, in this case corresponding to the four Oakdale precincts; and

3. A noise limit for each zone applies at the nearest residential area. The combined limits for all four zones complied with the adopted noise objectives for the residential area.

The 'noise zones' established for the *Draft ESTATE Concept Plan* follow this approach. The approach aims to minimise the potential for exceedance of the amenity goals and allow for a more equitable share of the noise 'budget'.

Cumulative noise impact would be considered as part of applicable project/development applications for the *CENTRAL Concept Plan*.

Cumulative Impacts – DHL Project
The DHL Noise Assessment includes consideration of cumulative impacts associated with the combined operations of the *DHL Project* and the continued operation of the Bedford Quarry in the area immediately to the west of the development site.

The assessment indicates that the *DHL Project* would not result in any additional cumulative noise impact on surrounding residences over and above the noise levels associated with the approved quarry, because the predicted quarry noise emissions are significantly higher than the *DHL Project*'s predicted emissions. The combined noise emissions would comply with applicable noise criteria.

It is noted that the Bedford Quarry is expected to cease operations in 2008.

8.2.5 Traffic Noise

There are no residences in proximity to roads between the *Oakdale CENTRAL* site and the arterial road network (ie. Old Wallgrove Road to the M7). Accordingly, the development of *Oakdale CENTRAL,* including the *DHL Project*, is not expected to result in any traffic noise impacts.

8.3 Air Quality and Odour

8.3.1 Air Quality

Construction Related Dust Emissions
Dust emissions during construction works associated with the *CENTRAL Concept Plan* and the *DHL Project* – the majority of which would be associated with bulk earthworks – are able to be managed in accordance with standard best practice techniques, including:

- minimising the area of disturbance as far as practicable during works;
- minimising drop heights for materials being worked on the site;
- keeping exposed surfaces moist at all times;
- rehabilitating/revegetating disturbed surfaces as soon as practicable; and
- ensuring that trucks are covered and do not track sediment onto public roads.

These measures would be documented in a construction dust management plan, which would be prepared as part of an Environmental Management Strategy for the *CENTRAL Concept Plan*.

It is noted that a number of air quality monitoring stations have been established as part of the Bedford Quarry operations within *Oakdale CENTRAL* (see Section 2.3.1), as shown on Figure 8.4 below. It is considered that these monitoring stations would provide appropriate coverage for monitoring the dust emissions associated with the development of *Oakdale CENTRAL*, including the *DHL Project*.

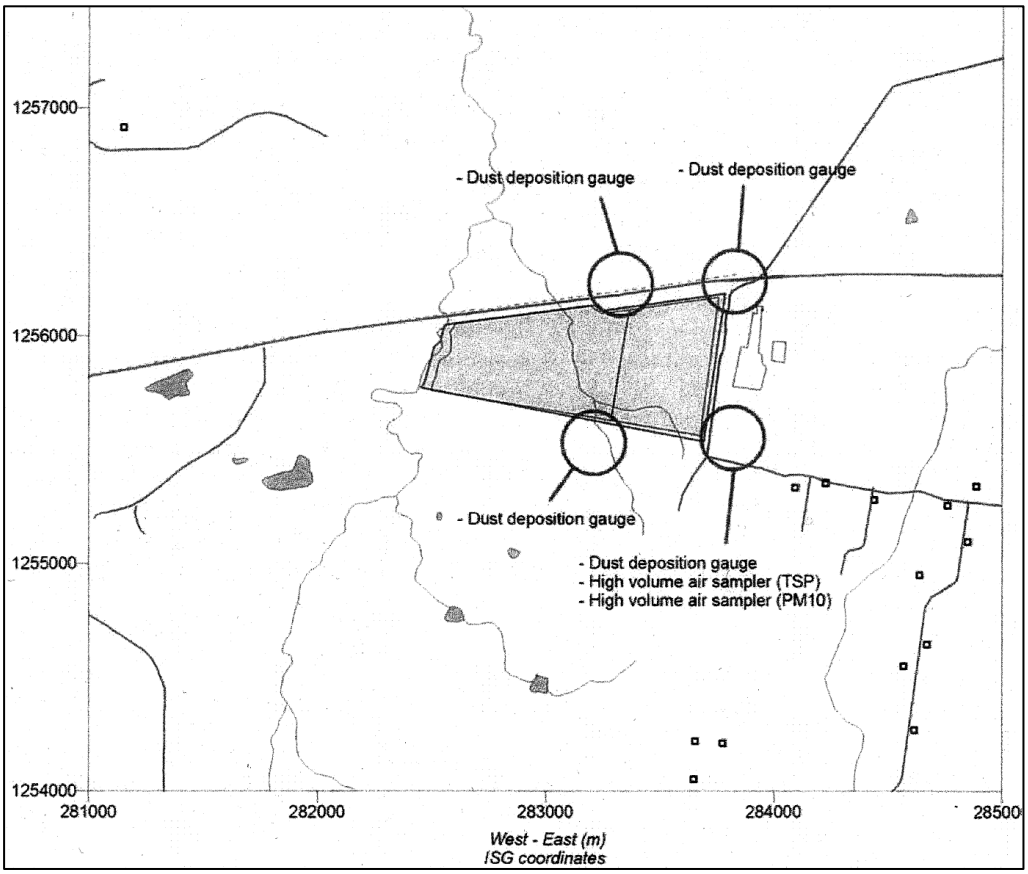

Figure 8.4: *Bedford Quarry Air Quality Monitoring Locations*

To ensure that the *DHL Project* does not result in any significant incremental dust impacts over and above those of the Bedford Quarry, Goodman has committed to complying with the air quality criteria in the Bedford Quarry consent, for the combined operations of the quarry and the *DHL Project* (whilst the quarry remains in operation on the site).

Operational Air Quality

The main sources of air emissions associated with the operation of development in *Oakdale CENTRAL* would be vehicle and plant emissions. These emissions would be typical of a warehouse/distribution environment, the levels of which are not expected to be significant.

The *Draft ESTATE Concept Plan* will include a commitment to preparing a comprehensive Transport Management and Accessibility Plan (T-MAP) for the *Oakdale ESTATE*, to encourage sustainable transport modes and reduce single-occupant car journeys. Implementation of the T-MAP would help to reduce transport-related air emissions associated with the Oakdale project. The T-MAP is discussed in more detail in Section 8.8.

Given the relatively small size of *Oakdale CENTRAL*, and that the precinct enjoys ready access to the arterial road network, it is not proposed to prepare a specific T-MAP for *Oakdale CENTRAL*. Notwithstanding, the *CENTRAL Concept Plan* provides for a comprehensive pedestrian, cycle and public transport system (see Section 4.6.1).

8.3.2 Odour

The proposed on-site sewage treatment systems have some potential for odour generation. However, the Oakdale ESTATE Sewer Servicing Strategy notes that the proper location, design and operation of the systems would prevent any adverse odour impacts.

The specific location of sewage treatment systems will consider adequate buffers distances from work areas and public amenities. The utilisation of systems such as Membrane Bioreactor (MBR) treatment systems may include odour scrubbing which would eliminate the need for buffers to the treatment systems.

Local treatment systems would be required to operate under an approved system management plan, including routine monitoring, scheduled maintenance and emergency response plan to avoid excess loading of organics and nutrients on the irrigation area or anaerobic conditions developing.

8.4 Greenhouse Gas and Energy Efficiency

8.4.1 Overview

The development and operation of Oakdale would generate direct and indirect greenhouse gas (GHG) emissions that would, albeit in a very small manner, contribute to global warming and climate change.

Methods for GHG assessment are outlined in applicable GHG guidelines including:

- the World Business Council for Sustainable Development and World Resource Institute's *Greenhouse Gas Protocol 2004* (GHG Protocol); and
- the Commonwealth Department of Climate Change's *National Greenhouse Accounts Factors, January 2008* (which replaces the former AGO Factors and Methods Workbook).

These guidelines classify GHG emissions associated with an organisation's activities into 3 'scopes', including:

- *Scope 1 emissions:* Direct GHG emissions from activities within an organisation's boundaries (eg. manufacturing processes and transportation of materials, products, waste and people);
- *Scope 2 emissions:* Indirect GHG emissions associated with the import of electricity; and
- *Scope 3 emissions:* Other indirect GHG emissions that are a consequence of an organisation's activities but are not from sources owned or controlled by the organisation, such as those that occur 'downstream' of the organisation's boundaries (eg. waste disposal, use of products manufactured or sold, business travel and commuting, etc.).

8.4.2 Greenhouse Gas Impacts and Mitigation Measures

CENTRAL Concept Plan

If it is assumed for the purposes of GHG emission source identification that the *Oakdale ESTATE* is one 'organisation', the main GHG emissions associated with the development of the *Oakdale ESTATE* and *Oakdale CENTRAL* would include those listed in the following table. It is noted that these emission sources are indicative only, as the specific activities associated with the final end-users are not known at this time.

Table 8.10: *Oakdale Main GHG Emission Sources*

Scope	*GHG Emission Sources*
Scope 1	• On-site manufacturing processes; • Transportation of raw materials and finished goods; • Transportation of waste; • On-site maintenance and servicing activities; • On-site sewage management emissions.
Scope 2	• Upstream electricity.

Scope	*GHG Emission Sources*
Scope 3	• Solid and liquid waste disposal; • Downstream electricity; • Use of products manufactured or sold; and • Business travel and employee commuting.

As Oakdale is expected to be developed primarily for warehousing and distribution type facilities (based on current and historical market demand within the Western Sydney Employment Hub), the main GHG emissions sources associated with the development of Oakdale are expected to be:

- transportation of raw materials and finished goods (ie. distribution activities);
- on-site sewage management; and
- upstream electricity.

On-site manufacturing processes also have the potential to generate relatively significant GHG emissions, however any such emissions sources are unknown at this time and would need to be considered on a case-by-case basis.

Transport Related Emissions

With regard to transportation related emissions, it is noted that the Western Sydney Employment Hub, including Oakdale and the balance of Site 8, has been established in this area of Western Sydney in large part due to its excellent proximity to Sydney's arterial road network, including the M4 and M7 Motorways. This proximity provides for the efficient transport of goods to and from the employment lands.

In this regard, and granted that the establishment of distribution centres are an integral component of modern society, it is considered that the transport-related GHG emissions associated with the development of Oakdale would be relatively less than an industrial estate established in a location with less efficient access to the arterial road network.

Notwithstanding, it is acknowledged that the development of Oakdale would facilitate the generation of transport-related GHG emissions. To mitigate these emissions, the *CENTRAL Concept Plan* includes provision of sustainable transport facilities (including public transport, pedestrian and cycle facilities, as discussed in Section 4.6).

Further, the *Draft ESTATE Concept Plan* will include a commitment to preparing a comprehensive Transport Management and Accessibility Plan (T-MAP), to encourage sustainable transport modes and reduce transport-related GHG emissions. As discussed in Section 8.8, the T-MAP would seek to maximise travel mode shift to public transport, cycling and walking. In particular, the T-MAP would seek to achieve:

- a reduction in mode split of 'car as driver' for journeys to/from work by at least 10% compared to existing surrounding areas; and
- a reduction in total vehicle kilometres travelled generated by the Oakdale development by at least 5% compared to a 'conventional' approach to development.

As stated in Section 8.3 above, given the relatively small size of *Oakdale CENTRAL*, and that the precinct enjoys ready access to the arterial road network, it is not proposed to prepare a specific T-MAP for *Oakdale CENTRAL*.

Along with these sustainable transport modes, it is noted that Site 8 and the wider Western Sydney Employment Hub is also planned to be connected to the rail network in the long term. In

this regard, the Metropolitan Strategy includes a number of actions[1] to facilitate the extension of the dedicated rail freight network to Western Sydney. In particular, the Metropolitan Strategy states that *'further investigations will be undertaken into development of a new dedicated freight railway from the Southern Sydney Freight Line through Western Sydney employment lands to connect to the Main West Line. This will be dependent on the availability of ARTC and Federal Government funds and would enable the development of a new intermodal terminal to service the industrial lands in Western Sydney'*.

Oakdale CENTRAL, as part of the Western Sydney Employment Hub, is well positioned to take advantage of such future rail connection.

On-site Sewage Management Emissions
The *CENTRAL Concept Plan* involves a fully self-contained sewage management system.

In terms of GHG emissions associated with the sewage, it is noted that the on-site system would generate similar GHG emissions to treatment of the sewage in a typical centralised system, as the amount of carbon in the sewage would be the same. The proposed on-site sewage treatment system (using Membrane Bio-Reactor technology) would produce these GHG emissions as carbon dioxide, as opposed to a typical system which would release the emissions as carbon dioxide and methane.

Accordingly, the net GHG impacts associated with the sewage treated on-site would be zero.

However, when considered at the broader level (ie. sewage plus infrastructure), the onsite sewage treatment system would result in net GHG efficiencies as compared to a typical regional centralised system, as:

- sewage pumping requirements would be lower;
- the recycled water generated by the on-site system would offset the need to generate and pump potable water to the site; and
- the proposed on-site system requires very little maintenance (eg. the system is managed remotely, produces no sludge and the membrane filters require replacement very infrequently).

Electricity Use Emissions
With regard to electricity use, the key energy demands associated with the development of Oakdale are expected to include lighting, air conditioning and other plant and equipment. Energy use associated with these facilities is able to be made more efficient through consideration of a number of measures, such as:

- site orientation and passive solar design;
- natural lighting;
- energy efficient lighting and lighting controls;
- building shading, thermal massing and insulation;
- natural ventilation;
- energy efficient ventilation; and
- solar panels and green power.

With the implementation of one or more of these measures, it is considered that Oakdale is able to be developed in accordance with best practice energy efficiency standards, in a manner that reduces GHG emissions associated with the project.

[1] Including actions D.6.2.1, D8.1.1 and D8.1.2 of the Metropolitan Strategy.

To mitigate GHG emissions associated with the development of the *CENTRAL Concept Plan*, all project applications/development applications would include consideration of energy efficiency and resource use.

DHL Project
In accordance with the above commitment, the *DHL Project* includes consideration of energy efficiency and resource use. As identified in Section 5.10, the DHL facilities would incorporate the following measures:

- warehouse roofing would comprise 10% translucent sheeting to facilitate natural lighting (apart from the area above proposed tobacco storage in Building 1A);
- warehouses have been designed to encourage cross ventilation and natural venting;
- offices have been designed to maximise natural lighting through generous use of glazing;
- western elevations have been designed with generous awnings and minimisation of exposed glazing (offices); and
- energy efficient lighting and occupancy sensing lighting controls would be installed throughout the office facilities.

8.5 Flora and Fauna

8.5.1 Overview

A detailed Ecological Assessment has been undertaken for the *Draft ESTATE Concept Plan* by specialist ecologists Cumberland Ecology Pty Limited (see accompanying *Oakdale ESTATE* Specialist Studies Volume).

The Oakdale ESTATE Ecological Assessment indicates that the *Oakdale ESTATE* currently comprises approximately 31 hectares of vegetation, with the balance comprising pasture. The vegetation identified includes:

- 22 hectares of Swamp Oak Forest;
- 2.5 hectares of Cumberland Plain Woodland;
- 1 hectare of degraded woodland; and
- 5 hectares of wetland vegetation, farm dams and exotic sedge.

