

Seqwater Portfolio Upgrade Project Plan Reports – September 2023

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Name	Title
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Approved for issue			
Date	Name	Position	Signature
28/09/2023	Neil Brennan	Chief Executive Officer	See declaration page 25

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Executive Summary

The Queensland Bulk Water Supply Authority trading as Seqwater, owns 25 referable dams.

In 2021, the Acceptable Flood Capacity Guideline was reissued as the Guidelines on Safety Assessments for Referable Dams (**SARD Guideline**). In 2022, revised Dam Safety Conditions were issued for each of Seqwater's referable dams.

The revised Dam Safety Condition 5 states: *"If a safety assessment using the Guidelines on Safety Assessments for Referable Dams 2021 results in an assessment that an upgrade is required to address an intolerable risk, an upgrade project plan in accordance with those Guidelines must be provided to the chief executive."* The report must be provided by 1 October each year.

This report has been prepared by the Principal Dam Safety, Strategy and Flood Operations to fulfil this compliance requirement. The Safety Assessments which trigger the need for an 'Upgrade' Project Plan report under Dam Safety Condition 5 are documented separately in a report titled "Portfolio Dam Safety Assessments – September 2023 report (D23/194607)". This report has been updated from the first issue in 2022.

Based on the available risk assessments for Seqwater's referable dams, Seqwater has identified that it has:

- Four referable dams which require an upgrade. This is because the dam failure risk for these four dams is above the limit of tolerability for societal risk. These dams are:
 - s.73 Irrelevant information
 -
 - Somerset Dam ID#0354
 - Wivenhoe Dam ID#0377.

Upgrade Project Plans for these dams are set out in Section 3 of this report.

s.73 Irrelevant information

The dam upgrade timeframes and schedules presented in this report are based on Seqwater's currently planned upgrade schedule. These timeframes may change in future reports as each project progresses through development and implementation. Timing adjustments are likely to be required to:

- mitigate emerging risks arising from further detailed assessments;
- account for consideration of impacts of potential concurrent dam upgrades; or
- account for delays beyond Seqwater's control (e.g. in obtaining the necessary planning approvals to undertake a project).

Except where indicated, terms in this report have the same meaning as used in the SARD Guideline.

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1 Introduction and Purpose

1.1 Background

The Queensland Bulk Water Supply Authority trading as Seqwater, owns 25 referable dams.

In 2022, Dam Safety Conditions across Seqwater's portfolio were revised to reflect the requirements of the Safety Assessments for Referable Dam (SARD) Guideline. The revised Dam Safety Condition 5 requires:

- *If a safety assessment using the Guidelines on Safety Assessments for Referable Dams 2021 results in an assessment that an upgrade is required to address an intolerable risk, an upgrade project plan in accordance with those Guidelines must be provided to the chief executive.*

The Upgrade Project Plan must be provided by 1 October each year.

Seqwater has assumed that the most recent quantified dam failure risk assessments prepared for each of Seqwater's referable dams are an appropriate basis to determine whether an upgrade project plan is required under Dam Safety Condition 5.

A separate report has been prepared for Seqwater's portfolio of referable dams to document the current status of Safety Assessments (Document D23/194607, September 2023). This separate report, updated from the 2022 version, identifies:

- Referable dams that require an upgrade because the estimated dam failure risk is above the limit of tolerability for societal risk; and
- Referable dams which:
 - The most recent risk assessment determined were below the limit of tolerability for societal risk;
 - Have not yet been assessed to determine whether the estimated dam failure risks are ALARP.

None of these dams have estimated individual risk exceeding 1×10^{-4} (life loss chance per year). Most dams have estimated individual risk below 10^{-5} . The SARD guideline does not prescribe a limit of tolerability for individual risk. The tolerability of individual risks will be assessed as part of a program of ALARP assessments.

1.2 Purpose

The purpose of this report is to satisfy Dam Safety Condition 5. The Upgrade Project Plan Reports are documented to align to the SARD Guideline. This report presents Upgrade Project Plan reports for Seqwater's referable dams that have not been assessed to determine whether the risks are in fact ALARP.

1.3 Structure of this report

This report is structured as follows:

- Section 2 presents important context and status limitations for all details presented in the Upgrade Project Plans;
- Section 3 presents Upgrade Project Plans to fulfil requirements of Dam Safety Condition 5 for four referable dams;
- Section 4 has the declaration made by a duly authorised officer of Seqwater that is cognisant of its obligations as referable dam owner.

