



# **PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN**

**Banana Wells Gravel Pit**

**January 2012**

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## SUMMARY

The Banana Wells gravel pit, located approximately 140km north of Broome, is composed of suitable gravel material for future upgrade works programmed for the Broome-Cape Leveque Road.

The gravel pit is approximately 200ha in size. Large sections of the gravel pit have been previously disturbed or excavated, prior to Main Roads being required to obtain statutory approval to clear native vegetation.

Depending upon material requirements associated with the Broome-Cape Leveque Road upgrade works, an area of no larger than 40 ha approx will be established annually within the Banana Wells gravel pit. As one area is excavated and exhausted of material it will be rehabilitated prior to a further material extraction area being established.

A search of the Department of Indigenous Affairs Aboriginal Heritage Inquiry database (Appendix D) identified no Aboriginal heritage sites of significance registered in the Banana Wells gravel pit area. Main Roads are currently in consultation with the Kimberley Land Council regarding the proposed works and all matters relating to Aboriginal heritage will be dealt with by the KLC and Traditional Owners to ensure any aspects relating to Aboriginal heritage and Native Title comply with the *Aboriginal Heritage Act 1972* and the *Native Title Act 1993* respectively before any excavation works proceed.

Clearing of native vegetation is the main environmental impact associated with this project. The Main Roads State-wide Purpose Permit (818/6) which has been granted to Main Roads under Section 51E of the Environmental Protection Act 1986 (EP Act 1986) does not authorise the clearance of native vegetation for project activities where:

- the clearing may be seriously at variance with the clearing principles; or
- those project activities are incorporated in any proposal that is referred to and assessed under Part IV of the EP Act 1986 by the EPA.

Environmental assessment of the proposed project has been undertaken which has determined clearing activities associated with the proposal to be 'not likely' to be at variance to the ten clearing principles (refer to section 5.2).

There are no environmental impacts or issues considered as having a significant impact on matters of national environmental significance, which would render the project a "Controlled Action" or invoke the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act 1999). The project is not expected to require formal referral to the EPA under the Environmental Protection Act 1986 (EP Act 1986).

# **PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN**

## **Banana Wells Gravel Pit**

### **1. BACKGROUND**

The Broome-Cape Leveque Road is the main transport link through the Dampier Peninsula providing access to:

- Major Aboriginal communities of Beagle Bay, Lombadina, Djarindjin and One Arm Point with a combined population estimated to be around 1200 people;
- Numerous smaller Aboriginal communities;
- Pastoral stations;
- Pearling industries; and,
- Tourist destinations.

Over the years the standard of the road has gradually deteriorated, becoming depressed below the natural surface. This has resulted in the gradual reduction in road width making it necessary for vehicles to negotiate steep banks in order to pass one another. Other sections are badly corrugated or have numerous sand holes making the road a hazard for drivers.

Banana Wells gravel pit is one of the few suitable gravel resources in the Dampier Peninsula to service material requirements necessary for the upgrade of the Broome-Cape Leveque Road. Excavation of material from Banana Wells gravel pit will allow the Broome-Cape Leveque Road to be upgraded to a safe and acceptable standard for road users.

Following Main Roads' corporate Environmental Assessment and Approval process, an initial 'Low Impact Environmental Screening Checklist' was completed for the proposal. The checklist determined the project required further environmental assessment as the project requires clearing outside of the maintenance zone (item 2 on the checklist). Therefore the preparation of a project specific Preliminary Environmental Impact Assessment (PEIA) and Environmental Management Plan (EMP) are required.

The preliminary environmental assessment will involve a desktop analysis of environmental aspects and impacts, a site investigation, an assessment of native vegetation clearing and consideration of necessary environmental management. The preliminary assessment will determine whether an Environmental Impact Assessment (EIA) is necessary and if referral to State and/or Commonwealth authorities is required.

### **2. DESCRIPTION OF THE PROJECT**

It is proposed to investigate the Banana Wells gravel pit area and locate naturally occurring gravels suitable for upgrade of the Broome-Cape Leveque Road. The whole area under investigation will not require clearing and excavation but the best available materials will be sourced from within the project area. Materials may be extracted from one or several locations within the proposed investigation area. Areas cleared of native vegetation for extraction purposes will be no larger than 40 hectares approx. All areas that are cleared and disturbed will be rehabilitated once gravel extraction is complete. The gravel area will likely remain open for the duration of construction activities associated

with the upgrade of the Broome-Cape Leveque Road, maybe seven years. Construction works are planned to proceed April 2013.

## 2.1 Project Location

Figure 1 provides a broad locality image of the project area.

Figure 2 provides a close-up image of the project area and location of clearing activities.



Figure 1...Broad locality image of the project area.





Figure 2...Close-up image of project area.

### **3. METHODOLOGY**

#### **3.1 Preliminary Desktop Study**

A preliminary assessment of the project area and the potential constraints of the proposal were undertaken by reviewing a number of government agency managed databases and viewing GIS shapefiles where necessary.

##### **3.1.1 Threatened Flora, Fauna & Communities, Conservation Reserves and ESAs**

Current GIS shape files provided to Main Roads by the DEC were examined for known populations of threatened flora, fauna, Threatened Ecological Communities (TECs) or conservation areas located within the vicinity of the works, refer to Appendix B. Consultation with the DEC confirmed that no TECs, priority flora or threatened fauna would be impacted by project activities, refer Appendix B.

##### **3.1.2 Heritage**

Non-indigenous heritage was examined utilising the Australian Heritage Places Inventory (<http://www.environment.gov.au/heritage/places/wa/index.html>) and the Heritage Council of Western Australia Places Database (<http://register.heritage.wa.gov.au/>), refer to Appendix C.

##### **3.1.3 Aboriginal Heritage**

A search of the Department of Indigenous Affairs' (DIA's) (<http://dia.wa.gov.au/AHIS/>) database was undertaken to determine whether the project area contains any sites of Aboriginal Heritage, refer to Appendix D.

##### **3.1.4 Sensitive Water Resources**

A search of the Department of Water's (DoW's) database was undertaken (<http://www.water.wa.gov.au/idelve/dowdataext/index.jsp>) to determine whether the project area contains any sensitive water resources (including Public Drinking Water Source Areas or Water Pollution Control Areas) or adjacent to any significant lakes, rivers, wetlands or located in proclaimed areas, refer to Appendix E.

##### **3.1.5 Wetlands**

The locations of any wetlands within the project area was determined using the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) mapping tool, the Department of Environment and Conservation (DEC) "Native Vegetation Map Viewer" mapping tool, viewing current GIS shapefiles, refer to Appendix F.

##### **3.1.6 Weeds**

A site inspection was carried out to identify any declared plants or significant weeds in or adjacent to the project area, refer to site photos Appendix I.

