28 SUMMARY OF COMMITMENTS AND MITIGATION MEASURES

28.1 INTRODUCTION

The environmental chapters within Volume 2 of the Environmental Impact Statement (EIS) identify a range of mitigation measures proposed to avoid, remedy and mitigate potential impacts from the Wandoan Coal Project (the Project) during:

- Project construction
- Project operations
- Project rehabilitation and decommissioning.

To avoid, remedy, mitigate and manage the Project impacts, the Wandoan Joint Venture (WJV) commits to adopting the mitigation measures summarised in this Chapter.

In addition to the mitigation measures, the WJV commits to a range of additional activities and strategies that will enhance the environmental, social and economic benefits of the Project, as well as ensure that residual adverse impacts are avoided or minimised as far as practicable. These additional measures have been developed to reflect the outcome of consultation with the local community and relevant key stakeholders, and the WJV's commitment to sustainable development.

For ease of reference, this Chapter summarises the proposed mitigation measures and additional strategies committed to by the WJV. For contextual information concerning mitigation measures summarised below, the reader is referred to the relevant chapter of the EIS.

Mitigation measures that are relevant to the environmental authority required under the *Environmental Protection Act 1994* (EPA) that will facilitate the Plan of Operations for the Project, are set out separately in the draft Project EMP (Chapter 27).

28.2 WANDOAN COAL PROJECT LIST OF COMMITMENTS

The following provides a list of commitments for construction and operation phases of the proposed southern coal seam methane (CSM) water supply pipeline (proposed pipeline).

Table 28-1: Wandoan Coal Project list of commitments

Chapter	Commitments
General	Where an easement within a property is required to facilitate the pipeline construction, the WJV will: ▪ enter into an agreement with the land owner and tenement holder (where applicable) regarding the easement.
Chapter 7 **Climate**	The WJV will monitor atmospheric conditions during project construction to assist with prediction of inclement weather conditions and management of operations. An Emergency Management Plan which will address all foreseeable site specific risks, such as cyclones, fire and flood, including appropriate contact details of emergency services agencies, will be prepared prior to commencement of construction activities.
Chapter 8 **Land use**	**Tenure** During the detailed design process, the finalised pipeline alignment will be developed to accommodate tenement requirements so as to prevent or minimise potential sterilisation of a resource, in consultation with the tenement holder. However, where an easement within a property is required to facilitate the pipeline construction, the Proponent will: ▪ enter into an agreement with the land owner regarding the easement, and discuss the easement with the tenement holder (where applicable) ▪ agree with the land owner about compensation and its form **Land use** The Proponent will implement measures to mitigate impacts on land uses arising from construction and operation of the pipeline to include: ▪ implementing a traffic management plan to control traffic, where work would occur in road reserves ▪ ensuring all land trenched for the pipe laying is back-filled with original excavated material and rehabilitated to allow for the use of that land to continue upon completion of construction ▪ managing potential environmental impacts (such as noise and air emissions), particularly where located in close proximity to sensitive receptors. These measures are contained in the respective chapters and sections of this Chapter. **Native title** ▪ Where it cannot be determined that native title has been extinguished over particular areas and the Proponent has the potential to impact native title rights and interests, the impacts will be mitigated through following the appropriate "future act" process under the *Native Title Act 1993* (Cth) (NTA). **Contaminated land** ▪ A soil sampling program will be implemented on those Lots identified as having the potential for contamination and based on the findings of the soil sampling program, mitigation measures will, if necessary, be established ▪ Where identified contaminated land is to be disturbed as a result of construction activities, the impacted soil is to be managed under a Site Management Plan (SMP) The site will also require listing on the EMR or other appropriate register ▪ Construction activities will be conducted in compliance with the EM Plan developed as part of this EIS (refer Chapter 27).

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	Stock routes ▪ Continuing consultation will be carried out with the Dalby Regional Council, the Department of Natural Resources and Water (DNRW) and the Department of Main Roads (for proposed works on SRN components that use State-controlled roads) to discuss the timing and duration of the temporary closure of the SRN components, thereby minimising the potential impacts on stock movement. ▪ implementing a management plan to control the use of stock routes, where work would occur in road reserves that are also used for the purposes of moving stock ▪ ensuring all land trenched for the pipe laying is back-filled with original excavated material and rehabilitated to allow for the use of the stock routes to continue upon completion of construction ▪ managing potential environmental impacts (such as noise and air emissions), particularly where located in close proximity to sensitive receptors These measures are contained in the respective chapters and sections of this Appendix.
Chapter 9 **Soils and Geology**	**Dispersion and erosion** The following measures will be implemented during site preparation and planning ▪ an erosion and sediment control plan will be prepared and implemented prior to the commencement of construction, specifying the locations and types of sediment and erosion control measures to be used ▪ vegetation clearing (including grass cover) will be limited to the minimal amount required for Project works ▪ Site drainage, erosion and sediment controls will be implemented and in place prior to, or as soon as possible, following the removal of vegetation ▪ traffic will be confined to defined roads and access tracks to minimise soil disturbance ▪ infrastructure, parking and laydown areas will be located at sites with minimal slope grade ▪ hardstands will be constructed using erosion resistant material The following measures are proposed to be implemented to manage water erosion where appropriate: ▪ erosion and sediment control measures will be installed on disturbed slopes to minimise erosion and sediment released into waterways. This is especially important for soils with sandy topsoil or dispersive subsoils ▪ water runoff will be directed around or away from disturbed areas using diversion bunds and catch drains as appropriate ▪ run-off from disturbed areas will be directed to sedimentation basins ▪ exposed soils will be revegetated as soon as practical after works have been completed. Soils on Light Forests LRA and Cypress Pine LRA will need to be revegetated with low water tolerant plants, or have soil amelioration measures to increase the water holding capacity of the soil ▪ disturbed and rehabilitated land will be retained with a rough surface (as opposed to a smooth surface) to slow overland water flow ▪ the reinstated landsurface will be shaped to ensure that rain water is not channelised, but is allowed to disperse over a large area ▪ all soil stockpiles will be bunded. Short term stockpiles may be bunded by sediment fencing, while long term stockpiles should have measures such as earthen bunds. Drainage works installed to divert overland flow from upslope of the longterm stockpile areas away from and around the stockpiles. Sediment traps or similar features will need to be installed downslope of stockpiles to present eroded sediment entering waterways

