

# **Attachment A**

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## **RISK MANAGEMENT**




# **RISK MANAGEMENT PLAN**

RAW WATER SUPPLY OEMP – ATTACHMENT A

SEPTEMBER 2016



## Revision History

Version	Revision Date	Details	Authorised	
			Name/Position	Signature
1.0	08/04/16	Draft for review	M Haege/Geolyse	
2.0	09/05/16	Issue for implementation	M Haege/Geolyse	
2.1	22/09/16	Minor edits	M Haege/Geolyse	

## ABBREVIATIONS

AEMP	Aquatic Environmental Monitoring Program
AHD	Australian height datum
AMS	Adaptive management strategy
ANZECC	Australian and New Zealand Environment and Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
BSCSHS	Blackmans Swamp Creek stormwater harvesting scheme
CCS	Community communication strategy
CTF	Cease to flow
CoA	Condition of approval
DEE	Department of Environment and Energy
DST	Decision Support Tool
DPI	Department of Primary Industries
DPI Water	Department of Primary Industries Water
DSEWPC	Department of Sustainability, Environment, Water, Population and Communities (now DEE)
EA	Environmental Assessment
EP&A Act	NSW Environmental Planning and Assessment Act 1979
GL	Gigalitre (1,000 megalitres)
GMP	Groundwater monitoring program
ha	Hectares
HMP	Hydrology monitoring program
IMP	Inspection and maintenance plan
kL	Kilolitre (1,000 litres)
km	Kilometre (1,000 metres)
kWhr	Kilowatt hour
L	Litre (1,000 millilitres)
LGA	Local Government Area
L/s	Litres per second
m <sup>3</sup>	Cubic metre (1,000 litres)
m <sup>3</sup> /hr	Cubic metres per hour
m <sup>3</sup> /s	Cubic metres per second
mg/L	Milligrams per litre
mL	Millilitre
ML	Megalitre (1 million litres or 1,000 kilolitres)
ML/day	Megalitres per day
m	Metre
mm	Millimetre
MOP	Macquarie River to Orange pipeline

OCC	Orange City Council
OEMP	Operation Environmental Management Plan
PA	Project approval
PCSHS	Ploughmans Creek stormwater harvesting scheme
ScWMP	Scour water management plan
SEP	Stakeholder engagement plan
STP	Sewage treatment plant
µg/L	Micrograms per litre
µS/cm	Micro Siemens per centimetre
WAL	Water access licence
WFP	Water filtration plant
WSP	Water sharing plan

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# Risk Management

## 1.1 INTRODUCTION

This Risk Management Plan (RMP) forms part of the *Orange Raw Water Supply Operational Environmental Monitoring Plan (OEMP)*. It describes how Orange City Council has assessed risk and the relevant controls proposed.

## 1.2 RISK MANAGEMENT FRAMEWORK

The risk rating is a factor of the **consequence** of an impact occurring and the **likelihood** of the impact occurring. Depending on the combination of consequence and likelihood, the overall risk rating could be low to very high. Very high risks (termed ‘key risks’) have warranted a higher level of control.

### 1.2.1 CONSEQUENCE

A consequence is the outcome (impact) of an event as described in **Table 1.1**.

**Table 1.1 – Consequence levels**

Level	Likelihood	Example description
1	Negligible	Negligible impact, little disruption to normal operation, low increase in normal operation costs.
2	Minor	Minor impact for small population, some manageable operation disruption, some increase in operating costs.
3	Moderate	Minor impact for large population, significant modification to normal operation but manageable, operation costs increased, increased monitoring.
4	Major	Major impact for small population, systems significantly compromised and abnormal operation if at all, high level of monitoring required.
5	Severe	Severe impact for large population, complete failure of systems.

### 1.2.2 LIKELIHOOD

Likelihood is the chance that something might happen. The information provided in the **Table 1.2** is used to determine the likelihood of identified risks.

Table 1.2 – Likelihood description and frequencies

Level	Likelihood	Example description
A	Almost certain	Will happen: imminent or will occur in 1 to 6 months
B	Likely	Expected to happen: expected to occur at least once in a 6 to 12 month period
C	Possible	Could happen: will probably occur between 1 to 5 years
D	Unlikely	Not expected to happen: may occur once every 5 to 10 years
E	Rare	Uncommon, unusual: not likely to occur within a 10 year period

### 1.3 RISK MATRIX

The rating of risks is evaluated using the matrix in **Table 1.3**. The scoring of risk is a subjective process. When assessing the likelihood and consequence of a particular risk, the following information is considered:

- The environmental impact assessment and suggested mitigation measures;
- Results of site audits or observations;
- Past history and similar occurrences and situations; and
- Review of relevant documentation and data.

