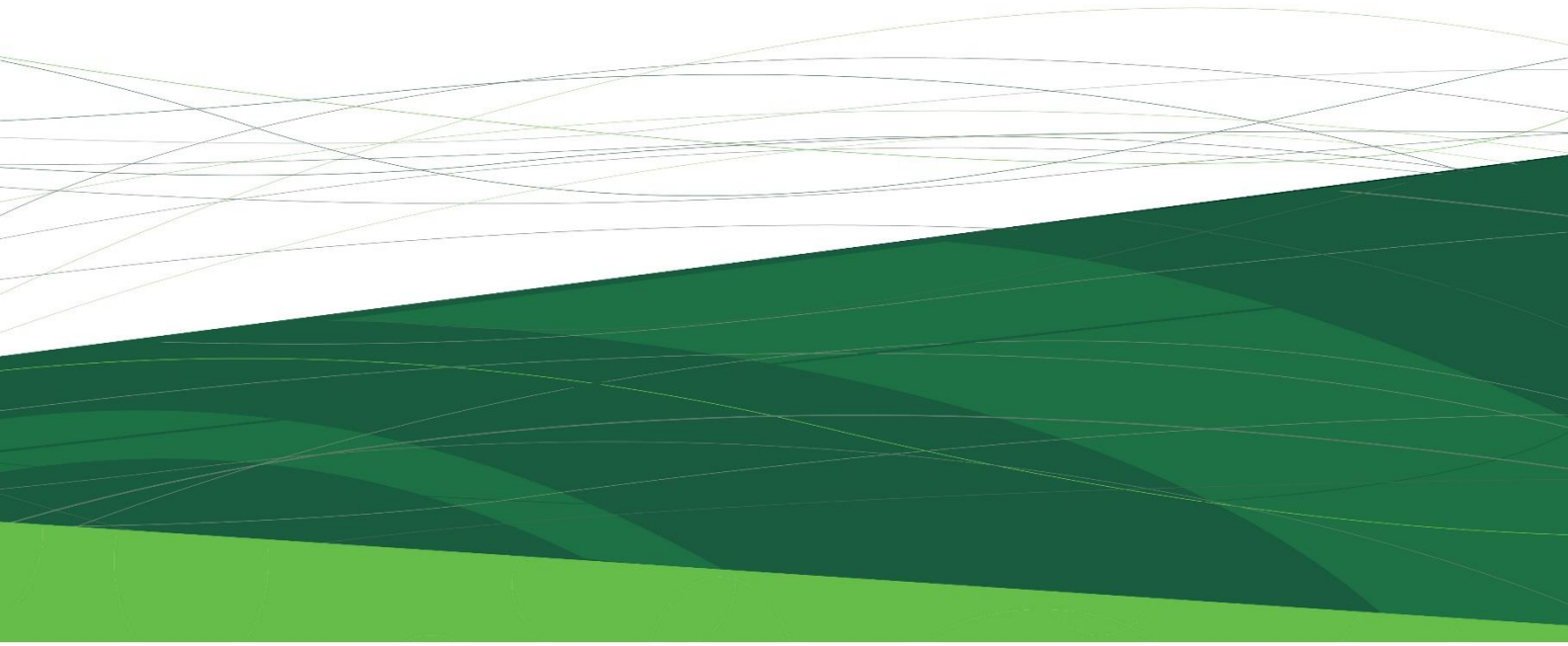
HUNTER GAS PIPELINE

Construction Readiness Report

September 2018



The following document was prepared by RLMS

On behalf of Hunter Gas Pipeline

RLMS (Resource and Land Management Services) is an independent consultancy established in 1990, focusing on the energy, transport, communications and exploration sectors Australia wide. RLMS specialises in tenure management, land negotiation and acquisition, route corridor selection, environmental approvals, mapping, and gas market analysis.

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September 2018

REVISION	DATE	NATURE OF REVISION	PREPARED BY	AUTHORISED BY
2	4/9/2018	Final	I Bridge	R Skerman

NAME (POSITION)	SIGNATURE	DATE
Ross Skerman		4 September 2018

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1. INTRODUCTION

This report identifies the matters required to commence construction of the Queensland Hunter Gas Pipeline (QHGP). Furthermore, an assessment of the status of the conditions of approval and the program to compete works prior to commencement of construction.

A timeline for the completion of the studies is presented.

2. BACKGROUND

The Hunter Gas Pipeline planning commenced in the early 2000s as a natural gas pipeline of approximately 830 km from Wallumbilla (Qld) to Newcastle (NSW). Initial configuration was for a 20 or 24 inch pipeline (508 or 609 mm).

The Project undertook an Environmental Impact Assessment under both Queensland and NSW legislation. Consultation with landholders identified along the route was undertaken.

2.1 NSW approvals

In NSW QHGP obtained an approval under the *Environmental Planning and Assessment (EP&A) Act 1979* under Part 3A. Following an Environmental Impact Assessment process the application was assessed and approved with conditions.

The approval was granted on 11 February 2009. The approval conditions identify that the Part 3A approval would lapse under physical construction commenced within 10 years (i.e. 11 February 2019).

There are a number of elements of the conditions that must be satisfied prior to the commencement of construction. A summary of the conditions of the Part 3A approval is included in Section 3 (below).

In the period since the Part 3A approval was granted to the QHGP the legislation was amended and the Part 3A provisions were repealed and replaced by a Critical State Significant Infrastructure designation. QHGP will be transitioned to the new provisions in or around July 2018.

2.2 Queensland Approvals

The QHGP obtained approvals under legislation in Queensland and New South Wales. The Queensland section was approved under the provisions of the *Petroleum and Gas (Production and Safety) Act 2004* (Petroleum Pipeline Licence) and the *Environmental Protection Act 1994* (Environmental Authority). These approvals are the primary approvals and provide conditions for commencement of construction.

The Petroleum Pipeline Licence is current and active. The Environmental Authority was suspended in 2016/17 by agreement with the Queensland Regulator. The Environmental Authority can be re-activated following an application by Hunter Gas. Re-activation will result in a review of conditions attached to the authority, as well as a recalculation of the Financial Assurance required to be held by the Queensland government.

2.3 Commonwealth Approvals

The project applied for Commonwealth approval under the *Environmental Protection Biodiversity Conservation Act 1999* (EPBC Act) during the Impact Assessment phase. In September 2004 the Commonwealth determined that this pipeline was not a controlled action under the EPBC Act.

3. PART 3A CONDITIONS

Conditions imposed on the pipeline under Part 3A are summarised in Table 1 (below). A number of conditions identify matters that must be completed prior to construction commencing. These are identified within Table 1.

Table 1 Part 3A Assessment conditions

Condition	Sub condition	Topic	Primary requirement	Secondary requirement	Comment/action
1.1		Admin	Project shall be carried out generally in accordance with	a) Major Project application 06_0286 b) QHGP Environmental Assessment dated September 2008 c) Submissions Report dated November 2008 d) Conditions of this approval	Specification within the Construction Contract
1.2		Admin	Dealing with inconsistency	a) Conditions of this approval prevail b) Condition 1.1 a to c most recent document prevails	Note
1.3		Admin	HGP to comply with any reasonable requirement of DG arising from Departments assessment of	a) Reports, plans, correspondence submitted in accordance with this approval b) Implementation of any actions or measures contained in these reports plans or correspondence	Note
1.4		Limits of Approval	Approval ends after 10 years, unless works subject to this approval are physically commenced on or before that time		11/2/2019
1.5		Statutory Requirements	All licences, permits, approvals are obtained and maintained as required for life of project.	Copies of approvals to be continuously available on all pipeline sites during the project.	Note
2.1	0.1	Project Design Requirements	a) Submit alignment sheets with CEMP b) Alignment sheets to demonstrate avoidance of Endangered Ecological Community (EEC) on the ROW)		Develop route alignment sheets for 30 metre ROW in CEMP (refer Section 4.1 of this report). Identification of EEC refer Section 4.2 of this report

Condition	Sub condition	Topic	Primary requirement	Secondary requirement	Comment/action
2.1	0.2	EEC	Route may only be aligned within EEC if proponent has: a) Demonstrate to DG of DECC that will result in only minimal impacts and b) Provision made for biodiversity offsets as per condition 3.20		Refer Section 4.2.1 and 4.2.2 of this report
2.2		Landholder consultation	Demonstrate consultation with landholders potentially affected by the final route during preparation of alignment sheets		Refer section 4.3.1 of this report
2.3		Other rights owner consultation	Consultation with owners of mineral and petroleum resource licences to resolve potential conflicts	Aimed at resolving conflict between HGP route and current and future resource extraction	Refer Section 4.3.2 of this report
2.4		HGP Corridor	Route alignment must remain within the corridor identified in Condition 1.1(c) of this approval	Deviations permitted to address: 1) reducing impacts to biodiversity, cultural heritage or human amenity 2) avoiding geological or topographical constraints, providing these do not increase impacts to biodiversity, cultural heritage or human amenity 3) After consultation with potentially affected landholders and relevant agencies	Noted
2.5		Watercourse crossings	Prepare site specific crossings for watercourses and details of construction methods	Must be submitted for DWE endorsement prior to commencement of relevant construction works. The CEMP shall include: a) A copy of the DWE endorsement b) Details of the duration and timing of works associated with watercourse crossings c) Details of the mitigation methods to protect riparian and aquatic habitats in an around water course crossings	References APIA code of practice. Refer Section 4.4 of this report

Condition	Sub condition	Topic	Primary requirement	Secondary requirement	Comment/action
				Must consult with DPI and the relevant catchment management authority regarding methodologies and mitigation measures	
2.6		Wetlands	Project shall avoid disturbance to or crossing of wetlands mapped under SEPP 14.	Where the project route lies within 100 metres of a mapped SEPP14 wetland an appropriate buffer shall be established and incorporated into the CEMP to ensure no adverse effects to the wetlands result from the project.	Identify in alignment sheets and CEMP. Refer Section 4.1 of this report.
2.7		Waterway crossing	Avoid temporary crossing for machinery where possible		Refer Section 4.4 of this report
2.8		Fish management	Consult with DPI regarding temporary infrastructure or works in and around watercourses that may block fish passage.		Refer Section 4.4 of this report.
2.9		Provision of offtake points	Provide for Offtake points Narrabri and Boggabri Port Stevens and Gunnedah Murrundi, Scone and Aberdeen Quirindi.		Include in Construction Tender and design consideration
2.10		Code of Practice	Construction in accordance with APIA Code of Environmental Practice for onshore pipelines		Refer Section 4.1 of this report.
3.1		Construction Noise	Construction activities that generate an audible noise at residents and sensitive receptors except within hours Mon - Fri 0700 - 1800 Sat 0800 - 1300 Sun Not permitted	CEMP may allow for construction outside of these hours (e.g. 28/9 construction schedule) if identified in CEMP and this variation is approved by DG	Identify sensitive receptors in CEMP and alignment sheets. Refer Section 4.1 of this report.

Condition	Sub condition	Topic	Primary requirement	Secondary requirement	Comment/action
3.2		Construction Blasting	Blasting restricted Mon - Fri 0900 - 1700 Sat 0900 - 1700 Sun Not permitted		Identify construction restriction in Construction Tender
3.3		Blast Limits	Air blast overpressure at sensitive receptors	Limit 115 dB (Lin peak) 5% of blasts over 12-month period Never to exceed limit 120dB	Identify in Construction Tender.
3.4		Ground Vibration	Ground vibration at sensitive receptors	Peak Particle velocity 5mm/sec in 5% of blasts over 12 month period 10mm/sec Not to exceed	Identify in Construction Tender
3.5		Notification of blasting	Prior to blasting notification of Local Government and potentially affected land owners.	Include time and date of blast Include contact details for advice and complaints	Construction contractor to comply (identify in Construction Tender)
3.6		Air Quality	Construct pipeline in a manner that minimises dust emissions, including windblown and traffic generated dust.	Objective is to prevent visible emissions and if emissions of dust are visible then mitigation measures must be taken (including cessation of works)	Refer Section 4.1 of this report.
3.7		Odour	Offensive odour is not permitted beyond project boundary	Odour as defined by S129 of *Protection of the Environment Operations Act 1997.*	Include in Construction Tender
3.8		Transport and traffic	Where directional drilling/boring or open trenching is proposed in road reserve or close to road pavement a licence under S138 of the *Roads Act 1993*	Details required to be included in application for licence for road crossings. a) Detailed plans (vertical and horizontal alignments) b) Plant and equipment required (including construction compound locations) c) Construction schedule and hours of construction d) Mitigation measures to reduce traffic and pedestrian safety	Links to condition 6.3(b). Refer Section 4.5 of this report.

