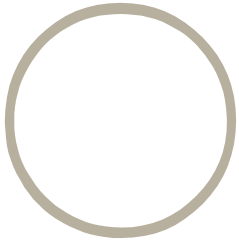




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*Review of economic aspects
of Traveston Crossing Dam
Environmental Impact
Assessment documentation*



Review of Coordinator General's report



Prepared for Department of Environment, Water, Heritage and the Arts



*Centre for International Economics
Canberra & Sydney*

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Canberra

Centre for International Economics
Ian Potter House, Cnr Marcus Clarke Street & Edinburgh Avenue
Canberra ACT 2601

GPO Box 2203
Canberra ACT Australia 2601

Telephone +61 2 6245 7800
Facsimile +61 2 6245 7888
Email cie@TheCIE.com.au
Website www.TheCIE.com.au

Sydney

Centre for International Economics
Suite 2, Level 16, 1 York Street
Sydney NSW 2000

GPO Box 397
Sydney NSW Australia 2001

Telephone +61 2 9250 0800
Facsimile +61 2 9250 0888
Email ciesyd@TheCIE.com.au
Website www.TheCIE.com.au

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Summary of findings

The Department of Environment, Water, Heritage and the Arts (DEWHA) has commissioned TheCIE to review the proposed Traveston Crossing Dam (TCD) in line with Part 9 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

TheCIE's role is to provide independent advice on the robustness of the economic analysis that has been undertaken in relation to the TCD and whether the analysis is sufficient to support the conclusion that the TCD is the best solution to meet the South-East Queensland (SEQ) communities' water needs. It is also intended to inform DEWHA on whether there are alternative measures that could deliver similar economic and social benefits.

TheCIE's review has been undertaken in two stages:

- Phase 1: A review of the economic analysis conducted as part of the Environmental Impact Statement (EIS) documentation provided by Queensland Water Infrastructure Pty Ltd (QWI), the proponent of the TCD.
- Phase 2: A review of the Queensland Coordinator-General's (QCG) report of the EIS documentation. This is not intended to be a detailed review of all aspects of the QCG's report. Rather it is intended to comment (at a high level) on the QCG's economic analysis undertaken as part of the EIS process and the conclusions drawn from the analysis.

TheCIE completed the review of the EIS documentation (Phase 1) and provided a report to DEWHA in October 2009. The QCG has now completed his review and summarised his findings in a document titled *Coordinator-General's Evaluation Report: Traveston Crossing Dam Stage 1*.

This report documents TheCIE's findings in relation to the report undertaken by the QCG. It has been prepared as a stand-alone document, although we have drawn on our findings from Phase 1 of the review.

The context for this review

The proposed TCD is a key feature of the draft South-East Queensland Water Supply Strategy, which aims to provide a secure and sustainable long term water supply to

SEQ. Phase 1 of the TCD is expected to deliver up to 70 000 megalitres (ML) per year for urban water supplies.¹ The Queensland Government has indicated that no decision will be made about pursuing a possible extension to the TCD until around 2035.

On 29 November 2006, the then Federal Minister for the Environment and Heritage decided that the TCD was a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to the likely and potential impacts on matters of national environmental significance. This means that the TCD proposal requires assessment and approval under Part 9 of the EPBC Act before it can proceed.

A key consideration for the Minister in deciding to grant approval for the proposed TCD is whether the economic and social benefits associated with the project are sufficiently large to outweigh any significant environmental impacts. In making this decision the Minister is also required to consider whether there are alternative strategies that could deliver similar economic and social benefits but at a lower cost to the environment.

In October 2007, Queensland Water Infrastructure Pty Ltd (QWI) released the EIS for public submission. Submissions to the EIS closed on 14 January 2008. Following this, a Supplementary EIS was completed which, in part, sought to respond to issues raised in the public submissions. In March 2008, the Queensland Government released its draft SEQ Water Supply Strategy which included Stage 1 of the TCD project to be completed by the end of 2011.