The location and distribution of all vegetation communities is shown on Figure 2.10.

The Cumberland Plain Woodland and Swamp Oak Forest communities are endangered ecological communities listed under the *Threatened Species Conservation Act 1995*. The Cumberland Plain Woodland community is also listed as endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

No threatened flora or fauna species were identified on the *Oakdale ESTATE*, although some evidence of the following threatened bat species was identified on bat recordings during targeted surveys around farm dams on the property:

- Eastern Cave Bat;
- Eastern Bentwing Bat;
- Eastern Freetail Bat; and
- Greater Broad-nosed Bat.

The *Draft ESTATE Concept Plan* has been planned to retain the vast majority of existing treed vegetation on the land, including the important Swamp Oak Forest of the Ropes Creek corridor (and its tributaries), and the majority of the Cumberland Plain Woodland occurring in the West Precinct.

In addition, the *Draft ESTATE Concept Plan* will include an Offset and Enhancement Strategy to expand these important vegetation communities and offset the loss of vegetation of conservation significance. The areas proposed to be retained, cleared and revegetated – based on the layout of the *Draft ESTATE Concept Plan* – are shown on Figure 8.5 and detailed in the following table.

Table 8.11: *Oakdale Vegetation Offset and Enhancement Strategy (Draft)*

Vegetation Community	***Existing Area (ha)***	***Area to be Cleared (ha)***	***Minimum Area to be Revegetated (ha)***	***Offset Ratio[1]***	***Total Net Area[2] (ha)***
Cumberland Plain Woodland	2.47	0.57	1.72	3:1	3.62
Swamp Oak Forest	22.02	2.48	19.54	8:1	39.08
Sub-total – EECs	24.49	3.05	21.26	-	42.70
Degraded Woodland[3]	1.22	1.22	0	-	0
Exotic Sedge	1.50	1.50	0	-	0
Wetland Vegetation / Farm Dams	3.54	3.54	3.54	1:1	3.54
Total	30.75	9.31	24.80	-	46.24

Notes:
1 Area Revegetated : Area Cleared
2 Existing Area + Area to be Revegetated - Area to be Cleared
3 Offset included as part of the Swamp Oak Forest offset

Figure 8.5: *Oakdale ESTATE Draft Vegetation Offset and Enhancement Strategy*

It is noted that the Oakdale ESTATE Offset and Enhancement Strategy considers all the existing vegetation within *Oakdale CENTRAL*, including that which is approved to be cleared as part of the Bedford Quarry (see Section 2.3.1). It is envisaged that offsetting for the Oakdale project will encompass and supercede offsetting requirements for the Bedford Quarry, to ensure that ecological planning is undertaken in an integrated and contemporary manner.

The Oakdale ESTATE Ecological Assessment includes assessments of significance for the Cumberland Plain Woodland and Swamp Oak Forest communities, which indicate that the Oakdale project is unlikely to have any adverse impact on the viability of the EECs.

With regard to the other vegetation communities on the site, it is noted that:

- the removal of the areas of degraded woodland would be compensated through the proposed Offset and Enhancement Strategy which provides for generous offset ratios for the revegetation of EECs on the site;
- the exotic sedge community is not native, and as such does not warrant offsetting. Notwithstanding, the Oakdale ESTATE Water Sensitive Urban Design Strategy (see Section 8.1) would provide ample areas for revegetation of native wetland/bog communities; and
- the wetland vegetation would be removed/altered as the *Draft ESTATE Concept Plan* will provide for the rehabilitation of the on-site farm dams (in which this community inhabits) to reinstate natural stream flows and enable fish passage. To compensate, at least 3.54 hectares of wetland vegetation would be provided in wetlands, stormwater retention systems and other features of the Oakdale ESTATE Water Sensitive Urban Design Strategy.

With regard to the identified threatened bat species, the ecological assessment includes tests of significance for each of the identified species which conclude that the *Oakdale ESTATE* project is unlikely to have any adverse impact on any of the bat species. The proposed Oakdale ESTATE Offset and Enhancement Strategy would likely increase the habitat potential for threatened bats and other threatened species on the site over the medium to long term.

To appropriately manage the implementation of the Oakdale ESTATE Offset and Enhancement Strategy and ensure the effective revegetation and management of the important riparian areas within the *Oakdale ESTATE*, Goodman would develop a detailed whole-of-site Vegetation Management Plan for the *Oakdale ESTATE*.

It is noted that Goodman plans to manage the offset areas, particularly the Ropes Creek corridor, in accordance with the biobanking scheme planned to be introduced by the NSW Government. This would include claiming credit for any of the proposed offset and enhancement areas over and above minimum offset areas calculated in accordance with the rules of the biobanking scheme. Managing the areas under the biobanking scheme would ensure that the offset and enhancement areas are established and maintained to a high quality (in terms of biodiversity values), and potentially provide an incentive for the establishment of additional biodiversity areas in and adjacent to the Ropes Creek Precinct.

With the implementation of these measures, the Oakdale ESTATE Ecological Assessment considers that the development of the *Oakdale ESTATE* would significantly enhance the flora and fauna values of the locality over the medium to long term.

8.5.2 Ecological Impacts and Mitigation Measures

CENTRAL Concept Plan

The *Oakdale CENTRAL* site contains little vegetation, with the vast majority of the site comprising pasture. Four vegetation communities mapped in the Oakdale ESTATE Ecological Assessment occur within the *Oakdale CENTRAL* site, including:

- 1.15 hectares of Swamp Oak Forest;
- 0.35 hectares of degraded woodland;
- 0.81 hectares of wetland vegetation (farm dam); and
- 1.50 hectares of exotic sedge.

The Swamp Oak Forest occurs adjacent Ropes Creek and its tributary, and would not be significantly impacted by the development of *Oakdale CENTRAL*.

The degraded woodland occurs within the proposed link road corridor, and would ultimately be largely cleared to accommodate the roadway.

The wetland vegetation is associated with the farm dam on the Ropes Creek tributary. In accordance with the *Draft ESTATE Concept Plan*, the farm dam is proposed to be removed and rehabilitated to reinstate natural stream flows and enable fish passage.

The exotic sedge occurs partially within the proposed development area. However, it is noted that works associated with the approved Bedford Quarry (as discussed in Section 2.3.1) have since cleared this vegetation.

No threatened flora and fauna species have been identified within *Oakdale CENTRAL*, although some (inconclusive) evidence of the Eastern Freetail Bat was identified on bat recordings near the farm dam on the Ropes Creek tributary.

The *CENTRAL Concept Plan* includes a commitment to undertaking that component of the Oakdale ESTATE Offset and Enhancement Strategy that pertains to the *Oakdale CENTRAL* site. The areas proposed to be retained, cleared and revegetated (based on Link Road Option A) are detailed in the following table (and shown on Figure 8.5).

Table 8.11: *Oakdale CENTRAL Vegetation Offset and Enhancement Strategy*

Vegetation Community	***Existing Area (ha)***	***Area to be Cleared (ha)***	***Minimum Area to be Revegetated (ha)***	***Offset Ratio[1]***	***Total Net Area[2] (ha)***
Swamp Oak Forest	1.15	0.19	2.50	13:1	3.46
Degraded Woodland[3]	0.35	0.35	0	-	0
Exotic Sedge	1.50	1.50	0	-	0
Wetland Vegetation / Farm Dams	0.81	0.81	0.81	1:1	0.81
Total	3.81	2.85	3.31	-	4.27

Notes:

1 Area Revegetated : Area Cleared

2 Existing Area + Area to be Revegetated - Area to be Cleared

3 Offset included as part of the Swamp Oak Forest offset

To implement the Oakdale CENTRAL Offset and Enhancement Strategy, and ensure the effective revegetation and management of the important riparian areas within *Oakdale CENTRAL*, the *CENTRAL Concept Plan* includes a commitment to developing a Vegetation Management Plan for the *Oakdale CENTRAL* site. The plan would:

- be prepared by suitably qualified expert/s in consultation with DECC, DWE, Penrith Council and Fairfield Council;
- be prepared in accordance with the DWE guidelines *How to Prepare a Vegetation Management Plan (Draft)*;
- establish performance and completion criteria for the Offset and Enhancement Strategy;
- include detailed plans:
    - identifying the vegetation to be retained/removed and areas to be rehabilitated;
    - indicating the measures to be implemented to:
        - revegetate the areas to be rehabilitated, including plant material, densities and species mix (consisting of native trees, shrubs and groundcover species local to the area); and
        - prevent damage to riparian zones.

With the implementation of these measures, it is considered that the development of *Oakdale CENTRAL* would significantly enhance the flora and fauna values of the area over the medium to long term.

DHL Project

The site of the proposed DHL facilities contains very little vegetation, with the vast majority of the site comprising pasture. Two vegetation communities mapped in the Oakdale ESTATE Ecological Assessment occur within the project disturbance area for the DHL facilities, including:

- 0.35 hectares of degraded woodland; and
- 1.50 hectares of exotic sedge.

These vegetation communities were assessed in the Oakdale ESTATE Ecological Assessment as having minimal conservation significance. In addition, no threatened flora and fauna species have been identified within the DHL facilities area. As such, it is considered that the DHL facilities would have a minimal impact of the flora and fauna values of the site.

However, the clearing required for the DHL facilities, plus the other estate works, would essentially amount to the total clearing required for the *CENTRAL Concept Plan* (as detailed in the preceding section).

Given this, Goodman has committed to implementing that part of the *Oakdale CENTRAL* Offset and Enhancement Strategy that pertains to the Ropes Creek tributary in the centre of the *Oakdale CENTRAL* site, as part of the *DHL Project*. This offset would involve the revegetation/ regeneration of approximately 1.78 hectares of Swamp Oak Forest in the riparian area to this tributary. This revegetation equates to an offset ratio of 3.3:1 (ie. Area Revegetated : Swamp Oak Forest and Degraded Woodland cleared in *Oakdale CENTRAL*).

The proposed revegetation works would be undertaken in accordance with the whole-of-site Vegetation Management Plan.

With the implementation of these measures, it is considered that the *DHL Project* would significantly enhance the flora and fauna values of *Oakdale CENTRAL* over the medium to long term.

It is noted that Goodman does not propose to undertake the additional *Oakdale CENTRAL* revegetation (ie. adjacent Ropes Creek) as part of the *DHL Project*, as:

- the future landuse (ie. recreation and environmental conservation) of this area has not been planned at this stage; and
- the proposed revegetation works (to the unnamed Ropes Creek tributary) would adequately offset the vegetation clearing required for the project.

Old Wallgrove Road

The Oakdale ESTATE Ecological Assessment includes an assessment of the flora and fauna values of the Old Wallgrove Road corridor between Roberts Road and the site, which found that the vegetation within the corridor is mainly exotic grassland and holds no conservation value. The ecological assessment concludes that no adverse ecological impacts are expected as a result of the proposed road upgrade works.

8.6 Aboriginal Heritage

8.6.1 Overview

A detailed Aboriginal Heritage Assessment for the *Draft ESTATE Concept Plan* has been undertaken by archaeologists Godden Mackay Logan Pty Ltd (see accompanying *Oakdale ESTATE* Specialist Studies Volume). The assessment was undertaken in consultation with local Aboriginal groups that registered an interest in the project[1], including:

- Deerubbin Local Aboriginal Land Council (DLALC);
- Darug Tribal Aboriginal Corporation (DTAC);
- Darug Custodian Aboriginal Corporation (DCAC); and
- Darug Aboriginal Cultural Heritage Assessments (DACHA).

The assessment involved archaeological survey of the site, along with background research, database searches, consultation and development of predictive modelling in accordance with applicable DECC guidelines. The assessment considers and builds on the findings of a previous archaeological assessment undertaken on *Oakdale CENTRAL* in 2002 by Archaeological Surveys and Reports Pty Ltd. This previous assessment was undertaken in support of the Bedford Quarry development application.

The assessment indicates that the *Oakdale ESTATE* is unlikely to have been subject to intensive Aboriginal visitation and use in the past that would have resulted in creation of substantial archaeological deposits.

16 Aboriginal objects/sites have been identified on the *Oakdale ESTATE* in current and previous surveys, including:

- 10 isolated finds/artefacts; and
- 6 open campsites (containing between 2 to 6 artefacts each).

The location of the sites/objects is shown on Figure 2.11.

All of the sites are considered to be of low local to moderate archaeological significance. Notwithstanding, the Oakdale lands form part of a far larger cultural landscape that is highly valued by the Aboriginal community, and as such the land is assessed to be a place of potentially moderate to high cultural and educative significance.

Based on the layout of the *Draft ESTATE Concept Plan*, it is likely that 9 of the 16 identified sites would be impacted during the development of the *Oakdale ESTATE*. The remaining 7 sites/objects are located in the Ropes Creek riparian corridor, and are likely to be able to be retained and protected.

To appropriately manage the impact of the Oakdale development on Aboriginal sites and cultural heritage values, the *Draft ESTATE Concept Plan* will include a commitment to the preparation of a comprehensive whole-of-site Aboriginal Heritage Management Plan. The plan would be developed by a specialist archaeological consultant in consultation with local Aboriginal groups and the DECC. The plan would include a program for intensive surface survey, and where survey warrants test excavation, of the shaded areas on Figure 2.11. These areas were identified in the Oakdale ESTATE Aboriginal Heritage Assessment as having at least some (low to moderate) archaeological sensitivity.

[1] Following consultation in accordance with the DECC's *Interim Community Consultation Requirements for Applicants* (2004)

With the implementation of these measures, it is considered that the development of the *Oakdale ESTATE* is able to be undertaken in a manner that would not have a significant impact on the Aboriginal heritage values of the land.

8.6.2 Aboriginal Heritage Impacts and Mitigation Measures

CENTRAL Concept Plan

Eight of the Aboriginal sites/objects identified in the Oakdale ESTATE Aboriginal Heritage Assessment are located in *Oakdale CENTRAL*, including:

- DTAC1 – an artefact/s recorded in the 2002 survey;
- DTAC2 – an artefact/s recorded in the 2002 survey;
- DTAC3 – an artefact/s recorded in the 2002 survey;
- HP1 – an isolated stone artefact recorded in the 2002 survey;
- HP2 – an open campsite comprising an isolated stone artefact recorded in the 2002 survey;
- IF1 – an isolated stone artefact recorded in the 2007 survey;
- IF2 – an isolated stone artefact recorded in the 2007 survey (which forms part of open campsite HP2 identified in the 2002 survey); and
- OC6 – an open campsite comprising 6 stone artefacts recorded in the 2007 survey.

All of the sites/objects are considered to be of low to moderate local archaeological significance.

It is noted that 4 of the sites/objects (including HP2, IF1, IF2 and DTAC3) are within the footprint of the approved Bedford Quarry (see Figure 2.11). On 12 November 2007, Austral Bricks lodged an application under Section 90 of the *National Parks and Wildlife Act 1974* to destroy the sites, to enable the approved quarry operations to proceed. The application was prepared in consultation with the local Aboriginal groups and in accordance with the DECC's *Interim Community Consultation Requirements for Applicants* (2004) guidelines. The DECC approved the application on 13 December 2007 (see attached in **Appendix F**). The sites have since been destroyed in accordance with the Section 90 consent.

