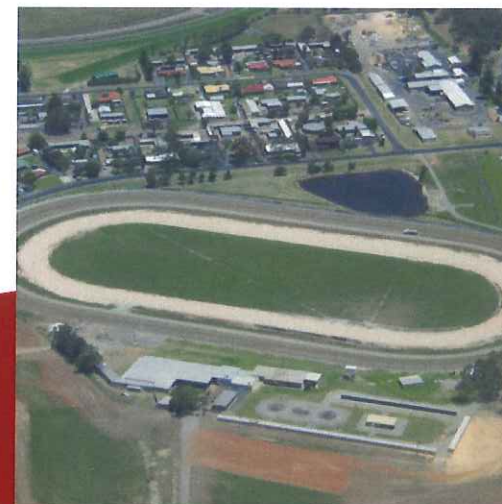
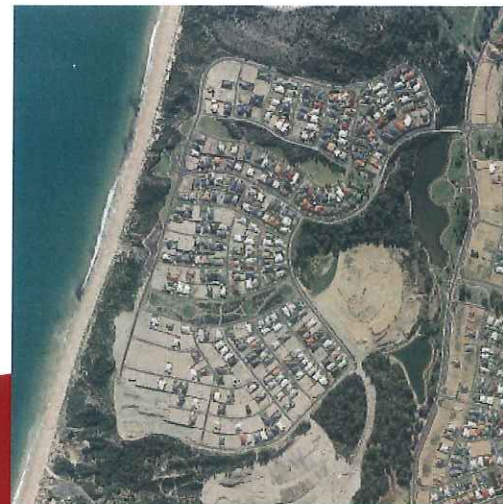




Thompson McRobert Edgeloe
Group

SHOTTS INDUSTRIAL PARK



Research, Design & Delivery of
Sustainable Development

08251
August 2010

Project Management Planning Geotechnical Environmental Engineering

Endorsement Page

This structure plan is prepared under the provisions of the Shire of Collie Local Planning Scheme No. 6

IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:

22 NOVEMBER 2010

In accordance with Schedule 2, Part 4, Clause 28 (2) and refer to Part 1, 2. (b) of the *Planning and Development (Local Planning Schemes) Regulations 2015*.

Date of Expiry:

19 OCTOBER 2030

Adoption

The Shotts Industrial Park structure plan was adopted by Council for final approval at its Meeting of the Twenty Second day of June 2010.

Endorsement

The Shotts Industrial Park structure plan has been endorsed by the Shire of Collie and the Western Australian Planning Commission.

Preamble

Landcorp is developing the Shotts Industrial Park located in the Collie Coal Basin to attract large scale industries which can value add to Collie's existing energy and coal production.

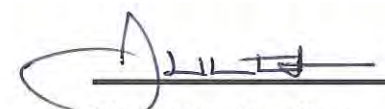
The site is located at the Shotts townsite located approximately 7.5km east of Collie. The Park will have an area of 235 hectares and is strategically positioned between the three major power stations and associated coal mines. This allows it to take advantage of existing infrastructure and supply connections including road, rail, water, power and coal.

To facilitate the development of the Park an Amendment to the Shire of Collie Local Planning Scheme is required. In addition to the Amendment a structure plan has also been prepared to provide the development framework for industries in the Park. In preparing the structure plan a wide range of issues have been investigated including the definition of the required buffers to the Park.

Given the Government's desire to implement the Park as quickly as possible, the structure plan has been prepared in conjunction with the Amendment. This report contains both the Amendment documents and the structure plan and the structure plan report is effectively the explanatory report for the Amendment.

The report is structured as follows:-

- Executive Summary
- Amendment No 1 documents; and
- Structure Plan Report.


Chief Executive Officer
Shire of Collie

30/9/2010
Date


Shire President
Shire of Collie

30/9/2010
Date


Chairman
Western Australian
Planning Commission

22/11/2010
Date

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REVISION TABLE

REVISION	PURPOSE	DATE
A	Edit	29.04.2008
B	Formatting and review of Management Statements.	02.10.2009
C	Refining Management Statements	08.10.2009
D	Fig 22 Priority Flora Areas	14.10.2009
E	Update noise and buffer, ecological corridors, fire management and figures	05.02.2010
F	Update provisions following EPA advice	22.03.2010
G	Advertising copy	13.04.2010
H	Modifications for final approval	13.08.2010

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BACKGROUND

Landcorp is developing the Shotts Industrial Park (SIP) to attract large scale industries which can value add to Collie's existing energy and coal production.

The subject land is located at the Shotts townsite approximately 7.5km east of Collie and the proposed industrial estate has an area of 235 hectares. The strategic location of the SIP between the three major power stations and associated coal mines allows it to take advantage of existing infrastructure and supply connections including road, rail, water, power and coal.

The SIP contains 67 land parcels being both crown and freehold land. The Crown land is predominantly State Forest; but also includes reserves for other various purposes. Currently, there is one registered Native Title application and one unregistered application over the site.

There is complex array of existing infrastructure within the site including transmission lines, coal conveyor, haul road, borefield and water pipelines. The main access to the site is from Premier Road which also provides access to the Premier Coal loading facility. Premier Coal has developed a rail siding "loop" to service this facility.

The SIP is situated in the Collie River catchment, which is located within the Public Drinking Water Source Area of the Wellington Dam. Stockton Lake is located approximately 1 km to the south west of the SIP.

POLICY CONTEXT

The development of the Collie Coal Basin is governed by the Collie Basin Structure Plan which contains the primary strategic planning recommendations affecting the development of the Council's Local Planning Strategy. The Council's Local Planning Strategy specifically recognises and promotes the intended development of the Shotts Industrial Park.

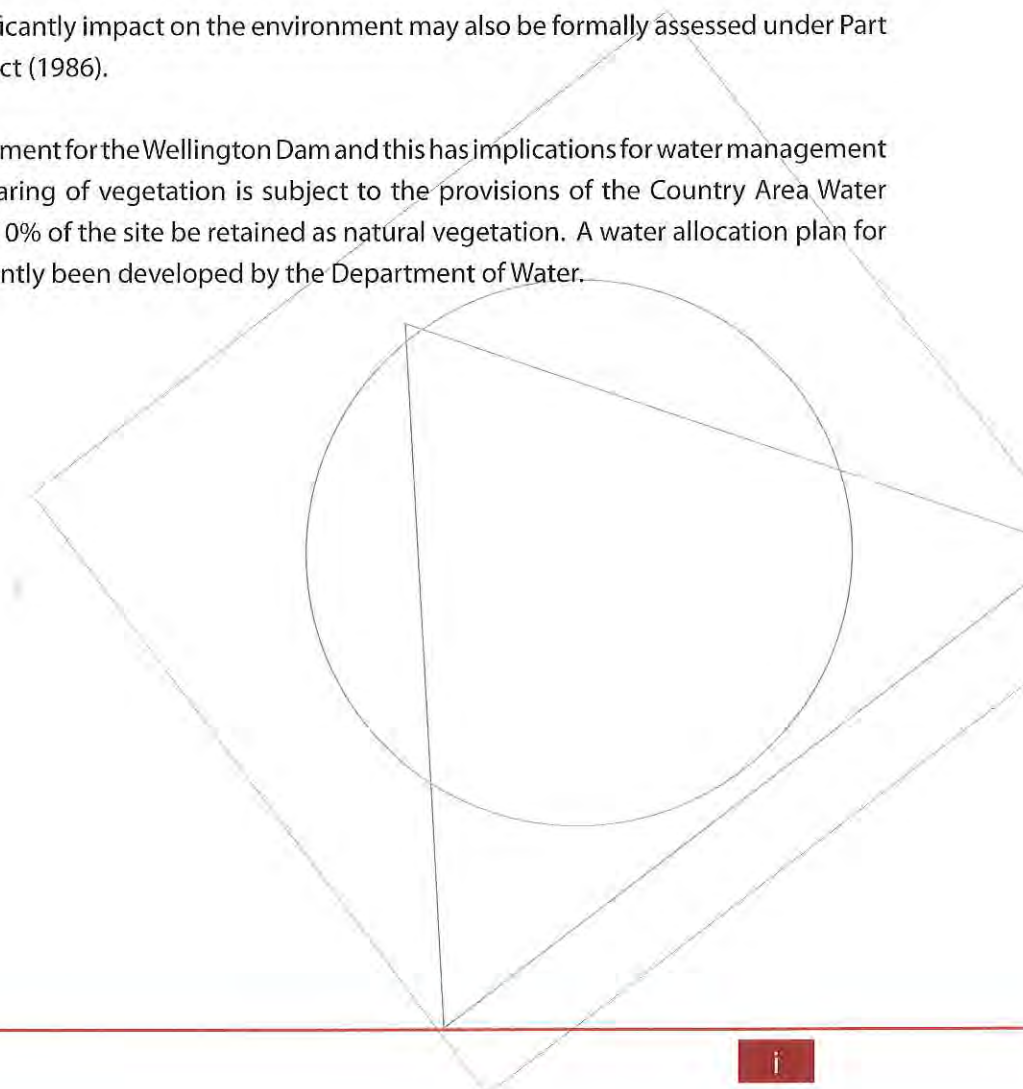
There are a number of State Planning Policies which affect the proposed development of the SIP including:-

- SPP2.0 Environment and Natural Resources (2003);
- SPP2.7 Public Drinking Water Source (2003);
- SPP2.9 Water Resources (2006);
- SPP3.4 Natural Hazards and Disasters (2006); and
- SPP4.1 State Industrial Buffer Policy - Draft (2009).

The Environment Protection and Biodiversity Conservation Act 1999 requires the assessment of projects that are likely to have a significant impact on matters of national environmental significance. Landcorp has referred the project to the Department of the Environment, Water, Heritage and the Arts for assessment.

Proposals with the potential to significantly impact on the environment may also be formally assessed under Part IV of the Environmental Protection Act (1986).

The SIP is within the proclaimed catchment for the Wellington Dam and this has implications for water management and the clearing of vegetation. Clearing of vegetation is subject to the provisions of the Country Area Water Supply Act 1947 which require that 10% of the site be retained as natural vegetation. A water allocation plan for the Upper Collie Catchment has recently been developed by the Department of Water.



ISSUES

The following issues have been examined in relation to the potential development of the SIP.

Underground Subsidence

Mine voids at depths of 12 to 15m below ground level are located in the eastern portion of the site in the vicinity of the rail loop and there is evidence of subsidence and collapses. Any structures proposed in these areas are likely to require substantial ground improvement works and/or piled foundations to avoid excessive settlement and distortion.

Water Management

A Local Water Management Strategy has been developed for the SIP to demonstrate that water quality and drainage at the SIP can be adequately managed. Each proponent of the SIP will be responsible for the preparation and implementation of an urban water management plan on their allotment, which will be subject to approval by the DoW.

No scheme water will be provided within the SIP and the potential water supply sources for development are from surface water, ground water, and mine dewatering.

Stormwater quantity and flood protection is to be achieved through the use of local detention basins, and infiltration. It is the responsibility of proponents to provide the appropriate level of treatment for all surface and groundwater discharges from the site.

Groundwater depths on the site range from 3m – 15m. The occurrence of shallow perched groundwater has drainage implications and may also affect the design of building foundations. It is the responsibility of the proponent to ensure that surface and subsurface drainage systems are designed to protect groundwater quality.

No wastewater infrastructure will be provided within the SIP and each proponent is required to manage their own wastewater collection, treatment, and disposal.

There are several wetlands adjacent to the border of the SIP. To reduce any potential impact from industrial uses on these wetlands and their associated vegetation a minimum development setback/buffer of 50m is to be provided.

Vegetation and Fauna

The SIP has a total area of 235 ha of which 121 ha contains existing vegetation. This represents 51% of the area of the SIP. There has been a high degree of disturbance and fragmentation of vegetation both within the SIP and the adjoining land. This has been due to the development of access tracks, roads and infrastructure associated with mining and power generation. There is no Declared Rare Flora within the SIP, however two priority flora species were found to be present in several locations mainly associated with the wetlands. Six Declared Plant (weeds) species were also identified.

A number of fauna species found in the region have conservation significance. In particular black cockatoos (Carnaby's Cockatoo, Baudin's Black Cockatoo and the Forest Red-tailed Black Cockatoo), the Chuditch and Western Brush Wallaby. Due to the amount of available habitat in the surrounding State Forest and National Parks, these species are unlikely to be dependent on the vegetation within the SIP for their survival.

The development of the SIP will inherently require the removal of most of the vegetation. To mitigate the impacts of this:-

- a) Each Development Area must retain 10% of the existing remnant vegetation in accordance with the provisions of the Country Areas Water Supply Act 1947.
- b) Previously cleared areas and areas not required during ongoing operations (i.e. buffer areas) at the SIP will be rehabilitated. Landcorp will prepare revegetation and landscaping guidelines for the SIP.
- c) Management measures to protect the areas of priority vegetation will be prepared.
- d) Proponents must manage Declared Plants in accordance with the Agriculture and Related Resources Act 1976.
- e) Where possible the clearing of vegetation containing potential cockatoo nesting trees should be avoided. Any large trees containing hollows which are removed will be salvaged and donated to Cockatoo care groups to support captive breeding efforts or used in rehabilitation programs.
- f) Habitat features should be salvaged for use in rehabilitation areas. LandCorp is proposing as a condition of lease, ongoing sponsorship of the Western Shield Project by proponents so as to mitigate any impact on the Chuditch.

Heritage

An Aboriginal archaeological and ethnographic survey has been undertaken and no sites of significance were recorded at the site.

Traffic and Access

The Coalfields Highway adjacent to the SIP has a traffic volume of 1,000 vehicles per day (vpd). This is estimated to increase to 3,900 vpd for during construction and 2,300 vpd for the operation phases of the SIP respectively. This assumes that the SIP will be fully constructed at the one time which is unlikely to happen.

The SIP will have three entrances, with the main access being from Premier Road and secondary access from both Shotts Road and Shotts River Road South. Shotts Road will be realigned to provide an improved intersection with the Coalfields Highway.

Each proponent will need to provide a further traffic impact study for both the construction and operational components of any project.

Soil Contamination

A preliminary site investigation was conducted and identified historical dumping of waste materials within the 'rail loop' at the eastern end of the site. Further site investigations and remediation will occur prior to development commencing.

Acid Sulphate Soils

There is potential for acid sulphate soils to be present in the vicinity of wetlands. While noting that development will be setback from these wetlands, proponents will be responsible for conducting soil investigations to assess acid generating potential.

Dieback

Phytophthora cinnamomi (dieback) has been present for a long time in the SIP due to the high level of disturbance and unrestricted access in the area. The risk of further spreading dieback during the proposed construction activities can be minimised by specific management measures.

Emergency Management

A Local Emergency Management Plan has been prepared for Collie and it details prevention, response and recovery arrangements. In the unlikely event of a major incident at the SIP there could be harm to people, property or the environment. Proponents must undertake a safety (risk assessment) report for each industry to demonstrate that measures will be taken to identify all foreseeable incidents, their likelihood and consequences. They must also justify the adequacy of the control measures used to minimise risk (both on-site and off-site).

The SIP will be protected from bush fires by:-

- The maintenance of primary burn buffers within the broader locality as part of DEC's district fire protection program;
- The maintenance of secondary burn buffers immediately around the SIP; and
- Provision of appropriate bush fire management measures within the SIP.

Proponents must prepare Fire Management Plans for each Development Area.

BUFFER MANAGEMENT

Landcorp has defined a buffer area around the SIP for the purpose of avoiding conflict between incompatible land uses. The definition of the buffer normally takes into account a number of factors including, odour, noise, risk, health hazard, light spill, dust, air quality, water quality and cleaner production and resource recovery.

The majority of the land around the SIP is State Forest which is used either for forestry, coal mining or power generation. Of the 38 freehold properties within an approximate 3km radius of the SIP, 14 are owned by government agencies, 19 are owned by industry and 5 are owned privately.

Within the surrounding State Forest there are also recreation facilities such as Stockton Lake and the Collie Motorcycle Club track.

In Local Planning Scheme No 5 the freehold land surrounding the SIP locality is:-

- Predominantly included in the Rural 2 zone;
- Partially included in the Rural 1 zone;
- Partially included in the Collie Power Station Special Control Area; and
- Partially included in the Coolangatta Industrial Estate Special Control Area.

The Collie Power Station Special Control Area extends south to the Coalfields Highway adjacent to the SIP and occupies a large proportion of the area to the north of the SIP. The purpose of the Collie Power Station and Coolangatta Special Control Areas are to ensure that no conflict will result with the power station, coal mining and related activities. Within these Special Control Areas no habitable buildings (dwellings) are permitted.

In assessing the requirements for the buffer area both noise and air emission studies were undertaken. These both considered the cumulative impacts of the existing and proposed industries in the locality.

The modelling of the existing industries identified significant exceedances of the Air National Environment Protection (Ambient Air Quality) Measure standard including at sensitive receptors. The results show that these standards are unlikely to be met irrespective of the SIP's development however, it is apparent that industries in the SIP will not be major contributors to this exceedance.

The air emission investigation recommends a planning buffer of between 1 and 2kms.

Noise modelling was undertaken using Computer Aided Noise Abatement (CadnaA) to determine reasonable buffer distances and indicative maximum allowable noise levels (sound pressure levels) from the SIP to noise sensitive areas. Based on the night time noise criteria (2200 - 0700 hours Monday to Saturday and 2200 - 0900 hours Sunday and Public Holidays) noise received from each industry within SIP at the nearest noise sensitive premises would need to be 35 dB(A) or less.

The maximum allowable noise level at the boundary of the SIP is 65dB(A).

The preliminary noise modelling results indicated that a 2km – 3km buffer would be suitable for the SIP depending upon the level of mitigation required to be undertaken by the proposed industries. The Environmental Protection Authority determined that a 3km buffer was required to ensure that the industries within the SIP can meet the assigned levels at the edge of the buffer.

Maximum sound power levels have also been established so that future proponents, decision makers and members of the public are aware that there is a limitation to the permitted maximum sound power levels. The sound power report outlines the likely capacity (sound power levels) of each Development Area to accommodate typical industries within the proposed 3 km buffer, for inclusion in the SIP Structure Plan. It indicates that the accumulative noise emissions from the Shotts Industrial Park will not have an unacceptable environmental impact on existing noise sensitive premises.

Two noise sensitive receptors are located within 2 km buffer distance, the Collie Motorcycle Club caretaker's residence and Stockton Lake recreational area and camping grounds. The noise modelling predicts marginal noncompliance with the night assigned noise level at the caretaker's residence and Stockton Lake.

In addition there is a vacant private property wholly located within the proposed 3km buffer which will not be able to have a dwelling constructed on it. Landcorp is presently negotiating agreement to this with the land owner.

Other factors such as odour, risk, health hazard, light spill, and dust will need to be assessed for each proposal to ensure that they are contained within the prescribed buffer.

The proposed buffer will be reflected in the Local Planning Scheme as a Special Control Area, which overlays the existing zoning. The objective of the buffer provisions will be to ensure that only 'compatible land uses' can develop within the buffer and that no 'sensitive land uses' including dwellings or habitable buildings will be permitted.

STRUCTURE PLAN STATEMENTS

The objective for the SIP is to provide for the development of coal related industries associated uses which, by the nature of their operations, should be separated from and not have an adverse impact on residential and other sensitive land uses.

The SIP will be 'assembled' into Crown and/or Freehold Titles by the Department of Regional Development and Lands. This assembly process will result in the creation of five (5) Development Areas of between 12 and 123 hectares in size. While the SIP has a total area of 235 hectares the net developable land is 187 hectares.

The proposed Special Use zone requires that all applications for planning approval shall be referred to the EPA for assessment unless:-

- a) The EPA has agreed that a specific class of industry will not have any additional environmental impacts in the area; or
- b) The application is for a minor or ancillary development with no significant environmental impacts.

The structure plan contains statements that have been separated into:-

- Statutory provisions which apply as if they were part of the Local Planning Scheme; and
- Management Guidelines which apply as non statutory statements to provide an explanation of various provisions.

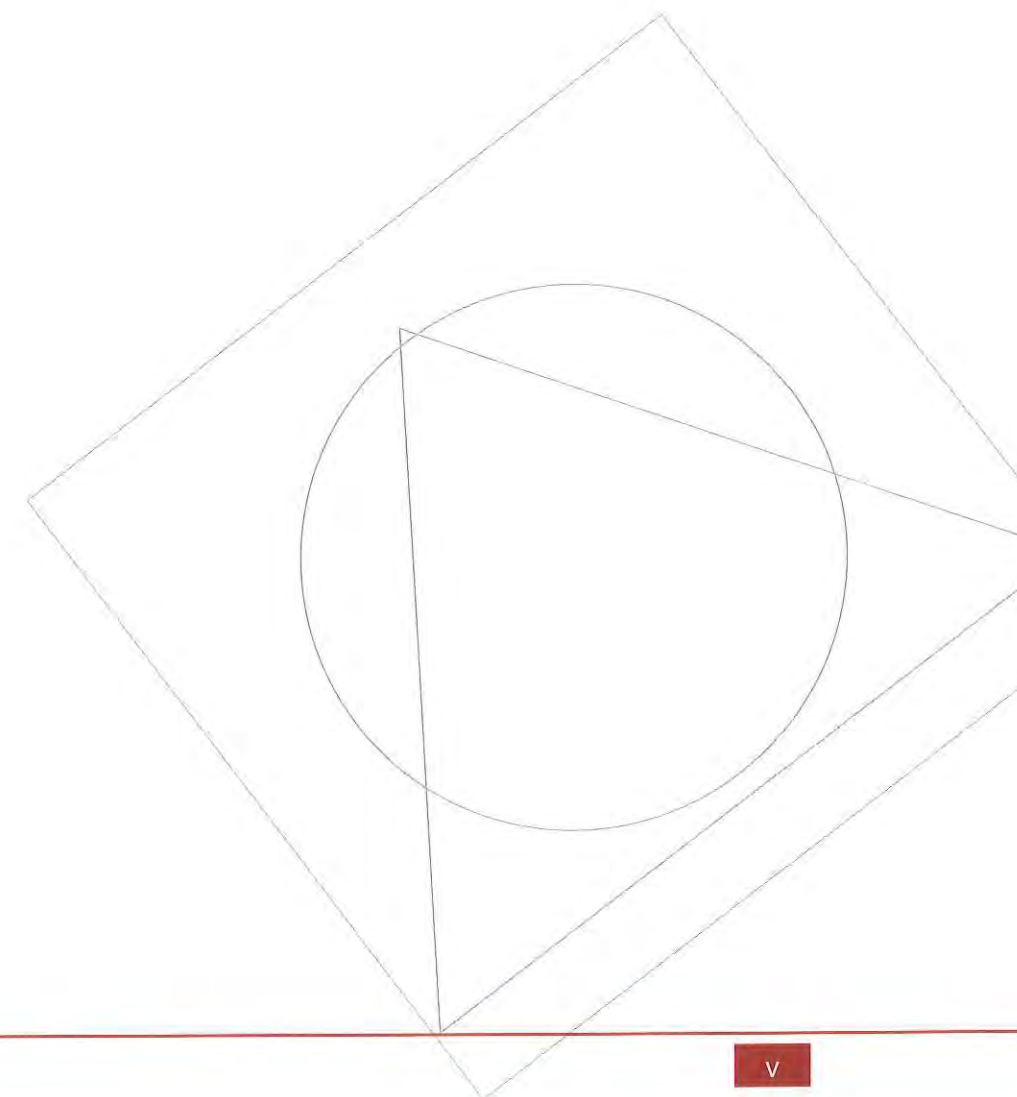
In summary the proposed statutory provisions address:-

1. The permitted land uses are various forms of industry.
2. All development requires the planning approval of the local government.
3. Proponents shall ensure that appropriate services are available to each Development Area.
4. There shall be a minimum development setback of 50m from the wetlands.
5. Each proponent shall prepare an Urban Water Management Plan.
6. Council may request an acid sulphate soils assessment.
7. Council may request the preparation of an acid sulphate soils management plan.
8. Access to and from each Development Area shall be to the requirements and satisfaction of the local government.
9. No additional access to the Coalfields Highway can be created without the approval of the local government.
10. Proponents shall prepare a management strategy for any areas of priority flora identified on the Structure Plan Map.
11. Proponents shall prepare and implement a Construction Phase Dieback Management Plan to minimise the spread of *Phytophthora Dieback*.
12. Proponents must undertake a safety (risk assessment) report for each industry.
13. Landcorp shall prepare an overall Fire Management Plan for the SIP addressing both internal and the external fire management measures.



14. Proponents shall prepare a Fire Management Plan for each Development Area.
15. Noise levels shall not exceed the assigned level as determined by the Environmental Protection (Noise) Regulations 1997, which requires LA10 not to exceed 65dB(A) at any time at the boundary of each Development Area.
16. In order to comply with Statement 15 and 18 b) the environmental impact criteria for noise levels are:
 - (i) noise levels should not exceed 35 dBA at night time at the boundary of the Special Control Area; and
 - (ii) maximum noise levels should not exceed the indicative levels shown in Table 14 between 22:00 and 07:00 hours.
17. Any significant source of air pollutants is required to undergo assessment by the EPA.
18. Applications for Planning Approval must address specific issues.

The proposed management statements are designed to ensure the sustainable development of the Shotts Industrial Park for major industry.





Local Planning Scheme No 5
Shotts Industrial Park Structure Plan



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August 2010

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ACRONYMS

Air NEPM	National Environment Protection (Ambient Air Quality) Measure
CBSF	Collie Basin Structure Plan
bgl	Below ground level
CAWS	Country Areas Water Source Supply Act 1947.
DAFWA	Department of Agriculture and Food WA
DEC	Department of Environment and Conservation
DEWHA	Department of the Environment, Water, Heritage and the Arts
DoP	Department of Planning
DoW	Department of Water
DRDL	Department of Regional Development and Lands
EPA	Environmental Protection Authority
EPBC	Environment Protection and Biodiversity Conservation Act 1999
EPP	Environmental Protection Policy
FESA	Fire and Emergency Services Authority
LEMC	Local Emergency Management Committee
LWMS	Local Water Management Strategy
MHF	Major Hazard Facility
PDWSA	Public Drinking Water Source Area
PFBFP	Planning for Bush Fire Protection
SIP	Shotts Industrial Park
SISD	Safe Intersection Sight Distance
UCL	Unallocated Crown Land
UWMP	Urban Water Management Plan
WAPC	Western Australian Planning Commission

1.0 INTRODUCTION

1.1 Project Objectives

The proposed Shotts Industrial Park (SIP) is situated within the Collie Coal Basin and is located approximately 7.5 km east of Collie and 220 km south from Perth as shown in *Figure 1*.

The site has an area of 235 hectares and has been identified as a proposed major industrial location. This is an integral component of the development of the region through the WA Coal Future's Strategy. The objective of the SIP is to attract large scale industries which could value add to Collie's existing energy and coal production.

1.2 Regional Context

The development of industrial estates within the South West Region generally reflects a four tiered hierarchy with the following characteristics¹:

- (i) Regional industrial estate to accommodate major heavy industrial processing installations, such as steel mills, aluminium smelters and other major plants of State significance.
- (ii) Sub-regional industrial estate to accommodate heavy industrial installations.
- (iii) District industrial estate to accommodate industries that may not be appropriately located within an urban industrial estate, for district produce;
- (iv) Urban industrial estate for urban scale light and general industrial uses.

The principal Regional Industrial Estate within the South West Region is the Kemerton Industrial Park located north of Bunbury. This estate has a potential industrial area of 2,400 hectares and accommodates major industrial activities including the Lyondell Chemicals Titanium Dioxide Pigment Plant, Simcoa Silicon Plant and Transfield Services Kemerton Power Station.

The proposed Preston Industrial Park is a sub-regional industrial estate located on the eastern boundary of the City of Bunbury. It is proposed to provide a total area of 4,400 ha of industrial land comprising of a core general industrial precinct (525ha); a secondary general industrial area (489ha); a transitional industrial precinct (562ha); and a mixed use precinct (299ha).

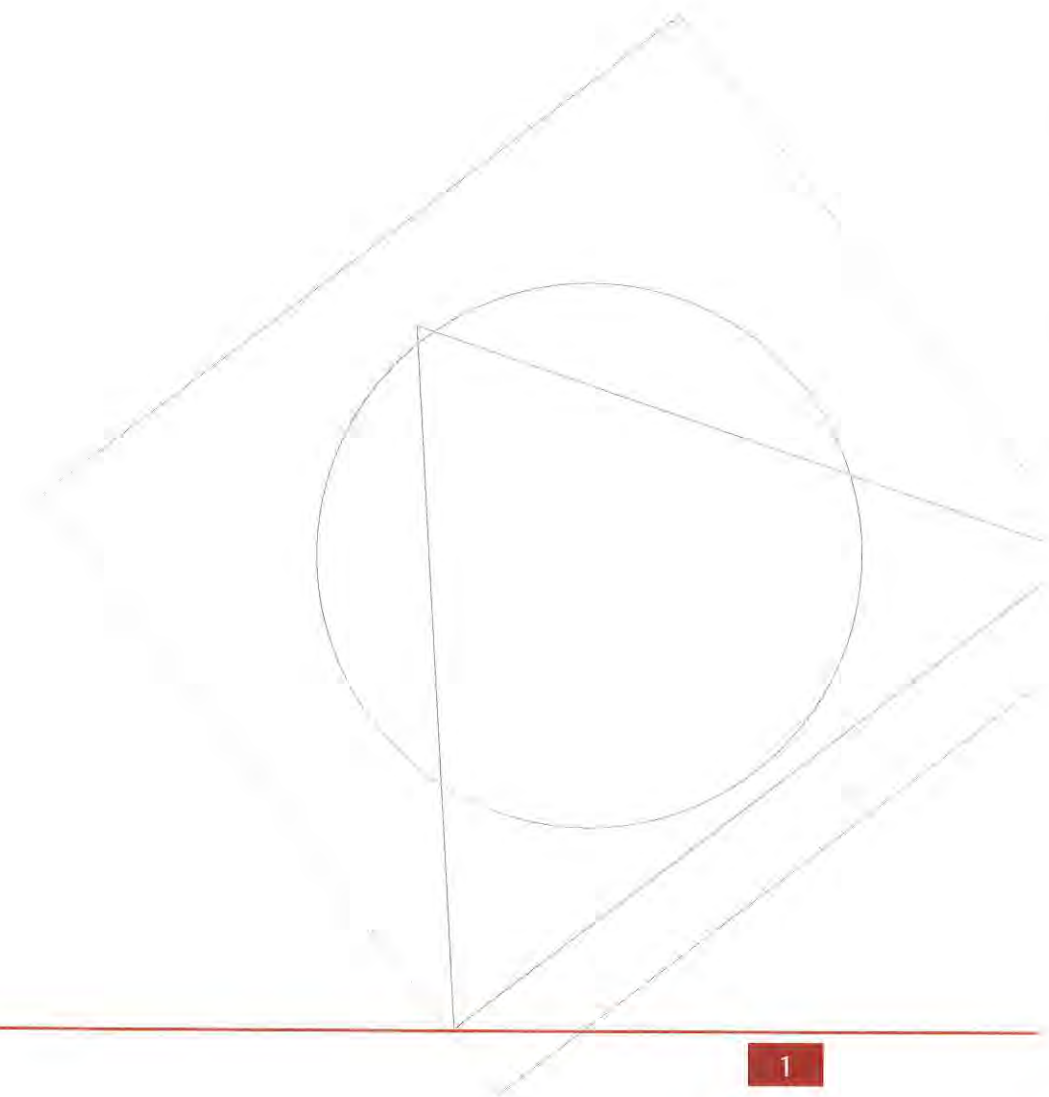
The SIP would be classified as a sub regional industrial estate.

The Coolangatta Industrial Estate is also a sub regional industrial estate and located in proximity to Shotts. While it has an area of 500 hectares, the development of the site is limited to the Bluewaters I and II power stations.

A feature of the regional industry structure is the major stand-alone industrial operations that fall outside of this hierarchy. These are predominantly mining operations including, aluminium refineries and mineral sand processing.

1.3 Project History

The Shotts locality was identified in the late 1990's by the South West Development Commission as an area possibly suitable for the establishment of coal related industries. The Commission established a working group with representatives from the Shire of Collie, Wesfarmers Premier Coal Limited, Department of Environment and Conservation and LandCorp to support and guide the site investigation process.



¹ DoP (2005) Warren Blackwood Industrial Sites Study – Vol 1 page 3.



Figure 1 - Location Plan



The objectives formed by the working group for the Shotts proposal were to identify a potential industrial site in Collie and commence planning for an industrial park that will accommodate the needs of future industry. Technical investigations commenced at the site in 2003 and have continued through to 2009.

In January 2005, the State Government released the WA Coal Future Strategy, and in August 2005 confirmed a range of actions to achieve the objective of increasing coal production from 6 million tonnes per annum (tpa) to 10 million tpa over the next four years. This is intended to create new jobs and a sustainable future for Western Australia's coal mining communities.

Subsequent announcements and approvals for the further development of the Muja and Bluewater power stations reinforced the strategic importance of industry in the area.

1.4 Collie Coal Basin

The SIP is located in the Collie Coal Basin. The Collie Basin is the only producing coalfield in Western Australia. It contains three distinct mining locations being Muja, Premier and Ewington.

The coal reserves of the Collie Basin are estimated at 2,000 million tonnes, which represents a 100 year resource.² Coal mining commenced more than 100 years ago, originally being underground mines which have now been replaced by open cut mines.

The Muja mine commenced operations in the 1950's, supplying coal Western Power's Muja Power Station. Muja Power Station is the largest coal fired power station in the region with a total electrical generation capacity of 1,094 Megawatts (MW). The station is divided into four sections, being A, B, C and D. The older stages A and B were decommissioned in 2007 causing an improvement in air quality in the region. Recently however, plans have been made to recommission stages A and B for peak periods.

The Ewington mine commenced operations in 1996 supplying coal to Griffin's industrial customers the Worsley Alumina refinery and new power generation at the Bluewaters power station.

The Bluewaters power station (Stages I and II) is currently being constructed at the Coolangatta Industrial Estate, located 4.5 kilometres north east of Collie. Stage I and II are both 208 MW coal fired generating units, for a potential total of 416 MW. The proposed Bluewaters power station (Stages III and IV) will consist of an additional two 208 MW coal fired generating units and will be constructed adjacent to Stages I and II.

The Premier mine commenced operations in 1998 supplying coal to both the Muja and Collie power stations. Collie Power Station is situated 10 km north of Collie. Collie Stage A was commissioned in 1998 and has a generating capacity of 300 MW.

