Referral of proposed action

Project title

1 Contacts

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1.3 Proponent

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2 Summary of proposed action

2.1 Short description

The Minister for Housing and Works is proposing to construct the Fiona Stanley Hospital at Murdoch. The Hospital will be constructed as a public work and will then be operated as a public hospital by the Minister for Health. It will house relocated tertiary health services from both Fremantle and Royal Perth Hospitals and will ultimately be the only tertiary hospital south of the river. The Fiona Stanley Hospital will be the State's centre for major trauma, burns, and heart and lung transplant services. It will provide 24-hour acute care together with teaching, research, medical and surgical services.

2.2 Latitude and longitude

	Latitude			Longitude		
location point	degrees	minutes	location point	degrees	minutes	location point
1	32	04	1	32	04	1
39	32	04	39	32	04	39
38	32	04	38	32	04	38
7	32	04	7	32	04	7
21	32	04	12.32	115	50	31.32
22	32	04	09.23	115	50	45.42
23	32	03	57.89	115	50	49.01
27	32	04	08.85	115	50	58.79
29	32	04	24.17	115	50	57.22
40	32	04	21.18	115	50	42.84
33	32	04	27.95	115	50	42.84
41	32	04	26.89	115	50	41.94
37	32	04	26.89	115	50	39.88

2.3 Locality

The Fiona Stanley Hospital will be located in the City of Melville. The proposed site is approximately 15km south of the Perth CBD, and 9km east of Fremantle (Figure 1).

The Hospital will be within a broader education, health and activity node commonly referred to as the 'Murdoch Activity Centre'. This Activity Centre forms part of an overall Structure Plan, bounded generally by South Street to the north, Farrington Road to the south, the Kwinana Freeway to the east, and Murdoch Drive and Murdoch University to the west (Figure 2).

Existing uses within the Murdoch Activity Centre' include the St. John of God Private Hospital, a TAFE campus and the Rangeview Remand Centre.

2.4 Size of the development footprint or work area (hectares)

The development footprint is 29.4ha within a 32.4ha Project Area (Figure 3)

2.5 Street address of the site

There is no current street address for the Project Area.

2.6	**Lot description**	Cockburn Sound Location 3059 Part Lot 300 on Plan 45110 Lot 4994 on Plan 40291 Lot 4378 on Plan 193548 Part Lot 4718 on Plan 26841 Part Lot 4379 on Plan 193548	
2.7	**Local Government Area and Council contact (if known)**	City of Melville Contact: Craig McLure Director, Strategic Urban Planning and Projects City of Melville 10 Almondbury Road, Booragoon WA 6154	
2.8	**Project life**	The clearing works are expected to commence in mid 2008 with construction following immediately after the completion of clearing. This will enable the Hospital to be completed in late 2013. The Hospital is expected to have an operational life in excess of 50 years due to its critical role in meeting the tertiary health needs of the southern metropolitan area and the State.	
2.9	**Alternatives**	X	No
			Yes, complete section 3.2
2.10	**State assessment**		No
		X	Yes, complete Section 3.5
2.11	**Component of larger action**	X	No
			Yes, complete Section 3.6

3 Detailed project description

3.1 Description of proposal

The proposal consists of the development of the Project Area for the construction of the Fiona Stanley Hospital, and includes clearing and site preparation, relocation of topsoil and vegetative material off-site for rehabilitation projects in the adjacent regional park, construction of associated roads and hospital buildings, and the installation of services.

The Fiona Stanley Hospital will be a world class facility that is a leader in clinical care, research and education. It will provide patient centric care in an efficient, safe and sustainable manner and it is therefore crucial to the reforms currently being implemented throughout the health system in Western Australia.

The Fiona Stanley Hospital is a key component in the development of the Murdoch Activity Centre, which aims to maximise the public benefit and use of the major bus/rail interchange that will soon be commissioned as part of the State's significant investment in the Perth to Mandurah rail project. The Hospital will form part of a health precinct, within the Murdoch Activity Centre, that will also include, but not be limited to, an existing major private hospital, medical research and educational facilities, clinical accommodation and consulting suites, and short-term accommodation to support friends and relatives of patients using the Hospital and other facilities in the Project Area.

The development of the Fiona Stanley Hospital is proposed to be undertaken in two phases. At the end of Phase 1 (due for completion in late 2013), the Hospital will provide a range of acute medical and surgical services. It will be the home of Western Australia's major centre for treatment of trauma, burns, and heart and lung transplants. It will also include:

- the State's first comprehensive cancer services south of the river including radiotherapy treatment facilities, medical oncology and haematology;
- renal transplantation and dialysis;
- paediatric services;
- a full array of tertiary medical and surgical services;
- extensive radiology services including MRI, CT and PET/CT; and
- a state-of-the-art medical research facility to be built by the Western Australian Institute for Medical Research.

At the completion of Phase 1, it is expected that the Hospital will comprise 643 beds (as detailed in Table 1) together with all tertiary medical services including full diagnostic and support services.

Table 1 Estimate of number of hospital beds from Phase 1 of Hospital

Bed description	Beds/places
Burns	10
Dialysis (same day)	12
ICU	60
Mental health	30
Oncology (same day)	23
Paediatrics	24
Peri-operative	30
Short stay areas	70
Other medical/surgical	384
Total	**643**

The second phase of the Hospital is proposed to increase bed numbers to approximately 1000, and to provide for the inclusion of obstetrics, additional surgery services and the State Rehabilitation Centre to deliver rehabilitation services for spinal cord injuries, acquired brain injury and other tertiary adult rehabilitation. Currently, the second phase is planned to be complete in mid-2016 and consequently construction activity is likely to continue immediately after (or prior) to the completion of Phase 1.

Description of components and timing of construction program

To enable the completion of Phase 1 of the Hospital in late 2013, which consists of the primary hospital buildings, the clearing works in the northern portion of the Project Area must commence in mid 2008 (Figure 4). This initial phase of clearing (Stage A) will also extend to the south to enable the development of a road that is required to provide car access to the bus/rail station and its associated car parking facilities.

The buildings/structures planned for the south of the Hospital site are primarily associated with the car parking facilities required to meet patient and staff demand. The State has placed aggressive public transport targets on the health precinct to maximise the use of the extensive public transport facilities and reduce the extent of car parking required for the health precinct. Due to the shorter construction times for the car parking buildings, the clearing of the Project Area in the southern section (Stage C) will not commence until 2010. The completion of these buildings will coincide with the completion date for the main hospital buildings. This will enable additional time (in the southern sector) for seed collection and other site preparation activities.

An intermediate stage (Stage B) relates to clearing of areas required for plant and other support facilities for the Hospital. Stage B clearing will be undertaken between Stage A and C, possibly at the same time as Stage C depending on required lead times for the construction of the relevant facilities (still being determined). The intention of clearing Stage B after Stage A is to retain a natural linkage between the proposed northern and southern Conservation Areas for as long as possible.

The site preparation activities (applicable to all stages of clearing for the Project Area) will include:

- harvesting of seed prior to clearing for the purpose of propagation of seedlings for use in on-site landscaping and off-site rehabilitation in the adjacent Beeliar Regional Park;
- removal of useable timber for purpose of on-site re-use (i.e. use in buildings, street furniture, etc);
- clearing of vegetation and mulching for use in landscaping and incorporation into topsoil in off-site rehabilitation;
- stripping of topsoil and transporting to areas off-site within the nearby regional park to be rehabilitated;
- bulk earthworks to create large building envelopes of a consistent elevation for the base of construction, and levelling for roads and other services;
- construction of hospital buildings and roads, and installation of services; and
- landscaping of road verges, median strips and open space within the grounds.

3.2 Alternative locations, time frames or activities that form part of the referred action

The proposed site for the Hospital has been allocated as a hospital site for almost forty years. The decision to introduce a hospital and a university in the Murdoch area was first officially considered by the then Town Planning Department in 1968. This intent is still reflected in the zoning of the Project Area as 'Public Purposes' (Hospital) under both the Metropolitan Region Scheme and the local government (City of Melville) Town Planning Scheme.

While investigations into alternative sites were undertaken in 2004 no other locations were identified that were:

- of suitable sized (in excess of 20ha);
- well located to service the health needs of the southern metropolitan area; and
- suitably serviced by transport infrastructure.

The Project Area meets these requirements as it:

- provides adequate space for the development of the Hospital; allows for related health facilities to be collocated in the Project Area; and enables a hospital replacement strategy to be implemented on the same site in 30 to 50 years time (a crucial part of modern major health facility planning);
- is located in the heart of the rapidly growing southern metropolitan population corridor (while still being closely located to the existing major population concentration immediately to the north of the Project Area);
- is located adjacent or close to the major vehicular transportation routes (these being the Kwinana Freeway which is the major north/south traffic route of the Perth metropolitan area, and the Roe Highway which provides excellent connections to the eastern suburbs of Perth);
- is located immediately adjacent a major bus/rail interchange on the soon to be opened Perth to Mandurah rail line; and
- is in close proximity to Jandakot airport (for major trauma and other emergencies from outside the metropolitan area).

