

SECTION 1

Introduction



1 Introduction

1.1 Background

Under a wider Larrakeyah Outfall Closure Program (LOCP), which includes closure of the Larrakeyah outfall, diversion of the Larrakeyah catchment, and upgrading the Ludmilla Wastewater Treatment Plant (WWTP), the Power and Water Corporation (PWC) proposes to duplicate an existing effluent rising main from the Ludmilla WWTP to a terminal manhole at East Point.

The Larrakeyah Outfall Closure Plan (see **Section 2.1, Project History**) supports the elimination of untreated sewage discharges to the Darwin Harbour from the Larrakeyah sewage outfall, with treated effluent discharged from the Ludmilla WWTP via an effluent rising main and the outfall at East Point. The expected project cost of the Larrakeyah Outfall Closure Plan is \$56 million.

1.1.1 Project Title

The title of the proposed project is the “East Point Effluent Rising Main Duplication Project”, which will hereby be referred to as the Proposed Development.

1.1.2 Proponent

The proponent of the Proposed Development is the Power and Water Corporation (PWC). The Project Manager for the proposed development is Mr Steve McKenzie, General Manager and can be contacted at:

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Stuart Park, NT 0820
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1.1.3 Scope, Purpose and Structure of the Draft Public Environmental Report

The Proposed Development presented under this Public Environmental Report (PER) is for the construction of a duplicate effluent rising main at East Point, extending from the Ludmilla WWTP to the East Point Outfall (EPO). The concept design and overall layout for the proposed effluent rising main is further discussed under **Section 2.4.1, Proposed Action**.

This PER has been prepared to identify and assess certain and potential impacts of the Proposed Development, including proposed management strategies. It has been developed in accordance with the requirements of the Northern Territory (NT) *Environmental Assessment Act* (1982), as amended in 1994 (the EA Act) and the *NT Environmental Assessment Administrative Procedures* (1984) of the EA Act (NRETAS, 2010a). The Proposed Development was also referred to the Australian Government under the *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act), who determine the project is a *controlled action* under aforementioned act.

This PER was developed in accordance with the NT Department Natural Resources, Environment, the Arts and Sport (NRETAS) *Guidelines for the Preparation of a Public Report, Duplication of the East Point Effluent Rising Main and Extension of the EPO, February 2010* (the Guidelines) (see **Appendix A**). However, PWC sought and obtained approval to vary the proposal by separating elements associated with duplicating the effluent rising main and the proposed extension of the EPO (Refer **Section 1.6.2, Initial Notification** [NOI and EPBC Referral]).

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Accordingly, this PER only address aspects of the Guidelines applicable to duplication of the effluent rising main as defined under **Appendix A**. Requirements associated with the EPO replacement project will be addressed separately once NRETAS provides a decision on the Notice of Intent (NOI) submitted for the EPO replacement project. This PER has been prepared to:

- Describe the existing environment of the Proposed Development site and adjacent areas.
- Describe the proposed project.
- Identify and clarify potential environmental impacts from the Proposed Development.
- Describe actions proposed to prevent, minimise and mitigate the identified potential environmental impacts.
- Provide a source of information to government agencies and the community about the proposal
- Facilitate public consultation about the proposal.
- Establish management measure that may be necessary for the proposal to proceed.

The draft PER comprise the following main sections:

- Section 1, Introduction
 - This section sets the context for the Proposed Development and provides background information on the proponent.
- Section 2, Project Description
 - This section predicts the location, major components of the proposal and details of the proposed project. It also outlines the key objectives and justification for the Proposed Development.
- Section 3, Alternatives
 - This section considers alternative proposals that may still allow the objective of the project to be met, detailing the reasons for the selection and rejection of particular options.
- Section 4, Existing Environment
 - This section describes the existing physical, biological, cultural and socio-economic environments at and in the vicinity of the project site.
- Section 5, Potential Environmental Impacts
 - This section predicts the potential environmental impacts arising from the Proposed Development.
- Section 6, Risk Analysis
 - This section identifies hazards associated with the Proposed Development and assesses the level of risk to the public and environment.
- Section 7, Mitigation, Management and Monitoring
 - This section outlines proposed management strategies and monitoring commitments to ensure the actual and potential adverse impacts on the environment are minimised to the extent practicable.
- Section 8, Preliminary Marine Water Monitoring Program
 - This section provides a summary of the proposed marine water monitoring program.
- Section 9, Public Involvement and Consultation
 - This section summarises the public consultation process and stakeholder engagement undertaken during the preparation of the draft PER.

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- Section 10 and 11, Acknowledgements and References
 - These sections acknowledge all authors, co-authors and other contributors to the report, provides an explanation of technical terms used in the body of the draft PER and specific references consulted and researched during the preparation of the draft PER. It also provides a Glossary of terms and abbreviations used in compiling the report.

1.1.4 Objective of the Proposed Development

The primary objective of the Proposed Development is to increase the hydraulic treatment capacity of the existing Ludmilla WWTP. A capacity increase at Ludmilla WWTP is necessary due to the planned closure of the Larrakeyah outfall, in accordance with the LOCP. As part of this project sewage previously disposed of through the Larrakeyah outfall will be diverted to the Ludmilla WWTP. Construction of the diversion pipework from the Larrakeyah outfall to the Ludmilla WWTP is currently underway. Additional background information relating to the objective of the Proposed Development is provided in **Section 2, Description of the Proposal**.

1.2 Context of the Proposed Development

1.2.1 Setting of the Proposed Development

The Proposed Development is located at East Point in the City of Darwin, NT. The regional setting is shown at **Figure 1-1**, and the location of the Proposed Development is shown at **Figure 1-2**. The corridor for the Proposed Development will traverse several allotments. The property descriptions for these allotments are listed in **Table 1-1**.

The site does not include the existing Ludmilla WWTP and the existing East Point outfall, however, the effluent rising main will be connected to the aforementioned infrastructure.

