Government of Western Australia
Department of Environment Regulation

Licence

Environmental Protection Act 1986, Part V

Licensee: Department of Corrective Services

Licence: L8262/2008/2

Registered office: Level 9
141 St Georges Terrace
PERTH WA 6000

Premises address: Acacia Prison Wastewater Treatment Plant
Lot 28302 on Plan 210583 Great Eastern Highway, and
Lot 17969 on Plan 160874 Linley Valley Road.
WOOROLOO WA 6558

Issue date: Thursday, 6 October 2011

Commencement date: Sunday, 9 October 2011

Expiry date: Friday, 8 October 2027

Prescribed premises category
Schedule 1 of the *Environmental Protection Regulations 1987*

Category number	Category description	Category production or design capacity	Approved Premises production or design capacity
54	Sewage facility: premises – (a) on which sewage is treated (excluding septic tanks): or (b) from which treated sewage is discharged onto land or into waters	100 cubic metres or more per day	906m³/day

Conditions
This Licence is subject to the conditions set out in the attached pages.

Date signed: 9 June 2016
.....
Alan Kietzmann
Manager Licensing (Waste Industries)
Officer delegated under section 20
of the *Environmental Protection Act 1986*

Contents

Introduction

This Introduction is not part of the Licence conditions.

DER's industry licensing role
The Department of Environment Regulation (DER) is a government department for the state of Western Australia in the portfolio of the Minister for Environment. DER's purpose is to advise on and implement strategies for a healthy environment for the benefit of all current and future Western Australians.

DER has responsibilities under Part V of the *Environmental Protection Act 1986* (the Act) for the licensing of prescribed premises. Through this process DER regulates to prevent, control and abate pollution and environmental harm to conserve and protect the environment. DER also monitors and audits compliance with works approvals and licence conditions, takes enforcement action as appropriate and develops and implements licensing and industry regulation policy.

Licence requirements
This Licence is issued under Part V of the Act. Conditions contained within the Licence relate to the prevention, reduction or control of emissions and discharges to the environment and to the monitoring and reporting of them.

Where other statutory instruments impose obligations on the Premises/Licensee the intention is not to replicate them in the licence conditions. You should therefore ensure that you are aware of all your statutory obligations under the Act and any other statutory instrument. Legislation can be accessed through the State Law Publisher website using the following link:
http://www.slp.wa.gov.au/legislation/statutes.nsf/default.html

For your Premises relevant statutory instruments include but are not limited to obligations under the:

- *Environmental Protection (Unauthorised Discharges) Regulations 2004* – these Regulations make it an offence to discharge certain materials such as contaminated stormwater into the environment other than in the circumstances set out in the Regulations.

- *Environmental Protection (Controlled Waste) Regulations 2004* - these Regulations place obligations on you if you produce, accept, transport or dispose of controlled waste.

- *Environmental Protection (Noise) Regulations 1997* – these Regulations require noise emissions from the Premises to comply with the assigned noise levels set out in the Regulations.

- *Western Australian Guidelines for Biosolids Management*, Department of Environment and Conservation, December 2012.

You must comply with your licence. Non-compliance with your licence is an offence and strict penalties exist for those who do not comply.

Licence holders are also reminded of the requirements of section 53 of the Act which places restrictions on making certain changes to prescribed premises unless the changes are in accordance with a works approval, licence, closure notice or environmental protection notice.

Licence fees
If you have a licence that is issued for more than one year, you are required to pay an annual licence fee prior to the anniversary date of issue of your licence. Non payment of annual licence fees will result in your licence ceasing to have effect meaning that it will no longer be valid and you will need to apply for a new licence for your Premises.

Ministerial conditions
If your Premises has been assessed under Part IV of the Act you may have had conditions imposed by the Minister for Environment. You are required to comply with any conditions imposed by the Minister.

Premises description and Licence summary
Acacia Prison opened in 2001 and is located in Wooroloo approximately 54.7 kilometres east of Perth on Great Eastern Highway, Wooroloo. The premises spans across Lot 28302 on Plan 210583 and Lot 17969 on Plan 160874. Acacia Prison is managed by the Department of Corrective Services (DCS) who is the licensee for Acacia Prison Wastewater Treatment Plant (WWTP) which has been assessed as a 'prescribed premises' category 54 under Schedule 1 of the *Environmental Protection Regulations 1987.* Acacia Prison has been expanded to accommodate up to 1374 prisoners and up to 250 staff. The area is zoned public purpose-prison.

Factor UTB has been contracted by DCS to build a new WWTP, manage and operate it on behalf of DCS for a period of 5 years with an option for DCS to extend that for a further 5 years. DCS was issued Works Approval W5693/2014/1 on 7 August 2014 for the construction of the new WWTP, construction was completed and a compliance document was submitted to DER on 27 October 2014.

This Licence is the result of an amendment sought by the Licensee to upgrade the Licence to reflect the changes under works approval W5693/2014/1.

The licences and works approvals issued for the Premises 09/10/2001 are:

Instrument log		
Instrument	**Issued**	**Description**
L7718/1999/1	9/10/2001	New Application, Licensee: AIMS Corporation Pty Ltd
L7718/1999/2	6/11/2002	Licence Re-issue
L7718/1999/3	13/10/2003	Licence Re-issue
L7718/1999/3	9/10/2004	Licence Re-issue
L7718/1999/4	12/10/2005	Licence Re-issue
L8262/2008/1	9/10/2008	New licence issued due to non payment of fees. Licensee changed to Department of Corrective Services.
L8262/2008/2	6/10/2011	Licence re-issue, conversion to new format.
W5693/2014/1	07/08/2014	Works approval for the installation of a new wastewater treatment plant.
L8682/2008/2	09/06/2016	Licence amendment

Severance
It is the intent of these Licence conditions that they shall operate so that, if a condition or a part of a condition is beyond the power of this Licence to impose, or is otherwise *ultra vires* or invalid, that condition or part of a condition shall be severed and the remainder of these conditions shall nevertheless be valid to the extent that they are within the power of this Licence to impose and are not otherwise *ultra vires* or invalid.

END OF INTRODUCTION

Licence conditions

1 General

1.1 Interpretation

1.1.1 In the Licence, definitions from the *Environmental Protection Act 1986* apply unless the contrary intention appears.

1.1.2 For the purposes of this Licence, unless the contrary intention appears:

'Act' means the *Environmental Protection Act 1986;*

'AHD' means the Australian height datum;

'annual period' means the inclusive period from 1 January until 31 December;

"AS 1940" means the Australian Standard AS 1940 *The storage and handling of flammable and combustible liquids;*

'AS/NZS 2031' means the Australian Standard AS/NZS 2031 *Selection of containers and preservation of water samples for microbiological analysis;*

'AS/NZS 5667.1' means the Australian Standard AS/NZS 5667.1 *Water Quality – Sampling – Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples;*

'AS/NZS 5667.10' means the Australian Standard AS/NZS 5667.10 *Water Quality – Sampling – Guidance on sampling of waste waters;*

'AS/NZS 5667.11' means the Australian Standard AS/NZS 5667.11 *Water Quality – Sampling – Guidance on sampling of groundwaters;*

'Assessment and management of contaminated sites guidelines' means the document titled "Assessment and management of contaminated sites, Contaminated sites guidelines, December 2014" published by the Chief Executive Officer of the Department of Environment Regulation, as amended from time to time;

'assessment levels' means the Tier 1 assessment levels as defined in the **'Assessment and management of contaminated sites guidelines'**

'averaging period' means the time over which a limit is measured or a monitoring result is obtained;

'CEO' means Chief Executive Officer of the Department of Environment Regulation;

'CEO' for the purpose of correspondence means;

Chief Executive Officer
Department Administering the Environmental Protection Act 1986
Locked Bag 33
CLOISTERS SQUARE WA 6850
Email: info@der.wa.gov.au

'controlled waste' has the definition in *Environmental Protection (Controlled Waste) Regulations 2004*;

'freeboard' means the distance between the maximum water surface elevations and the top of retaining banks or structures at their lowest point;

'hardstand' means a surface with a permeability of 10^{-9} metres/second or less;

'Licence' means this Licence numbered L8262/2008/2 and issued under the Act;

'Licensee' means the person or organisation named as Licensee on page 1 of the Licence;

'NATA' means the National Association of Testing Authorities, Australia;

'NATA accredited' means in relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis;

'Premises' means the area defined in the Premises Map in Schedule 1 and listed as the Premises address on page 1 of the Licence;

'quarterly' means the 4 inclusive periods from 1 April to 30 June, 1 July to 30 September, 1 October to 31 December and in the following year, 1 January to 31 March;

'Schedule 1' means Schedule 1 of this Licence unless otherwise stated;

'Schedule 2' means Schedule 2 of this Licence unless otherwise stated;

'spot sample' means a discrete sample representative at the time and place at which the sample is taken; and

'usual working day' means 0800 – 1700 hours, Monday to Friday excluding public holidays in Western Australia.

1.1.3 Any reference to an Australian or other standard in the Licence means the relevant parts of the standard in force from time to time during the term of this Licence.

