

Warrumbungle Shire Council

Bore Rehabilitation Project

Business Case

02/08/2023

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1 CASE FOR CHANGE

1.1 BACKGROUND

Warrumbungle Shire Council owns and operates a 9 different potable and non-potable water supply systems across the Local Government Area. These systems are supplied by both groundwater and surface water supply options. Each scheme and the water supply inputs are summarised in the table below.

Table 1 - Warrumbungle Shire Council Water Supply Schemes

Scheme	Drinking Water Status	Water Supply Inputs
Kenebri	Potable water	Groundwater
Baradine	Potable water	Groundwater
Bugaldie	Potable water	Groundwater
Coonabarabran	Potable water	Surface water, groundwater
Binnaway	Potable water	Surface water, groundwater
Mendooran	Potable water	Surface water, groundwater
Merrygoen	Non-potable water	Surface water
Dunedoo	Potable water	Groundwater
Coolah	Potable water	Groundwater

Ongoing asset management is a significantly important principle in order to inspect, maintain and where required renew assets in order to maintain an acceptable level of service to water customers across the Shire.

Both groundwater and surface water supply infrastructure need to have asset management principles adopted and applied to them in order to maintain the level of service that Council offers as part of the provided service.

The subject of this business case is groundwater infrastructure. 8 of the 9 water supply schemes within Warrumbungle Water operations are supplied via groundwater. Groundwater is extracted from aquifers within the earths surface by groundwater bores. A groundwater bore compromises of a cylindrical diameter hole to the water bearing aquifer, this hole is structurally restrained by a casing material in order to prevent collapse of hole. Water is let into the bore hole columns via openings in the casing called screens. As water moves into the open hole it will settle at a height or top water level (T.W.L) in accordance with the residual earth pressure from the aquifer. Water is extracted via a submersible pump and pumped into a rising main and distributed to a final point, mostly a water treatment plant (WTP).

1.1.1 EXISTING PROJECT BACKGROUND

Warrumbungle Shire Council, through the Orana Water Utilities Alliance conducted a desktop condition assessment of selected groundwater bores under the management of Warrumbungle Water. The purpose of the project was to conduct an assessment on Council's existing groundwater infrastructure to allow Council to plan for future renewal projects to maintain the delivery of secure water supplies to customers across the local government area.

The initial scope of the project consisted of a two-task desktop review and site inspection to review all of Council's existing groundwater bores. The project included assessment of twelve bores located within Coolah, Coonabarabran, Dunedoo, Baradine, Binnaway, Mendooran, Bugaldie and Kenebri.

From the initial desktop review and site inspection OWUA submitted a variation request to SSWP to conduct an additional activity to the project scope and further infrastructure assessments of existing groundwater bores via camera. The variation request was approved and Council nominated six (6) groundwater bores to OWUA for further camera inspection. The six bores that were further assessed by camera included the following:

- Kenebri Bore
- Bugaldie Bore
- Baradine Backup Bore
- Baradine Main Bore
- Dunedoo Town Well
- Coonabarabran Bore 2 – Namoi Street South

The CCTV collated as part of the project was preliminarily reviewed by ACS Equip as a part of the project scope.

Table 2 - ACS Equip Condition Assessment

Bore	ACS Equip Asset Condition Rating
Baradine Backup Bore	5 – The score has been allocated due to the failure of the mild steel casing and continued failure is imminent.
Baradine Main Bore	5 – The score has been allocated due to the failure of the mild steel casing and continued failure is imminent.
Dunedoo Town Well	5 - The score has been allocated due to the failure of the mild steel casing and continued failure is imminent.

A detailed summary of the CCTV and recommendations in relation to the scope of works completed by ACS Equip is attached as Attachment 1, Attachment 2 and Attachment 3.

Based upon the above information available and a costing analysis, a decision was made to proceed to tender to refurbish the Baradine Main Bore, Baradine Backup bore and Dunedoo bore via relining. Council also resolved to consider options for the supplies of Kenebri and Bugaldie and hence these two bores will not be considered as a part of this business case.

A tender was advertised by Council to the open market via tender link, a single tender was received. The information related to the tender is considered commercial in confidence so details will not be disclosed within this business case. However, as part of the tender submission the tenderer completed an independent review of the CCTV footage to analyse and confirm the scope of works outlined within the tender. The tender provided feedback to Council that contradicted the preliminary advice made to Council by ACS Equip.

As such, and as part of the tender evaluation process, a third-party consultant, GHD was engaged to assess the CCTV footage that was collated by Access Equip. The condition assessment provided by GHD is summarised in the table below and the report is provided as Attachment 4 to this business case.

