Ravenswood/West Murray 2A Infill Sewerage Project

Draft Construction Environmental Management Framework

July 2012

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Project Number:
C-S00802

Document Number:
AQUA Document No. 6971132

Document History

Report	Version	Author(s)	Reviewed by
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Reference

This document should be cited as:

Water Corporation (2012*) Ravenswood/West Murray 2A Infill Sewerage Project Construction Environmental Management Framework. July 2012.*

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1.0 Overview

1.1 Project Outline

1.1.1 Project Background

The Water Corporation is a public utility of the State Government of Western Australia providing essential public infrastructure for water supply, waste water treatment and drainage under the Water Corporation Act 1995.

The Western Australian State Government announced in May 2010 that the Statewide Infill Sewerage Program would be funded with $100 million dollars over the next four years. As a part of this program, the Ravenswood/West Murray 2A project was announced.

The Water Corporation proposes to construct infill sewerage along parts of Murray Bend Dr, Ravenswood Rd and Adam Rd, Ravenswood. This will enable the current residences to connect to the central wastewater system, with the capacity to upgrade the pumping station to cater for future development. The existing properties are currently using septic tanks and are situated in close proximity to the Murray River. This project will have the overall environmental benefit of removing the nutrient load from these septic tanks to the river.

1.1.2 Project Location

The proposed works are located in the Shire of Murray, along Murray Bend Drive, Ravenswood Rd and Adam Rd, Ravenswood. See Figure 1.

1.1.3 Project Infrastructure

The Ravenswood/West Murray 2A Infill Sewerage project comprises construction of the following infrastructure:

- Approximately 1.3 km of dual pressure sewer pipeline, approximately 100 mm in diameter (DN100);
- Approximately 1.5 km of gravity sewer pipeline, approximately 150 mm in diameter (DN150), with associated access chambers;
- A Type 10 pumping station, which will have the ability to pump at a rate of 10 litres per second, with a wet well to be founded at depth of approximately 9 m below ground level; and
- Connections to the existing pressure pipeline and gravity sewer system.

Pressure Sewer

The proposed 1.3 km of dual pressure main will be laid in a common trench from the pumping station, corner of Adam Rd and Murray Bend Dr, to the junction of Pinjarra Rd and South Yunderup Rd, where it will be connected to an existing pressure main.

The existing main continues along Pinjarra Rd across the road bridge to the junction of Pinjarra Rd and Nancarrow Way where it will be connected to an existing gravity sewer pipeline. This connection will be through an existing access chamber.

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The proposed dual pressure mains will be laid at an invert level of between 1.2 m and 2 m below ground level.

Gravity Sewer

A proposed gravity sewer system will be constructed as follows:

- 480 m of gravity sewer will be installed along Murray Bend Dr on the same alignment as the pressure main to service the residential properties from lot 801 to 19. The gravity sewer will be laid to fall from both lot 801 and 19 to lot 55 at an invert level of 2.5 m falling to an invert level of 4 m. This main will be constructed by open trench technique.
- 400 m along Adam Rd to service lots 12 to 24. The gravity sewer will be laid to a fall from lot 24 to lot 12 at an invert level of 1.2 m to 3.2 m. This main will be constructed by open trench technique.
- 420 m along Ravenswood Rd to service lots 23 to 13. The gravity sewer will be laid to a fall from lot 23 to lot 13 at an invert level of 2 m to 4 m. This main will be constructed by open trench technique.
- 315 m along Murray Bend Dr to transfer the flows from the above 3 systems to the pumping station. This main will be constructed by a trenchless technique from lot 55 to the pumping station site falling from an invert level of 4 m to 6 m.

The extent of the construction for the trenchless technique will need to be determined, but will more than likely involve the construction of 3 launch/receival pits. These pits could be constructed by open excavation, but given the presence of groundwater, a caisson method of construction may be preferred. The construction and set up of the launch/receival pits will take approximately 3 weeks, and approximately 2 weeks to install the pipeline.

Pumping Station

The proposed pumping station comprises a wet well, valve chamber and pipework connecting to the infrastructure.

Wet Well

The wet well is approximately 2.25 m in diameter and will be approximately 9 m deep. Given the presence of groundwater, it is proposed to construct the wet well using a caisson method with the base slab being poured using a tremmie pipe.

This method of construction will limit the amount of dewatering required.

Valve Chamber

The valve chamber is approximately 2.25 m in diameter and approximately 2.5 m deep. It will be constructed adjacent to the wet well. It is proposed that this chamber is also constructed using a caisson method due to the high water table, however an open excavation method could be used depending on the time of the year for construction and sump pumping to control the groundwater intrusion into the open excavation.

Pipelines

Within the pumping station site, approximately 20 m of pipe is required to connect the gravity sewer to the pumping station and from the valve chamber to the pressure main. The gravity system is approximately 6 m below ground level and the pressure system approximately 2 m below ground level.

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It is proposed that the gravity pipeline be constructed where possible using a trenchless technique with any small excavations to permit the connection between the pipe and the wet well by open excavation. This excavation is not expected to exceed 2 m x 2 m in plan area.

The pressure system will be connected by open excavation pit approximately 2 m x 2 m in plan area.

Emergency Storage

No emergency storage will be constructed at this stage as there is sufficient capacity within the pipework to allow for 7.2 hours of emergency storage for the current 54 properties.

The 54 properties will account for an initial flow rate of 1.48 l/s. The capacity within the pipework provides 38.6 m^2 of storage, which provides 7.2 hours of storage in the event of an emergency.

A generator connection will also be fitted for use in the event of a power failure.

If the pumping station is upgraded in the future, storage pipes will be installed in the land adjacent to the pumping station to store overflow in the event of an emergency. Up to 10 rows of storage pipes have been designed for future use, each row is 1800 mm in diameter and 17.1 m long.

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Figure 1 Location of the Proposed Ravenswood/West Murray 2A Infill Sewerage Infrastructure

1.2 Purpose of this CEMF

This Construction Environmental Management Framework (CEMF) outlines the actions to be taken to minimise environmental impacts arising during construction. It is the primary objective that all environmental impacts during construction are avoided or minimised as far as practicable.

It is the purpose of this CEMF to:

1. Enable the successful contractor to develop an appropriate Construction Environmental Management Plan (CEMP) for the works.
2. Ensure the CEMP addresses any statutory environmental requirements for the project.
3. Identify the actions to be undertaken to manage the environmental impacts of the construction works.
4. Ensure that the management actions are in accordance with accepted Water Corporation standards. Details of these documents are provided in the relevant sections of the CEMF and may be accessed through the water Corporation web site.
5. Address community and government expectations of transparency and accountability by identifying the management actions and making this CEMF publicly available.

1.2.1 Environmental Requirements of the CEMF

This CEMF focuses on the management actions to be implemented during construction by construction staff. Consequently, background environmental information on the proposal has been intentionally limited.

The environmental issues addressed in this CEMF include:

- Flora and Vegetation Clearing;
- Fauna;
- Erosion and Sedimentation
- Air Quality
- Dewatering and Acid Sulfate Soils;
- Hygiene;
- Fire;
- Waste;
- Aboriginal Heritage;
- Traffic and Public safety;
- Noise;
- Dangerous Goods;
- Discharge of Pipeline Pressure Testing Waters;
- Environmental Incident and Hazard;
- Community Complaints;
- Compliance with all aspects of the CEMF; and
- Auditing of the CEMF.

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It is the intention of the Water Corporation that this CEMF is developed with the assistance of the stakeholders listed for each management plan. Stakeholders will be consulted for specific matters within their spatial or statutory jurisdiction to enable the stakeholders to have an opportunity to provide input into the management actions governing the project.

1.3 Specifications

This CEMF and the materials and methodologies therein are correct as of the publication date. The following changes to materials and methodologies will not invalidate this plan:

1. Changes to materials that do not result in additional or different environmental impacts.
2. Minor changes to methodologies that do not result in lessened environmental monitoring and/or additional or different environmental impact.

Changes to the materials or methodology that may result in reduced monitoring and/or cause a significant environmental impact will be referred to the relevant advisory agencies prior to implementation of the change.

1.4 Implementation of Contingency Actions

The CEMF outlines a number of contingency actions that may be used in the event that the management actions proposed do not achieve the purpose stated in each management plan.

1.5 Environment Policy

This CEMF has been drafted to support The Water Corporation's Environmental Policy as contained in Appendix 1.

1.6 Training on the CEMF

All staff involved in the construction of the Ravenswood/West Murray 2A Infill Sewerage Project will receive training on relevant management plans within this CEMF. The names of the people trained on this CEMF will be recorded in a CEMF Training Log along with the date and the specific plans for which that training was conducted.

1.7 Limitations

Several management planning reports by Golder Associates were still in draft format at the time of writing this CEMF. These include the Flora and Fauna report, the Dewatering Management Plan and the Acid Sulfate Soil Management Plan.

The actual clearing required had not been marked out on the site at the time of writing this CEMF and therefore could only be approximated.

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2.0 Definitions

The terms used in this CEMF have the following meanings:

Airblast Level means the noise level resulting from blasting with explosives.

Blast overpressure means the sharp instantaneous rise in ambient atmospheric pressure resulting from detonation of an explosive.

Bund means an embankment of earth or a wall constructed of brick, stone or concrete to form the perimeter of a compound that will prevent lateral movement of the material contained within the embankment or wall.

Declared Rare Flora means the flora protected under the *Wildlife Conservation Act 1950* (WA) due to it being rare, in danger of extinction, or otherwise in need of special protection.

Elder means a mature person of Aboriginal decent with experience and knowledge on matters related to aboriginal culture, customs, traditions and/or heritage, as determined by the Aboriginal community.

Environmental Harm means the direct or indirect alteration of the environment as defined by the *Environmental Protection Act 1986* (WA).

Environmental Incident means any event or impact on the environment involving the Water Corporation and/or its contractor's actions or assets that is capable of:

- causing harm to the environment or any person or property;
- causing pollution; and/or
- coming to the attention of an environmental regulatory agency.

Excavator means a machine used for excavating soil or sediment material and may include a backhoe excavator, bulldozer, dredge or other similar equipment.

Ground Disturbing Activities means the disturbance of earth or waters involving machinery including clearing, excavation, backfilling and compacting, but excludes geotechnical investigations, surveying, fencing and rehabilitation works.

Fauna means animals.

Flora means plants.

Habitat Tree means a mature native tree containing hollows that may be suitable for habitat of native fauna.

Initial Ground Disturbing Activities means the disturbance of earth or waters involving machinery including clearing and excavation to a depth of 0.5m, but excludes geotechnical investigations, surveying, excavation in excess of 0.5m, backfilling, compacting, fencing and rehabilitation works.

Integrated Water Supply Scheme (or IWSS) means the water transfer network supplying drinking quality water to 1.5 million West Australians in the Perth metropolitan area, south-west, central wheatbelt and the goldfields regions.

Landowner means the person(s) or management body that lawfully owns or lawfully manages a specific parcel of land.

Native Vegetation means any local indigenous plant community containing throughout its growth the complement of native species and habitats normally associated with that vegetation type or having the potential to develop these characteristics. It includes vegetation with these characteristics that has been regenerated with human assistance following disturbance. It excludes plantations and vegetation that has been established for commercial purposes.

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pH_F means a field test of a water and soil paste to determine the presence of actual acid sulphate soils.

pH_{FOX} means a field test of a water and soil paste to determine the presence of potential acid sulphate soils (stored acidity).

Pollution means the direct or indirect alteration of the environment to its detriment or degradation, to the detriment of an environmental value, or is of a prescribed kind from an emission (as defined by the *Environmental Protection Act 1986* (WA)).

Priority Flora means flora that is recognised by the DEC as being under threat and in urgent need of further study; but is not yet declared rare flora under the *Wildlife Conservation Act 1950* (WA). Priority Flora is divided into Priority 1, Priority 2, Priority 3 and Priority 4 listings, with Priority 1 being the flora most under threat.

Registered Site means a defined spatial area registered as having significance to Aboriginal persons under the *Aboriginal Heritage Act 1972* (WA). The term excludes sites listed as "Stored Data" on the Department of Indigenous Affairs heritage database, which are not classified as sites under the *Aboriginal Heritage Act 1972* (WA).

Superintendent's Representative means the person nominated by the Superintendent from time to time in writing by and representing the Superintendent.

Sterile Hay Bales are hay bales that do not contain viable seeds and will therefore not introduce weed propagules when used for turbidity management.