In addition to the above, the Project Area is also:

- located adjacent to a significant private hospital (St John of God Private Hospital), maximising the synergies between the private and public health systems and allowing the potential sharing of health facilities and/or services; and
- is located near existing education infrastructure including Murdoch University and Challenger TAFE, which will help to facilitate potential partnerships and educational synergies.

3.3 Previously considered alternatives and the 'do nothing' case

The decision to introduce a hospital and a university in the Murdoch area was first officially considered by the then Town Planning Department in 1968. This is still reflected in the current zoning of the Project Area as 'Public Purposes' (Hospital) under both the Metropolitan Region Scheme and the City of Melville Town Planning Scheme.

In 2003, the State Government appointed the Health Reform Committee to examine the Western Australian public health system and develop a vision for its future. The Reid Report was subsequently released in 2004. The report proposed a "significant reconfiguration of hospital services", including an express recommendation that a north/south of the river model be adopted for health services in the Perth metropolitan area (Figure 5). It is this need for a tertiary hospital south of the river that resulted in the proposed development of the new Fiona Stanley Hospital in Murdoch as the central health facility for a growing southern metropolitan population.

Since the release of the Reid Report, the Western Australian Government has embarked on reform of the health system including the most significant health infrastructure investment program ever undertaken in Western Australia. The delivery of the Fiona Stanley Hospital, as the major tertiary hospital in the southern metropolitan area, is a fundamental part of this reform process. As such, planning works on the Hospital commenced in 2005 and in 2007 and funding was allocated by the State Government for the design and construction of the Hospital.

There is no 'do nothing' alternative to the development of the Fiona Stanley Hospital that meets the objectives of the health system reform. Increasing demand would require the redevelopment and expansion of existing tertiary facilities at Fremantle Hospital (FH) and Royal Perth Hospital (RPH) and, even then, the facilities would not be adequate. Thorough assessment of this option, undertaken during the preparation of the Fiona Stanley Hospital Business Case, recognised it extremely costly and far from optimal. In broad terms, it identified that:

- the facilities at RPH and FH are inadequate and would require significant redevelopment at enormous cost. The facilities are antiquated by contemporary design standards; are generally old and in poor condition; and are constrained and have limited ability to expand in the current locations.

Both facilities have generally grown organically over decades, which has resulted in some service configurations that impact negatively on staff efficiency and the provision of appropriate patient facilities;

- the long-term use of RPH and FH as tertiary facilities would see three adult tertiary facilities (when combined with Sir Charles Gairdner Hospital) continue to operate in metropolitan Perth. The Reid Report indicated an overuse or inappropriate use of tertiary hospitals for secondary care and noted that Western Australia would only need two adult tertiary facilities in the short to medium term. Keeping three adult tertiary facilities open (i.e. maintaining the status quo) would hinder the State's ability to more appropriately utilise the adult tertiary facilities and to achieve the reform objectives; and
- once the current bed capacity at RPH and FH is utilised, the additional estimated activity will remain 'unmet'. That is, it will be deferred to waiting lists, extended Emergency Department wait times, or simply not met at all.

3.4 Context, planning framework and state/local government requirements

The Project Area is reserved for 'Public Purposes' (Hospital) under the Metropolitan Region Scheme (MRS) and the City of Melville's Community Planning Scheme No. 5. (Local Town Planning Scheme).

In July 2005 the Department for Planning and Infrastructure and the Department of Health, in full consultation with the City of Melville and major stakeholders in the area, commenced the preparation of the Murdoch Activity Centre Structure Plan. This culminated in February 2007 with Western Australian Planning Commission's approval of the Murdoch Activity Area Structure Plan (Part A – Fiona Stanley Hospital and Health Precinct). The State Government subsequently released the Structure Plan in June 2007.

The Structure Plan provides a comprehensive framework to guide further detailed planning of the Project Area, which is now underway.

The land for the Hospital and associated infrastructure is in the process of being assembled. While the majority of the existing lots comprise Crown Reserves, the land assembly will require some Crown Reserve boundary adjustments between Government authorities. The creation of a major transit road adjoining the Hospital will also require freehold land subdivision and minor land exchanges with private parties.

As the land is reserved for 'Public Purposes' (Hospital) under the MRS, works associated with the development of the Fiona Stanley Hospital (i.e. road construction, bulk earthworks and subsequent Hospital buildings) will not require formal Development Approval (planning consent) by the Western Australian Planning Commission.

3.5 Environmental impact assessments under Commonwealth, state or territory legislation

The proposed development of the Fiona Stanley Hospital and associated infrastructure was referred to the Western Australian Environmental Protection Authority (**EPA**) under Part IV, Section 38, of the *Environmental Protection Act 1986* (WA) (**EP Act**) in March 2007. The referral was prepared by GHD Pty Ltd on behalf of the Department of Housing and Works and included a preliminary environmental impact assessment report. The referral report included a summary of consultation, surveys of flora, fauna and aboriginal heritage values within the project area, and proposed environmental management measures to be implemented (Appendix 1).

Most consultation was undertaken prior to, during and immediately following the public comment period for the Draft Murdoch Activity Centre Structure Plan, which was subject to a 10 week public review period commencing August 30 2006. Consultation was undertaken in the form of direct mail, media releases (print and visual), website information, Draft Murdoch Activity Centre Structure Plan circulation to libraries/Council offices, and through several other channels. There were 84 submissions received from local residents, students, community groups, State Government agencies, environment/conservation groups, health related organisations, local government, unknown, local businesses and the adjacent Murdoch University. A summary report on the submissions received is included in Appendix 2.

The EPA determined that the proposal would not be formally assessed under Section 38 but that the matter could be dealt with under Part V of the EP Act through a clearing permit.

Clearing Permit 1773/1 was granted to the proponent (Department of Health, on whose behalf the clearing is to be undertaken) under section 51E of the EP Act on 26 July 2007. The Clearing Permit included conditions relating to minimisation of clearing, dieback and weed control, fauna management and the development of an offsets package for the clearing of vegetation (Appendix 3).

3.6 A staged development or component of a larger project

The proposed action is for the development of the Fiona Stanley Hospital and associated infrastructure, which will be a staged development. An access road to the south-east corner of the Project Area may be required at some point in the future (beyond 2016) to ensure efficient traffic movement on the site. This would provide a connection to Farrington Road and the Kwinana Freeway exit/entry ramps. The alignment and width of this road is unknown as will be determined as part of future master planning of the Challenger TAFE site to the south.

4 Affected environment

4.1 Matters of national environmental significance

4.1 (a) World Heritage Properties

No World Heritage Properties lie within or near the project area.

4.1 (b) National Heritage Places

No National Heritage Places were identified that lie within or near the project area.

4.1 (c) Wetlands of International Significance (Ramsar)

A search of the EPBC Act Protected Matters database identified three wetlands listed under Ramsar Convention that are within the vicinity of the Project Area (Table 2). These are shown in Figure 6 in relation to the Project Area.

Table 2 Ramsar wetlands in proximity to the Project Area

Wetland	Proximity to the Project Area
Peel-Yalgorup Wetlands	60km to the south of the Project Area
Becher Point Wetlands	35km to the south of the Project Area
Forrestdale Lake and Thomsons Lake	Forrestdale Lake - 11km to the south-east of the Project Area Thomsons Lake - 6km to the south of the Project Area

The Project Area is considered to be within the broader catchment of Forrestdale and Thomsons Lakes. However, groundwater flow is in a westerly direction towards the coast, and the actual surface water catchments on this relatively flat part of the Swan Coastal Plain are small and intercepted by roads. Therefore, the Project Area is too far north-west and north respectively to be within the actual groundwater or surface water catchments of these wetlands. Therefore, the wetlands will not be affected by works associated with the proposal.

The Project Area is more than 30km away from both the Peel-Yalgorup Wetlands System and Becher Point Wetlands and not within their surface or groundwater catchments.

4.1 (d) Listed threatened species and ecological communities

One threatened species has been identified as utilising the Project Area, *Calyptorhynchus latirostris,* Carnaby's (short billed) Black-Cockatoo. Five other threatened fauna species and three threatened flora species listed under the EPBC Act identified in desktop review as potentially occurring in the area have been determined to unlikely to occur (Table 3 and Table 4). Appendix 4 includes further details on this determination. No threatened ecological communities (TEC) were identified as likely or potentially occurring in or near the Project Area.