Table 3 - GHD Bore Condition Assessment

Bore	GHD Asset Condition Rating
Baradine Backup Bore	The Baradine Backup Bore is 55 years old and reached the end of recommended service life. The bore casing is showing signs of deep pitting and corrosion however major failure has not been observed. It is recommended that the bore be replaced as it is high risk to failure given its age and current condition.
Baradine Main Bore	The bore casing is showing signs of minor corrosion and ageing however the asset is not in a failure state. It is recommended that the bore is mechanically cleaned and disinfected and the bore yield and water quality

	monitored over time to monitor the performance of the bore.
Dunedoo Town Well Backup Bore	The casing has significant amounts of encrustations and precipitates formed on the casing surface. These represents high risk areas to corrosion, however significant failures in the bore casing have not been observed. There is significant bio-fouling of the screens due to iron related bacteria growth. Overall the casing is in poor condition, however the condition of the casing can be remediated via redevelopment. It is recommended that this bore is remediated in the short term and replaced in the long term given the age and condition of the casing.

1.1.2 GROUNDWATER INFRASTRUCTURE ISSUES

The issues presented to Council for these three bores are discussed below.

1.1.2.1 BARADINE MAIN BORE

The casing of the Baradine main bore is largely in an acceptable condition. There has been little to no maintenance completed on the bore since its construction 14 years ago, this is evident given the water quality displayed in the CCTV footage from the bore and the evidence of flaking and minor corrosion to the casing. The condition of the bore does not facilitate or necessitate that the bore be replaced immediately. The casing material is a mild steel, which will rust in the given environment. The casing is also structurally well supported by a pressure cemented annulus on the exterior of the casing to a depth of 190m.

1.1.2.2 BARADINE BACKUP BORE

The Baradine Backup Bore has reached the end of its useful life and is exhibiting significant signs of pitting and corrosion within the casing. The bore has not yet exhibited any major failures however due to the condition of the casing and is only pressure cemented to 97.2m meaning that less than half of the bore casing is well supported by the structural pressure cement. The bore is a high risk to failure given its condition. A failure of the bore structure would result in Council being unable to have a backup water supply to supply water to the scheme, limiting operational flexibility and increasing the water security risk.

In addition to the condition of the bore structure, the bore mechanical and electrical equipment has failed. This bore is currently offline and water cannot be drawn from the bore until a replacement bore pump and associated electrical works have been installed.

The current condition of the backup infrastructure ultimately means that Council is operating a single raw water supply asset. Ultimately in current operational scenario, Council has no operational flexibility, meaning that a duty and standby system cannot be adopted, this does not allow for any failures. Also, Council cannot maintain the duty asset as the standby bore is not operational and thus water cannot be supplied to the scheme. this Utilising Council's enterprise risk management framework, this situation presents a high risk scenario to Council, ultimately controls need to be implanted to lower the of risk to an acceptable level to Council.

1.1.2.3 DUNEDOO BACKUP BORE

The Dunedoo Backup Bore has evidence of poor condition casing. The poor condition of the casing is however not consistent throughout the bore and is only in isolated segments. The bore however does have significant evidence of precipitate and encrustations forming on the casing of the bore. The stainless-steel screens are showing evidence of biofouling and thus yield is compromised. Additionally the bore is showing signs of sediment ingress, with 4.5m of sediment accumulating in the sump of the bore.

Ultimately the bore structure (casing) will be operational for the short term, however given the age of the bore being 44 years old, it has been recommended that in the long term that the bore be replaced.

In addition to this, the mechanical and electrical equipment associated with the bore has failed and the bore will need to be re-equipped in order to be operational.

The current condition of the backup infrastructure ultimately means that Council is operating a single raw water supply asset. Ultimately in current operational scenario, Council has no operational flexibility, meaning that a duty and standby system cannot be adopted, this does not allow for any failures. Also Council cannot maintain the duty asset as the standby bore is not operational and thus water cannot be supplied to the scheme. this Utilising Council’s enterprise risk management framework, this situation presents a high risk scenario to Council, ultimately controls need to be implanted to lower the of risk to an acceptable level to Council.

1.1.3 PREFERRED SOLUTION

The preferred solution to address the identified issues as well as meet the key project objectives includes the following:

- Refurbishment of the Baradine main bore via mechanical cleaning processes;
- Drill new Baradine backup bore;
- Refurbish Dunedoo backup bore via mechanical cleaning processes;
- Drill new Dunedoo backup bore in FY 29/30.

1.2 EXPECTED OUTCOMES

The expected outcomes of the project are discussed below.