Watercourse means a river, creek, gully, brook or irrigation channel that contains or has contained water, but excludes wetlands.

Water level indicator means a round steel post with a flat marked gauge plate of white background and black 1cm increment gauge markings each with a total nominal length of 2.0m (refer Water Corporation Plan B055-18-1 for example).

Wetland means land that is permanently, seasonally or intermittently waterlogged or inundated with water, but excludes watercourses.

Windrow means a line of stockpiled material, such as soil or vegetation.

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3.0 Abbreviations

The following abbreviations used in this CEMF have the following meanings:

Terms

CEMF	Construction Environmental Management Framework
DAF	Department of Agriculture and Food (WA)
DEC	Department of Environment and Conservation (WA)
SEWPaC	Department of Sustainability, Environment, Water Population and Communities (C'th)
DIA	Department of Indigenous Affairs (WA)
DoC	Department of Commerce (WA)
DoH	Department of Health (WA)
DoW	Department of Water (WA)
DPI	Department for Planning and Infrastructure (WA)
FESA	Fire and Emergency Services Authority (WA)
IWSS	Integrated Water Supply Scheme
MRWA	Main Roads Western Australia
MSDS	Materials Safety Data Sheet
NATA	National Association of Testing Authorities
SWALSC	South West Aboriginal Land and Sea Council
WAPC	Western Australian Planning Commission

Measurement

cm	Centimetre
m	Metre
m^2	Square metre
km	Kilometre
ha	Hectare
kg	Kilograms
kg/ha	Kilograms per hectare
mg/kg	Milligrams per kilogram
mg/L	Milligrams per litre
ML	Megalitre
GL/y	Gigalitres per year
ML/y	Megalitres per year
^oC	Temperature in degrees Celsius
dB	Decibels of noise
S%	Sulfur percentage

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4.0 Roles and Responsibilities

Construction Engineer

Overall Environmental Responsibility: Integrate minimisation of environmental harm into project planning/management.

Separate Responsibilities:

- Include the environment into all aspects of project planning, including the preparation of tenders;
- Allocate project resources to handle environmental issues;
- Ensure suppliers and contractors comply with environmental requirements;
- Report on environmental issues to Project Manager;
- Investigate and ensure that environmental incidents are recorded on the Corporate Incident Management System;
- Review the performance of environmental management on a monthly basis; and
- Ensure environmental inspection is conducted.

Supervising Foreperson

Overall Environmental Responsibility: Plan all works and activities on site to comply with the requirements of this integrated management plan.

Separate Responsibilities:

- Assist and guide the respective workers to meet their environmental responsibilities;
- Check the implementation of the environmental section of this integrated management plan;
- Report to the Construction Engineer on environmental issues;
- Monitor the rectification of incidents;
- Provide technical advice to personnel and management in the review of work methods; and
- Conduct a Site Start-up Meeting with the Site Personnel on site.

Site Supervisor

Overall Environmental Responsibility: Ensure that all works and activities on site are carried out within the environmental requirements of this integrated management plan.

Separate Responsibilities:

- Ensure that the Environmental Management section of this integrated management plan is implemented effectively;
- Incorporate the Environmental Management section of this integrated management plan into project specific procedures, including JSAs, and toolbox meetings;
- Implement appropriate action to address any environmental incidents;
- Ensure suppliers and contractors comply with environmental requirements;
- Halt construction activities in the event of inadequate environmental performance; and
- Regularly liaise with the Construction Engineer and Supervising Foreman regarding environmental issues.

Site (Contractors) Environmental Officer

Overall Environmental Responsibility: Ensure contractor is managing environment issues/impacts along with meeting their legal and other requirements.

Separate Responsibilities:

- Liaise with Construction Engineer regarding the environmental aspects and impacts of the project;
- Liaise with Clients Environment Representative regarding project specific environmental issues;
- Draft integrated management plan in consultation with Construction Engineer;

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- Continuously review and update the integrated management plan in consultation with Construction Engineer;
- Conduct environmental audit as per Contract Audit Schedule.
- Ensure that the Environmental Management section of this integrated management plan is effectively established, implemented and maintained at the project level;
- Be present on-site during any critical construction activities and provide support to the Contractor's team to enable them to meet their environmental commitments;
- Implement an appropriate environmental awareness training programme and ensure all site personnel complete the training program;
- Ensure that environmental records and files are maintained;
- Complete environmental checklists and report/liaise to the Site Supervisor;
- Ensure community complaints and non-conformances are recorded and appropriately considered;
- Investigate and report on any environmental incidents and ensure that appropriate action is taken;
- Undertake environmental monitoring requirements as required by approvals, licenses and permits;
- Prepare and collate documentation for Audit of compliance with CEMP, by Water Corporation Environment Branch's Operations Section.

All Employees (and hired Plant Operators) - (Full time)

Overall Responsibility: Contribute to effective environmental management at the site for the life of the project, by implementing the environmental section of this integrated management plan within their area of responsibility.

Separate Responsibilities:

- Comply with the relevant Act, Regulations, Codes of Practice and Standards;
- Comply with the Environmental Policy & Procedures;
- Comply with the Dieback Hygiene requirements as detailed in the Environmental – Significant Risks and Controls;
- Do not clear, damage or burn any vegetation outside the area permitted to be cleared as detailed in the Clearing Permit;
- Promptly report to management any environmental non-conformances and/or breaches; and
- Participate in environmental awareness training as directed by management.

Water Corporation (Client) Environmental Officer

Overall Environmental Responsibility: Ensure contractor is implementing environment management measures in accordance with the CEMP (developed with reference to this CEMF).

Separate Responsibilities:

- Complete site inspections to verify contractor performance in accordance with the CEMP. Frequency of inspections to be determined with respect to project risk;
- Document site inspections and findings to Water Corporation Project Management staff.

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5.0 Flora and Vegetation Clearing Management Plan

5.1 Context

The proposed construction works will require some clearing of native vegetation. Clearing will be carried out within defined clearing widths to minimise construction impacts on flora and fauna.

Prior to clearing, the boundaries will be defined and any priority species or habitat trees will be taped so that they can clearly be avoided.

A level 1 flora and opportunistic fauna survey was conducted by Anders Environmental (on behalf of Golders Associates) in December 2011, to assess the flora and vegetation within the proposed infrastructure route (see Ravenswood/West Murray 2A Infill Sewerage Project Level 1 Flora and Opportunistic Fauna Survey). The survey was conducted to determine the presence of sensitive flora species identified in the desktop study.

Two threatened flora species were recorded within the project area, *Grevillea manglesii* subsp. *ornithopoda* (Priority 2) and *Eucalyptus rudis* subsp. *cratyantha* (Priority 4). Both species occur along the riverbank as part of the riparian vegetation. There will be no clearing of riparian vegetation.

A number of habitat trees were recorded in the project area, these include Marri (Corymbia calophylla), Blackbutt (Eucalyptus patens), and Flooded gum (Eucalyptus rudis), these will be retained where possible.

Total clearing of native vegetation required is approximately 0.81 ha. This includes isolated trees within the road reserve, of which two are Marri (*Corymbia calophylla*) habitat trees, which will be avoided if at all possible. There is no evidence that these Marri trees are being used by Black Cockatoos.

The clearing required for the proposed works will be assessed and conducted in accordance with the Water Corporation's Clearing Permit CPS 185/3. The conditions associated with the clearing permit must be complied with.

5.2 Purpose

The objective of the Flora and Vegetation Management Plan is to outline management actions to:

1. Minimise construction impacts on flora, more specifically to:
    a. minimise impacts on Priority Flora identified by the DEC; and
    b. minimise impacts to habitat trees.
2. Remove topsoil during clearing, and return it following installation of infrastructure.

5.3 Performance Indicators

Performance will be demonstrated by:

- Compliance with the Water Corporation's clearing permit CPS 185/3;
- Compliance with the prescribed management actions.

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Vegetation

- Vegetation clearing is limited to within pre-determined clearing widths.
- Habitat trees will be marked prior to construction and retained where possible.

5.4 Management Actions

Prior to Construction

1. The boundary of the native vegetation requiring clearing will be marked with pegs and flagging tape (or other suitable marking method) prior to clearing.
2. Areas of native vegetation which require clearing, in particular those in close proximity to riparian vegetation, should be assessed for the presence of threatened flora prior to clearing, and any threatened species taped so that they can be avoided if possible.
3. Topsoil will be removed and retained where possible, in accordance with the clearing permit.

During Construction

4. No clearing will occur outside the marked area.
4. Trees will be preserved where possible.
5. Clearing of native vegetation will only commence once approval is received from superintendent (hold point);
6. Clearing of threatened flora species *Grevillea manglesii* subsp. *ornithopoda* and *Eucalyptus rudis* subsp. *cratyantha* will be avoided where ever possible.
7. Where ever possible, the use of heavy equipment along riverbanks will be prevented as this will reduce erosion or compaction and protect fauna habitats.
8. During clearing, where existing fallen logs with a diameter larger than 300mm (950mm circumference) partially overlay the area to be cleared, the log will be cut at the clearing boundary to preserve the part of the log outside of the clearing corridor;
9. Each calendar week, a survey of the area will be conducted to determine the area (in ha or m^2) of native vegetation cleared. The survey area will be recorded in the Native Vegetation Clearing Log (Table 1), and weekly updates will be provided along with the as-constructed drawings of the infrastructure;
10. Cleared vegetation will not be burned;
11. Topsoil removed from agricultural areas will only be re-spread in agricultural areas;
12. Topsoil removed from vegetated areas will be returned to the area it originated from;
13. The trench will be excavated (to the required depth), with the excavated overburden stockpiled close to its point of origin in a windrow of no greater than 5 metres nominal height.

After Construction

14. Excess overburden will be disposed of to a suitable location agreed, firstly with the Landowner (the Landowner has first preference to retain excess overburden from their own property), secondly with adjoining Landowners, or thirdly the excess overburden will be disposed of to a site agreed to by the Shire of Murray;

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5.5 Contingency Actions

No contingency actions are considered necessary.

5.6 Management Standards

PM#769642 Water Corporation Native Vegetation Clearing Procedure

5.7 Related Plans

- Fauna Management Plan
- Dewatering and Acid Sulfate Soils.
- Hygiene Management.
- Environmental Incident Management.

5.8 Relevant Legislation

- *Wildlife Conservation Act 1950*, and *Regulations 1970* (WA).
- *Environmental Protection Act 1986*, and *Regulations 1987* (WA).
- *Conservation and Land Management Act 1984*, and *Regulations 2002* (WA).
- *Environment Protection and Biodiversity Conservation Act 1999* (C'th).

5.9 Advisory Agencies

- DEC

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Table 1 Native Vegetation Clearing Log

Ravenswood/West Murray 2A Infill Sewerage Project
Land Clearing and Trench Management

Native Vegetation Clearing Log

The purpose of the Native Vegetation Clearing Log is to record the area of native vegetation cleared. The Native Vegetation Clearing Log is to be completed by the Contractor on a weekly basis.

Name ……

Page …… of ……

Date of Entry	Location and Property Reference	Area Cleared (m^2 or ha - specify)	Name and Position	Initial

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Figure 2 Priority Species Identification

Land Clearing and Trench Management

Priority Species Identification Chart

This chart identifies the priority flora that may occur within the project area.

Grevillea manglesii subsp. *ornithopoda*

Eucalyptus rudis subsp. *cratyantha*

Photos:
Plant This – http://www.plantthis.com.au/plant-information.asp?gardener=27557
Geographe Landcare Nursery – http://geographelandcarenursery.mysouthwest.com.au/Nursery%20List/Eucalyptus%20rudis

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6.0 Fauna Management Plan

6.1 Context

The construction works will require some clearing of native vegetation for the proposed infrastructure. The construction area may support locally and regionally significant fauna. Clearing will be carried out in a manner to minimise construction impacts on fauna.

In December 2011 a fauna survey was conducted concurrently with the project vegetation survey (see Ravenswood/West Murray 2A Infill Sewerage Project Level 1 Flora and Opportunistic Fauna Survey). The survey was conducted by Anders Environmental (for Golder Associates) to determine the presence of sensitive fauna species identified in the desktop study. Fauna species which may occur in the project area are displayed in Table 2.

A number of habitat trees were identified in the project area. These include Marri (*Corymbia calophylla*), Blackbutt (*Eucalyptus patens*), and Flooded gum (*Eucalyptus radis*).

The Common Brushtail Possum (*Trichosurus vulpecular*) was spotted through spotlighting and Flooded Gum habitat trees were recorded in the project area.

