

7.2 Mount Bold Reservoir Dam Safety Upgrade – Project Update

Report contact

Morgan Ellingham, Manager Assets & Technical Services
Committee
8384 0604

Meeting

Strategic Directions

Approving officer

Kirk Richardson, Director City Operations

Date

1 September 2020

1. Purpose

To provide an update on the Mount Bold Reservoir Dam Safety Upgrade project being delivered by SA Water and to seek endorsement for the Chief Executive Officer to advocate to the state government for the additional flood mitigation works to be delivered by SA Water.

2. Recommendations

That the Strategic Direction Committee:

- 1. Notes the information provided in the report and the Cross Section of Dam for Option Comparison (attachment 1 to the agenda report), the Essential Services Commission of South Australia Final Determination Statement of Reasons Excerpt (attachment 2 to the agenda report), the Letter provided by Local Government Association Mutual Liability Scheme (attachment 3 to the agenda report) and the Mount Bold Dam Safety Project Reference Group Presentation (attachment 4 to the agenda report).**
- 2. Endorses the Chief Executive Officer to write to the Minister for Environment and Water and the Minister for Infrastructure and Transport seeking a meeting to discuss and advocate for the delivery of the superior flood protection option by SA Water for the Mount Bold Reservoir Dam Safety Upgrade project.**

3. Executive summary

SA Water are undertaking a project to upgrade the Mount Bold Reservoir Dam to meet new safety guidelines. Through the scoping phase of the project it has been identified that an option to improve the downstream flood protection could be delivered for approximately \$11.7M on top of the existing budget of \$181M. A technical review of the works with SA Water and the Stormwater Management Authority (SMA) has determined that the extra flood protection would provide significant benefit for the Old Noarlunga community.

The Essential Services Commission of South Australia (ESCOSA) regulates SA Water’s budgets and has determined that the costs for those works should not be passed on to SA Water customers and instead should be funded by the community or the state government.

SA Water have determined that a decision or direction needs to be provided by December 2020 to meet their project delivery targets. Through discussions with the SMA it has become apparent that there are limited realistic funding options available within this timeframe.

We have communicated with the Local Government Association Mutual Liability Scheme (LGAMLS) to clarify the level of liability that sits with council which has been communicated through advice from Wallmans Lawyers.

This report recommends that the chief executive officer and relevant staff meet with the Minister for Environment and Water to discuss and advocate for the delivery of the superior flood protection option (M3-1 – Attachment 1) to be delivered and paid for by SA Water, leveraging the Ministers legislative power under the Public Corporations Act 1993.

4. Background

Community Plan 2030	<p>place: green, inviting, accessible, liveable</p> <p>The extra level of flood protection will enable the community to have a liveable environment and will also ensure the healthy and sustainable river system.</p>
Policy and/or relevant legislation	<p><i>Public Corporations Act 1993</i></p> <p><i>Local Government Act 1999</i></p>
Who did we talk to/who will we be talking to	<p>Several meetings and discussions with the project reference group, which includes representatives from:</p> <ul style="list-style-type: none"> • Friends of Scott Creek Conservation Park Environment Protection Authority (EPA) • Stormwater Management Authority (SMA) • Native Vegetation Council (NVC) • Clarendon Community Association • Old Noarlunga Resident Association • Botanic Gardens of SA • SA Water’s Aboriginal Partnerships Coordinator • SA Water • Department for Environment and Water (DEW) • Adelaide Mount Lofty Ranges Natural Resources Management Board (AMLR NRM) • Trees for Life/Bush for Life • Nature Conservation Society of SA/Threatened Plant Action Group (NCSSA/TPAG)

5. Discussion

SA Water are undertaking an approximately \$181M (not including the extra flood protection for \$11.7M) safety upgrade project on Mount Bold reservoir dam to meet new guidelines released by ANCOLD (Australian National Committee on Large Dams). The project is scoped to mitigate two main risks, the ability for the dam to safely pass floods and secondly to withstand seismic (earthquake) events. Increasing the overall capacity of the dam is not currently within the scope of the safety upgrade project.

