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LIST OF ABBREVIATIONS

AHD	Australian height datum
AMTD	Adopted middle thread distance
CID	Community infrastructure designation
CG	Coordinator-General
CQRWSS	Central Queensland Regional Water Supply Strategy
DEWHA	Department of the Environment, Water, Heritage and the Arts (Commonwealth)
DIP	Department of Infrastructure and Planning (Qld)
EIS	Environmental impact statement
EMP	Environmental management plan
EPA	Environmental Protection Agency (Qld)
EPBC Act	<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>
FSL	Full supply level
IAS	Initial advice statement
IDAS	Integrated Development Assessment System
IPA	<i>Integrated Planning Act 1997</i>
LGA	Local government area
ML	Megalitres
NRW	Department of Natural Resources and Water (Qld)
ROP	Resource operations plan
SDPWO Act	<i>State Development and Public Works Organisation Act 1971</i>
The project	The Nathan Dam project – significant project declaration to be sought
ToR	Terms of reference
VMA	<i>Vegetation Management Act 1999</i>
WRP	Water resource plan

1.0 INTRODUCTION

1.1 BACKGROUND

A dam on the Dawson River was originally proposed in 1922. Sited in the Nathan Gorge and destined to inundate the township of Taroom, the dam had a design capacity of three million megalitres (ML). For various reasons it didn't proceed.

The project gained impetus during the 1990s due to ongoing drought and increasing water demands in the region. A new proposal was developed to build a dam that would primarily supply irrigation water to 30,000 hectares of land (mostly for cotton) in the Lower Dawson Valley. The dam wall was moved from that of the original proposal to a site approximately 2.0 km upstream of the entrance to the gorge, and the storage size was substantially reduced to minimise cultural heritage and environmental impacts and avoid the inundation of Taroom.

An impact assessment study was completed by Hyder Environmental for the Department of Natural Resources in September 1997. The study found that, with appropriate management, no significant adverse impacts existed that would prevent the development from being progressed. Expressions of interest were then sought from the private sector and SUDAW Developments Ltd was chosen as the preferred developer of the dam on a fully commercial basis.

In August 2002, SUDAW referred the project for assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The (then) Australian Minister for Environment and Heritage approved the proposal; however, in December 2002 the Queensland Conservation Council and the World Wide Fund for Nature (Australia) applied for a judicial review of the Minister's decision. They argued that the environmental assessment report needed to address potential consequential impacts on the Great Barrier Reef – a position that was upheld by the Full Federal Court. SUDAW did not subsequently progress a revised EIS and no further work was undertaken on the proposal.

In 2006 the Central Queensland Regional Water Supply Strategy (CQRWSS) was released. The strategy examined the adequacy of current water supplies for existing and future demands across the Fitzroy River Basin and associated coastal areas and highlighted a short- to medium-term

need for additional supplies in the Dawson–Callide sub-region that could not be met by water trading or efficiency measures. It indicated that these demands could be met through the construction of a dam on the Dawson River, hereafter referred to as Nathan Dam.

In August 2006, the Queensland Government released its *Statewide Water Policy*, which outlined a plan to improve water security and support future economic growth in regional Queensland. The policy supports a \$420 million investment in regional water infrastructure which aims to meet the needs of urban and rural users as well as:

- enable the development of Bowen as a major industrial centre of the future
- provide additional water to the rapidly growing coalfield and coal mining communities in the Bowen Basin
- drought-proof coastal communities to ensure the viability of valuable tourism and manufacturing industries
- provide secure water supplies to the Surat Basin to open up the vast thermal coal reserves for mining and stimulate the rural economy
- provide secure water supplies for industrial and urban users in Central Queensland.

The *Statewide Water Policy* identifies 11 regional water infrastructure projects, with \$222 million committed for the development of dams and weirs and \$198 million for channels and pipelines. Funding of \$120 million was designated for the design and construction of the proposed Nathan Dam, subject to the Commonwealth Government’s approval under the EPBC Act.

In July 2007, the Queensland Government directed that a delivery program for the regional water projects be established and designated proponents to progress the projects through feasibility investigations and approvals to development of a business case. SunWater was designated as the proponent to develop the business case for Nathan Dam.

Given the timeframes within which water supply enhancements are required, the environmental approvals process will be conducted in parallel with the refinement of other components of the business case. As such, robust estimates of demand levels and location, the means of transporting

water to demand points and the end uses of the water will progress in line with the various studies. Development of the business case and the environmental impact statement (EIS) are complementary processes in that each component will take into account the outputs of the other in decision-making. The definition of the project included in the submitted EIS will consequently be more precise than that included here.

When the business case for the Nathan Dam has been finalised, the Government will be in a position to consider whether to proceed to construction and assess the commerciality of the proposed development.

1.2 THE PROPONENT

In July 2007 SunWater was announced by the Queensland Government as the designated proponent to develop the business case and undertake the EIS process for the Nathan Dam project.

SunWater owns and operates bulk water supply and distribution infrastructure located throughout regional Queensland that has a replacement value of \$4.6 billion. It supplies approximately 40% of the water used commercially in Queensland via 27 water supply schemes and three subsidiary companies. Its water supply customers number close to 6,000 and include mining, industrial and manufacturing companies, local governments, power stations, irrigators and local water boards.

SunWater specialises in the investigation, design, construction, operation and maintenance of water infrastructure, as well as supply of water to rural, urban and industrial customers. It has extensive experience in water supply development, and has the support systems in place to enable it to effectively implement the Nathan Dam project and ensure compliance with relevant legislation, including certified quality, environmental and workplace health and safety management systems. SunWater's Environmental Policy is shown on the following page.

SunWater is also the business case proponent for other water resource projects in the region nominated in the Queensland Regional Water Infrastructure Program, specifically Connors River Dam, Rookwood Weir and Raising Eden Bann Weir.

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1.3 PURPOSE AND SCOPE OF THE IAS

This initial advice statement (IAS) relates to the construction and operational impacts of the project and has been prepared to:

- assist the Coordinator-General (CG) in the decision making process on a declaration of the project as a 'significant project' under s.26 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act)
- assist the CG to prepare draft Terms of Reference (ToR) for the project's environmental impact statement (EIS); and
- enable stakeholders to determine the nature and level of their interest in the project.

2.0 THE PROPOSAL

2.1 LOCATION

Nathan Dam is proposed for construction in the vicinity of Nathan Gorge on the Dawson River, about 75 km downstream of Taroom and 315 km upstream of the confluence of the Dawson River with the Fitzroy River (Figure 1). It is a further 250 km to the Fitzroy Barrage at Rockhampton (which marks the extent of tidal influence in the Fitzroy River) and another 60 km to the mouth of the Fitzroy River. The total distance from the dam site to the Fitzroy River mouth is approximately 620 km.

Figure 1: Regional location plan.

The proponent will undertake a rigorous assessment of potential dam sites as part of the project EIS. Studies will build on the knowledge gained from previous investigations and will include geotechnical, topographical, hydrological, environmental and cultural heritage investigations.

