TITLE: **[E-CM] Water Supply Augmentation - Selection of Preferred Option**

SUBMITTED BY: **Water and Wastewater**

Valid

Supporting Community Life

LINKAGE TO INTEGRATED PLANNING AND REPORTING FRAMEWORK:

2	Supporting Community Life
2.3	Provide well serviced neighbourhoods
2.3.2	Provision of a secure, high quality and reliable drinking water supply services which meets health and environmental requirements and projected demand

SUMMARY OF REPORT:

There is a requirement for Council to select a preferred option, for the augmentation of Tweed District Water Supply, in the immediate future. This is required so that an additional water source is commissioned by 2026 and Council can fulfil its obligations to prepare a new Developer Servicing Plan.

The following options have been considered:

- Raise Clarrie Hall Dam
- Build Small Byrrill Creek Dam
- Build Small Byrrill Creek Dam and raise it at a later date
- Build Large Byrrill Creek Dam
- Link to SEQ Water
- Link to Gold Coast City Council

From an analysis of various impacts the raising of Clarrie Hall Dam is most advantageous to Council and its community.

If Council continue to delay a decision on a preferred Tweed District Water Supply augmentation option, there may be insufficient time prior to 2026 to implement any of the dam options. This will force Council to link to SEQ Water or Gold Coast City Council neither of which are preferred options.

RECOMMENDATION:

That Council adopts the raising of Clarrie Hall Dam as the preferred option for the augmentation of the Tweed District Water Supply.

REPORT:

Issue

There is a requirement to augment the Tweed District Water Supply by 2026. If the preferred option is to be a dam, the planning, environmental assessment and construction of the dam, such that it can provide the increase in secure yield required by 2026, will take 10 years.

Further, there is a government requirement to revise Council's Developer Servicing Plans (s64 charges). The Developer Servicing Plans cannot be completed until Council has selected a preferred option for the water supply augmentation.

To address these two issues a decision, by Council, on a preferred option for the augmentation of the Tweed District Water Supply is required in the immediate future.

Background

Studies undertaken for Tweed Shire Council by Hydrosphere - to estimate the future demand for water, and NSW Urban Water Services - to estimate the secure yield of Tweed District Water Supply as impacted by climate change, demonstrate a requirement to augment the Tweed District Water Supply by 2026.

Council has previously considered options to augment the Tweed District Water Supply but as yet has no preferred option for the augmentation of the water supply.

OPTIONS:

Consistent with Council resolutions the options of raising Clarrie Hall Dam and links to SEQ Water have been considered. In addition to these options, Byrrill Creek Dam(s) and links to Gold Coast City Council have also been considered. Therefore the options considered are:

- Raise Clarrie Hall Dam
- Build Small Byrrill Creek Dam
- Build Small Byrrill Creek Dam and raise it at a later date
- Build Large Byrrill Creek Dam
- Link to SEQ Water
- Link to Gold Coast City Council

Raise Clarrie Hall Dam

A study has been undertaken by NSW Public Works to determine the optimum size of Clarrie Hall Dam. It determined the optimum size of the dam was 43,000 ML based on raising the dam wall height by 8.5m to a dam wall height of 70m AHD.

The secure yield of the Raised Clarrie Hall Dam has been estimated by NSW Urban Water Services after undertaking stream flow estimation for both present flows and flows adjusted for climate change, and modelling the behaviour of the dam within licenced operating conditions. The modelling estimated the 2030 secure yield as 22,700ML/a. The Raised Clarrie Hall Dam would be able to provide adequate water supply to Tweed Shire until approximately 2046.

Cost estimates for the dam have been prepared by NSW Public Works. Those estimates were amended to include environmental assessment, project management and contingency for preconstruction.

As many of the factors influencing the cost of raising Clarrie Hall Dam are known, there is a higher degree of certainty with the cost estimates and there is only a small probability they could increase relative to other options. To address this, the estimates were subsequently amended by NSW Public Works using @Risk software to determine mean probable cost. The estimated mean probable cost to Raise Clarrie Hall Dam is $43.44M.

As the dam already exists there would be little or no additional operating costs for the raised dam.

Build Small Byrrill Creek Dam

This option consists of the construction of a small Byrrill Creek Dam with capacity of 16,300 ML.

The secure yield of the dam in conjunction with the existing Clarrie Hall Dam has been modelled by NSW Urban Water Services. The modelling estimated the 2030 secure yield as 15,800 ML/a. The dam, in conjunction with the existing Clarrie Hall Dam, would be able to provide adequate water supply to Tweed Shire until approximately 2035.

