

# SECTION 7

## Mitigation, Management and Monitoring



## 7 Mitigation, Management and Monitoring

The objective of this section is to provide general measures needed to prevent, minimise and mitigate environmental impacts with the view of achieving sound and responsible environmental management during the life cycle of the Proposed Development. A series of commitments to manage impacts of the Proposed Development are also provided. Measures recommended in this section are based on the existing environment described under **Section 4.1, Existing Environment**, discusses the certain and likely impacts associated with the Proposed Development (**Section 5, Potential Impacts** and **Section 6, Preliminary Risk Analysis**), and recommend measures which would manage and or / mitigate these impacts (this section).

### 7.1 Environmental Management Framework

Management of occupational health and safety (OH&S), quality, and the environment at PWC is undertaken in accordance with an Integrated Management System (IMS). The IMS is a mechanism by which PWC's environmental interactions are systematically managed. Operation of the PWC IMS is externally certified to meet the relevant international/Australian standards (AS 4801 for occupational health and safety; ISO 9001 for quality; ISO 14001 for environmental management).

Aspects of the environment potentially impacted by PWC activities are monitored, monitoring results and records are documented, and the environmental performance of PWC can thus be reviewed and audited. The level of environmental management stringency applied to the Proposed Development will be detailed in the construction contract and will therefore meet or exceed the standards which currently apply to PWC.

The PWC IMS sets out the framework, objectives and targets for sound and responsible environmental management, OH&S performance, and quality delivery. The role and intended outcomes of the IMS are effectively defined by a high level Environment, Quality, Health and Safety Policy which specifies PWC's aims and commitments. The aims and commitments of this Policy are as follows:

- Aim to achieve our ultimate goal of zero harm to people and the environment.
- Develop and review measurable objectives and targets that promote continuous improvement of our environment, quality, health and safety performance.
- Prevent pollution and minimise any adverse effects our operations may have on the environment.
- Promote a work culture that achieves corporate targets through safe behaviour, environmental awareness and use of quality systems.
- Aim to eliminate work-related illness and injury resulting from our operations.
- Comply with relevant legislation, regulations and other documents relevant to the Corporation.
- Ensure environment, quality, health and safety roles and responsibilities are documented and that they are clearly communicated, understood and accepted.
- Ensure personnel and contractors have the necessary information, training and supervision to meet regulatory and corporate requirements.
- Seek to understand our customer needs, meet their requirements and aim for total customer satisfaction.
- Be honest, consistent and fair in our dealings with our customers and suppliers.
- Ensure this policy is actively communicated and made available to personnel, relevant stakeholders and interested parties (including the public).
- Ensure this policy is periodically reviewed so that it remains relevant and appropriate.
- We will demonstrate these commitments by meeting the requirements of ISO14001, ISO9001 and AS4801.

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In addition to the stated aims of the Environment, Quality, Health and Safety Policy, PWC uses three objectives as a basis for its environmental performance:

- 100% compliance with legal and statutory obligations.
- Zero environmental incidents causing environmental harm and operating within licence conditions.
- Zero extreme environmental risks at any PWC facility.

Within PWC's IMS, beneath the Environment, Quality, Health and Safety Policy are some broad environmental targets relating to operations. Wherever PWC operates they aim to:

- Keep air clean and clear.
- Ensure that waterways and aquifers remain unpolluted.
- Ensure that PWC does not contaminate land.
- Enhance the biodiversity values of land and water that managed by PWC.
- Protect the ecosystems, plants, and animals that may be vulnerable or endangered.
- Maximise the efficient use of fossil fuels while seeking renewable and sustainable long-term alternatives.

The aforementioned Environment, Quality, Health and Safety Policy, and PWC's Environmental Goals, inform the development of PWC corporate procedures. The corporate procedures applicable to PWC's environmental performance are as follows:

- Land Management Procedure (see **Appendix J**).
- Chemical Management, Assessment, Purchase, Handling, Storage Disposal and Training Requirements Procedure (see **Appendix K**).
- Contractor OHS&E Management Procedure (see **Appendix L**).
- Emergency Response Procedure (see **Appendix M**).
- Hazard/Incident Recording, Reporting and Investigation Procedure (see **Appendix N**).
- Risk Management Procedure (see **Appendix O**).

