Environmental Impact Statement (EIS) Report under the Environmental Protection Act 1994

The Range Project

Proposed by Stanmore Coal Limited

Prepared by: Statewide Environmental Assessments, Department of Environment and Heritage Protection

April 2013

Contents

List of acronyms and abbreviations

AADT	Annual average daily traffic
ACH Act	*Aboriginal and Cultural Heritage Act 2003*
ARI	Average reoccurrence interval
BSC	Banana Shire Council
CHPP	Coal Handling and Preparation Plant
CHMP	Cultural Heritage Management Plan
CRG	Community Reference Group
DATSIMA	Department of Aboriginal and Torres Strait Islander and Multicultural Affairs
DAFF	Department of Agriculture, Fisheries and Forestry
DCS	Department of Community Safety
DHPW	Department of Housing and Public Works
DLG	Department of Local Government
DNRM	Department of Natural Resources and Mines
DO	Dissolved oxygen
DSITIA	Department of Science, Information Technology, Innovation and the Arts
DSDIP	Department of State Development, Infrastructure & Planning
DTMR	Department of Transport and Main Roads
EA	Environmental authority
EHP	Department of Environment and Heritage Protection
EIS	Environmental Impact Statement
EM Plan	Environmental Management Plan
EP Act	*Environmental Protection Act 1994*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPBCAEOP	EPBC Act Environmental Offsets Policy
EP Regulation	Environmental Protection Regulation 2008
ESA	Environmentally sensitive area
EVNT	Endangered, Vulnerable or Near Threatened
FBA	Fitzroy Basin Association
GQAL	Good quality agricultural land
HEV	High ecological value
IAS	Initial advice statement
IIESC	Interim Independent Expert Scientific Committee
Land Act	*Land Act 1994*
MIA	Mine infrastructure area
MLA	Mining lease application
ML	Mining lease
MR Act	*Mineral Resources Act 1989*
NC Act	*Nature Conservation Act 1992*
NT Act	*Native Title Act 1993*
TOR	Terms of reference

TSS	Total suspended solids
OCG	Office of the Coordinator General
PVMO	Policy for Vegetation Management Offsets
QBOP	Queensland Biodiversity Offsets Policy
QGEOP	Queensland Government Environmental Offsets Policy
QH	Queensland Health
QMDC	Queensland Murray-Darling Committee
QPS	Queensland Police Service
QTT	Queensland Treasury and Trade
RE	Regional Ecosystems
ROM	Run-of-mine (coal)
SBR	Surat Basin Rail
SCL	Strategic Cropping Land
SEWPaC	Commonwealth Department of Sustainability, Environment, Water, Population and Communities
SP Act	*Sustainable Planning Act 2009*
TEC	Threatened Ecological Community
TSF	Tailings storage facility
VM Act	*Vegetation Management Act 1999*
WDRC	Western Downs Regional Council
WICET	Wiggins Island Coal Export Terminal

1 Introduction

This report provides an evaluation of the environmental impact statement (EIS) process pursuant to Chapter 3 of the *Environmental Protection Act 1994* (EP Act) for The Range Project proposed by Stanmore Coal Limited (Stanmore), 100% owner of Comet Coal and Coke Pty Ltd. An application under section 154 of the EP Act for an environmental authority (EA) was granted by the former Department of Environment and Resource Management (DERM) and a draft terms of reference (TOR) was advertised in May 2011. Following a period of public consultation, the TOR were finalised in November 2011.

On 4 April 2011 the project was declared a controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), including that it be assessed through the EP Act EIS process under the agreement between the Commonwealth of Australia and the State of Queensland (the bilateral agreement) relating to environmental impact assessment. The controlling provisions are sections 18 and 18A (listed threatened species and communities) and 20 and 20A (listed migratory species). This report contains an assessment of the significance of impacts of the action on the controlling provisions. A copy of this report will be given to the Commonwealth Environment Minister, who will decide whether to approve or refuse the controlled action under Part 9 of the EPBC Act.

The Department of Environment and Heritage Protection (EHP), as the administering authority of the EP Act, coordinated the EIS process. This assessment report has been prepared pursuant to sections 58 and 59 of the EP Act. Section 58 of the EP Act lists the criteria that the EHP must consider when preparing an EIS assessment report and section 59 states that the content of the report must:

a. assess the adequacy of the EIS in addressing the final TOR

b. assess the adequacy of the draft environmental management plan (EM plan)

c. make recommendations about the suitability of the project

d. recommend any conditions on which any approval required for the project may be given

e. contain another matter prescribed under a regulation.

The purpose of this report is to:

- to complete the EIS process under section 60 of the EP Act
- provide information for assessment of the project under the bilateral agreement for the purposes of the EPBC Act.

