



Australian Government

Department of the Environment, Water, Heritage and the Arts

Referral of proposed action

What is a referral?

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) provides for the protection of the environment, especially matters of national environmental significance (NES). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any of the matters of NES without approval from the Australian Government Environment Minister. To obtain approval from the Environment Minister, a proposed action should be referred. The purpose of a referral is to obtain a decision on whether your proposed action will need formal assessment and approval under the EPBC Act.

Your referral will be the principal basis for the Minister's decision as to whether approval is necessary and, if so, the type of assessment that will be taken. These decisions are made within 20 business days, provided that sufficient information is provided in the referral.

Who can make a referral?

Referrals may be made by a person proposing to take an action, the Commonwealth or a Commonwealth agency, a state or territory government, or agency, provided that the relevant government or agency has administrative responsibilities relating to the action.

When do I need to make a referral?

A referral must be made for actions that are likely to have a significant impact on the following matters protected by Part 3 of the EPBC Act:

World Heritage properties (sections 12 and 15A)

National Heritage places (sections 15B and 15C)

Wetlands of international importance (sections 16 and 17B)

Listed threatened species and communities (sections 18 and 18A)

Listed migratory species (sections 20 and 20A)

Protection of the environment from nuclear actions (sections 21 and 22A)

Marine environment (sections 23 and 24A)

The environment, if the action involves Commonwealth land (sections 26 and 27A), including:

- actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land);
- actions taken on Commonwealth land that may have a significant impact on the environment generally;

The environment, if the action is taken by the Commonwealth (section 28)

Commonwealth Heritage places outside the Australian jurisdiction (sections 27B and 27C)

You may still make a referral if you believe your action is not going to have a significant impact, or if you are unsure. This will provide a greater level of certainty that Commonwealth assessment requirements have been met.

To help you decide whether or not your proposed action requires approval (and therefore, if you should make a referral), the following guidance is available from the Department's web site:

the Policy Statement titled [Significant Impact Guidelines 1.1 – Matters of National Environmental Significance](#). Additional [sectoral guidelines](#) are also available.

the Policy Statement titled [Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies](#).

the [interactive map tool](#) (enter a location to obtain a report on what matters of NES may occur in that location).

Can I refer part of a larger action?

In certain circumstances, the Minister may not accept a referral for an action that is a component of a larger action and may request the person proposing to take the action to refer the larger action for consideration under the EPBC Act (Section 74A, EPBC Act). If you wish to make a referral for a staged or component referral, read '[Fact Sheet 6 Staged Developments/Split Referrals](#)' and contact the Referral Business Entry Point (1800 803 772).

Do I need a permit?

Some activities may also require a permit under other sections of the EPBC Act. Information is available on the Department's [web site](#).

What information do I need to provide?

Schedule 2 of the EPBC Regulations sets out the information that must be included in a referral. Completing all parts of this form will ensure that you submit the required information and will also assist the Department to process your referral efficiently.

You can complete your referral by entering your information into this Word file.

Instructions

Instructions are provided in green text throughout the form.

Attachments/supporting information

The referral form should contain sufficient information to provide an adequate basis for a decision on the likely impacts of the proposed action. You should also provide supporting documentation, such as environmental reports or surveys, as attachments.

Coloured maps, figures or photographs to help explain the project and its location should also be submitted with your referral. Aerial photographs, in particular, can provide a useful perspective and context. Figures should be good quality as they may be scanned and viewed electronically as black and white documents. Maps should be of a scale that clearly shows the location of the proposed action and any environmental aspects of interest.

Please ensure any attachments are below two megabytes (2mb) as they will be published on the Department's website for public comment (Note: the Minister may decide not to publish information that is commercial-in-confidence). To minimise file size, enclose maps and figures as separate files if necessary. If unsure, contact the Referral Business Entry Point for advice. Attachments larger than two megabytes (2mb) may delay processing of your referral.

How do I submit a referral?

Referrals may be submitted by mail, fax or email.

Mail to:

Referral Business Entry Point
Environment Assessment Branch
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
CANBERRA ACT 2601

- If submitting via mail, electronic copies of documentation (on CD/DVD or by email) are appreciated.

Fax to: 02 6274 1789

Faxed documents must be of sufficiently clear quality to be scanned into electronic format. Address the fax to the mailing address, and clearly mark it as a 'Referral under the EPBC Act'. Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

Email to: epbc.referrals@environment.gov.au

Clearly mark the email as a 'Referral under the EPBC Act'. Attach the referral as a Microsoft Word file and, if possible, a PDF file. Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

What happens next?

Following receipt of a valid referral (containing all required information) you will be advised of the next steps in the process, and the referral and attachments will be published on the Department's web site for public comment (**Note: the Minister may decide not to publish information that is commercial-in-confidence**).

The Department will write to you at the end of 20 business days to advise you of the outcome of your referral and whether or not formal assessment and approval under the EPBC Act is required. There are a number of possible decisions regarding your referral, including:

The proposed action is NOT LIKELY to have a significant impact and does NOT NEED approval

No further consideration is required under the environmental assessment provisions of the EPBC Act and the action can proceed (subject to any state or local government requirements).

The proposed action is NOT LIKELY to have a significant impact IF undertaken in a particular manner

The particular manner in which you must carry out the action will be identified as part of the final decision. You must report your compliance with the particular manner to the Department.

The proposed action is LIKELY to have a significant impact and does NEED approval

If the action has, will have or is likely to have a significant impact it is called a *controlled action* and the particular matters upon which the action may have a significant impact (such as World Heritage or threatened species) are known as the *controlling provisions*.

The proposed action is subject to a public assessment process before it can be considered for approval. The assessment approach will usually be decided at the same time as the controlled action decision. (Further information about the levels of assessment and basis for deciding the approach are available on the Department's web site.)

Compliance audits

The Department may audit your project at any time to ensure that it was completed in accordance with the information provided in the referral or the particular manner specified in the decision. If the project changes, such that the likelihood of significant impacts could vary, you should write to the Department to advise of the changes.

For more information

call the Department of the Environment, Water, Heritage and the Arts Community Information Unit on 1800 803 772 or

visit the web site www.environment.gov.au/epbc

All the information you need to make a referral, including documents referenced in this form, can be accessed from the above web site.

Glossary

%	Percent
~	approximately
AHD	Australian Height Datum
AMC	Australian Marine Complex
ANZECC	Australian and New Zealand Environment Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
AUD\$	Australian Dollars
BEC	Bennett Environmental Consulting
bgs	below ground surface
BPM	best practicable measures
BOD	Biological oxygen demand
CALM	Department of Conservation and Land Management (WA)
cfu/100ml	Thermo-tolerant coli forms per 100 millilitres of water
DEC	Department of Environment and Conservation (WA)
DEWHA	Department of Environment, Water Heritage and the Arts (Formerly Department of Environment and Water (DEW)) (Commonwealth)
DIA	Department of Indigenous Affairs (WA)
DoH	Department of Health (WA)
DoW	Department of Water (WA)
DPI	Department of Planning and Infrastructure (WA)
DSD	Department of State Development (WA)
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EPA	Environmental Protection Authority (WA)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i>
ERM	Environmental Resources Management Australia
ERWWTP	East Rockingham Wastewater Treatment Plant
FCT	Floristic Community Type
GIS	Graphical Information System
Ha	Hectares
IP14	Improvement Plan No.14
IWSS	Integrated Water Supply Scheme
JAMBA	Japan-Australia Migratory Bird Agreement
JEC	Johnstone Ecological Consultants
KIA	Kwinana Industrial Area
km	Kilometre(s)
KWRP	Kwinana Water Recycling Plant
KWWTP	Kwinana Wastewater Treatment Plant
LandCorp	WA's land and property development agency
m	Metre(s)
m ²	Metre(s) squared
m ³	Cubic Metre(s)
mm	millimetres
m/day	Metre(s) per day
MBR	Membrane Bioreactors
mg/L	Milligrams per Litre
MIEX	Magnetic Ion Exchange
ML/d	Mega-litre (s) per day
MNES	Matters of National Environmental Significance
MRS	Metropolitan Region Scheme
MW	Megawatt
MWWTP	Mandurah Wastewater Treatment Plant
NES	national environmental significance
OMP	Operations Management Plan
OU	Odour Units
PATN	A numerical classification techniques based on the similarity of floristic composition
PEMP	Project Environmental Management Plan

PLOOM	Perth Long-term Ocean Outlet Monitoring
PPWWTP	Point Peron Wastewater Treatment Plant
PST	primary treatment
RAMSAR	The Convention on Wetlands of International Importance
RBM	Regional Business Manager
RIZ	Rockingham Industrial Zone
RO/MF	Reverse Osmosis/Micro-Filtration
SD	sewer districts
SDOO	Sepia Depression Ocean Outlet
SDOOL	Sepia Depression Ocean Outlet Landline
SEA	Strategic Environmental Assessment
TEC	Threatened Ecological Community
TPS	Town Planning Scheme
TWW	Treated wastewater
UF/RO	Ultrafiltration/ Reverse Osmosis
WA	Western Australia
WALIS	WA Land Information Service
WAPC	Western Australian Planning Commission
WAWD	Western Australian Wetland Database
WMP	Site Water Management Plan
WPWWTP	Woodman Point Wastewater Treatment Plant
WWTP	Wastewater Treatment Plant

Referral of proposed action

Project title: **East Rockingham Wastewater Treatment Plant**

1 Summary of proposed action

1.1 Short description

The Water Corporation proposes to construct and operate a new municipal Wastewater Treatment Plant (WWTP) in East Rockingham, Western Australia (WA) (Figures 1 & 2), approximately 35 km south of Perth in the City of Rockingham. Specifically, the East Rockingham Wastewater Treatment Plant (ERWWTP) will be located in the Rockingham Industrial Zone (RIZ), within Improvement Plan No.14 (known as IP14) initiated in 1998 under the *Metropolitan Region Town Planning Scheme Act 1959*.

The IP14 area is currently undergoing a Strategic Environmental Assessment (SEA) under the WA *Environmental Protection Act 1986* (the *EP Act*), and has been referred to the Department of Environment, Water, Heritage and the Arts (DEWHA) by LandCorp for determination and possible assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (the *EPBC Act*). The ERWWTP referral is complementary to LandCorp's and should be considered in conjunction with it.

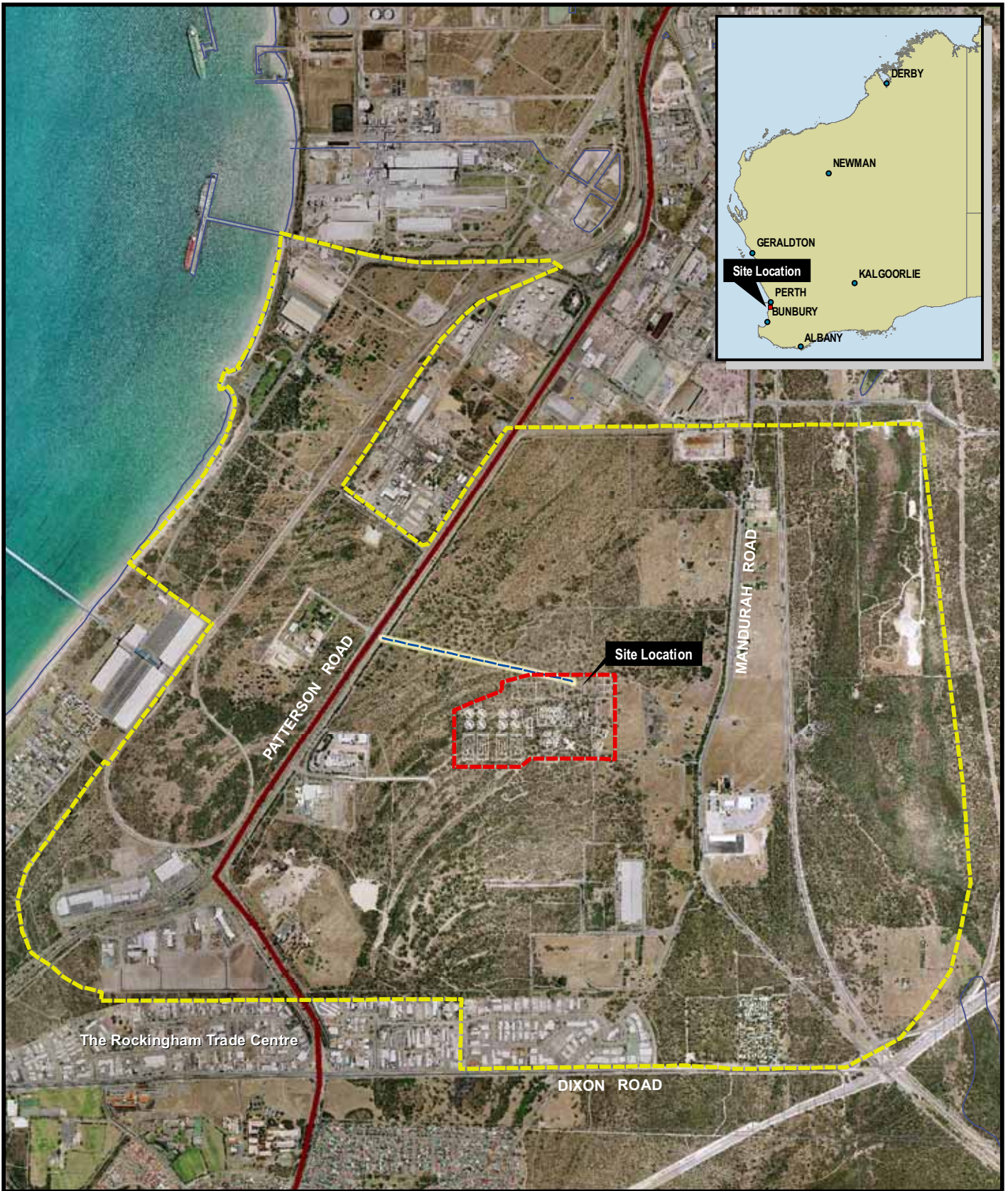
The ERWWTP is proposed to meet the increasing sewage demands of the City of Rockingham, which has a rapidly growing population and will ultimately service about 700,000 people. The proposal is to be developed in stages up to an operational capacity of a 160 ML/d beyond 2070.

The proposed location of the ERWWTP covers an area of approximately 30.85 hectares (Ha), including the outlet pipeline corridor. Stage 1 construction is planned to commence in 2012 with Stage 1 of the ERWWTP to be fully commissioned and operational by 2015.

The Water Corporation proposes to construct and operate the ERWWTP with wastewater being treated to an advanced secondary standard most likely to be based upon the activated sludge process. This process achieves a high degree of nitrogen removal and would maximise opportunities for further downstream treatment and recovery of 'reclaimed water' for recycling.

Treated wastewater (TWW) will be discharged via the currently operating Sepia Depression Ocean Outlet (SDOO), 4.2km offshore. The discharge will be within Ministerial Conditions applied to the SDOO under the *EP Act* and the current Part V licence operating conditions applied to those facilities discharging to it. It is envisaged that ultimately up to a maximum of 75% (120 ML/d) of the total volume of TWW ((160 ML/d) could be utilised through 'reclaimed water' recycling as and when recycling opportunities present themselves as the IP14 area and greater RIZ develops over time. The design of the ERWWTP will be such that future recycling can be facilitated.

The ERWWTP proposal will be referred to the WA Environmental Protection Authority (EPA) to determine whether formal environmental assessment is required under Part IV of the *EP Act*. In addition, the proposal will require a Works Approval, Operating License and a Clearing Permit from the WA Department of Environment and Conservation (DEC) under Part V of the *EP Act*.



Legend

- Site Boundary
- IP14 Boundary
- Outlet
- Outlet Buffer
- Site Detail
- Main Road
- Cadastre

Client:	Water Corporation
Project:	East Rockingham WWTP EPBC
Drawing No:	0083144_01_GIS_EPBC Suffix No: A0
Date:	01/04/2009 Drawing size: A4
Drawn by:	DD Reviewed by: BC
Source:	-
Scale:	1:25 000 @ A4

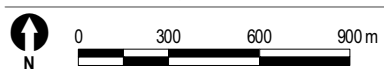
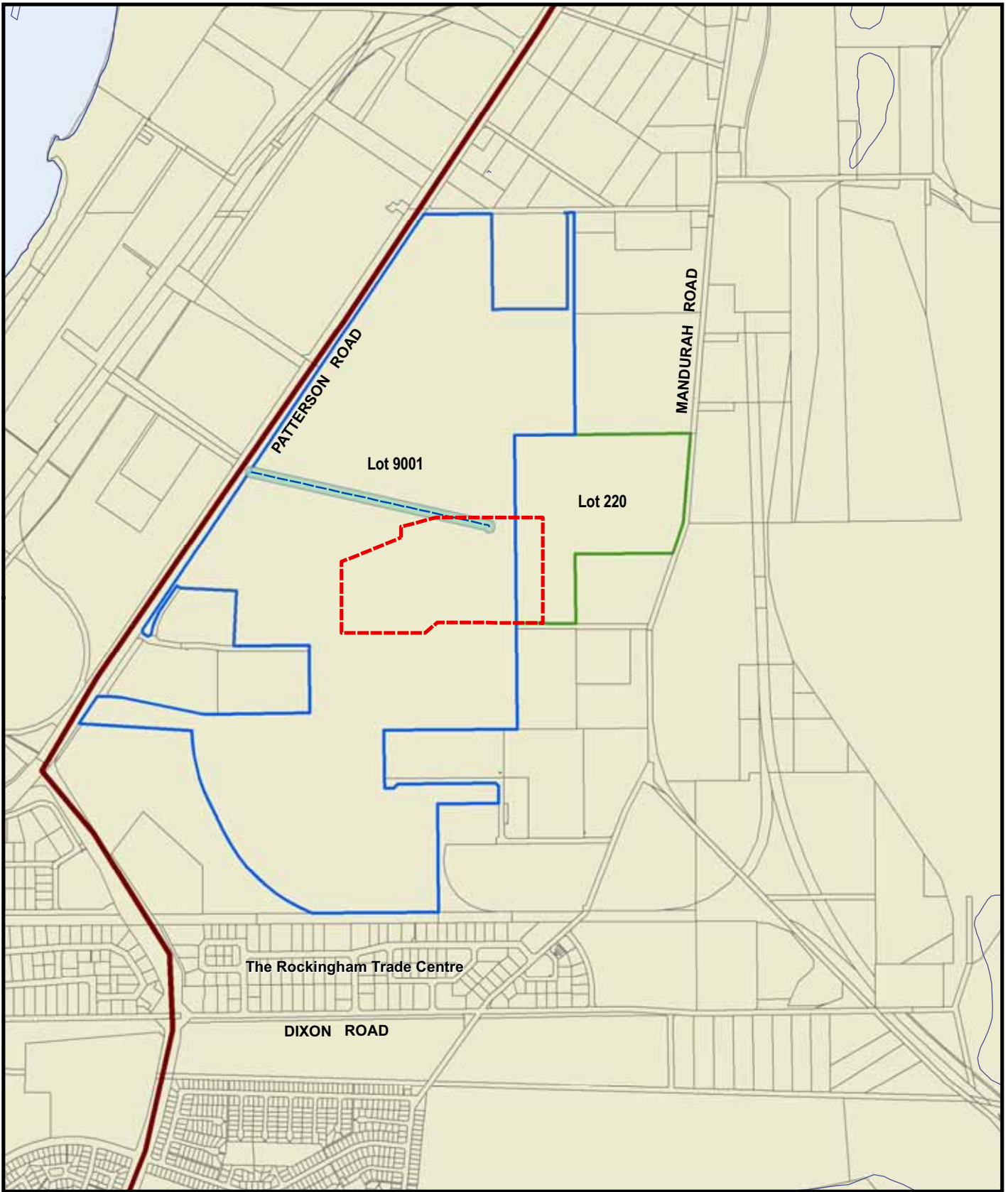


Figure 1
Site Location

Environmental Resources Management Australia Pty Ltd
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Telephone +61 9 321 5200





Legend

- Site Boundary
- Cadastre
- Lot 220
- Lot 9001
- Main Road
- Outlet Pipeline
- Outlet Buffer

Client:	Water Corporation
Project:	East Rockingham WWTP EPBC
Drawing No:	0083144_02_GIS_EPBC Suffix No: R1
Date:	11/06/2009 Drawing size: A4
Drawn by:	DD Reviewed by: BC
Source:	Landgate, 2008
Scale:	1:20 000 @ A4



**Figure 2
Lot Boundaries**

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1.2 **Latitude and longitude** Table 1.1: Proposed ERWWTP Site

Please refer to *Figure 3* for detailed GIS delineated boundaries of the proposed ERWWTP and outlet Pipeline Corridor.

location point	Latitude			Longitude		
	degrees	minutes	seconds	degrees	minutes	seconds
NW corner	32	15	41.97	115	46	2.88
NE corner	32	15	37.88	115	46	31.6
SE corner	32	15	50.14	115	46	31.35
SW corner	32	15	51	115	46	2.8

Table 1.2: Proposed Outlet Pipeline Corridor

location point	Latitude			Longitude		
	degrees	minutes	seconds	degrees	minutes	seconds
NW corner	32	15	30.97	115	45	50.37
NE corner	32	15	37.23	115	46	21.65
SE corner	32	15	37.33	115	46	15.82
SW corner	32	15	31.82	115	45	49.42

1.3 **Locality**

The ERWWTP is proposed to be located within Lot 220, Chesterfield Rd and Lot 9001, Patterson Rd, East Rockingham (*Figure 2*) within the IP14 area. In the City of Rockingham, the ERWWTP is proposed to be located approximately 35 km south of the Perth central business district, and will be positioned between Mandurah Road to the east and Patterson Road to the west.