In choosing the preferred site, the proponent will aim to maximise storage and construction efficiency while minimising adverse environmental, cultural heritage and socio-economic impacts on the local community.

Figure 2 illustrates a potential dam site at adopted middle thread distance (AMTD) 315.3 km (latitude 25:27:51S, longitude 150:06:52E), which is about 2.0 km upstream of the gorge entrance.

The project includes construction and operation of the dam, including distribution of water to demand nodes. Construction will include the dam wall, an access road, offtake infrastructure and pipeline systems to distribute the water to demand nodes. It is likely that a major pipeline from Nathan Dam will be constructed through the Surat Basin to supply mining, power generation, and urban customers in this region. Water will also be released downstream for extraction by customers adjacent to the watercourse. Water used for urban purposes during critical supply periods would be treated using existing infrastructure and would supplement existing supplies.

SunWater is currently assessing the feasibility of raising Glebe Weir for the purpose of supplying water to the Wandoan Coal Mine being developed by Xstrata. Glebe Weir is located on the Dawson River at AMTD 326.2 km, approximately 10.9 km upstream of the proposed Nathan Dam site. The mine is projected to commence operations in late 2011, which is several years before the planned construction timeframe for the dam.

The weir raising would be undertaken on the basis that it will form the long-term water supply solution for the mine, and is a completely separate project to Nathan Dam. However, the pipeline that will supply Wandoan Coal Mine from Glebe Weir is likely to follow the same route as the eventual Nathan–Surat pipeline for the vast majority of its length. In view of this, SunWater is examining the viability of constructing the Glebe–Wandoan pipeline to a larger-than-required capacity, which would allow the pipeline to be extended beyond Wandoan should the Nathan project proceed, in order to supply water users other than Xstrata. This would avoid

Figure 2: Extent of inundation

an otherwise likely scenario of two pipelines being constructed from the Dawson River to Wandoan along an identical route. Should Nathan not proceed, the pipeline will continue to service the needs of the Wandoan mine exclusively.

It should be noted that if Nathan Dam proceeds it will inundate Glebe Weir, at which point the water allocations from Glebe would be transferred to Nathan.

2.2 PROJECT JUSTIFICATION

The CQRWSS highlighted the ongoing growth in urban and industrial development in the region, particularly in the Lower Fitzroy and Gladstone areas, and in the Bowen and Surat coal basins. Water entitlements in some of the existing supply systems in the region are at or approaching full usage, and some are performing below water users' requirements. Based on projections of water demand to meet urban, industrial, coal mining and agriculture requirements from 2005–20, supply shortfalls were predicted throughout much of the region, affecting future economic prosperity.

The existing Dawson Valley Water Supply Scheme, in which the proposed Nathan dam is located, relies on a series of relatively small-capacity weirs along the Dawson River. These storages are dependent on regular seasonal flows and access to medium priority water (for agricultural purposes) is often restricted at the start of the water year. Similarly, urban and industrial users with access to high priority water may occasionally experience restricted supplies until wet season flows replenish the weir storages.

The CQRWSS identified an immediate shortfall in high-priority water supply potential of 3,300 ML/yr for urban and industrial use in the Moura area (downstream of the proposed dam). The longer-term shortfall for high-priority urban and industrial supplies across the Dawson–Callide subregion was estimated at 6,000 ML by 2010, 10,000 ML by 2015 and 12,000 ML by 2020. In addition, there is a potential need for reserve supplies for the Lower Fitzroy during times of critical supply needs.

The proponent is undertaking demand surveys of likely future high-priority water requirements for coal mining and power generation in the area. Current indications are that by 2020, demand could be in the order of 40,000 ML/yr from the Surat Coal Basin in addition to the demands from

the Dawson–Callide subregion, indicating a critical need for additional high-reliability supplies in the region. Rigorous demand surveys will be undertaken as part of the project business case development to confirm the preliminary estimates.

The Fitzroy Basin Water Resource Plan (WRP) was developed at the time when Nathan Dam was an approved project. The plan included a medium-priority water allocation of 190,000 ML for the project, which accounts for all unallocated water in the Dawson–Callide sub-region. This allocation was based on the assumptions that:

- a dam with a capacity of 880,000 ML was constructed on the Dawson River at AMTD 315.3 km, and
- a weir with a capacity of 6,000 ML was constructed on the Dawson River at AMTD 30.1 km.

The WRP provides for the granting of an equivalent volume of water allocations in a different priority group provided the environmental flow and water allocation security objectives are not adversely affected. In consideration of revised storage parameters and the requirement for high priority water entitlements for mining and industrial uses, the WRP water allocation provisions for Nathan Dam will need to be reviewed. There is currently no plan to construct the weir noted above and it does not form part of the Project.

2.3 PROJECT ALTERNATIVES

A range of potential alternatives to a major dam on the Dawson River have been assessed by the CQRWSS and previous Dawson River dam studies. These include the use of groundwater, coal seam methane water and alternative surface water storages (e.g. offstream storages or additional weirs). None of these options were considered to be capable of reliably providing the quantity of additional water that is required in the region, in particular to support the rapidly expanding requirements of the Surat Basin coal mines and power stations.

The CQRWSS also looked at the potential for water savings through demand management mechanisms (i.e. pricing, education, rostering, recycling and water-use efficiency improvements) in order to free up existing supplies; however, the potential for gains was assessed as being insufficient to cater for future growth.

Although unable to identify any viable long-term options to the dam, the CQRWSS suggested some possible interim solutions to meet identified short-term high-priority water requirements prior to the dam being commissioned:

- Raising Glebe Weir – This could present an interim solution to providing water for a proposed mining development in the Upper Dawson catchment until Nathan Dam is built (Nathan Dam would drown the existing Glebe Weir).
- Staging of the Nathan Dam development – The dam could initially be constructed to the fixed crest level, leaving the gates and piers to be installed later. However, based on the pre-feasibility design of Nathan Dam developed in the 1990s, the cost of constructing a mass concrete dam to the fixed crest level of EL 175 m makes up a major part of the overall dam project costs, but contributes less than half of the overall yield.
- Nathan coffer dam – The construction of Nathan Dam is likely to involve a coffer dam arrangement to divert Dawson River flows around the site during construction. This was suggested for use as a temporary storage prior to the main dam being finalised; however, preliminary investigations indicated this option to be neither cost-effective nor practical.
- Dawson River to Callide Valley pipeline – While not a new water source, a pipeline from the Dawson River was raised as an option to supply additional water to the Callide Valley, which has virtually no new viable local sources to meet expanding industrial water needs in the area. The feasibility of this option relies upon the availability of new water supplies in the Dawson Valley, such as would be realised through the development of Nathan Dam.

As part of the project EIS, the proponent will further investigate alternative water sources to Nathan Dam, including water generated as a by-product of coal seam methane gas extraction activities in the Surat Basin. According to the CQRWSS, long term expansion of coal mining and power generation in the area will be restricted if a secure water supply is not developed. The EIS will re-visit the work of the CQRWSS as well as investigate any other prudent and feasible alternatives capable of providing the quantity of water necessary to meet expected long-term demand.

