PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN

Kalgan Crossing Floodway Improvement Works
March 2011

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	Name & Title	Date
Project Manager:	**Rhys Colreavy** Senior Project Manager	
Prepared by:	**Fiona van Rijnswoud** Environment Officer	
Reviewed by:	 Senior Environment Officer	

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SUMMARY OF REPORT FINDINGS

The project proposal is to redesign and construct the Kalgan Crossing floodway on Marble Bar Road (M030) in the Shire of East Pilbara, at 24.62SLK.
During the wet season, this floodway becomes quite treacherous and is often closed to all vehicles due to flooding. The project objective is to reduce operational costs of post event repairs and ongoing maintenance, provide safer crossing in wet conditions when access is available, reduce traffic restriction or closure periods and improve road user safety in all conditions.

The Kalgan Creek flows east and joins with the Fortescue River, where it crosses Marble Bar Road further north, in the area of Roy Hill. Kalgan Creek is classified as a non-perennial and minor waterway. Currently the floodway consists of a primary and secondary channel. The primary channel is approximately 60m wide and the secondary channel is approximately 80m wide and 1m higher than the primary channel. A bed and banks permit has been applied for with the Department of Water for this reason. There are no relief culverts in situ and the existing surface and its approaches are unsealed.

The vegetation in the area is described as 'very open woodland of Mulga (*Acacia aneura*) on gently undulating plain'. The vegetation association is number 29; Sparse low woodland; mulga, discontinuous in scattered groups (Beard, 1975).
The vegetation that will be cleared is not considered remnant as it was disturbed when the Marble Bar Road alignment was first built. However, the vegetation within the maintenance zone that will be cleared in order to insert culverts under the carriageway is potentially older than ten years.

BHPB Iron Ore have a railway approximately 300km to the west of Marble Bar Road, with a railway access track that runs parallel with the railway line. MRWA will utilise this access track as a side track for vehicles whilst construction works are occurring. A small amount of clearing will be required to create an entry point to the access track, from Marble Bar Road, where existing tracks are not possible. This entry point would occur approximately 500m from the floodway on the southern end. The northern entry point to the sidetrack will utilise an already existing track that occurs approximately 200m from the northern end of the floodway.

There are no registered Aboriginal Heritage sites located within the project area. However there is one site classified as Lodged for assessment on the Department of Indigenous Affairs Database, located nearby to the project area that needs to be addressed when developing any construction plans or environmental management plans. The infrastructure works are of such a nature that they will not occasion disturbance to any known or as yet undiscovered ethnographic sites.

PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN KALGAN CROSSING FLOODWAY IMPROVEMENT WORKS

1. BACKGROUND

Marble Bar Road provides access to a number of stations, aboriginal communities, mines and the towns of Marble Bar and Nullagine. During the wet season in the Pilbara region, this floodway is often inundated with water and closed to all vehicles until water levels recede enough to make it safe to pass. Once water levels have receded, there is often extensive damage to the unsealed road and high maintenance costs are associated with repairing the damaged floodway, due to this section of road being unsealed.

As per Main Roads' Environmental Assessment and Approval process, the Low Impact Environmental Screening Checklist has been completed for the proposal, refer to Appendix A. As the project involves works that are not considered to be of low impact (clearing of native vegetation that is older than 10 years within the maintenance zone, passes over, adjoins or drains directly into a wetland or sensitive watercourse and local drainage regime/hydrology will be changed), the preparation of a project specific Preliminary Environmental Impact Assessment (PEIA) and Environmental Management Plan (EMP) are required. This report fulfils this requirement.

2. DESCRIPTION OF THE PROJECT

The project proposal is to upgrade Kalgan Creek crossing (floodway) on Marble Bar Road which is located approximately 25kms north of Newman. Currently the floodway is unsealed and it is proposed to seal the floodway with a concrete pavement. Preliminary designs propose the installation of pipe culverts (14x1200mm pipe culverts in the primary channel and 7x900mm pipes in the secondary channel), under the concrete pavement.

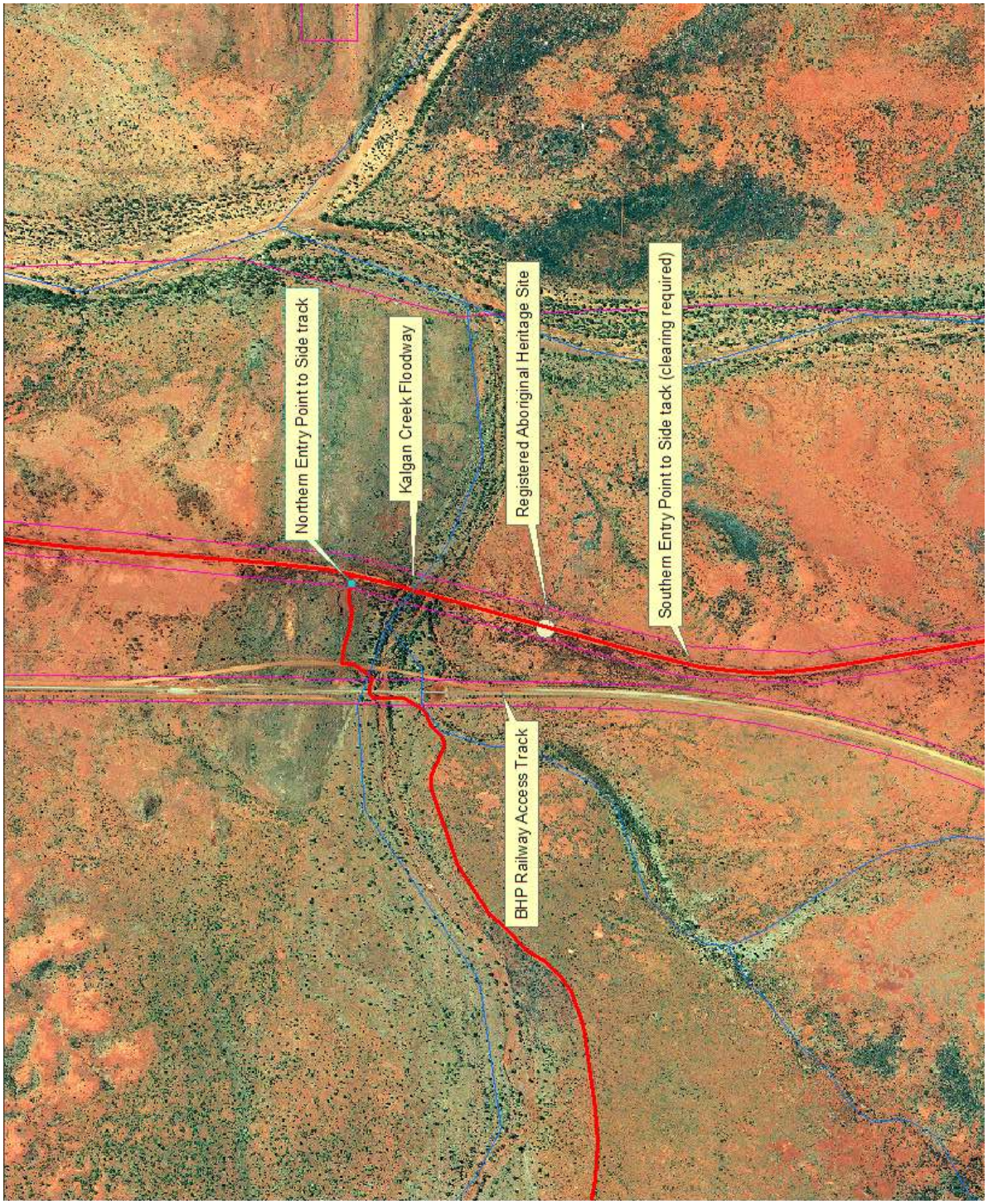
There will be some earthworks associated with the sealing of the floodway and the approaches (250m) to the floodway. As the works are going to be conducted on the existing alignment, there will be minimal impact to surrounding vegetation. Sealing works will be conducted within the Road Reserve.
An existing railway sidetrack that is owned by BHP will be used as the side track for traffic whilst the floodway construction takes place. An entry point from the Marble Bar Road to tie in with the access track at the southern end of the floodway will also need to be created and hence, clearances will cover this area. The southern entry point to the sidetrack will be created approximately 500m south of the floodway and the northern entry point to the sidetrack will utilise an already existing and cleared track 200m to the north of the floodway.

The works will result in a sealed, concrete pavement floodway that will direct water flow under the road during flood events and will result in a reduction of road damage post flooding.

2.1 Project Location

The location of the study area for the project are shown in Figure 1a.

FIGURE 1A: PROJECT LOCALITY- APPROX. 24KMS NORTH OF NEWMAN



3. METHODOLOGY

3.1 Preliminary Desktop Study

A preliminary assessment of the project area and the potential constraints of the proposal was undertaken by reviewing a number of government agency managed databases, viewing GIS shapefiles and consulting with relevant stakeholders where necessary.

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

DEC were contacted and their database was searched for known populations of threatened flora, fauna, Threatened Ecological Communities (TECs) and conservation reserves. Current GIS shapefiles provided to Main Roads by the DEC were also 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.

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), Heritage Council of Western Australia Places Database (http://register.heritage.wa.gov.au/) and the Shire of East Pilbara's local heritage list (previously known as the Municipal Heritage Inventory), 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 was adjacent to any significant lakes, rivers, wetlands or 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 and by viewing current GIS shapefiles, refer to Appendix F.

3.1.6 Weeds

The Declared Weeds database provided by the Department of Agriculture and Food was searched to determine whether there are any known populations of declared plants or significant weeds in or adjacent to the project area, refer to Appendix H.

3.1.7 Dieback

As the project receives <400 mm of rain dieback is considered not to be an issue.

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 I.

3.1.9 Acid Sulphate Soils

The DEC's acid sulphate soils maps were reviewed on the Shared Land Information Platform (SLIP - https://uat2.landgate.wa.gov.au/bmvf/app/waatlas/) to determine the level of risk the project is exposed to, refer to Appendix J.

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's 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.*

3.4 Site Investigation

A site visit was carried out by Fiona van Rijnswoud on 24th November 2010 to examine the general features of the area. The broad vegetation types in the vicinity of the project area were identified. Other issues that were considered included topography, the impacts on creek lines, property access and if further studies are required for noise and vibration impacts (dilapidation).

Site photos were taken and are included in Appendix K.

