

Attachment K

MANAGEMENT STUDIES

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RAW WATER SUPPLY OEMP – ATTACHMENT K

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	Changes to operational noise and vibration review	M Haege/Geolyse	

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Background

1.1 INTRODUCTION


The following management studies form part of the *Orange Raw Water Supply Operational Environmental Monitoring Plan (OEMP)*.

The studies outlined only need to be undertaken once during the operation of the Orange raw water supply system. Any actions/recommendations arising from the studies shall be incorporated into the OEMP.

Once completed and reported, the studies can be removed from this section. Other specific studies may be added. In this way, the number of studies included in this section of the OEMP will vary.

The following management studies are included:

1. Operational noise and vibration review;
2. Macquarie River hydraulics; and
3. Macquarie River flow series and pumping trigger.

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Noise and Vibration

2.1 REQUIREMENT

CoA D1 of the Project Approval:

Operational Noise and Vibration Review


*D1 The Proponent shall, within six (6) months of commencing operations, unless otherwise agreed by the Director General, prepare and submit an **Operational Noise and Vibration Review**. The review shall:*

- (a) identify the Project specific noise and vibration criteria applicable;*
- (b) measure the operational noise and vibration levels at affected receivers;*
- (c) where the noise and vibration criteria was not achieved, the review shall present an analysis of all feasible and reasonable noise and vibration mitigation measures, and the ‘best practice’ achievable noise and vibration outcome achievable for each activity;*
- (d) identify the proposed mitigation measures to be implemented in order to meet the applicable noise and vibration criteria if operational noise and vibration levels exceed the specific criteria in D1(a); and*
- (e) include a consultation strategy with directly affected receivers on mitigation measures identified through the Community Communication Strategy in Condition C14.*

2.2 DEFERMENT

The DP&E agreed to defer the completion of an Operational Noise and Vibration Review until a noise complaint is received (letter dated 1 April 2015). This agreement requires that OCC notify the DP&E:

- Upon receipt of any operational noise complaint and subsequent investigation to determine if the complaint was related to the operation of the Macquarie River to Orange pipeline; and
- Advise the timeframe for completion of the Operational Noise and Vibration Review should the complaint be related to operation of the Macquarie River to Orange pipeline and noise monitoring is required.

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2.3 SCOPE


If required under **Section 2.2**, the study would be scoped to address the specific requirements of Project Approval CoA D1 as outlined above.

2.4 WHEN REQUIRED

If a noise complaint related to the operation of the Macquarie River to Orange pipeline is received and verified and it is determined that noise monitoring is required (refer to **Section 2.2**)

2.5 RESPONSIBILITY

The **Water and Sewerage Strategic Manager** shall be responsible for ensuring the Operation Noise and Vibration Review is completed as indicated.

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Macquarie River Hydraulics

3.1 REQUIREMENT

CoA B1 of the Project Approval outlines the requirement for the preparation of an Aquatic Environment Monitoring Program (AEMP) which shall be developed:

- (a) *in consultation with DPI (NSW Office of Water and Fisheries NSW) and OEH;*
- (b) *include a monitoring design to:*
 - i. *confirm predictions and identify changes in hydrology and aquatic ecology (including fish and aquatic and riparian vegetation); and*
 - ii. *determine the efficiency of the offtake design and screens to limit impingement, entrainment and minimise impacts to eggs, larvae or changes to recruitment of threatened aquatic species.*
- (c) *include an appropriate number and location of monitoring points to determine impacts and changes to hydrology and aquatic ecology at:*
 - i. *Cobbs Hut Hole including the offtake and riffle or rockbar sections from operation of the pipeline;*
 - ii. *in Summer Hill Creek resulting from increased flow volumes and spills from Suma Park Dam; and*
 - iii. *other locations as necessary.*


3.2 SCOPE

The study outlined in this section addresses CoA B1(b)(i) and B1(c)(i).

Other requirements of CoA B1 are addressed in the AEMP.