Eighty per cent of the annual production of the Collie coalfields is used for power generation. Other uses of coal include:

- Iron smelting;
- Production of synthetic rutile;

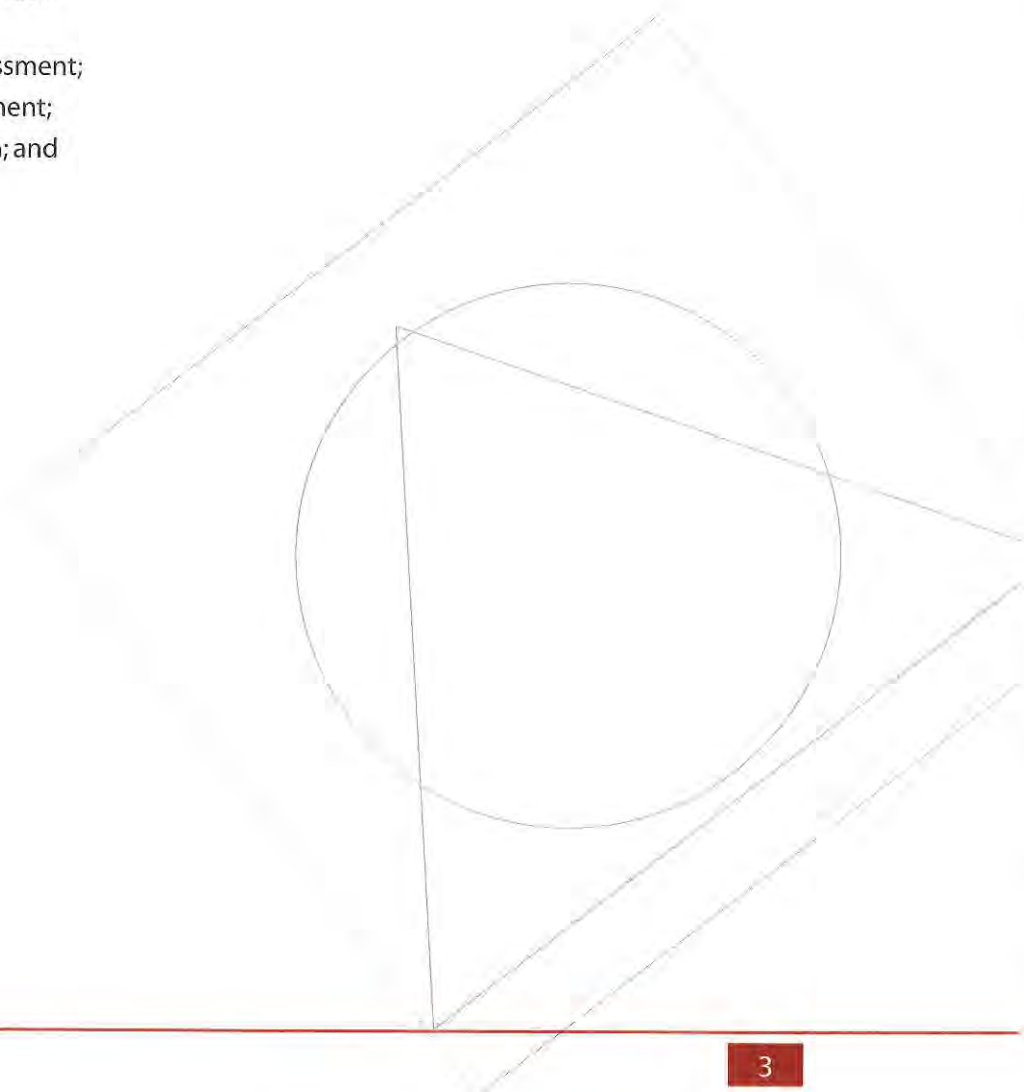
- Cement making;
- Production of alumina, mineral sands and nickel;
- Production of chemicals; and
- Heating.

Verve Energy is the main generator of electricity in the State and operates the Collie and Muja power stations. A number of private companies also generate electricity in Western Australia. Coal currently fuels around 42% of the State's power generation. Gas contributes around 54% while fuel oil and renewable energy sources such as wind and hydro make up the remainder.

1.5 Supporting Investigations

In preparing this report Landcorp have undertaken the following studies:-

- Engineering Servicing Report;
- Spring Flora and Fauna and Wetland Assessment;
- Geotechnical Study;
- Aboriginal Heritage Survey;
- Supporting Information for Referral under the EPBC Act;
- Preliminary Site Investigation (Contaminated Sites);
- Local Water Management Strategy;
- Traffic Assessment;
- Cumulative Noise Impact Assessment;
- Cumulative Air Quality Assessment;
- External Fire Management Plan; and
- Sound Power Limit Study.



² http://www.colliecoal.com/wa_coal_industry/resources.phtml

2.0 EXISTING CONDITIONS

2.1 Location and Site Description

The subject land is located at Shotts townsite being approximately 7.5km east of Collie as shown in *Figure 2*. The proposed industrial estate has an area of 235 hectares.

The site is located on the southern side of the Coalfields Highway and is centred on Premier Road. The site is largely contained within the state forest which is managed by the Department of Environment and Conservation. The surrounding crown land primarily contains native forest, and plantations.

To the south and south east of the site are major open cut mining operations and coal processing facilities associated with Wesfarmers Premier Coal operation. Further south is the Muja power station.

North of Coalfields Highway is Griffin Coal Ewington open cut mine. Further north is the Collie power station (300MW), Coolangatta Industrial Estate and Blue Waters power stations (each approximately 250MW).

To the south west of the site is Stockton Lake and the Collie Motorcycle Club facility.

These features are shown in *Figure 2*.

2.2 Site History

The eastern sector of the study area comprises some of the original mining tenements of Premier Coal Mine. The mine commenced underground works in 1911 but halted in 1914 as a result of creep, fire and water problems on Lease 261. A further tunnel was put down some 0.5km south west of the original mine and mining commenced again in 1916 but problems such as soft roof and floors that required extensive shoring up continued. The mineworks ceased in 1927.

The settlement of Shotts, located in the north-east sector of the project area, commenced at the same time as mining at Premier Coal Mine. There is little information pertaining to the Shotts town area but it is understood that there were approximately twenty permanent houses within the town, with 4-5 lots of 5 acres located outside of the township and small farms occupied within a mile from the town.

The residential area was situated immediately north of the Narrogin railway line and forms part of the study area. The mine workers preferred to live in the village or on small farm holdings close enough to the mine to commute by walking or riding a horse.

2.3 Land Ownership

The SIP comprises land in multiple ownership being both crown land and freehold land. Landcorp in conjunction with the Department of Regional Development and Lands (DRDL) is presently undertaking the necessary procedures to assemble the land into multiple Crown Titles.

The site has a complex land tenure comprising of approximately 67 land parcels (not including road reserves) as documented in *Table 1* and shown in *Figure 3*. These include:-

- Crown Land;
- Unallocated Crown Land;
- Private Land;
- Road Reserves;
- Railway Reserves;
- Easements;
- Mining Leases; and
- Townsite (Shotts).

The Crown land is predominantly State Forest; but also includes reserves for various purposes including School Site, Hall Site, Water and Public Utility.

The principle private land holding within the proposed estate is Lot 2 D62462 having an area of 34.183 hectares which is registered to the Department of Conservation and Land Management (now DEC).

The subject land has historically been subject to mining leases to allow for coal extraction. Wesfarmer's Premier Coal Ltd has two Mining Leases over portions of the subject land. These leases are being surrendered as part of the land assembly process.

Currently, there is one registered Native Title application and one unregistered application over the study area. These are:-

- Gnaala Karla Booja WC 98/058; and
- Single Noongar Claim (Area 1) WC03_006 (unregistered).

2.4 Existing Development

The existing development of the site is characterised by being located between the two main power stations and associated coal mines. The site has a complex array of existing infrastructure within and crossing it. The main access to the site is from Premier Road which also provides access to the Premier Coal loading facility. This facility provides coal to both the Muja and Collie power stations by a conveyor belt.

Verve Energy has the following infrastructure within the site:-

- Shotts Transfer Station and borefield;
- Wellington Dam Take-Off to Shotts pipeline;
- Shotts Transfer Station to Muja Power Station pipelines; one buried and two above ground;
- Shotts Transfer Station to Collie Power Station pipeline;
- Ewington to Shotts pipeline;
- Woolnough to Shotts pipeline;
- Shotts Overflow drainage and sump (aka Lake Douglas);

Western power has two main transmission lines crossing the SIP.

- The Muja Northern high voltage (330kv) transmission line;
- The Muja to Cannington high voltage (132kv) transmission line

Premier Coal has a private rail sidings/loop associated with its coal loading facility. There is an existing dwelling on leased land within the Premier rail loop. The Premier to Collie Power Station coal conveyor also crossing the site.

Griffin Coal has a heavy haulage road crossing the site and the Coalfields Highway. This is used for transporting coal, over burden material and for general maintenance access.

Telstra has a telephone exchange on Lot 2 and there are a series of optic fibre cables across the site.

There are a number of informal access tracks as well as the remains of the old Shotts townsite. There is also evidence of historic quarrying (sand) on the western portion of the site and open paddock areas used for farming.

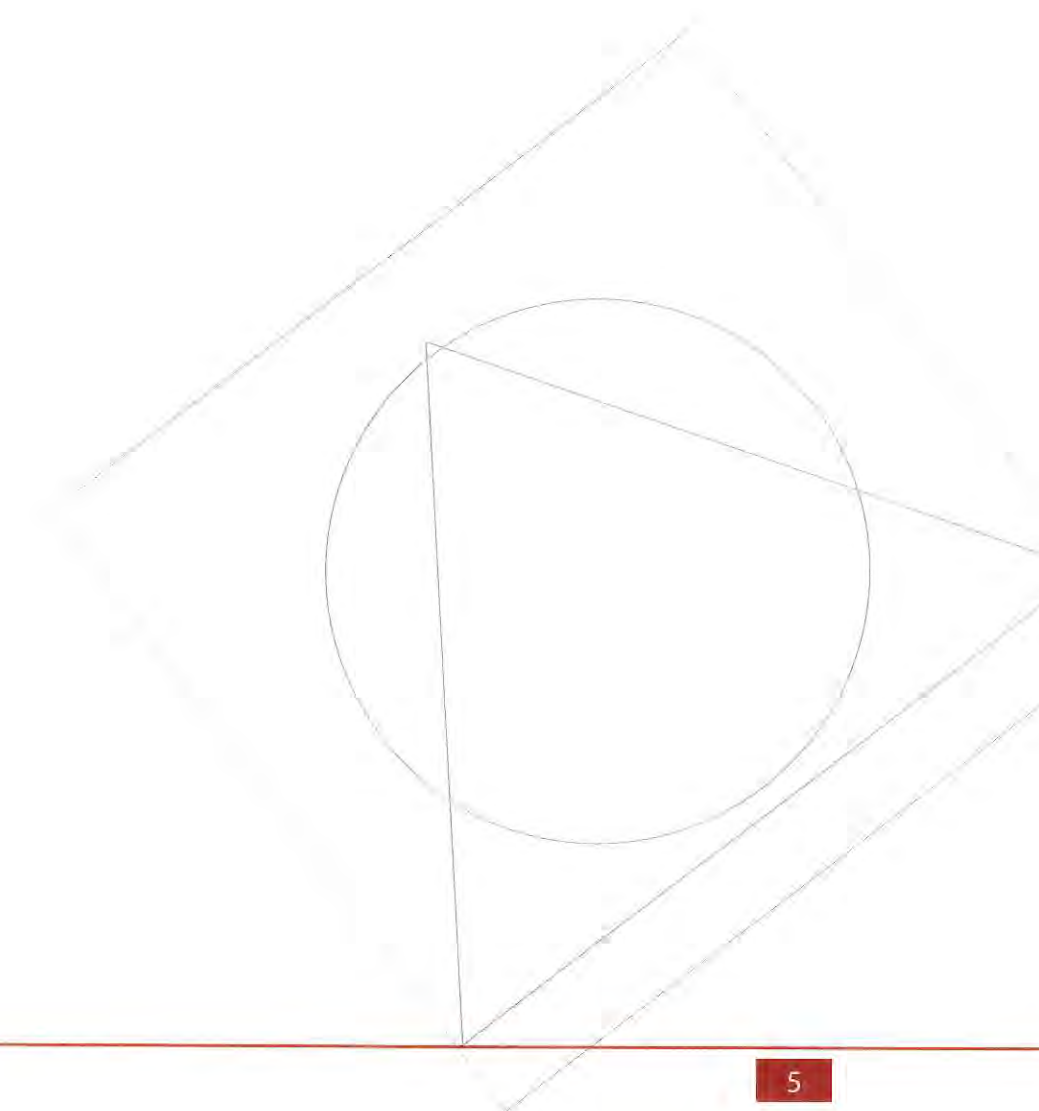
These features are shown in *Figures 4 and 5*.

2.5 Topography

The general topography of the site is shown in *Figure 6*. The highest part of the site has an elevation of 245m AHD and is situated between Premier Road and the Shotts townsite.

The land generally slopes to the south and the west. Shotts Road is situated on a east – west orientated ridge line, with a small portion of the site sloping to the north towards Coalfields Highway.

The site has moderately undulating topography with slopes of between 5% and 12%.



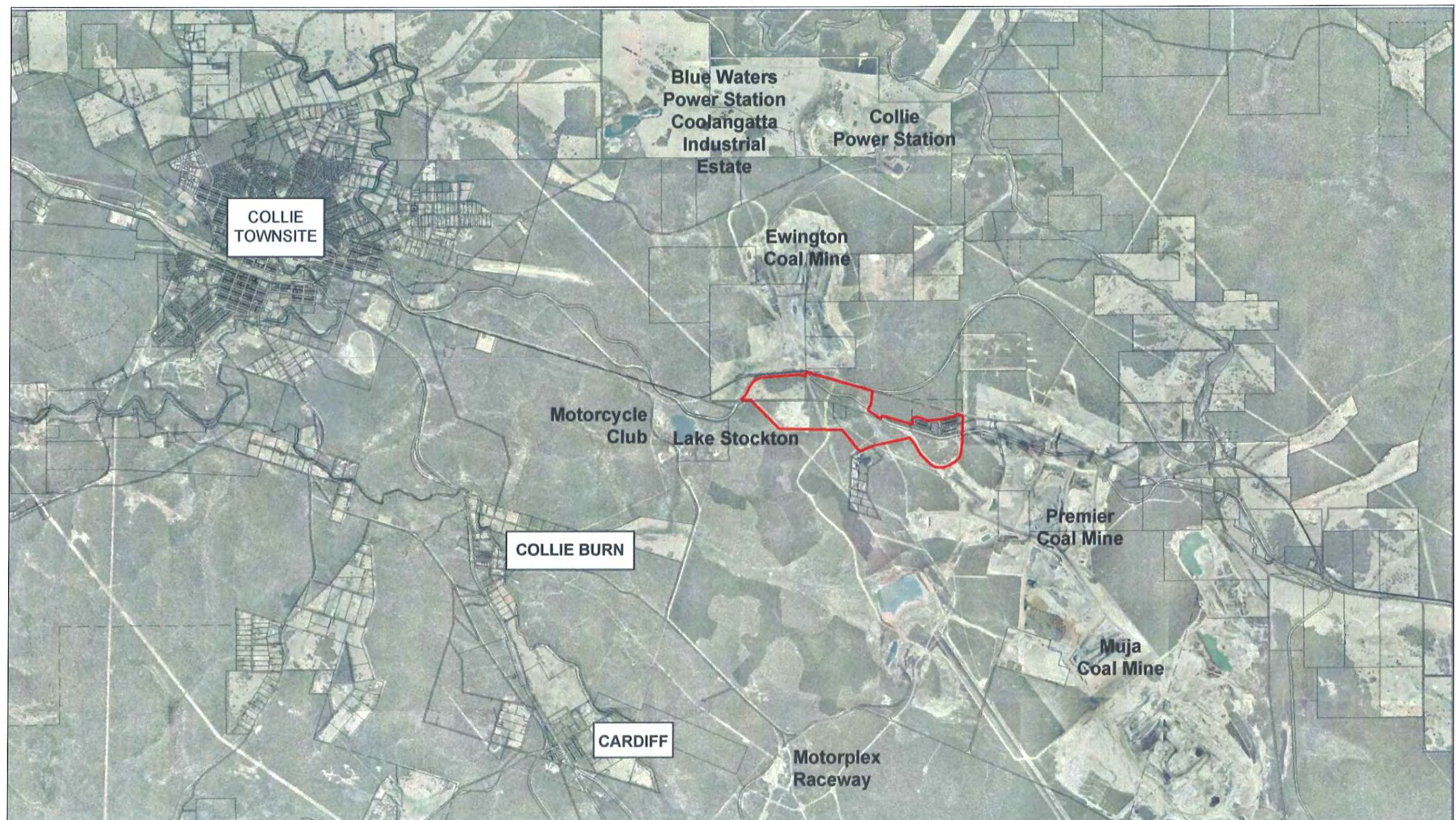


Figure 2 - Coal Basin Context

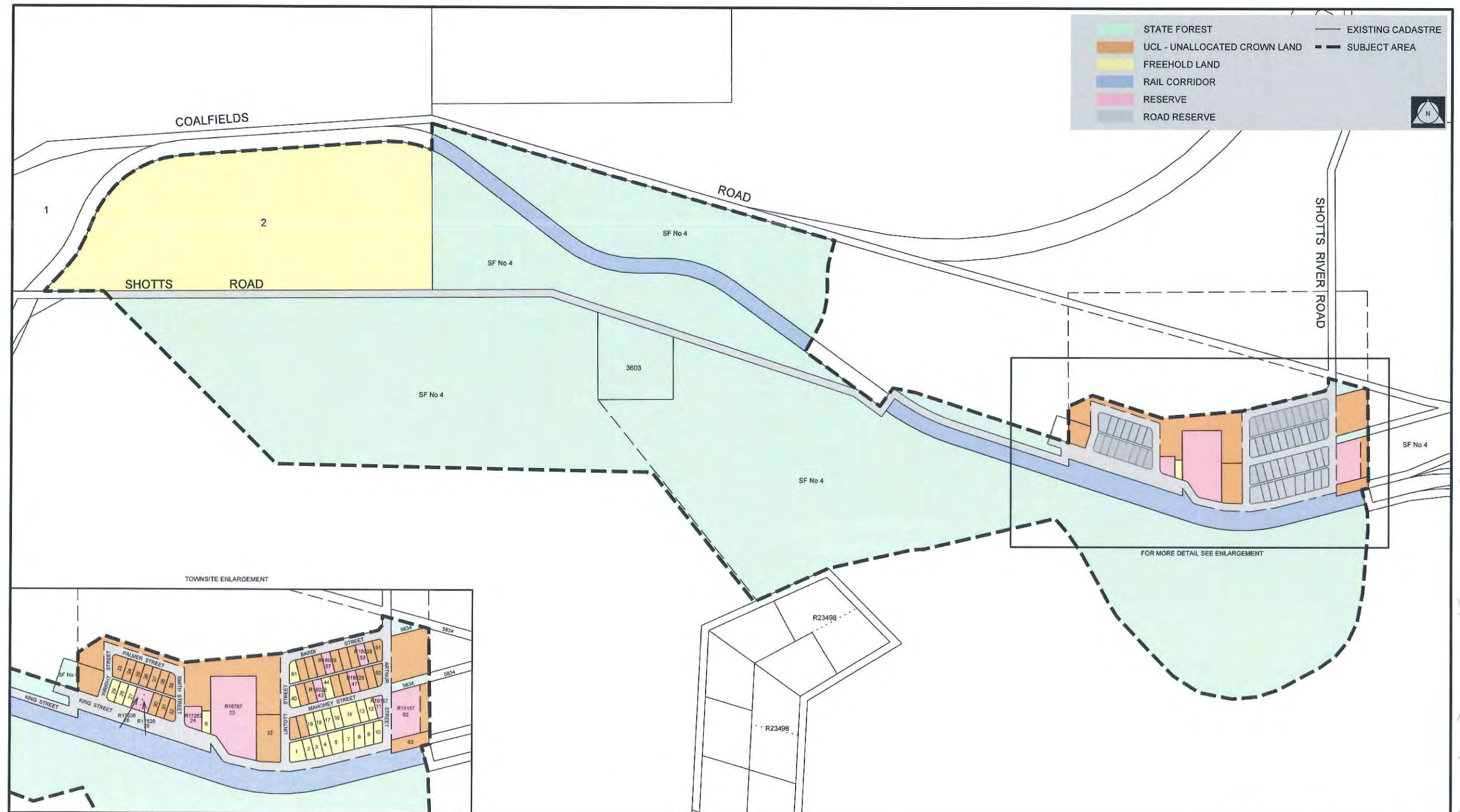


Figure 3 - Land Ownership

SHOTTS INDUSTRIAL PARK

Lot	DP	Vol	Folio	Reserve	Owner
2	62426	1634	502		The Exec. Director of Dept of Calm (lease & 2 Easements)
337	64212			UCL	
338	64212			19157	Department of Environment and Conservation
339	64212			UCL	
1	90219	1647	835		Western Collieries Ltd
2	90219	1916	220		Western Collieries Ltd
3	90219	1130	736		Wesfarmers Coal Ltd
4	90219	1761	540		Wesfarmers Coal Ltd
5	90219	1634	481		Wesfarmers Coal Ltd
6	90219	1410	671		Western Collieries Ltd
7	90219	1657	392		Wesfarmers Coal Ltd
8	90219	1657	391		Wesfarmers Coal Ltd
9	90219	1765	750		Western Collieries Ltd
10	90219	813	82		D.E. Howe
11	90219	3007	275	19157	Department of Environment and Conservation
12	90219	769	105		H. Marley
13	90219	1352	720		Western Collieries Ltd
15	90219	1929	166		Western Collieries Ltd
16	90219	1737	194		Western Collieries Ltd
17	90219	1445	426		Western Collieries Ltd
18	90219	1814	869		Western Collieries Ltd
19	90219	1814	870		Western Collieries Ltd
20	90219	3007	280	UCL	
21	90219	3007	281	UCL	
22	90219	3007	282	UCL	

Lot	DP	Vol	Folio	Reserve	Owner
23	90219	3007	273	16767	MO to Shire of Collie : "Recreation" (CLT – Not issued)
24	143495	3139	148	17262	Unmanaged : "Hall Site" – with Perpetual Lease CL 1155-1923
25	143495	1634	676		Western Collieries Ltd
26	143495	1765	781		Western Collieries Ltd
27	143495	1132	187		Wesfarmers Coal Ltd
28	143495	3007	276	17538	Unmanaged : "Public Utility"
29	143495	3007	277	17538	Unmanaged : "Public Utility"
30	143495	3007	283	UCL	
31	143495	3007	284	UCL	
32	143495	3007	285	UCL	
33	143495	3007	286	UCL	
34	143495	3007	287	UCL	
35	143495	3007	288	UCL	
36	143495	3007	289	UCL	
37	143495	3007	290	UCL	
38	143495	3007	291	UCL	
39	143495	3007	292	UCL	

Table 1 - Land Ownership



Figure 4 - Existing Conditions



Figure 5 - Existing Infrastructure

2.6 Geotechnical

The subject land is located within the Collie Basin which in turn lies within the Darling Plateau.

The Collie Basin is thought to be a depression within the Archaean bedrock containing Permian sediments were extensively reworked and lateritized during the Tertiary period.

The Collie Basin extends approximately 26km southeast from Allanson, and has an average width of approximately 13km. It is subdivided into three units the Cardiff, Shotts and Muja sub-basins. Each sub-basin is asymmetrical in profile with the deepest portion close to the south-western margin. The maximum thickness of the Permian strata is around 1,300m in the Cardiff sub-basin.

The Permian strata of the Collie Basin consists of the Stockton Formation and the Collie Coal Measures. The Stockton Formation is reported to be up to 260m thick and rest on a glacially striated pavement of Archaean rocks. The Stockton Formation comprises of a basal tillite containing dolerite and granitic fragments, and is overlain by a sequence of pale claystone, siltstone and fine grained sandstone. The Collie Coal Measures, which appear to conformably overly the Stockton Formation, consist of a succession of weakly lithified conglomerate, sandstone, siltstone and claystone, with intercalated seams of sub-bituminous coal. They reach a reported maximum thickness of 1,050m.

The surface soils from 0 to 3.5m below ground level (bgl), may comprise fine to medium white to brown sand with layers up to 0.5m of dark brown medium grained sand (Coffee Rock). Typically, sand was encountered from surface level across the entire site, with a typical thickness of 0.6m, to at least the target depth of investigation (2.0m below ground level). Several different materials (silts, clays and gravels) were encountered underlying the topsoil/sand layer at number of locations across the site.

There are also mine voids at depths of 12 to 15m bgl in the eastern portion of the site in the vicinity of the rail loop.

Coffey Geotechnics has conducted a preliminary geotechnical survey of the site.³ The general features, physical properties and suitability for specified uses attributed to the superficial geology are shown in *Figure 7*.

The fieldwork consisted of 19 test pits (TPO1 to TP19), excavated to depths varying from 1.3m (TP12) to 2.4m (TP18) below the existing ground surface. The location of the test pits are shown on *Figure 7*.

The generalised subsurface profile for the site is documented in *Table 2*. *Table 3* provides the detailed soil and landform characteristics.

³ Coffey Geotechnics (2008) Collie Shotts Geotechnical Study.

Soil Type	General Description/Remarks	Encountered In Test Pit No.
TOPSOIL/SAND	Fine to coarse grained, dark grey, With trace organic material and Rootlets with trace silt (TP03)	All test pits
Materials Underlying Typical Sand Layer		
SAND	Fine to coarse grained: white, orange brown: with trace rootlets: with trace/some fine gravel: with trace silt, with trace clay. Loose to medium dense	TP04, TP05, TP09, TP11, TP14 and TP18
Sandy CLAY/CLAY	Low plasticity, fine to coarse grained sand: pale orange brown, white with trace fine gravel: Firm to stiff.	TP01, TP07, TP08, TP15 Underlying sandy gravel in TP02, TP17 and TP20
Sandy SILT/SILT	(Fine to coarse grained sand), white, orange brown: with trace gravel: with slight plasticity, with trace fine to medium grained sand.	TP06 and TP08
Sandy GRAVEL /GRAVEL	Fine to coarse grained sand, fine to coarse grained gravel, sub rounded to rounded sandy claystone laterite: pale brown, pale orange brown: with some/trace silt, with clay.	TP02, TP03 TP10, TP12, TP13, TP17 and TP20.

Table 2 - Generalised Soil Profile

Table 3 - Soil and Landform Units

CODE	NARRATIVE	Relief: Slope	PHYSICAL PROPERTIES									CURRENT CHANGES	SUITABILITY FOR SPECIFIED USES						NOTES
			Industrial Mineral Resources	Shear		Permeability	Consolidation	Shrink Swell	Cohesion	Ease of	USC*		Foundations	Road fill	Base Course	Septic Tanks	Sanitary Land Fill	Excavation (mining & Quarrying)	
G2	GRAVEL – yellow to dark reddish brown	170 – 340m;G	Gravel	H	L	H	L	N	N	H	GW	Surface Wash	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Widely distributed colluvial gravels found on gentle slopes
Gs1	SANDY GRAVEL – coarse, sub-angular to rounded quartz gravel with matrix of fine to medium subangular quartz sand, overlies LA4	210 – 220m;G		H	L	H	L	N	N	H	GW	Surface Wash	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Associated with LA4 north-west of Shotts
LA3	LATERITE – massive, indurated, nodular and vesicular, iron cemented, much fine to medium angular quartz and occasionally some fine well rounded quartz and quartzite pebbles	180-360m;F-G		H	N/A	M-H	N/A	N	N/A	L	N/A	Surface Wash	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Possible Problems for Land use	Possible Problems for Land use	Land use compatible with unit	Extensive deposits occurring on ridge crests within coal basin is laterized and iron cemented silty sands (variably thick alluvial and lacustrine sediments overlying weathered and fresh Coal Measure sediments)
LA4	LATERITE – as LA3 but contains abundant	220-230m;G		H	N/A	M-H	N/A	N	N/A	L	N/A	Surface Wash	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Possible Problems for Land use	Possible Problems for Land use	Land use compatible with unit	Small restricted outcrop north-east of Stockton open cut
S14	SAND – white to pale grey, fine to medium, occasionally coarse, angular to sub-angular quartz, little fines, poorly to moderately sorted	170-280m;F	Low quality specification sand and fill	H	L	H	L	N	N	H	SW		Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Land use undesirable for the environment and possible problems with land use	Land use undesirable for the environment and possible problems with land use	Land use compatible with unit	Alluvial sand of broad, shallow valleys, well drained, loose, high water table, prone to flooding in part
S23	SAND – grey to strong brown, fine, sub-angular quartz, well sorted, leached at surface	210-300m;F	Fill Sand	H	L	H	L	N	N	M	SP	Intermittent stream flow	Land use compatible with unit	Possible Problems for Land use	Possible Problems for Land use	Land use undesirable for the environment and possible problems with land use	Land use undesirable for the environment and possible problems with land use	Land use compatible with unit	Generally restricted to fluvial channel with seasonal flow
S24	SAND - pale grey, medium to coarse, angular to sub angular quartz, no fines, moderately well sorted, some fine to coarse sub-rounded quartz pebbles at top	210-220m;F	High quality specification sand and fill	H	L	H	L		N	M	SP		Land use compatible with unit	Possible Problems for Land use	Possible Problems for Land use	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Isolated deposit on ridge crest east of Stockton open cut
S25	SAND – white to pale grey, fine to coarse, sub-angular quartz, poorly sorted, little fines, occasionally some pebbles of round quartz	200-220m;F-G	Low quality specification sand and fill	H	L	H	L	N	N	H	SW		Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Occurs on interfluvies south-east of Collie
S5	SAND – yellow-brown, fine to medium, sub-angular quartz, no fines, moderately to well sorted, contains occasional well rounded pisolithic gravel	200-220m;F	Low quality specification sand and fill	H	L	H	L	N	N	M	SP		Land use compatible with unit	Possible Problems for Land use	Possible Problems for Land use	Land use undesirable for the environment and possible problems with land use	Land use undesirable for the environment and possible problems with land use	Land use compatible with unit	Limited areal extent, some reworking evident
S6	SAND – fawn to strong brown, fine to medium, sub-angular quartz, some fines, typically leached at surface, poorly sorted	200-300m;G	Fill Sand	H	L	H	L	N	N	H	SW	Intermittent stream flow	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Land use compatible with unit	Occurs in upper reaches of valleys, large colluvial component
Smc1	CLAYEY SILTY SAND – pale yellow-brown, mottled, fine to medium, angular quartz, well rounded pisolithic gravel at top, broken quartz veins in common places	180-0300m;F-G		M	L	L-M	L-M	N-L	L	M	SM	Soil moisture changes	Land use compatible with unit	Possible Problems for Land use	Possible Problems for Land use	Land use compatible with unit	Land use compatible with unit	Possible Problems for Land use	Completely weathered granitic material generally in-situ
		F=Flat G=Gentle Max&Min elevation on unit with respect to Australian Height	H = High, M = Moderate, L = Low N = None, N/A = Not Applicable *Unified Soil Class System															Assessed in terms of mineral resource potential of the unit	



2.7 Surface Water

Surface water features within and near the site are shown in *Figure 6*.

The SIP is situated in the Collie River catchment, above Wellington reservoir, which encompasses over 2,800km² of land. Surface water from the area generally flows in a south westerly direction towards the Collie River South Branch.

The Western Australian wetland database, Wetland Base, does not indicate the presence of any defined wetlands within the survey area. Stockton Lake, to the south west, is the closest defined wetland and is located approximately 1 km from the SIP boundary. Stockton Lake is an old mine void, which is known for its blue waters due to its low acidity generated from the interaction of surface waters and historical coal mining activities.

There are two minor wetlands situated adjacent to the southern boundary of the SIP as shown in *Figure 6*.

The eastern wetland, adjacent to Premier Road, has had a moderate to high level of disturbance from previous and current land uses. This has been dissected as a result of clearing for roads/access tracks and infrastructure. A small portion of this wetland is situated inside the rail loop.

The western wetland is adjacent to the sand quarry and has generally good vegetation.

The natural hydrology of these wetlands has been altered over the years due to the land uses in the area which have changed the landscape by modifying of the natural drainage network in the catchment, groundwater abstraction, extensive clearing of vegetation, mining and mine dewatering.

There are no identifiable waterways within the proposed SIP site. To the south and west of the site there is a creekline which flows into Stockton Lake.

2.8 Groundwater

The subject land is situated within the Collie Basin, which sits in the centre of the Upper Collie groundwater area. The Collie Basin is made up of the Premier and Cardiff sub-basins. Collie groundwater is valuable and in high demand. The quality of the groundwater is naturally fresh, however due to disturbance from mining activities acidity ranges from pH of 2 to 3 near mines to pH 6 to 7 in other parts. In the basin, water acidity generally increases with depth.

Local groundwater features in the survey area comprise the wetlands in the broad sandy valley floors. Recharge generally occurs via direct infiltration of rainfall and some infiltration from the Collie River south and east branches. The groundwater flow in the survey area is likely to be in a southwest direction, following the drainage lines of the broad valley floors.

Groundwater levels measured during the course of the geotechnical investigation are shown in *Table 4* and the locations of these sites are shown in *Figure 7*.

Testpit No.	Depth to Groundwater (m)	Testpit No.	Depth to Groundwater (m)
TP1	0.1	TP12	0.5
TP2	1.0	TP15	1.6
TP6	0.3	TP17	1.3
TP11	1.3		

Table 4 - Groundwater Depths

Coffey (2008) concluded that the measured groundwater depths is likely to indicate the presence of a perched groundwater table. This is situated above material layers of low permeability, including silts, clays and gravels that were encountered at various depths across the site. The groundwater table is likely to be encountered at depth beneath the superficial strata.

It is noted that local groundwater levels are subject to variation due to the influence of rainfall, temperature, local drainage and the seasons.

2.9 Underground Mining

The eastern portion of the site has been subject to previous underground mining. This is restricted to the general vicinity of the rail loop.