4. EXISTING ENVIRONMENT

4.1 Description

The Pilbara region has two distinct seasons with a wet season typically occurring from January to March. Cyclones can frequent the coast typically during the months of November to May, bringing heavy and unpredictable amounts of rain. The existing environment at this project location often results in heavy flooding of Kalgan Creek, resulting in flooding over the road on Marble Bar Road.

The project area is located in the Pilbara Ibra region and the Fortescue Ibra sub-region. The vegetation in the area is described as 'very open woodland of Mulga (*Acacia aneura*) on gently undulating plain'. The vegetation association is number 29; Sparse low woodland; mulga, discontinuous in scattered groups (Beard, 1975).
The vegetation that may be cleared is not considered remnant as it was disturbed when the Marble Bar Road alignment was first built. However, the vegetation within the maintenance zone that will be cleared in order to insert culverts under the carriageway is older than ten years.

The project area lies within the Kalgan Creek floodway. The Kalgan Creek flows east and joins with the Fortescue River, where it crosses Marble Bar Road further north, in the area of Roy Hill. There are two channels that make up the Kalgan Creek crossing, the primary channel to the north and the secondary channel to the south. Kalgan Creek is classified as a non-perennial and minor waterway. The secondary channel is currently approximately 1.0m higher than the primary channel, and would require some degree of levelling in order to seal the road and floodway. A bed and banks permit has been applied for and granted by the Department of Water for this reason.

BHPB Iron Ore have a railway approximately 300km to the west of Marble Bar Road, with a railway access track that runs parallel with the railway line. It is proposed that MRWA will utilise this access track as a side track for vehicles whilst construction works are occurring. A small amount of clearing will be required to create an entry point to the access track on the southern end of the floodway (approximately 900m), from Marble Bar Road. An existing cleared track 200m north of the floodway will be used for the northern entry point to the sidetrack.
There are no known DRF, priority flora, threatened fauna or TEC's in the area.

4.2 Site Investigation

Whilst the native vegetation that will be cleared is not considered remnant, the vegetation is most likely older than ten years and is identified as being in good condition.
The total amount to be cleared will not exceed 0.5ha.
There are weeds present in the project area such as Buffel Grass (*Cenchrus ciliaris*), but proposed works are not anticipated to further spread these weeds and no known declared weeds have been identified in the 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 regulations, such as clearing vegetation that is less than 10 years old for maintenance, typically all Main Roads clearing will be undertaken using a permit.

The clearing will be undertaken using Main Roads Purpose Clearing Permit CPS818/5.

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 Kalgan Floodway Improvement Works;

- Select design/locations that minimise adverse impacts on the biological environment,
- Site office and materials storage areas will be located on previously disturbed/ designated area,
- Any stockpiled vegetation from clearing works shall not be burnt. This vegetation shall be used during any rehabilitation works and either mulched or respread according to the TDP/Revegetation Plan,
- Implement the Project Revegetation Management Plan and monitor effectiveness of revegetation works and weed control.

5.1 Details of Vegetation Associations to be Cleared

Table 1: Vegetation Description, Condition and Percent Remaining

No.	Description	Start & End SLK	Side of Road (L- left, R - right, RBM - road buidling materials)	Condition*	Pre-European Extent Remaining (%) **	Area (ha)
29	Sparse low woodland; mulga, discontinuous in scattered groups	24	B	Good	100	0.5
					Total Area (ha)	0.5

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

Pristine - no obvious signs of disturbance
Excellent - veg. structure intact, disturbance affecting individual species and weeds are non aggressive
Very Good - veg. structure altered, obvious signs of disturbance
Good - veg. structure significantly altered by multiple disturbance, retains basic vegetation structure or ability to regenerate it
Degraded - basic veg. structure severely impacted by disturbance. Scope for regeneration of veg. structure but not to "good" condition
Completely Degraded - veg. structure no longer intact and area is completely or almost completely without native species

* * CAR_RESERVE_ANALYSIS_2009 as provided by the Department of Environment and Conservation under Licensed Agreement.

Table 2: Vegetation Percent Remaining

Pre-European Extent Remaining: Vegetation Association No.29 Sparse low woodland; mulga, discontinuous in scattered groups		
Regional Context	**Location**	**Pre-European Extent Remaining (%)**
State-wide	N/A	100.00
Bioregional (IBRA Region)	Pilbara (PIL)	100.00
Bioregional (IBRA Sub-Region)	Fortescue (PIL2)	100.00
LGA	Shire of East Pilbara	100.00

5.2 Assessment against Clearing Principles

In assessing whether the project is likely to have a significant impact on the environment, the project has been assessed against the ten clearing principles.

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

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.	
ASSESSMENT	The project area is not within one of WA's identified areas of biodiversity hotspots for priority action. Priority flora and other significant flora are one measure of biodiversity values that should be considered under this principle. There will be no clearing of native vegetation that is representative of an area of high biodiversity. The clearing of native vegetation that is in good condition is not in better condition than other vegetation of the same ecological communities in the local area. One vegetation type was recorded within the study area. The vegetation type covers approximately 1,133,219Ha across the Pilbara and is considered to be close to 100% intact.
METHODOLOOGY & REFERENCES	DEC Rare and Threatened Flora database Beard (1975) ArcGis Dataset search
Proposal is not likely to be at variance to this Principle.	

(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.	
ASSESSMENT	Two known threatened fauna species were identified as occurring within the project area. The vegetation was not identified as habitat that was critical or a requirement for the maintenance and existence of a fauna population. The clearing of vegetation associated with this project will not result in a reduction of width of remnant vegetation and loss of any vegetation will not result in a loss of ecological linkages or limit the support of any breeding populations of species with limited dispersal.
METHODOLOOGY & REFERENCES	DEC Species and Communities Branch for Threatened Flora/Fauna search ArcGis Dataset search
Proposal is not likely to be at variance to this Principle.	

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	
ASSESSMENT	No known threatened flora species were identified as occurring within the project area. Areas of vegetation classed as buffer zones necessary to maintain ecological processes and functions for rare flora will not be cleared.
METHODOLOOGY & REFERENCES	DEC Species and Communities Branch for Threatened Flora/Fauna search. ArcGis Dataset search
Proposal is not likely to be at variance to this Principle.	

(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.	
ASSESSMENT	The Native Vegetation does not have a bioregional conservation status of depleted or less than 50% representation and is therefore less likely to contain threatened or other significant ecological communities. The buffer area of vegetation to be cleared also does not have a bioregional conservation status of <50%.The project area does not contain any known TEC's or habitat necessary for the existence and maintenance of any known TEC's.
METHODOLOOGY & REFERENCES	DEC Species and Communities Branch database search.

	Site visit (24/11/2010). ArcGis Dataset search.
Proposal is not likely to be at variance to this Principle.	

(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.	
ASSESSMENT	The major vegetation association system occurring within the project area is not considered remnant and is considered of least concern as there is 100% extent remaining. Native vegetation to be cleared in association with this project is not considered essential native vegetation in the landscape for the maintenance and existence of ecological values. Considering the native vegetation associated with the vegetation association is at 100% pre-european extent remaining, it is considered that this area of ecological community will remain well represented after project completion.
METHODOLOOGY & REFERENCES	SLIP NRM database – Car Reserve Analysis (DEC) Beard (1975) ArcGis Dataset search
Proposal not likely to be at variance to this Principle.	

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.	
ASSESSMENT	The project area is associated with Kalgan Creek crossing, a non perennial and minor waterway. The road already passes through Kalgan Creek crossing and no expansion or new development of the waterway is proposed in relation to this project. Culverts will be placed under the road to allow water to pass under the road instead of pooling on top of the road as it currently does. The watercourse is not considered to provide important linkages between any significant landforms. The watercourse in this area is not known to support any specialist assemblages and/or restricted plant species. Processes and changes in the water levels/flows will not be seriously impacted, and it is considered the work will improve the flow of water in the area.
METHODOLOOGY & REFERENCES	DSEWPC mapping tool (DEC) Native Vegetation Map Viewer ArcGis Dataset search
Proposal is not likely to be at variance to this Principle.	

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	
ASSESSMENT	Limited native vegetation clearing is required for these proposed works. It is considered not likely to cause and land degradation to the area. Major weed species in the project area are widespread in the area and adjacent tracks/disturbed areas. The sealing of the road and installation of culverts will not likely create further weed spread. Hydrological balance is not expected to be altered by clearing and therefore salinity is not considered to be an issue. Clearing is considered to be minimal and therefore not expected to increase water or wind erosion on or off the site.
METHODOLOOGY & REFERENCES	Desktop Assessment
Proposal is not likely to be at variance to this Principle.	

(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.	
ASSESSMENT	There are no conservation reserves or core habitat reserves within the project area. Fragmentation of landscapes is not likely to occur as a result of these works as the works do not intersect any conservation areas, nor will it contribute to the maintenance or restorability of one or more key ecological processes required to sustain a conservation area. No smaller remnant areas of vegetation (and their basic ecological functions) will be impacted on.

METHODOLOOGY & REFERENCES	ArcGis maps and Landgate searches were conducted to check for any conservation reserves or areas of conservation value.
Proposal is not likely at variance to this Principle.	

(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.	
ASSESSMENT	Project proposal is not going to increase the volume of traffic in the area and the project proposal is not likely to increase/affect contamination levels or water quality levels. The clearing of any native vegetation in relation to this project, is not likely to contribute to an increase in nutrient levels, salinity levels or sedimentation levels, as the clearing is of a relatively small nature. A Bed and Banks Permit has been applied for from the Department of Water as the project lies within a Proclaimed Groundwater and Surface Water Area. During this process, it was demonstrated to DoW that the works would aim to avoid permanent pools, bends or high velocity sections of water courses, which is a key principle to address when applying for this permit. Another key principle is to reduce watercourse crossings to a minimum and consolidate watercourse crossings with other infrastructure, where possible, which is the case with this proposal. Limited clearing is required and the floodway/road alignment is already in existence and the vegetation in the area is not expected to be greatly affected by the installation of culverts. Water is not being redirected away from vegetation in the area.
METHODOLOOGY & REFERENCES	Liaison with DoW (Karratha Office – Kevin Hopkinson) ArcGis Dataset search DoW Geographic Data Atlas Database search
Proposal is not likely to be at variance to this Principle.	

(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.	
ASSESSMENT	As the project is not considered a large clearing proposal, it is very unlikely that any vegetation clearing associated with these works will result in the increase of frequency or intensity of flooding. The installation of culverts will prevent localised flooding at this floodway and will aim to improve the drainage in this area. Culvert design and size has been chosen with the “1 in 100 year flood event” in mind.
METHODOLOOGY & REFERENCES	Desktop assessment
Proposal is not likely to be at variance to this Principle.	