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2 Important Context and Status Limitations

2.1 Status of Safety Assessments

2.1.1 General

Seqwater used its most recent quantified dam failure risk assessments to identify whether an upgrade is required to address an intolerable risk. As provided in 2022 the Seqwater Portfolio Dam Safety Assessment – September 2022 (D22/298247) includes the risk position from fully documented and reviewed risk assessments, and tentative risk positions for risk assessments that remain in progress at the time of preparation of this report.

The existing risk assessments:

- were prepared prior to 2023;
- were prepared, or overseen, by an RPEQ; and
- in most cases did not include the certification specified in the Queensland Dam Safety Management Guidelines (referred to in section 3.8 of the SARD Guideline), which post-dated the assessments.

There are no dams where the risk is clearly tolerable. This is because definitive ALARP assessments are not yet available. At present, the Stage 3 Portfolio Risk Assessment Project is in progress (3 work packages). Once completed, the risk assessment results will be updated and the information will be presented within the Portfolio Dam Safety Assessments report when studies are finalised and available.

2.1.2 Dams requiring upgrade to address an intolerable risk

Four referable dams require an upgrade to address an intolerable risk:

- s.73 Irrelevant information
- s.73 Irrelevant information
- Somerset Dam ID#0354
- Wivenhoe Dam ID#0377

These dams have an estimated dam failure risk which is above the societal risk limit of tolerability in accordance with the SARD Guideline. Upgrade Project Plan reports for these referable dams are presented in Section 3.

2.1.3 Dams currently below the societal risk limit of tolerability where the ALARP assessment is to be completed

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2.2 Dam Improvement Program

As the dam owner and the operator, Seqwater is responsible for the safety of its dams and compliance with dam safety regulations. To meet the Water Supply (Safety and Reliability) Act 2008 and the SARD Guideline requirements, Seqwater identified that additional resources were needed to undertake the complex and lengthy investigations, design and delivery for the upgrade projects cited in section 2.12. The Dam Improvement Program has been established as a key priority within Seqwater's Corporate Strategy 2022-24 to plan and implement dam upgrade projects by 2035. The governance structure within the Dam Improvement Program has been established to streamline project progress and ensure continual engagement with key government agencies throughout the life cycle of each of the dam upgrade projects.

2.3 Portfolio risk reduction approach – Important information on potential future variances in timeframes

The Upgrade Project Plans in this report currently envisage completion of all upgrades currently assessed as being required by 2035. Seqwater is adopting a portfolio risk reduction approach. The schedule for the referable dam upgrades will consider multiple factors including priority according to life safety risk reductions and mitigating risk of concurrent upgrade projects that may be necessary to achieve the 2035 target date.

Section 5.3.1 and Table 9 in the SARD Guideline (2021) describes a list of factors for a reasonable timeframe for a dam safety upgrade project. The timeframes and scheduling for Seqwater's referable dam upgrades are complex and include:

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Need for robust upgrade option selection. Somerset, Wivenhoe s.73 Irrelevant info Dams all have:

- very high consequences of dam failure;
- very significant benefits for water supply (all three are gated dams) and flood mitigation (for Wivenhoe and Somerset Dam); and
- anticipated very high capital upgrade costs.

The upgrades for Wivenhoe Dam s.73 Irrelevant information have significant engineering challenges. The options analysis required is significantly more complex than typical dam upgrade projects to identify:

- The best overall value upgrade option (across CAPEX, OPEX, lifecycle costs, benefits, and flexibility for future dam operations).
- An option that meets multiple stakeholder interests for benefits provided by the dam.
- An option that maintains flexibility for future variation in dam operations to meet community expectations for benefits and risks. This includes climate change and changing economic context (key themes in ICOLD Bulletin 171).
- An option that is confidently feasible for safe construction and has low risks for the completed permanent works. This includes the adequacy of field investigations for costing and feasibility.
- An option that is ALARP for dam safety risks and will have longevity for ALARP in the context of continuing population growth.
- An option that has adequately identified and costed social and environmental impacts and mitigations for assurance in the options evaluation and implementation timeframes for subsequent phases.