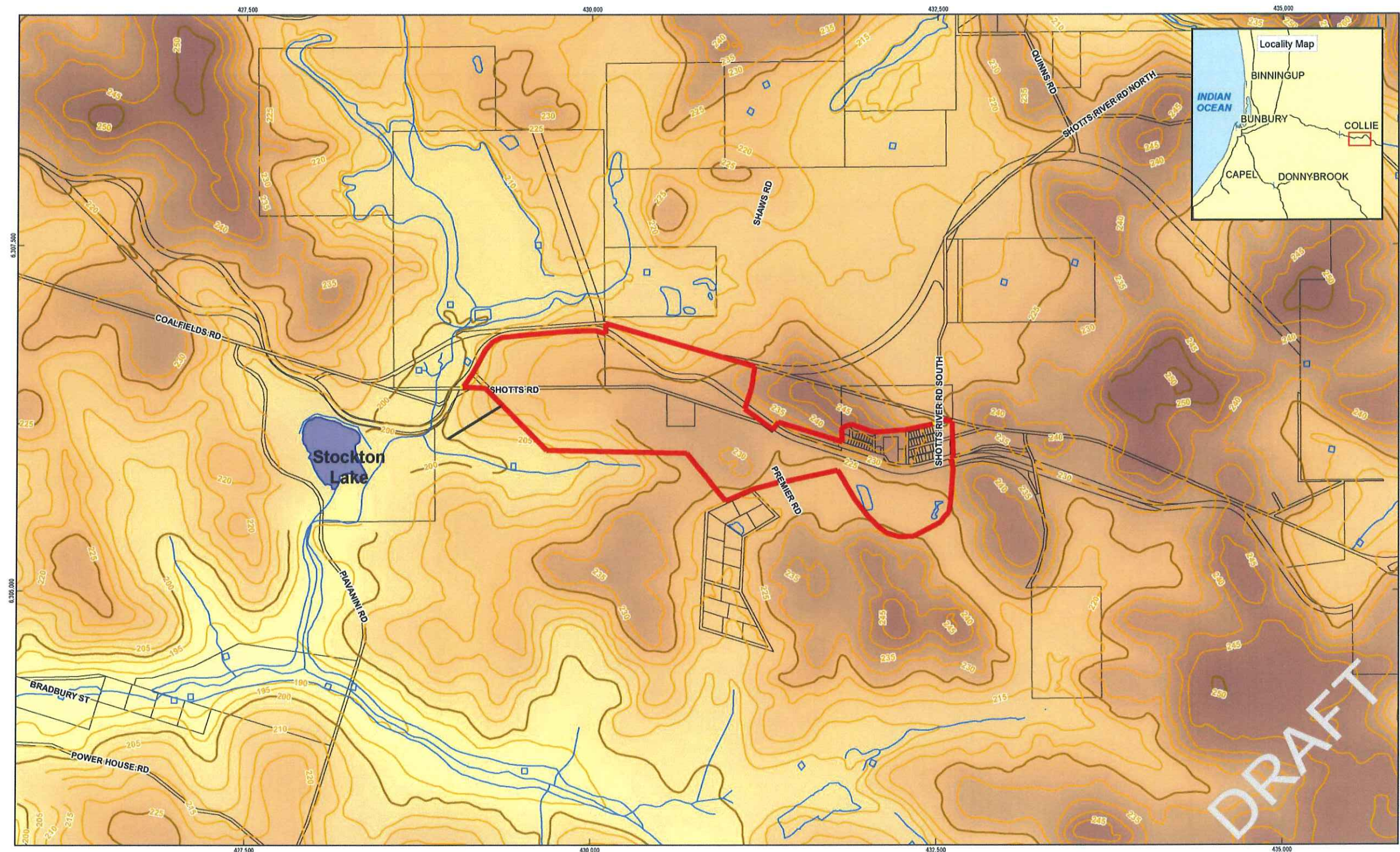
These workings were typically "bord and pillar" construction with bords 3m to 5m wide and up to 2m high.

In conducting the Geotechnical Study Coffey encountered voids at depths of 12 to 15m below ground level (bgl) in the vicinity of the site. It is understood that depths of mine workings may be as shallow as 8m bgl in places.

Coffey noted that previous experience in the area indicates that workings with minimal cover (less than 12m) should be treated with concern.

Liaison with the Premier Colliery has revealed a history of collapses on and around the rail loop in the eastern portion of the site. It is understood that there is an ongoing process at the site of filling collapse voids as they occur at surface in the vicinity of the rail loop. It is advised that the location and date of any infilling should be established to confirm any directional creep or pattern to occurrence of collapses (e.g. following significant rainfall events).

To the west of the subject land the entrance to the Stockton Mine in the vicinity of Shotts Road has also been subject to some subsidence.



1:25,000 (at A3)
0 150 300 450 600 750
Metres
Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 50

LEGEND
iris_network_arc
Proposed Industrial Park Boundary
Cadastral
Linear Hydrography

1:25,000 Contours
Minor Contour (5m Intervals)
Major Contour (25m Intervals)

Digital Terrain Model (DTM)
High : 300
Low : 180

GHD
CLIENTS | PEOPLE | PERFORMANCE

LANDCORP

FIGURE 6
Topography and Drainage

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© 2009 While GHD has taken care to ensure the accuracy of this product, GHD and LANDGATE, HARLEY SURVEY GROUP make no representations or warranties about its accuracy, completeness or suitability for any particular purpose. GHD and LANDGATE, HARLEY SURVEY GROUP cannot accept liability of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred as a result of the product being inaccurate, incomplete or unsuitable in any way and for any reason.
Data Source: Landgate: Cadastral - SLIP 20090320, Harley Survey Group: Proposed Shotts Industrial Park Boundary - 20090812, Landgate: Travellers Atlas - 2004. Created by: xrtan, slee2, ndeeks
GHD House, 239 Adelaide Terrace Perth WA 6004 T 61 8 6222 8222 F 61 8 6222 8555 E permail@ghd.com.au W www.ghd.com.au

Figure 6 - Topography and Drainage

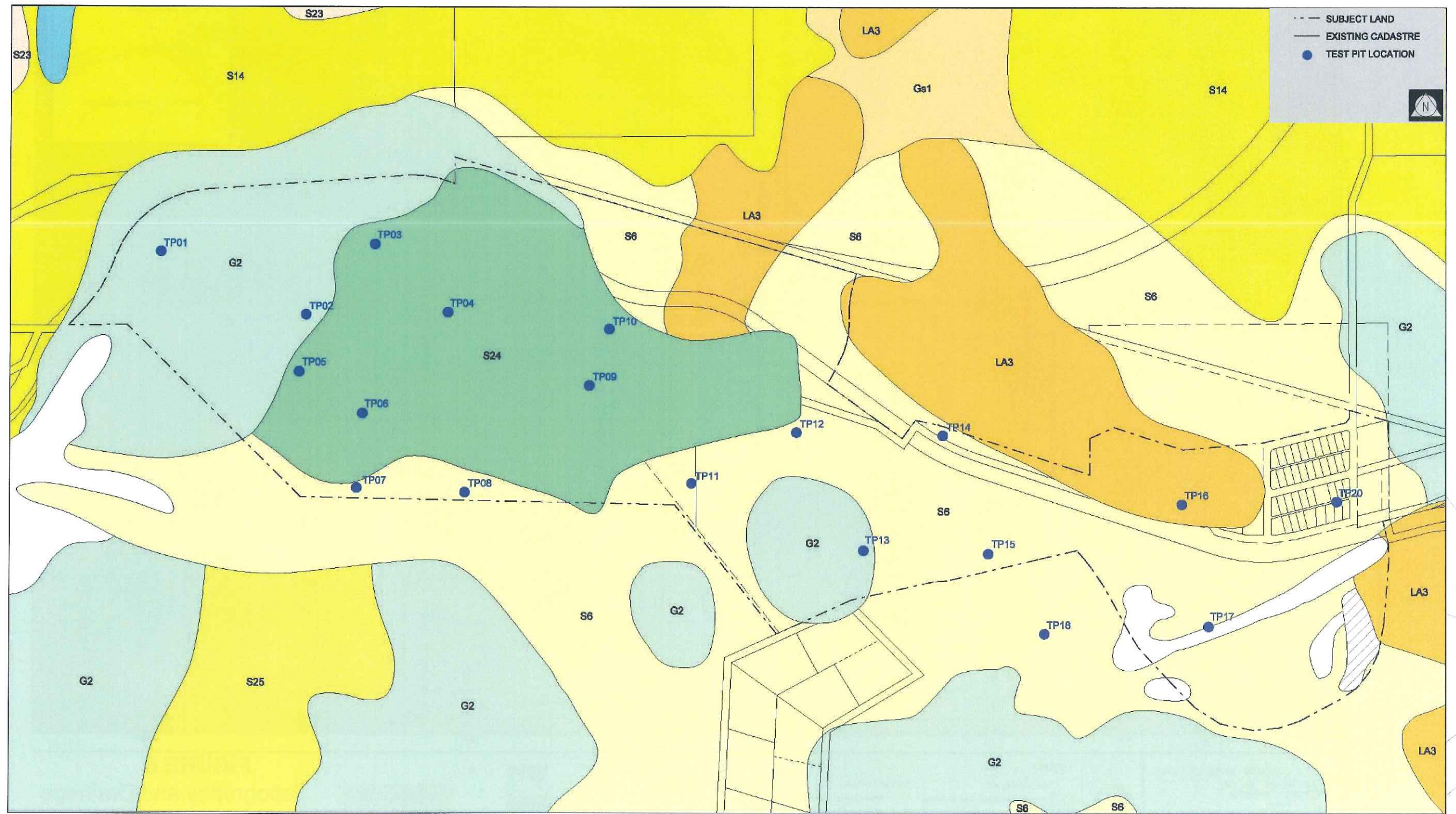


Figure 7 - Geology

2.10 Flora

GHD undertook a field survey of the site in October 2007⁴. The site boundaries for the flora survey extend past the present SIP boundaries and included:-

- A portion of Lot 1 to the north west of the Park; and
- Additional areas along the southern boundary.

The field survey identified a total of five vegetation types comprising predominantly of Jarrah forest, open woodlands, and vegetation associated with the wetlands.

The location of the various vegetation classifications are shown in *Figure 8* and these consist of:-

1 Jarrah Forest / Woodland	1a Jarrah, Marri, Sheoak Open Forest
	1b Jarrah, Banksia, <i>Xylomelum</i> , Sheoak Woodland
2 Mixed Open Woodland	2 Banksia Sheoak Muja Open Woodland
3 Wetlands / Damplands	3a <i>Melaleuca preissiana</i> , <i>Taxandria limearifolia</i> , <i>Kunzea glabrescens</i> Low Woodlands.
	3b <i>Melaleuca preissiana</i> , <i>Kunzea glabrescens</i> Low Woodland

The cleared / degraded areas consist of:-

- Cleared paddock;
- Old sand quarry;
- Old Shotts Townsite;
- Plantation; and
- Infrastructure.

A total of eighty eight introduced and weed species were identified at the site. The dominant weed species are grasses, irises, peas and daisies. Weed species were prevalent around the Shotts Townsite, sand quarry and cleared or disturbed areas.

⁴ GHD (2009) Spring Flora and Fauna and Wetland Assessment.

2.11 Fauna

A fauna survey was completed in conjunction with the flora survey in 2007. A total of 48 species were recorded but this number may have been limited to the timing of the survey.

Two species with conservation significance were observed being:-

- Baudin's Black Cockatoo; and
- Western Brush Wallaby.

Baudin's Cockatoos was observed foraging in the paddock areas and adjacent forest. The site contains areas with suitable feeding habitat and a number of potential habitat trees suitable for refuge and breeding.

The Western Brush Wallaby is not protected under legislation but is listed as a Priority 4 species meaning that it is in need of monitoring. It was sighted at two different locations. However given the historical development and disturbance of the locality and its proximity to the surrounding bushland the species is unlikely to be dependent upon the site.

The Department of Environment and Conservation's (DEC) database indicates that there are a number of priority fauna species which are found within a 5km radius of the site. An assessment of these species and the likelihood of their occurrence was conducted during the flora survey.

Chuditch	This species has been recorded from the survey area in the past, and is considered likely to be present, utilising the survey area as a source for foraging and refuge.	
Forest Red-tailed Black Cockatoo		This species has been recorded from the survey area in the past and is considered likely to use the survey area as a source for foraging and refuge. This species may breed in the survey area.
Quenda (bandicoot)	Likely to be present. Dense scrubby vegetation is present would provide good habitat for Quenda. This species has been recorded from within the vicinity of the survey area in the recent past. No diggings were observed during the fauna survey.	
Numbat	This species was recorded from the survey area in the 1980s. Considering the level of disturbance of habitat and the fact that they have not been recorded since, it is considered unlikely that this species remains within the survey area.	
Dell's Skink	This species has been recorded from the survey area in the past, and is considered likely to be present within the site.	
<i>Pachysaga minggai</i> (cricket)	This species has been recorded from the survey area in the past, and is considered likely to be present within the site. No survey of invertebrate fauna was undertaken.	

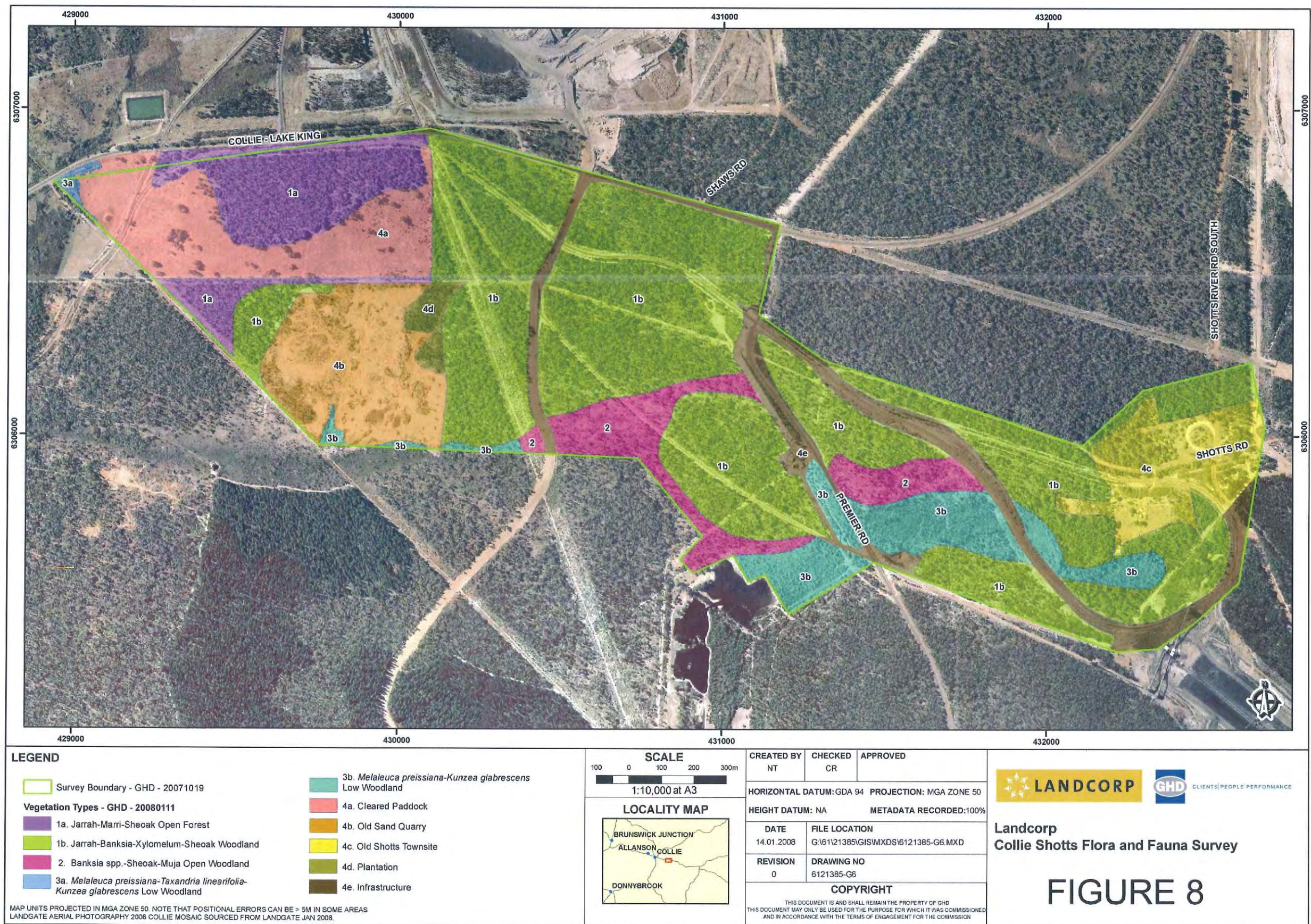


Figure 8 - Vegetation

3.0 POLICY CONTEXT

3.1 Planning Framework

3.1.1 State Planning Framework

State Planning Policy No 1 (SPP No 1) is the State Planning Framework. Variation No 2 was gazetted on the 3rd February 2006.

The State Planning Framework is divided into two parts:

- Part A General Principles for Land Use Planning and Development
- Part B State and Regional Provisions

Part A “General Principles for Land Use Planning and Development” promotes that the primary aim of planning is to provide for the sustainable use and development of land. This will be achieved by the five key principles which influence good decision-making in land use planning and development. These principles relate to:-

- Environment;
- Community;
- Economy;
- Infrastructure; and
- Regional Development.

Part B “State and Regional Provisions” includes State Planning Policies prepared by the Commission as well as regional strategies, regional and sub-regional structure plans, strategic policies and operational policies prepared from time to time and endorsed by the Commission.

The following State Planning Policies may be relevant to the development of the Shotts Industrial Estate:-

- SPP2.0 Environment and Natural Resources (2003);
- SPP2.7 Public Drinking Water Source (2003);
- SPP2.9 Water Resources (2006);
- SPP3.4 Natural Hazards and Disasters (2006); and
- SPP4.1 State Industrial Buffer Policy - Draft (2009).

The only Regional Strategy which applies to the Collie area is the Bunbury-Wellington Region Plan (1995). The only Regional and Sub-regional Structure Plans applicable to the area is the Collie Basin Structure Plan (1995). This is also incorporated into the Bunbury-Wellington Region Plan.

The Greater Bunbury Region Scheme does not apply to the Shire of Collie.

3.1.2 State Planning Strategy

The State Planning Strategy was released in November 1996 by the State Government to provide Western Australia with a strategic guide for land use planning through to the year 2029. The strategy sets out a common vision for the state and its regions, identifies the likely changes and establishes the mechanisms for strategic guidance.

The State Planning Strategy identifies strategies for each region of the State. Collie is located within the South West Region, which under “promoting opportunities for economic growth” the Strategy Actions include “to investigate a site in Collie for a heavy industrial estate”⁵.

3.1.3 Collie Basin Structure Plan

The Collie Basin Structure Plan (CBSP) was approved 1992 and is intended to have a lifespan of 30 years. It contains the primary strategic planning recommendations affecting the development of the Council’s Local Planning Strategy.

The fundamental objective of the CBSP is to protect the important coal resource. The Plan seeks to place restrictions on urban development and expansion which might conflict the protection of the coal resource.

The recommendations of the structure plan also address the following issues:

- Roads;
- Rail;
- Aerodrome;
- Sewer/Wastewater;
- Limit Line of Substantial Urban Development;
- Subsidence Controls;
- The Westralia State Forest Block
- Urban Development;
- Industrial Development;
- Tourism & Recreation Development
- Rural Development; and
- Rehabilitation

The Collie Basin Structure Plan (CBSP) does not specifically recognise the proposed Shotts industrial estate.

3.1.4 Bunbury – Wellington Region Plan

The Bunbury-Wellington Region Plan was released in December 1995 by the Western Australian Planning Commission (WAPC).

It establishes the regional planning framework for the Shire dividing it into planning units (consistent with specific river catchments) and identifying the various issues relevant within each planning unit and the range of land use options and planning guidelines to be applied. These guidelines, as they apply to the Shire of Collie include planning and management of state forest and conservation reserves, landscape protection measures over the river corridors, continuance of raw material extraction, rehabilitation of mined areas and development in accordance with the Collie Basin Structure Plan.

⁵ WAPC (1997) State Planning Strategy Part 2 Page 71

3.1.5 SPP 2.0 Environment and Natural Resources Policy

State Planning Policy No. 2 Environment and Natural Resources Policy sets out the broad environment and resource management policies for ecologically sustainable development.

It notes that careful assessment will be required to resolve conflicts between land use and protection of natural resources, giving consideration to potential impacts on the environment, community lifestyle preferences, and economic values. This requires an understanding of the competing pressures of development and environmental protection, together with the economics of sustainable land use and management practices, advances in technology, and the priorities of the community.

In summary the Policy promotes the following general objectives:-

- (i) Avoid development that may result in unacceptable environmental damage.
- (ii) Actively seek opportunities for improved environmental outcomes.
- (iii) Take account of the availability and condition of natural resources, based on best available information at the time.
- (iv) Protect significant natural, indigenous and cultural features.
- (v) Take into account the potential for economic, environmental and social effects on natural resources.
- (vi) Recognise that certain natural resources are restricted to particular areas and that these geographical areas may need to be identified accordingly and appropriate provision made to protect the areas for the use of those resources.
- (vii) Take account of the potential for on-site and off-site impacts of land use on the environment, natural resources and natural systems.
- (viii) Safeguard and enhance areas of environmental significance on the coast.
- (ix) Ensure use and development on or adjacent to the coast is sustainable.
- (x) Support conservation, protection and management of native remnant vegetation.
- (xi) Consider alternatives to land acquisition for conservation and landscape protection.
- (xii) Take into account the potential for impacts from changes in climate and weather.
- (xiii) Consider any relevant accredited Natural Resource Management Regional Strategy, or catchment management strategies.

It also contains more specific objectives for:-

- Water Resources;
- Air Quality;
- Soil and Land Quality;
- Biodiversity;
- Agricultural Land and Rangelands;
- Minerals, Petroleum and Basic Raw Material Resources;
- Marine Resources and Aquaculture;
- Landscape; and
- Greenhouse Gas Emissions and Energy Efficiency.

In relation to minerals the specific objectives include:-

- (i) Identify and protect important and economic mineral resources to enable mineral exploration and mining in accordance with acceptable environmental standards.
- (iii) Support sequencing of uses where appropriate to maximise options and resultant benefits to community and the environment.
- (v) Support, where possible, improved efficiencies in the production and consumption of mineral and basic raw material resources to ensure their availability for future environmental and human uses.

3.1.6 SPP 2.7 Public Drinking Water Source Policy

A key strategic statement in the State Planning Strategy (1997) is to 'ensure that water resources are conserved and their quality protected'. This is recognised in various criteria for plans and key actions in the Strategy to protect existing and future public drinking water supplies.

The subject land is located within the Public Drinking Water Source Area (PDWSA) of the Wellington Dam. The Department of Water (DoW) has identified the following priority classification for PDWSAs:

Priority 1 (P1) source protection areas are defined and managed to ensure there is no degradation of the water resource in these areas. This is the highest level of protection for the water source and normally will apply to land owned by the State, and that is characterized by low-intensity and low-risk land use, such as forestry.

Priority 2 (P2) source protection areas are defined to ensure that there is no increased risk of pollution to the water source. P2 areas are declared over land where low-risk development already exists.

Priority 3 (P3) source protection areas are defined to manage the risk of pollution of the water source. P3 areas are declared over land where water supply sources need to co-exist with other land uses such as residential, commercial and light industrial developments, although there is some restriction on potentially highly polluting land uses.

The Department of Water has also published a Water Quality Protection Note on Land Use Compatibility in Public Drinking Water Source Areas which shows the compatibility of different land uses within the different priority source protection areas. The guidelines contain a table which lists land uses which are compatible, incompatible, and conditional with or in regard to the management objectives of the priority source protection areas. These land uses are recommended as permitted, not permitted, or discretionary uses respectively within each priority source protection area, and may be incorporated into the provisions of the proposed special control areas. These guidelines should be used in conjunction with any endorsed water source protection plan or land use and water management strategy.

State Planning Policy 2.7 recommends that outside the Perth Metropolitan Region, all priority source protection areas in PDWSA's should be shown as special control areas in region schemes and in local government schemes in accordance with the recommendations of any relevant land use and water management strategy published by the WAPC, or any water source protection plan approved by the Department of Water.

State Planning Policy 2.7 also recommends that land uses and developments in all priority source protection areas that have the potential to impact detrimentally on the quality and quantity of public drinking water supplies should not be permitted unless it can be demonstrated, having regard to advice from the Department of Water, that such impacts can be satisfactorily managed.

3.1.7 SPP 2.9 Water Resources

State Planning Policy No 2.9 Water Resources (2006) requires that planning should contribute to the protection and wise management of water resources through local and regional planning strategies, structure plans, schemes, subdivisions, strata subdivisions and development applications.

Better Urban Water Management (WAPC 2008) provides guidance on implementation of State Planning Policy 2.9. It identifies the requirements for water management strategies and plans that must be developed to accompany the land use planning and approvals process in the SIP district at each stage of the planning process.

3.1.8 SPP 3.4 Natural Hazards and Disasters

State Planning Policy 3.4 Natural Hazards and Disasters is based upon the principles contained in the report Planning Safer Communities prepared by Emergency Management Australia.⁶ It applies the principles of emergency risk management to land use planning.

The main elements of the emergency risk management process are to establish the context, identify risks, analyse risks, evaluate risks (including acceptability of residual risk) and treat risks.

In terms of natural hazards the Policy considers, storms, storm surges, coastal erosion, bush fires, landslides and earthquakes.

The most likely natural hazard to be addressed in relation to the development of the SIP is from bush fire.

However the operations within the SIP can themselves have a hazardous element which might affect the surrounding areas, including the transportation of material to the Bunbury Port. Therefore the general principles of emergency risk management as outlined in AS4360 Risk Management (2004) may have application to the development of the Park.

3.1.9 SPP 4.1 State Industrial Buffer Policy

State Planning Policy 4.1 is the State Industrial Buffer Policy and a revised draft of this was released in June 2009. The objectives of the policy are to:

- avoid conflict between industry and/or essential infrastructure and sensitive land uses;
- protect industry and/or essential infrastructure from encroachment by those land uses that would be sensitive to impacts and adversely impact the efficient operations;
- provide for the development of industry and/or the provision of essential infrastructure in a way that maximises amenity, minimises environmental and health impacts and takes account of risk to nearby sensitive land uses; and
- promote compatible uses in areas affected by off-site impacts of industry and/or essential infrastructure.

⁶ Emergency Management Australia (2002) Planning Safer Communities – Land Use Planning for Natural Hazards Canberra, Emergency Management Australia

The Policy is closely linked to EPA Guidance Statement No 3, “Separation Distances Between Industrial and Sensitive Land Uses” (Environmental Protection Authority, June 2005).

Sensitive land uses are defined as including but not limited to:

- residential development;
- hotels, motels, hostels and caravan parks;
- hospitals and nursing homes;
- schools and other educational establishments;
- childcare facilities;
- shopping centres;
- sporting facilities;
- restaurants;
- tourist facilities;
- cinemas and theatres;
- community and cultural centres;
- churches and other places of worship;
- indoor sporting venues or constructed playing arenas;
- outdoor and bulky goods showrooms and
- some public buildings.

A “compatible land use” is a use that when located in a buffer will tolerate exposure to off-site emissions without impairment to its own operation. Hence the buffer is the area in which sensitive land uses are restricted because of the likely impacts upon it.

The definition of the buffer must take into account a number of factors including, odour, noise, risk, health hazard, light spill, dust, air quality, water quality and cleaner production and resource recovery.

Local planning schemes are the preferred basis for identifying and managing use and development within the buffer.

While there are a number of different planning mechanisms which can be used to manage the buffer the most common method is to introduce land use restrictions as a special control area in the local planning scheme. These are over and above those provisions provided in the underlying zoning of the land and where the area requiring additional controls can be technically justified and clearly identified.

It is noted that the Policy states that proposals which satisfy recommended buffer distances in EPA’s Guidance Statement No 3 are deemed to comply with the objectives of SPP 4.1.

3.1.10 Collie Local Planning Strategy

The Council’s Local Planning Strategy specifically recognises and promotes the intended development of the SIP. Section 5.4.2 states that:

“The South West Development Commission is presently coordinating investigations into the development of an industrial estate centred in the Shotts townsite. The Steering Committee comprises

of representatives from the Shire, Wesfarmers Premier Coal, CALM (now DEC) and Landcorp. The objective is to develop a heavy industrial estate to compliment the Coolangatta Estate. The site comprises approximately 160 hectares adjacent to the Wesfarmer's Premier Coal Limited (WPCL) mine. The Shotts Townsite forms part the area and it is partially owned by WPCL with which other adjoining crown land is being considered as part of a land swap with Department of Environment and Conservation."

The Aim of the Industrial Policy is to:-

"To provide for the economic well being of the community with the provision of appropriate and sufficient industrial land for different classes of industrial activity."

The Actions of the Industrial Policy includes

"That the Shotts Industrial Site be recognised as a Development Investigation Area. The preparation of the Structure Plan and subsequent amendment to the Town Planning Scheme have specific regard to the cumulative effects upon the existing buffer areas."

The SIP is nominated as Development Investigation Area No 2 in Section 5.11 of the Strategy. This states that:

"As a means of implementing orderly planning the Council has identified a number of areas which are considered to be strategically suitable for investigating the potential for further development.

This investigation and its assessment shall primarily be done by the preparation of an Amendment to the Local Planning Scheme. This includes the justification of lots sizes based upon the guiding comments below.

Each area shall require the preparation of a Structure Plan in accordance with the Scheme requirements. Where there are contiguous Development Investigation Areas (DIA), the Council may require the Structure Plan to address the relationship with those adjoining areas."

3.1.11 Collie Local Planning Scheme No 5

The Shire of Collie Local Planning Scheme No 5 applies to the whole of the municipality including the subject land and the surrounding area.

The general aim of the Scheme is to improve the aesthetic appeal of the Collie townships, safeguard its natural resources, (which include mineral, hydrological and ecological), whilst promoting sustainable development through diversified residential, agricultural, tourist and resource based economic activities.

The majority of the SIP is included in the Scheme as a "State Forest Reserve" with the smaller Crown holdings as "Public Purpose Reserves". The freehold land is included in the Rural 2 zone. The current zoning of the site and surrounding area is shown in *Figure 9*.

There is no specific objective in the Scheme relating to "State Forest Reserve". State Forest is classified as a "Local

Reserve" in the Scheme as distinct from a "Regional Reserve." The designation of local reserves is intended to reflect the purpose for which the land is used or developed, or intended to be used or developed, for public purposes.

In this instance the "State Forest Reserve" is intended to recognise that land which will be managed by the Department of Environment and Conservation in accordance with the Forest Management Plan 2004 – 2013.⁷

The Forest Management Plan covers all land categories vested in the Conservation Commission, and freehold land in the name of the Executive Director of the Department of Conservation and Land Management. However, there is a focus on the management of State forest and timber reserves because it is primarily on these land categories that disturbance activities are permitted.

The development of an industrial estate is considered not to be consistent with the purpose of State Forest Reserve.

The objective for the Rural 2 zone is:-

"The use of land in the Rural 2 Zone shall be consistent with the following objectives:

- (a) The zone shall consist of predominantly rural and mining uses;
- (b) To protect land from urban uses that may jeopardise the future use of that land for other planned purposes which are compatible with the zoning; and
- (c) To protect the land from closer development, which would detract from the rural character and amenity of the area."

Table 1 of the Scheme (the 'Zoning Table') nominates that General Industry as a prohibited use within the Rural 2 zone.

In order for the SIP to proceed an amendment to Local Planning Scheme No 5 is required.

Clause 6.3 of the Scheme deals with the preparation, approval and operation of structure plans. It is noted that Clause 6.3.7.4 provides for a structure plan to distinguish between:-

- Provisions, requirements or standards which are intended to have effect as if included in the Scheme, or
- Provisions, requirements, or standards which are only for guidance or such other purposes as stipulated in the Structure Plan.

⁷ Conservation Commission of Western Australia (2005)

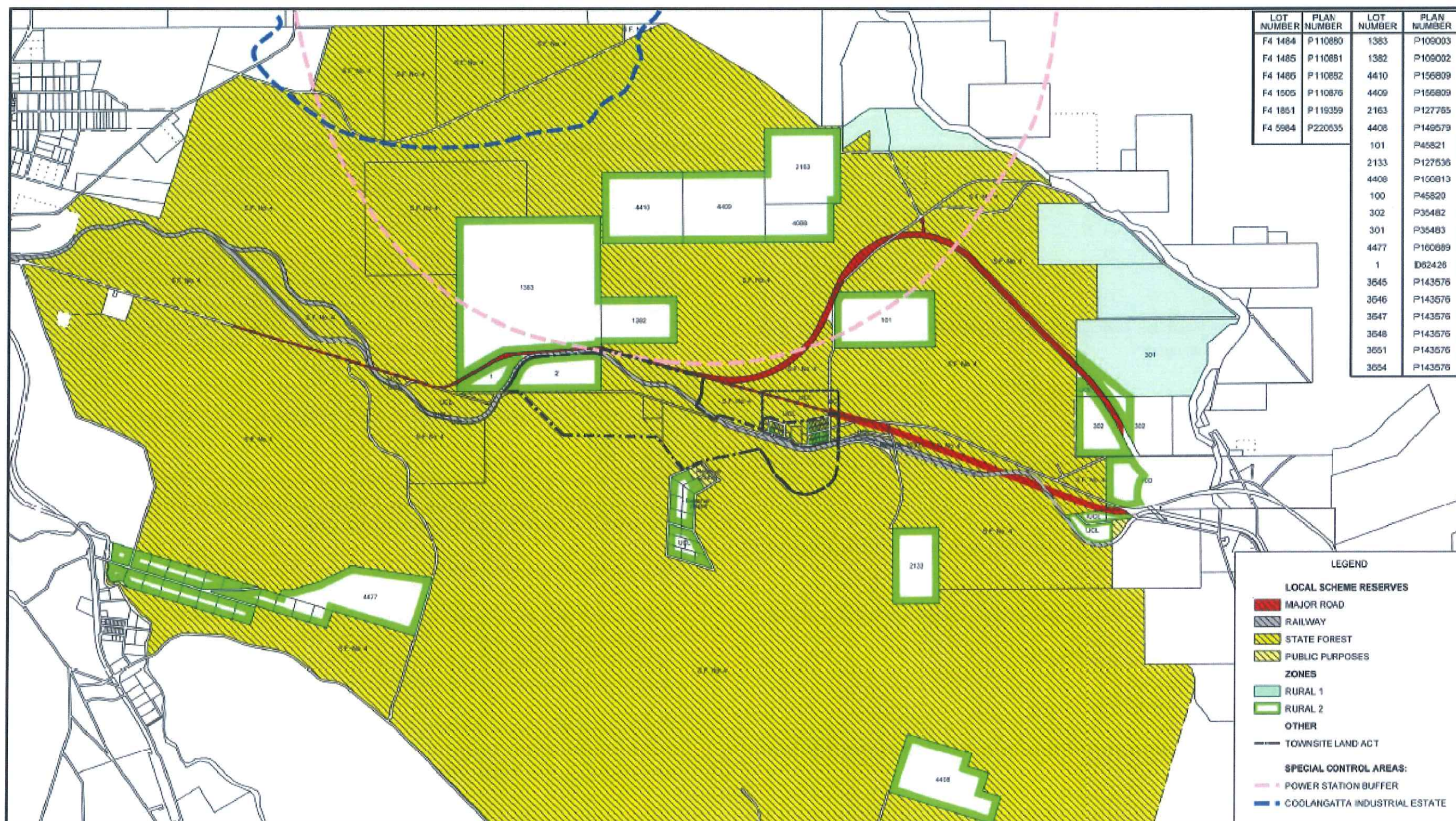


Figure 9 - Zoning Plan

3.2 Environmental Framework

3.2.1 Commonwealth

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) requires the assessment of projects that are likely to have a significant impact on matters of national environmental significance defined under the Act, or on Commonwealth land.

