

**Appendix 1
EPA Referral
(GHD 2007)**

**Department of Housing
and Works**

Fiona Stanley Hospital and
Health Precinct

Environmental Protection Authority
Referral Document

March 2007



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- B Area Clearing Permit Application
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Executive Summary

The Department of Housing and Works (DHW) on behalf of the Department of Health (DoH) and the Department for Planning and Infrastructure (DPI) are proposing to develop the Fiona Stanley Hospital and Health Precinct (FSHHP) at Murdoch within the context of the Murdoch Activity Centre Structure Plan (Part A). The Western Australian Planning Commission has endorsed the Murdoch Activity Centre Structure Plan (MACSP) after a period of public consultation, review and appropriate amendment.

The MACSP area will be referred to as the 'study area'. This proposal is to be referred for assessment under Section 38 of the *Environmental Protection Act (1986)*.

The construction of the FSHHP is expected to commence in 2008. Completion of Stage 1 of the hospital is anticipated to occur in 2012. Additional stages are planned to occur incrementally over the next 10-15 years. This proposal relates predominantly to the proposed FSHHP development area, which encompasses approximately 57ha.

An assessment of the FSHHP indicates that the proposal has potential to impact on environment aspects within the study area. The main concerns are the:

- » Potential impact on Quenda swamp which is listed as a Conservation Category and Draft Environmental Protection Policy (EPP) wetland;
- » Potential impact on Melaleuca swamp, listed as a Conservation Category wetland, Draft EPP Wetland and listed on the register of the Ramsar Convention;

(If the extent of the impact on Melaleuca wetland is significant then referral under the *Commonwealth Environmental Protection and Biodiversity Conservation Act (1999)* will be required).

- » Proposed clearing of 30 hectares of native bushland within the study area;
- » Potential impact on significant fauna habitats within the study area, due to clearing of habitat trees; and
- » Potential impact on 'sensitive premises' from dust and noise generated during construction and operation of the FSHHP.

On the advice of the Environmental Protection Authority Services Unit (EPASU) GHD Pty Ltd (GHD) have received advice from the DEC to submit an Area Clearing Permit in accordance with Part V of the *Environmental Protection Act (Environmental Protection (Clearing of Native Vegetation) Regulations 2004)*. Due to the staging of the project the proponent is opting for the extended timeframe for the clearing permit, which will be reflected in the application.

DHW, DoH and DPI have completed a significant amount of community consultation. Environmentally, the community identified concern about excessive noise from roads, buildings, sirens, loss of wetlands, bushlands, fauna and fauna habitat, and lack of protection for wetlands. Additionally, generation of stormwater and pollutants from the precinct as well as the need for the relocation of fauna was also of concern.



1. Introduction

1.1 Background

The state is proposing to develop the FSHHP at the Murdoch superblock (Figure 1).

GHD has been commissioned to prepare the referral document for submission to the EPA under Section 38 of the *Environmental Protection Act (1986)*. This proposal relates to the FSHHP, which forms a substantial part of the MACSP area. This development is being referred due to community concern related to the clearing of native vegetation within a nominated Bush Forever site and appropriate offsets being provided, as well as being in the vicinity of a significant wetland and protected fauna habitat.

The proposal includes the development of a major hospital as well as relocation of tertiary services from both Fremantle and Royal Perth Hospitals. It will ultimately be the only major tertiary hospital in the southern suburbs. The FSHHP will be the State's new centre for major trauma services and burns and will provide 24-hour acute care together with teaching, research, medical and surgical services.

1.1.1 Relationship to other proposals

The FSHHP proposal forms part of a larger area known as the Murdoch Activity Centre. The MACSP (Part A) recently adopted by the WAPC is concerned primarily with the development of the FSHHP. A later structure plan [referred to as MACSP (Part B)] will be prepared in the future to deal with the wider Murdoch Activity Precinct, encompassing Murdoch University, Challenger TAFE, St John of God Hospital and other associated areas.

This proposal relates predominantly to the proposed FSHHP development area, which encompasses approximately 57 ha of the total MACSP area. The proposal also includes land that will continue to be used for the purposes of a TAFE college to the south, and a portion of land in the upper northeast area of the superblock that is proposed long term for mixed-use development.

1.2 Document Scope

This document is a submission to the EPA under Section 38 of the *Environmental Protection Act (1986)*. This document provides the following information for the FSHHP site:

- » Background information regarding the proposal;
- » An analysis of the significant environmental and social impacts of the proposal; and
- » A description of the environmental management measures that are recommended for the development.



Figure 1 Locality Map

1.3 Document Structure

To provide the reader with an accurate appreciation of the development, this referral document has been divided into the following sections.

- » Section 1 – provides an introduction and scope of this referral document;
- » Section 2 – describes the statutory requirements of the proposal;
- » Section 3 - describes the existing environment and then identifies and summarises the potential environmental impacts;
- » Section 4 – discusses the potential environmental impacts identified in Section 3, and provides management recommendations for both the construction and operation phases. Additional aspects of the project, that are not required by the Section 38 checklist, also considered to be relevant to the assessment process by the EPA are discussed; and
- » Section 5 – provides information on consultation that has taken place, including government and community consultations.

1.4 Site Description and Surrounding Land Uses

The location of the study area is shown in Figure 1. The proposal area is bound by the Kwinana Freeway to the east, South Street to the north, Murdoch Drive to the west, the southern boundary of the TAFE campus to the south and Farrington Road to the south.

1.5 Proposal Timeframe

The construction of the FSHHP is expected to commence in 2008. Completion of Stage 1 of the hospital is anticipated to occur in 2012 and will comprise 600 beds together with all tertiary medical services including full diagnostics, and support services.

Additional stages are planned to occur incrementally over the next 10-15 years.

1.6 Staging of Proposal

Completion of Stage 1 of the FSHHP is anticipated in 2012 and will comprise 600 beds together with all tertiary medical services including full diagnostics and support services. Subsequent stages will complete the consolidation of tertiary services from Fremantle and provide an additional capacity of 350 to 600 beds.

1.7 Proponent Information

The **Department of Health** is the proponent for this proposal.

The proposal is to be referred to as the **Fiona Stanley Hospital and Health Precinct**.

The Department of Health's contact details are as follows:

Department of Health

189 Royal Street



EAST PERTH WA 6004

The key contact for the proposal is **Ray Adams** – Contact details as follows:

Phone: (08) 6466 7800

Email: rayadams@iinet.net.au

1.7.1 Land Ownership

The existing land tenure for the proposal area is shown in Figure 2.

The area breakdown of the current *public* land ownership within the proposal area is as follows:

Department of Health	164,743 m ²
WA Police	5,283 m ²
Fire and Emergency Services Authority (FESA)	3,301 m ²
Department of Education and Training	241,458 m ²
City of Melville (depot)	30,003 m ²
Vacant Crown Land	10,436 m ²

Figure 2 Murdoch Activity Centre Land Tenure



2. Statutory Requirements

2.1 Rezoning

The portion of land shown as 'Mixed Use' on the structure plan in the north eastern section of the study area is required to be rezoned. The land will be rezoned under the Metropolitan Region Scheme (MRS) and the City of Melville's Community Planning Scheme No. 5. A portion of the 'Mixed Use' site is currently reserved for 'Primary Regional Road' under the MRS and the remaining portion is reserved for 'Public Purposes – Hospital' under the MRS.

The mixed-use area is required to be rezoned to 'Urban' under the MRS in order to facilitate the 'Mixed Use' development and a proposal to amend the MRS will be lodged with the Western Australian Planning Commission (WAPC) in due course. In the event that the WAPC determines that the amendment constitutes a substantial alteration to the MRS, the amendment will be referred to the EPA for consideration.

2.2 Statutory Approvals

The WAPC approved the MACSP (Part A) on the 30th January 2007, subject to modification (Figure 3). The MACSP has since been endorsed by the Minister for Planning and Infrastructure in its modified format.

In addition to the structure plan, the proponent will also prepare a Master Plan for the FSHHP site. The Master Plan will provide the detailed layout of the buildings and internal road network. The Master Plan will be prepared prior to lodgement of the development application with the City of Melville.

The FSHHP site is reserved for 'Public Purposes – Hospital' under the MRS. The WAPC has the authority to determine any development applications on the study area and can approve development with or without conditions. Applications for development approval are submitted through the relevant local authority and immediately forwarded to the WAPC. The local authority has 42 days (or such further period as the WAPC may allow) to provide any comment to the Commission.