Accordingly, 4 identified Aboriginal sites/objects remain in *Oakdale CENTRAL*. Of these, 3 are likely to be disturbed during the development of *Oakdale CENTRAL*. The remaining site (ie. HP1) is located adjacent to Ropes Creek and it is likely that this site/object will be able to be conserved.

To appropriately manage the impact of the *Oakdale CENTRAL* development on Aboriginal sites and cultural heritage values, the *CENTRAL Concept Plan* includes a commitment to the preparation of a comprehensive Aboriginal Heritage Management Plan for the project. The plan would be developed by a specialist archaeological consultant in consultation with local Aboriginal groups and the DECC, and would include:

- include a program for intensive surface survey of the shaded areas on Figure 2.11 (apart from the areas already disturbed by the Bedford Quarry operations – ie. that area to the east of the unnamed Ropes Creek tributary);
- a detailed salvage program and management plan for all Aboriginal sites within the project disturbance area;
- detailed description of the measures that would be implemented to protect the Aboriginal site/s outside the project disturbance area;
- description of measures that would be implemented if new Aboriginal objects or skeletal remains are discovered during the development of *Oakdale CENTRAL*; and
- a protocol for the ongoing consultation and involvement of the Aboriginal communities in the conservation and management of Aboriginal cultural heritage on the site.

With the implementation of these measures, it is considered that the development of *Oakdale CENTRAL* would not have any significant impact on Aboriginal cultural heritage values.

DHL Project

Four of the Aboriginal sites/objects identified in the Oakdale ESTATE Aboriginal Heritage Assessment (ie. HP2, IF1, IF2 and DTAC3) are located within the footprint of the proposed DHL buildings or in ancillary project areas (ie. stormwater detention basin). As detailed above, all of these sites/objects have since been destroyed as part of the Bedford Quarry operations, in accordance with a Section 90 Consent under the *National Parks and Wildlife Act 1974*.

Accordingly, the construction of the DHL facilities is not expected to have any impact on Aboriginal cultural heritage values.

The wider estate works (including bulk earthworks and road construction) would likely disturb 3 of the 4 remaining Aboriginal sites/objects located in the *Oakdale CENTRAL* site. Further, some of these works are within the area deemed to having at least some (low to moderate) archaeological sensitivity (ie. the shaded area on Figure 2.11).

In accordance with the commitments made under the *CENTRAL Concept Plan*, Goodman would undertake these works in accordance with the whole-of-site Aboriginal Heritage Management Plan. This plan would be prepared prior to the disturbance of any Aboriginal site/object, or disturbance of the shaded area on Figure 2.11 (excluding the area already disturbed by the Bedford Quarry operations).

With the implementation of these measures, it is considered that the *DHL Project* would not have any significant impact on Aboriginal cultural heritage values.

Old Wallgrove Road

The Oakdale ESTATE Aboriginal Heritage Assessment includes assessment of the archaeological values of the Old Wallgrove Road corridor between Roberts Road and the site. No Aboriginal sites were identified in the road corridor and, given the significant disturbance of the road corridor (during the construction of the roadway), the corridor was assessed as having a very low sensitivity for Aboriginal archaeological and cultural heritage value.

8.7 Historic Heritage

8.7.1 Overview

A detailed Historical Heritage Assessment for the *Draft ESTATE Concept Plan* has been undertaken by Australian Museum Business Services (see accompanying *Oakdale ESTATE* Specialist Studies Volume).

The assessment indicates that there are no items listed on the State Heritage Register within or adjacent to the *Oakdale ESTATE*, or within the Old Wallgrove Road corridor.

Under Section 170 of the *Heritage Act 1977*, government instrumentalities are required to maintain a register of heritage assets. The Warragamba-Prospect Pipelines 1 and 2 within the Sydney Water Supply Pipeline corridor (to the north of the project site) are listed on the Sydney Catchment Authority's (SCA's) draft Section 170 Register.

The archaeological survey identified 3 relics/areas of some heritage value on the *Oakdale ESTATE*, as shown on Figure 2.11. The items include:

- the Lockwood outbuildings site – including a terraced hillside, concrete-lined water trough and a small empty dam in the north-eastern corner of the *Oakdale SOUTH* precinct, which may be associated with the former Lockwood estate;

- the ruins of a timber slab hut cottage in the *Oakdale WEST* Precinct, which is estimated to have been constructed between 1840-1860. Evidence suggests that the slab hut has collapsed only in recent years, and as such may have been continuously utilised for the Razeville estate and the Lenore Closer Settlement scheme, through to more recent landuses; and
- the remains of a post and rail fence, comprising 4 timber posts, near Ropes Creek. The fenceline may represent an internal boundary associated with the Lenore Closer Settlement scheme.

The Lockwood outbuildings site and the timber slab hut cottage ruins have been assessed in the Oakdale ESTATE Historical Heritage Assessment as being of moderate and high local heritage significance, respectively.

Both of the items are within the developable area of the *Oakdale ESTATE*, and would likely be disturbed during the development of Oakdale.

To appropriately manage the impact of the *Oakdale ESTATE* development on historical heritage values, the *Draft ESTATE Concept Plan* will include a commitment to the preparation of a detailed Heritage Management Strategy for the Oakdale project. The plan would be developed by a specialist heritage consultant in consultation with the NSW Heritage Office and would include:

- a program for the dismantling and excavation of the timber slab cottage ruin;
- a program for archaeological test excavation of the Lockwood outbuildings site; and
- an interpretation strategy for the Oakdale archaeological resources to ensure that the developmental history of the site, from the period of large estates to the subdivisions of the Lenore Soldier Settlement, is acknowledged.

With the implementation of these measures, it is considered that the development of the *Oakdale ESTATE* would not have any significant impact on historical heritage values of the land.

8.7.2 Historic Heritage Impacts and Mitigation Measures

CENTRAL Concept Plan and DHL Project

No items of historic heritage significance have been identified within *Oakdale CENTRAL*. As such, the *CENTRAL Concept Plan* and the *DHL Project* are not expected to have any direct impacts on historic heritage.

The *CENTRAL Concept Plan* and the *DHL Project* are not expected to have any impacts on the 3 identified heritage items within the *Oakdale ESTATE*, given the project's distance from these sites and the nature of the sites. Further, the Oakdale ESTATE Historical Heritage Assessment indicates that the project would not impact upon the heritage values of the Warragamba-Prospect Pipelines 1 and 2.

Old Wallgrove Road

The Oakdale ESTATE Historical Heritage Assessment includes assessment of the heritage values of the Old Wallgrove Road corridor between Roberts Road and the site. No items of historical heritage value were identified in the road corridor.

It is noted that Old Wallgrove Road does cross the Sydney Water Supply Pipeline corridor (the pipelines are tunnelled below the road in this section of the pipeline corridor), and as stated above the Warragamba-Prospect Pipelines 1 and 2 are listed on the SCA's draft Section 170 Register.

The proposed Old Wallgrove Road upgrade works, including the commitment to duplication of the existing roadway, would not require any disturbance to the Warragamba-Prospect Pipelines

(which are tunnelled well below the road surface in this area), and are not expected to have any impact on the heritage value of the pipelines.

In addition to the main pipelines, there is a small section of obsolete pipe below the pavement of Old Wallgrove Road (which appears as a culvert to Old Wallgrove Road), which has some heritage value. The proposed Old Wallgrove Road upgrade works would not require any significant disturbance to this pipe and its setting.

8.8 Traffic and Parking

8.8.1 Overview

A detailed Traffic Assessment has been undertaken for the *Draft ESTATE Concept Plan* by specialist traffic consultants Traffix Pty Ltd (see accompanying *Oakdale ESTATE* Specialist Studies Volume).

Additional traffic assessments have been undertaken for both the *CENTRAL Concept Plan* and the *DHL Project* by Traffix Pty Limited, and are attached as **Appendix G** and **Appendix H**, respectively.

The Oakdale ESTATE Traffic Assessment has informed and assessed the road layout of the *Draft ESTATE Concept Plan*. The assessment has been undertaken with reference to the wider road network, as well as the proposed internal road layout.

A brief summary of the road system as proposed in the *Draft ESTATE Concept Plan* is provided below.

Regional Road System

A central component of the *Draft ESTATE Concept Plan* will be the development of a regional 'Southern Link Road' extending from Mamre Road in the west to Old Wallgrove Road[1] in the east (see Figure 3.1).

The link road, comprising a 4-lane divided roadway (with scope for additional lanes) within a 40 metre road reservation, would provide an uninterrupted and efficient arterial access from Mamre Road through to the M7 and the M4.

The location of the link road would be generally consistent with, and expand upon, the link road network as proposed by the RTA in its concept plan for the Western Sydney Employment Hub – Erskine Park Link Road (MP 06_0166), which is on currently on exhibition. The road network proposed in the RTA's concept plan is shown on Figure 8.6.

[1] The Link Road to be developed under the Concept Plan will link with the section of Old Wallgrove Road required to be upgraded under Ministerial approvals for the M7 Hub development (ie. MP 06_0164 and DA 283-11-2004-i), which is on the corner of Roberts Road.

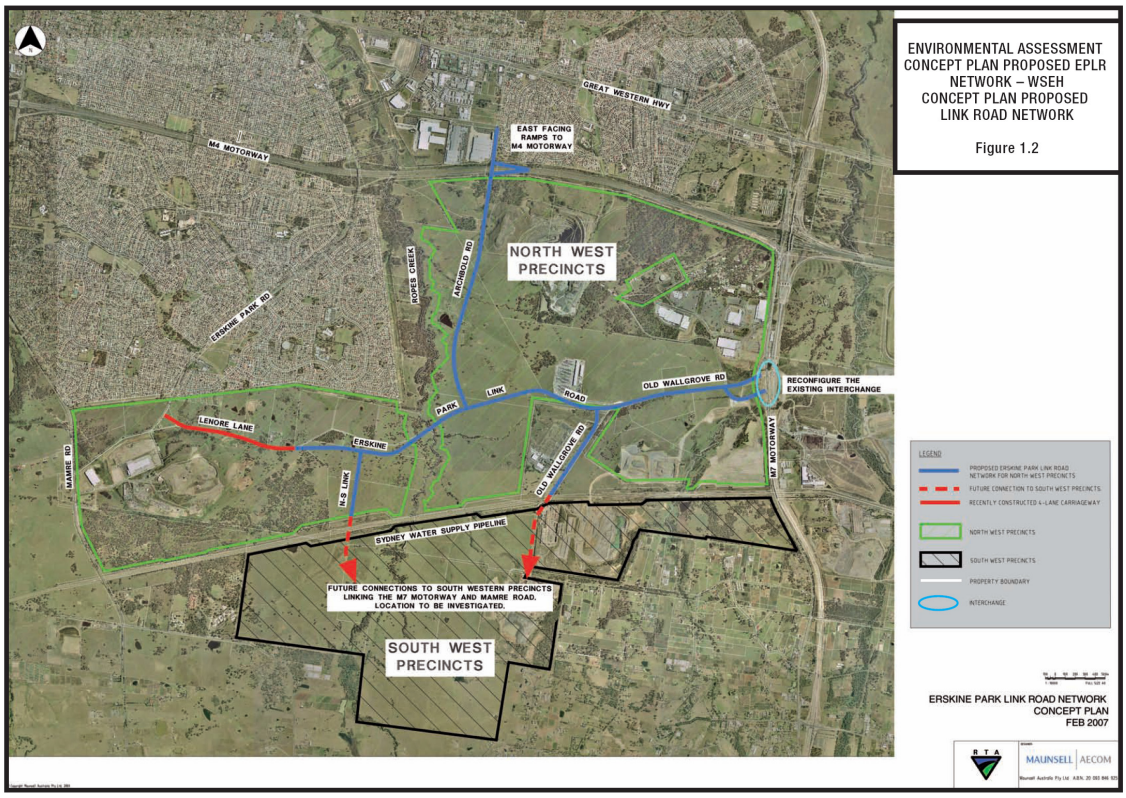

Figure 8.6: *RTA Erskine Park Link Road Network*

It is noted that the final alignment of the 'Southern Link Road' has not been determined to date. The Oakdale ESTATE Traffic Assessment is based on Link Road Option A (see Figure 3.1 and 4.1), although the layout of the *Draft ESTATE Concept Plan*, the *CENTRAL Concept Plan* and the *DHL Project* has been designed so as not to preclude the possibility of the link road being ultimately developed on a different alignment, namely:

- as an extension to the existing southern terminus of Old Wallgrove Road (ie. Option B on Figure 4.1); or
- on an alignment that cuts through the centre of *Oakdale CENTRAL* to access lands to the south (ie. Option C on Figure 4.1).

If such an alternative alignment were to eventuate, the proposed link road corridor on the site (ie. Link Road Option A) would be reduced to an estate collector road (subject to approval).

With regard to the interchange of Old Wallgrove Road and the M7, traffic assessment undertaken for the *Draft ESTATE Concept Plan* indicates that the interchange will perform adequately for the development of much of the *Oakdale ESTATE*, but that at some stage[1] either a significant upgrade of the interchange or the development of a new interchange in a different location, would be required. This is discussed in more detail in Section 8.8.2 below.

Internal Road System

The internal road system for the *Draft ESTATE Concept Plan* comprises a 3-level road hierarchy based on internally and externally generated traffic volumes, including:

- the link road (4 lanes with capacity for additional lanes);
- collector roads (2/4 lanes); and
- local estate access roads (2 lanes).

[1] This timing will depend on the timing of development in the entire portion of the Western Sydney Employment Hub that utilises the roadway. Estimates indicate that the timing would occur at around 2015.

The draft internal road network is shown on Figure 3.1, and the nominal design of each road type is presented in the following table.

Table 8.13: *Road Summary Table*

Road Type	***Reservation Width***	***Carriageway***	***Verge***
Link Road	40m	4 x 3.5m	Centre – 3.75m Shoulders – 4.5m and 3.75m
Collector Road	23m	2 x 7.75m	Shoulders – 2 x 3.75m
Local Estate Road	20.5m	2 x 6.75m	Shoulders – 2 x 3.5m

The Oakdale ESTATE Traffic Assessment indicates that the traffic generation arising from the development of the *Oakdale ESTATE*, together with the development of the surrounding area (ie. Site 8) can be accommodated on the road network as identified in the *Draft ESTATE Concept Plan*.

Pedestrian and Cycle System and Public Transport

The *Draft ESTATE Concept Plan* will provide for a comprehensive pedestrian, cycle and public transport system to service the *Oakdale ESTATE*, including:

- a network of pedestrian pathways and cycle ways;
- provision of bus stops at appropriate locations; and
- provision of bicycle parking facilities for all developments.