Currently, the dam does afford flood protection to the downstream community only when the dam is not at full supply level. SA Water works closely with the Bureau of Meteorology (BoM) to minimise flooding to the downstream community by pre-releasing water in a controlled manner if large rain events are forecasted. This is done by opening the gates to pre-release water to create more space in the dam to absorb additional flood water. This pre-release offers some additional

but limited flood protection downstream. Only once the dam is full are the gates opened to release water at the same rate in which water enters the dam.

A Memorandum of Understanding (MOU) between SA Water, BoM, the South Australian State Emergency Service (SASES) and Department for Environment and Water (DEW) was developed after the 2016 floods. The MOU outlines additional measures for communication and sharing of information to improve management of reservoirs in line with SA Water’s principles for operation of dams.

SA Water have engaged consultants Hydrology and Risk Consulting (HARC) to compile a hydrological model for the Onkaparinga River. As part of their work SA Water in consultation with BoM and the Department for Environment and Water (DEW) asked HARC to calculate what flow volume would cause significant flooding at Old Noarlunga. HARC calculated that the dam currently offers flood protection to the downstream community for up to 1 in 15 year Annual Exceedance Probability (AEP) flood events.

SA Water’s preferred option for this project is called Option M3-2 (Attachment 1). This option will provide up to 1 in 100 year AEP flood protection to the downstream community if the reservoir is not full at the start of a flood event. If the reservoir is full at the start of a flood event Option M3-2 (Attachment 1) will provide a 1 in 18 year AEP flood protection.

HARC also modelled a superior flood protection option called Option M3-1. This option will provide a 1 in 100 year AEP flood protection when a flood event starts even if the reservoir is full.

Option M3-2 has been estimated to cost \$181M as opposed to Option M3-1 which has been estimated to cost \$192.7M. The extra flood protection would therefore constitute an increase of 6% to the overall project budget.

A meeting was held on Thursday, 30 July 2020 between SA Water, the Stormwater Management Authority and City of Onkaparinga staff to review the technical and engineering details of the project. At that meeting it was clarified that should a rain fall event of a similar magnitude as the flood event in 1992 occur (approximately a 1 in 50 year AEP) at the same time as the dam is full, then 1.5 meters of flood water would cover the majority of Old Noarlunga. In that event, if residents are not evacuated or choose not to leave within two hours of the rain event then community safety cannot be guaranteed with significant permanent damage to property and other assets.

HARC completed a flood damage assessment to assess the aggregate cost of flood impacts and the economic benefit of Option M3-1 and Option M3-2. The results can be found in the table below.

Flooding Event	Total Damages for Existing	Total Damages for M3-1	Total Damages for M3-2
1 in 10 year	\$345,400	\$260,600	\$324,200
1 in 20 year	\$1,462,000	\$307,400	\$428,700
1 in 50 year	\$3,847,200	\$408,500	\$840,700
1 in 100 year	\$8,152,500	\$450,800	\$1,260,200
1 in 500 year	\$45,256,700	\$6,394,200	\$11,553,100

The analysis calculated and compared the AAD (Average Annual Damage) for events ranging from 1 in 10 year up to 1 in 500 year flood events. AAD includes the damages (residential, non-residential, agriculture, roads & infrastructure and indirect costs) but does not cater for any of the social, environmental or other non-economic impacts. There is also no analysis that has been undertaken on the affect the flood risk imposes on property values.

The Essential Services Commission of South Australia (ESCOSA) regulate SA Water and they have released their determination for the next four years of SA Water expenditure, with the following specific statement on the project:(attachment 2)

The optimal flood mitigation benefits come at a marginal cost, which SA Water has indicated is in the order of five to ten percent of overall project costs. However, flood mitigation is not a SA Water responsibility, and so would need to be funded separately by the community or the South Australian Government.

SA Water would like a decision on whether to proceed with the extra work by December 2020 to ensure enough time to complete detailed design. The project is currently scheduled to be run over multiple years beginning in 2021.

A meeting on Thursday, 9 July 2020 was held between the Local Government Association Mutual Liability Scheme (LGAMLS) and City of Onkaparinga staff (Assets and Governance teams) with the intent on seeking advice from the scheme on the level of Councils liability should the additional works not be funded. The LGAMLS have subsequently sought advice from Wallmans Lawyers which is available in attachment 3.

The advice states that South Australia does not preclude a finding of negligence based on allocation of resources, but if challenged as to whether council acted properly similar principles might be said to apply at common law. Going through a process of considering relevant factors would also help council say that it has undertaken proper process and its decisions about resource allocation should not be second guessed by a Court.