The construction of the FSHHP will be subject to a Development Application, which is required to be lodged with the City of Melville, and determined by the WAPC. The Development Application will be lodged and approval obtained prior to the commencement of construction planned for 2008. The Department for Planning and Infrastructure (DPI) is likely to refer the Development Application to the Department of Environment and Conservation for comment, given the scale and extent of the development proposed.

The proponent is also required to lodge a Clearing Permit with the Department of Environment and Conservation (DEC) for the proposal area, in accordance with section 51E of the *Environmental Protection Act (1986)*.

Figure 3 Murdoch Activity Centre Structure Plan



3. Existing Environment

3.1 Assessment Approach

The EPA's *Section 38 (1) Referral Checklist* was used to determine the environmental impacts associated with the project (construction to operation). The assessment identifies which aspects of the existing environment require further discussion and subsequent management measures.

The EPA referral checklist has listed the following environmental impacts, for further discussion:

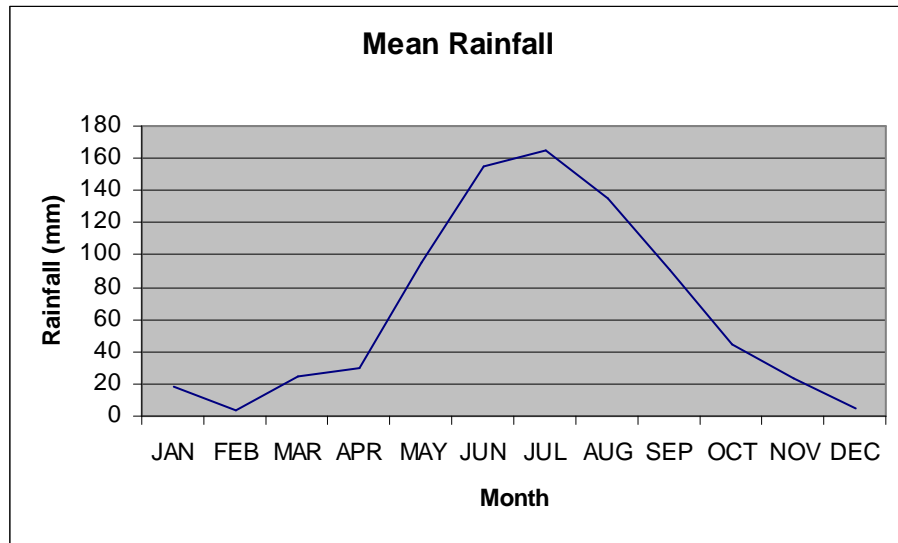
- » Flora, vegetation and fauna;
- » Wetlands;
- » Significant areas and or land features;
- » Water supply and drainage catchments;
- » Pollution;
- » Greenhouse gas emissions;
- » Contamination;
- » Social surroundings; and
- » Risk Management.

This assessment identifies which impacts/aspects require further management. A summary of the significant environmental impacts has been provided in Section 3.30 of this report. Further management measures will be provided in Section 4.

3.2 Climate

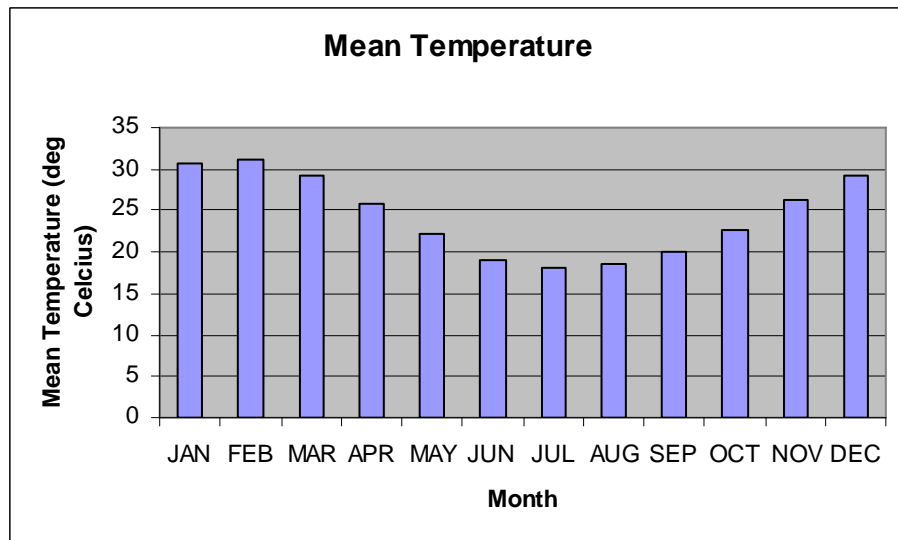
The study area is subject to a Mediterranean climate with cool wet winters and dry hot summers. Construction is to occur over both the summer and winter seasons. Figures 4 and 5 show the mean rainfall and temperature within the Perth Metropolitan Area. Construction management measures will need to take into account the time of year, such as the generation of dust during summer and impact from high water tables during winter.

Figure 4 Mean Rainfall of the Perth Metropolitan Area



Source: Bureau of Meteorology (2007).

Figure 5 Mean Temperature of the Perth Metropolitan Area



Source: Bureau of Meteorology (2007).

3.3 Geology

The study area is located on the Swan Coastal Plain, and is situated on Bassendean Sands, which indicates that it provides good potential for infiltration, due to its sandy composition (GHD, 2006). Previous studies in the same area (South West Metropolitan Rail Package E – Kwinana Freeway and South St Interchange) recorded the presence of coffee rock 700mm deep which will reduce the infiltration rate and hence the water holding capacity of the soil.

3.4 Current Land Use

The study area is largely vacant bushland. However, a portion of the study area currently contains a park-and-ride facility associated with the Murdoch/South Street bus/rail interchange located to the north east of the study area. Police, FESA and community buildings are also located in the central west portion of the study area. The Challenger TAFE campus is located in the south western portion of the site and the City of Melville Depot is located in the south portion of the study area.

3.5 Contaminated Sites

A search of the DEC's Contaminated Sites Database was undertaken for the proposed study area and indicated there were no contaminated sites registered under the *Contaminated Sites Act 2003*. Therefore, soil and groundwater contamination assessment has not been undertaken for the study area, as it has not been deemed necessary.

3.6 Acid Sulphate Soils

The WAPC's Planning Bulletin No. 64 indicates that there is a Moderate risk of acid sulphate soils occurring in the study area. This relates to acid sulphate soils (ASS) that are found <3m from the surface (refer to Figure 6).

The DEC *Draft Identification and Investigation Guidelines 2004* provides guidance on how to identify situations where ASS investigations are necessary. It is advised that ASS investigations will be required when;

- » Disturbance of the soil or alteration of groundwater levels is proposed (excavation below the water table);
- » Lowering of the water table, whether temporary or permanent (e.g. for groundwater abstraction, dewatering, installation of new drainage, modification to existing drainage) in areas depicted in the ASS risk map as "high risk of ASS or potential ASS occurrence" or dewatering operations in areas depicted in the ASS risk map as "moderate to low risk of ASS or potential ASS occurrence" within 500m from the high risk areas; and
- » The highest known groundwater level is less than 3 m from the surface.

It has been determined that the site meets all of the above criteria, as such management measures will be set out in Section 4.2.

Figure 6 Acid Sulphate Soils



3.7 Hydrology

Reference to the DEC's *Perth Groundwater Atlas* (2006) provided the following information regarding hydrology within the study area;

- » Groundwater levels in the area reach 18 m below ground level in the elevated southern zones of the study area;
- » In the northern and central parts of the study area the groundwater level is at the surface or within 1 m of the surface. Surface expressions occur at the neighbouring Quenda and Melaleuca Wetlands.
- » The general direction of the groundwater movement is in a north west direction;
- » The groundwater is fresh (salinity <500 mg/L TDS); and
- » Groundwater levels fluctuate by up to 2 m during the year.

Reference to the Department of Water's, *Geographic Data Atlas* (2006) indicates that the study area is not located in a groundwater or surface water protection area, Underground Water Supply and Pollution Control area, or Public Drinking Water Supply Area.

3.8 Significant Areas and/or Land Features

The *Environmental Protection (Environmentally Sensitive Areas) Notice 2005* identified the following triggers that indicate the presence of an Environmentally Sensitive Area (ESA); they are addressed in the respective sections of this report;

- » A defined wetland within the study area, and the area being within 50m of the wetland (Section 3.9); and
- » Areas covered by the lakes to which the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992* applies (Section 3.9).