The QCG's report

The QCG's evaluation report for the TCD Stage 1, which represents the final stage of the Queensland Government's review of the TCD, was released in October 2009. The evaluation report has been conducted in accordance with the *State Development and Public Works Organisation Act 1971 (Qld)*.

In undertaking the evaluation the QCG's report (p. 13) states that

I have considered the EIS, issues raised in submissions, the SREIS, the Commonwealth Reviewer Reports, the proponent's response to my information requests and the response to Commonwealth reviewer reports, and the advice I have received on a range of key issues from State agencies and DEWHA. In addition, I received a range of communications outside of the submission period from a number of community groups and individuals, which have been considered in my evaluation.

The Coordinator-General determined that the project can proceed,

¹ This represents approximately 14 per cent of currently annual unrestricted demand.

subject to a set of stringent conditions and requirements to manage potential adverse impacts. These more than 1200 conditions and requirements are outlined in the Coordinator-General's report.²

The QCG's support only refers to Stage 1 of the TCD with some concerns raised regarding Stage 2 of the TCD.

TheCIE's findings in Phase 1

In reviewing the economic analysis undertaken as part of the EIS documentation, TheCIE had raised a number of concerns regarding the robustness of the economic analysis undertaken, which concludes in support of the TCD. TheCIE concluded that there is considerable scope for the economic analysis underlying the EIS documentation to provide a better decision making guide.

Some of the key findings include:

- The economic analysis has been undertaken in a piecemeal way and does not bring together the findings in regards to the indirect economic, social and environmental impacts in a way that enables a systematic comparison of the TCD option against the alternatives. The economic analysis, therefore, does not provide a complete picture that would allow the alternative options to be ranked in a consistent manner that allows a comparison of both the direct and indirect impacts associated with all options.
- The economic analysis is based on a number of assumptions that are contentious and likely to 'bias' the results in favour of the TCD portfolio of options. These include, for example:
 - the objective to require that 88 000 ML of additional water supply be available by 2012 (Objective 1 in the Benefit Cost Analysis (BCA)), which limits the ability to allow for a more staged/flexible augmentation of demand and supply that results in a lower Net Present Value of costs; and
 - the use of a relatively low discount rate to 'convert' costs incurred in the future into 'dollars of today' (present value). This diminishes the cost advantage (in Net Present Value terms) of those portfolios that provide a more staged/flexible augmentation of options and that may defer the construction of large scale infrastructure.
- Some of the key assumptions are not sufficiently transparent. These particularly relate to the operating rules for the desalination plant and the lead time for the construction of the TCD and the alternative portfolios. Changing these assumptions could change the ranking of the portfolios.

² Queensland Department of Infrastructure and Planning, <http://www.dip.qld.gov.au/projects/water/dams/traveston-crossing-dam.html>.

- The treatment of risk and uncertainty in the economic analysis is limited. These are significant issues that need to be considered in detail, particularly given the developing knowledge of the potential impacts of climate change.
- The sensitivity analysis undertaken in the economic analysis is limited and does not consider a range of important variables where a precise single estimate is not available.

Comments on the QCG's report

Overall the QCG's evaluation report relies on the conclusions drawn in the economic analysis undertaken as part of the EIS documentation. It does not fundamentally review the robustness of the economic analysis undertaken in relation to the TCD or alternative measures. To this extent the QCG's report does not alter our conclusions noted above in relation to the economic analysis undertaken as part of the EIS documentation.

As noted above the QCG concludes in support of Stage 1 of the TCD, but also raises some concerns regarding Stage 2 of the TCD. TheCIE has some concerns regarding the QCG's findings. These are documented further below.

The QCG report does not consider whether there are alternative measures that could achieve the same outcomes but at a lesser cost to the community. It relies on the alternatives considered in the original BCA undertaken prior to the EIS. The QCG's comments do, however, cast further doubt on the conclusions drawn from the original BCA. There are additional costs attributed to the TCD that were not included in the BCA and there are questions raised by the QCG regarding the viability of Stage 2 of the TCD. Both these factors are likely to raise the cost of the TCD portfolio and to 'narrow the gap' between the TCD portfolio and the second best portfolio.