The presence of Black cockatoo species is not known. Calls were heard in the distance but there were no sightings and no indication of their presence in the area by suitable nesting hollows, limb scars, scratching, foraged fruit or feathers. Marri trees provide habitat for all three species of Black Cockatoos and were recorded in the area. Two Marri trees are likely to be cleared during construction of this project, there is no evidence that Black Cockatoos are using these trees for nesting, feeding or roosting.

Track activity on the riverbank was sighted, which could be evidence of the native Water rat (*Hydromys chrysogaster*) or the common pest ship rat (*Rattus norvegicus*) as the tracks appear similar.

A termite mound is expected to be disturbed during construction. Numbats feed on termites, although no evidence of Numbat activity was found or any disturbance to the termite mound. Disturbance to the termite mound during construction will be reduced as much as possible.

Table 2 - Fauna species that may occur in the West Murray Sewerage Infill Project area

Species	Conservation Significance
Birds	
Carnaby's Black Cockatoo *Calyptorhynchus latirostris*	Schedule 1 Endangered (EPBC Act) Endangered (Wildlife Conservation (WC) Act)
Forest Red Tailed Black-Cockatoo *Calyptorhynchus banksii naso*	Schedule 1 Vulnerable (EPBC Act, WC Act)
Baudin's Cockatoo *Calyptorhynchus baudinii*	Schedule 1 Vulnerable (EPBC Act, WC Act)

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Mammals	
Water Rat *Hydromys chrysogaster*	Priority 4 (CALM Priority List)
Common Brushtail possum	Least concern (IUCN Red List)

6.2 Purpose

The purpose of the Fauna Management Plan is to outline management actions to minimise construction impacts on fauna, more specifically to:

1. Protect Specially Protected Fauna, consistent with the provisions of the *Wildlife Conservation Act 1950* (WA).
2. Protect Endangered and Vulnerable fauna, consistent with the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (C'th).
3. Minimise impacts on Priority fauna identified by the DEC.
4. Minimise opportunities for fauna to become trapped in the excavated trenches.
5. Develop response procedures for fauna that enter excavated trenches.

6.3 Performance Indicators

Performance will be demonstrated by:

- Compliance with the prescribed management actions.
- Contacting the local DEC office if fauna is injured or found trapped in the trench.
- Habitat trees are marked prior to construction and retained where possible.

6.4 Management Actions

Prior to Construction

1. Potential habitat trees will be marked out prior to commencement of construction and retained where possible;
2. Prior to clearing, the clearing area will be walked to gently scare off fauna prior to machinery.

During Construction

3. Trenches will be kept open for the minimal time required.
4. A barrier will be established at the end of each installed pipeline at the end of each working day to prevent fauna entering the installed pipelines;
5. Fauna ramps will be installed in any trench or pit which is left open overnight.
6. If the trenches have the potential to flood (for example if an overnight storm risk), rafts or something similar will be installed in the trenches overnight.
7. Excavated trenches will be visually inspected prior to construction works commencing on each day to determine the presence of trapped fauna. The visual inspection will be conducted during daylight hours and will be completed by no later than 0900hrs;
8. If any native fauna is found within any excavated trench, the local DEC office will be contacted and they will either remove the fauna or advise the actions to be taken. The

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fauna removed will be recorded in the Fauna Removal Log (Table 3), which shall be retained at the site office;

The injured fauna will not be harmed or killed unless a decision to euthanize (kill) any injured fauna is made by the DEC and/or a veterinary doctor.

9. The contact number for the local DEC office and a local veterinary doctor will be displayed in the site offices.
10. Dead fauna will be removed from the excavated trenches to prevent additional fauna from re-entering trenches to source food. They will be disposed of as putrescible waste (to landfill);
11. No dogs, cats or firearms will be allowed within any construction area;
12. A temporary security fence of approximately 1.8m height will be installed around any open trench greater than 0.5m depth at the end of each construction day. The purpose of the fence will be to prevent access to the open trench by large terrestrial fauna (such as kangaroos);
13. The trench will be left open for the minimum time practicable to minimise the chance of fauna entering the trench and becoming trapped;

6.5 Additional Information

Fauna Removal

A Licence will be required under r17 of the *Wildlife Conservation Regulations 1970* (WA) issued by the DEC to take native fauna from the trench.

Guidance on fauna handling, fauna diseases and occupational safety matters in handling fauna can be sourced from the document *Minimising Disease Risk in Wildlife Management: Standard operating procedures for fauna translocation, monitoring and euthanasia in the field (*DEC, July 2005).

Photographs of native fauna that are likely to be encountered by the construction works are provided in the fauna Identification Chart (Figure 3). The Fauna Identification Chart will be displayed at the site offices to assist with field identification.

6.6 Related Plans

- Flora and Vegetation Clearing Management Plan
- Dewatering and Acid Sulphate Soils.
- Hygiene Management.
- Environmental Incident Management.

6.7 Relevant Legislation

- *Wildlife Conservation Act 1950*, and *Regulations 1970* (WA).
- *Environmental Protection Act 1986*, and *Regulations 1987* (WA).
- *Conservation and Land Management Act 1984*, and *Regulations 2002* (WA).
- *Environment Protection and Biodiversity Conservation Act 1999* (C'th).

6.8 Advisory Agencies

- DEC

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Table 3 Fauna Removal Log

Ravenswood/West Murray 2A Infill Sewerage Project
Trench Management

Fauna Removal Log

The purpose of the Fauna Removal Log is to record the number, location and removal of fauna from within the trench. The Fauna Removal Log is to be completed by the Contractor on each day that fauna is removed from the trench.

Name ……

Page …… of ……

Date of Entry	Location and Property Reference	Fauna Description (eg. snake, lizard)	No. Removed	Alive (Y/N)	Method of Removal	Name and Position	Initial

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Figure 3 Fauna Identification Chart

Ravenswood/West Murray 2A Infill Sewerage Project
Land Clearing and Trench Management

Fauna Identification Chart

This chart identifies some of the fauna that may occur within the West Murray Project area

Carnaby's Cockatoo (left)

Red-tailed Black Cockatoo
Listed under *Wildlife Cons. Act, 1950 - Schedule 1 EPBC Act, 1999 – as Vulnerable*

Baudin's Cockatoo (right)

Water Rat (*Hydromys chrysogaster*)

Photos: Birds Australia – www.birdsaustralia.com.au
Birds in Backyards - http://www.birdsinbackyards.net/
Black Cockatoo Preservation Society - http://www.blackcockatoorecovery.com/amazing-cockatoos.php
Water Corporation - http://www.watercorporation.com.au/index.cfm
Water for a Healthy Country - http://www.anbg.gov.au/cpbr/WfHC/index.html

7.0 Erosion and Sedimentation Management

7.1 Context

The proposed works are to be constructed alongside the Murray River, between 10 and 200 metres from the river. The proposed timing of the construction is summer 2013. Given the time of year, it is unlikely that the project will encounter much rainfall. This management plan will help ensure there is no risk of contributing to any erosion or sedimentation. Sedimentation in the waterways can cause a reduction in water quality, reduction in river habitats, increased turbidity and transport pollutants.

7.2 Purpose

The purpose of the Erosion and Sedimentation Management Plan is to outline management actions to minimise:

1. Erosion of the disturbed areas during rainfall; and
2. Rainfall runoff causing sedimentation of the Murray River.

7.3 Performance Indicators

Performance will be demonstrated by:

- Adherence to the Water Corporation *Guideline for Erosion and Sediment Control at Construction Sites*;
- No evidence of erosion; and
- Prevention of soil runoff entering the river.

7.4 Management Actions

1. Minimise clearing of vegetation which exposes soils;
2. Dust suppression activities as per Section 8.0;
3. Any soil stockpiles to be at least 50 m from the river;
4. At the closest point to the river, if erosion or sedimentation is a risk, install geofabric fence with star pickets. If required a seedless straw bale wall can be installed alongside the river.
5. If rainfall and resulting water erosion is expected or observed in any part of the site, erosion control techniques are to be installed. These include, where suitable, seedless straw bales and land stabilising materials such as geofabric sheets.

7.5 Contingency Actions

No contingency actions are considered necessary.

7.6 Management Standards

PM#367300 Water Corporation Guideline for Erosion and Sediment Control at Construction Sites.

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7.7 Related Plans

- Dewatering and Acid Sulphate Soils Management

7.8 Relevant Legislation

- *Environmental Protection Act 1986*, and *Regulations 1987* (WA).

7.9 Advisory Agencies

- DEC

DRAFT

8.0 Air Quality Management

8.1 Context

Dust can be generated from land clearing activities and from cleared areas exposed to wind. Dust generation can be detrimental to human health, reduce visual amenity, smother vegetation and interfere with fauna. Appropriate management actions, listed below, will be implemented to minimise dust as much as possible.

8.2 Purpose

The purpose of the Air Quality Management Plan is to outline management actions to:

1. Minimise and control dust generation.

8.3 Performance Indicators

- Prevent dust from leaving the construction areas as much as practicable.
- No public complaints received regarding dust.

8.4 Management Actions

1. Daily weather forecasts will be obtained for temperature and wind speed (Bureau of Meteorology) and the forecast information will be made available to persons involved in dust generating activities and dust suppression activities;
2. Water trucks and/or water cannons will be used to dampen potential dust generating areas (sandy soils, soil stockpiles, unsealed access roads etc.). The frequency of dampening will be determined based on a visual assessment of the need and the weather conditions;
3. Dewatering water may be used for dust suppression activities if the dewatering water meets the criteria for discharge to land contained in the Dewatering and Acid Sulphate Soils Management Plan;
4. Other dust control measures may be implemented (such as hydro-mulching, wind fencing or hard-standing);
5. Vehicles transporting soils off-site will be covered to minimise dust generation during transport.

8.5 Contingency Actions

1. Should dust suppression equipment be unavailable, the work rate will be reduced to decrease the impacts until such time that the equipment becomes available.

8.6 Management Standards

PM#367389-v3A Water Corporation Guideline for the Management of Dust and Smoke

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8.7 Related Plans

- Flora and Vegetation Clearing Management Plan

8.8 Relevant Legislation

- *Environmental Protection Act 1986*, and *Regulations 1987* (WA).

8.9 Advisory Agencies

- DEC

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9.0 Dewatering and Acid Sulfate Soils Management

9.1 Context

Golder Associates were contracted by the Water Corporation to undertake geotechnical and hydrological investigations along the proposed route, and prepare acid sulfate soil (ASS) and dewatering management plans to address any issues. The resulting report and management plans are:

1. Geotechnical Investigation, Hydrological Assessment and Preliminary Acid Sulfate Soils Assessment, 2011.
2. Dewatering Management Plan, West Murray Sewerage Project, Ravenswood, 2012.
3. Acid Sulfate Soil Management Plan, West Murray 2A Infill Sewerage Project, Ravenswood, 2012.

The DEC's ASS risk maps indicate that approximately half of the proposed pressure main alignment is in an area of "high to moderate ASS disturbance risk (<3 m from surface)". The remaining length of the pressure main, the gravity sewer and pump station is within an area mapped as "moderate to low ASS disturbance risk (<3 m from surface)".

The results from Golder Associates geotechnical and hydrological investigations determined that much of the area categorised as "high risk" in the DEC mapping was identified as having no potential ASS or actual ASS. However, in the area of the gravity sewer alignment and the pump station, either potential or actual ASS were detected in the samples collected.

Figure 4 combines the DEC ASS risk map with the results from Golder's geotechnical investigations.

Excavated soils will be managed in accordance with the procedures in the Acid Sulfate Soils management plan:

- Identification of ASS
- Management of ASS Materials and Preparation of Treatment Areas,
- Treatment and Verification of Excavated ASS

Some dewatering will be required for sections of the pressure main and sewer excavation and installation. Construction is planned for summer 2013 when groundwater levels will be at their lowest. Dewatering methods will be a combination of well spears and in-pit sump pumps (open pumping).

To limit the dewatering required, the wet well for the pump station will be constructed using caisson methodology, and the deeper parts of the gravity sewer will be installed using trenchless technology.

The proposed works are 10-200 m from the Murray River, and some wetlands are present in the vicinity of the project area. There will be no impact on wetlands from dewatering. There is a small possibility of making a hydraulic connection with the Murray River at the closest point, dewatering volumes will be monitored and if this occurs sheet piling can be used.

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Dewatering water will be treated according to DEC guidelines prior to disposal. Dewatering disposal options are:

1. Re-infiltration over previously excavated trenches or in infiltration basins located along the alignment.
2. Dust-supression (if required).