Table 4 - Expected Project Outcomes

Key Issues	Key Project Objectives	Key Success Indicators
Baradine operational flexibility and robustness	The objective of the project is to improve the flexibility and robustness of the Baradine Water Supply Scheme. With the current issues associated with the backup bore, maintenance cannot be performed on the main bore and Council has no contingency if failure was to occur with the main bore asset.	Delivery of a backup raw water supply asset that is capable of supply water treatment plant demand and raw water demands of the community.
Baradine water security	Improve the water security of Baradine. There is adequate groundwater in Baradine to supply the demands of the scheme, however without appropriate infrastructure to extract water, quantities of water able to be supplied can be compromised.	Provision of sufficient infrastructure that adequately meets the demands of the Baradine Water Supply Scheme.
Dunedoo water security	Improve the water security of Dunedoo. There is adequate	Provision of sufficient infrastructure that adequately

	groundwater in Baradine to supply the demands of the scheme, however without appropriate infrastructure to extract water, quantities of water able to be supplied can be compromised.	meets the demands of the Dunedoo Water Supply Scheme. This includes in a full suite of environmental conditions.
Dunedoo operational flexibility and robustness	The objective of the project is to improve the flexibility and robustness of the Dunedoo Water Supply Scheme. With the current issues associated with the backup bore, maintenance cannot be performed on the main bore and Council has no contingency if failure was to occur with the main bore asset.	Delivery of a backup raw water supply asset that is capable of supply water treatment plant demand and raw water demands of the community.
Baradine water supply scheme operability and maintainability	All assets that are to be refurbished are to perform to an operational standard in order to supply water at Council's committed level of service. All new assets are to be built with operational budgeting to be considered and that they can be easily operated and maintained at the lowest acceptable cost.	Assets are refurbished to an acceptable standard, KPI's to be established for each asset. New assets are improve existing operations and be constructed with a long term maintenance strategy that is technically feasible and financially achievable to Council.
Dunedoo water supply scheme operability and maintainability	All assets that are to be refurbished are to perform to an operational standard in order to supply water at Council's committed level of service. All new assets are to be built with operational budgeting to be considered and that they can be easily operated and maintained at the lowest acceptable cost.	Assets are refurbished to an acceptable standard, KPI's to be established for each asset. New assets are to improve existing operations and be constructed with a long term maintenance strategy that is technically feasible and financially achievable to Council.
Strategic Affordability	The proposed solution needs to meet the needs of Council's water fund.	The project and projected costs are determined as feasible in Council's Water Fund strategic planning model.
Avoid cost of water carting	A failure of main and backup bores in Dunedoo and Baradine will require Council to cart water in order to supply the schemes. It is essential that Council has appropriate contingency in the supply of water through the provision of a primary and backup raw water supply.	The delivery of functional primary and backup bores in both Dunedoo and Baradine.

1.3 PROJECT TIMING

There are a number of key factors driving the timing of the project, these are discussed below.

1.3.1 RAW WATER SUPPLY CONTINGENCY

Presently, both Baradine and Dunedoo have no functional backup water supplies. This presents a significant risk to Council as a failure in the main bore will require Council to effectively cart water to supply each of the schemes. Costs for water carting are outlined below for each water supply scheme:

- Baradine Water Supply Scheme
 - Minimum requirement of 130 L/p/d
 - Baradine population is 586
 - Total water carter per day is 76.18 kL
 - Water carting costs are \$34 / kL
 - Total water carting - \$2,580.12 / day.
 - Forecasted duration of carting – 2 months
 - Overall cost to Water Fund - \$154,807.20
- Dunedoo Water Supply Scheme
 - Minimum requirement of 130 L/p/d
 - Baradine population is 725
 - Total water carter per day is 94.25 kL
 - Water carting costs are \$34 / kL
 - Total water carting - \$3,204.50 / day.
 - Forecasted duration of carting – 2 months
 - Overall cost to Water Fund - \$192,270.00

Thus utilising the above breakdowns, the works are justified in terms of being urgent and necessary as a unforeseen failure in the main bores will accrue more cost than it costs the refurbish / construct new bores. The initial implementation (phase 1) of the project is to be delivered as a matter of priority.

1.3.2 STRATEGIC AFFORDABILITY

The project will be delivered in two different stages:

- Stage 1 – Refurbishment of the Baradine main bore, drill new Baradine backup bore, refurbish Dunedoo backup bore.
- Stage 2 – Drill new backup bore in Dunedoo.

The key driver for delivering this project over two stages is strategic affordability. Council has committed to a number of high risk projects that are to be resolved over the next number of financial years. Stage 1 solution represents the lowest capital cost solution in order to re-establish all bores. Stage 2 is indicative of Council's asset renewals program and overall asset management.