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	▪ erosion will be remediated as soon as practicable. This may include levelling the eroded area, capping with non-dispersive topsoil, application of seed and applying erosion control measures to prevent water impacting the site. The longer erosion is allowed to develop, the more costly and difficult it is to remediate ▪ Any soil conservation measures, such as contour banks, that are disturbed during works will be reinstated following construction. The following measures are proposed to be implemented to manage wind erosion: ▪ watering trucks will be used during windy conditions for dust suppression ▪ vegetation clearing (including grass cover) will be limited to the minimal amount required for proposed pipeline works ▪ where appropriate, long-term (greater than 3 months) stockpiles of topsoil will be planted with vegetation to minimise entrainment of soil particles into the air and minimise erosion through raindrop impact ▪ exposed soils will be revegetated as soon as practical after works have been completed. The following measures are proposed to be implemented to manage wind erosion: ▪ exposure of alkaline or sodic subsoils (e.g. all soils other than Kinnoul, Chinchilla, Davy and Minnabilla) should be avoided where possible, and should be limited to the minimal amount of time practicable ▪ alkaline or sodic subsoils should not be left exposed on the surface, and should be covered with topsoil or other material. The following measures are proposed to be implemented to manage tunnel erosion: ▪ fill around the proposed pipeline will be compacted to at least the density of the surrounding soil material, and the filled trench left slightly higher than the natural land surface to minimise ponding or infiltration around the pipe. ▪ all dispersive soils along the corridor will be fully capped with at least 0.2 m of topsoil with low erosion potential. Deeper topsoil depths have the potential to store rainwater and reduce infiltration into dispersive subsoils. ▪ the geometry of the final landsurface will be managed to prevent the ponding of water on Teviot soils, to reduce the potential for infiltration into subsoils. **Monitoring** ▪ Regular (e.g. weekly or fortnightly) monitoring for erosion will be conducted during construction, including the trench and water management infrastructure. ▪ Erosion monitoring will continue until the vegetation cover has become fully established. ▪ Monitoring for the development of tunnel erosion will be undertaken 3 monthly for 12 months following the completion of construction. **Salinity** The following mitigation measures will be applied, where appropriate, in relation to salinity of soils: ▪ the topsoil of Teviot is saline and generally will not be used as a topsoil layer in rehabilitation. Where suitable supply of other topsoil is available, this should be used in preference to Teviot, or Teviot soil mixed with this soil. Salt tolerant vegetation species may be required for rehabilitation on Teviot topsoils ▪ the subsoils of Cheshire, Teviot, Poplar Box Flat Plains soils, Bogandilla and Tara are saline and where practicable will be buried below the rooting depth plants and crops (i.e. below about 0.6 m depth).

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	Compaction The following measures will be applied, where appropriate, in relation to compaction of topsoil: ▪ soils that will be trafficked or compacted during construction will have water control and sediment containment measures installed to minimise potential erosion and sediment entering into waterways. ▪ previously compacted areas that are to be rehabilitated will, where practicable, be remediated by ripping the top layer of soil. Ripping the top layer of soil breaks down the soil structure, and as a result protection of these areas from re-compaction (i.e. vehicles or grazing animals) after ripping is required to allow the soil structure to reform. ▪ compaction of topsoil can be reduced by selection of appropriate earthmoving machinery for these soils (i.e. light weight vehicles with large wheel/track size). **Topsoil reuse** Suggested stripping depths and identified constraints for various encountered soil types are provided in Attachment A. Topsoil is proposed to be managed as follows: ▪ stripped separately to subsoil and stockpiled during clearing for reuse in site rehabilitation ▪ stored in stockpiles no more than 3 m high to retain seed germination potential ▪ stored for the shortest period practicable, and where possible reused within 6 months of stripping to maximise the retention of the seed bank in the soil ▪ reused in the general area from which it was stripped ▪ during site rehabilitation works topsoil should be spread to a depth of not less than 0.2 m ▪ control measures such as fencing should be installed on newly topsoiled areas to exclude vehicle or stock access until a vegetation cover has established. Watering may need to be provided in the germination or early development stages of vegetation, together with appropriate seasonal timing of the revegetation works. ▪ see Attachment A for topsoil stripping depths and potential constraints for reuse **Soil conservation plans** Although no approved soil conservation plans are present in the proposed pipeline study area, the following measures should be applied to soil conservation measures: ▪ existing soil conservation measures should be retained and maintained where they currently exist ▪ any soil conservation measures, such as contour banks, that are disturbed during works should be reinstated following construction. **Post construction land use** To maintain the existing land use and land suitability class after construction, the following measures should be implemented: ▪ topsoil should be stripped prior to construction and respread over the corridor following construction ▪ where applicable, the land surface should be left in a smooth even grade suitable for surrounding land use ▪ sodic or acidic subsoils should not be left on the land surface and should be buried below the rooting depth of crops (i.e. below about 0.6 m depth).

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Chapter 10 **Groundwater**	**Construction** ▪ It is proposed that machinery and potentially contaminating equipment be stored and operated away from drainage areas where possible ▪ Ensure chemical spill kits are available on site in case of fuel spills and that there are appropriate waste disposal protocols in place **Operation of pipeline** ▪ Implement a leakage detection system for the water pipeline
Chapter 11 **Water supply**	**Construction** An Erosion and Sediment Control Plan will be prepared in accordance with Soil Erosion and Sediment Control; Engineering Guidelines for Queensland (Institution of Engineers, Australia, 1996) prior to the commencement of any construction activities. Measures that are likely to be incorporated in this plan include: ▪ installing erosion and sediment controls, such as sediment fences, in accordance with the Erosion and Sediment Control Plan ▪ diversion of clean surface runoff away from disturbed areas ▪ stockpiles of excavated materials will be located away from gullies and drainage lines ▪ clear identification of the areas required to be disturbed to ensure that land disturbance is minimised and as little vegetation is cleared as possible ▪ planning construction works to minimise the length of time that soils are disturbed and ensuring prompt rehabilitation and revegetation of areas as soon as works are complete ▪ other measures as detailed in 'soils and geology' of Chapter 9. The following measures will be implemented to minimise impacts during construction of the proposed pipeline at waterway crossings: ▪ during detailed design of the pipeline, DNRW will be consulted to ensure that the proposed construction methods are appropriate at each watercourse crossing and to obtain any approvals required under the *Water Act 2000*. Should significant or sensitive features be identified during detailed design phases, other construction techniques such as directional drilling will be considered for pipeline construction ▪ construction activities will be planned at waterway crossings to coincide with dry periods or low flow periods (autumn and winter months) where possible ▪ should it be necessary to construct the pipeline across a watercourse that is not dry, the water will be contained by a levee and the pipeline constructed in the minimal time possible to ensure minimal disturbance to the watercourse. Alternatively, if necessary other construction techniques, such as directional drilling will be adopted ▪ material excavated from within watercourses will be segregated so that, for example, material from the creek bed and topsoil from the banks are not mixed. This material will be reinstated in its natural position ▪ construction materials will not be stored within the channel of watercourses. Movement of construction vehicles, plant and personnel within the channel and banks of watercourses will be restricted. ▪ other general mitigation measures which will be required during construction include: ▪ ensuring that chemicals and fuels are appropriately stored and bunded