Monitoring of dewatering discharge and groundwater will be undertaken throughout construction. The water quality of the dewatering discharge will be tested daily and recorded in the Water Discharge Monitoring Log (see Table 4).

9.2 Purpose

The purpose of the Dewatering and Acid Sulfate Soils Management Plan is to outline management actions to:

- minimise the environmental impacts of dewatering; and
- identify and manage areas of ASS.

9.3 Performance Indicators

Performance will be demonstrated by:

- Compliance with the ASS and Dewatering Management Plans

9.4 Management Actions

Refer to ASS and Dewatering Management Plans

9.5 Contingency Actions

Refer to section 11.0 of the Dewatering Management Plan.

9.6 Related Plans

- Flora and Vegetation Clearing Management Plan

9.7 Relevant Legislation

- *Environmental Protection Act 1986*, and *Regulations 1987* (WA).
- *Environmental Protection (Unauthorised Discharges) Regulations 2004* (WA)
- *Contaminated Sites Act 2003*, and *Regulations 2006* (WA).
- *Water Agencies (Powers) Act 1984* (WA).

9.8 Advisory Agencies

The following organisations have been consulted on development of this plan:

- DEC
- DoW

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Figure 4 ASS Risk Mapping for the Construction Area

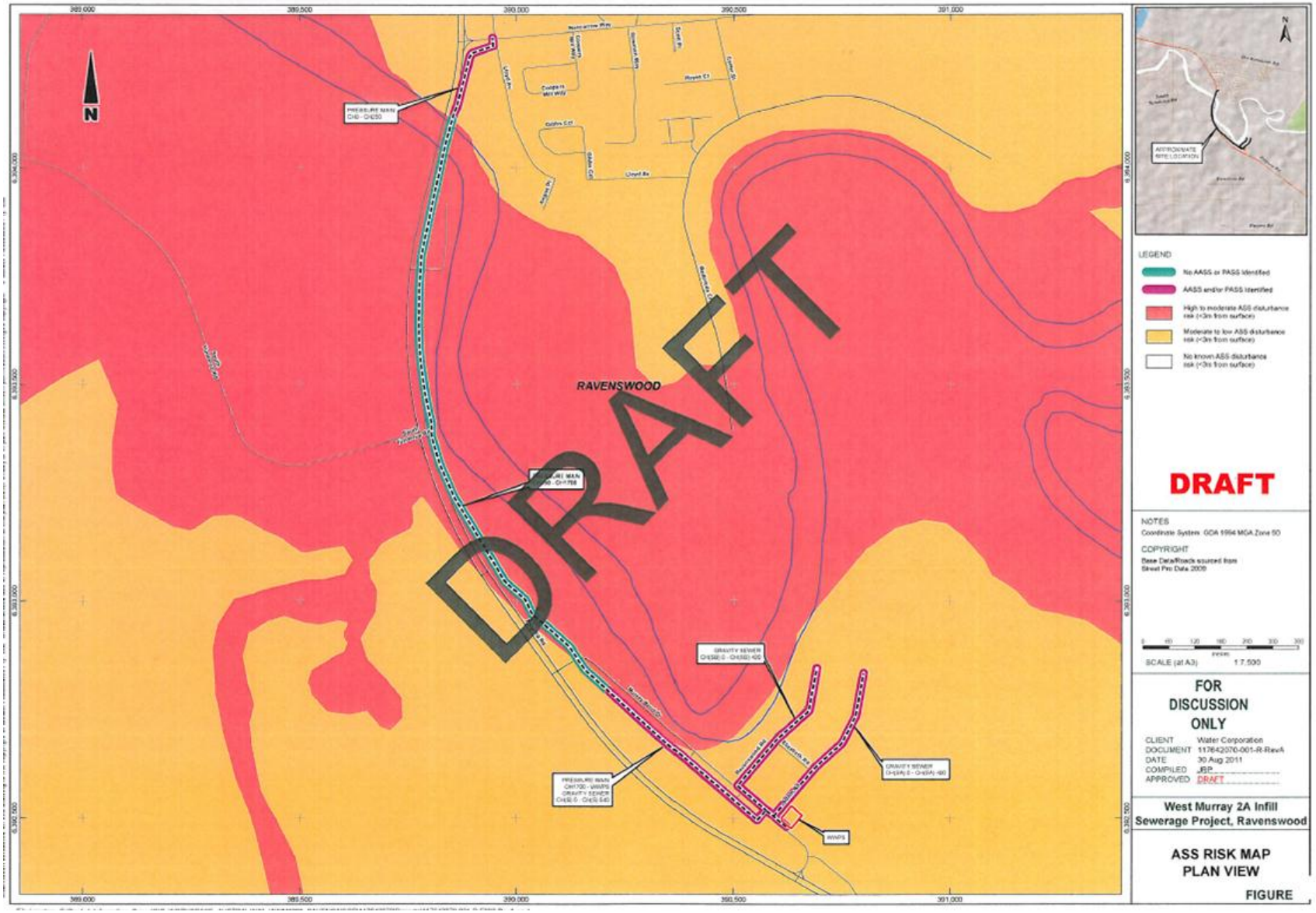

Table 4 Example of a Water Discharge Monitoring Log

Ravenswood/West Murray 2A Infill Sewerage Project
Dewatering and Acid Sulfate Soils Management

Water Discharge Monitoring Log

The purpose of the Water Discharge Monitoring Log is to record the water quality of water discharge. The Water Discharge Monitoring Log is to be completed on each day of water discharge.

Name ……

Page …… of ……

Date of Entry	Property Description and Sample Site (e.g. discharge, watercourse upstream or downstream)	Discharge Rate (L/min)	Temp. (^{o}C)	pH	Turbidity (visible)	Name and Position	Initial

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10.0 Hygiene Management

10.1 Context

The construction areas may contain infestations of the plant pathogens that cause Phytophthora Dieback (*Phytophthora cinnamomi*) and Armillaria Root Disease (*Armillaria luteobubalina*). The symptoms of plant pathogens include the dieback of limbs and branches, yellowing of foliage, and vegetation death.

The construction area may also contain weed species, which have the potential to compete with native flora. Dormant weed seeds can be contained in topsoil, which when disturbed by construction activities can cause the weed seeds to germinate. Weed species are often opportunistic and can quickly colonise cleared land.

Plant pathogens and weeds are spread through the movement of soil and water from infected areas to uninfected areas. Hygiene management actions will be implemented during construction to prevent the potential spread of weeds and plants pathogens.

The flora survey conducted by Anders Environmental (on behalf of Golders Associated) found that weed cover in the project area is high, up to 90% in some of the more disturbed and degraded areas. One Weed of National Significance (WoNS) was recorded, Lantana camara (Lantana). It was identified as a WoNS because of its invasiveness, potential to spread and impacts on the environment. Lantana was recorded at one location along the riverbank (see Figure 5).

10.2 Purpose

The purpose of the Hygiene Management Plan is to outline management actions to minimise the spread of the plant pathogens (*Phytophthora cinnamomi* and *Armillaria luteobubalina*) and weeds from infested to uninfested land.

10.3 Performance Indicators

Performance will be demonstrated by:

- Compliance with the management actions (hygiene procedures) to minimise the spread of plant pathogen and weeds.

10.4 Management Actions

Prior to Construction

1. It will be ensured that vehicles and machinery (including wheels, racks, undercarriage and inside cabins) and footwear are to be inspected and cleaned of dirt, slurry and vegetative material prior to construction commencing.

Construction

2. Construction materials (e.g. soil) will not be sourced from areas known to contain forest diseases or high weed infestations;
3. Hygiene Inspection Points with signage will be established at construction site entrances and between areas of high weed infestation (especially Lantana) and low weed infestation if the Water Corporation Environment Officer determines this is required;
4. It will be ensured that all vehicles, footwear and equipment entering the Hygiene Inspection

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Points will be cleaned to remove attached dirt and vegetative material (including the tyres, undercarriage and inside cabin of the vehicle). Vehicles, footwear and equipment will be cleaned by:
a. air hosing and brushing during dry conditions;
b. low volume, high pressure water hosing during wet/boggy conditions;

5. Cleared vegetation will be retained in areas as close as possible to its origin;
6. Topsoil removed from agricultural areas will only be re-spread in agricultural areas;
7. Topsoil removed from vegetated areas will be returned to the area it originated from.

10.5 Additional Information

Hygiene Inspection Points (if required)

Hygiene Inspection Points will be designed such that:

1. There is physical separation between object being cleaned and effluent produced (i.e. grate over a sump).
2. Cleaning wastewater is infiltrated on-site within disturbed areas.
3. The object being cleaned does not become re-contaminated by the wastewater.

10.6 Related Plans

- Flora and Vegetation Clearing Management

10.7 Management Standards

- PM# 588724-V6B Water Corporation Guideline Use of Pesticides (Herbicides and Insecticides).
- PM# 367299-v4A Water Corporation Guideline Dieback Management.

10.8 Relevant Legislation

- *Conservation and Land Management Act 1984*, and *Regulations 2002* (WA)
- *Agriculture and Related Resources Protection Act 1976* (WA)

10.9 Advisory Agencies

- DEC

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Figure 5 Weed Identification Chart

Ravenswood/West Murray 2A Infill Sewerage Project

Weed Identification Chart

Lantana (*Lantana camara*)

Photos: Weeds in Australia – http://www.weeds.gov.au/publications/guidelines/wons/pubs/l-camara.pdf

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11.0 Fire Management

11.1 Context

The construction works include activities that may represent a fire risk. Such risks may arise from welding and grinding, vehicle movements over dry vegetation, and disposal of matches or cigarettes. Fires have the potential to cause irreversible damage to the environment, property and human health or life.

11.2 Purpose

The purpose of the Fire Management Plan is to outline management actions to:

1. Minimise the risk of preventable fires.
2. Respond to fires in an appropriate manner.

11.3 Performance Indicators

Performance will be demonstrated by:

- Absence of fires generated during construction.
- Response to fires in accordance with the management actions.

11.4 Management Actions

Fire Prevention - General

1. A Site Fire Officer will be designated to identify and rectify potential fire hazards. Construction staff will report potential fire hazards to the Site Fire Officer;
2. The daily 'fire danger' ratings will be obtained from the Bureau of Meteorology and will be displayed daily at the site office for the awareness of construction personnel;
3. The lighting and smoking of cigarettes will be prohibited except in designated cleared areas and immediately outside of site buildings;
4. Dry chemical or carbon dioxide fire extinguishers will be located in close proximity to all cutting, grinding or welding (or any other spark generating activity);
5. A shroud will be installed if cutting, grinding or welding (or any other spark generating activity) occurs within 5m of vegetation/dry grasses. The shroud will be installed between the activity and the vegetation to capture sparks;
6. Flammable liquids and materials will only be stored in designated areas fitted with a dry chemical or carbon dioxide fire extinguisher;
7. During the bushfire season, the Shire of Murray is to be contacted (Senior Ranger Rob Malborough – 9531 7709) regularly for information on any work restrictions that may apply. Construction work that presents a high risk of ignition (e.g. cutting, grinding or welding) may be temporarily terminated on days declared to have a "high", "very high" or "extreme" fire danger and/or if there are fires in close proximity so as to avoid the potential for further depletion of fire fighting resources.

Fire Prevention - Vehicles

8. It will be ensured that all construction vehicles will be fitted with a dry chemical or carbon dioxide fire extinguisher;

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9. There will be daily inspections of all construction vehicles to remove combustible material from radiators, tracks, guards and undercarriages;
10. It will be ensured that construction vehicles are inspected and serviced to prevent or repair oil and fuel leaks prior to the start of construction works, and then inspected monthly;
11. It will be ensured that tractors, bulldozers and road graders will not be used during prohibited burning times, unless they are fitted with a vertical exhaust pipe that is maintained in a sound and efficient condition and fitted with a spark arrestor (r37A Bush Fires Act 1954 (WA)).

Fire Response

12. Training will be provided to construction staff on the proper use of fire extinguishers;
13. A mobile water tanker will be located within 10km of any construction area for fire response. Each water tanker will be equipped with a connectable hose that can be used for fire fighting;
14. Dewatering water may be used for fire response (irrelevant of water quality);
15. Fires will be managed by:
    a. Small fires – fire extinguishers and/or on-site water tankers will be used by the field personnel to extinguish the fire.
    b. Large fires – FESA will be called to attend and extinguish fires that cannot be managed by the field personnel. Phone 000.
16. The Shire of Murray (Senior Ranger Rob Malborough – 9531 7709) and FESA will be notified of any fire in which fire fighting equipment is used. Notification will be made as soon as reasonably practicable following the detection of the fire.