2.4 PROPOSED PROJECT TIMEFRAMES

Below is the preliminary timeline for completion of the major components of the Nathan Dam project, assuming its designation as a 'significant project' under the SDPWO Act:

- Concept design – early 2008.
- Preliminary design – mid/late 2009.
- Environmental impact assessment – mid/late 2009.
- Water resource planning approvals – early 2010.
- Business case – mid 2010.
- Detailed design – early 2011.
- Construction – 2012.
- Commissioning – 2014.

2.5 ELEMENTS OF THE PROJECT

2.5.1 The Storage

While a number of storage sites have previously been investigated along the Dawson River, the only sites considered to have potential for a large dam are within or immediately upstream of Nathan Gorge. The catchment area above the gorge is about 23,000 km².

A significant level of investigation work has historically been conducted into potential storage options; however, changes to planning and design techniques in the interim necessitate re-visiting earlier assumptions.

Planning and design of the dam will need to consider such issues as:

- the extent of land inundation and the socio-economic impacts
- minimising flooding impacts on the town of Taroom
- minimising environmental and cultural impacts
- an appropriate full supply level (FSL) to optimise storage yield.

2.5.2 The Dam Wall

Based on previous conceptual design alternatives, Nathan Dam is expected to comprise a mass concrete or roller compacted concrete wall incorporating 10 or 12 vertical lift gates. The gates will enable flood flows to be managed so as not to inundate Taroom and minimise flooding around the storage perimeter.

The dam type will be reconsidered during the preliminary design and EIS phases when:

- the geological model for the site can be better defined following geotechnical investigations
- potential material sources are better understood following geotechnical investigations
- social, environmental and economic considerations are better understood
- design floods have been refined and modelled.

The location of quarries is not yet known; however, it is expected that most quarry materials will be available in the vicinity of the project.

The dam design parameters will be assessed with the aim of optimising capacity at minimum cost to the community and the environment. A construction cost estimate will be made as part of the design process.

The dam wall will be designed and constructed in accordance with relevant Australian Standards, ANCOLD dam safety guidelines and dam safety regulator (NRW) standards.

2.5.3 Fishways and Outlet Works

The dam will incorporate a fishway to enable upstream and downstream fish migration. The proponent will work with the Department of Primary Industries and Fisheries (DPI&F), and other relevant government agencies and stakeholders to develop appropriate fishway arrangements with respect to the requirements of local fish species. Advice will be sought from experts as necessary. Investigations will be needed to assess the impact of existing weirs on the Dawson River on fish migration, and it is envisaged that a long-term strategy will be developed for fish community maintenance within the system.

Strategies may also need to be developed for protection of turtle species including minimising the impact of design elements and providing for movement if required.

Outlet works on the dam will be designed to enable downstream releases to be made in compliance with the requirements of the Fitzroy Basin Resource Operations Plan (ROP). A suitable offtake will be constructed to enable water of appropriate quality for the downstream environment to be released from the dam.

2.5.4 Water Reticulation

Water for downstream users will be released from the dam to existing weirs along the Dawson River and potentially to the Lower Fitzroy during critical supply periods. Specific downstream locations for extraction have not yet been conclusively defined, but a secure water supply is in high demand for coal mining in the Southern Bowen Coal Basin and for irrigation and industrial use along the length of the Dawson River. Demand nodes will be refined during development of the business case.

Studies are also underway to confirm current and future water supply demands from coal mines and power stations proposed for the Surat Coal Basin to the south of the dam. Current indications are for a demand of up to 40,000 ML of high-reliability water from this area within the foreseeable future. Water pipeline options will be investigated and reported as part of the project EIS. A pipeline could extend as far south as Dalby, a distance of approximately 282 km, depending on the final business case.

The viability of this process will be assessed through the EIS, with the intention of incorporating coal seam water into the final pipeline design.

3.0 EXISTING ENVIRONMENT

3.1 BUILT ENVIRONMENT

Studies have indicated that at FSL 185 m and with a gated dam structure, the upstream town of Taroom would not be impacted by inundation or increased flooding; however, this will need to be confirmed through detailed flood hydrology studies.

Within the proposed inundation area are a number of rural homesteads, sheds, local roads, bridges, farm roads, fences, yards and watering points. No major roads, power transmission lines, rail links or other public infrastructure are impacted by the project. There is no reticulated water supply or sewerage in the area as it is generally a remote rural location. The extent of the impact of the storage on this infrastructure will depend on the final FSL and flood inundation levels which will be determined through flood hydrology studies.

3.2 LAND TENURE AND OWNERSHIP

The dam will potentially have direct impact on about 70 land parcels (Figures 3 and 4). These range from small holdings on the outskirts of Taroom to large pastoral leasehold and freehold lots. Almost 70% of the affected area is held under lease from NRW. A small number of nature conservation and council reserves are also impacted.

If the project proceeds, all land subject to inundation will need to be purchased. In some instances this may involve the purchase of whole properties. A number of the main affected properties have already been purchased, representing a sizable proportion of the total area of land required for the project.

Figure 3: Photo image base

Figure 4: Land Tenure

3.3 NATURAL ENVIRONMENT

The Upper Dawson River catchment is characterised by areas of plateaux and steep hills, rolling hills and undulating plains, and broad alluvial plains along the river. The geology is dominated by Jurassic sediments of the Surat and Bowen Basin strata, with younger Tertiary sediments of the Duaringa basin to the north. Quaternary Alluvium occurs along the upper reaches of the river, with broad deposition areas in the old meander patterns between Taroom and Nathan Gorge. These areas are used for both irrigated and rain-fed cropping and pasture development primarily supporting beef cattle grazing.

The Precipice Sandstone formation marks the eastern boundary of the Great Artesian Basin in Taroom Shire. It is along the junction of the Precipice Sandstone outcrop near the proposed dam site that artesian waters force their way through joints and fissures in the rocks and form the Taroom boggomosses (mound springs) which characterise the area. Texture contrast and sandy/gravelly soils are largely associated with these areas. They have low water-holding capacity and are highly susceptible to erosion when cleared. The Precipice National Park, which includes part of Nathan Gorge, is situated downstream of the proposed dam site.

Landscape units in the area upstream of the dam site comprise brigalow, softwood scrub and eucalypt uplands; eucalypt and softwood scrub highlands; and eucalypt flood plains along the Dawson River and tributaries.

The EPBC Act database of national environmental significance identifies the occurrence of four threatened ecological communities in the region that could occur in the study area (Table 3-1 and Figure 4). Also of importance are the Boggomosses Area Nos 1 and 2, and the Brigalow Invertebrate site which are listed on the Register of the National Estate. The Brigalow Invertebrate Site is located along the Leichhardt Highway and is probably beyond any area of potential impact. Boggomosses Area No 1 comprises an 800 ha area to the north of the confluence of Cockatoo Creek and the Dawson River, and Boggomosses Area No 2 comprises a 300 ha area situated downstream of the proposed dam wall (see Figure 4). The boggomosses provide a specialised wetland habitat because they are fed by artesian groundwater in a region where other sources of water are often lacking. They support significant invertebrate life, highlighted by the localised land snails *Adclarkia dawsonensis* and *Elsothera hewittorum*. Nature

refuges for the protection of boggomosses have been established on the properties 'Mt Rose' and 'Boggomoss'. A total of 69 boggomosses have been identified in the vicinity of the proposed dam storage area. The number of boggomosses inundated by the storage will depend on the final storage arrangements.