1.4 **Size of the development footprint or work area (hectares)**

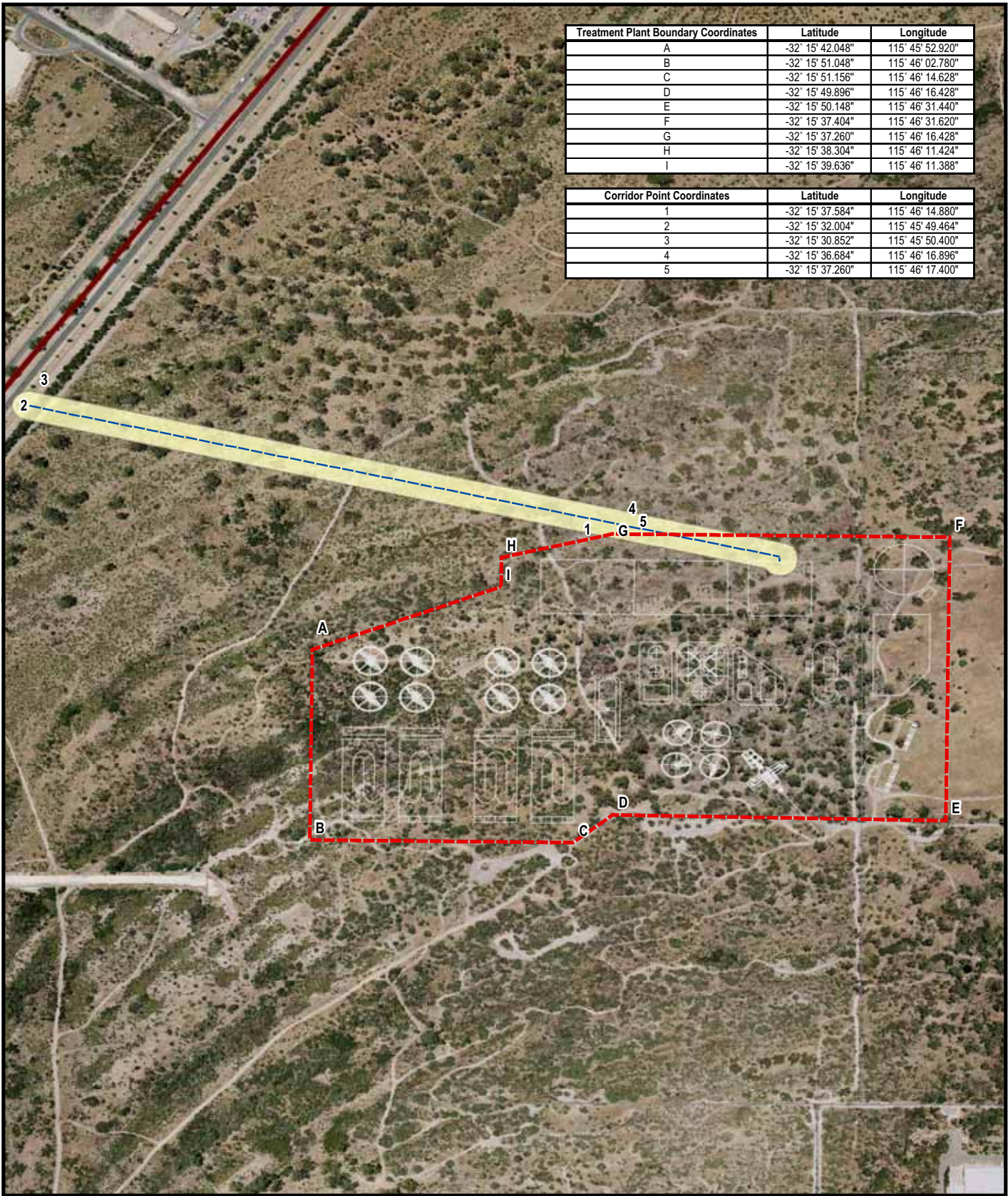
The proposal will occupy a total footprint of 30.85 Ha as shown in *Table 2* below.

Table 2: ERWWTP Footprint

Footprint Breakdown	Area Required
WWTP	280,070 m ² (28 Ha)
Outlet pipeline corridor	28,563 m ² (2.85 Ha)
Total Area	30.85 Ha

1.5 **Street address of the site**

Lot 220, Mandurah Rd and Lot 9001, Patterson Rd, East Rockingham, Western Australia.



Treatment Plant Boundary Coordinates	Latitude	Longitude
A	-32° 15' 42.048"	115° 45' 52.920"
B	-32° 15' 51.048"	115° 46' 02.780"
C	-32° 15' 51.156"	115° 46' 14.628"
D	-32° 15' 49.896"	115° 46' 16.428"
E	-32° 15' 50.148"	115° 46' 31.440"
F	-32° 15' 37.404"	115° 46' 31.620"
G	-32° 15' 37.260"	115° 46' 16.428"
H	-32° 15' 38.304"	115° 46' 11.424"
I	-32° 15' 39.636"	115° 46' 11.388"

Corridor Point Coordinates	Latitude	Longitude
1	-32° 15' 37.584"	115° 46' 14.880"
2	-32° 15' 32.004"	115° 45' 49.464"
3	-32° 15' 30.852"	115° 45' 50.400"
4	-32° 15' 36.684"	115° 46' 16.896"
5	-32° 15' 37.260"	115° 46' 17.400"

- Legend**
- Site Boundary
 - Outlet
 - Outlet Buffer
 - Site Detail
 - Main Road
 - Cadastre

Client:	Water Corporation
Project:	East Rockingham WWTP EPBC
Drawing No:	0083144_10_GIS_EPBC Suffix No: A0
Date:	11/06/2009 Drawing size: A4
Drawn by:	DD Reviewed by: BC
Source:	-
Scale:	1:10 000 @ A4

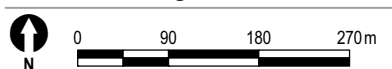


Figure 3
Proposed Site Location and Coordinates

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1.6 **Lot description**

The Water Corporation is in the final stages of acquiring the site (including land for the outlet corridor) in freehold tenure from LandCorp. Although the current lot description is 'Lot 220, Mandurah Rd and Lot 9001, Patterson Rd, East Rockingham' this will change upon acquisition. In July 2008, the Western Australian Planning Commission (WAPC) granted conditional subdivision approval to create the WWTP site. Upon creation of new titles, the land will be transferred to the Water Corporation via a Contract of Sale and subsequently rezoned to "Public Purposes" under the Metropolitan Region Scheme (MRS) and City of Rockingham Town Planning Scheme (TPS) (refer to *Annex A* and *Section 3.3(j)*).

1.7 **Local Government Area and Council contact (if known)**

Local Government Area: Shire of Rockingham

R M Jeans

Director Planning and Development Services

Ph: (08) 9528 0333

1.8 **Timeframe**

Stage 1 of the ERWWTP is scheduled to be operational by December 2015. This schedule is based around the key milestones presented in *Table 3*.

Table 3: Indicative Development Schedule¹:

Project Phase	Commencement	Completion
Environmental Approvals	April 2009	2011
Definition and Preliminary Design	2009	2013
Stage 1 Construction	2014	June 2015
Stage 1 Commissioning	June 2015	December 2015

For more information on the proposed staging schedule of the development, refer to *Section 2.1*.

1.9 Alternatives	<input type="checkbox"/>	No
	<input checked="" type="checkbox"/>	Yes, you must also complete Section 2.2
1.10 State assessment	<input type="checkbox"/>	No
	<input checked="" type="checkbox"/>	Yes, you must also complete Section 2.4
1.11 Component of larger action	<input type="checkbox"/>	No
	<input checked="" type="checkbox"/>	Yes, you must also complete Section 2.6
1.12 Related actions/proposals	<input type="checkbox"/>	No
	<input checked="" type="checkbox"/>	Yes, provide details: The development of the ERWWTP is in response to current and planned urban development and provision of wastewater schemes to service them in the South-Western Corridor of metropolitan Perth.
1.13 Australian Government funding	<input checked="" type="checkbox"/>	No
	<input type="checkbox"/>	Yes, provide details:

¹ May vary based on approvals timelines, delivery of long lead items and other personnel and resource constraints.

2 Detailed description of proposed action

2.1 Description of proposed action

Introduction

The Water Corporation proposes to construct and operate a new municipal WWTP, the ERWWTP (see *Figures 1, 2 & 3*), to meet the increasing sewage demands of urban and industrial development in the South-Western Corridor of metropolitan Perth, which has a rapidly growing population. The proposal is to be developed in stages up to an operational capacity of a 160 ML/d beyond 2070. Details of the Staging of the proposal are described in *Tables 5*.

Planning for the ERWWTP has been in train for 15 years. Five viable alternate sites, both within and outside the IP14 area have been evaluated over the years, with social and/or environmental constraints predicating the shift to the current proposed location resulting in significant State Government investment in planning and infrastructure progressing in accordance with the *current plan*.

The IP14 area, in which the ERWWTP is proposed to be located, is part of the greater RIZ. Separate to this referral for the ERWWTP, an SEA has been prepared for the RIZ by the WA State Government land and property development agency, LandCorp, to identify the environmental features of the RIZ that require protection from development and to gain environmental approval for the development footprint outside this area. As part of LandCorp's proposal, a proposed 76 hectare conservation area has been put forward immediately south of the proposed ERWWTP site.

In proposing the conservation area, the State has taken into account the likely impacts of the ERWWTP proposal upon Matters of National Environmental Significance (MNES), and believes these are appropriately offset and managed through this conservation reserve.

Development of the ERWWTP within the IP14 area will provide substantial social, economic and environmental benefit to the State of WA. These benefits include, but are not limited to:

- Closure of the Point Peron WWTP (PPWWTP) resulting in:
 - Removal of primary (low level of treatment) wastewater from the ocean at Sepia Depression with resultant improvement in wastewater quality discharged to the Sepia Depression;
 - Make available a valuable community recreational, ecological and tourism precinct on Cape Peron; and,
 - Meet community expectations for decommissioning the plant by ~2015.
- Avoiding excessive greenhouse gas emissions from the high amount of energy required to pump sewage to other WWTPs in the region such as Woodman Point WWTP (WPWWTP) and Kwinana WWTP (KWWTP); and,
- Catering for the increasing sewage demands regionally by appropriately locating the new ERWWTP within an industrial precinct thereby avoiding exacerbating social impact (odour, visual amenity) at existing plants (WPWWTP and KWWTP).

To position the Water Corporation for future opportunities for 'reclaimed water' recycling and energy recovery, it is proposed to base treatment at the ERWWTP on the 'activated sludge' process, which is shown in *Figure 4*. This is an advanced secondary treatment process similar to that recently constructed at the Mandurah WWTP (MWWTP) and KWWTP's in WA. It is envisaged that ultimately up to a maximum of 75% (120 ML/d) of the total volume of TWW (160 ML/d) from the ERWWTP could be utilised through 'reclaimed water' recycling (such as Groundwater Replenishment), while energy recovery through the capture of biogas to fuel gas engines is proposed to be introduced in a 30 to 50 year timeframe following the plants commission.

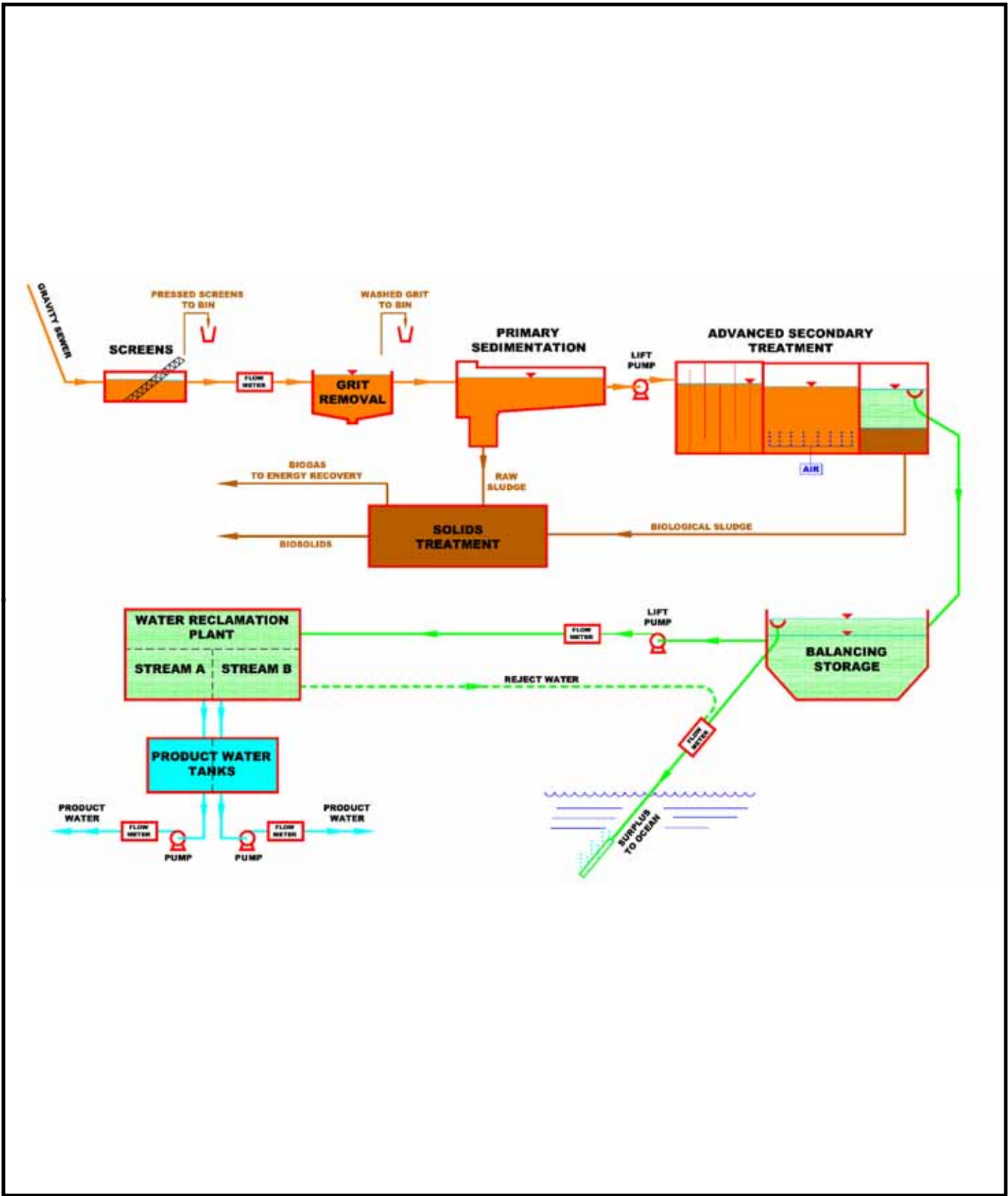


Figure 4
Flow Diagram of WWTP

Client:	Water Corporation
Project:	East Rockingham WWTP EPBC
Drawing No:	0083144_03_GIS_EPBC Suffix No: R1
Date:	11/06/2009 Drawing size: A4
Drawn by:	DD Reviewed by: BC
Source:	Water Corporation
Scale:	

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As well as providing opportunities for TWW recycling and energy recovery, the advanced secondary treatment process will achieve a high degree of nitrogen removal which will mitigate impacts on the marine environment and allow for disposal of the TWW via the SDOO in an environmentally responsible manner.

The level of wastewater treatment and the method of TWW management proposed for the ERWWTP are based on the Water Corporation’s requirements to protect the environment and public health while having regard for the economic outcomes (economic – as the Water Corporation has an obligation to provide wastewater treatment at a financial cost the community can afford).

It must be recognised that wastewater treatment technology and potentially the layout of the ERWWTP are likely to evolve with process advances as the facility develops through stages. The design for the first stage is subject to finalisation and process requirements; however, the preliminary layout of the site is shown in *Annex B*.

Key Characteristics

The key characteristics of the proposal are summarised in *Table 4* below and include an outlet conveyance pipeline transporting TWW from the ERWWTP via the Sepia Depression Ocean Outlet Landline (SDOOL) to the SDOO. The ERWWTP is being designed as a staged development until 2070, the implementation of which will be in four stages, as per *Table 5*. Estimates of the staged demand are based on current population growth projections until 2070.

Table 4: Key characteristics for the proposed ERWWTP²:

Feature	Characteristic					
Indicative life of the Project	Staged capacity to be implemented for the ERWWTP as follows:					
	Indicative Timing			Installed Capacity (ML/d) of Inflow		
	2015			40		
	2020			40		
	2027			80		
	2040			120		
	2070 and beyond			160		
Treatment process	Sewage will be treated to an advanced secondary standard most likely based upon the activated sludge process similar to that recently constructed at MWWTP and KWWTP, achieving a high degree of nitrogen removal. Additional treatment processes will be utilised to make the TWW ‘fit for purpose’ for disposal and re-use opportunities as and when they become available/achievable. Odours will be vented via an approximate 50m tall stack.					
TWW Quality (annual average)	2015	2020	2027	2040	2070	Ultimate
BOD (mg/L)	20	20	20	20	20	20
Suspended solids (mg/L)	30	30	30	30	30	30
Total Nitrogen (mg/L)	8	8	15	15	15	15
Total Phosphorus (mg/L)	10	10	10	10	10	10
Thermo-tolerant coli forms (cfu/100ml)	10 ⁵	10 ⁵	10 ⁵	10 ⁵	10 ⁵	10 ⁵
TWW Disposal Ocean Outlet	As a worst case scenario, 100% of the discharges (up to 160ML/d ultimate) of advanced secondary TWW may need to be disposed of through the ocean outlet beyond 2015. Duplication of the outlet may be required in the future, dependent upon availability of the other disposal/recycling options at the time. As part of this proposal, the Water Corporation intends to construct a land outlet pipeline connecting the WWTP to the SDOOL.					
Toxicant Concentrations	Project loads and flows will result in toxicant concentrations meeting the ANZECC & ARMCANZ 80% species protection guideline values for bio-accumulating toxicants within 100m of the SDOO diffuser. Project loads and flows will also meet the ANZECC & ARMCANZ 99% species protection guideline values for bio-accumulating toxicants beyond 100m from the SDOO diffuser.					

² May vary based on technology used, approvals timelines, delivery of long lead items and other personnel and resource constraints.

Feature	Characteristic
Water Reclamation and Recycling	Up to 75% (up to 120ML/d) of the volume of TWW from the ERWWTP can be reclaimed through advanced treatment technologies such as Reverse Osmosis for industrial use, if opportunities arise at quality and quantity required. The remaining 25% (up to 40ML/d) of the volume of the TWW, containing the excess TWW from the ERWWTP and the concentrate from the advanced treatment technologies utilised will require disposal to the ocean via the SDOO.
Power Requirements	3 - 4 MW for the ultimate (160ML/d) plant
Power Source	Western Power grid
Clearing of Vegetation required WWTP site (including batters) Outlet Corridor Total for WWTP	28 Ha 2.9 Ha 30.85 Ha
Odour Footprint	1000m, based on 53060 Odour Units (OUs) per second total odour emissions to achieve 7 OUs 99.9% of the time over 1 hour averaging period. The zone delineated by 7 OU is within an industrial area (no housing) and the area within the odour footprint can be used by compatible land users.

