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### **Submission of Objection**

Dungowan Dam and Pipeline Project SSI - 10046

#### **Introduction**

The Inland Rivers Network (IRN) is a coalition of environment groups and individuals that has been advocating for healthy rivers, wetlands and groundwater in the Murray-Darling Basin since 1991.

IRN objects to this proposal. IRN does not support the construction of new or enlarged dams in the Murray-Darling Basin because of the cumulative loss of water-dependent ecosystems and aquatic species caused by the entrapment of critical stream flows and over-extraction in an already stressed system.

The proposed larger Dungowan Dam (the proposed project) on the Peel River catchment, a tributary of the Namoi River in the Northern Basin, has not been adequately assessed. The Environmental Impact Statement (EIS) fails to assess the full range of alternative options to provide improved water security for the city of Tamworth.

The proposed project will have a significant impact on threatened fish populations listed under the federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and will cause a failure to meet Sustainable Diversion Limits under the federal *Water Act 2007*.

The proposed project will not provide a Benefit Cost Ratio (BCR) of greater than 1 as required by the NSW Treasury Guidelines.<sup>1</sup> The Summary Business Case<sup>2</sup> identifies that the economics of the proposed project are challenging in that there is a low BCR.

The NSW Government has made a political promise to grant \$600 million dollars to the city of Tamworth towards the construction costs of the proposed project. IRN objects to taxpayers of NSW footing the bill for an unnecessary and environmentally destructive project.

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<sup>1</sup>NSW Treasury 2017. *Guide to Cost Benefit Analysis* p19

<sup>2</sup> NSW Department of Planning and Environment 2022. *Dungowan Dam Summary Business Case* p 24

## Key Issues:

### 1. Surface Water Assessment (Appendix F)

This submission focuses on the results and adequacy of the Surface Water Assessment developed as part of the EIS with comments on the following topics:

#### 1.1 Increased urban reserve

The EIS does not clearly explain the background to the proposed larger urban reserve to improve drought security or how the increased volume was arrived at in relation to Tamworth water use.

There appears to be a high level of confusion between various documents in regard to a proposed increased urban reserve in Chaffey Dam. The EIS is based on lifting the urban reserve in Chaffey Dam from 14.3 GL to 30 GL with necessary consultation, negotiation and changes to water sharing plan rules to occur after approval. This is a significant issue that needs to be better explained prior to any decision being made on the proposed project.

The Business Case outlines that an increased urban reserve was not chosen as the best option even though it had the highest benefit cost ratio of all options. The rationale is based on a number of conflicting statements concerning the level of impact on general security water users and agricultural production in the Peel Valley.

A key finding of the Summary Business Case<sup>3</sup> states that *‘an increase in urban reserve in Chaffey Dam has a greater impact on allocation reliability for Peel Valley licence holders because it would reduce the amount of water licence holders can call on from Chaffey Dam when they need it.’*

Another area of the Summary Business Case<sup>4</sup> states that *‘the significantly lower capital cost and limited reduction in agricultural production in the Peel Valley resulted in the highest Benefit Cost Ratio (BCR) of all longlist options.’*

The modelling process outlined in Appendix F Annexure A and the Hunter H<sub>2</sub>O Hydrology Report (Attachment E) is not clear about how the increase in the urban reserve to 30 GL is arrived at. This volume is described as an assumption in the revised model for the proposed project assessment.<sup>5</sup>

The issue of a 30 GL urban reserve in Chaffey Dam combined with the proposed project is not explained in regard to current rules where general security licence holders receive no allocation once Chaffey Dam is at 20% capacity. A 30 GL urban reserve is closer to a 30% capacity and will presumably be triggered in a drought once the proposed new Dungowan Dam is at a level of 3 GL.

There are many issues about the increase in urban reserve proposal that are not clearly articulated in the EIS.