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	▪ training of construction employees to implement spill response procedures and implement, maintain and be aware of sediment and erosion control measures and requirements. Mitigation measures required during hydrostatic testing include: ▪ approximately 1km will be tested at a time. ▪ should leaks be detected, testing will cease immediately ▪ water from each test will be captured for dust suppression for the pipeline construction, reuse in further tests or for construction water at the mine site. **Operation** Measures to mitigate impacts during operation of the pipeline will be incorporated into the pipeline design and maintenance and monitoring schedule. The pipeline will be designed and constructed such that it is located at adequate depth from the bottom of all watercourses crossed to ensure that there is minimal potential for scour and resulting changes to channel morphology. The DNRW will be consulted during pre-construction activities to ensure that design factors such as depth of cover will be suitable minimise potential impacts and to obtain any approvals required under the *Water Act 2000*. ▪ following periods of heavy rainfall, watercourse crossings will be inspected to check for signs of scour and erosion. If necessary, rehabilitation works will be carried out to prevent erosion along the pipeline route. ▪ scour outlets will be equipped with a cam-loc coupling to allow the pipe to be dewatered into a water truck. Water collected will be trucked to the mine site for release into the water storage dam (if of a suitable water quality), or disposed of to the tailings dam. Spill containment will be incorporated at each of the scour outlet locations to ensure that any spills during pump out of water are contained and not released to the surrounding environment. The small amounts of water that may spill during scour outlet pump out will be left to evaporate from the containment structure. The WJV will monitor the impacts of any spills and develop appropriate responses as required within the Project EMP. ▪ regular maintenance and monitoring of the pipeline will be conducted to minimise the potential for pipeline leaks or ruptures to occur. This will include continuous monitoring of flows and regular inspection of the pipeline condition. ▪ pipeline maintenance will be carried out when inspection notes this being required to minimise potential for leaks to occur. The pipeline will incorporate appropriate mechanisms for use in the event that failure of the pipeline occurs. This will ensure that large volumes of CSM water will not leak from the pipeline.
Chapter 12 **Transport**	▪ Refer to Volume 1
Chapter 13 **Air Quality**	To ensure that levels remain well below the EPP (Air) goals for annual TSP, PM10 and dust deposition haul roads and stockpiles will not be located within 500 m of a sensitive receptor. A dust management plan will be developed for the construction of the Southern pipeline as part of the Project's Construction Management Plan. This plan will include: ▪ use of water sprays during excavation and on roads when potentially sensitive receptors are located within 500 m of the pipeline corridor ▪ rehabilitation of the disturbed area as soon practicable following trench refill

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Chapter 14 **GHG and Climate Change**	▪ Refer to Volume 1
Chapter 15 **Noise**	**Construction** A Noise Management Plan will be developed as part of the Project's Construction Management Plan. The plan will include: ▪ permission will be sought from the administering authority to conduct construction activities during all hours. However if noise monitoring indicates that Project construction activities will or are likely to cause audible noise at a sensitive receptor, relevant Project construction activities will not be undertaken during the following hours (as per Section 6W of *Environmental Protection Regulation 1998*): ‣ on a Sunday or Public holiday at any time ‣ on a Saturday or business day before 6:30 am or after 6:30 pm. ▪ recommendations given in AS 2438 "Guide to noise control on construction, maintenance and demolition sites", 1981 will be implemented ▪ all machinery on site will be maintained regularly and in good working order to minimise noise generation ▪ stationary equipment such as air compressors and generators will be placed as far as possible from noise sensitive areas especially when construction activities will be within 500 m of sensitive receptors. ▪ temporary structures or screens will be used where required to limit noise exposure to meet noise goals when construction occurs within 500 m of the affected sensitive receptors. ▪ noise logging will be carried out at the potentially affected noise sensitive receptors when the construction activities will be within 500 m of the dwelling ▪ a community consultation program will be undertaken. **Operations** Once detailed design of the pump station located at the Condamine Power Station (beginning of the pipeline) has been carried out, a suitable acoustic enclosure will be designed to attenuate any excessive noise emissions from the site based on the location of closest receptor.
Chapter 16 **Vibration**	Vibration generated by the construction will be sufficiently attenuated due to the high buffer distances between the construction site and any sensitive receptors. Any vibration issues associated with traversing existing pipelines or other easements can be controlled through the use of low vibration construction techniques and equipment (e.g. smaller excavators, different compaction techniques, use of vibration isolating trenches). Mitigation measures related to the operation phase of the pipeline will be potentially installed at the pump station. Vibration isolation mounts will be incorporated into the pumps and other associated reciprocating machines
Chapter 17A **Terrestrial Ecology**	**Terrestrial** As part of the detailed design, and prior to the start of construction, more detailed mitigation measures will be developed and presented in a biodiversity management plan relating to both the construction and operation of the proposed pipeline. The biodiversity management plan will include, where appropriate, procedures for:

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	▪ detailed design of mitigation measures such as fauna underpasses and fencing (as required associated with access tracks) ▪ general impact mitigation ▪ staff/contractor inductions and ongoing education ▪ pre-clearing surveys and fauna salvage/translocation where practical ▪ rehabilitation and restitution of adjoining habitat where possible ▪ weed control ▪ pest management ▪ rehabilitation protocols ▪ monitoring. The biodiversity land management plan will include clear objectives and actions for the proposed pipeline including, where appropriate: ▪ minimising human interferences to flora and fauna ▪ minimising vegetation clearing/disturbance ▪ minimising impact to threatened species and communities ▪ minimising impacts to riparian and aquatic habitats and species ▪ ongoing monitoring of impacts on flora and fauna. The biodiversity management plan will include mitigation measures as outlined in Attachment B. Further seasonal surveys will be undertaken in late spring/early summer 2008 and late summer/early autumn 2009 in order to better detect threatened and rare species and inform detailed design. The alignment of pipeline will be reassessed in light of biological knowledge and design constraints in accordance with this report. A Green Offsets Package for the proposed pipeline will be developed in consultation with EPA and DEWHA giving consideration to relevant State and Commonwealth policies relating to offsets. This Green Offsets Package will address both state and Commonwealth offsetting requirements.
Chapter 17B **Aquatic Ecology**	**Aquatic** Risks associated with the spillage of fuels and other contaminants can be substantially reduced where: ▪ no vehicle maintenance is conducted in areas associated with the proposed pipeline construction, with maintenance only conducted at designated maintenance areas in the Project construction compound area of the MLAs ▪ portable refuelling stations, for refuelling of machinery in the field, are bunded to meet AS 1940 and placed above the Q100 flood level of nearby waterways and dams ▪ all spills of contaminants (such as diesel, oil, hydraulic fluid etc.) are immediately reported to the Project's Environmental Officer ▪ appropriate spill containment kits are available, and used for the cleanup of spills in the field. Equipment that is susceptible to spills and/or leakages should have a spill kit onboard or within 5 m of the equipment at all times. The kits should contain equipment for clean-up of both spill on land or in dry creek beds, and spills to water (such as floating booms).