This range of factors requires adequate time be planned for a robust options evaluation phase. It is important that the expected timeframes for upgrade option selection can be adapted to emerging issues that inevitably arise on complex gated dam upgrade projects.

Water supply considerations for scheduling. Seqwater's statutory functions include maintaining secure and safe water supply to over 3 million people in Southeast Queensland. The timeframe for individual dam upgrades for dams that are a significant part of Southeast Queensland's water supply cannot be fully determined until:

- The final option is selected; and
- Further work on detailed construction sequencing to maintain water supply operations during construction for each dam upgrade is completed.

The need to maintain water supply is another important consideration for sequencing of multiple Seqwater major dam upgrade projects.

Forward planning can consider the requirement to maintain water supply during construction of the dam upgrades. However, it is important that scheduling and timeframe expectations can be adapted to the prevailing capacity and demand of the entire SEQ water grid and climate conditions in the period approaching and during construction.

Flood operations considerations for scheduling. Somerset Dam, Wivenhoe Dam, and s.73 Irrelevant inform will require very careful consideration of the construction sequencing to maintain readiness and capability for flood operations throughout construction. This includes adopting appropriate lowest reasonably practical risk for dam safety during construction and integrating consideration of procurement and works sequencing to replace gates and associated mechanical equipment.

Planning for flood operations capability and risks during construction will need to be considered as part of options selection. However, it is the further detailed works sequencing studies beyond options selection / business case phase that ultimately determines the construction scheduling and timeframe. It is important that the expectations of the scheduling and timeframe can be adapted to provide for reasonable dam safety management integrated

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with requirements for flood operations in the construction period. This can inevitably only be resolved fully at detailed design and construction planning.

Projects are progressively committed and approved. The upgrade project timeframes and schedules presented in this report are not committed and approved for the entire durations presented for each dam. A formal gateway approval structure is used throughout Seqwater for capital projects. This is overseen by program management offices that employ structures and methodologies aligned with the Government's Project Assurance Framework (PAF) and Business Case Development Framework (BCDF). Each gateway secures the approval for the investment in the next phase of project development and implementation, including finalising and securing the delivery model. The environmental approvals pathways and timeframes are also likely to vary from initial expectations as more maturity in project definition and associated environmental and social impacts and mitigation options emerges during the project planning.

The project stages defined in the Upgrade Project Reports in Section 3 align to Seqwater's requirements to implement the State Government Project Assessment Framework and Business Case Development Framework, and other requirements of Seqwater's internal governance arrangements for investment in capital works. It is noted that the SARD Guideline Table 10 has different definition of project stages which do not fully align to Seqwater's requirements.

Impacts of climate change on extreme floods. While engineering flood hydrology guidelines have recently developed guidance for impact of climate change on common floods, there has been no meaningful guidance for impact of climate change on extreme floods. In 2020, Seqwater and eight other dam owners executed agreements to fund research for impacts of climate change on extreme floods. This research is underway with outcomes expected in or around mid-November this year. If the outcomes of the in-progress research on extreme floods are deemed sufficiently robust to put into practice, this will require further consideration of the options assessment and ALARP determination for Wivenhoe Dam, s.73 Irrelevant Inform, and Somerset Dam (i.e. dams which are substantively below flood capacity requirements). This may require revision of the preferred upgrade option and/or considering the potential to stage the dam upgrade requirements to achieve flood capacity that can be deemed to be ALARP for dam failure risks.

The above additional factors require caution to be applied to appropriately manage expectations in future versions of the annual Upgrade Project Plan reports. The matters affecting timeframes and schedules are extensively more complex than the factors outlined in the SARD Guideline.

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3 Upgrade Project Plans – risk above limit of tolerability