1.1.4 Any reference to a guideline or code of practice in the Licence means the version of that guideline or code of practice in force from time to time, and shall include any amendments or replacements to that guideline or code of practice made during the term of this Licence.

1.2 Premises operation

1.2.1 The Licensee shall only allow waste to be accepted on to the Premises if:
(a) it is of a type listed in Table 1.2.1;
(b) the quantity accepted is below any limit listed in Table 1.2.1; and
(c) it meets any specification listed in Table 1.2.1.

Table 1.2.1: Waste acceptance

Waste	Quantity Limit	Specification
Sewage	906m³/day	Accepted through sewer inflow(s) only

1.2.2 The Licensee shall ensure that the wastes accepted onto the Premises are only subjected to the processes set out in Table 1.2.2 and in accordance with any process limits described in that table.

Table 1.2.2: Waste processing

Waste type	Process	Process requirements
Sewage	Biological/Physical/Chemical	906m³/day peak 648m³/day average
Sewage sludge	Storage	200 m^3 at any one time.
Bypass storage	Storage	One Megalitre

1.2.3 The Licensee shall ensure that wastewater and sewage sludge is only stored and/or treated within vessels or compounds provided with the infrastructure detailed in Table 1.2.3.

Table 1.2.3: Containment infrastructure

Storage vessel or compound	Material	Infrastructure requirements
Balance tank and reactor	Wastewater	Bolted epoxy coated steel with concrete floor tested at construction to show no leaks.
Bypass storage pond 1ML	Used for emergency storage. A small quantity of effluent held at all times to resist wind. Raw sewage/sewage sludge held in emergency. Pumps and pipes to return to raw sewage to WWTP immediately	Formed earth clay lined dam lined with welded 1.5mm HDPE laid over sand base with inherent permeability $<10^{-9}$
Existing storage pond / lagoon (Irrigation balancing pond) 45 ML	Treated effluent	Formed dam lined with welded 2.0 mm HDPE liner.
Sewage sludge compound	Sewage sludge and filter backwash sludge	35kL nominal poly tanks in 70 kL concrete bund.

1.2.4 The Licensee shall manage all wastewater treatment, storage ponds such that:
- (a) overtopping of the ponds does not occur; and
- (b) a freeboard equal to, or greater than, 300mm is maintained;
- (c) the integrity of the containment infrastructure is maintained;
- (d) trapped overflows are maintained on the outlet of ponds to prevent carry-over of surface floating matter; and
- (e) vegetation and floating debris (emergent or otherwise) is prevented from encroaching onto pond surfaces or inner pond embankments.

1.2.5 The Licensee shall manage the irrigation of treated wastewater such that:
- (a) bunding/cut-off drains are maintained around irrigation areas such that run-off is recirculated back into the wastewater treatment system; and
- (b) no irrigation generated run-off, spray drift or discharge occurs beyond the boundary of the defined irrigation area(s); and
- (c) treated wastewater is evenly distributed over the irrigation area;

(d) no soil erosion occurs; and
(e) irrigation does not occur on land that is waterlogged; and
(f) vegetation cover is maintained over the irrigation area.

1.2.6 The Licensee shall manage the wastewater treatment vessels such that:
(a) overtopping of the vessels does not occur; and
(b) stormwater runoff is prevented from entering the vessels; and
(c) the integrity of the vessels is maintained; and
(d) vegetation and floating debris (emergent or otherwise) is prevented from growing or accumulating in the vessels.

2 Emissions

2.1 General

2.1.1 The Licensee shall record and investigate the exceedance of any descriptive or numerical limit specified in any part of section 2 of this Licence.

2.2 Emissions to land

2.2.1 The Licensee shall ensure that where waste is emitted to land from the emission points in Table 2.2.1 [and identified on the map of emission points in Schedule 1] it is done so in accordance with the conditions of this Licence.

Table 2.2.1: Emission points to land

Emission point reference (and located on Map of emission points)	Emission point reference on Map of emission points	Description	Source including abatement
Irrigated Water Sample Point	Woodlots 1, 2, 3, 4 & 5	Discharge to on-site woodlot irrigation area	Treated wastewater
Irrigated Water Sample Point	Oval and prison landscaping	Discharge to on-site garden irrigation area	Treated wastewater

2.2.2 The Licensee shall not cause or allow emissions to land greater than the limits listed in Table 2.2.2.

Table 2.2.2: Emission limits to land

Emission point reference	Parameter	Limit (including units)	Averaging period
Irrigated Water Sample Point	Total Suspended Solids	30 mg/l	Composite Sample
	Biological Oxygen Demand	20 mg/l	
	Total Nitrogen	25mg/l	
	Total Phosphorus	3 mg/l	
Irrigated Water Sample Point (Woodlots 1, 2, 3, 4 & 5)	Thermotolerant Coliforms	10,000 cfu/100 ml	
Irrigated Water Sample Point (Oval and prison landscaping)	Thermotolerant Coliforms	1,000 cfu/100 ml	
Irrigated Water Sample Point	Total Nitrogen	300 kg/ha	
	Total Phosphorus	50 kg/ha	

3 Monitoring

3.1 General monitoring

3.1.1 The licensee shall ensure that:

(a) all water samples are collected and preserved in accordance with AS/NZS 5667.1;
(b) all wastewater sampling is conducted in accordance with AS/NZS 5667.10;
(c) all groundwater sampling is conducted in accordance with AS/NZS 5667.11;
(d) all microbiological samples are collected and preserved in accordance with AS/NZS 2031;
(e) all soil sampling is conducted in accordance with AS 4482.1 and AS 4482.2 as relevant; and
(f) all laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured.

3.1.2 The Licensee shall ensure that :

(a) quarterly monitoring is undertaken at least 45 days apart; and
(b) annual monitoring is undertaken at least 9 months apart.

3.1.3 The Licensee shall ensure that all monitoring equipment used on the Premises to comply with the conditions of this Licence is calibrated in accordance with the manufacturer's specifications.

3.1.4 The Licensee shall, where the requirements for calibration cannot be practicably met, or a discrepancy exists in the interpretation of the requirements, bring these issues to the attention of the CEO accompanied with a report comprising details of any modifications to the methods.

3.2 Monitoring of emissions to land

3.2.1 The Licensee shall undertake the monitoring in Table 3.2.1 according to the specifications in that table.

Table 3.2.1: Monitoring of emissions to land

Emission point reference	Parameter	Units	Frequency
Irrigated Water Sample Point	Volume discharged	m^3	Daily
	Thermotolerant Coliforms	cfu/100 ml	Quarterly
	pH	-	Monthly
	Total Suspended Solids	mg/L	
	Total Dissolved Solids		
	Biological Oxygen Demand		
	Total Nitrogen		
	Total Phosphorus		
	Ammonia	mg/L	Annual
	Arsenic		
	Cadmium		
	Chromium		
	Copper		
	Lead		
	Nickel		
	Selenium		
	Zinc		

3.3 Monitoring of inputs and outputs

3.3.1 The Licensee shall undertake the monitoring in Table 3.3.1 according to the specifications in that table.

Table 3.3.1: Monitoring of inputs and outputs

Input/Output	Monitoring point reference	Parameter	Units	Averaging period	Frequency
Sewage – inlet flow	Inflow meter	Volumetric flow rate (cumulative)	m^3/day	Monthly	Continuous
Treated wastewater discharged to irrigation	Outflow measuring unit	Volumetric flow rate (cumulative)	m^3/day	Monthly	Continuous

3.4 Process monitoring

3.4.1 The Licensee shall undertake the monitoring in Table 3.4.1 according to the specifications in that table.

Table 3.4.1: Process monitoring

Process description	Parameter	Frequency	Method
Irrigation system	The Licence shall ensure that the irrigation system is maintained and the following checked: • Pumping system pressure; • Routine leak inspection; and • Crop health.	Weekly	None specified

3.5 Ambient environmental quality monitoring

3.5.1 The Licensee shall undertake the monitoring in Tables 3.4.1 and 3.4.2 according to the specifications in those tables.

Table 3.5.1: Monitoring of ambient groundwater quality

Monitoring point reference and location	Parameter	Units	Averaging period	Frequency
Bores: BH1-1 BH1-2 BH2-1 BH2-2 BH3 BH4 Bh5-1 BH6-1 BH6-2 BH7 BH9	Standing water level	m(AHD)	Spot Sample	Quarterly
	pH	-		
	Electrical conductivity	µS/cm		
	Total Phosphorus	mg/L		
	Total Nitrogen			
	Ammonium-Nitrogen			
	Nitrate			
	Aluminium	mg/L	Spot Sample	Annual
	Arsenic			
	Cadmium			
	Chromium			
	Cobalt			
	Copper			
	Lead			
	Nickel			
	Selenium			
	Zinc			

Table 3.5.2: Monitoring of ambient soil quality			
Monitoring point description and location	**Parameter**	**Units**	**Frequency**
Woodlots 1, 2, 3, 4 & 5. Sampling is to be undertaken at three depths at each woodlot to provide a composite sample.	pH	-	Annual
	Electrical conductivity	µS/cm	
	Nitrogen	mg/kg	
	Phosphorus		
	Potassium		
	Ammonia		
	Aluminium		
	Arsenic		
	Cadmium		
	Chromium		
	Copper		
	Lead		
	Nickel		
	Selenium		
	Zinc		

4 Improvements

4.1 Improvement program

4.1.1 The Licensee shall complete the improvements in Table 4.1.1 by the date of completion in Table 4.1.1.

4.1.2 The Licensee, for improvements not specifically requiring a written submission, shall write to the CEO stating whether and how the Licensee is compliant with the improvement within one week of the completion date specified in Table 4.1.1.