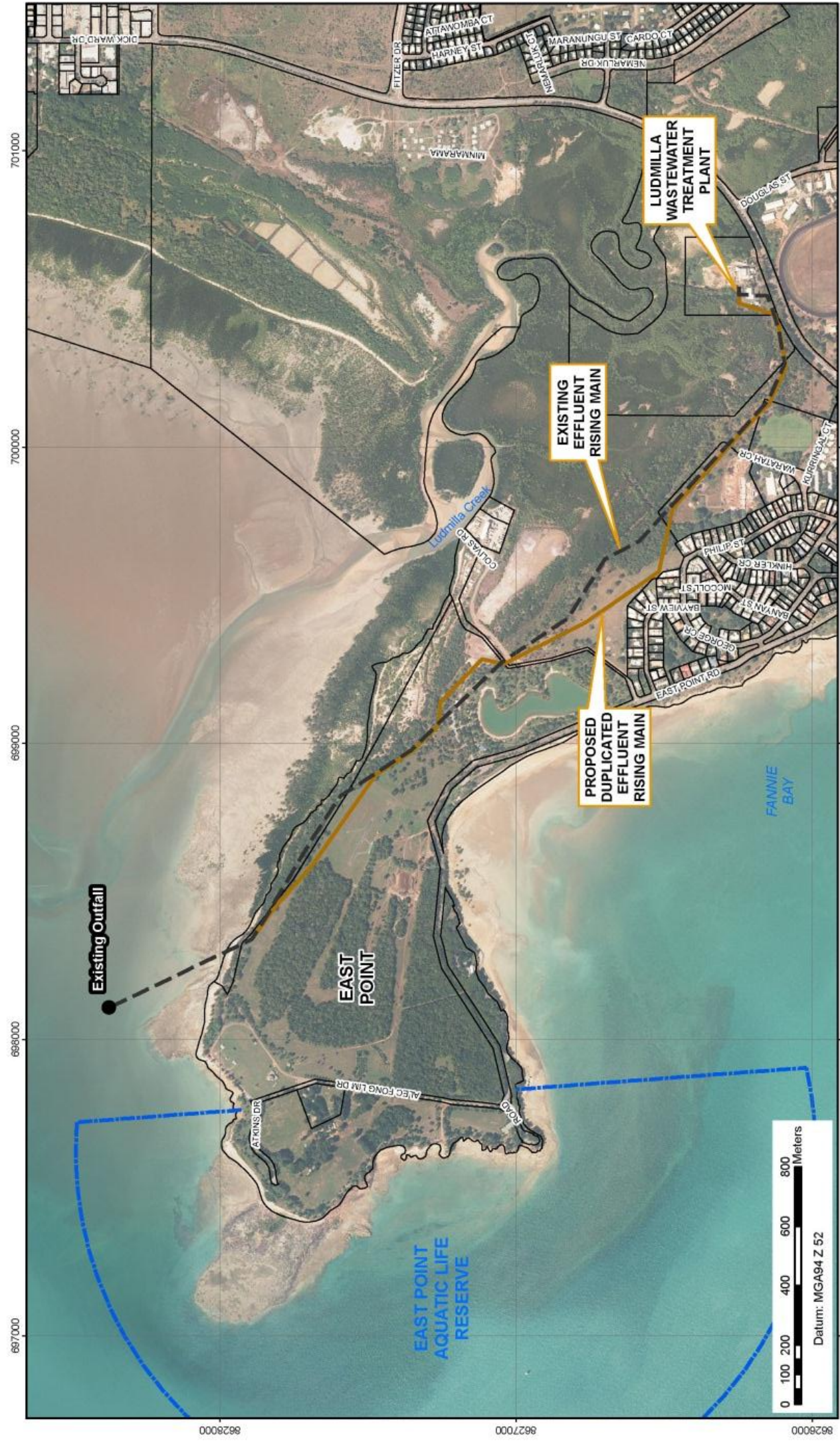
Table 1-1 Real Property Description Details for Proposed Development Corridor

Parcel Type	Parcel Number	Survey ID	Folio	Suburb	Zone	Tenure
Lot	7302	S2001/155	344	Ludmilla	Utilities	Freehold
Lot	5794	S90/248C	0	Ludmilla	Multi Zone	Vacant
Lot	5775	S90/248D	411	East Point	Multi Zone	Freehold
Lot	3729	C000111	302	Fannie Bay	Public Open Space	Freehold
Lot	5693	S89/194A	639	Fannie Bay	Community Purpose	Crown Lease Term
Lot	5983	S90/248F	0	Town of Darwin	Public Open Space	N/A

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Figure 1-1 Darwin Regional Setting



LOCATION OF PROPOSED DEVELOPMENT

Figure 1-2 Location of Proposed Development



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1.2.2 Features of Sewage Management in Darwin

The sewage catchments in Darwin consist of Berrimah, Leanyer Sanderson, Ludmilla and Larrakeyah. The oldest system is the Larrakeyah macerator and outfall which serves the Darwin CBD. The Ludmilla WWTP was constructed to serve most of Darwin Peninsula and the suburbs south and west of the airport (Sinclair Knight Merz, 1998; PWC, 2006). The Leanyer / Sanderson Waste Stabilisation Ponds (WSPs) mainly serve the northern suburbs of Darwin (Sinclair Knight Merz, 1998; PWC, 2006), with the Berrimah WSPs receiving sewage from Berrimah and Darwin Business Park.

Larrakeyah Maceration Plant and Outfall

The Larrakeyah plant is located on a small bench excavated into the cliff face between Larrakeyah Terrace and the Harbour. The bench is approximately 11 m above mean sea level and 5 m below the road (SKM, 1998). Sewage received at the plant is macerated (that is larger solids reduced to smaller particles through a mechanical process) and discharged into the Darwin Harbour through the Larrakeyah Outfall.