Condition	Sub condition	Topic	Primary requirement	Secondary requirement	Comment/action
				e) Indicative maintenance arrangements during operation	
3.9		Road Crossings	Reinstate roads in timely manner and in compliance with conditions and to the satisfaction of the relevant road authority (including Department of Lands)		Note
3.10		Road Crossings	Consult with councils regarding crossing methodology and depth of cover		Construction Tender
3.11		Existing infrastructure	Use all reasonable and feasible measures to: a) Minimise impact on existing infrastructure b) Consult with the appropriate owner of the infrastructure with regard to measures to mitigate or manage any potential impact. c) Bear the cost of repairing or relocating infrastructure		Refer Section 4.3.3 of this report
3.12		Gunnedah Shire Council	Consult regarding the Pullaming Stock Route regarding existing leases and access rights	Manage potential impacts	Refer Section 4.3.4 of this report
3.13		Consultation	Consult with mineral, mining and coal tenements	Specific tenements CL316, AUTH 406, Muswellbrook Coal Co (AUTH176, ML1304), and others	Refer Section 4.3.2 of this report

Condition	Sub condition	Topic	Primary requirement	Secondary requirement	Comment/action
3.14		Consultation	Consult with each landholder whose property is directly impacted.	Terms and Conditions of construction including: a) Access to land b) Measures to control weeds, GMO's and measures to ensure security of livestock during construction c) Acquiring easements including terms and compensation	Refer Section 4.3.1 of this report
3.15		Ecological Impacts	a) Submit as part of the CEMP a study on the impact from construction on potential koala habitat b) Monitor open trench areas for any fauna and sightings of fauna to be actively managed to minimise actual or potential impacts on these species. Any fauna found in the open trench shall be recorded and managed in consultation with the DECC c) Monitor weed infestations for a period of two years following construction and any infestation shall be actively managed to remove or minimise the spread of infestations.		Refer Section 4.1 of the report. Fauna monitoring and recovery and weed management to be included in construction specification.
3.16		Vegetation management	Clearing of native vegetation shall be limited to the minimal extent practicable required for the construction of the pipeline.	This shall be achieved by siting the pipeline in previously cleared areas where possible and where clearing cannot be avoided a minimal width clearing corridor.	Refer Section 4.2 of this report.

Condition	Sub condition	Topic	Primary requirement	Secondary requirement	Comment/action
3.17		Kooragang Wetland rehabilitation	Construction activities shall not disrupt the previous rehabilitation works Kooragang wetland and Hunter Bird Observers Club, on the western part of Koorgang Island (aka Ash Island)		Identify in alignment sheets and construction specification.
3.18		Biodiversity Offset Needs Study	Develop and submit for approval a Biodiversity Offset Needs Study	a) Quantify vegetation clearing, considering condition, loss of potential habitat and resulting consequences b) Detail the significance of impacts as a result of the loss at 3.18 (a) c) Inform the quantification of biodiversity offset measures d) Consider the biodiversity measures or activities as required with this approval including revegetation measures, relevant construction measures to reduce terrestrial and aquatic impacts, other fauna mitigation measures such as nest boxes, any ongoing biodiversity or threatened species monitoring e) Describe the decision making framework used in determining the level of impact f) Detail the final methodology used to determine the biodiversity offset requirements g) Include a program timeline to achieve implementation of the final suite of measures to mitigate or manage biodiversity	Refer Section 4.6 of this report.

Condition	Sub condition	Topic	Primary requirement	Secondary requirement	Comment/action
3.19		Hazards and Risk	At least one month prior to commencement of construction prepare and submit a final hazard analysis confirming risks are no greater than Table 9.1 of Preliminary Hazards Analysis and all relevant recommendations have been implemented.	Final Hazard Analysis must be approved by DG.	A HAZOP will be conducted prior to construction.
3.20		Safety and operating Plan	At least one month prior to the commencement of operation must provide a safety and operating plan to the Department		The SOP must comply with the *Pipeline Regulation 2005*. Note this will be undertaken prior to construction.
3.21		Soil and Water Quality Impacts	Except as expressly provided by an Environment Protection Licence the proponent shall comply with S120 of *Protection of Environment Operations Act 1997*		Refer to Section 4.1 of this report.
3.22		Erosion and Sediment	Soil and Water management controls to minimise soil erosion and discharge of sediment.	Managed in accordance with Landcoms Managing Urban Stormwater: Soils and Conservation	Refer Section 4.7 of this Report
3.23		Contingency Plan	Prepare contingency plan for events that have potential to pollute or contaminate surface or groundwater	Plan to include threshold levels, remediation actions communication strategies for effective management	Prepare following the HAZOP and risk based assessments
3.24		Contaminated soil	Notify local council if soil contamination is identified during construction	CEMP to include measures to manage existing soil contamination if found.	Refer Section 4.1 of this report
3.25		Water Supplies	All water supplies for construction, hydro-testing and operation are sourced from authorised and reliable supply		Construction contract specification. Construction contractor to undertake a water supply study.

Condition	Sub condition	Topic	Primary requirement	Secondary requirement	Comment/action
3.26		ASS/PASS	Any ASS encountered shall be treated and disposed of in accordance with Acid Sulphate Soils Manual	Treated and disposed of in accordance with "Acid Sulphate Soils Manual" 1998 or later ed.	Refer Section 4.8 of this report
3.27		Native heritage	Prepare an oral histories study for determining heritage significant sites along the ROW. Shall be informed by Traditional Owners and Appropriate Aboriginal community.	CEMP must consider and include protocols related to avoidance, constraints and mitigation measures	Refer Section 4.9.2 of this report
3.28		Native heritage	If groundwork identifies significant sites of aboriginal heritage consult with DECC re management.		Refer Section 4.9.2 of this report.
3.29		Native heritage	Finding artefacts during construction requires cessation of work likely to affect the object.	Must consult DECC. Relevant works shall not recommence until written authorisation from DECC given.	Refer Section 4.9.2 of this report/
3.30		Crown lands	Liaise with Dept of Lands regarding measures to minimise potential impact to the environment on crown lands		Refer Section 4.3.5 of this report.
3.31		Long term access	Manage long term access at pipeline entry points to prevent the easement being used for illegal dumping, trail bike riding, 4WD entry or bushfire ignition.		Construction contract and operational management plan.
3.32		Waste Management	Waste to be removed to licensed facilities for that waste.		Refer Section 4.10 of this report.
3.33		Waste Management	Maximise the treatment, reuse and/or recycling on site of any waste oils, soils, slurries, dusts, sludges associated with the project to minimise the minimise the need for treatment or disposal outside.		Refer Section 4.10 of this report

Condition	Sub condition	Topic	Primary requirement	Secondary requirement	Comment/action
3.34		Waste Management	Not cause, permit or allow waste generated outside of the site to be disposed of on site. Unless permitted under a licence		Refer Section 4.10 of this report.
3.35		Waste Management	Classification and storage of waste in accordance with DEC 2004 environmental guidelines: *Assessment and Classification and Management of Liquid and Non-liquid wastes* or future guideline		Refer Section 4.10 of this report
4.1		Compliance monitoring and tracking	Implement compliance tracking program to track compliance with this approval. Program to be submitted to DG for approval prior to commencement of construction or operation as appropriate	Compliance tracking program to include: a) Provision for periodic review of compliance status against this approval b) Provision for periodic reporting of compliance status to DG c) Mechanisms for correcting non-compliances identified during audit or review.	Refer Section 4.11 of this report
5.1		Public availability	Subject to confidentiality all documents to be made available for public inspection on request.		Noted
5.2		Complaints	Prior to commencement of construction provide a method for receiving and responding to community complaints including: a) Telephone number on which complaints from construction or operation can be recorded b) Postal address where written complaints may be sent	Telephone number postal and email address shall be displayed on signs as identified in the CEMP. Project contact details on signage to be in accordance with AS2885	Complaints procedure to be developed prior to construction. Personnel to be trained in the Complaints Procedure.

Condition	Sub condition	Topic	Primary requirement	Secondary requirement	Comment/action
			c) Email address for electronic complaints		
5.3		Complaints	Record details of complaints through an up to date complaint register. Complaints register to be made available to DG upon request	Register shall record (but not limited to): a) Time and date of the complaint b) Means by which the complaint was made c) Any personal details of the complainant (if supplied) or [if not] a note to that effect d) The nature of the complaint e) Any action(s) taken by the proponent in relation to the complaint, including follow-up contact with the complainant f) If no action taken then the reasons why no action was taken.	Complaints procedure to be developed prior to construction. Personnel to be trained in the Complaints Procedure.
5.4		Electronic Information	Prior to commencement of construction establish a dedicated website or maintain dedicated pages within an existing website for provision of project information (subject to confidentiality) provide a method for receiving and responding to community complaints including: a) Telephone number on which complaints from construction	Proponent to publish and maintain up to date information including: a) Information on the statutory context of the project (including on any approvals obtained under the Environment Planning legislation and relationship to mining and petroleum leases and the current implementation status of the project b) Copy of this approval and any future modification to this approval	Noted. Website reviewed and updated 2017.

Condition	Sub condition	Topic	Primary requirement	Secondary requirement	Comment/action
			or operation can be recorded b) Postal address where written complaints ma	c) A copy of each relevant environmental approval d) Details of the outcome of compliance reviews and audits of the project	
6.1		Environmental monitoring and management	Prior to commencement of construction or operational activities or as otherwise agreed by the DG nominate a suitably qualified and experienced environmental representative during any construction activities and throughout the life of the project	Environmental representative shall: a) Oversee the implementation of all environmental management plans and monitoring programs, and advise the proponent upon the achievement of the plans/programs b) Consider and advise the proponent on its compliance obligations against all matters referred to under condition 1.1 (c) c) Have the authority and independence to recommend to the proponent steps to be taken to avoid or minimise unintended or adverse environmental impacts up to recommending stop work for significant risks that adverse impact may occur.	Appoint an environmental representative prior to construction (sufficient time to review documentation (n.b. this is not an owners team member)

6.2		CEMP	Prepare an implement a Construction Environmental Management Plan to outline environmental management practices and procedures during construction.	Consistent with Guideline for the preparation of environmental management plans including: a) Description of all relevant activities to be undertaken on site during construction b) Details of area designated for the erection of public information signage c) Details of any construction camp sites and the management of these sites d) Details of the measures to be employed to reduce soil erosion and trench compaction e) Details on the potential occurrence of expansive soils and saline areas along the proposed route and management and mitigation measures f) Details of measures to separate construction areas from publicly accessible areas g) Details of the protocols to mitigate and/or manage aboriginal cultural heritage sites h) Statutory and other obligations that the proponent is required to fulfil during construction including all relevant approvals, consultations, and agreements required from authorities and other stakeholders and key legislation and policies i) Details of how the environmental performance of the construction works will be monitored and actions to address potential adverse environmental impacts including monitor and manage dust emissions; soil erosion and sediment discharge; noise emissions during construction; air emissions; minimise impacts on local flora and fauna (refer other conditions re minimise areas to be	Refer Section 4.1 of this report.

				cleared etc); indigenous heritage values including involvement or relevant local land councils, committees, traditional owner groups. j) Description of the roles and responsibilities k) Additional studies (ref condition 6.3) l) Complaints handling procedures	