Table 4.1.1: Improvement program		
Improvement reference	**Improvement**	**Date of completion**
IR1	The Licensee shall provide a Management Plan to the CEO which shall outline how emissions to land will be decreased by 30 June 2018.	1 October 2016
IR2	The Licensee shall cease operating and decommission the 45ML storage pond. If additional storage capacity is deemed necessary, the pond integrity of the pond should be re-established, or a new storage pond constructed that achieves a permeability of at least $<1x10^{-9}$ m/s or equivalent in line with a DER Works Approval or Licence Amendment.	30 June 2018

5 Information

5.1 Records

5.1.1 All information and records required by the Licence shall:
(a) be legible;
(b) if amended, be amended in such a way that the original and subsequent amendments remain legible or are capable of retrieval;

(c) except for records listed in 5.1.1(d) be retained for at least 6 years from the date the records were made or until the expiry of the Licence or any subsequent licence; and
(d) for those following records, be retained until the expiry of the Licence and any subsequent licence:
  (i) off-site environmental effects; or
  (ii) matters which affect the condition of the land or waters.

5.1.2 The Licensee shall complete an Annual Audit Compliance Report indicating the extent to which the Licensee has complied with the conditions of the Licence, and any previous licence issued under Part V of the Act for the Premises for the previous annual period.

5.1.3 The Licensee shall implement a complaints management system that as a minimum records the number and details of complaints received concerning the environmental impact of the activities undertaken at the Premises and any action taken in response to the complaint.

5.2 Reporting

5.2.1 The Licensee shall submit to the CEO an Annual Environmental Report within 28 calendar days after the end of the annual period. The report shall contain the information listed in Table 5.2.1 in the format or form specified in that table.

Table 5.2.1: Annual Environmental Report

Condition or table (if relevant)	Parameter	Format or form[1]
-	Summary of any failure or malfunction of any pollution control equipment and any environmental incidents that have occurred during the annual period and any action taken	None specified
Table 2.2.2	Emission limits to land	LR1
Table 3.2.1	Monitoring of emissions to land	None specified
Table 3.3.1	Monitoring of inputs and outputs	None specified
Table 3.4.1	Process monitoring	None specified
Table 3.5.1	Monitoring of ambient groundwater quality • An interpretive summary and assessment of ambient groundwater quality monitoring results against relevant assessment levels for water as published in the Assessment and management of contaminated sites guidelines. • An interpretive summary and assessment of ambient groundwater quality monitoring results against previous monitoring results. Trend graphs shall be provided in support of this assessment.	A summary of the results should be presented in tabulated form within the body of the report as well as onto site drawings, where appropriate.
Table 3.5.2	Monitoring of ambient soil quality	None specified
5.1.3	Compliance	Annual Audit Compliance Report (AACR)
5.1.4	Complaints summary	None specified

Note 1: Forms are in Schedule 2

5.2.2 The Licensee shall ensure that the Annual Environmental Report also contains:
(a) any relevant process, production or operational data recorded under Condition 3.3.1 and 3.4.1;
(b) an assessment of the information contained within the report against previous monitoring results and Licence limits; and
(c) any original monitoring reports submitted to the Licensee from third parties.

5.3 Notification

5.3.1 The Licensee shall ensure that the parameters listed in Table 5.3.1 are notified to the CEO in accordance with the notification requirements of the table.

Table 5.3.1: Notification requirements

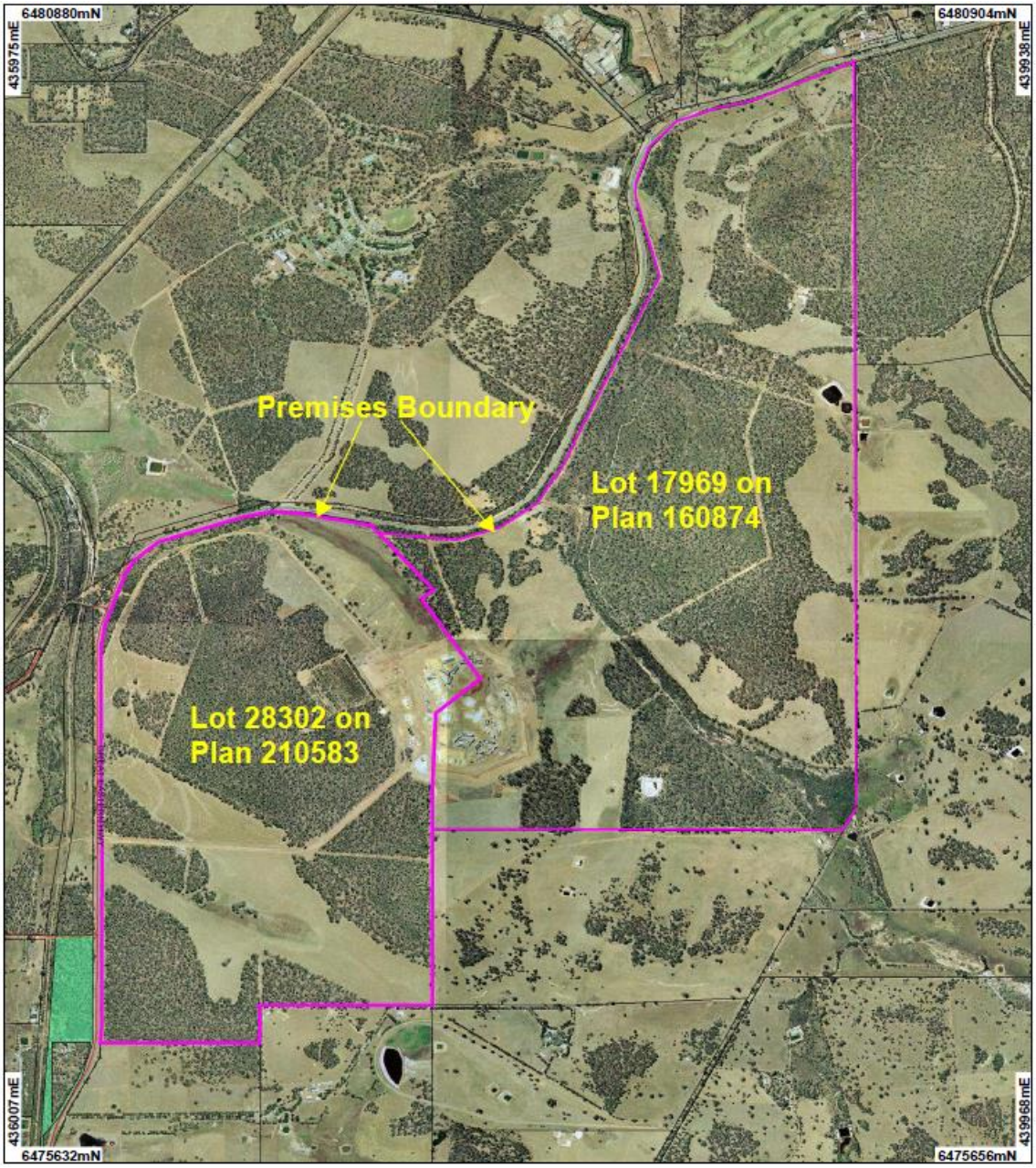
Condition or table (if relevant)	Parameter	Notification requirement[1]	Format or form[2]
2.1.1	Breach of any limit specified in the Licence	Part A: As soon as practicable but no later than 5pm of the next usual working day. Part B: As soon as practicable	N1
3.1.5	Calibration report	As soon as practicable.	None specified

Note 1: Notification requirements in the Licence shall not negate the requirement to comply with s72 of the Act
Note 2: Forms are in Schedule 2