Prevention, mitigation and management of potential impacts associated with the Proposed Development would be undertaken in accordance with the above procedures, described in further detail below.

### 7.2 Mitigation of Impacts on the Physical Environment

#### 7.2.1 Acid Sulphate Soils

The occurrence of acid sulphate soil at locations along the Proposed Development corridor was confirmed during two surveys for ASS in 2010 and 2011 (Cardno Ullman & Nolan, 2011). AASS and PASS were encountered at two locations (BH28 and BH34) during the 2010 investigation and four during the 2011 investigations. PASS and AASS can oxidise and generate sulphuric acid either when excavated (i.e. within stockpiles) or when in-situ (i.e. overlying soil is excavated, exposing underlying PASS / ASS).

To minimise the potential for oxidation of ASS an Acid Sulphate Soils Management Plan (ASSMP) will be prepared in accordance with the Land Management Procedure, see **Appendix J**.

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Management of AASS and PASS will be undertaken in accordance with the following principles (Department of Natural Resources and Mines, 2002):

9. The disturbance of AASS / PASS should be avoided wherever possible.
10. Where disturbances of AASS / PASS is unavoidable, preferred management strategies are:
  - e) Minimisation of disturbance.
  - f) Neutralisation.
  - g) Hydraulic separation of sulphides either on its own or in conjunction with dredging.
  - h) Strategic reburial (reinterment).

Other management measures may be considered but must not pose unacceptably high risks.

11. Works should be performed in accordance with best practice environmental management when it has been demonstrated that the potential impacts of works involving AASS / PASS are manageable to ensure that the potential short and long term environmental impacts are minimised.
12. The material being disturbed (including the in situ AASS / PASS) and any potentially contaminated waters associated with AASS / PASS disturbance, must be considered in developing a management plan for AASS / PASS and / or in complying with the general environmental duty.
13. Receiving marine, estuarine, brackish or fresh waters are not to be used as a primary means of diluting and / or neutralising AASS / PASS or associated contaminated waters.
14. Management of disturbed AASS / PASS is to occur if the acid sulphate soil action criteria listed in Table 1 of the Department of Natural Resources and Mines (2002) guidelines is reached or exceeded.
15. Stockpiling of untreated ASS above the permanent groundwater table with (or without) containment is not an acceptable long-term management strategy. For example, soils that are to be stockpiled, disposed of, used as fill, placed as temporary or permanent cover on land or in waterways, sold or exported off the treatment site or used in earth bunds, that exceed the ASS action criteria listed in Table 1 of the Department of Natural Resources and Mines (2002) guidelines should be treated / managed.
16. The following issues should be considered when formulating ASS environmental management strategies:
  - i) The sensitivity and environmental values of the receiving environment. This includes the conservation, protected or other relevant status of the receiving environment.
  - j) Whether groundwaters and / or surface waters are likely to be directly or indirectly affected.
  - k) The heterogeneity, geochemical and textural properties of soils on-site.
  - l) The management and planning strategies of Local Government and / or the NTG.

The ASSMP for the Proposed Development will describe measures to manage and / or mitigate the potential impacts of acid sulphate soil disturbance. Mitigation measures specified by the ASSMP will include:

- Minimise disturbance of acid sulphate soils occurring within and adjacent to the development corridor.
- Implement appropriate management techniques to reduce the potential for production of acid and / or release of acidity as run off caused by exposing acid sulphate soils to oxygen, such as liming, reinterment, and covering / bunding of stockpiles.
- Ensure that adequate OH&S measures are adopted when dealing with acid sulphate soils, and incorporation of this information into the construction and operational OH&S Plans.

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- Disposal of material to a suitable secure landfill or on-site disposal if this can be shown to adequately contain the material.
- Monitoring of acid sulphate soils is regularly completed during excavation and construction activities.