ERWWTP Location

The ERWWTP is proposed to be located at a central site within IP14 in the RIZ in East Rockingham, WA (Figure 1) approximately 35 km south of Perth in the City of Rockingham. The site lies between Mandurah Road to the east and Patterson Road to the west within the 1,150 Ha IP14, which consists of almost 587 Ha of industrial land for prospective tenants with approximately a further 400 Ha of parkland buffers, public open space, service commercial zones and the 76 Ha conservation area as proposed in LandCorp's SEA. The ERWWTP is proposing a disturbance footprint of 30.85 Ha within the overall IP14.

Wastewater Treatment Plant - Treatment Processes

As previously described, the development of the ERWWTP will be staged in modules, ahead of demand forecast to be placed upon it (refer to Table 5). Presently the following processes are envisaged:

- Sewer inlet;
- Screening and grit removal tanks at the eastern end of the site;
- Primary sedimentation tanks;
- Secondary treatment by an advanced version of activated sludge (for example by Oxidation Ditch or other process configuration designed to maximise nitrogen removal);
- Sludge thickening;
- Sludge digesters, (anaerobic digestion when primary treatment installed) with a gas recovery and combustion building;
- Digested sludge storage tanks;
- A sludge dewatering building, wherein sludge is dewatered using centrifuges (as at the Subiaco, Beenyup and Woodman Point WWTPs);
- TWW balancing storage;
- Outlet flow measurement in the west of the site;
- Water reclamation plant;
- Product-water tanks(s); and
- Odour control extraction and scrubbing plants, with discharge via vent stacks.

The intended design is further detailed in the following:

Treatment Process – Inflow Variations

Inlet works, primary and secondary treatment processes will be designed for flow variations as a result of pumped inflows. The ERWWTP (inlet works, primary treatment and secondary treatment) will be designed to safely accommodate these flow variations.

Treatment Processes – Preliminary Treatment

Preliminary treatment including screening and grit removal will be installed to protect downstream processes and equipment. Pressed screenings and washed grit will be disposed of in accordance with present approved practices and legislative requirements.

Treatment Process – Primary Treatment

An important process in terms of recovering and minimising energy is the installation of primary treatment (physical removal of floatable and settleable solids) before the activated sludge process. This will enable the collection of raw sludge and its subsequent anaerobic digestion to recover biogas to fuel gas engines. It is anticipated that the primary treatment and anaerobic digestion will be introduced in the future when quantities of biogas produced through the treatment processes are able to provide the economies of scale to support the biogas recovery.

Treatment Process – Secondary Treatment

The basic treatment process will be built around the activated sludge process. This secondary treatment process (the biological removal of dissolved solids) is the dominant treatment of wastewater for larger communities worldwide. Significant improvements over the last 30 years have seen configurations that manage anaerobic, anoxic and aerobic fractions to maximise nutrient removal. More recent advances have seen membranes introduced to replace final clarifiers and undertake the solids/liquid separation step (Membrane Bioreactors, known as the MBR process). The MBR process is in its infancy in Australia, with the largest plant recently built in Victor Harbour, South Australia.

The layout of the ERWWTP at the time of this referral, (refer *Annex B*), has been based on an advanced version of the activated sludge process (Oxidation Ditch) as recently used in Water Corporation's WWTP developments at Mandurah and Kwinana in WA. The ERWWTP will be developed in four stages over the foreseeable future (see *Table 5*). It is anticipated that this process will be modified over the development timeframe, and it is expected that the plant layout and configuration will adapt to improvements in technology over this timeframe.

Treatment Process – Sludge Treatment

Anaerobic digestion is the most common and energy efficient method world wide to stabilise raw sludge from large domestic WWTPs. The resultant digested sludge can be dewatered to achieve sludge-cake of greater than 30% dry solids content. Energy recovery potential from this process is high.

Conversely, biological sludges from the activated sludge process are already partially digested (aerobically in the activated sludge process), and consequently, energy recovery potential is low. Biological sludge is much more difficult to dewater, typically achieving cake of less than 20% dry solid content.

While the sludge processes at the ERWWTP will in the longer term, be developed in line with current and future processes, it is likely that the focus will shift to energy recovery which in turn will require maximising capture of raw primary sludge and minimising biological sludge production.

Biosolids produced from the sludge treatment process will be recycled and disposed of in accordance with the WA Department of Health's (DoH) *Guidelines for Direct land Application of Biosolids and Biosolids Products* (Feb 2002).

Treatment Process – Reclaimed Water Plant

The proposal to base treatment at the ERWWTP on an advanced version of the 'activated sludge' process that achieves a high degree of nitrogen removal will maximise opportunities for further downstream treatment and recovery of 'reclaimed water' for recycling.

Depending on the location and beneficial use of the reclaimed water, a number of processes are envisaged ranging from high rate sand filtration and disinfection by chlorine or UV light (as currently being trialled at the SWWTP), to Membrane separation: Ultrafiltration/ Reverse Osmosis ((UF/RO) as currently operating at Kwinana Water Recycling Plant (KWRP), WA). The ERWWTP layout has made provision for a future advanced water treatment (UF/RO) plant to facilitate any recycling opportunities.

WWTP Staging and Implementation

Staging

The first stage of the ERWWTP is for an installed capacity of 40 ML/d. The design of the first stage is subject to finalisation and flexibility and may involve either:

- Construction of two activated sludge streams (ie. 2 oxidation ditches + 4 clarifiers); or,
- Construction of primary treatment (PST) and one activated sludge stream (ie. 1 PST + 1 oxidation ditch + 2 clarifiers).

The final Stage 1 configuration will be determined during the Preliminary Design Stage on the bases of environmental, technical and economical values.

A conceptual flow diagram setting out how the ERWWTP may be developed over the long term is shown in *Figure 4*. The preliminary plant layout of the ultimate (160 ML/d) ERWWTP is shown in *Annex B*.

The ERWWTP will be based on advanced versions of the activated sludge process and developed in four stages over the next 50 to 100 years. Current inflow projections have been used to develop the following staging strategy, shown in *Table 5* below. Each stage consists of one treatment module with a capacity to treat approximately 40 ML/d of wastewater. The final capacity of the WWTP will be 160 ML/d, which is expected to be completed by 2070 or as population growth demands. The WWTP will provide additional wastewater capacity for the rapidly growing City of Rockingham.

Based on current growth forecasts, the Water Corporation anticipates the proposed ERWWTP needs to be operational by 2015. The current demand in the South-West coastal corridor is such that commencement of construction of Stage 1 is now on the critical path.

NOTE: Any acceleration of the current rate of residential development in the South West Corridor, including that associated with the opening of the Perth to Mandurah railway line, may require advancing the WWTP commissioning date.

Table 5: Notional Staging – Baseline Treatment³:

Year	Average Daily Flow (ML/d)	Installed Capacity (ML/d)	Description of Liquid Process
2015	25	40	STAGE 1: Inlet works (temporary). Extended aeration activated sludge.
2020	34	40	Continuation of Stage 1.
2027	40	80	STAGE 2: Expansion of above processes. Possible introduction of primary treatment step to recover raw sludge for energy recovery and reduce energy consumption in activated sludge process.
2040	80	120	STAGE 3: Expansion of above processes.
2070	120	160	STAGE 4: Expansion of above processes assumed. Primary treatment. Activated sludge.

³ May vary based on approvals timelines, delivery of long lead items and other personnel and resource constraints.

Construction Methods

Design and construction methods of the ERWWTP will utilise best practicable measures (BPM) as defined by EPA Guideline No 55 (EPA, 2003). A Construction Management Plan (including all environmental and risk management measures) will be developed in accordance with the Project Environmental Management Plan (PEMP), (see *Annex C*), and the Water Corporation's standard operating procedures and quality management system.

Operations and Maintenance

An Operations Management Plan (OMP) will be developed during the design and commissioning phase to reflect the operational environment at East Rockingham. The OMP will document work procedures for operations and maintenance (including safety) of a facility that is predominantly covered for odour control.

Noise

All new works will be designed and operated to comply with noise regulations. Noisy equipment will be housed in buildings or other noise attenuating enclosures.

Power Requirements

When at full development and operation of 160 ML/d, power consumption at the ERWWTP is expected to be approximately 3.42 MW most of which is consumed providing aeration to the secondary treatment process. Recovery of biogas to produce electricity for the WWTP and heat for the digesters is expected to be implemented at Stage 3 (potentially Stage 2) of the project and will contribute approximately 30% of the plants energy requirements.

The above does not include energy required for future water reclamation plants or the pumping of reclaimed water to areas of recycling.

Conveyance

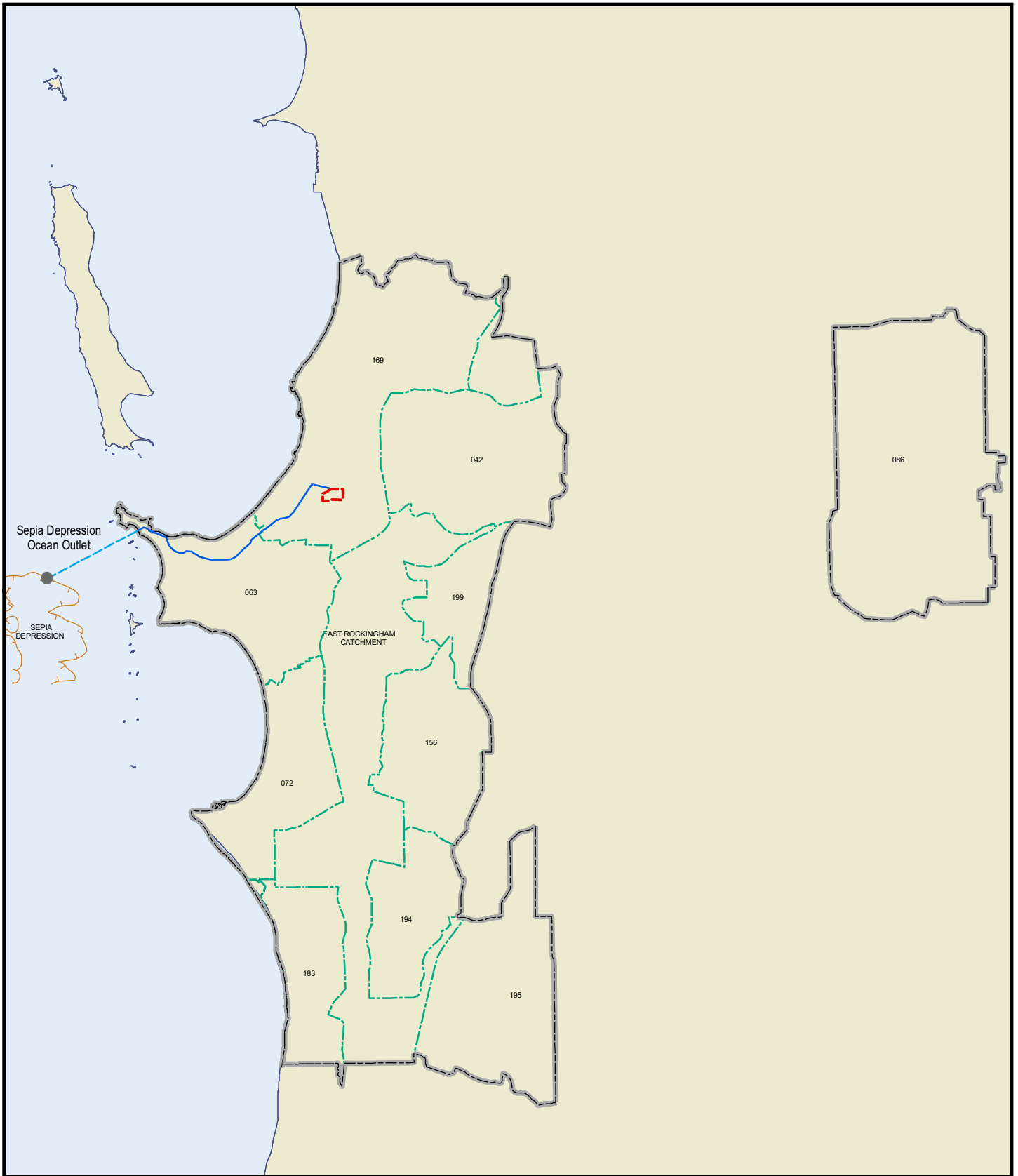
The Rockingham and Kwinana regions are among the fastest growing in WA. The ERWWTP will service the East Rockingham Wastewater catchment area which covers a major part of the South-West metropolitan corridor, a portion of the South-East metropolitan corridor and a portion of the northern Peel Region (see *Figure 5*). Within the South-West metropolitan corridor, the existing scheme incorporates the sewer districts (SD) of Rockingham, East Rockingham, Kwinana, Baldivis South, Warnbro and Peelhurst. With continuing development the Baldivis North, Karnup and Amarillo North SDs will be included. The Byford and Mundijong SDs in the southeast metropolitan corridor have previously been identified for inclusion in the scheme in the longer term; however, it will be dependent on the capacity of other WWTPs in the South-West metropolitan corridor.

Sewage from these SDs will be conveyed to the ERWWTP for treatment. An inlet conveyance pipeline will be connected to the ERWWTP. The exact route of the inlet pipeline has yet to be determined (this pipeline will be subject to separate approval).









The outlet conveyance pipeline, as shown in *Figure 6*, is required to be approximately 750m in length to connect to the SDOOL, which follows a route to the SDOO. The initial outlet pipeline is required to be approximately 1200mm in diameter and will be buried. The ultimate outlet will consist of two 900mm and one 1200mm pipelines.

As the ERWWTP capacity increases over time, duplication of the SDOOL will be required to meet the ultimate capacity of the plant and the other inflows to this system (i.e. WPWWTP, KWWTP, KWRP and Kwinana industries). This pipeline duplication is not part of this referral, and will be subject to a separate approval process in the future.

Potential Water Re-use for TWW from the ERWWTP



Legend

-  Site Boundary
-  Coastline
-  Sepia Depression
-  Sepia Depression Ocean Outlet
-  Sepia Depression Ocean Outlet Landline
-  Catchment Boundary
-  Sewer District Boundary
-  Outlet Pipeline

Client:	Water Corporation
Project:	East Rockingham WWTP EPBC
Drawing No:	0083144_04_GIS_EPBC Suffix No: R1
Date:	11/06/2009 Drawing size: A4
Drawn by:	DD Reviewed by: BC
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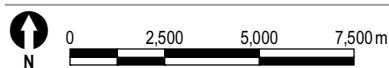
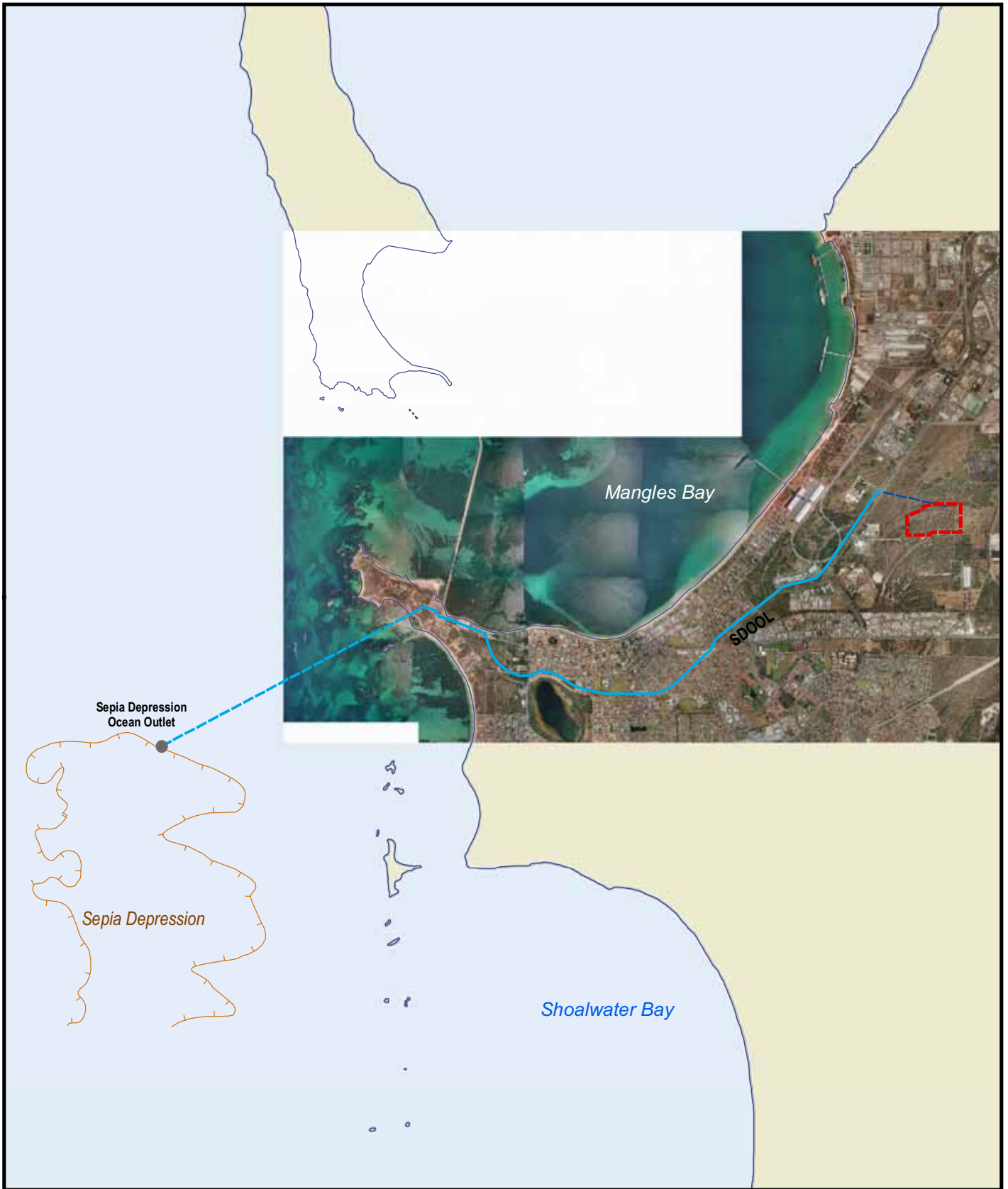


Figure 5

Sewer Districts to be serviced by the proposed ERWWTP

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Legend

- Site Boundary
- Coastline
- Sepia Depression
- Sepia Depression Ocean Outlet (SDOO)
- Sepia Depression Ocean Outlet Landline (SDOOL)
- Outlet Pipeline

Client:	Water Corporation
Project:	East Rockingham WWTP EPBC
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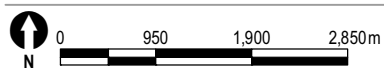


Figure 6

Treated Wastewater Conveyance and Ocean Outlet Pipelines

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The WA State Government has set a target of 20% recycling of TWW by 2012 and 30% by 2030 in the *State Water Plan 2007* and *State Water Recycling Strategy 2008*, (DoW, 2007).

There are a number of options to achieve the 20% and eventual 30% target, and these can be described under four scheme categories:

- Category 1 - Industrial.
- Category 2 - Green Space - irrigation of public parks, golf courses and possibly domestic back gardens.
- Category 3 - Agricultural - irrigation of agricultural areas.
- Category 4 - Indirect Potable - use of recycled water to augment scheme water supplies.

The investigated opportunities for recycling at the ERWWTP include:

- Category 1 - Industrial; and,
- Category 4 - Indirect Potable (possibly in future).

East Rockingham Industrial Area

Location of the ERWWTP in the IP14 industrial area will encourage industrial recycling in the area to be actively pursued. That is, opportunities will arise in the long planning process for the IP14 industrial area to be 'future protected' through the provisioning of a third pipe to facilitate other water sources.

Ultimate recycling values will be developed upon demand, increasing to a maximum of 75% (120 ML/d) of the total volume of TWW (160 ML/d).

Indirect Potable Water Supplies

Treated wastewater recycling to augment scheme water supplies can be either supplied direct from the WWTP or it can be stored in aquifers. Groundwater Replenishment for the purpose of recycled water has been identified as having significant potential as a source for both indirect public drinking water and non-potable water for environment and other benefits.

Conceptually, water from the ERWWTP following microfiltration and reverse osmosis could be piped inland either for infiltration to a superficial aquifer or to the Hills storage dams of the Integrated Water Supply Scheme (IWSS).