The outfall is 450 mm in diameter and 850 m long and constructed of a combination of Polyvinyl Chloride (PVC) and High-density Polyethylene (HDPE) pipes. The diffuser is 66 m long, comprising 11 ports of 100 mm diameter at 6 m spacing on alternate sides of the pipe (Sinclair Knight Merz, 1998).

Ludmilla Waste Water Treatment Plant

The Ludmilla Waste Water Treatment Plant (WWTP) is the second largest sewage treatment plant in Darwin, handling flows from an equivalent population¹ (EP) of 32,000. The plant receives and treats sewage from Nightcliff, Winnellie, Ludmilla, Coconut Grove, Fannie Bay and most of the inner city of Darwin. The treatment process includes solids screening and grit removal, chlorination, and Chemical Assisted Sedimentation (CAS).

Ludmilla WWTP is currently being upgraded to increasing treatment capacity, which is further discussed under **Section 2.5.1, Upgrade of Ludmilla Wastewater Treatment Plant**.

East Point Outfall and Existing Effluent Rising Main

The treated effluent from Ludmilla WWTP is discharged via a pressurised pipeline, the effluent rising main, and then via gravity through the EPO to Darwin Harbour. The existing effluent rising main comprises 3,040 m of 610 mm diameter reinforced concrete pipe, leading to a terminal manhole on the north side of East Point (see **Figure 1-2**). From the manhole, effluent is discharged via gravity, through a subsurface pipeline which runs to an offshore outfall (a discharge point), referred to as the EPO.

At low tide it is possible to walk to the crown of the exposed outfall, an upturned pipe (**Plate 1-1**). The EPO is a 910 mm diameter concrete pipeline (700 m long), which extends northwest across the intertidal mudflats. The end of the outfall is a vertical discharge at approximately neap tide low water level and 2.2 m below mean sea level (SKM 1998b). The existing rising main has a hydraulic capacity of 30 ML/d at a velocity of 1.2 m/s, with a designed hydraulic capacity of 60 ML/d at a velocity of 1.1 m/s (Sinclair Knight Merz, 1998). If the proposed duplicated rising main is constructed, hydraulic capacity of 60 ML/day at a velocity of 1.1 m/s will be achieved.

¹ Equivalent population (EP) refers to the equivalent residential population, which involves converting the wastewater flows from commercial and industrial sources to reflect the flows from an equivalent number of residents.

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Apart from wet weather overflows, treated wastewater must sometimes be discharged into Ludmilla Creek rather than passing through the normal discharge at East Point. This occurs when inflows are high, pumping systems are inoperable, or a pipe blocks (PWC, 2006).



Plate 1-1 Existing East Point Outfall Discharge Point

1.2.3 Tenure

The site of the Proposed Development is on allotments owned by the Northern Territory Government (NTG) or Darwin City Council (DCC). Permission will be obtained from the property owners prior to commencement of construction. An easement for the Proposed Development will extend from the Ludmilla WWTP to the terminal manhole.

1.2.4 Features of Surrounding Environment

East Point is located approximately 6 km north of the Darwin Central Business District (CBD). Much of East Point has been designated public open space, and is now the East Point Recreation Reserve. The Ludmilla WWTP, which is the origin of the effluent rising main, is located on Dick Ward Drive at the south east boundary of East Point, with the suburb of Ludmilla on the opposite side of Dick Ward Drive. The entire Proposed Development is located within the City of Darwin local government area.

Following is a brief overview of the surrounding environment, further detailed under **Section 4, Existing Natural, Social and Economic Environment**.

East Point Recreation Reserve

East Point Recreation Reserve is a popular open space recreation and conservation area. The reserve covers almost 200 ha, of which approximately 15% is native monsoon vine forest. Mangrove forests are also present, and the area provides habitat for wild populations of wallaby, bandicoot and jungle fowl.

Sections of East Point were cleared during World War II (WWII) to construct military defences. The cleared areas at East Point are now utilised for picnic areas, a horse riding school, and a military museum. Some of the original military infrastructure has also been retained. Pee Wee's at the Point restaurant is located within the reserve on the northern shore of Fannie Bay, accessed from Alec Fong Lim Drive.

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An artificial salt water lake, Lake Alexander, has been constructed in the southern section of the reserve, adjacent to the junction of Alec Fong Lim Drive and Colivas Road. Management and control of East Point Reserve was passed to DCC in 1984 (DCC, undated).

Flora

Several revegetation and management projects have been implemented by DCC since the declaration of East Point as a reserve (DCC, undated). The Northern Territory monsoon vine forest flora comprises some 600 plant species and 251 of these have been recorded at East Point. A walking trail through the vine forest has been constructed to provide access for visitors. This is situated near the Pee-Wee's at the Point restaurant.

A mangrove community is present at the north eastern shoreline of the reserve and borders Ludmilla Creek. There are 11 species of mangroves occurring within the community (Mangrove Watch Australia, 2010). A walking trail, including boardwalk sections, extends into the tidal region of the mangrove forest and is the only public mangrove boardwalk in the NT.

The East Point Mangrove Boardwalk begins at the car park at the northern end of Lake Alexander, and consists of two sections of boardwalk traversing the north-eastern side of East Point. It provides a vantage to view mangrove ecosystems inhabiting rocky and sandy shorelines with a 4 to 5 m tidal range. The boardwalk sections span the upper tidal range of the sandy area including: a small high intertidal stand of *Lumnitzera racemosa*; and an incomplete 100 m section from the beach to a seafront forest dominated by *Sonneratia alba* and *Rhizophora stylosa* (Mangrove Watch Australia, 2010).

Within the monsoon forest there are active jungle fowl (DCC, undated), as well as other bird species. Many species of fish breed in the mangroves, as do various crustaceans and molluscs. Birds also utilise mangroves for breeding and feeding (DCC, undated).