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3.3 Somerset Dam ID#0354

Upgrade Project Plan for Somerset Dam

General	ID	#0354
	Lot and Plan	Lot 35 on Plan CG2149
	Date of construction and upgrades:	Constructed: 1953 Upgrades: 2016 flood defence wall to raise dam crest level. Further details of the dam are included in the Dam Safety Conditions.
Version history	2023 report is second issue	
Reason for upgrade	Insufficient flood capacity, stability limitations of the existing dam, and insufficient spillway dissipator capacity and training walls. Verification of the above failure modes to be addressed is subject to the ALARP assessment.	
Background	<p>Key background items:</p> <ul style="list-style-type: none">• 2013: PRA – estimated risk was assessed below limit of tolerability• 2014: Dam Safety Review – revision of estimated risk for dam overtopping erosion estimated risk above limit of tolerability.• 2015: Investigations for geology review• 2016: Design and construction of flood defence wall to raise dam crest level• 2016-2018: Geotechnical investigations and concepts options for upgrade• 2018-2019: Preliminary Business Case• 2020-2021: Investigations to explore potential increased benefits (Increased Benefits Assessment)• 2022: Reference Design development, risk assessment update, and Detailed Business Case.• 2023: Continued development of Detailed Business Case and Reference Design (for Option sch4).• 2023: Seqwater endorsement to undertake planning geotechnical investigations. This may also include the installation of additional Dam Safety instrumentation to assist with a better understanding of the existing dam safety risk.• 2023: Seqwater endorsement to undertake further investigation as design activities to decouple the Outlet Works Upgrade from the main SDIP project.	
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Works required	<p>Increase flood capacity, improve dam stability and improve reliability of gate operations with:</p> <ul style="list-style-type: none"> • Raising of dam crest level, new bridge deck, demolish and build new piers, new gantry crane • Downstream Buttress of dam including spillway • Substantive dissipator basin work for increased flood capacity including a downstream control structure • New foundation drainage • New Saddle Dam • New sluice gates and regulator valves <p>Verification of above works required is subject to ALARP assessment in the detailed design phase.</p>
Notable matters for timeframe	<p>Revision of construction sequencing to manage dam safety risk during construction and ensure capability for flood operations throughout construction.</p> <p>Future investigations e.g. consideration of climate change, geotechnical, hazardous materials, do not yield information that differs significantly from current assumed conditions.</p> <p>All required approvals are gained within required timeframes e.g. to enable broad scale geotechnical investigations to inform detailed design.</p> <p>Selection of programme delivery strategy.</p> <p>Currently proceeding with a single upgrade option sch4p4 Should consideration of other options be requested by the Queensland Government (decision currently pending), this will impact the project timeframes estimated below.</p>
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Timeframe

The following project milestones align to the Project Assessment Framework and Business Case Development Framework under which this Somerset Dam Project is being delivered.

Activity	Planned Date	Notes / justification for timeframe
Options Analysis (Gate 1)	September 2019	Completed
Detailed Business Case (for Option sch4p (Gate 2)	December 2023	In progress. Gate 2 Board approval, May 2024. Issue for Government consideration in June 2024.
Commence geotechnical investigations to inform detailed design	Mid - Late 2024	Planning activities have commenced
Outlet works upgrade planning	Planned commencement September 2024	Dependent on availability of resources with technical capability and capacity.
Investment Approval and Procurement Planning of Detailed Designer	Late 2023 – Mid 2024	Market sounding in progress, noting investment activity will occur prior to full project approval to maintain schedule.
Commencement of Detailed Design	Late 2024	Dependant of Dam Improvement Program delivery strategy.
Readiness for Service (Gate 4)	Significant effort is currently being undertaken (in the context of the regulatory target timeframe of 2035) to plan the overall project delivery schedule. There are notable issues to be resolved before a target completion date can be confirmed. See note below.	Alternate construction sequence from the reference design is being progressed with the view of achieving interim dam safety risk reduction where practical – such as decoupling and advancing outlet works renewal from overall project, interim drainage curtain to be included as part of geotechnical investigations, removal of radial gates, etc.

Note – The project schedule will continue to be refined as part of finalising the Detailed Business Case and beyond. The schedule includes factors such as consideration of approvals, construction sequencing, further geotechnical investigations, upgrade options development, market conditions, programme delivery