3.9 Potential Impact on Wetlands

There were two wetlands identified within close proximity to the study area. Quenda Swamp is located in the northwest corner of the Murdoch superblock and is bordered by the St John of God Hospital (Figure 7). This waterway is located within approximately 180m of the most northwesterly point of the study area and is therefore within a 200m zone of influence of the wetland.

This wetland is classified as a Conservation Category wetland in the Wetlands of the Swan Coastal Plain (Hill, *et al.*, 1996) and listed on the Draft Environmental Protection Policy (EPP) Wetlands. The wetland is therefore regarded as a significant wetland and has a high level of protection. The Wetland Management Plan prepared by the City of Melville for the Quenda wetland indicated that the wetland has a high conservation value for fauna habitat and floristic diversity.

Melaleuca Swamp is located southwest of the study area, the wetland is approximately 400m from the proposed study area (Figure 7). Melaleuca Swamp is a Conservation Category wetland and is listed on the Draft EPP Wetlands Policy. This swamp forms part of the Beeliar wetland chain, and as such is listed on the register of the Ramsar Convention.



In addition to Quenda and Melaleuca wetlands, an artificial pond was identified within the study area. The artificial pond is located in the centre of the study area within the nominated Bush Forever site. The artificial pond is being managed by TAFE, and they are working towards re-establishing the vegetation surrounding the wetland in order to create a well-functioning wetland with associated riparian vegetation.

Figure 7 Existing Environmental Constraints

3.9.1 Impoundment

Due to the buffer provided by the St John of God Hospital, Quenda Wetland will not be impounded, which would partially or completely isolate the hydrological regime of the wetland. This is also true of Melaleuca Swamp due to the distance from the construction works.

3.9.2 Vegetation Clearing

The development will result in clearing of native vegetation at the periphery of the 200m zone of influence of the Quenda wetland. Clearing will also occur directly adjacent to the north of the artificial pond and within close proximity to the eastern and western extent of the pond. Clearing will not occur within the 200 m zone of influence of Melaleuca wetland.

As clearing may alter the hydrological balance of the wetlands, in particular Quenda wetland and the artificial pond, a hydrogeological study will be undertaken to determine the significance of the impact on the wetlands.

3.9.3 Excavation and Dewatering

Groundwater is in close proximity to the surface, so it is essential before excavations commence and foundations are laid for infrastructure.

Dewatering is likely to have the following impacts on the surrounding wetlands:

- » Disturbance to the groundwater levels in the area; and
- » Potential adverse effects on the water quality of the wetlands.

If dewatering is required during excavations, the likely receiving environment is Quenda Swamp or the artificial pond. The water quality is likely to be impacted by increased turbidity from sand and organic matter that is drained to the wetland. Water quality is also likely to be adversely effected by the addition of acidic water, which is created when potential acid sulphate soils are dewatered.

3.9.4 Drainage Impacts

An assessment was undertaken of the current state of the drainage infrastructure onsite. The assessment confirmed a lack of stormwater drainage infrastructure for the majority of the proposed study area, which is bushland. The main local storm water drainage infrastructure comprises underground pipes along the major roads around the study area and in the residential area to the east.



The City of Melville has advised that no additional storm water inflows are to enter the existing drainage infrastructure along Murdoch Drive and South Street. This is due to the storm water draining via underground pipes to Quenda Wetland, a Conservation Category wetland. It is possible that the wetland may receive groundwater inflows as it lies down gradient of the development area. However, this is not the desired outcome as the wetland may be impacted by changes to the hydrology and water balance within the study area

The City of Melville is not willing to receive storm water from the study area and disposal to the Water Corporation main drain on the east side of the Kwinana Freeway is impractical, due to restricted access across the freeway. As such it is likely that 100% of the stormwater generated will be disposed of on site (GHD, 2006a).

It is expected that storm water generated on site will increase substantially with the development. This is due to the large proportion of impermeable area that will result in decreased infiltration of stormwater locally.

3.10 Supply of Water

An assessment by the Water Corporation indicates that there is sufficient existing external water infrastructure in the vicinity of the MACSP area to service the proposed development. There is potential to connect into the mains water supply at South Street and Murdoch Drive.

There is currently no information available in regard to the water requirement during construction and operation of the proposal. This information will only be provided at the detailed master-planning stage.

The Water Corporation has confirmed that there is sufficient water pressure to service the whole site. It is envisaged that standard water reticulation mains, typically DN150 to DN200, generally located in road reserves will be required to service the study area. This will be confirmed during preliminary design.

3.11 Flora

A flora and vegetation field assessment was undertaken on the 6th and 10th of October 2005 by GHD Pty Ltd. The Flora and Vegetation Assessment report can be found in Appendix A.

3.11.1 Declared Rare Flora or Priority Flora Species

A search of the Commonwealth's Department of the Environment and Water Resources (DEW) *Environmental Protection and Biodiversity Conservation Act (1999)* Protected Matters database was undertaken for the study area. There were four Declared Rare species that potentially occur in the area. These are:

- » *Caladenia huegelii*;
- » *Caladenia* sp. Jarrah forest;
- » *Drakaea elastica*; and
- » *Lepidosperma rostratum*.

Significant flora in WA are protected under the *Wildlife Conservation Act (1950)*, which is administered DEC. The DEC specifically protects Declared Rare Flora (DRF) species and priority listed flora (PLF) species. A search of the DEC's Rare Flora Databases and the WA Herbarium records indicated 15 significant species in the vicinity of the study area. The results are presented in Table 1.

Table 1 Significant Flora known to occur in the vicinity of Murdoch Superblock and Murdoch TAFE

CALM Rare Flora Database	Western Australian Herbarium Records
<i>Acacia lasiocarpa</i> var. <i>bracteolata</i> : long peduncle variant (P1)	<i>Aotus cordifolia</i> (P3)
<i>Tripterococcus paniculatus</i> (P1)	<i>Phlebocarya pilosissima</i> subsp. <i>pilosissima</i> (P3)
<i>Amanita carneiphylla</i> (P2)	<i>Amanita carneiphylla</i> (P2)+
<i>Amanita griseibrunnea</i> (P2)	<i>Amanita griseibrunnea</i> (P2)+
<i>Byblis gigantean</i> (P2)	<i>Dodonaea hackettiana</i> (P4)
<i>Stylidium longitubum</i> (P3)	<i>Caladenia huegelii</i> (Declared Rare)
<i>Dodonaea hackettiana</i> (P4)	<i>Hydrocotyle striata</i> (P1)
<i>Microtis media</i> subsp. <i>quadrata</i> (P4)	

+ Please note: both species of *Amanita* are Basidiomycota – members of fungi, rather than true plants. Only true vascular plant species were surveyed during this project.

The field survey completed in October 2005 confirmed that no DRF or priority flora species identified on site. However, species of *Caladenia* that occur within the *Caladenia huegelii* complex were noted. The *Caladenia* species identified is the species *Caladenia arenicola*, which is not a DRF species.

3.12 Threatened Ecological Communities

A desktop search of the DEC Threatened Ecological Communities (TEC) database did not identify any TEC's within the Study area. This was confirmed during the field survey in October 2005.

3.13 Vegetation

The vegetation within the study area was identified as being within the South western Botanical Province (Beard, 1990). The vegetation is comprised of dryland and wetland vegetation representative of the Bassendean Central and South Vegetation Complex. Vegetation mapping indicates the following vegetation types as described by Heddle *et al* (1980);

- » Woodlands of Jarrah-Banksia on the sand dunes; and
- » *Melaleuca* species in the low-lying depressions and swamps.

A field study was undertaken for the site and identified three vegetation communities (Figure 8). The bushland within the site is predominantly Jarrah-Banksia Woodland on sandy slopes, which is in excellent condition. There are smaller, low lying areas that contain patches of *Melaleuca* damplands, which range from excellent to degraded



condition as well as the central dampland of *Banksia littoralis* and *Melaleuca pressiana*. The understorey of the dampland is sparse however the vegetation is in very good to excellent condition.

3.13.1 Vegetation Condition and Representation

Generally, the vegetation condition was recorded as “Very Good to Excellent” based on condition rating provided by Bush Forever (Government of Western Australia, 2000) (refer to Figure 9). The majority of disturbance was observed around the perimeter of the study area at existing tracks. Most of the weed species were recorded along the tracks and firebreaks.

The condition rating of Bush Forever (Government of Western Australia, 2000) describes both the dampland and central Banksia woodland communities as “depleted” and of “least concern”, respectively. This indicates that greater than 30% and up to 50% of the pre-European extent of the dampland exists. Further, the central Banksia woodland still has greater than 50% of pre-European extent and is subject to little degradation over the majority of the Swan Coastal Plain.