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<sup>3</sup> Ibid p8

<sup>4</sup> Ibid p19

<sup>5</sup> Hunter H<sub>2</sub>O report p ii

The lack of transparency around the assumed 30 GL urban reserve in Chaffey Dam is a key problem with the Surface Water Assessment that needs to be addressed. IRN does not support the proposal to push all considerations of this issue to a post approval process.

## 1.2 Modelling process

IRN has many concerns about the models developed to assess the impacts of the proposed project on the surface and groundwater sources in the Peel River and Dungowan Creek.

While Dungowan Creek is managed as an unregulated water source under water sharing plan rules, the modelling to assess the impacts of the proposed project is based on the Source Model developed for the Regulated Peel River. There is no clear indication how these differing management and assessment processes work together or the implications on the outcomes of the impact assessment.

It is also noted that there is no consistency in the model data used for different parts of the assessment. The water balance was prepared using the Peel Valley Source model with historic climate sequence while the flow regime was modelled using the newer stochastic climate data for rainfall and evaporation.<sup>6</sup>

There is no attempt to model the benefit of water savings and efficiency measures in relation to reduced town water demand from residential, commercial or industrial users. There should have been modelling of reductions in demand for water from dams due to recent and additional waste reduction and efficiency promotion or if there is more swapping to use of rain tanks or captured stormwater or recycled water, notably Tamworth Council's proposal to recycle water for industrial use. The likely results of increasing the price of water to each category of user could also have been modelled.

The assessment of impact on the Long-term Annual Average Extraction Limit (LTAAEL) has a number of modelling inconsistencies. No climate modelling was used to analyse the impact of the proposed project on Namoi water use because it was not completed at the time of the assessment.<sup>7</sup> Only historic data was used to model the LTAAEL and impacts on general security licence holders.

## 1.3 Transmission losses or 'run of river' losses

### 1.3.1 Model assumptions

The Surface Water Assessment fails to report how transmission losses or 'run of river losses' are considered in the models used to assess the impacts of the proposed project. This lack of information does not comply with the Secretary's Environmental Assessment Requirements (SEARs) regarding modelling assumptions, methodologies and inputs.

There is no reference to how these volumes of water are factored into the various climate and increased water demand scenarios or what the base case is. In discussion about the Chaffey pipeline there is reference to 'losses' of between 13 GL to 17 GL per year in the Peel River.<sup>8</sup> This appears to be the only reference to 'losses' in the Surface Water Assessment.

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<sup>6</sup> EMM September 2022 *Dungowan Dam and pipeline EIS* Appendix F: Surface Water Assessment p 170

<sup>7</sup> Ibid p 231/2

<sup>8</sup> Ibid p 85

None of the modelling tables provide figures for transmission losses.

The use of the Peel Valley Source Model as the base case model has limitations in relation to ‘run of river’ losses to the highly connected alluvial groundwater source. Groundwater is not explicitly modelled and losses are only estimates.<sup>9</sup>

Tamworth water supply is the largest licenced demand from Chaffey Dam. It provides the daily ‘run of river’ flows, in addition to the 3 ML/day end-of-system flow requirement. The proposal to provide all Tamworth licence demand from a new Dungowan Dam will reduce the flow rates in the Peel River. This loss of flow has been identified in the EIS.

However, the requirement for additional water releases to supply general security demand to account for transmission losses does not appear to be factored into the assessment process. Even though this argument is being used for restricting use of the Chaffey pipeline to only severe drought conditions, it has not been identified as an issue when providing all Tamworth water demand from Dungowan Dam. There is no transparency around the assessment of transmission losses caused by the proposed project.

### 1.3.2 Dungowan Creek

Modelling includes water extracted from Dungowan Creek and the associated alluvium as transmission losses. Water users downstream from the dam can extract water until there is no flow recorded at the end-of-system gauge (419103). There is no information provided in the EIS about the number of licences, size of licences or annual water extraction from Dungowan Creek, including for basic rights.