Condition	Sub condition	Topic	Primary requirement	Secondary requirement	Comment/action
6.3	a	Noise Management Plan	CEMP shall include a a) Construction Noise Management Plan to manage noise impacts during construction and identify all feasible and reasonable noise mitigation. Plan to address all requirement of DECC 1) review of construction noise criteria and related noise impact assumptions to the calculated noise levels for the final route b) Details of scheduled hours of construction works outside the hours in condition 3 including where construction noise will be audible or inaudible at residential or sensitive receptors, where audible then include consultation provisions for construction outside of hours in condition 3.1 and negotiated agreements for affected receivers in out of hours; reflect 28/9 day construction and identify where additional mitigation measures will apply and the scheduling cycle is refined in		Refer Section 4.1 of this report

Condition	Sub condition	Topic	Primary requirement	Secondary requirement	Comment/action
			recognition of the impacted receivers; Consider tonality and impulsiveness in impact of construction noise (and provision of respite for affected receivers; recognise special arrangement for public and religious holidays, sensitive receivers and sensitive periods (e.g. school exams); proactive and reactive monitoring and management measures for all audible out of hours construction works; auditing and reporting requirements to ensure sensitive receptors are not being adversely impacted by construction noise c) Details of measures to avoid or mitigate the actual major impact noise levels d) Details where impacts cannot be avoided or mitigated of consultation with sensitive receivers		

Condition	Sub condition	Topic	Primary requirement	Secondary requirement	Comment/action
6.3	b	Traffic Management Protocol	Outline management of traffic conflicts that maybe generated during construction. Plan to address the requirements of the local councils, RTA and Dept of Lands and any other relevant roads authority: a) Details of how construction of project infrastructure will be managed in proximity to local and regional roads b) Details of traffic routes for heavy vehicles including any route or timing restriction for oversized loads c) Detailed consideration of measures to be employed to ensure traffic volumes acoustic and amenity impacts along heavy vehicle routes are minimised d) Detailed consideration of alternative routes (where necessary) e) Demonstration that all statutory responsibilities with regard to road traffic impacts have been complied with		QHGP will negotiate road corridors closer to construction commencement. Construction Contractor will prepare and implement a Traffic Management Plan which complies with this condition. To be included in the Construction Contract.

Condition	Sub condition	Topic	Primary requirement	Secondary requirement	Comment/action
6.3	c	Water Management Plan	a) Identify all sources of water for construction and operation prior to commencement of construction works. The amount of water to be extracted to be justified and potential impacts to other users of the specific water source shall be justified and potential impacts to other water users to be minimised b) Describe any proposed disposal sites for hydro-test water and detail the environmental protection measure to be utilised for any such disposal measures		Construction contractor will be responsible for undertaking a Water Supply Management Study under the terms of the Contract.

6.4		Operational Management Plan	Prepare and implement an operational Environmental Management Plan to detail an environmental management framework practices and procedures to be followed during operations. OEMP to be consistent with Guideline for the Preparation of Environmental Management Plans. OEMP shall be submitted to the DG no later than one month prior to commencement of operations. Operation shall not commence until written approval has been received from the DG.	OEMP to include a) Identify all statutory and other obligations that Proponent is required to fulfil in relation to operation including all relevant approvals licences and consultations. b) Details of the areas designated for the erection of public information signage (AS2885) c) Details of the monitoring methods of rehabilitated areas d) Specific consideration of relevant measures to address any requirements identified in documents required in Condition 1.1 (b) and 1.1 (c) of this approval e) Details the control measures for soil erosion and sedimentation f) Description of the roles and responsibilities for all relevant employees involved in the operation g) Overall environmental policies and principles to be applied to the operation of the project relevant standards and performance measures to be applied to the project h) Relevant standards and performance measures and a means by which environmental performance can be periodically reviewed and improved i) Management policies to ensure that environmental performance goals are met and comply with the conditions of this approval j) Measures to ensure that relevant ambient air criteria will be met for operational	OEMP to be developed

				activities including gas venting (meet DECCS requirements) k) Measures to mitigate and manage noise during operation and demonstrate the noise criterion specified in the New South Wales Industrial Noise Policy (EPA2000) will be met for operational activities l) Management measures for easement areas including management of vegetation soil erosion, weed control, and landholder liaison.	

Condition	Sub condition	Topic	Primary requirement	Secondary requirement	Comment/action
7.1		Incident reporting	Within 24 hours of any incident with actual or potential off-site impacts on people or the biophysical environment a report shall be provided to the department outlining the basic facts. A further detailed report (including causes and additional preventative measures submitted no later than 14 days after the incident	Maintain a register of accidents, incidents or potential incidents. The register to be available for inspection by independent auditor or the DG	Included in the Emergency Management Plan to be developed following the HAZOP and Risk Assessment workshops
7.20		Incident response.	Proponent shall meet the requirements of the DG to address the cause or impact of any incident as it relates to this approval, reported in accordance with condition 7.1 within such period as the DG may require		Included in the Emergency Management Plan to be developed following the HAZOP and Risk Assessment workshops

4. CURRENT STATUS OF CONDITIONS

Management plans developed for this section are living documents and will be periodically updated to reflect additional studies, engineering techniques, construction methodologies and legislative changes.

4.1 Construction Environmental Management Plan

4.1.1 Overview

This Construction Environmental Management Plan identifies the environmental issues, risks and mitigation measures to be adopted during construction of the NSW section of the pipeline. QHGP is committed to managing environmental issues during construction and operation of the pipeline and compliance with legislation and conditions of approval.

This shall include, but not be limited to, avoiding unnecessary felling or damaging of trees, proper discharge of effluent, dust control, emission of noise, vibrations, fumes, waste, both hazardous and non-hazardous; including from the construction of marine landing facilities, infrastructure (ports, roads, rail-lines or other pipelines) and weed control wash down facilities, vent systems, site drainage and other methods of disposal or discharge.

The Construction Contractor will prepare and implement supporting measures to protect the environment

4.1.2 Scope and Objectives

The objective of the CEMP is to set out the environmental management protection measures to be undertaken for the Project.

The Plan details the means for:

- Making provisions for all construction activities to be completed with due care and diligence to comply with all environmental specifications provided by the Environmental Impact Statement, Project Approval granted under the *Environmental Planning and Assessment Act 1979* (Application number 02_0286), Environmental Requirements under Australian Legislation, Standards, and License conditions, and the APGA *Code of Environmental Practice – Onshore Pipelines* (APGA Code).
- Providing stability to the Right of Way (RoW);
- Minimising the negative environmental impacts of the pipeline on the marine crossing;
- Minimising soil erosion and sedimentation;
- Protecting endangered, vulnerable, rare and threatened (EVRT) fauna and flora and further ensuring successful rare plant translocation;
- Protecting sites of natural, historical or cultural significance;

- Minimising hazards and risks to the health and well-being of both landowners and the public and the construction personnel;
- Protecting landowners, agricultural and other infrastructure and minimizing the disruption to agricultural activities during construction; and
- Rehabilitation and monitoring
- To minimize any significant and permanent environmental impact from the Project;
- To ensure that due account is taken of the need to preserve the natural environment, to prevent nuisance and disturbance to the natural ecosystems and wildlife and to adopt a sustainable approach to resource conservation including the reporting on Greenhouse gas emissions (GHGEs), throughout the duration of the contract;
- To actively promote a conservation-oriented approach to the Project amongst the workforce;
- To protect the identified Special areas, Historical sites, Aboriginal and Non-Aboriginal Cultural heritage sites available along the proposed pipeline route;
- To minimise water use and waste production and ensure waste disposal is carried out in an environmentally acceptable manner;
- To ensure that the construction of the onshore pipeline does not compromise the ability of the human population to continue their traditional activities and lifestyle;
- To ensure that, through an active environmental awareness training program, employees at all levels in the organization are familiar with the requirements of environmental control/ mitigation as defined in the EMS;
- To provide focused training for supervisory/managerial staff to ensure that they are aware of the broader environmental implications of the Project and in particular the highly sensitive nature of the environment through which the pipelines routes traverse.

4.1.3 Environmental Targets

To minimise the impact on the environmental due to pipeline construction activities by:

- Minimising the footprint of the Project (e.g. vegetation clearing);
- Minimising disturbances to the sensitive receptors from construction and to the fauna as far as reasonably practicable;
- Minimising waste production;
- Preventing any contamination of the marine environment through disposal of waste or spillages of chemicals;
- Ensuring that all necessary environmental consents/ permits etc. are obtained before commencement of operations;
- Ensuring that the Project is implemented in accordance with environmental permits and requirements.

The environmental monitoring and audit program will check compliance/ achievement with the above targets, including permitted waste discharges.

4.1.4 Organisation and Responsibilities

Effective implementation of this plan will be the responsibility of all personnel engaged on the construction project. The Project Management team will be responsible for managing the implementation. Positions with direct responsibilities will include:

- Project Manager
  The Project Manager is accountable for establishing the environmental performance standards for the project and for ensuring adequate resources are available to enable delivery of this plan

  The Project Manager shall actively promote the EMS and ensure that all Project personnel are fully conversant with this CEMP and any incumbent responsibilities.

  The Project Manager shall:

  - Provide leadership in the implementation of all environmental initiatives;
  - Determine the resources necessary to conduct specific activities and achieve Project objectives;
  - Develop a construction methodology with due regard for the environment;
  - Ensure mitigation actions agreed as part of the risk assessment process are included in the CEMP, supporting plans and procedures.
  - Provide for training to ensure that each member of the Project Team is competent to implement the CEMP;
  - Be actively involved in environment meetings, audits and reviews; and
  - Arrange community liaison program for local residents and respond to their complaints/concerns;

- Environmental Manager

  - The Environment Manager is accountable to the Project Manager for all factors relating to Environment issues on the Project;
  - Finalize and monitor Project environmental criteria and standards;
  - Develop and oversee the CEMP and issue specific EMPs (e.g. Waste Management Plan) - maintain upload lists of emissions, effluents, and wastes, including quantities and treatments;
  - Co-ordinate the implementation of noise and vibration control measures under the Noise & Vibration EA Conditions;
  - Ensure that all construction activities carried out by the construction contractor are conducted in strict accordance with the Australian federal, state and local legal obligations;
  - Review construction activities on a day-to-day basis and act as environmental focal point for the construction Work;
  - Develop an emergency response plan (ERP) for implementation in the event of any environmental incident;
  - Identify and report all non-compliance's and follow up actions, including preventative action and close out of management measures;
  - Implement an environmental site audit program;

- Promote environmental awareness amongst the workforce and hold regular site meetings with supervisors, workers, sub-contractors etc on environmental matters relevant to the construction;
- Prepare environmental engineering content of permit applications and provide ongoing environmental engineering interface with governmental permitting entities;
- Review and finalise lists of special restoration and rehabilitation areas along the RoW and at off-right-way locations to be disturbed by construction;
- Co-ordinate preparation of rehabilitation plans required for implementing the temporary and permanent aspects of Project's rehabilitation specifications;
- Verify adequacy and availability of seed, tube stocks, plantings, and other related materials required for supporting rehabilitation activities;
- Verify competency, manpower capabilities, and readiness of rehabilitation sub-contractors and associated personnel to be retained to provide field support to construction;
- Co-ordinate off-right-of-way activities by nurseries, growers, and suppliers to ensure adequate and timely deliveries to the right-of-way (RoW) at appropriate season and stages of construction.
- To liaise and work with the Project Manager, Contracts Manager, Environmental Regulatory Compliance Advisor and Permit Coordinator;
- Responsible person/single point of contact pertaining to Environmental Regulatory interface;
- Conduct engagement session(s) and/or clarification sessions with the relevant discipline heads and responsible parties for all parties to understand their roles and responsibilities pertaining to compliance;
- Ensure that appropriate actions are taken leading to full compliance by all Compliance Owner;
- To identify the Environmental Regulations are being adhered to;
- Liaison with governmental authorities on environmental approvals and performance matters;
- Participate in project management meetings as the environmental representative;
- To report the status of Environmental Regulatory Compliance to the Project Manager, Contract Manager, Discipline Engineers and Compliance Owner(s).
- To review and finalise Environmental Activities Matrix.