Cost estimates for the dam have been prepared by NSW Public Works. Those estimates were amended to include a fish ladder, environmental assessment, project management and contingency for preconstruction.

As many of the factors influencing the cost of constructing the small Byrrill Creek Dam are unknown, there is a low degree of certainty with the cost estimates. That is, there is a large probability the cost could increase significantly. To address this, the estimates were subsequently amended by NSW Public Works using @Risk software to determine mean probable cost. The estimated mean probable cost to construct the small Byrrill Creek Dam is $54.35M.

In the longer term, operating costs for the dam would be similar and in addition to the present operating costs of Clarrie Hall Dam.

Build Small Byrrill Creek Dam then Raise the Dam Wall

This option consists of the construction of Small Byrrill Creek Dam with capacity of 16,300 ML and then approximately 9 years later, raising the wall of the dam to provide a dam with a capacity of 36,000 ML.

The secure yield of the raised dam, in conjunction with the existing Clarrie Hall Dam, has been modelled by NSW Urban Water Services. The modelling estimated the 2030 secure yield of the raised dam as 20,950ML/a. The dam would require raising in 2035 and after raising and in conjunction with the existing Clarrie Hall Dam, would be able to provide adequate water supply to Tweed Shire until approximately 2044.

Cost estimates for the small dam and then raising the dam have been prepared by NSW Public Works. Those estimates were amended to include a fish ladder, environmental assessment, project management and contingency for preconstruction.

As many of the factors influencing the cost of constructing and then raising Byrrill Creek Dam are unknown, there is a low degree of certainty with the cost estimates. That is, there is a large probability the cost could increase significantly. To address this, the estimates were subsequently amended by NSW Public Works using @Risk software to determine mean probable cost. The estimated mean probable cost to construct the small Byrrill Creek Dam then raise it is $105.17M.

In the longer term, operating costs for the dam would be slightly above and in addition to the present operating costs of Clarrie Hall Dam.

Build Large Byrrill Creek Dam

This option consists of building a Byrrill Creek Dam with a capacity of 36,000 ML.

The secure yield of the dam in conjunction with the existing Clarrie Hall Dam has been modelled by NSW Urban Water Services. The modelling estimated the 2030 secure yield as 20,950 ML/a. The dam, in conjunction with the existing Clarrie Hall Dam, would be able to provide adequate water supply to Tweed Shire until approximately 2044, the same as the raised Byrrill Creek Dam.

Cost estimates for the small dam and then raising the dam have been prepared by NSW Public Works. Those estimates were amended to include a fish ladder, environmental assessment, project management and contingency for preconstruction.

As many of the factors influencing the cost of constructing the large Byrrill Creek Dam are unknown, there is a low degree of certainty with the cost estimates. That is, there is a large probability the cost could increase significantly. To address this, the estimates were subsequently amended by NSW Public Works using @Risk software to determine mean probable cost. The estimated mean probable cost to construct the large Byrrill Creek Dam is $81.86M.

In the longer term, operating costs for the dam would be similar, slightly above and in addition to the present operating costs of Clarrie Hall Dam.

Link to SEQ Water

This option consists of the construction of a pipeline, capable of transferring up to 20ML/day, from adjacent to the Tugun Desalination Plant to Piggabeen Road and a pump station.

The secure yield of this option in conjunction with the existing Clarrie Hall Dam has been modelled by NSW Urban Water Services. The modelling estimated the 2030 secure yield as 14,650 ML/a. The pipeline, in conjunction with the existing Clarrie Hall Dam would be able to provide adequate water supply to Tweed Shire until approximately 2034. Modelling by NSW Urban Water Services indicated that an average of 3,600 ML would be drawn from SEQ Water.

Cost estimates for the link have been prepared by MWH and updated to present day dollars by NSW Public Works. Many of the factors influencing the cost of constructing the link are known and hence there is a reasonable degree of certainty in costs. As with previous options to address risk the estimates were subsequently amended by NSW Public Works using @Risk software to determine mean probable cost. The estimated mean probable cost to construct the pipeline is $13.64M.

In addition to this SEQ Water have indicated that they would seek a "buy in" of $25.5M making the mean probable cost to construct the pipeline plus buy in is $39.14M.
In the longer term, operating costs consist of:

• Pump Station operation	$ 650,000 pa
• Water Cost @ $1500/ML for 3,600 ML/a	$ 5,400,000 pa
• Annual Access Charge	$ 13,600,000 pa
• Total	$ 19,650,000 pa

As many of the factors influencing the cost of this option are well known, there is only a small probability of significantly increased costs when compared with all options.