The moist riparian habitats of the Dawson River and its tributaries support considerable vertebrate and invertebrate biodiversity. The EPBC Act database identifies as vulnerable or endangered, five bird, two mammal and five reptile species that occur in the region and could occur in the study area (Table 3-1).

It should be noted that the Great Barrier Reef World Heritage Area (GBR), which is also listed as a National Heritage Place, was not included in the report but SunWater acknowledges that the Fitzroy River discharges to the GBR lagoon.

A survey undertaken in 1997 (Hyder) describes the proposed impoundment area as being predominantly cleared of forest vegetation. Remnant vegetation in the study area listed under the state *Vegetation Management Act 1999* (VMA) is shown in Table 3.2 and Figure 5.

The instream environment of the Dawson River has been substantially altered through the construction of weirs and the associated flow regulation. When the weirs are full, more than half of the regulated section of the river (from Glebe Weir to Neville Hewitt Weir) is inundated by the storages. When full, Glebe Weir, which is within the proposed impoundment area of Nathan Dam, inundates 26 km of the river. When full, the Gylanda Weir backs up through the gorge to the area of the proposed dam.

Relevant studies of the natural environment have previously been undertaken in the area. It is proposed to build on these studies by undertaking specific ecological surveys of the terrestrial and aquatic environments. The studies will be undertaken in accordance with standard field survey procedures and will target confirmation of the presence of endangered, vulnerable or rare (EVR) species. If not specifically encountered, the reports will assess the likelihood of the presence of EVR species and the potential impacts of the project on these and on natural communities and native species in general. Impact mitigation and management strategies will be developed aimed at maintaining the diversity of natural flora and fauna in the area. The needs of

migratory fish species found to be present will be assessed in relation to the development of suitable fishway designs for Nathan Dam.

Table 3-1: Matters of National and State environmental significance

Species or habitat that may occur in the study area or be impacted by the project – based on EPBC protected matters report (21 November 2007) and Wildlife Online Extract (25 January 2008)			
Wetlands of international significance	Shoalwater and Corio bays area	Ramsar site	
Threatened ecological communities	Bluegrass (<i>Dichanthium</i> spp.) dominant grasslands of the Brigalow Belt Bioregions (North and South)	Endangered	
	Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant)	Endangered	
	Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	
	The community of native species dependent on natural discharge of groundwater from the Great Artesian basin	Endangered	
		EPBC Act	Qld NC Act
Threatened species	<u>Birds</u>		
	<i>Erythrotriorchis radiatus</i> (Red Goshawk)	V	
	<i>Geophaps scripta scripta</i> (Squatter Pidgeon (southern))	V	
	<i>Neochmia ruficauda ruficauda</i> (Star Finch eastern and southern)	E	
	<i>Rostratula Australia</i> (Australian Painted Snipe)	V	
	<i>Turnix melanogaster</i> (Black-breasted Button Quail)	V	V
	<i>Lophoictinia isura</i> (Square-tailed Kite)		R
	<i>Stictonetta naevosa</i> (Freckled Duck)		R
	<i>Nettapus coromandelianus</i> (Cotton Pygmy-goose)		R
	<i>Ephippiorhynchus asiaticus</i> (Black-necked Stork)		R
	<i>Melithreptus gularis</i> (Black-chinned Honeyeater)		R
	<u>Mammals</u>		
	<i>Chalinolobus dwyeri</i> (Large-eared Pied Bat, Large Pied Bat)	V	
	<i>Chalinolobus picatus</i> (Little Pied Bat)		R
	<i>Nyctophilus timoriensis</i> (south-eastern form) (Eastern Long-eared Bat)	V	
	<u>Insects</u>		
	<i>Jalmenus evagoras eubulus</i> (Imperial Hairstreak (northern subspecies))		V
	<u>Reptiles</u>		
	<i>Denisonia maculata</i> (Ornamental Snake)	V	
	<i>Egernia rugosa</i> (Yakka Skink)	V	
	<i>Furina dunmalli</i> (Dunmall's Snake)	V	
	<i>Paradelma orientalis</i> (Brigalow Scaley-foot)	V	V

	<i>Rheodytes leukops</i> (Fitzroy Tortoise/Fitzroy River Turtle)	V	V
	<i>Strophurus taenicauda</i> (Golden-tailed Gecko)		R
	<u>Snails, slugs</u>		
	<i>Adclarkia dawsonensis</i> (Boggomoss Snail, Dawson Valley Snail)	CE	
	<u>Plants</u>		
	<i>Arthraxon hispidus</i> (Hairy-joint Grass)	V	V
	<i>Cadellia pentastylis</i> (Ooline)	V	V
	<i>Commersonia</i> sp. <i>Cadarga</i> (G.P. Guymmer 1642)	V	
	<i>Dichanthium queenslandicum</i> (King Blue-grass)	V	
	<i>Digitaria porrecta</i> (Finger Panic Grass)	E	
	<i>Thelypteris confluens</i>		V
	<i>Rutidosia crispata</i>		R
	<i>Wahlenbergia islensis</i>		R
	<i>Leucopogon grandiflorus</i>		R
	<i>Bertya pedicellata</i>		R
	<i>Acacia argentina</i>		V
	<i>Calytrix islensis</i>		R
	<i>Sannantha brachypoda</i>		R
	<i>Livistona nitida</i>		R

V – Vulnerable

E – Endangered

CE – Critically endangered

R – Rare

Migratory species	<u>Migratory terrestrial species</u>	
	<i>Haliaeetus leucogaster</i> (White-bellied Sea Eagle)	Migratory
	<i>Hirundapus caudacutus</i> (White-throated Needletail)	Migratory
	<i>Merops ornatus</i> (Rainbow Bee-eater)	Migratory
	<i>Myiagra cyanileuca</i> (Satin Flycatcher)	Migratory
	<u>Migratory wetland species</u>	
	<i>Ardea alba</i> (Great Egret, White Egret)	Migratory
	<i>Ardea ibis</i> (Cattle Egret)	Migratory
	<i>Gallinago hardwickii</i> (Latham's Snipe, Japanese Snipe)	Migratory
	<i>Nettapus coromandelianus albipennis</i> (Australian Cotton Pygmy-goose)	Migratory
	<i>Numenius minutus</i> (Little Curlew, Little Whimbrel)	Migratory
	<i>Rostratula benghalensis s. lat.</i> (Painted Snipe)	
	<u>Migratory marine birds</u>	Migratory
	<i>Apus pacificus</i> (Fork-tailed Swift)	Migratory
	<i>Ardea alba</i> (Great Egret, White Egret)	Migratory
	<i>Ardea ibis</i> (Cattle Egret)	