The Water Corporation will actively encourage TWW recycling. The Water Corporation is continuing to work with regulators and local stakeholders to define the most sustainable approaches for regional water recycling on the Swan Coastal Plain. Further scientific investigations and government policy changes are required before all recycling options, particularly use of recycled water to augment scheme water supplies, becomes a viable option for TWW management from the ERWWTP.

Ocean Outlet

As part of this proposal, the Water Corporation intends to:

- Construct a land outlet pipeline connecting the ERWWTP to the SDOOL. The ERWWTP's secondary TWW will be discharged via SDOOL to the SDOO and into the Sepia Depression, some 4.2km offshore, within the SDOO's current approved operating conditions; and,
- Operate, maintain and monitor the ocean outlet in accordance with established Asset Management Plans and WA Minister for the Environment conditions (see *Annex D*).

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

Wastewater Treatment Plant

Five WWTP options were considered by the Water Corporation as conceptual options for a required WWTP to accommodate for the increased sewage needs of the South-West metropolitan corridor of Perth due to population growth. These were:

- Option 1 - To East Rockingham Area - All of the SDs to go to an ERWWTP (refer to *Figure 5*). This would involve the de-commissioning of the new KWWTP.
- Option 2 - Part Flows to the ERWWTP and KWWTP - Receive inflows from Kwinana SD in varying amounts.
- Option 3 - All Flows to KWWTP - Baldivis SDs directed to KWWTP, Rockingham & Warnbro SDs to Major Transfer Pumping Station in East Rockingham area to the KWWTP.
- Option 4 - All Flows to a Pinjarra located WWTP - Byford SD direct to a Pinjarra WWTP. All other SDs to major Transfer Pumping Station in Baldivis to be routed to a Pinjarra WWTP.
- Option 5 - Part flows to the ERWWTP and KWWTP, with Byford SD to KWWTP.

Each scheme was assessed to determine which could best be established as a long-term option against multiple criteria including technical, social, environmental, health and safety.

The assessment determined that Option 2, 'Within IP14 in East Rockingham with a small Kwinana WWTP', was the preferred option based on the following reasons:

- Public Health - the area has an adequate odour buffer and compatible surrounding land uses, with industrial properties surrounding and part of the IP14 area. The nearest sensitive premises (housing) are approximately 1.7 km to the south of the ERWWTP, which is well outside the 5 Odour Unit 99.9% 1 hour averaging period criteria footprint considered to be of minimal impact.

- Commercial – The area is located within the RIZ and the ERWWTP is within IP14, which will maximise opportunities for ‘reclaimed water’ recycling.
- Environment – No Declared Rare or Priority Flora (BEC, 2009) and no EPBC Act listed endangered or threatened species (Greg Harewood, 2009) were recorded on the site. Vegetation on the site was determined to be between good and degraded with areas in completely degraded condition (BEC, 2009). The site has an existing road access corridor which will minimise the area required to be cleared for site access.
- Technical – The area is centrally located within the SD catchment area and is capable of accommodating a site sufficiently large enough to contain both the WWTP and inlet and outlet pipeline infrastructure.
- Social – most acceptable area to the local stakeholder groups, including the local aboriginal communities and Native Title Claimants. The Department of Planning and Infrastructure (DPI), DEC, Fremantle Port Authority, Department of State Development (DSD), Minister for Water Resources and the Minister for Planning agreed that the ERWWTP is to be located at the currently proposed site within the IP14 area.

Site Selection within IP14

Background

Planning in the late 1980s identified the need for a new WWTP within the IP14 area in the vicinity of East Rockingham. The new WWTP would replace the Point Peron WWTP and would provide treatment for the industrial area to its north and urban development to its south.

Current projected growth within the East Rockingham catchment indicates that approximately 77 ML/d of wastewater will require treatment by 2040. Ultimately, plant inflows will grow to 160 ML/d. This necessitates providing an area large enough to accommodate a plant of that capacity as well as a sustainable and effective buffer of land surrounding the plant to mitigate the potential effects of odour.

The major factors in the planning for the new WWTP was to provide for a site which incorporated the below criteria:

- In close proximity to the areas being serviced - The general nature of the catchment topography does not lend itself to a full gravity system and a partial pumped system will be incorporated. Minimising pumping distances and utilising gravity options is important;
- In close proximity to an existing disposal outlet - As this project will involve a major upgrading of existing sewer schemes, incorporating existing conveyance assets wherever possible is important, i.e. pipes and pump stations;
- In close proximity to opportunities for recycling - Such as the RIZ;
- Within a ‘brownfield’ area – An area with the least impact on the existing land uses and areas; and,
- An area that can cater for the long term future or an ultimate planning scenario of the project.

The Water Corporation assessed the options against the following WWTP location principles:

- Staged WWTP development (treatment, recycling);
- A suitable ocean outlet for disposal of surplus treated wastewater;
- Secure routes for main sewers;
- A secure route for the connection to the SDOOL;
- Odour control on selected odour emission sources;
- Suitable buffer size;
- Secure buffer by land purchase if required or compatible land zonings;
- Minimise environmental footprint; and,

- Social acceptability.

Based on the nine principles for locating a site, Option A was identified within the IP14 area (refer to *Figure 7*) and reserved on the MRS for use as a WWTP. Draft structure plans for the IP14 precinct were developed which incorporated compatible land uses within the WWTP buffer.

Between 2002 and 2004, the Department of Conservation and Land Management (CALM) and the Department of Environment, now the DEC, expressed an increasing interest in vegetation and wetlands in IP14 and indicated that they would aim to have a substantial area of IP14 reserved for conservation (irrespective of existing zoning), including Option A. The City of Rockingham also confirmed that Option A should not be located within the proposed conservation boundary.

LandCorp indicated that they would provide the Water Corporation with an alternative viable site given the likelihood of the Option A being reserved for conservation. Discussion focused on a cleared area fronting Mandurah Road, known as Option B (refer to *Figure 7*).

Option B was then assessed as a viable option for the proposed ERWWTP. While suitable in many respects, the land east of Option B was within the odour footprint of the proposed WWTP and is privately owned. The potential odour impacts upon this land attracted claims of injurious affection from the land owners. To ensure compatible development within this area would require Water Corporation ownership. The purchase price was estimated to be upwards of AUD\$ 90 million. This necessitated moving from Option B so that the WWTP did not injuriously affect the privately owned land.

Proposed Action

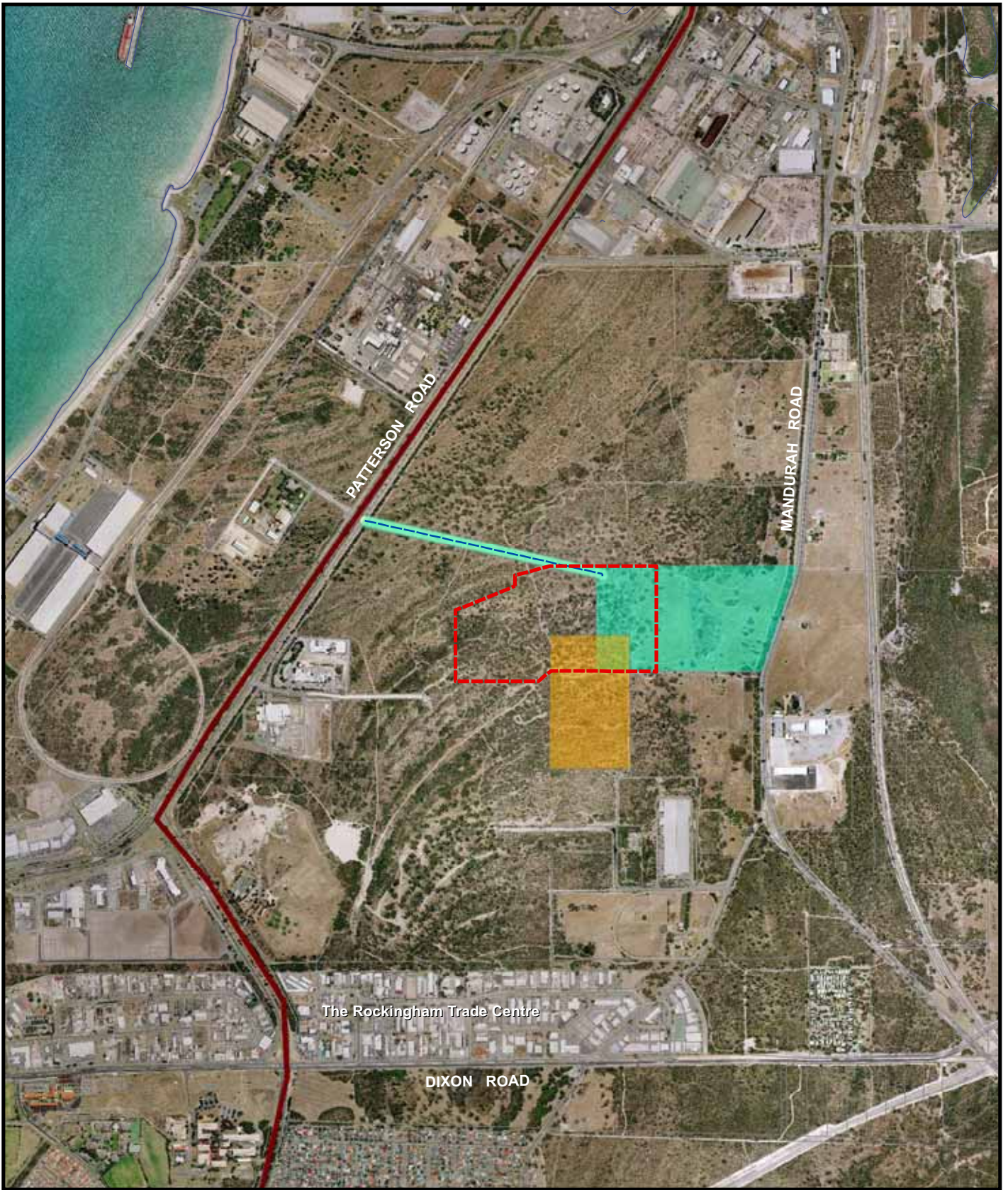
The final option, and the preferred site being proposed in this proposed action, was then established westward of Option B to minimise the odour impact on the private land, while still complying with the nine location principles (see *Figure 7*). The site is located outside the proposed conservation area but will involve clearing of the 30.85 Ha site in order to build the new WWTP (refer to *Figure 7*). Based on preliminary stakeholder communication this location is most likely to be accepted by the major stakeholders. The DPI, DEC, Fremantle Port Authority, DoIR, Minister for Water Resources and the Minister for Planning agreed that the ERWWTP is to be located at the currently proposed site within the IP14 area.

Conveyance Options

With the SDOOL and SDOO already established and to be utilised by the ERWWTP, the outlet pipeline required for the plant is relatively short and will cause minimal impacts. The route for the construction of the outlet conveyance pipeline was investigated to minimise environmental impacts. The preferred route was identified due to:

- The soil structure and type is the most suitable for the proposed infrastructure;
- The ground is accessible for the majority of the year, including during the wet season;
- No significant flora have been identified within the pipeline corridor (BEC, 2009); and,
- No heritage sites were found on the route.

The inlet pipeline for the proposed plant has not yet been finalised and consequently does not form part of this referral. Investigations are continuing to determine the best route to eliminate impacts on the environment, and will be finalised at a future date and subject to separate approval.



Legend

- Final Site Option (proposal site)
- Alternative Site Option A
- Alternative Site Option B
- Outlet Pipeline
- Outlet Buffer
- Main Road
- Cadastre

Client:	Water Corporation
Project:	East Rockingham WWTP EPBC
Drawing No:	0083144_06_GIS_EPBC Suffix No: R1
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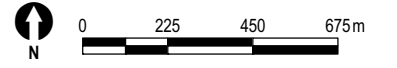


Figure 7
Alternative Site Selection Options

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Treated Wastewater Management

Options considered for the management of TWW at the ERWWTP are:

- Aquifer storage and recovery;
- Ocean outlet;
- Land disposal via infiltration;
- Irrigation of parks, ovals and recreation facilities such as a golf course; and,
- Irrigation of woodlots/horticulture/pasture.

Each option was carefully assessed by the Water Corporation against the key criteria including technical, public health, environment, social and financial.

A decision was made to use the ocean outlet for disposal of TWW for the following reasons:

- Ocean discharge of advanced secondary TWW is an acceptable and logical closure of the Water Cycle;
- Advanced secondary TWW is not sewage. The proposed discharge to the ocean via the SDOO will not be sewage, but highly TWW;
- The magnitude of scale of the ERWWTP (eventually 160ML/d) is such that there is not enough direct recycling on the WA Swan Coastal Plain to enable all wastewater to be recycled;
- Ocean discharge does not mitigate against large scale recycling (such as groundwater replenishment) in the future as technology, political and societal acceptance is garnered;
- All other recycling options (parks and gardens, industrial etc.) can only account for a small proportion of the total projected flows. The sites future recycling opportunities exist within the RIZ;
- Infiltration ponds were rejected as an option for disposal of TWW due to the uncertainty from modeling surrounding the fate and transport of nutrients to the near shore of Cockburn Sound;
- Ocean Discharge, at partial plant capacity (~ 30%), needs to be provided for reject water from a future Reverse Osmosis/Micro-Filtration (RO/MF) plant which may be used to provide the required water for groundwater replenishment;
- Ocean Discharge, at full plant capacity, needs to be provided for 'fail safe' management during shutdown of RO/MF plant and/or catastrophic power or process failure at the plant, to continue to take the sewage away from urban areas and continue to provide partial treatment and disposal; and,
- Even with future recycling of TWW, ocean outlet disposal is still required because it is the only option capable of sustainably managing the entire TWW flows during periods of low recycling demand, seasonal variability of inflows or recycling plant shut downs.

While ultimate recycling volumes are proposed to increase up to a maximum of 75% (120 ML/d) of the total volume of TWW (160 ML/d), it is important to recognise that, for the foreseeable future, there will always be a need for some form of ocean disposal for the recycling reject streams and also to 'overflow' TWW that cannot be recycled due to lack of demand (e.g. due to seasonal effects). The Water Corporation believes that ocean outlet is the most practical and environmentally responsible solution for the ERWWTP.

No Development Option

The Water Corporation is responsible for the collection, treatment and disposal of wastewater in WA. As Perth's population and infrastructure continues to grow so does the demand for wastewater infrastructure to service the growing community. The Rockingham and Kwinana regions are among the fastest growing in WA.

The ERWWTP is an important infrastructure project that will allow further growth in the South-West metropolitan corridor and ensure state-of-the-art wastewater services are provided for the community well into the future. *Figure 5* shows the sewer districts that will be serviced by the ERWWTP.

As well as increase demand, the current PPWWTP, which currently services some of the ERWWTP catchment, is close to capacity. The land upon which PPWWTP is sited is under development pressure from the DPI and City of Rockingham due to proposed Cape Peron recreational and conservation precinct and the Mangles Bay Marina in the area. The recent upgrade to 20 ML/d at the PPWWTP was approved by the DEC/EPA on the grounds that the WWTP will be decommissioned by 2015. Moreover, Point Peron is the only WWTP in WA that treats to a primary standard, hence producing a poor effluent quality. The EPA has a current objective to cease primary effluent discharge to the ocean before 2015.

As the TWW quality from the ERWWTP will be substantially better than from the PPWWTP (advanced secondary TWW versus primary TWW respectively), once PPWWTP is shut down and the ERWWTP is commissioned, the average daily load of nitrogen discharged to the ocean via the SDOO will be reduced, therefore minimising any potential impacts on the marine environment.

As the population in the South-West metropolitan corridor increases, resulting in increased volumes of wastewater, the Water Corporation will find it increasingly difficult to operate the existing PPWWTP effectively, within the current DEC conditions. Accordingly, a new WWTP is required for the City of Rockingham to accommodate the expected increases in wastewater volumes as population increase.

Therefore the Water Corporation believe that the 'no development option' is not considered a viable option to the City of Rockingham or the State of WA.

2.3 Context, planning framework and state/local government requirements

Rockingham Industrial Zone (RIZ) and Improvement Plan No.14 (IP14)

Situated approximately 35 km south of Perth and directly north east of Rockingham city centre, the RIZ, within which the ERWWTP is proposed, comprises approximately 1,150 Ha of mostly vacant land which is zoned for industry under both the State MRS and Local Town Planning Scheme (TPS). It is the only remaining land in WA, other than the Burrup Peninsula, which is zoned for heavy industry. The RIZ has direct access to sea transport, and has the necessary infrastructure in place to be developed immediately. As such, the RIZ is considered to be of significant strategic importance to the State.

The RIZ forms part of the Western Trade Coast, which is the collective term applied to five industrial precincts within the Kwinana-Rockingham coastal strip. The five precincts include the Australian Marine Complex (AMC), the Kwinana Industrial Area (KIA), the Latitude 32 Industry Zone, the RIZ and the Kwinana Quay outer harbour project.

East Rockingham was first earmarked for industrial activities more than 50 years ago as part of the Interim Development Order from the *Stephenson Hepburn Plan in 1956*. The envisaged zone was later confirmed in the first MRS Map in 1963.

Industrial zoning was reflected in subsequent iterations of the MRS.

Improvement Plan No.14 (referred to as IP14), was initiated in 1988 under the provisions the *Metropolitan Region Town Planning Scheme Act 1959* for the purpose of advancing the planning, development and use of the industrial land in East Rockingham.

IP14 was endorsed under the provisions of the then *Town Planning and Development Act 1928* and simply comprises boundaries identifying the area in which the Improvement Plan is to apply.

The WAPC has subsequently endorsed, on various occasions, strategic development plans and structure plans over this area including plans prepared in 1991 and 1996. A more recent plan was prepared in 1998 which has been used as a basis to consider planning applications within the IP14 area.

Separate to this referral for the ERWWTP, a SEA has been prepared by the WA State Government land and property development agency, LandCorp, for the RIZ to identify the environmental features of the area that require protection from development and to gain environmental approval for the development footprint outside this area.

The objective of the SEA is to determine an appropriate development footprint in which future industrial development can be located. The SEA also identifies the parts of the IP14 redevelopment area that have environmental values considered worthy of protection from future development.

Proposed Conservation Area

It is recognised that the IP14 area contains environmental features of regional significance. It is proposed to create a Conservation Area of approximately 76 Ha in the south-central portion of the IP14 area which will be protected from industrial development and set aside as a conservation reserve. This proposed Conservation Area takes into account the likely future impacts from development within the IP14 area, including those from the proposed ERWWTP.

The Conservation Area proposed in the SEA protects the following environmental values:

- the *Melaleuca huegelii* dominated vegetation on wetland soils with a limestone substrate to the west of the wool scouring plant;
- the largest wetland on the limestone marl;
- all areas of the Tuart (*Eucalyptus gomphocephala*) / *Melaleuca raphiophylla*) wetland vegetation;
- 28 Ha of *Very Good* condition Threatened Ecological Community (TEC), Floristic Community Type (FCT) 19 - 'Sedgelands in Holocene dune swales of the southern Swan Coastal Plain' (referred to from here on as TEC 19);
- the area of wetlands that is most likely to sustain TEC 19 under future climate conditions;
- vegetation largely in Good – Very Good condition (the highest condition rating in the SEA area);
- 14 of the 20 vegetation associations that occur in the SEA area;
- Seven complete and parts of four more of the 34 wetlands in the SEA area, all of which are Conservation Category wetlands; and,
- a large portion of the beach-ridge plain within the SEA area that provides evidence of the early formation of the Point Peron peninsula.

The proposed Conservation Area is also of sufficient size to be manageable, allowing for restriction of access and minimisation of weed infestation and vegetation degradation.

East Rockingham Wastewater Treatment Plant

Planning for the East Rockingham Waste Water Treatment Plant (ERWWTP) has been in train for 15 years. Five viable alternate sites, both within and outside the IP14 area were evaluated over the years, with social and/or environmental constraints predicating the shift to the current proposed location. This has resulted in significant State Government investment in planning and infrastructure, progressing in accordance with the *current plan*.

The ERWWTP is proposed to service a population of 700,000, including the City of Rockingham, North Mandurah, Kwinana, Baldivis, Karnup and Amarillo in the South-West corridor, and Byford-Mundijong in the South-East corridor. The plant is also required to service industrial development in the Western Trade Coast and the remainder of the RIZ. The ERWWTP is planned to be operational by 2015.

The ERWWTP would ultimately replace the PPWWTP, which is unsuitable for major upgrade and complement the KWWTP. The KWWTP is only able to service 70% of the existing zoned land (Urban and Urban Deferred) in Baldivis. Accordingly, the ERWWTP has been earmarked as the strategic long term WWTP to service the remaining southern corridors.