Further, larger pipelines were considered. The larger pipelines attracted significantly larger "buy-in" costs and significantly higher Annual Access Charges making the larger pipelines less financially acceptable than the 20ML/day pipeline.

Link to Gold Coast City Council

This option is basically the same as the option above with the exception that no buy in cost is forecast. At this point no access charges are forecast and the price of water is $3.77/kL in accordance with Gold Coast City Council's Fees and Charges.
In the longer term, operating costs consist of:

• Pump Station operation	$ 650,000 pa
• Cost of Water @ $3.77/kL for 3,600 ML/a	$ 13,572,000 pa
• Total	$ 14,222,000 pa

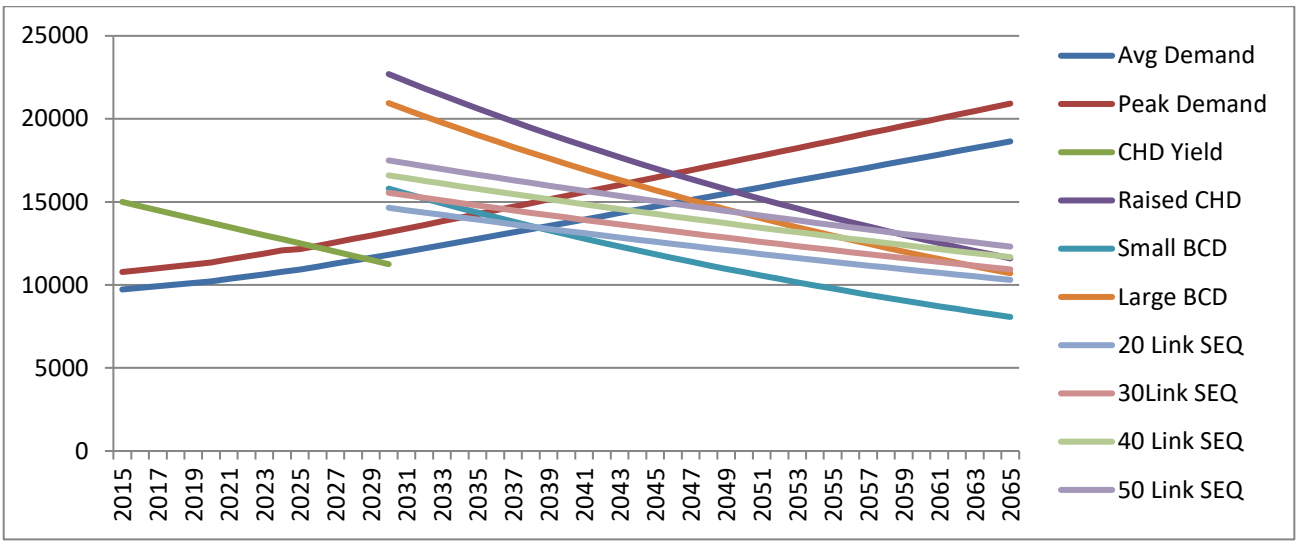
As many of the factors influencing the cost of this option are well known, there is only a small probability of significantly increased costs when compared with all options.

Larger pipelines were considered. Because the cost of water from Gold Coast City Council is significantly greater than the cost of production of water by Tweed Shire Council increasing the pipeline capacity and drawing more water from Gold Coast City Council would cause the cost of water in Tweed to rise further. This would make the larger pipelines less financially acceptable than the 20ML/day pipeline.

COMPARISION OF OPTIONS:

Longevity

Longevity is based on when a further supply augmentation would be required after the implementation of the given option. This was determined by comparing the forecast demand as determined by Hydrosphere and the secure yield of the options.



The longevity of each option is determined as the point at which peak demand exceeds secure yield and is tabulated in Table 1.

Table 1: Longevity of Water Supply Augmentation Options:

Option	**New Supply required by**
Raise Clarrie Hall Dam	2046
Small Byrrill Creek Dam	2035
Staged Byrrill Creek Dam	2044
Large Byrrill Creek Dam	2044
Link to SEQ Water	2034
Link to Gold Coast City Council	2034

Cost

The mean probable cost of the options and longevity are compared in Table 2.