Listed marine species	<u>Birds</u> <i>Anseranas semipalmate</i> (Magpie Goose) <i>Apus pacificus</i> (Fork-tailed Swift) <i>Ardea alba</i> (Great Egret, White Egret) <i>Ardea ibis</i> (Cattle Egret) <i>Gallinago hardwickii</i> (Latham's Snipe, Japanese Snipe) <i>Haliaeetus leucogaster</i> (White-bellied Sea Eagle) <i>Hirundapus caudacutus</i> (White-throated Needletail) <i>Merops ornatus</i> (Rainbow Bee-eater) <i>Myiagra cyanoleuca</i> (Satin Flycatcher) <i>Nettapus coromandelianus albipennis</i> (Australian Cotton Pygmy-goose) <i>Numerius minutus</i> (Little Curlew, Little Whimbrel) <i>Rostratula benghalensis s. lat.</i> (Painted Snipe)	Listed – overfly marine area (all)
Places on the Register of the National Estate (RNE)	Boggomosses Area No 1 Qld Boggomosses Area No 2 Qld Brigalow Invertebrate Site, Qld	

Table 3-2: Regional ecosystems (Queensland Environmental Protection Agency)

RE Code	Regional Ecosystem Description (EPA 2005)	VMA
11.3.2	<i>Eucalyptus populnea</i> woodland on alluvial plains	Of concern
11.3.3	<i>Eucalyptus coolabah</i> woodland on alluvial plains	Of concern
11.3.4	<i>Eucalyptus tereticornis</i> and/or <i>Eucalyptus spp.</i> tall woodland on alluvial plains	Of concern
11.3.19	<i>Callitris glaucophylla</i> , <i>Corymbia spp.</i> and/or <i>Eucalyptus melanophloia</i> woodland on Cainozoic alluvial plains	Not of concern
11.3.25	<i>Eucalyptus tereticornis</i> or <i>E. camaldulensis</i> woodland fringing drainage lines	Not of concern
11.3.27	Freshwater wetlands	Not of concern
11.3.39	<i>Eucalyptus melanophloia</i> ± <i>E. chloroclada</i> woodland on undulating plains and valleys with sandy soils	Not of concern
11.9.1	<i>Acacia harpophylla</i> - <i>Eucalyptus cambageana</i> open forest to woodland on fine-grained sedimentary rocks	Endangered
11.9.4	Semi-evergreen vine thicket on fine grained sedimentary rocks	Endangered
11.9.5	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on fine-grained sedimentary rocks	Endangered
11.9.7	<i>Eucalyptus populnea</i> , <i>Eremophila mitchellii</i> shrubby woodland on fine-grained sedimentary rocks	Of concern
11.9.10	<i>Acacia harpophylla</i> , <i>Eucalyptus populnea</i> open forest on fine-grained sedimentary rocks	Of concern
11.10.3	<i>Acacia catenulata</i> or <i>A. shirleyi</i> open forest on coarse-grained sedimentary rocks. Crests and scarps	Not of concern
11.10.7	<i>Eucalyptus crebra</i> woodland on coarse-grained sedimentary rocks	Not of concern
11.10.9	<i>Callitris glaucophylla</i> woodland on coarse-grained sedimentary rocks	Not of concern

Figure 5: EPA Regional Ecosystems

3.4 SOCIO-ECONOMIC ENVIRONMENT

3.4.1 Indigenous and Cultural Heritage Issues

Previous surveys have indicated the existence of significant Aboriginal cultural heritage value within and around the proposed Nathan Dam project that will be directly impacted by the project or through enhanced public access to the area. Many of the heritage sites are in close proximity to the Dawson River and associated creeks. The level of impact of the dam on these sites will vary depending on the final dam wall location and the FSL chosen.

The project's impact on Aboriginal cultural heritage values will be managed under a cultural heritage management planning (CHMP) process that will address the duty of care requirement under the *Aboriginal Cultural Heritage Act 2003*. This may include the following:

- A process for undertaking a comprehensive and systematic cultural heritage assessment of the project development area and associated works and infrastructure.
- A processes for mitigation, management and protection of identified cultural heritage places and material in the project development area and associated works and infrastructure, both during the construction and operational phases of the project.
- Provisions for management of the accidental discovery of cultural material, including burials.
- A conflict resolution process.

SunWater will work with registered native title claimants to develop CHMPs covering all claim areas impacted by the project. Where no registered claims exist, SunWater will advertise the areas and develop CHMPs with those aboriginal parties with cultural links to these areas.

The project will also impact on a number of significant European cultural heritage places. The most important of these is The Glebe homestead which is listed on the Queensland Heritage Register. SunWater will develop management strategies aimed at minimising European cultural heritage impacts across the project area.

3.4.2 Economic Issues

About 40 landholders currently grow crops and graze cattle within the proposed inundation area. At FSL 183.5, 12 properties larger than 500 ha will have more than 10% of their total area inundated. This may result in loss of production on the remaining land due to the imposition of land use constraints, lack of access and fragmentation of usable land. The government has a responsibility to resume the entire property if land requirements result in the remaining area of an individual property being non-viable. The process of land acquisition needs to be applied with sensitivity and appropriate compensation provided to those affected.

The Dawson Valley Water Supply Scheme currently services about 150 customers who hold a total water allocation of about 57,000 ML. The water is predominantly used to irrigate cotton, cereals, fodder and horticultural crops, while some is used for industrial and urban purposes. Glebe Weir, which is the uppermost storage in this scheme and supports existing water entitlements, will be inundated by the new storage. The rights of current water entitlement holders in the Dawson Valley scheme will need to be maintained under new arrangements for Nathan Dam.

3.5 APPROVALS PROCESS AND RELEVANT LEGISLATION

It is expected that the project will receive 'significant project' status under Section 26 of the *State Development and Public Works Organisation Act 1971*, centralising coordination of the environmental assessment process.

3.5.1 Commonwealth Approvals

Environment Protection and Biodiversity Conservation (EPBC) Act 1999

The project will be referred to the Australian Government Department of the Environment, Water, Heritage and the Arts (DEWHA). It is expected that the project will be a 'controlled action' under the EPBC Act. This would require assessment of the project impacts on matters of national environmental significance (MNES) by the Australian Government Minister for the Environment, Heritage and the Arts.

3.5.2 State Approvals

State Development and Public Works Organisation Act 1971

This IAS has been prepared to assist CG in the decision-making process on the declaration of the proposed Nathan Dam as a ‘significant project requiring an EIS’ under s.26 of the SDPWO Act. Should ‘significant project’ status be given, the IAS will be considered by the CG when preparing draft terms of reference (ToR) for the EIS. This process allows central coordination of the assessment process.

If the Nathan Dam proposal is declared to be a ‘significant project’, it is likely that the EIS will be progressed under the Bilateral Agreement between the Commonwealth and the State of Queensland.

3.5.3 Other Approval Requirements

The construction and operation of the dam will require a number of statutory planning and environmental approvals. The information presented in Table 3-1 provides an overview of the key legislation that needs to be considered for the approval process. Other requirements will be identified as the project progresses, and hence the table should not be considered as exclusive.