A flora assessment was undertaken by GHD Pty Ltd including a desktop review and a four day field survey in spring 2005 (GHD 2006b). No flora species listed under the EPBC Act or declared rare or priority species were identified within the Project Area during the 2005 field survey (Appendix 5). A supplementary threatened flora survey was conducted in spring 2007, from 26 September to 4 October, to ensure the Project Area had been subject to comprehensive searches for *Caladenia huegelii*. No evidence of *Caladenia huegelii* or any other listed species was recorded during this survey (Appendix 6).

Table 3 Threatened flora species potentially found in the project area

Species	Common Name	Status	Type of presence	Reference	Likelihood of occurrence in Project Area
Caladenia huegelii	King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid	endangered	Species or species habitat likely to occur within area	EPBC Protected Matters Search (September 2007)	Unlikely to occur
Lepidosperma rostratum	Beaked Lepidosperma	endangered	Species or species habitat likely to occur within area	EPBC Protected Matters Search (September 2007)	Unlikely to occur
Drakaea elastica	Glossy-leaved Hammer-orchid, Praying Virgin	endangered	Species or species habitat may occur within area	EPBC Protected Matters Search (GHD)	Unlikely to occur

Source: EPBC Act Protected Matters Interactive Search Tool (26 September 2007), coordinate area search with 500 m buffer; GHD search of EPBC Protective Matters, DEC Threatened Fauna Database, Birds Australia WA Records, Records of WA Museum.

A fauna assessment was undertaken by GHD Pty Ltd in October and November 2005 (GHD 2006c) and included a desktop review and a field survey (Appendix 7). Several individuals of Carnaby's Black-Cockatoo were observed during the field survey undertaken by GHD (Appendix 7). The field survey did not identify any evidence of any other EPBC listed fauna species within the project area.

***Carnaby's Black-Cockatoo,* Calyptorhynchus latirostris**

In the Jandakot region, including Murdoch, Carnaby's Black-Cockatoo is moderately common in pairs and small flocks, occasionally seen in larger flocks, and very rarely seen in larger aggregations. GHD (2006c) undertook a fauna survey in October 2006 which included an opportunistic survey for evidence of Carnaby's Black-Cockatoo. GHD (2006c) recorded the following results:

1. Chewed Marri nuts and Banksia flowers were found in the Project Area, consistent with the feeding signs of Carnaby's Black-Cockatoo.
2. On one occasion, a number of Carnaby's Black-Cockatoos were seen landing in the Project Area but no other feeding activity was directly observed.
3. Flocks of Carnaby's Black-Cockatoo were seen flying overhead on a number of occasions and the Project Area appears to be along one of the fly-ways for the flocks in the southern suburbs.

Based on the survey results and the occurrence of suitable feeding species in the Project Area, GHD (2006c) concluded that it is likely that Carnaby's Black-Cockatoo utilise the Project Area for foraging but that the Project Area does not appear to be one of the primary feeding areas for the species (GHD 2006c). This may not always have been the case. Historically, the local area was known to be visited by large aggregations of Cockatoos for feeding however the numbers of Cockatoo visiting this area of Perth have declined since the removal of pine plantations for urban development in the 1980s (WA Museum, pers. comm., Johnstone, R. 2007). Members of faculty and the student body at the adjacent Challenger TAFE have reported, verbally to the Project, sightings of groups of Carnaby's Black Cockatoo using the Project Area for feeding confirming groups of the species are still frequenting the area.

Table 4 Threatened and migratory fauna species potentially found in the project area

Species	Common Name	Status	Type of presence	Reference	Likelihood of occurrence in Project Area
Threatened fauna					
Calyptorhynchus baudinii	Baudin's Black-Cockatoo (long billed)	Vulnerable	Species or species habitat likely to occur within area	EPBC Protected Matters Search (September 2007)	Unlikely to occur
Calyptorhynchus latirostris	Carnaby's Black-Cockatoo (short billed)	Endangered	Species or species habitat likely to occur within area	EPBC Protected Matters Search (September 2007)	Observed
Dasyurus geoffroii	Chuditch, Western Quoll	Vulnerable	Species or species habitat likely to occur within area	EPBC Protected Matters Search (September 2007)	Unlikely to occur
Phascogale calura	Red- tailed Phascogale	Endangered	Species or species habitat may occur within area	EPBC Protected Matters Search (September 2007)	Unlikely to occur
Setonix brachyurus	Quokka	Vulnerable	Species or species habitat may occur within area	EPBC Protected Matters Search (September 2007)	Unlikely to occur
Myrmecobius fasciatus	Numbat	Vulnerable	Species or species habitat may occur within area	DEC Protected Matters	Unlikely to occur
Migratory Marine species					
Ardea alba	Great Egret, White Egret	Migratory (JAMBA, CAMBA)	Species or species habitat may occur within area	EPBC Protected Matters Search (September 2007)	Unlikely to occur
Ardea ibis	Cattle Egret	Migratory –as Ardeola ibis (JAMBA, CAMBA)	Species or species habitat may occur within area	EPBC Protected Matters Search (September 2007)	Unlikely to occur
Apus pacificus	Fork Tailed Swift	Migratory (JAMBA, CAMBA)	Species or species habitat may occur within area	EPBC Protected Matters Search (September 2007)	Unlikely to occur
Calidris acuminata	Sharp-tailed Sandpiper	Migratory (Bonn, JAMBA, CAMBA)	Recorded within 5 km of project area	WA MUSEUM Records	Unlikely to occur
Calidris ruficollis	Red-necked Stint	Migratory (Bonn, JAMBA, CAMBA)	Recorded within 5 km of project area	WA MUSEUM Records	Unlikely to occur
Limosa limosa melanuroides	Black-tailed Godwit	Migratory (Bonn, JAMBA, CAMBA)	Recorded within 5 km of project area	WA MUSEUM Records	Unlikely to occur
Tringa hypoleucos	Common Sandpiper	Migratory (Bonn – as *Actitis hypoleucos*, JAMBA, CAMBA) Marine - as *Actitis hypoleucos*	Recorded within 5 km of project area	WA MUSEUM Records	Unlikely to occur
Tringa stagnatilis	Marsh Sandpiper, Little Greenshank	Migratory (Bonn, JAMBA, CAMBA)	Recorded within 5 km of project area	WA MUSEUM Records	Unlikely to occur
Plegadis falcinellus	Glossy Ibis	Migratory (Bonn, CAMBA)	Recorded within 5 km of project area	BAWA Records	Unlikely to occur
Migratory Terrestrial species					
Haliaeetus laucogaster	White-bellied Sea-eagle	Migratory (CAMBA)	Species or species habitat likely to occur within area	EPBC Protected Matters Search (September 2007)	Unlikely to occur
Falco peregrinus	Peregrine Falcon	Migratory (JAMBA)	Species or species habitat may occur within area	DEC Protected Matters	Unlikely to occur
Merops ornatus	Rainbow Bee-eater	Migratory (JAMBA)	Species or species habitat may occur within area	EPBC Protected Matters Search (September 2007)	Observed

Source: EPBC Act Protected Matters Interactive Search Tool (26 September 2007), coordinate area search with 500 m buffer; GHD search of EPBC Protective Matters, DEC Threatened Fauna Database, BAWA Records, Records of WA Museum.

4.1 (e) Listed migratory species

Migratory bird species may potentially fly over the Project Area, following flight paths between the Beeliar Wetland Chain to the southwest and the Swan River Estuary to the north of the Project Area (GHD 2006c). Only one of the potential 12 migratory species listed under the EPBC Act identified as potentially occurring within the Project Area was confirmed as a likely frequent visitor to the Project Area, *Merops ornatus*, Rainbow Bee-eater (Table 4).

A fauna field survey performed by GHD Pty Ltd in October and November 2005 observed only one of the potentially occurring listed species (GHD 2006c). A pair of Rainbow Bee-eaters was observed at the artificial pond in the Melaleuca-Banksia woodland. This corresponds to observations that the species usually occurs in open, cleared or lightly-timbered areas that are often, but not always, located in proximity to permanent water (Badman 1979; Boekel 1976; Fry 1984; Roberts 1979; Storr 1984a, 1984b, 1985). It is possible that the site is used by additional individuals of this species not observed in GHD (2006c).

No evidence of any other listed migratory species was observed during the field survey.

4.1 (f) Nuclear actions

The proposal does not involve nuclear actions.

4.1 (g) Commonwealth marine areas

There is no marine environment within the Project Area and no Commonwealth marine areas were identified in or near the project area by the EPBC Act Protected Matters Interactive Search Tool.

4.2 Important or unique aspects of the environment, if relevant

4.2 (a) Soil and vegetation characteristics

Geology

The Project 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 2006b). Previous studies in the same area recorded the presence of coffee rock 700 mm deep, which will reduce the infiltration rate and hence the water holding capacity of the soil.