The vegetation types at the site are well represented within the Ken Hurst Park (located south-east of the Roe Highway), and within the small pockets of public open space. According to the floristic types from Gibson *et al* (1994) all vegetation types on site are regarded as ‘well reserved’, indicating that their reservation and conservation status is low risk.

Figure 8 Vegetation Type

Figure 9 Vegetation Condition

3.14 Dieback and Weed Infestation

A formal *Phytophthora cinnamomi* (dieback) assessment of the study area has not been undertaken. However, during the 2005 Flora survey, vegetation, which appears to have been infested by dieback, was noted on the north-facing slope to the east of the St John of God Hospital. Dieback infestations spread through bushland either naturally; through soil water movement, or artificially through vector movement of soil on vehicles; during fencing or firebreak/track maintenance; and occasionally via foot traffic. Based upon visual inspection, a large percentage of the site appears to be free of dieback infestation.

Eighty-eight introduced taxa were recorded for the surveyed area. Of these, 79 species are regarded as weeds within the Perth metropolitan area, mainly belonging to the Asteraceae and Poaceae families. Generally, weed invasion was restricted to areas around the edge of the site and along access and firebreak tracks. Limited and scattered weeds were noted within the core areas of the bushland and these species did not appear to be reducing native plant diversity. There was one species of Declared Plant, Bridal Creeper (*Asparagus asparagoides*) noted during the 2005 field survey.



3.15 Vegetation Clearing

Given the encroachment onto ESAs, an assessment against the 10 Clearing Principles was undertaken, and is contained in Appendix B. This project has been assessed as being at variance with principles (a) and (b). Therefore an area clearing permit will need to be obtained for the proposal.

3.15.1 Application for an Area Clearing Permit

This development requires clearing of approximately 30 hectares of native vegetation (refer to Figure 10 for extent of clearing). GHD have received formal advice from the DEC to submit an Area Clearing Permit in accordance with Part V of the *Environmental Protection Act (Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.

Due to the staging of the project the proponent has received advice from the DEC that the application could nominate an extended timeframe (up to 15 years). As an Area Clearing Permit has a standard 3-year term of validity, the proponent is opting for the extended timeframe for the clearing permit, and this will be reflected in the application.

The clearing permit will be submitted to the DEC for assessment in conjunction with this report. A copy of the clearing permit application is attached in Appendix B.

Figure 10 Extent of Native Vegetation Clearing

3.15.2 Clearing Offsets

It is estimated that 30 ha of vegetation clearing will be required (predominately Jarrah-Banksia woodland), with approximately 9 ha of bushland remaining within the referral area to offset the loss of vegetation; the objective being to rehabilitate and improve the existing vegetation communities that remain.

During the formal public consultation for the Murdoch Activity Centre Structure Plan several comments were received specifically in relation to offsets. Notably, the City of Melville requested adequate offsets be provided, and the Western Australian Planning Commission flagged the notion of offsets when the proposal was presented for endorsement.

If the clearing permit is approved and issued for the proposal, it may be necessary for the proponents to consider environmental offsets in the form of protection of other good quality vegetation and/or regeneration works on site.

The clearing of vegetation within the MACSP area for the FSHHP, whilst significant, is the result of the state being required to implement the actions of its Health Reform program. The provision of this community service facility at Murdoch has a regional significance, and stands to provide both a service to the community and a significant source of employment.

The associated mixed-use precinct, which will include community facilities, retail and office space and residential accommodation, will also deliver employment benefits, and will contribute to increasing the use of the rail and bus public transport network.



Moreover, the design and development of the FSHHP proposes to include the provision of co-generation, recycling of wastewater, and other sustainability measures. The DoH has also committed to replanting with native species where possible.

The proponent acknowledges the extent of clearing required for the proposed FSHHP, and requests that the clearing of this site be considered a 'special circumstance', as foreshadowed in the *Environmental Protection Authority's Position Statement No. 9 – Environmental Offsets* (Jan 2006).

3.16 Bush Forever

In 1999 a joint letter was drafted by South Metro TAFE, Melville City Council and the Health Department regarding the study area being included on the Bush Plan register.

The study area is currently nominated as a Bush Forever site. However, the proponent has written to the DPI to request the withdrawal of the Bush Forever nomination, for the following reasons:

- » The government has announced the intention to develop a major tertiary hospital on the study area in order to provide improved health services to Western Australia; and
- » The government has also announced its intention to develop the Murdoch Activity Centre, a portion of which includes a mixed-use development, to maximise the value of the adjoining Perth to Mandurah railway and the proposed hospital.

A copy of the letter to DPI regarding the request to withdraw the Bush Forever nomination from the site is included in Appendix C.

3.17 Fauna

A Fauna Assessment was undertaken by GHD Pty Ltd, in October and November 2005. A copy of the report can be found in Appendix D. Below are the results of the initial desktop assessment and the subsequent field survey.

3.17.1 Priority Fauna

The DEH maintains a database of Matters of National Environmental Significance that are protected under the *Environmental Protection and Biodiversity Conservation Act (1999)*. A search of the database was conducted for matters of significance that relate to the study area. The following species were recorded as being within the study area:

- » Baudin's Black Cockatoo; and
- » Chuditch.

Additionally, a search of the DEC's Threatened Fauna Database was conducted for any rare and priority species that may occur in the Murdoch area. A number of threatened species were identified, as follows:

- » Carnaby's Black Cockatoo;
- » Numbat;
- » Peregrine Falcon;
- » Lined Skink;

- » Native Bee;
- » Western Brush Wallaby; and
- » Quenda.

The subsequent survey of the study area identified three protected fauna species on site. These are the Quenda, Lined Skink and Carnaby's Cockatoo. The remaining species that were listed as potentially occurring in the area are not likely to be impacted by development. Other protected fauna, such as the Peregrine Falcon, may use the study area sporadically, and as such removal of this habitat may not have a significant impact on this species. A complete list of the species identified on site is included within the Fauna Assessment at Appendix D.

3.17.2 Fauna Habitat

A healthy and diverse understorey, as found in the study area, is important habitat for mammals and reptiles. The study area also has a number of microhabitats that would be utilised by reptile species, such as areas of thick leaf litter, logs and loose sand. The study area also has habitat value to waterbirds and frogs due to the artificial pond and fringing vegetation.

There are parts of the study area that are completely degraded, and offer little habitat value. These disturbed areas are located primarily on the periphery of the study area but there are a number of access tracks/firebreaks through the centre of the area that divide the habitat areas and have created some edge effects, with weed invasion into habitat areas along the disturbed section.

The Jarrah – Banksia woodland holds the highest habitat values of the study area (refer to Figure 8), as it is in good condition and supports a number of fauna species. This habitat type is common on the Swan Coastal Plain and is well represented in reserves in the Perth region.

The tall trees have value as potential nesting habitat; however, the hollows in most of the tall trees on this site are not large enough to be used by the significant species, such as Masked Owls and Carnaby's Cockatoos.

3.17.3 Potential impacts on Priority Fauna

Clearing may impact on fauna species through loss of habitat and habitat linkages. Clearing of the site for construction may have impacts on the Quenda population at Quenda Wetland, as this area of habitat may not be large enough to support the population long-term. Habitat connections to other Quenda populations, such as those at Murdoch University and Beeliar Wetlands are likely to improve the long-term viability of the Quenda.

The site also contains potential feeding habitat of Carnaby's Black Cockatoo, a species protected under the *Environmental Protection and Biodiversity Conservation Act (1999)*. This species may use the site occasionally for foraging, but while this individual site is considered to be not critical to the survival of the species, it forms part of the increasingly reduced and isolated network of patchy feeding grounds across the Swan Coastal Plain.

The Lined Skink has a very limited species distribution and has been heavily impacted by clearing within this area. However, the species has adapted to urbanisation of its habitat and is now found primarily within the backyards in the southern suburbs. The clearing of the study area may reduce the availability of habitat for this species, but it is likely that the skink will re-establish itself within the proposed Health Precinct.

3.18 Aboriginal Heritage

A search of the Department of Indigenous Affairs (DIA), Register of Aboriginal Sites was conducted. The findings are only relevant to the FSHHP as the second study area is related to the Kwinana Freeway Southern Connection (KFSC), which is the second stage of this development and not subject to this referral. The complete report for the Aboriginal heritage survey is attached in Appendix E.

The search delineated 17 registered sites within 1km of the survey area. However, only one of these sites, #3708 Murdoch Drive Camp, is recorded on the southern border of the study area. A site verification program conducted by the DIA in 1999 - 2000 could not locate the site or any archaeological material associated with site #3708. It appears that the site has been destroyed by previous construction activities in the area. Consequently, the development proposed for the study area will not have any additional impact on site #3708.