The matters of national environmental significance under the EPBC Act are:

- Listed threatened species and communities
- Migratory species protected under international agreements
- Ramsar wetlands of international importance
- The Commonwealth marine environment
- World Heritage properties
- National Heritage places
- Nuclear actions

To date the Department of the Environment, Water, Heritage and the Arts (DEWHA) has been predominantly concerned with proposals which may impact upon:

- Baudin's Black-Cockatoo,
- Carnaby's Black-Cockatoo, and
- Western Ringtail Possum

The EPBC Act assessment is a separate process to any State assessment and any referrals are done by the proponent.

3.2.2 State

The management of environmental control principally rests with the Environmental Protection Authority (EPA) and the Department of Environment and Conservation (DEC).

The EPA has three main methods by which it can assess proposals which are likely, if implemented, to have a significant effect on the environment. These are:

- As part of an amendment to the Council's town planning scheme;
- As a referral by the third party or the proponent; or
- As the proposal is a premises which requires a licence

Proposals with the potential to significantly impact on the environment may be formally assessed under Part IV of the Environmental Protection Act (1986).

Licensing of industries with the potential for significant environmental impact has been a traditional tool for ensuring that emissions are controlled within acceptable limits. In Western Australia, the licensing powers are derived from the Environmental Protection Act, 1986 (as amended) and associated regulations. The Act provides the head powers to require premises to be licensed, while the licence fees and the list of industries which are required to hold a licence are detailed in the Environmental Protection Regulations, 1987 (as amended).

The EPA also has powers to affect the planning approval process through Section 48A of the Environmental Protection Act and Section 81 of the Planning and Development Act 2005. These require the referral of all Local Planning Schemes and Amendments to the EPA for assessment.

3.2.3 Vegetation

There are overlapping responsibilities relating to the protection of remnant vegetation on the subject land. These may result in the need to retain areas of remnant vegetation on the site.

The general control of the clearing of vegetation is contained in Part V Division 2 of the Environmental Protection Act 1986 and its associated Regulations. This Act is administered by the Department of Conservation and Environment. There are exemptions to these provisions where land is located in a gazetted catchment under the Country Areas Water Supply (CAWS) Act 1947.

The subject land is within the proclaimed catchment for the Wellington Dam, and is subject to the provisions of the Country Areas Water Supply (Clearing Licence) Regulations 1981. These require a permit from the Department of Water for any clearance of native vegetation. The subject land is situated in Zone D under the catchment policy. Consequently the DoW will require that 10% of the site be retained as natural vegetation in accordance with the provisions of its document "Policy Guidelines for the Granting of Licences to Clear Indigenous Vegetation in Catchments Subject to Clearing Control Legislation 1996".

The Conservation and Land Management Act also protects any declared or rare flora and fauna on the site.

3.2.4 Water Management

The State Water Plan 2007 has established a vision for water resource management in Western Australia. Its objectives include to plan and manage water resources in a sustainable manner. It encourages industrial areas, both new and old, to adopt water sensitive design principles.

Water resource management integrates land use planning and natural resource management processes.

Regional water plans are developed by the DoW and are strategic in nature with a long-term planning horizon that aligns with the State Water Plan. They assess the current state of water resource management and service delivery in the region, identify current and forecast future water availability and demand and set priority actions to support water policy and planning implementation.

Drinking water source protection plans are developed by the Department of Water to protect water catchments and groundwater aquifers to minimise the risk of drinking-water contamination. They recommend protection strategies, such as the establishment of reservoir protection zones.

The DoW manages Western Australia's water resources by issuing licenses to take water.

Under the Rights in Water and Irrigation Act 1914, areas need to be proclaimed before the Department can issue licenses. Surface and groundwater management areas are boundaries established by the DoW so that it can proclaim the area and manage resources through issuing licenses. The Upper Collie surface and groundwater area covers two proclaimed areas - the Collie groundwater area and part of the Collie irrigation district (DoW, 2007).

The Upper Collie surface water area is also a proclaimed public drinking water source catchment under the CAWS Act.

This proclamation relates to the protection of public drinking water source areas to ensure the availability of good quality drinking water (DoW, 2007).

The Department of Water has advised that Wellington Reservoir is now targeted as “fit for purpose” and not “potable” water, and therefore a P1 classification will not be applied. As a result DoW will consider development proposals and rezoning under other more appropriate water quality and quantity protection measures, e.g. Allocation Plans and District/Local Water Management Strategies.

DoW will not apply the ‘priority area’ measures (i.e. P1, P2 or P3) to Land Use Planning proposals in the catchment area of the Wellington Reservoir (excluding the catchment to the Harris Dam) as this is more appropriate to drinking water protection. The assessment of proposals in this catchment should occur under the more general provisions of the Western Australian Planning Commissions’ SPP 2.9 (for Water resources) which provides the flexibility to achieve the stated objectives of Government.

3.2.5 Upper Collie Catchment Plan

The DoW has developed a water allocation plan for all the water resources (surface and groundwater) within the Upper Collie Catchment. The Upper Collie Water Allocations Plan (DoW, 2009) outlines the strategy for the allocation of water, and details how the Department of Water will manage water resources in the region to meet demand and also protect the natural environment.

The plan contains allocation limits that define how much water can be abstracted from the water resources each year. It includes policies for how we will allocate and manage water resources and informs how we will monitor, measure and evaluate the objectives of the plan.

3.2.6 EPA Guidance Statement No 3

The EPA’s Guidance Statement No. 3 (2005) Separation Distances between Industrial and Sensitive Land Uses addresses generic separation distances between industrial and sensitive land uses to avoid conflicts between these land uses.

A number of emissions are generated by industrial, commercial and rural activities and infrastructure. These include noise and air emissions (gases, dust and odours). The levels of emissions may at times exceed amenity levels considered acceptable in residential areas and at other sensitive land uses. Land uses considered to be potentially sensitive to emissions from industry and infrastructure include residential developments (including subdivision), hospitals, hotels, motels, hostels, caravan parks, schools, nursing homes, child care facilities, shopping centres, playgrounds, and some public buildings.

The EPA Guidance Statement provides generic separation distances based on the consideration of typical emissions that may affect the amenity of nearby sensitive land uses. These include:

- gaseous and particulate emissions;
- noise;
- dust;
- odour; and
- risk.

The generic buffer distances do not take into account:

- cumulative impacts;
- non-typical emissions;
- the protection of natural resources and significant elements of the natural environment; and
- potential health impacts from emissions.

As part of comprehensive environmental impact management, the EPA expects that these will also be considered and managed as appropriate.

Examples of buffers for various industry types are shown in *Table 5*.

Industry	Gas	Noise	Dust	Odour	Risk	Generic Buffer Distance(m)
Charcoal Production	✓	✓	✓		✓	1,000
Chemical Fertilisers	✓	✓	✓	✓	✓	1,000 – 2,000 *
Chemical Manufacture	✓	✓	✓	✓	✓	300 – 1,000
Coal Mine		✓	✓			1,000 – 2,000
Electric Power Generation	✓	✓	✓			3,000 – 5,000
Heavy Industry Site	✓	✓	✓	✓	✓	Case by case
Industrial Gases	✓	✓		✓	✓	500 – 1,000 *
* Depends upon size of the industry Source – EPA Guidance Statement No 3 Appendix 1.						

Table 5 - Generic Buffer Distances

4.0 SITE ISSUES

4.1 Strategic Justification

There are many factors which influence the potential location of industries or an industrial estate. Given the nature of the Collie Coal Basin it is to be expected that it would attract resource based and associated industries. The DoP's draft Southwest Framework⁸ identifies Collie as:-

"Collie will develop as an employment centre focusing on development of renewable energy, clean coal technology and as a preferred location for high-energy use industries. Distributor of renewable energy to Perth, major regional centres and the South-West."

Resource industries are often orientated towards export markets and are likely to locate their primary processing facility close to the source of the product so as to reduce transportation costs and to avoid double handling.

With liberalisation of international trade and the reduction of trade barriers, regional economies are becoming more permeable and more strongly linked to other national and international regions. Such linkages obviously focus upon transport hubs and corridors, such as ports and rail networks.

The use of rail is preferable to roads and is promoted as an efficient and sustainable form of transport especially for bulky goods. In this scenario the linkage of the Collie Coal Basin to the Bunbury Port by rail offers significant locational advantages. The other likely factors influencing location are transfer costs, energy costs, labour availability, capital costs, government policies, water availability and disposal and benefits from agglomerations.⁹

Within the Collie Coal Basin the Shotts locality is strategically positioned between the three major power stations and associated coal mines. This allows it to take advantage of existing infrastructure and supply connections including road, rail, water, power and coal. This relationship is shown conceptually in *Figure 10*.

The development of the SIP will also strengthen the interdependences with associated industries providing additional benefit to the Coal Basin as a whole and promoting its function as a sub regional industrial estate.

4.2 Underground Mine Workings

The far eastern portion of the SIP is understood to have been subject to subsurface coal workings and the known extent of these is shown in *Figure 17*. Coffey observed a number of collapses and evidence of subsidence at the eastern portion of the SIP on and around the rail loop during its site investigation.

Coffey Geotechnical recommends that an assessment of the issues associated with existing underground infrastructure should be made, and efforts should be made to identify any further workings which may not have been noted in the documents supplied for this study.

⁸ DoP (2008) South West Framework (Draft)

⁹ DoP (2005) Warren Blackwood Industrial Sites Study

The geotechnical report states (page 14) that:-

"It is advised that structures proposed in areas affected by underground mining are likely to require substantial ground improvement works and/or piled foundations to avoid excessive settlement and distortion. It may be more prudent to site all structures outside of areas suspected or known to be affected by mining. Coffey does not have sufficient information to assess deep foundations at this stage."

It is understood that there is an ongoing process at the site of filling collapse voids as they occur at surface in the vicinity of the rail loop. Coffey advises that the location and date of any infilling should be documented to confirm any directional creep or pattern to occurrence of collapses (e.g. following significant rainfall events).

4.3 Water Management

4.3.1 General

There is potential for the development of the SIP to alter surface water flows in the local environment and reduce downstream surface and ground water quality.

Impacts to surface water from the proposed industrial land use include:

- Reduced water quality in the Wellington Dam catchment;
- Increased sediment or nutrient loads entering drainage lines and ultimately the Collie River;
- Alterations to surface hydrology;
- Increased pollution and possible contamination of surface water;
- Alteration to the hydrological regime, including interruption and alteration of surface water and groundwater quality and flow; and
- An increase in salinity as a result of vegetation clearing and a rise in the groundwater table.

A Local Water Management Strategy (LWMS) has been developed for the SIP in accordance with the Better Urban Water Management guidelines (WAPC, 2008). The LWMS outlines the strategies, design criteria, objectives and guiding principles for water management, including:-

- Water use and conservation;
- Stormwater management;
- Groundwater management;
- Wastewater management; and
- Implementation.

The LWMS demonstrates that water quality and drainage at the SIP can be adequately managed.

Each proponent of the SIP will be responsible for the preparation and implementation of an Urban Water Management Plan (UWMP) on their allotment, which will be subject to approval by the DoW.

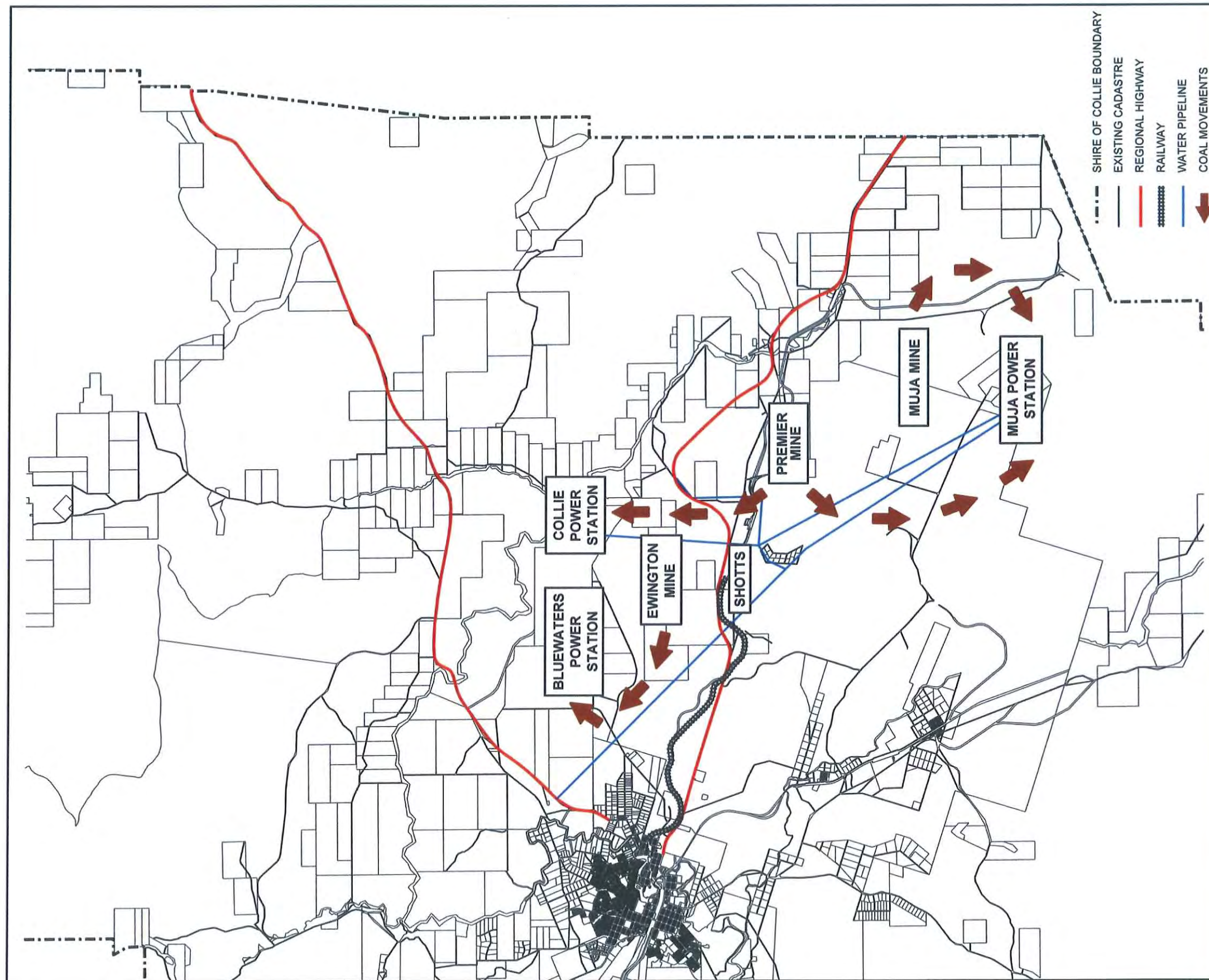


Figure 10 - Context Plan

4.3.2 Water Supply

There is no scheme water supply currently planned for the SIP and proponents must consider their potable water needs in addition to their non-potable needs when determining appropriate water sources and treatment options. The potential water supply sources for development are from surface water, ground water, and mine dewatering.

Allocations of water are managed through the Upper Collie Water Management Plan.

Surface water from the upper Collie River catchment drains to Wellington Dam which has a capacity of 186 GL. Due to climate change and declining rainfall, annual inflows into Wellington Dam have decreased from an average of 135 GL in 1975-1996 to 74 GL in 2001-2006. This compares to total license allocations of 85 GL/A.

If the inflows to Wellington Dam are maintained at 74 GL/A, or decline further due to the impacts of climate change, and the 85 GL/A allocations are fully consumed, then the current allocations are unsustainable. Therefore, to meet the demands of industrial development, the existing licences would require reallocation.

Within the Collie groundwater area there are eighteen abstraction licences. This includes abstraction for mine dewatering of the nearby Premier and Muja coal mines. As at November 2007, the groundwater resources of the Premier subarea are considered to be over-allocated, hence no water is available.

A large volume of water will continue to be abstracted during coal mining activities in the Collie Coal Basin. Of the 22 to 37 GL/a predicted to be produced by mine dewatering in 2010 (DoW 2007d), 20 GL is allocated to power stations leaving 2 to 17 GL available for other uses.

The Upper Collie Water Allocation Plan (page 28) states that to optimise the use of existing resources the DoW strongly supports the use of surplus mine dewater by third parties. Although it is recognised that it will be difficult to estimate the volumes of dewater that will be available in the future on an annual basis.

The DoW does not currently have the legal ability to allocate surplus dewater to a third party. Third parties seeking to utilise this water source must enter in to agreements with either Premier or Griffin Coal.

Potential supply options for non-potable uses also include roof runoff, stormwater (runoff from hard surfaces, predominately roads), treated wastewater, discharged cooling water or process water (dependent on the type of industrial development); or brackish Wellington Dam water.

4.3.3 Storm Water

Stormwater quantity and flood protection is to be achieved through the use of on-site detention, local detention basins, and increased opportunities for infiltration. The proposed SIP is not at risk of flooding or inundation.

Indicative detention volumes have been calculated to maintain the pre-development flow rates and volumes. The LWMS has assessed the requirements for detention basins based upon the existing topographical features and providing 230 kL/Ha storage to limit post development to pre-development rates.

The detention basins will need to be provided at various low points around the edge of the development as generally shown in *Figure 11*.

Stormwater quality will be managed through a treatment train process involving gross pollutant traps, rainwater tanks, swales, bioretention swales, and infiltration basins. At the lot scale, potentially contaminated runoff will need to be managed appropriately depending on the volume and properties of the potential contaminant.

It is the responsibility of individual proponents to refine water quality design requirements and provide the appropriate level of treatment for all surface and groundwater discharges from the site.

4.3.4 Ground Water

The groundwater flow system is unconfined near the surface (representing the shallow perched groundwater) and confined within the deep aquifer system. For the majority of the bores the depth of groundwater ranged from 3 m – 15 m relative to the surface.

The occurrence of shallow perched groundwater across the site has been confirmed in the geotechnical investigations (Coffey 2008). This has implications for drainage efficiency and protection of foundations. This will need to be further investigated and managed by proponents.

A 1.5m clearance is required between soakwells and groundwater levels to ensure the stability of foundations and footings (Coffey 2008). Where perched groundwater exists within 2m of the surface, subsurface drainage and/or imported fill may be required to provide the necessary separation.

It is the responsibility of the proponent to ensure that surface and subsurface drainage systems are designed to protect groundwater quality.

4.3.5 Wastewater

There are no plans for any industrial park-wide wastewater infrastructure.

Each proponent is required to manage their own wastewater collection, treatment, and disposal. This may involve a number of sewerage networks to collect industrial and domestic wastewater and a number of custom treatment plants providing treatment to suit the wastes generated.

Where possible, wastewater should be re-used within the development area. Wastewater must be treated to a level which is acceptable for the proposed end use of that water.

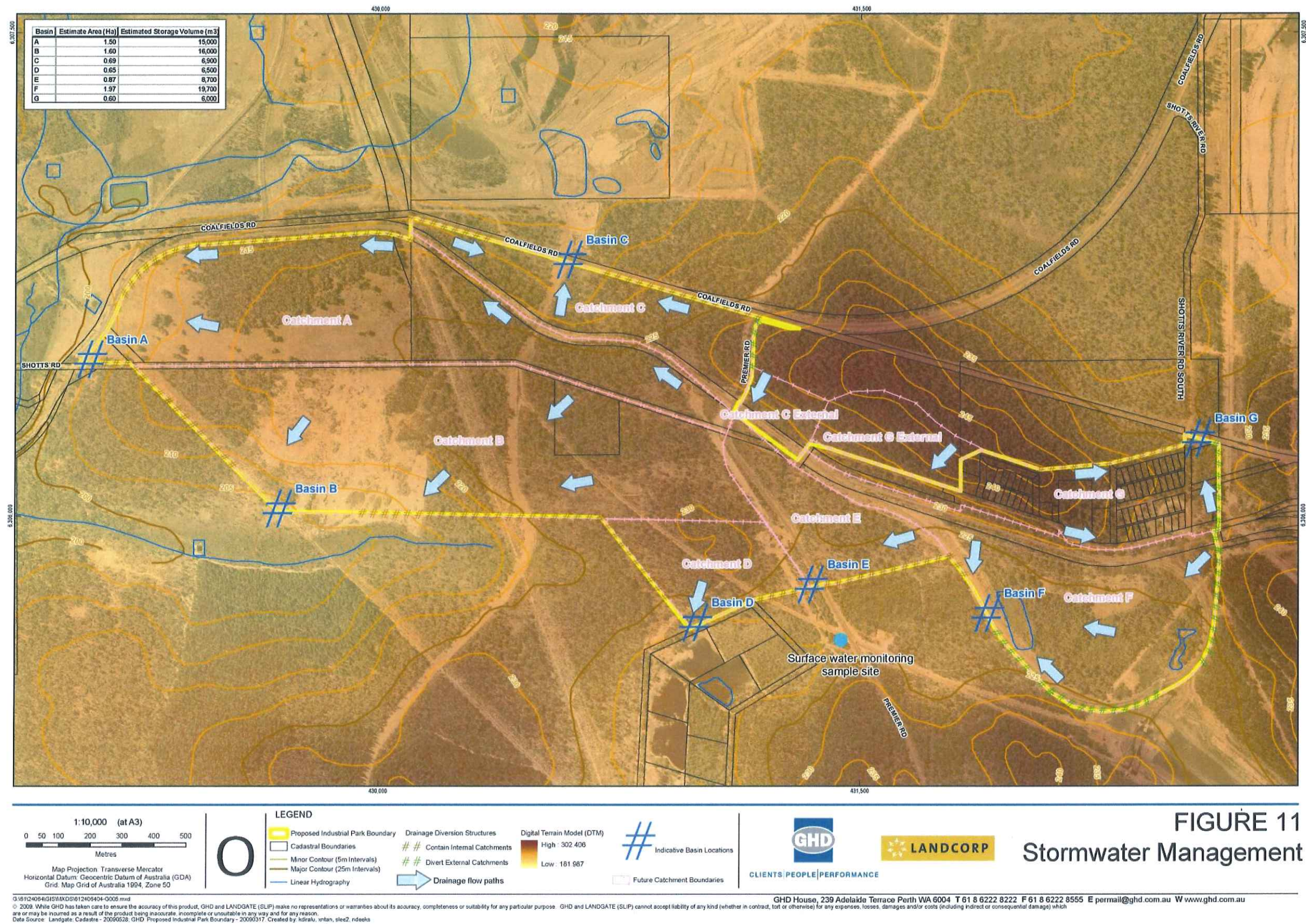


Figure 11 - Drainage Basins

4.3.6 Wetlands

As shown on *Figure 6* several wetlands are in close proximity to the proposed SIP. There is potential for industrial land uses at the site to impact on these wetlands and their associated vegetation.

Possible impacts include:

- Potential clearing of wetland habitat;
- Impacts from clearing and adjoining development such as nutrient enriched stormwater runoff, exotic weed invasion, domestic animal intrusion into wetland areas which prey on wildlife, rubbish dumping and clearing.
- Erosion of sediment and nutrients;
- Increase in pollution and possible contamination;
- Reduction in water quality;
- Introduction or spread of plant pathogens; and
- Alteration to the hydrological regime, including interruption and alteration of surface water and groundwater quality and flow.

These impacts can be reduced by the use of appropriate buffers. In determining an appropriate wetland buffer, it is necessary to consider the potential hydrological impacts of the proposed land use (industrial) as well as impacts to wetland dependent vegetation and fauna.

The Department of Water's Wetland Position Statement (dated 06/06/01) recommends that in the absence of a biophysical assessment that a 200m buffer is required from industrial land uses that have the potential to pollute with hydrocarbons, surfactants, petroleum, heavy metals and nutrients.'

The EPA Guidance Statement 33 suggests that wetlands to be protected require a minimum 50m buffer distance, hence the recommended buffer for the maintenance of wetland dependent vegetation, including Priority flora, and associated fauna habitat, is 50m.

A hydrological assessment of the survey area would be required to determine any buffer requirements for the maintenance of wetland hydrology and water quality.

4.4 Vegetation

The condition of the vegetation on the site is shown in *Figure 12* and is classified in terms of:-

- 1 Pristine or nearly so;
- 2 Excellent;
- 3 Very good;
- 4 Good;
- 5 Degraded; and
- 6 Completely degraded.

There is a total of 121 ha of existing vegetation within the SIP. This includes vegetation within road reserves and railway line corridor. As the SIP has a total area of 235 ha, the existing vegetation represents 51% of the area of the SIP. This vegetation is generally classified as being in a "Very Good" condition.

The initial concept plan for the SIP included an additional 155 ha of surrounding land however the boundary has been refined to minimise potential impacts on areas of relatively intact vegetation, significant fauna habitat and wetlands.

Within the vicinity of study area, there has been a high degree of historical disturbance of vegetation. This has been fragmented by the location of access tracks, roads and existing infrastructure into a series of relatively narrow blocks.

The vegetation within and immediately adjacent to previously cleared areas is more degraded than other areas. These areas are classified as either Degraded or Completely Degraded and contain little to no remaining native flora. These areas include the two paddocks, old sand quarry, Shotts townsite, access tracks, roads, and the infrastructure associated with coal mining. This is due to clearing, weed invasion, introduction/spread of dieback and general public access.

There are no threatened ecological communities or priority communities identified in the field survey. No Declared Rare Flora is present on the site. However two priority flora species were found to be present and the location of these are shown on *Figure 13*.

The priority Four species is *Pultenaea skinneri* (Skinner's Pea). Two large populations of this species were recorded, along the wetland adjacent to the sand quarry and the wetland in the southern portion of the SIP adjacent to Premier Road.

The priority Three species is *Acacia semitrullata* which was found in the sandplains in and adjacent to the wetlands.

The EPA Guidance Statement No 33¹⁰ defines priority three and four flora as:-

Priority Three – taxa with several, poorly known populations, some on conservation lands. Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. These taxa need urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

Priority Four – taxa in need of monitoring. Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.

Six Declared Plant species were recorded on the site being Arum Lily, Blackberry, Bridal Creeper, One-leaf Cape Tulip, Common Prickly Pear and Narrowleaf Cotton Bush.

¹⁰ EPA (2005) Guidance Statement No 33 – Attachment B3-2 p11.

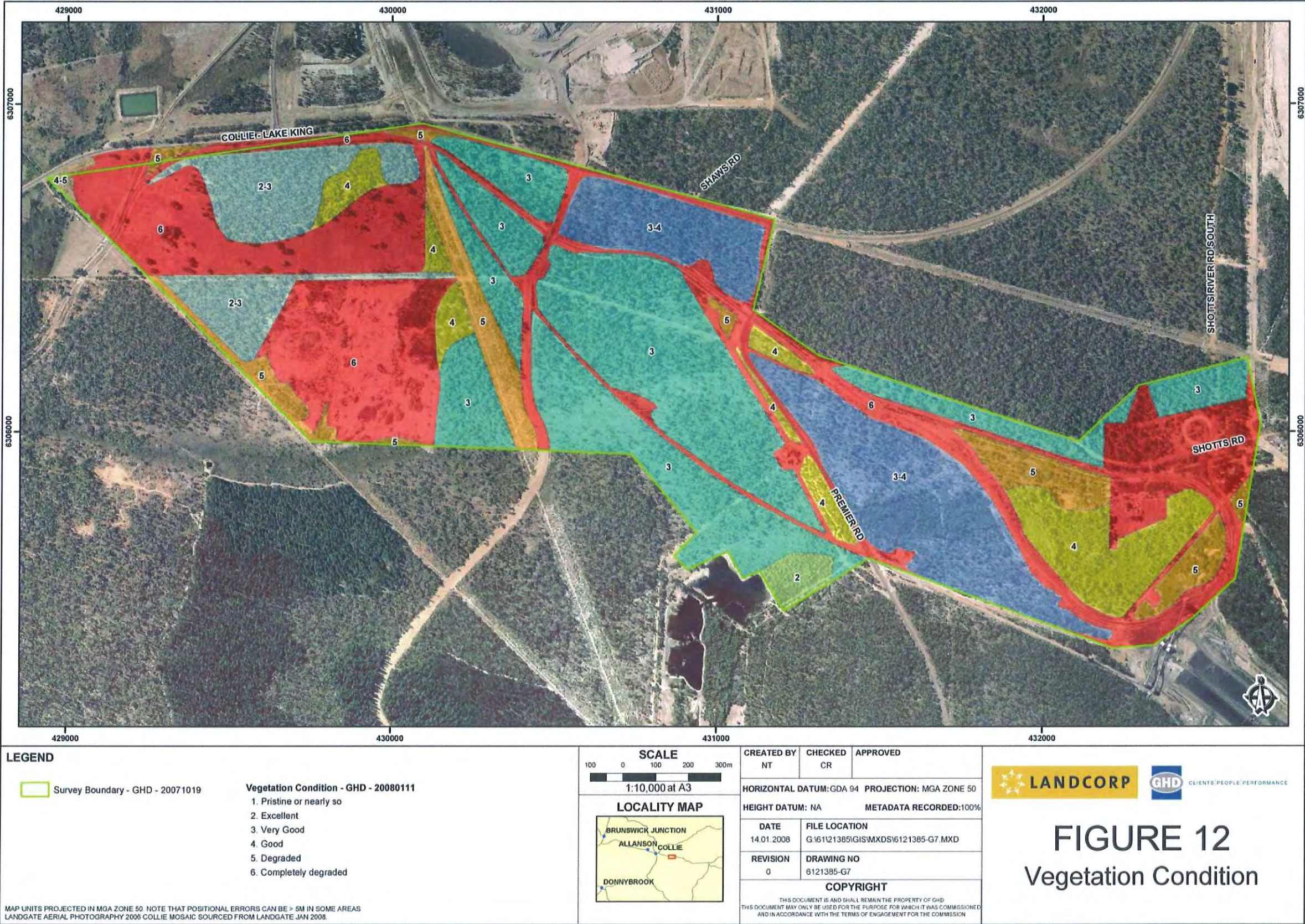


Figure 12 - Vegetation Conditions

The Department of Agriculture and Food (DAFWA) has classification of Declared Plants is as follows.

- P1 Prohibits movement of plants or their seeds within the State. This prohibits the movement of contaminated machinery and produce including livestock and fodder.
- P2 Eradicate infestation to destroy and prevent propagation each year until no plants remain. The infested area must be managed in such a way that prevents the spread of seed or plant parts on or in livestock, fodder, grain, vehicles and/or machinery.
- P3 Control infestation in such a way that prevents the spread of seed or plant parts within and from the property on or in livestock, fodder, grain, vehicles and/or machinery. Treat to destroy and prevent seed set all plants.
- P4 Prevent the spread of infestation from the property on or in livestock, fodder, grain, vehicles and/or machinery. Treat to destroy and prevent seed set on all plants.
- P5 Infestations on public lands must be controlled.

The identified plants are classified as follows:-

- The Arum Lily is classified as P1 and P4 for the whole of the State;
- Blackberry is classified as P4 in Collie;
- The Bridal Creeper is classified as P1 for the whole of the State;
- Common Prickly Pear is not classified in Collie;
- The One-leaf Cape Tulip is classified as P4 in Collie; and
- The Narrowleaf Cotton Bush is classified as P1 and P4 in Collie.

The location of these is shown in *Figure 13* and they are most prevalent around the Shotts Townsite.

The proposed development of the SIP is likely to have direct and/or indirect impacts on flora and vegetation. The possible impacts may include:

- Clearing of vegetation for development. The proposed SIP is 235ha in area and the total area of vegetation within the SIP is 121ha. A minimum of 10% of this vegetation is required to be retained under the CAWS Act. Therefore the maximum area of permissible vegetation clearing is 109ha;
- Potential direct and indirect impacts on populations of conservation significant flora: *Pultenaea skinneri* (P4) and *Acacia semitrullata* (P3);
- The introduction or spread of invasive and declared weed species as a result of clearing and development; and
- The introduction or spread of plant pathogens into adjacent bushland.

The development of the SIP will inherently require the removal of most of the vegetation. To mitigate the impacts of this, Landcorp will:-

1. Each Development Area must retain 10% of the existing remnant vegetation in accordance with the provisions of the CAWS Act.
2. Previously cleared areas and areas not required during ongoing operations (i.e. buffer areas) at the SIP will be rehabilitated. Landcorp will prepare revegetation and landscaping guidelines for the SIP.

3. Management measures to protect the areas of priority vegetation will be prepared.
4. Proponents must manage Declared Plants in accordance with the Agriculture and Related Resources Act 1976.

Additional mitigation measures are also included in the flowing section relating to fauna.

4.5 Fauna

A number of conservation significant species, in particular black cockatoos, Chuditch and Western Brush Wallaby are known to occur in the region.

Much of the existing vegetation within the site area is in very good condition and could be used by a variety of fauna species. The main impacts on fauna which are likely to result from the development of the SIP are associated with the clearing of vegetation and subsequent loss of habitat. The possible impacts may include:

- Loss of shelter and linkages between areas of habitat.
- Increased susceptibility to predation;
- Habitat fragmentation;
- Loss or disturbance of habitat/shelter and/or food sources.
- Fauna loss during clearing activities;
- Vehicle strike resulting in fauna death or injury;
- Restriction of movement of wildlife within the area during vegetation clearing and as a result of industrial development;
- Potential introduction or spread of weeds in adjacent areas, which may alter the habitat used by particular fauna species; and
- A potential increase in introduced species such as cats.

The clearing of vegetation for the SIP is considered to be minor given the history of disturbance to the survey area and its proximity to quality native vegetation in the surrounding area. As the survey area is adjoining native vegetation to the north, south and west, any displaced fauna will be able to move easily to those areas.

The black cockatoo's which might be affected are Carnaby's Cockatoo, Baudin's Black Cockatoo and the Forest Red-tailed Black Cockatoo.

Due to the amount of available habitat in the surrounding State Forest and National Parks, clearing of the proposed SIP is considered unlikely to cause population fragmentation for any of the Black Cockatoo species. However it may cause a minor reduction in the area of occupancy of the species.