In addition, the *Draft ESTATE Concept Plan* will include a commitment to preparing a Transport Management and Accessibility Management Plan (T-MAP) for the *Oakdale ESTATE*. The T-MAP would be prepared in consultation with relevant stakeholders and in accordance with the Ministry of Transport's draft *Interim Guidelines on T-MAPs*. The plan would seek to maximise travel mode shift to public transport, cycling and walking. In particular, the T-MAP would seek to achieve the mode shift goals of SEPP 59, including:

- a reduction in mode split of 'car as driver' for journeys to/from work by at least 10% compared to existing surrounding areas; and
- a reduction in total vehicle kilometres travelled generated by the Oakdale development by at least 5% compared to a 'conventional' approach to development.

8.8.2 Traffic Impacts and Mitigation Measures

CENTRAL Concept Plan Traffic Impacts

Traffic Generation

The Oakdale CENTRAL Traffic Assessment has adopted a trip rate of 15 trips per developable hectare to assess the traffic generation associated with the concept plan development. This rate has been used in the Oakdale ESTATE Traffic Assessment and has been adopted by the RTA in other comparable areas of the Western Sydney Employment Hub (and in its Erskine Park Link Road Network Concept Plan). The rate is considered to be a worst-case scenario which in the long term is likely to overstate the traffic generation from Oakdale and *Oakdale CENTRAL*. Many of the development applications within Erskine Park and the M7 Business Hub have demonstrated trip rates that are lower than 15 trips/ha and this is a direct consequence of the following factors:

- large warehouse developments typically operate 24 hours per day and 7 days per week, thereby spreading traffic loads and minimising peak period generation;
- warehouse staff are usually rostered over this 24 hour shift with changeover times that do not generally coincide with the on-street peak period; and
- peak period travel is usually associated with administrative staff, which is a small proportion of the overall workforce.

Application of this planning rate to *Oakdale CENTRAL* at full development results in the following trips:

- 590 vehicle trips per hour in the morning peak (472 in, 118 out); and
- 590 vehicle trips per hour in the evening peak (118 in, 472 out).

Traffic Impacts – Internal Road System – Link Road

As detailed above the maximum volumes on the link road within the site would be 590 veh/hr. The Oakdale CENTRAL Traffic Assessment indicates that these volumes are moderate and can be readily accommodated by a single through lane in each direction on the link road (Link Road Option A).

The Oakdale CENTRAL Traffic Assessment includes modeling of the performance of the three link road (Option A) intersections at full development of *Oakdale CENTRAL*, which indicates that the intersections would all operate satisfactorily with a Level of Service A, with minimal delay, assuming:

- priority (stop) sign control at Intersection 1;
- priority-controlled T-junction at Intersection 2; and
- basic through movement at Intersection 3 (given that the link road would terminate at this intersection).

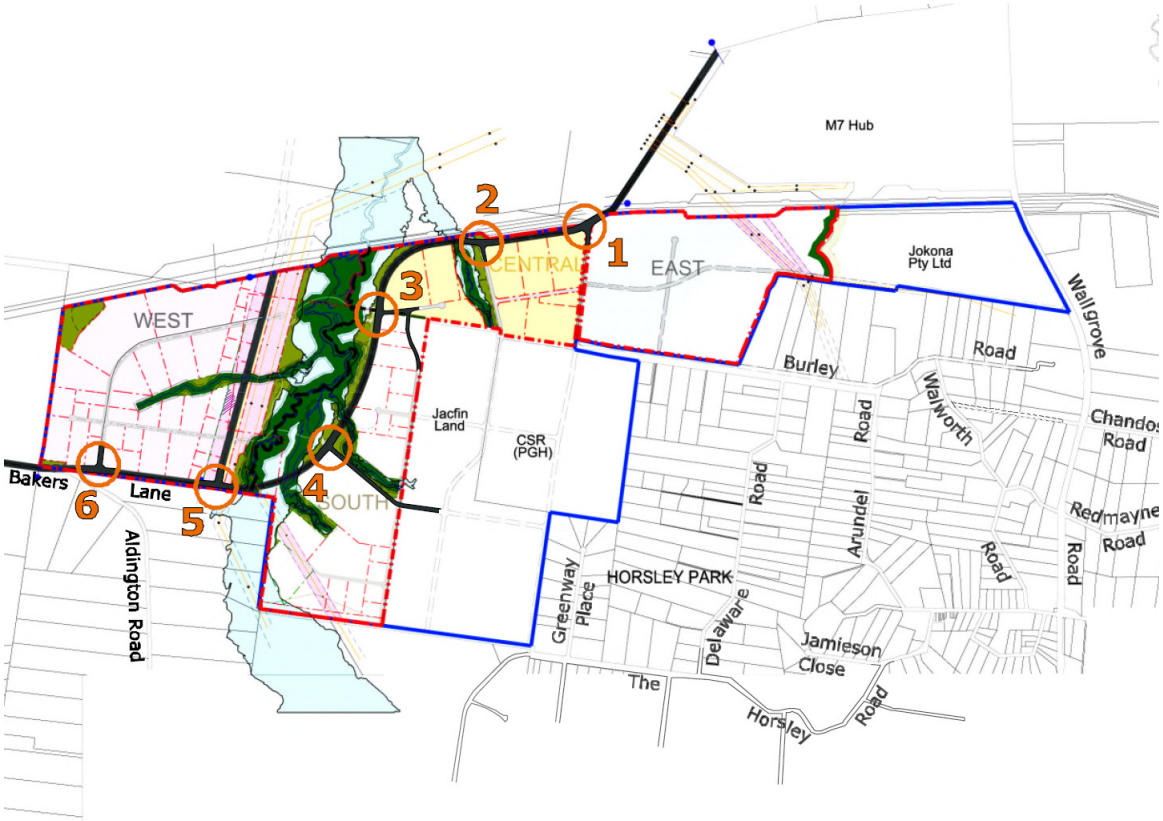

Figure 8.7: *Link Road (Option A) Intersections*

It is noted that the Oakdale ESTATE Traffic Assessment includes additional assessment of these intersections at the full development of the *Oakdale ESTATE* and the remainder of Site 8. The assessment indicates that the intersections would continue to operate satisfactorily, assuming signalised intersections.

Traffic Impacts – Internal Road System – Other Estate Roads
The Oakdale CENTRAL Traffic Assessment indicates that the traffic volumes on the two internal roads accessing Intersections 2 and 3 would be moderate and in all cases, provision of a single through lane in each direction would be acceptable with kerbside parking also permitted.

It is noted that the Oakdale ESTATE Traffic Assessment includes additional assessment of these roadways at the full development of the *Oakdale ESTATE* and the remainder of Site 8 (based on Link Road Option A). The assessment indicates that the proposed internal collector road (ie. Estate Road 1) would accommodate the full development of Site 8.

Traffic Impacts – External Road System – Old Wallgrove Road (west of Roberts Road)
Existing traffic volumes on Old Wallgrove Road in the vicinity of the site (ie. to the west of Roberts road) principally relate to the existing quarrying activities associated with the CSR/PGH quarry and brickmaking plant (south of Burley Road) and Austral Bricks' operations on Oakdale's EAST precinct. These sites together generate moderate volumes which are estimated to be approximately 30 veh/hr during peak periods. Austral Bricks' approved operations on the *Oakdale CENTRAL* site (ie. the Bedford Quarry) also generate moderate traffic volumes (up to about 15 veh/hr), although these operations are expected to cease in 2008.

Therefore, at full development of *Oakdale CENTRAL*, the through traffic on Old Wallgrove Road north of the site (west of Roberts Road) would be about 620 veh/hr during peak periods (combined flow in both directions). This traffic can be readily accommodated by Old Wallgrove Road, which has a mid-block capacity of about 1,200 veh/hr for a single undivided lane under uninterrupted flow conditions.

Traffic assessment undertaken for the *DHL Project* indicates that Old Wallgrove Road would require some relatively minor upgrade works to service *Oakdale CENTRAL*, including localised widening to achieve a consistent 7 metre road width. These works are discussed below.

Although traffic assessment indicates that it is not required to service *Oakdale CENTRAL*, Goodman has also committed to the additional upgrading of Old Wallgrove Road from Roberts Road to the north-eastern corner of the site, in accordance with the link road design contemplated in the RTA's Erskine Park Link Road Network Concept Plan (MP 06_0166) – see commitments below.

Traffic Impacts – External Road System – Old Wallgrove Road (east of Roberts Road) – Existing Conditions
Existing peak hour traffic volumes on Old Wallgrove Road east of Roberts Road to Wallgrove Road are approximately 403 veh/hr. The Oakdale CENTRAL Traffic Assessment considers that these volumes are moderate and can readily be accommodated by a single lane in each direction. However, the assessment notes that Old Wallgrove Road is presently constructed with two lanes in each direction for a distance of 220 metres west of Wallgrove Road, providing excess capacity.

The traffic assessment includes modelling of the intersection of Old Wallgrove Road and Wallgrove Road, concluding that the existing intersection operates satisfactorily during peak periods (Level of Service A-C).

The additional traffic generated by *Oakdale CENTRAL* (ie. 590 veh/hr) were superimposed onto the above volumes and the performance of the intersection was re-analysed. The analysis indicates that the intersection would generally perform satisfactorily, except for right turn movements from Wallgrove Road into Old Wallgrove Road (north to west). This would require the construction of a 100m right turn bay in Wallgrove Road (north approach). The traffic assessment also recommends that a single right turn lane is provided on the eastern (M7) approach, rather

than two lanes as currently line-marked, due to the moderate volumes associated with this movement.

The need for these local intersection improvements would be assessed during applicable project/development applications within *Oakdale CENTRAL* (as detailed below, traffic analysis indicates that these works would not be required for the DHL Project).

Traffic Impacts – External Road System – Old Wallgrove Road and M7 – Planned Future Conditions

Traffic conditions along Old Wallgrove Road west of the M7 have been previously assessed as part of planning for the Eastern Creek Precinct of the Western Sydney Employment Hub (ie. Site 2 of the WSEH). The assessments assumed 5,565 trips during both the morning and afternoon peaks associated with the entire Eastern Creek Precinct, with 360 hectares of developable land. The various intersections along Old Wallgrove Road (from the M7 to Roberts Road) as well as the M7 interchange were assessed on this basis, with 100% development completion of the Eastern Creek Precinct (anticipated in about 2016).

The Oakdale ESTATE Traffic Assessment indicates that the development of the *Oakdale ESTATE* and the balance of Site 8 would generate an additional 4,600 veh/hr along this eastern corridor (connecting to the M7), which would therefore increase total flows on approach to the M7 to about 10,165 veh/hr. This represents traffic associated with a total developable area of about 678 hectares, assuming a trip rate of 15 trips/ha.

On the basis that traffic planning along Old Wallgrove Road should be 'capped' at 5,565 veh/hr as is inherent in current planning (which underpins the current intersection layout at Old Wallgrove Road with the M7), it follows that the implicit development of up to 360 hectares can be accommodated that feeds into this intersection, wherever this may occur. Expressed another way, the infrastructure that is already planned will accommodate 360/678 hectares or slightly more than 50% of the overall developable area within all areas under investigation (Eastern Creek Precinct, Oakdale and the balance of Site 8). At that time (predicted to be around 2015), consideration would need to be given to:

- the upgrading of the existing approved corridor and M7 interchange to provide increased road capacity; and/or
- the construction of a new connection to the M7 south of Old Wallgrove Road.

Goodman acknowledges that there is some uncertainty regarding the final solution to the M7 interchange capacity upgrade at this stage, but believes that a number of reasonable and feasible options exist. Goodman does not believe that the absence of a final solution at this stage should preclude the commencement of the development of *Oakdale CENTRAL*, given that:

- the *Oakdale CENTRAL* precinct development would generate approximately 590 veh/hr (two-way) along Old Wallgrove Road to/from the M7. This represents a relatively small proportion of the 5,565 trips that are 'implicit' in the conservative traffic planning for this road. The Oakdale CENTRAL Traffic Assessment concludes that the road system currently being developed (a 4 lane divided road with turn bays) will readily accommodate traffic generated by *Oakdale CENTRAL* (though with long term planning making provision for a 6 lane divided road within a 40 metre road reservation);
- a number of reasonable and feasible options exist to relieve capacity constraints, either through increasing the capacity of the existing interchange or through construction of a new interchange;
- capacity is not expected to be reached until about 2015, allowing considerable time to determine a final solution;

- traffic predictions for the WSEH have been based on conservative traffic volumes, which are likely to overstate the impact on the planned interchange; and
- the *Draft ESTATE Concept Plan* will include a commitment to make an equitable contribution to the M7 interchange upgrade, when it is required.

CENTRAL Concept Plan Commitments

The *CENTRAL Concept Plan* includes a number of commitments in relation to provision of the road infrastructure required for the development of *Oakdale CENTRAL* and the wider area. A summary of the commitments is provided below. The road infrastructure would be delivered in a staged manner, in accordance with the development of *Oakdale CENTRAL* and the need for the road works.

Link Road

Goodman would:

- upgrade the 1.0 km section of Old Wallgrove Road from Roberts Road to the north-eastern corner of the site to 4 lanes (ie. by provision of an additional 2 lanes, including a bridge over the Sydney Water Pipeline Corridor), to form the first component of the 'Southern Link Road' as contemplated in the RTA Erskine Park Link Road Network Concept Plan (MP 06_0166). This commitment would be subject to the RTA/NSW Government acquiring the land required for the additional road reservation (see Section 6.5 for further detail);
- provide the 40 metre road reservation for extension of the Southern Link Road through *Oakdale CENTRAL* (ie. Link Road Option A); and
- construct the northern carriageway (2 lanes, 1.4 kilometres) of the Southern Link Road – Option A (including a bridge over the Ropes Creek tributary) through *Oakdale CENTRAL*, as an estate road.

These commitments would be subject to an equitable agreement with the Minister for Planning (or other responsible authority) that provides for reimbursement by the NSW Government to Goodman from the contributions of other landowners/developers that benefit from the infrastructure installed by Goodman.

As discussed in Section 8.8.1, the *CENTRAL Concept Plan* also provides flexibility regarding the alignment of the Southern Link Road through Site 8.

Internal Collector Roads

Goodman would:

- provide the 23 metre road reservation for the collector roads detailed in the *CENTRAL Concept Plan* (ie. Estate Road 1 and the western side of Old Wallgrove Road); and
- construct the 2/4-lane collector road servicing the Jacfin land (ie. Estate Road 1) as described in the *CENTRAL Concept Plan*.

Internal Local Estate Roads

Goodman would:

- provide the 20.5 metre road reservation for the local estate roads as shown in the *CENTRAL Concept Plan* (ie. Estate Roads 2 and 3); and
- construct the 2-lane local estate roads.

Public and Sustainable Transport Facilities

Goodman would provide the pedestrian and cycle and public transport system as described in the *CENTRAL Concept Plan*, including:

- a shared pedestrian/cycleway on one side of all internal estate roads;
- provision of bicycle parking facilities for all developments; and

- provision of bus stops.

With the implementation of the above measures, it is considered that the development of the *CENTRAL Concept Plan* is able to be undertaken in a manner that would not result in any significant traffic impacts. Indeed, the proposed works would provide for key road infrastructure required for Site 8 and the Western Sydney Employment Hub.