Fisher Research Pty Ltd (Fisher Research) was commissioned to conduct an Aboriginal Heritage survey for two areas within the Murdoch superblock. Field surveys were undertaken between May and June 2006. The surveys identified no Aboriginal sites in the survey area. Furthermore, no new ethnographic or archaeological sites were identified during the survey.

In terms of The *Aboriginal Heritage Act 1972* there are no heritage impediments to the proposed development proceeding.

3.19 Native Title

The National Native Title Tribunal states, "*Native Title is extinguished on privately owned land (including family homes or freehold farms), on residential, commercial and certain other exclusive possession leases and in areas where government has built roads or other public works*" (National Native Title Tribunal. 2000, p4). As the proposed site is located on vacant Crown Land, Native Title does apply to this site.

The advice provided by the ethnographic or archaeological reports prepared by Fisher Research indicated that two unregistered Native Title claims cover the Perth metropolitan area, including the survey area:

- » WC95/86 - Ballaruks Peoples (BPNTC); and
- » WC03/6 - Single Noongar Claim Area 1 (SNC).

It has been confirmed that Native title applies within the study area; further discussion and subsequent management measures will be expanded on in Section 4.7.

3.20 Non-Indigenous Heritage

A search of the *Environmental Protection and Biodiversity Conservation Act (1999)* Protected Matters database was conducted and identified one place listed on the Register of the National Estate within 5km of the site. The Beeliam Regional Park was identified from the search, however it is not likely to be impacted by the proposed health precinct as the Beeliam Regional Park is located approximately 600m from the proposed project area, and there are sufficient barriers (i.e. main roads, residential and recreational areas) in place between the site and the Beeliam Regional Park.

No World Heritage Properties, National Heritage Places, Commonwealth Lands or Commonwealth Heritage Places were identified by the *Environmental Protection and Biodiversity Conservation Act (1999)* Protected Matters search tool.

A search of the Heritage Council of Western Australia Register of Heritage Places was also undertaken. The search identified 3 non-indigenous heritage sites within the locality of Murdoch. However, only one is located within an area that is likely to be affected by the proposed health precinct. This site is the Murdoch Police Station (Ref # 17407), at 120 Murdoch Drive, located within the extent of the referral area.

3.21 Construction and Operation Traffic

The FSHHP will draw different types of commercial vehicles, both during the construction and development stage and also during the operation of the hospital. The traffic into FSHHP is likely to include ambulance vehicles, delivery vehicles, rubbish trucks, couriers and maintenance and goods transport vehicles such as forklifts and utilities. Primary access to the study area will be obtained from Murdoch Drive, Farrington Road and South Street.

The FSHHP site is provided with good access to a primary distributor road and integrator roads, which can accommodate commercial and emergency vehicles coming to and from the FSHHP. It is considered that the commercial and emergency vehicles coming to and from the FSHHP will have minimal impact on the amenity of the locality, given that the surrounding road network of South Street, Farrington Road and Murdoch Drive currently accommodate a range of commercial and heavy vehicles.

The detailed internal layout for the FSHHP will be planned at the Master Planning stage to be undertaken for the hospital site.

3.22 Noise and Vibration

The proposed development of the FSHHP may impact on a number of noise sensitive premises in the vicinity of the proposal area. Including;

- » The St John of God Hospital and the Palliative Care Hospital;
- » The Murdoch Police Station;
- » FESA;
- » Challenger TAFE;
- » Rangeview Remand Centre;
- » City of Melville Depot; and

- » Ensign Services.

Due to the number of potential noise sensitive receivers, off-site noise emissions and vibration are considered to be a significant issue. The potential sources of noise during construction are earthmoving equipment throughout the study area and general construction activities.

Potential impacts include:

- » Intermittent high levels of noise with cause a nuisance to sensitive premises; and
- » Exceedence of occupational noise levels to construction workforce.

In order to manage noise emissions adequately, Section 4.10 of the report will provide appropriate management actions.

3.23 Solid Waste

Solid waste will be produced from both the construction phase and operational phase of the development.

During the construction phase Construction Contractors are likely to generate inert wastes that will require disposal. These wastes may include litter and materials in the waste stream that result from construction.

Through the operation of the FSHHP both general and controlled waste will be generated. Controlled wastes are generated from clinical applications and require special consideration when being disposed of. According to the DEC's *Landfill Waste Classification and Waste Definitions 1996*, the controlled waste consists of the following:

- » Special waste;
- » Clinical Waste; and
- » Cytotoxic Waste.

Incineration is the current preferred practice for treatment of these wastes. All biomedical waste will be stored in drums and bags and will then be disposed of off site by authorised contractors.

General waste that includes inert and intractable waste is directed to landfill for disposal. There is however an opportunity to manage general wastes through recycling facilities for sorting, storage and processing of paper, plastics, specific glass materials, drink containers, aluminium and other metals. The extent of these facilities will be reliant on the management practices within the health precinct.

Generation of solid wastes during operation of the FSHHP has been identified as being a potential environmental impact. Therefore, management actions will be proposed in Section 4.11.

3.24 Non-Prescribed Premise

Reference to the Environmental Protection Authority's *General Guide for Referral of Proposals to the EPA under Section 38 (1) of the Environmental Protection Act (1986)* has confirmed that the proposed development of the FSHHP is not classified as a prescribed premise. The guide specified that the development is not a prescribed



premise as there is no disposal of biomedical waste or incineration of medical waste on site.

3.25 Wastewater

Wastewater that is generated on site will be directed to the sewerage system, as the main line is along the east west road reserve. Primary treatment is not occurring on site; however there may be some screening of wastewater before entering the main line.

The Murdoch Activity Centre Structure Plan (2006a) confirmed that there is significant existing external sewerage infrastructure in the vicinity of the MACSP area to service this proposed development. The existing 1220 diameter Bibra Lake Main Sewer is located in South Street, extending southward to Farrington Road Main Sewer.

Discussions with the Water Corporation suggest there are no likely issues regarding sewerage serviceability. The hospital will also require an Industrial Waste Permit for the disposal of waste as outlined in the Water Corporations' Industrial Waste Information Brochure (IW PUB35) regarding the quality and quantity of hospitals discharging waste to sewers.

3.26 Liquid Effluent

The operation of the FSHHP will result in liquid effluent discharge. With respect to effluent discharge, biomedical waste has strict guidelines for its disposal as specified by the DEC. All biomedical waste will be stored in drums or appropriate storage bins and will then be disposed of off site using authorised contractors as per the DEC's *Guideline for Controlled Waste Carriers, No 2*.

Liquid Effluent generated on site will either be contained within the sewerage infrastructure or disposed of by authorised contractors. There will be no discharge of wastewater to the surrounding waterways.

3.27 Risk Management

3.27.1 Onsite Risk

The proposed FSHHP will not be classified as a hazardous facility under the *Explosives and Dangerous Goods Act*, as it will not involve the storage of any chemicals to the amount specified under the Act. However, the Department of Consumer and Employment Protection (DOCEP) has advised that they will regard the FSHHP as a 'sensitive premises', which will ensure that any surrounding industry storing dangerous goods will need to manage the dangerous goods to ensure the hospital is adequately protected.

High Pressure Gas Mains

One hundred Steel 5.2 High Pressure gas mains are located part way in Farrington Road, Bramanti Road to service Ellis Laundry and Murdoch Drive to service the St John of God Hospital.



The High Pressure System is required to be reinforced and includes extending the existing high pressure main in Murdoch Drive by completing the 'loop' which shall ensure a secure supply of High Pressure gas to the hospital should part of the line need to be decommissioned due to repairs or maintenance. This reinforcement includes sufficient capacity for Co-Generation power supply to the future hospital. The system reinforcements mentioned are for the ultimate supply of gas to the hospital (GHD, 2006).

Industrial Foundation for Accident Prevention

The proposal is also located near the Industrial Foundation for Accident Prevention (IFAP), which may be considered a hazardous industrial facility. However, IFAP is located south of the study area (south of Farrington Road). It is understood that the IFAP site holds training courses for industry, including training in fire fighting and emergency response and in the management of major hazards. These training courses may require the storage of dangerous goods on the premises, however it is anticipated that the impacts of the construction and development of the FSHHP will not extend to the IFAP site. As previously mentioned, DOCEP has advised that the FSHHP will be treated as a sensitive premise and that surrounding industries will be required to manage their operations to protect the hospital.