##### **3.1.7 Dieback**

The Project Area is located outside the vulnerable areas of the southwestern parts of Western Australia. A site inspection was carried out to determine the presence of dieback, refer to site photos Appendix I.



### 3.1.8 Contaminated Sites

A search of the DEC's contaminated sites database was undertaken (<https://secure.dec.wa.gov.au/idelve/css/>) to determine whether the project area contains or is adjacent to any contaminated sites, refer Appendix H.

### 3.1.9 Acid Sulfate Soils

The project is outside the DEC's acid sulfate soils maps. No further investigations are necessary as the site is outside of the high risk area for ASS and there is no dewatering or excavation below the water table planned.

### 3.1.10 Air Quality

The need for a local air quality assessment was determined using the criteria outlined in the MRWA Environmental Guideline, Air Quality.

## 3.2 Commonwealth Referral

The decision whether to refer the project to the Commonwealth DSEWPC was based upon whether the project would impact Commonwealth land, or may have a significant impact upon matters of national significance, which are protected under the *EPBC Act*. These are; World Heritage properties, National Heritage places, wetlands of international importance (listed under the Ramsar convention), Commonwealth Marine Areas, migratory species protected under international agreements, nuclear actions, nationally threatened species and ecological communities.

The DSEWPC protected matters search tool was used to determine if the project will impact upon any matters of national significance: (<http://www.environment.gov.au/erin/ert/epbc/index.html>) refer to Appendix G for the results of this search and Section 7 for a discussion on the findings.

## 3.3 State Referral

The decision whether to refer the project to the State's EPA was based on whether the project would impact on environmental factors significantly enough to require referral under section 38 of the *Environmental Protection Act 1986*.

## 4. EXISTING ENVIRONMENT

### 4.1 Description

A site visit was carried out by Environment Officer Marni Baetge and Project Manager Michael Hickling 13th January 2012 to examine the general features of the area. Vegetation data which has been developed between DEC and the Development Assessment Forum (DAF) indicates that vegetation within the project area is predominantly '*Shrublands, pindan; Acacia tumida shrubland with grey box & cabbage gum medium woodland over ribbon grass & curly spinifex*'. This vegetation / land description association is well represented throughout the region with 99.75 % remaining throughout the State.

No Threatened Ecological Communities, Declared Rare or Priority Flora were found to exist in the project area. No declared weeds were detected in the project area.

## 5. CLEARING OF NATIVE VEGETATION

Native vegetation describes all indigenous aquatic and terrestrial vegetation (living or dead). The term does not include vegetation that was intentionally sown, planted or propagated unless it was required under a statutory condition.

Apart from activities that are exempt under the clearing regulation (Section 5 – Prescribed Clearing), typically all Main Roads clearing will be undertaken using a permit.

The clearing for this project is proposed to be undertaken using Main Roads' clearing permit CPS 818/6.

### 5.1 Details of Vegetation Associations to be Cleared

In order to assess the significance of the vegetation proposed to be cleared for the Banana Wells gravel pit, condition and percent of pre-European Extent remaining has been identified. Table 1 describes the location and condition of vegetation associations within the project area and at road building material extraction sites while Table 2 provides further information regarding each vegetation association's representativeness.

**Table 1: Vegetation Description, Condition and Percent Remaining**

No.	Description	Start & End SLK	Side of Road (L- left, R - right, RBM - road building materials)	Condition (Keighery 1994)	Pre-European Extent Remaining (%)	Area (ha)
750	<i>Shrublands, pindan; Acacia tumida shrubland with grey box &amp; cabbage gum medium woodland over ribbon grass &amp; curly spinifex</i>	NA	LHS of Cape Leveque Road	4 – Vegetation structure significantly altered by very obvious signs of multiple disturbance, retains basic vegetation structure or ability to regenerate it	99.75	Project Area = 200 ha. Only 40ha maximum will be cleared from the project area at any one time
<b>Total Area (ha)</b>						40ha approx.

**Table 2: Vegetation Percent Remaining**

Pre-European Extent Remaining: Vegetation Association No. 750		
Regional Context	Location	Pre-European Extent Remaining (%)
State-wide	N/A	99.75
Bioregional (IBRA Region)	Dampierland	99.74
LGA	SHIRE OF BROOME	99.72

## 5.2 Assessment Against Clearing Principles

In assessing whether the project is likely to have a significant impact on the environment, the project was assessed against the ten clearing principles (EP Act 1986 Schedule 5).

**The project is not likely to be at variance with the 10 clearing principles.**

<b>(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.</b>	
ASSESSMENT	The area proposed to be cleared consists of highly homogenous vegetation which is somewhat degraded and disturbed in various parts. Biological diversity will not be significantly compromised.
METHODOLOGY & REFERENCES	Site inspection 13 <sup>th</sup> of January 2012.
Proposal is not likely to be at variance to this Principle.	

<b>(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.</b>	
ASSESSMENT	A habitat assessment, carried out January 2012, confirmed that vegetation within the project area was unlikely to support any threatened species. No specific habitats identified during the assessment appeared to be spatially restricted to the area of impact or to be supporting important populations of significant species of fauna communities. Proposed works will have at worst a short term effect on any fauna species utilising this habitat.
METHODOLOGY & REFERENCES	Site inspection 13 <sup>th</sup> of January 2012.
Proposal is not likely to be at variance to this Principle.	

<b>(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.</b>	
ASSESSMENT	DEC Threatened Flora Database search indicated that no Declared Rare or Priority Flora species are located within the project area.
METHODOLOGY & REFERENCES	DEC Threatened Flora Database & GIS shapefiles.
Proposal is not likely to be at variance to this Principle.	

<b>(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.</b>	
ASSESSMENT	DEC Threatened Flora Database search indicated that no Threatened Ecological Communities are located within the project area.
METHODOLOGY & REFERENCES	DEC Threatened Flora Database & GIS shapefiles.
Proposal is not likely to be at variance to this Principle.	

<b>(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.</b>	
ASSESSMENT	Vegetation data which has been developed between DEC and the Development Assessment Forum (DAF) identifies that the primary vegetation association located within the Project Area are lower than the EPA's threshold level of 30%. 99.75% Pre-European vegetation extent remains in the Project Area. Vegetation is not a significant remnant and not of a vegetation association that has been extensively cleared.
METHODOLOGY & REFERENCES	Beeston <i>et al.</i> 2002. GIS Databases: - Interim Biogeographic Regionalisation of Australia – 5/1/12 - Pre-European Vegetation
Proposal is not likely to be at variance to this Principle.	

<b>(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.</b>	
ASSESSMENT	Any vegetation cleared in the project area will not alter any potential communities that are wetland or groundwater dependent. The proposed road design will be hydrologically neutral and will minimise any impact vegetation associated with a watercourse.
METHODOLOGY & REFERENCES	DoW and DEC shapefiles.
Proposal is not likely to be at variance to this Principle.	