2 ANALYSIS OF THE PROJECT

2.1 INFORMATION ABOUT THE PROJECT

2.1.1 SCOPE OF WORKS

The proposed scope of works for the project is outlined below:

- Redevelop the Baradine main bore – this includes mechanical scrubbing of the existing bore casing, removal of foreign objects, bore bailing (removal of settled ingress matter) from the sump of the bore and disinfection of the bore. In addition to this the rising main in the bore will be changed from stainless steel to a flexible hose, this will facilitate Council being able to conduct internal bore maintenance. A transducer will also be installed which will allow the bore yield and drawdown to be monitored via telemetry, thus Council can effectively monitor the performance of the bore.
- Construct a new Baradine backup bore. It is proposed to construct the new bore on the same Lot and DP as the existing bore, a survey will need to be completed to confirm the existing lot boundaries and to determine if a bore can be sunk safely on the same lot. Council will need to apply to amend the existing water supply works approval through DPE. The proposed bore will have the following specifications:
 - Total bore depth – 221m
 - Screens to be located between 97m and 221m, screens to be stainless steel mesh screens
 - PVC pipe casing
 - Pressure cemented to 97m, casing to 97m depth
 - Casing diameter 219mm
 - Screen diameter 168mm OD
- Redevelop the Dunedoo backup bore – this includes mechanical scrubbing of the existing bore casing, removal of foreign objects, bore bailing (removal of settled ingress matter) from the sump of the bore and disinfection of the bore. In addition to redevelopment works the following will be completed:
 - The rising main in the bore will be changed from stainless steel to a flexible hose, this will facilitate Council being able to conduct internal bore maintenance.
 - A transducer will also be installed which will allow the bore yield and drawdown to be monitored via telemetry, thus Council can effectively monitor the performance of the bore.
 - A new electrical connection and bore pump will be installed.

Following redevelopment of the Dunedoo backup bore, the bore will be continued to be monitored via telemetry to assess yields as well as draw downs. This information can be utilised to determine the appropriate timing to initiate the project that involves the construction of a new backup bore in Dunedoo. It is however recommended at this point in time, based upon the condition assessment completed by GHD, that the Dunedoo backup bore be replaced in FY 29/30. The scope of works for drilling a new Dunedoo backup bore includes the following:

- Construct a new Dunedoo bore – it is assumed that the existing Dunedoo backup bore has approximately 10 – 15 years of useful life remaining. The basis for this estimation is due to the age of similar assets that Council owns and have been discussed in this business case. The bore will be located on the same lot as the existing bore. The scope of works will involve the construction of a bore with the following specifications:
 - Total bore depth – 60m
 - Screens to be located between 31m and 60m, screens to be stainless steel mesh screens
 - PVC pipe casing

- Pressure cemented to 31m, casing to 31m depth
- Casing diameter 342mm
- Screen diameter 275mm OD

It is proposed that a new deeper bore be constructed into a deeper zone of the Talbragar alluvium channel. It is assumed this will improve the security of supply even in drought, this assumption will however be confirmed by a study to be completed in FY 23/24. If it is found additional depth will not secure the security of supply a shallow bore of the same depth specification can be constructed.

2.1.2 DESIGN AND CONSTRUCTION SPECIFICATIONS

All design and construction works are to be completed in accordance with the Minimum Construction Requirements for Water Bores in Australia, fourth edition.

2.1.3 BORE DECOMMISSIONING PLAN

It is proposed that both the Baradine backup bore and Dunedoo backup bore will be decommissioned. All decommissioning works are to be completed in accordance with the Minimum Construction Requirements for Water Bores in Australia, fourth edition.

2.2 OTHER OPTIONS CONSIDERED

A number of options were considered as part of the options assessment for this project. The options include a business as usual scenario, relining, drilling new bores and different combinations in order to establish the best value for Council investment. These options are discussed below.

2.2.1 OPTION 1 – DO NOTHING

Under option 1, Council does not make any alterations to the existing Baradine and Dunedoo water supply scheme groundwater infrastructure. Overall this option does result in no capital expenditure being required. However, none of the key project objectives or issues are addressed and thus the residual risk to Council will remain at a high level.

2.2.2 OPTION 2 – RELINE ALL EXISTING BORES

There is the option to consider relining all bores. The basis for pricing was developed from the advertised tender to reline bores in Dunedoo and Baradine. This option does present a number of issues to Council:

- Both the Baradine Main Bore and Baradine Backup Bore are not suitable assets to be relined due to the intake works to design. The slotted screens with stainless steel mesh screens will reduce the yield of the bore.
- A reline will reduce the diameter of the bore and could possibly compromise the yield.
- Will likely incur more operational cost and complexity due to the flagged blocking issue between wire mesh screens and slotted screens.
- The option does not represent an affordable solution to Council.