Table 2: Mean Probable Cost, Mean Probable NPV and Longevity:

Option	**Mean Probable Capital Cost $M**	**Mean Probable NPV @7% $M**	**Longevity after 2026 Years**
Raise Clarrie Hall Dam	$ 43.33	$ 34.07	20
Small Byrrill Creek Dam	$ 54.35	$ 43.42	9
Stage Byrrill Creek Dam	$ 105.17	$ 76.16	18
Large Byrrill Creek Dam	$ 81.86	$ 70.75	18
Link to SEQ Water	$ 39.14	$ 222.46	8
Link to Gold Coast City Council	$ 13.64	$ 149.45	8

Financial Impact

The financial impact of each option was considered by HydroScience. After completion of the further cost analysis by NSW Public Works the financial impacts of each of the options was determined using the methodology of HydroScience. The assessment considered both the impact on Developer Charges and the impact on a Typical Residential Bill.

Table 3: Financial Impact of Water Supply Augmentation Options:

Option	Increase in Typical Residential Bill	Net Impact on Developer Charges based on average mean Note 1
Raise Clarrie Hall Dam	0	$ 3,649
Small Byrrill Creek Dam	$ 7.55	$ 9,397
Stage Byrrill Creek Dam	$ 10.00	$ 9,425
Large Byrrill Creek Dam	$ 10.00	$ 9,702
Link to SEQ Water	$ 370.00	$ 5,725
Link to Gold Coast City Council	$ 284.00	$ 1,099

Note 1:
The Net Impact on Developer Charges was based on the Equivalent Annualised Annuity of each option adjusted by the reduction in existing Developer Charges by the removal of previously forecast water supply augmentation work.

Based on current charges Water Usage Charges, Typical Residential Bill and Developer Charges would increase as shown in Table 4

Table 4: Gross Typical Residential Bill and Developer Charges for Water Supply Augmentation Options:

Option	Water Usage Charge $/kL	Typical Residential Bill	Developer Charges Note 2
Raise Clarrie Hall Dam	$ 2.70	$ 572.00	$ 16,777
Small Byrrill Creek Dam	$ 2.73	$ 579.55	$ 22,525
Stage Byrrill Creek Dam	$ 2.73	$ 582.00	$ 22,553
Large Byrrill Creek Dam	$ 2.73	$ 582.00	$ 22,830
Link to SEQ Water Note 1	$ 5.12	$ 942.00	$ 18,853
Link to Gold Coast City Council **Note 1**	$ 3.91	$ 856.00	$ 14,227

Note 1:
Present consumption determined from (TRB - access)/2.7. Usage Charge calculated from (TRB - access)/consumption. In these two cases the typical user charge exceeds the user charge for water at Gold Coast City Council of $3.77/kL.

Note 2:
Consistent with Note 1 Table 3 the actual developer charges will need to be recalculated as part of the revision to the Developer Servicing Plan. That revision will also take into account the lower growth rates which have been experienced as well as new costings and strategies for servicing.

Previous Community Consultation

In 2010 a Community Working Group considered and assessed the options of:

- Raise Clarrie Hall Dam
- New Byrrill Creek Dam
- Pipeline to SEQ Water

The options were assessed on the criteria of Environmental Impact and Social Impacts of the options. The Community Working Group assessed the options on the rating of:

- I can live with this option
- I don't know / am not sure
- I cannot live with this option

The results of the assessment are set out below:

Table 5: Community Working Group Assessment of Options based on Environmental Impact:

Option	Raise Clarrie Hall Dam	New Byrrill Creek Dam	Pipeline to SEQ Water
I can live with this option	9	2	1
I don't know / am not sure	1	0	6
I cannot live with this option	1	8	3

Table 6: Community Working Group Assessment of Options based on Social Impact:

Option	Raise Clarrie Hall Dam	New Byrrill Creek Dam	Pipeline to SEQ Water
I can live with this option	6	2	1
I don't know / am not sure	2	1	5
I cannot live with this option	1	6	2

The results show that more people (15) can "live with" the raising of Clarrie Hall Dam than can "live with" New Byrrill Creek (4). Fewest (2) can "live with" Pipeline to SEQ Water.

Similarly, the results show that the fewest people (2) "cannot live with" Raise Clarrie Hall Dam compared to fourteen (14) who "cannot live with" with Byrrill Creek Dam and five (5) who could not live with Pipeline to SEQ Water.

Subtracting "cannot live with" numbers from "can live with" ranks the options in order of preference as:

- Raise Clarrie Hall Dam (13)
- Pipeline to SEQ Water (-3)
- New Byrrill Creek Dam (-10)

Previous Studies

In 2008 and 2009, a series of studies were undertaken to compare options for the augmentation of the Tweed District Water Supply.