<b>(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.</b>	
ASSESSMENT	Approx 40 ha maximum of the 200 ha approx project area is proposed to be cleared with adjacent vegetation to remain intact. Therefore, appreciable land degradation is not expected to be caused by project activities.
METHODOLOGY & REFERENCES	Site inspection 13 <sup>th</sup> of January 2012.
Proposal is not likely to be at variance to this Principle.	

<b>(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.</b>	
ASSESSMENT	The proposal is not at variance with this Principle as remnant native vegetation in the project area is not associated with any adjacent or nearby conservation areas.
METHODOLOGY & REFERENCES	Site inspection 13 <sup>th</sup> of January 2012.
Proposal is not likely to be at variance to this Principle.	

<b>(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.</b>	
ASSESSMENT	Clearing of remnant native vegetation is considered unlikely to cause deterioration in the quality of surface waters. No impact to groundwater as no dewatering proposed.
METHODOLOGY & REFERENCES	Site inspection 13 <sup>th</sup> of January 2012.
Proposal is not likely to be at variance to this Principle.	

<b>(j) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.</b>	
ASSESSMENT	Small amount of clearing not located near any watercourses, this will not affect flooding.
METHODOLOGY & REFERENCES	Site inspection 13 <sup>th</sup> of January 2012.
Proposal is not likely to be at variance to this Principle.	

### 5.3 Summary of Management Actions

Main Roads attempts to avoid clearing vegetation if possible, where clearing cannot be avoided then this clearing is kept to a minimum. The following actions are proposed to manage and minimise vegetation clearing for the Banana Wells Gravel Pit;

- Excavation works to be undertaken in the dry season to reduce the potential for soil erosion impacting adjoining vegetation during heavy rains,
- Any stockpiled vegetation from clearing works shall be used during any rehabilitation works and either mulched or respread.
- The use of pre-existing tracks for diversions will be utilised to avoid clearing.
- Utilising traffic management where diversion tracks cannot be established i.e. there is an area of sensitivity or significance.

The following table summarises what further assessment and management is required in accordance with MRWA State-wide vegetation Clearing Permit (CPS 818/6).

**Table 3: Summary of Additional Management Actions**

<b>Impact of Clearing</b>	<b>Yes/No or NA</b>	<b>Further Action Required</b>
<b>1.</b> Does the assessment indicate that the clearing may be at variance or is at variance with one or more of the principles for clearing?	<b>No</b>	No further action required.
<b>2.</b> Does the assessment indicate that the clearing is at variance with one or more of the principles for clearing?	<b>No</b>	No further action required.
<b>3.</b> Does the assessment indicate that the clearing is at variance with clearing principle (g) land degradation, (i) surface or underground water quality or (j) the incidence of flooding?	<b>No</b>	No further action required.
<b>4.</b> Will the project involve clearing for purposes considered temporary in nature under Condition 13 of CPS818/6?	<b>Yes</b>	Where temporary clearing exceeds 0.5ha, a revegetation plan needs to be forwarded to the Department of Environment and Conservation prior to clearing.

## 6.

## ASSESSMENT OF ASPECTS AND IMPACTS

Table 4: Aspects and Impacts – Banana Wells Gravel Pit

Aspect	Evaluation of Potential Impacts
Vegetation – clearing	<p>40ha maximum approx of native vegetation is proposed to be cleared at any one time within the 200ha project area. The vegetation identified is predominantly '<i>Shrublands, pindan; Acacia tumida shrubland with grey box &amp; cabbage gum medium woodland over ribbon grass &amp; curly spinifex</i>' (Beeston et al. 2002).</p> <p>The primary vegetation association located within the Project Area is lower than the EPA's threshold level of 30%. 99.75% Pre-European vegetation extent remains in the Project Area.</p> <p>According to Keighery, (1994) the condition of the native vegetation to be cleared is described as vegetation structure significantly altered by very obvious signs of multiple disturbance, retains basic vegetation structure or ability to regenerate it.</p>
Vegetation – TECs/DRF	<p>No significant vegetation types or threatened flora have been recorded within the project area. Refer to Appendix B.</p> <p>No Matters of National Environmental Significance as protected under EPBC Act (1999) will be impacted (refer to Appendix G).</p>
Vegetation – weeds	No declared weeds or environmental weeds were identified in the project areas.
Vegetation – dieback	Site inspection indicated that the area should be treated as dieback free.
Fauna	<p>No significant fauna issues associated with the proposed works. Site investigations identified the vegetation to be cleared for the proposal is not likely to support important populations of significant species of fauna communities. The presence of similar habitat in adjacent areas will enable fauna to relocate if necessary.</p> <p>No Matters of National Environmental Significance as protected under EPBC Act (1999) will be impacted (refer to Appendix G).</p>
Heritage (non-indigenous)	A search of the Australian Heritage Places Inventory and Heritage Council of Western Australia databases has indicated that there are no heritage significant listed sites present in the proposed works areas.
Aboriginal heritage	A search of the DIA's database identified no Aboriginal heritage sites of significance registered in the project area. Regardless, the Kimberley Land Council are currently being consulted regarding the proposed works and if any issues relating to Aboriginal heritage arise, these issues will be managed separately before any excavation work proceeds.
Wetlands	DSEWPC and DEC shapefiles show that there are no wetlands directly within the vicinity of the project area.
Surface water/drainage	A search of the DoW's database has confirmed that the proposed works will not disturb or interrupt any natural drainage and surface run-off patterns.
Groundwater	No dewatering nor drainage modifications are anticipated, hence no change to groundwater level or quality.
Reserves / Conservation areas	There are no conservation areas or reserves expected to be impacted by the proposed works, refer to assessment of Clearing Principle 'h' in Section 5.2.