5.3 Summary of Management Actions

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

Table 3: Summary of Additional Management Actions

Impact of Clearing	Yes/No or NA	Further Action Required
1. Does the assessment indicate that the clearing may be at variance or is at variance with one or more of the principles for clearing?	**No**	No further action required.
2. Does the assessment indicate that the clearing is at variance with one or more of the principles for clearing?	**No**	No further action required.
3. 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?	**No**	No further action required.
4. Will the project involve clearing for purposes considered temporary in nature under Condition 13 of CPS818?	**Yes**	A Revegetation Management Plan (RMP) must be prepared. The RMP must be submitted to the CEO of DEC prior to clearing unless it is; - less than ≤0.5 ha - not located in an ESA and - not at variance with one or more of the clearing principles, or - was undertaken within the pastoral regions of WA.

6. ASSESSMENT OF ASPECTS AND IMPACTS

Table 4: Aspects and Impacts – Kalgan Crossing Floodway Improvement Works

Aspect	Evaluation of Potential Impacts
Vegetation – clearing	0.5Ha of native vegetation is proposed to be cleared, the vegetation is described as Sparse low woodland; mulga, discontinuous in scattered groups (Vegetation Association 29). This Vegetation Association has 100% pre-European extent remaining. The native vegetation proposed to be cleared is well represented regionally as it possesses more than 30% of its pre-European extent. According to Keighery, (1994) the condition of the native vegetation to be cleared is described as Good. The 0.5ha of native vegetation proposed to be cleared is considered temporary clearing. As the project will involve temporary clearing revegetation will be required.
Vegetation – TECs/DRF	None present in the proposed works areas. No significant vegetation types or threatened flora have been recorded within the road reserve. Consultation with DEC confirms that the proposal is not going to have a significant impact upon any DRF or TECs. No Matters of National Environmental Significance as protected under EPBC Act (1999) will be impacted (see Table 5).
Vegetation – weeds	Consultation with the Department of Agriculture and Food confirms that there are no declared plants in the project area. There are numerous common weed species that occur throughout the proposed works areas. These species are likely to be widespread within the reserve and general area.
Vegetation – dieback	Not an issue given the project area receives less than 400 mm of average annual rainfall or is located above the 26˚ parallel.
Fauna	No significant fauna issues associated with any of the proposed upgrade works. With the generally degraded and exposed nature of the works areas, no significant impacts would be expected on native fauna generally as a result of the proposed works. No Matters of National Environmental Significance as protected under the EPBC Act (1999) will be impacted (see Table 5).
Heritage (non-indigenous)	A search of the Australian Heritage Places Inventory, Heritage Council of Western Australia and the Shire of East Pilbara's Municipal Heritage Inventory on-line databases has indicated that there are no known site(s) of heritage significance within the vicinity of the project area. No Matters of National Environmental Significance as protected under EPBC Act (1999) will be impacted (see Table 5).
Aboriginal heritage	A search of the DIA's database identified no known site(s) of Aboriginal heritage significance within the project area. There are 3 sites located in adjacent areas to the project site. These sites will be avoided and management strategies implemented in the EMP.
Wetlands	DEC has advised that there are no wetlands within the vicinity of the project area. (DSEWEP Mapping Tool) No Matters of National Environmental Significance as protected under EPBC Act (1999) will be impacted (see Table 5).

Table 4: Aspects and Impacts – Kalgan Crossing Floodway Improvement Works

Aspect	Evaluation of Potential Impacts
Surface water/drainage	Consultation with Department of Water has confirmed that the proposed works will disturb a watercourse in a proclaimed surface water area and a permit to disturb bed and bank has been applied for. This permit was granted 30/03/2011 (D11#80634). Little or no impacts are expected as the clearing of native vegetation in association with the watercourse is little and the culverts will improve hydrology flow as it will aim to prevent pooling and flooding at the Marble Bar Road floodway.
Groundwater	No dewatering nor drainage modifications are required, hence no change to groundwater level or quality.
Reserves / Conservation areas	There are no conservation areas or reserves adjacent to the project area.
Air quality	Not relevant to the proposed works. Local air quality assessment is not required for the project since: • the predicted traffic flow is less than 10,000 vehicles per day (in urban areas) or 15,000 vehicles per day in rural areas &; • residential and other sensitive receptors are not within 200 meters of the road centre.
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 East Pilbara 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	Provided traffic management and signage to 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	The works are within the road reserve and no known previous land use activities on or adjacent to the project area have had the potential to create contamination, e.g. petrol station. A search of the DEC's contaminated sites database indicates there are no identified contaminated sites within the project area. As project is near a drainage line, a spill management plan may be required.
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 Sulphate Soils	The SLIP database indicates that the area is classified as no risk as there is no dewatering or excavation below the water table planned no further investigations are required.
Statutory Land Use Planning	As the proposed works are entirely within the existing road reserve no planning scheme amendments are required.

Table 5: Commonwealth Aspects and Impacts – Kalgan Crossing Floodway Improvements

Aspect	Evaluation of Potential Impacts
World Heritage properties	The project will not impact any World Heritage properties.
National Heritage places	A search of the Australian Heritage Places Inventory Database located no sites within the vicinity of the project. .
Wetlands of international importance (Ramsar)	A search of the Department of Sustainability, Environment, Water, Population and Communities Protected Matters Search Tool located no Ramsar Wetland(**s**) within the vicinity of the project. .
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, two threatened species and no listed marine species within the vicinity of the project. The project activities are unlikely to have a significant impact on these species.
Migratory species protected under international agreements	A search of the Department of Sustainability, Environment, Water, Population and Communities Protected Matters Search Tool located seven migratory species within the vicinity of the project. The project activities are unlikely to have a significant impact on these species with the vegetation present unlikely to be habitat for these species.
Commonwealth marine areas	The project will not impact any Commonwealth marine area or marine protected area.
Nuclear Actions	Not relevant to the proposed works.

7. DECISION TO REFER

7.1 Referral to the Department of Sustainability, Environment, Water, Population and Communities

As the project will not impact on Matters of National Environmental Significance or impact Commonwealth land, the project does not require referral to the Commonwealth Department of Sustainability, Environment, Water, Population and Communities.

7.2 Referral to the Environmental Protection Authority

Due to the scale of the project, 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.

8. STAKEHOLDER CONSULTATION

Table 6: Project Consultation

Name	Agency	Date	Comments
Kevin Hopkinson	Department of Water	14/02/2011	Discussed the necessity and process for applying for Bed and Banks Permit. Permit granted 30/3/2011
Joshua Gilovitz	DEC	18/02/2011	Threatened Flora database search
Amy Mutton	DEC	15/02/2011	Threatened Fauna database search

9. OTHER APPROVALS/PERMITS/LICENCES

A Bed and Banks permit (Application for a section 11/17/21A permit to interfere with bed and banks) has been applied for with the Department of Water. Permit application was forwarded to the Department of Water (Karratha – Kevin Hopkinson) on 16 February 2011. Permit to disturb bed and banks was received from DoW on 30th March 2011 (refer TRIM reference D11#80634).

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.

Beard, J. S. (1975). Vegetation Survey of Western Australia, 1:1,000,000 Series. Pilbara: The Vegetation of the Pilbara Area. University of Western Australia Press, Nedlands.

Appendix A
Low Impact Environmental Screening Checklist

Form No. 6707/001/01

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 KALGAN CROSSING FLOODWAY IMPROVEMENT WORKS. MARBLE BAR ROAD (M030) SLK 24

ITEM NO.	ITEM	Y	N
1	New road or road reserve to be created or expansion of existing road reserve.		✓
2	Works require clearing of native vegetation outside the maintenance zone.		✓
3	Works require clearing of native vegetation that is older than 10 years old within the maintenance zone.	✓	
4	Works to occur outside normal working hours.		✓
5	Passes over, adjoins or drains directly into a wetland or sensitive watercourse.	✓	
6	Local natural drainage regime / hydrology will be changed.		✓
7	Dewatering, or a new water bore required.		✓
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)		✓
9	Buildings will require demolition.		✓

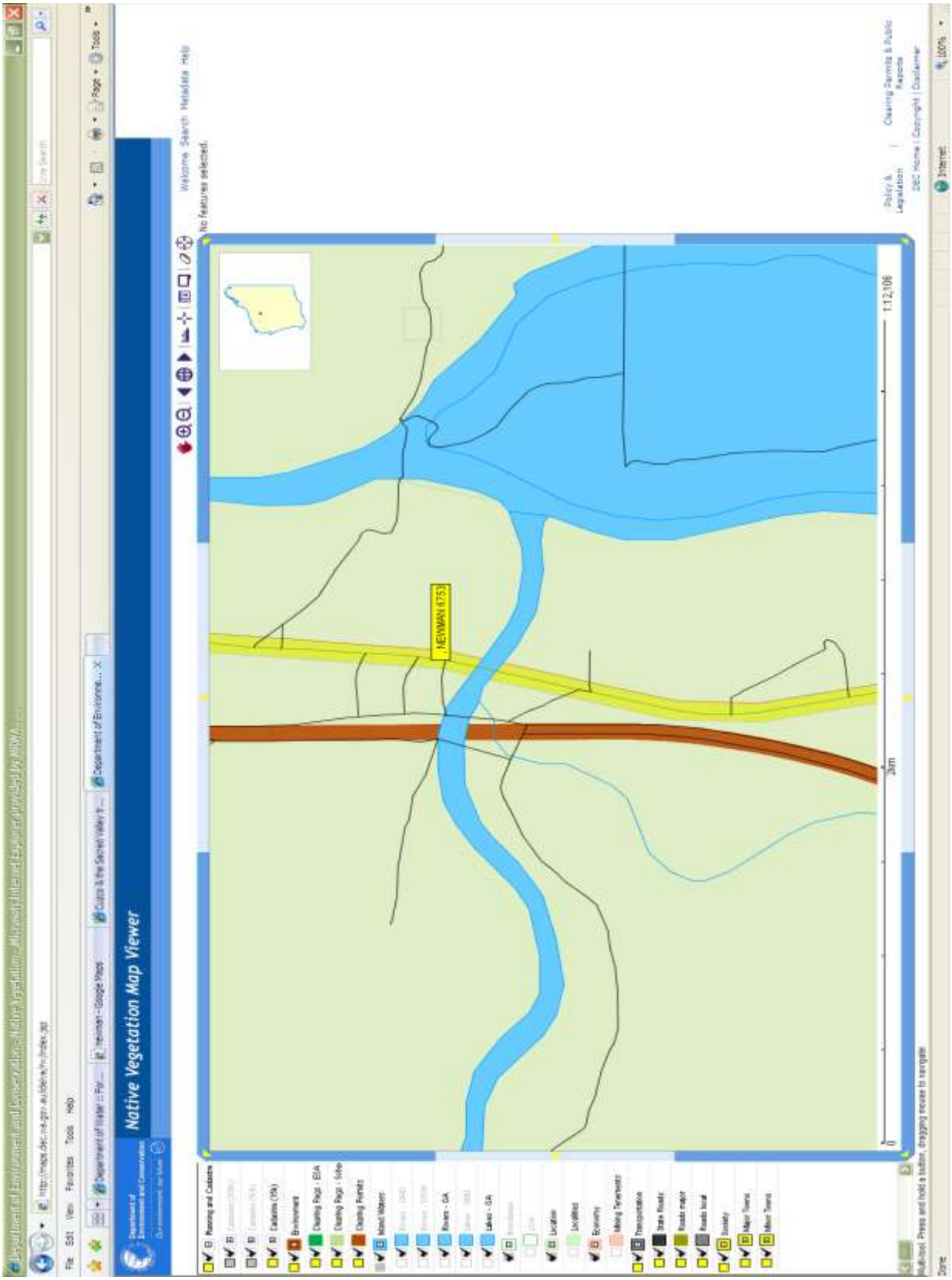
Completed By: *Signature* [signature] *Date* 01/03/11
Name D.R. PEARSON *Title* A/SPM