Chuditch occurrences are well documented from the Collie. It is possible that clearing of the proposed SIP may cause the fragmentation of any local population and a minor reduction in the area of occupancy of this species. Sightings of the Western Brush Wallaby were recorded the spring survey conducted by GHD in 2007. Given the high degree of historical disturbance to the site, and its immediate proximity to surrounding bushland, this species is unlikely to be dependent on the survey area for its survival.

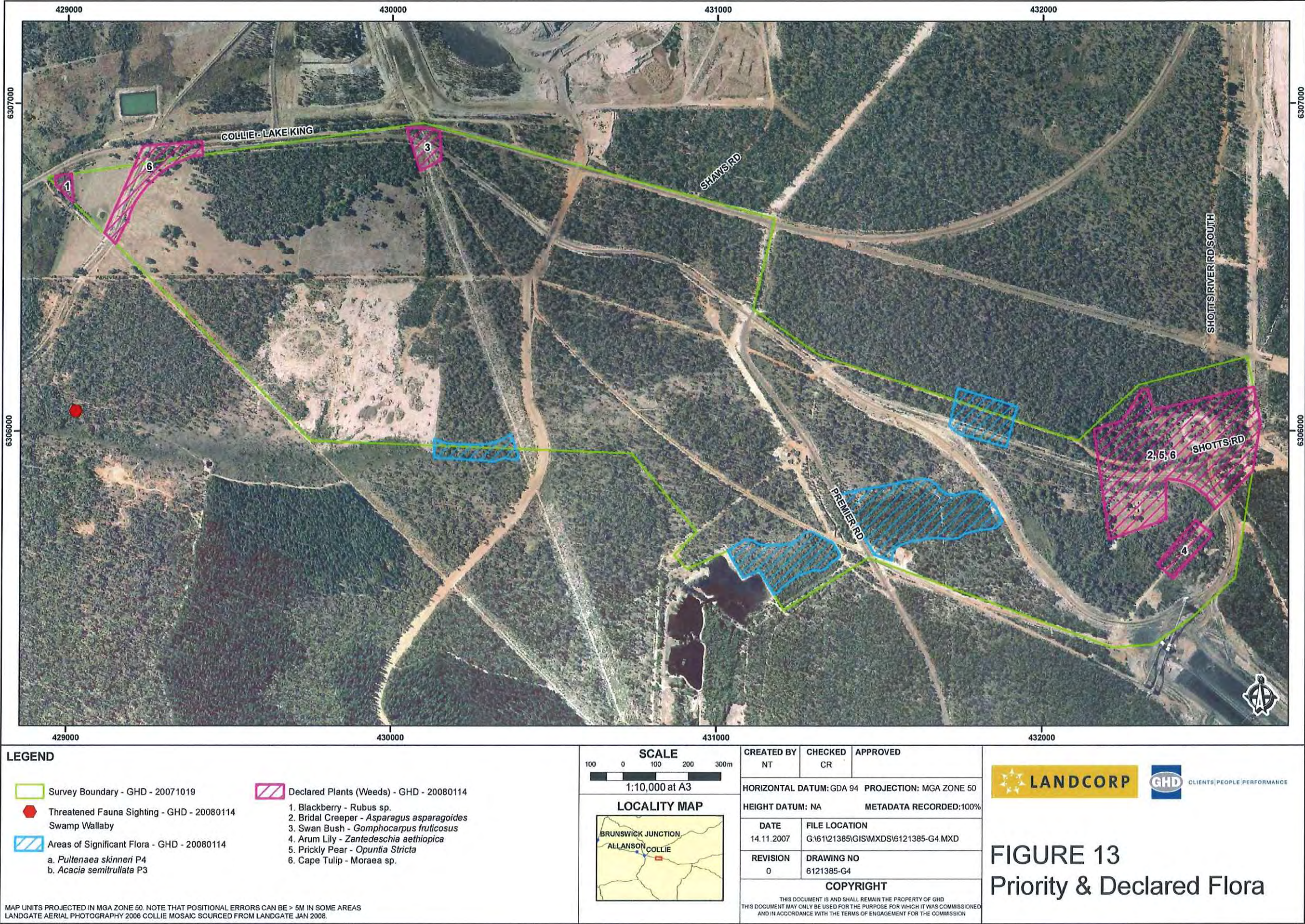


Figure 13 - Priority and Declared Rare Flora Sites

In addition to the vegetation mitigation measures referred to in the previous section the following additional mitigation measures are proposed to minimise impacts of the proposed SIP development on native fauna, in particular, Black Cockatoos and Chuditch:

1. Previously cleared areas and areas not required during ongoing operations (i.e. buffer areas) at the SIP will be rehabilitated. The proposed revegetation within the SIP will aim to provide alternative food sources and potential breeding trees through replanting native prime feed species, such as Banksia, Dryandra (now included in Banksia's), Marri, Jarrah, Hakea species and *Allocasuarina* species that currently occur in the project area;
2. Where possible the clearing of vegetation containing potential cockatoo nesting trees will be avoided. Any large trees containing hollows which are removed will be salvaged and donated to Cockatoo care groups to support captive breeding efforts or used in rehabilitation programs.
3. Habitat features should be salvaged for use in rehabilitation areas. LandCorp is proposing as a condition of lease, ongoing sponsorship of the Western Shield Project by proponents so as to mitigate any impact on the Chuditch.

4.6 Heritage

Brad Goode & Associates have conducted an archaeological and ethnographic survey Aboriginal Heritage of the subject land.¹¹

No previously recorded Aboriginal Heritage sites were identified within the SIP. Three archaeological sites, Site ID 601 Ewington 1, Site ID 602 Ewington 2 and Site ID 18734 Gci (Max's Site) are located nearby and to the north of the site. The presence of these sites indicates some potential for archaeological material to be present within the study area. No archaeological site was located within or in close proximity to the project area in the course of the survey.

At several locations on the eastern side of the project area there was a large amount of European historical remains indicative of the townsite. It was noted that no buildings remain in the area but there are the obvious remains of foundations, assorted discarded materials and a sign indicating the location of the old Shotts school building.

Following consultations with members of the Gnaala Karla Booja WC98/058 Native Title Claim no sites of significance were identified within the study area.

The most likely areas where archaeological sites, in particular, artefact scatters or burials, may occur are banks of creeks, swamps and exposed sandy deposits. The removal or excavation of large quantities of sediment increases the risk of disturbing archaeological sites that may lie beneath the ground surface.

Consequently the key conclusions of the heritage survey include that:-

- 1 As no sites of archaeological or ethnographic significance as defined by Section 5 of the Western Australian Aboriginal Heritage Act (1972) were identified to be located within the project area that Landcorp should proceed with the project as planned.

¹¹ Brad Goode & Associates (2009) An Aboriginal Heritage Survey of the Proposed Shotts Industrial Estate: Western Australia

- 2 Landcorp inform any project personnel of their obligation to report any archaeological material, should this be encountered during earthmoving, as outlined under Section 15 of the Western Australian Aboriginal Heritage Act 1972.

4.7 Traffic and Access

4.7.1 Existing Conditions

There are presently two primary access points to the site being from, Premier Road and Shotts River Road South. A third access is provided from Shotts Road to the west of the SIP.

The Coalfields Highway forms the northern boundary of the SIP and it is single carriageway standard with a speed limit of 110 km/hr. The Coalfields Highway is also a designated Heavy Haulage Route.

Premier Road is a sealed single carriageway road which provides access to Premier Coal operations located to the south of the site. It is not a declared public road. Immediately south of the Coalfields Road, Premier Road crosses the freight rail line which is controlled by flashing lights. The intersection of Coalfields Highway and Premier Road has a left turn lane and localised widening to allow through traffic to pass vehicles turning right into Premier Road.

Shotts River Road South is situated to the east of the subject land and is unsealed except at the intersection with Coalfields Highway. The intersection of Coalfields Highway and Shotts River Road South does not include any turning lanes but there is localised widening to allow through traffic to pass vehicles turning right into Shotts River Road South.

Shotts Road is a gravel road that traverses the site in an east-west alignment. It connects to the Coalfields Highway via Stockton Road some distance to the west of the site. It only provides limited access to the site.

Existing traffic counts in the vicinity of the site are:-

- Coalfields Highway - 1,000 vehicles per day (vpd) in the vicinity of Premier Road.
- Premier Road – no traffic count is available but during a typical day a maximum of 80 employees work on site
- Shotts River Road South – 10 vehicles per day.
- Shotts Road – 10 vehicles per day.

4.7.2 Traffic Generation

Transcore Pty Ltd has undertaken a traffic assessment of the proposed development.¹²

Traffic impacts have been forecasted for both the internal and external roads for the SIP. Trip generation calculation has been undertaken for both construction and operation phases of the proposed land uses.

There are five development areas (DA's) proposed within the site (see Figure 22). Development Area No 4 is the proposed urea plant and Development Area No 5 is the proposed char plant. Development Area No 2 includes the existing Verge Energy pumping station which has minimal traffic generation.

¹² Transcore (2009) Shotts Industrial Park Traffic Assessment Report

The calculations recognise the proposed urea and char plants separately from the possible developments of the other vacant industrial areas. A trip generation rate of 5 vehicles per day per 100m² gross floor area (GFA) has been adopted and it was assumed that the GFA of the development areas would be about 12% of the total land area. Based upon information available for similar general industry areas it is expected that the heavy vehicles will form about 20% of the total traffic of the general industry area.

Table 6 summarises the assumptions, trip rates and trip generation for the general industry area (DA1 to DA3)

During the construction phase of the general industry area (DA1 to DA3), it is assumed that 2 car movements and 1 truck movement would occur per day for every 2 hectares of the general industry area.

Trip generation calculations for the Urea Plant and Char Plant for the construction and operation phases have been based on the information obtained from Perdaman Chemicals Fertilisers and Wesfarmers Premier Coal, which are summarised in *Tables 7 and 8*, respectively.

Zones	Area (ha)	Build Up Area Factor	Daily Trip Rate Per 100m ² GFA	Daily Trip Generation
DA1	17.18	0.12	5	1031
DA2	13.75	0.12	5	825
DA3	12.21	0.12	5	733
Total				2,588

Table 6 - Daily Trip Generation for the Operation Phase of DA 1 - 3

Zones	Work Force	Bus Share	Bus Movements per Day	Car Movements per Day	Truck Movements per Day
DA4 -Urea Plant	1,600	50%	32	1,067	42
DA5 -Char Plant	200	50%	4	133	6
Total	1,800	50%	36	1,200	48

Table 7 - Trip Generation for Construction Phase of DA 4 & 5

It must be noted that the High and Wide Load vehicles are estimated to be about 12 vehicles and 8 vehicles per year for the construction phase of the Char Plant and Urea Plant respectively. However, the movement of these types of vehicles are not considered in the modelling process.

The Char Plant total production is estimated as being 250,000 tons per year. At this stage the split between road and rail transportation of char products is not known, but for the modelling purpose it is assumed that 50% of the char production would be transported by road.

It is expected that about 90% of the trips generated by the general industrial area will travel west towards Collie/Bunbury/Perth and the rest of the trips will travel east towards Albany Highway. It is also assumed that all of the trips generated by the Char Plant and Urea Plant would travel to the west.

Zones	Production (Ton / Year)	B Double Movements Per Day	Employees	Car Movements Per Day	Delivery Truck (Semis and Single Axle) Movements per Day
DA4 - Urea Plant	*	10	150	345	20
DA5 - Char Plant	250,000	21	20	46	8
Total		31	170	391	28

* The majority of the products of the Urea Plant will be transported by train

Table 8 - Trip Generation Calculation for the Operation Phase of DA 4 & 5

According to the modelling output, the highest traffic increase on Coalfields Road would occur to the west of the SIP. The forecast daily traffic count on this section of Coalfields Road is estimated to increase to 3,900vpd for the construction and 2,300vpd for the operation phases respectively.

The forecast daily traffic for the internal roads is expected to be as follows:-

- Shotts Road - 670vpd for the construction phase and 380vpd for the operation;
- Premier Road - 400 to 520vpd for the construction phase and 1,400 to 2,600vpd for the operation; and
- Shotts River Road South – 140vpd for the construction phase and 80vpd for the operation.

The most heavily trafficked intersection in the SIP will be the intersection of Premier Road and Coalfields Highway.

An intersection analysis has been conducted having regard to, degree of saturation; level of service; average delay and queuing. The results of the analysis indicate that this intersection will work satisfactorily and within capacity during the construction and operation phases.

Preliminary assessment of sight lines/distances in accordance with Austroads document "Guide to Traffic Engineering Practice – Part 5 – Intersections at Grade" was undertaken for the existing two intersections of Shotts River Road South and Premier Road with Coalfields Road.

The Safe Intersection Sight Distance (SSID) for the posted speed limit of 110 km/h of between 240m to 329m is achieved for Coalfields Road in both directions at the intersection of Shotts River Road South. For the intersection of Premier Road, SISD is achieved on Coalfields Highway in the eastbound direction, but in the westbound direction to achieve the SISD some vegetation would need to be cleared and maintained to the east from approximately 150m to 250m from the intersection on the northern side of Coalfields Highway.

All intersections would need to have the same layout for the appropriate design speed. This layout entails a left turn pocket in the westbound direction and widening in the eastbound direction to allow through traffic to pass a right turning vehicle.

Shotts, Premier and Shotts River Roads may need to be gazetted for Heavy Haulage, extra mass vehicles.

4.7.3 Proposed Realignment of Shotts Road

To provide for additional access to the western part of the SIP and in particular to the proposed urea plant, it is proposed to realign Shotts Road as its present intersection with Coalfields Highway is not suitable. The intersection will be relocated further east bisecting Lot 1 on the western side of the rail line.

The following sketch (*Figure 14*) shows a preliminary layout of the proposed intersection which is currently being discussed with Main Roads and the land owner.

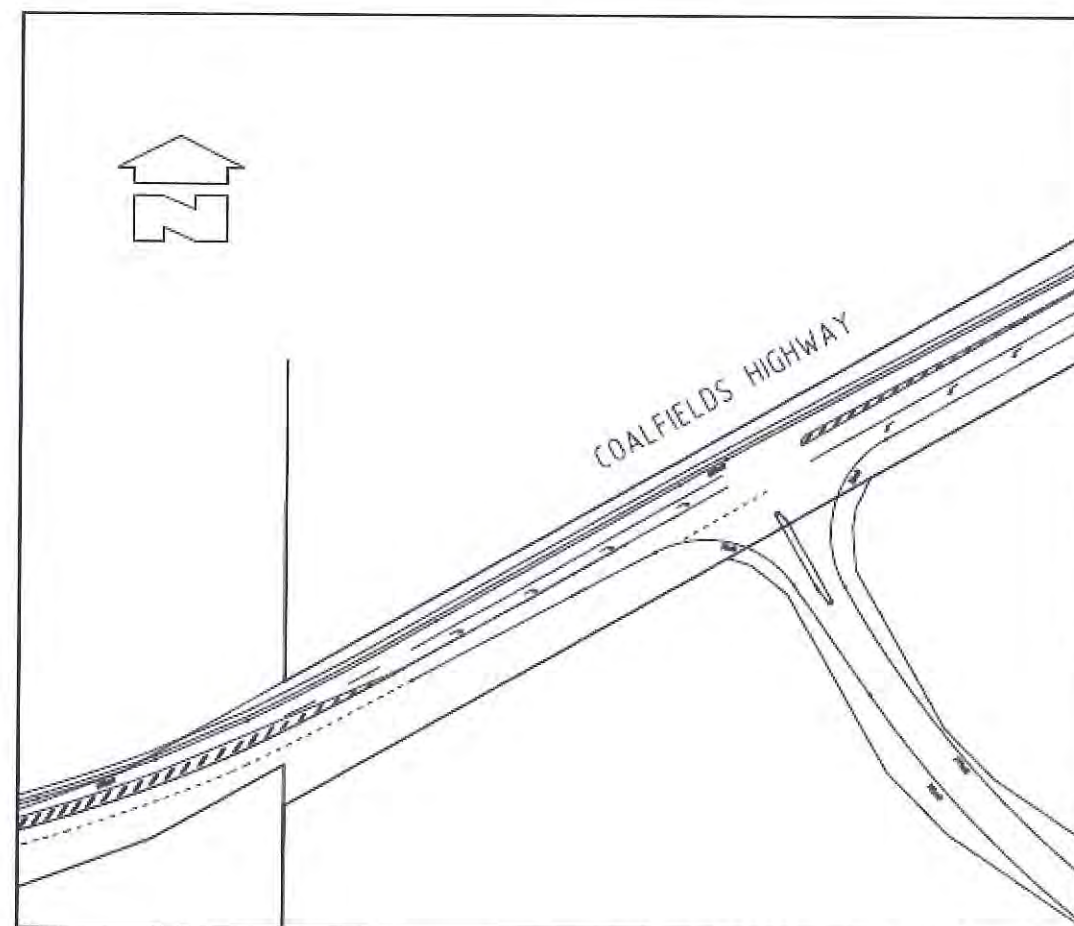


Figure 14 - Shotts Road Re-alignment

4.8 Soil Contamination

A search of the Department of Environment and Conservation's Contaminated Sites Database found no registered contaminated sites within the Site or surrounding area.

A Preliminary Site Investigation¹³ identified significant dumping of waste materials within the proposed SIP area. These areas are focused within the 'rail loop' at the eastern end of the site.

¹³ GHD (2009) Report for Collie Shotts Industrial Park Preliminary Site Investigation

One area was identified as an area of landfill within a former depression where earthmoving, in the form of pushing in wastes and covering over with soil, appears to have occurred. Other areas within the Site appear to have historically been used for illegal dumping with interspersed areas of waste material dumped on the ground surface. Materials included oily rags, oil filters, tyres, vehicle bodies, drums, household waste, corrugated iron sleepers, fridges, washing machines and fibrous cement sheeting (possibly asbestos).

This area is presently part of the State Forest reserve and is under the management of the Department of Environment and Conservation. LandCorp is consulting with DEC to ensure that any required investigations or remediation which may be required is undertaken in accordance with the Department's Contaminated Sites Management Series Guidelines prior to ground disturbing activities being undertaken.

4.9 Acid Sulphate Soils

There is potential for acid sulphate soils to be present at the SIP, particularly in the vicinity of wetlands. Inappropriate disturbance or management of these soils has the potential to generate sulphuric acid and leaching of contaminants naturally occurring in soils.

Proponents will be responsible for conducting soil investigations to assess the acid generating potential.

However this potential should be minimised as:

- The main wetlands are located outside of the SIP; and
- There is a prescribed 50m development setback from the wetlands.

4.10 Dieback

A preliminary assessment for *Phytophthora cinnamomi* (dieback) was undertaken for the proposed SIP in November 2007.¹⁴ The purpose of the assessment was to determine the degree of Dieback risk to native vegetation within and immediately adjacent to the proposed development area.

Preliminary site observations indicate that dieback is present and adjacent to numerous tracks where typical susceptible plant deaths were identified. It is noted that the given the high level of disturbance and unrestricted access in the area that dieback has been present for a long time.

Any uninfested vegetation within or bounding the study area is likely to be at risk of dieback infestation, if not already infested. This includes the forested land bounding the northwest, southeast and southwest parts that contain susceptible species.

Soil moving activities such as those associated with vegetation clearing and construction operations have a high risk of introducing and spreading dieback that increases in wet soil conditions. It is also likely that the development of the site will involve significant earthworks.

The risk of further spreading *Phytophthora* dieback during the proposed construction activities can be minimised by specific management measures.

¹⁴ GHD (2008) Collie Shotts Industrial Area *Phytophthora cinnamomi* (Dieback) Assessment

4.11 Emergency Management

4.11.1 Emergency Management Plans

State emergency management plans in Western Australia are known as Westplans and are prepared by organisations to provide strategic, state-level arrangements for managing particular hazards for which they are responsible.

These plans exist for a variety of hazards including bushfire, flood, hazardous material, structural collapse, road transport, rail freight etc. In the majority of cases the Fire and Emergency Services Authority (FESA) is the designated Hazard Management Agency.

Wherever hazardous materials are manufactured, used, stored or transported, there is a risk of a hazardous materials emergency. While there are many systems in place to prevent hazardous materials emergencies, an appropriate emergency response plan is required to ensure a rapid and effective response.

Under the Westplan – HAZMAT¹⁵, the role of industry owners and operators is to assist the Hazard Management Agency with dealing with the hazardous materials emergency, and to establish and maintain a capability for coping with hazardous materials emergencies occurring within their facilities.

In addition to this the Collie Local Emergency Management Committee (LEMC) has prepared a Local Emergency Management Plan. The aim of this plan is to detail prevention response and recovery arrangements to cope with the effects of a disaster/emergency in the Shire of Collie.

The Local Emergency Management Plan identifies the main hazards within the Shire and documents the responsibilities of key participating organisations including Griffin and Wesfarmers Premier Coal; Verve Energy; and Worsley Alumina. These organisations are also members of the LEMC.

All proponents within the SIP will have to make suitable arrangements for hazard management and any major proponent should consider joining the Local Emergency Management Committee

4.11.2 Major Hazard Facilities

The Dangerous Goods Safety (Major Hazard Facilities) Regulations 2007 (MHF Regulations) apply to those sites (including mines) where the type and quantity of dangerous goods have the potential to cause serious damage. The MHF Regulations are separate from the storage and handling regulations because they invoke particular requirements for safety management to deal with major incidents.

The status of a site as a major hazard facility is based on the critical quantity of dangerous goods and likelihood of a major incident. Major incident means an incident that causes serious harm to people, property or the environment, such as an emission of a defined substance, a fire, an explosion, or a release of energy.

¹⁵ State Emergency Management Committee (2005) HAZMAT – Western Australian Hazardous Materials Emergency Management Plan. FESA Perth

The relevant subsidences are defined in Schedule 1 of the Regulations and include a range of chemicals such as ammonia, explosives, compressed gases, flammable materials etc.

The MHF Regulations contain formal notification mechanisms to identify all facilities that have the potential to be declared to be a major hazard facility. A site that is classified as a major hazard facility must have submitted and obtained approval of a safety report before operations can commence.

The safety report (risk assessment) must address:

- Identifies all hazards relating to dangerous goods at the facility; and
- For each hazard, assesses:
 - The probability of that hazard causing a major incident
 - The harm to people, property and the environment that would result from the major incident; and
 - For each hazard, identifies the control measures that will eliminate, or reduce as far as reasonably practicable:
 - The probability of the hazard causing a major incident
 - The harm to people, property and the environment from that major incident.

Events with both on-site and off-site impacts need to be considered in the risk assessment. This includes the possible impact of a major incident on the people, property and environment in the area surrounding the facility. The assessment must consider the location of and possible impact upon:-

- Sensitive land uses;
- Commercial premises;
- Industrial premises (including other major hazard facilities);
- Residential premises;
- Major infrastructure (e.g. railways, ports, major electrical substations);
- Major roads or highways;
- Pipelines; and
- Environmental features such as waterways.

Operators must demonstrate that measures have been taken to identify all foreseeable incidents, their likelihood and consequences, and must justify the adequacy of the control measures used to minimise risk (both on-site and off-site).

4.11.3 Bush Fire Management

The principal bush fire agencies within Collie are the Shire of Collie for freehold land and the Department of Environment and Conservation for crown land (state forest).

The Council operates under the Bush Fires Act 1954, which gives local governments the power to require bush fire prevention measures on private land. FESA provides a co-ordinating, advisory and support role and administers the provision of equipment through the Emergency Services Levy.

Generally urban fire fighting services are provided by the Fire and Rescue Service, which is staffed by either career personnel (usually only in the major regional centres) or volunteers. The majority of their work involves structural fires (buildings), road crash rescue operations, and hazardous materials. These personnel are primarily trained and equipped to fight structural fires and conduct rescues, incorporating the use of breathing apparatus. Urban fire fighting is generally supported by reticulated fire hydrants.

Rural fire fighting services on private property are provided by volunteer Bush Fire Brigades (BFBs) which are administered by Local Government. Rural fire fighting services on public property (Crown Land) is generally provided by the Department of Environment and Conservation. The DEC Collie District office provides additional resources and personal in managing fire issues associated with the surrounding National Parks and State Forest.

In relation to Bush Fires, the State Planning Policy 3.4 incorporates by reference the provisions and requirements contained in the guidelines Planning for Bush Fire Protection (2001) and the Commission's Development Control Policy 3.7 Fire Planning (2001).

To address potential bush fire threats and the matters within SPP 3.4 proponents must prepare a Fire Management Plan. This Plan is to be prepared in accordance with the measures contained in Planning for Bush Fire Protection (PFBFP).¹⁶

Planning for Bush Fire Protection is the principal reference document in Western Australia and focuses on new subdivisions and related development in rural and urban-rural communities and townsites. It establishes a series of Performance Criteria and Acceptable Solutions for fire protection.

The level of bush fire hazard is influenced by a number of interrelated factors, being:

- Frequency of the fire season;
- Length of the annual fire season;
- Steepness of the site;
- Vegetation type;
- Vegetation – annual driest state;
- Local fire history;
- Development density;
- Access to the area; and
- Effectiveness of the fire fighting service.

The method for the assessment of bush fire hazard in PFBFP is based on Australian Standard 3959 (2001) Construction of Houses in Bush Fire Prone Areas. This methodology rates bush fire hazard based upon the vegetation classification, which is determined primarily by the height of the vegetation and the density of foliage cover.

In relation to the hazard ratings the following descriptions apply:

Low Hazard: The risk of bush fire attack in these areas does not require special bush fire related planning and building controls.

Medium Hazard The risk of bush fire attack in these areas requires that the subdivision and development are designed to incorporate fire protection measures. Houses in these areas are to be constructed in accordance with Australian Standard 3959.

High Hazard The risk of bush fire in these areas is significant and it is important that subdivision and development design incorporates fire protection measures. Houses in these areas are to be constructed in accordance with Australian Standard 3959.

Extreme Hazard These areas are not considered suitable for development as the risk of bush fire attack is likely to be excessive.

A preliminary assessment of the bush fire hazard has been conducted around the locality by SW Fire Services and is shown in *Figure 15*. This was prepared by examination of aerial photography, existing vegetation surveys and site inspections.

The majority of the surrounding State Forest is classified as having an 'extreme' fire hazard rating. It is noted that the forest areas surrounding the SIP are heavily bisected by both coal and power infrastructure, which provides distinct cells for the purpose of forest management.

While PFBFP is designed primarily for rural residential type development the basic fire management principles also apply to industrial development and the proposed SIP. The impact of bush fire can be minimised by ensuring that¹⁷:-

- Buildings are not located in highly vulnerable positions;
- Buildings are located sufficiently distant from areas of potentially hazardous fire behaviour. This is normally achieved by a 100m hazard separation zone;
- The road layout and other access features combine both fire service access and resident safety;
- Water supplies are sufficient for the fire services; and
- The fire service response is adequate to meet the building and bush fire risk.

The implications of this for the SIP are:-

1. The 100m hazard separation zone normally would not have any buildings located within it. As this will be difficult to achieve within the SIP the proposed protection buffers and hazard separation zones will be located externally to the SIP within the adjoining State Forest.
2. The provision of accessways around the inside of the perimeter of the SIP may be difficult due to the limitations on crossing existing infrastructure such as the coal conveyor. Similarly arrangements with DEC will be required to place such access in the adjoining State Forest.

¹⁶ FESA & DPI (2001) Planning for Bushfire Protection, WAPC Perth

¹⁷ FESA (2001) Planning for Bush Fire Protection Page 6.

3. As a result of the need to undertake regular fire protection burns in the surrounding area, the SIP is likely to be periodically affected by smoke and embers. While this will be at a lower intensity than happens in a wildfire, it may occur even when a burn is some distance from the SIP. The design of buildings, air conditioners, industrial operations and plant must take this into account.
4. Industrial premises processing chemicals may be vulnerable to bush fire threats due to the nature of their operations and that the complex configuration of the processing facilities may create additional wind turbulence increasing the threat from burning embers.
5. In the absence of reticulated water supplies in the Park, proponents will have to provide their own water supply, tanks and hydrants of sufficient capacity and pressure to comply with the Building Code of Australia.



- Low Hazard – all grasses, herbaceous plants and areas devoid of native vegetation. Includes existing open cut mines and lakes.
- Extreme Hazard – forest, woodland or tall scrub greater than 2m in height with more than 30% canopy coverage irrespective of slope.

Figure 15 - Bush Fire Hazard Rating

Protection of the SIP from bush fires will be addressed by the preparation of Fire Management Plans for:-

- a) The SIP as a whole addressing both external and internal issues.
The external issues relate to the proposed protection buffers and hazard separation zones within the surrounding State Forest. The internal issues relate to the general design of the SIP including water supplies and access.
- b) Each Development Area.
These plans would be prepared by each proponent. They will refine the above measures and recognise the specific issues associated with each development including:-
 - i. The provision of structural fire fighting services;
 - ii. Any associated safety (risk assessment) report for the proposed industry;
 - iii. Any associated structural fire fighting issues associated with complying with the Building Code of Australia and the Local Government (Miscellaneous Provisions) Act 1960;
 - iv. Egress and access to the development and the boundaries of the Development Area;
 - v. The potential provision of structural refuge areas for staff who might remain on site during an emergency; and
 - vi. The management of remnant vegetation and rehabilitation plantings within each Development Area.

A Fire Management Plan has been prepared for the external areas around the SIP by South West Fire Services.¹⁸ This notes (Page 4) that:

"The most effective method of reducing the intensity of any fire threatening the SIP, and to improve the likelihood of timely suppression by ground based forces is to undertake hazard reduction prescribed burning at appropriate intervals. This interval will be influenced by the canopy cover of the upper storey vegetation, and the amount of understory vegetation, and litter and trash on the ground. The objective is to maintain these ground fuel levels to <8.5 tonnes per ha, which will provide fire crews a reasonable chance of suppression in summer conditions."

The intention of the prescribed burns is to reduce the fuel loadings to 8 tonnes per hectare, which approximates the upper limit prescribed by FESA for a low fuel zone. Regeneration and the accumulation of fine fuels and leaf litter then increase the fuel loading over time. Depending upon local conditions a prescribed burn may provide protection to an area for up to five years.

In discussions with the Department of Environment and Conservation it has become apparent that there are a number of other developments within the Collie Basin which would also benefit from a more intensive district based fire protection strategy.

In relation to the SIP it was agreed that it can be protected from external bush fires at two levels:-

- 1 Primary burn buffers within the broader locality managed as part of DEC's district fire protection. These extend more than 3km from the SIP and will also afford protection to other developments within the Coal

¹⁸ SW Fire Services 2010 Shotts Industrial Park Fire Management Plan for External Fire Protection

Basin. DEC's objective is for these areas to be maintained with a maximum fuel loading of 8 tonnes per hectare.

- 2 Secondary burn buffers immediately around the SIP with the boundaries of these areas coinciding with existing infrastructure such as access tracks, power lines etc. This recognizes the open cut mines and cleared farming land as low hazard areas.

The primary and secondary burn buffers are shown in *Figure 16*. The primary burn buffers have been shown over the area up to 3kms distance from the SIP even though they may extend over a larger area.

The secondary burn buffers immediately adjacent to the SIP are generally more than 200m wide. These have a total area of approximately 360 hectares and have been designed to complement the adjoining existing development which already functions as a low fuel zone.

A draft Memorandum of Understanding is presently being prepared between Landcorp and the Department of Environment and Conservation to provide for the ongoing maintenance of the proposed burn buffers.

4.12 Ecological Corridor

The EPA released Environmental Bulletin No 8 South West Ecological Linkages in October 2009. The EPA recognises that the conservation reserve system would be strengthened by the retention and restoration of well-planned and managed ecological linkages. Such linkages would reduce the impacts on flora and fauna of habitat fragmentation and promote the maintenance of ecosystem function and the conservation of many native species in the south west region.

The Bulletin gives recognition to the South West Ecological Linkages (SWREL) project which identifies a network of regional linkages throughout the south west.¹⁹

The report identifies a potential regional linkage through the SIP and across the Collie Coal Basin in a north east to south west direction. The report (page 26) defines ecological linkages as:

"A series of (both contiguous and non-contiguous) patches of native vegetation which, by virtue of their proximity to each other, act as stepping stones of habitat which facilitate the maintenance of ecological processes and the movement of organisms within, and across, a landscape."

It also states that ecological linkages are not to be confused with biodiversity or wildlife, corridors. While biodiversity corridors are generally considered to be linear strips of remnant vegetation, ecological linkages, use axis lines to recognise the spatial relationships between patches of remnant vegetation.

The report (pp 39 – 41) examines the effects of the 'gaps' between vegetated areas on the movement of flora and fauna and in summary:-

- Gaps of less than 100m are not a significant barrier;
- Gaps of 500m provide a significant barrier to the movement of many fauna species;
- Gap of 1000m provide a major barrier to the movement of many fauna species and may inhibit the long term viability of some plant populations within patches. The movement of fauna across a 1000m gap is

mainly limited to larger species. A gap of 1000m represents a threshold past which there is a major decline in biotic interaction.

The location of the ecological corridor has been prepared in isolation from other planning factors relevant to this location including:-

- i. That the State Planning Framework (SPP 1) recognises the strategic importance of the Collie Coal Basin through the Collie Basin Structure Plan. This in turn promotes the development of the Coal Basin for mining purposes and this is reflected in Council's approved Local Planning Strategy. The proposed ecological corridor would appear to conflict with the recognised planning framework for the area.
- ii. The areas around the SIP, especially to the north and south of site, which are considered for regional corridor, have approved mining tenements and the mining of these areas is subject to existing State agreements.
- iii. The proposed linkage also traverses the Stockton plantation, which has now been harvested effectively creating a barrier.
- iv. An alternative linkage is available further to the east of the SIP, outside of the Coal Basin.
- v. An alternative linkage presently exists to the west of the SIP, in proximity to the Collie Townsite. This is within the notional 1km 'approach line' of the town where mining is unlikely to occur.

So even if a continuous linkage was provided through the SIP it would not function due to the proposed surrounding land uses.

The Environmental Protection Authority has advised that it expects that when planning for future proposals in the Collie area, the Council will support the retention (and preferably enhance) the remaining ecological linkages, as outlined in the EPA's Environmental Protection Bulletin No. 8 - South West Regional Ecological Linkages (September 2009).

4.13 Issues Summary

The issues identified in the previous sections are shown in *Figure 17*. In summary the main site issues are:-

Underground Subsidence

- There is evidence of subsidence and collapses around the rail loop. Any structures proposed in these areas will require substantial ground improvement works and/or piled foundations.