- Environmental Coordinators (Site based)
  - Provide the Environmental Officers in the field with operational guidelines and support while focusing on the marine crossing;
  - Ensure immediate implementation of ERP in the event of an environmental incident;

- Ensure that all construction activities carried out by the Project are conducted in strict accordance with the Environmental Policy Statement and with conditions of approval;
- Ensure availability of environmental consents/approvals (where applicable);
- Review construction activities regularly and to act as environmental focal point for the construction Work and to develop an emergency response plan in the event of any environmental incident;
- Identify and report all non-compliance's and follow up actions and to implement an environmental site audit Program;
- Promote environmental awareness amongst the workforce and to hold regular site meetings with supervisors, workers, sub-contractors etc on environmental matters relevant to the Project;
- Investigate and report detail reports on all types of environmental incidents.
- Maintains and updates the Environmental Activities Matrix;
- Review construction activities on a day-to-day basis and to act as environmental focal point for the construction work force;
- Identify and report all non-compliance's and follow up actions and to carry environmental site inspections in accordance with this CEMP;
- Promote environmental awareness amongst the workforce;
- Report and follow up of Environmental incidents reported at Work sites.

4.1.5 Communication and Reporting

Environmental issues will be communicated within the organization and it typically takes place in the following activities:

- ENVID workshop;
- Induction and training programs;
- Toolbox meetings;
- Environmental meetings;
- Incident, Accident, Near-miss Statistics;
- Distribution of Work Instructions relating to Environmental Management;
- Bulletins;
- Notice Boards;
- Signs and Posters; and
- Results of audits, monitoring and investigations made available to all personnel.

The function of the external communication system is aimed at informing Shareholders, Government and Public Authorities, the Public, Partners, and Clients on matters regarding Environmental Activities.

A contact Hotline number will be established to enable any person with any inquiry or complaint to voice their concerns during construction period.

Indicative timeframes for response and containment of typical complaints will be followed as per the QHGP guidelines.

A QHGP Project specific induction record (booklet or electronic form) for each of the construction contractor's personnel and all Subcontractor personnel, to track inductions and currency of training given to personnel in environmental management processes on the site.

No person will be permitted to work on site unless they have been inducted to the site (including an induction on environmental responsibilities).

Visitors will be required to undergo a visitors' induction.

4.1.6 Training Awareness and Competency Program

The Environmental Manager will ensure environmental awareness training is provided to all Project personnel. No personnel will be allowed to work on the pipeline unless this training is completed.

This training will involve the on-site education of the Project personnel with the aim of understanding the environmental impacts of their daily work practices and activities.

Training staff in the awareness of environmental issues will include at least:

- QHGP Environmental Policy;
- Environmental objectives and targets;
- Control procedures to be implemented to minimise the likelihood of environmental harm;
- Contingency plans (CPs) and emergency response procedures (ERPs) to be implemented for non-routine situations and to deal with foreseeable risks and hazards, including corrective action responses to prevent and mitigate environmental harm (excluding any necessary site rehabilitation);
- Organisational structure and responsibility to ensure that roles and responsibilities are appropriately defined to ensure effective management of environmental issues;
- Effective communication procedures to ensure two-way communication on environmental matters between operational staff and higher management;
- Obligations with respect to monitoring, notification and record keeping as well as obligations under the EMPs and relevant approvals; and
- Monitoring of the release of contaminants into the environment including procedures, methods and record keeping.

Apart from induction training, specialised environmental training will be given to all Line Management including site engineers, supervisors and managers.

This will encompass the following environmental aspects and corresponding mitigation concepts discussed in respective sections:

- Land Access Requirements;
- Acid Sulfate Soil Management;
- Vegetation Clearance Management techniques;
- RoW Requirements;
- Protection of flora and fauna (F&F);
- Identification and management of culture heritage and archaeological sites;
- Pest and Weed control;
- Protection of surface and groundwater resources;
- Noise and vibration control;
- Spill response and contaminated sites management;
- Hazardous and non-hazardous waste management;
- Storage and handling of hazardous wastes including radioactive materials;
- Road transportation hazards and journey management plans;
- Complaints Management guidelines

4.1.7 General Provisions (Construction)

This EMP identifies the proposed methodology to avoid or minimise potential adverse impacts that may arise from construction activities.

All impact mitigation measures that will apply to the QHGP Pipeline Project will be consistent with the APGA impact mitigation measures as outlined in the APGA Code.

Construct in accordance with sound environmental management principles. In general, this will include:

- A thorough review of the potential environmental impacts of the construction phase of the Project using HAZOP and similar risk evaluation techniques;
- Familiarization and strict adherence to the stated policies and procedures contained in this CEMP;
- Fulfilling the environmental objectives and targets for the Project;
- Enforcement of environmental mitigation measures, as detailed in this CEMP;
- Establishment of audits and review process, including periodic performance reporting;
- Developing and applying issue specific management plans as required (such as plans specific to weed management, flora and fauna, waste management, erosion and sediment, noise management and air quality)
- Rehabilitation of the RoW post construction
- Minimising the disruption to agriculture along the RoW.

4.1.8 Pre-construction

Prior to starting construction activities at site, numerous pre-construction activities will be planned. These activities include confirmation of ecological values, engineering for geotechnical, final methodologies for stream crossings, preparation of rock prior to trenching and inspections for constructability planning.

The relevant activities with regards to this CEMP are summarized in the following sections, but not limited.

- Prior to entry onto the construction corridor, relevant authorities, landowners and/or occupiers are notified about when their land will be entered and for how long construction Works will be undertaken (in accordance with land access protocols);
- Identify infrastructure (roads, railways) along the construction corridor that will require public access to be maintained or managed during construction;
- Identification of Conservation Values of sites along the route;
- Threatened Flora will be flagged and/or fenced and these areas protected from disturbance;
- Areas where animals are actively breeding will be flagged and fenced until the young are sufficiently mature;
- Regional Government Agency offices will be notified prior to construction activities occurring in areas of conservation value;
- Areas of surveyed occurrence of weed will be marked on the site; corridor access hygiene points are also marked on the sites;
- All watercourses, wetlands, lakes and springs and associated buffer areas will be marked in the field as NO refueling areas;
- Heritage sites in proximity to construction activities, identified for protection, shall be clearly flagged and/or fenced;
- Erosion control measures shall be installed as required to protect sites near the pipeline corridor.

4.1.9 RoW Management

Maps and alignment sheets will be produced based on the multidisciplinary investigations. These alignment sheets and maps will be used to identify sensitive environmental areas and the management measures necessary to manage risk to the environment.

No change, replacement or alteration of any plant or equipment is permitted if the change, replacement or alteration increases the environmental harm caused by construction activities.

The maintenance and cleaning of any vehicles, plant or equipment will not be carried out in areas from where contaminants can be released into any waters, roadside gutter, storm-water drainage systems or sensitive environments. No refueling will occur in or adjacent to watercourses.

All plant and equipment will be maintained and operated properly and efficiently by qualified personnel.

Construction will be managed to preserve the natural drainage, topography and vegetation that existed prior to construction as closely as is practicable and as documented in Project documents.

QHGP will clear areas within the project envelope to facilitate construction of the pipeline, laydown areas, access tracks and additional work areas. QHGP will use pre-clearing inspections by suitably qualified ecologists to identify and delineate the boundaries of the clearing area.

The RoW will be realigned where historical or cultural sites are identified within working strip in order to avoid disturbance of these areas; these areas will be identified, barricaded and protected during construction.

RoW and other Project occupied areas will be demarcated and activities restricted to the limited area. Personnel working on the RoW will be required to restrict their activities to the defined project areas.

The construction area along the RoW (other than the designated stockpile areas) will be cleared of combustible vegetation to reduce the risk of fire. Environmental features such as rocks and dead timber will be replaced in the RoW where appropriate.

4.1.10 Route, Ground and Environmental Surveys

The designated Right of Way (RoW) will be surveyed ahead of construction.

4.1.11 Environmentally Sensitive Areas

Within Environmentally Sensitive Areas (ESAs) and water bodies, the RoW and Work area will be limited to a maximum of 30m disturbance; clearing will not be permitted outside these areas.

In areas not nominated/specified as an “ESA” the RoW width will have a limit up to a maximum of 40 metres.

Topsoil removed from the banks and approaches to the crossing shall be conserved. Care will be taken to ensure that material from the stream or water-course bed does not become mixed with bank material.

After vegetation and topsoil removal and stockpiling of bed and bank material shall be separately stockpiled in a location that will not obstruct the water-course or flood plain. Banks shall be backfilled with bank material compacted and stabilised.

4.1.12 Fencing

A fencing crew will follow behind the Construction Advance Team and install the following:

- Temporary gates in existing fence lines across the RoW so that access to the RoW can be gained by vehicles and construction equipment without compromising the integrity of existing fences;
- Temporary fencing to prevent entering identified cultural and environmental significant areas;
- Fencing, where appropriate, to deter unauthorised entry onto the RoW;

- Safety signs at the intersection of the RoW and Public access roads and Environmental Permit and awareness signs at identified special protection areas with list of mitigation measures to be followed by the construction personnel.

Strategies for reducing soil erosion on graded sites include the following actions:

- Installation of erosion and sediment control measures (ESCMs) as necessary, and in line with the ESCMP;
- ESCMs will be employed only for as long as necessary;
- Special grading and ESCMs will be taken on Work sites adjacent to streams or rivers, and at watercourse crossings.

Depending on the particular site conditions one or more mitigation measures may be applied, including:

- Follow the watercourse crossing plan;
- Generally, soils will be graded away from the watercourse area;
- Installation of pre-construction drainage systems;
- Soils to be stockpiled at a safe distance away from the watercourse to avoid watercourse contamination;
- Installation of silt and sedimentation fencing as necessary;
- Installation of wooden subsoil retaining fences as necessary;
- Installation of a solid barrier such as geo-textile over stockpiled soils;
- Protective actions such as the installation of sand bags will be implemented to prevent or minimize erosion of stockpiled material or soil from rain or from rising water along an exposed stream or riverbank.

The measures used will be decided on a case-by-case basis on completion of an environmental risk assessment.

4.1.13 Flora and Fauna Management

Construction of the project requires the removal of vegetation from areas which have been largely previously disturbed, to enable access to the pipeline corridor, during construction of the pipeline and development of services and temporary workers accommodation facilities (TWAFs).

Minimum disturbance to both flora and fauna are planned with restoration of disturbed areas back to pre-construction condition occurring as soon as is practically possible.

The cleared vegetation may contain weeds, which if not adequately managed, may be spread into unaffected areas.

Also, stockpiling or burning of the cleared vegetation may increase the fire hazard associated with construction activities; all clearing activities will be carried out by proper planning to avoid disturbance to EVRT flora species as far as possible and to minimise the habitat disturbance of protected fauna species.

Hence, a program to implement offsetting of cleared vegetation communities will be undertaken as required in accordance with legislative criteria for the offsetting of significant vegetation communities.

Disturbance will be restricted to the RoW and designated work areas; to restrict access and avoid disturbance to significant vegetation areas, physical barriers will be installed around these areas.

Appropriate controls will be implemented during any diversion of watercourses to reduce the impact on aquatic species.

Appropriate permits for the clearing of vegetation will be obtained prior to the commencement of clearing.

All personnel working on the pipeline will undergo training and induction on ecological values.

All construction camps, facility sites or access tracks are to be located outside of significant areas.

Any EVNT Flora Species identified within the construction corridor will be managed in accordance with relevant legislative requirements. A Species Management Plan (SMP) for affected fauna, regardless of status (both terrestrial and marine); this plan shall be in accordance with.