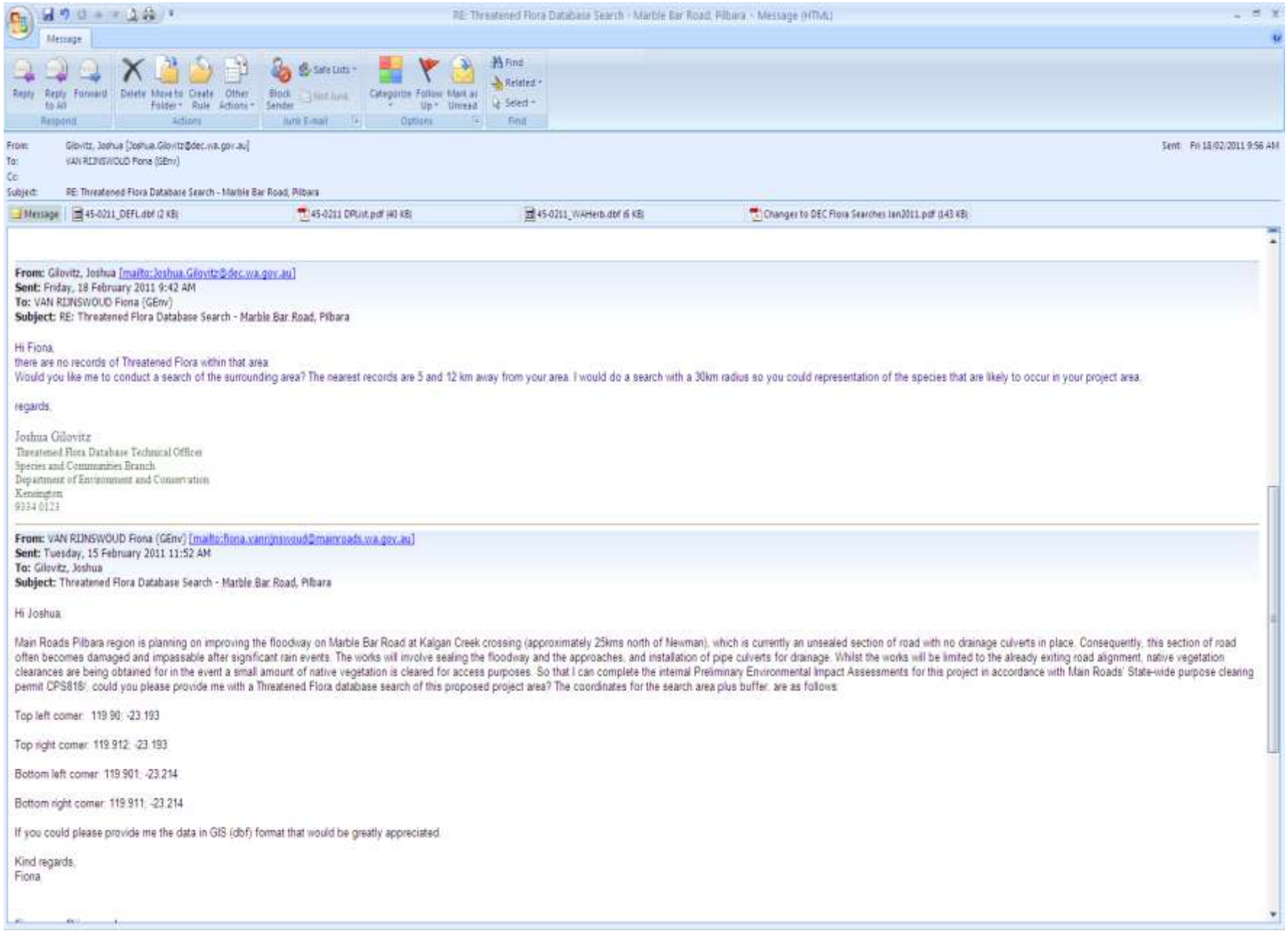
To be reviewed by a Main Roads Environment Officer: *Signature* [signature] *Date* 1/3/2011
Name F. van Rijnswoud *Title* Genv.

Comments: PEIA required for potential clearing of native vegetation that is older than 10 years. within the road reserve, likely to only be a few trees. ~~up~~ culverts will be installed, potentially altering flow of Kalgan Creek during flood events.
Bed and Banks permit will be applied for from Dept of Water.
PEIA triggered for the reason that works pass over a watercourse, and some vegetation may be cleared within the maintenance zone that is older

MAIN ROADS Western Australia
Form 670700101 Screening Checklist Rev 3.doc 30/05/07

Appendix B
DEC Threatened Flora and Fauna Database Searches





RE: Threatened Flora Database Search - Marble Bar Road, Pilbara - Message (HTML)

Message

Reply | Reply to All | Forward | Delete | Move to Folder | Create Rule | Other Actions | Block Sender | Safe Lists | Not Junk | Categorize | Follow Up | Mark as Unread | Find | Related | Select

Respond | Actions | Junk E-mail | Options | Find

From: Gilovitz, Joshua [Joshua.Gilovitz@dec.wa.gov.au]
To: VAN RIJNSWOUD Fiona (GEnv)
Cc:
Subject: RE: Threatened Flora Database Search - Marble Bar Road, Pilbara
Sent: Fri 18/02/2011 9:56 AM

Message | 45-0211_DEFL.dbf (2 KB) | 45-0211 DPList.pdf (40 KB) | 45-0211_WAHerb.dbf (6 KB) | Changes to DEC Flora Searches Jan2011.pdf (143 KB)

From: Gilovitz, Joshua [mailto:Joshua.Gilovitz@dec.wa.gov.au]
Sent: Friday, 18 February 2011 9:42 AM
To: VAN RIJNSWOUD Fiona (GEnv)
Subject: RE: Threatened Flora Database Search - Marble Bar Road, Pilbara

Hi Fiona,
there are no records of Threatened Flora within that area.
Would you like me to conduct a search of the surrounding area? The nearest records are 5 and 12 km away from your area. I would do a search with a 30km radius so you could representation of the species that are likely to occur in your project area.

regards,

Joshua Gilovitz
Threatened Flora Database Technical Officer
Species and Communities Branch
Department of Environment and Conservation
Kensington
9334 0123

From: VAN RIJNSWOUD Fiona (GEnv) [mailto:fiona.vanrijnswoud@mainroads.wa.gov.au]
Sent: Tuesday, 15 February 2011 11:52 AM
To: Gilovitz, Joshua
Subject: Threatened Flora Database Search - Marble Bar Road, Pilbara

Hi Joshua

Main Roads Pilbara region is planning on improving the floodway on Marble Bar Road at Kalgan Creek crossing (approximately 25kms north of Newman), which is currently an unsealed section of road with no drainage culverts in place. Consequently, this section of road often becomes damaged and impassable after significant rain events. The works will involve sealing the floodway and the approaches, and installation of pipe culverts for drainage. Whilst the works will be limited to the already exiting road alignment, native vegetation clearances are being obtained for in the event a small amount of native vegetation is cleared for access purposes. So that I can complete the internal Preliminary Environmental Impact Assessments for this project in accordance with Main Roads' State-wide purpose clearing permit CPS818/, could you please provide me with a Threatened Flora database search of this proposed project area? The coordinates for the search area plus buffer, are as follows:

Top left corner: 119.90, -23.193

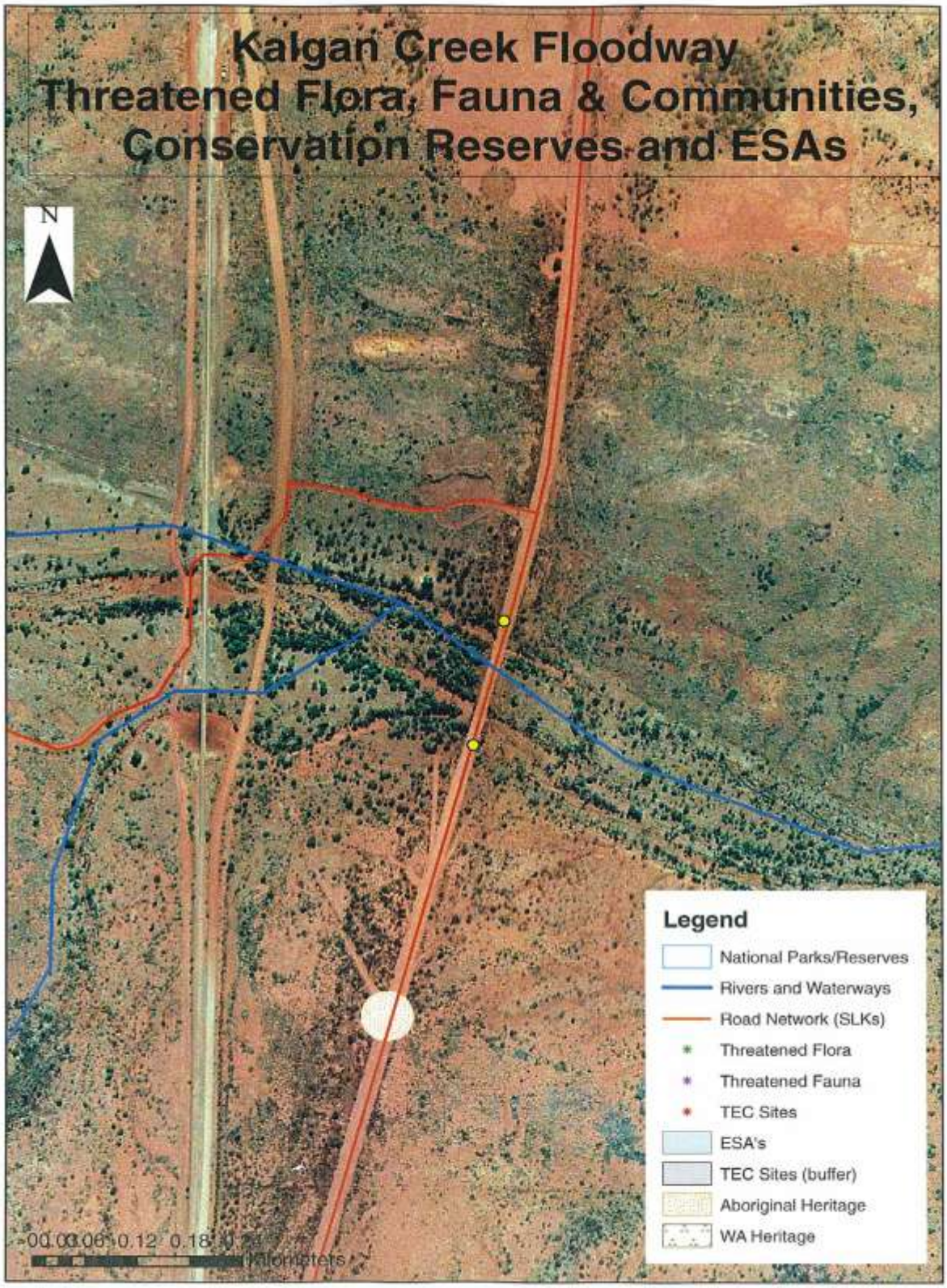
Top right corner: 119.912, -23.193

Bottom left corner: 119.901, -23.214

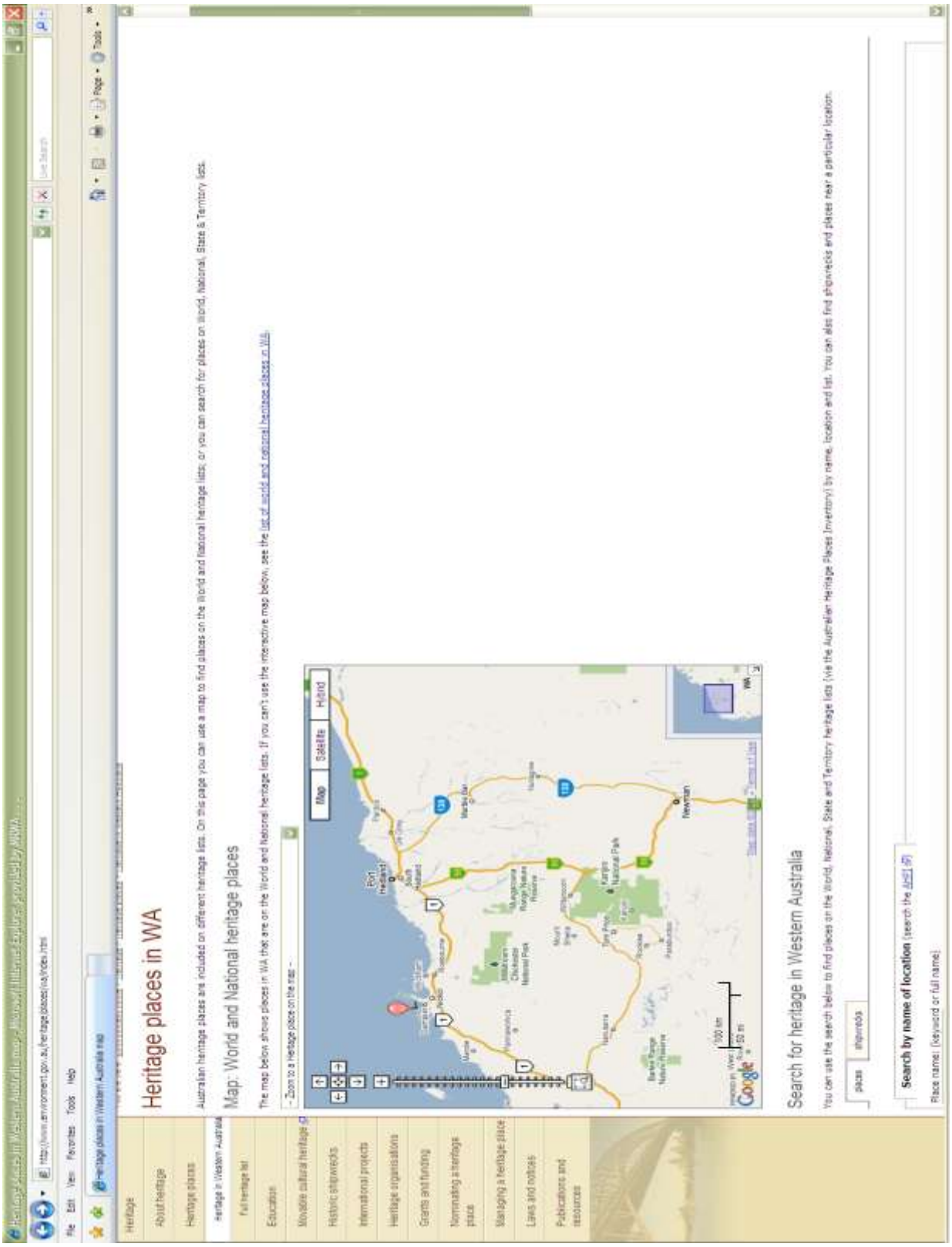
Bottom right corner: 119.911, -23.214

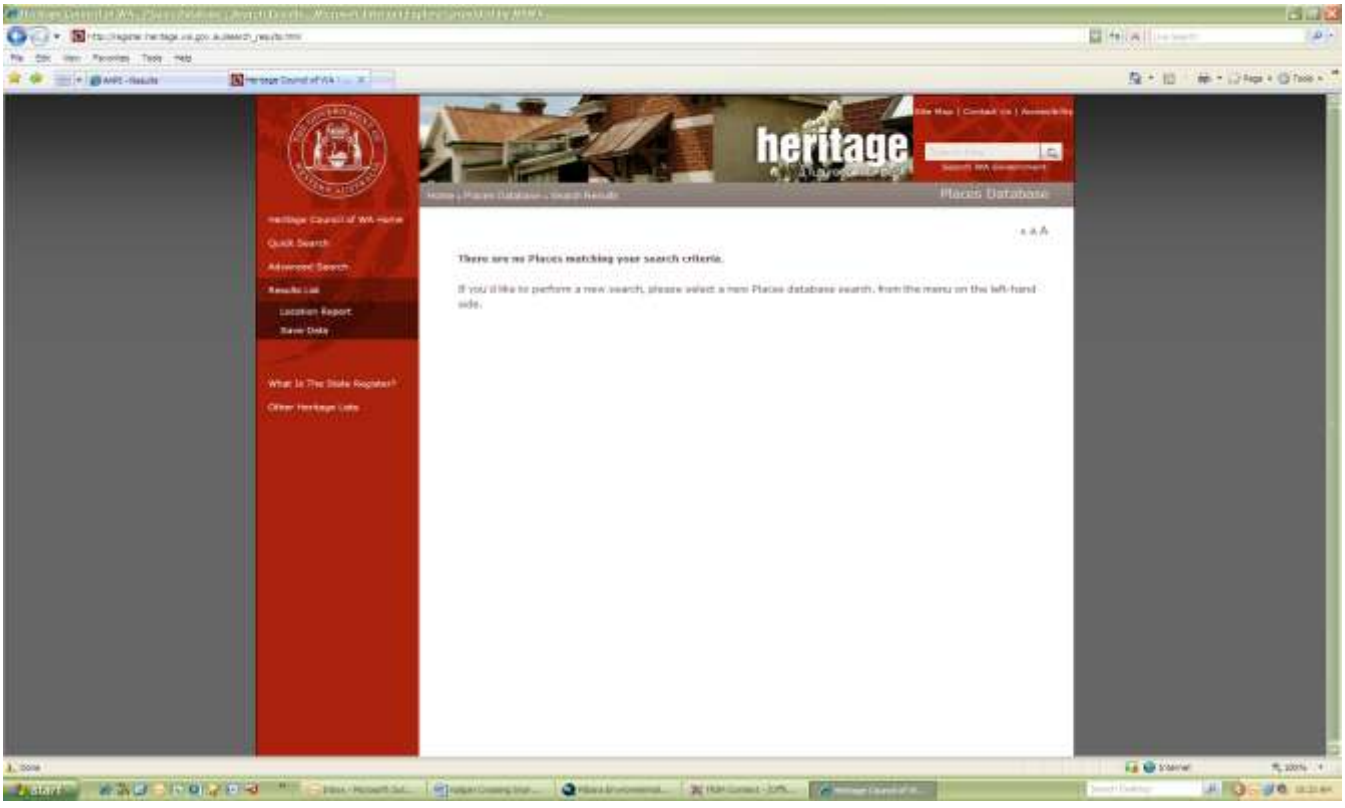
If you could please provide me the data in GIS (dbf) format that would be greatly appreciated.