Table 3-3 Summary of key approval considerations

Key project issue	Key legislation	Application
Impact assessment	<i>State Development and Public Works Organisation Act 1971</i>	The SDPWOA provides the CG with significant powers to manage major projects on a whole-of-government basis and to coordinate environmental approvals. The project can be assigned ‘significant project’ status under the Act based on one or more of the following criteria: <ul style="list-style-type: none"> ▪ Complex approval requirements, including local, State and Australian Government involvement ▪ A high level of investment in the State ▪ Potential effects on infrastructure and/or the environment ▪ Provision of substantial employment opportunities ▪ Strategic significance to a locality, region or the State. Once a project is declared ‘significant’ an environmental impact statement (EIS) is usually required to ensure that environmental, social and economic impacts are appropriately considered.
	<i>Integrated Planning Act 1997</i>	A development permit under the IPA will be required for material change of use. The project is likely to be designated as community infrastructure under Section 29K of the SDPWOA and Department of Infrastructure and Planning (DIP) assigned as the assessment manager.

Key project issue	Key legislation	Application
Vegetation clearance	<i>Vegetation Management Act 1999</i>	All vegetation clearing activities would generally require approval under the Vegetation Management Act and will require identification of appropriate offsets.
	<i>Integrated Planning Act 1997</i>	Carrying out operational work that is the clearing of native vegetation on freehold or leasehold land is assessable development under the IPA. A decision on the proposal's preferred option for the planning approval process and further investigations into the existing land tenure will be required to confirm precise vegetation clearing requirements.
Clearing and quarrying on Crown land	<i>Forestry Act 1959</i>	The Forestry Act regulates the use of forest products and quarry materials on Crown land. A permit is required for extractive resources in order to take quarry materials from Crown land. Where removal of (or interference with) millable timber is required on any Crown Land, a permit is required under Section 53(1)(b) and Section 56 of the Forestry Act. It will be necessary to consult with NRW regarding a permit for removing large trees for construction of the dam and associated infrastructure.
Habitat protection	<i>Nature Conservation Act 1992</i>	The NCA provides for the protection of protected areas, reserves and native wildlife in Queensland. The NCA is based on principles to conserve biological diversity, ecologically sustainable use of wildlife, and ecologically sustainable development. Applicable areas at the Nathan Dam site are the nature refuges on the properties Mt Rose and Boggomoss, specifically for the protection of boggomosses. Approval is required to disturb, harm or destroy species listed under the NCA found within the project footprint.
Native Title	<i>Native Title Act 1999</i>	Native title is managed under the Native Title Act. The proponent will need to identify any Aboriginal parties who may hold native title within the study area and address any potential issues that may arise.
Cultural heritage	<i>Aboriginal Cultural Heritage Act 2003</i>	The ACHA requires demonstrated compliance with the cultural heritage duty of care, as defined in the ACHA. The ACHA provides a series of mechanisms by which this can be done, including: <ul style="list-style-type: none"> ▪ preparation of a notified Cultural Heritage Management Plan (CHMP) developed in the manner specified in Part 7 of the ACHA, and approved by the Minister for Natural Resources and Water, or ▪ management of cultural heritage as a component of a native title agreement of a type specified in Schedule 2 of the ACHA.
	<i>Queensland Heritage Act 1992</i>	Requirements under this act will be addressed through the EIS process.

Key project issue	Key legislation	Application
Water permits	<i>Water Act 2000</i>	<p>The Water Act outlines several permits/licences that may be required for the proposal, including the following:</p> <ul style="list-style-type: none"> ▪ A resource operating licence to interfere with the natural flow of water to the extent necessary to operate water infrastructure ▪ A riverine protection permit for any works crossing a freshwater watercourse that interferes with the bed or banks ▪ A licence to take water from the catchment for taking water from a watercourse ▪ An interfering with a watercourse permit for interfering, taking and/or controlling the flow of water in a watercourse
Fish passage	<i>Fisheries Act 1994 (Qld) (s22), Fisheries Regulation 1995 (Qld) Part 12, Div 5, Integrated Planning Act 1997 (Qld)</i>	<p>Regulation of fisheries development has now been rolled into the Integrated Development Assessment System (IDAS) process under the IPA, and hence will be assessed under the EIS process. The Fisheries Act regulates water barrier works in relation to the restriction of fish passage. Nathan Dam is likely to require the provision of suitable fish passage devices that will need to be designed in consultation with the Department of Primary Industries and Fisheries.</p> <p>All other activities relating to or that may impact on fisheries resources and habitats may require a general fisheries permit.</p>
Statutory planning	State planning policies that may be relevant to the environmental assessment of the proposal	<p><i>State Planning Policy – 1/92 Development and Conservation of Agricultural Land.</i> The proposed dam would be located on properties predominantly utilised for rural purposes.</p> <p><i>State Planning Policy – 1/03 Mitigating the Adverse Impacts of Flood, Bushfire and Landslide.</i> An assessment of this policy would be required in consideration of natural hazards of flood, bushfire and landslide and in ensuring these matters are adequately addressed when carrying out the development.</p> <p><i>State Planning Policy – 2/07 Protection of Extractive Resources.</i> This policy may be applicable to the proposal if the subject site is identified as a key resource area. It is intended to maintain the long-term availability of major extractive resources.</p>
Lighting of fires	<i>Fire and Rescue Service Act 1990 (Qld)(Part 7, Div 1)</i>	<p>A permit is required to light fires associated with construction activities (includes permission for fires to be lit, maintained or used on land that SunWater owns or occupies).</p> <p>Any notice issued by the Commissioner prohibiting the lighting of fires on specified land, or requisition measures to reduce fire risk, must be complied with.</p>
Storage of chemicals	<i>Dangerous Goods Safety Management Regulation 2001 (Qld)</i>	<p>Specific signage, site emergency plans, registers, etc. may be required if stored chemicals exceed certain thresholds/criteria. The relevant area would therefore be classified as a Dangerous Goods Location (DGL) or a Large Dangerous Goods Location (LDGL).</p>