Information on the Upper Peel River Tributary Water Sources<sup>10</sup>, of which Dungowan Creek is likely to have the greatest water use, indicates surface water access licences covering 3,638 unit shares. Dungowan Creek is identified as a highly connected system that loses water to groundwater along most of its length.

The Dungowan Alluvium has 43 water access licences with entitlement of 5,268 unit shares and an average use of 621 unit shares (generally megalitres).<sup>11</sup> There is no indication of the volume of extraction from surface or alluvial sources for basic rights.

The level of extraction of transparent/translucent releases from the proposed project that are to provide environmental water, base flows and replacement flows for the capture of Terrible Billy Creek inflows is not clearly indicated. The volume of transmission losses or ‘run of river losses’ that include these extractions is not reported.

*‘Dungowan Creek Unregulated River WALs were not explicitly modelled but included in the model within the ‘run of river losses’ term.’<sup>12</sup>* The ‘run of river losses’ do not appear in the model assumptions.

This is a failure to comply with the SEARs.

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<sup>9</sup> Ibid p 487

<sup>10</sup> *Water Sharing Plan for the Namoi and Peel Unregulated Water Sources 2012* cl 24 (ac)

<sup>11</sup> NSW Office of Water 2010 Background Document Peel Valley Water Sharing Plan

<sup>12</sup> EMM September 2022 *Dungowan Dam and pipeline EIS* Appendix F: Surface Water Assessment Annexure A p 297

## 1.4 Groundwater Assessment

The Groundwater Impact Assessment (Appendix G) includes a table of potential direct effects on groundwater<sup>13</sup>. The only surface water – groundwater interaction from operation of Dungowan Dam is *'Altered baseflow to downstream watercourses due to a change in flow conditions'*: the table fails to list reduction groundwater recharge due to reduction of high flows and flooding.

These will be reduced more than occurs now by trapping high flows from the larger catchment including Terrible Billy Creek and whenever the new dam's water level is lowered by extracting more than is currently extracted. There is no modelling of this effect. The table of indirect effects<sup>14</sup> on groundwater dependent aquatic ecosystems, trees on the banks and floodplain which rely on groundwater during drought, and bore-water users, also omits to list or discuss the impact of this effect. The Assessment also fails to explicitly discuss this despite noting the high dependence of groundwater extraction from the Dungowan and Peel alluvial aquifers on recharge from river flows. It reproduces a set of flow duration curves from the surface water assessment that show effects on depth of water in such a way that effects during the critical short periods of overbank flow are hidden in the last few % of these curves. It fails to consider volumetric changes and reduction of the area covered by water during periods of high flow or flood, despite these being of great importance to aquifer recharge.

The EIS contains numerous conflicting statements on the impact of the proposed project on groundwater recharge, access to groundwater and on groundwater dependent ecosystems (GDEs). The Groundwater Impact Assessment has the following contradictory statements <sup>15</sup>:

*'It is possible that the PRA (Peel River Alluvium) groundwater regime may change due to the reduction in run-of-river transfers and environmental flows and GDEs and groundwater users (ie bores) on the Peel River may be affected.'*

*'Despite these reduction in surface water flows, there would be a negligible impact on the PRA's groundwater regime and subsequently negligible impact for GDEs and groundwater users to access groundwater in the Peel River.'*

*'the project is not expected to affect recharge rates to the DCA (Dungowan Creek Alluvium) (below the new Dungowan Dam) and PRA (below Chaffey Dam), or effect groundwater access to GDEs or other users.'*

*'The project has potential to impact on local and regional groundwater sources and sensitive receivers.'*

The lack of modelling information on groundwater recharge and losses through lower flows plus extraction provides no confidence in the adequacy of the EIS to fully assess groundwater impacts.

The EIS does not comply with the SEARs in failing to report on modelling relating to groundwater systems including alluvial aquifers and recharge rates.