Management measures which are likely to be included in the ASSMP include:

- Training and induction of any personnel involved in soil disturbance activities, advising workers of the adverse effects of acid sulphate soils to the environment and to personal health.
- Excavation activities will be carried out during the dry season to minimise leachate formation.
- Field testing of soil pH to determine potential acidity.
- Soils removed from areas with known AASS / PASS will be placed in bunded areas and subsequently disposed to a suitable secure landfill, to prevent oxidation acid sulphate soils.
- Acid sulphate soils will be treated with lime (based on the proposed liming rates in **Table 7-1** and any leachate will also be treated with lime.

Encounters with acid sulphate soils during construction and maintenance will be recorded and photographed, with soil sample locations and field pH test results documented on field data sheets. The approximate volume of soil placed in the bunds, the volume of lime added for treatment, the bund locations and off-site disposal information will also be documented.

Where an incident causes, or is threatening or may threaten to cause, pollution or environmental nuisance resulting in material or serious environmental harm, PWC will inform NRETAS.

**Table 7-1 Liming rates**

Investigation	Borehole	Depth (m)	pH KCl	TAA m/t	s-TAA %S	S Cr %S	s-NAS %S	ABA (1) Net Acid %S	Liming Rates (kg/T)	Liming Rates (kg/m <sup>3</sup> )
U&N 2011	BH1	0.0-0.25	4.80	27	0.04	0.04	n/a	0.05	2.00	4.0
U&N 2011	BH1	0.75-1.00	5.10	12	0.02	0.02	n/a	0.02	1.00	1.6
U&N 2011	BH2	3.25-3.50	5.60	5	0.01	0.02	n/a	0.02	<1	1.6
U&N 2011	BH2	3.75-4.00	6.30	2	0.00	0.02	n/a	0.02	<1	1.6
U&N 2011	BH5	1.00-1.25	7.60	2	0.00	0.02	n/a	0.02	<1	1.6
U&N 2011	BH5	2.00-2.25	6.30	2	0.00	0.02	n/a	0.02	<1	1.6
U&N 2011	BH6	1.75-2.00	6.80	2	0.00	0.02	n/a	0.03	1.00	2.4
U&N 2011	BH6	1.75-3.00	6.60	2	0.00	0.02	n/a	0.02	<1	1.6
U&N 2011	BH8	1.25-1.50	4.50	32	0.05	0.05	n/a	0.10	4.00	8.0
U&N 2011	BH8	1.75-2.00	4.70	24	0.04	0.04	n/a	0.04	2.00	3.2

Source: Cardno Ullman & Nolan, 2011

### Commitments

- *PWC will review and implement the acid sulphate soils management plan as part of an overarching construction environmental management plan.*
- *Soil disturbance and vegetation clearing will be limited as far as practically possible.*
- *Activities will be restricted to the dry season and drainage systems (natural and artificial) will be re-established after construction is completed.*

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### 7.2.2 Erosion and Sedimentation

Erosion of soil is a natural phenomenon that can be accelerated by site preparation and excavation activities during construction activities. Factors that can increase the potential for erosion include:

- Removal of vegetation or other ground cover.
- Exposure to forces such as flowing water or strong winds.
- Increased slope.
- Erosivity of soil.

Soils within the project area include deep loamy massive earths, gravelly yellow massive earths, shallow very gravelly yellow massive earths and intertidal area characterised by loose silty and pebbly sand over soft mangrove clay (Douglas Partners, 1998), with a low erosivity (DCC 2009a and DCC 2009b).

To reduce the potential risk of impacts to the environment associated with soil erosion, NRETAS has requested that an Erosion, Sedimentation and Drainage Management Plan (ESDMP) be prepared for the Proposed Development (NRETAS, 2010). The ESDMP will be prepared in accordance with the PWC Land Management Procedure (see **Appendix J**).

