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2. PROJECT RATIONALE AND ALTERNATIVES

2.1 Water Supply Planning and Policy Context

Central Queensland is one of the State's key growth regions, based predominantly on the significant natural coal resources of the Surat and Bowen Basins.

Key Queensland Government water supply objectives relevant to the Dawson – Fitzroy catchments include:

- providing additional water to the rapidly growing coalfields and coal mining towns in the Bowen Basin;
- providing secure water supplies to the Surat Basin to enable industry to unlock the vast thermal energy resources of the Basin and stimulate the rural economy;
- providing water to future industry in Rockhampton and securing water supplies to Yeppoon; and
- guaranteeing water to industry in Gladstone.

In order to better balance water supply with increasing demands from urban communities, mining, industry and rural users, and environmental requirements, and improve both economic and environmental outcomes, the Government commissioned preparation the *Fitzroy Basin Water Resource Plan 1999* (WRP) (NRW, 1999) under the *Water Act 2000* and the *Central Queensland Regional Water Supply Strategy* (CQRWSS) (NRW, 2006b).

The objective of the CQRWSS is to develop a long-term water supply strategy that fully considers evolving water needs and provides the best available solutions for meeting them (NRW, 2006b). Development of the CQRWSS was initiated through the Central Queensland Regional Water Supply Study and was driven by industrial and urban growth around the Capricorn and Curtis Coasts, and mining and urban growth in the Bowen and northern Surat Basin coalfields.

The CQRWSS is based on existing water supply and demand data, identified mining and industrial growth in the region and projected future demand. The CQRWSS notes that water supplies in the Dawson – Callide sub-region are limited, with most sources fully committed and that all unallocated supplies in the sub-region are reserved to be developed as part of the Nathan Dam proposal.

The CQRWSS records that the mining expansion is expected to continue throughout the Bowen Basin and the northern Surat Basin coal fields. Providing secure water supply to the Surat Basin, thereby enabling industry to unlock the vast thermal energy resources of the Surat and to stimulate the rural economy, is a key component of the Queensland Government's *Statewide Water Policy* released in 2006 (DIP, 2006).

The CQRWSS also recognises that potential new coal mines in the Taroom and Wandoan areas will need to obtain water from the Dawson-Callide sub-region by 2011. It further recognises that if the Nathan Dam has not been constructed before the anticipated mines plan to commence operation, there are a number of alternative options that could be considered including ground water from the great artesian basin (GAB), water associated with coal seam gas extraction or the raising of Glebe Weir.

Consistent with the CQRWSS and Statewide Water Policy, the raising of Glebe Weir is now proposed as one of three raw water supply options for the Wandoan Coal Project.

2.2 Need for Project

The WJV requires a secure (high priority) raw water supply for operations of the proposed Wandoan Coal Project.

Initial water demand for the Project through the construction phase will be approximately 3,000 ML/year by 2011. Coal production will reach the currently envisaged rate of extraction of 30 megatonnes per year (Mt/year) by 2014 when approximately 8,500 ML/year of makeup water will be required for coal washing and dust suppression.

The WJV has explored several alternative water supply sources for the mine. As part of the Project's prefeasibility studies, it was established that the GAB does not provide a feasible water supply alternative.

The Glebe Option was identified as a viable water supply option.

2.2.1 Benefits / Costs of the Glebe Option

The key direct and indirect benefits of the Glebe Option will flow from the capital expenditure of approximately \$160 M dollars for construction of the weir and associated pipeline (if the Glebe Option water supply option is selected). The construction timeframe for the weir is estimated to be 2 years, beginning from late 2009.

In terms of direct economic benefits, capital expenditure will occur regionally (Gladstone, Rockhampton) and in Brisbane with expenditure mainly related to construction of pipes, supply of bulk cement and steel. However there are likely to be some local flow on benefits related to expenditure by the temporary construction workforce.