The studies, through a Multi Criteria Analysis, ranked the options. The ranking was:

- Raising Clarrie Hall Dam
- Pipeline to SEQ Water
- New Byrrill Creek Dam

The studies recommended the preferred option for augmenting the Tweed District Water Supply as the raising of Clarrie Hall Dam.

Water Sharing Plan

It was confirmed by the relevant Minister in December 2010 that Clause 48 of the Water Sharing Plan for the Tweed River specifically prevents NSW Office of Water from approving water supply work in the Byrrill Creek Water Source.

Subsequent to that date, the new Minister in October 2011, advised that it was her belief that the inclusion of Clause 48 would not impact on any proposal to construct a major water storage on Byrrill Creek, as the provisions of the EP&A Act for major projects would apply. It should be noted that this is not a legal opinion.

Advice from Office of Water, also in October 2011, advised that Clause 48 of the Water Sharing Plan would not impact on a proposal to build Byrrill Creek Dam, because such a proposal may fall under the provisions of the SEPP on State and Regional Development. The SEPP considers dam proposals in excess of $30m to be state significant infrastructure.

Advice from NSW Planning is that the status of the Water Sharing Plan against the SEPP and legislation is unclear. Were the Water Sharing Plan to be taken into consideration in any development assessment, it is possible Clause 48 could take precedence over the SEPP. It is also possible the provisions of the SEPP could take precedence over the Water Sharing Plan. As the matter is contestable in the Land and Environment Court and no precedence exists, it is unclear whether the Water Sharing Plan impacts on the proposal to build Byrrill Creek Dam.

No differentiation between options can be determined and as such the Water Sharing Plan is not considered further, except in that it poses a significant risk within the planning process with probable significant cost and time implications.

Environmental Impact Assessment

In any environmental assessment of a proposal, alternatives must be considered. Any environmental assessment of the alternatives of links to SEQ Water, links to GCCC and Byrrill Creek Dam would be assessed against an alternative of raising Clarrie Hall Dam on the criteria of impact on the natural environment, social environment and economic environment.

Environmental studies, community consultation and economic analysis has consistently shown Clarrie Hall Dam has less environmental impact than Byrrill Creek Dam, is more readily accepted by the community and provides the best economic outcomes for Tweed

Shire. As such it is anticipated any Environmental Impact Assessment will find raising Clarrie Hall Dam the preferred option.

For Council to do otherwise may cause State Government intervention in Council's decision making process on this matter.

Risk

Risk to Residential Development

Any increase in the Developer Charges will have an adverse impact on the cost of residential development. In simple demand terms, this will reduce the demand for land and hence development within the Shire. Similarly, high user charges will act as a disincentive for people to live in the Shire if user charges are higher than on the Gold Coast.

To mitigate the risk to development of residential land, Developer Charges need to be kept as low as possible while maintaining the financial viability of Council's water and sewerage services. Similarly, user charges need to be kept as low as possible while maintaining the financial viability of Council's water and sewerage services.

The option with both the second lowest Developer Charges and lowest user charges is Raise Clarrie Hall Dam. This option will result in Developer Charges more than $6,000 less than other dam options.

Risks to Commercial and Industrial Development

Risks to maintaining and developing commercial and industrial development within Council, primarily, centred on cost. In essence, if the cost of doing business on the Gold Coast is less than the cost of doing business in Tweed Shire, businesses will move out of the Shire.

When considering costs the total cost of water and sewerage services is compared. Gold Coast City Council's costs are $3.77/kl for water. This can be compared to the present Tweed Shire Council charges of $2.70.

The options of Link to SEQ Water and Link to Gold Coast City Council would place the cost of water above the cost of water from other options and are therefore considered a risk to continued commercial and industrial development within Tweed Shire. The present usage charge at Gold Coast City Council is $3.77 /kL. With the Link to SEQ Water or the Link to Gold Coast City Council the usage charges would be $5.12 and $3.91 respectively.

Risk to Low Income Residents

Low income residents such as pensioners are those persons most adversely impacted by the increase in cost of essential services. Increases in the cost of water from the present $2.70/kL to $3.91 or over $4.00kL are considered unacceptable. Therefore the options of Link to SEQ Water and Link to Gold Coast City Council are considered unacceptable.

Cost Uncertainty

NSW Public Works was engaged to undertake an assessment of cost uncertainty. This was undertaken using @Risk software using a Monte Carlo based assessment methodology. The results are shown in Table 7.