	<p>model etc. There remains uncertainty, dates are estimated only and will continue to change.</p>
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Interim risk management	<p>Flood Mitigation Manuals were revised in 2016 for interim risk reduction. The Wivenhoe and Somerset Dams Flood Mitigation Manual have been revised based on recommendations from 2022 flood event reports, and the Minister's approval is expected to be completed by late 2023.</p> <p>Full Supply Level (for Somerset and Wivenhoe) lowered in 2016 to preserve flood mitigation benefits arising from modified Flood Mitigation Manuals (to continue until dam upgrade reduces risk).</p> <p>Construction of flood defence wall to raise dam crest level to 108.7m in 2016.</p> <p>Continued routine dam safety management program activities.</p>
Progress Reporting	<p>Key current project activities:</p> <ul style="list-style-type: none"> Detailed Business Case development is in progress (for Option sch4p) <ul style="list-style-type: none"> Preparation of Reference Design (for Option sch4p) Cost estimating, scheduling and risk assessments Delivery strategy assessment Review of potential fish passage requirements Heritage and environmental assessments and approvals Land tenure and approvals for saddle dam Social impact evaluation Economic, financial and commercial assessments Associated project reviews and assurance activities Planning for decoupling Outlet Works Upgrade Project from SDIP Planning for geotechnical investigation activities Planning for Dam Safety instrumentation and data collection activities Planning for Stability Analysis for safe water level determination. <p>Key project activities and priorities over the next 12 months:</p> <ul style="list-style-type: none"> Cost estimating, scheduling and risk assessments for the Reference Design (Option sch4p) Detailed Business Case finalisation for SDIP (for option sch4p) Dam safety instruments installation and data collection Commence geotechnical investigations Continue concrete mix design activities Commence revision of hydrology which includes climate change considerations Progressing SDIP approvals - Construction or Raising Water Barrier Works, EPBC Act (Federal requirements), Native Title and tenure, Aboriginal Cultural Heritage Duty of Care and Management, Somerset-Wivenhoe Dams Nature Refuge Agreement, Road boundary Realignment, and other environmental approvals Progress cultural heritage, social impact and community consultation Negotiations regarding Inverstanley and the Saddle Dam Detailed Business Case development and design for the outlet works upgrade Engagement of Engineering Consultant for Detailed Design

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3.4 Wivenhoe Dam ID#0377

Upgrade Project Plan for Wivenhoe Dam

General	ID	#0377
	Lot and Plan	Lot 242 on Plan SP161911
	Date of construction and upgrades:	Constructed: 1984 Upgrades: 2005 Further details of the dam are included in the Dam Safety Conditions.
Version history	2023 report is second issue	
Reason for upgrade	Insufficient flood capacity, potential need to increase stability of spillway (subject to review), and vulnerability of Saddle Dam 2 to piping failure. Verification of the above failure modes to be addressed is subject to the ALARP assessment.	
Background	<p>Key background items:</p> <p><u>Before formation of Seqwater:</u></p> <ul style="list-style-type: none"> 1985: Extreme flood estimates were revised after construction – identified to have deficient flood capacity. 2003-2005: Auxiliary spillway upgrade (fuse plugs) and dam crest raised to 80 mAHD to partially increase flood capacity with further future stage additional spillway capacity envisaged necessary. The stage of the upgrade was assessed to have estimated risk below limit of tolerability for societal risk. <p><u>After formation of Seqwater (in 2008):</u></p> <ul style="list-style-type: none"> 2012-2013: Revision of hydrology following recalibration with 2011 flood data. 2013: PRA estimated risk marginally above societal risk limit of tolerability. 2014: Wivenhoe Somerset Dam Optimisation Study. 2014-2015: Preliminary upgrade options study only with fuse plug spillway options, and concepts considered for dam crest raising and potential to increase flood mitigation. 2016-2019: Prefeasibility studies to increase flood capacity combined with assessment to understand dam limitations for dam raising identified numerous options and range of engineering issues to be addressed for feasibility. 2017-2019: Detailed study to reassess probability of extreme rainfall. 2020-2021: Revision of design flood hydrology. 2021-2022: Seismic hazard study, and series of investigations for detailed update of risk assessment including detailed dam failure consequences. 2022: Revision of existing dam estimated risk (work in progress) together with scoping and planning for Strategic Assessment (Gate 0) 2023: Finalise Strategic Assessment, continued risk assessment, flood mitigation discussion paper, and pier shear analysis are in progress 2023: Procurement for Geotechnical investigations 	