This report summarises the key issues associated with the potentially adverse and beneficial environmental, economic and social impacts of the project. It discusses the management, monitoring, planning and other measures proposed to minimise any adverse environmental impacts of the project. It notes those issues of particular concern that either require additional information to progress assessment or require specific conditions in order for the project to proceed.

Section 2 of this report presents details of the project to provide context for the findings of the report. Section 3 outlines the EIS process that has been followed for the project and the approvals that would be necessary for its commencement. Section 4 addresses the adequacy of the EIS, discusses the main issues for the environmental management of the project, and outlines the environmental protection commitments made in the EIS. Section 5 assesses the adequacy of the EM plan for the project in incorporating the environmental protection commitments and meeting the content requirements of section 203 of the EP Act. Section 6 discusses the suitability of the project and section 7 makes recommendations for conditions to be included in the draft EA.

The EIS process under the EP Act is completed for The Range Project when this assessment report is provided to Stanmore.

2 Project details

The proponent for the project is Stanmore Coal Limited (Stanmore), 100% owner of Comet Coal and Coke Pty Ltd, a publicly listed, coal exploration company with tenure interests in the Surat and Bowen Basins. The project is located in the Surat Basin (within the Western Downs Regional Council (WDRC) area), approximately 25km south east of the Wandoan and 20km east of Guluguba, in south-central Queensland (Figure 1). It lies on the eastern side of the Leichardt Highway between Taroom and Miles. The project is located on relatively flat land along the Great Dividing Range on the boundary of the Fitzroy River and Condamine-Balonne catchments.

The project would involve the development of a green-field open-cut coal mine, producing up to seven million tonnes per year (Mt/y) of product thermal coal for export. Stanmore expects to commence construction and mine development in 2014, with mining operations planned to commence in 2016 and continuing for approximately 26 years, followed by a period of decommissioning and rehabilitation.

Elements of the project would include:

1. A coal mine within MLA 55001 with an average production of approximately 6–6.7Mt/y of ROM coal to produce on average 5Mt/y of product coal and potentially up to 7 Mt/y product coal during times when markets conditions and coal extraction rates were favourable. Elements (outlined in Figure 2) would include:
    - Mining of three open pits (two initially and the third being utilised in the final years) using conventional open-cut mining techniques to target coal seams located between 20m to 120m below the natural ground surface. The pits would cover a maximum extent of approximately 2,200ha (inclusive of in-pit areas used for disposal of waste rock) and have a maximum depth of approximately 120m below the natural ground surface. The pit would be mined 24 hours a day, seven days a week with exceptions where air, noise and vibration impacts from mining operations on nearby receptors would not be adequately mitigated during night time activities.
    - Clearing of approximately 183.85ha of remnant vegetation on MLA 55001 (and an additional 3.37ha for a transport corridor and train loading facility).
    - Stripping of approximately 8 million cubic metres (Mm^3) of topsoil over the life of the project. In the first 3 to 5 years of mine operation approximately 3Mm^3 of topsoil would be stockpiled adjacent to the out-of-pit waste rock dumps or to west of the advancing open pit and cover an area of approximately 150ha and be approximately 2m high. From years 3 and 5, it is expected that there would be no need for long term stockpiling of topsoil as it would be used for ongoing progressive rehabilitation once out-of-pit waste rock dumps have attained their final landform.
    - Drilling and blasting of the overburden and removal of overburden by truck and excavator in box-cuts, creating new mining strips and filling in previously mined voids. Waste from the boxcut would be trucked to out-of-pit waste dumps initially and in succeeding strips, placed in-pit.
    - The excavation of run-of-mine coal (ROM) by truck and excavator.
    - Transport of uncrushed ROM coal from the open cut mine areas by haul trucks to designated ROM stockpiles. The ROM pad would cover a maximum area of 10ha and be elevated to prevent ingress of clean stormwater. Dirty stormwater from the ROM pad would be directed to a mine water dam. The ROM stockpiles would not exceed 10m in height.
    - Progressive rehabilitation of disturbed areas, particularly the out-of-pit and in-pit waste rock dumps. Waste rock would be used to back-fill the open pit.
    - Final landform re-profiling, topsoiling and revegetation activities.
    - Three voids would remain at the end of operations covering an area of some 73ha.
2. A coal handling and preparation plant (CHPP) for washing and processing ROM coal, located in the northeast on MLA 55001. Features would include:
    - Operating 24 hours a day, seven days a week and up to 7,200 hours a year.
    - An average of 42% (i.e. 2.7Mt/y) of ROM coal would bypass the CHPP. The remaining 3.8Mt/y of ROM coal would be crushed and processed in the CHPP. Product coal would be stockpiled adjacent to the CHPP.
    - The product stockpile would be approximately 20ha in area, have a maximum capacity of approximately 75,000 tonnes and a maximum height of approximately 15m. The stockpile would incorporate dust suppression measures and be bunded to prevent ingress of clean stormwater, with dirty stormwater from the product stockpile to be directed to a mine water dam.