Table 7: Mean Probable and Maximum Capital Costs for Water Supply Augmentation Options:

Option	Mean Probable Capital Cost $M	Maximum Capital Cost $M
Raise Clarrie Hall Dam	$ 43.44	$ 55.22
Small Byrrill Creek Dam	$ 54.35	$ 67.71
Staged Byrrill Creek Dam	$ 105.17	$ 130.78
Large Byrrill Creek Dam	$ 81.86	$ 105.26
Link to SEQ Water	$ 39.14	$ 43.20
Link to Gold Coast City Council	$ 13.64	$ 17.70

The Mean Probable and Maximum Net Present Values of each of the option are shown in Table 8.

Table 8: Mean Probable NPV and Maximum NPV for Water Supply Augmentation Options:

Option	Mean Probable NPV $M	Maximum NPV $M
Raise Clarrie Hall Dam	$ 34.07	$ 43.24
Small Byrrill Creek Dam	$ 43.42	$ 57.60
Staged Byrrill Creek Dam	$ 76.16	$ 85.53
Large Byrrill Creek Dam	$ 70.75	$ 90.57
Link to SEQ Water	$ 222.46	$ 222.74
Link to Gold Coast City Council	$ 149.45	$ 151.73

The Developer Charges in Table 9 were determined using the HydroScience methodology.

Table 9: Typical Residential Bill, Mean Probable Developer Charges and Maximum Developer Charges for Water Supply Augmentation Options.

Option	Water Usage Charge $/kL	Mean Probable Developer Charge	Maximum Developer Charges
Raise Clarrie Hall Dam	$ 2.70	$ 16,777	$ 18,220
Small Byrrill Creek Dam	$ 2.73	$ 22,525	$ 25,157
Stage Byrrill Creek Dam	$ 2.73	$ 22,553	$ 25,266
Large Byrrill Creek Dam	$ 2.73	$ 22,830	$ 26,213
Link to SEQ Water	$ 5.12	$ 18,853	$ 19,433
Link to Gold Coast City Council	$ 3.91	$ 14,227	$ 14,816

Other items that may impact on the cost of options which cannot be assessed at this stage include:

The likely requirement for compensatory habitat for areas inundated by Byrrill Creek Dam and a raised Clarrie Hall Dam are as yet undefined.

Presently unknown environmental conditions at the Byrrill Creek site may require further expenditure on studies and environmental measures. This is exacerbated because ECO-SURE have found high conservation areas both upstream and down-stream of the proposed dam wall.

There are 26 registered cultural heritage sites within the Byrrill Creek Dam catchment. There are most probably, further unknown cultural heritage issues requiring further expenditure on studies and protection measures.

There are 21 registered cultural heritage sites within the Clarrie Hall Dam area. Five (5) sites were inundated in 1983, a further five (5) would be inundated if Clarrie Hall Dam was raised. The area has been well studied and the risk of discovering further cultural heritage sites is low.

The construction of Byrrill Creek Dam would result in the partial inundation of nine (9) properties. Four (4) houses would be inundated. Two properties will be severed. The construction would require major road reconstruction of Byrrill Creek Road. As negotiations to address these items have yet to be undertaken there is no certainty as to the cost of these items and escalation could well occur.

The raising of Clarrie Hall Dam would result in the partial inundation of twenty-four (24) properties. Three (3) houses would be inundated. Three (3) properties would be impacted by road realignment. Discussions with the property owners impacted by any raising of Clarrie Hall Dam occurred in 2010/11.

Legal action.

Time Uncertainty

There is uncertainty associated with the time for completion of the water augmentation options.

Risks to time for the Links to SEQ Water and Gold Coast City Council are centred on three aspects being - acquisition of land, entering into an agreement with the bulk supplier and environmental assessment. As the construction time for these options is short the risk associated with being able to augment the water supply by 2026 are considered very small.

Risks to time for the Raising of Clarrie Hall Dam are centred on acquisition of land, environmental assessment, including legal challenge, and construction. As Council owns the majority of land in the catchment of Clarrie Hall Dam and preliminary discussions had commenced with the remaining land owners, it is considered that the risk of time delays due to land acquisition, although they exist, are not high.

Previous studies have identified the environmental and cultural heritage risks associated with Clarrie Hall Dam. Further, there has been significant community consultation and Raising Clarrie Hall Dam was the preferred option. As with land acquisition, it considered that the risk of time delays due to environmental assessment and planning processes, although they exist, are not high.

Clarrie Hall Dam is an existing dam and the construction required to raise the dam can be well quantified. Further, there are no unknown ground conditions and construction access has already been established. The risk of time delays due to adverse construction conditions, although they exist, are not considered high.