The South Australia Public Corporations Act 1993 Version: 5.7.2018 does afford the Minister for Environment and Water the legislative ability to control and direct SA Water, specifically Part 2—Ministerial control 6—Control and direction of public corporations (1) A public corporation— (a) is an instrumentality of the Crown and holds its property on behalf of the Crown; and (b) is subject to control and direction by its Minister.

Council and the SMA have investigated options for funding streams and due to the expense involved and the timeframes required have not been successful in finding any realistic options. The SMA have submitted the project to Infrastructure Australia to be included on the infrastructure priority list. The Presiding Member of the SMA has written to the Minister, and that the SMA supports the view that the opportunity to incorporate a greater level of flood protection as part of the current dam upgrade needs to be given serious consideration by the State Government.

6. Financial implication

There are no financial implications of the recommendations in this report.

7. Risk and opportunity management

Risk	
Identify	Mitigation
<p>Employee welfare/public safety: Significant risk to Community of flood damage</p>	<p>Undertake advocacy work with the state government as per the recommendation outlined above.</p>
<p>Reputation/community expectation: Loss of public trust and poor community perception for Council not funding extra level of flood protection</p>	<p>Ensure effective and clear communication with Community. Potential for elected members and/or staff to present to Old Noarlunga Community Residents Association (ONCRA).</p>
<p>Political: Community backlash could create political risk for State Government representatives, putting future relationships at risk Perception that inadequate efforts were made to prevent harm to people or property in the face of known risks Chance of legitimising future cost shifting for all councils</p>	<p>Undertake advocacy work with the state government as per the recommendation outlined above.</p>
<p>Financial/business sustainability</p>	<p>Not applicable for advocacy work.</p>
<p>Environment: Flood damage poses significant risk to flora and fauna of the Onkaparinga River system</p>	<p>Undertake advocacy work with the state government as per the recommendation outlined above.</p>
<p>Compliance/legal: Potential for liability for damages should a future flood event occur</p>	<p>Undertake advocacy work with the state government as per the recommendation outlined above. Seek and confirm legal advice and ensure risk is identified with LGAMLS.</p>
<p>Service delivery</p>	<p>Not applicable for advocacy work.</p>

Opportunity	
Identify	Maximising the opportunity
Creation of superior flood protection infrastructure through SA Water’s successful delivery of the project, protecting homes and people.	Enhance the stormwater capital planning process through Project and Capital Works to support SA Water and the community with the creation, scoping, design, budgeting and construction of effective stormwater projects in Old Noarlunga.

8. Timelines and deadlines

SA Water have communicated that they need direction on the scope of works by December 2020.

9. Next steps

Following endorsement of the recommendations, a letter to the Minister for Environment and Water and the Minister for Infrastructure and Transport seeking a meeting to discuss the proposed scope of works to be sent.

Once this process is complete a subsequent report detailing the outcomes will be presented to Council for consideration.

10. Attachments

Attachment 1 – Cross Section of Dam for Option Comparison (1 page)

Attachment 2 – ESCOSA final determination state,ment for reasons excerpt (1 page)

Attachment 3 - Letter provided by Local Government Association Mutual Liability Scheme (2 pages)

Attachment 4 – Mount Bold Dam Safety Project Reference Group Presentation (7 pages)