DHL Project Traffic Impacts

Traffic Generation

The DHL Traffic Assessment adopts the 15 trips per developable hectare rate as used in the Oakdale ESTATE and Oakdale CENTRAL Traffic Assessments. Application of this planning rate to the *DHL Project* results in the following trips:

- 164 vehicle trips per hour in the morning peak (131 in, 33 out); and
- 164 vehicle trips per hour in the evening peak (33 in, 131 out).

Traffic Impacts – External Road System – Old Wallgrove Road (west of Roberts Road)

With the existing traffic movements on Old Wallgrove Road in the vicinity of the site (ie. west of Roberts Road), the *DHL Project* would result in total through traffic on Old Wallgrove Road of about 200 veh/hr during peak periods (combined flow in both directions). This traffic can be readily accommodated by Old Wallgrove Road, which has a mid-block capacity of about 1,200 veh/hr for a single undivided lane under uninterrupted flow conditions.

The DHL Traffic Assessment recommends that, to safely accommodate the project's heavy vehicle traffic, Old Wallgrove Road should be upgraded to a uniform 7 metre width carriageway to the north-eastern site access, with local widening on bends to safely accommodate B-doubles.

Traffic Impacts – External Road System – Old Wallgrove Road (east of Roberts Road)

The traffic generated by the DHL Project (ie. 164 veh/hr) represents approximately 27% of the overall expected traffic generation associated with *Oakdale CENTRAL*. The DHL Traffic Assessment considers that these volumes are moderate and the main issue of potential concern relates to the right turn movement from Wallgrove Road into Old Wallgrove Road (north to west).

As detailed above, the existing route and intersection performance was found to be satisfactory subject to minor improvements at some stage during the development of *Oakdale CENTRAL* and the surrounding area.

The DHL Traffic Assessment includes an analysis of the performance of the Old Wallgrove Road / Wallgrove Road intersection, concluding that the intersection will continue to perform satisfactorily with no improvements required for the project.

Traffic Impacts – Internal Road System

The *DHL Project* proposes a single site access point to/from Old Wallgrove Road, as shown on Figure 5.3. The access is in the north-eastern corner of the site and is in a similar location to the existing site access for the Bedford Quarry. This access would provide truck and car access to the DHL facilities and the wider *Oakdale CENTRAL* precinct.

The DHL Traffic Assessment indicates that the site intersection with Old Wallgrove Road would operate very satisfactorily, with minimal delays arising from the predicted traffic volumes, assuming a priority-controlled T-junction.

The DHL Traffic Assessment includes an assessment of the proposed internal road design, concluding that the internal design complies with the requirements of applicable Australian Standards, and would provide a very good level of safety, convenience and amenity.

Parking

The DHL Traffic Assessment includes an assessment of parking provision in consideration of the requirements in the *Fairfield Development Control Plan 2006* and the RTA's *Guide to Traffic Generating Developments* (2002). The proposed parking provision, together with the requirements of the applicable codes, are shown in the following table, which also includes consideration of the parking requirements under the *CENTRAL Concept Plan*.

Table 8.14: *Parking Provision*

Bld	***Landuse***	***Required Parking Space Rate***			***Total Required[1]***			***Proposed Spaces***
		CENTRAL Concept Plan	***Fairfield DCP***	***RTA Guide***	***CENTRAL Concept Plan***	***Fairfield DCP***	***RTA Guide***	
1A	Warehouse	1 / 200m^2	1 / 80m^2	1 / 300m^2	120	262	70	152
	Office	1 / 40m^2	1 / 40m^2	1 / 300m^2				
2A	Warehouse	1 / 200m^2	1 / 80m^2	1 / 300m^2	194	421	112	240
	Office	1 / 40m^2	1 / 40m^2	1 / 300m^2				
Total					314	683	182	392

1 The required spaces are based on the floor areas listed in Table 5.2 and shown on the building plans.

As shown in the table, the project would comfortably comply with the parking requirements in the *CENTRAL Concept Plan* and the RTA requirements, but would be less than the requirement in the Fairfield DCP. It is considered that the DCP requirements are unreasonable, particularly for larger warehouses which typically have a lesser employee density than smaller facilities.

The proposed parking provision for the *DHL Project* has been based on consideration of the *CENTRAL Concept Plan* and DCP guidelines, together with information provided by DHL.

The DHL Traffic Assessment concludes that the parking demands would be fully accommodated within the site and would ensure that on-street parking does not occur.

DHL Project Commitments

Old Wallgrove Road

As detailed in Section 5.9.1, Goodman is proposing a two stage upgrade to Old Wallgrove Road to accommodate the *DHL Project* and deliver the first component of the link road as contemplated in the RTA's Erskine Park Link Road Network Concept Plan.

The first stage involves upgrading Old Wallgrove Road, in accordance with the recommendations of the DHL Traffic Assessment, to accommodate the traffic generated as a result of the project. These 'interim' works include:

- local widening between Roberts Road and the north-eastern corner of the site to achieve a consistent 7 metre road width for heavy vehicle traffic;
- local widening at bends to accommodate B-doubles;
- provision of passing bays on southbound lanes at the site access point; and
- 60 km/h signposting for southbound lanes in the vicinity of the site access driveway.

Goodman has included a commitment to undertake these works prior to the commencement of operations, to the satisfaction of Blacktown City Council and Fairfield City Council.

The second stage involves the full upgrading Old Wallgrove Road from Roberts Road to the north-eastern corner of the site, in accordance with the ultimate link road design contemplated in the *CENTRAL Concept Plan* and the RTA's Concept Plan (MP 06_0166). Although the Central and DHL Traffic Assessments indicates that this upgrade is not required to service the *Oakdale CENTRAL* precinct, Goodman has committed to constructing this part of the link road at an early stage to encourage and facilitate the development of the link road network and Site 8 in a timely manner.

The proposed road layout for this second stage is shown on Figure 5.8. Goodman has included a commitment to undertake the road works, subject to the RTA acquiring the land required to achieve the 40 metre road reservation required for the road upgrade. Goodman would complete this component of the link road within 12 months of the RTA acquiring the road reserve, in consultation with the RTA, Blacktown City Council and Fairfield City Council.

It is considered that the interim road works, together with the construction of the first stage of the link road, would satisfy the traffic demands associated with the *DHL Project* and facilitate the development of Site 8 of the Western Sydney Employment Hub.

Internal Roads
Goodman would construct all of the internal roads of the *CENTRAL Concept Plan*, as part of the *DHL Project*.

The roads would be constructed in two broad stages.

The Stage 1 internal roadworks would involve construction of temporary access roads to service the DHL facilities (ie. Temporary Access Road 1, as shown on Figure 5.3 and described in Section 5.9.1).

The Stage 2 internal roadworks would involve the construction of other internal roads of the *Oakdale CENTRAL* precinct, including:

- the 2 northern lanes of the link road (including a bridge across the Ropes Creek tributary);
- Estate Road 1 – based on a 'collector road' design (2/4 lanes); and
- Estate Roads 2 and 3 – based on a 'local estate road' design (2 lanes).

Details and dimensions of the roadways is provided in Section 8.8.1.

It is noted that the proposal involves the construction of the northern carriageway of the Link Road (Option A) so as not to preclude the possibility of the 'Southern Link Road', as contemplated in the RTA's Erskine Park Link Road Network Concept Plan (MP 06_0166), being ultimately developed on a different alignment (ie. Option B or Option C as shown on Figure 3.1, or a variation of one of these alignments). As stated previously, the link road corridor within *Oakdale CENTRAL* would be reduced to an estate road in this eventuality.

Parking
The *DHL Project* provides a total of 392 car parking spaces for the DHL facilities. Parking spaces for each facility are detailed in Table 5.2.

All parking spaces would be appropriately sealed and linemarked.

Public and Sustainable Transport Facilities
The *CENTRAL Concept Plan* envisages a number of measures to encourage and facilitate sustainable transport modes include:

- provision of a shared pedestrian/cycleways on the link road and estate roads;
- provision of bus stops on the link road; and
- provision of bicycle parking facilities for the proposed buildings.

These facilities would be provided on a staged basis in accordance with the development of the internal road system and the public transport network. Bicycle parking facilities would be provided for the DHL buildings.

8.9 Visual Amenity and Landscaping

The development the subject of the *CENTRAL Concept Plan* and *DHL Project* involves the development of large industrial buildings which, if not planned and designed appropriately, has the potential to impact on the visual amenity of the locality.

The *Oakdale CENTRAL* site is surrounded on all sides by employment land. Austral Bricks' existing quarry and brickmaking plant is located to the east of the site, and CSR/PGH's quarry/brickmaking plant is located to the south of the site. Sensitive visual receivers in the vicinity of the site include:

- Erskine Park residential area, approximately 1.3 kilometres to the north-west;
- Burley Road, Horsley Park rural-residential area, approximately 0.5 kilometres to the south-east;
- commuters on Old Wallgrove Road, immediately to the east of the site; and
- commuters on the future link road, immediately to the north of the site.

Other sensitive receivers in the vicinity of the site do not have any views to the site due to intervening topography. These include:

- Emmaus College and Retirement Village, approximately 1.75 kilometres to the west;
- Bakers Lane, Kemps Creek rural-residential area, approximately 1.3 kilometres to the south-west; and
- Greenway Place, Horsley Park rural-residential area, approximately 1.0 kilometre to the south.

The Erskine Park residential area and the Burley Road Horsley Park rural-residential area do not have significant views to the site, with views largely mitigated by distance, topography and vegetation (see Figures 8.8 and 8.9).

Figure 8.8: *View from site (top of bund) toward Burley Road residential area*

Figure 8.9: *View from site (top of bund) toward Erskine Park residential area (top left)*

At present, Old Wallgrove Road in the vicinity of the site provides access primarily to the Austral and CSR/PGH quarries/brickmaking plants. As the road does not provide through access, or access to sensitive landusers, the development of *Oakdale CENTRAL* is not expected to significantly impact existing commuters on Old Wallgrove Road.

However, the area surrounding the site is expected to change significantly over the coming years with the development of Site 8 of the Western Sydney Employment Hub. The proposed Southern Link Road would provide access from Mamre Road through to Wallgrove Road and the M7.

As such, the key visual receivers in relation to the project are considered to be future commuters on Old Wallgrove Road and the link road.

The visual impacts on these and other receivers would be mitigated through the implementation of a range of measures, including:

- building setbacks that comply with the *CENTRAL Concept Plan* development design controls, including:
    - minimum setback to the link road corridor of 20 metres, with provision for 100% landscaping within the setback. (Nb. DHL Building 1A is setback 28 metres from the road corridor);
    - minimum building setback to Old Wallgrove Road of 15 metres, with at least 50% of the setback landscaped. The proposed DHL building setbacks include[1]:
        - Building 1A – 33 metres; and
        - Building 2A – 42 metres;
    - provision for a wide area of open space in the north-eastern corner of the site, which would accommodate a high quality *Oakdale ESTATE* entrance marker (subject to approval of a Signage Strategy to be prepared in consultation with Council);
    - minimum building setback to the paper road to the south of the site of 15 metres, with at least 50% of the setback landscaped. DHL Building 2A is setback at least 19 metres from the road corridor;
- building heights that would be kept to reasonable levels:
    - the maximum ridge height for DHL Buildings 1A and 2A is 13.7 metres and the maximum wall height is 10.0 metres, which is consistent with contemporary warehouse buildings in the Western Sydney Employment Hub;
- ensuring site cover is kept to reasonable levels:
    - the allowable site coverage for the *CENTRAL Concept Plan* is 65%, which is consistent with contemporary sites in the Western Sydney Employment Hub (eg. Huntingwood West and Huntingwood East). It is also noted that the *Draft ESTATE Concept Plan* provides for approximately 75 hectares of Environmental Conservation / Recreation land (ie. approximately 18% of the total Oakdale site area); and
    - the average site cover for the proposed DHL buildings is 55%, which is comfortably within the 65% standard in the *CENTRAL Concept Plan*;
- ensuring a high quality architectural design to the buildings (see Section 8.9.1 below); and
- ensuring a high quality landscape design to the site and the development lots (see Section 8.9.2 below).

With the adoption of these measures, it is considered that the *CENTRAL Concept Plan* and the *DHL Project* would not result in any significant visual impact to surrounding visual receivers, and would not adversely affect the visual amenity of the locality.

[1] These setbacks are conservatively taken from an expanded 23 metre road reservation, as contemplated in the *CENTRAL Concept Plan*. The existing Old Wallgrove Road reservation is 20.5 metres wide.

8.9.1 Architectural Design Statement – DHL Buildings

The proposed DHL facilities have been designed by Goodman's in-house Design+ Team, together with Mackenzie Pronk Architects Pty Limited.

The architects have incorporated a range of architectural elements – through design and materials – to ensure that the buildings contribute to the development of a high quality and contemporary industrial estate. The architects have been particularly conscious of the need to provide a quality presentation to Old Wallgrove Road and the link road, with the incorporation of elements to break up the scale and bulk of these facades.

Details and schematics of the proposed building materials, colours and architectural forms are provided in the Oakdale CENTRAL Urban and Landscape Design Report, attached as **Appendix I**.

A design statement from the project architect is presented below:

> *"The design of buildings has been led by the masterplan [Draft Oakdale ESTATE Concept Plan] intent, sites have been identified in the masterplan as signature building sites - those sites that will be required to make a positive impact on the presentation of the estate. These buildings utilise an architectural language with a restricted palette, a language whose simple bold palette will be executed with conviction - the functional elements of Office, Dock, Awning and Entry have been exaggerated and celebrated whilst the structure and skin have been manipulated to achieve an appropriate cost effective and dynamic functional architecture.*
>
> *The proposed logistics and warehousing buildings for the DHL Project have been designed to best serve the end users needs creating a setting of functional excellence and efficiency.*
>
> *Buildings 1A and 2A are required to be secure precast concrete facilities. The proposed precast cladding will have an embossed vertical pattern, the panels are proposed to be in grey off form concrete with a clear finish. The natural off form colour tone will ensure the building mass is recessive whilst the functional elements of loading dock, office and entry are proposed to be treated in a strong primary colour scheme. The cladding pattern will dissolve the vertical joints and break down the component elements and therefore the scale of the façade, the pattern imbues a highly functionalist facility with a modicum of poetry. An incised pattern of advancing and receding vertical bands representing an abstraction of the Cumberland Plain Woodland. The patterning when allied with the landscape treatments will present a fine, considered and robust building, whose component elements will exhibit an uncommon care and style for a building of this type*
>
> *The treatment to facades of the DHL buildings will lift the buildings above the purely prosaic and aid in mitigating the enormous scale without undue cost or alternative construction methods."*

8.9.2 Public Domain and Landscaping

CENTRAL Concept Plan

Public domain elements and landscaping for the *CENTRAL Concept Plan* would be undertaken in a manner that is consistent with the Oakdale CENTRAL Urban and Landscape Design Report, attached as **Appendix I**, prepared by Mackenzie Pronk Architects and Site Image Pty Ltd.

The Urban and Landscape Design Report has been prepared in a manner that is consistent with the Oakdale ESTATE Landscape Masterplan and Urban Design Reports, prepared for the *Draft ESTATE Concept Plan* (see accompanying Oakdale Specialist Studies Volume).