2.2.3 OPTION 3 – DRILL NEW BARADINE MAIN BORE, BARADINE BACKUP BORE, DUNEDOO BACKUP BORE

There is the option for Council to construct three new bores utilising inert casing and to the same specifications as the existing bores. It is assumed that the proposed bores would be drilled in close proximity to the existing bores in order to satisfy DPE licensing and approvals requirements and accelerate a works approval and minimise overall program and cost. Despite this, this option does not meet all project outcomes particularly affordability as this solution as drilling three new bores in an expensive infrastructure based solution.

2.2.4 OPTION 4 – REDEVELOP BARADINE MAIN BORE, REEQUIP BARADINE BACKUP BORE AND DRILL NEW BARADINE BACKUP BORE IN TWO YEARS, REDEVELOP DUNEDOO BACKUP BORE, DRILL NEW DEEPER DUNEDOO BORE WITH 5 YEAR DEFERMENT

Under this option, Council does have the option to defer the replacement of the Baradine backup bore, this approach has been supported in recommendations by GHD, as significant collapse of the bore structure is yet to be observed and Council can continue to monitor the performance of the bore. Although this may seem attractive it does present risk to Council as if there is a collapse then Council will again not have a backup water supply. Reequipping the existing backup bore will allow the main bore to be cleaned as water can be supplied from the backup bore to the WTP.

This option addresses all of the key project deliverables outlined in section 2.2. Redevelopment of the Dunedoo bore includes a mechanical clean and disinfection of the bore as well as removal of all debris from the sump of the bore, this activity will improve yields, reduce corrosion potential and extend the lifecycle. Following redevelopment of the existing backup bore the bore yields and drawdown will continue to be monitored as such to monitor the performance of the bore. Utilising monitoring data, an evidence based decision can be made to construct a new deeper bore in Dunedoo.

2.2.5 OPTION 5 – REDEVELOP BARADINE MAIN BORE, DRILL NEW BARADINE BACKUP BORE, REDEVELOP DUNEDOO BACKUP BORE, DRILL NEW DEEPER DUNEDOO BORE WITH 5 YEAR DEFERMENT

This option offers addresses all of the key project deliverables outlined in section 2.2. Redevelopment of the Dunedoo bore includes a mechanical clean and disinfection of the bore as well as removal of all debris from the sump of the bore, this activity will improve yields, reduce corrosion potential and extend the lifecycle. Following redevelopment of the existing backup bore the bore yields and drawdown will continue to be monitored as such to monitor the performance of the bore. Utilising monitoring data, an evidence-based decision can be made to construct a new deeper bore in Dunedoo.

Given that the Baradine backup bore design (depth and water bearing zone intake) will be replicated to the new bore, Council can equip the existing bore and following construction of the new backup bore, transfer equipment from the existing backup bore to the newly constructed backup bore. Following this methodology will incur no additional capital cost to Council. The pump in the existing Baradine backup bore will be protected as the pump depth is within the pressure cemented zone.

This option presents a very strategically affordable solution to Council, whilst also addressing and mitigating key projects risks in a timely manner. The solution requires the least capital investment over the next two financial years, which is when there are forecasted cashflow restrictions within the Water Fund, meaning the Water Fund is fully allocated for this period of time. The remainder of the solution can be implemented at a strategically acceptable point in time, this is recommended in the FY 29/30.

2.2.6 OPTION 6 – REDEVELOP BARADINE MAIN BORE, DRILL NEW BARADINE BACKUP BORE, EQUIP EXISTING DUNEDOO BACKUP BORE AND DRILL DEEPER NEW DUNEDOO BACKUP BORE

This option presents a solid solution to Council to resolve the existing water security of Dunedoo. Whilst this issue is not directly related with the condition of the existing groundwater infrastructure within Dunedoo, drilling a deeper bore into the alluvium channel within Dunedoo will more than likely further increase the security of supply even in drought conditions to residents in Dunedoo. This assumption, however, will need to be supported by further evidence. Council is planning to conduct a study in FY 23/24 to assess the water security of Dunedoo via

a independent consultant, with the scope of works to be endorsed by DPE. In the interim, as it is assumed a new bore will take approximately 12 months to commission the existing backup bore will be equipped in order to have an appropriate contingency for water supply in Dunedoo.

Whilst this option does offer improved water security to Dunedoo, it does not meet all of the project key objectives, as with this option the short term flexibility and robustness of the Dunedoo Water Scheme remains compromised in the short term as whilst the backup bore will be online, the condition of the infrastructure will not be ideal. In addition, this option does not meet strategic affordability criteria as it will require a heavy capital investment, this is not in the best interests of Council's Water fund.

Given that the Baradine backup bore design (depth and water bearing zone intake) will be replicated to the new bore, Council can equip the existing bore and following construction of the new backup bore, transfer equipment from the existing backup bore to the newly constructed backup bore.