11.5 Contingency Actions

No contingency actions are considered necessary.

11.6 Related Plans

- Flora and Vegetation Clearing Management Plan
- Dangerous Goods Management Plan

11.7 Relevant Legislation

- *Bush Fires Act 1954* (WA).

11.8 Advisory Agencies

- FESA
- DEC

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12.0 Waste Management

12.1 Context

The construction works will produce a range of liquid and solid wastes. These wastes may include:

- Site office rubbish, paper, packaging and domestic wastes.
- Spoil and surplus rock from boring activities or backfilling.
- Sewage from temporary toilets.
- Used lubricating oils from machinery maintenance.

Inappropriate waste disposal has the potential to contaminate soil, surface water or groundwater and affect visual amenity. Wastes from construction must be disposed of in a lawful and environmentally acceptable manner.

12.2 Purpose

The purpose of the Waste Management Plan is to outline management actions to:

1. Reuse waste materials where possible
2. Recycle wastes where practicable
3. Dispose of construction wastes in an acceptable manner.

12.3 Performance Indicators

Performance will be demonstrated by:

- Compliance with the prescribed management actions.

12.4 Management Actions

Construction

1. Separate and marked waste bins will be established as per Table 5.

Table 5 Waste Bins for General Wastes, Recyclables, Steel Recycling and Hydrocarbons

CATEGORY	DISPOSAL
General wastes.	Dispose on-site in a covered bin to prevent attraction of vermin. Bulk disposal offsite to the nearest landfill.
Recyclables (generally glass, paper and plastics).	Bulk disposal offsite to the nearest recycling facility. May be disposed of to landfill if a facility does not exist within 50km of the construction area.
Steel Recycling (generally steel pipe and other steel wastes).	Bulk disposal offsite to the nearest steel recycling facility. May be disposed of to landfill if a facility does not exist within 50km of the construction area.
Hydrocarbons (generally drums/containers containing oil, grease, petrol, diesel or hydrocarbon contaminated soil).	Dispose on-site to plastic lined or bunded bins. Bulk dispose offsite to: 1. a Controlled Waste Contractor licensed under the *Environmental Protection (Controlled Waste) Regulations 2004* (WA); or 2. a hydrocarbon recycler (Note: if hydrocarbons are recycled they are not a controlled waste for transport purposes).

2. Periodic disposal of wastes from the construction area to the identified disposal locations are to be arranged;
3. Wastes, other than excess overburden (excluding spoil) will not be buried on any

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construction site;

4. All wastes will be removed from all construction sites following the completion of construction works;

5. Excess overburden produced from trench excavation will be disposed of to:

a. the excavated trench;
b. a suitable location agreed with the Landowner (the Landowner has first preference to retain excess overburden from their own property);
c. a suitable location agreed with adjacent Landowners (with preference to Landowners on the pipeline route); or
d. a local landfill as inert waste.

Other suitable sites for disposal of excess overburden may be identified. Disposal of soils affected by ASS will be treated as per the Acid Sulphate Soils Management Plan prior to disposal.

Post-Construction

6. Any waste that is identified post-construction will be removed.

12.5 Contingency Actions

The following actions will be undertaken if wastes are not appropriately disposed of:

a. Investigate the cause.
b. Alter management actions, if required.
c. Inform all field personnel of revised management actions.
d. Mitigation of any environmental and visual impacts.

12.6 Related Plans

- Dewatering and Acid Sulfate Soils Management Plan.

12.7 Relevant Legislation

- *Environmental Protection Act 1986*, and *Regulations 1987* (WA).
- *Environmental Protection (Controlled Waste) Regulations 2004* (WA).

12.8 Advisory Agencies

- DEC

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13.0 Aboriginal Heritage Management

13.1 Context

The *Aboriginal Heritage Act 1972* (WA) registers and protects sites of importance to Aboriginal persons. It is an offence to interfere with a registered site without the consent of the Western Australian Minister for Indigenous Affairs.

A research of registered Aboriginal Sites listed on the Department of Indigenous Affairs (DIA) database was undertaken and concluded that one registered Site is present in the vicinity of the proposed works.

- **DIA 3536 Murray River**

An application under s18 *Aboriginal Heritage Act 1972* has been made to gain consent for the use of this Site for the specified purpose of undertaking the proposed works.

Water Corporation prepared a Heritage Management Plan which outlines in further detail the management of Aboriginal Heritage issues during the proposed works.

13.2 Purpose

The purpose of the Aboriginal Heritage Management Plan is to outline management actions to:

1. Identify the presence of Aboriginal heritage sites
2. Manage disturbance of registered Aboriginal heritage sites.
3. Identify procedures in the event that a new potential site is identified during construction.

13.3 Performance Indicators

Performance will be demonstrated by:

- Compliance with the prescribed management actions listed below.
- Compliance with the Water Corporation's Heritage Management Plan.

13.4 Management Actions

1. Construction works will cease immediately 20 m from any archaeological material (artefacts including hunting tools, scatters, scar trees) identified within the construction area. An archaeologist will be engaged to record the identified material and to advise the DIA if the identified material is likely to be of Aboriginal heritage significance. Construction activities within 20 m of the identified material will only recommence based on advice of the archaeologist or the DIA.
2. Construction works will cease immediately within 20 m of any skeletal material identified within the construction area. The Pinjarra Police Station (Phone (08) 9531 1666, located at 24 George Street, Pinjarra) will be contacted to attend and determine a resolution of the matter. Construction activities will only recommence within 20 m of the identified material on the direction of the Superintendent based on advice of the Police.

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13.5 Contingency Actions

No contingency actions are considered necessary.

13.6 Related Plans

- Flora and Vegetation Clearing Management Plan

13.7 Relevant Legislation

- *Aboriginal Heritage Act 1972* (WA), and *Regulations 1974* (WA).
- *Native Title Act 1993* (C'th)

13.8 Advisory Agencies

- DIA

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14.0 Traffic and Public Safety Management

14.1 Context

There will be increased vehicle movements for the cartage of materials and other equipment during the construction of the proposed works. Partial road closures may be required, and increased traffic volumes from construction vehicles will result in short-term impacts on local traffic movement. The Water Corporation will maintain ongoing consultation with the Shire of Murray and MRWA throughout the construction period regarding the management of traffic and public safety.

Construction will occur within Water Corporation owned land, publicly accessible roads, road reserves and private land. The construction works involve earthworks, materials storage and handling, and heavy machinery and equipment that could pose a risk to members of the public if accessing the site.

14.2 Purpose

The purpose of the Traffic and Public Safety Management Plan is to outline management actions to:

1. Manage construction vehicle traffic and local traffic.
2. Minimise construction impacts on local traffic movements.
3. Reduce the risk to public accessing the construction site.

14.3 Performance Indicators

Performance will be demonstrated by:

- Compliance with the prescribed management actions.

14.4 Management Actions

Traffic

1. Traffic management activities on public roads will be coordinated with the Shire of Murray prior to construction;
2. Construction vehicles will typically use the following roads for the transport of construction materials and equipment to minimise disturbance on local traffic and the community:
    a. Pinjarra Rd
    b. Murray Bend Drive

    Local roads will be used for accessing the construction sites where major roads do not allow access to the construction works;
3. The use of local roads by semi-trailers and road trains will be limited for the transport of construction materials and equipment to daylight hours (nominally 0600 – 2000hrs) to minimise noise impacts on residences positioned on local roads;
4. Contractors will take care when operating near to private driveways;
5. Road signage will be displayed within all construction areas in accordance with Australian Standard 1742.3-2002 *Manual of Uniform Traffic Control Devices - Part 3: Traffic control devices for works on roads*;

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6. Road access in the construction area will be maintained by the use of signed detours and/or a single lane. Advisory signs will be installed sufficiently in advance of the construction works to allow road users to take alternative routes;
7. A temporary crossover(s) will be installed to maintain access by Landowners to their properties if the existing crossover is disturbed by the construction works. All disturbed crossovers will be repaired or replaced as soon as practicable following construction works affecting that property;
8. It will be ensured that construction vehicles do not exceed 50km/h on non-bituminised roads or access tracks;
9. A 15km/h speed limit will be imposed within the active construction area. Signage of the speed limit will be displayed within construction areas.

Safety

10. The public will be excluded from accessing all construction areas where practicable. Open excavations (such as trenches and dewatering pits) will be fenced or otherwise demarcated where there is a risk of public access;
11. Advisory warning boards identifying hazards, risks, safety requirements and emergency phone numbers will be installed at each entry to all construction areas;
12. Machinery and plant that is located in publicly accessible locations will be secured (in a locked compound where practicable) when the construction site is not occupied.

14.5 Contingency Actions

No contingency actions are considered necessary.

14.6 Related Plans

- Noise Management

14.7 Relevant Legislation

- *Local Government Act 1995* (WA)
- *Main Roads Act 1930* (WA)
- *Road Traffic Act 1974* (WA)

14.8 Advisory Agencies

- MRWA
- Shire of Murray

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15.0 Noise Management

15.1 Context

Construction works will generate noise that may interfere with the amenity of occupants of nearby residential properties. Noise from the construction works will be monitored to determine and manage the impacts of noise.

Noise in Western Australia is regulated under the *Environmental Protection (Noise) Regulations 1997* (WA). Construction works (excluding blasting) are generally exempt from compliance with the assigned noise levels between the hours of 0700 and 1900 subject to a number of provisions (the provisions are contained within this plan). Despite this exemption, construction noise should still be managed and noise level objectives set to minimise noise impacts.

No blasting is required for the construction of this project.

There are several residences along the pipeline route, and so all care will be taken to minimise noise, and adhere to the parameters outlined in the *Environmental Protection (Noise) Regulations 1997* (WA). This will also minimise the impact noise will have on potential fauna within the area.

15.2 Purpose

The purpose of the Noise Management Plan is to outline management actions to:

1. Identify noise objectives.
2. Undertake noise monitoring.
3. Outline corrective actions to variances of noise objectives and limits.

15.3 Performance Indicators

Performance will be demonstrated by:

- Compliance with the prescribed management actions.

15.4 Management Actions

General Construction Considerations

1. Noise screening will be installed where particularly noisy construction works are conducted adjacent to residential premises;
2. Known noisy activities will be scheduled during daylight hours (nominally 0700 to 1900hrs) where they occur within 100m of residential premises. Notice to the Landowner of the residential premises will be provided prior to the commencement of such works.
3. Noise and vibration will be monitored as below, if required.

Noise Meter Calibration

4. Noise will be measured using a portable sound level meter. It will be ensured that the meter is calibrated at least every 2 years by a laboratory accredited by NATA to undertake calibration of sound level measuring instruments;
5. The portable sound level meter will be tested in the field (using a standard sound source) prior to, and after, any series of measurements to be taken. The tests will be undertaken to confirm if the meter is accurate within ±0.5 dB.

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Measuring Construction Noise (if required)

6. Noise levels will be measured once every 7 days during construction, or in response to any complaint that may arise. Noise monitoring will be undertaken for a period of no less than 15 minutes, and no greater than 4 hours;
7. The frequency of noise monitoring may be increased (up to a maximum daily monitoring frequency) if complaints of unacceptable noise are received;
8. Noise measurements will be undertaken at the boundary of the construction sites and at least 1.2m above ground level and compared against the levels in Table 6. The boundary will be the edge of the pipeline working width;
9. The Noise Monitoring Log (Table 7) will be completed by the Contractor in order to record the levels of noise against the criteria in Table 6.
10. The occupiers of each premise will be given written notice when noise emissions are likely to exceed the specified noise levels at least 24 hours prior to such works for Sunday and Night Construction Works (1900 to 0700);
11. Construction will seek to meet the following noise level objectives:

Table 6 Noise Level Objective for Construction

Location of measurement	Time of day	Assigned level (dB)		
		$L_{A\ 10}$ (not to be exceeded more than 10% of the time)	$L_{A\ 1}$ (not to be Exceeded more than 1% of the time)	$L_{A\ max}$ (must not be exceeded at any time)
Boundary of the pipeline working width (i.e. main noise source) when less than 15m from a Residential building.	0700 to 1900 hours Monday to Saturday	45 + influencing factor	55 + influencing factor	65 + influencing factor
	0900 to 1900 hours Sunday and public holidays	40 + influencing factor	50 + influencing factor	65 + influencing factor
	1900 to 2200 hours all days	40 + influencing factor	50 + influencing factor	55 + influencing factor
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	35 + influencing factor	45 + influencing factor	55 + influencing factor
Boundary of the pipeline working width (i.e. main noise source) site when greater than 15m from a Residential building.	All hours	60	75	80
Note: (1) An influencing factor of 2 dB will be added to the Assigned Level where there is a major road within 100 metres of the construction works (6000-15000 vehicles per day; e.g. South Western Highway). (2) 10 db will be added to the noise measurement where impulsiveness is present (banging, thumping).				