The locating of the ERWWTP within the RIZ presents several positive opportunities in line with the WA State's key drivers for the development of the area. These include potential clustering of industries with a high demand for by-products from the WWTP (water, heat, bio-mass) and the potential recharging of wetlands affected by a drying climate and declining groundwater levels within LandCorp's proposed Conservation Area with recycled water from the ERWWTP.

2.4 Environmental impact assessments under Commonwealth, state or territory legislation

Commonwealth legislative requirements

The proposal will be subject to a number of Commonwealth and WA State legislative requirements. The Commonwealth *EPBC Act* is the principal statute for the protection of MNES. Other relevant Commonwealth statutes and regulations include, but are not limited to:

- *Australian Heritage Council Act 2003*;
- *Quarantine Act 1908*;
- *Water Act 2007*;
- *National Greenhouse and Energy Reporting Act 2007*; and
- *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989*.

WA State legislative requirements

The ERWWTP will be constructed and operated entirely on the mainland within WA State owned land. The *EP Act* and its regulations are the principal statutes in WA that provide the tools for environmental protection. Other WA statutes that may be relevant to the proposed development include, but are not limited to:

- *Bush Fires Act 1954*;
- *Contaminated Sites Act 2003*;
- *Wildlife Conservation Act 1950*;
- *Conservation and Land Management Act 1984*;
- *Aboriginal Heritage Act 1972 and Regulations 1974*;
- *Dangerous Goods Safety Act 2004*;
- *Soil and Land Conservation Act 1945 and Regulations 1992*;
- *Agriculture and Related Resources Protection Act 1976*; and,
- *Health Act 1911*.

Wastewater treatment plants are classified as Prescribed Premises under Schedule 1 of the *WA Environmental Protection Regulations 1987*, being Category 54: Sewage facility, with a capacity of greater than 100 m³ per day. Accordingly, the WWTP will require a Works Approval prior to construction and an Operating Licence prior to commissioning under Part V of the *EP Act*, administered by the DEC. The ERWWTP cannot legally be built without a Works Approval and cannot operate without an Operating Licence from the DEC.

In addition to the above mentioned compulsory approvals, the Water Corporation will be voluntarily referring the proposal to the WA EPA under Part IV of the *EP Act*. The Water Corporation wish to seek an early indication of the level of assessment for the proposal to avoid the risk of substantial time delays later in the project

Similarly, the Water Corporation is seeking an early determination from DEWHA on whether this project constitutes a 'Controlled Action' under the *EPBC Act*. The Water Corporation's assessment undertaken to date include significant studies and consultation undertaken over the site and in conjunction with LandCorp in regards to the overall IP14 area. These studies and consultation have identified that this proposal is unlikely to have a significant impact on any MNES and therefore is not likely to constitute a 'Controlled Action.'

A summary of the actual and potential environmental approvals that the project must acquire prior to development is provided in *Table 6*, below.

Table 6: Actual and Potential Environmental Approvals for the East Rockingham WWTP

Legislation	Approval	Agency
Commonwealth		
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Approval from Federal Minister POTENTIALLY required if the Federal Minister determines the proposal will “significantly impact” on a MNES.	DEWHA (Canberra)
State Government (Western Australia)		
<i>Environmental Protection Act 1986</i> Part IV (Section 38)	Approval POTENTIALLY required from EPA and Minister for Environment to implement a proposal if the Minister determines the proposal is likely to have a significant effect on the environment.	EPA (WA) DEC (EPA Service Unit) DEC - Appropriate Regional Office
<i>Environmental Protection Act 1986</i> Part V	Approval (Clearing Permit) REQUIRED to clear native vegetation (assuming the proposal does not need a Part IV approval above). Approval (Works Approval) REQUIRED to construct a Prescribed Premises Approval (Licence) REQUIRED to operate a Prescribed Premises	DEC - Appropriate Regional Office DEC - Appropriate Regional Office DEC - Appropriate Regional Office
<i>Health Act 1911</i>	Approval POTENTIALLY required to recycle treated human effluent	DoH, Environmental Health Directorate
Local Government (City of Rockingham)		
Development Application	Approval POTENTIALLY required to construct WWTP in accordance with the Town Planning Scheme, Local Planning Policies and By-Laws if zoning and ownership matters not resolved prior to commencement of construction.	City of Rockingham

Consultation

The Water Corporation has already commenced preliminary consultation with stakeholders regarding the proposal.

Consultation has occurred as part of the Water Corporation’s wider communications strategy for infrastructure proposed for the south west metropolitan corridor, including the ERWWTP.

In addition to this, information is provided on the Water Corporation’s website and a dedicated email address is available (swmetro.wastewater@watercorporation.com.au) for members of the public to request more information, make a comment or arrange a briefing. The project has also been highlighted in the local media.

As part of its commitment to stakeholder and community consultation, the Water Corporation will maintain ongoing contact with stakeholders throughout the course of the project.

Continuing and future proposed activities include letters to stakeholders, one-on-one briefings, public meetings, shopping centre displays, a media campaign, an advertising campaign, community newsletters,

frequently asked questions documents and continuously updated website copy throughout the course of the project

A communication strategy has already been prepared for the proposal. The goal of this strategy is to secure support for and understanding from stakeholders, regulators and the community regarding the need for a new WWTP in East Rockingham.

Specific objectives include:

- To engage stakeholders, regulators and the community to secure acceptance and understanding of the wastewater planning and infrastructure initiatives in the southern metropolitan corridor in general, and the ERWWTP in particular;
- To ensure the community is aware of the social benefit of the new WWTP and associated works;
- To specifically engage with local residents to ensure their concerns, if any, about future plans, immediate upgrades and associated works are considered;
- To garner support from neighbouring industry for the project;
- To maintain key stakeholder confidence in the project; and,
- To demonstrate the Water Corporation's competency in careful and sensitive management of the environmental impacts of the proposed activities in the area to stakeholders.

The Water Corporation is undertaking a communications strategy to encourage debate and discussion on all issues associated with the ERWWTP to ensure that community concerns and attitudes can be addressed and an understanding of the necessity for and risks and benefits of the proposal is communicated. Communication tools will include, but not be limited to:

- Stakeholder Meetings;
- Briefings;
- Media statements;
- Shopping centre displays;
- Website; and,
- Q&A sheets.

The Water Corporation will also undertake a political education campaign with local MPs who represent the local community. Communications will include, but not be limited to:

- Briefing notes; and,
- One-on-one briefings.

The intention of Water Corporation's communications strategy is to highlight the benefits that the WWTP will bring for the local community and the environment, as well as helping the public understand and accept the need for the project. Recently a phone survey was conducted targeting a representative sample of the local community to determine the current level of understanding and knowledge of the proposal. At a later date the survey will be conducted again to determine the effectiveness of the communication procedure and to measure the level of awareness within the community.

A communications plan for the ERWWTP will be developed and implemented prior to and during construction.

At this stage, the main stakeholder groups identified for the proposal are:

- Members of Parliament;
- Local Government Authorities;
- Government Departments;

- Regulators;
- Environmental action groups;
- Residents associations and the wider public;
- Landowners on proposed pipeline routes;
- Media; and,
- Internal stakeholders (Executive, Regional Business Manager (RBM)).

In addition to consulting with government agencies, including DEWHA and the WA EPA, regarding the environmental approval process, a preliminary identification of relevant stakeholders that have and/or will be consulted are outlined in *Table 7* below:

Table 7: Key Identified Stakeholders

	National Government	State Government	Local Government	NGO
Identified Stakeholders	Department of the Environment, Water, Heritage and the Arts	Environmental Protection Authority	City of Rockingham	Conservation Council of Western Australia
	The Hon. Peter Garrett, Commonwealth Minister of the Environment, Water, Heritage and the Arts	Environmental Protection Authority Services Unit	Safety Bay Ward Councillors and residents	SDOOL Stakeholder Liaison Group
	The Hon. Gary Gray ALP (Commonwealth Member of Brand)	Department of Environment and Conservation	Cockburn Sound Management Council	Communities and Industries Forum (Rockingham and Kwinana)
		Department of State Development	Town of Kwinana	Port Kennedy Management Board
		Department of Health	City of Cockburn	General Public – Rockingham Community
		WA Planning Commission		Telstra
		Department of Planning and Infrastructure		Alinta Gas
		Department of Indigenous Affairs (DIA)		WA Maritime Museum
		Department of Water		Verve Energy
		Rockingham Regional Parks Community Advisory Group		Landcorp
		Department of Fisheries		South West Aboriginal Land and Sea Council
		Department of Transport		Kalla Boodja Aboriginal Corporation
		Main Roads WA		Noonghar Circle of Elders
		National Native Title Tribunal		Cockburn Sound Management Council
		The Hon. Donna Faragher MLC, Minister for the Environment		Kwinana Industries Council (KIC) and Community Industry Forum (CIF)
		The Hon. Dr Graham Jacobs MLA, Minister for Water		Wetlands Research Association
	The Hon. Dr Kim Hames MLA, Minister for Health		Waikiki, Warnbro, Hillman, Palm Beach,	

National Government	State Government	Local Government	NGO
			Secret Harbour, Kennedy Bay, Settlers Hills and Singleton Residents Associations
	The Hon Fran Logan MLA (Member for Cockburn)		Surfrider Foundation
	The Hon. Mark McGowan MLA, (Member for Rockingham)		Rockingham Lakes Regional Park Community Advisory Committee
	The Hon Peter Cook MLA, (Member for Kwinana)		Satterley's
			Mirvac Fini
			Conservation of Rockingham Environment (CORE)
			Naragebup Environment Centre
			Rockingham Regional Environment Centre
			East Rockingham Community Consultation Committee
			The West Australian
			Weekend Courier
			Sound Telegraph
			Landowners affected by proposed pipeline route

2.5 Consultation with Indigenous stakeholders

The Water Corporation has undertaken Aboriginal Heritage Surveys of the area around the site and corresponding outlet pipeline and SDOOL, see *Annex E*. A desktop study has also been undertaken, including a search of the DIA Register of Aboriginal sites online database. The results of the search concluded that no Aboriginal Heritage sites were located within the project area, see *Annex E*.

The Water Corporation have been in consultation with the DIA in regards to the proposed site and they have concluded that the site is owned in Freehold, and therefore, Native Title is wholly extinguished within the project area. Accordingly, there is no requirement on the Water Corporation to notify any Native Title parties, see *Annex F*.

In accordance with the preliminary PEMP, if artefacts are identified during construction, the proper authorities will be notified and construction stopped, see *Annex C*.

2.6 A staged development or component of a larger project

The ERWWTP is not part of a larger project. However, it is a significant proposal sited within IP14, which is subject to a SEA (submitted by LandCorp) in both the Commonwealth and State Environment jurisdictions.

It is also required as a direct result of other developments (urban and commercial) within the South-West metropolitan corridor of the greater Perth region. Those developments are as a result of increased population pressure and housing demand in the region, due to the opening up of access for development by the Perth-Bunbury Highway (a Commonwealth funded project) and the Perth-Mandurah commuter rail system.

The ERWWTP will be developed in four stages. Although the ERWWTP development will be staged in accordance with growth in demand, the Water Corporation is seeking approval for the proposed ultimate WWTP capacity of 160 ML/d. All descriptions, areas and impacts herein refer to the construction and operation of the final WWTP.

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

3.1 (a) World Heritage Properties

Description

The ERWWTP is **not** located in or adjacent to any World Heritage Areas.

Nature and extent of likely impact

The ERWWTP will **not** have an impact on any World Heritage properties.

3.1 (b) National Heritage Places

Description

No World, National or Commonwealth heritage places exist within the site.

However, two sites on the Register of the National Estate, classified as Historical Sites, are within close proximity to the proposal. These are Day Cottage, Day Rd, East Rockingham (Place ID: 10658) and Bell Cottage, Mandurah Rd, East Rockingham (Place ID: 10659).

Nature and extent of likely impact

No impacts to World, National or Commonwealth heritage places are expected from the development and operation of the ERWWTP.

3.1 (c) Wetlands of International Importance (declared RAMSAR wetlands)

Description

A search of the DEWHA Australian Wetlands Database and Protected Matters Database on the 21 April 2009 indicated that no RAMSAR wetlands or wetlands of international or national significance exist within the site.

However, the EPBC Protected Matters Database identifies the site as being within the same catchment as three RAMSAR wetlands; Becher Point Wetlands, Forrestdale and Thompson Lakes and Peel-Yalgorup System.

Nature and extent of likely impact

No impact is expected on RAMSAR wetlands as a result of this proposal as they are located approximately 13 km north-west and south of the site and the location of the ocean outfall is approximately 4.2 km offshore.

3.1 (d) Listed threatened species and ecological communities

A search of the DEWHA protected matters database was conducted on the 21 April 2009 to identify those threatened species and TECs that have previously been recorded within a 10 km radius of the ERWWTP. A search was conducted for the ERWWTP site, including the pipeline corridor connecting to the SDOOL. A total of two TECs, 34 threatened species and one conservation dependent species were identified as having been previously recorded within a 10 km radius of the ERWWTP. The complete protected matters searches are located in *Annex G*, while a table considering the likely presence of the threatened species identified from the protected matters search within the site and the vicinity of the pipeline corridor is provided in *Annex H*.

In addition to a protected matters database search, Level 1 and Level 2 flora (Bennet Environmental Consulting Pty Ltd (BEC)) and fauna (Greg Harewood) surveys were undertaken for the site during spring 2008 and early 2009 (see *Annex's I and J*).

BEC (2009) indicated that one TEC, TEC 19 - *Sedgeland in Holocene dune swales of the southern Swan Coastal Plain*, is present in the south-western section of the WWTP footprint (*Figure 8*). The TEC covers an area of approximately 2.2 Ha within the 30.85 Ha WWTP and pipeline corridor footprint (approximately 7% of the proposed footprint to be cleared). No flora species listed as threatened under the *EPBC Act* were recorded on site or were likely to rely on the resources within the site for survival.

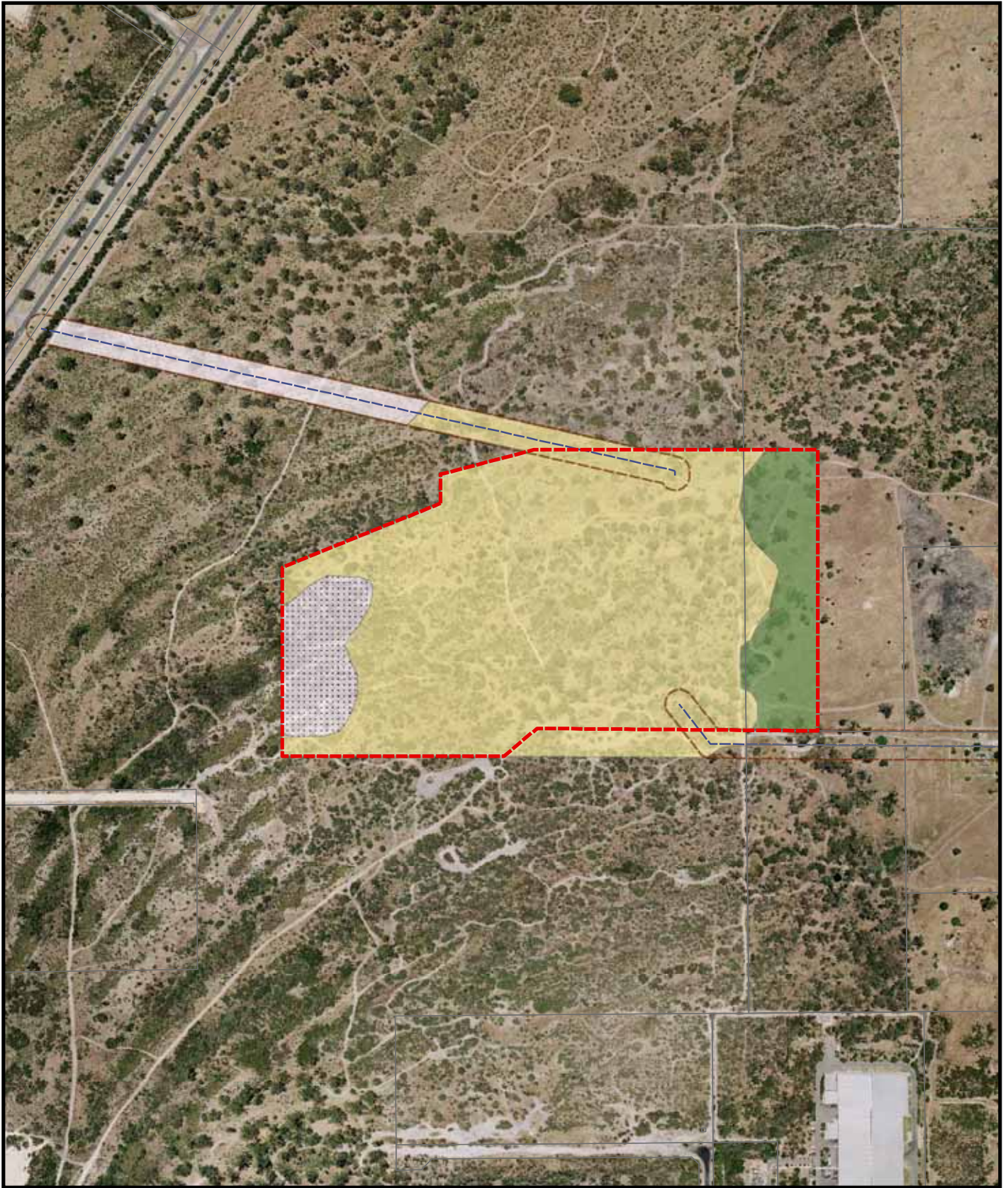
Clearing within the ERWWTP footprint will also require the removal of approximately 50 Tuarts (*Eucalyptus gomphocephala*) (R Johnstone, *pers com*). Of these, 5 are possibly habitat trees as identified by Greg Harewood (2009). The remaining are too small to be habitat trees currently but in the next 50 to 200 years have the potential to be so.

However, Harewood (2009) indicated that the site may provide only marginal foraging resources for the Endangered Carnaby's Cockatoo (*Calyptorhynchus latirostris*) and Vulnerable Baudin's Cockatoo (*Calyptorhynchus baudinii*) (*Annex J*). This is based on the known presence of the species within the area and the habitat potential of the site. The Water Corporation commissioned a more detailed Black Cockatoo habitat assessment which was undertaken at the site by Johnstone Ecological Consultants (JEC) in 2009.

The habitat assessment by JEC (2009) involved appraisal of the value of remnant vegetation in the proposed ERWWTP footprint (including the outlet pipeline corridor) to provide nesting, roosting and feeding sites for Carnaby's Cockatoo *Calyptorhynchus latirostris*, Baudin's Cockatoo *Calyptorhynchus baudinii* and Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*. The appraisal included:

- Inspection of all trees for signs of use by cockatoos e.g. wear around the hollows, chewing, scarring and scratch marks on trunks and branches;
- A search for any evidence of feeding, especially in areas with food plants e.g. Tuart *Eucalyptus gomphocephala*, Marri *Corymbia calophylla*, Dryandra and spikes of Balga *Xanthorrhoea preissii*, and for roost sites (evidence of droppings, feathers etc.); and,
- A search of the Storr-Johnstone Bird Data Bank for any relevant records of cockatoos in the East Rockingham region.

During the site visit no old or recent evidence of feeding, breeding or roosting by Carnaby's, Baudin's and Forest Red-tailed Black Cockatoos was found. The results of this survey are presented in more detail below (Terrestrial Fauna) with JEC's report to be found in full at *Annex K* (JEC, 2009).



Legend

- Site Boundary
 - Cadastral Information
 - Hydrography
 - Inlet Outlet
 - Inlet Outlet Buffer (20m)
- Vegetation Units
- Eg
 - Em
 - Xp
 - Xp (inferred area of TEC 19)

Client:	Water Corporation
Project:	East Rockingham WWTP EPBC
Drawing No:	0083144_09_GIS_EPBC Suffix No: R1
Date:	11/06/2009 Drawing size: A4
Drawn by:	DD Reviewed by: BC
Source:	-
Scale:	1:7500 @ A4

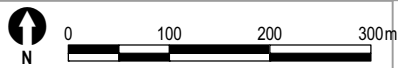


Figure 8
Vegetation Units

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Nature and extent of likely impact

Flora and fauna habitats located within the total 30.85 Ha footprint will be directly impacted from clearing activities associated with the proposed development of the ERWWTP. The 30.85 Ha footprint includes all areas to be disturbed, including construction laydown areas and the outlet pipeline corridor.