2.2.7 OPTION 7 – REDEVELOP BARADINE MAIN BORE, DRILL NEW BARADINE BACKUP BORE, DRILL NEW DEEPER DUNEDOO BORE, REDEVELOP EXISTING DUNEDOO BACKUP BORE.

Baradine project objectives are all meet, the solution is offers flexibility, robustness and is maintainable, it does however require heavy capital investment and is not strategically affordable to Council.

In Dunedoo, the solution meets most key project objectives, a new bore is to be constructed meaning water security is greatly improved, robustness and flexibility of the operation is also greatly improved. The major downfall to this option is that it attracts a higher capital investment to Council and will also attract additional O&M costs due to additional infrastructure and more than likely higher energy costs associated with larger pumping equipment in a new deeper bore.

2.2.8 OPTION 8 – REDEVELOP BARADINE MAIN BORE, DRILL NEW BARADINE BACKUP BORE, DRILL NEW DUNEDOO BACKUP BORE

This option is very similar to the option that is discussed in option 6, however a shallow bore with the same design specifications as the existing backup bore will be drilled in contrast to a deeper bore (60m). This is the lowest capital investment option to Council over the lifecycle of the project. With that in mind, the strategic affordability is not as attractive as option 5, this option requires a capital investment of \$685,590 over the next two financial years whilst option 5 requires a capital investment of \$559,540 over the next two financial years followed by a further investment of \$294,125 in FY 29/30 to drill the new Dunedoo bore. This option offers no overall improvements to the water security of Dunedoo in comparison to the existing situation.

2.3 MULTI CRITERIA ANALYSIS OF CONSIDERED OPTIONS

2.3.1 MULTI CRITERIA ANALYSIS ASSESSMENT CRITERIA

In order to effectively assess the option discussed in section 3.2 above, a multi criteria analysis (MCA) has been completed. The MCA considered both price and non-price criteria.

The scoring methodology for the MCA is presented in the table below.

Table 5 - MCA Criteria

Assessment Parameter	Weighting
Non-Cost Factor Weighting	40%
Water Security	10%
Maintainability and Operability	10%
Flexibility and Robustness	10%
Strategic Affordability	10%

Cost Factor Weighting	60%
Capital Cost	60%
Total	100%

Fore non-price criteria, the following assessment basis was utilised.

Table 6 - Non-Price Assessment Criteria

Score	Description
10 Exceptional	Full achievement of the requirements specified in the documentation, for that criterion. Demonstrated strengths, no errors, risks, weaknesses or omissions.
8-9 Superior	Sound achievement of the requirements specified in the documentation, for that criterion. Some minor errors, risks, weaknesses or omissions which may be acceptable as offered.
6-7 Good	Reasonable achievement of the requirements specified in the documentation, for that criterion. Some errors, risks, weaknesses or omissions which can be corrected/overcome with minimum effort.
5 Adequate	Minimal achievement of the requirements specified in the documentation, for that criterion. Some errors, risks, weaknesses or omissions, which are possible to correct/overcome and make acceptable.
1-4 Poor to deficient	No achievement of the requirements specified in the documentation, for that criterion. Existence of numerous errors, risks, weaknesses or omissions, which are difficult to correct or overcome and make acceptable.
0 Unacceptable	Totally deficient and non-compliant.

Capital costs were assessed utilising the following formula:

- Weighted Price Score = (lowest forecast price / forecast price) x 100 x (price weighting %)

2.3.2 OPTIONS CAPITAL COST SUMMARY

Each of the options forecast capital expenditure are outlined in the table below. The costing basis is further discussed in section 3.4.

It should be noted that the costing basis has been formulated with a 10-year maximum horizon. Thus, it is assumed that within this period the Dunedoo backup bore will be required to be replaced. In this period it is assumed that the Baradine main bore will not need to be replaced given the proposed level of maintenance proposed through the various options highlighted in this business case.

Table 7 - Options Capital Cost Summary

Option	Capital Cost	Cost Factor Weighting
1	\$0.00	0
2	\$927,327.28	44.36
3	\$900,380.00	45.69
4	\$853,665.00	48.19
5	\$853,665.00	48.19

6	\$803,115.00	51.22
7	\$853,665.00	48.19
8	\$685,590.00	60.00

2.3.3 NON-COST MULTI CRITERIA ANALYSIS

The below table outlines the scoring for each of the non-cost MCA items and finds the overall non-cost factor weighting

Table 8 - Non-cost MCA

Option	Water Security	Maintainability and Operability	Flexibility and Robustness	Strategic Affordability	Non-Cost Factor Weighting
1	0	0	0	0	0
2	2	6	6	1	15
3	5	7	8	1	21
4	8	5	6	8	27
5	8	7	7	9	31
6	8	7	8	1	24
7	9	5	9	1	24
8	5	6	6	2	19

2.3.4 MULTI CRITERIA ANALYSIS

The results of the MCA are presented in the table below.