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	An erosion and sediment control plan will be developed including the following elements where possible and practicable: ▪ construction of the pipeline in the dry season ▪ use of erosion control matting, or other appropriate erosion control measures ▪ monitoring turbidity during construction ▪ rehabilitation of native vegetation after clearing, including the establishment of ground cover ▪ rehabilitation of in-stream aquatic habitat after clearing, including bed and bank rehabilitation. The risk of sediment runoff impacting nearby waterways will be further reduced where construction of road and pipeline crossings of creeks, particularly of major waterways (i.e. Dogwood, Wallen, Eleven Mile, L Tree, Juandah and Frank creeks) is done in the dry season. During and after construction, water quality and ecosystem health of nearby waterways may be protected by: ▪ erosion control matting (or mulch), placed along ditches and drainage lines running from all cleared areas, especially on slopes and levee banks ▪ diversion drains, bunds or 'whoa-boys' installed across cleared slopes to direct runoff towards surrounding vegetation and away from creeks ▪ monitoring water quality. After construction, water quality and ecosystem health of nearby waterways may be protected by rehabilitation of the landscape by: ▪ salvaging and appropriately storing and maintaining clumps of native grass, shrubs and trees prior to clearing ▪ use of native vegetation of local provenance for replanting where possible ▪ replanting along creek margins (e.g. following construction of creek crossings). The width of the replanted riparian vegetation should match the existing riparian vegetation; however, 5 m would be the minimum width. Planted trees in the riparian zone should provide canopy cover and have root systems that can stabilise the banks and disturbed area. **Construction of permanent creek crossings** Impacts associated with the construction of permanent pipeline crossings will be minimised if: ***Dry season*** ▪ Crossings are located to result in minimal disturbance to vegetated areas. ▪ Construction is undertaken during the dry season (minimising the likelihood of rainfall and runoff carrying sediment and other pollutants into the creeks). ▪ Stormwater and erosion control measures are implemented. ▪ Crossing construction methods minimise disturbance to aquatic habitat and fish passage. ***Wet season*** Where practical, a trenchless crossing method is used (e.g. horizontal directional drill), in accordance with the following recommendations (AE 2001): ▪ the drilling is done in a manner that does not cause a disturbance in the water, to the exposed bed or shore of the water body, or to an area of undisturbed vegetation that measures 10 m from each bank of the active channel

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	If a trenchless crossing method is not possible, isolation and open-cut methods are also appropriate under wet conditions at numerous crossings (refer Appendix 17B-1-V2.4). The workspace should be isolated, irrespective of if there is an isolated pool or flowing water. The isolation should be designed as per 17B recommendations: ▪ upstream and downstream dams are installed on the edge of the temporary workspace, to maximise the workspace. These dams should: ‣ be constructed of an appropriate material for each creek (e.g. steel plates, flumes, sand bags or 'aquadam') ‣ be made impermeable by using polyethylene liner and sand bags. ▪ if flowing water is present, 100% downstream flow is maintained by using pumps with a capacity that exceeds expected flows. Backup pumps and generators should be on site and operational if required ▪ pump intakes have a screen, with openings no larger that 2.54 mm, to ensure that no fish are entrapped ▪ fish are salvaged from the isolated workspace and translocated ▪ the upstream dam is slowly removed, to allow water to flush the sediment from the workspace area ▪ sediment-laden water is be pumped into sumps or onto vegetation ▪ operation of the clean-water pump to sustain partial flow below the downstream dams is continued until the downstream dam is removed. **Construction of temporary vehicle creek crossings** Due to the limited water flow within the creeks of the region, opportunities for fish to migrate should be maximised (Cotterell 1998). The construction of temporary creek crossings can minimise disruption of fish passage if: ▪ the crossing structures at each site follow the recommendations presented in Appendix 17B-1-V2.4 **Water quality monitoring** As outlined in Appendix 17B-1-V2.4 Please see Attachment C for Preliminary water quality objectives for the water quality required in the creeks crossed by the pipeline, to maintain the natural fish communities of these creeks It is recommended that water quality be measured with a hand-held probe: ▪ at the crossing site immediately prior to construction, to determine background conditions ▪ daily during construction ▪ daily after construction until water quality returns to background conditions (as indicated by monitoring in the nearby 'comparison' creek). Where water quality objectives in the creek are exceeded, it is recommended that construction ceases and that stormwater and erosion control measures be revised prior to re-commencement of construction. **Rehabilitation of instream aquatic habitat** After installation of the pipeline and removal of a temporary crossing, impacts may be mitigated by: ▪ rehabilitation of the bed and bank structure such that original dimensions and shape of the creek are achieved. Bank recontouring should include stabilisation methods (crib walls or soil wraps) where appropriate (refer Appendix 17B-1-V2.4) as per 17B. ▪ revegetation of creek banks and beds

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	▪ aquatic habitat structures are replaced within the channel. Prior to construction, any instream structures (woody debris, large cobbles) may be salvaged. Felled trees may also be placed into creeks to create woody debris habitat. **Stranding of fish and other aquatic fauna** If an isolation method is used, fish and other aquatic fauna may become stranded once the work area is isolated. Attempts will be made to capture fauna and translocated, following the DPI&F *Fish Salvage Guidelines* (DPI&F 2004): ▪ fish should be captured from the creek using gear appropriate to the waterways and species present ▪ translocation should be done in the cooler months if possible, to minimise stress to the fish ▪ fish should be removed from the existing channel before water flow is isolated from the channel ▪ fish should be handled, transported and released so as to minimise damage to the fish. **Supply and storage of CSM by-product water** Water supplied from the proposed pipeline should be stored in an appropriate on-site dam. The dam should be designed so that this water is not released into natural waterways. The pipeline should be regularly inspected and maintained so that water does not leak from the pipeline into surrounding natural waterways. The use of water from a raw water dam or similar at the Condamine Power Station could increase the opportunity for carp to become established in the Fitzroy Basin. Prior to commissioning of the pipeline, a detailed assessment of the source water should be conducted, to determine whether carp are present. If they are present, as risk assessment of the likelihood of transfer should be completed before proceeding with the pipeline. Whether carp are present or not, it would be prudent to fit filter screens to the intake pipe, to prevent carp eggs and larvae from entering the pipe. However, this should be subject to risk assessment and detailed design. If a risk assessment determines a moderate to high potential for the presence of carp, then a screen to filter carp eggs will be installed. Carp have eggs as small as 800 µm, though their larvae are larger in size (Mather 1997). A screen mesh size of 500 µm is therefore recommended. Before water is transferred through the pipeline, it is recommended that each of the screens be tested with particles of known sizes (e.g. 500 and 800 m latex spheres). Cleaning and testing of the screens should become part of their routine maintenance, to ensure they are always fully functioning and ready for use. The Proponent should also ensure that the supply dam and the dams on the site are free from noxious species on a regular basis. **Biting insects** Mosquito breeding habitat may be minimised through: ▪ minimising the area of standing water, and ensuring drainage within four days ▪ grading to ensure sufficient drainage ▪ during construction, routinely filling incidental depressions and holes that may hold standing water ▪ regularly clearing drainage lines to ensure that water continues to flow and no ponded areas are created.
Chapter 18 **Waste**	The management of waste will consider the waste management hierarchy as specified in the EPP (Waste) is outlined as follows, with waste avoidance being the preferred option and disposal being the least preferred outcome: ▪ waste avoidance

