Executive summary

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Project overview

Tarong Energy Corporation Limited (Tarong Energy) proposes to construct an additional ash storage facility to service both the Tarong and Tarong North power stations (the power stations). The new storage facility is to be located on land recently purchased by Tarong Energy to the north-east of the existing ash dam and would utilise dense phase technology to create an above ground ash emplacement area.

Currently the power stations burn coal with an average ash content of 28%. At the normal rates of electricity generation, in excess of 1.9 million tonnes of ash is produced annually. Based on these rates, it is expected that the existing ash dam will reach its maximum capacity by mid-2008. It is therefore critical that the additional ash storage facility is operating prior to this date.

After assessing a range of options for the long-term storage of ash, the Tarong Northern Land Ash Emplacement Project (the project) has been identified as the preferred option. The project site is located within the Nanango Shire, approximately 180 km west of Brisbane and 12.5 km south-east of Nanango.

Key features of the project are:

- The proposed ash facility will accept ash from Tarong and Tarong North power stations.
- The majority of the ash from the power stations will be pumped to the proposed facility as a dense phase slurry via a dedicated pipeline. Furnace ash from the Tarong North Power Station (approximately 60,000 tonnes per year) will be transported to the proposed facility by truck.
- The project is expected to provide an additional 25 years of storage capacity (approximate ash storage volume of 45 Mm^3).
- Ash will be stacked as a dense phase material to create a stable landform with a support embankment at the lead face.
- The dense phase ash placement method will allow a greater storage density to be achieved than in the existing ash dam.
- The dense phase ash placement will be managed to allow progressive rehabilitation.
- Any excess runoff water from the proposed facility will be collected for reuse in the power stations or other uses as required.
- The final landform will be developed using a phased construction approach and will involve raising the support embankment as the ash level rises. Development of the landform design will investigate sequencing the ash emplacement in discrete areas over the project site to distribute construction works over the life of the project.

The proponent

Tarong Energy is the proponent for the project. Tarong Energy is a Queensland Government Owned Corporation and a public company established under the Commonwealth *Corporations Act 2001*. Tarong Energy participates in the National Electricity Market (NEM). Shares in Tarong Energy are held by Ministers of the Queensland State Government on behalf of the State of Queensland.

Tarong Energy's 100% owned and operated assets include the Tarong and Wivenhoe power stations in Queensland, South Australia's first wind farm at Starfish Hill and the Mt Millar wind farm in South Australia. Tarong Energy also owns 50% of the Tarong North Power Station in a joint venture with the Tokyo Electric Power Company and Mitsui and Co Ltd.

Project need and benefits

Tarong Power Station supplies low-cost reliable electricity to the NEM. Tarong Energy produces approximately one quarter of the electricity generated in Queensland. The Tarong site (Tarong and Tarong North power station combined) currently has a generating capacity of 1,845 MW and is the largest thermal electricity power station complex in Queensland. The size and location of the Tarong Power Station dictates that it plays an integral role in the supply of electricity to south-east Queensland. At present the ongoing provision of power to the south-east Queensland market, particularly during the peak summer demand period of November to February is reliant on the continued operation of the Tarong and Tarong North power stations.

Ash is produced as a by-product of the coal combustion process used in thermal power stations. It is formed from the non-combustible mineral fraction of the coal. The continuous collection and disposal of ash is an integral part of the power generation process. The power stations currently burn a total of about 7 million tonnes of coal per year, which results in approximately 1.9 million tonnes of ash remaining from the combusted coal. Approximately 1.6 million tonnes of this ash per year needs to be disposed of on-site. At present this ash is disposed of in the existing ash dam. However, the ash dam is expected to reach capacity in mid-2008. As such an alternative ash disposal facility is required to store waste furnace and fly ash produced at the power stations.

Objectives of the project

Based on current inflow rates from the Tarong and Tarong North power stations, the existing ash dam is expected to reach capacity by mid-2008. The objective of the project is therefore to provide Tarong Energy with an alternative ash disposal facility.

Project alternatives

For the past six years Tarong Energy has been developing a strategy for the long-term storage of ash. The conversion to dense phase ash production has been completed and studies carried out to identify long-term ash storage options.

The selection of the project as the preferred option for ash storage was decided after consideration of a number of alternatives. The options considered were:

- ash placement in the Meandu Mine final voids
- modifications to the existing ash dam
- construction of a new dam in the vicinity of the power stations
- commercial use of ash materials.