**Table 4: Aspects and Impacts – Banana Wells Gravel Pit**

<b>Aspect</b>	<b>Evaluation of Potential Impacts</b>
Air quality	Not relevant to the proposed works. Local air quality assessment is not required for the project since: <ul style="list-style-type: none"> <li>• the predicted traffic flow is less than 15,000 vehicles per day in rural areas;</li> <li>• residential and other sensitive receptors are not within 200 meters of the road centre.</li> </ul>
Dust	Likely to be a minor issue during earthworks. No major sensitive receivers adjacent to the proposed works, but excessive dust could impact vegetation. This is likely to be easily managed by standard construction dust management techniques.
Noise and vibration	No major sensitive local receivers. Construction works is not expected to significantly contribute to noise levels at the nearest sensitive receivers, provided works are limited to normal working hours. The requirements of the Shire of Broome must be met in respect of noise management and construction working hours.
Visual amenity	The proposed works will result in minor and short-term visual impacts during construction.
Public safety and risk	Traffic management and signage from Main Roads standards is employed, none of the proposed works present any significant hazards to public safety. The proposed works will serve to enhance public safety by improving local road and pedestrian conditions.
Hazardous substances	Not relevant to the proposed works, the project requires no hazardous substances to be used.
Contamination	A search of the DEC's contaminated sites database indicates there are no identified contaminated sites within the project area.
Salinity	There were no visual signs of salinity observed in the project area. Given the nature and scale of the project, the impact is considered not relevant.
Acid Sulfate Soils	No further investigations are necessary as the site is outside of the high risk area for ASS and there is no dewatering or excavation below the water table planned.
Statutory Land Use Planning	As the proposed works are entirely within the existing road reserve, no further amendments would be required to the Local Government Planning Scheme or Region Scheme.



**Table 5: Commonwealth Aspects and Impacts**

<b>Aspect</b>	<b>Evaluation of Potential Impacts</b>
World Heritage properties	The project will not impact any World Heritage properties.
National Heritage places	A search of the Australian Heritage Places Inventory Database has indicated there are no heritage significant listed sites present in the proposed works areas.
Wetlands of international importance (Ramsar)	A search of the Department of Sustainability, Environment, Water, Population and Communities Protected Matters Search Tool located no Ramsar Wetlands within the vicinity of the Project area.
Nationally threatened species or ecological communities	A search of the Department of Sustainability, Environment, Water, Population and Communities Protected Matters Search Tool located no threatened ecological communities, 7 threatened species and 13 listed marine species within the vicinity of the project. Site investigations identified the vegetation to be cleared for the proposed works is not likely to support important populations of significant species of fauna communities. The presence of similar habitat in adjacent areas will enable fauna to relocate if necessary.
Migratory species protected under international agreements	A search of the Department of Sustainability, Environment, Water, Population and Communities Protected Matters Search Tool located 15 migratory species within the vicinity of the Project area. Project activities are unlikely to have a significant impact on these species as the vegetation present is unlikely to be habitat for these species.
Commonwealth marine areas	The project will not impact any Commonwealth marine area or marine protected area.
Commonwealth lands	The project will not adversely impact a Commonwealth reserve.
Nuclear Actions	Not relevant to the proposed works.

## **6. DECISION TO REFER**

### **6.1 Referral to the Department of Sustainability, Environment, Water, Population and Communities**

The preliminary impact assessment determined the project does not, will not, or is not likely to have a significant impact on Matters of National Environmental Significance or impact Commonwealth land as outlined in Table 5 of the report. For this reason the project does not require referral to the Commonwealth Department of Sustainability, Environment, Water, Population and Communities.

### **6.2 Referral to the Environmental Protection Authority**

Due to the small scale of direct disturbance to the natural environment at any one time, the low significance of its impacts to the surrounding environment and that it is unlikely the project will generate significant public interest; the project does not require referral to the WA Environmental Protection Authority.

## **7. STAKEHOLDER CONSULTATION**

No stakeholders, other than the Kimberley Land Council and relevant Traditional Owners, have been consulted regarding the Project due to the relatively minor environmental impacts associated with the proposal.

Main Roads are currently consulting with the Kimberley Land Council regarding the proposed works. All matters relating to Aboriginal heritage will be dealt with through the KLC and Traditional Owners to ensure any aspects relating to Aboriginal Heritage and Native Title comply with the *Aboriginal Heritage Act 1972* and *Native Title Act 1993* respectively prior to excavation works proceeding.

## **8. OTHER APPROVALS/PERMITS/LICENCES**

No further clearances, permits or further studies are required. No further approvals, permits or licences are required.

## 9. ENVIRONMENTAL MANAGEMENT PLAN

This section of the report (the EMP) has been developed for the project area following the completion of the above sections. The main aims of this EMP is to provide a management plan to assist in minimising the environmental impacts of the activities associated with the proposed works and identify who is responsible for the implementation of the management strategies.

This EMP will only address the actions already listed as well as any site-specific issues that were identified during the Environmental Review. The environmental management measures/conditions in Main Road's Specifications 203, 204, 301, 302 and 304 will be followed where applicable.

The areas that require special management will be addressed in terms of: area of management (e.g. vegetation); the timing of the various management requirements; the management objectives for each area; the management strategies that are necessary to minimise the impact; the person/s responsible for implementing the management action; and on whose advice or Main Roads requirement.

ENVIRONMENTAL MANAGEMENT PLAN					
Area of management	Timing	Management objective	Management Strategy	Responsibility	Whose advice
<b>Induction</b>	Pre-Excavation works	Inform all personnel of the management actions/strategies required of them	Develop and implement a communication plan including response to complaints, liaising/reporting to government agencies, engagement with the community and others when work is performed, with specific reference to nuisance issues such as noise, dust, lighting and spills.	Project Manager	Main Roads
<b>Vegetation Clearing - Record-keeping</b>	All phases of works	All projects should maintain the required records relating to clearing native vegetation under the purpose permit	Clearing: <ul style="list-style-type: none"> <li>a copy of the PEIA &amp; EMP (Minor projects) for small projects;</li> <li>a map showing the location where the clearing occurred, recorded in an ESRI Shapefile;</li> <li>the size of the area cleared (in hectares);</li> <li>the dates on which the clearing was done.</li> </ul>	Environment Officer	DEC

ENVIRONMENTAL MANAGEMENT PLAN					
Area of management	Timing	Management objective	Management Strategy	Responsibility	Whose advice
<b>Vegetation - Clearing</b>	Pre-Excavation works	Ensure that the overall objectives of the works are compatible with maintaining and, where possible, enhancing the biological integrity of the surrounding environment and minimising vegetation loss and degradation	<p>Selection of locations that minimise adverse impacts on the biological environment</p> <p>Excavation and disturbance works to be undertaken in the dry season to reduce the potential for soil erosion and drainage line siltation due to vegetation removal and heavy rains</p> <p>Any stockpiled vegetation from clearing works shall not be burnt. This vegetation shall be used during any rehabilitation works and either chipped or replaced according to the EMP</p> <p>All clearing shall be done in accordance with Main Roads Specification:</p> <ul style="list-style-type: none"> <li>• <b>301: Clearing</b></li> </ul>	Project Manager/ Environment Officer	Main Roads
<b>Revegetation</b>	Post and during excavation works	To ensure revegetation is incorporated into the rehabilitation of the disturbed sites once works cease in an area and the extinction of the whole area has occurred.	Where there has been clearing of vegetation, revegetation will be incorporated into the rehabilitation works under the revegetation management plan devised prior to clearing and to ensure compliance with CPS 818/6 and the <i>Aboriginal Heritage Act 1972</i> is adhered to. This will occur as small portions of clearing within the land parcel are cleared and deemed not worthy of material extraction.	Project Manager/ Environment Officer	Main Roads