3.3 STUDY AIM

The aim is to verify water level changes in pools and riffles in the Macquarie River as a result of the operation of the Macquarie River to Orange pipeline.

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3.4 STUDY APPROACH

3.4.1 MONITORING SITES

The verification of water level changes in pools and riffles will be measured at:

1. Cobbs Hut Hole pool at the river gauge (upstream of Pump Station 1 intake) and at a location downstream of the pump intake (downstream of the rock bar);
2. At two (2) riffle sites located approximately 200 m and 300 metres downstream of the pump intake.

3.4.2 MONITORING PARAMETERS

Measurements will be undertaken for three flow ranges:

1. 108 to 120 ML/day;
2. 180 to 200 ML/day; and
3. 300 to 350 ML/day.

These flow ranges have been selected as they are at the lower end of flows under which the pipeline will operate and impacts above these flows will be less.

Measurement will include:

- Water level at the river gauge (pool zone);
- Water level downstream of pump intake (pool zone);
- Water level and depth (riffle zone); and
- Average flow width (riffle zone).

For each flow range, baseline measurements will be undertaken without the Macquarie River to Orange pipeline Pump Station 1 operating.

The measurements will then be repeated approximately one (1) hour after the pumps have started to operate.


One set of measurements will be undertaken in each flow range.

3.4.3 MONITORING FREQUENCY

The verification of water level changes in the Cobbs Hut Hole pool and downstream riffles will be undertaken during the first year of operation only.

3.4.4 REPORTING


Results of the monitoring shall be detailed in a report that will be included with the first Annual review (refer to **Section 4.4 – OEMP Reporting**).

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The need to do further monitoring of river hydraulics will be addressed in the report.

3.5 RESPONSIBILITY

The **Water and Sewerage Strategic Manager** shall be responsible for ensuring the Macquarie River Hydraulic Review is completed as indicated.

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Macquarie River Flow Series


4.1 REQUIREMENT

CoA B5 of the Project Approval:

B5 The Proponent may revise the exiting river flow model, or utilise another river flow model, to determine the 80th percentile flows in the Macquarie River at Gauging Station 421192 under current catchment conditions, if agreed by the NOW and the Director General. In seeking agreement of NOW and the Director General, the Proponent shall:

- (a) Calibrate and validate the model in accordance with current best practice;*
- (b) Operate the model to simulate daily river flows assuming the historical climate from the early 1890s until the present time was to repeat itself in the future;*
- (c) Examine the rigour of the model to accurately predict the streamflows over this period including wet and dry periods and the severe droughts which occurred in the later part of the 19th century and the early part of the 21st century;*
- (d) Document the model’s establishment, calibration, validation and operations;*
- (e) Calculate the 80th percentile river flow at Cobbs Hut Hole;*
- (f) Use the modelled river flows to inform the Decision Support Tool referred to in condition B3;*
- (g) Submit the model and its documentation for peer review by NOW (or a suitably qualified person agreed to by NOW and the Director General). A key objective of this review will be to determine whether the model is ‘fit for purpose’ in calculating the 80th percentile river flow and in calculating river flow sequences for use in the Decision Support Tool;*
- (h) Submit the model and its documentation to the Director General, including any peer review comments and any changes to the model, its documentation and the 80th percentile pumping trigger, resulting from that review.*

No water transfers from the Macquarie River shall be permitted at the revised 80th percentile pumping trigger (except where this may be higher than the 80th percentile flow rate already adopted) without the approval of the Director General. Any future revision of the model or the pumping trigger shall also require approval of the Director General in accordance with this condition.

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4.2 SCOPE


The study would be scoped to address the specific requirements of Project Approval CoA B5 as outlined above.

4.3 WHEN REQUIRED

The study will be undertaken only if Orange City Council determine that a review of the river flow series and pumping trigger is warranted.

4.4 RESPONSIBILITY

The **Water and Sewerage Strategic Manager** shall be responsible for coordinating this study if required.

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