The project was selected in preference to the above alternatives for the following reasons:

- problems associated with material stability of the lean-phase ash underlying the existing ash dam
- it avoids impact on the forestry land adjacent to the existing ash dam
- it makes use of the preferred method of tailings disposal in a wide range of mineral processing activities. This method offers significant economic and environmental advantages over wet storage systems
- the construction method allows for progressive rehabilitation of the ash, thus minimising the risk of dust generation
- it is cost competitive with the alternatives
- it allows for returning to the mine voids option in the future should it be proven that this alternative can be relied on for future long-term ash disposal.

Consequences of not proceeding

If on-site ash disposal were not possible due to the existing ash dam becoming full, the Tarong and Tarong North power stations would have to curtail operations. If this was to occur, there is a likelihood of power outages and interruptions, particularly in south-east Queensland during the peak summer demand period of November to February.

In addition, the Tarong and Tarong North power stations support the maintenance of a higher level of social and economic activity in the region. The dominant beneficial impacts of these facilities on the regional community are an increase in the living standards of local communities, and the widely observed increase in regional economic certainty and stability. These benefits would be lost to the region if the facilities had to curtail operations.

It is therefore vital to both the regional and Queensland communities and economies that the Tarong power stations have adequate long-term ash disposal available in order to continue to be operational. The project will provide the secure long-term ash disposal required to ensure electricity generation at the Tarong site is not constrained through lack of available ash disposal.

Project schedule

Construction of the ash storage facility is proposed to take place between April and October 2007. The ash emplacement area will be progressively filled with ash by creating a series of smaller, ash-bunded cells. The area will be progressively rehabilitated as the level of ash reaches its finished surface level. Therefore, construction, operation and rehabilitation will be ongoing for the duration of the life of the ash storage facility. The lifespan of the ash storage facility is expected to be up to 25 years. The time to fill will be influenced by the operating regimes of the power stations and the ash content of the coal being burnt.

Native title

One active native title claim has been lodged and registered over areas incorporating the project site. The claim is QC 99/33, registered on 18 November 1999 by the Wakka Wakka People No.2.

Based upon an examination of the project land tenures, native title is extinguished over the project site as the land is held under freehold title and does not contain any watercourses.

Environmental values and impact management

Land resources

The project area is located within the Nanango Shire, and in the past has been predominantly used for grazing and limited cropping. Surrounding land uses include the Tarong and Tarong North power stations, grazing and cropping. Much of the original vegetation has been cleared in the past to improve the grazing capacity of the land. All lots which make up the project area are freehold tenure, currently owned by Tarong Energy.

Topography

The project site is undulating with a north-south facing ridge forming the eastern boundary of the site. The slopes are dissected by gullies draining to the north-west. Surface elevation at the site ranges from 420 m AHD to 520 m AHD.

Soils and geology

Soils encountered on the project site have developed on one of the following geological units:

- Tertiary age weathered/lateritised basaltic rocks on the east of the site, sloping down to the west and non-lateritised basaltic rocks on the west
- Tertiary-Quaternary age alluvium and/or colluvium
- Quaternary age alluvial sediments along the drainage lines.

The orange-brown and red-brown silty/sandy clays encountered in the portion of the site with Red Kandosols are considered a good potential ash capping layer and earth embankment material.

The subsoils of the dark coloured Vertosol, the North Chippendale soil, encountered along the alluvial plain north of Berlin Road are considered unsuitable for use in an ash capping layer or earth embankments and where possible should be left insitu. While the clays between topsoil and weathered basalt in areas where the Southern Valley soil occurs could be considered as ash capping layer or

embankment materials, their low thickness (i.e. < 0.5 m) and topographic position on moderately steep terrain and in narrow valleys indicates that their use would not be practical. Workability of these clays would also be low in wet conditions.

Contaminated land

Land contamination investigations have identified isolated small pockets of elevated concentration of heavy metals (arsenic, cadmium, chromium, lead, nickel and zinc) and total petroleum hydrocarbons on the site stemming from previous agricultural pursuits. Affected areas will be cleaned up as part of site preparation works.

Potential contaminants that will be used during the construction and operation of the ash storage facility include: petroleum hydrocarbons (diesel – 10,000 L); septic fluids; and dust suppressants. Practical methods will be employed to ensure that the potential contaminants listed above do not impact surrounding soil.