It is likely that the maximum workforce for the Glebe Option over the 2 year construction period will be approximately 80 people and they will need to be accommodated locally (in Taroom and / or Wandoan), creating flow-on benefits for local businesses. This is further explained in **Chapter 17**.

The long-term, indirect economic benefits of the Glebe Option relate to those of the overall Project where the water supplied will be put to beneficial use to support the Wandoan mining venture. These benefits are discussed in Volume 1 of the EIS.

The main impacts of the Glebe Option primarily relate to:

- local loss of Good Quality Agricultural Land (920 ha, of which 710 ha is on state owned land);
- minor land acquisition and the registering of an easement for the pipeline;
- temporary traffic issues associated with construction traffic;
- temporary minor noise, dust and visual impacts from construction activities; and
- potential social implications of a temporary construction workforce.

While there will be some temporary impacts to the existing environment and community as a result of the construction activities, Volume 4 of the EIS assesses that the Glebe Option is likely to operate with minimal impact to existing environmental and social values.

The direct environmental benefits of the Glebe Option include the commitment to fit a fishway and multi-level offtake to the structure if Nathan Dam is not approved. The weir currently has neither of these structures. The Glebe Option will also continue to achieve water supply security and environmental flow objectives in compliance with the Water Resources (Fitzroy Basin) Plan (WRP) (NRW, 1999) and the Resource Operation Plan (ROP) (NRW, 2006a). At the completion of construction, the camping and recreation facilities will be reinstated so that they continue to provide recreation and tourism benefits to the region.

These issues have been addressed in the respective chapters of Volume 4 of the EIS.

2.3 Alternatives to the Glebe Option

The WJV is investigating several water supply options for the Project (Xstrata Coal, 2007) including:

- Alternative 1 – Do Nothing
- Alternative 2 – Treated by-product water from coal seam gas (CSG) extraction via pipeline from CSG operations to the west of the Wandoan Coal Project area (approximately 80 km)
- Alternative 3 – Treated by-product water from CSG extraction via pipeline from CSG operations to the south of Miles (approximately 100 km)
- Alternative 4 – Supply of water from the Dawson River via a pipeline from the raised Glebe Weir (the subject of this impact assessment)

This Volume 4 of the EIS assesses water supply Alternative 4.

Alternatives to conceptual design and location of weir raising infrastructure and the pipeline have also been identified and assessed, including the reasons for selection of preferred design and locations aspects. The assessment of the alternatives to the weir raising infrastructure was undertaken taking into account the principle of ecologically sustainable development, which requires the effective integration of long and short term economic, environmental, social and equity considerations so that development aims to both “meet the needs of Australians today, while conserving our ecosystems for the benefits of future generations” (*National Strategy for Ecologically Sustainable Development*, DEWHA 1992).

The existing Dawson Valley Water Supply Scheme does not have spare capacity from which to supply the additional allocation required by the Project. Integrated Quantity and Quality Modelling (IQQM) has established that that Glebe Weir, if raised to the proposed FSL of 172.9 m AHD, will provide an additional 12,400 ML of storage that generates 6,500 ML of high priority yield. As this volume of water is insufficient to meet the requirements of the Wandoan Coal Project, SunWater will source the shortfall through other options which may include purchase of existing medium priority water entitlements supplied from the Dawson Valley Water Supply Scheme. This is feasible through the existing water trading system (Fitzroy Basin ROP, NRW, 2006a).

Any high priority water allocation made as a result of the Glebe Option will be transferred to the Nathan Dam (if approved).

2.3.1 The ‘Do Nothing’ Option

If supplies from Glebe Weir are selected to supply all or part of the water required by the Project, failure to proceed with the Glebe Option would jeopardise the Wandoan Coal Project and the resultant economic and employment benefits to the Central Queensland Region, to Queensland, and to Australia.