Table 9 - Multi Criteria Analysis Results

Option	Non-Cost Factor Weighting	Cost Factor Weighting	Total Weighting	Ranking
1	0	0	0	8
2	15	44.36	59.36	7
3	21	45.69	66.69	6
4	27	48.19	75.19	3
5	31	48.19	79.19	1
6	24	51.22	75.22	3
7	24	48.19	72.19	5
8	19	60.00	79.00	2

Utilising the qualitative approach outlined in this section, it has been determined that option 5 – redevelop Baradine main bore, drill new Baradine backup bore, redevelop existing Dunedoo backup bore and drill new

2.4 PROJECTED COSTS

2.4.1 PROJECTED CAPITAL COSTS

Projected capital costs presented in this section and in section 2.3 were developed utilising the following:

- Contractor quotations
- Consultant advice
- Previous Council project experience

The capital costs are based on real market value pricing.

Table 10 - Capital Budget for preferred Option

Bore Rehabilitation Project	FY 23/24	FY 24/25	Total
Bore Redevelopment	Baradine Main Bore	Dunedoo Backup Bore	
Mobilisation	\$5,000	\$5,000	\$10,000
Personnel and equipment	\$7,500	\$7,500	\$15,000
Bore redevelopment	\$30,000	\$15,000	\$45,000
Mobile CCTV Unit	\$5,000	\$5,000	\$10,000
Headworks modifications	\$7,000	\$7,000	\$14,000
Transducer, crusader hose, connection to telemetry	\$15,000	\$3,000	\$18,000
Bore pump removal and reinstall	\$5,000	\$5,000	\$10,000
Bore equipping	\$0	\$50,000	\$50,000
Council Project Management	\$3,000	\$3,000	\$6,000
Base Cost Estimate	\$77,500	\$100,500	\$178,000
Contingency (10%)	\$7,750	\$10,050	\$17,800
Nominal cost	\$85,250	\$110,550	\$195,800
Bore Construction	Dunedoo Backup Bore (Completed in FY 29/30)	Baradine Backup Bore	
Drill New Bore (Includes Mobilisation, Drilling and Materials)	\$81,250	\$157,800	\$239,050
Site Establishment – Earth works, removal of drilling mud etc	\$20,000	\$20,000	\$40,000
Mobilisation	\$10,000	\$10,000	\$20,000
Bore Equipping	\$80,000	\$57,000	\$137,000
Telemetry Connection	\$7,500	\$7,500	\$15,000
Test Pumping	\$10,000	\$10,000	\$20,000
Council Project Management	\$7,500	\$7,500	\$15,000
Hydrogeological Support	\$10,000	\$10,000	\$20,000

Base Cost Estimate	\$226,250	\$279,800	\$506,050
Contingency (30%)	\$67,875	\$83,940	\$151,815
Nominal cost	\$294,125	\$363,740	\$657,865

2.4.2 PROJECTED ONGOING COSTS

It is expected that the design life of newly constructed bores is 50 years given the proposed inert casing and pressure cement protection. These assets however will need to be monitored and routinely maintained as required. It is assumed that bores will be required to be cleaned every 10 years, however this will be triggered by performance monitoring. Cleaning costs are outlined in the table below.

Table 11 - Projected Ongoing Costs

Bore	Proposed Cleaning Cost
Baradine Main Bore	\$50,500
Baradine Backup Bore	\$50,500
Dunedoo Backup Bore	\$32,500

These works will be required to be planned and will be integrated into the capital works program.

2.5 FINANCIAL APPRAISAL

This project and the proposed capital contributions have been modelled utilising Council's 30 year cashflow forecasting model. The base case capital works program has been adjusted in order to deliver the full suite of planned capital works over the next 30 financial years, with the next 10 years being the most important. A number of key changes have been made to Council's base case capital works program including the following:

- Timor Dam scour valve replacement project has been delayed to FY 2028/29 to allow sufficient recovery of capital within the Water Fund.
- Mendooran WTP Upgrade is drawn out and delivered over a 5 year period in order to spread the overall capital expenditure over a number of years.

Forecasted capital cost is summarised in section 3.4.

Utilising the adjusted Water Fund base case, the forecasted closing cash balance in the Water Fund is depicted in the below table.