- Product coal would be drawn from the stockpile to the reclaim conveyor and transported to a train loading facility connected to the Surat Basin Rail (SBR) approximately 10km north of Wandoan.

3. A mine infrastructure area (MIA) would be located in the north east of the MLA 55001 (immediately east of the CHPP), covering an area of approximately 77ha. The MIA would be bunded to direct clean water around the area and potentially contaminated water to a mine water dam (mine water dam 1). Areas storing fuels or oils and washdown areas would be bunded and runoff from these areas directed to a sump to separate oils and water prior to releasing water to the mine water dam. The MIA would include:
    - general earthworks including hardstands and laydowns
    - an administration facility
    - workshop and stores, including tyre change and storage facility
    - heavy vehicle and light vehicle fuel facilities
    - lube and oil storage facility
    - heavy vehicle and light vehicle wash down facilities
    - generator (if required)
    - potable water storage tanks
    - reticulated services.
4. An explosives magazine, located in an isolated area of MLA 55001, to house detonating explosives, bulk storage and all associated materials which would be designed and constructed to Australian Standard (AS) 2187 Explosives—Storage, Transport and Use, and any other applicable standards and industry best practice.
5. A transport corridor approximately 26km in length and a maximum of 200m wide, located within the MLA 55009 and MLA 55010 areas comprising:
    - An overland conveyor that would transfer coal from the product coal stockpile to the CHPP at a rate of up to 1,200 tonnes per hour, to the train loading facility.
    - Other linear infrastructure, including electricity transmission lines, water supply pipeline and communications lines.
6. A train loading facility comprising a small infrastructure area, train loading bin, coal conveyors and a rail loop connecting to the SBR. Approval for the rail loop and train loading facility would be sought as a Development Approval under the *Sustainable Planning Act 2009* (SP Act). The facility would comprise:
    - A *small infrastructure area*, which would contain workshop, shed for chemical storage (minor storage of lubricants, surfactants and waste oil), diesel storage tank (approximately 60,000L capacity), raw water tank (approximately 20,000L capacity), potable water tank and combined office/lunch room.
    - A *rail spur and loop* with the following design features: a maximum design speed of 25km/h for arrival, departure and holding roads; a maximum design speed of 80km/h for diverging route with the SBR rail line; accommodation of trains of up to approximately 2,250m length and each train having a carrying capacity of approximately 11,500 tonnes; an overhead bin with a loading rate of up to 5,000 tonnes per hour and operating 320 days per year; 1.25 trains a day to meet the 5Mt/y average annual export target; one train on the rail spur at any one time.
    - A *product coal stockpile area* covering approximately 20ha with a maximum height of approximately 25m and a maximum capacity of approximately 100,000 tonnes. The stockpiling method would be by linear stacker or radial stacker. The stockpile would be bunded to prevent ingress of clean stormwater, with dirty stormwater from the stockpile directed to an environmental dam.
    - A *reclaim conveyor system* that would feed coal from the product coal stockpile to a train loading bin positioned above the rail line. The train loading bin structure would be approximately 30m high.
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7. Transport of product coal along the proposed, multi user SBR (approximately 196km) to Banana and then along existing Queensland Rail networks to Wiggins Island Coal Export Terminal (WICET), in Gladstone, for export.
8. Management of waste rejects and tailings:
    - Coarse rejects would be trucked back into in-pit overburden dumps.
    - Fine rejects would be stored in three turkey's nest style out-of-pit tailings storage facilities (TSFs) which

would be designed for storage of approximately 28,450ML of tailings (solids + water) at the end of mine life. One of the TSF's would be designed to be covered by waste rock in later years. Tailings volumes are estimated to be 620ML in year 2 of operations, 3,460ML in year 5 and increase to 12,440ML in year 13.