Land use suitability

The land suitability assessment for the project site found that the majority of the site was Class 2 – grazing land and Class 3 – suitable for rain fed cropping. Areas around the Quaternary age alluvial sediments along the drainage lines were found to be Class 1 – grazing land and Class 2 – suitable for rain fed cropping.

Based on regional mapping (Nanango Shire Council planning scheme), the site is fully within Class B Good Quality Agricultural Land (GQAL). Site investigations suggest that the sloping eastern portion of the site may not be suitable for cropping due to the gradient of the slope and would be better classified as Class C GQAL. Land of a similar gradient directly east of the project site has not been classified as GQAL under the planning scheme.

The objective of the rehabilitation program for the ash storage facility is that the post-project land use should be directed towards a stable landform supported by grassland with a native tree and shrub component. This minimises the potential for long-term exposure of the underlying ash. While this strategy will not preclude use for future highly managed grazing or silviculture activity, no such commercial use of the land is proposed into the foreseeable future.

Water resources

Surface water

The project site is located in the upper Burnett River drainage basin and currently drains via a series of unnamed north-west flowing gullies 3.6 km to Meandu Creek.

Two water types have been defined for the purpose of water management on the site:

- stormwater – which originates from undisturbed or rehabilitated areas of the site
- reclaim water – which originates from the ash storage facility, either as leachate from the deposited ash, or runoff from rainfall falling on the ash surface.

The project site was selected to minimise the catchment discharging through the storage facility. The site is bounded to the west by a north tending ridge, and to the south by the ridge separating the project site from the existing ash dam. This simplifies the water management system design and reduces the risks associated with water flows.

The basis of the design of the project water management system is to where practical, separate stormwater from reclaim water, maximise the reclamation and re-use of water from the site and aims to avoid discharge except in extreme rainfall events. Separate drainage systems will be provided for stormwater and reclaim water.

Groundwater

Two confined aquifers are known to exist within the project site – within the Main Range Volcanics and Quaternary alluvium. The minimum recorded depth to the top of each formation in the project site is approximately 10 to 12 m. Four monitoring bores intersecting the Main Range Volcanics presently exist in the immediate vicinity of the project site. Groundwater level monitoring results from these bores indicate that the direction of groundwater flow within this geological unit is from north-east to south-west.

Groundwater analyses based on available data indicates that groundwater sourced from aquifers within the project site has very high conductivity, principally due to the presence of high levels of sodium and chloride ions. Based on the guideline values (ANZECC 2000), groundwater sourced from the site is therefore not appropriate for application for direct human consumption or for irrigation, however may be suitable for livestock watering or industrial uses.

A search of the database of the Queensland Department of Natural Resources and Water (NR&W) has identified 14 registered bores within 5 km of the project site. Due to the fact that the project site and surrounding area is not within a declared groundwater management area, there is no requirement for groundwater bores to be licenced and hence the use of each bore is unknown. All bores for which there is water quality information are brackish or salty other than one bore which was reported to be of potable quality. The reported yields of the bores are relatively low and range from 0.19 to 1.75 L/s.

Groundwater recharge within the project area may be reduced due to the diversion of stormwater to either the on-site dam and/or the existing ash dam and also due to the low permeability compacted soil layer that is designed to prevent infiltration within the proposed ash storage area. Due to the low permeability of the existing soils, depth to aquifers and relatively small area of the project site, the reduction in recharge is not expected to be significant. No groundwater extraction is proposed during the project (other than for monitoring purposes) hence groundwater depletion will not occur as a result of the project. The project is therefore not expected to have any significant impact on the quantity and flow of local groundwater resources.

The most likely groundwater resources to the affected by the proposal are the alluvial aquifers in and around the project area. In particular, the alluvial aquifer in the north-western part of the project area. There will be no increase in the level of potential environmental harm, groundwater resource impact or contamination potential resulting from disposal of stormwater and leachate from the proposed ash storage facility into the existing ash dam.

Due to the low permeability of the soils within the project area the rate of any potential contaminant migration is expected to be slow. The proposed ash storage facility is unlikely to have a significant direct impact on the local groundwater resources provided good design and construction practices are followed.

Due to the anticipated slow rate of any such impact, an appropriate monitoring program would identify impact at an early stage to allow an appropriate mitigation strategy to be implemented.

Air quality

Dust is considered the only potential emission to air likely from the project. The main sources of dust emissions from the ash storage facility are expected to be wind erosion of the working area and vehicle movement on haul roads. Air dispersion modelling was conducted to predict the ground level concentrations of dust. The predicted levels of suspended and deposited dust are within the Environmental Protection Policy (Air) 1997 guideline levels at all nearby residential properties.