The Western Australian Planning Commission Planning Bulletin No. 64 indicates that there is a moderate risk of acid sulphate soils occurring within three metres of the surface in the Project Area.

Vegetation

The vegetation within the Project Area is within the South Western Botanical Province (GHD 2006b) and comprised of dryland and wetland vegetation representative of the Bassendean Central and South Vegetation Complex (Heddle et al. 1980). This complex is characterised by woodlands of Jarrah Banksia on the sand dunes and Melaleuca species in the low-lying depressions and swamps.

The vegetation survey identified three distinct vegetation communities over the site (GHD 2006b) (Figure 7):

- Jarrah-Banksia Woodland on sandy slopes;
- Melaleuca dampland; and
- Central dampland of *Banksia littoralis* and *Melaleuca pressiana*.

The majority of the bushland within the site is Jarrah-Banksia Woodland on sandy slopes, which is generally in excellent condition. There are smaller, low lying areas 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.

The vegetation types found at the site are well represented within Ken Hurst Park (southeast of the Roe Highway), and within small pockets of public open space (GHD 2006b). Gibson et al. (1994) determined that the floristic community types that these vegetation types are representative of are regarded as 'well reserved', indicating that their reservation and conservation status is low risk.

4.2 (b) Water flows, including rivers, creeks and impoundments

There are no rivers or creeks; however there are two wetlands adjacent to the Project Area.
Quenda Swamp is located in the northwest corner of the Murdoch superblock and is bordered by the St John of God Hospital. This wetland is located within approximately 180m of the most north westerly point of the Project Area. This wetland is classified as a Conservation Category wetland in the Wetlands of the Swan Coastal Plain (Hill et al. 1996). The wetland is therefore regarded as a significant wetland and has a high level of protection. A 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 400m southwest of the Project Area. Melaleuca Swamp is a Conservation Category wetland and forms part of the Beeliar Wetland Chain. The Beeliar Wetland Chain includes Thomsons Lake which is listed on the register of the Ramsar Convention.

In addition, an artificial wetland, currently managed by Challenger TAFE, is in the centre of the Project Area.

Reference to the DEC's Perth Groundwater Atlas (online 2006) provides the following information regarding hydrology within the Project Area;

- groundwater levels in the area reach 18m below ground level in the elevated southern zones of the Project Area;
- groundwater level is at the surface or within 1m of the surface in the northern and central parts of the Project Area;
- the general direction of the groundwater movement is in a north west direction;
- groundwater is fresh (salinity <500 mg/L TDS); and
- groundwater levels fluctuate by up to 2m during the year.

4.2 (c) Outstanding natural features, including caves

No features of particular note occur in the Project Area.

4.2 (d) Gradient

The Project Area is located on the Swan coastal plain and is situated on the Bassendean Sands. Elevation at the Project Area ranges from 38m to 20m AHD on a slope of between 20° and 5°.

4.2 (e) Buildings or other infrastructure

No known buildings or other infrastructure occur within the Project Area.

4.2 (f) Marine areas

Not applicable.

4.2 (g) Kinds of fauna

The desktop searches and field surveys identified 120 bird, 15 mammal, 40 reptile and 10 amphibian species that may occur in the Murdoch region and therefore have the potential to occur at the project site (refer Table 3 and Table 4). However, many of these species have become locally extinct.

The field survey recorded 44 bird, seven mammal, 12 reptile and four amphibian species. During the field survey there were several observations of *Calyptorhynchus Latirostris* (Carnaby's Black-Cockatoo) and *Merops ornatus* (Rainbow Bee-eater) which are listed under the EPBC Act.

4.2 (h) Current state of the environment

The vegetation condition over the site is mostly "Very Good to Excellent" based on condition rating provided by Bush Forever (Government of Western Australia 2000) (Figure 8).

The dampland and central Banksia woodland communities include areas ranging from degraded to excellent condition (GHD 2006b).

The degraded areas are typically weed infested. Eighty-eight introduced taxa were recorded in the surveyed area and, of these, 79 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 Declared Weed species, Bridal Creeper (*Asparagus asparagoides*), noted during the 2005 field survey.

Vegetation that appears to have been infested by dieback was noted on the north facing slope to the east of the St John of God Hospital during the 2005 flora survey. Based on visual inspection, the majority of the site appears to remain free of dieback infestation. A formal *Phytophthora cinnamomi* (dieback) assessment of the project area is to be undertaken in January 2008, to determine the areas from which topsoil will be taken for off-site rehabilitation.

4.2 (i) Commonwealth Heritage Places and places on the Register of the National Estate

The project is not being undertaken by a Commonwealth agency, nor will it affect Commonwealth land.

The Project Area is approximately 600m from Beeliar Regional Park, which is listed on the Register of the National Estate. The Park is not likely to be altered by the proposed health precinct because of the distance and barriers in place between the Park and the project site (including main roads, and residential and recreational areas).

No other Commonwealth Heritage Places or places on the Register of the National Estate have been identified as being near the Project Area.

A search of the Heritage Council of Western Australia Register of Heritage Places identified one non-indigenous heritage site located in proximity to the proposal. This site is the Murdoch Police Station (Ref # 17407) at 120 Murdoch Drive.

4.2 (j) Known Indigenous heritage values

The project is not being undertaken by a Commonwealth agency, nor will it affect Commonwealth land.
A search of the Department of Indigenous Affairs (DIA), Register of Aboriginal Sites delineated one site, #3708 Murdoch Drive Camp on the southern border of the Project Area. A site verification program conducted by the DIA in 1999 and 2000 could not specifically locate the site or any archaeological material associated with it. DIA has removed the site from the permanent register and now only records the site as 'stored data'. There is ongoing consultation with Aboriginal elders in regard to this site.

Fisher Research Pty Ltd 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 new ethnographic or archaeological sites.

4.2 (k) Other important or unique values of the environment

The Project Area is at the northern point and comprises a small portion of a much larger area of vegetation representative of the Bassendean Central and South Vegetation Complex in the southern metropolitan area

(Figure 9)[1]. Carnaby's Black-Cockatoo is known to utilise vegetation types associated with this complex, as well as those associated with adjacent complexes such as the Karrakatta Complex Central and South (Figure 9), in the southern metropolitan area.

Areas within 50m of the Conservation Category Quenda wetland are defined as Environmentally Sensitive Areas under the Environmental Protection (Environmentally Sensitive Areas) Notice 2005. The Project Area is 180m from the Quenda wetland and is therefore not within the Environmentally Sensitive Area.

No other important of unique values of the environment occur within the Project Area.

4.2 (l) Tenure of the action area (e.g. freehold, leasehold)

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

- Department of Health Lot 4378 164,743m^2
- Department of Education and Training Part Lot 300 140,471m^2
- Unallocated Crown Land Part Lot 4718 4851m^2
- Unallocated Crown Land Part Lot 4994 9932m^2

4.2 (m) Existing land uses

The Project Area is largely undeveloped with no current formal use, although part is known to be used for educational purposes by Challenger TAFE.

The site is also known to be used by local wildflower enthusiasts, birdwatchers and dog walkers; however there are no formal walking tracks.

The Challenger TAFE campus is located to the south of the Project Area (Figure 2). A Park 'n' Ride facility associated with the Murdoch/South Street bus/rail interchange is located to the north east and the Kwinana Freeway runs north-south adjacent to the eastern side of the Project Area. St John of God Health Care Murdoch is located to the north west of the Project Area and Murdoch University is located further to the west. Western Australia Police, Fire and Emergency Services Authority of Western Australia and community buildings are also located to the immediate south, and the City of Melville Depot is also located south of the Project Area.

4.2 (n) Proposed land uses

The proposed land uses for the site are primarily related to the zoning for the site being 'Public Purposes' (Hospital). Land uses under this zoning will include:

- the Hospital and its related acute care, ambulatory care, educational, research and other clinical and clinical support functions;
- office development, clinical accommodation and consulting rooms to support health related services for the Hospital;
- car parking to service the needs of the Hospital and the health related facilities;
- short-term accommodation, retail and other miscellaneous uses to provide support services to the users of the Hospital;
- conservation areas; and
- public and private roads.

[1] Note the vegetation mapping shown in Figure 9 is the latest available for the Swan Coastal Plain. The database is currently being updated and it is understood that there will be some areas shown as remnant vegetation that have since been cleared.

5 Nature and extent of likely impacts

5.1 Likely impacts on matters of national environmental significance (NES)

5.1 (a) Likely impact on the world heritage values of a declared World Heritage property

The proposal will not affect any World Heritage Properties.

5.1 (b) Likely impact on the heritage values of a listed National Heritage place

The proposal will not affect any National Heritage Places or Commonwealth Heritage Places.