ENVIRONMENTAL MANAGEMENT PLAN					
Area of management	Timing	Management objective	Management Strategy	Responsibility	Whose advice
<b>Weeds</b>	Pre-Excavation works/ Works	Prevent and reduce the introduction and spread of weeds	<p>Control any weed species, if present, within the project area prior to works to limit the amount of propagative material that may be spread during disturbance</p> <p>Ensure all machinery/vehicles are clean prior to entering the works area. If a new weed infection is identified within the area, measures to reduce its spread should be established such as vehicle wash/brush-down points</p> <p>Main Roads Specifications applicable:</p> <ul style="list-style-type: none"> <li>• <b>204: Environment</b></li> <li>• <b>301: Clearing</b></li> </ul>	Project Manager/ Environment Officer	Main Roads
<b>Water Courses and Surface Drainage</b>	Pre-Excavation works/ Excavation works	Maintain the hydrological regime that exists prior to works and prevent erosion in areas subject to flooding	<p>Areas subject to erosion as a result of clearing shall be stabilised and designed to minimise rainfall/runoff impacts</p> <p>Works should minimise vegetation and soil disturbance to prevent soil movement. Finished works should be left in a stable condition to minimise the risk of scouring</p> <p>If washdown facilities or chemical storage takes place on site, best management practices will be utilised in accordance with DEC's <i>Water Quality Protection Notes, Mechanical Equipment Washdown</i> to minimise impact on water resources</p> <p>Stormwater drainage shall be treated and disposed of in accordance with DEC requirements</p>	Project Manager/ Environment Officer	Main Roads

ENVIRONMENTAL MANAGEMENT PLAN					
Area of management	Timing	Management objective	Management Strategy	Responsibility	Whose advice
			<p>Ensure Main Roads design is followed.</p> <p>Main Roads Specifications applicable:</p> <ul style="list-style-type: none"> <li>• <b>402: Surface Drains</b></li> <li>• <b>405: Drainage Structures</b></li> </ul>		
<b>Visual Amenity</b>	Pre-Excavation works	Ensure that the road blends in with the surrounding environment	Ensure that the road blends in with the surrounding environment	Project Manager	Main Roads
<b>Noise, Vibration and Dust</b>	Excavation works	Ensure that the works does not become a nuisance to the public	<p>Access to private property and appropriate traffic management measures should be planned and implemented prior to the start of works</p> <p>Works associated with the start of works should not prevent public access along the adjacent reserve. Public access should be maintained along the reserve at all times</p> <p>Any complaints regarding dust will be attended to as soon as possible</p> <p>Where it is found that trucks leaving the site are carrying excessive material onto sealed surfaces, these areas will be swept to reduce dust generation and maintain traffic safety</p> <p>Watering shall be used as a mitigation measure to protect loose surfaces</p>	Project Manager	Main Roads

ENVIRONMENTAL MANAGEMENT PLAN					
Area of management	Timing	Management objective	Management Strategy	Responsibility	Whose advice
<b>Pollution and Litter</b>	Excavation works	Ensure that works are managed to a standard that minimises any adverse impacts on the environment	<p>Bulk fuels and oil stores will be bunded and managed in accordance with Australian Standards</p> <p>If vehicle or machinery servicing is to occur on site it will occur in designated servicing areas which are supplied with adequate spill trays and spill response equipment.</p> <p>Emergency cleanup procedures shall be implemented in the case of any spillage. These will include control of spilled material and removal of contaminated soil to an approved site. Spillages of substances will be reported and identified immediately.</p> <p>The Contractor shall ensure appropriate equipment is available at all times to control any spills and shall notify the Project Manager as soon as possible following a spill</p> <p>All waste oil will be collected for recycling and any empty fuel/oil containers, used filters and waste hydraulic parts to be collected and stored in an allocated area then removed to an approved site</p> <p>Dumping or temporary storage of bitumen, asphalt, concrete or aggregate should only occur at designated depots or controlled hardstands</p> <p>The project areas, including hardstand areas,</p>	Project Manager/ Environment Officer	Main Roads



ENVIRONMENTAL MANAGEMENT PLAN					
Area of management	Timing	Management objective	Management Strategy	Responsibility	Whose advice
			will be kept in a tidy manner at all times. All litter on the project will be placed into lidded bins and disposed of at an approved landfill		
<b>Fire</b>	Excavation works	Ensure that the fire risk associated with the works of the proposal is minimised	A water tanker will be on site at all times  No fires shall be lit within the project area	Project Manager	Main Roads
<b>Aboriginal Heritage</b>	Excavation works	Ensure that there is no unauthorised disturbance to Aboriginal heritage sites during excavation works	If any materials of significance to Aboriginal people are discovered, works will immediately cease within 100m of the material and the site 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 the WA Police Service will also be advised immediately	Project Manager/Environmental Officer	DIA
<b>Rehabilitation</b>	Post-Excavation works	Leave the project area free from debris	All waste materials from the works are to be completely removed from the site upon exhaustion of the material area. Final clean-up shall be to the satisfaction of the Project Manager and the Environmental Officer	Project Manager /Environmental Officer	Main Roads

ENVIRONMENTAL MANAGEMENT PLAN					
Area of management	Timing	Management objective	Management Strategy	Responsibility	Whose advice
<b>Historical Records and monitoring of pre-existing gravel reserve</b>	Life period of operations	Ensure that historical records and affiliated information are accessible, are updated and monitored accordingly.	During works, having access to historical records, information regarding past operations, land definitions and so forth will allow the appropriate management for rehabilitation of the area, to make it know of any hazards or areas that are of significance or sensitivity and for general management. These records should be updated as works progress and cease, and monitored for future references. These records and information should be managed in a way that they are easily accessible, easy to comprehend and easy to communicate.	Project Manager /Environmental Officer	Main Roads

## 10. REFERENCES

Beeston, G.R., Hopkins, A.J.M. and Shepherd, D.P. (2002). Land-use and vegetation in Western Australia. Department of Agriculture, Western Australia, Resource Management Technical Report 250.

Keighery, B. J. 1994. *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

## Appendix A

### **Low Impact Environmental Screening Checklist**

**Checklist - Low Impact Screening Checklist**

The Low Impact Screening Checklist is part of the environmental assessment and approval process, refer to in Figure 2 in the Main Roads environmental guideline Environment Assessment and Approvals. It should be noted that the checklist does not address Aboriginal heritage issues. Please refer to Main Roads guideline *Aboriginal Heritage* for the heritage assessment process.

All projects are to be screened to identify those that are Low Impact.