Risks to time for the building of Byrrill Creek Dam are also centred on acquisition of land, environmental assessment, including legal challenge, and construction. Council owns the majority of land in the catchment/inundation area of Byrrill Creek Dam but Council has not commenced discussion with the remaining land owners on the acquisition of their land. It is considered there is a higher risk of time delays due to land acquisition at Byrrill Creek that there is for land acquisition at Clarrie Hall Dam.

Previous studies have identified significant environmental and cultural heritage risks associated with Clarrie Hall Dam. Further, there has been significant community opposition to building Byrrill Creek Dam which may lead to an increased probability of legal challenge. The Fine Screening Assessment estimated that fulfilling the planning obligations for Byrrill Creek Dam would take approximately 2 years longer than fulfilling the planning obligations for Raising Clarrie Hall Dam. It considered that the risk of time delays due to environmental assessment and planning processes are high.

Building Byrrill Creek Dam is a greenfield project and the risks associated with such a project are not as well understood as the risks of Raising Clarrie Hall Dam. Issues such as ground conditions and construction access are unknown. The risk of time delays due to adverse construction conditions are higher than other options.

In general, the time risks for the building of Byrrill Creek Dam are significantly higher than the time risks associated with other options.

It should be noted that if a decision on a preferred option for water supply augmentation is delayed, there may be insufficient time prior to 2026 to construct a new dam or Raise Clarrie Hall Dam. This will force Council to link to SEQ Water or Gold Coast. The risk of this occurring is greater with Byrrill Creek Dam options due to time uncertainty.

Council Resolutions

On 19 October 2010 it was resolved that Council:

"1. Monitors and resources demand management actions with the aim of achieving at least BASIX/WELS reductions and reports to Council annually on progress.

2. Adopts Byrrill Creek Dam as the preferred option for augmenting the Tweed District Water Supply.

3. Proceeds with the Planning Approvals process and Detailed Design in relation to Byrrill Creek Dam.

4. Pursues dialog with the relevant South East Queensland water authorities in parallel as an alternative augmentation option and as an emergency drought option."

On 18 October 2011 it was resolved by Council that:

"…..parts 2 and 3 of Minute 688 from the meeting held 19 October 2010, Item 24 – Tweed District Water Supply Augmentation Options – Selecting a Preferred Option, being:

2. Adopts Byrrill Creek Dam as the preferred option for augmenting the Tweed District Water Supply.

3. Proceeds with the Planning Approvals process and Detailed Design in relation to Byrrill Creek Dam.

be rescinded".

On 15 May 2012 it was resolved that Council places a "moratorium on any dam proposal at Byrrill Creek for a period of the next twenty (20) years, effective from 15 May 2012."

This places Council in a position where it has no preferred option to augment the Tweed District Water Supply and any dam proposal at Byrrill Creek cannot be considered until May 2032.

Given that a new water supply is required by 2026 it removes Byrrill Creek Dam from any further consideration unless Council resolves otherwise.

SUMMARY:

There is a requirement for Council to determine a preferred option for the augmentation of Tweed District Water Supply in the immediate future. This is required so that an additional water source is commissioned by 2026 and Council can fulfil its obligations to prepare a new Developer Servicing Plan.

The following options have been considered:

- Raise Clarrie Hall Dam
- Build Small Byrrill Creek Dam
- Build Small Byrrill Creek Dam and raise it at a later date
- Build Large Byrrill Creek Dam
- Link to SEQ Water
- Link to Gold Coast City Council

From an analysis of various impacts the Raising of Clarrie Hall Dam is most advantageous to Council and its community.

An assessment of each option as compared to the option of Raising of Clarrie Hall Dam is given below:

Build Small Byrrill Creek Dam:

- Shorter life than Raising Clarrie Hall Dam.
- Higher typical residential bill than Raising Clarrie Hall Dam.
- Developer Charges are approximately $6,000 higher than Raising Clarrie Hall Dam.
- Raising Clarrie Hall Dam was preferred by the Community Working Group.
- Raising Clarrie Hall Dam was the preferred option from previous studies.
- Poses a greater risk to residential development than Raising Clarrie Hall Dam.
- Poses a greater risk to commercial and industrial development than Raising Clarrie Hall Dam.
- Poses no significant increase in risk to low income residents.
- Has a higher cost uncertainty than Raising Clarrie Hall Dam.
- Has a higher time uncertainty than Raising Clarrie Hall Dam.
- Is precluded by Council resolutions.