The potential for soil erosion is mainly associated with site preparation and excavation activities (i.e. construction activities). The construction contractor will therefore prepare the ESDMP as a section of the CEMP. It will describe measures which will be undertaken by the contractor/s during construction of the Proposed Development to reduce the potential for soil erosion occurring, and to manage the potential impacts of any unavoidable soil erosion. Impact prevention and management measures specified by the ESDMP will include:

- Construction activities are carried out during periods of dry weather where practicable.
- Ground disturbance is kept to a minimum when developing an area.
- Natural slopes will be maintained to the extent practicable.
- Run-off is diverted into existing drainage lines through protected entry points.
- Traffic on unsealed areas will be minimised.
- Surface hardening and / or protective cover is provided in all areas experiencing intensive use.
- Off-site disturbance is kept to the minimum required during construction activities.
- Topsoil from cleared areas is conserved for use in degraded areas

Impact management measures will include:

- Unsealed surfaces will be wetted down where dust generation is observed.
- Silt fences and / or sediment traps to capture sediment will be installed where appropriate (e.g. to treat runoff from construction zones).

After rehabilitation and once vegetation is re-established after construction of the Proposed Development management of areas above the Proposed Development will revert to the property owner. Some impacts could potentially occur during operation of the Proposed Development. The ESDMP will therefore also include the following measures with the objective of preventing erosion and sedimentation during the operational phase:

- The formation of soil or vegetation windrows at the sides of cleared lines (tracks, easements, etc.) will be avoided.
- Vegetative or protective cover will be maintained where practical. Where this is not practical, vegetative cover shall be reinstated post-disturbance.
- Drainage systems, natural and man-made, will not be blocked.

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- Activity levels will be adjusted according to seasonal conditions.
- Inspections will be undertaken regularly, with maintenance and repairs carried out as quickly as possible.

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### Commitments

- *A draft ESDMP will be provided to NRETAS for review prior to the commencement of construction activities.*
  - *Soil disturbance and vegetation clearing will be limited to the extent practicable.*
  - *Construction activities will be restricted to the Dry season.*
  - *Disruption of drainage systems (natural and artificial) during the construction phase will be avoided to the extent practicable. Where avoidance of disruption is not possible, drainage will be re-established after construction is completed.*
  - *Unsealed surfaces and stockpiles will be wetted down or sealed where continuing dust generation is observed.*
  - *Run-off from unsealed areas of construction zones will be treated through sediment traps or silt fence prior to discharge to the environment.*
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### 7.2.3 Contaminated Runoff

Prevention and management of contaminated runoff will be undertaken in general accordance with PWC's Hydrocarbon Spill Response Work Instruction, Chemical Management Procedure, Land Management Procedure and Sewage Overflow Response Procedure. The following measures will be undertaken to reduce the likelihood that contaminated runoff is generated:

- Construction of the Proposed Development, in particular excavation activities, will be carried out during the dry-season.
- The extent of excavated / disturbed areas at any given time will be limited. That is, construction of each pipe section will be completed to the extent practicable prior to excavation and commencement of construction of the next section, such that the smallest practicable area is disturbed at any given time.
- Limit the time and duration of the construction period.
- Reduce or eliminate rainfall infiltration to storage stockpiles in unsealed hardstand areas.
- In addition to clean up of spills, implement procedures to ensure general clean ups are undertaken and that catchment areas are kept free of contaminants.
- Where land clearance is no longer required, stabilisation of surface soils will be undertaken through methods such as rehabilitation.
- In the event that contaminated runoff is unavoidably generated, potential impacts to the environment will be reduced by the following management measures:
  - Fuels, lubricants, and other chemicals will be stored within bunded areas, on an impermeable base.
  - Appropriate spill response equipment will be provided to contain and clean up spills.
  - Sediment retention ponds, vegetated buffer strips or other effective measures will be installed and maintained at all potential off-site stormwater discharge points.
  - Overland drainage will be controlled to prevent channelling and sediment transport by diverting flows away from areas that are exposed.
  - Stormwater contaminant capture measures such as gross pollutant traps, sedimentation traps, and silt fences will be implemented where required.

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### Commitments

- PWC will ensure proposed safeguards are incorporate into the overarching Construction Environmental Management Plan (CEMP).