9. A water management system designed to separate: mine water; clean water; and water draining areas where the waste rock dumps have been fully rehabilitated. It would include:
    - Four mine water dams (staged over the life of the mine) for storing mine affected water (i.e. groundwater inflows and runoff water from disturbance areas including un-rehabilitated waste rock dumps, the open pit and mine infrastructure areas). The mine water dams would be constructed as 4-sided turkey's nest style dams. The preliminary hazard assessment for the mine water dams classified the dams as "high" hazard. These dams would be progressively constructed during operations to meet storage requirements.
    - A network of drains and bunds to divert clean water around disturbance areas.
    - A sediment control system, including sediment dams, to treat water which would be diverted from rehabilitated waste rock dump areas prior to being released to the environment.
    - A raw water dam for storing imported water.
10. Access to the site for both heavy and light vehicles would be from Leichhardt Highway, via Downfall Creek Road and Old Chinchilla Road. Modification to existing road infrastructure would include:
    - Upgrades to the intersection of Downfall Creek Road with the Leichhardt Highway by either Stanmore for The Range Project or the proponents for other resource extraction projects in the region.
    - Upgrade to Downfall Creek Road including upgrades of local road intersections, sealing and widening roads.
    - Realignment of one public road (Knights Road) and the provision of alternative access routes for public roads severed by the mine site.
    - On-site vehicle access roads.
11. Power supply infrastructure (66kV transmission lines) from Wandoan to the transport corridor via Roche Creek Road reserve and connection of the project to existing electricity transmission grid infrastructure near Wandoan or Guluguba. The expected power demand for the project is 11 megawatts (MW) but infrastructure would be designed for the supply of up to 15MW.
12. The supply of the projects water requirements from SunWater's proposed Wolleebee Creek to Glebe Weir pipeline. Maximum water requirements for the project are estimated to be approximately 2,868 million litres per annum (ML/a) in year 25.

The project would cover an area of approximately 6110ha—MLA 55001 would cover an area of 5226ha, MLA 55009 and MLA 55010 would cover a combined area of 574ha and the area of the development approval application area for the train loading facilities would cover 392ha, of which 82ha would overlap with MLA 55010. In addition, the proponent intends to apply for two additional mining lease application areas immediately adjacent to MLA 55001 to secure tenure for the proposed conveyor.

Direct surface disturbance of mining is 3419ha. Surface area of mining operations would comprise:

- final void—73ha
- out-of-pit waste rock dumps—478 ha
- in-pit waste rock—1,934ha
- out-of-pit TSFs—385ha
- mine water dams—248ha
- other dams (sediment, mine catchment)—6ha
- MIA, CHPP, raw water dam, access roads, haul roads—77 ha
- infrastructure in the train loading facilities area—80ha
- infrastructure in the transport corridor—75ha
- transport corridor on mine site area—31ha
- power corridor along Roche Creek Road—31ha.

At the end of mining a total of 2,167ha is expected to have completed rehabilitation and a total of 245ha of waste rock would remain un-rehabilitated. After rehabilitation and decommissioning was complete, 3 final voids covering an area of 73ha would remain.

The total workforce required during construction would be 300 persons, rising to approximately 400 employees during operations and increasing to an estimated 500 employees during peak production. Employees would be accommodated at a central accommodation village at or near Wandoan or Miles for the drive-in drive-out members of the workforce. The village would be owned and operated by an external party and is not included in the scope of The Range Project.