- END OF REPORT -

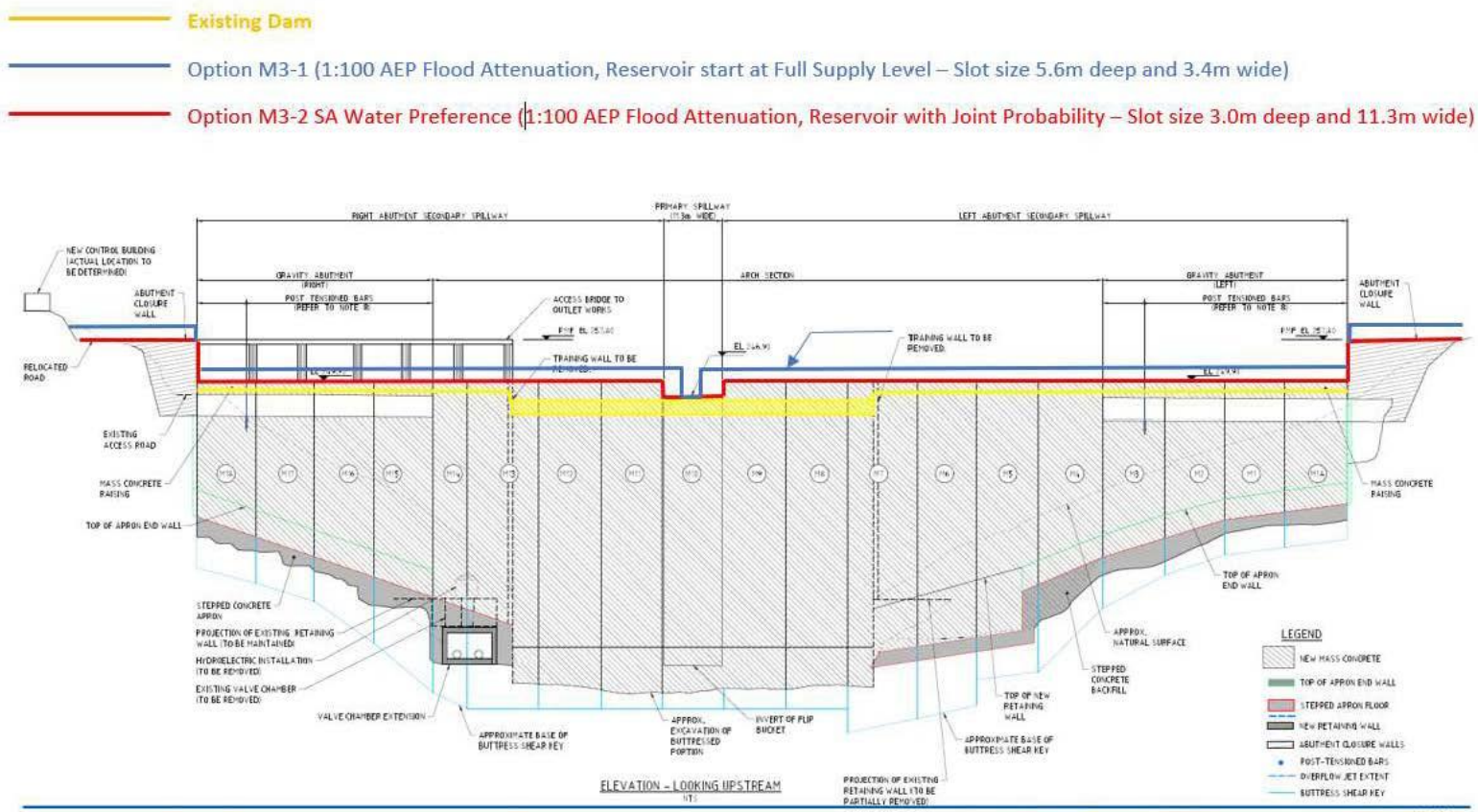


Figure 2: Spillway design showing the difference between Options M3-1 and M3-2

Discussion

The Commission accepts the ANCOLD Guidelines as the basis of best practice for dam safety in Australia. Given the available evidence, the Commission has decided that \$86.9 million as proposed by SA Water is a prudent and efficient amount to be included in SAW RD20 for safety upgrades at the Mount Bold Reservoir.

This final decision is supported by Cardno's assessment of this program, which suggested that the proposed works were prudent, as they were within SA Water's overall obligations to manage its dams in line with the ANCOLD guidelines, and that the forecast costs represent the current best estimate of efficient costs for the project.²¹³

The Commission notes that a secondary benefit of the project is that the upgraded dam can provide flood mitigation for the community downstream in Onkaparinga. That is, in addition to the dam upgrade works reducing the risk of failure, they can also reduce the risk of downstream flooding. SA Water has considered flood mitigation benefits in its options analysis. The optimal flood mitigation benefits come at a marginal cost, which SA Water has indicated is in the order of five to ten percent of overall project costs. However, flood mitigation is not an SA Water responsibility, and so would need to be funded separately by the community or the South Australian Government.