The risk level actions are:

- 1 immediate action
- 2 action within one week
- 3 action within one month
- 4 Monitor
- 5 Monitor

Table 1.3 – Risk rating table

		CONSEQUENCE				
		Negligible	Minor	Moderate	Major	Severe
LIKELIHOOD	Almost certain	5	4	2	1	1
	Likely	5	4	2	1	1
	Possible	5	5	3	1	1
	Unlikely	5	5	4	2	2
	Rare	5	5	4	3	3



## 1.4 RISK REGISTER

A register of operation environmental hazards, the anticipated level of risk and relevant control measure is provided in **Appendix A**.

This register shall be updated as required during operation if new environmental hazards are identified or environmental controls altered.

## 1.5 RMP REVIEW

### 1.5.1 REVISION TO STRATEGIES, PLANS AND PROGRAMS

CoA C6 requires that OCC shall review requires that OCC shall review, and if necessary revise, strategies, plans and programs included in the OEMP to the satisfaction of the Director-General within 3 months of:

- a) the Annual Review (**Section 4.4 – OEMP Reporting**);
- b) any Incident Report (**Section 3.2.18 – Environmental Incident Management**);
- c) an Audit Report (**Section 4.3 – Environmental Auditing and Compliance**); or
- d) any modification to the conditions of the Project Approval,

This is to ensure that plans and programs are updated on a regular basis, and incorporate any recommended measures to improve environmental performance.

### 1.5.2 DOCUMENT CONTROL

The following will be classed as ‘major’ revisions:

- Changes to processes;
- Changes to monitoring programs, either timing or parameters monitored;
- Changes made in response to an incident; and/or
- Changes requested by a relevant Government agency.


Major revisions will be identified by the whole number in the version number (i.e. 1.0, 2.0, 3.0....) and will be reviewed, approved and re-circulated as necessary.

The following will be classed as ‘minor’ revisions:

- Minor typing and grammar corrections;
- Changes to position titles; and
- Updates to recording forms to suit changes in operations.

Minor revisions will be identified by the decimal point in the version number (i.e. 1.1, 2.2, 3.3....) and will not require review and approval prior to re-circulation.

Major and minor revisions will be listed in the Revision History at the front of this document.

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# Appendix A – Risk Register

# OCC Raw Water System: RISK REGISTER

Version 2.1: 22 September 2016

Number	Risk Management Area	Cause	Effect/Impact	Controls	Current Risk Rating					Responsible Person	
					Consequence	Likelihood	Risk Level				
1	Extraction Volume	Ineffective management and monitoring of extraction volumes.	Exceed water share listed on the various Water Access Licences.	<b>OEMP Section 3.2.1</b> Extraction Volume <b>Hydrology Monitoring Program</b>	1	Negligible	C	Possible	1C	5	Water and Sewerage Strategic Manager
2	Operating Rules	Not complying with approved operating conditions.	Departure from approved operating conditions causing changes to creek and river flow regimes that are different to the predictions made in the various assessment documents.	<b>OEMP Section 3.2.2</b> Operating Rules <b>Decision Support Tool</b>	3	Moderate	D	Unlikely	3D	4	Water and Sewerage Strategic Manager
3	Gauging Stations	Inadequate maintenance/monitoring of gauging stations.	Gauging stations do not accurately reflect flow and incorrectly trigger harvest operations.	<b>OEMP Section 3.2.3</b> Gauging Stations <b>Hydrology Monitoring Program</b>	2	Minor	D	Unlikely	2D	5	Water Treatment Manager
4	Environmental Water Quality	Ineffective management and monitoring of water quality.	Deterioration of surface and groundwater quality. Impact on aquatic habitat.	<b>OEMP Section 3.2.4</b> Water Quality <b>Aquatic Environment Monitoring Program</b>	3	Moderate	D	Unlikely	3D	4	Water Treatment Manager
5	Drinking water quality	Drinking water quality targets for external sources not met. Lack of monitoring and control.	Impact on raw water quality in Suma Park Dam that compromises drinking water quality.	<b>OEMP Section 3.2.4</b> Water Quality OCC Drinking Water Management System	3	Moderate	E	Rare	3E	4	Water Treatment Manager
6	Aquatic Ecology	Ineffective management and monitoring of water quality and hydrology.	Alteration to feeding and spawning habitats, entrainment during offtake operation, and indirect impacts to habitat as a result of changes to water quality and flow.	<b>OEMP Section 3.2.5</b> Aquatic Ecology <b>Aquatic Environment Monitoring Program</b>	3	Moderate	E	Rare	3E	4	Water Treatment Manager
7	Environmental Flow Rules	Lack of monitoring. System failure.	Do not comply with approval conditions.	<b>OEMP Section 3.2.6</b> Environmental Flow Rules <b>Hydrology Monitoring Program</b>	2	Minor	D	Unlikely	2D	5	Water Treatment Manager
8	Groundwater Management	Ineffective management and monitoring of groundwater levels and quality.	Deterioration of groundwater quality. Impact on other groundwater users through reduction in water levels.	<b>OEMP Section 3.2.7</b> Groundwater Management <b>Groundwater Monitoring Program</b>	2	Minor	D	Unlikely	2D	5	Water Treatment Manager
9	Terrestrial Ecology	Scour water discharge.	Downslope or downstream habitat sedimentation, and modification of vegetation composition in the long-term (if releases occur periodically).	<b>OEMP Section 3.2.8</b> Terrestrial Ecology <b>Scour Water Management Plan Inspection and Maintenance Plan</b>	2	Minor	D	Unlikely	2D	5	Water Treatment Manager
10	Stakeholder Engagement	Ineffective communication with stakeholders.	Misinformation in the community. Disgruntled community.	<b>OEMP Section 3.2.9</b> Stakeholder Management <b>Stakeholder Engagement Plan</b>	2	Minor	D	Unlikely	2D	5	Water and Sewer Strategic Manager
11	Air Quality	Dust generation from maintenance crews traversing unsealed roads and the easement.	Infrequent impacts to air quality due to dust generation.	<b>OEMP Section 3.2.10</b> Air Quality <b>Inspection and Maintenance Plan</b>	1	Negligible	C	Possible	1C	5	Water and Sewerage Strategic Manager