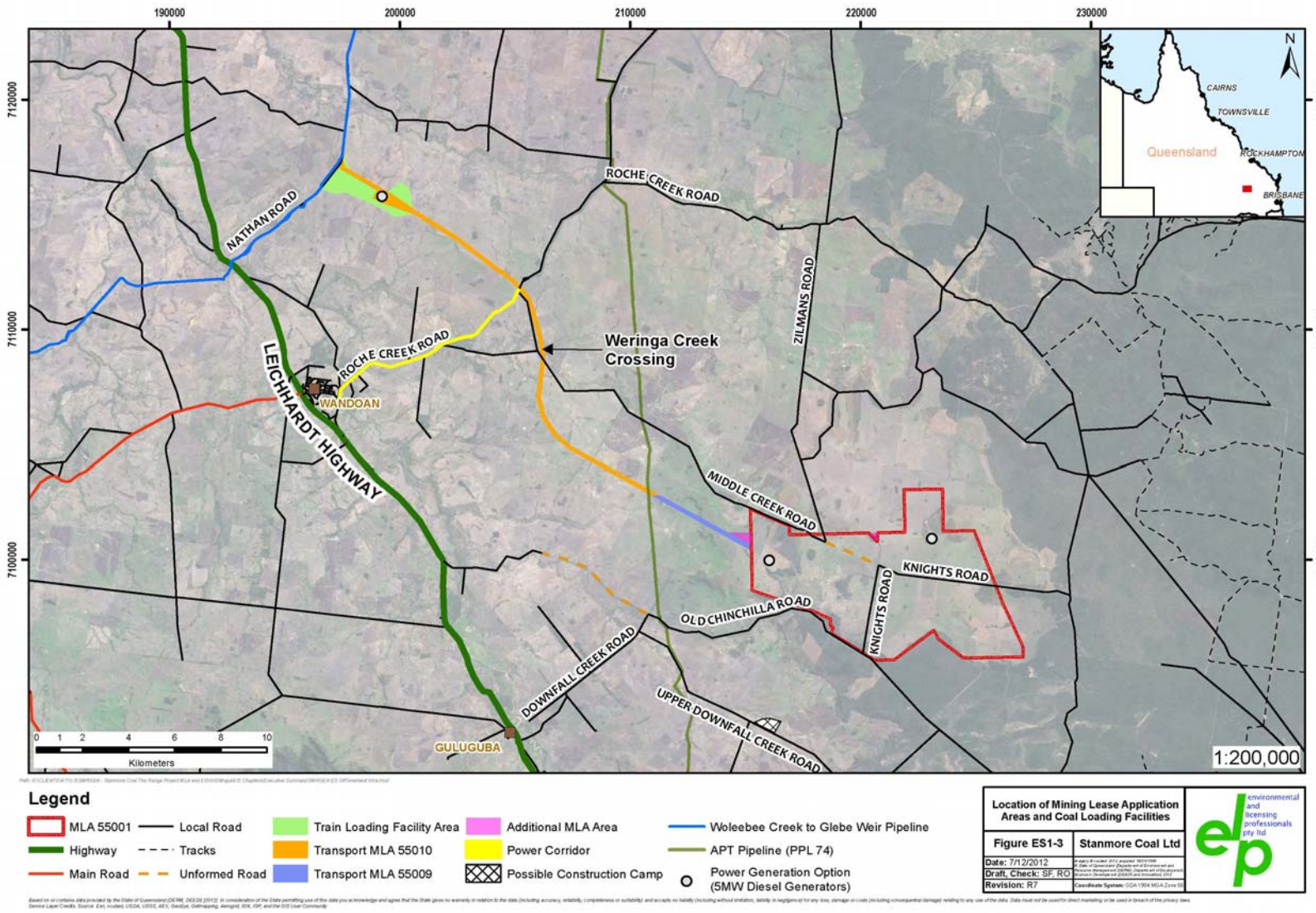

Figure 1 Location of the MLA areas and train loading facilities (source: The Range EIS).