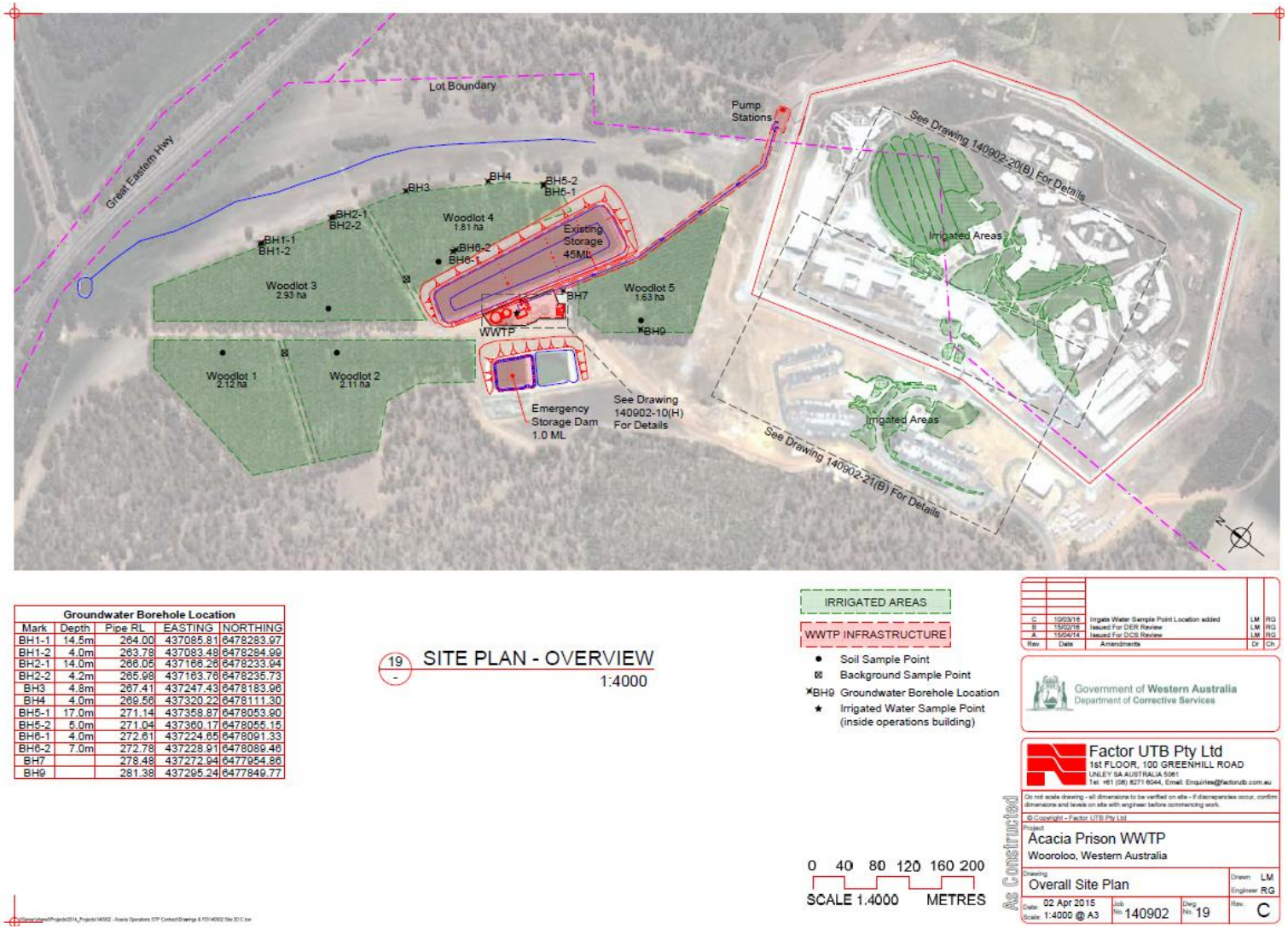
Schedule 1: Maps

Premises map

The Premises is shown in the maps below. The pink line depicts the Premises boundary.



Site Plan overview



Groundwater Borehole Location				
Mark	Depth	Pipe RL	EASTING	NORTHING
BH1-1	14.5m	264.00	437085.81	6478283.97
BH1-2	4.0m	263.78	437083.48	6478284.99
BH2-1	14.0m	266.05	437166.26	6478233.94
BH2-2	4.2m	265.98	437163.76	6478235.73
BH3	4.8m	267.41	437247.43	6478183.96
BH4	4.0m	269.56	437320.22	6478111.30
BH5-1	17.0m	271.14	437358.87	6478053.90
BH5-2	5.0m	271.04	437360.17	6478055.15
BH6-1	4.0m	272.61	437224.65	6478091.33
BH6-2	7.0m	272.78	437228.91	6478089.46
BH7		278.48	437272.94	6477954.86
BH9		281.38	437295.24	6477849.77

19 - SITE PLAN - OVERVIEW
1:4000

IRRIGATED AREAS
WWTP INFRASTRUCTURE
- Soil Sample Point
- Background Sample Point
- BH9 Groundwater Borehole Location
- Irrigated Water Sample Point (inside operations building)

0 40 80 120 160 200
SCALE 1.4000 METRES

Rev.	Date	Amendments	Dr	Ch
C	10/03/16	Irrigate Water Sample Point Location added	LM	RG
B	15/02/16	Issued For DER Review	LM	RG
A	15/04/14	Issued For DCS Review	LM	RG

Government of Western Australia
Department of Corrective Services

Factor UTB Pty Ltd
1st FLOOR, 100 GREENHILL ROAD
UNLEY SA AUSTRALIA 5061
Tel: +61 (08) 8271 6044, Email: Enquiries@factorutb.com.au

Do not scale drawing - all dimensions to be verified on site - if discrepancies occur, confirm dimensions and levels on site with engineer before commencing work.

As Constructed

Project: Acacia Prison WWTP
Wooroloo, Western Australia

Drawing: Overall Site Plan
Drawn: LM
Engineer: RG
Date: 02 Apr 2015
Scale: 1:4000 @ A3
Job No: 140902
Dwg No: 19
Rev: C

Schedule 2: Reporting & notification forms

These forms are provided for the proponent to report monitoring and other data required by the Licence. They can be requested in an electronic format.

ANNUAL AUDIT COMPLIANCE REPORT PROFORMA

SECTION A

LICENCE DETAILS

Licence Number:	Licence File Number:
Company Name: Trading as:	ABN:
Reporting period: _____ to _____	

STATEMENT OF COMPLIANCE WITH LICENCE CONDITIONS

1. Were all conditions of the Licence complied with within the reporting period? (please tick the appropriate box)

Yes ☐ Please proceed to Section C

No ☐ Please proceed to Section B

Each page must be initialled by the person(s) who signs Section C of this Annual Audit Compliance Report (AACR).

Initial:

SECTION B

DETAILS OF NON-COMPLIANCE WITH LICENCE CONDITION.

Please use a separate page for each Licence condition that was not complied with.

a) Licence condition not complied with:	
b) Date(s) when the non compliance occurred, if applicable:	
c) Was this non compliance reported to DER?:	
☐ Yes ☐ Reported to DER verbally Date _____ ☐ Reported to DER in writing Date _____	☐ No
d) Has DER taken, or finalised any action in relation to the non compliance?:	
e) Summary of particulars of the non compliance, and what was the environmental impact:	
f) If relevant, the precise location where the non compliance occurred (attach map or diagram):	
g) Cause of non compliance:	
h) Action taken, or that will be taken to mitigate any adverse effects of the non compliance:	
i) Action taken or that will be taken to prevent recurrence of the non compliance:	

Each page must be initialled by the person(s) who signs Section C of this AACR

Initial:

SECTION C

SIGNATURE AND CERTIFICATION

This Annual Audit Compliance Report (AACR) may only be signed by a person(s) with legal authority to sign it. The ways in which the AACR must be signed and certified, and the people who may sign the statement, are set out below.

Please tick the box next to the category that describes how this AACR is being signed. If you are uncertain about who is entitled to sign or which category to tick, please contact the licensing officer for your premises.

If the licence holder is		The Annual Audit Compliance Report must be signed and certified:
An individual	□	by the individual licence holder, or
	□	by a person approved in writing by the Chief Executive Officer of the Department of Environment Regulation to sign on the licensee's behalf.
A firm or other unincorporated company	□	by the principal executive officer of the licensee; or
	□	by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation.
A corporation	□	by affixing the common seal of the licensee in accordance with the *Corporations Act 2001*; or
	□	by two directors of the licensee; or
	□	by a director and a company secretary of the licensee, or
	□	if the licensee is a proprietary company that has a sole director who is also the sole company secretary – by that director, or
	□	by the principal executive officer of the licensee; or
	□	by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation.
A public authority (other than a local government)	□	by the principal executive officer of the licensee; or
	□	by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation.
a local government	□	by the chief executive officer of the licensee; or
	□	by affixing the seal of the local government.

It is an offence under section 112 of the *Environmental Protection Act 1986* for a person to give information on this form that to their knowledge is false or misleading in a material particular. There is a maximum penalty of $50,000 for an individual or body corporate.

I/We declare that the information in this annual audit compliance report is correct and not false or misleading in a material particular.

SIGNATURE: _____

NAME:
(printed) _____

POSITION: _____

DATE: _____/_____/_____

SIGNATURE: _____

NAME:
(printed) _____

POSITION: _____

DATE: _____/_____/_____

SEAL (if signing under seal)

Licence: L8262/2008/2
Form: LR1
Name: Emissions limits to land

Licensee: Department of Corrective Services
Period :

Form LR1: Monitoring of emissions to land

Emission point	Parameter	Limit	Result[1]	Averaging period	Method	Sample date & times
Irrigated Water Sample Point	Total Suspended Solids	30mg/L	mg/L	Composite sample		
	Biological Oxygen Demand	20mg/L	mg/L			
	Total Nitrogen	25mg/L	mg/L			
	Total Nitrogen	300kg/ha/yr	kg/ha/yr			
	Total Phosphorus	3mg/L	mg/L			
	Total Phosphorus	50kg/ha/yr	kg/ha/yr			
Irrigated Water Sample Point (Woodlots)	Thermotolerant Coliforms	10,000 cfu/100 ml	cfu/100mls	Composite sample		
Irrigated Water Sample Point (Oval and prison landscaping)	Thermotolerant Coliforms	1,000 cfu/100ml	cfu/100mls	Composite sample		

Note 1: All units are referenced to STP dry

Signed on behalf of Department of Corrective Services: …….. Date: ……..