15.5 Contingency Actions

1. Actions may be taken to reduce noise impacts on residential premises if the construction noise criteria are exceeded. Such actions may include:

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a. noise bunds or screens;

b. adjusting the work schedule for the offending work to be conducted at a more appropriate time;

c. changing the technology or method of construction; and

d. temporary relocation of the affected Landowner (subject to agreement with the Landowner).

2. Noise monitoring will be undertaken to confirm that the noise criteria have been achieved by the directed actions.

15.6 Management Standards

PM# 367306-v5A Water Corporation Control of Noise at Construction Sites Guideline

15.7 Related Plans

- Fauna Management Plan.
- Dangerous Goods Management Plan

15.8 Relevant Legislation

- *Environmental Protection Act 1986* (WA)
- *Environmental Protection (Noise) Regulations 1997* (WA)

15.9 Advisory Agencies

- DEC

DRAFT

Table 7 Noise Monitoring Log

Ravenswood/West Murray 2A Infill Sewerage Project
Noise Management Plan

Noise Monitoring Log

The purpose of the Noise Monitoring Log is to record the levels of noise against the criteria. The Noise Monitoring Log is to be completed by the Contractor.

Name ……

Page …… of ……

Date of Entry	Location of monitoring location (Lot number and location description)	Construction activity description (general construction, blasting, etc)	Noise (dB)	Applicable Noise Criteria Limit (dB)	Vibration (mm/s)	Applicable Vibration Criteria Limit (mm/s)	Name and Position	Initial

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16.0 Dangerous Goods Management

16.1 Context

Dangerous goods used during construction works will include hydrocarbons (petrol and diesel), oils and uPVC glue. Storage of dangerous goods will be most likely be restricted to uPVC glue. Spillages of dangerous goods have the potential to:

- contaminate soil, surface water and groundwater;
- impact personnel and public safety; and
- create an ignition source.

Dangerous goods must be contained (bunded) to prevent spillages and ensure compliance with regulatory requirements.

There is no blasting required for this project and therefore no explosives will be on site.

16.2 Purpose

The purpose of the Dangerous Goods Management Plan is to outline management actions for:

1. The storage and containment of dangerous goods.
2. Responding to a spill of dangerous goods.
3. The reporting of incidents involving dangerous goods.

16.3 Performance Indicators

Performance will be demonstrated by:

- Compliance with the prescribed management actions.

16.4 Management Actions

Dangerous Goods

1. Liquid dangerous goods will be stored in a bund or compound capable of containing 110% of the volume of the dangerous goods stored. For packaged liquid dangerous goods (goods in a number of smaller containers), the goods shall be stored in a bund or compound capable of containing 110% of the volume of the largest container;
2. Dangerous goods will be stored in minimum quantities (where possible) to minimise the environmental impact if spillage occurs;
3. Dangerous goods will be segregated to ensure incompatible dangerous goods are not collocated (refer Figure 6);
4. Dangerous goods will not be stored within 50 m of any watercourse.

Record Keeping

5. Material Safety Data Sheets (MSDS) will be maintained for each dangerous good and each explosive stored. The MSDS will be located outside of the compound in which the material is stored. The compound will be placarded in accordance with the DoC *Guidance Note for Placarding*;

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6. Deliveries of dangerous goods will only be accepted if they are accompanied by a MSDS for that dangerous good, or, if there is an existing and current MSDS for that dangerous good already held on the site;
7. A Dangerous Goods Log (Manifest) will be maintained of all dangerous goods held on the construction site. The Log will be stored in a secure location at the site entrance. The Log will identify the:
    a. Date on which the goods were received.
    b. Location(s) at which the goods are stored.
    c. Volume/quantity stored at each location.
    d. Date and volume/quantity removed from storage when used.
    e. Name of the person(s) receiving/removing goods to/from storage on each occasion.

    A site plan that identifies the storage location of each dangerous good will accompany the Log.

Safety

8. Dangerous goods will be stored in a locked compound to prevent unauthorised access;
9. Ignition sources (e.g. cigarettes and lighters) will be prohibited within any compound used for the storage of dangerous goods.

Training

10. All construction staff will be trained on identification, storage and handling procedures for dangerous goods. Construction staff will also be trained on response procedures (including use of Spill Response Kits) for accidents and incidents and emergencies involving dangerous goods.

Accidents, Incidents and Emergencies

11. A Spill Response Kit will be installed and maintained for the cleanup and containment of spills to land or water. The spill kit will contain:

    a. universal absorbent pads or pillows or blankets;

    b. a containment boom (for containing discharges to water);

    c. labelled plastic contaminated waste bags; and

    d. safety gloves.

    Contaminated material from a spill will be disposed of in accordance with the Waste Management Plan.
12. The Chief Officer of the DoC will be notified of any accident involving dangerous goods *Dangerous Goods Safety Act 2004 (WA)*;
13. FESA will be notified of any incident involving dangerous goods that has had, or has the potential to, have a significant impact on the environment or human safety;
14. The DEC will be notified of any incident involving dangerous goods that has had, or has the potential to, have a significant impact on the environment.

16.5 Contingency Actions

No contingency actions are considered necessary.

16.6 Related Plans

- Incident Management

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- Waste Management

16.7 Relevant Legislation

- *Dangerous Goods Safety Act 2004* (WA)
- *Dangerous Goods Safety (General) Regulations 2007*
- *Dangerous Goods Safety (Road and Rail Transport of Non-explosives) Regulations 2007*
- *Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007*
- *Dangerous Goods Safety (Major Hazard Facilities) Regulations 2007*
- *Environmental Protection Act 1986* (WA)
- *Occupational Safety and Health Regulations 1996* (WA)

16.8 Advisory Agencies

- DEC

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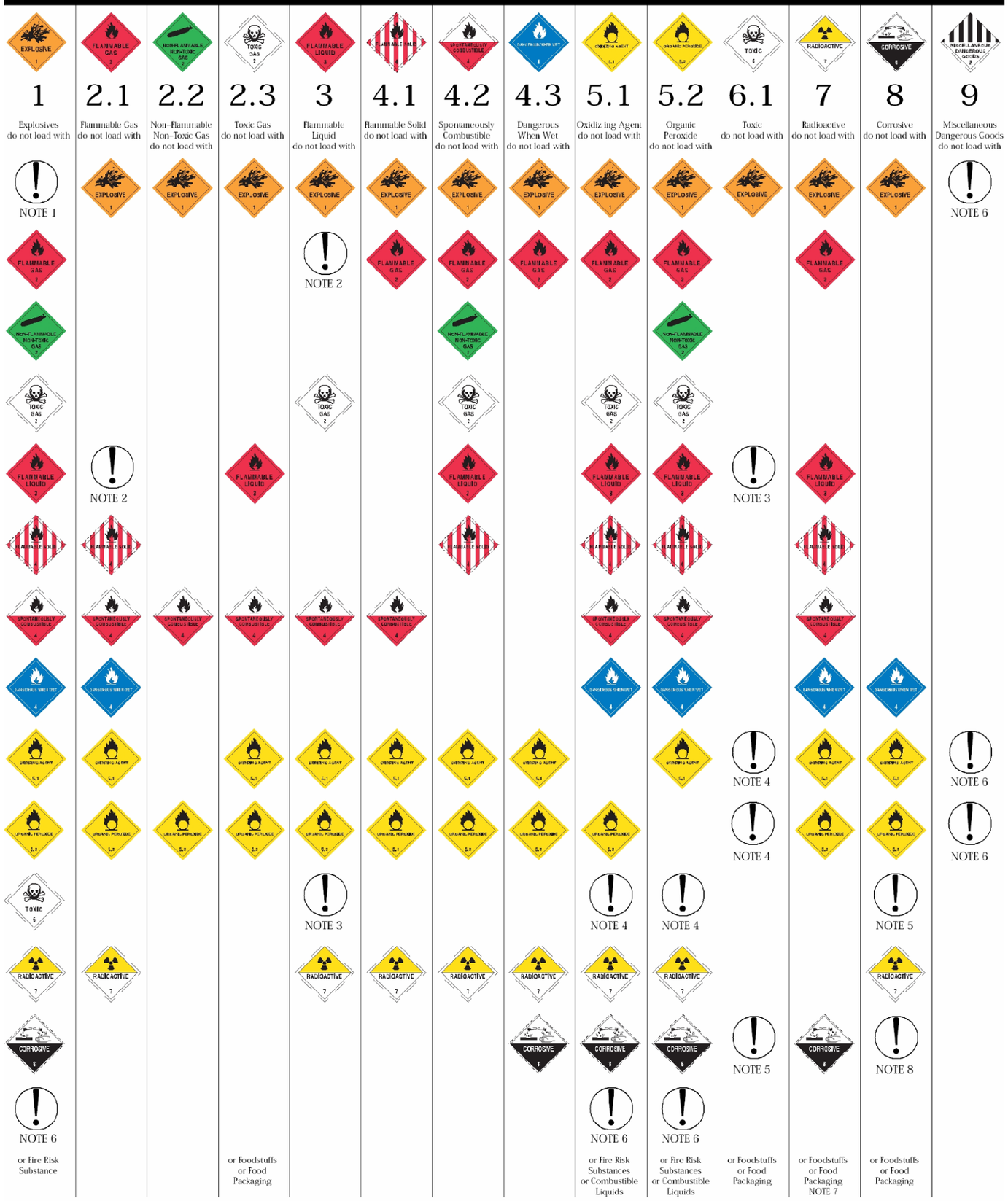
Recognising dangerous goods

Segregation of dangerous goods in road vehicles and freight containers



NOTES:

1. Refer to explosives regulations for details of the transport of explosives. Explosives of Class 1.4 S may be transported with dangerous goods of any other Class if the total quantity of dangerous goods does not exceed 1,000 kg.
2. When both Classes are in bulk.
3. When Class 3 substance is nitromethane.
4. When Class 6 substance is a fire risk substance.
5. When Class 6 is a cyanide and Class 8 is an acid (is acidic).
6. When Class 9 substance is a fire risk substance.
7. See also the Code of Practice for the Safe Transport of Radioactive Substances.
8. Concentrated strong acid is to be segregated from concentrated strong alkali.

Figure 6 Guidance on Segregation of Dangerous Goods

This guidance has been designed for road vehicles and freight containers, however is also applicable to storage on construction sites. Print A3 for best results

Table 8 Dangerous and Explosive Goods Manifest (4 pages)

Ravenswood/West Murray 2A Infill Sewerage Project
Page 1 of 4

Dangerous Goods Log

The principal purpose of the manifest is to provide contractors and emergency service authorities with information about the quantity, type and location of dangerous goods stored.