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management	▪ waste re-use ▪ waste recycling ▪ energy recovery from waste ▪ waste disposal. Where waste materials cannot be recycled, they will be segregated and disposed of to an appropriate facility. All hazardous and regulated wastes will be collected by a licensed waste contractor and transported off-site for disposal to an appropriately licensed facility. Waste materials awaiting collection will be stored within facilities designed to AS 1940 – The Storage and Handling of Flammable and Combustible Liquids to prevent and seepage and contamination of groundwater. General waste that cannot be re-used or recycled will be disposed of to a nearby landfill facility. The landfill facility will be required to meet acceptable standards to minimise the risk of potential contamination to surface water and groundwater. Please refer to Attachment D for Construction waste streams and management **Construction** A detailed Waste Management Plan (Construction) will form part of the Environmental Management Plan (Construction) and will be prepared prior to the commencement of construction (see Chapter 27 Environmental Management Plan). The Waste Management Plan will address the following items: ▪ identification of waste streams ▪ consideration of the waste management hierarchy when selecting waste management strategies, with emphasis on minimising any hazardous waste ▪ identification of solid, liquid or hazardous waste collection, storage and disposal strategies ▪ training of all relevant contract personnel on procedures concerning waste minimisation, recycling and disposal ▪ waste removal and transport from site ▪ waste tracking requirements. **Operation** **Waste minimization** The waste streams generated from operation of the pipeline and the selected management strategies are listed in Attachment E. These strategies will be reviewed periodically by the pipeline operator and updated throughout the operational phase. A detailed Waste Management Plan (Operations) will form part of the Environmental Management Plan (Operations) and will be prepared prior to the commissioning of the pipeline (see Chapter 27 Environmental Management Plan). The Waste Management Plan will address the following items: ▪ identification of waste streams ▪ consideration of the waste management hierarchy when selecting waste management strategies, with emphasis on minimising any hazardous waste ▪ identification of solid, liquid or hazardous waste collection, storage and disposal strategies ▪ training of all relevant contract personnel on procedures concerning waste minimisation, recycling and disposal ▪ waste removal and transport from site

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	▪ waste tracking requirements.
Chapter 19 **Visual Amenity**	Visual mitigation strategies will reduce the visual effect of the pipeline construction process and aim to reduce contrast created by clearing and earthworks. **Easement location** Along the highway, the eastern side of the highway is visually preferred as it supports less vegetation that could be affected by clearing. This side of the highway is further enhanced by the existence of pipeline and communication cable easements adjacent to the highway easement itself. Use of a widened easement, outside the road reserve is the preferred visual alignment. Failing this, use of the area at the outside edge of the highway road reserve is preferred. Should this area be required for use, development of an asymmetric easement is the desired visual development outcome. **Sectionalising work area** The establishment of a pipeline has the potential to create a high visual effect along the length of the pipeline. The pipeline will be established in sections to enable early restoration and minimise the length of impact and the time over which it is experienced. **Minimising easement clearing** Although an easement width of 20 m will be established, it may not be necessary to clear this full width. Where practicable, pipe delivery, pipe laying, backfilling and restoration all other operations such as pipe lay down areas, storage areas, etc should avoid visually sensitive areas. Staggering of operations in visually sensitive locations will be undertaken where practicable to minimise the need to clear wide easement areas. **Fragmenting construction easement functions** Tree clearing will be minimised in visually sensitive locations where practicable. Measures that can be undertaken to reduce tree clearing include moving laydown and associated worksites laterally to minimise tree clearing and/or to achieve the “feathered easement” edge that will avoid the creation of a visual ‘gun barrel’ through wooded areas. **Feathered easement clearing** Where there are long and sensitive views along easements, the easement edges will be “feathered” where practicable to prevent hard and regular edges to clearings. Where practicable, the upper canopy (mature trees) will be retained during clearing to assist in minimising the visual impact of clearing. **Re-establishment of ground cover** In most cases, initial restoration will involve the establishment of grass cover. Selected grass species should be of types that occurs in adjoining field areas where practicable to reduce the major visual effect created by colour contrast between exposed soil and adjoining grasslands or other vegetation types. In bushland areas where mulch is not used, sterile grasses that will provide soil protection values should be used to assist in re-establishment of shrub and tree cover Re-establishment of shrub and tree cover will be completed according to specified rehabilitation practices outlined in Chapter 17A. Such restoration will remove the more subtle contrast factor between the pipeline easement and the adjoining vegetation. The reestablishment of large trees on the pipeline is not desirable. Use of indigenous shrubs and small trees will also remove the linear visual effect of clearing through native vegetation.

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	Should cultural planting, say along a driveway be removed, such plantings will where practicable be re-established in close proximity based on mutual agreement with the land owner. **Screening of sensitive receptors** In the unlikely circumstance that a homestead is adversely affected by the post re-habilitated landscape, plantings will be carried out adjacent to the affected viewing area to provide screening of visual integration of the affected landscape.
Chapter 20A **Indigenous cultural heritage**	The proponent will develop an "approved" CHMP, as required under the ACHA, for the proposed pipeline area. The CHMP that is negotiated with the Iman People #2 will provide for the following (based on the similar CHMP for the MLA areas): ▪ a comprehensive surveys will be undertaken over the pipeline area to identify and protect cultural heritage prior to any construction activities taking place on the area. ▪ items of cultural heritage that may be harmed by the pipeline will be relocated out of harm's way to a "Keeping Place" to be provided by the Proponent ▪ a report be provided at the completion of a field survey, which will include the items and location of any cultural heritage found and identify any areas where monitoring is recommended; ▪ the identification of monitor areas, and how monitoring by the Iman People #2 can be undertaken in areas where there is a high probability that additional cultural heritage may be found during ground breaking activities; ▪ the provision of cultural heritage awareness and induction training to employees and contractors, and training for senior management; and ▪ a dispute resolution process generally within the CHMP, as well as a specialised dispute resolution process for disputes regarding specific cultural heritage issues. ▪ The Proponent will also seek to negotiate a CHMP on similar terms with the Barunggam People ▪ At all times, the proponent will comply with its duty of care obligations and any other obligations under the *Aboriginal Cultural Heritage Act 2003*, in relation to operations associated with the Project.
Chapter 20B **Non-Indigenous cultural heritage**	Based on the findings of the non-Indigenous heritage assessment along the proposed southern CSM water supply pipeline, the following mitigation measures will be implemented: ▪ the location of the historical items identified in the survey will be noted in field maps, and design and construction drawings of the proposed pipeline. These locations will be avoided during design and construction ▪ a cultural heritage management plan will be implemented to address the management of any historical items/material which may be located during clearing or construction work.
Chapter 21 and 22 **Social and Economic**	**Light impacts** A point of contact, such as the recommended CLR, should be provided to the community to use should artificial light impacts begin to cause a nuisance or limit their activities. Management of lighting impacts would best be mitigated by limiting night work in areas of the corridor where residences would be impacted by construction lighting.