Water Management

- The Local Water Management Strategy (LWMS) has been developed for the SIP which demonstrates that water quality and drainage at the SIP can be adequately managed.
- There is no scheme water supply planned for the SIP and proponents must consider their water needs.
- It is the responsibility of proponents to provide the appropriate level of treatment for all surface and groundwater discharges from the site.
- The shallow perched groundwater has drainage implications for the protection of foundations.
- It is the responsibility of the proponent to ensure that surface and subsurface drainage systems are designed to protect groundwater quality.
- There are no plans for any wastewater infrastructure and each proponent is required to manage their own wastewater collection, treatment, and disposal.
- There are several wetlands adjacent to the border of the SIP where a minimum setback/buffer of 50m is to be provided.

¹⁹ WALGA & DEC (2009) South West Regional Ecological Linkages Technical Report

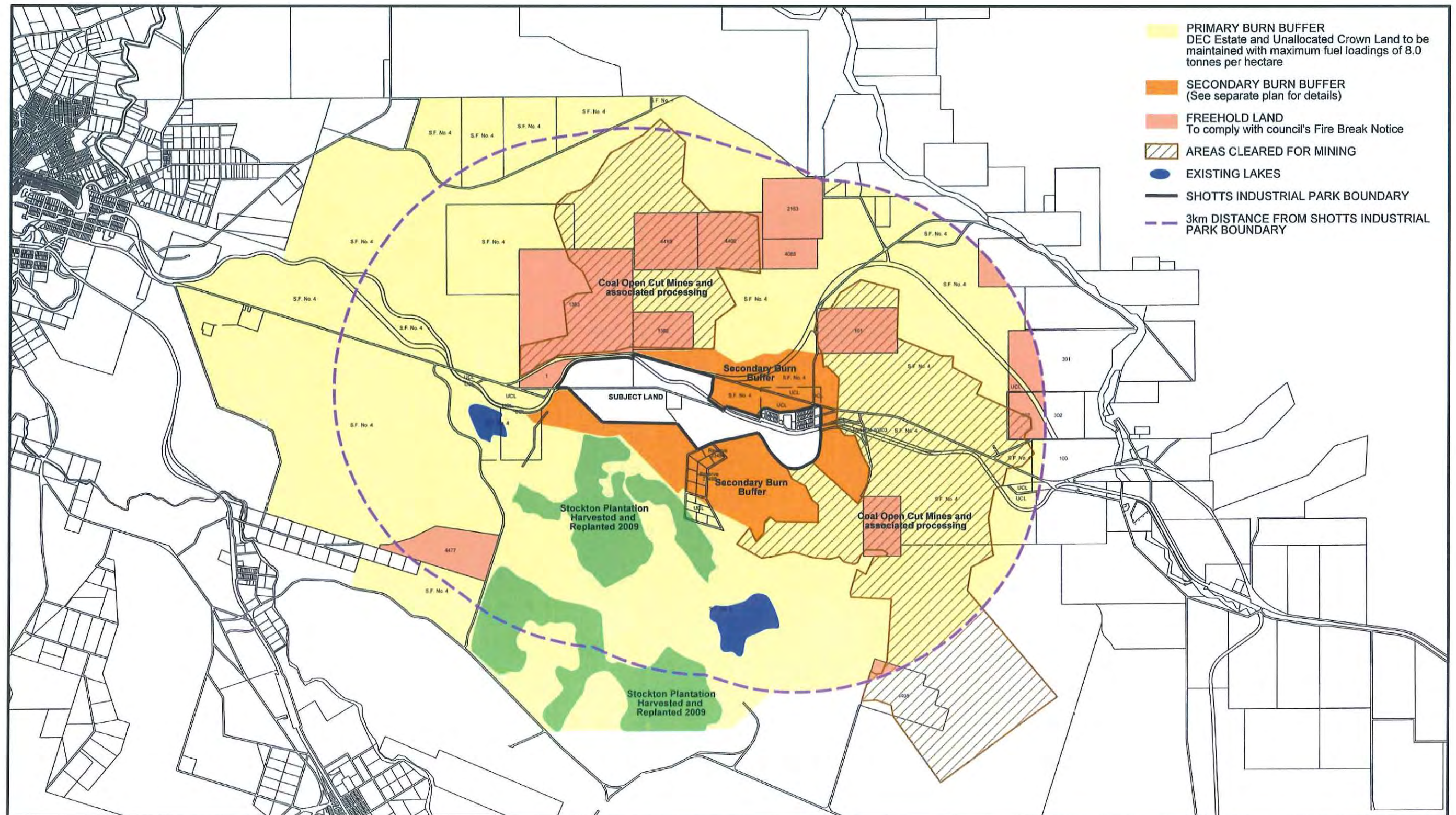


Figure 16 - Bush Fire Protection Buffers

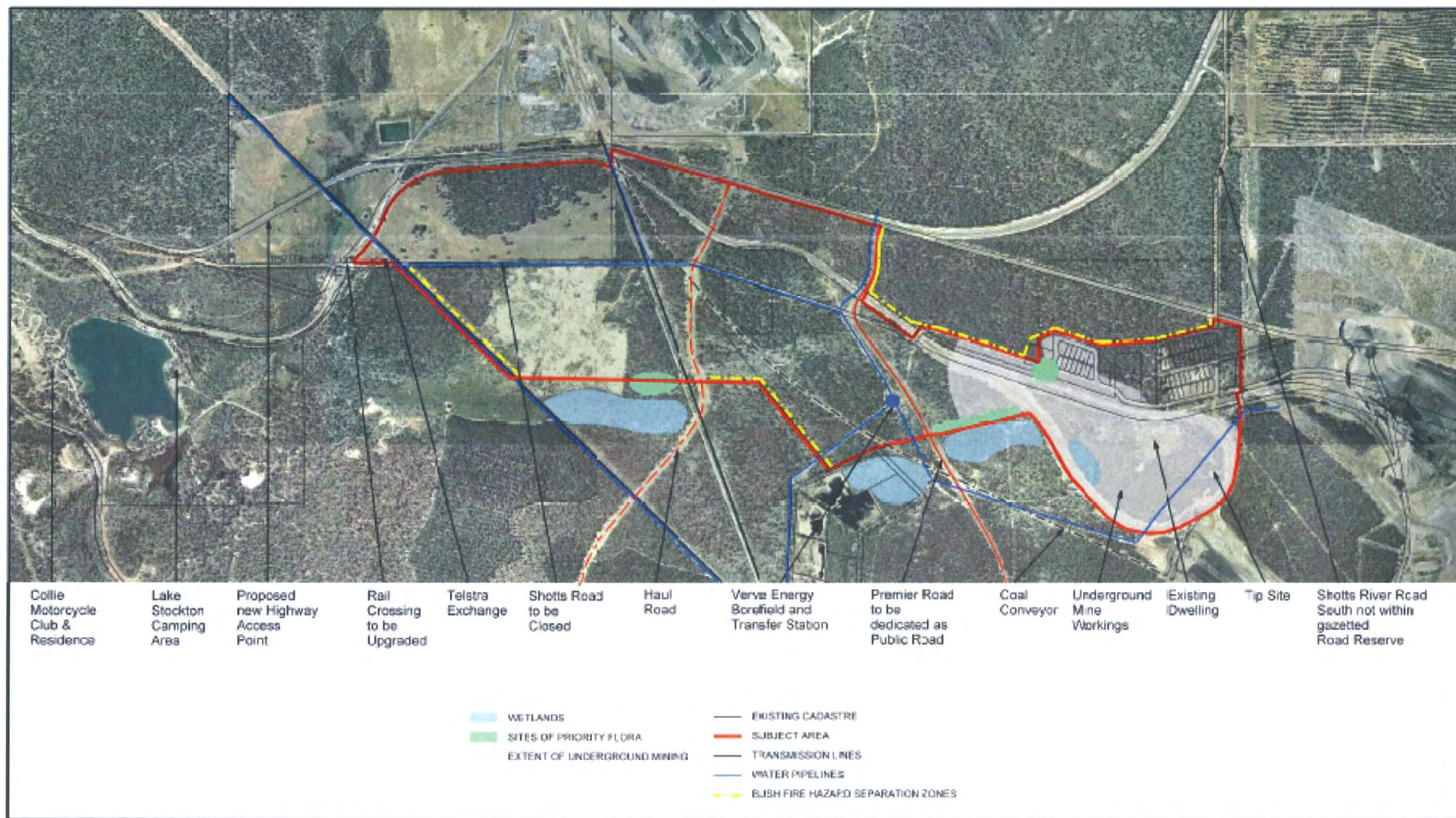


Figure 17 - Development Issues

Vegetation and Fauna

- The SIP has a total area of 235 ha of which 121 ha contains existing vegetation.
- Ten percent of the existing vegetation is required to be retained on site ie 12 hectares.
- There has been a high degree of disturbance and fragmentation of vegetation.
- There is no Declared Rare Flora within the SIP however two priority flora species were found. Six Declared Plant (weeds) species were identified.
- The SIP will result in the clearing of a significant amount of remnant vegetation which priority fauna species use as habitat.
- Endangered fauna species identified on the subject site are; Red-tailed Black-Cockatoo (*Calyptorhynchus banksii*), Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris*) Chuditch (*Dasyurus geoffroii*) and the Priority 3 species Brush-tail Phascogale (*Phascogale tapoatafa*).
- Due to the amount of available habitat in the surrounding State Forest and National Parks, these species are unlikely to be dependent on the survey area for their survival.
- Landcorp has developed strategies to mitigate the possible impacts of vegetation clearance.
- The EPA recommends the undertaking of species specific surveys for the Red-Tailed Black-Cockatoo and Baudin's Black-Cockatoo and use this information when next considering acquiring land for conservation purposes, to ensure that land is conserved in the area to protect these species habitat.

Heritage

- No sites of Aboriginal archaeological or ethnographic significance were recorded at the site.

Traffic and Access

- The Coalfields Highway has a traffic volume of 1,000 vehicles per day (vpd).
- This will increase to 3,900vpd for the construction and 2,300vpd for the operation phases of the SIP respectively.
- The SIP will have three entrances, with the main access being from Premier Road.
- Each proponent will need to provide a further traffic impact study.
- Shotts Road is to be realigned to provide an improved intersection with the Highway.

Soil Contamination

- There has been historical dumping of waste materials within the 'rail loop'.
- Further site investigations or remediation will occur prior to development commencing.

Acid Sulphate Soils

- There is potential for acid sulphate soils to be present in the vicinity of wetlands.
- Proponents are responsible for conducting soil appropriate investigations

Dieback

- Phytophthora cinnamomi (dieback) is present in the SIP.
- The risk of further spreading dieback during the proposed construction activities can be minimised by specific management measures.

Emergency Management

- A Local Emergency Management Plan has been prepared for Collie.

- A major incident at the SIP could result in harm to people, property or the environment. Proponents must prepare a safety (risk assessment) report for each industry.
- The SIP is surrounded by State Forest which has an 'extreme' bush fire hazard.
- To provide adequate protection from bush fire, primary and secondary burn buffers will be located around the SIP in the adjoining State Forest.
- An overall Fire Management Plan will be prepared for the SIP and proponents must prepare a Local Fire Management Plan for each Development Area. This should be done in conjunction with safety (risk assessment) report and also potentially address structure fire fighting issues.
- The design and management of operations within the SIP must recognize the potential effects from smoke and embers as a result of the fuel reduction burns in the surrounding area being done for the protection of the SIP.

Ecological Corridor

- The Environmental Protection Authority has identified a potential regional linkage through the SIP and across the Collie Coal Basin in a north east to south west direction.
- The development of the SIP and the mining of the surrounding land with associated power generation operations and infrastructure will make it difficult to implement any regional ecological corridor across the Collie Coal Basin and will result in the loss of this linkage over time.

5.0 BUFFER MANAGEMENT

5.1 Objectives

A buffer area is defined by specifying a distance in relation to an industrial or infrastructure operation for the purpose of avoiding conflict between incompatible land uses.

Buffer zone requirements are contained in two documents being:-

- State Planning Policy No. 4.1 State Industrial Buffer Policy; and
- EPA's Guidance Statement No. 3 - Separation Distances between Industrial and Sensitive Land Uses.

SPP 4.1 promotes that it is essential that once buffer areas are defined, the impacts of industry/infrastructure are confined within the buffer and the buffer area is not encroached upon by sensitive uses. It is important that any variations to a defined buffer area must have regard to the rights of landowners, existing industries and the future development intentions of the industry or infrastructure.

The definition of the buffer must take into account a number of factors including, odour, noise, risk, health hazard, light spill, dust, air quality, water quality and cleaner production and resource recovery.

For the purposes of examining issues within the potential buffer area of the SIP an indicative distance of 3km has been used.

5.2 Existing Conditions

5.2.1 Ownership and Use

The majority of the land around the SIP is State Forest which is used for forestry, coal mining or power generation. In addition to this there is also Unallocated Crown Land, Existing Crown Reserves and Freehold Land.

Of particular concern in relation to the formulation and management of buffers is the location of any freehold land. The details and ownership of all freehold land within a 3 km radius of the SIP boundary is shown in *Figure 18* and is documented in *Table 9* (over page).

There are 38 freehold properties within an approximate 3km radius of the SIP. *Figure 19* shows this land categorised in terms ownership by Government, industry or private citizens. Of the 38 properties, 14 are owned by government agencies, 19 are owned by industry and 5 are owned privately.

Within the State Forest there are also recreation facilities such as Stockton Lake and the Collie Motorcycle Club track.

Property ref no's 1, 2, 3, 4, 5, 6, 7 and 17 are all open cut mining areas. Property ref no's 22 to 38 (inclusive) contain mining and power infrastructure as well mine voids. Mining is not restricted to the land owned by the mining companies and there are existing mining leases over the surrounding State Forest.

This reinforces that large tracts of land around the proposed SIP are already committed for industrial (mining) uses.

Map Ref.	Lot No	DP	Volume	Folio	Registered Proprietor
1	1383	109003	1285	569	Griffen Coal Mining Co Pty Ltd
2	4410	15680	Pt225	67A	Griffen Coal Mining Co Pty Ltd
3	4409	15680	Pt225	67A	Griffen Coal Mining Co Pty Ltd
4	2163		Pt1955	572	Western Collieries Ltd
5	4088		Pt1955	572	Western Collieries Ltd
6	1382	109002	1118	63	Griffen Coal Mining Co Pty Ltd
7	101	45821	2600	723	Wesfarmers Coal Ltd
8	1	64908	1651	353	Dept of Environment & Conservation
9	2	64908	1651	354	Dept of Environment & Conservation
10	1639	122030	1197	444	POM Pilatti
11	2315	130580	1348	875	POM Pilatti
12	301	35482	2223	626	NJ & HJ Wiese
13	302 4250	35482 115837	223	627	Western Collieries Ltd
14	100	45820	2600	724	Western Collieries Ltd
15	3604	143549	1453	4	Western Collieries Ltd
16	1619	115839	3148	856	State of WA (unmanaged reserve)
17	2133	127536	1955	568	Western Collieries Ltd
18	4408	156813	1215	750	Western Collieries Ltd
19	4477	160889	1845	631	PA & DR Piavanini
20	1482		Pt1314	394	SN Simmonds
21	1	62426	1919	271	Griffen Coal Mining Co Pty Ltd
22	3649	143576	3007	264	State of WA (unmanaged reserve)
23	3650	143576	3007	265	State of WA (unmanaged reserve)
24	3648	143576	1603	827	Western Collieries Ltd
25	3651	143576	1603	828	Western Collieries Ltd
26	3647	143576	1629	588	Western Collieries Ltd
27	3652	143576	3007	266	State of WA (unmanaged reserve)
28	3646	143576	1629	590	Western Collieries Ltd
29	3645	143576	1629	589	Western Collieries Ltd
30	3654	143576	1624	799	Western Collieries Ltd
31	3653	143576	3007	267	State of WA (unmanaged reserve)
32	4109	149702	3006	160	State of WA (UCL)
33	4110	149702	3006	161	State of WA (UCL)
34	4111	149702	3006	162	State of WA (UCL)
35	4112	149702	3006	165	State of WA (UCL)
36	4113	149702	3006	166	State of WA (UCL)
37	4114	149702	3006	167	State of WA (UCL)
38	4115	149702	3006	168	State of WA (UCL)

Table 9 - Buffer Land Ownership

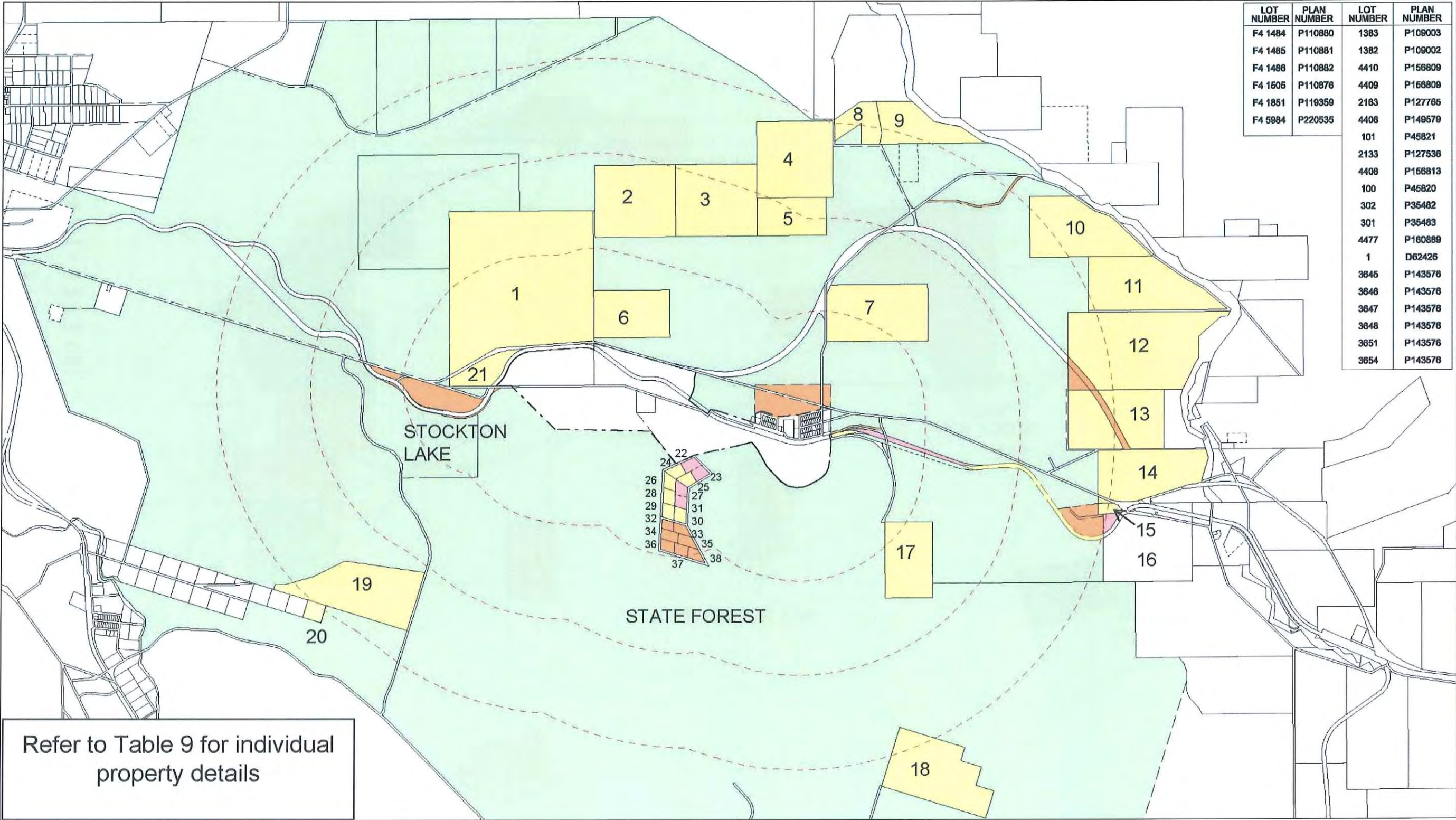


Figure 18 - Buffer Property Details

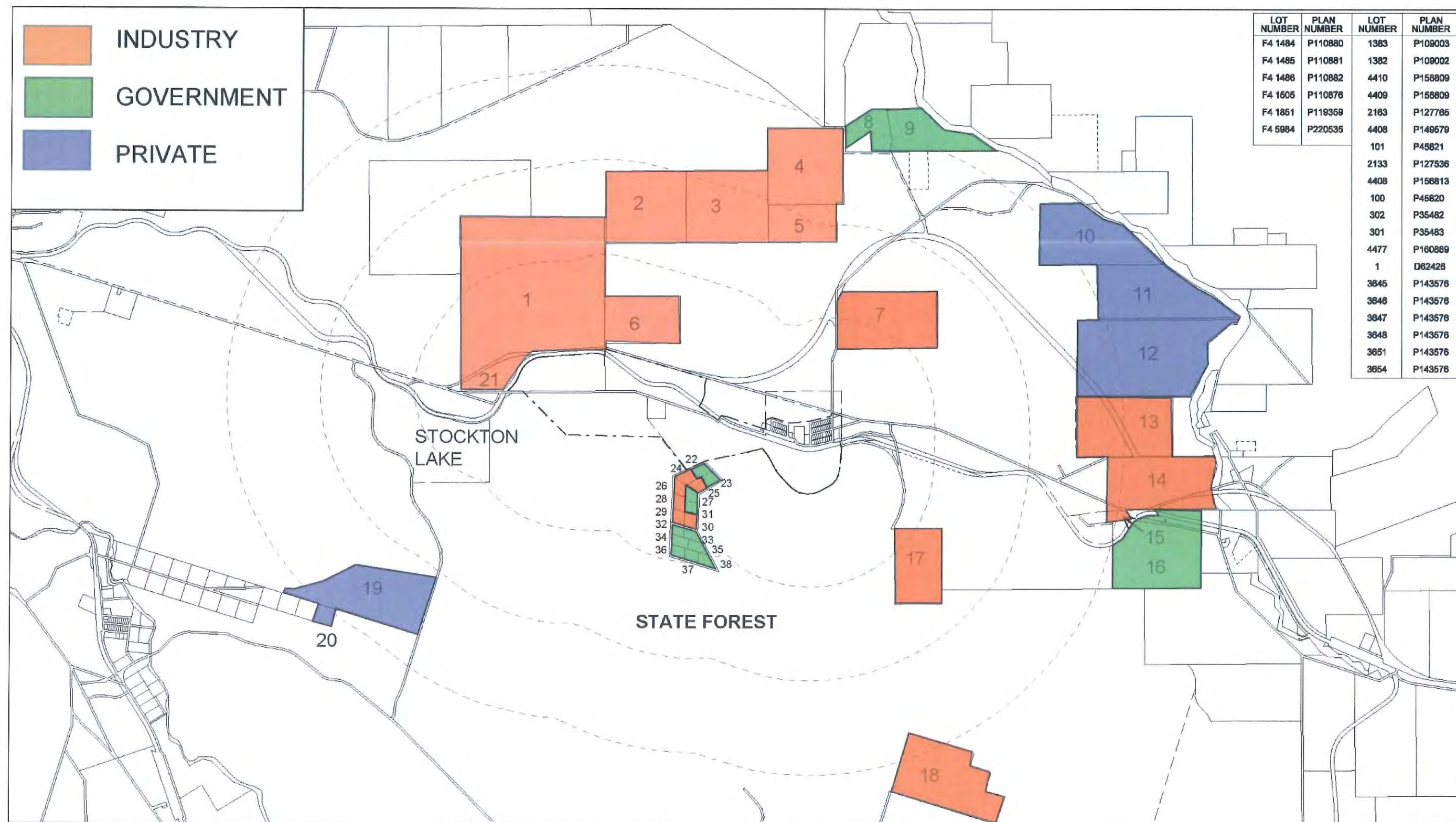


Figure 19 - Freehold Land Categories

5.2.2 Existing Zoning

The zoning of the land surrounding the SIP in Local Planning Scheme No 5 is shown in *Figure 9*. The zoning provisions are documented in Section 3.1.10.

The freehold land surrounding the SIP locality is:-

- Predominantly included in the Rural 2 zone;
- Partially included in the Rural 1 zone;
- Partially included in the Collie Power Station Special Control Area; and
- Partially included in the Coolangatta Industrial Estate Special Control Area.

The objectives of the Rural 2 zone include that the zone shall consist of predominantly rural and mining uses. A dwelling is a 'P' use within this zone.

The purpose of the Collie Power Station and Coolangatta Industrial Estate Special Control Areas is to ensure that no conflict will result with the power station, coal mining and related activities. Within the Special Control Areas no habitable buildings (dwellings) are permitted.

In summary the existing zoning provisions within the Scheme already restrict the development of freehold land near the SIP. In reality *Figure 19* clarifies that the freehold land within the existing buffers is either owned by industry (mining companies) or government agencies.

5.2.3 Sensitive Land Uses

Section 3.1.9 defines sensitive land uses which may be incompatible with intended development of the SIP. The primary concern is with potential residential uses including tourist accommodation or venues where large numbers of people may gather such as sporting venues.

A number of potentially sensitive land uses have been identified within a 3km radius of the SIP as described below.

(i) Private Properties

The private properties within a 3km radius are Property Ref No's 8, 9, 10, 11, 12, 19 and 20.

Property Ref No's 8, 9 are owned by the DEC and are situated within the Collie Power Station Special Control Area and as such a dwelling is a prohibited use on this land.

Property Ref No's 10, 11 and 12 are not located within the defined Collie Coal Basin and are also located outside of the Collie Power Station Special Control Area. These lots are zoned Rural 1 in LPS No 5.

Of the privately owned blocks, Ref No's 10, 11, 12, 19 and 20, it is understood that dwellings are located only on blocks numbered 10 and 12, and that these dwellings are outside of the 3 km separation line. No Council approval is needed to develop a dwelling on Lot 11. The minimum rear boundary setback for this is 30m.

Property Ref No's 19 and 20 are zoned Rural 2 and a dwelling is a 'P' use in this zone.

(ii) Unallocated Crown Land

In addition to the seven Crown Titles listed in the attached table there are also several additional parcels of other unallocated crown land within the vicinity of the estate. These are:-

- Between Stockton Lake and Shotts Road; and
- Near the Premier Mine entrance east of the site (Buckingham).

For the purposes of the defining the buffer it is assumed that none of the areas of UCL (both those mentioned above and also referred to in the attached table) would be ever be created or released as freehold titles.

(iii) Stockton Lake

Stockton Lake is located 1km to the south-west of the SIP. There is a camping areas to the south and east of the lake and the Collie Motor Cycle Club lease area on the western side of the lake.

AboutAustralia.com.au, a travel and accommodation web site contains the following information about Stockton Lake:

"A disused open cut coal mine that has formed an attractive artificial lake, the Stockton Lake now provides both locals and visitors with a popular water skiing and camping area. Due to past mining activities the water is more acidic than other natural lakes and skiers and swimmers are advised to limit their time in the water - especially those with sensitive skin.

Basic facilities are provided such as barbeque and long drop toilets. No camp fees apply and bookings are not taken. A relaxing location situated in the Jarrah forest with lots of wildflowers in season. Access to the lake is seven kilometres east of Collie, off the Collie - Darkan Road".

DEC manages the site which is on Crown Land (State Forest 4). DEC has advised that the area is particularly popular in the summer school holidays, Easter, and long weekends, with from 1 - 2,000 people camping around the lake. The lake can be used for skiing year round, unlike local dams which are closed if water levels are too low.

It is noted that Lake Kepwari (located south of the Muja power station) is being developed as a major recreational facility for the region which will provide additional recreational facilities to Stockton Lake in the future.

(iv) Collie Motor Cycle Club

The Collie Motor Cycle Club has a lease on the west bank of Stockton Lake. The land is leased by the Shire of Collie from DEC (Lease 1377/97), and the Club has a sub-lease from the Shire.

There is a caretaker's residence on the property which is usually occupied on a full time basis to provide security and maintenance the Club's facilities. Therefore, this is believed to be the closest permanent residence to the proposed SIP

The most likely environmental impact from the SIP which could potentially affect the motor cycle facility is noise from the proposed industries. However as the motor cycle facility is itself a generator of noise, it is appropriate for it to be located within the buffer.

The potential impact upon the caretaker's residence at the Motor Cycle Club site will need to be assessed and potential remediation measures considered such as noise insulation.

Protection from excessive night time noise levels maybe important.

(v) Residence within the Rail Loop.

DEC also has a lease arrangement in place with a Mr RJ Hetherington (Lease 1619/97) for occupation of part of State Forest 4 which includes a residence. The property is located in the middle of the rail loop at the Eastern end of the SIP. It is understood that Mr Hetherington has been occupying this residence since 1975.

The location of this residence within the SIP boundaries is potentially a problem in regard to its proximity of air emissions and noise that will be generated from the Urea Plant, Char Plant, and other industries.

It is intended to terminate the lease agreement and have Mr Hetherington relocated from the site prior to the commencement of industrial operations within the Park.

5.3 Air Quality

GHD has undertaken an air quality assessment for the proposed Park.²⁰

The cumulative air quality investigation was conducted to determine the appropriate size for an air quality buffer around the SIP. The technical analysis required establishing baseline air quality conditions and identifying industries which may impact on the air quality. Assumptions were made about the worst likely air quality based on the understanding that the SIP will be fully developed in the future.

Determining the quantity of air pollution being released into the local airshed proved difficult. This was because emissions from the Muja power station have been over-estimated by a large amount.

The emissions inventory for the Collie Shotts air-shed is divided into four sections. These are:

1. Existing Collie airshed industries being Muja Power Station, Collie Power Station, and Worsley Alumina Refinery.
2. Approved Collie airshed industries (including industries seeking relevant approvals) being Bluewaters Power Station and Worsley Alumina Refinery Expansion;
3. Proposed industries at Shotts; and
4. Worst case development at Shotts.

In total the emissions to air from the proposed SIP are less than a quarter of all emission in the airshed. Furthermore, the plans for how the SIP will be developed are not complete. Consequently, many of the emissions to air from the SIP are based on a hypothetical situation. The investigation considered the following potential industries within the Park:-

- Urea fertiliser plant;
- Char plant;
- Cement manufacturing plant;
- Sulphuric acid plant; and
- Waste incinerator (biomedical).

The investigation used the TAPM (The Air Pollution Model) meteorological and dispersion model and considered four scenarios as follows:-

Scenario A Existing Industries

This was designed to model the baseline, or the minimum results likely for the air-shed. As such it includes all current existing and approved industry in the broader region including:

- Muja power station, stages A, B, C, and D;
- Collie power station, stage A;
- Worsley alumina refinery;
- Worsley alumina refinery expansion; and
- Bluewaters power station, stages I, II, III and IV.

Scenario A predicts significant exceedances of the Air NEPM standard including at sensitive receptors. Exceedances are in the vicinity of the Bluewaters, Collie and Muja power stations but not at Shotts. The Kwinana EPP standard however, will be exceeded at the SIP.

Scenario B: Urea and Char Plants

Scenario B models the impacts of the proposed urea fertiliser plant and char plant in isolation (also known as their incremental impact) under normal, steady state operation.

There are no areas in the model domain predicted to exceed the Air NEPM or Kwinana EPP standard. Consequently it can be concluded that the char and urea fertiliser plants in isolation will not cause exceedances of the criteria and their impact on air quality is low.

Scenario C Existing Industries plus the Urea and Char Plants

Scenario C shows existing, approved and proposed industry, demonstrating what the air quality is likely to be if the urea fertiliser and char plants are built.

This predicted significant exceedances of the Air NEPM and the Kwinana EPP standards including at sensitive receptors. These exceedances occur in the vicinity of the Bluewaters, Collie and Muja power stations but not at the SIP.

These results show that the Air NEPM goals are unlikely to be met irrespective of the urea fertiliser and char plants being built. Comparing the results with Scenarios A and B it is apparent that the urea fertiliser and char plants are not major contributors to this exceedance.

²⁰ GHD (2009) Shotts Industrial Park Cumulative Air Quality Assessment

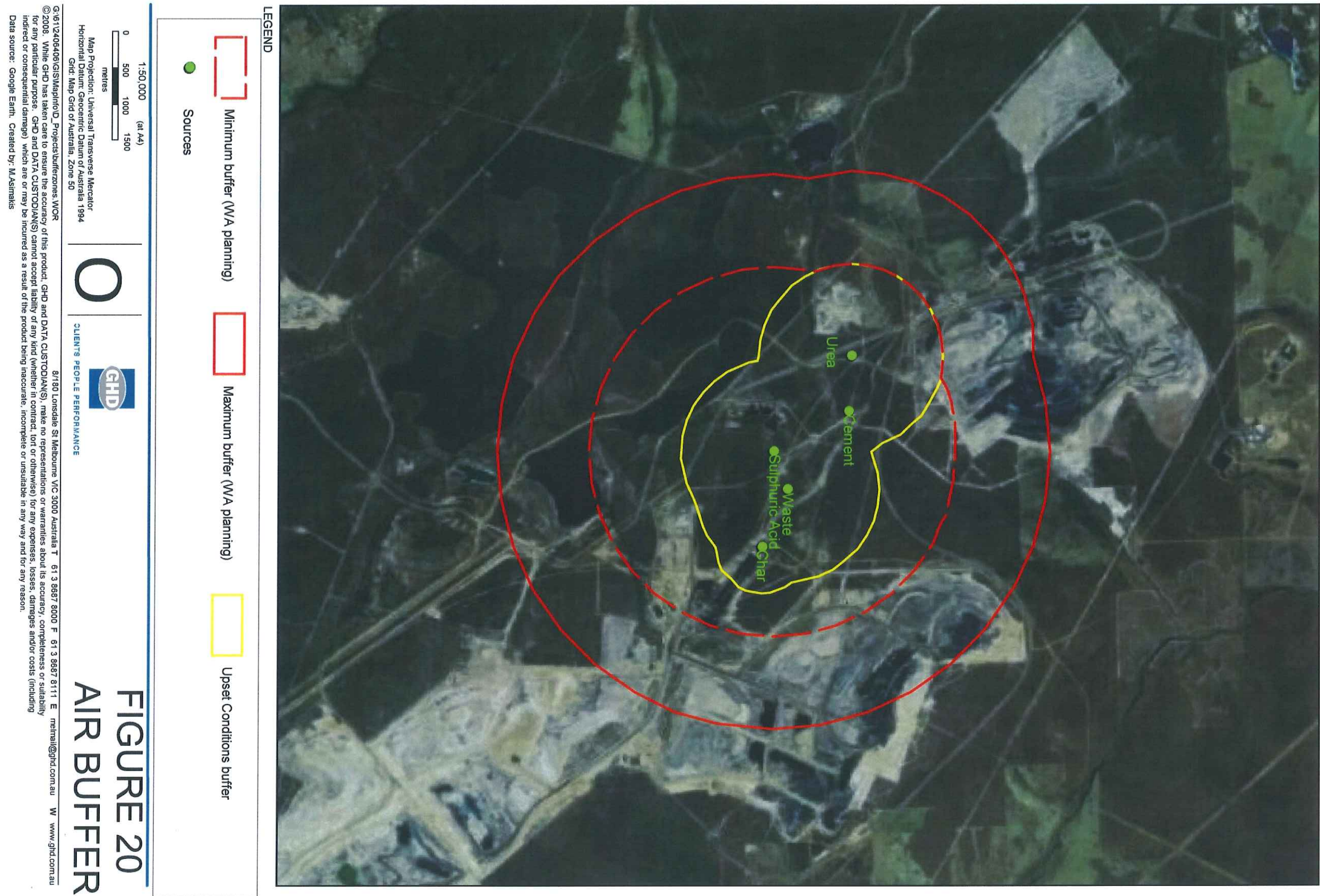


Figure 20 - Air Buffers

Scenario D Existing Industries and Full Development

Scenario D: includes existing, approved, proposed and worst case industries to show what the Shotts airshed might look like if the SIP were to be completely developed.