Build Staged Byrrill Creek Dam:

- Similar life than Raising Clarrie Hall Dam (one to two years less).
- Higher typical residential bill than Raising Clarrie Hall Dam.
- Developer Charges are approximately $6,000 higher than Raising Clarrie Hall Dam.
- Raising Clarrie Hall Dam was preferred by the Community Working Group.
- Was not considered in previous studies.
- Poses a greater risk to residential development than Raising Clarrie Hall Dam.
- Poses a greater risk to commercial and industrial development than Raising Clarrie Hall Dam.
- Poses no significant increase in risk to low income residents.
- Has a higher cost uncertainty than Raising Clarrie Hall Dam.
- Has a higher time uncertainty than Raising Clarrie Hall Dam.
- Is precluded by Council resolutions.

Build Large Byrrill Creek Dam:

- Similar life than Raising Clarrie Hall Dam (one to two years less).
- Higher typical residential bill than Raising Clarrie Hall Dam.
- Developer Charges are approximately $6,000 higher than Raising Clarrie Hall Dam.
- Raising Clarrie Hall Dam was preferred by the Community Working Group.
- Raising Clarrie Hall Dam was the preferred option from previous studies.
- Poses a greater risk to residential development than Raising Clarrie Hall Dam.
- Poses a greater risk to commercial and industrial development than Raising Clarrie Hall Dam.
- Poses no significant increase in risk to low income residents.
- Has a higher cost uncertainty than Raising Clarrie Hall Dam.
- Has a higher time uncertainty than Raising Clarrie Hall Dam.
- Is precluded by Council resolutions.

Link to SEQ Water:

- Shorter life than Raising Clarrie Hall Dam.
- Very much higher typical residential bill than Raising Clarrie Hall Dam.
- Developer Charges are approximately $2,000 higher than Raising Clarrie Hall Dam.
- Raising Clarrie Hall Dam was preferred by the Community Working Group.
- Raising Clarrie Hall Dam was the preferred option from previous studies.
- Poses a much greater risk to residential development than Raising Clarrie Hall Dam.
- Poses a much greater risk to commercial and industrial development than Raising Clarrie Hall Dam.
- Poses very significant increase in risk to low income residents.
- Has a similar cost uncertainty to Raising Clarrie Hall Dam although cost may be influenced by other parties.
- Has a similar time uncertainty to Raising Clarrie Hall Dam.

Link to Gold Coast City Council:

- Shorter life than Raising Clarrie Hall Dam.
- Very much higher typical residential bill than Raising Clarrie Hall Dam.
- Developer Charges lower than Raising Clarrie Hall Dam.
- Raising Clarrie Hall Dam was preferred by the Community Working Group.
- Raising Clarrie Hall Dam was the preferred option from previous studies.
- Poses a risk to residential development than Raising Clarrie Hall Dam.
- Poses a much greater risk to commercial and industrial development than Raising Clarrie Hall Dam due tom high usage charges.
- Poses very significant increase in risk to low income residents.
- Has a similar cost uncertainty to Raising Clarrie Hall Dam although cost may be influenced by other parties.
- Has a similar time uncertainty to Raising Clarrie Hall Dam.

The table Comparison of Water Supply Augmentation Options attached, summarises this report.

CONCLUSION:

There is a requirement for Council to determine a preferred option for the augmentation of Tweed District Water Supply in the immediate future. This is required so that an additional water source is commissioned by 2026 and Council can fulfil its obligations to prepare a new Developer Servicing Plan.

From an analysis of various impacts the Raising of Clarrie Hall Dam is most advantageous to Council and its community.

If Council continues to delay a decision on a preferred water supply augmentation option, there may be insufficient time prior to 2026 to construct a new dam or Raise Clarrie Hall Dam. This will force Council to link to SEQ Water or Gold Coast City Council. The risk of this occurring is greater with Byrrill Creek Dam options due to time uncertainty.

COUNCIL IMPLICATIONS:

a. Policy:
The current adopted position of Council as at 15 May 2012 is that Council places a "moratorium on any dam proposal at Byrrill Creek for a period of the next twenty (20) years, effective from 15 May 2012."

Council has an Asset Management Plan for water which details levels of service and is presently updating its Strategic Business Plan for Water Supply in accordance with best practice guidelines.

b. Budget/Long Term Financial Plan:
Significant budget variation dependent on the preferred option which will impact Developer Contributions for any new development as well as user charges for existing users, as detailed within the body of this report.

c. Legal:
As per the Report.

d. Communication/Engagement:
Inform - We will keep you informed.

UNDER SEPARATE COVER/FURTHER INFORMATION:

Attachment 1. Comparison of Water Supply Augmentation Options (ECM 3849961).