Suitably qualified fauna handlers will conduct inspections along areas of open trench to rescue and recover fauna within the trench. Wet sacks and fauna ramps will be used to provide shelter for fauna or a means of escape.

Personnel trained as faunal spotters will be present during clearing of woodland vegetation and any other areas of faunal habitat.

Any uninjured fauna will be removed and released to a safe area; injured fauna will be handed over to a predetermined wildlife curer.

Details of all animals found in the trench will be recorded and made available to the regulator.

4.1.14 Ecological Monitoring

The RoW, all work areas and access tracks be regularly inspected to assess the effectiveness of such protection measures as monitoring of vehicle movements, wash-down activities, keeping of records and restoration activities.

Following commissioning of the pipeline weed monitoring and subsequent weed seed control will be ongoing throughout pipeline operations.

4.1.15 Air Quality management

Atmospheric dust is the main component of air emissions during the construction phase of the proposed development. Minimisation and mitigation measures for dust control will be used to keep dust emissions at sensitive receptors to the practical minimum.

In the construction of the gas pipeline, the main source of Greenhouse Gas emissions would arise from land clearing, on-site equipment use, camps and transport of construction materials either by truck or rail.
Air emissions during construction of the GTP will be primarily dust, with some minor source of combustion pollutants such as nitrogen oxides due to diesel and petrol vehicles and machinery.

Emissions will be generated from number of sources including:

- Clearing of vegetation and topsoil;
- Excavation and transport of earth material;
- Vehicle (including heavy vehicles delivering pipeline) traveling on unpaved roads; and
- Vehicles and construction equipment (such as excavators) exhausts.

The impacts of construction activities will be managed though the Project Air Quality Management Plan (AQMP).

This will include strategies to prevent or minimize dust during construction activities, an outline of methods to monitor the effects of construction activities, and documentation of procedures that will be implemented to mitigate any adverse off-site impacts.

4.1.16 Air Quality Mitigation Measures

Mitigation measures to reduce potential dust emissions during construction activities include:

- The cleared areas not required for ongoing maintenance will be rehabilitated through re-vegetation;
- In areas where planting, mulching or paving is impractical, apply gravel or landscaping rock to reduce source of dust emission;
- Minimise areas cleared for construction;
- Minimising vehicle speeds in the vicinity of sensitive receptors for pipeline patrol vehicles;
- Minimise fuel consumption and vehicle emissions at all times;
- Dust control management actions will be provided in respect of:
    - Vehicle Movement;
    - Clearing and Grading;
    - Trenching;
    - Pipe Joining;
    - Padding;
    - Sand blasting;
    - Rock blasting;
    - Areas of bull dust;
    - Rehabilitation; and
    - Hygiene.

- Dust control will be managed effectively by use of water sprays or water trucks. Dust suppression will be performed at locations typical as above where the effects of dust impact working conditions, visibility and environmental disturbance. Control of the water trucks will be the responsibility of the area supervisor, where there is a requirement to reduce water usage chemical dust suppressants may be used (e.g. Dustmag);
- Educate community on dust emissions and their impacts;
- A “no burning” policy will be implemented;
- Monitor and maintain adequate vegetation cover on the RoW areas along the pipeline to avoid dust generation.
- Regular visual monitoring of dust emissions will be conducted and watering frequency altered as required.
- Use energy efficient lighting and other electrical appliances in office and accommodation buildings.

4.1.17 Special crossings

Special crossings such as roads, oil/gas/water pipeline, electrical/telecommunication lines will be installed to meet the requirements and conditions set for by the Authorities having jurisdiction.

QHGP will negotiate crossing agreements with the owners of the existing infrastructure (such as pipelines) and mineral tenures (including coal) with respect to the route across the tenure and conditions associated with construction and minimising the sterilisation of the resource.

4.1.18 Water management

It is anticipated that huge quantities of water may be required for construction e.g. dust control, weed seed wash down bays and at residential camps.

These sources will be identified from existing bores, water mains and dams.

Approval will be obtained from the relevant regulatory authority for the abstraction of water from existing sources.

All Project employees will be trained and inducted for spill prevention and response procedures.

Temporary dams may be constructed to store water during the Project; the required licenses will be sought from the relevant regulatory authorities prior to commencement of construction in any area.

Water will be reused where practicable, which will reduce water supply requirements.

QHGP will ensure that portable water is consumed on site, and at camps complies with the Australian Drinking Water Guideline 2004.

4.1.19 Water Disposal Management

The construction and decommissioning of camps, stockpile sites, small worksites and access roads requires filling, excavation, pipe-laying, backfilling, hydro-testing and rehabilitation.

The following activities may require removal of water to facilitate construction works if shallow water/ surface water is encountered:

- Trenching;
- Sediment Core Drilling

All water disposal will be through appropriate ESC devices at sufficient distance away from watercourses and mindful of its potential to damage vegetation.

There will be no release of contaminated water with potential to cause environmental harm to surface waters, land or groundwater.

4.1.20 Hydro-test Water

Hydro-testing will be carried out to confirm the strength of, and detect leakage from, the pipeline.

Hydrotest water will be recycled along the various test sections with make-up water sourced from local supplies as negotiated with the relevant authorities or water resource owner.

Discharge of spent hydrotest water will be analysed to ensure that this meets conditions for release and does not result in environmental harm. Direct discharge to watercourses is not proposed.

A detailed Hydro Test Water Management Plan (HTWMP) prior to commencement of construction works for Project.

The HTWMP will include:

- A detailed assessment of impacts from hydrostatic test water along the pipeline route including source water quality data and characteristic of additives, particularly biocides;
- Proposed storage, treatment and disposal methods of hydrotest water;
- Site specific mitigation measures for management of hydrotest water including monitoring and reporting.

4.1.21 Noise and Vibration

The significance of noise generated by the construction Work is dependent upon the particular area in which the construction Work is being undertaken and the proximity of environmentally sensitive receivers.

Sources of noise include:

- Camp sites;
- Traffic;
- Construction plant;

- Grinding and sand blasting;
- Hydro-testing;
- Ripping and rock blasting

Noise will not exceed the authorised noise levels at any sensitive or commercial place.

Alignment sheets will identify the location of sensitive receptors.

Mitigation measures will include consultation with potentially affected parties to discuss the duration and expected levels of impact with respect to construction noise.

To minimize the potential impacts, appropriate and well-maintained equipment/plant will be used throughout the life of the Project, speed limits will be reduced along the RoW near sensitive receptors.

Operators of construction equipment will be made aware of the potential noise problems and techniques to minimise noise emission through a continual process of operator education and issuance and use of prescribed PPE.

4.1.22 Blasting

Noise from blasting operations must not exceed an airblast overpressure level, when measured at or extrapolated to any noise sensitive or commercial place, of 115 dB (linear peak) for nine (9) out of ten (10) consecutive blasts initiated nor 120 dB (linear peak) at any time.

Ground borne vibration peak particle velocity caused by blasting operations, when measured at or extrapolated to any noise sensitive or commercial place, must not exceed more than 5 mm per second for nine (9) out of ten (10) consecutive blasts initiated, or 10 mm per second at any time.

A Blasting Plan(s) will be prepared prior to the commencement of any blasting activities, giving consideration of potential air blast pressure, vibration and mitigation measures. Blasting requirements will be pre-determined and each blast designed to achieve the fracture of the rock without exceeding prescribed limits.

All blasting will be in accordance with relevant legislation and best practice environmental management and Australian Standard 2187.

The work will be carried out during normal daylight working hours to minimize the effects of noise impacts in built-up or established farming areas.

4.1.23 Noise and blasting monitoring

Where complaints about noise are received these will be investigated and remedial action taken where noise levels are found to exceed authorised limits.

Monitoring will extend to individual items of plant to ensure that they are effectively silenced and operating in accordance with the legislative noise limits.

Monitoring and recording of air blast overpressure and ground borne vibration will be undertaken to investigate any complaint of nuisance.

Monitoring must include:

- Maximum instantaneous charge;
- Location of the blast within the site (including any bench level);
- Air blast overpressure level (dB Linear Peak);
- Peak particle velocity (mms-1);
- Location, date and time of recording;
- Measurement instrumentation and procedure;
- Meteorological conditions for blasting monitoring (including temperature, relative humidity, temperature gradient, cloud cover, wind speed and direction); and
- Distances from blast site to potentially noise affected buildings or structures.

The method of measurement and reporting of noise levels must comply with AS1055 Acoustics and the relevant legislation.

All noise complaints will be investigated and remedial action implemented if noise levels exceed specified limits at sensitive and commercial places.

4.1.24 Bushfire Prevention

QHGP will implement a “No burning” policy on the RoW. No open fires will be lit by personnel engaged in construction. Smoking will be in designated areas only.

The main fire risk during pipeline construction is during welding, grinding and field joint coating operations.

The cleared construction area along the pipeline easement forms an area free of combustible vegetation and therefore reduces the risk of fire.

Water trucks will be used in the vicinity of welding operations to suppress dust, as well as fire in the advent of fire.

Portable fire extinguishers required in all vehicles will be provided at the Worksite.

QHGP will comply with local fire prevention regulations in respect of all construction activities, including storage of flammable liquids.

Portable fire extinguishers of suitable type will be provided at camp premises at a minimum 30 m interval.

These extinguishers will be provided outside camp cabins at suitable height to use readily at an emergency time.

Health and Safety personnel will inspect these extinguishers on monthly basis and maintain service records.

“Assembly Point” will be established at suitable places inside camp premises. These areas will be identified with suitable signboards.

4.1.25 Emergency Response

In order to ensure that any environmental emergency affecting the place of operational activities will be dealt with in an efficient and professional manner, a

Project Specific ERP has been developed and training will be conducted for all working personnel in order to familiarise with the emergency procedures.

Each part of the ERP will provide instructions and guidelines, to be utilized to assist in incident management including:

- Response procedures in the event of a fire, chemical release, spill, accident, explosion, equipment failure, bomb threat, natural disaster (including severe storm, bushfire and flood events) or any other likely emergency;
- Communication arrangements and contact details;
- Roles and responsibilities of responsible personnel;
- Emergency controls and alarms;
- Evacuation procedures;
- Emergency response equipment;
- Leak detection and control points;
- Training requirements;
- Site access and security

The effectiveness of the emergency response plan will be regularly tested and audited.

It is the responsibility of all site personnel to be familiar with the Emergency Procedures which apply to the Project.

Possible cases of environmental emergencies are:

- Chemical spillage;
- Oil spillage;
- High capture/mortality rates of fauna entrapment within the trench.
- Untreated sewage release.

QHGP will report incidents to the relevant authority, and provide the following information

- The holder of the authority;
- The location of the emergency or incident;
- The number of the authority;
- The name and telephone number of the designated contact person;
- The time of the release;
- The time and the holder of the authority become aware of the release;
- The suspected cause of the release;
- The environmental harm caused, threatened, or suspected to be caused by the release; and
- Actions taken to prevent any further release and mitigate any environmental harm caused by the release.

4.1.26 Rehabilitation

Following installation of the pipeline the trench will be backfilled and rehabilitation operations commenced and completed as expediently as practicable.

All third-party land will be reinstated in accordance with any pre-entry agreement. Where there is no pre-entry agreement, any land disturbance on the RoW caused by construction or associated activities will be reinstated to pre-existing condition.

In agricultural areas access tracks made specifically for the Works will be removed and the area restored to its original state, unless otherwise agreed with the property owner.

In cases where the landholder has requested that the access tracks remain, the shoulders will be finished in keeping with the local environment and handed over to the landholder.