### 7.2.4 Noise and Vibration

Noise is likely to be generated during the construction phase of the Proposed Development. The majority of noise associated with construction activities will be generated by the operation of equipment such as excavators, trucks and light vehicles. Noise from clearing and trenching is expected to be short term and of minimal intensity. It is anticipated that noise will not be generated during the operational phase of the Proposed Development.

### Commitments

- Construction activities will align with NRETAS Noise Guidelines for Development Sites, June 2011.
- All construction vehicles and other machinery will be fitted with noise restriction apparatus in accordance with current Australian regulations and standards.
- The CEMP will advise PWC staff and contractors to be considerate of residents and other users of East Point who may be in close proximity to construction zones.

### 7.2.5 Air Quality

Air quality impact prevention and management measures regarding dust will be included in the ESDMP. These will include:

- Ground disturbance will be kept to the minimum practicable extent when developing an area.
- Access roads will be sealed as soon as practicable after clearing, and access restricted to open cleared areas, in order to minimise dust emissions from open areas and from vehicle movements.
- Traffic on unsealed areas will be minimised.
- Construction material loads on trucks travelling to and from the construction area will be covered to prevent dust releases.
- Surface hardening and / or protective cover will be provided in all areas experiencing intensive use.
- Off-site disturbance will be kept to the practicable minimum during construction activities.
- Topsoil from cleared areas will be conserved for re-use in rehabilitation.
- Stockpiles of construction materials on site will be kept to a reasonable size, and multiple handling of materials will be avoided where possible.
- Stockpiles will be covered where practicable.
- Vegetative or protective cover will be maintained where practical. Where this is not practical, vegetative cover shall be reinstated post-disturbance.
- As much naturally occurring vegetation around the Proposed Development as practicable will be retained.

Other air quality impact management measures will include:

- Unsealed surfaces will be wetted down where dust generation is observed.
- Uncovered stockpiles will be wetted down where continuing dust generation is observed.
- Residues and spills will be cleaned up in a timely manner.
- All machinery will be maintained in good working order with appropriate exhaust systems fitted.

Impact management measures will include:



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- Unsealed surfaces will be wetted down where dust generation is observed.
- Uncovered stockpiles will be wetted down where continuing dust generation is observed.

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### Commitments

- PWC will ensure the above air quality management measures are incorporate into the CEMP.
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## 7.3 Mitigation of Impacts on the Biological Environment

### 7.3.1 Terrestrial Flora and Fauna

The PWC Land Management Procedure (**Appendix J**) covers land management practices that are to be undertaken by PWC on all lands managed by PWC. It applies to new projects and existing facilities. Relevant land management parameters covered by this procedure include:

- Weed management.
- Vegetation management.
- Fire management.

The following potential impacts to native flora and fauna have been identified in the current Land Management Procedure and as a result of the survey undertaken to advise this assessment:

- Loss of habitat, habitat degradation or further fragmentation due to clearing of areas for the development of infrastructure and access tracks.
- Decreased surface and groundwater quality or altered flow as a result of construction and maintenance activities impacting on riparian habitats.
- Impacts on surrounding habitats due to erosion and sediment deposition from construction activities.
- Potential introduction or spread of weed and naturalised vegetation and pests from vegetation clearing / disturbance and use of vehicles and machinery on site.

Measures will be taken to minimise potential impacts on native vegetation communities, threatened fauna and migratory shorebirds and their habitats, including:

- Minimising the area of mangrove forest areas disturbed for any works.
- Undertaking significant works in the vicinity of areas where migratory shorebirds in the dry season when most northern hemisphere migrants are absent (May – August).
- Strict controls on sedimentation or other impacts that may impact shorebird feeding sites.
- Controls on activities or facilities that might disturb feeding and roosting birds (e.g. noise, nocturnal lighting).
- Implementing measures to minimise the potential import and / or spread of weeds during construction and rehabilitation. It is noted that both PWC and DCC have current weed management programs and procedures that involve regular weed treatment. An assessment of the weed risks in the study area will be undertaken to prioritise management responses in line with PWCs Land Management Procedure and DCCs current weed management program, which will involve inspection, identification and control of weeds.
- Checking the length of open trench each morning to remove any fauna that has fallen / entered the trench.
- Putting in place controls to ensure that no cane toad breeding habitats are created during or following construction (e.g. small, still ponded freshwater or brackish areas).