Projects that have "No" to **all** items are classed as Low Impact and should be implemented using standard contract clauses in the Tender Document Process.

Projects that have "Yes" to **any** item will require further environmental assessment and will be implemented using an Environmental Management Plan.

Tick "Yes" or "No" for every item.

**Project Name** .....Banana Wells Gravel Pit

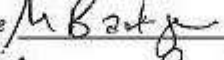
ITEM NO.	ITEM	Y	N
1	New road or road reserve to be created or expansion of existing road reserve.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Works require clearing of native vegetation outside the maintenance zone.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Works require clearing of native vegetation that is older than 10 years old within the maintenance zone.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Works to occur outside normal working hours.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Passes over, adjoins or drains directly into a wetland or sensitive watercourse.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	Local natural drainage regime / hydrology will be changed.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	Dewatering, or a new water bore required.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8	Known potential source of hazardous materials within or adjoining project area. e.g. Acid Sulphate Soils, existing petrol station, industrial site or waste disposal site (landfill)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9	Buildings will require demolition.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Completed By:

Signature   
Name MICHAEL HICKLING

Date 22/12/2011  
Title PROJECT MANAGER

To be reviewed by  
a Main Roads  
Environment Officer

Signature   
Name Maria Badger

Date 22.12.2011  
Title Environment officer

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Appendix B

### **DEC Threatened Flora, Fauna and Conservation Areas GIS Search**



## Appendix C

### **Australian Heritage Places Inventory and Heritage Council of Western Australia Database Searches**





[Search](#)   [Help](#)

<b>Search In:</b>	<input type="radio"/> State Register of Heritage Places <input checked="" type="radio"/> e Database	
<b>Place No:</b>	<input type="text"/>	
<b>Name Contains:</b>	<input type="text" value="Banana Wells"/>	
<b>Street:</b>	<input type="text" value="Cape Leveque Road"/>	<input type="text" value="Street"/>
<b>Suburb/Town:</b>	<input type="text" value="Broome"/>	
<b>Local Govt:</b>	<input type="text" value="Broome"/>	

Heritage Council of WA Home

[Quick Search](#)

[Advanced Search](#)

[Results List](#)

[Location Report](#)

[Save Data](#)

[What Is The State Register?](#)

[Other Heritage Lists](#)

[Site Map](#) | [Contact Us](#) | [Accessibility](#)

[Search WA Government](#)

[Places Database](#)

[Home](#) » [Places Database](#) » [Search Results](#)

[A](#) [A](#) [A](#)

**There are no Places matching your search criteria.**

If you'd like to perform a new search, please select a new Places database search, from the menu on the left-hand side.

## Appendix D

### **Department of Indigenous Affairs Database Search**

What do you want to do?

Search for Sites in... : ...

show legend



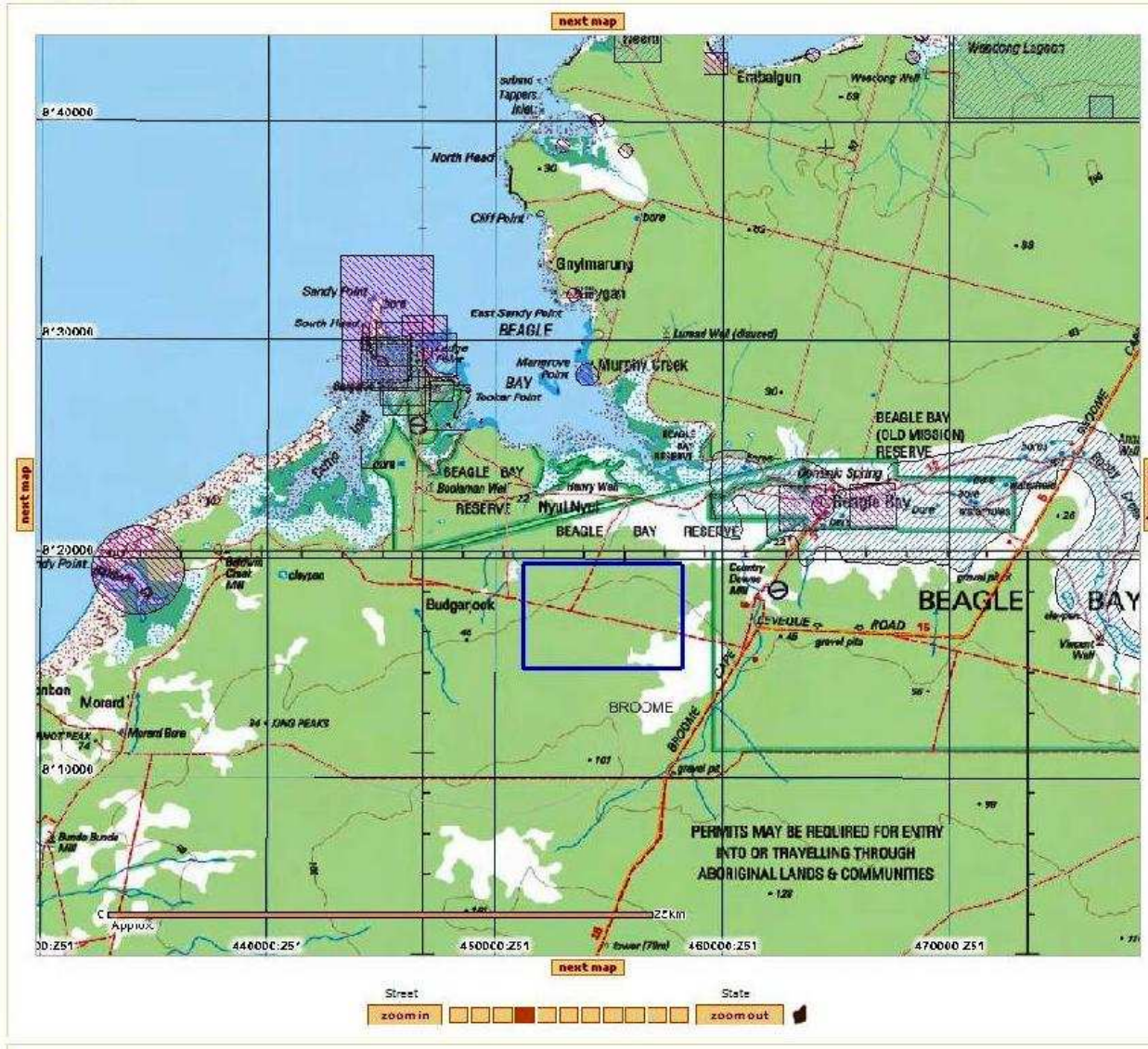
Show on map

- ☒ Aboriginal Sites  
☐ Heritage Surveys

refresh more

Map size

- ☐ Small  
☐ Medium  
☒ Large



Sites in a search box

0 results

[Clear Results](#)