Predicted suspended dust levels for the ash storage facility were up to 92.2 µg/m^3 for the 24-hour PM_{10} (respirable particulates less than 10 µm in diameter), compared to the guideline level of 150 µg/m^3 and up to 26.3 µg/m^3 for the annual $PM_{10,}$ compared to the guideline level of 50 µg/m^3. Both of these levels were predicted to occur at the resident directly adjacent to the site on the corner of Berlin and Hazeldean roads. The predicted dust deposition at this sensitive receptor is up to 98.5% of the EPA's dust deposition guideline of 120 mg/m^2/day. Dust deposition rates at this level, at this property are predicted to occur when the working area moves to the north-east corner of the site (after year 15) and can be reduced by increasing the watering of the haul road to more than 2 L/m^2/day (giving a 75% reduction in dust emissions) and reducing the size of the working area by 25% to 210,000 m^2. The maximum annual average dust deposition rate is predicted to be less than 80% of the recommended EPA guideline of 120 mg/m^2/day at the other receptors.

The project has been designed to provide an ash storage facility that has a lower potential for off-site dust impacts with improved capacity for dust control and which can reach a stable landform more quickly so that rehabilitation can be undertaken.

Dust emissions from the ash storage facility will be controlled by:

- limiting the size of the working area to a maximum of 280,000 m^2 at any one time throughout the duration of the project
- progressive rehabilitation of the completed surface
- use of vegetative screens and bunds
- management of haul roads
- application of surface treatments to the ash when high dust conditions are expected.

Noise and vibration

Background sound levels during the day occasionally drop below 30 dB(A) and stay consistently around 30 dB(A) during the night. These noise levels are typical of a quiet low-density transportation area, with low background (L_{A90}) sound levels during the day and night, and slightly elevated average maximum (L_{Aeq}) sound levels during the day.

If the operational noise criteria are used as a guide for setting construction noise criteria, noise emissions from ongoing construction activities are expected to marginally exceed the criteria at a number of receiver locations during some part of the ongoing construction phase. However, the use of operational criteria as a means of assessing construction noise is considered to be conservative, given the intermittent nature of

the activity locations and durations. It is also noted that the predicted levels will not exceed the sleep disturbance criteria. Given this, noise levels from ongoing construction are not expected to cause significant impact on the sensitive receivers.

In addition, construction activities will be restricted to the following hours:

- Monday to Friday 7:00 am to 6:00 pm
- Saturday 7:00 am to 1:00 pm
- Sunday and public holidays no construction activities.

During operation of the ash storage facility, operational noise levels will comply with the sleep disturbance criteria of 52 dB(A) L_{Amax} under adverse meteorological conditions.

Throughout the life of the project, noise monitoring will be carried out to monitor noise levels and if required, appropriate mitigation measures will be implemented to ensure that noise criteria are not exceeded.

Nature conservation

Matters of National environmental significance

The project was referred to the Commonwealth Minister for Environment and Heritage in accordance with the provisions of the *Environment Protection and Biodiversity Conservation Act 1999*. The Commonwealth Minister decided that the project did not constitute a controlled action under the Act.

Terrestrial flora

A terrestrial flora study was undertaken for the project to identify the current extent of vegetation communities within the study area, determine the conservation values of the flora on the site, assess the potential impacts from the project and develop appropriate management strategies for the mitigation of potential impacts. A desktop review of existing information was conducted, and previous vegetation mapping for the site was updated. A field investigation was also undertaken to examine the current distribution of species of conservation significance.

The area has been used for cattle grazing and is largely cleared of native vegetation. Small patches of dry vine forest vegetation remain although these have been disturbed by timber harvesting and are surrounded by cleared land. Remnant vegetation covers 12.8 ha (less than 6.5% of the project site).

A total of 189 plant species, representing 62 families of vascular plants were recorded from the study area. Thirty seven exotic or introduced plant species were recorded for the site, five of which are currently 'declared species' and are identified as being of management concern. Over 90% of the land to be affected has been used for grazing. Five primary vegetation communities were described and mapped for the broader study area on the basis of aerial photograph interpretation and field survey results. None of these communities were listed as threatened ecological communities under Commonwealth legislation. The largest in area is pasture land.