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- Progressive rehabilitation of areas, with suitable species, that are disturbed during construction activities, with due consideration of the requirements of fauna species that will potentially recolonise these areas.
- Where possible clearing operations will include:
  - stockpiling of top-soil to conserve the soil seed bank (where relevant and appropriate given the level of previous disturbance)
  - stockpiling of deadwood and woody debris for later return to the rehabilitation area to provide fauna micro-habitat and increase the rate of faunal re-colonisation.

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### Commitments

- *PWC commits to minimising areas of disturbance, particularly areas of Mangrove and Coastal Monsoon Forest communities.*
  - *PWC commits to ensuring that clearing of vegetation for construction and operational activities associated with the Proposed Development will be undertaken in accordance with the NRETAS Northern Territory Land Clearing Guidelines (NRETAS, 2010b). Wherever possible, PWC will seek to identify opportunities to rehabilitate previously disturbed areas as part of the Proposed Development.*
  - *PWC commits to reducing the extent of weed infestations along the Proposed Development corridor through implementing measures to minimise the potential import and / or spread of weeds during construction and rehabilitation in consultation with DCC.*
  - *PWC commits to ensure that measures will be taken to minimise potential impacts on vegetation communities, threatened fauna and migratory shorebirds and their habitats, such as:*
    - *Undertaking significant works in the vicinity of areas where migratory shorebirds roost and forage in the dry season when most northern hemisphere migrants are absent (May – August)*
    - *Strict controls on sedimentation or other impacts that may impact shorebird feeding sites*
    - *Controls on activities or facilities that might disturb feeding and roosting birds (e.g. noise, nocturnal lighting)*
    - *Covering the trench each evening to minimise fauna becoming trapped and checking the length of open trench each morning to remove any fauna that has fallen / entered the trench.*
  - *PWC commits to progressive rehabilitation of areas, with suitable species from the relevant vegetation communities, that are disturbed during construction activities or no longer required, and with due consideration of the requirements of fauna species that will potentially recolonise these areas.*
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### 7.3.2 Biting Insects

The draft Biting Insect Management Plan (BIMP) included as **Appendix P** contains more detailed information on biting insect management. Biting insect impact management measures are summarised as follows:

- Stormwater
  - Stormwater drainage for the Proposed Development will be constructed in accordance with the ‘*Guidelines for preventing biting insect problems for urban residential developments or subdivisions in the Top End of the Northern Territory*’ (Medical Entomology, 2009a)
  - Roadside drains, swales and other minor drains will have concrete low flow inverts or other suitable surface when the fall of the drain would not be enough to prevent ponding
  - All roadside drains and swales will discharge to a suitable stormwater drainage system or directly to the sea
  - Any stormwater pit created as part of the Proposed Development will be free draining to prevent the creation of potential breeding sites for mosquitoes, including exotic dengue mosquitoes
- Reclamation / Construction
  - Any cut off tidal area created during construction will have appropriate temporary drainage provisions provided, to prevent upstream ponding until the upstream area is reclaimed
  - Scrapes, and other disturbed areas will be rehabilitated to be free draining
  - Site disturbance such as wheel ruts and compacted ground will be rectified upon completion of construction, to prevent these areas from becoming perennial mosquito breeding sites.
- Ongoing Management
  - PWC will regularly check the alignment to assess potential breeding sites for mosquitoes and rectify as required.

The only way to effectively reduce *C. ornatus* breeding would be to permanently flood or fill their breeding sites, from the mean high water spring tide mark to below the level of occurrence of seaward mangrove (Shivas and Whelan 2001).

The mangrove biting midge breeds in mud adjacent to and under dense mangrove canopies. Insecticide control of these sites is not practical, as very large quantities of insecticides would be required to penetrate the canopy and reach the mud below in sufficient amounts to achieve control. This would be unacceptable from an environmental perspective, due to the potential impacts to other organisms. There is also no registered insecticide product in Australia specifically suited to mangrove biting midge larval control (Warchot and Whelan, 2011).