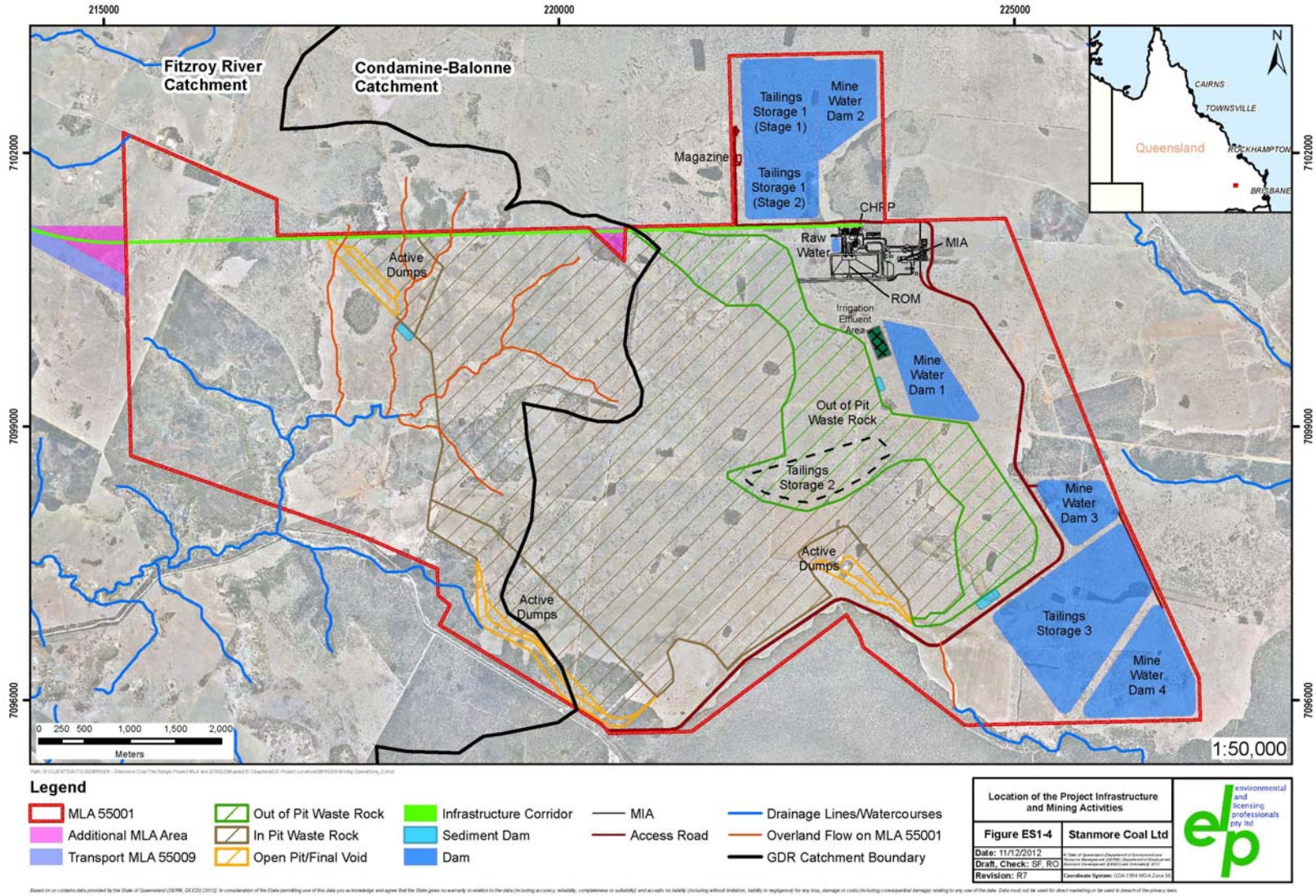

Figure 2 Location of the project infrastructure and mining activities (source: The Range EIS).

3 The EIS process

3.1 Timeline of the EIS process

On 23 November 2010, an application was made by the proponent, Stanmore, under section 154 of the EP Act for an EA. Under section 162 of the EP Act it was determined on 7 December 2010 that assessment of The Range Project would be by EIS.

On 4 April 2011, the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) determined the proposed project to be a controlled action under the Commonwealth EPBC Act. The controlling provisions were sections 18 and 18A (listed threatened species and communities) and 20 and 20A (listed migratory species). The EP Act's EIS process has been accredited under "An Agreement between the Commonwealth and the State of Queensland under section 45 of the EPBC Act Relating to Environmental Assessment" (the Bilateral Agreement) for the purpose of the Commonwealth's assessment of the project under Part 8 of the EPBC Act.

Stanmore submitted draft TOR for the EIS on 8 April 2011. The former Department of Environment and Resource Management (DERM), now Department of Environment and Heritage Protection (EHP), issued a notice of publication of the draft TOR to Stanmore on 4 May 2011. EHP then placed a public notice (the TOR notice) announcing the start of the comment period for the draft TOR on its website on 6 May 2011, in the *Courier-Mail* on 7 May 2011 and in the *Chinchilla News* on 12 May 2011. The comment period for the draft TOR ran from 9 May 2011 till close of business on 20 June 2011. Stanmore issued copies of the TOR notice to affected and interested persons.

EHP received comments on the draft TOR from 16 stakeholders within the comment period. Five comments were also received subsequent to the public submission period, which the chief executive accepted. These comments, together with those provided by EHP, were forwarded to Stanmore on 4 July 2011. On 29 August 2011 Stanmore requested an extension of 20 business days to finalise the TOR. EHP agreed to extend the period to finalise TOR under section 12(b) of the Environmental Protection Regulation 2008 (EP Regulation) and set the new date to finalise the TOR to Friday 23 September 2011. The purpose of the extension was to allow the proponent to nominate preferred locations for the transport corridor required for the project as the route proposed in the initial advice statement (IAS) was no longer feasible. As part of the extension EHP requested further information on the proposed routes and of any persons that would be considered to be interested or affected persons associated with the revised routes. On 22 September 2011 Stanmore requested another extension of 30 business days. On 26 September 2011 EHP extended the period to finalise the TOR under section 12(b) of the EP Regulation for another 30 business days.

The proponent published a notice in the *Courier-Mail* on 1 October 2011 and the *Chinchilla News* on 6 October 2011, to inform the public of the proposed new transport corridors. To ensure that the requirements of section 43(3) of the EP Act were met, the proponent was required to notify and provide an opportunity for comment on the revised draft TOR to new interested and affected persons before the TOR were finalised. The proponent sent out letters to the new affected and interested parties with a comment period of two weeks. The updated IAS was published on EHP's website on Monday 3 October 2011. EHP received comments on the amended transport corridor route from eight stakeholders and forwarded these to the proponent on 14 October 2011. Stanmore provided a response to EHP on all comments received on the draft TOR. EHP considered all comments, including the new comments on the amended transport corridor route together with Stanmore's response and issued the final TOR on 4 November 2011.