Number	Risk Management Area	Cause	Effect/Impact	Controls	Current Risk Rating					Responsible Person	
					Consequence	Likelihood	Risk Level				
12	Noise and Vibration	Operational traffic, and inadequate maintenance/monitoring of noise-generating infrastructure.	Impact on local noise amenity.	<b>OEMP Section 3.2.11</b> Noise and Vibration	2	Minor	D	Unlikely	2D	5	Water and Sewerage Strategic Manager
13	Land Use	Impact on landuse during operation and maintenance.	Decreased development potential of land within the easement due to restrictions included in the acquisition agreement between Landowners and Council.	<b>OEMP Section 3.2.12</b> Land Use <b>Inspection and Maintenance Plan</b> <b>Stakeholder Engagement Plan</b>	2	Minor	D	Unlikely	2D	5	Water and Sewerage Strategic Manager
14	Traffic Management	Operational traffic.	Minor traffic and road impacts.	<b>OEMP Section 3.2.13</b> Traffic Management <b>Inspection and Maintenance Plan</b>	1	Negligible	C	Possible	1C	5	Water and Sewer Strategic Manager
16	Visual Amenity	Maintained cleared vegetation and surface infrastructure such as pumping stations and ancillary services	Change to local visual environment.	<b>OEMP Section 3.2.14</b> Visual Amenity	2	Minor	D	Unlikely	2D	5	Water and Sewer Strategic Manager
17	Contamination and Soils	Scour water and contamination	Erosion and soil contamination	<b>OEMP Section 3.2.15</b> Contamination and Soils <b>Scour Water Management Plan</b>	2	Minor	D	Unlikely	2D	5	Water Treatment Manager
18	Waste Management	Scour water and sediments generated by infrequent cleaning and dewatering requirements.	Impacts to water quality.	<b>OEMP Section 3.2.16</b> Waste Management <b>Scour Water Management Plan</b>	1	Negligible	D	Unlikely	1D	5	Water Treatment Manager
19	Complaints Management	Not following procedures.	Disgruntled community. Lack of feedback and follow-up.	<b>OEMP Section 3.2.17</b> Complaints Management <b>Stakeholder Engagement Plan</b>	2	Minor	D	Unlikely	2D	5	Water and Sewerage Strategic Manager
20	Environmental Incident Management	Not following procedures.	No continual improvement. OEMP not updated.	<b>OEMP Section 3.2.18</b> Environmental Incident Management <b>Adaptive Management Strategy</b>	3	Moderate	D	Unlikely	3D	4	Water and Sewerage Strategic Manager
21	Non compliance with OEMP	Lack of personnel training. Lack of monitoring. Lack of auditing.	Non compliance with OEMP and possible environmental impact.	<b>OEMP Section 3.2.18</b> Environmental Incident Management <b>OEMP Section 4.3</b> Environmental auditing and compliance <b>Adaptive Management Strategy</b> <b>OEMP Section 2.5</b> Environmental Training	3	Moderate	E	Rare	3E	4	Water and Sewerage Strategic Manager

**Risk Level Actions:**

- 1 Immediate action
- 2 Action within 1 week
- 3 Action within 1 month
- 4 Monitor
- 5 Monitor