5.1 (c) Likely impact on the ecological character of a declared Ramsar wetland

The proposal will not have any impact to the ecological character of any listed Ramsar sites. The proposal is too far north and east, and down gradient of Forrestdale Lake and Thomsons Lake. It is also isolated from the Peel-Yalgorup Wetlands and Becher Point Wetlands, which are 60km and 35km away respectively.

5.1 (d) Likely impact on the members of a listed threatened species or ecological community, or their habitat

Flora

The 2005 and 2007 spring surveys did not identify any flora species listed under the EPBC Act within the Project Area. The surveys were undertaken at the appropriate and optimal time to find the three species identified as potentially occurring in the Project Area (Table 4). The proposal is unlikely to directly affect any threatened flora.

Fauna

Of the six species of fauna listed under the EPBC Act identified as potentially occurring in the Project Area, only Carnaby's Black-Cockatoo was observed and considered likely to regularly visit the Project Area (Table 4). The action is highly unlikely to have a significant on any other threatened fauna species.

Carnaby's Black-Cockatoo, *Calyptorhynchus latirostris*

The Project Area is a small portion of a large fragmented area of Bassendean Central and South Vegetation Complex (Figure 9)[2], which, along with other vegetation complexes in the southern metropolitan area of the Swan Coastal Plain, support vegetation types utilised by Carnaby's Black-Cockatoo for feeding. The Cockatoo's food includes seeds of Banksia, Dryandra, Hakea, Eucalyptus, Grevillea but also introduced Pinus, as well as fruiting almonds. The species typically occupies and breeds in the remnant tall woodlands of the Wheatbelt of WA, in hollows of smooth-barked eucalypts, but in the non-breeding season, it wanders in flocks to coastal areas, especially pine plantations (Western Australian Museum 2006). There is evidence the species is currently expanding its breeding range westward and south into the Jarrah-Marri forests of the Darling Range and into the Tuart forests of the Swan Coastal Plain (Johnstone & Kirkby 2006).

Breeding success is largely dependent on suitable feeding habitat adjacent to the nest sites to provide the necessary food for the survival of the chick. Any proposal to clear land on the Swan Coastal Plain used by the Carnaby' Black-Cockatoo for food has the potential to affect the availability of food, and consequently the visiting and foraging habits for the species in the local area. The clearing of feeding habitat adjacent to habitat tree sites, such as Tuart forests, is of particular significance.

The Project Area is known to be visited by groups of Carnaby's Black-Cockatoo for feeding purposes. The proposed action alone is not expected to have the potential to affect the distribution and size of Carnaby's Black-Cockatoo populations in consideration of the scale of the impact compared to the area of feeding habitat available to the species, both as indicated by the extent of remnant vegetation in the southern metropolitan area (Figure 9) and the known importance of pine plantations to the species. Carnaby's Black

[2] Note the vegetation mapping shown in Figure 9 is the latest available for the Swan Coastal Plain. The database is currently being updated and it is understood that there will be some areas shown as remnant vegetation that have since been cleared.

Cockatoo are known to exploit the rich and densely packed food source provided by mature cones of the introduced pine trees. Shah (2006) found the species occurred in all regions across the Swan Coastal Plain but with a higher number and greater abundance in areas with native vegetation and pine plantations, with the largest counts of individuals being in pine plantations.

The Project Area is also not adjacent to Tuart forest or woodland with tree hollows suitable for nesting. Male Carnaby's Black-Cockatoos will only travel a relatively short distance to bring food to females during the nesting period (approximately 1-2 kilometres) (Johnstone & Kirkby 2006).

The immediate local area is not known to be commonly utilised by large aggregations of the Carnaby's Black-Cockatoo, and GHD (2006c) reported that the Project Area does not represent a "primary feeding habitat area" for the species. This may not have always been the case; Dr Ron Johnstone of the Western Australian Museum has noted that large groups of the bird were often observed in the pine plantations that used to cover the existing adjacent residential areas and university grounds, but that those numbers have declined since the encroachment of urban development led to the clearing of these pines (R. Johnstone, pers. comm. 28 November 2007). There are now only some small sections of the original pine plantations remaining on the adjacent Murdoch University site, which are still frequented by the birds (Shar 2006), but in much smaller numbers (R. Johnstone, pers. comm. 28 November 2007). Piney Lakes Reserve, which is located to the north of the project area and contains some remaining pines, was identified as a roosting site for Carnaby's Black-Cockatoo in Shah (2006) and is described in the Birds Australia pamphlet *Birdwatching in Melville* as a site to observe Carnaby's Black-Cockatoo often feeding (Bird Australia, undated).

The proposed clearing has the potential to affect smaller groups of Black-Cockatoos habitually or occasionally utilising the Project Area, decreasing the availability of food and affecting habitual movement of such groups across the area. The cumulative impact of clearing of non-breeding habitat on the Swan Coastal Plain is also of concern. As such, the potential impact on the species of clearing feeding habitat in the Project Area will be reduced through a combination of on-site retention of key areas of vegetation and re-establishment of flora species suitable as a food source in hospital landscaping and street scaping.

Approximately 25ha of the 32.4ha Project Area (including vegetation suitable for feeding purposes of the Carnaby's Black-Cockatoo) will be cleared. Approximately 3ha will be protected in conservation areas within the Hospital Grounds (Figure 10). Areas to be retained within and adjacent to the Project Area will be linked by a network of landscaped corridors (greenways) and streetscapes primarily utilising species originally found in the Project Area (some of which may be propagated from seed removed from the Project Area prior to clearing) and other natives (Figure 10). There will be some introduced flora species used in limited areas (e.g. roof gardens, courtyard gardens) but all streetscaping and greenways will utilise natives, a large proportion of which will be those originally found on site (refer to Draft Carnaby's Black Cockatoo Management Plan (Appendix 8)).

The significance of clearing 25ha of vegetation is tempered by the existence of larger areas of feeding habitat to the south of the Project Area (Figure 9), which exists as 'stepping stones' of various scale across the southern metropolitan area. The retention of areas of vegetation and use of suitable species is intended to preserve the function of the Project Area as a northern 'tip' of these areas of vegetation (Figure 9).

The measures described above are further detailed in the attached Draft Carnaby's Black-Cockatoo Management Plan and are intended to ensure the species continues to utilise the Project Area when visiting the Swan Coastal Plain from their breeding grounds to the east in the Western Australian Wheatbelt. In addition, the Plan details the use of soil and vegetative material for rehabilitating degraded areas in the nearby regional park for the purpose of restoring feeding habitat in degraded areas of the park and reducing fragmentation in these areas. The removal of topsoil and direct placement (no stockpiling) in these areas forms part of the construction program. The approach is based on success with direct placement of topsoil for rehabilitation near South Lake in the park using similar soils.

Evaluated against the significant impact criteria for Endangered Species as per the Department of Environment and Heritage (now Department of Environment and Water Resources) EPBC Act Policy Statement 1.1 (Significant Impact Guidelines) (See Table 5), the Department of Housing and Works is not convinced the action is likely to have a significant impact on the Carnaby's Black-Cockatoo species.