Of the species previously recorded within a 10 km radius of the site (see *Annexes H and J*) the following threatened species have been positively identified or considered likely to be located within or possibly frequent the site:

- TEC 19 - present within the South-West corner of the WWTP footprint;
- Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) - a possible but rare visitor to Swan Coastal Plain north of Harvey. There are no records of sightings of Baudin's Cockatoo in the Rockingham region; and,
- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) - small flocks (up to 50) have been recorded feeding on *Callistemon* in the East Rockingham region.

The impact of the proposal on the identified TEC 19 and Baudin's and Carnaby's Black Cockatoo is considered in the following section.

The remaining threatened species considered in *Annex H* were not considered as part of this assessment due to the lack of suitable habitat within the site.

Flora

Direct Impacts on TEC 19

Direct impacts on the TEC 19 will include vegetation clearance and modification associated with the ERWWTP and outlet pipe corridor. Based on the areas of TEC 19 identified during BEC's 2009 Level 2 Flora survey, approximately 2.2 Ha of the TEC would be cleared within the project footprint.

The TEC 19 on site has been described as *Very Good* (Vegetation structure altered, obvious signs of disturbance) to *Good* (Vegetation structure significantly altered by very obvious signs of multiple disturbances) by BEC (2009), though the TEC has been disturbed with tracks, rubbish and fire.

There is currently 116 Ha of the TEC 19 previously mapped on the Swan Coastal Plain by the DEC (Gibson, *et al.*, 1994). The Flora and Vegetation studies undertaken on behalf of the LandCorp for the IP14 area mapped a further 26 Ha not previously recorded, giving a total of 142 Ha on the Swan Coastal Plain (please refer to the LandCorp referral document). The development of the site would result in the clearing of 2.2 Ha of TEC 19, or approximately 1% of the TEC 19 on the Swan Coastal Plain. The proposal is therefore considered unlikely to result in a significant reduction in the extent or viability of TEC 19 within the Swan Coastal Plain.

Indirect Impacts on TEC 19

Indirect short and long term impacts on the TEC 19 as a result of the development of the ERWWTP include alterations to the surface hydrology and groundwater regime during development and ongoing operation of the ERWWTP. This in turn can lead to the expansion or contraction of plant community boundaries, changes in species composition, richness and diversity, a decline in overall plant health and loss of habitat for fauna species and may result in increases in weed species. In regards to this proposal, these impacts are not considered a significant impact with respect to MNES. Potential indirect impacts are discussed in more detail below.

Decrease in Groundwater Levels

TEC 19 is a groundwater dependant vegetation community. Indirect impacts on the TEC due to a decrease in groundwater levels may include de-watering of the root zone leading to debilitation or death of vegetation and a change in abundance and/ or composition of the plant community, particularly if the growth of certain native and exotic plant species is favoured by the changing conditions (for example, drier conditions may lead to an increased dominance of other species).

Groundwater modelling was undertaken by Umwelt (2008) to assess the impact of groundwater and topography on TEC 19 and other groundwater dependent floristic communities. Groundwater levels in the IP14 have shown a decline in water levels of approximately one metre since 1990, and could further decrease if rainfall levels continue to stay low as indicated by climate change predictions for the Perth area (Umwelt, 2008). Umwelt (2008) modelled the topography of the IP14 area and found that the wetlands to the south-east of the site had a lesser distance to the watertable than those to the north of the site. Using established root depths for species within the wetlands (including TEC 19), Umwelt (2008) predicted that TEC 19 requires water levels within 1.8 - 1.9m of the ground surface during the dry months of the year to survive. Umwelt (2008) considered that the wetlands to the south-east of the site could be sustainable in the future, whereas other wetlands are not likely to survive in their current condition. As such, areas of TEC 19 within the site and to the north of the site were considered unlikely to survive in the long-term (See *Annex L*, Figure 4.6).

Wetlands within the IP14 area are groundwater dependant rather than perched wetlands. As a result of this, low groundwater levels are likely to see the wetland vegetation, including TEC 19, change from wetland to dryland vegetation. Therefore, the sustainability of the wetlands within the IP14 area, including the site, is thus directly related to the survival of TEC 19 within the IP14 area.

Accordingly, LandCorp has proposed that an area to the direct south of the WWTP site be conserved (see *Figure 9*). This area is considered by Umwelt (2008) as an area in which current groundwater trends will sustain TEC 19 in the long-term. The proposed conservation area contains 76 Ha of native vegetation, including approximately 28 Ha of *Very Good* (Vegetation structure altered, obvious signs of disturbance) condition TEC 19. The proposed conservation area will contain approximately 20% of the total amount of TEC 19 within the Swan Coastal plain. The wetlands within the proposed conservation area have the least distance to the groundwater. As such, the groundwater dependant vegetation has the highest potential to survive in its current form as TEC 19.

With LandCorp retaining the proposed conservation area, this will ensure that the areas of TEC 19 in the proposed Conservation Area will be preserved into the future. Also, the enhancement and protection of approximately 20% of the know TEC 19 on the Swan Coastal Plain within the proposed conservation reserve will allow for the preservation and protection of the TEC 19 within the locality.

However, should DEWHA disagree with the Water Corporation's assessment of the low significance of impact on the TEC 19, the Water Corporation will contribute to the enhancement of the TEC 19 within the proposed conservation area at a 4:1 ratio (four plantings of relevant species for each plant of inferred TEC 19 cleared) for the TECs removed within the ERWWTP site⁴. Other appropriate management commitments for flora and vegetation at the site are presented in *Section 4*.

Dewatering of the site

The proposed development of the ERWWTP will require dewatering of the site during construction resulting in water drawdown in and around the site. In particular, areas (including some wetlands, see *Annex L*, Figure 1.2) within 200m of the site boundary will be subject to expected maximum drawdown of approximately 0.4 to 1m without groundwater recharge. With ground water recharge, maximum drawdown will vary between -0.1 to 0.6m. This is within the natural seasonal variation of the groundwater under the site (ERM, 2008). For further detail refer to *Annex M*.

Telfer and Mensforth (1997, cited by McEwan, Davies, Walker and Cox 2002) suggest that both the rate of groundwater drawdown and the maximum and minimum groundwater depth are important in maintaining vegetation health. The removal of groundwater from the root zone may cause debilitation or death of vegetation.

As part of the Level 2 Flora survey the potential affects of the modelled dewatering on any groundwater dependent taxa or vegetation communities, in particular, TEC 19, was assessed. BEC (2009) concluded that the drawdown at the site and the impacts on the surrounding areas (outside of the site) is minimal and should not cause any impacts on the vegetation at the site, including those species associated with permanent water sources, such as *Melaleuca rhaphiophylla* and *Banksia littoralis*. (BEC, 2009).

⁴ Successful establishment of communities has never been undertaken and as such, the Water Corporation will be planting species representative of the communities for enhancement at a 4:1 ratio.



Legend

- Site Boundary
- Outlet Pipeline
- Outlet Buffer
- Proposed Conservation Area
- IP14 Boundary
- Cadastre

Client:	Water Corporation
Project:	East Rockingham WWTP EPBC
Drawing No:	0083144_11_GIS_EPBC Suffix No: R1
Date:	11/06/2009 Drawing size: A4
Drawn by:	DD Reviewed by: BC
Source:	-
Scale:	1:20 000 @ A4

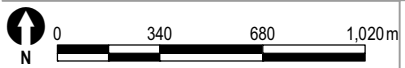


Figure 9
Proposed LandCorp Conservation Reserve within IP14

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With dewatered water proposed to be recharged, minimising the impact of dewatering to within the natural range of variation within the aquifer, it is not expected that dewatering activities will have a significant impact on the areas of TEC 19 outside of the site or other areas of vegetation within or in close proximity to the site.

Alterations to Surface Hydrology

Native vegetation communities and individual plant species are adapted to particular surface hydrological regimes. For example, the duration, frequency and depth of inundation can have a significant effect on species composition and biomass of establishing plants (Seabloom *et al* 1999, cited in Casanova & Brock 2000). Alteration of these regimes can lead to significant changes in plant species assemblages (Pressey & Middleton 1982; Middleton *et al.* 1985; Pressey 1989). In particular, changes in surface hydrological regimes can eliminate some species or vegetation communities whilst favouring the growth of others (van der Valk 1994).

Despite the potential for increased surface flows within the site, the hydraulic modelling at the site (ERM, 2008) suggests that it is unlikely that there will be any considerable increase in surface flooding at the site (see *Section 3.3* below and *Annex M*), or in wetland systems and swales in close proximity to the site.

Terrestrial Fauna

Fauna surveys of the site were undertaken by Greg Harewood in September 2008 (Level 1) and March 2009 (Level 2), see *Annex J* for the full reports.

Baudin's and Carnaby's Black Cockatoos

As part of the Level 2 Fauna survey, Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) and Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) were assessed against DEWHA's series of Significant Impact Guidelines (DEH, 2006). Based on the significant impact criteria for endangered and vulnerable species, both the Baudin's Black Cockatoo or Carnaby's Black Cockatoo are considered unlikely to be significantly impacted by the proposed development, (see *Annex J (Section 6.1)* and *Annex K*).

As well as the Level 2 fauna survey undertaken by Greg Harewood, a specific Black Cockatoo survey was also conducted by R.E. & C. Johnstone and T. Kirkby of JEC on 3 April 2009 (JEC, 2009), (See *Annex K*). During the site visit no old or recent evidence of feeding, breeding or roosting by cockatoos was found. Overall both Harewood and JEC believe that the clearing of vegetation from the site would not cause significant impact on the availability of feeding, breeding and roosting habitat for black cockatoos or cause any decline in local populations.

The clearing of the project area would also not impact on the local availability or quality of feeding habitat and would not adversely affect habitat critical to the survival of Carnaby's Cockatoo, Baudin's Cockatoo or the Forest Red-tailed Black Cockatoo in the region or lead to a decrease in the size of the population (Johnstone, 2009). Clearing will however necessitate the removal of approximately 50 Tuarts *Eucalyptus gomphocephala* (R Johnstone, *pers com*) within the site. Of these, 5 are potential habitat trees as identified by Greg Harewood (2009). The remaining are too small to be habitat trees currently but in the next 50 to 200 years have the potential to be so

The Harewood (2009) and JEC (2009) surveys indicated that no breeding is taking place on site, with no breeding sites identified in either of the surveys. It is considered very unlikely that any one tree would develop a hollow that will in the future be used by a black cockatoo for breeding at the site (Harewood, 2009). There are many prerequisites for a suitable hollow for black cockatoos. They need to be:

- in the right area (i.e. within the breeding area);
- in the right tree species; and,
- have suitable dimensions (entrance, depth and floor space etc.).

The existence of a suitable hollow (even within the breeding area) does not necessarily make it available for breeding. Hollows must be spatially, structurally and temporally correct (Johnstone & Johnstone 2004). Therefore while it is possible that suitable trees on the site could develop large hollows, the probability that any one would ever be suitable for use by breeding cockatoos is considered to be very low (Harewood, 2009).

While cockatoos (mainly Carnaby's) are known to frequent the general area, evidence gathered during the Level 2 fauna and the Black Cockatoo surveys suggests they are not being specifically attracted to the site and that the vegetation onsite cannot be regarded as representing habitat critical to the survival of either species.

It is therefore considered that the proposed development of the site is unlikely lead to significant impacts on the Carnaby's or Baudin's Black Cockatoo and that the development is unlikely to cause:

- a decrease in the size of the Carnaby's or Baudin's Black Cockatoo population;
- a significant reduction in the area of occupancy by Carnaby's or Baudin's Cockatoo population;
- fragmentation of any existing black cockatoo populations;
- significant modification, destruction, removal, isolation or decrease in the availability or quality of habitat to the extent that either cockatoo species is likely to decline ;
- an invasive species that is harmful to cockatoos becoming established on the site or in the vicinity;
- introduction of a disease that may cause cockatoos to decline; or,
- interference with the recovery of either Cockatoo species.

However, the Water Corporation recognises DEWHA's position on the desirability of open woodlands of *Eucalyptus gomphocephala* (Tuart) that require clearing to be replaced to provide for potential Black Cockatoo habitat in the future. Should DEWHA disagree with the Water Corporation's assessment of the low significance of impact of this proposal on the Black Cockatoo's, the Water Corporation will contribute to enhancing the ecological value of the IP14 site, LandCorp's proposed Conservation Area and/ or the wider local vicinity through the planting and densification and management of Tuart stands at a planting ratio of 4:1 (i.e 200 *E. gomphocephala* planted for 50 taken).

Marine Fauna

No construction activities will be undertaken in the marine environment as part of this proposal. Discharge from the ERWWTP will be through the existing SDOO and in compliance with set Ministerial conditions for the SDOO. Impacts upon the marine threatened species listed in *Annex H* were therefore not assessed. The design and operation of the ERWWTP will ensure TWW meets quality standards as stipulated in the existing WA Ministerial approval conditions (see *Annex D*) and extensive monitoring and management of this outfall since 1996 demonstrates no adverse impacts upon marine habitat. (See details of the Perth Long-term Ocean Outlet Monitoring (PLOOM) program in Section 3.3(f) and *Annex N*)

The monitoring and management measures that are currently in place for the SDOO (see *Annex O*) will continue to be utilised to enable the mitigation of impacts on the local marine environment and threatened species listed in *Annex H*.

Based on the TWW being discharged from the ERWWTP complying with the Ministerial conditions set and the utilisation of two management and monitoring programs, it is considered unlikely that any of the species listed in *Annex H* will be significantly impacted by the development of the site or the potential increased inflows of the SDOO.

3.1 (e) Listed migratory species

Description

A search of the DEWHA protected matters database was conducted on the 21 April 2009 to identify those migratory species that have previously been recorded within a 10 km radius of the site and the SDOO. A total 31 migratory species were identified, with two terrestrial birds, four wetland birds, 13 marine birds, eight mammals, two reptiles and two sharks having previously been recorded within a 10 km radius of the site and the SDOO. The complete protected matters searches are located in *Annex G*, while a table considering the likely presence of the migratory species identified from the protected matters search within the site and the vicinity of the SDOO is provided in *Annex P*.

From the fauna studies undertaken at the site, Harewood (2009) observed and recorded a small flock of Rainbow Bee-eater (*Merops ornatus*) (Marine; Migratory (JAMBA)) foraging at the site.

The site was also considered to provide foraging resources for an additional four Migratory bird species (Great Egret (*Ardea alba*); Cattle Egret (*Ardea ibis*); White-bellies Sea Eagle (*Haliaeetus leucogaster*); and, the Fork-tailed Swift (*Apus pacificus*) (Harewood, 2009). The impact of the proposal on these species is considered in *Annex P* and discussed below. The remaining bird and marine migratory species were considered unlikely to be impacted by the proposal owing to the absence of preferred habitat at the site and that TWW emitted within the current Ministerial approved conditions (see *Annex D*) from the SDOO is unlikely to affect habitat quality for those marine species under consideration.

Nature and extent of likely impact

Rainbow Bee-eater

The Rainbow Bee-eater was recorded within the site and it is likely that the species utilises the site as part of a suite of habitat resources within the local area (Harewood, 2009). It is considered that the Rainbow Bee-eater may potentially use some earthen banks in the general area of the site for tunnel construction/breeding, though no evidence of tunnel construction/breeding was observed within the site (Harewood, 2009).

The proposal would result in the removal of approximately 30.85 Ha of potential foraging habitat. This is unlikely to be considered significant given the presence of additional foraging habitats within the local area and the mobile nature of the species.

Other Listed Migratory Species

Of the other migratory species listed within *Annex P*, the species that can be assumed likely to utilise the study area for some purpose at times were identified as follows (Greg Harewood, 2009):

- Great Egret (*Ardea alba*) – Migratory;
- Cattle Egret (*Ardea ibis*) – Migratory;
- Fork-tailed Swift (*Apus pacificus*) – Migratory; and,
- White-bellied Sea-Eagle (*Haliaeetus leucogaster*) – Migratory.

As part of the Level 2 Fauna survey, the above migratory species identified by Harewood (2009) were assessed against DEWHA's series of Significant Impact Guidelines (DEH, 2006). Based on the significant impact criteria for migratory species, none of the identified species are likely to be significantly impacted by the proposed development, (see *Annex J, Section 6.2* for more details).

The above species identified by Harewood (2009) are not considered to be frequent visitors, nor are they expected to utilise or rely on the site for breeding or feeding (Harewood, 2009).

Both the Great Egret and Cattle Egret may infrequently visit pasture areas within the site during wetter months of year, however they are considered unlikely to breed on site (Harewood, 2009). The White-bellied Sea Eagle may fly over the site occasionally due to proximity to ocean and lakes, but the probability that the White-bellied Sea Eagle would use the site for any other purpose is considered to be low. No existing or potential nest sites were observed during the fauna surveys (Harewood, 2009). The Fork-tailed Swift is potentially an occasional summer visitor to the site, but it is unlikely that the proposal would significantly reduce habitat availability within the area (Harewood, 2009).

The site does not represent important habitat of any of the migratory species listed in *Annex P*. Harewood (2009) concluded that:

- surveys at the site found no important habitat available for any of the migratory species listed as potentially utilising the site; and,
- the site or adjoining areas do not support a significant proportion of the population of any migratory species for foraging, habitat or breeding, at any time of the year.

Based on this information it is considered unlikely that any of the migratory species listed in *Annex P* will be significantly impacted by the development and activities of the site.

3.1 (f) Commonwealth marine area

Description

Not Applicable

Nature and extent of likely impact

The proposal will **not** have an impact on any Commonwealth marine areas.

3.1 (g) Commonwealth land

Description

Not Applicable

Nature and extent of likely impact

The proposal will **not** impact on any Commonwealth land.

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, or actions taken on Commonwealth land

3.2 (a)	Is the proposed action a nuclear action?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (b)	Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (c)	Is the proposed action to be taken in a Commonwealth marine area?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))

3.2 (d)	Is the proposed action to be taken on Commonwealth land?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))

3.3 Other important features of the environment

3.3 (a) Soil and vegetation characteristics

Soil

The RIZ (IP14), upon which the proposal lies within, forms part of the coastal fringe of the Swan Coastal Plain and is situated on the Rockingham-Becher Plain to the north of Lake Coo loongup (Woodman, 2003). This extends from north of Rockingham to south of Mandurah. The Becher Plain is a sub unit of the Quindalup Dune System, and consists of a series of parallel coastal Holocene dunes and ridges with overlying damp lands. Soils of the Quindalup Complex primarily consists of calcareous sands with varying amounts of quartz and minor amounts of feldspar (Beard, 1981, Churchward & McArthur, 1980).

The East Rockingham area has a generalised geomorphology of relic plains and Quindalup Dunes. The generalised surface geology is Safety Bay Sand, which unconformably overlies Tamala Limestone (Davidson, 1995). Regional environmental geology mapping presented in Gozzard (1983) indicates Tamala Limestone is at a depth of about 15m below natural surface of the site.

Detailed regional geology and geological observations from the site can be found in *Annex M*, with details of geomorphology and topography of the IP14 area found in *Annex L*.

Vegetation

Level 1 and Level 2 Flora and Vegetation surveys have been conducted by BEC over the site in 2008 and 2009, including the outlet pipeline corridor, see *Annex I*. Two other Flora and Vegetation surveys were also conducted in the immediate vicinity of the site, generally to the east, in 2006 by Maunsell-Aecom Australia, (Maunsell-Aecom, 2006a and 2006b).

From the flora surveys undertaken by BEC in 2008/9, three vegetation units were inferred to be located within the site (*Annex I*). The three vegetation units inferred to occur and observed at the site are:

1. Woodland of *Eucalyptus gomphocephala* over mixed shrubs in sand;
2. Low Woodland A of *Eucalyptus gomphocephala* and *Melaleuca raphiophylla* over Scrub of *Acacia saligna*, *Banksia littoralis* and *Melaleuca huegelii* subsp. *huegelii* over weeds. Within this vegetation unit there were occasional pockets of lower lying areas where the vegetation was a Low Woodland A of *Melaleuca raphiophylla* over Open Tall Sedges dominated by *Gahnia trifida*; and,
3. Dense Thicket of *Xanthorrhoea preissii* over weeds.

The above vegetation units were also observed outside the Water Corporation site during BEC's survey in January 2009. This indicates that no vegetation community is restricted solely to the proposed development area.