Licence: L8262/2008/2 Licensee: Department of Corrective Services
Form: N1 Date of breach:

Notification of detection of the breach of a limit.

These pages outline the information that the operator must provide.
Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

Part A

Licence Number	
Name of operator	
Location of Premises	
Time and date of the detection	

Notification requirements for the breach of a limit	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Part B

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident.	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission.	
The dates of any previous N1 notifications for the Premises in the preceding 24 months.	

Name	
Post	
Signature on behalf of Department of Corrective Services	
Date	

Government of Western Australia
Department of Environment Regulation

Decision Document

Environmental Protection Act 1986, Part V

Proponent: Department of Corrective Services

Licence: L8262/2008/2

Registered office:	Level 9 141 St Georges Terrace PERTH WA 6000
ACN:	25 103 389 163
Premises address:	Acacia Prison Wastewater Treatment Plant Lot 28302 on Plan 210583 Great Eastern Highway, and Lot 17969 on Plan 160874 Linley Valley Road WOOROLOO WA 6558
Issue date:	Thursday, 6 October 2011
Commencement date:	Sunday, 9 October 2011
Expiry date:	Friday, 8 October 2027

Decision

Based on the assessment detailed in this document the Department of Environment Regulation (DER) CEO delegated officer has decided to issue an amended licence. The delegated officer considers that in reaching this decision, he has taken into account all relevant considerations and that the Licence and its conditions will ensure that an appropriate level of environmental protection is provided.

Decision Document prepared by:	Josephine Tuohy Licensing Officer
Decision Document authorised by:	Alan Kietzmann Delegated Officer

Contents

1 Purpose of this Document

This decision document explains how CEO delegated officer has assessed and determined the application and provides a record of the decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to the delegated officer's assessment and decision making under Part V of the *Environmental Protection Act 1986.* Other approvals may be required for the proposal, and it is the proponent's responsibility to ensure they have all relevant approvals for their Premises.

2 Administrative summary

Administrative details		
Application type	Works Approval ☐ New Licence ☐ Licence amendment ☒ Works Approval amendment ☐	
Activities that cause the premises to become prescribed premises	**Category number(s)** 54	**Assessed design capacity** 906m³/day
Application verified Application fee paid	Date: N/A Date: N/A	
Works Approval has been complied with Compliance Certificate received	Yes☐ No☐ N/A☒ Yes☐ No☐ N/A☒	
Commercial-in-confidence claim	Yes☐ No☒	
Commercial-in-confidence claim outcome	N/A	
Is the proposal a Major Resource Project?	Yes☐ No☒	
Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986*?	Yes☐ No☒	Referral decision No: Managed under Part V ☐ Assessed under Part IV ☐
Is the proposal subject to Ministerial Conditions?	Yes☐ No☒	Ministerial statement No: EPA Report No:
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the *Environmental Protection Act 1986*)?	Yes☐ No☒ Department of Water consulted Yes ☐ No ☒	
Is the Premises within an Environmental Protection Policy (EPP) Area Yes☐ No☒ If Yes include details of which EPP(s) here.		
Is the Premises subject to any EPP requirements? Yes☐ No☒ If Yes, include details here, eg Site is subject to SO_2 requirements of Kwinana EPP.		

3 Executive summary of proposal and assessment

1. Background

Acacia Prison opened in 2001 and is located in Wooroloo approximately 54.7 kilometres east of Perth on Great Eastern Highway, Wooroloo. The premises spans across Lot 28302 on Plan 210583 and Lot 17969 on Plan 160874. Acacia Prison is managed by the Department of Corrective Services (DCS) who are the licensee for Acacia Prison Wastewater Treatment Plant (WWTP) which has been assessed as a 'prescribed premises' category 54 under Schedule 1 of the *Environmental Protection Regulations 1987.* Acacia Prison has been expanded to accommodate up to 1374 prisoners and up to 250 staff. The area is zoned public purpose prison.

Factor UTB has been contracted by DCS to build a new WWTP, manage and operate it on behalf of DCS for a period of 5 years with an option for DCS to extend that for a further 5 years. DCS was issued Works Approval W5693/2014/1 on 7 August 2014 for the construction of the new WWTP, construction was completed and a compliance document was submitted to DER on 27 October 2014.

2. Location in environmental setting

There are no wetlands mapped within the Premises boundary. There is a Public Drinking Water Source Areas located approximately 4.6 kilometres (km) south of the Premises. Mundaring Weir Catchment is 3.5 km south of the site at its closest point. There is open woodland upslope on the western side of the woodlots and a water course, Wooroloo Brook, approximately 100 metres (m) to the northwest of the existing woodlots. The closest sensitive receptors are the residents of the Acacia Prison and Wooroloo Prison Farm approximately 350 m and 1.2 km north respectively. The closest residential dwelling is located approximately 1.6 km to northwest of the Premises.

A perched groundwater was found above the clay layer by Brown Root (2001) in the woodlot area. This groundwater was found to be fresh to brackish and slightly acidic. This semi-confined to confined aquifer was found at approximately 3 metres below ground level. This groundwater was found in the investigation to be more saline. It is likely that there may be some leakage into the confined (saprolite) aquifer. The hydraulic conductivity indicated a flow of 0.02 metres per day to 0.06 metres per day in a north-westerly direction, (Brown and Root 2001).

3. Proposal

Factor UTB has submitted a licence amendment of behalf of DCS to reflect the current operations in line with Works Approval W5693/2014/1, to increase the throughput to 906m³/day and to increase the emissions to land until 2021.

The new WWTP was assessed as having a maximum design capacity of 906m³/day and an average throughput of 648m³/day and can treat and discharge up to 236.5ML of wastewater per year. The inflow of wastewater was estimated to by 648m³/day, however that Factor UTB has requested that the peak throughput be increased to 906m³/day to reflect the current operations. The expected discharge to irrigation is 185ML per year for 1,375 residents.

The original wastewater treatment plant was designed for prison occupancy of less than 750 prisoners. It had been receiving wastewater from 1,000 prisoners and staff members for a significant period of time. To cope with the extra load, the 45ML irrigation balancing lagoon was used as a facultative lagoon. Much of the treatment of the wastewater was being carried out within the lagoon. Water samples have been taken from about 1.2 metres below the surface and results found suspended soils concentration of 70mg/L, carbonaceous biochemical oxygen demand of 83mg/L, chemical oxygen demand 610mg/L, total nitrogen 54mg/L and total phosphorus of 12mg/L. The pond / lagoon contained approximately 40ML of water. A recycling system has been added to 'suck' this material from the deepest part of the lagoon and return it to the new WWTP for re-treatment.

This recycling has been continued throughout the reporting year. The recycling rate has slowly increased to maximise re-treatment capacity. The nature of the biological process is such that when the maximum load capacity of the plant is reached, nitrogen and phosphorus removal reaches maximum first. The recycling has been operated so that nitrogen is limited in the discharge to irrigation at 25mg/L. It is expected to take approximately 12 – 24 months to 'clean up' the lagoon. To allow the additional treatment of wastewater in the pond, Factor UTB has requested that the limits to land be increased to for a period of 5 years as detailed below:

- Total Nitrogen 25mg/L and 300kg/ha/year
- Total Phosphorus 3mg/L and 50kg/ha/year

The Delegated Officer has assessed the proposed increase of emissions to land and compared them to the short term trigger values of ANZECC. It is recommended that the emissions to land are permitted at the increased level for a two year period only, to allow the balancing pond to be remediated and re-treated by the new WWTP. After this time, the emissions to land will be re-assessed and the Licence will be reviewed to ensure that the long term impacts of irrigation are in line with the current standards.

Emissions and discharges to land have been assessed as high risk given the increase of emission limits to land. It is imperative that DCS carry out substantial work to the stabilisation pond as its lining has failed, causing the leakage of untreated and partially treated wastewater to ground. Once work has been completed, this licence will require further review and amendment by DER to ensure that emission limits to land have been reduced.

All potential emissions and discharges have been assessed as part of this amendment. Changes in line with the latest licence formatting have also been undertaken.

4 Decision table

All applications are assessed in line with the *Environmental Protection Act 1986*, the *Environmental Protection Regulations 1987* and DER's Operational Procedure on Assessing Emissions and Discharges from Prescribed Premises. Where other references have been used in making the decision they are detailed in the decision document.