Table 5 Assessment of action against DEH (2006) significant impact criteria

Significant impact criteria (DEH 2006)	Likelihood	Rationale
Will the action lead to a long-term decrease in the size of a population	Appears unlikely but difficult to assess	The loss of feeding habitat on the Swan Coastal Plain is of concern to the species. The recovery plan for Carnaby's Black-Cockatoo highlights the importance of protecting and regenerating vegetation remnants that are feeding sources for the species. Remnants that are within breeding areas being of most importance to this species, which the Project Area does not constitute. Given the Project Area is not near potential breeding habitats and the size of the area to be cleared (25ha) compared to the available feeding habitat in the southern metropolitan area (albeit in decline), it appears unlikely the action alone could lead to a decrease in the 'size' of Carnaby's Cockatoo populations. The cumulative effect of such clearing represents some uncertainty to this assessment, hence the referral of the action to the Commonwealth.
Will the action reduce the area of occupancy of the species	Unlikely	Action does not affect areas of breeding habitat. Role of Project Area as 'stepping stone' of feeding habitat through area should be retained through conservation of areas of vegetation in the Project Area and use of flora species used by Carnaby's Black-Cockatoo for feeding in landscaping and street scaping.
Will the action fragment an existing population into two or more populations	Unlikely	The species is highly mobile and travels large distances across the region between feeding areas, including crossing from the north to south of the metropolitan area. The clearing of 25ha of vegetation over a maximum distance of 500m would not represent a barrier for movement.
Will the action adversely affect habitat critical to the survival of a species	Unlikely	The Project Area is a small portion of available feeding habitat to the species, which includes Banksia woodland and pine plantations on the Swan Coastal Plain. Nesting trees near feeding areas represent the most critical habitat to this species, which this site does not constitute.
Will the action disrupt the breeding cycle of a population	Unlikely	No breeding sites or potential nesting trees will be affected by the action. The Project Area is not close to known well-used breeding sites.
Will the action modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Appears unlikely but difficult to assess	The loss of feeding habitat on the Swan Coastal Plain is of concern to the species. It appears unlikely the action alone could lead to a decrease in the 'size' of Carnaby's Black-Cockatoo population however the cumulative effect of such clearing represents some uncertainty to this assessment, hence the referral of the action to the Commonwealth.
Will the action result in invasive species that are harmful to a critically endangered or endangered species	Unlikely	The project has low potential to directly introduce invasive species to mobile populations of cockatoos. There are numerous introduced flora species (weeds) in the Project Area however the implementation of a Dieback and Weed Management Plan during construction and maintenance of areas to be conserved should ensure the viability of those areas is not threatened by weed infestation.
Will the action introduce disease that may cause the species to decline	Unlikely	The project has low potential to introduce disease directly to mobile populations of cockatoos. Phytophthora (Dieback) potentially occurs on a small section of the Project Area (to be confirmed in January 2008) and appropriate management is critical to ensure the infection is not spread to those areas being retained in the Project Area, which could cause the loss of vulnerable flora species of importance as fodder to Carnaby's Black-Cockatoo. A Dieback and Weed Management Plan has been prepared for the Project Area for implementation during construction. Topsoil from areas of Dieback infection (if confirmed) will not be used for off-site rehabilitation projects.
Will the action interfere with the recovery of the species	Possible, unlikely to have a significant effect in isolation, however cumulative affect of clearing of such habitat is of concern	The clearing of any feeding habitat for the Carnaby's Black-Cockatoo possibly interferes with recovery efforts for the species. The Project Area is not near potential breeding habitats and the size of the area to be cleared (25ha) compared to the available feeding habitat in the southern metropolitan area (albeit in decline) is low. The significance of the action to recovery of the species is difficult to assess and justification for referral of the action to the Commonwealth.

Nevertheless, the action is being referred at this time in light of concern in regard the potential for cumulative impact to the species from clearing of non-breeding feeding habitat on the Swan Coastal Plain and to avoid any possible disruption to the development schedule at a later stage. The environmental management approach proposed for the development of the Fiona Stanley Hospital (refer to Section 6.1) has been adopted in light of the potential for incremental clearing to have a cumulative impact on habitat, which poses some risk to the species in the long term and because of a commitment that the project meet a high level of environmental responsibility.

5.1 (e) Likely impact on the members of a listed migratory species or their habitat

Of the 12 migratory species listed under the EPBC Act that were identified as potentially occurring within the Project Area, only the Rainbow Bee-eater was present during the 2005 site fauna survey. The Project Area is not considered to comprise significant habitat for any of the remaining 11 migratory species (Table **4**). The proposal is not likely to have a significant impact on these species or their habitat.

Rainbow Bee-eaters **Merops ornatus**

The proposal is not likely to have a significant impact on this species or its habitat. Large numbers of the species were not observed in the Project Area (only one pair was sighted) and GHD (2006c) did not consider the Project Area to be a key habitat for this migratory species. This is supported by what is known of the species and its distribution and habitat needs in the metropolitan area (adapted from Department of Environment and Water Resources 2007):

- the species has a widespread distribution and a variety of habitats that it has been recorded in across Australia;
- although not properly estimated, the total population size of the species is assumed to be reasonably large, based on reporting rates for the species (i.e. the Atlas of Australian Birds has received more than 30,000 records of the Rainbow Bee-eater since 1998);
- the mobility of the species suggests that it is unlikely that any local or regional population would be genetically isolated from the remainder of the Australian population; and
- although trends in the extent of occurrence have not been quantified, records indicate that the distribution of the species (and, hence, the extent of occurrence) has expanded in south-western Australia. The Rainbow Bee-eater was rare around Perth during the 19th century, and was recorded only infrequently before the 1920s. However, the bird had begun to visit Perth regularly and in larger numbers by the late 1970s, and it colonised Rottnest Island in 1977.

The scale of clearing from the proposed action is unlikely to have a significant impact on the Rainbow Bee-eater given the available habitat for the species and the fact that its extent of occurrence and area of occupancy is possibly increasing in the region, not declining.

The areas of highest potential use by the species will be enhanced through the reconstruction of the artificial pond to the north of the southern conservation area, which is to be used as a stormwater infiltration basin, and establishment of denser stands of vegetation (propagated from seed collected on-site) around the basin. These and plantings of local wetland species within the basin will provide habitat for Rainbow Bee-eaters and other species. Historical disturbance does not represent a major issue to this species and it is common in cleared and semi-cleared habitats (Morris 1976, 1977; Wolstenholme 1925).

5.1 (f) Likely impact on the environment in part of the Commonwealth marine area

The proposal will not affect any Commonwealth marine areas.

5.2 Likely impacts for nuclear actions, actions affecting Commonwealth land or actions taken by the Commonwealth

The proposal does not involve nuclear actions.

6 Measures to avoid or reduce impacts

It is recognised that the project will affect the value of the Project Area to Carnaby's Black-Cockatoo however, given the scale of the clearing compared to the extent of feeding habitat available to the species and the relative higher importance of large areas of pine plantation on the Swan Coastal Plain, it seems unlikely the species would be significantly affected. Nevertheless, in the aim of minimising impact and providing a net environmental benefit to the species, as well as providing further security that the Rainbow Bee-eater will not be significantly affected, the following management strategies will be implemented.

6.1 Carnaby's Black-Cockatoo

A Draft Carnaby's Black-Cockatoo Management Plan has been prepared for this proposal and is submitted as a supporting document to this proposal (Appendix 8).

6.1 (a) Management objective

The objectives of the Management Plan are to:

- maximise the potential for the Project Area to continue to be utilised by Carnaby's Black-Cockatoo during and following development; and
- restore areas of Carnaby's Black-Cockatoo feeding habitat in the adjacent Beeliar Regional Park.

6.1 (b) On-site management

Prescribed management actions include:

- retaining and protecting areas of vegetation within the Project Area of best relative condition in allocated Conservation Areas in the FSH grounds;
- on-site landscaping and street scaping using flora known to be utilised by Carnaby's Black-Cockatoo for food in proposed areas of open space (including using plants propagated from seed harvested prior to clearing);
- establishing roof gardens on Hospital buildings using flora known to be utilised by Carnaby's Black-Cockatoo;
- investigating the potential for Carnaby's Black-Cockatoo nest boxes to be installed in areas of retained vegetation to "add value" to these areas;
- implementation of a Weed and Dieback Management Plan before and during construction;
- implementing an environmental induction program to raise staff awareness and education;
- ensuring proper construction management processes including:
    - installing fences to protect remnant vegetation;
    - imposing vehicle speed limits;
    - ensuring proper waste disposal management; and
- implementing a fauna encounter management system during construction.

6.1 (c) Off-site rehabilitation

Rehabilitation of areas of land external to the Project Area for the purpose of restoring suitable habitat for Carnaby's Black-Cockatoo (and other species) in the adjacent regional park is proposed. The rehabilitation will utilise topsoil and vegetative material stripped from the Project Area during clearing. The total area to be revegetated will be approximate to the area cleared. Degraded sites within the regional park are being considered for rehabilitation are those that would have originally been of a similar vegetation type to the Project Area and that are adjacent to areas known or likely to be frequented by Carnaby's Black-Cockatoo. The rehabilitation sites being considered are outlined in the Draft Carnaby's Black-Cockatoo Management Plan (attached) and all are within the Conservation Estate, ensuring long-term protection.

6.1 (d) Other initiatives

With the aim of delivering a net environmental benefit from this project, the following additional off-site measures are being proposed in the Draft Carnaby's Black-Cockatoo Management Plan:

- acquire a potentially threatened area of known Carnaby's Black-Cockatoo habitat in the Western Australian Wheatbelt for the purpose of conservation;
- rehabilitate habitat similar to that of the Project Area within the nearby Beeliar Regional Park, using topsoil, seed and vegetative material stripped from the Project Area during clearing;
- provide funding support to assist community groups in the provision of care and rehabilitation facilities for Carnaby's Black Cockatoo;
- provide funding support for the operation of the Wildcare Helpline that provides 24 hours per day advice on the care of sick and injured wildlife, including Carnaby's Black Cockatoo
- provide funding support to DEC over five years to augment the Regional Parks Community Grants Scheme to encourage community groups to become involved in conservation projects in and around Perth's regional parks (Projects may include that for the protection and enhancement of habitat for Carnaby's Black Cockatoo and it is envisaged that groups will be encouraged to apply for projects associated with the habitat rehabilitation areas in Beeliar Regional Park)
- funding to support further research into the Carnaby's Black Cockatoo aimed at increasing knowledge on and facilitating the recovery of the species.