3.27.2 Offsite Risk

Jandakot Airport

The FSHHP site is located approximately four kilometres to the northwest of Jandakot Airport and within the protected air space area. Building height limitations range from 73.5m AHD to 110m AHD.

An overhead departing flight path currently accommodating approximately 22,800 movements per annum may also affect the study area. Plume velocity generated from hospital exhaust features will be considered under the *Airport Regulations 1996*. The maximum exhaust velocity is currently set at 4.3mps.

During the construction phase, the potential intrusion into the protected air space by cranes will attract the involvement of the Civil Aviation Safety Authority (CASA) as well as Air Services Australia and the Department of Transport and Regional Services.

Emergency helicopter rescue flights from Jandakot are increasing and CASA officers are suggesting that the FSHHP may require more than one helipad in the long term (GHD, 2006a).

3.28 Expected Visual Impacts

The FSHHP will be located adjacent to the existing St John of God Hospital and will be designed as a complimentary land use, as both are sensitive premises. The proposed development may have a visual impact on the surrounding area; however, the surrounding environment is already developed so this should be taken into consideration.

The premises will be designed in a manner that minimises the negative visual impact on the locality. The urban design component of the MACSP requires that the design and development within the MACSP area integrate complimentary streetscape and



landscape features (i.e. providing trees, footpaths, lighting) that enhance the appearance of the buildings and provide continuity of activity from the street (GHD, 2006a). At the completion of construction, the FSHHP will undergo landscaping of the site to further improve visual amenity from the roadway and surrounding business areas.

The detailed design of the buildings, including height and scale will be subject to a future Detailed Area Plan that will be referred to the community and stakeholders for public comment.

Building height will also be limited by the Civil Aviation Safety Authority (CASA) requirements relating to the protection of the Jandakot Airport air space.

3.29 Air Quality

The operation of the FSHHP is not likely to produce any significant point source emissions to air (including particulates and significant greenhouse gas emissions > 100,000 tonnes per annum of CO₂). As discussed there are no significant point sources of gas emissions therefore, it is not necessary to propose measures to manage the minimal emissions on site. Based upon this information air emission modelling is not required.

The hospital will not be constructed with an operating incinerator; therefore any significant emission sources from the development have been eliminated.

Generation of dust during operation will not be an issue due to asphalt and sprinkler systems. However, dust generated during construction will be of concern, and is discussed below.

3.29.1 Dust Emissions Construction Phase

The development of the FSHHP will impact on a number of sensitive premises within 1 km of the project area. Impacts on air quality resulting from dust emissions are expected to be a significant issue during construction. The sensitive premises include;

- » The St John of God Hospital and the Palliative Care Hospital;
- » The Murdoch Police Station;
- » FESA;
- » Challenger TAFE;
- » Rangeview Remand Centre;
- » City of Melville Depot;
- » Murdoch University East Precinct; and
- » Ensign Services.

Dust management actions will be proposed in Section 4.13.



3.30 Summary of Potential Environmental Impacts

Table 2 Potential Environmental Impacts Requiring Management

Section	Potential Impact	Discussion
3.9	Potential Impact on Wetlands	4.1
3.6	Acid Sulphate Soils	4.2
3.14	Dieback and Weed Infestation	4.3
3.15	Vegetation Clearing	4.4
3.17	Fauna	4.5
3.18	Aboriginal Heritage	4.6
3.19	Native Title	4.7
3.20	Non-Indigenous Heritage	4.8
3.21	Construction and Operation Traffic	4.9
3.22	Noise and Vibration	4.10
3.23	Solid Waste	4.11
3.27	Risk Management	4.12
3.29	Air Quality	4.13
Additional Construction Management		
	Stored Fuel and Oil	4.14.1
	Environmental Incident Management	4.14.2



4. Environmental Constraints and Recommended Management

A number of potential issues have been identified for the project. These were identified in Section 3, with recommended management actions for these issues provided for in this section of the report.

4.1 Potential Impact on Wetlands

Section 3.9 indicates that there are two protected wetlands in the vicinity of the Study area, Quenda and Melaleuca Swamp as well as the artificial wetland. These wetlands have been identified as being potentially impacted by the proposal as they located within approximately 180 m, 400 m and 10 m, respectively of the study area.

Management Objective

To ensure that no wetlands (including Quenda wetland, Melaleuca wetland and the artificial pond) are significantly impacted by the proposal.

Management

The Project Manager will be responsible for ensuring the following actions are completed during the *pre-construction* phase;

- » A hydrogeological study should be undertaken to determine if the wetlands' water levels will be impacted; and
- » If the extent of the impact on Melaleuca wetland is significant (listed by the Ramsar Convention) then referral under the *Environmental Protection and Biodiversity Conservation Act (1999)* will be required.

The Project Manager will be responsible for ensuring the following actions are carried out *during construction*;

- » Abide by all recommendations made in the hydrogeological study;
- » Monitor surface water levels of both Quenda and Melaleuca swamp, as well as the artificial pond to ensure there is no major changes to the hydrology and water balance; and
- » If there are significant changes to the surface water levels, the proponent will artificially maintain the water levels in the wetlands and pond.

4.1.1 Dewatering

Section 3.9.3 indicates that groundwater will be abstracted as a result of dewatering within the study area.

Management Objective

To ensure that the water quality of Quenda wetland is not adversely impacted by discharging of groundwater from site dewatering and drawdown.



Management

The following actions are recommended during the *pre- construction* phase:

- » A water quality analysis is to be undertaken to demonstrate that the wastewater complies with the state water quality management strategy or other appropriate standard;
- » Consult with the Department of Water (DoW) to ensure that discharging the groundwater in to the wetland is acceptable, in the event the water quality complies with the appropriate standards; and
- » If the water is not of suitable quality for discharge, then alternatively the proponent will construct a drainage swale to contain groundwater discharge.

4.1.2 Drainage Impacts

As discussed in Section 3.9.4 an assessment was undertaken of the current state of the drainage infrastructure onsite. The assessment confirmed a lack of storm water drainage infrastructure for the majority of the proposed development area. Site drainage infrastructure should be put in place, in line with the recommendations below.

Management Objective

No impacts on surface or subsurface drainage associated with the construction of the development.

Management

The following actions will be responsibility of the proponent during *construction*:

- » Develop management procedures to ensure that spills (i.e. fuels and oil) do not drain into the stormwater;
- » Manage recharge to groundwater to minimise potential impacts on the Quenda Melaleuca Wetlands and the artificial pond, avoiding any substantial increase or decrease in groundwater levels;
- » Develop storm water infiltration areas in the two proposed parks that can accommodate all storm water generated on site; and
- » Maximise the productive reuse of locally sourced groundwater, to minimise the amount of seepage to groundwater.

4.2 Acid Sulphate Soils

Section 3.6 indicated that the Western Australian Planning Commission's Planning Bulletin No. 64 identified a Moderate risk of acid sulphate soils occurring in the study area. It has been determined that all of the applicable criteria have been triggered, in particular by the requirement for dewatering and excavation for the proposal.

Management objective

To ensure that acid sulphate soils are not disturbed during construction of the proposal.



Management

The following management action should be implemented during the *pre-construction* phase:

The proponents will be required to undertake a preliminary acid sulphate soil investigation, and prepare the associated management plan for the study area prior to any soil or groundwater disturbance.

4.3 Dieback and Weed Infestation

There is a small risk of spreading dieback and weed species during the construction of the facility. This will be managed through cleaning vehicles and machinery of soil and vegetative material and also ensuring that any introduced materials are free from environmental or noxious weeds.

Management Objective

To ensure that no remaining native vegetation is impacted by the construction of the FSHHP.

Management

The following actions are the responsibility of the Construction Contractor *prior to construction*:

- » Develop a Dieback and Weed hygiene procedure as part of the Construction Environmental Management Plan (CEMP). The procedure should contain provisions to:
 - Avoid the spread of weed-infested material into uninfested sites during construction;
 - Minimise the risk of dieback introduction and spread in the project area; and
 - Ensure adequate topsoil management in order to enhance vegetation success by minimising spread of weeds.

The following actions are the responsibility of the Construction Contractor *during construction*:

- » Any vegetation or soil removed as part of the works will be treated so as not to damage remaining vegetation or alter surface drainage. The following management actions will apply.
 - Cleared vegetation will be used in site rehabilitation and erosion control via mulching chipping or brush cover. Larger logs will be left on-site to provide additional habitat;
 - Cleared vegetation will not be burnt on-site;
 - Stripped topsoil which is weed and dieback free will be salvaged for use in site rehabilitation; and
 - Materials and topsoil stockpiles will be located so as not to restrict or interfere with existing site drainage.
- » Any fill brought into to the study area will be certified 'dieback free'; and

- » All machinery and plant material will be cleaned down prior to arrival at the project site; vehicles should arrive onsite with clean floors and trays, and free of soil and plant material; and prior to departure from the project site.