- Slopes and original land profile will be restored following construction;
- Disturbed areas must be rehabilitated to a self-sustaining vegetation cover with same species and density of cover to that of the surrounding undisturbed areas;
- Agricultural areas will be left in a condition ready to be planted by the landowner;
- Re-vegetation of areas of native vegetation will use seed sourced from local suppliers of seed or tubestock of native species;
- Where applicable, any imported topsoil that is required for use in rehabilitation works will be of a similar quality to the topsoil it is replacing and will be weed and pest free;
- Rehabilitation must encourage the maximum re-establishment of native vegetation including the shrubby under-storey and ground cover;

4.2 Endangered Ecological Communities

4.2.1 Ecological surveys

A desktop review undertaken in 2017 of the QHGP route identified 42 sites where further ecological investigation is required. The timetable to construction will incorporate ecological investigation across the route with a particular focus on these sites.

The results of the ecological investigation will be incorporated into construction planning and alignment sheets, induction programs and other construction preparedness.

Environmental and ecological systems are dynamic and consequently data collected on ecological systems and assemblages must be current at time of construction. The project policy is to collect ecological data in a manner which provides support to mitigation measures to minimise impact during construction and inform rehabilitation.

Ecological surveys will be undertaken closer to construction commencement. Pre-clearing surveys, by suitably qualified ecologists, will be undertaken prior to clear and grade of the RoW to identify and flag vegetation that will retained.

4.3 Consultation

4.3.1 Land holder consultation

QHGP has updated the project website and responded to a number of enquiries from landholders along the route. Negotiations associated with the easement and access to properties for studies and constructability assessments has been limited. It is acknowledged that specific negotiations with all landholders along the route will be undertaken leading to construction.

4.3.2 Overlapping tenure (mineral and petroleum)

Limited negotiation

4.3.3 Infrastructure owners

No negotiation with infrastructure owners has occurred in recent periods

4.3.4 Local Authorities

Detailed presentations and project updates were provided to all local authorities along the QHGP route through 2017/18.

Further consultation with these groups is required in the lead up to construction

4.3.5 State Lands

No negotiation with state controlled lands has occurred in recent periods.

4.4 Watercourse Crossing Management Plan

This document provides an overview of the recommended procedure to be adopted by the construction contractor for the crossing of watercourses and the methods by which any potential adverse impact on the environment will be mitigated.

As part of its commitment to work in an environmentally responsible manner, this Management Plan is intended to reduce the potential impacts from the Project to a level that is as low as reasonably practicable. The environmental impacts and mitigation measures to be adopted are hence the basis for the development of this Plan.

The pipeline right of way will occupy a width of between 30 and 40m, additional working areas may be required at watercourse crossings.

The pipeline will be designed and developed to the highest standards and shall fully comply with the requirements of AS 2885. AS 2885 contains requirements for the design, material selection (including coating selection), construction and operation of pipelines and that apply to watercourse crossings.

4.4.1 Aquatic Values

Each watercourse along the route will be identified and mapped. The Aquatic Values associated with the watercourse will be assessed. This assessment forms the basis for the design and selection of the construction crossing techniques and identifying the basis to avoid, minimise and mitigate potential impacts.

The AVA will take into consideration a number of factors, including but not limited to:

- Riparian zone and condition (e.g. weeds, erosion, riparian vegetation present, regrowth remnant and the vegetation community)
- Presence of trailing vegetation (local and catchment)
- Physical features of the channel such as undercut banks, in-stream timber, overhanging vegetation, deep pools.
- Breeding places for aquatic fauna.
- Habitat for conservation significant aquatic species.

4.4.2 Environmental Risk

Effective Environmental Management is considered essential to the successful execution of the Project and for compliance with regulatory and legal requirements.

The key environmental concerns associated with watercourse pipeline crossings lie in the disruption to the natural environment during pipeline construction. For the construction period, the key potential impacts specific to watercourse crossings include:

- Removal of protected riparian habitat and increase in sedimentation with damage to root stock;
- Disturbance of unstable 'poor' soil types with resultant breakdown causing sedimentation and creation of preferential pathway (trench) causing changes in soil stability and hydrological condition and potentially undermining pipeline integrity;
- An increase in sedimentation from riverbed and bank disturbance;
- A short-term deterioration in water quality; and
- Alteration in stream morphology (form and structure of the stream) and the groundwater table.

4.4.3 Environmental Mitigation Measures

Environmental surveys will be conducted prior accessing the watercourse with heavy equipment and prior to the installation of any temporary crossing structure, including assurance that there are no turtles, threatened/endangered/vulnerable plants or habitat bearing trees, water quality issues or soil conditions near the watercourse banks where the bridge will be installed.

Prior to the commencement of crossing activities, environmental surveys by an environmental specialist or ecologist will be conducted to enact the Environmental Management Plans (EMPs) and sub-Plans and for monitoring and recording the condition of the watercourse by schedules and photographs, as well as relocating any turtles or other endangered species in the construction area.

4.4.4 Crossing Methodology

The selection of the preferred crossing method at a specific location is the result of a process that addresses the following:

- overall pipeline route selection

- crossing location selection
- crossing method selection

In selecting a pipeline watercourse crossing method, many factors must be taken into consideration. These include, among others:

- project schedule
- watercourse crossing width, depth and flow
- environmental sensitivity and associated constraints
- geotechnical conditions
- substrate composition
- hydrological data
- amount of working space
- access
- equipment availability
- downstream water users
- landowner and community issues
- engineering constraints
- construction season (water flow condition)

The selection of a crossing method is an exercise in assessment of these factors (above) to derive the most practical solution. The method that is preferred is usually that which offers the required level of environmental protection and can be executed as efficiently and reliably as possible with the least amount of disturbance.

4.4.5 Trench crossing methodology

The crossings shall be constructed as close to perpendicular to the axis of the watercourse channel as engineering and routing conditions permit.

If the pipeline parallels a watercourse, attempt to maintain at least 5 m of undisturbed vegetation between the watercourse, any adjacent wetland and the construction RoW.

Where watercourses meander or have multiple channels, the pipeline route shall be chosen to minimise the number of watercourse crossings.

Adequate flow rates shall be maintained to protect aquatic life and prevent the interruption of existing downstream uses.

Watercourse buffers (extra work area setbacks, refuelling restrictions, etc.) shall be clearly marked in the field with signs and highly visible flagging until construction related ground disturbing activities are complete.

4.4.6 Additional Work Areas

Permit and approvals shall be obtained from the relevant authorities, and landowners if extra work areas are required for the watercourse crossing construction.

The need for extra work space shall be determined on a case by case basis for each waterway crossing.

4.4.7 Spoil and excavated material

All spoil from minor and intermediate watercourse crossings and upland spoil from major watercourse crossings must be placed in the construction RoW at least 20 m from the watercourse banks edge or in additional extra work areas.

The erosion and sediment Management Plan will govern the environment protection measures to be adopted at spoil piles.

4.4.8 Waterway Access

Watercourse crossing should consider that vehicle and equipment access to both sides of the watercourse will be required for the execution of the crossing.

Adequate access across the watercourse is therefore required to be provided. As with the selection of the crossing method, selection of the access technique also involves striking a balance between the many of the same considerations listed above for the crossing method selection to derive the most practical solution. The technique that is preferred is usually the one which offers the required level of environmental protection and is quickest.

At times of the year when flows are reasonably likely to occur or where flowing water is present in the watercourse, a diversion strategy shall be developed and implemented that addresses flow management and fish passage.

Any temporary works installed to gain access, from one side of the crossing location to the other, shall avoid any undue obstruction to flows of water and shall be engineered so as not to give rise to flooding particularly following periods of heavy rainfall.

Temporary bridges and flume pipe crossings may be installed across streams and rivers. The flume pipes shall be designed and installed to withstand and pass the highest flow expected to occur during the construction period. Culverts shall be aligned to prevent bank erosion or streambed scour. If necessary, energy dissipating devices shall be installed on the downstream of the culverts.

At general crossing locations areas without environmental restrictions, a hydraulic excavator equipped with a ditching bucket shall clear the sides and bottom of watercourses to remove vegetation, collapsed earth and other debris across the full extent of the running track. This clearing out operation will reduce sediment loading. Flume pipes of an appropriate diameter, to prevent flow restriction, shall be installed into the watercourse to facilitate the temporary bridging in accordance with the typical drawing (Appendix C).

Gravel filled sandbags shall be stacked between the watercourse banks and flume pipes at each end to form retaining walls. The area in between the retaining walls, flume pipe and watercourse banks shall then be filled with stone. Finally, the stone infill shall be capped with either bog mats or earth ramping to prevent mud-laden tires or tracks on construction equipment from removing the stone, thus eliminating the need for topping up, whilst traversing the flume pipe crossing.

Erosion Sediment Control (ESC) measures throughout the pipeline construction works shall be carried out in accordance to the Erosion and Sediment Control Management Plan

4.5 Traffic Management Plan

4.6 Biodiversity offsets

QHGP acknowledges the need to implement biodiversity offsets in equivalent ecosystems to those disturbed by the Project. Biodiversity offsets will be informed by ecological surveys and calculations of the regional ecosystems areas that will be cleared during construction.

4.7 Erosion and Sediment Control Plan

4.7.1 Objectives

This plan provides information regarding the proper mitigation measures and practices to be implemented to control erosion during the construction the QHGP.

This plan was developed generally in accordance with the International Erosion Control Association, Best Practice Erosion and Sediment Control Guideline (IECA, 2008).

This Erosion and Sediment Control Plan (ESCP) describes the physical processes and nominates controls and interventions that are expected to result in compliance with the objectives and targets

It must be noted that this Erosion and Sediment Control Management Plan (ESCMP) as currently constructed, is a working document and will continue to be reviewed and updated as is required.

4.7.2 Risk Management

Erosion risk assessment provides an indicator tool to determine the sediment control and erosion control standards that should be applied to a project.
The Impacts of soil erosion and sediment runoff risk will be discussed below:

- Dust generated on construction sites can cause significant problems to neighbouring properties.
- Control of the erosion of dispersive and sodic soils during clearing, stripping, cutting and filling operations.
- Stormwater running off the site should be treated in a manner that does not result in the mixing of clean with dirty water. Installation of catch drains and diversion banks or similar will be required.
- Retention of as much vegetation as practicable during phased construction.
- Long period stockpile storage.

Table 2 Risk Assessment

Potential disturbance activity	Risk Assessment	Risk Level
Clearing of surface vegetation and topsoil which are stockpiled for future rehabilitation.	• Increased erosion on cleared surfaces • Increased sediment level of adjacent land watercourse. • Increased stormwater runoff • Increased soil salinity through changes in Hydrology	High
Use site soil for earthen-windrows	• Increased erosion in excavation activities. • Compaction of soil during berm construction. • Mixing between the naturally developed soil layers and the loss of important organic content. • Loss of fertile soil • Dust generation	High
Stockpiling and backfill of soil	• Loss of soil structure • Loss of seed bank and fertile soil • Compaction of soil • Inversion of soil profiles • Generation of dust	High
Pollution	• Hydrocarbon spills • Oil leaking from heavy machine operation. • Potential contaminants from construction chemicals • Sediment Pollution<0.02mm	High
Construction activity close to roads	• Impact on water quality due to hydrocarbons and sediment pollution. • Sediment deposition can cause traffic safety hazards.	High

4.7.3 Methodology

A quantitative erosion risk assessment for the site has been conducted using the Revised Universal Soil Loss Equation (RUSLE) Equation 1. RUSLE aims to predict the potential long term average soil loss rate from a given site based on the following parameters.

$$A = K \times R \times LS \times P \times C$$ Equation 1 (IECA 2008)

Where:

- A is the predicted soil loss per hectare per year
- K is the soil erodibility factor (0.058);
- R is the rainfall erosivity factor (2329 – refer to section 4.1.3);
- LS is the slope length/gradient factor (0.21);
- P is the erosion control practice factor (1);
- C is the ground cover and management factor (1.3);

Application of the RUSLE is based on site and soil characteristics determined by others.

4.7.4 Soil Erodibility

The soil erodibility factor (K factor) is a measure of the susceptibility of soil particles to detachment and transport by rainfall and runoff. Soil texture is the principle component affecting the K factor, but soil structure, organic matter and profile permeability also contribute.