Key project issue	Key legislation	Application
	<i>Environmental Protection Act 1994 (Qld), Environmental Protection Regulation 1998 (Qld)</i>	Storage of any chemicals in quantities greater than 10m ³ (excluding crude oil, natural gas & petroleum products) – ERA 7 registration certificate and development permit required. Level 1 ERA = >1,000m ³ Level 2 ERA = 10m ³ –1,000m ³ . Storage of petroleum products or crude oil in quantities >10,000 litres – ERA 11 registration certificate and development permit required. Level 1 ERA = 500,000 litres or more (apply to EPA) Level 2 ERA = 10,000–500,000 litres (apply to local council).
Excavation	<i>Environmental Protection Act 1994 (Qld), Environmental Protection Regulation 1998 (Qld) and Integrated Planning Act 1997 (Qld)</i>	Dredging material (removal of material) from the bed of any waters (includes channels, drains, natural watercourses etc.) – ERA 19 development permit and registration certificate required. Extracting rock, sand, clay, gravel or other material from a pit or quarry – ERA 20 registration certificate and development permit required in most circumstances.
Use, transport, storage or purchase of explosives	<i>Explosives Act 1999 (Qld) (Part 3), Explosives Regulation 2003 (Qld) (s19)</i>	Licence to use and/or shotfirer's licence, licence to transport, licence to store, authorisation to buy.
Pest management	<i>Land Protection (Pest and Stock Route) Management Act 2002 (Qld) (s46)</i>	Moving or transporting a vehicle where soil or other organic material on the vehicle may contain reproductive material of a declared pest plant. Must: (1) take reasonable steps to restrict the release of reproductive material; a (2) ensure that the vehicle is free from reproductive material.
Road management	<i>Transport Infrastructure Act 1994 (Qld) (s50), Department of Main Roads (DMR) Transport Infrastructure (state controlled roads) Regulation (Qld) 2006</i>	Interference with a State-controlled road or its operation (e.g. temporary or permanent closure) requires written approval of the chief executive. Construction of ancillary works and encroachments on a State-controlled road (either temporary or permanent) requires ancillary works and encroachment permit required from DMR. Use of vehicles which exceed certain mass and dimensions criteria require various approvals depending on dimensions of load – dimensions are outlined in the Transport Operations (Road use Management – mass, dimensions and loading) Regulation (Qld) 2005 (e.g. excess mass permit, excess dimension permit, letter of no objection, etc). To construct, maintain, use or operate miscellaneous transport infrastructure requires a licence from DMR. Conditions may be attached to this licence. If granted a licence, the proponent may then apply for an approval to construct, maintain, operate or use the infrastructure (for which the licence was granted), across, over or under an intersecting area. The proponent must obtain written authorisation from the chief executive to temporarily occupy and use land, including roads, for miscellaneous transport infrastructure works. Before temporarily occupying the land, the proponent must also either provide the landowner with three days notice or obtain written permission from the land owner to enter the land.

Key project issue	Key legislation	Application
	<i>Land Act 1994</i>	A permit to occupy from NRW is required for temporary or permanent encroachment onto a non-state controlled road or reserve. Road closures will be required in areas of permanent inundation. The dedication, opening, closing and temporary closure of roads is managed under the Land Act (Section 93, 94, 98, 106). Roads may be built under this Act (Section 110).
Waste management	<i>Environmental Protection (Waste Management) Regulation 2000 (Qld) (Part 4)</i>	Non-commercial regulated waste transportation – ERA 83 Registration Certificate and Development Permit required. If using a commercial transporter to collect the waste, the proponent's registration certificate and development permit must be sighted. Waste tracking certificates are required.
Civil works	<i>Environmental Protection Act 1994 (Qld), Integrated Planning Act 1997 (Qld)</i>	Screening (incl. washing, crushing, grinding, milling, sizing, etc.) materials – ERA 22 Registration Certificate and Development Approval required. Concrete batching in equipment with a production capacity >100 t/yr – ERA 62 Registration Certificate and Development Approval required.
Land use	<i>Land Act 1994</i>	The Land Act has regard for allocating land for development in the context of the State's planning framework, and applying contemporary best practice in design and land management. The Land Act provides a framework for the allocation of State Land as freehold, leasehold or other tenure. Permits will be required under the Land Act for road closures or permits to occupy unallocated state land, a reserve or a road.

Further requirement for approvals and permits will be assessed continuously through the EIS and approvals process.

4.0 POTENTIAL IMPACTS

The construction and operation of any major infrastructure project will inevitably lead to some degree of social, environmental and economic impact, which may be positive or negative. However, projects are undertaken only if the perceived overall result is a net benefit to society. In the case of Nathan Dam, the proponent will commit, via the EIS process, to a range of mechanisms to minimise the negative impacts and enhance the positive benefits.

4.1 BUILT ENVIRONMENT

No major roads currently traverse the project area, although some property access roads will need to be reconfigured. The Taroom–Cracow Road will require an upgraded crossing at Cockatoo Creek. The Bundulla Road river crossing below Taroom will also be impacted. The

level of impact on current road corridors will depend on the final FSL chosen. The recreation area at Glebe Weir will be inundated by the storage. There is very little infrastructure owned by Local Government or service providers in the area as it is a remote rural location.

4.2 CONSTRUCTION AND OPERATIONS INFRASTRUCTURE

Prior to commencement of construction of the dam wall, a permanent access road and power supply to the construction site will be required. Site preparation will include land clearing within the construction area, deep excavation at the dam site, a diversion channel by-passing the excavation, and coffer dams upstream and downstream of the dam site to ensure reasonable immunity against flooding of the excavated area. Quarry areas and associated machinery access roads will be established at suitable sites.

Temporary infrastructure will include accommodation units, offices, storage and waste disposal facilities, quarries, batching plants, vehicle service and wash-down facilities, as well as power supply/generation, fuel storage and on-site water supply facilities. Some of this infrastructure will be retained after construction in support of ongoing operational, monitoring and perhaps recreational requirements.

There will be an ongoing requirement for facilities to support operations and maintenance personnel who will be stationed at the storage to ensure efficient delivery of water entitlements to customers and the environment in compliance with the Fitzroy ROP, and to maintain the assets.

4.3 NATURAL ENVIRONMENT

While a substantial amount of information exists on the terrestrial and aquatic environments of the region, new surveys specific to the project (including pipeline routes) will be undertaken to supplement that information. Strategies to manage environmental impacts during investigation, construction and operation of the dam will be developed based on the results of surveys and discussions with relevant agencies.

The main direct impacts of construction are expected to arise from land clearing, drilling, site preparation, quarrying and excavation of materials, transporting materials and people to, from

and within the site, and other necessary activity within the watercourse and other areas of inundation. In all cases, best-management practices will be used to ensure that impacts are minimised and all relevant legislative requirements are adhered to.

The importance of the boggomosses and other unique or endangered communities is recognised and every effort will be made to minimise the impact of the dam on these areas or to provide appropriate offsets in cases where impact cannot be avoided.

The new environment offered by the storage will favour some animals and disadvantage others, and ongoing management of water quality, algae, weeds, the new riparian zone and human impacts (e.g. fishing) will be required. Management of the downstream flow regime will comply, at least, with the Fitzroy WRP with respect to environmental flows and water allocation security objectives.

Management strategies will be developed to minimise impacts of the project on the natural environment as part of the project EIS. Offsite, cumulative and consequential impacts of the project will also be assessed as part of the project EIS. With respect to the latter, the need for the dam is driven by the demands of developing industries; the dam is a consequence of those demands. Mines, power stations or other developments will require their own approvals so SunWater does not consider them part of this action. SunWater does not envisage developing specific new agricultural areas as part of this project.

4.4 EMPLOYMENT DURING CONSTRUCTION AND OPERATION

Workforce requirements during construction will be determined when the construction methodology and design configuration have been finalised and will be presented in the project EIS. It is expected that about 200 people will be employed on site during peak activity, plus a significant number offsite in support activities. The construction contractor will likely bring a nucleus of specialist skills; however, the project is expected to provide a range of employment opportunities for the local community.