If Glebe Weir is not raised, SunWater will not be able to provide sufficient water to cover all or part of the supply required by the Project. Nevertheless, the Project will select the most appropriate source of water or mix of sources to meet its requirements. This selection will include consideration of reliability, water quality, cost and other commercial factors over both the short and long-term. If the Project does not select water from Glebe Weir as part of its water supply package, then the Glebe Option will not proceed as part of the Wandoan Coal Project.

2.3.2 Alternative 4 Alternative sources from the Dawson River

Potential alternatives to the Glebe Option as sources of Dawson River water for the Project are:

- Nathan Dam;
- a new storage upstream of Glebe Weir; and
- raising Gylanda Weir.

2.3.2.1 Alternative 4a Nathan Dam

Pursuant to the program of works approved under the State Development and Public Works Organisation (SDPWO) Act, SunWater has been designated the responsible proponent to complete a final business case for the Nathan Dam by March 2011. It is a requirement of the program of works that SunWater undertakes the environmental assessment and applies for and uses its best endeavours to obtain all approvals required for the Nathan Dam.

Under the program of works, the outcome may be a business case approval for the Nathan Dam by the Coordinator-General. This is not a commitment to the ultimate construction and development of the Nathan Dam and the program of works expressly prohibits the proponent implying any level of prior government approval for the Nathan Dam to proceed beyond the business case approval stage.

On the timetable for submission of the business case under the program of works approved under the SDPWO Act, the Nathan Dam project will not be approved and constructed in time to service the Wandoan Coal Project's needs. The needs of the Wandoan Coal Project would not of themselves be sufficient to justify Nathan Dam.

Nathan Dam is therefore not a prudent alternative to the Glebe Option, primarily because of the time constraint.

2.3.2.2 *Alternative 4b New storage upstream of Glebe Weir*

Potential sites for construction of a new storage upstream of Glebe Weir were investigated in association with studies on the Dawson River Dam in the late 1990s (Hyder Environmental 1997). Russo (1995) reported alternative dam sites and Russo (1996) reported alternative weir sites. Both studies, plus offstream storage options, were reviewed by SMEC (1996). In assessing prudent and feasible alternatives to the Glebe Option two critical factors were first considered:

- the minimum yield that must be obtained from any alternative site is 6,500-8,500ML/a.
- the pipeline cost is a major determinant of overall cost, hence the distance from the site to the mine must not be significantly greater than that from Glebe Weir.

If these criteria were satisfied then the options were further assessed. At Glebe Weir the minimum acceptable yield is achieved by an additional storage volume of 12,400ML on top of the existing volume of 17,700ML. A potential weir site at Llandillo (407.9km AMTD), once mooted as a water supply for potential power stations in the Wandoan area, could only yield about 2,250ML. Another site at about 360km AMTD could only provide a volume of 12,000ML when fully developed (using a fixed crest weir and an inflatable dam) and as its catchment was smaller than that of Glebe Weir, the yield would be less reliable. The inundation area of such a storage would enter the town of Taroom and potentially impact on the Bundulla cemetery, an important site of cultural heritage.

The gradient of the Dawson River upstream of Taroom steepens and the channel cross-section becomes smaller, making it highly unlikely that a weir with the necessary yield to supply the Project could be constructed. An exception is a site at 469km AMTD (Baroondah). This site is approximately 85km upstream of Taroom while Glebe Weir is approximately 55km below Taroom. A considerably longer pipeline, traversing steeper country, would be required and would add considerably to project cost (approximately 1.5-2 million dollars per kilometre). The site was originally abandoned as an alternative to the Nathan Dam site because the costs of resumption and relocation made it unviable.

The cost of development of any greenfield site would be considerably more than that of raising an existing structure. A significant part of this cost is land resumption, much of which has already been undertaken at Glebe. The social impact associated with resumption would be commensurately greater at a greenfield site.

Similarly any new weir development would be expected to have considerably higher environmental costs than raising the existing Glebe Weir because a much larger area of riparian zone would be impacted, a much greater length of river would be inundated (for example the initial inundation of the Dawson River at Glebe Weir was 30.3 km while the raising proposal would only inundate a further 2.3 km), another barrier would be placed across the river and the flow regime would be regulated over a longer length of river.