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<sup>13</sup> Appendix G: Groundwater Impact Assessment p54

<sup>14</sup> Ibid p 55

<sup>15</sup> Ibid p 6

## 1.5 Environmental Flows

### 1.5.1 Translucency flows from proposed new Dungowan Dam

The current licence held by Tamworth Regional Council to operate the existing Dungowan Dam requires the transparent release of inflows up to 10 ML/day and translucent release of the same volume once inflows are above 10 ML/d. These releases plus inflows downstream from Terrible Billy Creek provide the water for extraction under unregulated, alluvial and stock & domestic water access licences plus basic rights access.

The proposal to release 13 ML/day from the new dam as transparent/translucent flows to replace lost flows from the increased capture of natural inflow events, including from Terrible Billy Creek, is being considered as environmental flows into Dungowan Creek.

However, as referred to above, under existing rules in the *Water Sharing Plan for the Unregulated Namoi and Peel Water Sources* water users downstream from the dam can extract water until there is no flow recorded at the end-of-system gauge (419103). There is no information provided about the scale of extraction in Dungowan Creek and highly connected alluvium or the timing of this extraction. The competition for water availability increases in dry times. Low flows may be reduced to no flow through extraction for irrigation, or for domestic and stock use (DPIE 2020b). This has significant environmental impacts.

There is also a proposal to bank the additional 3 ML/d inflows between the current 10ML/d and the proposed 13 ML/d translucent releases to provide additional environmental outcomes at a later time. This would keep the base flows from the new dam at 10 ML/d. Again, this consideration does not clearly identify the extraction rates or modelled transmission losses from these base flows.

The capture of natural, seasonal flows from Terrible Billy Creek will have a significant impact on the health of Dungowan Creek. It is not clear that the proposed 13 ML/d translucent releases will provide an adequate replacement for these lost flows. While useful, they cannot compensate for loss of brief but environmentally important high flows, notably during each drought and until the dam refills which can take years: the dam will effectively extend droughts throughout Dungowan Creek. It is also unclear how the proposal to bank the additional 3 ML/d will be managed to provide improved environmental outcomes. This proposal has been left for further consideration after approval.

IRN considers that the impacts of the proposed project on the health of Dungowan Creek will be significant and cannot be mitigated through the environmental watering proposals. The environmental impacts of this are discussed in section 3 below.

### 1.5.2 Environmental Water Allowance (EWA)

The identified 200 ML EWA to be provided from the additional storage in the proposed project is a trade-off between extractive demand and environmental needs.

There is no clear evidence of how this volume of EWA was arrived at, how it will be managed or what the key environmental benefits will be. The proposed project will capture and enable diversion of an additional 16.3 GL of Dungowan Creek natural flows. 200 ML is

1.2% of the proposed increased diversion and will not mitigate this significant additional loss of flow.

The modelling of a pattern for environmental water releases was based on one historic release from Chaffey Dam. The timing and pattern of releases was not optimised to achieve any particular environmental outcome.<sup>16</sup>

IRN rejects the claim that the proposed EWA will mitigate environmental damage caused by the proposed project: it is little more than a token gesture.

### 1.5.3 Impacts on Planned Environmental Water

Modelling has demonstrated that the proposed increase in water capture in a larger Dungowan Dam will cause a net reduction of planned environmental water in the Peel River system.

It is noted that while the proposed new Dungowan Dam is filling daily flows past Carroll (below Peel River confluence with Namoi) could drop by 30 ML and daily flows in Dungowan Creek could have a significant reduction of > 100 ML.<sup>17</sup> This is likely to be the capture of fresh events.<sup>18</sup>

The future dry climate scenario increases the number of ‘no flow’ days in both Dungowan Creek and the Peel River with a larger Dungowan Dam and the end-of-system flows at Carroll Gap will decrease.

The EIS concentrates on establishing an argument that there will be minimal impacts to water flows that provide environmental benefit. However, the capture of an additional 16.3 GL from an over allocated water source will cause a net reduction in planned environmental water in both the Namoi unregulated and regulated water sharing plan regions. This needs to be reported in the Namoi Surface Water Resource Plan being prepared for the Murray-Darling Basin Plan.