The establishment of the proposed ash storage facility would result in the removal of the five patches of dry rainforest/vine thicket with a total area of approximately 5.5 ha. Three of these patches (Sites 3, 4 and 5) comprising 2.4 ha belong to the 'endangered' RE 12.5.13 and the remaining two (Sites 1 and 2) comprising 3.1 ha to 'of concern' RE 12.9/10.16e. However, Sites 2 and 3 have been mapped as remnant

by the EPA as the 'of concern RE 12.3.8. Only one site (Site 2) meets the criteria defined under the *Vegetation Management Act 1999* to be considered remnant. Site 2 belongs to R12.9/10.16e and is approximately 1.6 ha. It is considered that vegetation removal proposed for the project would not have significant impact on flora species, vegetation communities or habitat connectivity on a regional scale.

Terrestrial fauna

A terrestrial vertebrate fauna survey of the project area was conducted in May 2006 and included a bird census, diurnal reptile searches, night spotlighting, analysis of tracks/traces, call playback and Anabat electronic bat detection. The survey results supplemented information obtained in previous surveys of the area.

The habitats of the study area have been substantially modified from their natural state through past land use practices. Native vegetation is limited to several small and isolated patches of dry rainforest/vine thicket and regrowth vegetation. It is considered unlikely that these patches of vegetation support rare or threatened species on a regular basis.

The degraded regrowth shrubland, plantation and pasture vegetation communities are considered to be of low habitat value. They lack most habitat elements of the original vegetation communities that would have been present in the study area such as mature canopy trees, coarse woody debris and deep leaf litter. In addition, they have high weed coverage.

A total of 47 native and 2 introduced terrestrial vertebrate species were recorded during the 2006 field surveys in the study area, including 34 birds, 3 reptiles and 12 mammal species.

One threatened species *Pteropus poliocephalus* (grey-headed flying fox) was observed from the study area during a previous survey. This species, which is listed as 'vulnerable' under the Environment Protection and Biodiversity Conservation Act, was observed roosting within one of the small patches of dry rainforest and was considered likely to be feeding on a fruiting *Ficus platypoda* (rock fig). This species remains relatively common in south-east Queensland. The presence of significant numbers of grey-headed flying-foxes in the study area, including the likelihood of camp sites, is considered unlikely due to the high level of clearing within the study area, removing food and roosting resources for this species.

Evidence of the black-breasted button-quail was found in the mature hoop pine plantation (Yarraman State Forest) immediately to the south of the project site. No evidence was found however, of this species within the small patches of dry rainforest/vine thicket on the site. These patches are considered to be too isolated from the Yarraman State Forest and too small to support resident animals.

Construction of the proposed ash storage facility is considered unlikely to have a significant impact on rare or threatened fauna or affect fauna movement in the area. The patches of native vegetation in the study area are small and geographically isolated from larger tracts of vegetation and each other. These patches are considered unlikely to play an important role in maintaining habitat connectivity in the local area. Therefore the removal of these patches of vegetation is considered unlikely to significantly affect fauna movement opportunities in the local area.

Aquatic flora and fauna

An aquatic ecology survey of the project area and surrounds was undertaken to gather information on the physical environment, water quality, aquatic plants, macro-crustaceans, and fishes. Information on macro-invertebrates was sourced from macro-invertebrate surveys undertaken by Tarong Energy over the last 7 years.

No aquatic species recorded during the survey are listed under the *Environment Prorection and Biodiversity Conservation Act 1999* or *Nature Conservation Act 1992*. However, there are records of many conservationally significant taxa inhabiting the downstream waters of the broader Burnett River Catchment (including the Barkers Creek Catchment).

The discharge of sediments, nutrients and contaminants from the site to natural waterways has the potential to impact upon aquatic ecology, including potential impacts to conservationally significant fauna or their habitat. Except in high rain events, all rainfall onto the site will be captured in the existing farm dams (and future reclaim water dam) in the north-west section of the site, or in the existing ash dam. In addition, there will be a number of controls to minimise erosion and transport of sediment incorporated into earthworks. Given that water management systems will be sized to limit the risk of discharge of water from the project site, no impacts on downstream water quality are expected under normal operation.

Cultural heritage

Indigenous cultural heritage

The assessment of indigenous cultural heritage for the project site involved a field survey undertaken in conjunction with the Wakka Wakka people. A total of 100 artefacts were found and recorded during the survey. Artefacts recorded during this survey consisted of:

- stone tools – identified by the presence of usewear and/or retouch along one or more edges
- cores – rocks from which flakes had been struck
- debitage – the non-used, waste flakes created during stone knapping.