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	Visual amenity The impacts to visual amenity would be managed through the selection of the most appropriate alignment for the Southern Pipeline, particularly one where the least amount of vegetation clearing would be required. Providing the community, and particularly property owners directly impacted by the alignment, an accurate understanding of what to expect during construction through a robust consultation process is recommended. The stockpiling of equipment and materials for construction should be managed and maintained to reduce the impact on the corridors scenic identity. **Properties directly affected by the Southern Pipeline alignment** Ongoing communication with affected property owners is required reduce negative impacts on their lifestyles and in particular, their agricultural activities. Suitable notice and practical arrangements for the movement of stock from paddocks affected by the corridor will be required as well as the implementation of suitable livestock protection barriers around access points or breathing holes located along the length of the alignment such as cattle proof fencing. Suitable notice of access to the proposed easement would be required as well as a detailed briefing on the type of activities occurring on these properties as well as any potential restrictions to access which residents are likely to encounter . The Project team is also encouraged to engage with property owners to decrease the potential impacts on agricultural activities during construction. This would include early negotiation to consider construction schedule impacts on seasonal activities such as cultivation, planting and/or harvesting to ensure the least amount of impact on crop yields. Suitable compensation for unavoidable impact to crop yields should be considered. **Current land use** A robust environmental restoration process is recommended to restore land impacted by the construction of the pipeline. This restoration should include any gates, fencing or access tracks which be affected during construction. During operation any access points or 'breathing holes' included for pipeline maintenance would be best fenced off to reduce any impact on stock. **Accommodation** Extended stays in local accommodation facilities such as hotels and motels located near the MLA areas would best be discouraged decrease the potential supply versus demand issues possible as a result of the cumulative impacts of projects in the region. It may be more appropriate to house construction workforce in or around Miles. The WJV and its contractors should actively engage with government stakeholders and departments to devise ongoing strategies for management of accommodation needs to ensure activities do not displace members of the community. **Education** It is recommended that the WJV work with contractors who value the provision of training and experience and who may consider entering into partnerships with local schools and training institutions. This may extend to provision of trade experience to local apprentices or allowing the use of mechanical equipment to provide 'hands-on' experience. **Health services** While impacts to health services are expected to be limited, it is recommended that where possible, WJV and their contractors provide support to existing providers through effective consultation and engagement. **Emergency services** The WJV is encouraged to develop strong partnerships with emergency service providers in the region, and their associated government agencies, to ensure robust emergency management plans are prepared and implemented.

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	It is recommended that WJV work closely with the local police force particularly in relation to traffic management and associated road safety issues. The policing of driver behaviour is recommended. **Local employment and training** Open dialogue between the WJV, its contractors and regional employment and training agencies, particularly those funded by the Queensland Government, is recommended. This would ensure that employment requirements and opportunities are managed from within the region. The consideration of contractors for construction work is recommended to include a facet of how well they are able to utilise local employees and training providers. **Roads and transport** The increase in heavy vehicles on regional roads would need to be managed by WJV, its contractors, local authorities, Queensland Transport and the Department of Main Roads, particularly during construction. A community information session with the communities of Wandoan, Taroom and Miles on how to manage the increased traffic on regional roads, as well as basic driver safety techniques is recommended. It is also recommended that a similar information session be conducted in conjunction with local schools. These community information sessions could be extended to Roma in consideration of road impacts associated from construction of the southern component of the Southern Pipeline. Effective communication with local communities regarding any possible construction works which would cause traffic delays or diversions is recommended. **Cumulative effects** The WJV is encouraged to work proactively with other project proponents in the area to work on plans to mitigate the cumulative effects of projects proposed for the region. It is recommended that the WJV develop partnerships with local service providers and government agencies to ensure ongoing management and mitigation of cumulative social impacts from projects in the region are proactively managed. Throughout construction it is recommended that proponents work closely with Queensland Transport to develop robust traffic management plans particularly in relation to road safety, health, education, training and housing. Where possible it is recommended that proponents look for opportunities to share infrastructure to decrease the impact on local communities.
Chapter 23 and 24 **Health and Safety / Hazard and Risk**	**Construction** The following mitigation measures will be implemented to limit the identified risks during construction: ▪ develop awareness of the importance of safe road use behaviours, and training programs for construction personnel ▪ keep local communities informed of work in progress ▪ provide appropriate traffic control personnel and/or devices for all work within road reserves ▪ prevent unauthorised access to excavations and any other hazardous areas during construction ▪ keep any works that can not be secured easily in a safe state with appropriate signage and/or fencing or guarding ▪ transport all dangerous goods during construction in accordance with the current Australian Code for the Transport of Dangerous Goods ▪ locate temporary fuel storage tanks away from watercourses and drainage paths, and provide secondary containment through self bunded tanks or with external bunding designed in accordance with AS 1940-2004 ▪ maintain appropriate procedures and equipment to manage leaks and spills of all dangerous goods used during construction ▪ provide workforce with awareness training regarding venomous snakes and biting insects, areas and times they are most likely to be

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	encountered, and how to react and provide first aid treatment. Provide workteams with appropriate first aid equipment to treat bites. **Operations** The following mitigation measures will be implemented to limit the identified risks during operation: ▪ educate work teams regarding the need to check for dangerous wildlife during pipeline inspections ▪ ensure the integrity of the proposed Pipeline is maintained, and shut down if a major failure occurs. **Decommissioning and rehabilitation** The following mitigation measures will be implemented to limit the identified risks due to the decommissioned pipeline: ▪ seal off the gas supply and remove the gas engine(s) and pump(s) ▪ fill or seal all inspection pits, and seal off the proposed water pipeline ▪ rehabilitate the pipeline corridor if the option to remove the pipeline is selected ▪ if the option is to abandon the pipeline is selected, then given the very low rate of subsidence expected, then no further action would be taken ▪ establish a beneficial re-use to a third party if the condition of the pipeline allows sale or donation of the infrastructure. **WJV health and safety policy** The WJV's objective is to eliminate work related injuries and occupational diseases from their operations and to be recognised as a leader in occupational health and safety management. The WJV is committed to providing and maintaining a healthy and safe environment for employees and contractors at its operations through appropriate leadership and systems, and continually improving its occupational health and safety performance. As part of its Health and Safety Policy, the WJV requires that health and safety are primary considerations in all its operations. **WJV safety and health management system** The WJV Health and Safety Policy commits to meeting the requirements of the WHSA by committing the company to: ▪ implementing and maintaining Occupational Health and Safety Management Systems ▪ complying with relevant legal and other health and safety requirements as a minimum ▪ complying with company policies and standards ▪ managing occupational health and safety through a continual process of identification, assessment and management of risks ▪ promoting the involvement of employees and contractors in developing systems and improvements ▪ defining and setting occupational health and safety performance targets and measure our performance against industry peers ▪ conducting regular internal and external audits to continually improve systems and performance ▪ communicating company policies and achievements to employees, contractors, visitors and the wider community. **Health controls** The following health controls will be implemented for the construction, operation and decommissioning phases of the Project.

