

Assessment of Coliban Water RFI responses received 2 December 2022

1. Dilution ratio

1(a) The response is acceptable in that we have clarity about the dilution ratio.

1(b) The response is not acceptable - EPA requested that Coliban Water provide an assessment (using their hydrological model) of discharge scenarios with higher dilution ratios such as with the ratio of river water to discharge being 3:1, 5:1 and 10:1. Please comment on the operational and cost implications of discharging under these scenarios and the adjustments /changes to plant and its operation that will be needed. This was not done.

EPA's feedback on Coliban Water's proposed dilution ratio

- A 1:2 dilution ratio (one part river water to two parts treated effluent) is considered to be extremely high risk, because any upset conditions or fluctuations in the treatment plant performance mean that the river has limited assimilation capacity. A 1:2 dilution ratio, means that if there are upset conditions in the plant, there is only a 1/3 dilution in the environment.
- GHD Table 16 shows that between 2015 and 2021, the maximum ammonia for the BNR water was 6.7 mg/L. Under this scenario, the concentration in the Campaspe would be only reduced by 1/3 downstream, or 4.5 mg/L. This is more than 5x the ANZG ammonia guideline value. This would be a high-risk situation, and likely to be toxic to fish and aquatic animals in the river. During upset conditions ammonia concentrations over 10 mg/L are foreseeable.
- The risk assessment by GHD assesses the risk from ammonia as low, using median and 90th percentile ammonia. EPA's assessment of this risk is **high** or potentially **very high**. It is *possible* (maximum ammonia of 5-10 mg/L likely to occur within a 5-10 year period) and the consequence is *moderate* to *major* (moderate to high local impact with a zone influence for several kilometres).
- It is not clear how CW could adequately manage a risk with a high environmental consequence with a 1:2 dilution ratio.
- EPA's preferred dilution ratio would be at least 3:1 (streamflow to discharge). At this dilution ratio an upper limit of 3.6 mg/l would be required to avoid the possibility of toxic effects from ammonia.

2. Discharge Limits

2(a) Response is not acceptable, EPA was seeking upper bounds for all discharge parameters

2(b) Response not acceptable. Proposed medians were not revised as requested.

EPA is of the view that as the current proposed limits are well in excess of what is currently achieved it should be possible to revise the limits down without risking non-compliance. It is EPA's view that the limits are set no higher than they need to be even if this falls below what is theoretically acceptable from a risk assessment, this is a precautionary approach. Coliban's comments indicate that they expect performance of the plant to deteriorate due to increasing loading. If this is the case provide some indication of your projections and a time frame.

2(c) Partially acceptable. EPA considers that it should be possible to have a cap and a dilution ratio. As long as we are confident that the level of nutrient discharge will limit adverse downstream impacts then the purpose of the cap is to indicate, in the future, when the plant might be reaching its design capacity and should trigger actions to manage input loads exceeding its original design capacity.

2(d) Response acceptable

3. Key issues missed by the risk assessment

The risk assessment has a significant flaw, it doesn't consider likelihood, but uses consequence and a threat score, which are effectively the same thing, without consideration of likelihood.

3(a) BOD (Biochemical Oxygen Demand)

EPA did consider the most recent version of the ERA and found the assessment in 6.3.2 to be unacceptable. The assessment in 6.3.2 only looks at the statistics for recorded BOD levels in the discharge and the river but makes no assessment of the likely impacts of Coliban's input of BOD to the river, as requested by EPA. Inputs of BOD would be most critical during summer low flow periods when temperatures are high. At these times it is important to consider likely high values for the BOD not just the median. In this respect the analysis in 6.3.2 does not provide any indication of how high BOD could be in the discharge and still provide protection of DO (dissolved oxygen) levels in the Campaspe.