Following a PATN analysis undertaken by BEC (2009), see *Annex I*, four floristic community types (Gibson et al., 1994) were inferred to be located within the site. However, due to the high level of disturbance at the site, these must be regarded as indicative only. The four inferred floristic community types are (BEC, 2009):

- FCT17 - *Melaleuca raphiophylla* - *Gahnia trifida* seasonal wetlands;
- FCT19 - Sedgelands in Halocene dune swales (TEC 19);
- FCT 24 - Northern Spearwood shrublands and woodlands; and,
- FCT30a - *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands.

Of the four inferred floristic communities listed above, one, TEC 19, is listed as an endangered TEC listed under the *EPBC Act* (DEWHA, 2009), see *Section 3.1(d)*.

The vegetation condition within the site varied between good and degraded with some areas completely degraded. Generally there is a high cover of weeds throughout the site (BEC, 2009), with the infestation of eight weeds at the site rated as High (ability to invade bushland/weed is prioritised for control and/or research) by the Environmental Weed Strategy for Western Australia 1999 (CALM, 1999).

Many tracks were observed throughout the site, as well as rubbish, including burnt out car bodies. Due to this disturbance of the vegetation at the site, the conclusion reached as to the FCT's present must be taken as indicative (inferred) only (BEC, 2009).

As well the high degree of disturbance across the site, the area where TEC 19 is located within the site was identified as have being partially burnt in the period between the September 2008 and January 2009 surveys (BEC, 2009).

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

A Hydrogeological and Hydrological investigation of the site was undertaken by Environmental Resources Management Australia (ERM) in December 2008. The investigation assessed the potential impacts of the development on the surrounding groundwater and hydrological environments, including the wetlands in the vicinity of the site. The key findings of the study are described below, while the full report can be found in *Annex M*.

Hydrogeology

The site is located on limestone and calcrete geology with a hydrogeology of surficial sediments and shallow aquifers.

Water at the site was encountered at depths of approximately 3 m below ground surface (bgs). This suggests the presence of a potential uniform, unconfined aquifer system within the Becher Sand, which is likely to extend to the base of the sand deposits at approximately 13.2 m bgs. Due to a lack of a confining zone at the base of this aquifer system, the aquifer system is likely to be in hydraulic connection with the underlying Tamala Limestone aquifer system (ERM, 2008).

The salinity of the shallow groundwater in the vicinity of the site is estimated at between 1,000 - 1,500 mg/L, which is considered marginal to brackish.

Hydraulic conductivities vary considerably within the Safety Bay Sand, ranging from 18.6 to 31.4 m/day. These values suggest that hydraulic conductivities are relatively consistent across the site and are at the lower end of the regional ranges reported for the Safety Bay Sand of between 5 - 175 m/day (ERM, 2008).

Groundwater flow within the aquifer is generally towards the coastline, with flow direction to the northwest across the site and a hydraulic gradient of about 0.00013 (ERM, 2008). Studies showed the unconfined groundwater level below the site varies between 1.271 m AHD in the west to 1.364 m AHD in the east, indicating the water table is generally in the order of 1.3 m AHD below the existing surface (ERM, 2008).

Assuming an annual average infiltration rate of between 10 and 20% of total annual average rainfall and given a site area of approximately 278,000 m², it is estimated that annual average infiltration recharge to the groundwater system within the site boundary is likely to approximate between 59 and 119 m³/day or 21,680 and 43,370 m³/year (ERM, 2008).

Surface Water/ Runoff

Run-off from the site is likely to increase due to development and increase in hardstand areas. It is estimated that maximum run-off will increase from approximately 16,330 m³/day to 61,084 m³/day with an average annual increase from 5,670 m³/year to 178,530 m³/year (ERM 2008).

It is likely that under natural conditions this surface run-off infiltrates into the underlying groundwater system at the site, with heavy flows potentially accumulating in swales and wetland systems in the vicinity of the site. With higher flows, significantly higher volumes of run-off will be generated in the vicinity of the site, potentially resulting in significantly increased of surface water flows into the wetland systems and swales, potentially causing surface flooding. However, on analysis of the topography of the site and surrounding area, the absence of any drainage channels coupled with the permeable geology of the area suggests that even the heaviest of rainfall will infiltrate. A surface water management plan has been developed as part of the WMP and will be initiated to ensure that any run-off discharge to surrounding wetland systems is of suitable water quality and water volumes.

After development of the WWTP there is likely to be a reduction in groundwater recharge to the aquifer system under the site of up to 34,700 m³/year, which corresponds to a 0.05 m reduction in groundwater elevations beneath the site. Given seasonal groundwater elevation fluctuations approximate 0.6 to 1 m this drawdown is not considered to be significant (ERM, 2008). Also, with the implementation of drainage on the site being sent to soak wells and/or infiltration basins/sumps, it is likely that a lot of this water will still infiltrate to the aquifer, thereby limiting any potential impacts associated with the hardstand areas of the plant.

Dewatering of the Site during Construction

During construction dewatering, the drawdown cones created are likely to extend to wetland systems to the south and west of the site. The maximum simulated drawdown without any groundwater recharge is expected to be approximately 0.4 to 1.0m and with groundwater recharge it is expected to be between -0.1 to 0.6m (see *Annex M*). This is considered to be a negligible impact given that the thickness of the aquifer system in this area approximates 12 m and that seasonal fluctuation in groundwater elevations in the area vary between an approximate 0.6 and 1 m. Therefore, provided that dewatering maintains groundwater elevations within the expected maximum and minimums, it is not anticipated that there will be any adverse impacts to surrounding wetland systems (ERM, 2008) or associated vegetation and taxa.

The Water Corporation will mitigate the potential impacts described above by recharging the dewatered groundwater. This practice falls in line with the DoW's preferred dewatered water disposal methods. An example of the potential impact cones of dewatering when coupled with recharge at the site is shown in (see Figure 14 in *Annex M*).

As well as mitigating impacts of dewatering, recharge of dewatered water is also the preferred option because there appears to be no significant drainage networks in the area to discharge dewatered groundwater. Also, discharge to conservation wetlands is generally not endorsed by the DoW.

Modelling of dewatering at the site also suggest that the dewatering is unlikely to induce seawater intrusion or impact on any potential acid sulphate soil generation on site.

Further assessment of dewatering well layouts will be investigated before construction and incorporated into the Site Water Management Plan (WMP) to potentially lower dewatering rates and further avoid impacts to surrounding groundwater users and wetland systems and associated TEC's.

A groundwater and dewatering management plan will also be implemented to ensure that contaminants are not introduced to the construction pit and/or recharge trenches during construction activities. A groundwater monitoring network will also be implemented during dewatering to ensure that variations outside expected maximum and minimums groundwater elevations did not occur. These plans are incorporated as part of the WMP presented in *Annex Q*

Wetlands

The site has no permanent surface water features present, with rainfall mostly infiltrating directly into the underlying sand deposits. A number of swales exist between old dune crests within the remnant Holocene dune system which makes up part of the site and the surrounding IP14 area. Many of these swales become waterlogged in the wet months of year as the water table approaches the ground surface, and dry out in dry months of the year, see *Annex L*, Figure 1.2 (Umwelt, 2008).

A search of the DEC Wetland Base Database, the Geomorphic Wetlands Swan Coastal Plain dataset, Wetland of the Swan Coastal Plain (Hill et al. 1996) and the current WA Land Information Service (WALIS) Geomorphic Wetlands dataset all identified a number of wetlands within close proximity to the site. Seven wetlands are mapped in an area up to 1 km south east of the site, with the closest approximately 450m to the south. All seven wetlands are mapped as sumplands (A basin type of wetland that has water above-ground for some part of the year) with a management category of Conservation due primarily to the presence of TEC 19. None of the wetlands in the area are protected by the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992*.

Wetlands in the vicinity of the site are groundwater dependent, rather than perched wetlands, relying on rainfall or surface runoff. Groundwater levels in the IP14 have had a decline in water levels of approximately one metre since 1990 and could further decrease if rainfall levels continue to stay low as predicted by climate change predictions for the Perth area. As a result, the impact of the proposed ERWWTP on groundwater levels and quality are important considerations (Umwelt, 2008).

Modelling of the groundwater undertaken by Umwelt in 2008 in the region of the IP14 Area, and the site, shows a decline in groundwater levels of approximately one metre since 1990. Umwelt (2008) modelled the topography of the IP14 area and found that the wetlands to the south-east of the site had a shallower distance to the watertable than those in the north of the site. Using established root depths for species within the wetlands, Umwelt (2008) predicted that the wetland vegetation needs to be sustained by water levels within 1.8 - 1.9m bgs during the dry months of the year. Based on their analysis, it was considered that the wetlands in to the south-east of the site could be sustainable in the future, whereas other wetlands to the north of the site are not likely to survive in their current condition (see *Annex L*, Figure 4.6). The LandCorp proposed Conservation reserve boundary contains the area of highest potential for sustainable wetlands, see *Figure 9*.

The sustainability of the wetlands within the area of the site is also directly related to the survival of the TEC 19. LandCorp's proposed designated conservation area has been delineated from Umwelt (2008) modelling as being the area in which current groundwater trends will sustain TEC 19 longer into the future. The wetlands within the proposed conservation area have the shallowest distance to the groundwater, thus the groundwater dependant vegetation has the highest potential to survive in its current form as TEC 19.

As the wetlands within the IP14 area are determined to be the result of groundwater levels, and not perched, continuing low levels are likely to see the wetland vegetation, including TEC 19, change from wetland to dryland, thereby causing the deterioration of the groundwater dependant TEC 19. By retaining the proposed conservation area and maintaining the groundwater in the area, this will ensure that the areas of TEC 19 in the proposed Conservation Area will be preserved into the future.

3.3 (c) Outstanding natural features, including caves

There are no outstanding natural features on the site or outlet pipeline corridor.

3.3 (d) Gradient

The topography of the site is generally flat but in parts contains a series of parallel shallow swales and low ridges. Based on the 2m contours as presented in the online Western Australian Wetland Database (WAWD), the topography of the site is characterised by gentle undulations, ranging between 2 and 8 m AHD (*Figure 10*). The dune swale areas in the vicinity of the site vary from 3 - 4m AHD with dune ridges generally at 5 - 6m AHD.

3.3 (e) Buildings or other infrastructure

The site is currently a greenfield site with no significant infrastructure.

There are currently no access roads to the site; however an access road will be developed along the present Chesterfield road off Mandurah Rd to the east of the site in conjunction with the City of Rockingham

Land surrounding the site is currently zoned for industrial purposes, with no developments or operations abutting the site. A number of industrial facilities are located within close proximity, with Australian Fused Metals and Chemeq Ltd located approximately 400m to the west and Jandakot Wool Washing located approximately 500m to the south east of the site.



- Legend**
- Site Boundary
 - Outlet Pipeline
 - Outlet Buffer
 - Cadastre
 - Contours (5 metre interval)

Client:	Water Corporation
Project:	East Rockingham WWTP EPBC
Drawing No:	0083144_08_GIS_EPBC Suffix No: R1
Date:	11/06/2009 Drawing size: A4
Drawn by:	DD Reviewed by: BC
Source:	-
Scale:	1:20 000 @ A4

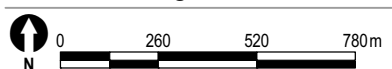


Figure 10
Topography

Environmental Resources Management Australia Pty Ltd
6th Floor, 172 St Georges Tce, Perth, WA, 6000
Telephone +61 9 321 5200



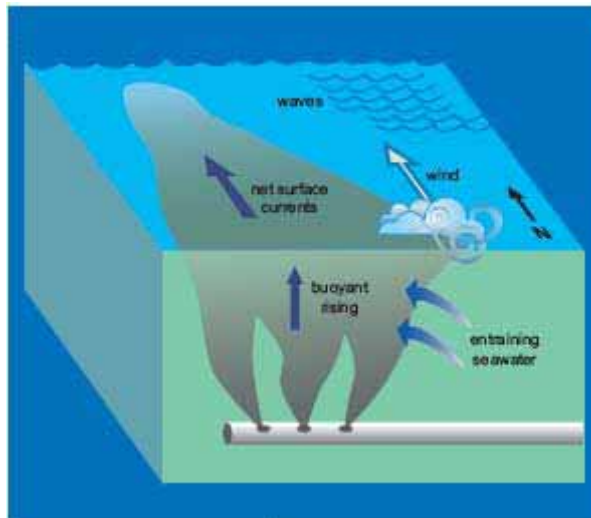
3.3 (f) Marine areas

No construction activities will be undertaken in the marine environment as part of this proposal. Discharge from the ERWWTP will be through the existing SDOO.

However, the ERWWTP will require connection to SDOOL which passes the western boundary of the IP14 site along Patterson Road. The SDOOL is currently being utilised to convey TWW from the WPWWTP, PPWWTP, MIEX resin regenerant, Jervoise Bay Groundwater Recovery Program, KWRP and selected industrial waste streams from within the KIA to the SDOO diffuser approximately 4.2km from shore and into the Sepia Depression at 20m depth (refer to *Figure 6*). All TWW discharged from the ERWWTP, minus any TWW recycled where possible, will also be discharged into the Sepia Depression in accordance with existing Ministerial and licence conditions.

The SDOO diffuser is designed to ensure maximum dilution for the volume of wastewater discharged (see *Figure 11* below).

Figure 11 – Plume Dilution Process



The majority of dilution from the SDOO occurs within minutes of discharge because TWW is significantly less salty than seawater and therefore less dense. The advantage of WA's climate of strong winds and open ocean waves is that rapid 'flushing' occurs at the SDOO, and PLOOM studies to date have found that there is no excessive build up of nutrients or contaminants around the outlet as a result of discharge of TWW. Impacts are considered minor as the minimum initial dilution from the SDOO is typically greater than 200-fold.

Also, the 20m depth of the outlet leads to low light, which generally inhibits benthic plant growth. The benthic habitat of the area is dominated by bare sand (*Annex N*).

The potential environmental impacts associated with TWW discharge via the SDOO will be mitigated by:

- TWW being treated to at least secondary treatment prior to discharge;
- Discharging TWW via a diffuser that has been designed to match projected flows and maximise dilution and dispersion;
- Discharging via the SDOO that has been built and located to avoid sensitive habitats; and,
- Discharging TWW via the SDOO diffusers which are located in an appropriate water depth for the discharge volumes predicted.

The operation of the Water Corporation's WWTPs and discharge of TWW to the marine environment are regulated under Ministerial Conditions set by the WA Minister for the Environment and Licence Conditions applied to each discharging entity by the WA Director General of Environment.

The SDOO and its projected cumulative waste flows were assessed (Assessment No. 1471) and reported in the WA EPA Bulletin 1135. This assessment incorporated planned flows and contaminants from the ERWWTP up to a discharge capacity of 80 ML/d (*Annex D*). The Minister for the Environment issued in her Statement that a Proposal may be Implemented for the SDOO (Statement No. 665) on 28 October 2004. Stringent operating conditions were specified, and these have translated back to the *EP Act* Part V operating licence conditions applicable discharging entities. The Water Corporation will fully comply with all Ministerial conditions set for SDOO and all relevant statutory requirements.

The full list of Ministerial conditions set for the SDOO can be found in *Annex D*.

As part of management and monitoring measures required to meet the Ministerial conditions set for the SDOO, TWW from the ERWWTP will be monitored by Water Corporation's PLOOM program (see *Annex N*).

The Water Corporation's PLOOM program commenced in 1996. The two main components of the PLOOM program are (i) monitoring; and, (ii) investigative studies.

The monitoring component has been designed to:

- Measure the performance of the SDOO, and to address the requirements of the licence conditions for the Water Corporation's WWTPs and outlets;
- Determine the influence of the discharge of TWW on the ecosystem (water quality, sediment quality, ecological processes) and human health values; and,
- Support the development of Environmental Quality Management Frameworks (see *Annex N*, Licensing and Management section). These include an Environmental Management Plan for the use of the SDOO to dispose of industrial wastewater (see *Annex O*).

Investigative studies conducted over the past 10 years as part of the PLOOM program show that although TWW discharge may have caused observable perturbations in the natural systems (elevated Chlorophyll in the water column) in the vicinity of the diffuser, the natural systems return to background levels rapidly and there have not been any harmful effects on the marine environment or loss of recreational amenity at beaches in the vicinity.

A summary of the PLOOM results during the past 10 years are as follows:

- Elevated nutrient concentrations occur downstream of outlet diffuser, but there are no harmful effects due to nutrient enrichment.
- There are occasional slight elevations in phytoplankton production downstream of the SDOO.
- The SDOO does not promote potentially harmful algal blooms, with no increases in the types or amounts of potentially harmful algae near outlets.
- There is a low risk of harmful effects on natural reefs because there are no reefs located close enough to the SDOO.
- There is negligible risk to human health at local beaches due to TWW discharge.
- There is a very low risk of harmful effects on marine biota, with no toxicity observed at the TWW dilutions that occur in the marine environment.
- There is no measurable contamination of sediments or marine biota due to TWW discharge.

For more detailed information on the PLOOM program, see *Annex N*.

3.3 (g) Kinds of fauna & flora

The Water Corporation has undertaken Level 1 and Level 2 flora and fauna surveys across late 2008 and early 2009. For details on the kinds of flora and fauna identified within the site, see the attached flora and fauna reports in *Annexes I & J* respectively.

A total of 70 vascular plant taxa from 36 plant families were recorded in the Level 2 flora survey of the site (BEC, 2009). No flora species pursuant to s179 of the *EPBC Act* have been recorded on the site or outlet pipeline, though TEC 19 was identified within the site.

With respect to native vertebrate fauna, 11 mammals (includes eight bats species), 83 bird, three frog and 30 reptile species have the potential to occur in or utilise the site at times. Five migratory bird species were also identified as potentially utilising the site at times (Greg Harewood, 2009).

The only species protected under the *EPBC Act* positively identified as utilising the project area during the Fauna surveys was the Rainbow Bee-eater (Greg Harewood, 2009).

3.3 (h) Current state of the environment in the area

Flora

The site is not currently in use, although some dirt tracks have and are being used as motorbike or walk trails throughout the Site and surrounding areas.

It appears to have been subject to variable amounts of historical disturbance and a large percentage of the vegetation appears to be regrowth from a significant historical clearing episode (Greg Harewood, 2008). The bushland within and surrounding the site also appears to be a frequent target for arsonists and there are numerous examples of illegal rubbish dumping (Greg Harewood, 2009).

The vegetation across the site varies mainly in the density of the weeds in the understorey. Generally, most of the understorey has been replaced by weeds. The vegetation condition is mainly *good to degraded* with some areas on the western side in *very good* condition with large areas on the eastern side in *completely degraded* condition (see *Annex I* for descriptions of vegetation condition). Generally the trees have a good cover, although not dense, and appeared healthy (BEC, 2009).

Weeds recorded during flora surveys (BEC, 2008 & 2009) that are rated by CALM (1999) as high (prioritised for control) are: Bridal Creeper (*Asparagus asparagoides*), Great Brome (*Bromus diandrus*), Perennial Veldtgrass (*Ehrharta calycina*), False Capers (*Euphorbia terracina*), Hare's Tail (*Lagurus ovatus*), West Australian blue lupin (*Lupinus cosentinii*), Rose scented geranium (*Pelargonium capitatum*) and Onion Grass (*Romulea rosea*). These weeds are common across the site and further indicate the overall *good to degraded* vegetation condition.

Fauna

In total 73 species of vertebrate fauna were sighted during the Level 1 and Level 2 fauna surveys (including trapping, bat and targeted survey results) (Greg Harewood, 2008 & 2009). Vertebrate fauna identified on site was comprised of 44 bird species (two introduced), six native and six introduced mammal species and 17 reptile species.

No evidence of any listed threatened species were observed. One listed migratory species (Rainbow Bee-eater) was observed.

Numerous feral or introduced species were observed or are potentially present within the site. This includes dogs (*Canis lupus*), feral cats (*Felis catus*), foxes (*Vulpes vulpes*), rabbits (*Oryctolagus cuniculus*), rats (*Rattus rattus*), bees (*Apis mellifera*) and mice (*Mus musculus*) (Greg Harewood, 2009). *Annex J* provides a more detailed list of identified fauna within the survey area.

3.3 (i) Other important or unique values of the environment

There are **no** national parks, conservation reserves or wetlands of national significance within or in close proximity to the site.