Licensee
……

Address of Premises
……

Date of Preparation
……

Site Plan No.
……

Emergency Contacts

Name	Position	Telephone	
		B/H: A/H/Mobile:	
		B/H: A/H/Mobile:	
		B/H: A/H/Mobile:	
		B/H: A/H/Mobile:	
		B/H: A/H/Mobile:	
		B/H: A/H/Mobile:	

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Water Corp: Dangerous Goods Emergency Contacts

Water Corporation's Emergency Contacts

Name	Position	Organisation	Telephone	
George Basanovic	Corporate Incident Management Coordinator	Water Corporation	B/H: A/H/Mobile:	9420 3247 0417 180 677
Chris Dolley	Manager Occupational Health and Safety	Water Corporation	B/H: A/H/Mobile:	9420 3347 0418 958 747
Joshua Lee	Project Manager	Water Corporation	B/H: A/H/Mobile:	9420 2286 0439 978 743
Trevor Roffman	OSH Consultant, Project Management Group	Water Corporation	B/H: A/H/Mobile:	9420 2413 0419 919 736
Gordon Groth	Environmental Operations Manager	Water Corporation	B/H: A/H/Mobile:	9420 2796 0409 941 758

External Emergency Contacts

Position	Telephone	
Fire and Emergency Services Authority (Mandurah)	B/H: A/H/Mobile:	9535 3526 000 all hours
Police (Pinjarra)	B/H: A/H/Mobile:	9531 1666 24 George Street Pinjarra 000 all hours
Department of Consumer and Employment Protection Resources Safety Division	B/H:	9222 3595
Department of Environment and Conservation (Perth)	B/H: A/H/Mobile:	6467 5000 1300 784 782

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Dangerous Goods - Maximum Permissible Quantities

Summary of Maximum Permissible Quantities - Licence under s45A of the *Explosives and Dangerous Goods Act 1961* (WA)

Bulk Storage

Tank Id No.	Dangerous Goods					Tank	
	Name	Class	Sub Risk(s)	UN No.	PG	Type	Capacity (L)

Package Storage Areas

Storage area	Dangerous Goods					Quantity (kg)	
	Name	Class	Sub Risk(s)	UN No.	PG	Average	Maximum

Other Packaged

Storage Area	Class	Sub Risk(s)	Packaging Group	Average Quantity (kg or L)	Maximum Quantity (kg or L)

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Dangerous Goods - Receipt/Removal Log

Date Received/ Removed	Storage Location	Type of Dangerous Good	Maximum Permissible Quantity (kg)	Quantity Received (kg)	Quantity Removed (kg)	Quantity Remaining in Storage (kg)	Name of Person Receiving/ Removing

DRAFT

17.0 Discharge of Pipeline Pressure Testing Water

17.1 Context

Following construction, the dual pressure mains and the existing pressure main will be pressure tested to confirm their structural integrity. Pressure testing will be conducted using scheme water. The total water requirement for pressure testing will be approximately 9.43 kl of scheme water.

Upon completion, the pressure testing water will be disposed of in the sewerage system via the existing access chamber near the corner of Nancarrow Way and Lloyd Avenue.

The gravity sewers will be pressure tested by air pressure testing.

17.2 Purpose

The purpose of the Discharge of Pipeline Pressure Testing Water Management Plan is to outline the management actions to:

1. Define the method and management of discharge of pressure test water to the environment.

17.3 Performance Indicators

Performance will be demonstrated by:

- Compliance with the prescribed management actions.

17.4 Management Actions

1. Pressure test water will not be discharged into the Murray River.

17.5 Contingency Actions

No contingency actions are considered necessary.

17.6 Related Plans

- Dewatering and Acid Sulphate Soils Management

17.7 Relevant Legislation

- *Environmental Protection Act 1986* (WA)
- *Environmental Protection (Unauthorised Discharges) Regulations 2004 (WA)*

17.8 Advisory Agencies

- DEC

DRAFT

18.0 Environmental Incident and Hazard Management

18.0 Context

Environmental Incidents

Environmental incidents have the potential to occur on construction sites due to the scale and type of works being undertaken. For the purposes of this CEMF, an Environmental Incident is:

> *Any event or impact on the environment involving actions or assets associated with the project that is capable of:*
>
> - *causing harm to the environment or any person;*
> - *causing pollution; and/or*
> - *coming to the attention of the public or an environmental regulatory agency.*

Environmental incidents include matters such as:

- Chemical spills (including hydrocarbons).
- Fires.
- Discharges of contaminated waters to the environment.
- Environmental monitoring results indicating an impact to the environment or any person (water quality, noise, etc).

Environmental incidents do not include matters where there is no impact on the environment or do not cause concern for external groups, for example, a routine variance to compliance with this CEMF.

The Water Corporations Standard *SG110 Incident Management Corporate Planning Model* defines the manner in which the Principal responds to incidents. Environmental incidents relating to construction of the project shall be conducted as per Standard SG110.

Environmental Hazards

Environmental Hazards have the potential to occur on construction sites due to the scale and type of works being undertaken. For the purposes of this CEMF, an Environmental Hazard is:

> *Any event involving actions or assets associated with the project that is capable of having the potential to cause harm to the environment or any person;*

Environmental hazards include matters such as:

- Bunding with holes.
- Oil drums lying on their sides.
- Discharges of fuel to a bund around a tank.

18.1 Purpose

The purpose of the Environmental Incident and Hazard Management Plan is to outline management actions to:

1. Identify, manage and report any environmental incidents and hazards.
2. Identify management actions required for the prevention of future environmental incidents and hazards.

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18.2 Performance Indicators

Performance will be demonstrated by:

- Compliance with the prescribed management actions.

18.3 Management Actions

Determining an Environmental Incident

1. The Contractor shall provide and advertise a telephone number for public reporting of incidents for the duration of the construction works.

2. The Contractor shall undertake daily examinations of the project site so that any incidents are identified as quickly as possible;

3. Suspected environmental incidents will be reported to the Water Corporation environmental officer. The environmental officer will assess the impact site and make a determination on whether the suspected environmental incident is confirmed. If a suspected incident occurs after hours, the Contractor shall contact the Environmental Operations Manager for advice.

4. If a confirmed environmental incident occurs, the incident will be reported as soon as practicable to:

Table 9 Water Corporation Environmental Incident Contact List

Name	Position	Organisation	Telephone	
George Basanovic	Corporate Incident Management Coordinator	Water Corporation	B/H: A/H/Mobile:	9420 3247 0417 180 677
Joshua Lee	Project Manager	Water Corporation	B/H: A/H/Mobile	9420 2286 0439 978 743
Gorgon Groth	Environmental Operations Manager	Water Corporation	B/H: A/H/Mobile:	9420 2796 0409 941 758
Lorna McGuire	Environmental Officer	Water Corporation	B/H:	9420 3113

During an Environmental Incident

5. An environmental officer (appointed by Gordon Groth) will determine if the incident is likely to have a continued environmental impact if construction work continues;

6. Based on that advice, construction work that would continue to have an environmental impact will temporarily cease. Other construction works not related to the environmental incident and environmental impact will continue;

7. Construction works at the affected area will only recommence on the approval of the Environmental Operations Manager;

8. The incident will be investigated and an Incident Report (refer to Figure 7) will be completed as soon as reasonably practicable (generally within 24 hours). The Incident Report will be provided to the persons listed above;

9. All Incident Reports will be logged on a file retained at the construction site office.

Reporting an Environmental Incident

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10. Environmental incidents will be reported to the DEC by phone as soon as reasonably practicable following the environmental incident if the environmental incident has caused or is likely to cause pollution or serious environmental harm (in accordance with s72(1) of the Environmental Protection Act 1986 (WA)). Contact both:

- DEC Mandurah Local Office

  Phone: 08 9405 0750

- DEC Pollution Response (Perth)

  Phone: 1300 784 782

Written confirmation of the environmental incident will be provided to the CEO of the DEC, based on the Incident Report;

11. Environmental incidents will be reported to the Local Government Authority, FESA and the Police as appropriate (as per Standard SG110);

12. All environmental incidents will be reported to the DEC as part of annual compliance reporting required under the Minister for the Environment's Statement of Conditions imposed under the Environmental Protection Act 1986 (WA), irrespective of whether the environmental incidents have caused or are likely to cause pollution, or material or serious environmental harm (in accordance with s72(1) of the Environmental Protection Act 1986 (WA)).

Remediation of an Environmental Incident

13. The Water Corporation's environmental officer will determine any requirement to undertake remediation works, and the manner in which remediation works will be undertaken. Additional advice may be sought from the Water Corporation, the other on-site personnel or the DEC in making that determination.

Post Environmental Incident Training

14. There will be a briefing following the investigation of a confirmed environmental incident. The briefing will include any identified construction process improvements that could prevent reoccurrence of the same environmental incident;

15. The CEMF will be updated (as appropriate) to reflect process improvements.

18.4 Contingency Actions

No contingency actions are considered necessary.

18.5 Management Standards

PM#367692 S110 Water Corporation Incident Management Guideline

PM# 438168-v3C Environment Branch Incident Support Procedure

PM# 589090-v11 Water Corporation Management of Environmental Hazards, Near Misses and Incidents Procedure

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18.6 Related Plans

- Fire Management
- Dewatering and Acid Sulphate Soils Management
- Flora and Vegetation Clearing Management
- Dangerous Goods Management

18.7 Relevant Legislation

- *Environmental Protection Act 1986* (WA)

18.8 Advisory Agencies

- DEC

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INCIDENT REPORT

From: _____ Branch/Region: _____

Description: _____

REPORT

WHAT HAPPENED: _____

WHY: _____

WHEN: _____

WHERE: _____

EXTENT OF IMPACT - Actual _____

Potential - *(Consider; Secondary Effects, Environment, Customer, Community, Corporation's System)* _____

THOSE INFORMED OF THE INCIDENT (*Internal & External*) (*When?*) _____

PROGNOSIS - (*Consider; Action Taken, Action Planned, Time to Resolution*) _____

DECISION and NOTIFICATION by BRANCH/REGION

IS THE INCIDENT REPORTABLE? ☐ NO ☐ YES (provide details) ☛

IS IT? ☐ MINOR ☐ SIGNIFICANT ☐ MAJOR

(Seek advice from senior management or the CIMC if unsure)

Decisions made by (Name): (*print*) _____

Designation: _____

Notified Control Centre/CIMC
Customer Contact & Scheduling/Manager

Report to (Name): _____

Date: ..../..../.... Time: _____

Agreed report back (*who & when*)

_____

Report By: _____

Signed: _____ Date: _____ Contact Phone (24 *hr*) _____

Branch/Region: _____ Time: _____ Contact Fax (24 *hr*) _____

Contact Callsign (24 *hr*) _____

A copy of this form must be faxed/phoned to the
Corporate Incident Management Coordinator Fax (09) 420 2656 Mobile 0417 180 677

Figure 7 Water Corporation's Incident Report Form

19.0 Community Complaints Management

19.1 Context

The proposed construction works will occur in public and private lands and in close proximity to private residences. Some impacts on the public during construction works are expected, through inconveniences. A community complaints process will be established to ensure that community complaints are managed effectively.

19.2 Purpose

The purpose of the Community Complaints Management Plan is to outline management actions to:

1. Record complaints received from the community.
2. Record the response to community complaints received.

19.3 Performance Indicators

- Performance will be demonstrated by compliance with the prescribed management actions.

19.4 Management Actions

1. There will be a designated Communications Officer to coordinate the receipt, investigation and resolution of community complaints;
2. There will be a free-call telephone number and an email address to which the community can telephone/email and have their complaints recorded;
3. The Communications Officer will acknowledge receipt of emailed complaints within 48 hours of receipt;
4. The free-call telephone number and email contact details will be displayed at the external fence to the construction site;
5. The Communications Officer (or delegate) will record all complaints received on a Community Complaint Record (Figure 8). All Community Complaint Records will be maintained at the site office;
6. The Communications Officer will commence investigations into the nature and cause for the complaint within 48 hours of receipt of the complaint. The investigation will include consultation with the Environmental Officer to determine if the cause for the complaint was nonconformity with the management actions contained within this CEMF;
7. The Communications Officer will seek to provide a response to the complainant within 7 days of receipt of the complaint. The Communications Officer will complete the Community Complaint Record with details of how the complaint was addressed and the close-out discussions with the Complainant;
8. The Communications Officer will retain all Community Complaint Records at the site office during construction;
9. The Communications Officer will provide a copy of all Community Complaint Records at the end of each month during construction.

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19.5 Contingency Actions

No contingency actions are considered necessary.

19.6 Related Plans

All plans are considered relevant.

19.7 Relevant Legislation

- *Environmental Protection Act 1986* (WA)

19.8 Advisory Agencies

- DEC

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Community Complaint Record

Complaint Receipt – Communications Officer to Complete

Date: _____

Time: _____

Complainant Details: Name: _____

Telephone Number(s): _____

Email address: _____

Residential Address: _____

Postal Address: _____

Nature of Complaint: _____

_____

_____

_____

Does the complaint require further investigation? Yes / No (please circle)

Estimated timeframe for completion: 24hrs 48hrs 7 days (please circle)

Relevant on-site personnel: _____

Construction location relevant to complaint: _____

Details of investigations undertaken: _____

_____

_____

_____

Assessment of complaint: _____

_____

Are corrective actions to be implemented? (if yes, describe) _____

_____

Close-out with Complainant - Communications Officer to Complete

Date of response to Complainant: _____

Time of response to Complainant: _____

Method of response: Telephone Email (please circle)

Describe the actions implemented: _____

_____

_____

_____

_____

Is the complaint resolvable? Yes / No (please circle)

Inform staff? Yes / No (please circle)

Does the Complainant wish to be added to the project mailing list? Yes / No (please circle)

Officer Name: _____ Signature: _____

A copy of all completed Community Complaint Records is to be forwarded to the Superintendent at the end of each month of construction.