Given this project will be completed over two regulatory periods, the Commission will require SA Water to provide further documentation about the outputs expected by the end of SAW RD20. Further, SA Water will need to keep sufficient financial records to be able to demonstrate that the marginal costs of any possible flood mitigation works that proceed as part of the project are funded by third parties (such as the community or the South Australian Government) and are not charged to water customers. This will be captured within the monitoring and reporting framework, discussed in Chapter 10.

6.9.3 Eyre Peninsula Desalination Plant

The final decision is that \$86.1 million is a prudent and efficient amount of capital expenditure to be included in SAW RD20 for completion of the Eyre Peninsula desalination project. This is the same amount as proposed by SA Water. The project commenced in 2018-19, with expenditure up to June 2020 forecast at \$5.1 million, leading to total project cost of \$91.2 million.

The completed plant will have a capacity of 4 GL per annum, with the marine and transfer pipeline infrastructure sized for an ultimate capacity of 8 GL, to allow for future demand growth. The plant will relieve pressure on the existing groundwater source (Uley South Basin), which is currently operating at above the long-term sustainable extraction level.

SA Water proposed to construct a desalination plant at Sleaford Bay on the Eyre Peninsula, to relieve pressure on the existing groundwater source (Uley South Basin), which is currently operating at above the long-term sustainable extraction level. The completed plant would have a capacity of 4 GL per annum, with the marine and transfer pipeline infrastructure sized for an ultimate capacity of 8 GL, to allow for future demand growth. Construction costs were estimated at \$91.2 million, with expenditure up to June 2020 forecast at \$13.1 million, and the remaining \$78.1 million included in the SAW RD20 proposal, with proposed commissioning of the plant to occur ahead of the 2021-22 summer.

²¹³ Cardno, pp. 82-83, C21-C24.

Daniel

I didn't read every page in detail, but enough to conform what is set out in the email below from Morgan Ellingham.

SA Water will do an upgrade costing about \$181.8 million. It could do a more extensive upgrade that will mitigate flooding potential, but at an extra cost of about \$7.7 million.

SA Water cannot pass on the cost of the extra work to its consumers as it is not allowed to do so by ESCOSA. So it has asked Council if it will fund the extra works, as flood mitigation is a responsibility of LG.

Council is concerned about whether it is exposed to claims if it decides not to be involved – could it be said to be negligent for not buying in the project?

The answer is not a black and white one, although I think the principles are relatively clear.

Council has to make a decision taking into account

- Level of risk to its community
- Likelihood of risk occurring
- Extent of \$ damages, as well as potential for loss of life (will be in the millions in terms of property damage if lots of houses will be submerged))
- What it might cost
- Any other options
- And very importantly all competing claims on its budget resources

And make an informed decision.

Council should also consider whether this sort of decision is something that should go to public consultation, under any relevant policy. My gut feeling is that it wouldn't be, but that should be checked.

We don't have the same sort of statutory considerations that are in place in some other States such as NSW see extracts from their Civil Liability Act, which preclude a finding of negligence based on allocation of resources

42 Principles concerning resources, responsibilities etc of public or other authorities

The following principles apply in determining whether a [public or other authority](#) has a duty of care or has breached a duty of care in proceedings for civil liability to which this Part applies--

- (a) the [functions](#) required to be [exercised](#) by the authority are limited by the financial and other resources that are reasonably available to the authority for the purpose of exercising those [functions](#),
- (b) the general allocation of those resources by the authority is not open to challenge,
- (c) the [functions](#) required to be [exercised](#) by the authority are to be determined by reference to the broad range of its activities (and not merely by reference to the matter to which the proceedings relate),
- (d) the authority may rely on evidence of its compliance with the general procedures and applicable standards for the [exercise](#) of its [functions](#) as evidence of the proper [exercise](#) of its [functions](#) in the matter to which the proceedings relate.

But if challenged as to whether Council acted properly principles like that might be said to apply at common law. Going through a process of considering relevant factors would also help Council say that it has undertaken proper process, and its decisions about resource allocation should not be second guessed by a Court later on.

If the ask was \$80,000, it might be an easy decision – it would be hard to say no to mitigate damage in the millions.

If it was \$800,000 a harder decision

But an \$ 8 million contribution is another level completely. I expect that would cause Council to shelve a whole lot of other capital projects, maybe for years.