There are predicted to be significant exceedances of the Air NEPM and the Kwinana EPP standards across the model domain and at many sensitive receptors in the vicinity of the Bluewaters, Collie and Muja power stations and at the Park.

The results show that the Air NEPM goals are unlikely to be met irrespective of the Park's development however, it is apparent that the SIP industries will not major contributors to this exceedance.

The fact that predicted non-compliance with the Air NEPM standard was caused by industries outside the proposed SIP raises problems in assessing whether an expanded buffer is required around the fully developed Park.

Figure 20 shows the generic buffers based upon the Western Australian EPA No 3 Guidance Statement and the plant upset buffer distances (EPA Victoria recommendations). The plant upset buffer should be used to set the minimum buffer for planning purposes and GHD report used to assess the impact of routine emissions beyond this zone.

The investigation recommends a planning buffer of between 1 and 2kms (see Figure 20) to giving the best protection against amenity reduction caused by the SIP. Based on the information currently available a larger buffer would not offer any additional protection for the Park.

The Office of the Environmental Protection Authority considers that the 3km buffer is sufficient to not require further Air Quality modelling. Despite this, industries are still required to operate and control their air emissions at 'best practice' standards. Modern well designed and operated industries should not cause unacceptable impacts at 3 km and beyond.

5.4 Noise Management

The Environmental Protection (Noise) Regulations 1997 prescribe standards for noise emissions from industrial areas. The Regulations stipulate that the allowable noise levels that can be received at any noise sensitive premises (i.e. a dwelling) as shown in Table 10.

Noise received at the nearest noise sensitive premises would need to be 35 dB(A) or less, based on the night time noise criteria (2200 0700 hours Monday to Saturday and 2200 0900 hours Sunday and Public Holidays).

Where there are multiple industries regard must be given to the cumulative impact of those industries. The EPA's Policy on Environmental Noise²¹ states that (page 6)

"When assessing a planning proposal for a proposed industrial estate, the EPA expects that the proponent will demonstrate that cumulative noise emissions from notional industries within the proposed estate should meet the assigned levels. The EPA expects the source sound power levels will be set at reasonable and realistic levels for the type of industry envisaged, and that the proposal will provide for realistic buffers, in order that the industries will not be unreasonably constrained, nor

the buffers compromised. As a rule of thumb, the EPA envisages that the proponent will provide for a buffer for a large industrial estate that is of the order of 3km wide."

GHD has undertaken a noise impact assessment²² and a report to determine indicative sound power limits for the proposed SIP.²³

Type of Premises	Time of Day	Assigned Noise Level (dB(A))		
		L _{A10}	L _{A1}	L _{Amax}
Noise sensitive premises at locations within 15m of a building directly associated with a noise sensitive use.	0700 – 1900 Mon – Saturday	45 + IF	55 + IF	65 + IF
	0900 – 1900 Sunday & PH's	40 + IF	50 + IF	65 + IF
	1900 – 2200 All Days	45 + IF	50 + IF	55 + IF
	2200 – 0700 Mon – Sundays and 2200 – 0900 Sunday & PH's	35 + IF	45 + IF	55 + IF
Noise sensitive premises at locations further than 15m from a building directly associated with a noise sensitive use.	All Hours	60	75	80
Commercial	All Hours	65	75	80
Industrial	All Hours	65	80	90

IF = Influencing Factor
PH's = Public Holidays

L_{A10} - Means an assigned level which, measured as a LA Slow value, is not to be exceeded for more than 10% of the representative assessment period.
L_{A1} - Means an assigned level which, measured as a LA Slow value, is not to be exceeded for more than 1% of the representative assessment period.
L_{Amax} - Means an assigned level which, measured as a LA Slow value, is not to be exceeded at any time.

Table 10 - Noise Limits

Maximum sound power levels have also been established for the SIP so that future proponents, decision makers and members of the public are aware that there is a limitation to the permitted maximum sound power levels and ensuring that unacceptable noise levels are retained within the 3 km buffer.

The sound power report outlines the likely capacity (sound power levels) of each development area to accommodate typical industries within the proposed 3km buffer, for inclusion in the SIP Structure Plan. GHD determined indicative sound power levels for each development area using noise modelling undertaken with CadnaA (Computer Aided Noise Abatement) to predict noise levels at locations along the proposed 3km buffer.

Two scenarios were considered as follows:-

- Scenario 1: Industries located on all five development areas operating continuously; and
- Scenario 2: Only the urea and char plants operating continuously.

²² GHD (2009) Shotts Industrial Park Cumulative Noise Impact Assessment

²³ GHD (2010) Report for Shotts Industrial Park Sound Power Levels

²¹ EPA (2007) Draft Guidance Statement No 8 – Environmental Noise p6.

Indicative sound power levels were assigned to each development area as shown in *Table 11*, by using a single point source (at 5m height) to represent all of the equipment likely to be located at ground level and a single stack source (at 50m height) to represent high level sources.

Development Area	Scenario 1		Scenario 2	
	Plant Source dB(A)	Stack Source dB(A)	Plant Source dB(A)	Stack Source dB(A)
DA 1	110	104	120	114
DA 2	110	104	120	114
DA 3	110	104	120	114
DA 4 Urea	122	116	122	116
DA 5 Char	120	114	120	114

Table 11 - Source Sound Power Levels

(Source: GHD (2010) Report for Shotts Industrial Park Sound Power Levels)

For Scenario 1, as industries located on all five development areas will be operating continuously, the criteria which has been used for assessment of noise levels is compliance with the 35 dB(A) night time assigned level at the 3 km buffer.

For Scenario 2, as the industries operating on the smaller development areas will only be operating during day and evening periods, the criteria used is compliant with the 40 dB(A) evening assigned level for DA's 1, 2 and 3 at the 3km buffer.

The predicted night time noise levels for Scenario 1 are shown in *Figures 21* (Sheets 1 and 2).

There are two noise receptors located within the 3km buffer distance, being the Collie Motorcycle Club caretaker's residence and the Stockton Lake recreational area and camping ground.

Noise modelling predicts marginal noncompliance with the night assigned noise level at the caretaker's residence and at Stockton Lake. As the caretaker's residence is recognised by the EPA as a 'noise sensitive premises', the noise levels from the SIP will be required to comply with the night assigned level. This may require additional noise mitigation at source by industries within SIP to ensure compliance. Alternatively, industries within SIP may need to consider acoustic treatment of the caretaker's cottage or the provision of alternative accommodation for the caretaker.

The 3km buffer has been designated on the structure plan to ensure that new dwellings are not constructed in an area where they may be exposed to unacceptable emissions levels, from the SIP. This meets the Environmental Protection Authority's requirements.

5.5 Risk Management

EPA's Guidance Statement No 2 "Risk Assessment and Management: Offsite individual risk from Hazardous Industrial Plant" addresses off-site individual risk criteria for fatalities from hazardous industrial plant. The Guidance provides information which the EPA will consider when assessing proposals where off-site risk is a relevant environmental factor in an assessment to ensure the off-site individual risk from new hazardous industrial plant is assessed and managed to assure public safety.

This issue overlaps with Section 4.11 Emergency Management as any proponent of a potentially hazardous plant must undertake a risk assessment that recognises buffer requirements and potential sensitive land uses.

The generic buffer distances contained in Guidance Statement No 3 includes 'risk' as one of the buffer factors (see *Table 5*).

Undertaking any risk assessment is inherently difficult until the characteristics of proposed industries are known. Hence this is factor needs to be considered in conjunction with individual proposals while noting that:-

- The SIP will be providing a 3km buffer zone which generally complies with Guidance Statement No 3; and
- Any risk assessment would have to pay specific attention to the two closest receptors located within 3km buffer distance, the Collie Motorcycle Club caretaker's residence and Stockton Lake recreational area and camping grounds.

5.6 Other Factors

As indicated in the State Industrial Buffer Policy the definition of the buffer must take into account a number of factors including, odour, noise, risk, health hazard, light spill, dust, air quality, water quality and cleaner production and resource recovery.

While water quality is addressed in the Local Water Management Strategy, air quality and noise are addressed in the previous sections. Other factors such as odour, risk, health hazard, light spill, and dust will need to be assessed for each proposal to ensure that they are contained within the prescribed buffer.

As noted previously the State Industrial Buffer Policy states that proposals which satisfy recommended buffer distances in the EPA's Guidance Statement No 3 for separation distances between industrial and sensitive land uses are deemed to comply with the objectives of SPP 4.1.

Table 2 (Generic Buffer Distances) notes that the buffer distance for chemical fertilisers is 2km. This matches the proposed buffer required for noise mitigation and management.

As noise often requires the largest buffer there can be cautious optimism that industries establishing within the SIP should be able to contain.

5.7 Proposed Buffer and Land Use Controls

Based upon the preceding investigation the proposed buffer should be designed so that at the nearest noise sensitive premises the night time noise level would be 35dB(A) or less. This is Scenario 1 as shown in *Figure 21* which generally reflects a 3km distance from the SIP boundaries.

The proposed buffer will be reflected in the Scheme as a Special Control Area, which overlays the existing zoning. The objective of the buffer provisions will be to ensure that only 'compatible land uses' can develop within the buffer. A "compatible land use" is defined as a use that when located in a buffer will tolerate exposure to off-site emissions without impairment to its own operation.

The primary concern is that no dwellings or habitable buildings should be located within the buffer Special Control Area. Extensive agriculture would be permissible as occurs within the Coolangatta buffer Special Control Area. However the definition of "sensitive land uses" in SPP 4.1 (see Section 3.1.9) includes a variety of other associated uses.

Conversely prohibiting all other uses apart from extensive agriculture could result in restricting the normal development of other infrastructure and uses in the surrounding area which are defined uses in the Local Planning Scheme. An example of this would "telecommunication infrastructure."

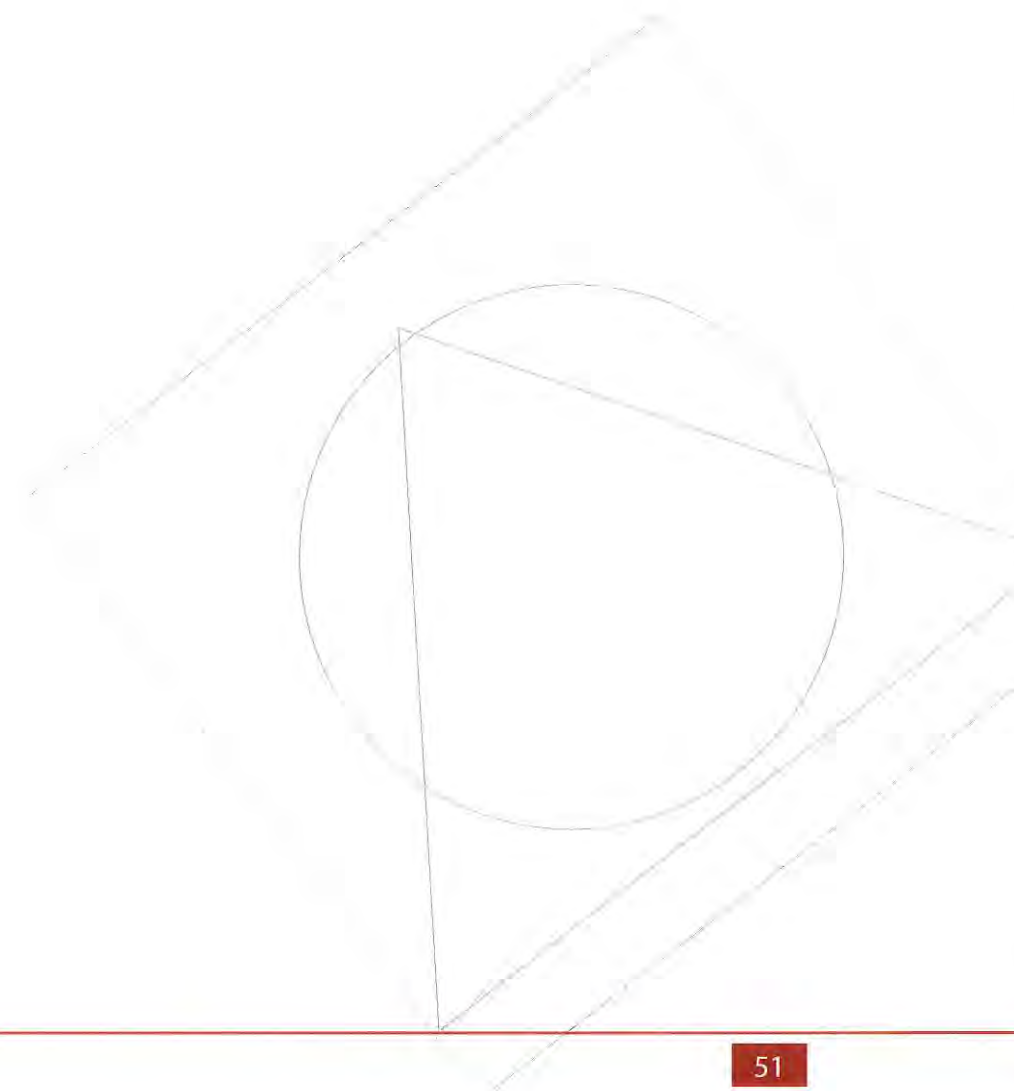
The proposed Scheme provisions for the buffer area should clearly nominate that no 'sensitive land uses' are permitted within the Special Control Area unless supported by the EPA and approved by the local government.

In accordance with SPP 4.1 in considering development or planning proposals in the proposed buffer area regard should be given to:

- The proximity to the emission source and estimated level of impact and/or risk on the use or development;
- The sensitivity of the proposed use or development to off-site emissions and risk;
- The mitigation measures proposed to be undertaken to reduce the level of off-site emissions or risk, including proposed cleaner production or resource recovery techniques;
- The level of understanding demonstrated by existing landowners as to the potential likely impact (including an acceptance of likely reduced amenity) and/or risk, and the mechanisms proposed to ensure that prospective purchasers or future landowners will be made aware of the likelihood of reduced amenity or potential risk from those impacts;
- The known potential for any increase or reduction in off-site emissions or risk impacts in the future;
- The potential for the proposal to constrain the operation of existing or future industry or infrastructure protected by the buffer;
- Applicable state, regional or local planning statutes and policies;
- Advice received from the EPA, DEC, Department of Housing, Department of Mines and Petroleum, Department of State Development and any other relevant agencies;
- Local government views or submissions made during any public consultation period; and
- Any other relevant town planning consideration.

LandCorp proposes to negotiate with any affected landowners in recognition of the land use restrictions proposed by the Special Control Area in Amendment No 1.

This process may include the landowner agreeing to the registration on title of a notification pursuant to Section 70A of the Transfer of Land Act 1893 (TLA) to make subsequent landowners and other interested parties aware of factors affecting the use or enjoyment of the land.



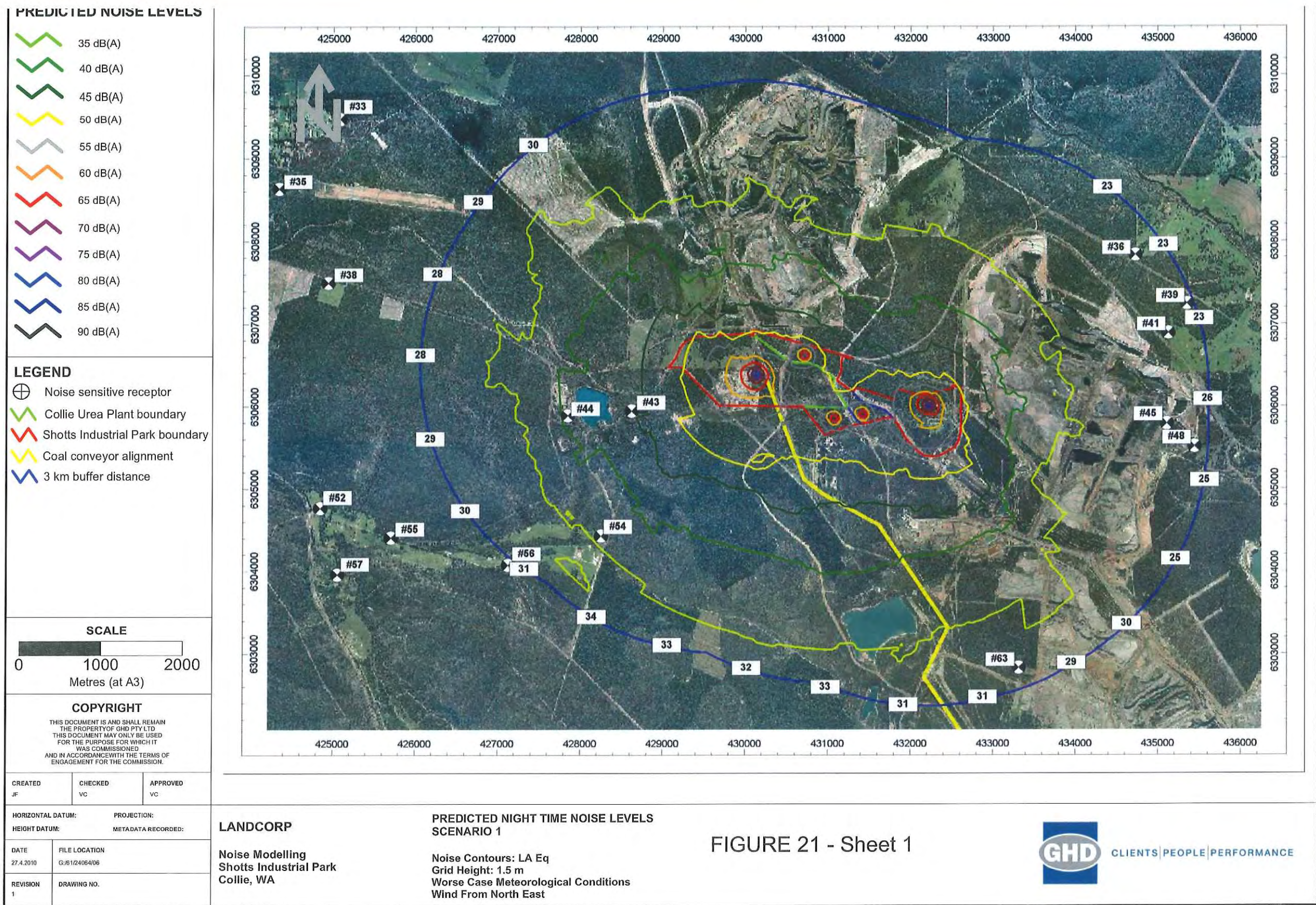
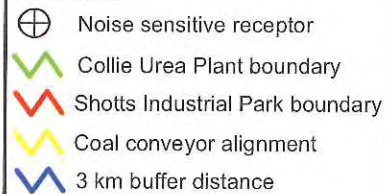


Figure 21 - Predicted Night Time Noise Levels (Sheet 1 of 2)

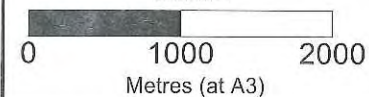
PREDICTED NOISE LEVELS



LEGEND



SCALE



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CREATED JF	CHECKED VC	APPROVED VC
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HORIZONTAL DATUM:	PROJECTION:
HEIGHT DATUM:	METADATA RECORDED:

DATE 27.4.2010	FILE LOCATION G:\6124064\06
REVISION 1	DRAWING NO.

LANDCORP

Noise Modelling
Shotts Industrial Park
Collie, WA

PREDICTED NIGHT TIME NOISE LEVELS SCENARIO 1

Noise Contours: LA Eq
Grid Height: 1.5 m
Worse Case Meteorological Conditions
Wind From South West

FIGURE 21 - Sheet 2



CLIENTS | PEOPLE | PERFORMANCE

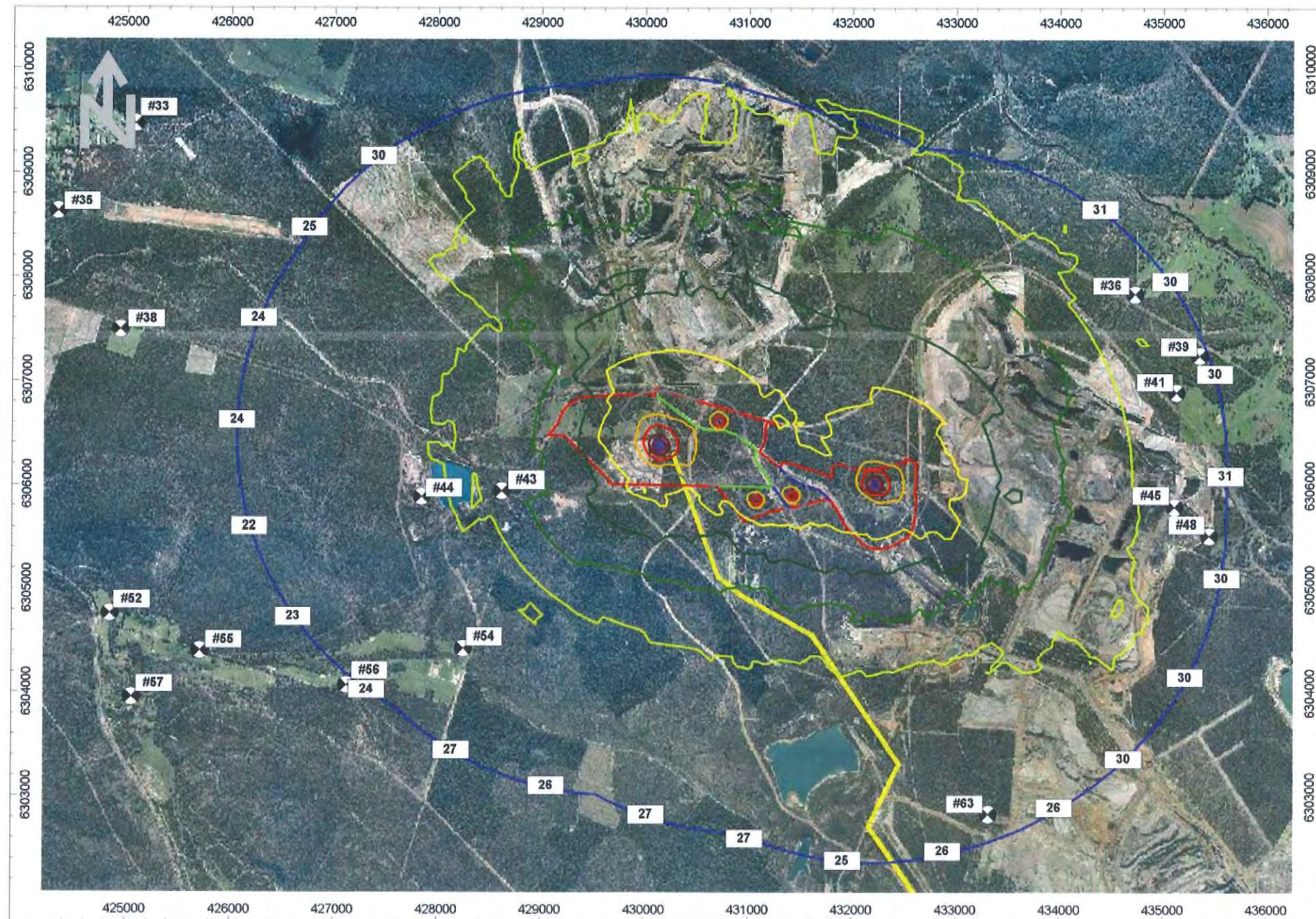


Figure 21 - Predicted Night Time Noise Levels (Sheet 2 of 2)

6.0 MANAGEMENT STATEMENTS

6.1 Objectives

The objectives for the Shotts Industrial Park are:-

- To provide for the development of coal related industries and associated uses which, by the nature of their operations, should be separated from and not have an adverse impact on residential and other sensitive land uses.
- To facilitate sustainable, efficient and environmentally responsible industrial development.
- To provide community certainty to the long term development of the Coal Basin.
- To establish clear development guidelines and provisions for the Shotts Industrial Park including ongoing monitoring.

6.2 Land Assembly

The Shotts Industrial Park will be 'assembled' into Crown and/or Freehold Titles by the Department of Regional Development and Lands. This assembly process will result in the creation of five (5) Development Areas as shown in Figure 22 with the gross land areas as shown in Table 12.

The creation of the Shotts Industrial Park will require the excision of approximately 161 hectares of land from State Forest and acquiring other Unallocated Crown Land and Reserves within the Townsite as shown in Figure 23.

In creating the Shotts Industrial Park the existing internal road network will be rationalised with the closures as shown in Figure 24.

Development Area	Area	Vegetation	10% Vegetation Retention	Detention Basins	Easements	Net Developable Land
DA1	17.1800	13.6978	1.3698	0.3450	0.8430	14.6222
DA2	13.7562	10.1207	1.0121	0.3250	1.9702	10.4489
DA3	12.2123	6.1053	0.6105	0.4350	0.7803	10.3865
DA4	123.3245	56.2980	5.6298	1.5800	12.5275	103.5872
DA5	54.2345	32.4299	3.2430	1.2850	1.2615	48.4450
Railway	11.3296	2.5000	0.2500			
Roads	3.0837	0.2117	0.0212			
Total (ha)	235.1208	121.3634	12.1363	3.9700	17.3825	187.4898

Notes
All areas above are in hectares.
For the purposes of this table the area of the detention basins has been derived from the required volume and assuming an average depth of 2m.

Table 12 - Development Areas

Existing infrastructure within the Shotts Industrial Park boundaries will generally be protected by easements but in some instances may require relocation. This infrastructure and associated easements are shown in Figure 22 and are summarised as:

- Water pipelines will need 6m wide easements;
- Transmission lines will need either a 60 or 28m wide easements;
- The coal conveyor will need a 10m wide easement; and
- The haul road will need a 73m wide easement.

6.3 Statutory Provisions and Management Guidelines

In accordance with Clause 6.3.7.4 of the Scheme the following provisions numbered 1 – 16 (inclusive) are statutory provisions are intended to have effect as provisions of the Scheme.

The following provisions identified as management guidelines are intended for the guidance of the local government and proponents. Most of the guideline information relates to or provides additional detail for Scheme provisions in Section 6.3 above. Management guidelines are not intended to have effect as provisions of the Scheme.

6.3.1 Definitions

Unless otherwise provided for words and expressions used have the same meaning as they have in the Scheme.

"Development Area"	means the areas designated DA1 to DA5b on the structure plan map.
"Planning Application"	means an application for the planning approval of the local government under Part 9 of the Scheme.
"Proponent"	means the occupier of a Development Area.
"Scheme"	means the Local Planning Scheme No 5 (as amended).
"Shotts Industrial Park Buffer"	means land shown on the Scheme Map as the Special Control Area – Shotts Industrial Park Buffer.
"Structure plan map"	means the figure designated as "Structure plan map" and contained in this report.

Management Guidelines

None

6.3.2 Development Requirements

Land Uses

1. The permitted use classes are contained in Schedule 4 Special Use Sites of the Scheme.
2. No use or development shall commence on a Development Area without the prior planning approval of the local government.

Management Guidelines

The principle land uses within the Shotts Industrial Park are expected to be the Urea and Char plants. These are considered as 'general industry.' A range of other industries may also be appropriate on the other Development Areas including support and service industries.



Services

3. Prior to commencing a use, a proponent shall demonstrate to the local government that arrangements have been made to ensure that appropriate services, including water supply and wastewater treatment are available or will be provided by the proponent at the site.

Management Guidelines

No services (e.g. water, waste water, power, rail access or telecommunications) beyond those currently available in the Structure plan area will be provided to the individual Development Areas.

Water Management

4. Unless otherwise approved by the local government there shall be a minimum development setback of 50m from the wetlands shown on the Structure plan map.
5. Prior to the commencement of any development a proponent shall prepare an Urban Water Management Plan approved by the local government on advice of the Department of Water. All development shall be in accordance with the requirements identified in the approved Urban Water Management Plan.

Management Guidelines

It is the responsibility of the proponent to ensure that surface and subsurface drainage systems are designed to protect surface water and groundwater quality.

Each development is likely to require a water supply pipeline for potable water and a sewage treatment plant for wastewater. Other infrastructure, such as desalinisation plants and mine dewatering pipelines may be required depending on adopted supply strategy.

The Urban Water Management Plan for each Development Area is to be consistent with the strategies and objectives of the approved Local Water Management Strategy and "Urban water management plans: guidelines for preparing plans and complying with subdivision conditions" the published by the Department of Water in 2008.

To maximise water efficiency in the Shotts Industrial Park individual proponents should ensure that:

- Industrial processes are to be water efficient;
- Water efficient fittings are to be used; and
- Landscaping is to be waterwise.

The size and appropriate location of detention basins will need to be investigated and refined by individual proponents. Each Development Area should provide drainage basins in accordance with the Table 12 unless approved otherwise as part of the Urban Water Management Plan.

Development Area	Catchment	5 yr ARI event		100 yr ARI event	
		Discharge peak flow (m ³ /s)	Detention Volume (m ³)	Discharge peak flow (m ³ /s)	Detention Volume (m ³)
4	A	0.13	12,000	0.42	15,000
4	B	0.13	16,000	0.14	16,600
1	C	0.04	3,000	0.06	6,900
2	D	0.04	3,500	0.06	6,500
3	E	0.04	4,600	0.05	8,700
5B	F	0.09	10,200	0.38	19,700
5A	G	0.14	3,000	0.14	6,000

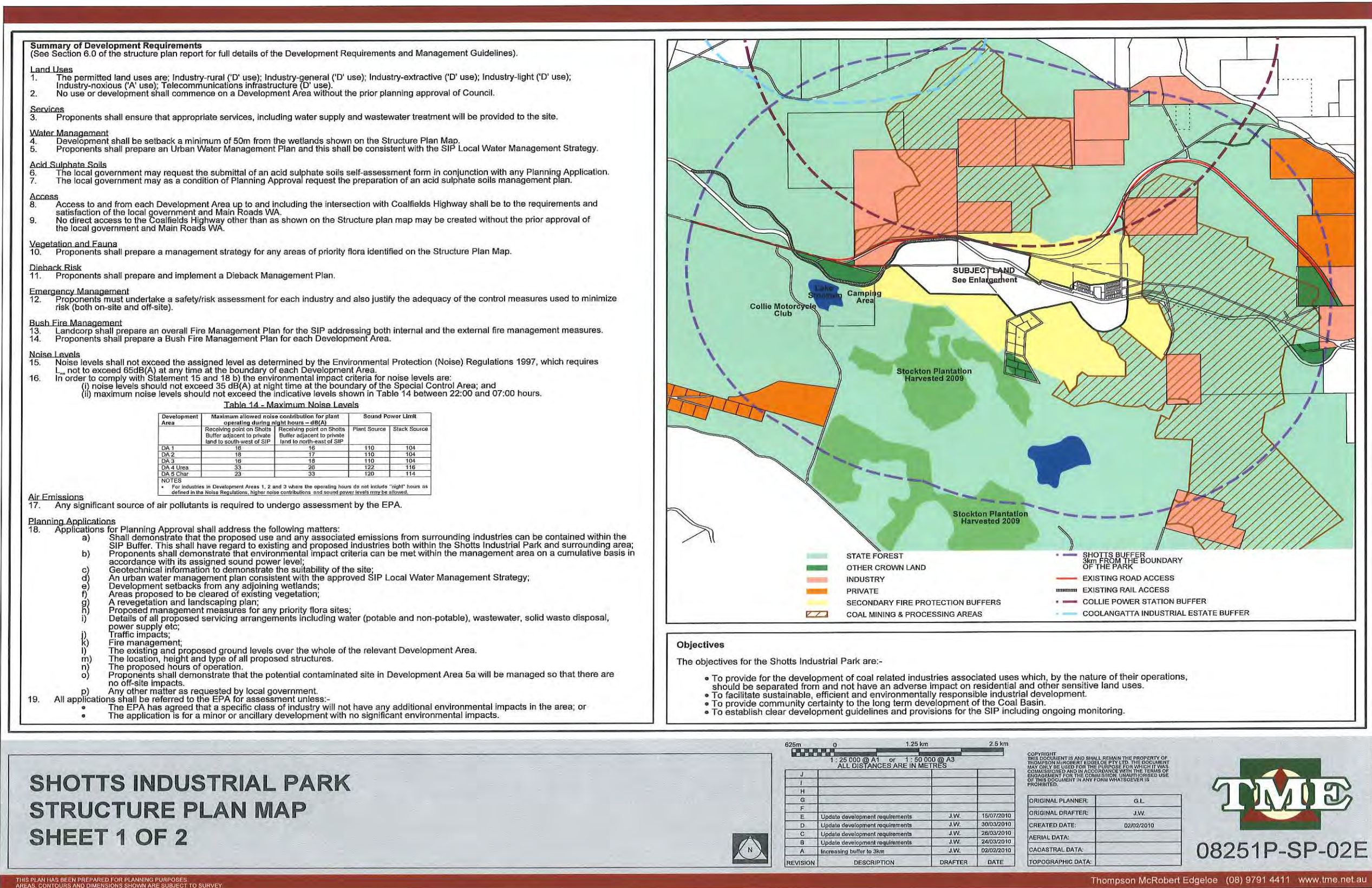
Table 13 - Detention Basin Volumes

Acid Sulphate Soils

6. The local government may request the submittal of an acid sulphate soils self-assessment form in conjunction with any Planning Application.
7. The local government may as a condition of Planning Approval request the preparation of an acid sulphate soils management plan.