[Printable - All results \(with map\)](#)

0 Registered Aboriginal Sites

No results

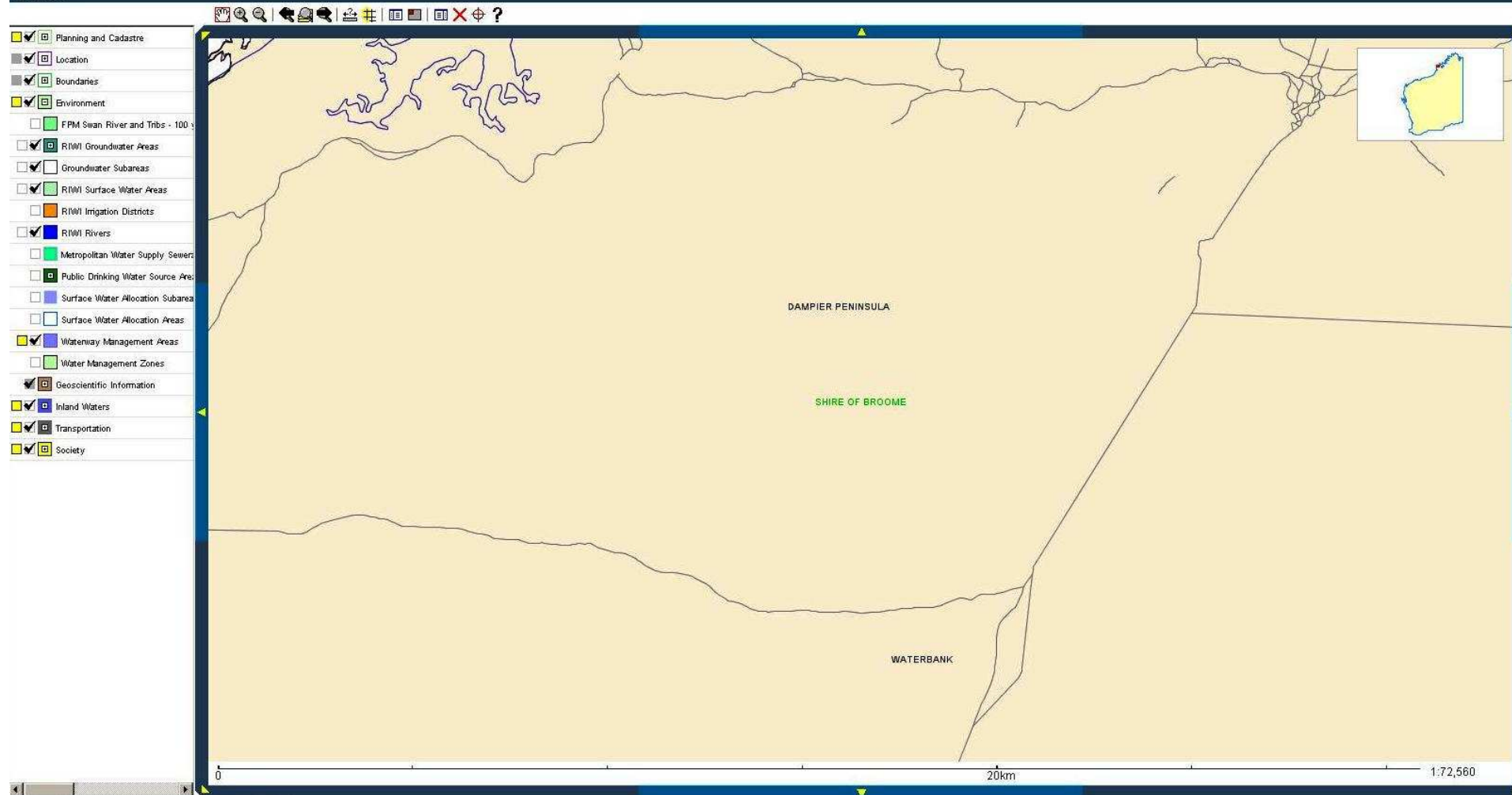
0 Other Heritage Places

No results

## Appendix E

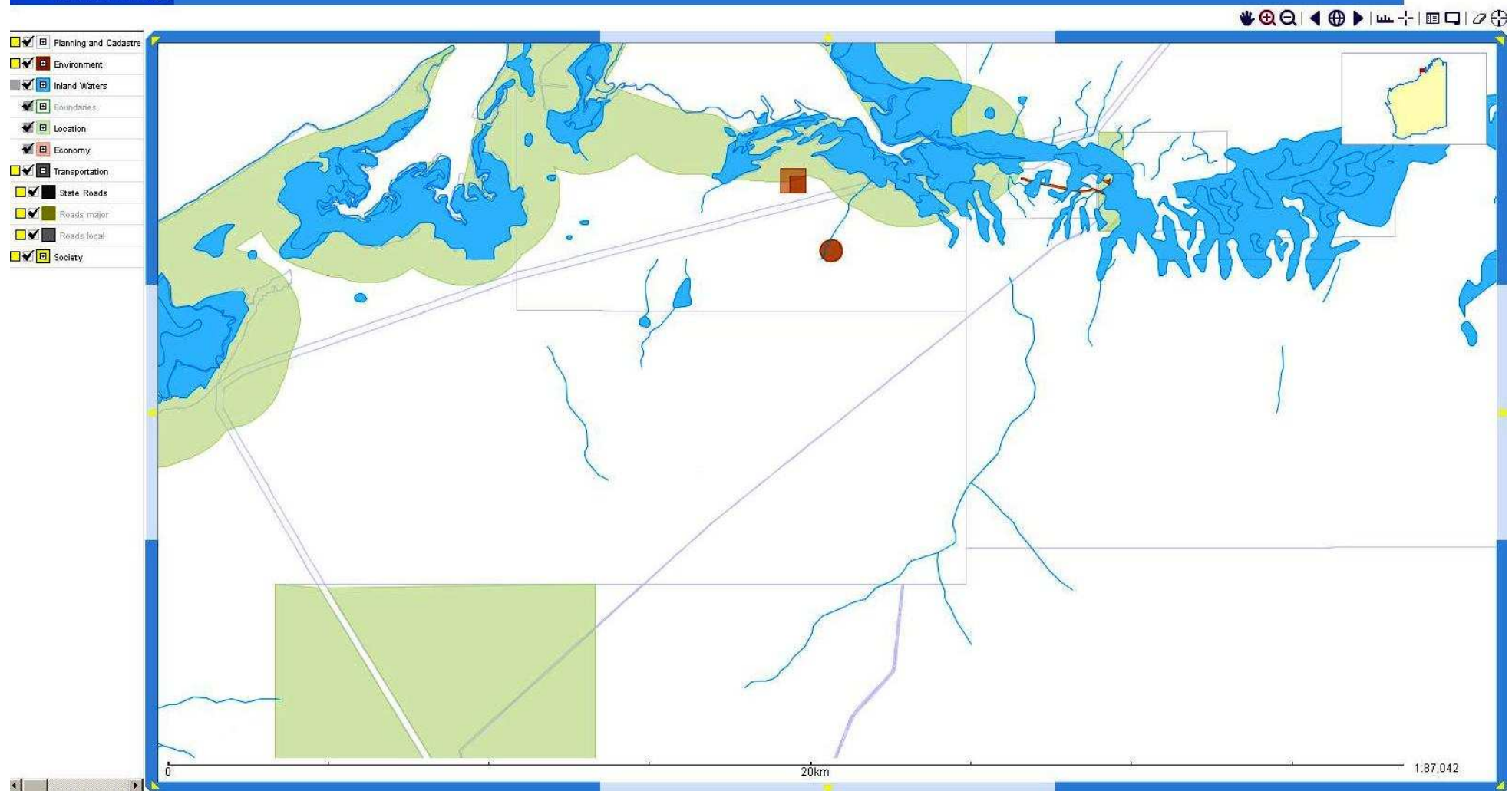
### **DoW Geographic Data Atlas Database Search**