4.7.5 Steepness

Slope length and slope gradient have substantial effects of soil erosion by water. The two effects are represented by the slope length factor (L) and the slope steepness factor (S). In application of RUSLE the two are evaluated together as a numerical representation of the length-slope combination (LS factor).
The natural slope of area where will be constructed the camp (Arcadia Station) is approximately of 1%. This means that the LS factor is 0.19 based on a maximum slope length of 80 m.

4.7.6 Rainfall Erosivity

The rainfall erosivity factor (R factor), is a measure of the ability of rainfall to cause erosion. It is the product of two components (1) total energy and (2) intensity for each rainfall event. R factors are published for some locations, however interpolation of published results is considered inappropriate for a given subject area, using the geographical differences and similarities between the closest published locations.

An annual erosivity factor was calculated using the following equation (Rosewell & Turner, 1992):

$$R = 164.74\ (1.1177)^{S}\ S^{\ 0.6444}$$

Where, S is the 2-year ARI, 6-hour ARI rainfall event (mm)

Design rainfall events for the project area will be based on BOM Rainfall IFD system:

4.7.7 Application

A summary of best practice erosion management techniques for various erosion risk ratings is presented in Table 2. The minimum sediment control standard based on erosion risk rating and corresponding soil loss rate is shown in Table 3.

Table 3 Erosion Risk Rating Based on Soil Loss and Required Management (adapted from Table 4.47 of IECA 2008)

Erosion Risk Rating	Soil Loss Rate (t/ha/yr)	Advance Land Clearing Allowed (wrs work)	Max days to stabilisation	Staged Construction and Stabilisation of earth Batters> 6H:1V	Stockpiles stabilised
Very Low	0 to 150	8	30 (60%)		
Low	150 to 225	8	30 (70%)		
Moderate	225 to 500	6	20 (70%)	√	
High	500 to 1500	4	10 (75%)	√	√
Extreme	>1500	2	10 (80%)	√	√

Table 4 Minimum Sediment Control Standards Based on Soil Loss

Soil Loss Rate (t/ha/year)	Sediment Control Technique	Default Sediment Control Treatment Measure
0 to 75	Type 3	Sediment fence, sediment trap
75 to 150	Type 2	Filter tube dam, rock filter dam, sediment trench, sediment weir, compost/mulch berm
> 150	Type 1	Sediment basin (sized in accordance with design standard)

These calculations enable selection of specific control techniques for Erosion and Sediment management.

4.7.8 Design standards

Design calculations and sizing for the sediment basin, emergency spillway and temporary clean and dirty water drains is provided in Appendix B.

The operation of the sediment basin is to be in accordance with the Sediment Basin Operating Procedure within Appendix C.

This document provides guidance to site personnel on the management, operation, monitoring, treatment, discharge and maintenance of sediment basins located onsite. Technical notes regarding the implementation of erosion and sediment control measures on site are provided in Appendix D.

Standard design drawings and factsheets for nominated erosion and drainage controls can be sourced from www.austieca.com.au.

The application of best practice erosion and sediment control is based upon the appropriate integration of three groups of control measures:

- Drainage control measures;
- Erosion control measures (including revegetation measures); and
- Sediment control measures.

Wherever reasonable and practical, control measures from all three groups must be integrated in a total treatment system.

4.7.9 Drainage

Drainage standards adopted are shown below in Table 5 below. Temporary drain alignment is to be incorporated into the final drainage design layout.

Table 5 Design standard drainage

Structure	Conveyance/stability	Notes
Temporary Drainage Structures	2 year ARI + 150mm freeboard	Assumes <12 month design life
Emergency Spillway Basin	20 year ARI + 300mm freeboard	Assumes <12 month design life
Diversion of clean water around the site	2 year ARI + 150mm freeboard	Assumes <12 month design life
C_{10}	0.70	Low soil permeability assumed, $^{1}I_{10}$ = 59.9mm/hr

4.7.10 Flow Diversion around soil disturbances and stockpiles

Where possible, provision for the diversion of up-slope stormwater runoff for catchments area exceeds 1500m2, including temporary stockpile locations, stringing yards, access roads and compounds shall be made.

Table 6 Recommended “Maximum” Drain or Bench Spacing on Non-Vegetated Slopes

Batter slope			Horizontal spacing(m)	Vertical spacing (m)
Percentage	(Degrees)	(H):(V)		
1%	0.57	100:1	80	0.9
2%	1.15	50:1	60	1.2
4%	2.29	25:1	40	1.6
6%	3.43	16.7:1	32	1.9
8%	4.57	12.5:1	28	2.2
10%	5.71	10:1	25	2.5
12%	6.84	8.33:1	22	2.6
15%	8.53	6.67:1	19	2.9
20%	11.3	5:1	16	3.2
25%	14	4:1	14	3.5
30%	16.7	3.33:1	12	3.5
35%	19.3	2.86:1	10	3.5
40%	21.8	2.5:1	9	3.5
50%	26.6	2:1	6	3

4.7.11 Erosion Control

The first and most important control on this site is to not disturb the topsoils until required. This is to avoid disturbance of the underlying dispersive subsoils. Once disturbed, the material needs to be promptly placed, and the upper 200mm stabilised with gypsum at the rate advised in the (pending) soils report. The default rate of gypsum application is15 t/ha.

Similarly, prompt, progressive revegetation is required.

Various applicable stabilisation measures are presented in Table 9. Such measures should be considered if the proposed permanent revegetation and stabilisation measures are delayed beyond 30 days.

4.7.12 Spacing of Lateral Drains Down Long Continuous Slopes

Long unstable slopes must be divided into manageable drainage areas to prevent the formation of rill erosion. Catch drains or flow diversion banks should be placed at regular intervals down the slope to collect and divert surface runoff to a stable outlet.

Given, the varying batter slopes to be formed across the site Table 5 (IECA 2008) is provided as a guide to the maximum drain or bench spacing down exposed slopes.

Table 7 Application of Erosion Control Measures to soil slopes (reproduced from table 4.4.13 of IECA 2008)

Flat Land (<1 in 10)	Mild Slopes (1 in 10 – 1 in 4)	Steep Slopes (steeper than 1 in 4)
Erosion Control Blankets	Bonded Fibre matrix	Bonded Fibre Matrix
Gravelling	Compost Blankets	Cellular Confinement Systems
Mulching	Erosion Control Blankets, Mats and Mesh	Compost Blankets
Revegetation	Mulching well anchored	Erosion Control Blankets, Mesh, and Mats
Rock Mulching	Revegetation	Revegetation
Soil Binder	Rock Mulching	Rock Armouring
Turf	Turf	Turf

Concentrated flow from any sediment retention devices should be turned back Into sheet flow on steep ground, or where there is a high erosion risk from output from that structure.

4.7.13 Sediment Control

The need for a sediment basin was triggered due to the need to protect the terminal receiving environment from suspended solids in most rainfall events.

4.7.14 Revegetation and Stabilisation

Revegetation or temporary stabilisation should be completed within 30 days for sites with a very low or low erosion risk. If works are likely to be suspended for an extended period, stabilisation of exposed areas will also be required within the specified timeframes.

It is understood that the majority of exposed areas on the site will be stabilised by gravelling. In accordance with IECA (2008) gravelling should be undertaken with the following design principles:

- Minimum 100% coverage of the soil surface
- Nominal aggregate size of 20 to 75mm

- Apply at a minimum thickness of 50mm, or at least twice the nominal aggregate size.

4.7.15 Dewatering

Where overflow ponds are installed the water in the overflow pond will be treated using flocculent prior to discharge. Sediment controls include:

- Flow diversion barriers will be used to minimise the quantity of watering entering excavations and trenches.
- Filter bag should be used and inspect regularly for de-watering operations for camp soil condition.
- Flocculants such as gypsum on exposed areas;
- Soil stabilisers.

All sediment control measures implemented for the control of sediment-laden discharge from de-watering activities are designed to satisfy, as a minimum, current best practice discharge standards.

Inspect the filter tubes for obvious leaks resulting from holes, tears or joint failure in the fabric. Replace any filter tube if sediment blockage of the fabric decreases the flow rate to an unacceptable level, or the filter tube contains excessive sediment.

4.7.16 Corrective action

An environmental incident with respect to the ESCP is defined as any occurrence where sediment is released from the site, whether controlled or uncontrolled, or where stormwater is released (controlled) from site which does not meet the water quality requirements.

All incidents and non-conformances are to be reported and investigated and corrected in accordance with the ESCP to ensure effective soil and water quality management practices at all times.

Best practice site management requires all ESC measures to be inspected by the construction contractor's nominated representative at least daily when rain is occurring, within 24 hours prior to expected rainfall, and within 18 hours of a rainfall event of sufficient intensity and duration to cause onsite runoff (IECA, 2008).

4.7.17 Inspections and monitoring

Erosion and sediment control devices will be inspected in accordance with the following schedules:

- Daily site inspections (during periods of runoff producing rainfall)
  - All drainage, erosion and sediment control measures
  - Occurrences of excessive sediment deposition (whether on-site or off-site)
  - All site discharge points

- Weekly site inspections (even if work is not occurring on-site)
  - All drainage, erosion and sediment control measures

- Occurrences of excessive sediment deposition (whether on-site or off-site)
- Occurrences of construction materials, litter or sediment placed, deposited, washed or blown from the site, including deposition by vehicular movements
- Litter and waste receptors
- Oil, fuel and chemical storage facilities

- Prior to anticipated runoff producing rainfall
  - All drainage, erosion and sediment control measures
  - All temporary flow diversion and drainage works

- Following runoff producing rainfall
  - Treatment and de-watering requirements of sediment basins
  - Sediment deposition within sediment basins and the need for its removal
  - All drainage, erosion and sediment control measures
  - Occurrences of excessive sediment deposition (whether on-site or off-site)
  - Occurrences of construction materials, litter or sediment placed, deposited, washed or blown from the site, including deposition by vehicular movements

4.7.18 Audits

Site inspections are to be undertaken in accordance with the Site Inspection Checklist provided on page 7.19 – 7.31 of the IECA, Best Practice Erosion and Sediment Control Guidelines (2008).

In accordance with the IECA, Best Practice Erosion and Sediment Control Guidelines (2008), audits are to be conducted at intervals of not more than one (1) calendar month commencing from the day of site disturbance until all disturbed areas have been adequately stabilised against erosion to the acceptance of the relevant regulatory authority. Such audits must be:

- Undertaken by a person suitably qualified and experienced in erosion and sediment control (i.e. CPESC);
- Conducted on the next business day following a rainfall event in which greater than 10mm of rainfall has been recorded by the Bureau of Meteorology rain gauge nearest to the site.

It is recommended audits include:

- Copies of all original completed ESC site audit checklists, non-conformance and corrective action reports;

4.8 Acid Sulphate Soil Management Plan

Acid Sulphate Soils (ASS) are soils that contain iron sulfide or sulfide oxidation products. When such soils are exposed to air and water, the iron sulfides can oxidise to produce sulphuric acid, iron precipitates and ground water with elevated concentrations of dissolved metal such as aluminium, iron and arsenic.

Occurrence of Acid Sulphate Soils are typically associated with estuarine and marine sediments (below 5 m AHD). Consequently, the risks associated with these soils is expected to be very low.

Should Acid Sulphate Soils be encountered the measures identified below will apply.

This management plan refers to Acid Sulphate Soils (ASS) and Potential Acid Sulphate Soils (PASS) depending on whether the soils are active and generating acid or have the potential to generate acid if exposed to the atmosphere respectively.

4.8.1 Objective

The objective is to ensure there are no adverse impacts to sensitive receptors as a result of the excavation and stockpiling of ASSs.

During the construction phase, water will not be released from the Project area unless its pH is within the acceptable range (pH 6 – 8). The generation of Acidic material in-situ is to be prevented from being released to receiving waters. A range of options (such as bund walls) to prevent spills and cause potential environmental hazards prior to the commencement of excavation activities.