Management Guidelines

None



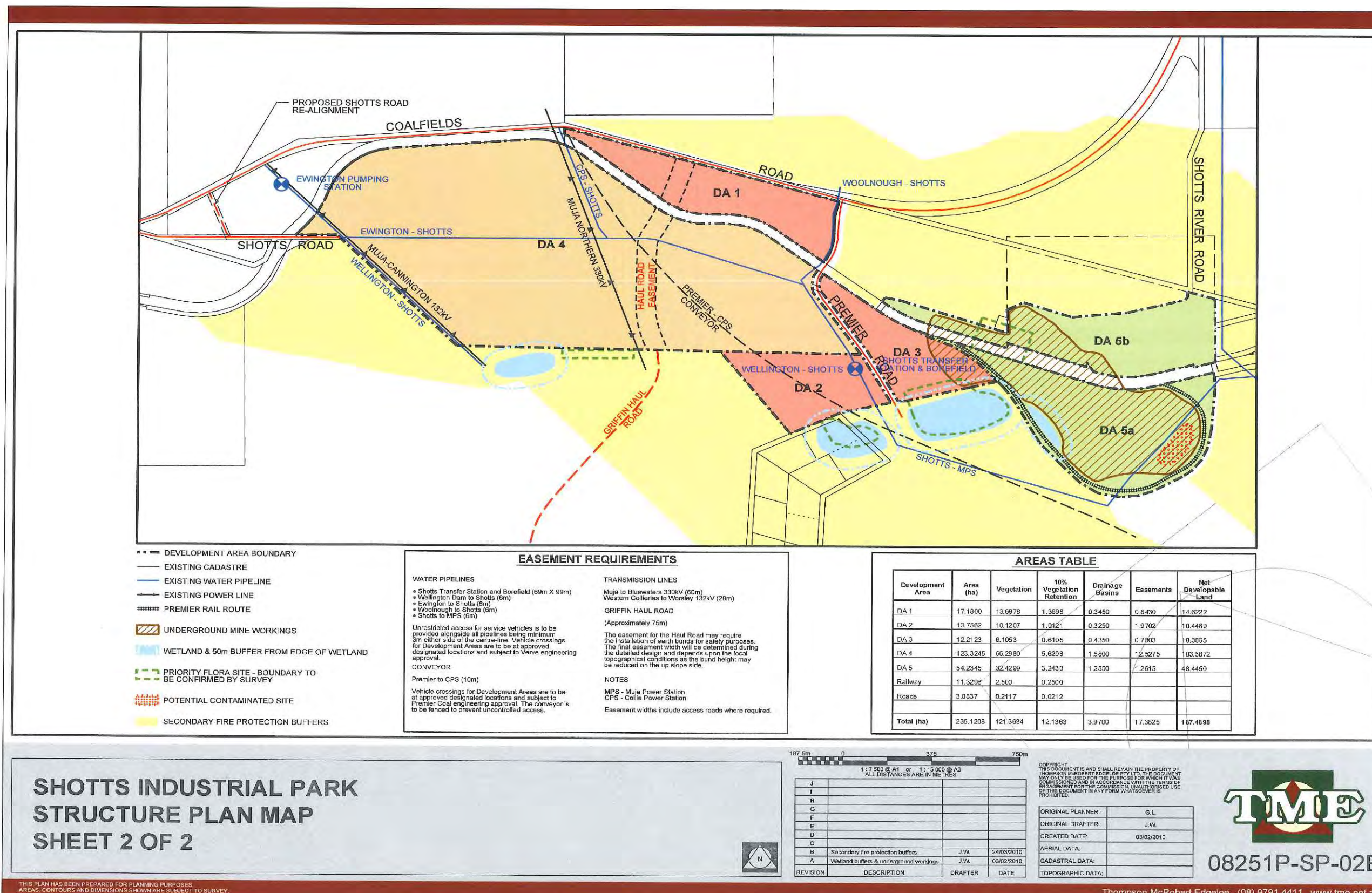


Figure 22 - Structure Plan Map (Sheet 2 of 2)

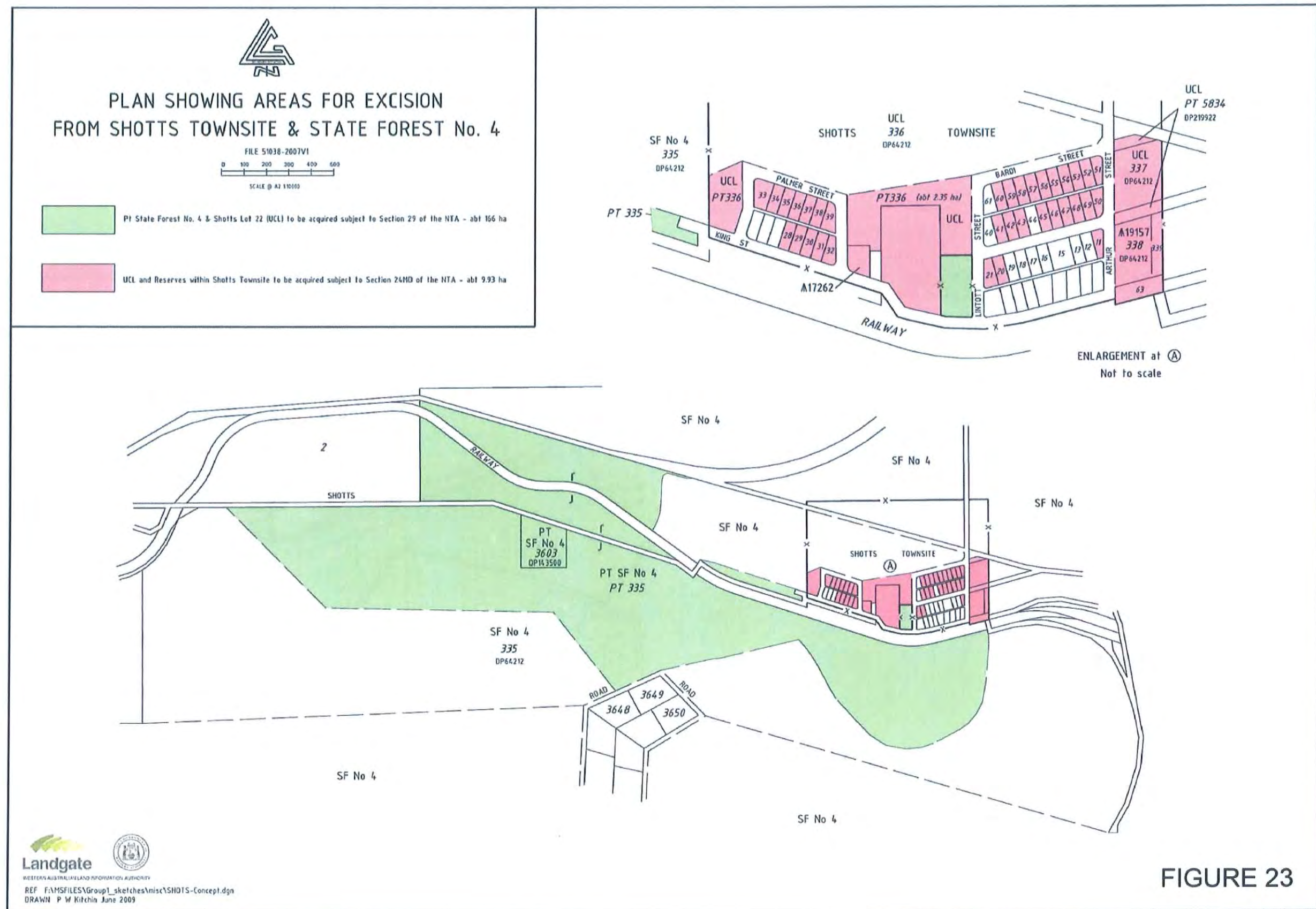


Figure 23 - State Forest Excision

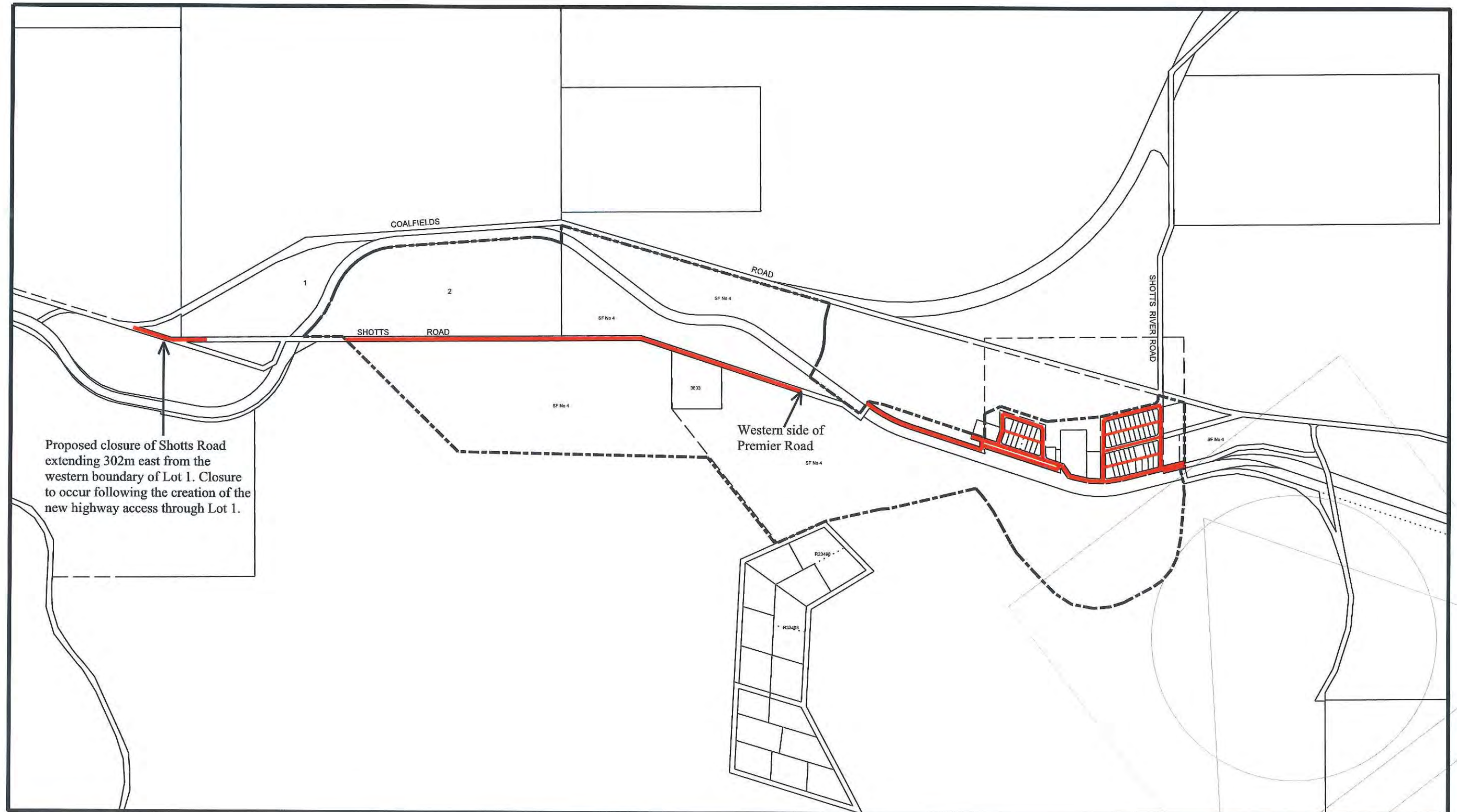


Figure 24 - Road Closures

Access

8. Access to and from each Development Area up to and including the intersection with Coalfields Highway shall be to the requirements and satisfaction of the local government and Main Roads WA.
9. No direct access to the Coalfields Highway other than as shown on the Structure plan map may be created without the prior approval of the local government and Main Roads WA.

Management Guidelines

Shotts Road should be realigned with the Coalfields Highway to provide access to Development Area No.4, as shown in Figure 22, with the intersection developed to the satisfaction of Main Roads Western Australia.

Premier Road, within the Park, is to be dedicated as a public road with the intersection with the highway upgraded to the satisfaction of Main Roads Western Australia.

The rail crossing on Shotts and Premier Roads will be upgraded as required.

The local government may stipulate that traffic impact study is required for either the construction or the operational components of any project. The traffic impact study is to identify:

- *current traffic conditions on relevant external roads;*
- *predicted traffic volumes (internal roads and relevant external roads);*
- *peak traffic periods and options to manage traffic in the Collie townsite in peak periods;*
- *current and future road hierarchy;*
- *road upgrade requirements (including intersection requirements);*
- *intersection treatments; and*
- *recommended design solutions.*

The local government should be requested to seek approval for Shotts, Premier and Shotts River Roads to be gazetted for extra mass vehicles if required.

Vegetation and Flora

10. Management strategies for vegetation areas to be retained and for priority flora areas identified on the Structure plan map are to be prepared to the satisfaction of the local government, on the advice of the Department of Environment and Conservation.

Management Guidelines

Where possible, industries should retain remnant vegetation on site and minimise clearing.

Each Development Area must retain 10% of the existing remnant onsite vegetation in accordance with the provisions of the Country Area Water Supply Act. Consideration should be given to providing the 10% remnant vegetation in a north-south corridor near the middle of the estate to provide for fauna movement. Premier Road and the coal conveyor provide existing linear corridors where retention of remnant vegetation in parallel with this infrastructure could be considered.

Landcorp will prepare revegetation and landscaping guidelines for the Shotts Industrial Park, to be included in proponent's development application. Previously cleared areas and areas not required during ongoing operations (i.e. buffer areas) at the Shotts Industrial Park will be rehabilitated. Rehabilitation will aim to provide alternative food sources and potential breeding trees through replanting native prime feed species, such as Banksia, Dryandra (now included in Banksia's), Marri, Jarrah, Hakea species and Allocasuarina species that currently occur in the project area. Further guidance on the requirements for revegetation and landscaping plans is provided under "Planning Applications – Revegetation and landscaping plan" below.

Clearing of vegetation containing potential cockatoo nesting trees should be avoided. Where nesting trees cannot be avoided, individual trees or stags containing potential nesting hollows should be retained where practicable. Any large trees containing hollows which are removed should be salvaged and donated to Cockatoo care groups to support captive breeding efforts or used in rehabilitation programs.

Large habitat features such as logs, branches and rock should be salvaged and used in rehabilitation areas or adjacent forest to supply hides and nest sites for the Chuditch. LandCorp is proposing as a condition of lease, ongoing sponsorship of the Western Shield Project by proponents so as to mitigate any impact on the Chuditch.

Proponents are required to manage Declared Plants in accordance with the Agriculture and Related Resources Act 1976.

Dieback Management

11. Proponents shall prepare and implement a Dieback Management Plan to minimise the spread of Phytophthora Dieback into uninfested areas off-site, uninfested areas of vegetation to be retained or uninfested areas identified as priority flora areas on the Structure plan map.

Management Guidelines

Dieback spreads autonomously (i.e. by itself) fairly rapidly down slopes, or slowly (a metre or so per year) in flat areas or uphill. In flat areas or where dieback is in the valleys, dieback spread can be significantly slowed down through phosphite treatment. There is little point in developing and implementing dieback management measures in an area that will soon be affected by autonomous spread.

Dieback management depends of preventing infested soil from being carried into dieback free areas.

Therefore, dieback mapping is essential to determine if dieback management measures are necessary, and to identify boundaries where soil movement measures are needed.

If mapping identifies that there are no uninfested areas to be protected, the dieback management plan would simply comprise the maps with a conclusion that dieback management measures need not be implemented.

The risk of introducing and spreading *Phytophthora* Dieback during the proposed construction activities can be therefore be minimised by the following management measures.

- a) Undertake dieback interpretation in the development area to determine the extent of hygiene management necessary in the area. (Landcorp)
- b) Induct all contractors and site employees on any dieback hygiene requirements.
- c) Ensure that earth earthmoving machinery is cleaned prior to entering protectable areas or exiting the site.
- d) Apply hygiene management measures to all machinery, vehicles, footwear and equipment.
- e) Schedule construction and site works in dry soil conditions to reduce the efforts required for hygiene management.
- f) Avoid the movement of soil/basic raw materials in wet soil conditions.
- g) If movement of soil in wet conditions is necessary (in the absence of a Hygiene Management Plan), consult with the DEC on a case by case basis to minimise the spread of dieback during operations.
- h) Ensure that no dieback affected road building materials, mulches or fill are brought into an area that is not affected by dieback.

Emergency Management

12. Proponents must undertake a safety (risk assessment) report for each industry to demonstrate that measures will be taken to identify foreseeable incidents, their likelihood and consequences. Proponents must also justify the adequacy of the control measures used to minimize risk (both on-site and off-site).

Management Guidelines

The Dangerous Goods Safety (Major Hazard Facilities) Regulations 2007 apply to those sites (including mines) where the type and quantity of dangerous goods have the potential to cause serious damage. The Regulations are separate from the storage and handling regulations because they invoke particular requirements for safety management to deal with major incidents.

Development applications should include a hazard assessment and may be referred to the Department of Mines and Petroleum as required.

The Fires and Emergency Services Authority has a role to ensure that appropriate strategic protection is provided to the industries of regional and state importance in the Collie Coal Basin.

Major proponents are to be encouraged to become active members of the Local Emergency Management Committee.

Bush Fire Management

13. Prior to development occurring Landcorp shall prepare a Fire Management Plan for the whole of the SIP. This shall address both internal management and the external management of the proposed burn buffers surrounding the SIP.
14. Prior to development proponents shall prepare a Bush Fire Management Plan for each Development Area. These will refine the measures within the SIP Fire Management Plan (Statement 13) and recognise the specific issues associated with each development including:-
 - i. Any associated safety (risk assessment) report for the proposed industry;
 - ii. Proposed water supplies;
 - iii. Any associated structural fire fighting issues associated with complying with the Building Code of Australia and the Local Government (Miscellaneous Provisions) Act 1960;
 - iv. Egress and access to the development and the boundaries of the Development Area;
 - v. The potential provision of structural refuge areas for staff who might remain on site during an emergency;
 - vi. The management of remnant vegetation and rehabilitation plantings within each Development Area;
 - vii. Development setbacks from extreme bushfire fuels;
 - viii. Design provisions for construction and operation in the presence of bushfire smoke that in some cases may persist for days at a time, reduces visibility, and contributes to particulates in the atmosphere;
 - ix. Fire detection, alert and (initial) response capability; and
 - x. Structural and chemical fire suppression capability.

Management Guidelines

Protection of the SIP from bush fires will be achieved by:-

- The maintenance of primary burn buffers within the broader locality extending more than 3km from the SIP. These will be managed as part of DEC's district fire protection with a maximum fuel loading of 8 tonnes per hectare;
- The maintenance of secondary burn buffers immediately around the SIP with the boundaries of these areas coinciding with existing infrastructure such as access tracks, power lines etc; and
- Provision of appropriate bush fire management measures within the SIP.

Landcorp will prepare a Bush Fire Management Plan that shall be prepared for the whole of the Shotts Industrial Park to the requirements and satisfaction of Council, DEC and FESA. Landcorp is also entering into a Memorandum of Understanding with the Department of Environment and Conservation for the ongoing management of the external burn buffer areas.

Bush fire protection requirements for subdivision and development are identified in Planning for Bush Fire Protection (2010) as referenced in Western Australian Planning Commission Policy DC 3.7. Key issues to be addressed include:

- the location of and responsibility for installation and maintenance of water supply infrastructure such as hydrants and water tanks (Section 3.5);
- Management of fuel loads in remnant vegetation to be protected on and off-site site and how this affects the size of hazard and building protection zones and therefore the siting of buildings (Section 3.6);
- Vehicular access; and
- Design of development

Fire protection of Development Areas should be undertaken without entirely relying on fuel reduction and fire suppression activities within the adjacent State Forest.

Noise Levels

- Noise levels shall not exceed the assigned level as determined by the Environmental Protection (Noise) Regulations 1997, which requires LA10 not to exceed 65dB(A) at any time at the boundary of each Development Area.
- In order to comply with Statement 15 and 18 b) the environmental impact criteria for noise levels are:
 - noise levels should not exceed 35 dB(A) at night time at the boundary of the Special Control Area; and
 - maximum noise levels should not exceed the indicative levels shown in Table 14 between 22:00 and 07:00 hours.

Development Area	Maximum allowed noise contribution for plant operating during night hours – dB(A)		Sound Power Limit	
	Receiving point on Shotts Buffer adjacent to private land to south-west of SIP	Receiving point on Shotts Buffer adjacent to private land to north-east of SIP	Plant Source	Stack Source
DA 1	16	16	110	104
DA 2	18	17	110	104
DA 3	16	18	110	104
DA 4 Urea	33	26	122	116
DA 5 Char	23	33	120	114
NOTES • For industries in Development Areas 1, 2 and 3 where the operating hours do not include "night" hours as defined in the Noise Regulations, higher noise contributions and sound power levels may be allowed.				

Table 14 - Maximum Noise Levels

Management Guidelines

In accordance with Statements 19(a) and (b) any application for Planning Approval must demonstrate that the proposed land use and the associated noise levels can be contained within the Shotts Industrial Park Buffer by complying with the assigned levels as prescribed by the Environmental Protection Authority and contained in Table 14.

In addition, the noise levels from each Development Area should not exceed 65dB(A) at the boundary of the site at any time.

Industrial facilities operating within the industrial park will:

- *be designed and operated in such a manner to mitigate noise levels to as low as reasonably practicable; and*
- *undergo continuous improvement with regard to noise mitigation.*

As Planning Approval would be sought during planning and design stages for industrial developments, direct measurement would not be possible. The indicative sound power levels provide guidance during the design process.

Once an industry is established and operating, compliance with the Noise Regulations would be demonstrated by conducting monitoring at sensitive receptors or at the boundary of the industrial lot.

Noise modelling assumed the char and urea plants were located according to proposed layouts provided by Perdanman and LandCorp (for Wesfarmers). For the three other Development Areas, industries were assumed to be located centrally on the lot.

The noise modelling includes use of topography (based on 5 m contours) and as such the assumed height was the relative ground level (prior to site earthworks) as follows:

- *Development Area 1: 219.1m*
- *Development Area 2: 230.0m*
- *Development Area 3: 225.0m*
- *Development Area 4: 223.8m*
- *Development Area 5: 238.5m*

Therefore, plant sources would be 5m above these heights and stack sources would be 50m above these.

Air Emissions

17. Any significant source of air pollutants is required to undergo assessment, either under Part IV or Part V of the Environmental Protection Act 1986; to ensure that:

- a) The proposal accords with best practice for limiting the emissions of pollutants;
- b) The cumulative concentration of pollutants (emissions from future proposed industries and existing industry) comply with relevant environmental criteria (as verified by modelling).

Management Guidelines

The Environmental Protection Authority considers that the 3 km buffer is sufficient to not require further Air Quality modelling. Despite this, industries are still required to operate and control their air emissions at 'best practice' standards. Modern well designed and operated industries should not cause unacceptable impacts at 3 km and beyond.

The assessment of air emissions and the consequent approval of conditions (Ministerial, Works Approval and Licence) will regulate emissions to allowable limits.

It is conceivable that the application of best practice to the proposed future Shotts Industrial Park industries might lead to air quality meeting residential standards at distances much closer than 3 km from the industries.

While the buffer zone should be seen as an independent planning measure to provide long term adequate separation between incompatible land uses, it is noted that even well operated industries can sometimes experience upset conditions and accidents.

6.3.3 Applications for Planning Approval

18. Applications for Planning Approval shall include the information prescribed by Clause 9.2 of the Scheme and address the following matters unless exempted by the local government:
 - a) Proponents shall provide sufficient information to demonstrate that the proposed land use and any associated emissions considered cumulatively with existing emissions from surrounding industries can be contained within the Shotts Industrial Park Buffer. This information shall also have regard to existing and proposed industries both within the Shotts Industrial Park and surrounding area.
 - b) Proponents shall demonstrate that environmental impact criteria can be met within the management area on a cumulative basis in accordance with its assigned sound power level.
 - c) Geotechnical information to demonstrate the suitability of the site for the proposed use and development.
 - d) Water management as required by an urban water management plan consistent with the approved SIP Local Water Management Strategy.
 - e) Development setbacks from any adjoining wetlands.
 - f) Areas proposed to be cleared of existing vegetation.
 - g) A revegetation and landscaping plan that is responsive to other identified needs that may include water conservation, vegetation protection, minimal fertiliser use, fauna corridors and cockatoo habitat trees.

- h) Proposed management measures to protect any priority flora sites identified on the Structure Plan Map.
- i) Details of all proposed servicing arrangements including water (potable and non-potable), wastewater, solid waste disposal, power supply etc.
- j) Provision of a 'Traffic Impact Study' to the satisfaction of the local government and Main Roads WA that:
 - demonstrates that traffic generated by the proposed development can be accommodated by the existing and/or upgraded local and state road network;
 - determines road upgrading and widening requirements to the road network to accommodate the proposed traffic generated by the proposed development
 - identifies the developer contributions to be provided in regard to any required upgrading and road widening; and
 - provides an analysis of the proposal's impact on traffic peaks, particularly in relation to the Collie townsite.
- k) Fire management;
- l) The existing and proposed ground levels over the whole of the relevant Development Area.
- m) The location, height and type of all proposed structures.
- n) The proposed hours of operation.
- o) If located in the area identified as Development Area 5a on the Structure plan map, proponents are to demonstrate that the potential contaminated site marked on the Structure plan map will be, or has been, managed so that there are no off-site impacts or remediated to a standard suitable for the proposed use.
- p) Any other matter as requested by local government.

Management Guidelines

Application information

The information to be supplied with an application will vary depending upon the nature and characteristics of the proposed use and development. It is expected that the 'predominant use' on each Development Area will address each of the matters listed.

The local government should only exempt the need to supply the prescribed information with an application where:-

- *The application is for a minor or ancillary development;*
- *It is satisfied that the proposed use or development will not have any significant impacts on the area;*
- *Such information has already been provided and approved by the local government for a previous application; or*
- *The local government considers that it is appropriate not to require such information having regard to the objectives of the Shotts Industrial Park.*

EPA Referral

All applications for planning approval within the SIP shall be referred to the EPA for assessment unless:-

- *The EPA has agreed that a specific class of industry will not have any additional environmental impacts in the area; or*
- *The application is for a minor or ancillary development with no significant environmental impacts.*

In referring applications the EPA has not assessed the following environmental issues; noise; ecological linkages; flora and fauna and air quality.

Geotechnical information

The need for suitable geotechnical investigations is emphasised for those areas shown on the structure plan map as having been subject to underground mine workings.

The Geotechnical Study Report notes that the extent of the Stockton Mine workings is unknown and advises that the extent of these workings should be established (Coffee Geotechnics 2008, p.6), further emphasising the need for suitable geotechnical investigations.

Geotechnical investigations are required to allow the local government to classify the site and to design appropriate foundations for the intended developments at the building licence stage.

The geotechnical investigations should confirm the nature and extent of localised shallow groundwater within each Development Area to the level of detail required for Urban Water Management Plan preparation.

Revegetation and landscaping plan

The revegetation and landscaping plan is intended to cover both small scale landscaping and larger scale revegetation. The plan should give consideration to completion criteria for different types of revegetated areas (e.g. screening revegetation compared to that which seeks to achieve ecological outcomes), and to bonding of works to ensure completion criteria are met. Further advice on typical criteria and bonding arrangements can be obtained from the local government. Consistent with Provision 13 fuel load management for revegetation and remnant vegetation areas needs to be considered.

19. In considering any application for Planning Approval the local government shall have regard to:-

- The relevant matters contained in Clause 10.2 of the Scheme;
- The mitigation measures proposed to be undertaken to reduce the level of off-site emissions or risk, including proposed cleaner production or resource recovery techniques and the known potential for any increase or reduction in off-site emissions or risk impacts in the future;
- The potential for the proposal to constrain the operation of existing or future industry or infrastructure protected by the Shotts Industrial Park Buffer;
- The advice received from the Environmental Protection Authority, Department of Environment and Conservation, Department of Water or any other relevant agency.

Management Guidelines

In order to demonstrate that the proposed land use and any associated emissions can be contained within the Shotts Industrial Park Buffer land use emissions are expected to meet the following standards or criteria to the satisfaction of the Environmental Protection Authority, Department of Environment and Conservation or Department of Water.

- a) *Odour – criteria will be established through case-by-case assessments using the methodology outlined in Guidance for the Assessment of Environmental Factors – Assessment of Odour Impacts from New Proposals (EPA, March 2002).*
- b) *Noise – Environmental Protection Noise Regulations 1997, considered with due regard to potential cumulative noise impacts as detailed in Scenario B of the Report for Shotts Industrial Park Cumulative Noise Assessment (GHD 2009).*
- c) *Risk – Guidance for Risk Assessment and Management: Offsite Individual Risk from Hazardous Industrial Plants (EPA, July 2000).*
- d) *Health risk – Department of Health Guideline - Environmental health risk assessment guidelines for assessing health risks from environmental hazards (National Health Council, 2002).*
- e) *Light spill – Control of the obtrusive effects of outdoor lighting (Australian Standard 4282-1997).*
- f) *Dust – Environmental Protection (Kwinana) (Atmospheric Wastes) Amendment Regulations 1999*
- g) *Air quality – National Environment Protection Measure for Ambient Air Quality (NEPC, 1998) for particles (as PM10), ozone, sulphur dioxide, nitrogen dioxide, carbon monoxide and lead and the draft variation to the NEPM for PM2.5.*
- h) *Water quality – Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC & ARMCANZ, 2000).*
- i) *Cleaner production and resource recovery – Environmental Improvement Plans – Western Australian model (DEC, August 2004).*

6.3.4 Scheme Provisions

20. Unless otherwise approved by the local government, Part 5 'General Development Requirements' of the Scheme shall apply to the land as if it were included in the General Industry zone.

6.4 Development Area Descriptions

Development Area No 1

Development Area No 1 has an area of 17.1800 hectares. It is situated adjacent to the Coalfields Highway and bounded by the rail line. The Haul Road crosses the site isolating the western portion.

Direct access to the Coalfields Highway is not permitted and all access must be via Premier Road.

Due to its location on the highway at the 'entrance' to the Shotts Industrial Park it may be appropriate for remnant vegetation to be retained along the highway frontage as a landscape screen.

Development Area No 2

Development Area No 2 has an area of 13.7562 hectares. It is situated on the southern portion of the Shotts Industrial Park on the western side of Premier Road.

Development Area No 2 contains the Verve Energy bore field and pumping transfer station. This occupies an area of 6,381m² and will need to be protected as either a Crown Reserve or by easements. A number of major water pipelines then radiate from this site to various locations including the Muja and Collie power stations.

Immediately to the south of Development Area No 2 is a wetland and the Shotts overflow drainage basin. A 50m development setback is applicable to the wetland which includes provision of perimeter access.

The Premier Coal conveyor bisects the site isolating the western portion. This may need to be fenced and a suitable access point / crossing designated as approved by Premier Coal.

Development Area No 3

Development Area No 3 has an area of 12.2123 hectares. It is situated on the southern portion of the Shotts Industrial Park on the eastern side of Premier Road.

Development Area No 3 contains areas of previous underground mining and will require further geotechnical investigation to confirm suitability for development.

Development Area No 3 contains a portion of Shotts Road and a designated rail crossing which provides access to the Shotts Townsite (Development Area No 5). This access will be maintained for emergency purposes.

Immediately south of Development Area No 3 is a wetland. A 50m development setback is applicable to the wetland.

Development Area No 3 contains priority vegetation along its southern boundary adjacent to the wetland. Specific management measures to protect the priority vegetation are required.

Development Area No 4

Development Area No 4 has an area of 123.3245 hectares. Development Area No 4 occupies the western half of the Shotts Industrial Park and is the site of the proposed urea plant.

The site is bisected by a number of infrastructure corridors including Shotts Road, transmission lines, the coal conveyor, haul road and water supply pipelines.

It also contains the Telstra exchange and optic fibre cables.

Access to Development Area No 4 will be from the proposed realignment of Shotts Road through the adjoining Lot 1 connecting to the highway. Internal access must also be provided to Premier Road as this will provide an important 'loop' connection through the Shotts Industrial Park for emergency access.

Relocation of infrastructure on the site may be required for the development of the urea plant. These matters should be addressed in the preparation of the required site plan for this area and as part of the Planning Application.

Immediately to the south of Development Area No 4 is a wetland area. A 50m development setback is applicable to the wetland which includes provision of perimeter access.

Development Area No 4 also contains priority vegetation along its southern boundary adjacent to the wetland. Specific management measures to protect the priority vegetation are required.

Development Area No 5.

Development Area No 5 has an area of 54.2345 hectares. Development Area No 5 occupies the eastern portion of the Shotts Industrial Park and includes the Shotts townsite and the Premier Coal rail loop / coal loading facility.

Development Area No 5 is the site of the proposed Premier char plant.

Development Area No 5 contains areas of previous underground mining and will require further geotechnical investigation to confirm suitability for development. Development Area No 5 contains old rubbish sites which have been examined for contamination. Rehabilitation of this area should occur before further development within Development Area No 5 commences.

The existing dwelling and lease within the rail loop will be terminated before development proceeds.

The Shotts Townsite will be relinquished with the internal roads closed and the town sites lots amalgamated to form a single title over the site.

Access to Development Area No 5 is provided from Shotts River Road South. It is noted that the Coalfields Highway is proposed to be relocated back to the original alignment of Coalfields Road by 2015 and this will provide direct access to the north eastern corner of Development Area No 5. Pending this happening Shotts River Road South may need to be upgraded and sealed to a standard satisfactory to the local government. Shotts River Road South also requires some minor realignment as it is not fully contained within the gazetted road reserve.

Access is also provided via Shotts Road connecting to Premier Road. This provides an important 'loop' connection through the Park for emergency access.

Development Area No 5 contains priority vegetation near the rail corridor and specific management measures to protect the priority vegetation are required.

7.0 CONCLUSION

The Shotts Industrial Park will be the only area within the Collie Coal Basin that is suited for major industry as the Coolangatta Industrial Estate cannot accept further industry beyond the Bluewaters 3 and 4 power stations. The SIP will facilitate value adding through elaborate transformation of the coal resource.

The SIP is strategically located in an area that is well serviced by infrastructure including road, rail and power.

The Shotts Industrial Park Structure Plan is intended as a strategic planning document that provides a clear direction for the future planning and development of the area. It is intended that the Shire of Collie and the WAPC will adopt the Structure Plan and associated Amendment provisions to guide decision making in the SIP.

As development is proposed a range of additional investigations and assessment will be required in accordance with the detailed investigations that have occurred.

In developing the project Landcorp is ensuring that the proposed site for the SIP is the most appropriate in relation to the proposed activities and surrounding land uses. An understanding of the ecological and the physical characteristics of the site has been developed.

The structure plan has assessed the opportunities and constraints for development. It is seeking to manage and protect ecological water systems, and manage potential pollution emissions, air quality and noise levels.

The proposed recommendations and management statements are designed to ensure the sustainable development of the Park for major industry.

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