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Interpretation	L1.1.2	Definitions have been altered in line with DER's current licensing process.	N/A
General conditions	N/A	Previous condition 1.2.1 is removed as these requirements are stipulated under the EP Act removing the need to replicate them. Previous condition 1.2.2 that relates to notifying the DER of any works is removed as it relates to EP Act requirement to have a works approval or licence amendment. Previous condition 1.2.3 is removed as it details premises location and description which is already detailed in the Premises address. Previous condition 1.2.4 that relates to maintaining pollution control equipment is removed as the Licensee as it is not specific. The Licensee is expected to do this as a matter of course to prevent unauthorised discharges. Previous condition 1.2.5 that relates to the storage of dangerous goods is removed on the basis the storage of dangerous goods will need to be such that no unauthorised discharges occur (as regulated under the provisions of the UDR). Dangerous goods management is regulated by the Department of Mines and Petroleum, where applicable. Previous condition 1.2.6 that relates to recovering, removing and disposing of environmentally hazardous materials is removed. Previous condition 1.2.7 that relates	*Environmental Protection Act 1986* (EP Act) *Environmental Protection (Unauthorised discharges) Regulations 2004* (UDR)

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		to contaminated stormwater is removed as these requirements can be suitably regulated under existing legislation. Any unauthorised discharge will be subject to the provisions of the UDR.	
Premises operation	L1.2.1 – 1.2.6	Emission Description *Emission:* Treated wastewater effluent discharged to the stabilisation pond prior to irrigation to land. The stabilisation pond is the old facultative pond / irrigation balancing pond. Its lining has failed causing the leakage of untreated and partially treated wastewater to ground (estimated to be up to 20ML during the past year). The deep water within this pond has a COD of approximately 600mg/L; total nitrogen of 50mg/L (up to 80mg/L) and total phosphorus 13-15mg/L. *Impact:* Contamination of surrounding land, surface water and groundwater with an increase of nutrients, heavy metals and other contaminants, impacting ecosystem health. The leakage of treated or partially treated effluent poses an ongoing environmental risk that will need to be addressed. By-passing the storage pond and irrigating directly to land has been considered to reduce impacts from nutrient loading with the establishment of further irrigation woodlots; both options will require significant capital investment. The existing effluent in the storage pond requires resolution by either removal by a controlled waste carrier for treatment elsewhere, or recirculating the effluent in the pond through the treatment system as additional activities (e.g. aeration of the pond) for remediation. *Controls:* The stabilisation pond is lined with HDPE lining, however it has been reported in the Annual Environmental Report for the 2015 reporting period, that the liner is compromised with a number of holes identified. The wastewater in the storage/balancing pond that was previously treated by the old WWTP, does not meet the emissions to land limits. Therefore Factor UTB has identified that the wastewater will need to be re-treated with the new WWTP prior returning to the pond from which effluent is drawn for chlorination and irrigation; this wastewater is removed from the	*Australian and New Zealand Guidelines for the Fresh and Marine Water Quality (2000).*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		upper layers of the pond where the water quality is at its best. Since Factor UTB has taken over the management of Acacia WWTP, approximately 50% of wastewater has been re-treated and the volumes in the pond maintained at 50% pond capacity to reduce hydraulic head pressure and seepage rates. It has been estimated to take another 12 to 24 months for all of the stored wastewater to be re-processed. Risk Assessment *Consequence:* Moderate *Likelihood:* Likely *Risk Rating:* High Regulatory Controls Condition 1.2.1 replaces previous condition 1.3.1 and has been included in this licence to specify the waste types and quantity limits that may be accepted at the premises as those that have been assessed under the licence application as suitable given the infrastructure and controls measures in place at the premises. Condition 1.2.2 replaces 1.3.2 of the previous licence that that specifies how sewage waste is to be processed on site, given the infrastructure and control measures at the premises and relevant to the licence categories applied for. Condition 1.2.3 replaces 1.3.3 of the previous licence for the purpose of specifying the containment infrastructure on the Premises. This condition has been updated to reflect the changes implemented for Works Approval 5693/2014/1. Condition 1.2.4 replaces 1.3.4 of the previous licence that specifies how wastewater treatment ponds are to be maintained to provide adequate protection to the environment. Condition 1.2.5 replaces 1.3.5 of the previous licence that species how irrigation of treated wastewater should be managed.	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Condition 1.2.6 has been included in this licence to ensure that wastewater treatment vessels are maintained to maintain integrity of infrastructure and prevent unauthorised discharge to the environment. Improvement condition 4.1.1 requires the Licensee to submit a report that outlines how emissions to land will be decreased by 2018. Condition 4.1.1 (IR2) has also been included in this licence requiring the Licensee to cease operating and decommission the current 45ML storage pond. If necessary for the wastewater treatment process, a new storage pond that achieves permeability of at least $<1x10^{-9}$ m/s or equivalent should be constructed in line with a DER Works Approval or Licence Amendment. Residual Risk *Consequence:* Moderate *Likelihood:* Likely *Risk Rating:* High	
Emissions general	L2.1.1	Descriptive and numerical limits will be set through this section of the licence and therefore this condition regarding recording and investigation of exceedances of limits has been included.	N/A
Point source emissions to air including monitoring	N/A	The heading and wording relating to 'no specified condition' is removed as these are redundant; there are no associated conditions under the heading.	N/A
Point source emissions to surface water including	N/A	The heading and wording relating to 'no specified condition' is removed as these are redundant; there are no associated conditions under the heading.	N/A

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
monitoring			
Point source emissions to groundwater including monitoring	N/A	The heading and wording relating to 'no specified condition' is removed as these are redundant; there are no associated conditions under the heading.	N/A
Emissions to land including monitoring	L2.2.1 – 2.2.2 L3.2.1	Refer to detailed assessment of Emissions to land including monitoring in Appendix B.	United States Environmental Protection Agency, *Process Design Manual, Land Treatment of Municipal Wastewater Effluents,* 2006 *Australian and New Zealand Guidelines for the Fresh and Marine Water Quality (2000).*
Fugitive emissions	N/A	There is no dust emissions expected from the normal operation of the premises. The heading and wording has been removed.	N/A
Odour	N/A	Emission Description *Emission:* Odour potentially generated on site for the storage and treatment of wastewater. *Impact:* Potential impact of surrounding residents receiving unpleasant odour.	*Environmental Protection Act 1986*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Controls: The plant is more than 300m away from the nearest occupied part of the prison. The nearest residential sensitive receptors are 1.6 km west south west and 1.5 km north west. Risk Assessment *Consequence:* Insignificant *Likelihood:* Unlikely *Risk Rating:* Low Regulatory Controls Previous licence condition 2.7.1 has been removed as odour can be sufficiently regulated under Section 49 of the *Environmental Protection Act 1986*. In accordance with DER's licensing process, no specified condition for fugitive emission has been included in this licence. Residual Risk *Consequence:* Insignificant *Likelihood:* Unlikely *Risk Rating:* Low	
Noise	N/A	Emission Description *Emission:* Low levels of noise generated from the operation of the equipment (pumps) associated with the WWTP. *Impact:* Noise can be a nuisance to persons not on the Premises. *Controls:* The plant is more than 300m away from the nearest occupied part of the prison. The nearest sensitive receptors are 1.6 km west south west and 1.5 km north west away. Risk Assessment *Consequence:* Insignificant	*Environmental Protection (Noise) Regulations 1997*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Likelihood: Unlikely *Risk Rating:* Low Regulatory Controls No conditions relating to noise are proposed for the licence as any noise emissions are considered low risk and can be adequately managed under the *Environmental Protection (Noise) Regulations 1997.* Residual Risk *Consequence:* Insignificant *Likelihood:* Unlikely *Risk Rating:* Low	
Monitoring general	L3.1.1 – 3.1.4	Condition 3.1.1 requires wastewater and soil sampling to be conducted in accordance with the AS/NZS standards and analysis by a NATA accredited laboratory with the exception of pH and volumetric flow rate which will be measured in the field. This condition has been updated and replaces 3.1.1 of the previous licence. Condition 3.1.2 replaces 3.4.1 of the previous licence and requires that quarterly monitoring is undertaken at least 45 days apart and annual monitoring is undertaken at least 9 months apart. Condition 3.1.3 has been kept in the licence and requires the Licensee to have all monitoring equipment calibrated in accordance to the manufacturer's specification. Condition 3.1.4 has been kept in the licence and states that if the requirements of calibration cannot be met, the CEO must be notified. Previous licence condition 3.1.2 has not been included in this licence in line with DER's current licensing procedures.	AS/NZS 2031 AS/NZS 5667.1 AS 4482

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Monitoring of inputs and outputs	L3.3.1	Condition 3.3.1 has been included in the Licence to require monitoring of the sewage inlet flow and treated effluent, prior to being irrigated. These conditions assist in verifying that the treatment plant is operating effectively and to confirm compliance with condition 1.2.1.	N/A
Process monitoring	L3.4.1	Emission Description *Emission:* Uncontrolled leakage of nutrient rich treated water to woodlots and prison landscape via the irrigation system. *Impact:* Contamination of local soils, impacting planted woodlots, surface water and groundwater. *Controls:* WWTP process controls are illustrated in Appendix A. A Nutrient Irrigation Management Plan (NIMP) has been developed for the irrigation area; ambient groundwater and soil monitoring program and irrigation design to ensure appropriate application rates and infrastructure leakage detection. Risk Assessment *Consequence:* Moderate *Likelihood:* Possible *Risk Rating:* Moderate Regulatory Controls L3.4.1 has been included in this licence to ensure that there are weekly inspections of the irrigation to ensure the system is work effectively and there are is no uncontrolled leakage of treated wastewater. Crop health will also be monitored to ensure leakage of treated wastewater is not having a negative impact of the woodlots Residual Risk *Consequence:* Moderate *Likelihood:* Unlikely *Risk Rating:* Moderate	N/A