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	Dust Dust generation will be minimised for project personnel and the public by: ▪ the progressive rehabilitation of disturbed areas once pipelaying is complete ▪ the watering of disturbed areas, roads and stockpiles that have the potential to impact sensitive receptors during construction during windy conditions ▪ providing employees with personal protective equipment (PPE) to limit dust inhalation. It is not expected that dust levels will be an issue as indicated in Chapter 13 Air Quality. **Heat** The effects of heat will be managed by providing suitable working environments, equipment and protective clothing, making workers aware of the signs and symptoms of heat effects including dehydration, and ensuring that adequate hydration levels are maintained. **Noise and vibration** Noise and vibration levels will be monitored as indicated in Chapter 15 and Chapter 16 Vibration, Work will not generally occur outside the hours of 6:30 am to 6:30 pm. Exposure of workers to noise and vibration will be limited by the use of equipment complying with relevant emission standards, and if necessary by the use of suitable PPE where high noise levels can not be prevented. **Dangerous goods and waste** Dangerous goods will be stored in accordance with relevant standards, but only relatively small inventories of materials other than diesel will be held. Details are provided in Chapter 23 Hazard and Risk. Material Safety Data Sheets for all dangerous goods used or stored on the site will be maintained in a register accessible to all personnel. Appropriate controls will be established during the preparation of the operations risk register and implemented for the safe use of each item in the inventory. Waste from portable toilets will be pumped out as required by a licenced waste contractor. Overall, waste streams are expected to be minor and there is unlikely to be any health effects. **Pests and disease** The construction and operation of the pipeline is not expected to result in any change in the number of pest species present, or in any change in the populations of any existing pest species that might impact on the health of Project personnel or the public. **Snakes** Employees will be made aware of the risk of snakes, and will be provided with appropriate training and first aid equipment with which to deal with snake bite. **Safety controls** **Traffic and journey accidents** The conditions of employment for all WJV personnel will include a requirement limiting the distances travelled to and from work sites to minimise the risk of journey accidents caused by fatigue as well as ensuring that employees are fit for work. Induction and ongoing awareness training sessions will include the risk of traffic accidents and the need to drive with care at all times. Contractual arrangements, monitoring, and awareness training will be used to ensure compliance with this requirement.

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	Local residents will be kept aware of any changes expected in traffic during the construction period. WJV will liaise with the Queensland Police Service to ensure that the driving habits of the workforce do not unduly increase the risk to the rest of the community. An assessment of the risks to the community and mitigation measures recommended is contained in Chapter 12 Transportation. **Moving equipment and vehicles** Plant and equipment used during construction pose a risk to personnel that might resulting in injury through collision, crushing, trapping and other forms of physical contact or uncontrolled release of energy. These risks can be kept to acceptable levels by putting key controls in place. Procedures and rules for use of equipment and safe driving on site, including speed limits, together with standard vehicle safety fittings such as flags, and reversing beepers will assist in reducing the likelihood of collision. Site induction and driver training programs will ensure vehicles are driven in a safe manner and that site driving rules are understood. Vehicle inspection checks will also be undertaken as part of the Project's regular maintenance program. **Fuel storage and handling** Diesel fuel will be stored and transported in accordance with AS 1940-2004: The storage and handling of flammable and combustible liquids. The risk of fire is very small, and it is unlikely that any other significant health effects would arise. **Confined spaces** Working in confined spaces has the potential to cause injury or death through the presence of toxic materials, a lack of oxygen, movement of equipment or material, or a release of energy. In the case of the Pipeline, this is most likely to be the result of unexpected flooding due to a failure or incorrect operation, or possibly entrapment in a tight spot or by falling items. Confined space procedures will be followed by anyone entering a confined space. These procedures will be enforced under the WJV health and safety system, and will be supported by appropriate training. This will be adequate to keep the risk to personnel entering confined spaces within acceptable limits. Unstable structures such as trenches and stockpiles have the potential to collapse and entrap or engulf personnel. Specific risks may be covered under confined space safety management procedures, but will otherwise be covered by relevant requirements and guidelines under WHSA detailing the risks and safety measures that must be taken when working in these areas. Inspection pits and valve pits may comprise confined spaces during operation, and entry to these must be controlled in accordance with relevant regulations and confined space procedures.
Chapter 25 **Decommissioning**	The proponent will: ▪ develop and maintain a project closure plan ▪ routinely assess project rehabilitation ▪ return the land to a post-project land use that is stable, self-sustaining and require minimal maintenance ▪ maintain downstream water quality, during the construction, operational and post operation phases of the project. ▪ remove all surface infrastructure unless agreed with subsequent post-mining landowner ▪ decommission the water pipelines unless beneficial reuse can be found as per Chapter 25, Section 25.2.2.

Table 28-2: Topsoil stripping depths and potential constraints for reuse

Soil type	Surface soil composition	Topsoil stripping depth (m)	Potential constraints
Brigalow Uplands LRA			
Cheshire	light clay	0.4	▪ highly alkaline and saline subsoil ▪ dispersive subsoil
Downfall	clay	0.15	▪ shallow topsoil depth ▪ dispersive subsoil
Kinnoul	clay	0.3	▪ low nutrient availability in topsoil ▪ dispersive subsoil ▪ shallow soil depth
Rolleston	clay	0.2	▪ alkaline ▪ topsoil may be dispersive ▪ dispersive subsoil
Teviot	clay	0.2	▪ dispersive subsoil ▪ moderately alkaline and saline
Rugby	loam	0.4	▪ sodic lower subsoil
Glenhaughton Forest			
Texture contrast soils	sandy loam	—	▪ stone and gravel ▪ very low pore available water capacity (soil water storage capacity) ▪ low nutrient availability ▪ susceptible to wind erosion following disturbance
Poplar Box Flat Plains			
Braemar	sandy loam	0.15	▪ very low pore available water capacity (soil water storage capacity)
Weranga	loamy sand	0.05	▪ very low pore available water capacity (soil water storage capacity) ▪ sodic and dispersive subsoils ▪ highly saline lower subsoils

Soil type	Surface soil composition	Topsoil stripping depth (m)	Potential constraints
			▪ impermeable subsoil ▪ low nutrient availability
Cypress Pine Sands			
Chinchilla	sandy loam	0.3	▪ low pore available water capacity (soil water storage capacity) ▪ susceptible to wind erosion following disturbance
Davy	sandy loam	0.4	▪ low pore available water capacity (soil water storage capacity) ▪ low nutrient availability ▪ susceptible to wind erosion following disturbance
Combidiban	sandy loam	0.3	▪ very low pore available water capacity (soil water storage capacity) ▪ variable topsoil depth ▪ susceptible to wind erosion following disturbance
Bogandilla	clay loam	0.1	▪ strongly sodic and dispersive subsoil ▪ highly saline lower subsoil ▪ low pore available water capacity (soil water storage capacity)
Brigalow Plains			
Tara	light clay	0.4	▪ sodic subsoils ▪ low to medium pore available water capacity (soil water storage capacity) ▪ gilgai (stripping difficulties)
Light Forests			
Minnabilla	sandy clay loam	0.1	▪ very low pore available water capacity (soil water storage capacity) ▪ very shallow profile depth ▪ stone and gravel
Binkey	sandy loam	0.3	▪ very low pore available water capacity (soil water storage capacity) ▪ stone and gravel ▪ acidic throughout ▪ low nutrient availability

Soil type	Surface soil composition	Topsoil stripping depth (m)	Potential constraints
			▪ strongly sodic and dispersive subsoil
Ironbark/bull oak forest			
Braemar	sandy loam	0.15	▪ very low pore available water capacity (soil water storage capacity)
Cutthroat	loamy sand	0.3	▪ sodic lower subsoil ▪ very low pore available water capacity (soil water storage capacity) ▪ low nutrient availability
Channing	sandy loam to loam	0.15	▪ acidic throughout ▪ sodic and saline subsoil ▪ low pore available water capacity (soil water storage capacity)