Therefore, the QCG's report does not significantly add to the EIS or address TheCIE's concerns regarding the EIS documentation. It therefore, does not fundamentally alter TheCIE's conclusions in relation to the review of the EIS documentation.

Aggregating the economic, social and environmental impacts

The TCD and alternative measures considered are likely to have a diverse range of economic, social and environmental impacts (both positive and negative). The impacts could occur at a local or regional level and may differ over time. Therefore, aggregating these diverse impacts to derive the *net impact* of the alternative portfolios is a complex task.

The QCG's conclusions appear to be based on an aggregation of the social, economic and environmental impacts of the TCD to derive a *net impact*. However, it is not clear whether there has been any robust process that has informed this aggregation process or whether it is only based on the judgement of the QCG.

For example, the QCG' report (p. 180) states that

I have weighed up the benefits of secure water supplies to the community of SEQ, including substantial localised benefits results from the Project construction, against the negative impacts the Project will have for some people.

The QCG's report does not explain further how these benefits and costs were 'weighed up'.

The QCG's report (p. 12) also notes that

Based on the material before me, I have evaluated the potential cumulative impacts of the Project having regard to the potential risks and benefits that the Project will create, the mitigation and offset measures and conditions that I have imposed. I consider that on balance, the potential cumulative impacts of the Project will be positive, *particularly in consideration of the improved environmental and habitat outcomes that will be created.*

The QCG's conclusions therefore appear to be based on the finding that there will be improved environmental and habitat outcomes created from the project. This implies that the net environmental impacts have been a significant reason for the QCG reaching the conclusion to support the TCD.

It is not clear how the QCG has reached this conclusion given that the EIS documentation provides disparate pieces of information and does not appear to draw together the material in a systematic way. This is not likely to be a straightforward process given the diversity of impacts and the timing of when these impacts occur.

The QCG's report notes the social impacts are likely to be negative in the initial periods and gradually turn positive. Using a discounted cashflow framework (as undertaken in the BCA) implies that there is greater weight placed on impacts that occur in earlier periods in the analysis. Depending on the magnitude of the negative and positive impacts and the timing of these impacts, it could result in a net negative impact (in Net Present Value terms).

Before supporting the conclusions of the QCG it is, therefore, important to gain further information on how the QCG has aggregated the economic, social and environmental impacts to make judgements on the net impact of the TCD.

Additional costs imposed by QCG's requirements

The QCG's support of the TCD is subject to a set of stringent conditions and requirements to manage potential adverse impacts of the TCD. While we have not reviewed all of the 1200 conditions imposed, we note that a significant number of these appear to result in costs that are required to be incurred in addition to the construction and operational costs of the TCD.

For example, the QCG has required the following programs to be put in place if the TCD is supported:

- \$20m to implement a community and economic development program
- \$3.5m towards the implementation of a master plan for Kandaga
- \$4m to upgrade the sewerage and water supply infrastructure for Kandaga prior to the completion of dam construction
- \$2.5m towards the relocation of the Kandaga Bowls Club
- Replace community facilities below the flood line with upgraded facilities on higher ground at Kandaga. The cost of this has not been reported.

These additional costs have not been incorporated into the original Benefit Cost Analysis undertaken by Marsden Jacob Associates.³ It is likely that a lot of these additional costs will be required to be undertaken during or prior to the construction of the TCD. Therefore, these additional costs are likely to be reduced in a discounted cashflow analysis, as undertaken in the BCA.

The significance of these additional costs is that they are likely to narrow the gap between the alternatives and potentially change the ranking of the portfolios analysed in the BCA. In the BCA, the cost difference between the TCD and the next best portfolio was \$45 million (without the imposition of Objective 1). With the additional costs imposed by the QCG this cost differential is likely to be substantially less or could change in favour of the next best portfolio.