### 1.5.4 Impacts on Held Environmental Water

Modelled results for a future climate demonstrate a decrease in availability of held environmental water up to minus 5% with the proposed new Dungowan Dam compared to current arrangements.<sup>19</sup> This demonstrates that the water recovery targets under the Murray-Darling Basin Plan will be compromised through the proposed project.

There is an anomaly in the modelling in that Held Environmental Water is given an annual average reliability of 20% while General Security water access licences have an annual average reliability of 65%.

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<sup>16</sup> Ibid p 294

<sup>17</sup> Ibid p 320/1

<sup>18</sup> Ibid p 379

<sup>19</sup> Ibid Table 5.2 p 382

## 2. Alternative options analysis

The key objectives of the Dungowan Dam and Pipeline project, as assessed in the EIS are:

- **Objective 1:** improve water availability and security for the city of Tamworth and to enable growth, whilst maintaining average annual reliability of allocations for other Peel Valley water users.
- **Objective 2:** provide efficient and affordable bulk water supplies to Tamworth.
- **Objective 3:** promote environmental and social outcomes in Tamworth and the Peel Valley.

The proposed project fails to meet any of these objectives.

Also, the EIS fails to analyse alternative options that could meet or improve on these objectives and therefore does not comply with the SEARs.

EIS Chapter 2 does not provide ‘ *A description of how alternatives to and options within the project were analysed and optimised to inform the selection of the preferred alternative/option. The description must contain sufficient detail to enable an understanding of why the preferred alternative was selected over other options(s) considered for achieving the project strategic objective.*’<sup>20</sup>

The most obvious alternative option with a much higher BCR is the proposed \$100 million industry recycling project developed by Tamworth Regional Council that would save 50% of Tamworth potable water. Although this project would meet all the objectives it has been ignored in the options analysis.

Chapter 2 of the EIS does not outline the options analysis undertaken and refers only to the short list of options in the Summary Business Case.

The snapshot of the options development pathway (Fig 2-1)<sup>21</sup> demonstrates that the *Tamworth Bulk Water Supply Long-term Augmentation Option Review* undertaken by Hunter H2O in 2015 is the most recent analysis of a full range of options. This report included a limited assessment of the option for purified recycled water. The terms of reference for the Hunter H2O report were constrained and do not reflect current best practice. The assessment was preliminary in nature and desktop based and did not involve consultation with any stakeholders or government agencies. The assessment was primarily focused on assessing the order of cost of each option, the technical viability and the potential yield benefit.<sup>22</sup>

An upgrade to Dungowan Dam was one of four viable options identified in the report and was the most expensive option.

Other documents referred to in the EIS snapshot of the options development pathway (Fig 2-1) all focus on a new Dungowan Dam : 2017 GHD Feasibility Study, July 2020 SMEC Dungowan Dam Concept Options Design Report, October 2020 Strategic Business Case.

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<sup>20</sup> Secretary’s Environmental Assessment Requirements

<sup>21</sup> EMM September 2022 *Dungowan Dam and pipeline EIS* Main Report Fig 2-1 p 41

<sup>22</sup> Hunter H2O Tamworth Bulk Water Supply Long-term Augmentation Options Review (Final Report) p1



There has been no genuine analysis or follow up on key alternative options that meet the above project objectives or a suite of options, that combined could achieve improved water security in a more efficient and cost effective manner.

The Summary Business Case argues that other options have been discounted because they are at very early stages of development and that minimal stakeholder engagement has occurred on options other than a new Dungowan Dam and Pipeline. This process exposes the bias towards a project that is not the best economic, social or environmental outcome for providing increased water security for Tamworth Regional Council.