On 8 February 2012, an application for a single EA was made by the proponent for the mining project, incorporating the new transport corridor MLAs (55009 and 55010) and the existing MLA 55001. This allowed EHP to assess The Range EIS as a single project. This new EA application did not trigger requirements for a new EIS as the activities which are the subject of the new EA application (inclusion of transport corridor MLAs) were already included in the final TOR of 4 November 2001 for the project.

Stanmore submitted the EIS on 24 April 2012. EHP considered whether the EIS addressed the final TOR in an acceptable form. On 24 May 2012, EHP agreed for a request by Stanmore to extend the decision period on the EIS to 8 June 2012 to allow for changes to be made to the submitted EIS, including specific requirements requested by SEWPaC. On 25 May 2012, Stanmore submitted the amended EIS to EHP. On 1 June 2012, EHP decided to allow the EIS to proceed under s49(5) of the EP Act.

The public notification and submission period was set at the minimum 30 business days, starting on 18 June 2012 until close of business on 27 July 2012. EHP announced the start of the submission period for the EIS on its website on 14 June 2012. Stanmore advertised the EIS notice in the *Chinchilla News* on 14 June 2012 and the *Courier-Mail* and *The Australian* on 16 June 2012. Stanmore provided copies of the public notice to all affected

and interested persons.

Thirty-two submission were received on the EIS during the submission period—17 from state government departments; 3 from regional councils; 3 from non government organisations; 2 from energy providers; and 7 from the public and/or residents. Three submissions were received after the close of the submission period. These submissions were from a Commonwealth agency, state government agency and an energy provider. All 35 submissions were accepted in accordance with section 55 of the EP Act.

These submissions, together with a submission from EHP, were forwarded to Stanmore on 3 August 2012 allowing the proponent to respond to the submissions within 20 business days. On 27 August 2012, Stanmore applied for an extension of three months to allow sufficient time to consider all the submissions received and provide detailed advice in relation to each issue. On 28 August 2012, EHP extended the period to the 30 November 2012 under s56(3)(b) of the EP Act. On 27 November 2012, the proponent sought an extension of 1 month. On 28 November 2012, EHP extended the period to the 2 January 2013 under s56(3)(b) of the EP Act.

The proponent provided the department with a supplementary report to the EIS (including responses to submissions) on 20 December 2012. Copies of the response to submissions were then distributed to all government submitters, including EHP, where outstanding issues needed to be addressed by the proponent. Following the review of the supplementary EIS, EHP received 17 submissions (including one from EHP itself) with outstanding issues from the following advice agencies:

- Commonwealth Department of Sustainability, Environment, Water, Population and Communities
- Department of National Parks, Recreation, Sport and Racing
- Department of Aboriginal and Torres Strait Islander and Multicultural Affairs
- Department of Transport and Main Roads
- Department of Natural Resources and Mines
- Office of the Coordinator General
- Department of Community Safety
- Department of Science, Information Technology, Innovation and the Arts
- Queensland Police Service
- Department of Environment and Heritage Protection
- Banana Shire Council
- Western Downs Regional Council.

On 4 February 2013, under section 56A of the EP Act, EHP decided that the submitted EIS could proceed to the assessment report stage. A notice of decision was provided to the proponent on 18 February 2013.

In the preparation of this report consideration has been given to submissions and comments received from members of the advisory body (see section 3.3.2 for advisory body constituents) and other interested parties throughout the EIS process. This EIS assessment report will be made available to the public on EHP's website at www.ehp.qld.gov.au.

3.2 Approvals

Approvals for this project fall under two broad categories:

- On lease—activities that are contained within the mining tenure and are approved under the provisions of the *Minerals Resources Act 1989*.
- Off lease—activities that are not on the mining tenure and are approved under a combination of other legislation, including the SP Act.

The project would require a mining lease under part 7 of Queensland's MR Act for land covered by mining leases mining infrastructure areas 55001, 55009 and 55010. Stanmore would need to apply for additional mining lease areas (adjoining MLA 55001 and MLA 55009) to accommodate refinements to the conveyor alignment detailed in the supplementary EIS.

The project would require an EA under Chapter 5 of the EP Act. The EA would need to cover the following activities that are directly associated with, or facilitate or support, the mining activities, and which would (were they not conducted on a mining tenement) otherwise require approval under the EP Act as environmentally relevant activities (ERA):

- ERA 8 Chemical storage – storing a total of 50 t or more than of chemicals of dangerous goods class 1
- ERA 8 Chemical storage – storing more than 500 m3 of a class 1 combustible liquid or storing 10 to 500 m3 of class 2 combustible liquid
- ERA 33 Crushing, milling, grinding or screening – more than 5,000t of coke in a year
- ERA 56 Regulated waste storage – consisting of operating a facility for receiving and storing regulated waste for more than 24 hours.
- ERA 60 Waste disposal – operating a facility for disposing of regulated waste (other than limited regulated waste)
- ERA 63 Sewage treatment – operating sewage treatment works, other than no-release works, with a total daily peak design capacity of more than 100 to 1500 equivalent persons (EP) where treated effluent is discharged from the works through an irrigation scheme.
- ERA 31 Mineral Processing – processing more than 1,000t of coke in a year.