Military History and Darwin Military Museum

The military structures of East Point Reserve are listed in the Register of the National Estate. Of major historic significance, the area comprises the last major 'fortress' built on Australian soil and is a reminder of a prominent element of Australia's only battleground.

The Darwin Military Museum (formerly the Royal Australian Artillery Association Museum) was later established at the site, incorporating some of the original military equipment and infrastructure. Other infrastructure, such as the turrets for the nine inch anti-aircraft guns, is still present outside of the museum.

The gun emplacement precinct comprises much of the north eastern section of the peninsula. The area includes 150 mm and 230 mm gun emplacements and a plotting room. The main sites are linked by pedestrian access and comprise examples of early sites from the buildup period to the post-bombing period. Anti-Aircraft gun emplacements to the east of the main entry to East Point, approximately 250 m along Colivas Road, have been restored by DCC.

Lake Alexander

The site of Lake Alexander was originally an area of low-lying coastal marsh, but has been developed into a man-made salt water lake (sea water is drawn from Fannie Bay). Lake Alexander occupies an area of approximately 3.5 ha and maximum depth of 2.8 m (DCC, undated). The lake is for swimming throughout the year, and so is especially popular between October and May when box jellyfish are present in the ocean.

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East Point Aquatic Life Reserve

The East Point Aquatic Life Reserve (EPALR) is a marine reserve of approximately 1.5 km², offshore of and abutting East Point, which contains a fringing coral reef developed on a laterite rock platform. **Figure 1-2** shows the location of the EPALR relative to the project site. The EPALR was established under the *Fisheries Act 1998* (Fisheries Act) to protect the marine biological assemblages in the area of East Point and Dudley Point, which were threatened by collectors in the early 1980s.

The reef is in a dynamic marine environment, subjected to prolonged exposure during spring low tide and high levels of turbidity during high tides. Adjoining the marine reserve is a large area of subtidal sponge and gorgonian beds. The offshore coral reef that is regularly exposed during low spring tides is unique in the Darwin area, as it is the only accessible major reef on the Darwin side of the harbour. Being easily accessible and in close proximity to Darwin the reef has been the collection site for a number of marine organisms, including 160 species of sponge and 60 three shrimp species.

Residential Receptors

The Darwin suburb of Ludmilla is adjacent to the Ludmilla WWTP, on the opposite (south) side of Dick Ward Drive. The Fannie Bay Race Course lies directly opposite the Ludmilla WWTP. The nearest residences to the Ludmilla WWTP are approximately 200 m to the south east, on Douglas Street.

The residences closest to the proposed effluent rising main duplication corridor are located within the suburb of Fannie Bay particularly Bayview Street, Georges Crescent and Phillip Street. The proposed effluent rising main duplication corridor lies approximately 20 m in open space located at north east or at the rear of the nearest Bayview Street residences.

Ludmilla Creek

Ludmilla Creek lies to the north east of the East Point Recreation Reserve, and forms part of the north and east boundaries of the park. A channel of the creek reaches the Ludmilla WWTP site. When sewage loads to the Ludmilla WWTP exceed the capacity of the current WWTP a number of flow bypass points allow for the controlled discharge of partially treated sewage to Ludmilla Creek. There are no sewage overflows into Ludmilla Creek during the dry season. A number of flow bypass points allow for the controlled discharge of partially treated sewage to Ludmilla Creek, if required.

It must also be noted that sewage overflows are not the only discharges into Ludmilla Creek. Other discharges including, but not limited, to are:

- Local stormwater reticulation.
- Runoff from residential and industrial areas.

Groundwater Resources

The site of the Proposed Development is low lying, and groundwater has been encountered at shallow depths within the vicinity of the proposed effluent rising main duplication corridor. Cardno Ullman & Nolan (2010) excavated 34 soil boreholes along the length of the Proposed Development corridor to varying depths. Groundwater was encountered within 13 of the 34 boreholes during the investigation. The two general areas where groundwater was encountered were at the Ludmilla WWTP end of the alignment and at the intersection of the alignment and Covlias Road.

The water table was encountered between depths of 0.4 m and 2.8 m below ground level (bgl). Cardno Ullman & Nolan (2010) considered it is likely that groundwater would fluctuate significantly under seasonal

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influences and also under tidal influences; however, it was also considered likely by Cardno Ullman & Nolan (2010) that groundwater may occur at the project site as a perched water table, particularly above clay soil horizons and at the soil / bedrock interface. No chemical analysis of groundwater was undertaken by Cardno Ullman & Nolan (2010). It is most likely that groundwater in the vicinity of the Proposed Development is saline due to the close proximity of the ocean.

1.3 Regulatory Framework for Environmental Assessment

1.3.1 Environmental Impact Assessment

The Environmental Impact Assessment (EIA) process, as adopted through Commonwealth (Cwlth) and NT legislation, is an integral part of sustainable environmental development and management.

The NT environmental assessment process is administered under the *Environmental Assessment Act 1982* and the *Environmental Assessment Amendment Act 1994* (together referred to here as the EA Act) and their Administrative Procedures. The Act and Procedures establish the framework for the assessment of potential or anticipated environmental impacts of development. The object of the EA Act is to ensure that matters affecting the environment to a significant extent are fully examined and taken into account in decisions by the NTG. The proposal was referred to the Australian Government by the Proponent under the EPBC Act, who determined that the Proposed Development is a *controlled action*, since it has the potential to significantly impact on listed threaten species and communities (sections 18 and 18A) and on listed migratory species (section 20 and 20A).

An overview of the EIA process as applied in the NT is shown in **Figure 1-3**.

1.3.2 Initial Notification (NOI and EPBC Referral)

The proposed effluent rising main duplication and extension of the EPO were initially referred to the Northern Territory Minister of Natural Resources, the Environment and Heritage (the Minister) in October 2009 through a NOI. Similarly, a Referral under the EPBC Act was submitted to Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPAC) on 5 October 2009, advising the department of the Proposed Development.