4.4 Vegetation Clearing

As discussed in Section 3.15, the development requires clearing of 30 hectares of native vegetation, which will encroach on Environmentally Sensitive Areas (ESA's), resulting in the proposal being at variance with the 10 Clearing Principles.

Management Objective

To ensure that no native vegetation located within ESAs are impacted by construction, and that adequate measures are in place to compensate for the loss of native vegetation.

Management

In the *Pre-construction* phase the proponents should:

- » Consult with the DEC to discuss offsets for the clearing required in the project area; and

The following offsets should be brought to the attention of the DEC and discussed further:

- » Approximately 9 ha of available bushland can be rehabilitated with local native species, within the project area. The rehabilitation will be aimed at enhancing the habitat value of the Quenda wetland, Melaleuca wetland and additional good quality vegetation areas proposed as bushland reserves in the MACSP;
- » Eradication of weeds within the study area;
- » Establishment of buffers for the rehabilitated bushland and wetlands.

During construction the following actions will be the responsibility of the Construction Contractor:

- » Native and planted vegetation will be cleared from works areas and suitable vegetation will be chipped and stored for re-use in rehabilitation;
- » Prior to the start of clearing operations the clearing line shall be marked out and this will be checked by the Superintendent to ensure that it is correctly defined;
- » Damage to existing remnant vegetation shall be avoided as far as practicable; and
- » Vehicle and material storage lay down areas will be in existing cleared or disturbed areas.

4.5 Priority Fauna

As discussed in Section 3.17, the site survey identified three protected fauna species;

- » Quenda;
- » Lined Skink; and
- » Carnaby's Cockatoo.



The project area is situated on a well-vegetated area of land. Habitat value of the project site is considered to be very good. Therefore, any clearing of vegetation could have substantial impacts on the fauna species identified above.

Management Objective

To ensure that any native fauna in the project area are not unnecessarily impacted.

Management

The following recommendation will be undertaken by the Project Manager during the *pre-construction* phase.

- » Develop a Fauna Management Plan as part of a Construction and Environmental Management Plan (CEMP). To minimise the impact on and loss of native fauna. The Plan should include:
 - » Provisions to determine suitable reserves to re-locate the priority fauna species. The proponent is to consult with the DEC in this regard;
 - » Provisions to trap and relocate native mammals and reptiles, such as Quenda and Skinks,
 - » Instruction to retain native vegetation where possible, or use landscaping to ensure maximum food source for native fauna, particularly for bird species;
 - » Advice for Construction Contractors to inspect for stray fauna in the works area each morning, prior to operating machinery and plant; and
 - » Provision for any injuries to wildlife to be reported to the local DEC Wildlife Officer or wildlife carer.

The proponent will adhere to the following management actions during the *post-construction* phase:

- » Where revegetation is required, the use of local native plant species should occur to replace habitat lost (i.e. wetland dependant species). Specifically, plants that are feeding species of the Carnaby's Black Cockatoo should be planted to counter as much as possible the effects of clearing of potential foraging habitat.

4.6 Aboriginal Heritage

No Aboriginal heritage sites have been identified in the vicinity of the project area.

Management Objective

To comply with the *Aboriginal Heritage Act (1972)*.

Management

The contractor will adhere to the following management actions during the *construction* phase:

- » If any materials of significance to Aboriginal people are discovered, works will immediately cease within 50m of the material and the study area will be examined by a qualified archaeologist;
- » The DIA will be notified in the event of any significant Aboriginal Heritage discovery;

- » If skeletal material is uncovered during works then the WA Police Service will also be advised immediately;
- » An archaeological monitoring program should be implemented during any ground disturbing activities to ensure that heritage material is not damaged; and
- » Under the *Aboriginal Heritage Act (1972)*, it is an offence to disturb an Aboriginal heritage site whether it is registered or not. If an unregistered site is disturbed then a Section 18 Clearance will be obtained for the study area.

4.7 Native Title

As the proposed site is located on Vacant Crown Land Native Title applies to this site.

Management Objective

To consult with the two unregistered Native Title claimants for the survey area:

- » WC95/86 – Ballaruks Peoples (BPNTC).
- » WC03/6 Single Noongar Claim Area 1 (SNC).

Management

The following recommendations will be the responsibility of the Proponent, *prior to construction*:

- » The proponent will consult with the two Native Title Claimants identified in this Section, prior to the commencement of construction works.

4.8 European Heritage

A search of the Heritage Council of Western Australia identified only one site that is likely to be affected by the proposed health precinct. This site is the Murdoch Police Station (Ref # 17407), located at 120 Murdoch Drive.

Management Objective

To ensure that the Murdoch Police Station is not damaged by the construction of the FSHHP.

Management

The following actions will be carried out in the *pre-construction* phase:

- » A dilapidation study will be undertaken by a qualified consultant; and

The following recommendation should be complied with during the *construction* phase:

- » Impacts during construction (i.e. increased traffic, noise, dust emissions and) will be managed in line with recommendations provided in Sections 4.9, 4.10 and 4.14 respectively).

4.9 Construction and Operation Traffic Management

Adequate traffic management will be required to ensure that increased traffic volumes arising from construction activities, do not have adverse effect on local traffic travelling near the study area.

The following potential impacts have been identified:

- » Risk of injury to road users and site personnel due to construction and transport vehicles entering and leaving the construction site;
- » Disruption of local traffic access as a result of construction works near the entry of the construction site; and
- » Potential damage to roads and spillage of carted materials, particularly sand.

Management Objective

To ensure that traffic management and road closures do not cause unnecessary impacts on the local road users.

Management

Contractors will employ the following management strategies during *construction*:

- » Selection of appropriate routes for light vehicles and heavy construction vehicles to minimise disturbances;
- » The use of appropriate personal safety and traffic management signs;
- » Advanced notification of construction activities to the City of Melville;
- » Any material, particularly sand spilled from haulage vehicles leaving the construction site will be cleaned up immediately; and
- » Haulage routes will be inspected on a weekly basis for accumulation of spilled material, which will be cleaned up if required.

Management strategies for traffic management are yet to be confirmed for operation of FSHHP. These will be decided during the detailed design phase of the project.

4.10 Noise and Vibration

The proposed development of the FSHHP will impact on a number of noise sensitive premises in the vicinity of the construction area. The potential sources of noise during construction are earthmoving equipment throughout the study area and general construction activities.

Due to the number of noise sensitive receivers, off-site noise emissions are also considered to be a potential issue during operation of the FSHHP. The FSHHP is itself a noise sensitive premises and noise modelling will need to take into account noise impacts on the hospital precinct.

Management Objective

To ensure that noise levels meet the requirements of the *Environmental Protection (Noise) Regulations 1997*.

Management

In order to manage noise emissions adequately, the following recommendation will be adhered to *prior to construction*:

- » Engage a qualified noise consultant to undertake a detailed noise assessment and noise modelling prior to construction, to determine the noise impacts of the proposal. The noise assessment will include an analysis of background noise prior



to construction and subsequent noise modelling will be based on these observations.

In order to manage noise emissions adequately, the following recommendations will be adhered to during *construction*:

- » During construction activities the contractor will be required to observe all obligations under the *Environmental Protection Noise Regulations (1997)*; and
- » Section 6 of AS2436-1981 "*Guide to Noise Control on Construction, Maintenance and Demolition Sites*"; and
- » Compliance with the regulation and guideline will minimise noise impacts during construction and reduce the likelihood of noise complaints being received during construction of the health precinct.

In order to manage noise emissions adequately, the following recommendation will be adhered to *during operation*:

- » The proponent will comply with any recommendations of the noise modelling assessment completed during the pre-construction phase. The noise assessment and modelling will include noise impacts from adjacent roadways and the Jandakot Airport flight path.

4.11 Solid Waste

The operation of the hospital and health precinct will produce both general and controlled waste. Controlled wastes are generated from clinical applications and inert wastes will be generated, including litter and materials in the waste stream that result from construction (i.e. cardboard, paper, sand, wood, steel).

Management Objective

To ensure that the facility disposed of solid waste in accordance with the following:

- » Department of Environmental Protection Code of Practice for the Management of Clinical and Related Waste (May 1999);
- » NHMRC. National Guidelines for Waste Management in the Health Care Industry. (1999); and
- » Australian Standards, AS/NZS 3816 (1998), Management of clinical and related wastes.