The assessment of the proposed project by other bodies has resulted in strong criticism:

- The Federal Productivity Commission Report on National Water Reform 2021 used the poor decision-making for Dungowan Dam as a case study.<sup>23</sup> Comments highlighted that the analysis focused on long-term water supply, rather than ensuring water security during extreme events.
- The Infrastructure NSW State Infrastructure Strategy 2022 – 2042 strategic directions for enhanced long-term water security recommends increasing water security through demand management, water and wastewater recycling, and rainfall-independent supply.<sup>24</sup>
- Infrastructure Australia Dungowan Dam and Pipeline Business Case Evaluation Summary identifies that *‘non-infrastructure solutions, including demand management and water use efficiency measures, combined with more targeted, small scale supply solutions, such as recycled wastewater for industrial users, could be a more efficient means of addressing the service need. Infrastructure Australia recommends further analysis is undertaken on combinations of infrastructure and non-infrastructure options.’*<sup>25</sup>

In light of these critical reviews and no certainty that the Federal Government is prepared to fund the proposed project as presented in the EIS, it would be prudent for the NSW Government to not approve the project and to fund other ‘shovel ready’ projects such as the \$100 million industry recycling project.

The EIS identifies that the proposed new Dungowan Dam could take up to 10 years to fill during a drought sequence and could take up to 20 years to fill if town water supply was extracted at the same time. This is on top of the predicted construction time of at least 6 years. Cheaper and more efficient alternative options could be providing improved water security to Tamworth in a much shorter timeframe.

It is assumed that all the modelling associated with the proposed project involves a full dam, although this is not clear anywhere within the EIS.

### **3. Environmental Impacts**

IRN is greatly concerned that the environmental impacts from the project will be greater than predicted and that river health will continue to decline in the Peel and Namoi Valleys.

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<sup>23</sup> Australian Government Productivity Commission. May 2021. *National Water Reform 2020 Inquiry Report* Box 14.1 p 190/1

<sup>24</sup> Infrastructure NSW 2022. *Staying Ahead: State Infrastructure Strategy 2022 – 2042* p 19

<sup>25</sup> Infrastructure Australia 2022 *Dungowan Dam and Pipeline Business case Evaluation* p 2

Field investigations recorded the presence of threatened fish and platypus listed as Matters of National Environmental Significance under the EPBC Act.

The loss of access to and loss of critical native fish habitat for populations of threatened Murray Cod, Silver Perch and Eel-tailed Catfish is significant. This impact cannot be offset by building fish passage on downstream structures that should have been identified and implemented under the Northern Basin toolkit measures program or other programs.

The building of a new, higher structure on Dungowan Creek that will capture an additional 16.3 GL of natural flow including inflows from Terrible Billy Creek is a major change to the hydrology of the system and a significant further reduction in fish passage to the Upper Peel tributaries. The EIS identifies a high risk to habitat availability and connectivity.

Dungowan Creek is classified as Type 1 highly sensitive fish habitat. The new dam will remove 210 km<sup>2</sup> of key fish habitat including 192 km<sup>2</sup> of Type 1 habitat and remove connectivity access to 34.2 km of key fish habitat of a 3rd order waterway and above, including loss of access to 26.4 km of type 1 key fish habitat.

Changes to hydrology is likely to impact on access to macrophytes, inundation of large woody debris for breeding sites and other breeding requirements.

This combined loss of access to and loss of critical threatened fish habitat will further reduce the opportunities for threatened species recovery to a more stable population.

The healthy platypus population in the Peel Valley will be impacted through the further isolation of the upstream gene pool caused by the impassable new dam wall. This will threaten the genetic health of the entire population.

The impact on groundwater and groundwater dependent ecosystems has not been adequately assessed because of the dependence of the EIS on poor modelling assumptions.

## **Conclusion**

IRN does not support that the environmental impact assessment of the proposed project is based on adequate information. The bias in the assessment documents has been directed by political influence and not by independent analysis.

The proposed project is not the best options to achieve the stated objectives and must not be approved.

For more information on this submission please contact [inlanddriversnetwork@gmail.com](mailto:inlanddriversnetwork@gmail.com)