The broader local community can be expected to gain significant flow-on benefits from the project, in particular local businesses in the township of Taroom. While it is expected that the core of the workforce will be located on site, there will likely be employment opportunities for

local people, as well as a need for accommodation, food, entertainment and other essential requirements to be sourced from Taroom and Wandoan. Other local service and supply businesses are also expected to gain significant benefits from the development.

4.5 SOCIAL ENVIRONMENT

The dam development, along with planned mining and industrial expansion in the area, will inevitably lead to changes in the social environment of the local community. More than half of the employed persons in Taroom currently work in agriculture and related industries, with a heavy reliance on extensive agriculture (particularly cattle). As the dam will inundate an area of prime cropping and grazing land, it will have a direct impact on those currently living and working within the inundation area.

During the construction phase there will be considerable expenditure in the local region, including likely employment of local workers, purchase of goods and services for construction purposes and expenditure by workers based at the construction camp, which will be required in the vicinity of the dam wall. The long-term social impact of the scheme on the local population will inevitably depend on the extent of projects that expand or develop in the region as at least a partial consequence of the distribution of water from the project.

The dam has the potential to provide major recreational value for the local community. The appropriate extent of recreational development undertaken at the dam will be assessed in consultation with local government and the community and a strategy developed for funding construction and ongoing management activities.

4.6 LOCAL, STATE AND NATIONAL ECONOMIES

The annual value of production from Queensland's minerals and energy sectors is currently estimated at \$23 billion, which represents about 14 per cent of the state's economy. The Surat Coal Basin has the potential to produce at least four billion tonnes of high quality steaming coal, and is set to make a major economic contribution at all levels. This growth requires capital investments in major new projects – dams, pipelines, railways and ports, power stations and transmission lines. Thousands of new highly skilled jobs will be created in the Surat Basin and its emerging service centres (Roche 2007).

The trade-off specific to this project is the loss of current agricultural productivity from within the inundation area, although if some of the yield is made available to increase the security of agricultural supply downstream, this productivity may not be lost to the region.

It is expected that the project economics will be sound, particularly in view of the extent of coal mining and power station development planned for the Surat Coal Basin. The flow-on benefits of the project to the local and State economies are expected to be substantial.

A comprehensive analysis of the project's impact on the local, state and national economies will be undertaken as part of the EIS. Economic factors will be weighed up alongside the social and environmental considerations when examining project viability and options.

4.7 COMMUNITY CONSULTATION

As part of the EIS, community consultation will be conducted with the local rural and urban communities, federal, state and local government representatives, industry sectors, special interest groups and organisations impacted by the project, traditional owners, public utility providers and the media. The objectives are to inform the community about the project, provide an effective mechanism for community involvement and enable the various groups and individuals to add value to the EIS process.

A Consultation and Community Involvement Plan for the project will be developed by the proponent. This plan will articulate the consultation and communication activities and mechanisms to be implemented over the duration of the project. The Draft ToR, the EPBC referral and the EIS are made publicly available as required by the Act in order that the public may have input during these important phases.

5.0 ENVIRONMENTAL MANAGEMENT

5.1 CONSTRUCTION / COMMISSIONING

An environmental management plan (EMP) will be prepared to provide strategies for the planning, design, construction and operation of the project to ensure safe, efficient and environmentally sensitive outcomes. The EMP will provide local, state and federal governments and the proponent with a framework to confirm compliance with relevant policies and requirements. The EMP will also provide the community with evidence that the management of the project will be conducted in an environmentally acceptable manner. As the operator of existing infrastructure in the State, SunWater has previously developed such plans and they have been accepted by authorities.

5.1.1 Water Quality

Water quality impacts and appropriate mitigation measures will be assessed in the project EIS. Performance criteria for the management of water quality will be based on guidelines established from:

- the Queensland Environment Protection (Water) Policy (1997)
- the National Water Quality Management Strategy: Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000)
- the draft Queensland Water Quality Guidelines (2004).

During construction temporary erosion and water quality protection measures will be required to prevent release of contaminants into the Dawson River. These measures will include sediment barriers, removal of sediment from waters prior to discharge, reinstatement of disturbed areas, correct storage and handling of chemicals, fuels, oils etc. and spill response procedures.

Monitoring of water quality in the works area and downstream will be required and responses made as necessary to ensure water quality objectives are achieved.

5.1.2 Noise

Potential noise sources on the site will occur mainly during the construction phase, with activities such as drilling and blasting likely to have the highest noise and/or vibration impact. Increased heavy vehicle movements will occur during construction.

The construction site will be located at significant distance from the nearest residence. With appropriate controls in place, noise impacts should be minimal.

5.1.3 Air Quality

Air quality impacts are anticipated to be primarily from dust generated during clearing and construction activities. It is anticipated that water will be used for dust suppression in disturbed areas.

5.1.4 Hazardous Material

Hazards associated with explosives, fuels, oils, pesticides, solvents etc. will be managed by strict adherence to relevant legislation, standards and codes of practice, with particular emphasis on health and safety issues/considerations.

5.1.5 Waste Management

It is expected that substantial waste will be generated during the construction phase. Where waste is generated, the proponent will ensure that appropriate waste management practices are specified with contractors and applied in order to minimise any adverse environmental impacts. The proponent and its contractors will hold appropriate waste management licenses. Waste management will be included in the project EMP.

The operation of the dam is not expected to generate significant amounts of waste.

5.1.6 Infrastructure and Traffic

The impact of potential construction traffic on the local road network will be assessed and mitigation measures developed in the project engineering study and EIS.

5.1.7 Monitoring and Reporting

Environmental baseline studies will be undertaken prior to construction and environmental monitoring and reporting will be undertaken throughout the construction and operational phases of the project to ensure that the objectives of the EMP are met and corrective actions can be implemented if need be.

5.1.8 Consultation

The community consultation program will continue through the construction phase, ensuring the community is aware of project activities, how to be involved if they desire and how to complain if need be. A complaints handling process will be specifically established.

5.2 OPERATION

The dam will be operated in accordance with the requirements of the Fitzroy Basin ROP with respect to water releases for use by customers, water for the environment and enabling upstream and downstream fish passage. Operating rules related to the new infrastructure will be established through amendments to the ROP.

5.2.1 Monitoring and Reporting

Environmental monitoring and reporting will continue during operation to provide a basis for tracking changes to the ecosystems and resource availability.

The ongoing environmental monitoring program will be developed as part of the EIS and approvals process and in accordance with ROP requirements for flow releases, water quality, biological assessment and visual inspections.

An annual environmental summary report will be prepared each calendar year by the operator containing, in part, the following information:

- Summary of the periodic and specific monitoring reports.
- Fluctuations in water storage level.
- Environmental and pass-through releases.

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- Water quality monitoring.
 - Biological indicator monitoring.
 - Fish passage monitoring.

This report will be submitted to the appropriate agencies and will be made available to the public.

6.0 REFERENCES AND DATA SOURCES

1. Hyder Environmental, *Impact Assessment Study for Proposed Nathan Dam*, 1997.
2. Department of Natural Resources & Water, *Central Queensland Regional Water Supply Strategy*, 2006.
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