A Memorandum of Understanding (MOU) has been drafted between the Department of Health (DoH), the Department of Housing and Works (DHW) and the Department of Environment and Conservation (DEC) to establish the mechanisms in order to successfully implement these environmental management and conservation initiatives (Appendix 9).

6.2 Rainbow Bee-eater

6.2 (a) Management objective

The management objective is to minimise the on-site impact on the Rainbow Bee-eater and its habitat.

6.2 (b) Management approach

The management approach to minimising the impact to the Rainbow Bee-eater and its habitat includes:

- enhancing the artificial wetland located to the north of the southern conservation area and
- planting denser stands of vegetation around the wetland for use by the species.

The area of highest potential use by the Rainbow Bee-eater will be enhanced through the reconstruction of the artificial pond the north of the southern conservation area, which is to be used as a stormwater infiltration basin, and establishment of denser stands of vegetation (propagated from seed collected on-site) around the basin. These and plantings of local wetland species within the basin will provide habitat for Rainbow Bee-eaters and other species.

7 Conclusion on the likelihood of significant impacts

Do you THINK your proposed action is likely to have significant impacts?

X	No, complete section 7.1
	Yes, complete Section 7.2

7.1 Proposed action is NOT LIKELY to have significant impacts

7.1 (a) Key reasons

The proponent considers that the proposal does not constitute a 'controlled action', as defined by the EPBC Act, in that it:

- does not have any potential to affect:
  - World Heritage Properties;
  - National Heritage Properties;
  - Ramsar Wetlands;
  - Threatened ecological wetlands; and/or
  - Commonwealth marine areas;
- is not a nuclear action;
- does not impact Commonwealth land; and
- is not being implemented by a Commonwealth agency.

The field survey identified one migratory and one vulnerable species of fauna listed under the EPBC Act which could potentially be affected by the proposed action – the Rainbow Bee-eater *Merops ornatus* and Carnaby's Black-Cockatoo *Calyptorhynchus latirostris*. No other threatened species or ecological communities are likely to be affected by the proposed action.

Approximately 25ha of vegetation known to be frequented by Carnaby's Black-Cockatoo for the purpose of feeding will be cleared for the development of the Fiona Stanley Hospital. Any clearing of such habitat is of concern to the recovery of the species, however the scale of this clearing is relatively low compared to the area of feeding habitat available to the species, both as indicated by the extent of remnant vegetation and pine plantations in the southern metropolitan area. The Project Area is also not adjacent to areas of potential nesting trees, where the species would depend on the existence of the feeding habitat for feeding of their chicks following hatching.

The immediate local area is not known to be currently utilised by large numbers of the Carnaby's Black-Cockatoo and GHD (2006c) reported that the Project Area does not represent a "primary feeding habitat area" for the species. Historically, large groups of the species were observed in the local area within the pine plantations that covered much of this part of Perth. The number of birds seen visiting the area has declined since the pine plantations were cleared for urban development.

The potential risk to the species from clearing feeding habitat in the Project Area will be reduced through a combination of on-site retention of 3ha of vegetation and re-establishment of flora species suitable as a food source in hospital landscaping and streetscaping. Such landscaped areas will provide linkages between those areas to be retained. Vegetation abutting the Project Area will also continue to function as feeding habitat also in the immediate area. The retention of areas of vegetation and use of suitable species in landscaping is intended to preserve the Project Area as a 'stepping stone' of feeding habitat through the region.

A pair of Rainbow Bee-eaters was observed at the artificial pond during the field survey, however, there are no other wetlands within the Project Area and it is not considered to be a key habitat for this migratory species. The area of highest potential use by the Rainbow Bee-eater will be enhanced through the reconstruction of the artificial pond to the north of the southern conservation area and planting of adjacent

dense stands of vegetation. The wetland area will include local wetland species and continue to provide a habitat for Rainbow Bee-eaters and other species.

Also of note, with the aim of providing a long term net benefit from this project, it is proposed to:

- acquire a potentially threatened area of known Carnaby's Black-Cockatoo habitat in the Western Australian Wheatbelt for the purpose of conservation;
- rehabilitate habitat similar to that of the Project Area within the nearby Beeliar Regional Park, using topsoil, seed and vegetative material stripped from the Project Area during clearing;
- provide funding support to assist community groups in the provision of care and rehabilitation facilities for Carnaby's Black Cockatoo;
- provide funding support for the operation of the Wildcare Helpline that provides 24 hours per day advice on the care of sick and injured wildlife, including Carnaby's Black Cockatoo
- provide funding support to DEC over five years to augment the Regional Parks Community Grants Scheme to encourage community groups to become involved in conservation projects in and around Perth's regional parks (Projects may include that for the protection and enhancement of habitat for Carnaby's Black Cockatoo and it is envisaged that groups will be encouraged to apply for projects associated with the habitat rehabilitation areas in Beeliar Regional Park)
- funding to support further research into the Carnaby's Black Cockatoo aimed at increasing knowledge on and facilitating the recovery of the species.

A Memorandum of Understanding (MOU) has been drafted between the Department of Health (DoH), the Department of Housing and Works (DHW) and the Department of Environment and Conservation (DEC) to establish the mechanisms in order to successfully implement these environmental management and conservation initiatives (Appendix 9).

7.2 Proposed action is LIKELY to have significant impacts

7.2 (a) Matters likely to be impacted

	sections 12 and 15A (World Heritage)
	sections 15B and 15C (National Heritage places)
	sections 16 and 17B (Wetlands of international importance)
	sections 18 and 18A (Listed threatened species and communities)
	sections 20 and 20A (Listed migratory species)
	sections 21 and 22A (Protection of the environment from nuclear actions)
	sections 23 and 24A (Marine environment)
	sections 26 and 27A (Protection of the environment from actions involving Commonwealth land)
	section 28 (Protection of the environment from Commonwealth actions)

7.2 (b) Key reasons

Not applicable.

8 Assessment approach under the EPBC Act

8.1 (a) Level of assessment

	Bilateral Agreement applies
	Accredited assessment
	Assessment on referral information
	Preliminary information
	Public Environment Report
	Environmental Impact Statement
	Commission of Inquiry
X	No comment/Not sure

8.1 (b) Key reasons

Evaluated against the significant impact criteria for Endangered Species as per the Department of Environment and Heritage (now Department of Environment and Water Resources) EPBC Act Policy Statement 1.1 (Significant Impact Guidelines) (See Table 5), the Department of Housing and Works is not convinced the action is likely to have a significant impact on the Carnaby's Black-Cockatoo species.

Nevertheless, the action is being referred at this time in light of concern in regard the potential for cumulative impact to the species from clearing of non-breeding feeding habitat on the Swan Coastal Plain and to avoid any possible disruption to the development schedule at a later stage. The environmental management approach proposed for the development of the Fiona Stanley Hospital (refer to Section 6.1) has been adopted in light of the potential for incremental clearing to have a cumulative impact on habitat, which poses some risk to the species in the long term and because of a commitment that the project meet a high level of environmental responsibility.

9 Environmental history of the responsible party

		Yes	No
9.1	**Does the party taking the action have a satisfactory record of responsible environmental management?** • **If Yes, provide details** The Department of Housing and Works (DHW), as the State's major Works agency, currently manages $4billion of works and building projects. DHW also manages office accommodation for Government agencies; carries out millions of dollars' worth of repairs and maintenance; and is working with the building industry to implement energy efficiency standards for new housing. DHW's documented architectural record of public works dates back to 1901. It has maintained a track record for successfully managing environmental issues in planning and development. DHW's Landstart division offers land development projects like Keralup (formerly Amarillo) and Harrisdale as examples. Recent examples of site decontamination works include the Perth Arena, Swanbourne School and Bunbury Hospital sites. DHW also has a record of responsible management for the Mt Walton Class A waste treatment site and the World Heritage listed Fremantle Prison.	Yes	
9.2	**Is the party taking the action subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?** • **If Yes, provide details**		No
9.3	**For an action for which a person has applied for a permit under the EPBC Act, is the person making the application subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?** • **If Yes, provide details** Clearing permit 1773/1 was granted to the proponent (Minister for Health, on whose behalf the clearing is to be undertaken) under section 51E of the EP Act on 26 July 2007. The Clearing Permit allows up to 30ha to be cleared for the purpose of the development of the Fiona Stanley Hospital and includes conditions relating to minimisation of clearing, dieback and weed control, fauna management and the development of an offsets package for the clearing of vegetation (Appendix 3). The proponent has since reduced the footprint of the project and is revising the Clearing Permit so that it includes the clearing of only 25ha, consistent with this referral.	Yes	
9.4	**If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?** • **If Yes, provide details of environmental policy and planning framework** The party taking the action is a State Government Department.		No

10 Information sources and attachments

10.1 References

Badman, F.J. (1979). *Birds of the southern and western Lake Eyre drainage*. South Australian Ornithologist 28: 57-81.