## Appendix F

### **DEC Native Vegetation Map Viewer Database Search**





## Appendix G

### **DSEWPC Database Search**



## EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information about the EPBC Act including significance guidelines, forms and application process details can be found at <http://www.environment.gov.au/epbc/assessmentsapprovals/index.html>

Report created: 23/12/11 13:09:53

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are  
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(Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 1.0Km



### Summary

#### Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see <http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html>

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Areas:</a>	None
<a href="#">Threatened Ecological Communities:</a>	None
<a href="#">Threatened Species:</a>	7
<a href="#">Migratory Species:</a>	15

## Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage/index.html>

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at <http://www.environment.gov>.

<u>Commonwealth Lands:</u>	None
<u>Commonwealth Heritage Places:</u>	None
<u>Listed Marine Species:</u>	13
<u>Whales and Other Cetaceans:</u>	None
<u>Critical Habitats:</u>	None
<u>Commonwealth Reserves:</u>	None

## Extra Information

This part of the report provides information that may also be relevant to the area you have

<u>Place on the RNE:</u>	1
<u>State and Territory Reserves:</u>	None
<u>Regional Forest Agreements:</u>	None
<u>Invasive Species:</u>	5
<u>Nationally Important Wetlands:</u>	None

## Details

### Matters of National Environmental Significance

Threatened Species		[ Resource Information ]
Name	Status	Type of Presence
<b>BIRDS</b>		
<u><a href="#">Erythrotriorchis radiatus</a></u>		
Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area



<a href="#">Erythrura gouldiae</a> Gouldian Finch [413]	Endangered	Species or species habitat likely to occur within area
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Vulnerable	Species or species habitat may occur within area
<b>MAMMALS</b>		
<a href="#">Dasyurus cristicauda</a> Mulgara [328]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Dasyurus hallucatus</a> Northern Quoll [331]	Endangered	Species or species habitat likely to occur within area
<a href="#">Macrotis lagotis</a> Greater Bilby [282]	Vulnerable	Species or species habitat likely to occur within area
<b>SHARKS</b>		
<a href="#">Pristis microdon</a> Freshwater Sawfish [66182]	Vulnerable	Species or species habitat likely to occur within area
<b>Migratory Species</b>		<b>[ Resource Information ]</b>
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
<b>Migratory Marine Birds</b>		
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat may occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Species or species habitat may occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Fregata ariel</a> Lesser Frigatebird, Least Frigatebird [1012]		Foraging, feeding or related behaviour known to occur within area
<a href="#">Sula leucogaster</a> Brown Booby [1022]		Breeding known to occur within area
<b>Migratory Marine Species</b>		
<a href="#">Crocodylus porosus</a> Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
<b>Migratory Terrestrial Species</b>		
<a href="#">Erythrura gouldiae</a> Gouldian Finch [413]	Endangered	Species or species habitat likely to occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
<a href="#">Hirundo rustica</a> Barn Swallow [662]		Species or species habitat may occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<b>Migratory Wetlands Species</b>		
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Species or species habitat may occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Charadrius veredus</a> Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
<a href="#">Glareola maldivarum</a> Oriental Pratincole [840]		Species or species habitat may occur within area
<a href="#">Rostratula benghalensis s. lat.</a> Painted Snipe [889]	Vulnerable*	Species or species habitat may occur within area

#### Other Matters Protected by the EPBC Act

Listed Marine Species		[ Resource Information ]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
<b>Birds</b>		
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat may occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Species or species habitat may occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Charadrius veredus</a> Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
<a href="#">Fregata ariel</a> Lesser Frigatebird, Least Frigatebird [1012]		Foraging, feeding or related behaviour known to occur within area
<a href="#">Glareola maldivarum</a> Oriental Pratincole [840]		Species or species habitat may occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
<a href="#">Hirundo rustica</a> Barn Swallow [662]		Species or species habitat may occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Rostratula benghalensis s. lat.</a> Painted Snipe [889]	Vulnerable*	Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Sula leucogaster</a> Brown Booby [1022]		Breeding known to occur within area
<b>Reptiles</b>		
<a href="#">Crocodylus johnstoni</a> Freshwater Crocodile, Johnston's Crocodile, Johnston's River Crocodile [1773]		Species or species habitat may occur within area
<a href="#">Crocodylus porosus</a> Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area

## Extra Information

### Places on the RNE [ Resource Information ]

Note that not all Indigenous sites may be listed.

Name	State	Status
<b>Natural</b>		
<a href="#">Parts of the Kimberley</a>	WA	Indicative Place

### Invasive Species [ Resource Information ]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit,

Name	Status	Type of Presence
<b>Mammals</b>		
<a href="#">Felis catus</a> Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
<a href="#">Sus scrofa</a> Pig [6]		Species or species habitat likely to occur within area
<b>Plants</b>		
<a href="#">Cenchrus ciliaris</a> Buffel-grass, Black Buffel-grass [20213]		Species or species habitat likely to occur within area
<a href="#">Lantana camara</a> Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat may occur within area
<a href="#">Parkinsonia aculeata</a> Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area

## Coordinates

-16.99944 122.50362,-16.99884 122.61724,-17.06815 122.61843,-17.06785 122.50778,  
-16.99974 122.50362,-16.99944 122.50362

## Caveat

## Appendix H

### **DEC Contaminated Sites Database Search**







## Appendix I

### **Site Photos**



Image (1)



Image (2)



Image (3)



Image (4)