The 2009 NOI and EPBC Referral described a two phased project in support of the LOCP, comprising:

- East Point effluent rising main constructed from high tensile steel or reinforced concrete pipe between the Ludmilla WWTP and the EPO
- Extending the existing EPO.

In August 2011, PWC notified NRETAS of a proposed variation to the East Point Effluent Rising Main and Ocean Outfall project, in accordance with Clause 14A of the NT *Environmental Assessment Administrative Procedures 2003* (EAAP). A similar notification was submitted to SEWPAC in July 2011, requesting a variation in accordance with Section 156A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

PWC sought to vary the Proposed Development by removing the EPO replacement, meaning that this PER only covers the effluent rising main duplication. PWC is committed to replacing the EPO and a subsequent NOI for this project was submitted to NRETAS in August 2011.

Both NRETAS and SEWPAC have approved the variation, and a decision from NRETAS on the revised NOI was forthcoming when this PER was developed.

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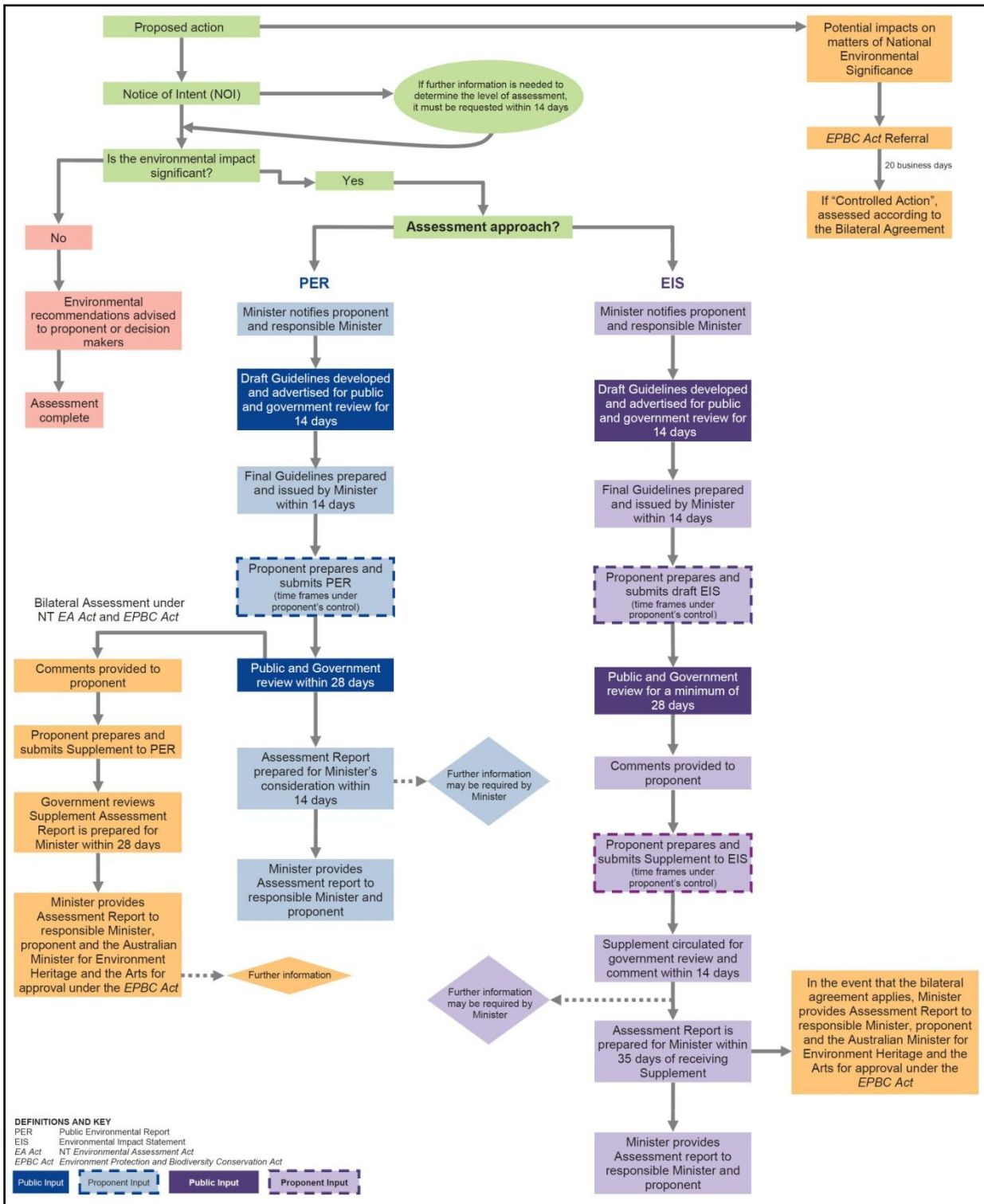


Figure 1-3 NT Environmental Impact Assessment Process

Source: NRETAS, 2011a

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1.3.3 Level of Assessment Set for the Proposed Development

There are two levels of formal assessment defined under the NT assessment process, Environmental Impact Statement (EIS) or PER.

An EIS is the highest level of EIA document, specified for projects where the certain and likely environmental impacts are considered to be very significant either in terms of site specific issues, off-site issues and conservation values, or based on the nature of the proposal. Preparation of a PER is specified to assess certain and likely environmental impacts that are considered significant but limited in extent.

The NT Minister for Natural Resources, Environment and Heritage (NT Minister) determined that the Proposed Development requires formal assessment, under the EA Act, at the level of a PER. Uncertainties contributing to the decision to require formal environmental assessment, included:

- Impacts on mangrove and coastal monsoon rainforest communities and an adjacent conservation area (zoned Conservation under the NT Planning Scheme) at East Point that could occur during construction.
- Disturbance to Acid Sulphate Soils (ASS) during construction.
- Impacts to marine flora and fauna and foraging habitat likely to be affected during construction and operation.