Kind regards,
Fiona


Kalgan Creek Floodway
Threatened Flora, Fauna & Communities,
Conservation Reserves and ESAs
N
Legend
National Parks/Reserves
Rivers and Waterways
Road Network (SLKs)
Threatened Flora
Threatened Fauna
TEC Sites
ESA's
TEC Sites (buffer)
Aboriginal Heritage
WA Heritage
0.06 0.12 0.18
Kilometers

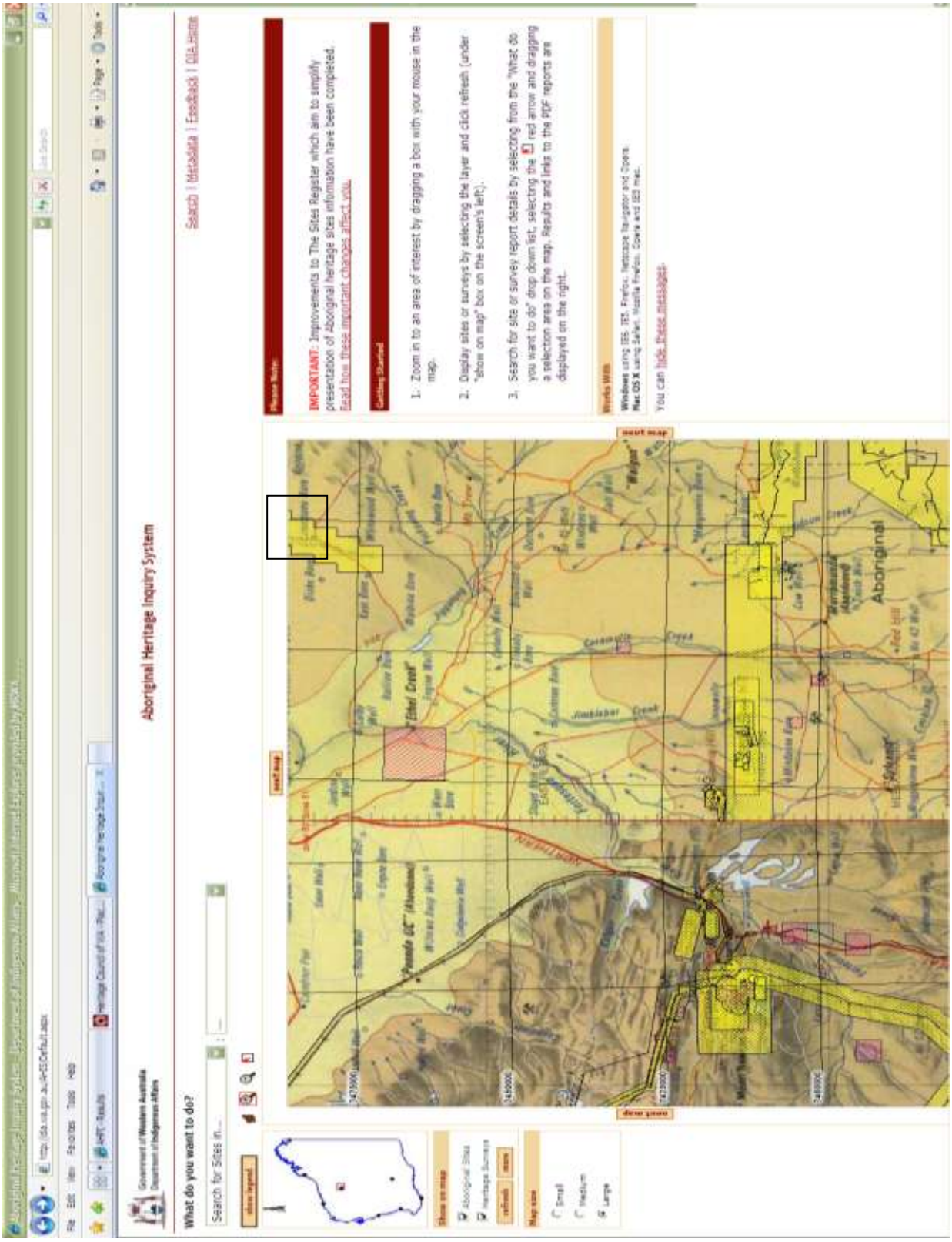
Appendix C
Australian Heritage Places Inventory, Heritage Council of Western Australia and the Municipal Heritage Inventory Database Searches





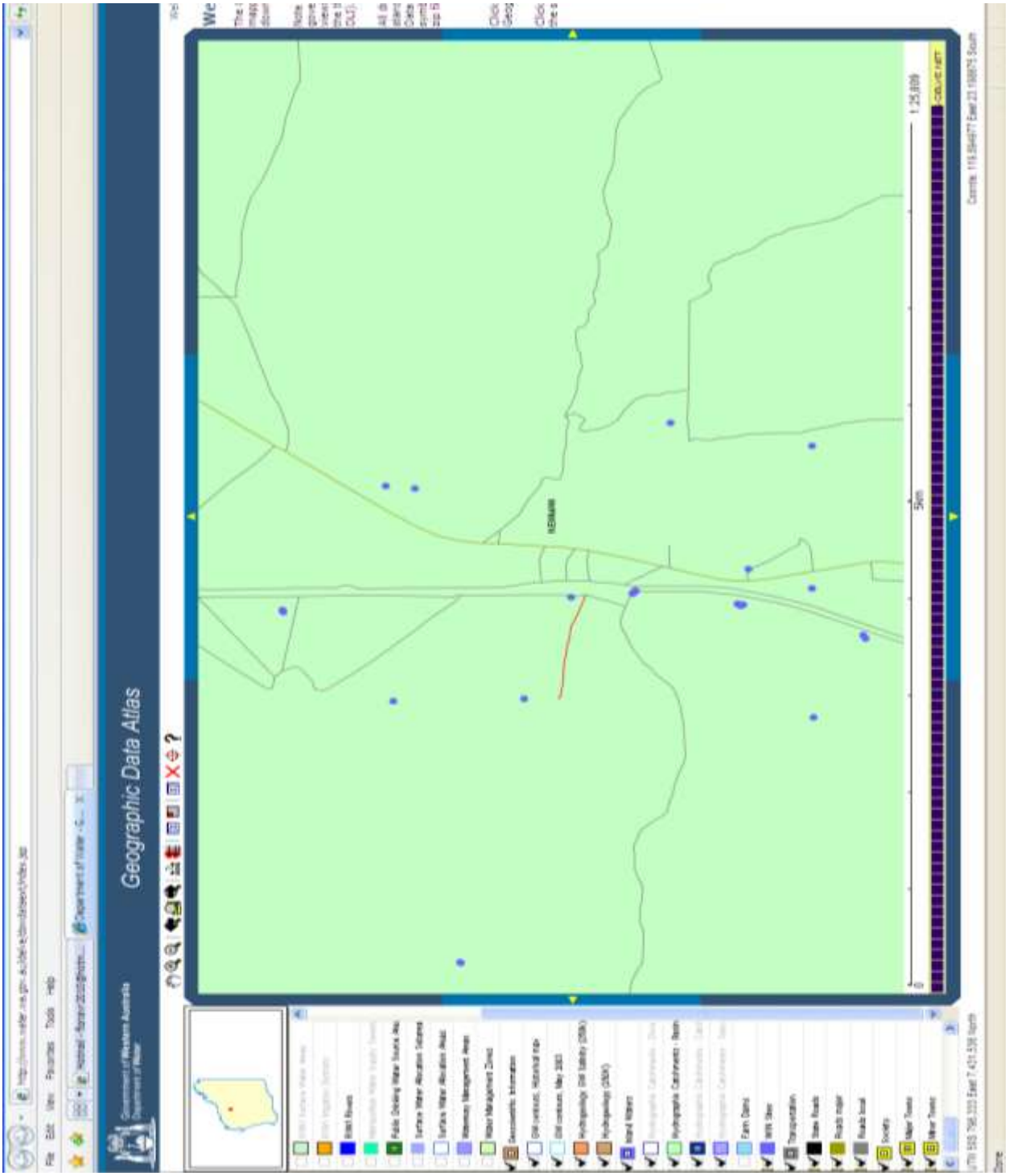
Department of Heritage WA Heritage Register Search

Appendix D
Department of Indigenous Affairs Database Search

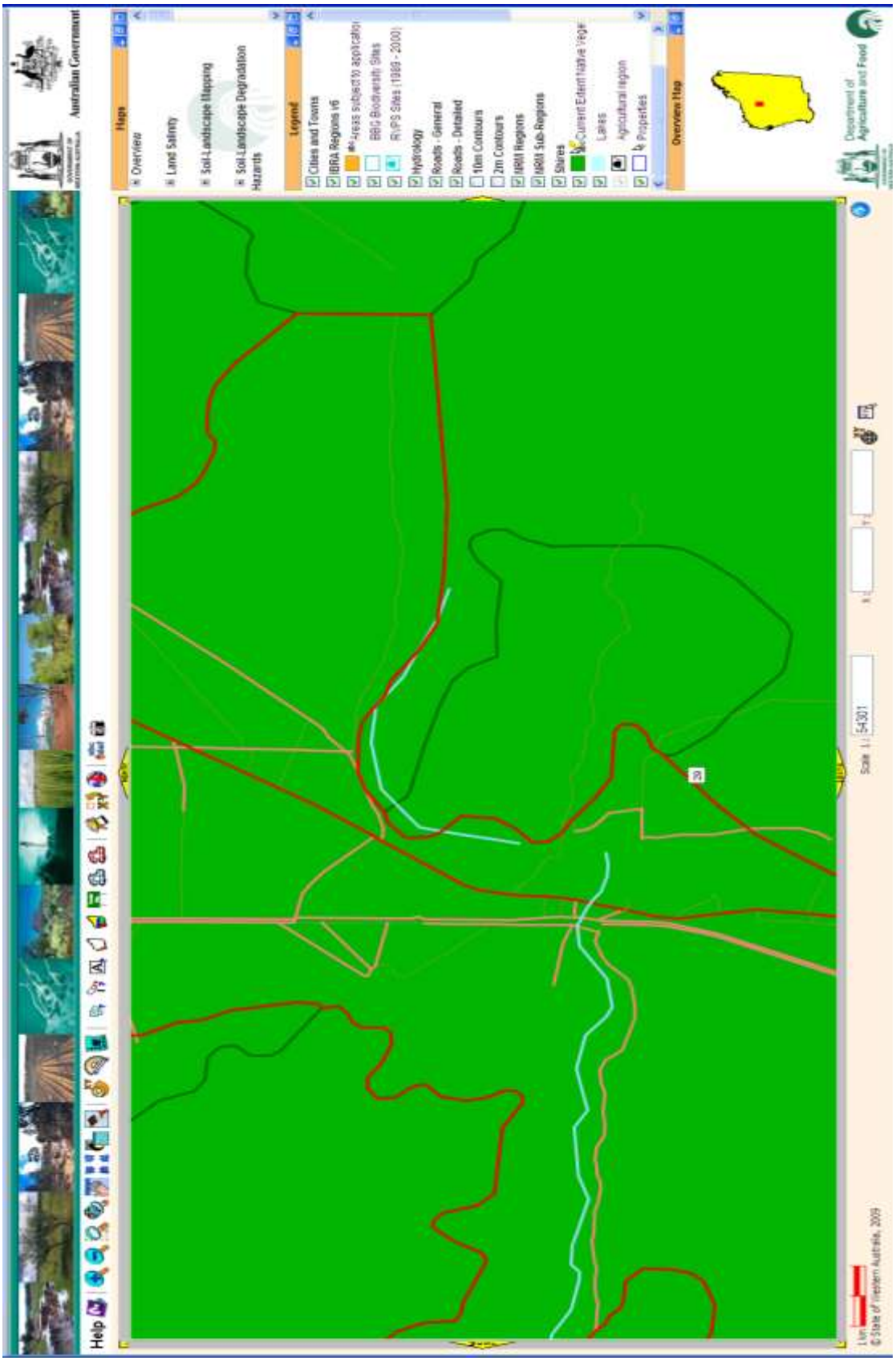


Department of Indigenous Affairs – Aboriginal Heritage Database Enquiry System Search