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Ambient quality monitoring	L3.5.1	Condition 3.5.1, Table 3.5.1 replaces 3.8.1 of the previous licence and has been included to require the Licensee to monitor ambient groundwater quality for the detection of pollution. Table 3.5.2 has been included in this licence, which requires the Licensee to monitor ambient soil quality to ensure approved application rates are not negatively impacting vegetation health, or contaminants accumulating in the soils.	United States Environmental Protection Agency, *Process Design Manual, Land Treatment of Municipal Wastewater Effluents,* 2006
Meteorological monitoring	N/A	Meteorological monitoring is not required, the heading and wording has been removed.	
Improvements	L4.1.1 - 4.1.2	It has been identified that the liner of the stabilisation pond has been compromised and is leaking partially treated waste water via infiltration; therefore Condition 4.1.1 (IR2) has been included in this licence requiring the Licensee to cease operating and decommission the current 45ML storage pond. If necessary for the wastewater treatment process, a new storage pond that achieves permeability of at least $<10^{-9}$ m/s or equivalent should be constructed in line with a DER Works Approval or Licence Amendment. Improvement condition 4.1.1 (IR1) requires the Licensee to submit a report that outlines how emissions to land will be decreased by 2018.	General provisions of the *Environmental Protection Act 1986.*
Information	L5.1.1 – 5.3.1	Condition 5.1.1 has been kept on the licence regarding record keeping. Previous condition 5.1.2 is removed in line with DER's current licensing procedures. Condition 5.1.2 replaces 5.1.3 of the previous licence for the submission on an Annual Audit Compliance Report.	General provisions of the *Environmental Protection Act 1986.*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Condition 5.1.3 replaces 5.1.4 of the previous licence for complaint management system. Condition 5.2.1 has been kept and Table 5.2.1 has been updated to the new monitoring requirements in line with conditions 3.2.1 monitoring of emissions to land, condition 3.3.1 monitoring of inputs and outputs and condition 3.4.1 process monitoring, 3.5.1 monitoring of ambient environmental quality monitoring. Condition 5.2.2 has been kept that requires the Licensee to submit additional information in the Annual Environmental Report including assessment of monitoring results against previous Licence limits. Condition 5.3.1 notification has been kept in the licence and has been amended according to current practices as there is no longer as sewage sludge treatment pond, all sludge is maintained in an enclosed tank as referred to in the containment infrastructure condition 1.2.3.	
Licence Duration	N/A	The licence duration has been extended to 2027 in accordance with DER's *Guidance Statement: Licence duration* as specified in section 59(1)(k) of the EP Act.	N/A

5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
N/A	Application advertised in West Australian (or other relevant newspaper)	N/A	N/A
31/03/2016	Proponent sent a copy of draft instrument	Table 3.5.1 monitoring of emissions to land, Aluminium frequency of monitoring to be changed from quarterly to annual.	This was an administrative error and has been rectified.
		Department of Corrective Services provided the following comments on 1 June 2016: The Department is still considering the amendments to the licence in light of the improvement recommendations which will require significant funding. Therefore we are not yet in a position to approve the licence amendment. In light of the cost required to implement the improvement recommendations we have progressed our submission through the DCS internal Finance Division and the Department's Executive for funding sourcing and approval. If there is no funding available, we cannot approve the licence amendments as they have been currently presented.	These comments have been considered by DER, however the improvements are necessary and timeframes are considered appropriate to prevent long-term environmental impacts.

6 Risk Assessment

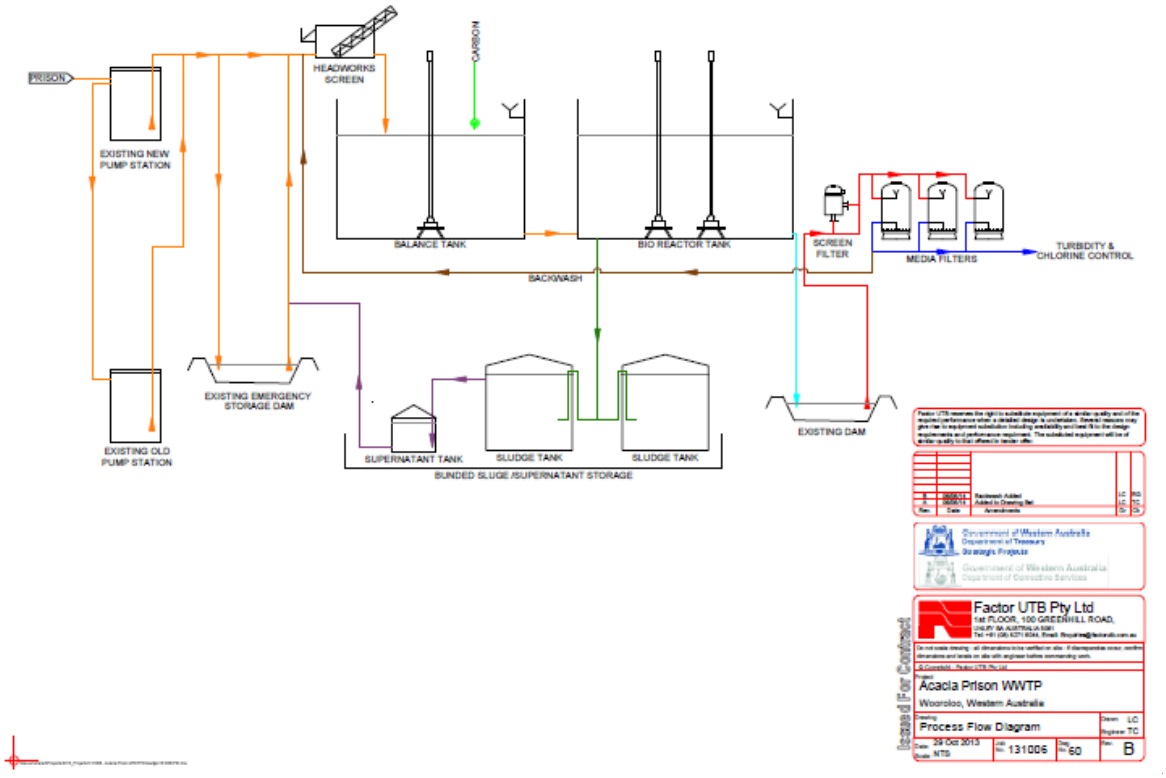
Note: This matrix is taken from the DER Corporate Policy Statement No. 07 - Operational Risk Management

Table 1: Emissions Risk Matrix

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Severe
Almost Certain	Moderate	High	High	Extreme	Extreme
Likely	Moderate	Moderate	High	High	Extreme
Possible	Low	Moderate	Moderate	High	Extreme
Unlikely	Low	Moderate	Moderate	Moderate	High
Rare	Low	Low	Moderate	Moderate	High

Appendix A

Process flow diagram



Appendix B

Emission Description

Emission: Irrigation of nutrient rich treated water to woodlots and prison landscape. The WWTP is designed to produce treated wastewater with nutrient concentrations below 20mg/L (median) and total phosphorus concentration 2mg/L median on discharge to the 45ML storage (balancing) pond. While the effluent is chlorinated prior to irrigation, the treated wastewater quality from the new plant is compromised by the recirculating to treated wastewater in the storage pond which still contains legacy effluent. Furthermore, it has been determined that the areas provided for proposed irrigation areas in the works approval were incorrect (actual area being 15% smaller). Proposed shot-term loading rates identified in the Nutrient and Irrigation Management Plan (NIMP) for nitrogen and phosphorus is slightly less than 300kg/ha/year and 40kg/ha/year, respectively.

Department of Health has approved the Recycled Water Scheme for the irrigation to the sports oval, garden bed and woodlots with conditions. This includes irrigated wastewaters having total chlorine residual values between 0.2 – 2 mg/L; pH 6.5-8.5; turbidity <NTU (95%ile); E.coli <10cfu/100mL.

Impact: Contamination of local soils, surface water and groundwater. An assessment of the emissions to land, proposed loading rates and impacts as provided by the DER Principal Hydrogeologist are discussed at the end of the residual risk assessment.

Controls: WWTP process controls are illustrated in Appendix A. A NIMP has been developed for the irrigation area; ambient groundwater and soil monitoring program and irrigation design to ensure appropriate application rates and infrastructure leakage detection. Irrigation of the woodlots is overseen by Serco, the contractor for the prison operation.

Given the above assessment, the proposed increase to emissions to land is not appropriate as a long term solution. However, in the short term an increase of nitrogen and phosphorus will be an acceptable while the Licensee resolves the existing issue of the storage pond.

The proposed emissions comply with the short-term trigger value guidelines for nitrogen and phosphorus in accordance with the *Australian and New Zealand Guidelines for the Fresh and Marine Water Quality (2000).* An improvement condition has been included in this licence to require the Licensee to submit a report detailing how emissions to land will be decreased. It is recommended that once the storage dam has been remediated and re-treated through the new WWTP, that emissions to land are re-assessed.