In summary, few sites are available which could provide the necessary yield at a competitive price and the relative environmental and social costs associated with development of a greenfield site are not justified when modification to an existing structure can provide an economically viable alternative.

2.3.2.3 *Alternative 4c Gylanda Weir*

Gylanda Weir is located downstream of Glebe Weir at AMTD 284.5 km, which is also downstream of Nathan Gorge. When full, Gylanda Weir currently backs water up through the Gorge. Gylanda Weir's design allows for a 1.5 m raising by fixing an inflatable rubber dam to the crest. At this level the weir's capacity would be increased by only 6,300 ML, which is insufficient to supply the yield required by the Project. It would therefore still be necessary to raise Glebe Weir. Besides not meeting this critical element, the additional length of pipeline plus the cost to pump from a lower elevation, make the option economically prohibitive. Raising Gylanda Weir would also inundate more of the relatively pristine Nathan Gorge, which abuts Precipice National Park.

2.3.3 Summary of Alternatives

Based on the assessment of alternatives, and taking into account the principles of ecologically sustainable development, the preferred alternative for water supply Option 4 for the overall Project is the raising of Glebe Weir.

The Glebe Option has been assessed to achieve the most sustainable outcome for the Dawson River natural environment, as well as the social and economic environment of the region.

2.3.4 Pipeline Options

The corridor for the pipeline (Error! Reference source not found.) from Glebe Weir to the Wandoan Coal Project area has been selected based on criteria including:

- minimising route length
- possible redundancy of a section if the Nathan Dam Project proceeds;
- minimising maximum elevations along the route;
- avoiding crossing the Dawson River or Cockatoo Creek within the Glebe Weir reservoir area; and
- maximising the use of existing road reserves and co-locating with existing or proposed infrastructure as far as possible (including the planned SBR corridor).

The option to co-locate within the proposed SBR corridor was assessed but:

- the location of the alignment was not well defined within a broader planning corridor;
- the Nathan Road reserve represented a more direct route with fewer impacts to private property; and
- other services were already co-located within the reserve (power and telecommunications as well as the road itself).

The location of the SBR corridor in comparison to the Nathan Road reserve is shown in **Figure 2-1**.