Table 12 - Strategic Water Fund Assessment

Financial Year	Cash Balance in Water Fund
FY 23/24	\$466,057
FY 24/25	\$489,576
FY 25/26	\$249,760
FY 26/27	\$1,099,858
FY 27/28	\$1,175,157
FY 28/29	\$1,374,712
FY 29/30	\$125,847
FY 30/31	\$921,800
FY 31/32	\$2,378,260
FY 32/33	\$2,787,613

Thus, whilst Council's Water Fund does not record a forecasted negative result, it should be noted that the Water Fund does approach zero net cash particularly in FY 30/31. This does represent much contingency within the fund for Council and it is possible that a loan may be required in the event of an emergency or Council requiring to complete any unplanned works.

2.6 PROPOSED FUNDING ARRANGEMENTS

This project is to be funded exclusively from Council's Water Fund. The affordability of the proposed solution has been assessed in section 2.5 of this document.

3 PROGRAM AND MILESTONES

Please refer to attachment 5 for the project plan, key milestones from the project plan are summarised in the below table.

Table 13 - Project Key Milestones

Milestone	Date
Council Approval of Business Case	28/08/2023
Tender Award – Stage 1	15/01/2024
Dunedoo Backup Bore Refurbishment Complete	24/06/2024
Baradine Backup Bore Commissioned	03/06/2024
Baradine Main Bore Refurbishment Complete	23/09/2024
Stage 2 Works Commencement – Dunedoo Backup Bore Replacement	02/07/2029
Completion of Stage 2 Works	26/07/30

4 GOVERNANCE

4.1 ORGANISATIONAL STRUCTURE

Table 14 - Project Organisation Hierarchy

Role	Personnel	Responsibility	Reporting To
Council	Ambrose Doolan	Approval of the project including the proposed preferred option and Contractor's.	The community
General Manager	Roger Bailey	Responsible for liaising between Council staff and Councillors.	Council
Project Director	Leeanne Ryan	Overall oversight of the project and ensuring that the project manager delivers the project on time, to budget and the project meets the key deliverables.	General Manager
Project Manager	Tom Cleary	Responsible for general running of the project including procurement, contract management, financial management, reporting and liaising with the community.	Project Director
Contractor	TBA	The contractor will be responsible for the overall delivery of the physical scope of works.	Project Manager
Hydrogeologist	TBA	The hydrogeologist will be responsible for bore design oversight and providing technical direction as requested from the Project Manager.	Project Manager

Council will undertake the role as Principal and Project Manager during the construction phase of the project. A hydrogeologist will be engaged by Council to provide technical assistance as required, most likely in developing tender documents a reviewing bore design and construction techniques. Council will complete all contract administration internally; these activities will be delegated to other assigned project staff by the Project Manager as required.

4.2 KEY RISKS

Key project risks and risk mitigation strategies are summarised in the below table.

Table 15 - Key Project Risks

Location	Risk Description	Inherent Consequence	Inherent Likelihood	Inherent Risk	Existing Controls	Residual Risk
Baradine Backup Bore	Collapse of bore prior to construction of new bore	Major	Unlikely	Moderate	Accelerate new bore construction	Moderate
	Cost exceeding project budget	Moderate	Possible	High	Competitive quotation process with high price weighting, 30% contingency adopted in the project budget	Moderate
Dunedoo Main Bore	Damage caused by mechanical cleaning to bore casing	Catastrophic	Possible	High	Integrate ITP's into contract, have appropriate liability and liquidated damages written into the executed contract.	High
	Bore failure prior to planned replacement	Catastrophic	Possible	High	Adequate monitoring and maintenance as required	High
	Cost exceeding project budget	Moderate	Possible	High	Competitive quotation process with high price weighting, 30% contingency adopted in the project budget	High
Baradine Main Bore	Damage caused by mechanical cleaning to bore casing	Catastrophic	Possible	High	Integrate ITP's into contract, have appropriate liability and liquidated damages written into the executed contract.	High
	Bore failure prior to planned replacement	Catastrophic	Possible	High	Adequate monitoring and maintenance as required	High
	Cost exceeding project budget	Moderate	Possible	High	Competitive quotation process with high price weighting, 30% contingency adopted in the project budget	High

4.3 LEGISLATIVE, REGULATORY ISSUES & APPROVALS

In order to construct new bores, Council will need to apply to the Department of Planning and Environment to amend existing water supply works approvals. This application will be assessed under the Water Management Act 200 (NSW). Council will meet with DPE to discuss the intent of the application and liaise with DPE prior to the submission of the application.

5 ATTACHMENTS

1. Attachment 1 - ACS Equip- Baradine Back-Up Bore Assessment Report
2. Attachment 2 - ACS Equip - Baradine Main Bore Assessment Report
3. Attachment 3 - ACS Equip - Dunedoo Old Bore Assessment Report
4. Attachment 4 - GHD - Independent Review of Bore CCTV Footage
5. Attachment 5 - Bore Refurbishment Project Plan