As there is no specific larval control method for *C. ornatus*, affected people have to rely on reducing midge bites by personal protection measures or treatment of individual properties with a suitable residual barrier insecticide. Avoiding exposure to biting midges during peak monthly abundance around sunset and sunrise is the best form of personal protection. Other measures include the use of personal repellents and protective clothing (Warchot and Whelan, 2011).

Any receptacle that has the potential to pond water will be appropriately disposed of, stored under cover away from rain, fitted with drainage holes or treated with an appropriate larvicide, to prevent endemic mosquito breeding.

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### Commitments

- *PWC will construct and operate the Proposed Development in accordance with a BIMP.*
  - *Stormwater drainage for the Proposed Development will be constructed in accordance with the Guidelines for preventing biting insect problems for urban residential developments or subdivisions in the Top End of the Northern Territory (Medical Entomology, 2009).*
  - *Scrapes, and other disturbed areas will be rehabilitated to be free draining.*
  - *Any depressions resulting from construction activities will be rectified upon completion of construction, to prevent these areas from becoming perennial mosquito breeding sites.*
  - *All workers will be informed that pest and disease-carrying mosquito species may be periodically present at the wharf.*
  - *Appropriate personal protection equipment will be made available in accordance with guidelines developed by the Medical Entomology Branch of the Department of Health.*
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### 7.4 Mitigation of Impacts on the Build Environment

#### 7.4.1 Land-use

Access to the rising main alignment will be limited during construction of the Proposed Development. The proposed alignment intersects the East Point bike path. Use of the bike path will therefore be restricted for a short period during the construction phase. The bicycle path will be reinstated once construction in that area is complete, and any nearby construction zones do not pose a safety risk to path users.

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### Commitments

- *PWC will reinstate the bike path as soon as practicable and safe for path users.*
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#### 7.4.2 Road Network and Traffic

Road traffic will increase in the East Point area during construction of the Proposed Development. Additional traffic during the construction phase of the Proposed Development is expected to be limited, on average, to the following:

- Dump trucks: Six movements per day.
- Excavators / front end loaders: Two movements per day.
- Lorries / Closed trucks: Two movements per day.
- Cars / utilities: Ten movements per day.

There would be no traffic impact associated with the Proposed Development during the operational phase aside from occasional maintenance vehicle (utilities / light trucks / excavators) movements along the alignment itself, and occasional deliveries of materials to the construction site.

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### 7.5 Mitigation of Impacts on the Socio-economic Environment

#### 7.5.1 Visual Amenity, Dust and Noise Levels

Mitigation measures associated with dust and noise are described under **Section 7.2.4, Noise and Vibration** and **Section 7.2.5, Air Quality**. Impacts to the visual amenity are considered unavoidable and temporary, limited to construction.

#### 7.5.2 Employment

The Proposed Development will have a positive impact on employment, with an estimated 10 people gaining employment through a contractor appointed by during the construction period.

#### 7.5.3 Sites of Recreational and Socio-economic Importance

The Proposed Development will have a short-term impact on recreational activities at East Point and also require removal of vegetation along the effluent rising main alignment, discussed under **Section 5.4, Impacts on the Socio-economic Environment**.

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##### Commitments

- *PWC will reinstate the bike path as soon as practicable and safe for path users.*
  - *PWC commits to ensuring that clearing of vegetation for construction and operational activities associated with the Proposed Development will be undertaken in accordance with the Northern Territory Land Clearing Guidelines (NRETAS, 2010b).*
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#### 7.5.4 Itinerants

East Point and in particular the East Point Reserve is frequented by itinerants staying illegally within proximity of the Proposed Development corridor. During construction, itinerants may be exposed to activities that may result in injury. The Proposed Development will be clearly sign posted and where appropriate delineated to prevent unauthorised access. This may include fencing and barricades around trenching and heavy machinery.

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##### Commitments

- *PWC will clearly sign post, and where appropriate, delineate construction areas (including fencing and barricades) to prevent unauthorised access.*
-