Appendix E
DoW Geographic Data Atlas Database Search



Appendix F
DEC Native Vegetation Map Viewer Database Search



Appendix G
DSEWPC Database Search

Australian Government
Department of Sustainability, Environment, Water, Population and Communities

Protected Matters Search Tool

EPBC Act Protected Matters Report: Coordinates

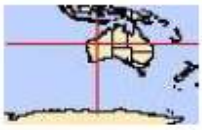
This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

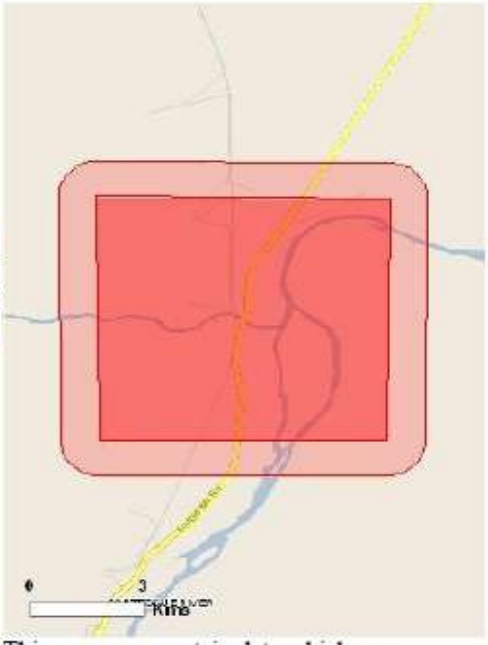
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

You may wish to print this report for reference before moving to other pages or websites.

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: 27/02/11 15:40:21





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

Coordinates
Buffer: 1Km

Summary

Matters of National Environmental 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.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Significance (Ramsar Wetlands):	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Threatened Ecological Communitites:	None
Threatened Species:	2
Migratory Species:	7

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

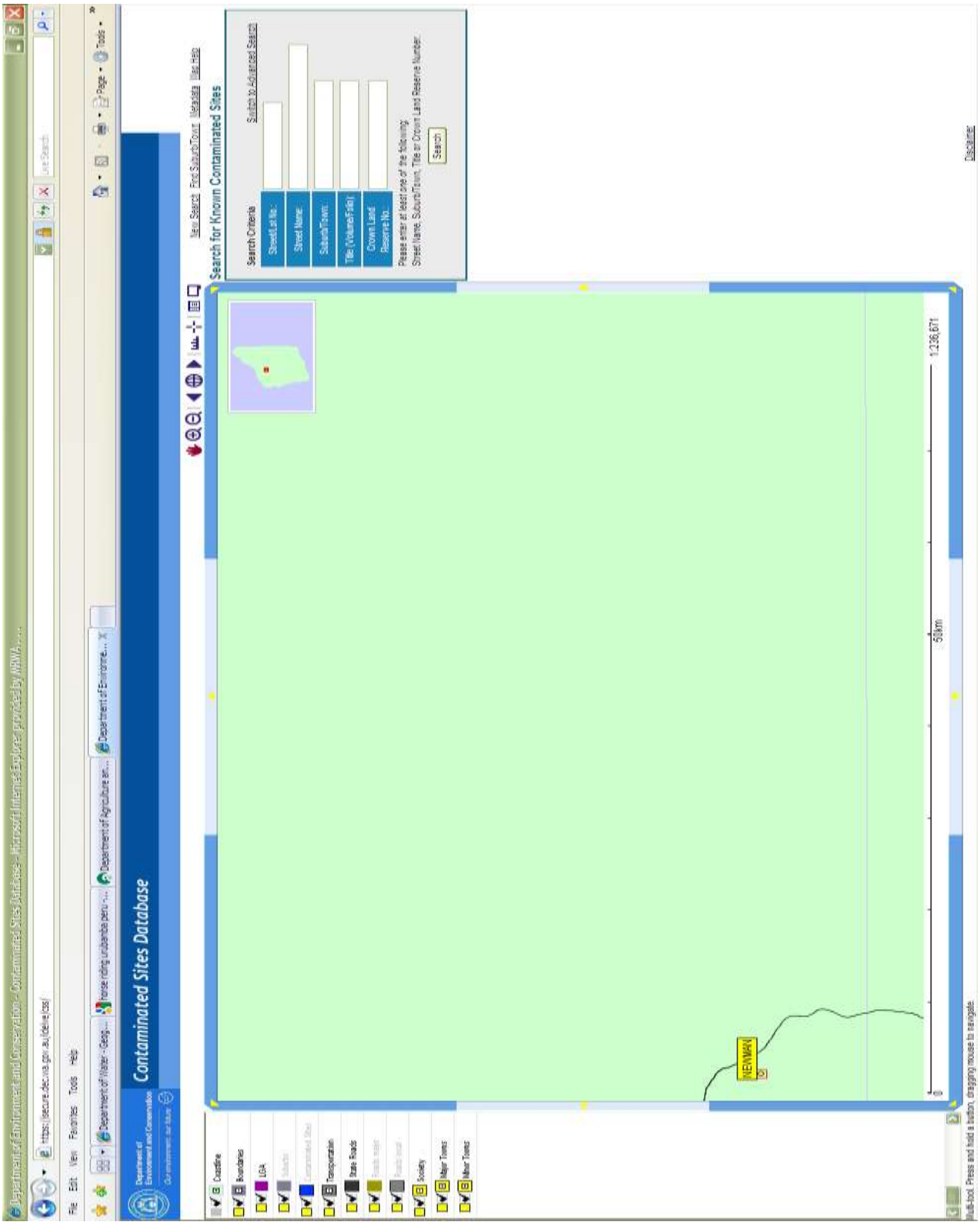
Please note that the current dataset on Commonwealth land is not complete. Further information on Commonwealth land would need to be obtained from relevant sources including Commonwealth agencies, local agencies, and land tenure maps.

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.au/epbc/permits/index.html.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	5

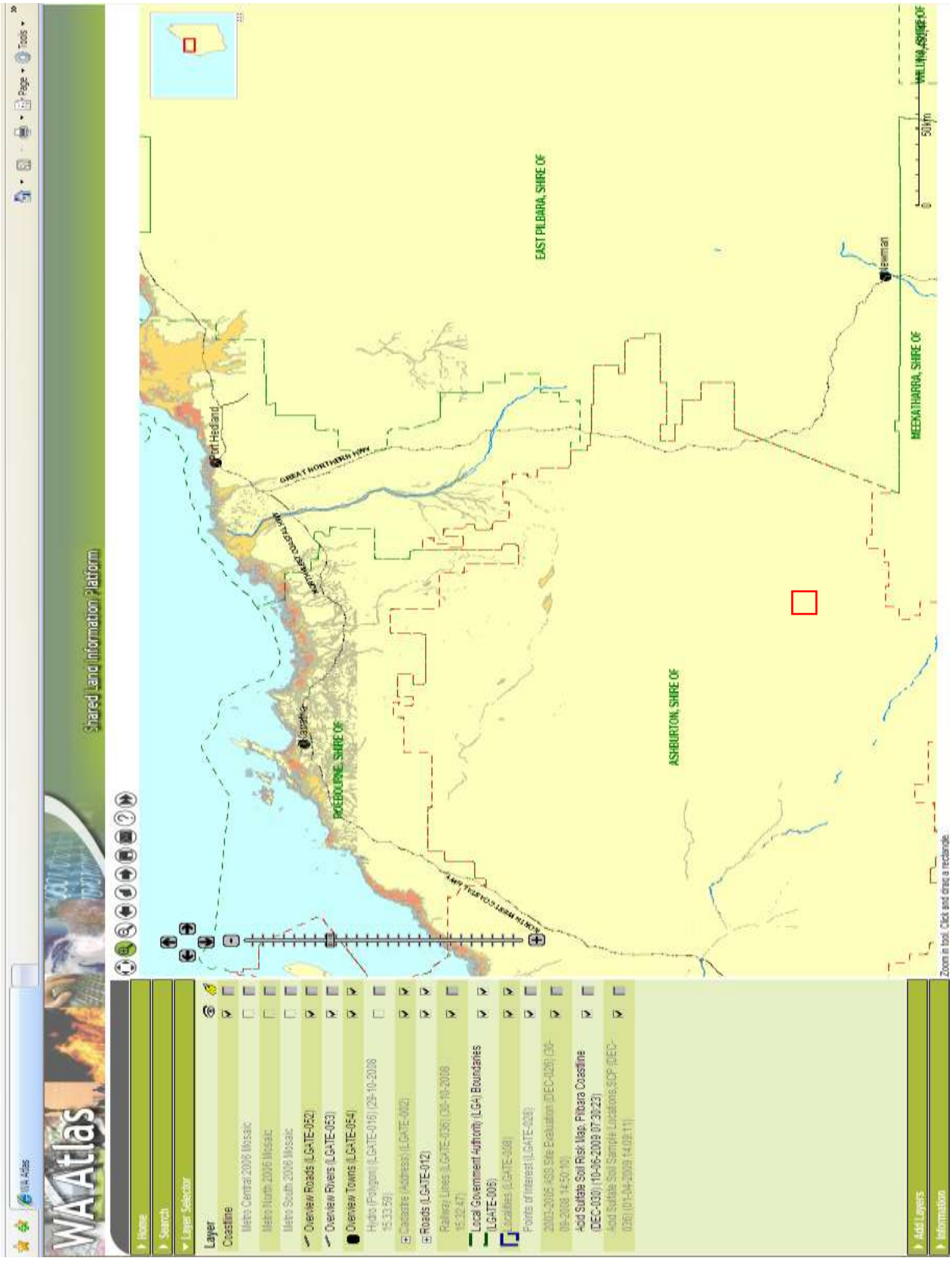
Appendix H
Department of Agriculture & Food Advice on Declared Weeds

Appendix I
DEC Contaminated Sites Database Search



Department of Environment and Conservation - Contaminated Sites Register Search

Appendix J
Acid Sulfate Soils Mapping



Appendix K
Site Photos

Photo 1: M030 Kalgan floodway facing north

Photo 2: M030 Kalgan floodway facing south

Photo 3: M030 Kalgan floodway facing north

Photo 4: M030 Kalgan floodway side track

Photo 5: M030 Kalgan floodway facing south

Photo 6: M030 Kalgan floodway facing south from secondary channel

Photo 7: M030 Kalgan floodway side track

Photo 8: Possible location for southern end of start of detour

Photo 9: View upstream (West) of southern creek

Photo 10: View downstream (East) from southern creek

Appendix L
Environmental Management Plan

ENVIRONMENTAL MANAGEMENT PLAN

KALGAN CROSSING FLOODWAY IMPROVEMENTS

Introduction

This Environmental Management Plan (EMP) has been developed for the project area following the completion of the Preliminary Environmental Impact Assessment (PEIA) report. The aim of this EMP is to minimise the environmental impacts associated with the proposed works as well as to identify areas of responsibilities required for the implementation of management strategies.