Risk Assessment
Consequence: Moderate
Likelihood: Likely
Risk Rating: High

Regulatory Controls

Condition 2.2.1 replaces 2.4.1 of the previous licence that specifies emission points to land.

Condition 2.2.2 replaces 2.4.2 of the previous licence that specifies emission limits to land. Total nitrogen, total phosphorus quality limits have been amended as a short term solution to the wastewater treatment issue on site. Once wastewater from the storage pond has been re-treated, emissions to land will be re-assessed by DER to ensure that the long term irrigation of treated wastewater will not have a significant environmental impact.

Condition 3.2.1 replaces condition 3.4.1 of the previous licence that specifies volume and quality of treated wastewater discharged to irrigation being monitoring. This condition has been updated to include a standard suite of metals, and total dissolved solids and has been included in this licence to confirm compliance with Condition 2.2.2.

Residual Risk
Consequence: Moderate
Likelihood: Likely
Risk Rating: High

Assessment of emissions to land:
Wastewater discharges produced from sewage treatment, from food-based industries, or from agricultural waste products have the potential to be a useful resource for irrigating a wide range of crops on a sustainable basis. Wastewater discharges from these sources typically contain high concentrations of nutrients that can help sustain plant growth, and natural biogeochemical processes that take place in soils can help decompose or immobilise other contaminants present in these discharges. Potential environmental impacts from wastewater irrigation schemes are generally minimised when the following nationally-recognised management principles are applied to a given scheme:

- Evapotranspiration by plants in the irrigated area should drive both the volume and timing of wastewater applications to land. Wherever possible, nutrients and the applied water should be utilised within the crop root-zone and there should be minimal seepage of nutrients and other chemical constituents from the wastewater past the root-zone into groundwater; and

- Applications of wastewater should not exceed the soil's capacity to provide suitable growing conditions for the irrigated plants, or cause long-term changes to soil structure that may adversely affect the capacity of the soil to continue to support plant growth and a healthy soil-fauna.

Therefore, the principal components of a sustainable wastewater irrigation scheme are:

- The annual loads of nitrogen and phosphorus applied in wastewater do not exceed the uptake of these nutrients by vegetation in the irrigated area. This generally means that wastewater is irrigated to a sufficiently large land area such that nutrients are taken up by the crop and removed from the area in harvested biomass;

- The irrigated area should be sufficiently large to enable the applied wastewater to be fully utilised by the crop. This generally means that irrigation does not take place in the southern part of the State during winter months when rainfall exceeds the rate of evapotranspiration and when there is a significant risk that nutrients will be leached into groundwater. Wastewater produced during winter is often stored for use during warmer months, and sufficient land area should be available to enable both the stored and ongoing production of wastewater to be discharged; and

- The chemical composition of the wastewater will not cause adverse effects on soil structure in the irrigated area. The most significant impacts on soil structure in Western Australia are typically caused by increased soil sodicity.

These issues are examined below for the proposed expansion of the wastewater irrigation scheme at the Acacia Prison WWTP.

1. Assessment of the proposed nutrient loading rates at Acacia Prison WWTP
A preliminary estimate of the land area required to ensure that a particular crop takes up all of the nutrients applied by wastewater irrigation area is given by the following formula (NSW EPA, 1998; NSW DEC, 2004):

$$A = \frac{C \times Q}{L_x}$$

Where A = land area (m^2)
C = concentration of N or P in wastewater (mg/L)
Q = treated wastewater flow rate (L/d)
L_x = critical loading rate (uptake rate) for N or P for a specific crop ($mg/m^2/d$)

It is understood that the total nitrogen concentration in wastewater in the upgraded scheme will be about 25 mg/L, and the total phosphorus concentration will be about 3 mg/L. It is also understood that the proposed wastewater production rate will be up to 900 m^3/d (i.e. 900 000 L/d) and that irrigation will take place on a 10.6 hectares area of eucalypts and a 3.6 hectares are of prison gardens. The critical nutrient loading rates for this vegetation is tabulated below:

Vegetation type	L_N ($mg/m^2/d$)	L_P ($mg/m^2/d$)	Source of Information
Eucalypt woodlot	25	4	Vic EPA (2003), Sydney Catchment Authority (2012)
Turf and general garden irrigation	18-36	2-4	NSW EPA (1998)

On the basis of this information and the relative proportion of woodlot and gardens irrigated, an average critical loading rate of 25 $mg/m^2/d$ was assumed for nitrogen, and a value 4 $mg/m^2/d$ was assumed for phosphorus. Applying these values in the above equation gives a required land area for the uptake of nitrogen of 90 ha, and a land area of about 67 ha for phosphorus uptake. Nitrogen is therefore the limiting nutrient in this system, as its area requirement is the larger of the two values.

Clearly, the land area required for nutrient uptake at the site (90 ha) greatly exceeds the total area of 14.2 ha that has been made available for wastewater irrigation. This means that nutrients could be leached from the site on a seasonal basis into groundwater. Additionally, these calculations indicate that excessive nutrients are being applied to soil in the irrigation areas even with the current wastewater production rate of 330 m^3/d.

The limited information that was provided in the Nutrient and Irrigation Management Plan (NIMP) suggests that nutrient levels do not appear to be excessively high in soil immediately beneath the irrigated woodlot despite the current high nutrient loading rates. Possible reasons for this include:

- The shallow gravelly-textured soil horizons have a limited retention capacity for nutrients which are rapidly leached beyond the root zone into deeper parts of the soil profile and groundwater which do not appear to have been sampled. In particular, the phosphorus sorption capacity of poorly structured gravelly-textured soil materials is very low (Sydney Catchment Authority, 2011); and

- Ammonium oxidation and microbial denitrification in shallow soils are efficiently removing excess nitrogen from this part of the soil profile.

Further information would be required to enable all of the components of the mass balances for nitrogen and phosphorus in the irrigation area to be determined.

2. Assessment of the water balance of the irrigation area

The water balance for the soil in a wastewater irrigation area for a specified time interval (often on a monthly basis) is given by the following equation:

Precipitation + Depth of wastewater applied = Evapotranspiration + Percolation past the root zone

That is, water inputs to the soil should equal water outputs from the soil. During periods of the year when average rainfall exceeds the rate of evapotranspiration, an external water storage pond is usually required to ensure that the amount of water that percolates past the root zone is minimised.

This water balance was calculated for the proposed Acacia Prison WWTP scheme using a spreadsheet calculation procedure from Appendix 6 of NSW EPA (1998). The average monthly rainfall for the site was assumed to be equivalent to values from the nearby Bureau of Meteorology Baker's Hill weather station, and pan evaporation figures for Northam were assumed to apply at the Acacia Prison WWTP. A percolation rate of 5 mm/week was assumed to prevent excess soluble salts accumulating within the soil profile. The crop factor for the eucalypt woodlot was assumed to be 0.8. Output from the spreadsheet is presented below:

Design wastewater flow	(Q)	l/day	900000
Design Percolation rate	R	mm/week	5 (removal of salt in root zone)
Land area	L	m2	1.42E+05

Parameter	Symbol	Formula	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Days in month	D		days	31	28	31	30	31	30	31	31	30	31	30	31
Precipitation	P		mm/month	16	13	18	31	71	107	113	86	64	34	21	10
Evaporation	E		mm/month	366	311	263	150	91	56	57	69	110	167	236	329
Crop factor	C			0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Inputs															
Precipitation	P		mm/month	16	13	18	31	71	107	113	86	64	34	21	10
Effluent irrigation	W	(QxD)/L	mm/month	196	177	196	190	196	190	196	196	190	196	190	196
Total input		(P+W)	mm/month	212	190	214	221	267	297	309	282	254	230	211	206
Outputs															
Evapotranspiration	ET	(E*C)	mm/month	256	218	184	105	64	39	40	48	77	117	165	230
Percolation to remove salt	B	(R/7) x D	mm/month	22	20	22	21	22	21	22	22	21	22	21	22
Total output		(ET+B)	mm/month	278	238	206	126	86	61	62	70	98	139	187	252
Storage (i.e. excess water)	S	(P+W)-(ET+B)	mm/month	-66	-47	8	95	182	237	247	212	156	91	25	-46
Cumulative storage			mm/month	0	0	0	103	276	418	484	459	368	247	116	0
Maximum storage	V		mm	484											
Storage volume required		(V x l)/1000	m3	68,721											

These calculations suggest that a wet-weather storage pond with a capacity of about 69 ML would be required to minimise seepage from the soil profile in the irrigated area. The requirement exceeds the current wastewater storage capacity at the site of about 42ML. Therefore, it is likely that excess water would be applied to soil in the irrigation area on a seasonal basis to allow nutrients and other chemical constituents in wastewater to percolate past the crop root zone.

3. Potential impacts on soil structure

Although only incomplete chemical data were provided in the NIMP, it is likely that the chemical composition of wastewater at the Acacia prison farm is dominated by sodium and chloride ions, and could cause sodicity problems in sensitive soils. This is unlikely to be a problem in parts of the site underlain by gravelly-textured soil materials, but could be an issue in some low-lying parts of the site which are more likely to be underlain by more clayey-textured soils. Sodicity problems can often be controlled by periodic application of gypsum to soils in affected areas.