In compliance with the *Aboriginal Cultural Heritage Act 2003*, the proponent will develop an approved Cultural Heritage Management Plan (CHMP) in negotiation with the Wakka Wakka people. The CHMP will provide for the management of cultural heritage matters on the project site.

Non-indigenous cultural heritage

An assessment of non-indigenous cultural heritage was carried out through examination of the local and regional history and heritage registers and a site visit. There are no listings with the Register of National Estate or State Heritage Register within the project area. Four sites within the project area contain physical evidence of former 20th century dairy farms. Given the large number of family dairy farms that existed in the region, the examples within the study area are not unique, although they do provide information on dairy operations in the south Nanango area. These sites are deemed to have local interest but no discernible, particular significance to the local community.

Waste

The major sources of waste expected to be generated by the project are:

- green waste including all vegetation that is cleared to allow the development of the project and associated infrastructure
- operational wastes – namely bleed water from the emplaced slurry
- sewage and sullage waste

- hydrocarbon contaminated waste comprising solvents, waste oils and lubricants produced during minor vehicle maintenance, vehicle washdown, interceptor sludge, spills during refuelling operations and leaks from storage facilities
- domestic wastes such as food scraps, paper, glass, aluminium cans and cardboard
- used tyres from heavy and light vehicles.

Waste streams from the Tarong and Tarong North power stations that are the major inputs into the existing ash dam include:

- Tarong Power Station ash
- Tarong North furnace ash (trucked)
- Tarong North dense phase ash.

In addition to these wastes, a number of other minor effluents and waste from the power station are disposed of in the existing ash dam. Of these coal and screen rejects, and ash blockages will report to the proposed ash storage facility. The remainder are to continue to be treated in the existing ash dam circuit. Water from the existing ash dam circuit will be mixed with dry ash to form the slurry which is transported to the ash storage facility.

Tarong Energy will develop a Waste Management Plan as part of the project EMP. The plan will be developed in accordance with the relevant legislation and will address both the construction and operational phases of the project. This plan will take into consideration international best practice management for wastes including opportunities and actions to be taken to implement the waste management hierarchy and lifecycle assessment recommendations.

Infrastructure and traffic

The region surrounding the project site has well established public road infrastructure. The Tarong site also has established road, water, power and communications infrastructure in place to service the power stations. The project will utilise the existing infrastructure and services at the Tarong site wherever possible.

Energy

A number of existing feeder power lines are located within the project area. Those lines directly impacted by the ash storage facility will be removed and/or relocated as necessary.

The existing ash dam area is currently serviced by three separate 6.6 kV feeders which deliver power to two separate locations, namely the stormwater diversion feeder and the reclaim water motor supply feeder.

The main power supply demands for the project site are the booster station, water reticulation and site infrastructure area. The booster station for the ash transport system is within the existing ash dam boundary. Power will be supplied by extending existing infrastructure within the power station. Miscellaneous pumps for water management may be required to reticulate water about the site. The site infrastructure area will also require provision of domestic supply. The supply required for operation of these facilities is not of significant magnitude and it is expected power will be drawn from the local power network in the vicinity of the project area.

Water

The primary water demands at the project site will be for use in rehabilitation and haul road dust suppression. Water supplies will be drawn from the following sources in order of priority, depending on the suitability of water quality:

- reclaim water storage at the project site
- stormwater dam on project site
- reclaim water stored at the existing ash dam
- recycled cooling water from Tarong Power Station
- water pumped from Black Creek Dam at Tarong Power Station
- raw water pumped from Tarong Power Station.

Potable water will be required at the workshop, primarily for drinking and also for other minor uses such as the emergency eye wash/shower. It is anticipated that this demand will be relatively small and will be captured in rainwater tanks and also trucked to site as required.

Telecommunications

The project region has an adequate communication base with standard lines and mobile telephone capacity available. Mobile telephones are operational at the project site. The project does not have need to increase the capacity of available communication services for the site.

Sewage

The Tarong site has a sewage treatment plant for management of sewage within the site. Due to distance, the use of these facilities for project operational staff is not considered practical.

During the initial construction phase, sufficient portable sewage facilities will be provided on site by the contractor to support work crews. During the operational phase a septic system will be provided for operational staff at the site infrastructure area. There will therefore be no impact to sewerage services provided by Nanango Shire Council.