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Works required	<p>Foundation cut-off / piping failure mode protection for Saddle Dam 2 (subject to review and preferred option(s) selection).</p> <p>Auxiliary spillway to increase flood capacity to be determined in combination with dam crest raise or no raise plus modifications to main spillway (subject to review and preferred option(s) selection).</p> <p>There is significant uncertainty given the early stages and complexity of the project and verification of above works required is subject to ALARP assessment in the Detailed Business Case.</p>
Notable matters for timeframe	<p>Robust option selection study is required with consideration of:</p> <ul style="list-style-type: none"> • Engineering feasibility limitations to raise the dam crest level • Significant realignment of Brisbane Valley Highway • Cost and scale of works for auxiliary spillway to increase flood capacity • Critical downstream flood safety issues if flood capacity is increased without raising of dam crest level • Assessing best value proposition for future water supply full supply level • Large number of potential options requires careful ALARP assessment (ALARP requires consideration of all reasonable options to reduce risk) • Directive from Government in 2015 to consider potential to increase flood mitigation • Opportunity and risks for staged construction • Delivery model and approach • Environmental approvals pathway • Construction sequencing for dam safety risk and maintaining flood operation capability / flood mitigation benefits during construction combined with Somerset Dam Improvement Project construction considerations • Significant public interest in high profile dam major upgrade • Prevailing market with respect to construction, competing with a significant volume of works, particularly associated with the 2032 Brisbane Olympics, which will be a focused priority for the State Government.
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Timeframe	The following project milestones align to the Project Assessment Framework and Business Case Development Framework under which this Wivenhoe Dam Project is being delivered.		
	Activity	Planned Date	Notes
	Strategic Assessment (Gate 0)	May 2023	Commenced
	Options analysis (Gate 1)	May 2025	In progress
	Detailed Business Case (Gate 2)	December 2026	
	Funding/Investment Decision	May 2027	
	Procurement and tendering leading to construction award (Gate 3)	Planned commencement February 2030	Delivery strategy will be a recommendation within the Detailed Business Case. Procurement activity will commence following Funding/Investment Decision Previous advice had a 2027 commencement date, this took into consideration the highway relocation which is a precursor to any dam works. The updated date reflects dam works only.
	Detailed Design commencement	2027	Detailed Design approach will be dependant of delivery strategy.
	Construction	Planned to be completed by 2035	Construction timeframe dependent on delivery strategy, and takes into consideration staged works for potential highway relocation
	Readiness for Service (Gate 4)	2035	
Note – Wivenhoe Dam project is in the early stage of planning, dates noted are estimated only and until the final option is identified and scope, complexity of design/construction and risks are known, the key project dates will continue to change.			
Interim risk management	Continued routine dam safety management program activities. <i>Note the current Wivenhoe Dam FSL (in the 2019 revised Resource Operations Licence) is related to the modified operation of Somerset Dam until it is upgraded.</i>		

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Progress Report	<p>Key current project activities:</p> <ul style="list-style-type: none"> • Continued development of existing dam risk assessment • Pier shier analysis • Hydrology - • Delivery of geotechnical investigations • Consultation and development of relationship requirements with TMR • Investigations for environment and sustainability studies. <p>Key activities and priorities over the next 12 months:</p> <ul style="list-style-type: none"> • Options Analysis Report development • Geotechnical investigation, material strength testing • TMR highway Options Analysis and Detailed Business Case • Engagement of engineering firm for Options Analysis • Flood mitigation and Climate Change discussion papers • Development of Options Analysis and Concept designs to determine the preferred Dam Improvement Project option (to achieve full dam safety upgrade). • A range of field investigations to support the approvals for Dam Improvement Project. • Consideration of fish passage requirements • Financial, commercial, economics and construction methodology assessment • Consultation with Traditional Owner groups
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4 Declaration

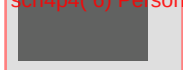
This Portfolio Upgrade Project Plan report has been prepared to fulfil the requirements of Dam Safety Condition 5 for Seqwater's referable dams that require upgrade as determined using the SARD Guideline. The declaration is based on the current safety assessment information documented separately in the Portfolio Dam Safety Assessments – September 2022 report (D22/298247). The information on current safety assessments was compiled by a Registered Professional Engineer of Queensland (RPEQ) with the limitations and caveats documented in that report. In making this declaration, I have:

- assumed that the content of the Seqwater Portfolio Dam Safety Assessments September 2022 report is correct; and
- relied on the RPEQ advice provided in the Seqwater Portfolio Dam Safety Assessments September 2022 report in relation to the current safety assessments for Seqwater's referable dams.

The Portfolio Upgrade Project Plan report is issued and approved by the Chief Executive Officer as an authorised representative of Seqwater and is cognisant of Seqwater's obligations as a referable dam owner.

Neil Brennan

sch4p4(6) Person



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