EPA's calculations indicate that at the proposed dilution of 1:2 and the maximum BOD recorded of 17 mg/l that the DO in the river (at 20° C) would reach a minimum of 66% saturation due to the input from the discharge, this is below the ERS for this segment of river. At 1:2 dilution the maximum BOD would have to be set at 7.5 mg/l to stay within the ERS limits this is about the 99th percentile for the BNR discharge. At 3:1 dilution and 17 g/L the minimum DO reached is 87% sat. which is acceptable, the BOD in the discharge could be as high as 20 mg/l and still meet the ERS standard of 85% sat. Whilst it is acknowledged that BOD concentrations in the upstream waters can be much higher and could cause rapid reduction of DO concentrations in warm temperatures, it can be seen that the discharge can be managed so as not to contribute to this problem. The high BOD in the upstream waters is a problem that needs to be managed, probably through catchment management measures, it is acknowledged that Coliban's contributions to offset

measures in the catchment would likely make a positive contribution to this problem.

3(b) Toxicants

EPA was not asking for an assessment of all possible toxicants, but it is reasonable to consider at least metals. In the ERS it is mentioned that metals exceed ANZG on page 130 and 131 (aluminium, copper, zinc), but dismiss this because it also exceeds downstream at Redesdale during non-discharge periods. This is not a compelling reason not to assess metals during discharge periods.

3(c) Drinking Water Supply Catchment Area

1) Proposed new limits are acceptable (rolling median value of 100 E. coli and max of 400) as they correspond to Class B recycled water.

2) Data shown suggested an increase of human markers on some occasions downstream of the discharge. This was not discussed by the consultants involved. The QMRA provided also showed DALYs over 1 uDALY, which means that there are risks for public health. The UV system installed by Coliban Water is not efficient enough to eliminate viruses of concern.

3) Coliban Water had argued that discharge was mostly occurring outside the swimming season. The key word is mostly. Communication of risks to public health should be thorough if discharge is to occur during summer months. Discharge during summer months should only be allowed when river flow is high (i.e. when rainfall has occurred). The minimum flow when flow would be allowed should be determined by Coliban, with the help of an appropriate microbial risk assessor.

4) Coliban Water argued that drinking water supply was not a concern since Lake Eppalock is 50 km away. This needs to be confirmed by a risk assessor based on die-off and dilution of pathogens of concerns. The risk is likely to be very low, but this needs to be appropriately checked and confirmed to the satisfaction of the Department of Health.

3(d) Update the risk assessment to consider the specific risks from eutrophication related to algal blooms and Azolla growth.

Not met.

Risk is assessed in two ways in sections 6 and 7, and both approaches seem flawed or incomplete.

The conclusion in section 6.4 that the eutrophication risk is high, although it is noted that this risk assessment has flaws as it doesn't consider likelihood.

The daily risk tool used in section 7 produces a risk score that is difficult to interpret. It shows a likely reduction in risk from baseline, but other than that its not

possible to put this risk in the context of a standard risk assessment. It is very difficult to assess a risk score of 12,141 or 521, assessment would be improved if they are presented in accordance with a standard risk matrix. It appears there is likely to be a reduction in risk from eutrophication, however it's not possible to determine what the residual risk is.

It is also noted that Coliban present work on offsets, although this isn't a formal offset application.

4. Controls to manage risk

4 (a) Response is inadequate.

The Lang Lang and Longwarry licenses have a condition in them that requires real time monitoring to set the discharge rate so as to maintain the mixing zone below a certain distance.

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The maximum rate of discharge allowed from from DP1 to Adams Creek is to be set so that the mixing zones for total phosphorus and total nitrogen in Adams Creek are less than 4.0 km. The rate of discharge must be calculated using current creek flow rate and the most recent measured effluent total phosphorus and total nitrogen concentrations. The setting of the discharge rate and measurement of effluent total phosphorus and total nitrogen concentrations must be performed weekly during the discharge period.

This is given as an example of an approach to ensuring that water quality stays within acceptable limits at all times rather than just relying on an annual median. EPA would be happy to discuss possible approaches with Coliban Water.

We will specify a mixing zone in the licence based on the information provided.

4(b) No updated communication plan was provided as requested the response suggests that communication with the community is on-going through existing channels.