Table 28-3: Summary of mitigation measures

Mitigation measure	Design	Construction	Operation
▪ Further survey is required to increase the likelihood of detecting Rare and Threatened species in the study area and surrounds and assess sections of the study area that could not be accessed during the winter surveys.	Y		
▪ Refine alignment of pipeline in light of biological knowledge and design constraints in accordance with this report.	Y		
▪ Utilise trenchless technology to cross drainage lines. Directional drilling launch and receiving pad areas should be carefully planned in order to avoid removal of mature trees. If this is not possible, the number of trees to be affected should be minimised. It is envisaged, however, that any directional drilling should take place from within the cleared easement.	Y	Y	
▪ Prepare and implement a flora and fauna management plan.	Y	Y	Y
▪ Provide for designated areas in cleared and degraded land for stockpiles and equipment lay-down to minimise the overall impact of construction and avoid unnecessary vegetation and habitat removal.	Y	Y	
▪ Conduct staff/contractor inductions on site a suitably qualified staff/contractor (e.g. a trained ecologist or other qualified environmental specialist).		Y	
▪ Implement dust suppression during construction.		Y	
▪ Implement appropriate erosion and sediment control strategies.		Y	
▪ Utilise preferred seed mixes for revegetation works, ideally to be collected from the study area and surrounds.		Y	
▪ Procedures for specific targeted species searches for those threatened species and priority taxa considered to have potential to occur prior to any staged development will be implemented. If located, consideration will be given to translocation of individuals according to guidelines from the Australian Network for Plant Conservation (Vallee et al. 2004) or fauna guidelines such as those in the Nature Conservation (Koala Conservation) Plan 2006 (Environmental Protection Agency & Queensland Parks and Wildlife Service 2005).		Y	Y
▪ Prepare weed and feral animal management plans, including vehicle washdown procedures to limit edge effects such as the establishment of aggressive weeds, and the spread of annual and perennial exotic herbs.		Y	Y
▪ Sensitive areas, such as those containing fauna habitat, will be cleared of fauna prior to construction activities commencing in co-ordination with a trained ecologist or other qualified environmental specialist in order to: ‣ mark the limits of clearing in sensitive areas (e.g. Endangered and Of concern REs) to avoid unnecessary vegetation and habitat removal		Y	

Mitigation measure	Design	Construction	Operation
▸ place transportable habitat features such as large logs and boulders in adjacent retained areas to allow their continuation as potential fauna refuge sites ▸ implement pre-clearing surveys for fauna. Pre-clearing involves removal of the understorey and smaller non-hollow bearing trees in order to disturb fauna and encourage them away from the clearing area.			
▪ Except for trenching, vegetation clearing should involve only the removal of above-ground plant parts, with root systems and the soil profile left undisturbed.		Y	
▪ Areas not necessary for the operation of the pipeline should be rehabilitated in a progressive manner as construction proceeds. Revegetate areas to improve habitat value and visual amenity, including: ▸ planting of a range of locally occurring native shrubs, trees and groundcover plants, in keeping with the former vegetation types present. Choice of species would be in consultation with the Environmental Protection Agency (EPA) and should include Allocasuarina, Eucalyptus, Angophora and Corymbia species to compensate for any impacts to habitat of the Koala and other hollow dependant species ▸ increasing the overall vegetation cover within the proposed pipeline alignment area ▸ incorporating existing natural vegetation where possible ▸ linking vegetation remnants ▸ focusing on riparian vegetation to protect waterways ▸ excluding stock from rehabilitated areas.		Y	Y
▪ Soil that may contain seeds of exotic species should be stockpiled away from drainage lines, and vegetated areas and weed-free soil stockpiles. Weed infested stockpiles would be covered to eliminate the spread of the soil and seed during rainfall and high wind events.		Y	
▪ No materials, spoil or machinery should be stored or parked within the drip-line of any trees.		Y	
▪ The amount of open trenching should be generally limited to 100 m per crew at any one time.	Y	Y	
▪ Trenches should be backfilled so as to cover as much open trench as practicable by the end of each day's work. If this is not possible, the ends of the open trenches would be graded to allow escape for any animals that may venture into the trench.		Y	
▪ Implement a flora and fauna monitoring program (as part of the greater Wandoan Coal Project flora and fauna monitoring program) aiming to better understand and manage impacts and rehabilitation actions to flora and fauna throughout the study area. Monitoring would also include exotic weeds and feral animals. The detailed monitoring plans would be incorporated into the biodiversity management plan for the Wandoan Coal Project.		Y	Y

Table 28-4: Preliminary water quality objectives for the water quality required in the creeks crossed by the pipeline, to maintain the natural fish communities of these creeks

Parameter	Range required to sustain the fish communities sampled during this Study
Temperature (º C)	< 34
Dissolved Oxygen (mg/L)	1.5 – 10.0
pH	6.5 – 8.5
Conductivity (µS/cm)	19.5 – 770
Turbidity (NTU)	< 200*, or 10% above background values, whichever is higher

Table 28-5: Construction waste streams and management

Waste streams	Waste sources	Estimated quantity	Management strategies
Green waste	Clearing of vegetation along the pipeline route	Approximately 500 ha	Activities to follow the Construction Management Plan for vegetation clearing to minimise vegetation loss. Suitable material will be used on site to provide fauna habitat where practical. Remaining material to be mulched and reused where possible.
Soil waste	Excess soil excavated during trench formation	Nil	Suitable top soil will be segregated from subsoil and reused on-site for revegetation activities.
Excess/damaged pipe materials (concrete, metals, and/or plastics)	Construction and installation of pipework	Approximately 5 km	Material to be segregated and recycled where possible by pipeline contractor. Otherwise materials will be disposed of to an appropriately licensed landfill.
Hydrocarbon contaminated waste	Hydrocarbon spill/leak from construction equipment	Minimal	Spill-kits will be available on-site for immediate incident response. Any resulting contaminated waste will be disposed of to a licensed facility.
Effluent (saline water)	Testing pipeline integrity	Nil	Discharge resulting from the pipeline testing will be collected in the mine WMS and reused.
Sewage	Workforce	< 2,000 kg	Portable toilets provided. Sewage will be collected from portable toilets by a licensed waste contractor and disposed of at an appropriately licensed facility.
General waste (including metals, paper, cardboard and plastics)	Construction materials, packaging and general/ putrescible waste from contractors	< 5 tonnes	All general wastes generated will be removed from site and disposed of to an appropriate waste facility.
Exhaust emissions	Vehicle and fuel/electrical operated equipment	Minimal	Vehicles and other equipment to be maintained in good condition.

Table 28-6: Operational waste streams and management

Waste material	Waste sources	Estimated quantity	Management strategies
Maintenance waste (e.g. seals, oil, lubricants)	Pump station maintenance	< 1 t/annum	Hydrocarbon waste will be disposed of to a licensed facility.
Effluent (saline water)	Flushing sections of the pipeline following maintenance work	Nil	Discharge resulting from the pipeline flushing will be collected in the mine WMS.
Sludge/scale waste	Periodic pigging of the pipeline	< 1 t/annum	Water discharge resulting from pipeline pigging will be included within the mine WMS. Sludge and scale materials will be disposed of in a spoil.
Leaks	Leaks from pipework	Minimal	Routine servicing and maintenance activities to reduce risk leaks.