3.3 (j) Tenure of the action area (eg freehold, leasehold)

The site partially occupies two lots, Lot 220, Chesterfield Rd and Lot 9001, Patterson Rd, East Rockingham. The two lots are partially zoned as 'Special Industry,' 'General Industry' and 'Public Purpose - Water Corporation' under the City of Rockingham TPS. The two lots are proposed to be consolidated as one unserviced lot and rezoned as "Public Purposes" through discussions with LandCorp, the WAPC and the City of Rockingham (see *Annex A*).

3.3 (k) Existing land/marine uses of area

There are currently **no** existing land uses at the site. Areas in the vicinity of the SDOO can and have been used as recreational fishing areas.

3.3 (l) Any proposed land/marine uses of area

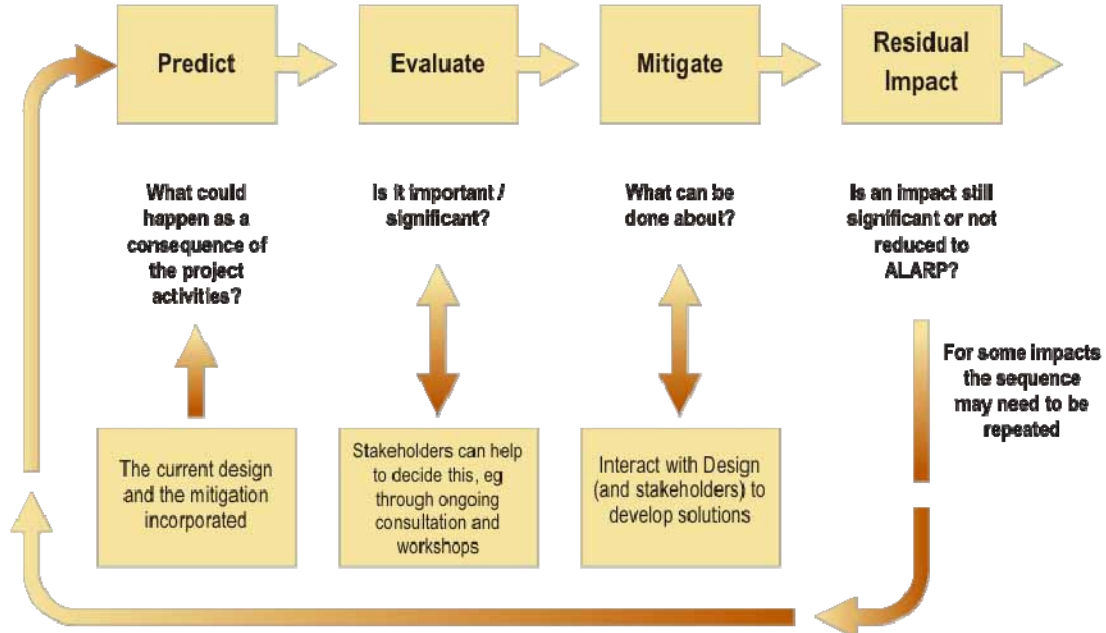
The proposed ERWWTP is located within the RIZ (IP14 Area). The IP14 area has been identified as one of the last significant landholdings in the Perth metropolitan region that is designated for industrial purposes. Located adjacent to the Cockburn Sound, IP14 is zoned Industrial under the WA MRS.

IP14 has been partially developed for mainly industrial land uses over many years. Industries that currently exist within the IP14 area include the Jandakot Woolscourers, Chemeq Ltd., Novacoat, Australian Fused Materials, Doral, Wesfarmers Transport, Fremantle Ports, Service Commercial adjacent to Dixon Road, and commercial either side of Patterson Road.

4 Measures to avoid or reduce impacts

The impacts of Water Corporation’s proposal have been predicted and evaluated, and mitigation measures developed. The process will link in with consultation and stakeholder input regarding the significance of impacts and the suitability of the proposed mitigation measures below. This process is illustrated in *Figure 12*.

Figure 12 Prediction, Evaluation and Mitigation of Impacts



A suite of preliminary environmental and water management plans for the proposal have been developed to indicate the environmental management activities and techniques that will be finalised and implemented during the construction and operation of the ERWWTP. These include:

- Preliminary PEMP (*Annex C*). This plan deals with (but is not limited to) the management and mitigation of the following matters:
 - Flora and Vegetation Management;
 - Fauna Management;
 - Pest Plant and Animal Management;
 - Heritage Management;
 - Odour Management;
 - Dust management;
 - Noise Management;
 - Erosion management;
 - Disturbance management; and,
 - Fire management.
- Preliminary WMP (*Annex Q*). This plan deals with (but is not limited to) the management and mitigation of the following matters:
 - Groundwater Dewatering Monitoring Plan;
 - Surface Water Management;
 - Discharge Management; and,
 - ASS Management.

As well as implementation of the environmental management plans highlighted above, the following commitments will guide investigations and development of specific management measures in order to minimise the potential risks to the environment associated with Water Corporation's proposed ERWWTP, and where possible maintain or enhance ecological function in the proposed conservation area within IP14.

Flora/Fauna

With respect to the management and mitigation of flora and fauna, the Water Corporation will:

- Implement the project in strict compliance with the PEMP and WMP (*Annex C and Annex Q respectively*). The PEMP includes, but is not be limited to, management and mitigation activities such as pre-clearance surveys, relocation of fauna, treatment of injures fauna, covering holes to prevent accidental fauna entry if required, etc. (see *Annex C*).
- Rehabilitate areas of temporary disturbance with appropriate vegetation using provenance seed stock.
- Prepare and implement an appropriate Pest Plant and Animal Management Plan to minimise the spread of weeds from degraded areas into better quality bushland remnants in the TEC 19 and Tuart plantings.
- Clearly mark areas required to be cleared and restrict access to other areas to prevent accidental clearing of areas to be retained.
- Temporarily fence Conservation wetlands during construction where access is probable (for example along side pipelines), if deemed necessary.
- Maintain the presence of at least one environmental personnel (eg. an ecologist or appropriately trained person) on site at all times during construction, as deemed necessary.
- Design the ERWWTP and outlet pipe corridor to incorporate surface stability, erosion potential and drainage control in all design aspects.
- Rehabilitate disturbed areas post construction through the implementation of a Rehabilitation Management Plan to avoid long term disturbance to local flora and fauna.
- Minimise dust generation from vehicles etc. during construction through watering where necessary and in accordance with the PEMP (*Annex C*), to avoid any impacts to the local flora and fauna.

Also, should DEWHA disagree with the Water Corporation's assessment of the low significance of impact on the TEC 19 and Black Cockatoo habitat from the proposal, the Water Corporation will contribute to:

- The enhancement and management of the ecological value of TEC 19 community within LandCorp's conservation area including replanting at a 4:1 ratio⁵ (four plantings of relevant species for each plant of the inferred TEC 19 cleared) for the TEC 19 removed within the ERWWTP site.
- The enhancement and management of Tuart stands within IP14, within LandCorp's conservation area and/ or within the wider local vicinity including the planting of Tuart seedlings ratio of 4:1 (i.e 200 *E. gomphocephala* planted for 50 taken).
- The control of access into the proposed conservation area adjacent to the site, to reduce additional disturbances to vegetation, including areas of TEC 19 and Tuarts, such as to avoid the spread of weeds and dieback, track proliferation and erosion, fires, rubbish dumping and unauthorised clearing.

⁵ Successful establishment of communities has never been undertaken and as such, the Water Corporation will be planting species representative of communities for enhancement at a 4:1 ratio.

Marine Environment

The Water Corporation will:

- Comply with WA Minister for the Environment's conditions in Ministerial Statement 665 for the SDOOL/SDOO (see *Annex D*).
- Monitor and manage all discharges of TWW from the ERWWTP through the Water Corporation's PLOOM program (*Annex N*) and SDOOL/SDOO Monitoring and Management Plan (*Annex O*) in accordance with set WA Ministerial conditions for the SDOOL/SDOO and relevant statutory requirements (*Annex D*).

Groundwater and Surface Water Pollution

The Water Corporation will:

- Implement a WMP including:
 - developing a groundwater monitoring program during construction, dewatering and potential groundwater recharge;
 - ensuring any acidic water from dewatering during construction is appropriately treated;
 - developing appropriate dewatering plans for disposal of water that may be effected by ASS;
 - developing and implementing appropriate Surface Water Management Plans;
 - ensuring that the ERWWTP will be designed such that spillages are contained; and,
 - creating safe passages for excessive stormwater runoff.
- See the preliminary WMP (*Annex Q*) for more details around mitigation, monitoring and management measures to be implemented by the Water Corporation.

Liquid and Solid Waste

The Water Corporation will:

- Provide a sustainable option for overall waste management so as not to compromise local and regional environmental, economic and social values.
- Explore opportunities for recycling of TWW for ecological, commercial or domestic use.

Community Issues

The Water Corporation will:

- Monitor all activities associated with the ERWWTP so as not to adversely impact on the socio-economic or cultural values of the area or of beneficial users.
- Undertake preliminary consultation with relevant government departments and decision-making authorities. The consultation process will be ongoing during the preparation of the environmental impact assessment for the project.
- Maintain open communication and provide full opportunity for stakeholder input and comment through the project development.
- Develop and implement a communications plan for the Site during the assessment and construction process.

The formal EIA process will ultimately result in a list of commitments that the Water Corporation will apply to the project's design, construction and operation. It is anticipated that the final Environmental Management Plans will contain more detailed mitigation measures than those described above.

5 Conclusion on the likelihood of significant impacts

5.1 Do you THINK your proposed action is a controlled action?

<input checked="" type="checkbox"/>	No, complete section 5.2
<input type="checkbox"/>	Yes, complete section 5.3

5.2 Proposed action IS NOT a controlled action.

The ERWWTP proposal is **not** a controlled action, as it would not have significant impact on matters of national environmental significance protected under the EPBC Act. The Water Corporation, being the company making this referral, believes that the action described in this referral is **not a controlled action** for the following reasons:

- No World, National or Commonwealth heritage places will be disturbed or impacted by the development.
- There are no RAMSAR wetlands within, or in close proximity (within 10km) of the site. The site is located within the same catchment as three RAMSAR wetlands; Becher Point Wetlands, Forrestdale and Thompson Lakes and Peel-Yalgorup System. It is considered unlikely that development at the site will affect these RAMSAR wetlands in any way, as the wetlands are up hydraulic gradient from the site and a minimum of 13km north-west and south of the site.
- None of the EPBC listed threatened or endangered fauna species (outlined in *Annex G* and assessed in *Annex H*) predicted to occur in the area has been recorded on the site. Due to their habitat requirements it is considered unlikely that these species would occur within the site (refer to *Annex J*).
- No evidence of Baudin's Black Cockatoo and Carnaby's Black Cockatoo breeding or feeding was observed at the site, with the vegetation onsite not regarded as representing habitat critical to the survival of either species (Harewood, 2009; Johnstone, 2009). Based on the significant impact criteria for endangered and vulnerable species, Baudin's Black Cockatoo and Carnaby's Black Cockatoo are not likely to be significantly impacted by the proposed development, see *Annex J, Section 6.1* and *Annex K* for more details.
- Furthermore, clearing of approximately 50 Tuart trees (of which 5 are potential habitat trees as identified by Greg Harewood (2009)), will not have a significant impact upon the Baudin's Black Cockatoo and Carnaby's Black Cockatoo viability and conservation status in the region (Harewood, 2009; Johnstone, 2009).
- Notwithstanding this, the Water Corporation recognises DEWHA's preference for open woodlands of *Eucalyptus gomphocephala* (Tuart) that require clearing to be replaced to provide for potential Black Cockatoo habitat in the future. Should DEWHA disagree with the Water Corporation's assertion on the significance of impact on the Black Cockatoo's, the Water Corporation will contribute to the planting and densification and management of Tuart stands within IP14, within LandCorp's proposed conservation area and/ or within the wider local vicinity at a planting ratio of 4:1 (i.e 200 *E. gomphocephala* planted for 50 taken).
- Of the EPBC listed migratory fauna species predicted to occur in the area (listed and assessed in *Annex P*), the Rainbow Bee-eater was the only species positively identified as utilising the site. It is unlikely that the Rainbow Bee-eater will be significantly impacted by activities of the site, with it being capable of flying long distances and not being solely reliant on any area to be impacted by the proposal.
- Of the EPBC listed threatened fauna species predicted to occur in the area (listed and assessed in *Annex J*), no species was determined to be solely reliant on the 30.85 Ha of land and habitat to be cleared within the site, therefore the development of the proposed ERWWTP is not predicted to significantly impact any species or MNES.
- The EPBC listed TEC 19 has been inferred as occurring in approximately 2.2 Ha of the site. Based on the current know extent of TEC 19 on the Swan Coastal Plain (142 Ha), clearing of the proposed site, including all of the 2.2 Ha of TEC, will result in the removal of approximately 1 % of the known TEC 19

extent. Based on this, the proposal is considered unlikely to result in a significant reduction in the extent or viability of the TEC 19, and therefore will not significantly impact on this MNES.

- Also, the enhancement and protection of approximately 20% of the known TEC 19 on the Swan Coastal Plain within the proposed conservation reserve will allow for the preservation and protection of the TEC 19, which if left unmanaged, is unlikely to survive into the future due to falling groundwater levels (Umwelt, 2008).
- However, should DEWHA disagree with the Water Corporation’s assertion on the significance of the proposals impact on the TEC 19, the Water Corporation will contribute to the enhancement of the TEC 19 within the proposed conservation area at a 4:1 ratio⁶ (four plantings of relevant species for each plant of inferred TEC 19 cleared) for the TECs removed within the ERWWTP site.
- No Commonwealth marine or land areas will be impacted beyond that currently approved and operating by the proposed development.
- Monitoring, reporting and management measures in place (see *Annexes N and O*) for marine flora and fauna suggest that no marine species will be significantly impacted by the proposal.
- The site will be located in an already designated industrial area, away from sensitive receptors such as residential housing and hospitals.
- The proponent will undertake the mitigation and management measures discussed in Section 4 to reduce potential direct and indirect impacts on flora and fauna at the site. Mitigation measures to reduce potential impacts of the ERWWTP have been provided in *Section 4*.

5.3 Proposed action IS a controlled action

Matters likely to be impacted

<input type="checkbox"/>	sections 12 and 15A (World Heritage)
<input type="checkbox"/>	sections 15B and 15C (National Heritage places)
<input type="checkbox"/>	sections 16 and 17B (Wetlands of international importance)
<input type="checkbox"/>	sections 18 and 18A (Listed threatened species and communities)
<input type="checkbox"/>	sections 20 and 20A (Listed migratory species)
<input type="checkbox"/>	sections 21 and 22A (Protection of the environment from nuclear actions)
<input type="checkbox"/>	sections 23 and 24A (Marine environment)
<input type="checkbox"/>	sections 26 and 27A (Protection of the environment from actions involving Commonwealth land)
<input type="checkbox"/>	section 28 (Protection of the environment from Commonwealth actions)
<input type="checkbox"/>	Sections 27B and 27C (Commonwealth Heritage places outside the Australian Jurisdiction)

⁶ Successful enhancement of communities has never been undertaken and as such, the Water Corporation will be planting species representative of the communities for enhancement at a ratio of 4:1.

6 Environmental history of the responsible party

	Yes	No
<p>6.1 Does the party taking the action have a satisfactory record of responsible environmental management?</p> <p>The Water Corporation's focus is on balancing environmental, social and economic outcomes to 'sustainably manage water services to make WA a great place to live and invest', and maintain legal compliance with relevant legislation including environmental licenses and conditions, see <i>Annex R</i>.</p> <p>The Water Corporation conducts its operations in accordance with its AS/NZ 14001:2004 Environmental Management System Certificate No. CEM 20765 issued on 13 June 2008, (see <i>Annex S</i>).</p> <p>When considered against the magnitude of scale of its operations, and the diversity of the natural environment within which it operates, the Water Corporation's environmental performance is considered by many observers to be very good. As evidence of its excellence in environmental performance, the Water Corporation has won the Prime Minister's Award (2004) for environmental excellence in Public Sector Management, the WA Premiers Award (2004), the 2003 Australian Greenhouse Office Gold Award, and the United Nations Association of Australia World Environment Day Award 2004 for excellence in Marine and Coastal Management to name a few.</p>	X	
<p>6.2 Has the party taking the action ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?</p> <p>The Water Corporation has had no actions brought against it in relation to its environmental performance under Commonwealth legislation, but has received two modified penalty notices from WA State authorities. Note that under the applicable WA legislation modified penalty notices do not represent an admission for the purposes of criminal or civil proceedings.</p>		X
<p>6.3 If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?</p> <p>The Water Corporation conducts its operations in accordance with its AS/NZ 14001:2004 Environmental Management System Certificate No. CEM 20765 issued on 13 June 2008, (see <i>Annex S</i>).</p>	X	

6.4 Has the person proposing to take the action previously referred an action under the EPBC Act?

X

Provide name of proposal and EPBC reference number (if known)

The Water Corporation is a highly experienced and respected organisation in the preparation of WWTP's and other water and sewage infrastructure. The Water Corporation understand it's environmental duties and responsibility to mitigate any potential impacts on the surroundings environment. This has been demonstrated in the following proposals referred to DEWHA under the EPBC Act:

- 2008/4545 Water Corporation/Waste Management (sewerage)/Broome/WA/Wastewater Treatment Plant
- 2008/4173 Water Corporation/Water management and use/Lots 32, 33 and part Lot 8 Tarato Rd, Binningup/WA/Southern Seawater Desalination Project
- 2007/3532 Water Corporation/Transport - water/Armadale/Gosnells/WA/Wungong Transfer Mains Project
- 2007/3259 Water Corporation of Western Australia/Waste management (sewerage)/Alkimos/WA/Development of new Alkimos Wastewater Treatment Plant
- 2006/2507 Water Corporation WA/Water transport/Port Hedland/WA/Bulgarene Borefield
- 2005/2073 Water Corporation/Water transport/Blackwood Plateau, southwest WA/WA/Yarragadee Water Supply Development
- 2005/1971 Water Corporation of Western Australia/Water management and use/Perth/WA/Perth Seawater Desalination Project: Thomsons Lake to Kogolup Pipeline
- 2003/1010 Water Corporation of Western Australia/Water management and use/Vasse and Wonnerup Estuaries/WA/Replacement Floodgates

7 Information sources and attachments

(For the information provided above)

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7.2 Reliability and date of information

For information in section 3 specify:

source of the information;

how recent the information is;

how the reliability of the information was tested; and

any uncertainties in the information.

Information referred to in this referral is published by or sourced from reputable organisations and individuals and is based on recent data (mostly less than 10 years old). Database searches were conducted in the last six

months while the ERWWTP description and process information is based on the most recent design and engineering information.

ERM is a respected consulting company operating globally and was commissioned to provide Hydrological, Hydrogeological, ecological and environmental information to the Water Corporation and help prepare this referral.

The Flora and Fauna surveys were conducted by two reputable WA consulting firms; BEC and Greg Harewood. The former has operated throughout WA for many years and specialises in flora surveys, while the latter has many years' experience in conducting surveys of flora and vegetation throughout WA. The flora and fauna surveys were conducted over the spring of 2008 and summer of 2009 (see *Annexes I & J*).

7.3 Attachments

Indicate the documents you have attached. All attachments must be less than two megabytes so they can be published on the Department's website. Attachments larger than two megabytes (2mb) may delay the processing of your referral.

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	✓	
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.3)		
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.4)		
	copies of any flora and fauna investigations and surveys (section 3)	✓	
	technical reports relevant to the assessment of impacts on protected matters and that support the arguments and conclusions in the referral (section 3 and 4)	✓	
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		

8 Contacts, signatures and declarations

Project title: East Rockingham Waste Water Treatment Plant

8.1 Person proposing to take action

Name Andrew Baker
Title Principal Environmental Consultant
Organisation Water Corporation
ACN / ABN (if applicable) ABN : 28 003 434 917
Postal address PO Box 100, Leederville, WA, 6901
Telephone 9420 2420
Email andrew.baker@watercorporation.com.au
Declaration I declare that the information contained in this form is, to my knowledge, true and not misleading. I agree to be nominated as the proponent for this action.

Signature _____ Date _____

8.2 Person preparing the referral information (if different from 8.1)

Name Toby Whincup
Title Office Managing Partner
Organisation Environmental Resources Management Australia (ERM)
Postal address PO Box 7338 Cloisters Square, WA 6850
Telephone (08) 9321 5200
Email toby.whincup@erm.com
Declaration I declare that the information contained in this form is, to my knowledge, true and not misleading.

Signature _____ Date _____