Management

The contractor will adhere to the following management actions during the *construction* phase:

- » Consult the City of Melville to determine the appropriate rubbish disposal facility to direct waste;
- » General waste generated during construction will be placed into appropriate bins and taken to an approved rubbish disposal facility as instructed by the City of Melville; and
- » General housekeeping will be undertaken on a daily basis to ensure that the study area is kept clean and tidy.



The following management actions are the responsibility of the proponents *during operation* of the FSHHP:

- » General waste i.e. inert waste will be directed to landfill for disposal;
- » Prioritise recycling and waste issues by ensuring adequate waste/recycling storage areas and facilities are planned for, and provided to support existing and new waste and recycling initiatives;
- » All biomedical waste will be stored in drums and bags and will then be disposed of off site using authorised contractors;
- » Management of controlled waste will be in accordance with the DEC's *Guideline for Controlled Waste Generators*, Guideline No 1;
- » That biomedical waste be managed in accordance with the Australian Standards, AS/NZS 3816 (1998), Management of clinical and related wastes;
- » As well as the Environmental Protection (Controlled Waste) Regulations 2004; and
- » The proponent will ensure the controlled waste is properly contained on premises to prevent discharge into the environment in accordance with the *Environmental Protection (Unauthorised Discharges) Regulations 2004*.

4.12 Risk Management

The Department of Consumer and Employment Protection has advised that the FSHHP is a 'sensitive premises', which will ensure that any hazardous facilities in close proximity to the hospital will need to manage dangerous goods to ensure the hospital is adequately protected.

The hospital is also in close proximity to high-pressure gas mains, which will require management during construction. As well as being located approximately 4 km north west of Jandakot Airport. An overhead departing flight path currently accommodating approximately 22,800 movements per annum also affects the study area, indicating that plume velocity generated from hospital exhaust features will be considered under the *Airport Regulations 1996*.

Management Objective

To ensure that all risks identified above are managed during *construction* and *operation* of the FSHHP.

Management

The following actions will be the responsibility of the proponent during *pre-construction*:

- » During the construction phase, the potential intrusion into the protected air space by cranes will require liaison with Civil Aviation Safety Authority (CASA) as well as Air Services Australia and the Department of Transport and Regional Services. The contractor will need to ensure this liaison occurs pre-construction to identify the imminent risk.

The following actions will be the responsibility of the proponent *during construction*:



- » Construction and development of the FSHHP will need to comply with the Commonwealth's *Airports (Protection of Airspace) Regulations 1996* of the *Airports Act 1996*;
- » That the proposal includes provision for the movement of emergency helicopters into and out of the FSHHP commensurate to the requirements of CASA; and
- » The high pressure gas main is required to be reinforced and includes extending the existing high pressure main in Murdoch Drive by completing the 'loop' which shall ensure a secure supply of High Pressure gas to the hospital should part of the line need to be decommissioned due to repairs or maintenance.

The proponent will ensure the following actions are adhered to *during operation* of the FSHHP:

- » That the proposal includes provision for any foreseeable changes to the operational capability of Jandakot Airport; and
- » That the proposal demonstrates a commitment not to compromise the safety, efficiency or regularity of existing and future air transport operations into and out of Jandakot Airport.

4.13 Dust Emissions

The proposed development of the FSHHP may impact on a number of sensitive premises within 1 km of the study area. Impacts on air quality resulting from dust emissions are expected to be a potential issue requiring management during construction.

Management Objective

To protect the surrounding land users such that dust emissions will not adversely impact upon their welfare and amenity or cause health problems. Dust emissions will be managed in accordance with the EPA final Policy Guideline No 18, *Prevention of Air Quality Impacts from Land Development Sites*.

Management

The Construction Contractor will be responsible for the following actions to mitigate against dust emissions during *construction*.

- » To control dust the contractor will retain vegetation where possible; as patches and strips can be very effective as wind breaks;
- » The contractor will stabilise exposed soil where large areas of vegetation are disturbed. A combination of the following techniques are likely to be most effective:
 - Wind fencing;
 - Water to damp down areas;
 - Hydromulch; and
 - Chipped vegetation.
- » Contractors will also ensure that dust-generating activities are minimised as far as practicable. These include dust generated during earthworks and movement of machinery and vehicles on site; and



- » During Construction Contractors will need to meet the requirements of the dust complaints and management responses will be recorded as part of the project environmental monitoring report.

Contingencies

In the event that dust from the construction site becomes excessive, such as during periods of strong winds, or if dust during non-working days becomes a recurrent issue, the Construction Contractor will initiate one or more of the following actions;

- » Additional wetting down of dust producing areas;
- » Erect wind fences; and
- » Cease work at the dust producing area until the dust has been stabilised.

4.14 Additional Construction Management

The following aspects are not required for discussion by the Section 38 Referral Checklist, however they were identified as requiring management during the construction phase.

4.14.1 Stored Fuel and Oil

During the construction of the health precinct it is likely that fuel (i.e. diesel or oil) will need to be stored on site. Only a small amount will be permitted to be stored on site (<500 litres) for machinery use, to minimise the risk of land contamination resulting from accidental spillage of fuel or oils.

Management Objective – to ensure that stored chemicals and fuels are do not pose any impacts on the FSHHP site.

Management

The proponent will be responsible for the following actions during *construction*;

- » Any accidental spillage will be reported to the management of the facility as soon as practicable;
- » No light vehicles will be serviced or refuelled on site;
- » Larger plant machinery may be serviced on-site providing that mitigation measures are in place for accidental spillage i.e. mobile drip trays and hydrocarbon absorbent materials. Any waste products should be taken off site and disposed of appropriately;
- » Emergency clean up procedures will be implemented in the case of any spillage, including the use of 'spill kits; and
- » Personnel are to be trained in the use of spill kits.

4.14.2 Environmental Incident Management

The Construction Contractor as part of the CEMP will ensure that incidents that may have a significant potential environmental impact are appropriately managed. The contractor will provide suitable incident reporting mechanisms to record all incidents on site.



In the event of an environmental incident the following procedure will be adhered to;

- » Reporting of the incident in an environmental incident log;
- » Time limits for incident reporting;
- » Structure and content for incident reporting;
- » Assessment of the significance of each event;
- » Discontinue work if necessary; and
- » Remediation/mitigation of impacts.



5. Consultation

As part of the Environmental Protection Authority's requirements under the *Environmental Protection Act (1986)*, the community must be consulted on the project.

DHW on behalf of the DoH and DPI has completed a significant amount of community consultation associated with the proposal. Consultation has included liaison with Government agencies and major landholders in the superblock prior to the formal public consultation period. A detailed outline of stakeholder consultation in advance of the commencement of public comment period is included in Appendix F.

Consultation prior to the public comment period also included:

- » Consultative workshop with key stakeholders;
- » Three day stakeholders' consultative workshop; and
- » Ongoing meetings, presentations and general liaison.

The Minister for Planning and Infrastructure launched the formal public comment period for the Draft MACSP on 30 August 2006. The period for public comment was 8 weeks, with the closing date on the 27 October 2006. This was extended for 2 weeks until 10 November 2006.

During the public comment period a number of engagement methods were used to prompt the community to provide feedback on the proposal. Some of these were press advertising, media releases, Ministerial briefings, launch events, circulation of the draft Murdoch Activity Centre Structure Plan and media liaison. A detailed account of stakeholder consultation during the public comment period is contained in Appendix G.

There were a total of 84 public submissions received for the project. Thirty-Seven of these submissions (2 from local Government/service authority, 8 from groups/committees, 27 from individuals) related to environmental aspects within the extent of the referral area. All of these submissions contained negative comments towards the development in regard to:

- » Concern about excessive noise from roads, buildings, sirens etc);
- » Loss of wetlands/lack of protection of wetlands;
- » Loss of bushland and habitat including 'green links'
- » Loss of fauna (bird life, Quendas) due to lack of habitat;
- » Generation of stormwater/pollutants from the precinct;
- » Need for the relocation of fauna; and
- » The project leading to unwanted pressure on the local environment.



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Appendix A
Flora and Vegetation Assessment



Appendix B
Area Clearing Permit Application



Appendix C

Correspondence Regarding Bush Forever Nomination



Appendix D
Fauna Assessment



Appendix E

Aboriginal heritage survey of the proposed Fiona Stanley Hospital and Health Precinct



Appendix F
Register of Stakeholder Consultation (Pre-
August 2006).



Appendix G
Consultation Report



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