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Figure 8 Community Complaint Record

20.0 Compliance Management

20.1 Context

This CEMF outlines the actions, criteria and objectives to be implemented or achieved during construction. If for any reason the actions, criteria or objectives are not implemented or achieved, a response process is required to correct those matters within an appropriate timeframe and with notification to appropriate personnel.

20.2 Purpose

The purpose of the Compliance Management Plan is to outline the management actions to:

1. Identify, communicate and correct non-conformity with the management actions contained in this CEMF.

20.3 Performance Indicators

Performance will be demonstrated by:

- Resolution of non-conformity with the management actions contained in the CEMF in accordance with the actions contained in this plan.

20.4 Management Actions

1. The site personnel, Water Corporation, or third parties (such as regulators, local government authorities and the public) may identify potential non-conformity with the actions, criteria or objectives identified in this CEMF. All potential non-conformities will be reported to the environmental officer on site;
2. The report will be investigated within 48 hours of notification to confirm its validity;
3. An Improvement Notice will be issued if the report is confirmed as valid (i.e. there is nonconformity with the CEMF). The Improvement Notice details:

   a. the nature of the non-conformity;

   b. an assessment of the environmental impact;

   c. a decision on the corrective action(s) required. This may include revision of the actions, criteria or objectives identified in the CEMF;

   d. the timeframes allowed to implement the corrective actions;

   e. any requirements to inform contracting staff of the corrective actions to prevent reoccurrence; and

   f. close-out of corrective actions.

   The Improvement Notice is shown at Figure 9.
4. The corrective actions contained in the Improvement Notice will be implemented;
5. The actions required by the Improvement Notice will be completed and notification that the corrective actions have been completed will be provided to the environmental officer;

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8. The Environmental Officer will review the actions taken, confirm that the corrective actions have been implemented and the complete the close-out section of the Improvement Notice;
7. A copy of all completed Improvement Notices will be maintained at the Site Office.

20.5 Additional Information

An Improvement Notice is a written communication tool that is used to improve environmental performance. An Improvement Notice should not be regarded as a sanction. The process flowchart for management of CEMF non-compliances is contained in Figure 10.

20.6 Contingency Actions

If there is a dispute between the on-site environmental officer and construction personnel, regarding the requirements contained in an Improvement Notice, the Water Corporation will resolve the dispute.

20.7 Related Plans

All plans are considered relevant.

20.8 Relevant Legislation

- *Environmental Protection Act 1986* (WA)

20.9 Advisory Agencies

- DEC

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Improvement Notice

Report - On-site environmental scientist and responsible construction personnel to complete

Date: _____

Location: _____

Contractor: _____

Nature of Non-Compliance Reported: _____

_____

_____

Is the Reported Non-Compliance Valid? Yes / No (please circle)

Assessment of Environmental Impact: _____

_____

_____

Corrective Actions to be Implemented: _____

_____

_____

Timeframe for completion: Immediately 24hrs 48hrs 7 days (please circle)

Contractor to Inform Staff: Yes/No (please circle)

Issue Date and Time: _____

Issued to (Name and Position):

Close-out - Responsible construction personnel to complete

Describe the corrective actions implemented: _____

_____

_____

_____

Name: Signature: Date:

Close-out - On-site environmental scientist to complete

Corrective actions have been implemented?: Yes / No (please circle)

Are additional corrective actions required? Yes / No (please circle)
If Yes – complete a new Improvement Notice with the new corrective actions

Name: Signature: Date:

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Figure 9 - Improvement Notice

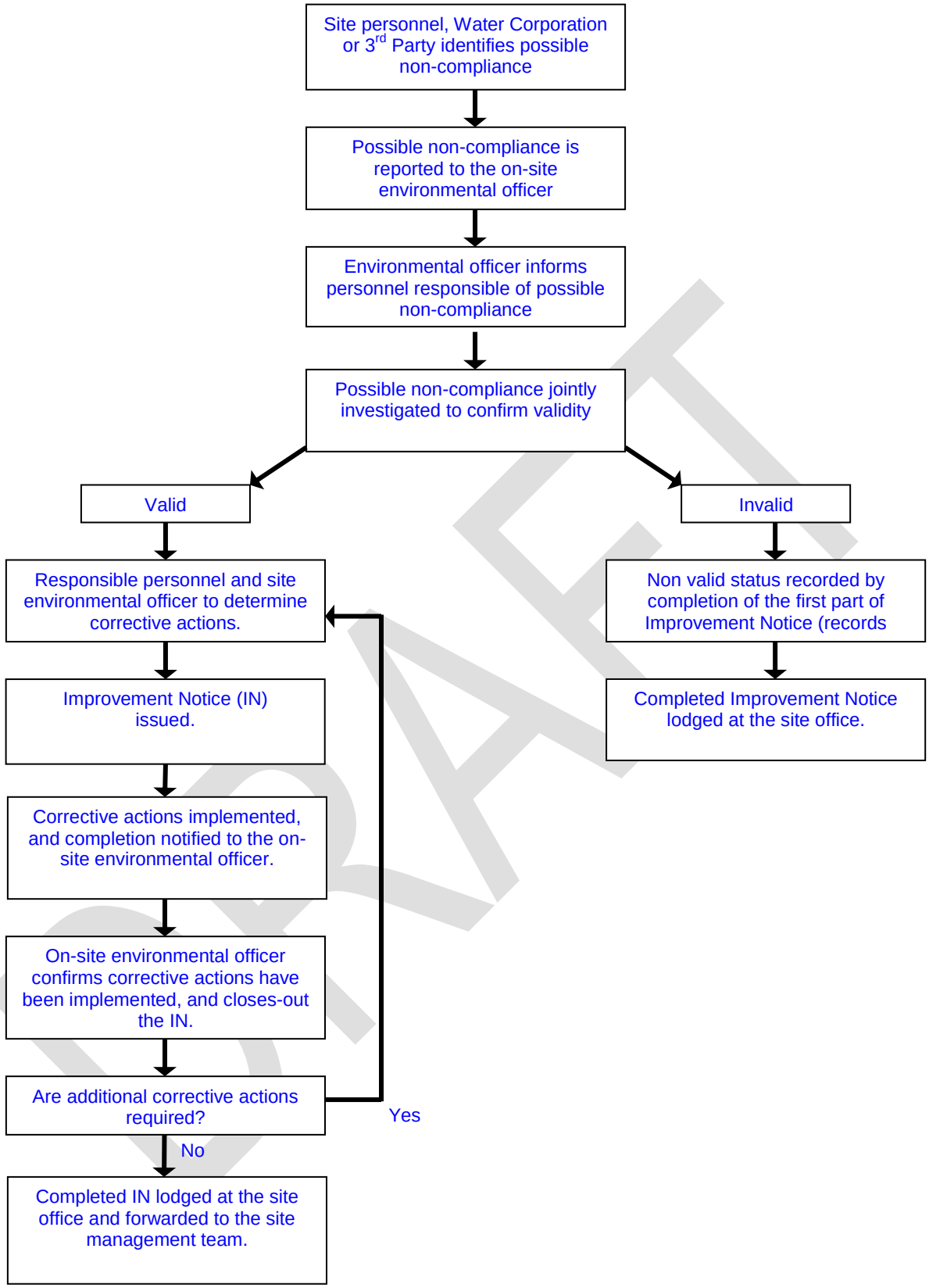

Figure 10 Compliance Assessment Process Flowchart

21.0 Auditing of the CEMF

21.0 Context

This CEMF for the Ravenswood/West Murray Infill Sewerage Project outlines a large number of management actions to be implemented during construction. These management actions will be audited to confirm that the management actions have been implemented. Auditing will be undertaken by the contractor and the Water Corporation or their assigned representatives, and may also be undertaken by local and state regulatory agencies.

Where auditing identifies that the management actions contained in the CEMF have not been implemented or do not achieve a satisfactory environmental performance, the specified contingency actions will be undertaken. Where contingency actions are not specified or are considered unsuitable, the auditor will seek to identify alternative actions to achieve the intended environmental objective.

Auditing of the Dewatering and Acid Sulfate Soils Management Plan is separate to the CEMF auditing.

21.1 Purpose

The purpose of this Auditing of the CEMF Management Plan is to outline management actions to:

1. Identify the schedule and context of audits against the management actions contained within this CEMF.
2. Confirm compliance with the management actions.
3. Identify potential improvements in environmental performance.

21.2 Performance Indicators

Performance will be demonstrated by:

- Compliance with the prescribed management actions contained in this CEMF.

21.3 Management Actions

1st Party Audits - Contractor

- The Contractor will undertake daily informal observations of compliance with the management actions contained in this CEMF. These audits need not be recorded.

2nd Party Audits – Principal

- The Water Corporation will undertake assessments of compliance with the management actions contained in this CEMF each 3 consecutive months of construction. Reports generated from the audits will be provided to the Contractor.

3rd Party Audits – DEC

- The DEC may undertake compliance audits of construction works at any time pursuant to the provisions of s48(1) and Part VI of the *Environmental Protection Act 1986* (WA).

3rd Party Audits – Local Government Authorities or other State Government Agency

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- The Contractor and the Water Corporation will welcome inspections and audits by the Shire of Murray and other State Government agencies interested in the project. The Water Corporation will arrange the timing of such audits and inspections following requests from the local government authorities and other State Government agencies.

21.4 Additional Information

- All audits by all parties should seek to indicate if the project has:
    a. complied with the requirements as stipulated in the CEMF; and
    b. achieved satisfactory environmental performance.

  Non-conformity will be deemed to have occurred if the requirements of this CEMF have not been implemented and there is unsatisfactory environmental performance.

  Both criteria are relevant, because although the CEMF may not have been strictly followed, alternative (and more appropriate) actions to achieve the intended environmental outcome may have been implemented. Alternatively, compliance with the actions specified in the CEMF may not have achieved satisfactory environmental performance and require modification/corrective action.
- It is expected that any audit by a 3rd party will be limited to within the statutory jurisdiction of that party.

21.5 Contingency Actions

No contingency actions are considered necessary.

21.6 Related Plans

All plans are considered relevant.

21.7 Relevant Legislation

- *Environmental Protection Act 1986 (WA)*

21.8 Advisory Agencies

- DEC

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22.0 References

The following documents were reviewed and/or cited in preparation of the CEMF:

Department of Agriculture Western Australia and Grains Research and Development Corporation (2006) *2006/2007 Canola, Pulse and Legume Pasture Spraying Charts – Bulletin 4674.*

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Water Corporation (October 2004) *SG110 Incident Management Corporate Planning Model*.

Legislation referred to in this CEMF can be accessed via the Western Australian State Law Publisher website at *http://www.slp.wa.gov.au* or via the Australasian Legal Information Institute website at *http://www.austlii.edu.au*.

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APPENDIX 1 – WATER CORPORATION ENVIRONMENT POLICY

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Environment Policy

Striving for Zero Footprint

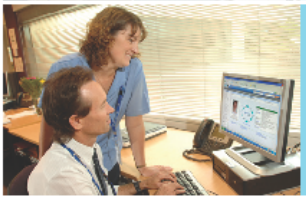
The Water Corporation provides essential water, wastewater and drainage services to the people of Western Australia. These services include construction, operation and maintenance of assets. We take water from the environment and return drainage water, treated wastewater and its by-products to the environment. We are committed to protecting and enhancing the environment. We will comply with our environmental obligations, reduce our environmental impact, prevent pollution and continually improve our environmental performance.

We will strive for Zero Footprint by:

1 **Managing risks**
We are all responsible for identifying and addressing environmental risks and potential incidents.

2 **Taking personal responsibility**
We are all responsible for protecting the environment and understanding and meeting our environmental obligations.

3 **Improving performance**
Our environmental objectives include reducing native vegetation clearing, reducing greenhouse gas emissions, reducing water use and increasing recycling of wastewater. We set targets to continually reduce our environmental impact and to improve our environmental performance and regularly review performance against targets.



4 **Maintaining an effective system**
Our Environmental Management System provides the framework for setting and reviewing our environmental objectives and targets and continually improving our environmental performance.

This policy applies to all employees and contractors of the Water Corporation and includes all activities and services we provide, in accordance with our operating licence.

We will provide the necessary resources, systems, training and mechanisms to improve our environmental performance.

Sue Murphy
Chief Executive Officer
Water Corporation

WATER CORPORATION

PCY230 Environment Policy Date: October 2011 Doc#: 5908380 Next Review: October 2012