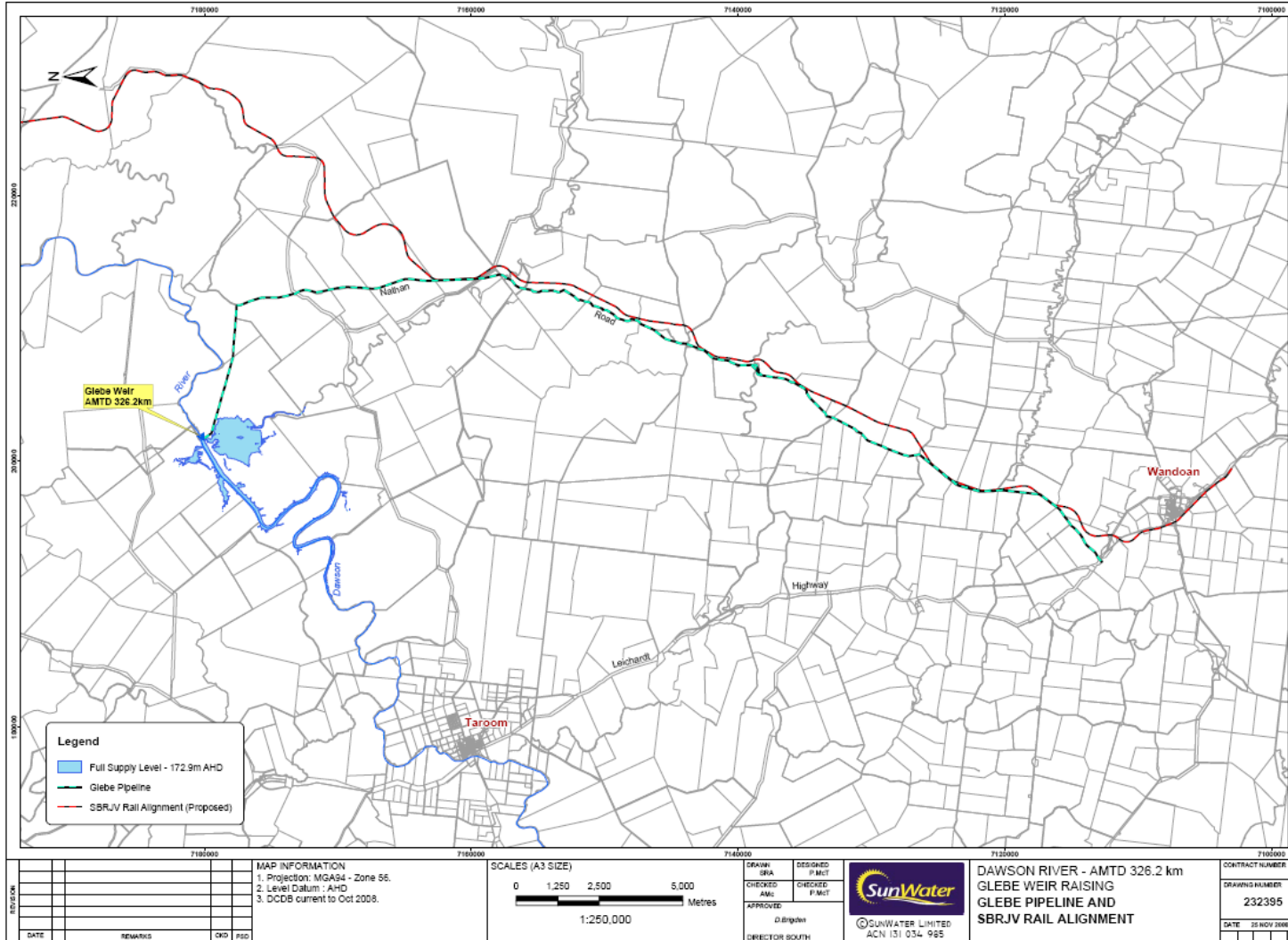


Figure 2-1 Glebe pipeline and SBRJV Rail alignment

At the time of compiling the EIS, two other studies were being undertaken addressing the option of co-locating the pipeline within the SBR corridor, these being the SBR EIS and the Surat Basin to Gladstone Linear Infrastructure and Services Corridor Study which is being developed by the Department of Infrastructure and Planning. Both of these studies will review the option of aligning the Glebe pipeline directly adjacent to the SBR. Should these studies identify any factors not previously considered by SunWater in their assessment of pipeline route options, SunWater will revisit its route selection process to give consideration to these.

Another option was assessed which was shorter than the Nathan Road reserve option and was of reduced elevation at the high point, both attributes which reduced capital and operating costs. However the approximate 6 km saving in route length required easements across 46 km of private property, as opposed to approximately 12 km. This also necessitated construction of a maintenance access track which was served by Nathan Road for the majority of the road reserve option. Much of the land to be traversed was heavily timbered and this would require clearing. As a lower elevation route, the major creeks to be crossed were larger and more likely to be holding water during construction.

As a result, the Nathan Road reserve route was assessed as being the preferred option.

The preferred alignment within the broader corridor has been selected to:

- minimise the number of, and area within, private properties affected;
- minimise the extent of clearing of relatively undisturbed vegetation (even when that vegetation is not mapped as remnant within a State planning context);
- achieve the best alignments for crossing creeks and drainage lines; and
- reduce the highest elevation on the route by by-passing high points.

The preferred alignment will be located mainly within the existing road reserve, which already contains power and telecommunication facilities, resulting in four co-located services utilising the single corridor.