With regard to the public domain, a design statement from the project architect is provided below which outlines the principles underpinning the proposed design:

> *"A unique and appropriate set of urban elements will be developed for Oakdale CENTRAL to provide the highest amenity and differentiate it from other developments. The placement and coordination of the urban elements will reinforce the masterplan [Draft ESTATE Concept Plan] intent and aid in way finding and precinct theming.*
>
> *Oakdale CENTRAL will be a contemporary well planned efficient estate. Lots have been identified for signature buildings, flexibility in the planning will allow for a mix of smaller and larger lot sizes to suit a range of tenant needs the estate has been conceived as a high quality and cohesive unified estate. The quality of the estate will be best exemplified by the care exhibited in the public domain. A range of urban elements from street lighting through to street furniture have been selected and designed so as to unify the estate and reinforce the high quality, high efficiency estate character. The range of elements and their placement and co-ordination will reinforce the large scale of the environment – an environment that is commonly viewed from a moving vehicle.*
>
> *This environment is dominated by very large single use buildings stretching for 100's of metres and often visited by 100's of trucks every day. These facts require a response that is equally and appropriately large. The elements as designed have a direct and robust character composed of simple forms and combining high quality components to create unique and appropriate elements. The colour scheme will combine integral self finished materials such as concrete, galvanised steel and gabion walls with elements of strong primary colour.'*

With regard to landscaping, the landscape masterplan has been guided by the following principles:

> *Landscape Principles:*
> - create a large high quality parkland at the core of the estate;
> - respect and enhance natural features on the site;
> - provide passive & active open space, as well as community recreation areas;
> - create gateway statements at entry points;
> - provide pedestrian and bicycle routes.
>
> *Landscaping should:*
> - respect and enhance the natural features on the site to create a regenerated green heart to the estate;
> - create a strong landscape identity;
> - achieve a balance between restoration of creeklines, water management systems and recreational spaces; and
> - reinforce precinct character, hierarchy of roads and precinct entries.
>
> *The key principles guiding the development of the landscape design are to;*
> - create a regenerated green heart to the estate;
> - achieve a balance between restoration of the creeklines, endemic vegetation, water management systems and recreational spaces;
> - create an estate with a strong, uniform landscape identity;
> - create clear entry nodes into the parkland areas;
> - aggregate recreation spaces around entry points;
> - enhance vistas into the parklands;
> - reinforce hierarchy of roads within the estate with planting;
> - reinforce precinct character via landscape treatments;
> - reinforce precincts entries with elements of landscape architecture;
> - provide pedestrian and bicycle route as edge condition between natural and man-made landscape;

- respect and enhance natural features on the site; and
- provide passive & active open space, as well as community recreation areas.

To ensure that public domain elements and landscaping are appropriately considered during the development of *Oakdale CENTRAL*, Goodman has committed to preparing project-specific Landscape Plans to accompany all applicable project applications / development applications. The Landscape Plans would be prepared in a manner that is consistent with the Oakdale CENTRAL Urban and Landscape Design Report and the Oakdale ESTATE Landscape Masterplan and Urban Design Report.

In addition, Goodman has committed to preparing a detailed Signage Strategy for the *Oakdale CENTRAL* precinct, in consultation with Fairfield Council. The strategy would provide guidelines for all building and estate signage within *Oakdale CENTRAL*.

DHL Project

A project-specific Landscape Plan has been prepared for the DHL facilities by Site Image Pty Limited, and is included in the Oakdale CENTRAL Urban and Landscape Design Report in **Appendix I**. The landscape plan has been prepared in a manner that is consistent with the Oakdale CENTRAL and ESTATE Landscape Masterplans.

The balance of the *Oakdale CENTRAL* area is proposed to be landscaped in conjunction with future project/development applications within the precinct.

8.10 Wastes and Hazards

Wastes

The proposed DHL facilities are not expected to generate significant quantities of waste other than general solid and putrescible waste, and sewage waste (sewage waste is discussed separately in Section 8.1.7). No liquid trade waste is expected to be generated, and the facilities would not store or use significant quantities of dangerous goods or hazardous materials.

The facilities would minimise and recycle wastes where practicable, in accordance with internal management systems. Waste storage facilities would be provided for each building in locations that are appropriately screened from public areas.

To ensure effective waste management planning, Goodman has committed to preparing and implementing a Waste Management Plan for the *DHL Project* in consultation with Fairfield Council.

Bushfire Hazard

A Bushfire Protection Assessment has been undertaken for the *Draft ESTATE Concept Plan* (see accompanying *Oakdale ESTATE* Specialist Studies Volume).

The assessment indicates that the DHL facilities would not require any specific bushfire protection measures, given the distance of the proposed buildings to vegetated areas.

All development within *Oakdale CENTRAL* would be undertaken in accordance with the recommendations of the bushfire assessment, and in accordance with the aims, objectives and provisions *Planning for Bushfire Protection 2006*.

9 Draft Statement of Commitments

9.1 CENTRAL Concept Plan

A Overview and Definitions

Goodman will carry out the *CENTRAL Concept Plan* and all related projects/developments in accordance with the following commitments.

The following defines some of the terms and abbreviations used in the Statement of Commitments:

Approval	The Minister's approval to the *CENTRAL Concept Plan* (Project Application No.08_0065)
Approval Authority	Unless specified otherwise, 'approval authority' includes an approval authority under Part 3A of the EP&A Act, consent authority under Part 4 of the Act, or determining authority under Part 5 of the Act (or delegate).
Concept Plan	*CENTRAL Concept Plan*, dated May 2008, as described in the EA
Council	Fairfield City Council
DECC	Department of Environment and Climate Change
Department	Department of Planning
Director-General	Director-General of the Department (or delegate)
DWE	Department of Water and Energy
EA	*Environmental Assessment: CENTRAL Concept Plan and Estate Works + DHL Project*, dated May 2008
EP&A Act	*Environmental Planning & Assessment Act 1979*
Goodman	Goodman International Limited, or its successors in title
Minister	Minister for Planning
Oakdale CENTRAL project	The development as described in the Concept Plan
Project application	Unless specified otherwise, 'project application' includes a major project application under Part 3A of the EP&A Act or development application under Part 4 of the Act
Site	Land to which the project application applies
Statement of commitments	Goodman's commitments made in the EA (ie. these commitments)

B Administrative Commitments

Commitment to Minimise Harm to the Environment

B.1 Goodman will implement all practicable measures to prevent and/or minimise any harm to the environment that may result from the construction and/or operation of the *Oakdale CENTRAL* project.

Terms of Approval

B.2 Goodman will carry out the *Oakdale CENTRAL* project generally in accordance with the:
(a) Concept Plan;
(b) EA;
(c) Drawing, CP1.02(A) *CENTRAL Concept Plan* (CP#1) – Scope of Application
(d) statement of commitments; and
(e) conditions of the approval.

B.3 If there is any inconsistency between the above, the conditions of the approval shall prevail to the extent of the inconsistency.

B.4 Goodman will comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:
(a) any reports, plans, strategies, programs or correspondence that are submitted in accordance with the approval; and
(b) the implementation of any actions or measures contained in these reports, plans, strategies, programs or correspondence.

Development Contributions

B.5 Goodman will enter into an agreement/s with the NSW Government and/or Council as part of applicable project applications, in accordance with Division 6 of Part 4 of the EP&A Act, to provide the development contributions for the *Oakdale CENTRAL* project as outlined in Section 6.5 of the EA.

C Specific Environmental Commitments

C.1 Soil and Water

Erosion and Sedimentation

C.1.1 Goodman will prepare Erosion and Sediment Control Plans / Soil and Water Management Plans to accompany each project application involving ground disturbance (apart from minor works), to the satisfaction of the approval authority. The plans will:
(a) be consistent with the requirements of Landcom's (2004) *Managing Urban Stormwater: Soils and Construction* manual;
(b) identify activities that could cause soil erosion and generate sediment;
(c) describe measures to minimise soil erosion and the potential for the transport of sediment to downstream waters;
(d) describe the location, function, and capacity of erosion and sediment control structures; and
(e) describe what measures would be implemented to maintain the structures over time,

Salinity Management

C.1.2 Goodman will prepare Salinity Assessment and Management Plans as part of detailed geotechnical investigations for the development of the *Oakdale CENTRAL* project, to the satisfaction of the Director-General. The plans will:
(a) be prepared prior to the commencement of construction of any project involving ground disturbance (apart from minor works);
(b) be prepared in accordance with applicable guidelines, including the *Western Sydney Salinity Code of Practice* (2003) and *Site Investigations for Urban Salinity* (2002);
(c) assess salinity risk on the site, based on soil and (where applicable) groundwater testing and investigation;
(d) where applicable, describe the measures that would be implemented to minimise and manage salinity risk; and
(e) describe the measures that would be implemented to monitor salinity risk during construction and operation of the project/development.

Rainwater Harvesting

C.1.3 Goodman will participate in the Regional Rainwater Harvesting Scheme as described in the Concept Plan, for all buildings within the *Oakdale CENTRAL* site (apart from very small buildings where no significant water saving benefit is realised), to the satisfaction of the approval authority.

Prior to the commencement of operations for applicable projects/development, Goodman will demonstrate that it has provided the necessary infrastructure to enable roof stormwater to be collected, stored and separately discharged, to the satisfaction of the approval authority.

Notes:

- *The relevant infrastructure would be provided on a progressive basis, in accordance with confirmation of the Regional Rainwater Harvesting Scheme's feasibility by the relevant infrastructure provider, and the status of the scheme;*
- *Goodman will utilise collected roofwater for on-site non-potable uses (including toilet flushing, air-conditioning and irrigation), with the balance exported to the Regional Rainwater Harvesting Scheme.*

Water Sensitive Urban Design

C.1.4 Goodman will prepare Stormwater Management Strategies to accompany each project application involving development of new stormwater infrastructure, to the satisfaction of the approval authority. The strategies will:

(a) be consistent with the Oakdale ESTATE Water Sensitive Urban Design Strategy, unless otherwise agreed by the approval authority; and
(b) demonstrate that the proposed stormwater scheme would comply with the performance criteria (stormwater quantity and quality) in the Oakdale ESTATE Water Sensitive Urban Design Strategy.

C.1.5 Goodman will prepare detailed Stormwater Management Plans for projects involving development of new stormwater infrastructure, to the satisfaction of the approval authority. The plans will:

(a) be prepared in consultation with the applicable Council/s, and be submitted to the approval authority for approval prior to the commencement of construction of applicable projects;
(b) be consistent with the Oakdale ESTATE Water Sensitive Urban Design Strategy, unless otherwise agreed by the approval authority;
(c) include detailed plans showing the proposed stormwater management scheme for the site, including any rainwater harvesting infrastructure;
(d) fully detail measures to incorporate the Category 3 streams into the stormwater scheme, in accordance with DWE's *Watercourse and Riparian Area Planning, Assessment and Works Design Guideline* (Draft Version 1: January 2007);
(e) demonstrate that the proposed stormwater scheme would comply with the performance criteria in the Oakdale ESTATE Water Sensitive Urban Design Strategy; and
(f) describe how the efficiency and effectiveness of the proposed scheme would be monitored and maintained over time.

Sewage Recycling and Management

C.1.6 Goodman will recycle all sewage generated on the site for use in toilet flushing, air-conditioning and irrigation, unless otherwise approved by the approval authority.

C.1.7 Goodman will prepare Sewage Management Strategies to accompany each project application involving development of new estate sewerage infrastructure, to the satisfaction of the approval authority. The strategies will:
(a) be consistent with the Oakdale ESTATE Sewer Servicing Strategy;
(b) describe the proposed sewage management scheme for the project, including;
- estimated sewage generation rates;
- sewage treatment type;
- effluent criteria; and
- recycled water disposal/irrigation.

C.1.8 Goodman will prepare Recycled Water Irrigation Management Plans for projects involving development of new estate sewerage infrastructure, to the satisfaction of the approval authority. The plans will:
(a) be prepared in consultation with the DECC and Council, and be submitted to the approval authority for approval prior to the commencement of operation of applicable projects;
(b) be consistent with the DECC's *Environmental Guidelines: Use of Effluent by Irrigation*; and
(c) fully describe:
- the effluent irrigation site selection process;
- site access arrangements
- effluent transport and storage arrangements;
- maximum loading rates;
- the irrigation system, its management and operation of its control system;
- soil erosion control;
- stormwater control arrangements; and
- monitoring, reporting and control systems.

Flooding

C.1.10 Goodman will undertake flood assessments for any development (apart from minor works) within the 1 in 100 year flood level (as shown on Figure 2.8), to the satisfaction of the approval authority. The assessments will accompany any project application that involves development within the flood affected area.

C.1.11 Goodman will prepare a Flood Evacuation Strategy for any employment-related development (apart from minor works) within the probable maximum flood level, to the satisfaction of the approval authority. The strategy will be prepared prior to operation of the relevant development.

C.2 Noise

C.2.1 Goodman will develop a noise model to manage noise emissions from the *Oakdale CENTRAL* project, to the satisfaction of the Director-General. This model will:
(a) be prepared by a suitably qualified expert in consultation with DECC;
(b) be submitted to the Director-General for approval within 3 months of Concept Plan approval;
(c) be based on the criteria identified in Tables C.1 to C.3 below.

Table C.1: *Construction Noise Criteria, $L_{Aeq,15min}$ dB(A)*

Receiver	***Construction Duration – (Day time)***		
	Up to 4 weeks	***4 to 26 weeks***	***> 26 weeks***
All receivers	54	44	39

Table C.2: *Operational Noise Criteria, dB(A)*

Receiver	***Time Period***	***Intrusiveness Criteria $L_{Aeq,15min}$***	***Amenity Criteria $L_{Aeq, period}$***	***Sleep Disturbance Criteria $L_{A1, 1min}$***
A Erskine Park residences	Day	39	55	-
	Evening	39	45	-
	Night	39	40	49
B Emmaus College and retirement village	Day	39	50	-
C Bakers Lane residences	Evening	39	45	-
D & E Horsley Park residences	Night	39	40	49

Table C.3: *Traffic Noise Criteria*

Road	***Criteria***	
	Day/Evening $L_{Aeq,1hr}$	***Night $L_{Aeq,1\ hr}$***
Link Road	60	55

C.2.2 Goodman will prepare Noise Impact Assessments to accompany each project application involving significant construction, operational and/or traffic noise generation. The assessments will:

(a) be prepared in accordance with applicable guidelines, including the *NSW Industrial Noise Policy*, *Environmental Noise Control Manual* and *Environmental Criteria for Road Traffic Noise*;

(b) consider the proposed project in relation to the Oakdale noise model and the noise criteria listed above; and

(c) where relevant, consider measures to minimise, mitigate, and manage noise emissions from the project.

C.3 Air Quality

C.3.1 Goodman will carry out all reasonable and feasible measures to minimise dust generated by the *Oakdale CENTRAL* project, particularly during construction and bulk earthworks.

C.4 Flora and Fauna

Offset and Enhancement Strategy

C.4.1 Goodman will establish and conserve the vegetation identified in Table C.4 below, in the riparian areas of Ropes Creek (and Ropes Creek tributary), to offset the vegetation clearing required by the *Oakdale CENTRAL* project and to improve local and regional ecological habitat function.