On 2 November 2009 a delegate for the Australian Minister for the Environment, Heritage and the Arts determined that the Proposed Development is a controlled action under Part 3 of the EPBC Act having the potential to impact on the following Matters of National Environmental Significance (MNES) that are protected under Part 3 of the EPBC Act:

- Listed threatened species and communities (Sections 18 and 18A)
- Listed migratory species (Section 20 and 20A).

The NTG has a bilateral agreement with the Commonwealth, which accredits the EA Act for conducting environmental assessments on the Commonwealth's behalf. The response from SEWPAC advised that this project will be assessed under the bilateral agreement, and specified that the EIA document required would be a PER.

1.3.4 Public Review of the Guidelines

The information contained within the 2009 NOI and Referral, together with consultation with relevant agencies, assisted in the preparation of PER Guidelines which outline the matters to be addressed during the EIA process.

Draft Guidelines covering issues to be addressed in a PER for both the effluent rising main duplication and extending the EPO were released for public comment on 22 January 2010, for a 14 day public review period. The Final PER Guidelines were issued in February 2010 taking into account comments received from the community and Government agencies. The Final PER Guidelines are included at **Appendix A**.

1.3.5 Preparation of the Draft Public Environmental Report

Work began on the preparation of this draft PER in March 2011. This draft PER contains data gathered by PWC during the NOI process, data gathered subsequently during supporting studies and stakeholder consultation, and environmental assessment and determination of management measures to fulfil the requirements of the Final PER Guidelines.

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1.3.6 Submission of Draft Public Environmental Report and Public Review

The draft PER has been released for review to enable the public and government agencies to comment on the project. Notification of the display centres, submission procedures, and purchasing details have been advertised in local newspapers.

The public and government agencies have a minimum review period of 28 days from the date of submission of the draft PER to submit comments to NRETAS, or via the website to be established by PWC, to elicit comments from interested parties.

1.3.7 Preparation of the Final PER

Any comments received by the close of the public review period will be addressed in a PER Supplement which will be prepared by PWC and submitted to NRETAS. The Draft PER together with the Supplement (the 'Final PER') will be reviewed by NRETAS.

1.3.8 Government Assessment and Final Approval

Once assessment is completed to the satisfaction of the Minister, NRETAS will prepare an Environmental Assessment Report EAR and recommendations on the project's acceptability for the Minister's consideration. It is noted that NRETAS will liaise with SEWPAC through the approval process to ensure that both agencies are satisfied that all matters are being satisfactorily addressed throughout the process, in terms of the EA Act.

Following this, the Minister will make a recommendation to the Minister for Power and Water regarding the project's environmental acceptability and its compliance with the requirements of the EA Act.

Approval (if granted) would be given by the Minister for Power and Water under the *Northern Territory Planning Act 2008*.

1.4 Regulatory Environment

1.4.1 Commonwealth and NT Legislation

The Commonwealth and NTG have jurisdiction over environmental and other legislation relating to the location, construction and operation of the Proposed Development.

The list of legislation below provides a summary overview of the legislation (other than the EA Act, which is discussed above) that may be relevant to construction and operation of the Proposed Development. It is noted that preparation of this Draft PER is being undertaken in accordance with the requirements of the EA Act, and its implications for the development are discussed in **Section 1.6.1, Environmental Impact Assessment**.

Aboriginal Land Rights (NT) Act 1976 (Cwlth) provides for the preservation and protection from injury or desecration of areas and objects in Australia and in Australian waters, being areas and objects that are of particular significance to Aboriginals in accordance with Aboriginal tradition.

Aboriginal Land Act 1979 (NT) provides access to areas which are on, border or are adjacent to Aboriginal Land, whether it is on land or sea.

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Australian Heritage Council Act 2003 (Cwlth) establishes the Australian Heritage Council, a statutory body replacing the Australian Heritage Commission as the Australian Government's principal adviser on heritage matters. The Australian Heritage Council is administered by the Heritage Division of the Department of Environment and Heritage and seeks to:

- Assess whether a place meets National or Commonwealth Heritage criteria.
- Advise the Minister on conserving and protecting places included, or being considered for inclusion, in the National Heritage List or Commonwealth Heritage List.
- Invite public comment on whether a place meets any of the National Heritage criteria or Commonwealth Heritage criteria and whether a place should be included in the National Heritage List or Commonwealth Heritage List.
- Promote the identification, assessment, conservation and monitoring of heritage.
- Keep the Register of the National Estate.

The Council also makes assessments under the EPBC Act, and performs any other functions conferred by the EPBC Act.

Bushfires Act 1980 (NT) provides for the establishment of the Northern Territory Fire and Rescue Service (NTFRS), the operational and emergency response activities of the Service, the protection of life, property and the environment against fires and other emergencies and for related purposes. The Act states:

- Fires must not be started in a declared Fire Protection Zone without a current permit.
- Fires must not be started on a declared fire ban day, or in a fire ban area contrary to the fire ban.

Control of Roads Act 2008 (NT) provides for the administration and control of roads, including the maintenance of roads and construction of roads.

Dangerous Goods (Road and Rail Transport) Act 2008 (NT) makes provision for safety in the transport of dangerous goods by road as part of the system of nationally consistent road transport laws and makes provision for safety in the transport of dangerous goods by rail. Common guidelines are in place so that dangerous goods can be transported between states and territories. This eliminates confusion of knowing what procedures should be followed in the event of accident or spill.

Environment Protection and Biodiversity Conservation Act 1999 (Cwlth) - this Commonwealth legislation provides a national framework for environment protection through a focus on protecting MNES and on the conservation of Australia's biodiversity. The EPBC Act:

- Provides protection of MNES.
- Promotes ecologically sustainable development through the conservation and ecologically sustainable use of natural resources.
- Promotes the conservation of biodiversity and protection and conservation of heritage.
- Promotes a co-operative approach to the protection and management of the environment involving governments, the community, land-holders and indigenous peoples.
- Assists in the co-operative implementation of Australia's international environmental responsibilities.
- Recognises the role of indigenous people and promotes the use of indigenous peoples' knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge.