Traffic

The project site is roughly bounded by Berlin Road to the north, Nanango-Neumgna Road to the east, Chippendale Road to the west and Yarraman State Forest to the south. The main arterial roads in the region are:

- the Daguilar Highway that connects Yarraman and Nanango
- the Burnett Highway to the north of the Nanango
- the New England Highway to the south of Yarraman.

The main access to the Tarong site is provided by the Nanango-Tarong Road, which is west of the power stations. It is expected that the majority of vehicles will access the project site via Chippendale Road or via Nanango-Tarong Road (main power station access). No construction and/or operation vehicles will be permitted to access the site from Nanango-Neumgna Road.

The traffic impact assessment indicates that the daily increase in total traffic volumes is in the order of 1.5% on Nanango-Tarong Road and 7% on Berlin Road during the construction period. The existing intersections and roads are expected to operate satisfactorily with this increase in traffic volumes. As such, no infrastructure works are anticipated on the local or state controlled roads, and a detailed assessment of pavement life is not considered necessary. The traffic impact assessment for the operational period indicates that the existing intersections and roads are expected to operate satisfactorily with the predicted increase in traffic volumes. As such, no infrastructure works are anticipated on the local or state controlled roads. The increase in daily traffic volumes of the order of 4.4% on Berlin Road during the operational period is unlikely to result in any safety impacts that may require mitigation measures.

Rail

There is currently no rail infrastructure in the vicinity of the project that will be affected by development of the ash storage facility.

Visual amenity

The project site is situated on a relatively gently falling side slope orientated to the west. It consists of an open grassed paddock with very few trees, with a rural character. The Nanango-Neumgna Road, east of the project site follows a local ridge that effectively visually divides the site from areas further east. Berlin Road rises up and over the ridge as it intersects with Nanango-Neumgna Road and Hazeldean Road and moves west. From near the intersection of the roads there are regional views possible towards the distant Stuart Ranges and beyond. The Tarong and Tarong North power stations, and particularly the two large chimney stacks, dominate these regional views. As viewers move further west along Berlin Road and the topography drops, these regional views are eventually lost. Similar distant views are possible from some locations along Nanango-Neumgna Road.

The landscape surrounding and within the site could be described as having a low to moderate visual landscape value. Scenic quality is low to moderate and there has been no specific landscape significance identified for this landscape type. There is however some landscape value associated with the attraction of the Burnett region to tourists, which is related to the beauty of the natural and rural landscapes. The existing Tarong and Tarong North power stations are a dominant industrial element in this mostly natural and rural landscape.

The ash storage facility will be progressively established over a 25 year timeframe. It will ultimately be approximately 50 m high with a moderate slope of 1:8 (height: width). Visibility of the site will be relatively low, as it is situated within the existing Tarong site and has few outside viewpoints. Sensitive receptors include residential properties and road users. The key locations from where the project may be visible include:

- properties located on Hazeldean Road and Hohnke Road

- properties located on Nanango-Neumgna Road
- properties and travellers along Berlin Road.

For the most part, there are not likely to be any views of the facility from the residences along Hazeldean and Hohnke roads as they will see over the top of it. When the facility reaches its final height and form there may be some view of the upper edge within foreground views from these residents, although this will probably not be a noticeable visual change due to the distance.

The residence near the corner of Hazeldean Road and Berlin Road would have views towards the facility, yet it is anticipated that the planned landscape buffer would partially screen the area. The impact to travellers along Berlin Road is considered to be low, given the low traffic volumes.

Measures to be implemented to further reduce visual impacts include the establishment of a visual landscape screen around the ash storage facility along all sides from where the site will be viewed from outside the power station site (i.e. the north and east). The proposed buffer zone is viewed as essential to ensure screening of the ash storage facility occurs over time. This will be established as quickly as possible, with the initial focus on screening views from Berlin Road.

Community and stakeholder consultation

Community consultation for the EIS process involves a number of stakeholder groups and community members. These community representatives included:

- local, state and federal government agency representatives
- directly affected property owners
- local community groups
- residents
- the broader community.

Community consultation forms an important part of the EIS process and is vital in generating a social and economic impact assessment. Consultation to date has included:

- a freecall telephone number
- email address
- issues database
- information newsletter
- direct contact with stakeholders, government agencies, local councils and the general community
- meetings with property owners
- local community update sessions.

Key issues that have been raised through the community consultation process include:

- air quality, specifically how Tarong Energy would minimise dust from the new storage facility
- property impacts such as devaluation
- potential health concerns through ash entering water tanks via gutters
- concerns about the future Stage 2 and how it would impact their property
- visual impacts from properties and proposed buffer zones for both stages
- construction concerns including monitoring of air quality, traffic movements and noise
- operational traffic using local roads
- potential impacts on the local natural environment including groundwater impacts and loss of flora and fauna habitats.