If you need more , let me know.

regards



Chris Wellington
Special Counsel
Wallmans Lawyers

Mount Bold Dam Safety Upgrade

Reference Group Meeting 1

Thursday 28 May 2020



Government of
South Australia



Mount Bold Reservoir

- Situated in southern Mount Lofty Ranges approx. 25 kms south-east of Adelaide near Clarendon, is SA 's largest reservoir
- It has approx. capacity of 46,000 mega litres - enough to fill Adelaide Oval more than 93 times!
- It was constructed between 1932 and 1938, and upgraded in 1962 with the dam wall raised 16 metres to provide further storage capacity of additional 16,000 mega litres
- Mount Bold dam was designed and built as a water supply dam purposed to maximise storage levels, as a critical source of water supply for metropolitan Adelaide



Project overview

- Upgrades will be made to Mount Bold to meet the Australian National Committee on Large Dam's (ANCOLD) guidelines to better withstand flood and earthquake events
- Much planning has been undertaken to date including design investigation, environment surveys and condition assessment to inform further work ahead
- While SA Water does not hold responsibility for flood mitigation in our regulated business, there is opportunity to include a design option with increased downstream flood mitigation as part of project works
- Currently, design options include considerations with respect to:
 - strengthening the dam
 - spillway management
 - improving the level of flood mitigation downstream
 - maintaining existing storage capacity

Environment and heritage

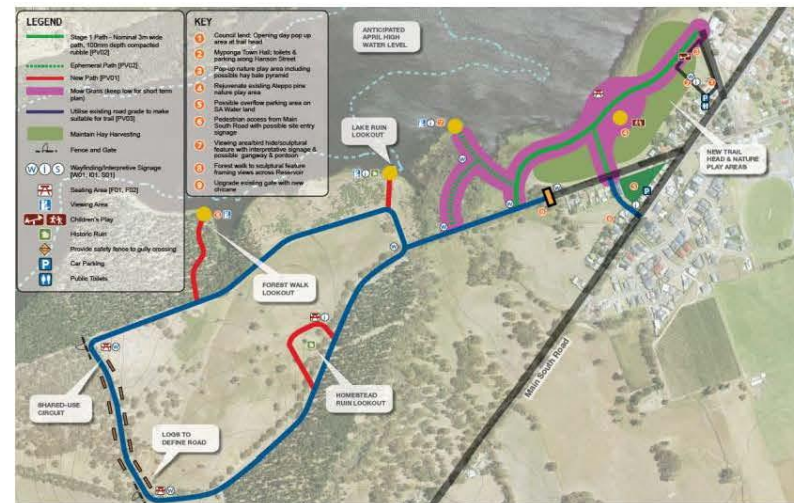
- The reservoir is surrounded by more than 5,500 ha of land and much native vegetation that has conservation significance and biodiversity value
- Preliminary environment and heritage assessments including flora and fauna studies, have been undertaken to understand potential impacts associated with the dam safety project
- Assessments will help inform strategies to minimise environmental and construction impacts and vegetation offsets required



Vegetation showing *Eucalyptus leucoxylo* ± *Eucalyptus* spp. woodland over an open shrub and grassy/herbaceous understorey

Community engagement

- We are working with other government agencies including Stormwater Management Authority, Department for Environment and Water, City of Onkaparinga and Natural Resources Management
- Long term recreational facilities for Mount Bold will be incorporated in our planning as well as opportunities to maintain access during construction
- We will continue engagement with the community to communicate project information and to address interest areas through stakeholder meetings, mailouts and information sessions, online materials and the Reference Group



Example of recreational access masterplan – Myponga

Approvals

- Once the preferred design is chosen, we will continue with detailed design and project planning work
- The project needs to follow a number of approval pathways and consideration to legislation such as:
 - ESCOSA, Cabinet and Public Works Committee
 - Planning and Infrastructure Act, SCAP
 - Native Vegetation Act, EPBC Act
 - Aboriginal Heritage Act, Native Title Act
 - EPA Act, Natural Resources Management Act
 - National Parks and Wildlife Act, Fisheries Management Act
- Depending on necessary approvals, we expect construction to begin around 2022/2023 and take approximately three and a half years
- ABC News SA: <https://www.msn.com/en-au/video/sport/south-australias-largest-reservoir-emptied/vp-BB14tUho>

Project questions.