Environmental Assessment Act 1982 (NT) As part of the process of environmental impact assessment for the project, Power and Water is required to submit a Notice of Intent (this document) for the project to NRETAS.

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Environmental Offences and Penalties Act 2010 (NT) establishes a penalty structure for environmental offences based around four offence levels. Penalties for infringement notices are also defined. These penalties are picked in a variety of environmental statutes such as the *Waste Management and Pollution Control Act*, the *Water Act* and the *Mining Management Act*, which create the actual offence provisions. The effect is to create a common penalty structure among different legislation.

Fire and Emergency Act 2004 (NT) provides for the establishment of the Northern Territory Fire and Rescue Service, the operational and emergency response activities of the Service, the protection of life, property and the environment against fires and other emergencies and for related purposes.

Fisheries Act 1988 (NT) allows for the flexible management of aquatic resources in the NT and stewardship of aquatic resources which promote fairness, equity and access to aquatic reserves. It outlines licensing provisions for a range of activities including taking aquatic life for research purposes.

Heritage Conservation Act 2008 (NT) provides a mechanism to conserve heritage in the NT and the agency responsible for the administration of this Act is the Heritage Conservation Services, Department of Natural Resources, Environment and the Arts. The Act provides for the creation of a Heritage Advisory Council (HAC). The HAC assesses and recommends places to the Minister for the Environment for inclusion on the Northern Territory Heritage Register.

Litter Act 2009 (NT) makes provision for the management of litter in a public place or vacant Crown land. It also regulates the removal of a dead animal from a public place or vacant Crown land that is used by vehicular or pedestrian traffic.

Northern Territory Aboriginal Sacred Sites Act 1989 (NT) provides for a practical balance of the recognised need to preserve and enhance Aboriginal cultural tradition by establishing a procedure for the protection and registration of sacred sites. This includes providing for conditional entry onto sacred sites; establishing procedures for the avoidance of sacred sites in the development and use of land; and establishing an Authority for the purposes of the Act and a procedure for the review of decisions of the Authority by the Minister.

Public Health (General Sanitation, Mosquito Prevention, Rat Exclusion and Prevention) Regulations 1988 (NT) provide for the prevention of mosquito breeding through the appropriate management of identified areas. Measures are to be taken to reduce the areas that are considered potential breeding grounds for mosquitoes. Open containers and areas that can hold water suitable for mosquito breeding are to be covered up, filled in or removed.

Public Health Act 1952 (NT) related to public health and is directed at preventing pollution of water-courses and water supplies in the Northern Territory.

Soil Conservation and Land Utilisation Act 1985 and ***Soil Conservation and Land Utilisation Act 2001 (NT)*** make provisions for the prevention of soil erosion and soil conservation and reclamation. They make provisions for restricted construction activities, that may result in land clearing, driving vehicles and causing water or other fluid to be drained or to flow over an area, which may cause further damage to the land that is not environmentally stable, such as areas suffering soil erosion or areas that have the potential to erode.

Territory Parks and Wildlife Conservation Act 2001 (NT) makes provision for the establishment of Territory Parks and other Parks and Reserves and the study, protection, conservation and sustainable utilisation of wildlife. It sets aside areas of the NT as parks and conservation areas that may not be developed.

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Waste Management and Pollution Control Act 2009 (NT) aims to Protect and where practicable restore and enhance the quality of the NT environment; encourage ecologically sustainable development; and facilitate the implementation of NEPMs established by the National Environment Protection Council. It is designed to prevent contamination of the surrounding environment. The environment includes soil, air, and water. The Act imposes a general duty on personnel who conduct an activity, or perform an action, that causes or is likely to cause pollution resulting in environmental harm, or that generates or is likely to generate waste.

Water Supply and Sewage Services Act 2002 (NT) regulates the provision of sewage and water services in the Northern Territory. The NT Power and Water Corporation must be contacted before any trade waste or noxious waste is disposed to sewer. Noxious waste might include garbage, offal, dead animals, fruit or vegetable matter, solids, ashes, silt, sand or gravel, explosive or flammable substances, minerals, salt or acid, or any other substances which are likely to be injurious to the sewerage system.

Water Act 2010 (NT) (Water Act) provides for the investigation, allocation, control, protection, management and administration of water resources in the NT. The Act prohibits waste to come in contact with water or water to be polluted unless under authorisation.

Weeds Management Act 2001 (NT) aims to prevent the spread of weeds throughout the NT, ensuring the management of weeds is an integral component of land management in accordance with the Northern Territory Weeds Management Strategy 1996 – 2005, or any other strategy adopted to control weeds in the NT. It is designed to ensure there is community consultation in the creation of weed management plans and that the community takes responsibility in weed management when implementing the plans.

1.4.2 Licensing Requirements

The Water Act prohibits the discharge of waste, including sewage effluent, to natural surface and ground waters, unless it is a licensed discharge.

Effluent discharge from the Ludmilla WWTP is undertaken in accordance with the Waste Discharge License (WDL) 150 issued by NRETAS 13/10/2006 and expiring 31/10/2011 (included in **Appendix B**). The current licence limits and PWC's achievable quality targets for the Ludmilla WWTP are summarised in Table 1-2.

The current WDL requires PWC to undertake works to redirect Larrakeyah catchment sewage flows to an alternate facility and closure of the Larrakeyah outfall by October 2011.