Table C.4: *Offset and Enhancement Strategy*

Vegetation Community	***Existing Area (ha)***	***Area to be Cleared (ha)***	***Minimum Area to be Revegetated (ha)***	***Offset Ratio[1]***	***Total Net Area[2] (ha)***
Swamp Oak Forest	1.15	0.19	2.50	13:1	3.46
Degraded Woodland[3]	0.35	0.35	0	-	0
Exotic Sedge	1.50	1.50	0	-	0
Wetland Vegetation / Farm Dams	0.81	0.81	0.81	1:1	0.81
Total	**3.81**	**2.85**	**3.31**	**-**	**4.27**

Notes:

1 Area Revegetated : Area Cleared

2 Existing Area + Area to be Revegetated - Area to be Cleared

3 Offset included as part of the Swamp Oak Forest offset

Vegetation Management Plan

C.4.2 Goodman will prepare and implement a Vegetation Management Plan for the *Oakdale CENTRAL* project, to the satisfaction of the Director-General. The plan will:

(b) be prepared by suitably qualified expert/s in consultation with DECC, DWE and Council;

(c) be submitted to the Director-General for approval within 6 months of Concept Plan approval;

(d) be prepared in accordance with the DWE guidelines *How to Prepare a Vegetation Management Plan – DRAFT Version 6: January 2007*;

(e) establish performance and completion criteria for the offset and enhancement strategy;

(f) include detailed plans:

- identifying the vegetation to be retained/removed and areas to be rehabilitated;
- indicating the measures to be implemented to:
  - revegetate the areas to be rehabilitated, including plant material, densities and species mix (consisting of native trees, shrubs and groundcover species local to the area); and
  - prevent damage to riparian zones.

C.5 Heritage

Aboriginal Heritage Management Plan

C.5.1 Goodman will prepare and implement an Aboriginal Heritage Management Plan for the *Oakdale CENTRAL* project, to the satisfaction of the Director-General. The plan will:

(a) be prepared in consultation with DECC and the Aboriginal communities;

(b) be submitted to the Director-General for approval prior to the disturbance of any Aboriginal object or site;

(c) include a:

- program for intensive surface survey of the identified low-moderate archaeological sensitivity areas (as shaded on Figure 2.11 of the EA);
- detailed salvage program and management plan for all Aboriginal sites within the project disturbance area;
- detailed description of the measures that would be implemented to protect Aboriginal sites outside the project disturbance area;

- description of the measures that would be implemented if any new Aboriginal objects or skeletal remains are discovered during the project; and
- protocol for the ongoing consultation and involvement of the Aboriginal communities in the conservation and management of Aboriginal cultural heritage on the site.

C.6 Transport

Regional and Internal Road Network

C.6.1 Goodman will ensure that the regional and internal road network and parking associated with the *Oakdale CENTRAL* project are designed, constructed and maintained in accordance with the latest versions of the Australian Standards *AS 2890.1:2004*, *AS 2890.2:2002* and AUSTROADS.

C.7 Visual Amenity

Landscaping

C.7.1 Goodman will prepare Landscape Plans to accompany each project application (apart from minor works), to the satisfaction of the approval authority. The Landscape Plans will be prepared in a manner that is consistent with the Oakdale CENTRAL Urban Design and Landscape Report, and the Draft Oakdale ESTATE Landscape Masterplan.

Signage Strategy

C.7.2 Goodman will prepare a Signage Strategy for the *Oakdale CENTRAL* project, to the satisfaction of the Director-General. The strategy will be prepared in consultation with Council, and be submitted to the Director-General for approval within 3 months of the date of Concept Plan approval.

C.8 Bushfire Management

C.8.1 Goodman will develop the *Oakdale CENTRAL* project to provide defendable spaces, access provisions, water supplies for fire-fighting operations and construction standards in accordance with the Oakdale ESTATE Bushfire Assessment and the aims, objectives and provisions of *Planning for Bushfire Protection 2006*.

C.9 Energy and Greenhouse Gases

C.9.1 Goodman will consider measures to reduce energy and resource use in each project application (apart from minor works).

C.10 Environmental Management Strategy

C.10.1 Goodman will prepare and implement an Environmental Management Strategy for the *Oakdale CENTRAL* project, to the satisfaction of the Director-General. This strategy will:

(a) be submitted to the Director-General for approval within 3 months of the date of Concept Plan approval;

(b) describe in broad terms the proposed environmental management strategy for the *Oakdale CENTRAL* project;

(c) identify the person who would be responsible for overseeing the environmental management of the *Oakdale CENTRAL* project, and provide contact details for this person;
(d) describe the procedures that would be implemented to:
- keep the relevant agencies informed about the progress of the project;
- receive, handle, respond to, record and report any complaints about the project;
- resolve any disputes that may arise during the project; and
- respond to any non-compliances.

(e) include construction noise and dust management plans.

Goodman will update this strategy to the satisfaction of the Director-General every 3 years, or as directed by the Director-General.

9.2 Estate Works + *DHL Project*

A Overview and Definitions

Goodman will carry out the *DHL Project* in accordance with the following commitments.

The following defines some of the terms and abbreviations used in the Statement of Commitments:

Approval	The Minister's approval to the project (Project Application No.08_0066)
BCA	Building Code of Australia
Concept Plan	*CENTRAL Concept Plan*, dated May 2008, as described in the EA
Council	Fairfield City Council, unless otherwise noted
DECC	Department of Environment and Climate Change
Department	Department of Planning
Director-General	Director-General of the Department (or delegate)
DWE	Department of Water and Energy
EA	*Environmental Assessment: CENTRAL Concept Plan and Estate Works + DHL Project*, dated May 2008
EP&A Act	*Environmental Planning & Assessment Act 1979*
Goodman	Goodman International Limited, or its successors in title
Minister	Minister for Planning
Oakdale CENTRAL project	The development as described in the Concept Plan
Project	The Estate Works and *DHL Project* development as described in the EA
Site	Land to which the project application applies
Statement of commitments	Goodman's commitments made in the EA (ie. these commitments)

B Administrative Commitments

Commitment to Minimise Harm to the Environment

B.1 Goodman will implement all practicable measures to prevent and/or minimise any harm to the environment that may result from the construction and/or operation of the project.

Terms of Approval

B.2 Goodman will carry out the project generally in accordance with the:
(a) Concept Plan;
(b) EA;
(c) drawings listed in Table B.1 below;
(d) statement of commitments; and
(e) conditions of the approval.

Table B.1: *Drawings*

Development Lot	*Plan No.*	*Plan Title*
Site Plans	PA1.01(A)	Scope of Application
	PA1.02(A)	Site Plan
	PA1.03(A)	DHL 1A & 2A Site Plan
	PA1.04(A)	DHL 1A & 2A Elevations / Section
Building 1A	PA1.05(A)	DHL 1A Ground Floor Plan
	PA1.06(A)	DHL 1A Roof Plan
	PA1.07(A)	DHL 1A Elevations / Sections
Building 2A	PA1.08(A)	DHL 2A Ground Floor Plan
	PA1.09(A)	DHL 2A Roof Plan
	PA1.10(A)	DHL 2A Elevations / Sections
Other Plans	PA1.11(A)	Bulk Earthworks Plan
	PA1.12(A)	Subdivision
	PA1.13(A)	Link Road – OWR (SW) + Bridge B1

B.3 If there is any inconsistency between the above, the conditions of the approval shall prevail to the extent of the inconsistency.

B.4 Goodman will comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:

(a) any reports, plans, strategies, programs or correspondence that are submitted in accordance with the approval; and
(b) the implementation of any actions or measures contained in these reports, plans, strategies, programs or correspondence.

Subdivision

B.5 Goodman will subdivide the land generally in accordance with the subdivision layout shown on Plan PA1.12(A). Prior to obtaining a subdivision certificate, Goodman will prepare a final subdivision plan for the land, in consultation with Council, and to the satisfaction of the Director-General.

Structural Adequacy

B.6 Goodman will ensure that all new buildings and structures on the site are constructed in accordance with the relevant requirements of the BCA.

Note: Under Part 4A of the EP&A Act, Goodman is required to obtain construction and occupation certificates for the proposed building works. Part 8 of the EP&A Regulation sets out the requirements for the certification of the project.

Protection of Public Infrastructure

B.7 Goodman will:

(a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the project; and
(b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the project.

Operation of Plant and Equipment

B.8 Goodman will ensure that all plant and equipment used on the site is:

(a) maintained in a proper and efficient condition; and
(b) operated in a proper and efficient manner.

Pre-Operation Compliance Audit

B.9 Prior to the commencement of operations of each building, Goodman will submit work as executed plans to the Department for all the development associated with the project. These plans will be prepared by a suitably qualified and experienced expert, and include plans showing the work as executed plans laid over the approved plans to demonstrate that the project has been carried out in accordance with the approved plans.

Development Contributions

B.10 Goodman will, within 12 months of the date of this approval, enter into an agreement/s with appropriate NSW Government agencies and/or the applicable Council/s, in accordance with Division 6 of Part 4 of the EP&A Act, to provide the development contributions for the project as described in Section 6.5 of the EA.

C Specific Environmental Commitments

C.1 Soil and Water

Erosion and Sedimentation

C.1.1 During construction, Goodman will carry out all reasonable and feasible measures to minimise soil erosion and the discharge of sediment from the site to downstream waters.

C.1.2 Goodman will carry out the construction of the DHL facilities (ie. Buildings 1A and 2A) in accordance with the Soil and Water Management Plan contained in Appendix B of the EA.

C.1.3 Goodman will prepare additional Erosion and Sediment Control Plans / Soil and Water Management Plans for the other estate works in accordance with the commitments made for the *CENTRAL Concept Plan*, prior to the commencement of construction of the relevant works, to the satisfaction of the Director-General.

Watercourse Crossing

C.1.4 Goodman will prepare and implement a Watercourse Crossing Management Plan for the proposed bridge crossing over the Ropes Creek tributary, to the satisfaction of the Director-General. The plan will:
(a) be prepared in consultation with DWE and Council, and be submitted to the Director-General for approval prior to the commencement of construction of the bridge;
(b) be prepared in accordance with applicable guidelines, including the DWE's *Watercourse Crossing Design and Construction Guideline* (Draft, 2007) and *Works and Watercourse Design Guideline* (Draft 2007);
(c) fully describe measures to ensure that:
- the design maintains a naturalised bed and bank stability; and
- there will not be any detrimental impact on flows and flooding; and

(d) describe how the efficiency and effectiveness of the works would be monitored and maintained over time.

Salinity Management

C.1.5 Goodman will prepare and implement a Salinity Assessment and Management Plan for the project, to the satisfaction of the Director-General. The plan will:

(a) be prepared in consultation with Council, and be submitted to the Director-General for approval prior to the commencement of construction;
(b) be prepared in accordance with applicable guidelines, including the *Western Sydney Salinity Code of Practice* (2003) and *Site Investigations for Urban Salinity* (2002);
(c) assess salinity risk on the site, based on soil and (where applicable) groundwater testing and investigation;
(d) where applicable, describe the measures that would be implemented to minimise and manage salinity risk; and
(e) describe the measures that would be implemented to monitor salinity risk during construction and operation of the project.

Rainwater Harvesting

C.1.6 Prior to the commencement of operations for each building, or as otherwise approved by the Director-General, Goodman will provide the necessary infrastructure on site to enable roof and hardstand stormwater to be collected, stored and discharged separately to the satisfaction of the Director-General.

Prior to installing the required storage tanks, Goodman will determine the final location for the tanks in consultation with Council, and to the satisfaction of the Director-General.

Notes:

- *The relevant infrastructure will be provided on a progressive basis, in accordance with confirmation of the Regional Rainwater Harvesting Scheme's feasibility, and the status of the scheme. In this regard, the dual pipework for the warehouse buildings will be provided in conjunction with the building construction. The required storage tanks, and associated connecting pipes, will be installed in conjunction with the construction of the regional infrastructure (ie. regional trunk mains and connector pipes) by the relevant infrastructure provider;*
- *Unless the Director-General agrees otherwise, the roof stormwater infrastructure will include:*
  - *a rainwater collector system with a design capacity for the 1 in 20 year (critical duration) storm event; and*
  - *roof water reservoirs or storage tanks with a capacity of at least 440KL/ha of roof services or 190 KL/ha gross land area (whichever is larger), and the ability to discharge flows (by way of pumped rising mains or gravity mains) to any regional rainwater harvesting infrastructure at a rate of 11.6 l/s per megalitre of storage.*

C.1.7 During operations, Goodman will participate in any regional rainwater harvesting initiatives to the satisfaction of the Director-General.

Note: This participation will involve making the roof stormwater infrastructure on site available for connection to any regional rainwater harvesting infrastructure. Goodman will utilise collected roofwater for on-site non-potable uses (including toilet flushing, air-conditioning and irrigation), with the balance exported to the Regional Rainwater Harvesting Scheme

Water Sensitive Urban Design

C.1.8 Goodman will prepare and implement a Stormwater Management Plan for the DHL facilities (ie. Buildings 1A and 2A), to the satisfaction of the Director-General. The plan will:

(a) be prepared in consultation with Council, and be submitted to the Director-General for approval prior to the commencement of construction;
(b) be consistent with the DHL Stormwater Management Strategy and the Oakdale ESTATE Water Sensitive Urban Design Strategy, unless otherwise approved by the Director-General;

(c) include detailed plans showing the proposed stormwater management scheme for the site, including any rainwater harvesting infrastructure;
(d) fully detail measures to incorporate the Category 3 streams into the stormwater scheme, in accordance with DWE's *Watercourse and Riparian Area Planning, Assessment and Works Design Guideline* (Draft Version 1: January 2007);
(e) demonstrate that the proposed stormwater scheme would comply with the performance criteria in the Oakdale ESTATE Water Sensitive Urban Design Strategy; and
(f) describe how the efficiency and effectiveness of the proposed scheme would be monitored and maintained over time.

C.1.9 Goodman will prepare additional Stormwater Management Plan/s for the other estate works in accordance with the commitments made for the *CENTRAL Concept Plan*, prior to the commencement of construction of the relevant works, to the satisfaction of the Director-General.

Sewage Recycling and Management

C.1.10 Goodman will prepare and implement a Recycled Water Irrigation Management Plan for the project, to the satisfaction of the Director-General. The plan will:
(a) be prepared in consultation with DECC and Council, and be submitted to the Director-General for approval prior to the commencement of operation;
(b) be consistent with the DECC's *Environmental Guidelines: Use of Effluent by Irrigation*; and
(c) fully describe:
- the recycled water irrigation site selection process;
- site access arrangements;
- recycled water transport and storage arrangements;
- maximum loading rates;
- the irrigation system, its management and operation of its control system;
- soil erosion control;
- stormwater control arrangements; and
- monitoring, reporting and control systems.