All ASS areas require neutralisation treatment with dosage rates of lime as determined from published guidelines.

4.8.2 Impact of Acid Sulphate Soil

Disturbing PASS can have a destructive effect on plant and fish life, and on coastal ecosystems.

Flushing of acidic leachate to groundwater and surface waters can cause a number of impacts, including:

- Ecological damage to aquatic and riparian ecosystems through fish kills, increased fish disease outbreaks, dominance of acid-tolerant species, precipitation of iron, etc;
- Effects on estuarine fisheries and aquaculture Projects (increased disease, loss of spawning contamination of groundwater with arsenic, aluminium and other heavy metals;
- Reduction in agricultural productivity through metal contamination of soils predominantly by aluminium);
- Damage to infrastructure through the corrosion of concrete and steel pipes, bridges and other subsurface assets. area etc);

4.8.3 Testing of Acid Sulphate Soil (ASS)

Excavated ASS (Soil Acidity and Resistivity) shall be tested by a SQEP (to operate the equipment and interpret the results) and NATA approved laboratory. In addition, recorded at pre-agreed intervals and reported, to confirm the appropriate liming rate.

Validation testing of the treated material will be completed on a representative sample(s). Lime will be blended thoroughly into the material to neutralize any potential acid production.

Proposed liming rates will be developed following testing of the material to be treated. If testing indicates inadequate treatment, additional lime will be mixed with the soil material and further validation testing carried out until satisfactory results are achieved.

4.8.4 Treatment of Acid Sulphate Soil (ASS)

If ASS is identified, site specific mitigation measures will be developed such as:

- Minimising the time the spoil is stockpiled within a bunded area of treated layers(approx. 300mm thick);
- Neutralising spoil with lime;
- Containing runoff from stockpile areas in holding ponds or bunded areas;
- Disposing of trench water only after analysis;
- Burying of soil below the water table.

If ASS is found to occur, lime treatment to neutralise the acidity levels will be required,

If PASS is found to occur, depending on the depth, thickness, acid generation potential and the likely period of exposure, lime treatment of the PASS material may also be necessary.

4.8.5 ASS Treatment Areas

ASS treatment areas will be established prior to construction in areas of ASS and will:

- Be lined with an impervious layer (e.g. geo-membrane line, concrete slab or compacted clay);
- Be bunded with suitable material to prevent run-off or leachate from exiting the treatment area. Bund will comprise non-ASS materials and will be approximately 0.5 – 1m high;
- Have diversion banks installed to prevent overland flow entering the treatment area; Have a layer of agricultural lime (aglime) laid over the liner/ treatment area (5kg per square meter) before addition of the ASS excavated material.
- Sections of the RoW exposed to receiving water will be visually inspected at the time of water ingress to assess the effectiveness of protection measures with particular attention to management of soil and spoil stockpiles, erosion control devices and the effectiveness of control measures following rainfall.

4.8.6 Record Keeping During Construction

- Keep records of all areas where ASS management occurs. Records to be kept include: date, period for which trench is open, location (KP), datum, neutralising agent requirements, actual volumes of neutralising agent used, volume of soil treated, soil type, photographic evidence, field testing result and visual inspection result.

4.9 Cultural Heritage Management Plan

Initial consultation with native title parties occurred during the development of the Environmental Impact Assessment. Further work to update and renegotiate with native title parties is required prior to construction commencing.

4.9.1 ILUA and Native title

4.9.2 Oral History study

4.9.3 Cultural Heritage

4.10 Waste Management Plan

Any scheduled wastes produced by the construction of the pipeline will be handled in accordance with NSW legislation. The waste handling procedures will be cognisant of the nature of waste generation, anticipated quantities, the means of disposal and the environmental controls that will be applied to prevent significant environmental impacts.

This section provides a summary of the waste management arrangements documented in the WMP:

- Waste segregation will be practiced at each residential camp;
- Waste logs will be maintained for disposal of each category of waste;
- Reuse, recycle and recovery.

Special care will be taken to ensure that waste collection and disposal does not create any hazard/nuisance to the local residents or communities.

Careful planning will be employed when ordering materials with preference given to materials that will result in no, or low, levels of waste (from both the material and the packaging).

4.10.1 Waste Disposal

Prior to start of camp facilities, permits will be obtained for the transportation, storage and disposal of Hazardous and Non-hazardous wastes from the regulator and local authorities.

Sewage and liquid waste generated by the camps will be collected in tanks and will be disposed of at approved Municipal dumping area by road tankers, or treated and disposed of through evapo/transpiration/surface irrigation.

Regulated waste will be removed from site, as soon as practicable; in addition, any authorised waste removal or disposal will be reported to the administering authority as soon as it becomes known.

A record of regulated waste removed will be kept including the following:

- Date of waste transport;
- Quantity of waste removed and transported;
- Type of waste removed and transported;
- Route selected for transport of waste;
- Quantity of waste delivered; and
- Any incidents (e.g. spillage) that may have occurred on route.

4.10.2 Sewage

The release of contaminants from the sewage treatment plant (STP) to land must comply, at the sampling and in situ monitoring points with each limit specified for each quality characteristic.

The effluent released must not have any properties nor contain any organisms or contaminants in concentrations which are capable of causing environmental harm or an environmental nuisance.

The amount of treated sewage effluent irrigated must be matched to the water requirements of the vegetation irrigated, without exceeding a reasonable estimation of the field capacity of the soil, in the root zone and in the irrigation area.

Treated effluent will not be released to other parties for irrigation.

Signage must be placed around the land irrigation area and irrigation equipment warning the public that the area and equipment has been set aside for irrigation by treated effluent, which is not used for drinking purposes.

The signs must be maintained in a visible and legible condition.

Any treated effluent irrigation area must not be used to:

- Recreational activities or as a traffic through-fare during irrigation; and
- Any activity which may involve members of the public or employees without appropriate personal protective equipment coming in contact with treated wastewater during irrigation periods and for at least four (4) hours after irrigation has ceased or until irrigated vegetation has dried.

The construction contractor will prepare a Wastewater Irrigation Management Plan (WIMP). This plan shall address at least, but not limited to the following matters:

- The measurement of the quantity and quality of treated effluent produced by the activity;

- An assessment of the suitability of the area of land available for waste water irrigation;
- The definition and clear identification of areas to be used for wastewater irrigation;
- Carrying out daily time step modelling to estimate at least wastewater irrigation application rates, the wastewater irrigation area required and the volume of wet weather storage required, taking into account at local tropical climatic conditions, soils in the wastewater irrigation areas and the vegetation grown in the wastewater irrigation area;
- An assessment of surface waters, including storm water, that may be affected;
- An assessment of the characteristics of the soils in the wastewater irrigation areas including assessment of nutrient and salt levels of the soils in the disposal areas and how soils will be managed;
- An assessment of the potential impacts of odour resulting from wastewater irrigation; and
- Management of human and fauna health issues associated with the irrigation of wastewater.

4.11 Compliance and Audit Plan

An appropriate monitoring program must be developed that will demonstrate compliance with legal requirements including additional requirements as listed.

Procedures and protocols establish routine monitoring activities and specific parameters of control of use of resources and environmental impacts.

All instruments, equipment and measuring devices used for measuring or monitoring will be calibrated, appropriately operated and maintained.

All analyses and tests required to be conducted will be carried out by a laboratory that has NATA certification for such analyses and tests, except as otherwise authorised.

Determinations of the quality of contaminants released will be made in accordance with reference laboratory methods and carried out on samples that are representative of the discharge.

However, the environmental audit program is a tool to measure the effectiveness of recommended mitigation measures and the implementation of set procedures and protocols.

Achievement of objectives and targets and key performance indicators will be assessed for adjustment of the systems where needed.

Monitoring results will be used to control the measures to alleviate any possible impact on the surrounding environment.

Suitably qualified, experienced and competent person(s) will conduct the monitoring activity.

The Project Environmental Site Officer will conduct a regular reconnaissance (Pre-construction) sufficiently in advance of construction activities to ensure that all ESAs

are identified, recorded and brought to the attention of the Project Environmental Manager so that appropriate mitigation measures can be adopted.

The Project Environmental Manager will ensure that all approved Environmental Procedures detailed in this document are being followed by all personnel involved in the pipeline construction Project, including those allotted specific tasks.

Project Environmental Manager will promote environmental awareness amongst the workforce by means of regular presentations to supervisory staff and others.

They will also organize “Tool Box” meetings to assist Supervisors in maintaining environmental awareness in their individual teams.

The Project Environmental Manager will act as environmental focal point for the construction Work and ensure that the Emergency Response Plan and associated Emergency Procedures are immediately implemented in the event of any environmental incident.

An annual monitoring report will be prepared and will include but not be limited to:

- A summary of the previous twelve (12) months monitoring results and to relevant prior results;
- An evaluation/ explanation of the data from any monitoring programs;
- A summary of any record of quantities of releases required to be kept;
- A summary of record of equipment failures or events recorded for any site; and
- An outline of actions taken or proposed to minimize the environmental risk from any deficiency identified by the monitoring or recording programs.

Monitoring results will be recorded, compiled and kept for minimum of five years and made available for inspection upon request.

The Project Environmental Manager will establish an environmental monitoring and audit program applicable to all phases of the construction works.

The purpose of the audit Program will be to ensure that Contractor’s environmental policies, objectives and targets are being complied with, and that all the environmental mitigation measures described in the CEMP are fully and properly implemented.

The environmental audit Program will be developed based on AS/NZS ISO 14001 guidelines.

It will be based on the criteria for acceptable environmental performance defined in this document including those criteria relating to the following:

- Project Environmental Policy;
- Environmental objectives;
- Key Environmental Performance Indicators (KEPIs);
- Minimizing impacts associated with traffic movements;
- Water resource conservation;
- Protection of archaeological and cultural heritage finds;

- Waste management;
- Ecological conservation;
- Community relations;
- Protection of soils;
- Weed control
- Minimising nuisance from noise and dust.

The audit report will identify the segment of the Project being audited, the conditions that were activated during the period, and a compliance/non-compliance table.

A description of the evidence to support the compliance table will be provided. The audit report shall also contain recommendations on any non-compliance or other matter to improve compliance.

The third-party auditor will certify the findings of the audit report.

The Environmental Manager will issue an audit report and raise this with the project management team. This team will identify:

- Actions taken to ensure compliance with the imposed conditions; and
- Actions taken to routinely prevent a recurrence of any non-compliance issues.

4.11.1 Environmental Inspections

The Project Environmental Coordinator will conduct (daily) inspections along the active sections of Working Strip to monitor environmental performance of all work activities and a (weekly) inspection at Camps for the same purpose.

These inspection reports will be recorded on a specified format; these reports will be audited.

The Project Environmental Manager will carry out regular inspections on working strip and report all non- compliance's and follow up actions; these will be recorded in a specified log.

4.11.2 Environmental Records

The following Environmental Records will be maintained during the course of the Project:

- Environmental KPIs;
- Environmental permits and licenses;
- Environmental awareness training (inductions and others, including HSE meetings, etc.);
- Environmental line list;
- Environmental site record form;
- Job environmental analysis;
- Audit reports including CARs (Corrective Action Requests);

- Compliance checklist;
- Complaints register;
- Incident register, including fires and spill reports;
- Environmental monitoring records:
- Dewatering and groundwater abstraction and monitoring records;
- ASS records;
- Quantitative records of discharges to the environment that are accurate and can be Monitored and audited;
- Details on fauna capture and release and opportunity sightings (daily records, weekly or monthly reports);
- Waste register;
- Environmental awareness bulletins/alerts;
- Consultation records and meeting notes;
- Hygiene registers.

5. CONCLUSIONS

Planning for the construction of the QHGP is well advanced. Areas for increased activity include land holder consultation, development of transport management plans and negotiation and consultation with relevant native title owners.

In other respects, QHGP is in an advanced state of preparedness to commence and undertake construction.