Beard, J.S. (1979). Vegetation Survey of Western Australia, 1:250 000 Series. *The Vegetation of the Perth Area, Western Australia*, South Perth, Western Australia.

Birds Australia (undated). *Birdwatching in Melville*. Bird Australia Pamphlet, 167 Perry Lakes Drive, Floreat, WA.

Boekel, C. (1976). Ten months on Gove Peninsula. *Australian Bird Watcher* 3: 231-245.

Department of Environment and Heritage (2006). *EPBC Act Policy Statement 1.1 (Significant Impact Guidelines) –Matters of National Environmental Significance.* Canberra, Australia.

Department of the Environment and Water Resources (2007). *Merops ornatus* in Species Profile and Threats Database, Department of the Environment and Water Resources, Canberra. Available from: http://www.environment.gov.au/sprat. Accessed 2007-11-08@13:56:14.

Department of Environment and Conservation (online 2006). *Perth Groundwater Atlas* http://portal.water.wa.gov.au/portal/page/portal/MapsDataAtlases/PerthGroundwaterAtlas

Fry, C.H. (1984). *The Bee-eaters*. Poyser, Calton, England.

Gibson, N., Keighery, B.J., Keighery, G.J., Burbridge, A.H. & Lyons, M.N. (1994). *A Floristic Survey of the Southern Swan Coastal Plain*. Unpublished Report for the Australian Heritage Commission prepared by Department of Conservation and Land Management and the Conservation Council of Western Australia (Inc).

GHD, (2006a). *Draft Murdoch Activity Centre Structure Plan (Including Fiona Stanley Hospital and Health Precinct)*. Prepared for the Department of Housing and Works.

GHD, (2006b). *Fiona Stanley Hospital and Health Precinct Site investigation – Flora and Vegetation Assessment*. Prepared for The Department of Housing and Works. Perth, Western Australia. February 2006.

GHD, (2006c). *Fiona Stanley Hospital and Health Precinct Site investigation – Fauna Assessment*. Prepared for The Department of Housing and Works. Perth, Western Australia. March 2006.

GHD, (2006d). *Report for Utilities Services Fiona Stanley Hospital and Health Precinct*. Prepared for The Department of Housing and Works.

GHD, (2007a). *Fiona Stanley Hospital and Health Precinct, Environmental Protection Authority Referral Document*. Prepared for the Department of Housing and Works. Perth, Western Australia. March 2007.

GHD (2007b). *Murdoch Activity centre Structure Plan Summary Report on Submissions.* Prepared for The Department of Housing and Works.

Government of Western Australia (2000). *Bush Forever Volume 2. Directory of the Bush Forever Sites*. Department of Environment Protection. Perth, Western Australia.

Government of Western Australia (2004). *Perth Groundwater Atlas,* Second edition 2004, Department of Environment, Perth Western Australia.

Heddle, E.M., Loneragan, O.W and Havel, J.J (1980). *Vegetation Complexes of the Darling System, Western Australia*. In: *Atlas of Natural Resources, Darling System Western Australia*. Department of Conservation and Environment., Perth Western Australia

Hill, A.L.. Seminiuk, C.A., Seminiuk, V. and del Marco, A. (1996) *Wetlands of the Swan Coastal Plain. Volume 2: Wetland Mapping, Classification, and Evaluation – Wetland Atlas*. Prepared for the Water and Rivers Commission and the Department of Environment Protection, Perth, Western Australia.

Johnstone & Kirkby (2006). *Perth-Bunbury Highway (Kwinana Freeway Extension and Peel Deviation) – Targeted Threatened Fauna Survey.* Prepared for Main Roads Western Australia by Biota Environmental Sciences Pty Ltd, May 2006.

Morris, I.C. (1976). Observations of the Rainbow Bird *Merops ornatus* in the Warby Ranges. *Victorian Naturalist* 93: 152-154.

Morris, I.C. (1977). More observations of Rainbow Bee-eaters *Merops ornatus* in the Warby Ranges. *Victorian Naturalist* 94: 158-160.

Phillips R, (2007), *Fiona Stanley Hospital and Health Precinct, Caladenia huegelii Targeted survey,* prepared for Strategen, October 2007.

Roberts, G.J. (1979). *The Birds of South-East Queensland*. Queensland Conservation Council, Brisbane.

Shar, B. (2006). *Conservation of Carnaby's Black Cockatoo on the Swan Coastal Plain, Western Australia*. Floreat, Birds Australia.

Storr, G.M. (1984a). Birds of the Pilbara Region, Western Australia. *Records of the Western Australian Museum Supplement 16*.

Storr, G.M. (1984b). Revised list of Queensland birds. *Records of the Western Australian Museum Supplement 19*.

Storr, G.M. (1985). Birds of the Gascoyne Region, Western Australia. *Records of the Western Australian Museum Supplement 21*.

SKM, (2006). *Southern Tertiary (Fiona Stanley) Health Precinct Transport Plan Report*, Perth, Western Australia.

Western Australian Government (2005). *Gazette No. 55- Environmentally Sensitive Areas under the Environmental Protection (Environmentally Sensitive Areas) Notice 2005.* Perth, Western Australia.

Western Australian Museum 2006. http://www.cockatoocare.com/

Wolstenholme, H. (1925). Notes on the birds observed during the Queensland congress and camp-out, 1924. *Emu* 24: 243-51.

10.2 Reliability of information

10.2 (a) Source of the information

Information regarding the presence of matters of national significance was obtained through the EPBC Act Protected Matters Interactive Search Tool (accessed March 2007 (GHD 2006b & c) and in September 2007). This information was supplemented with results from flora and fauna surveys commissioned by the proponent.

Additional information obtained by GHD Pty Ltd for the purpose of the EPA referral includes records from Birds Australia Western Australia Inc, the WA Museum, DEC and DIA. Information obtained by the

proponent relating to aboriginal and European heritage was supplemented with results from archaeological and ethnographic surveys commissioned by the proponent.

Sources of information and data presented in Section 3 and 4 are referenced where appropriate, with these references listed in section 10.1, including dates for each.

10.2 (b) How recent the information is

The majority of information and studies used for the preparation of this referral are from the 1995 to 1997 period.

Of particular note, was the flora and fauna surveys performed by GHD in 2005 and 2006 (GHD 2006b).

A supplementary field survey performed specifically for threatened flora occurred in spring 2007.
Section 10.1 indicates the dates of other references used for the purpose of this referral.

The vegetation mapping shown in Figure 9 is from the *Bush Forever* (Government of Western Australia 2000) publication.

10.2 (c) How the reliability of the information was tested

All supporting flora and fauna studies were undertaken by suitably qualified personnel using widely accepted survey methods. All personnel have extensive experience with undertaking similar surveys in the south west of Western Australia.

10.2 (d) Any uncertainties in the information

The proponent is not aware of any uncertainties in the information used to prepare this referral. Records from the EPBC Act Protected Matters Interactive Search Tool have the caveats that are stated on entering the database.

10.3 Attachments

You must attach	figures, maps or aerial photographs showing the project locality (section 2)	X
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 4)	X
If relevant, attach	copies of any state or local government approvals and consent conditions (section 3.4)	X
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 3.5)	X
	copies of any flora and fauna investigations and surveys (section 4)	X
	technical reports relevant to the assessment of impacts on protected matters and that support the arguments and conclusions in the referral (section 4 and 5)	X
	report(s) on any public consultations undertaken, including with Indigenous Stakeholders (section 4)	

List of Figures

List of Appendices

11 Signatures and declarations

Project title

11.1 **Party who prepared the referral**

I declare that the information contained in this form is, to my knowledge, true and not misleading. I request that the person named in 11.3 below (if any) be designated as the proponent for the action.

Signature

Date 16/1/2008

Full name WARREN ALISTER MCGRATH

11.2 **Party who is responsible for action**

I declare that the information contained in this form is, to my knowledge, true and not misleading.

Signature

Date 16/1/2008

Full name ALAN PIPER

11.3 **Proponent (complete only if different from 11.2)**

I, being the person nominated in Section 1.3 of this referral form as the nominated proponent (or agent acting on behalf of), agree to be designated as the proponent for the action described above if it is decided that the action requires approval under Part 9 of the EPBC Act.

Signature

Date 15. 1. 08

Full Name JOHN ALFRED GOLE.

If the referring party is a small business (fewer than 20 employees), estimate the time, in hours and minutes, to complete this form (include your time reading the instructions, working on the questions and obtaining the information and time spent by all employees in collecting and providing this information).

Hours	Minutes