In our review of the economic analysis undertaken as part of the EIS documentation we have raised concerns regarding the imposition of Objective 1. Given the imposition of the additional costs related to the TCD, as required by the QCG, the conclusion regarding the least cost portfolio is likely to hinge on the validity of Objective 1 in the BCA.⁴

Stage 2 of the TCD

The QCG notes that Stage 2 of the TCD would adversely impact on the measures to mitigate community impacts of Stage 1 of the TCD. To this extent the QCG recommends that the long-term strategy for the SEQ should not rely on Stage 2. This implies that the TCD portfolio presented in the original BCA is not likely to be viable, and alternative measures would need to be considered in the analysis instead of Stage 2 of the TCD.

³ Marsden Jacob Associates (MJA) 2007, *An economic evaluation of the proposed Traveston Crossing Dam in South East Queensland*, Final Report prepared for the Queensland Water Infrastructure, September, Brisbane.

⁴ Although, as we have noted earlier in this report, there are a range of other concerns regarding the economic analysis that could have an impact on the ranking of the portfolios.

The BCA assumes that the TCD portfolio of measures includes both Stage 1 and 2 of the TCD. There are significant financial cost advantages of having the two stages and enhancing Stage 1 of the TCD, compared with building a separate (more costly) piece of infrastructure

To the extent that Stage 2 of the TCD may not be a viable longer term option, as implied by the QCG's evaluation report, this would undermine the conclusions drawn from the BCA. The TCD portfolio is likely to be more costly than that reported in the BCA and may result in the TCD portfolio no longer being the least cost option.

Review of additional measures

The QCG (p. 202) concludes that

The social and economic impacts of the Project in regards to SEQ are strongly beneficial, but I recognise that while there are many positive local economic and social benefits that will result from the Project, the process of change and the resulting uncertainty has caused anxiety and distress to many local residents. However, in view of the need for the Project and the mitigation and offset measures that have been imposed, I consider that overall, the cumulative impacts of the Project are positive and the adverse impacts are acceptable.

The QCG's conclusions are largely based on a review of Stage 1 of the TCD, with limited consideration of any alternative measures that could achieve the same objectives (but with less environmental or social impacts). The QCG does not consider whether there are alternatives that may deliver better outcomes than the TCD. That is, whether an alternative portfolio delivers greater 'positive local economic and social benefits' or has less negative impacts on the community and environment.

The QCG's report (p. 236) does, however, offer some comment on the scope for investing in additional desalination facilities. The report states that

It is highly likely that delivered water costs to the serviced community may, especially in the longer term, be greater for water provided from a portfolio of water supply infrastructure that includes an increased proportion of desalination infrastructure, imposing an increased economic burden on the serviced community

The increased composition of water sourced from desalination in the overall water supply portfolio may change the serviced community's water supply risk profile, with a resulting increased economic burden for additional supply 'risk protection'

Energy requirements for desalination for each delivered unit of water is, at this time, orders of magnitude greater than that provided from a dam, with correspondingly greater levels of production of greenhouse gas emissions

Environmental impacts of any desalination project are specific to the location of a particular plant.

Firstly, the QCG does not consider the additional benefits of desalination facilities such as having a supply that is not reliant on rainfall. This is likely to be important in the context of considerable uncertainty regarding future rainfall patterns.

Secondly, it is not clear that the desalination portfolio may not result in a lower cost to the community than the TCD portfolio. The QCG has also raised concerns regarding Stage 2 of the TCD, meaning that some additional options (that are likely to be more expensive) would be required. Further, uncertain weather patterns may mean that even if the TCD is built, additional measures would be required much sooner than anticipated, in the event of a bad drought. With an additional desalination facility the chance of requiring further investment sooner is much lower.

Thirdly, the difference in the energy costs of the TCD and the desalination plant will depend on the assumptions regarding how often the desalination plant is running. If the desalination plant is operated only as an insurance policy when dam levels are at relatively low levels, then there may be a limited difference in the energy costs of the TCD and additional desalination facilities.

Instead of conducting his own analysis, the QCG relies on the robustness of the initial BCA to draw the conclusions about the alternative portfolios. Therefore, to the extent that underlying economic analysis undertaken as part of the EIS documentation is not sufficiently robust, this would undermine the conclusions drawn by the QCG in favour of the TCD Stage 1.