This EMP addresses specific issues that were identified during the PEIA. The project management measures identified within this EMP are in addition to the standard environmental management contract specifications used for Category 2 projects. Main Roads' standard environmental contract specifications (Specifications 203, 204, 301, 302 and 304) are to be adhered to where appropriate.

The areas that require special management will be addressed in terms of:

- the timing of the various management actions;
- the topic (e.g. vegetation);
- the objectives for each area;
- the actions that are necessary to minimise the impact;
- the responsible party for implementing the action; and
- whether the action arose from external advice or is a Main Roads requirement.

Communication Plan

Environmental issues specific to the project will be communicated as follows

Method	Frequency	Participants	Reference	Record
Project Site				
Induction	Prior to Work	All personnel and subcontractors	EMP and Contractor Environmental Policy	Induction Meeting
Toolbox Meetings	Weekly	Project Personnel	Contractor Safety Plan	Minutes of Meeting
Contract Meetings	As they occur	Main Roads' Project Manager and Contractor Project Manager	EMP	Minutes of Meeting
Authority Consultation				
Department of Water	As required	Main Roads' Project Manager and Contractor Project Manager	-	Filing of correspondence on relevant project file

External Communication and Complaints

A complaints register shall be maintained by the contractor. All complaints received shall be forwarded to the Main Roads' Project Manager for action. Serious complaints shall be investigated within 24 hours of the complaint being received.

ENVIRONMENTAL MANAGEMENT PLAN					
Timing	**Topic**	**Objective**	**Action**	**Responsible Party**	**Advice**
All phases of Construction	Vegetation Clearing - Record-keeping	All projects should maintain the required records relating to clearing native vegetation under the purpose permit.	Clearing: • a copy of the PEIA & EMP (Minor projects) for small projects; • a map showing the location where the clearing occurred, recorded in an ESRI Shapefile • the size of the area cleared (in hectares); and • the dates on which the clearing was done.	Project Manager	DEC
			Revegetation and rehabilitation of areas: • a copy of each Revegetation Plan; • a map showing the location of any area revegetated and rehabilitated recorded in an ESRI Shapefile; • a description of the revegetation and rehabilitation activities undertaken; and • the size of the area revegetated and rehabilitated (in hectares).	Project Manager	DEC
			Each management strategy implemented: • a map showing the location of any area to which a management strategy has been applied recorded in an ESRI Shapefile; • a description of the management strategy implemented; and • the size of the area to which the management strategy was applied (in hectares).	Project Manager	Project Manager
All phases of Construction	Vegetation Clearing - Record-keeping	All projects should maintain the required records relating to clearing native vegetation under the purpose permit.	Control of weeds, dieback and other pathogens: • a copy of any management plan prepared; and • for any pathogen other than dieback, the appropriate steps taken.	Project Manager	Main Roads
All phases of Construction	Aboriginal Heritage	All activities should avoid registered sites located adjacent to project area.	No construction or disturbance to any of known sites. All personnel to be informed of existence of sites and that avoidance of sites is necessary. Personnel to be made aware of reporting process and procedures for the event that sites are accessed and/or disturbed.	Project Manager	Main Roads
Pre - Construction	Revegetation and Landscape planning	To revegetate site.	Prepare a Project Revegetation Plan to meet project requirements as identified.	Project Manager	Main Roads

ENVIRONMENTAL MANAGEMENT PLAN					
Timing	**Topic**	**Objective**	**Action**	**Responsible Party**	**Advice**
Pre - Construction	Vegetation Clearing – Submissions to DEC	All projects comply with requirements of the purpose permit in relation to submission of documentation to DEC and where relevant obtain DEC approval of these documents prior to clearing of native vegetation.	Management Strategy • Submit management strategy as required by Condition 12 b) of the purpose permit. • Revegetation and Rehabilitation. • Submit revegetation plan as required by Condition 13 c) of the purpose permit.	Project Manager	DEC
Pre-Construction	Vegetation Clearing	Ensure that the overall objectives of the alignment and construction works are compatible with maintaining and, where possible, enhancing the biological integrity of the surrounding environment and minimising vegetation loss and degradation; and Ensure the retention of as many habitat trees, shrubs and vegetated corridors for fauna as possible, particularly where associated with riparian zones.	Selection of designs/locations that minimise adverse impacts on the biological environment.	Project Manager	Main Roads
			Construction works to be undertaken in summer to reduce the potential for soil erosion and drainage line siltation due to vegetation removal and heavy rains.	Project Manager	Main Roads
			Control/spray weeds species within the project area prior to construction to limit the amount of propagative material that may be spread during disturbance.	Contractor	Main Roads
			Any stockpiled vegetation from clearing works shall not be burnt. This vegetation shall be used during any rehabilitation works and either mulched or respread according to the TDP/Revegetation Plan.	Contractor	Main Roads
Pre - Construction	Vegetation Clearing - CPS 818/4 management requirements	Compliance with management conditions of purpose permit.	If clearing is pursuant to Main Purpose Permit (CPS818) ensure compliance with Section 14 of the permit relating to Dieback, other pathogen and weed control.	Contractor/Project Manager	DEC
Pre-Construction	Surface Drainage	Maintain the hydrological regime that exists prior to the construction of the proposal.	Stormwater drainage shall be treated and disposed of in accordance with DEC requirements.	Project Manager	DEC

ENVIRONMENTAL MANAGEMENT PLAN					
Timing	**Topic**	**Objective**	**Action**	**Responsible Party**	**Advice**
Construction	Noise, Vibration and Dust	Ensure that the construction of the proposal does not become a nuisance to the public.	Access to private property and appropriate traffic management measures should be planned and implemented prior to the construction of works.	Contractor	Main Roads
			Pedestrian public access should be should be planned and implemented prior to the construction of works.	Contractor	Main Roads
			Any complaints regarding dust will be attended to as soon as possible.	Contractor/Project Manager	Main Roads
			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.	Contractor	Main Roads
			Watering, the use of hydromulch or other forms of mulching to protect loose surfaces shall be used as mitigation measures.	Contractor	Main Roads
Construction	Pollution and Litter	Ensure that the construction of the proposal is managed to a standard that minimises any adverse impacts on the environment.	The designated servicing area will be bunded to contain any spills or leaks and shall not be located in an area adjacent to any drainage areas or watercourses or will drain into a temporary sump.	Contractor	Main Roads
			Temporary storage of bitumen, asphalt, concrete or aggregate should only occur at designated depots or controlled hardstands. Precoating of aggregate will only occur in approved areas.	Contractor	Main Roads
			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. The contractor shall ensure appropriate equipment is available at all times and shall notify the Superintendent's Representative of a spill.	Contractor	Main Roads
			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.	Contractor	Main Roads
			The project areas, including hardstand areas, will be kept in a tidy manner at all times.	Contractor	Main Roads
Construction	Fire	Ensure that the fire risk associated with the construction of the proposal is minimised.	No fires shall be lit within the project area.	Contractor	Main Roads
			Machinery will be fitted with approved spark arresting mufflers.	Contractor	Main Roads
			A water tanker/fire fighter unit will be on site at all times.	Contractor	Main Roads
Construction	Fauna	Avoid unnecessary impacts to fauna and damage to	Fauna are not to be fed or intentionally harmed.	Contractor	Main Roads
			No pets or firearms permitted on site.	Contractor	Main Roads

ENVIRONMENTAL MANAGEMENT PLAN					
Timing	**Topic**	**Objective**	**Action**	**Responsible Party**	**Advice**
		fauna habitat.	The WILDCARE Helpline is to be contacted, 9474 9055, in the event of sick, injured or orphaned native wildlife on the site.	Contractor	Main Roads
Construction	Site Management	Ensure that the site is managed to ensure that construction of the proposal will have minimal impact upon the surrounding environment.	Site office and materials storage areas will be located on previously disturbed/ designated area.	Contractor	Main Roads
Construction	Rehabilitation	Rehabilitate the project area to meet project commitments.	Implement the contract specifications for rehabilitation of the site.	Contractor	Main Roads
			All waste materials from the development are to be completely removed from the site upon completion of the project. Final clean-up shall be to the satisfaction of the Project Manager and the Site Superintendent.	Contractor	Main Roads
Construction	Revegetation	Meet project commitments for revegetating and landscaping.	Implement the Project Revegetation Plan.	Contractor	Main Roads
Construction	Revegetation and rehabilitation requirements	Compliance with revegetation and rehabilitation requirement of purpose permit.	If revegetation and rehabilitation is pursuant to Purpose Permit (CPS 818/4) ensure compliance with Condition 13 Revegetation and Rehabilitation) and Condition 14 (Dieback, other pathogen and weed control) of the permit.	Contractor/Project Manager	Main Roads
Post - Construction	Monitoring	Meet project revegetation commitments.	Monitor effectiveness of revegetation works and weed control.	Contractor/ Project Manager	Main Roads

Monitoring

After project completion and project handover, the Asset manager should develop a monitoring program to monitor for those aspects that have been identified as requiring monitoring.

Contingency Measures

Due to the scale and nature of the project, no contingency measures are identified as the inherent environmental risks are small.

Auditing

Due to the scale and nature of the project, there is no requirement for auditing the implementation of the EMP as the environmental risks are small.