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Table 1-2 Current Licence Limits and PWC's Achievable Effluent Quality Targets for the Ludmilla WWTP

Assessable Parameter	Units	Current Licence Limits		Achievable Targets
		Median	90th percentile	90th percentile
Dry Weather Flow	kL/day	8,000	11,000	-
Wet Weather Flow	kL/day	15,000	30,000	-
Temperature	°C	-	± 5°C ambient	-
pH	-	-	>6	6.0 – 8.5
Biochemical Oxygen Demand (BOD)	mg/L	100	180	140
Total Suspended Solids (TSS)	mg/L	110	170	75
<i>E.Coli</i>	Cfu/100mL	1 x 10 ⁶	1 x 10 ⁷	1 x 10 ⁶
Total Nitrogen (TN)	mg/L	37	47	47
Free Ammonia	mg/L	28	33	33
Total Phosphorus (TP)	mg/L	10	15	5

* Subject to confirmation through plant flocculation trials

Source: NRETAS, 2006a

1.4.3 Other Regulatory Obligations

Policies and Guidelines relevant to this project include are outlined in **Table 1-3**.

Table 1-3 Policies and Guidelines Relevant to the Proposed Development

Policies and Guidelines	Relevance
A Strategy for the Conservation of Marine Biodiversity in the Northern Territory of Australia, Parks and Wildlife Commission of the NT (PWCNT) (2000)	Outlines strategies for the conservation of marine biodiversity.
Australia and New Zealand Environment Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) Guidelines for Fresh and Marine Water Quality (2000) National Water Quality Management Strategy (1994) The Framework for Marine and Estuarine Water Quality Protection – Version 1 (2002)	Guides the setting water quality objectives to sustain environmental values. Provides specific water quality objectives for environmental values and the context in they should be applied.
Australia and New Zealand Environment Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) Guidelines for Fresh and Marine Water Quality (2000) <i>National Assessment Guidelines for Dredging</i> . Canberra (2009)	Guides the assessment of quality of sediments in marine waters. Sets levels of substances in sediments below which toxic effects on organisms are not expected, and levels at which bioaccumulation tests are required, and bioaccumulation may be of concern even where toxicity has not been identified.

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Policies and Guidelines	Relevance
A Review of Environmental Monitoring of the Darwin Harbour Region and Recommendations for Integrated Monitoring (2005)	Facilitate the development of integrated environmental monitoring program for Darwin Harbour Region (in accordance with the Darwin Harbour Regional Plan of Management – now replaced by the Framework below).
<i>AS 1289 Method for testing soils for engineering purposes series</i>	Comprises over 60 methods for: soil sampling and preparation; soil moisture content tests; soil classification tests; soil chemical tests; soil strength and consolidation tests; and soil reactivity tests.
<i>AS 2436-1981 Guide to Noise Control on Construction, maintenance and demolition sites</i>	Guidance on noise control in respect of engineering construction, maintenance and demolition works, including guidance in investigation and identification of noise sources, measurement of sound, and its assessment, with a view to the planning of measures for noise control.
<i>NRETAS Noise Guidelines for Development Sites</i>	Provides guidance to the community and industry on noise associated with development sites with the objective to protect noise sensitive receptors from unreasonable construction noise while supporting an active construction industry.
<i>AS 3798 Guidelines on earthworks for commercial and residential developments</i>	Guidance on the specification, execution, and control testing of earthworks and associated site preparation works of commercial and residential developments. It does not in itself constitute a specification for earthworks. It also gives guidance on the interpretation and application of the relevant test methods specified in the AS 1289 series of Standards.
Darwin Harbour Regional Management Strategic Framework 2009 – 2013 (draft), DHAC	Policy framework and guidelines for management of environment, social, cultural and economic values and uses of the Darwin Harbour. Sets goals and guidelines for the Harbour waters.
Darwin Harbour Water Quality Protection Plan (in prep) Towards the Development of a Water Quality Protection Plan for the Darwin Harbour Region – Phase One Report (2009)	Plan to identify and address key water quality risks to values of Darwin Harbour and its catchments. Follows the Commonwealth <i>Framework for Marine and Estuarine Water Quality Protection</i> . Phase One Report describes activities undertaken thus far in developing a Water Quality Protection Plan for the Darwin Harbour Region.
Darwin Harbour Strategy, DHAC (2010)	A comprehensive guide for the responsible stewardship and sustainable development of the Darwin Harbour region. It sets out goals, principles and guidelines for all users and stakeholders of Darwin Harbour and its catchment to imbed in their planning for any action which could have an impact on the region. A key objective is to achieve a balance between environmental, social and economic values.
Water Quality Objectives for the Darwin Harbour Region	As a key component of the Water Quality Protection Plan a suite of Water Quality Objectives that relate to the beneficial uses and environmental values of the waterways has been developed to provide some preliminary benchmarks against which various attributes of the health and condition of these waterways can be measured and reported.
Erosion and Sediment Control Guidelines; built environment, service corridors, transport corridors, rehabilitated old infrastructure, (undated), NRETAS.	Guidelines to inform activities that may impact on surface stability and sediment movement. Provides advice on developing Erosion and Sediment Control Plans.
Guidelines for Preventing Mosquito Breeding Associated with Construction Practice Near Tidal Areas in the NT, DHF, 2005	Checklist for planners, engineers or any supervisory officers, responsible for the planning, impact assessment or implementation of any construction activity near tidal areas, in order to prevent the creation of mosquito breeding sites.

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Policies and Guidelines	Relevance
Land Clearing Guidelines, NT Planning Scheme, 2006	Technical advice for planning and conduct of land clearing.
Mangrove Management in the Northern Territory, Department of Infrastructure, Planning and Environment, 2002	Direction for the research and management of mangrove ecosystems.
PWC Environment, Quality, Health and Safety Policy	Framework under which PWC manages environmental impacts and risk.
Stormwater: Draft Management Strategy for the Darwin Harbour Catchment, EPA, 2006	Overarching guidelines for the management of stormwater in Darwin Harbour Catchment. Key steps for the development of Stormwater Management Plans.