Social aspects

The community profile for the regional area indicates that there has been a slight increase in population between the 1996 census and the 2001 census. This population increase is projected to continue at an average annual rate of 1.1% for Nanango and 0.7% for Kingaroy. There is a notably low proportion of persons aged between 15 and 35 years. The statistics suggest that these communities may be experiencing rural-urban drift, as young adults move to urban areas for employment and education opportunities.

No privately owned properties are directly affected by the project. All properties located within the project area have been previously acquired by Tarong Energy. The properties surrounding the project site to the north and east are mainly involved in agriculture, particularly extensive cropping and cattle production. There are also two rural-residential areas in close proximity to the project site. These areas are made up of small-lot rural-residential properties, with the main landuses for homesteading, minor grazing, horticulture and small crops.

Due to the minor employment increase associated with the project, it is expected that there will be minimal impacts to the social profile, employment profile, local economy or service delivery. The project however will enable the continued operation of the power stations. This in turn will enable the higher level of sustainable social and economic activity in the region attributable to these facilities to continue.

The greatest impact expected to occur as a result of the project, is changes to the existing lifestyle and amenity of surrounding residents. These impacts will however be reduced through appropriate management measures.

Economics

Other than a small impact from the loss of low fertility agricultural land, no significant direct economic impacts have been identified as a result of the project. Overall, the proposed ash storage facility would protect and marginally contribute to the enhancement of economic value of the local area and region by creating additional employment and economic activity. In addition, the project would enable the continuing operations of the Tarong and Tarong North power stations and hence the continuation of the immediate and flow on benefits these facilities provide to the local, regional and state economies.

The direct impact of the project on local and regional economic values would be directly related to employment and spending in the local area. These benefits could be captured and enhanced during the construction and operational phases by sourcing goods and services for the project from local businesses in the Nanango and Kingaroy shires.

The economic boost to the local economy would also be maximised by the project using local suppliers and contractors where possible. This strategy would also mitigate any pressure on local housing availability through employing people who already reside in the area. The small operational workforce required for the project will have minimal direct impact on the high unemployment rate in the area.

Hazard and safety

The hazards and risks associated with the project have been identified through a preliminary hazard analysis undertaken for the project. In addition, a qualitative risk assessment has been completed for the construction, operation and decommissioning of the project. The methodology generally follows the Australian Standard AS 4360-2004: *Risk assessment.*

The initial risk assessment without controls presented one extreme risk – the stability of exposed ash surfaces. However, following implementation of controls, this risk was reduced to moderate.

Based on the risk assessment, all risks were reduced to residual levels of moderate to low once appropriate mitigation measures and/or further investigation to better quantify the risk were undertaken. Items with moderate residual risk levels included dust, visual and landform stability. These issues will be managed on an ongoing basis with a view to reducing the likelihood of an occurrence and also to reduce the level of potential consequences.

Environmental management and monitoring

Potential environmental issues requiring management and monitoring have been identified during the environmental impact assessment process. The draft Environmental Management Plan (EMP) integrates the risk assessment, and the environmental management commitments made throughout the Environmental Impact Statement (EIS). The draft EMP relates to the construction and operational phases of the project and will be used as the basis for preparation of the final EMP prior to commencement of these phases. The EMP will be a dynamic document that will be amended as necessary, incorporating conditions imposed as part of any relevant environmental approvals or permits.

The purpose of the EMP is to identify potential environmental issues and mitigation measures together with corrective actions if an undesirable impact or unforeseen level of impact occurs. Internal environmental audits to check performance will occur throughout the construction and operation stages of the project. Monitoring will also be used as a tool to assess the operation's compliance with performance criteria. Annual review of monitoring results will be conducted to assess the operation's compliance with any approval conditions.

Tarong Energy will ensure that scheduled internal audits are undertaken to confirm adherence to the EMP

Tarong Energy is responsible for the implementation of the EMP, including provision of resources to ensure it is followed through construction and operation. Day to day environmental responsibility to maintain the requirements of the EMP will fall on delegated personnel.

The EMP will be reviewed and periodically updated, if necessary, to reflect knowledge gained during the detailed design process, construction and the course of operations. Changes to the EMP will be implemented in consultation with the relevant authorities where necessary.