Notes:
- *The relevant infrastructure would be provided on a progressive basis, in accordance with confirmation of the Regional Rainwater Harvesting Scheme's feasibility, and the status of the scheme;*
- *Goodman will utilise collected roofwater for on-site non-potable uses (including toilet flushing, air-conditioning and irrigation), with the balance exported to the Regional Rainwater Harvesting Scheme.*

C.2 Noise

C.2.1 Goodman will only carry out construction on the site between 7am and 6pm Monday to Friday, and 7am and 1pm on Saturdays. No construction will be allowed on site on Sundays or public holidays.

Note: Construction works which are inaudible at any residence may be carried out outside these times.

C.2.2 During the project, Goodman will ensure that noise from the project does not exceed the noise limits presented in Table C.1.

Table C.1: *Project Noise Limits (dB(A))*

Noise Assessment Location	***Day***	***Evening***	***Night***	
	$L_{Aeq\ (15\ min)}$	$L_{Aeq\ (15\ min)}$	$L_{Aeq\ (15\ min)}$	$L_{A1(1\ min)}$
A Shaula Place, Erskine Park	39	39	39	49
B Emmaus College and Retirement	39	39	39	49

Noise Assessment Location	Day	Evening	Night	
	$L_{Aeq\ (15\ min)}$	$L_{Aeq\ (15\ min)}$	$L_{Aeq\ (15\ min)}$	$L_{A1(1\ min)}$
Village				
C Bakers Lane, Kemps Creek	39	39	39	49
D Greenway Place, Horsley Park	39	39	39	49
E Burley Road, Horsley Park	39	39	39	49

Notes:

- *For the purposes of this condition, day is defined as the period from 7am to 6pm, Monday to Saturday, and 8am to 6pm, Sundays and Public Holidays. Evening is defined as the period from 6pm to 10pm. Night is defined as the period from 10pm to 7am, Monday to Saturday, and 10pm to 8am, Sundays and Public Holidays.*
- *Noise emission limits apply under meteorological conditions of wind speeds up to 3 m/s at 10 metres above ground level. To determine compliance with the LAeq(15 minute) noise limits, noise from the project will be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of the dwelling where the dwelling is more than 30 metres from the boundary. To determine compliance with the LA1(1 minute) noise limits, noise from the project will be measured at 1 metre from the dwelling façade.*
- *However, where it can be demonstrated that direct measurement of noise from the project is impractical, the DECC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy will also be applied to the measured noise levels where applicable.*

C.3 Air Quality

Construction Dust Emissions

C.3.1 During construction, Goodman will comply with the air quality impact assessment criteria of the development consent for the Bedford Quarry (DA-260-8-2002-i), for the combined operations of the quarry and the project.

Construction Traffic

C.3.2 During construction, Goodman will ensure that:

(a) all trucks entering or leaving the site with loads have their loads covered;
(b) trucks associated with the project do not track dirt onto the public road network; and
(c) the public roads used by these trucks are kept clean.

Dust Management

C.3.3 During the project, Goodman will carry out all reasonable and feasible measures to minimise the dust generated by the project.

C.4 Flora and Fauna

C.4.1 Within 6 months of the date of approval of the Oakdale CENTRAL Vegetation Management Plan, Goodman will implement that component of the plan that relates to the Ropes Creek tributary (in the middle of the *Oakdale CENTRAL* precinct). This will include:

(a) revegetation of at least 1.78 hectares of Swamp Oak Forest in the riparian area; and
(b) rehabilitation of the farm dam on the tributary to reinstate natural flows and enable fish passage.

C.5 Transport

C.5.1 Goodman will ensure that the road network and parking associated with the project are designed, constructed and maintained in accordance with the latest versions of the Australian Standards *AS 2890.1:2004*, *AS 2890.2:2002* and AUSTROADS.

Old Wallgrove Road Upgrade

C.5.2 Prior to the commencement of operations, or as otherwise agreed by the Director-General, Goodman will undertake the following 'Stage 1' upgrade works to Old Wallgrove Road:

(a) local widening between Roberts Road and the north-eastern corner of the site to achieve a consistent 7 metre road width for heavy vehicle traffic;
(b) local widening at bends to accommodate B-doubles;
(c) provision of a passing bay for southbound traffic at the site access point; and
(d) 60 km/h signposting for southbound traffic in the vicinity of the site access point,

to the satisfaction of Blacktown Council and Fairfield Council.

C.5.3 Within 12 months of the RTA (or the NSW Government) acquiring the necessary road 40 metre reservation, or within such other timing as may be agreed by the Director-General, Goodman will design and construct the proposed 'stage 2 external roadworks' upgrade works to Old Wallgrove Road, in consultation with Blacktown Council, Fairfield Council and the RTA, and to the satisfaction of the applicable road authority.

Note: These works, involving the construction of 2 additional lanes and associated works, are described in Section 5.9 of the EA, and shown on Figure 5.8.

Internal Roads

C.5.4 Prior to the commencement of operations, or as otherwise agreed by the Director-General, Goodman will design and construct Temporary Access Road 1, in consultation with Council and the RTA, and to the satisfaction of the applicable road authority.

Note: Temporary Access Road 1 is described in Section 5.9 of the EA, and shown on Figure 5.3.

C.5.5 Within 12 months of the date of the approval, or within such other timing as may be agreed by the Director-General, Goodman will design and construct the internal road network, including:

- the northern carriageway of the Link Road – Option A;
- Estate Road 1;
- Estate Road 2; and
- Estate Road 3,

in consultation with Council and the RTA, and to the satisfaction of the applicable road authority.

Note: The internal road network is described in Section 5.9 of the EA, and shown on Figure 5.2.

Parking

C.5.6 Goodman will ensure that all parking generated by the project is accommodated on site. No vehicles associated with the project will be allowed to park on the public road system at any stage.

Vehicle Queuing

C.5.7 During the project, Goodman will ensure that project does not result in any vehicles queuing on the public road network.

C.6 Visual Amenity

Landscaping

C.6.1 During the project, Goodman will:
(a) maintain the landscaping on the site to the satisfaction of the Director-General; and
(b) ensure that the landscaping on the site does not impede driver sight distance of vehicles entering or leaving the site.

Signage

C.6.2 Prior to installing any signage on the site, Goodman will submit detailed plans of this signage to the Director-General for approval. These plans will be prepared in consultation with Council, and be generally consistent with the Oakdale CENTRAL Signage Strategy.

Fencing

C.6.3 Prior to installing any fencing on the site, Goodman will submit detailed plans of this fencing to the Director-General for approval. These plans will be prepared in consultation with Council. Following approval, Goodman will ensure that the fencing is installed in accordance with the approved plans.

Lighting

C.6.4 Goodman will ensure that the lighting associated with the project:
(a) complies with the latest version of Australian Standard *AS 4282(INT) - Control of Obtrusive Effects of Outdoor Lighting*; and
(b) is mounted, screened and directed in such a manner that it does not create a nuisance to surrounding properties or the public road network.

C.7 Waste

C.7.1 During the project, Goodman will implement reasonable and feasible measures to minimise the waste generated by the project.

C.7.2 Goodman will prepare and implement a Waste Management Plan for the project in consultation with Council, and to the satisfaction of the Director-General. This plan will:
(a) be submitted to the Director-General for approval prior to the commencement of construction;
(b) be consistent with the requirements in any Council DCP; and
(c) detail the measures that will be implemented to minimise waste generation associated with the project.

C.8 Environmental Management Strategy

C.8.1 Goodman will carry out the project in accordance with the Oakdale CENTRAL Environmental Management Strategy.

10 Project Justification and Conclusion

10.1 Consideration of Alternatives

Alternatives to carrying out the development of *Oakdale CENTRAL*, including the *DHL Project*, in the proposed manner include:

- developing the site to a lesser or higher scale;
- developing the site on a different layout (in particular, the layout of the road network);
- undertaking development for a different purpose on the site; and
- not undertaking the project at all.

These alternatives are discussed in the following sections.

10.1.1 Project Scale

In terms of project scale, it is noted that:

- the *CENTRAL Concept Plan* and *DHL Project* are broadly consistent with the *Draft ESTATE Concept Plan*, other developments in the Western Sydney Employment Hub, and applicable planning instruments including the *Draft SEPP (Western Sydney Employment Hub) 2008*;
- the allowable site coverage for the *CENTRAL Concept Plan* is 65%, which is consistent with contemporary sites in the Western Sydney Employment Hub (eg. Huntingwood West and Huntingwood East). It is also noted that the *Draft ESTATE Concept Plan* will provide for approximately 75 hectares of Environmental Conservation / Recreation land (representing approximately 18% of the total Oakdale site area);
- the average site coverage for the *DHL Project* is about 55%, which is comfortably below the 65% maximum site cover under the *CENTRAL Concept Plan*;
- the proposed *DHL Project* buildings have a maximum ridge height of 13.7 metres, which is not considered excessive, and is consistent with contemporary warehouse buildings in the Western Sydney Employment Hub;
- the proposed building layout and scale has been designed in accordance with the constraints of the site, and the current and forecast market demand for employment land in the area; and
- environmental assessment indicates that the development of *Oakdale CENTRAL* is able to be undertaken in a manner which would not result in any significant environmental impacts.

Accordingly, it is considered that the proposed scale of the *CENTRAL Concept Plan* and the *DHL Project* provides a reasonable balance between maximising the development and employment opportunities of the site whilst ensuring that the amenity of the surrounding area is not adversely affected.

10.1.2 Project Layout

In terms of alternative layouts, it is acknowledged that the layout of the road network – in particular the alignment and location of the 'Southern Link Road' – is an important consideration for a number of stakeholders, including other Site 8 landowners.

The layout of *Oakdale CENTRAL* is in large part influenced by the layout or alignment of the regional road network. It is acknowledged that Old Wallgrove Road, from the M7 down to the north-eastern corner of the *Oakdale CENTRAL* site, will form a primary component of the Western Sydney Employment Hub road network, as indicated in the RTA's Erskine Park Link Road Network Concept Plan (MP 06_0166).

From the north-eastern corner of the site, the regional road network has two main options for continuing through Site 8, namely:

- south, as a continuation to and beyond the current terminus of Old Wallgrove Road; or
- west, along the northern boundary of the *Oakdale CENTRAL* site, and hence turning southwards at some point within *Oakdale CENTRAL*.

(In practice, it is probable that both of these routes will have an arterial/sub-arterial function in the regional road network servicing Site 8 and surrounding areas).

It is noted that the third option – namely an alignment slicing directly south-west through the eastern half of the *Oakdale CENTRAL* site – would not be considered reasonable by Goodman as it would compromise good quality employment-generating land and would result in the creation of awkward-shaped (ie. triangular), inefficient development lots within *Oakdale CENTRAL*.

The *CENTRAL Concept Plan* has been prepared to allow flexibility in the final layout of the regional road network.

In this regard, although provision has been made in the *CENTRAL Concept Plan* to provide the 40 metre link road reservation in the preferred location (ie. Link Road Option A), Goodman has committed to developing the northern carriageway of the link road first (which would be adequate to service the traffic demands of *Oakdale CENTRAL*). Should the 'Southern Link Road' ultimately be developed on another alignment, namely:

- as an extension to the existing southern terminus of Old Wallgrove Road (ie. Option B); or
- on an alignment that cuts through the centre of *Oakdale CENTRAL* to access lands to the south (ie. Option C),

the link road corridor within *Oakdale CENTRAL* could be reduced to an estate road.

10.1.3 Project Purpose

In terms of potential alternative development purposes, it is noted that:

- the proposed landuse (ie. warehousing and distribution / light industry) is consistent with the industrial landuse contemplated in the draft *State Environmental Planning Policy (Western Sydney Employment Hub) 2008* and the employment purposes envisaged in the Metropolitan Strategy;
- environmental assessment indicates that the *Oakdale CENTRAL* precinct is able to be developed in a manner that would not adversely affect the environment or surrounding landusers;
- there is considerable current market demand for the proposed employment-generating facilities, which would generate considerable socio-economic benefits, including the creation of approximately 400 direct full-time jobs in the proposed DHL facilities, and 1,200 across the entire *Oakdale CENTRAL* precinct; and
- the forecast job creation associated with the DHL facilities is well in excess of the 20 jobs per developable hectare nominated in the Metropolitan Strategy.

Accordingly, it is considered that the proposed development purpose (ie. warehousing/ distribution with ancillary office) represents reasonable and orderly development of the land.

10.1.4 The No Development Option

Not undertaking the *CENTRAL Concept Plan* and/or the *DHL Project* at all is not considered to be a reasonable alternative, as:

- the land is identified as employment land in the Metropolitan Strategy and the draft *State Environmental Planning Policy (Western Sydney Employment Hub) 2008*;

- the proposal is not predicted to have any significant impacts on the environment or surrounding landusers; and
- not undertaking the proposal would negate its significant socio-economic benefits, including:
    - the creation of approximately 1,200 full-time jobs and a capital investment of $194 million in the Western Sydney Employment Hub, associated with the development of the *CENTRAL Concept Plan*; and
    - the creation of approximately 400 direct full-time jobs and a capital investment of $89 million, associated with the *DHL Project*.

10.2 Project Need and Justification

The Oakdale employment lands form a key component of the Western Sydney Employment Hub, identified in the Sydney Metropolitan Strategy as a key centre for employment growth in Western Sydney over the 25 year period to 2030. The Western Sydney Employment Hub is expected to create up to 36,000 jobs for the people of Western Sydney.

The proposed *CENTRAL Concept Plan* and *DHL Project* would initiate and unlock the development of Site 8 of the Western Sydney Employment Hub, particularly through the expansion of roads and other infrastructure down to these employment lands. Site 8 has a total land area of 656 hectares, representing some 26% of the 2,450 hectare area of the Western Sydney Employment Hub. Site 8 is expected to generate around 10,000 jobs once fully developed.

The development of the *CENTRAL Concept Plan* involves a capital investment in the employment hub of some $194 million, and is expected to generate some 1,200 upon full development of the *Oakdale CENTRAL* precinct.

The *DHL Project* involves a capital investment in the employment hub of some $89 million, and is expected to generate 300 jobs during construction and up to 400 direct jobs during operations. This operational jobs figure is well in excess of the 20 jobs per hectare target identified in the Metropolitan Strategy[1].

Environmental assessment indicates that the *CENTRAL Concept Plan* and the *DHL Project* are able to be conducted in a manner that would not result in any significant environmental impacts, or adversely affect the amenity of the surrounding area. The project can therefore be conducted in a manner that is consistent with the principles of environmentally sustainable development.

The site is well suited to the proposal, as it has been identified for employment uses, is consistent with the *Draft ESTATE Concept Plan*, and includes a comprehensive strategy to deliver all required services and utilities.

On balance, it is considered that the *CENTRAL Concept Plan* and the *DHL Project* represent the orderly and reasonable development of the land and the benefits of the project outweigh any environmental impacts. The project is therefore in the public interest and worthy of approval.

10.3 Conclusion

Having regard to all the salient environmental, social and economic issues, it is considered that the *CENTRAL Concept Plan* and the *DHL Project* represent orderly development of the land. It is

[1] Application of the 20 jobs per hectare estimate in the Metropolitan Strategy to the project results in a total of 220 jobs.

requested that the Minister for Planning, having due regard for the information submitted in this document, grant approval to the application for the *CENTRAL Concept Plan* and the *DHL Project*.