The EA application would need to include all the relevant ERAs, including relevant thresholds under schedule 2 of the Environmental Protection Regulation 2008 that would apply to the project.

ERAs located off the mining lease would require approval through a separate development application for the train loading facility would include:

- ERA 8 Chemical storage – storing more than 500m3 of class C1 or C2 combustible liquids.
- ERA 50 Bulk material handling – loading or unloading minerals at a rate of 100t or more a day; or stockpiling 50000 t or more of minerals.

Approvals under other legislation and policies would also be required and are discussed in section 4 of this report.

3.3 Consultation program

3.3.1 Public consultation

In addition to the statutory requirements for advertising the TOR and EIS notices and mailing of the notices to interested and affected parties, the proponent undertook community consultation as part of the EIS process. This included consultation with affected and interested parties as defined by the EP Act, potentially affected landholders, utility and service providers, local industry groups, local, Queensland and Australian government agencies, and Indigenous and community groups.

Stanmore committed in the EIS to continue consultation with interested and affected parties, Traditional Owners and the community throughout the life of the project, and to adopt a Stakeholder Engagement Strategy. Initiatives in this strategy would include:

- maintenance of a project website and public release of information
- establishment of a dispute resolution process
- appointment of a stakeholder and Community Relations Officer to oversee handling of comments, enquiries and complaints
- initiation of annual community, business and workers surveys
- production of regular project updates (bi-annual community newsletters and fact sheets) and the provision of this information at community events
- scheduling meetings with interested groups and community contacts
- building long-term relationships and maintaining regular correspondence with interested and affected parties and Traditional Owners particularly on matters relating to mine closure, land rehabilitation and post closure monitoring.

3.3.2 Advisory body

The administering authority invited the following organisations to assist in the assessment of the TOR and the EIS by participating as members of the advisory body for the project:

- Commonwealth Department of Sustainability, Environment, Water, Population and Communities

- Department of Aboriginal and Torres Strait Islander and Multicultural Affairs
- Department of Agriculture, Fisheries and Forestry
- Department of Communities
- Department of Community Safety
- Department of Communities, Child Safety and Disability Services
- Former Department of Education and Training
- Former Department of Employment, Economic Development and Innovation
- Department of Housing and Public Works
- Department of Local Government, Community Recovery and Resilience
- Department of Natural Resources and Mines
- Department of Science, Information Technology, Innovation and the Arts
- Department of State Development, Infrastructure and Planning
- Department of Transport and Main Roads
- Office of the Coordinator General
- Queensland Health
- Queensland Police Service
- Queensland Treasury and Trade
- Former Queensland Treasury
- Banana Shire Council
- Toowoomba Regional Council
- Western Downs Regional Council
- Condamine Alliance
- Construction, Forestry, Mining & Energy Union, Mining & Energy Division, Qld District Branch
- Ergon Energy
- Fitzroy Basin Association
- Network Property Group
- Powerlink Queensland
- SunWater
- Queensland Murray-Darling Committee
- Queensland Rail Limited.

An advisory body briefing for the project was held in Toowoomba on 27 May 2011, during the notification stage of the EIS. A field trip to inspect the project site took place on 18 and 19 June 2012.

In April 2012, machinery of government changes created new departments in the Queensland Government (see Administrative Arrangements Order (No.3) 2012). Details of how departmental responsibilities relevant to this EIS assessment report were redistributed between old and new organisations are described in Appendix 1.

3.3.3 Public notification

In accordance with the statutory requirements of sections 42, 46 and 52 of the EP Act, public notifications of the draft TOR and EIS and public comment periods were made through notices in the *Courier-Mail*, *The Australian*, the *Chinchilla News* and on the department's (DERM and EHP) websites.

The draft TOR and EIS were placed on public display at the following locations during their respective public comment and submission periods:

- The department's websites (former DERM for the TOR and EHP for EIS)
- EHP's central office, 400 George Street, Brisbane
- EHP's regional office, 173 Hume Street, Toowoomba
- Toowoomba City Library, 27 Victoria Street, Toowoomba
- Wandoan Library, 6 Henderson Road, Wandoan
- Stanmore's website: www.stanmorecoal.com.au.

3.4 Matters considered in the EIS assessment report

Section 58 of the EP Act requires that an EIS assessment report consider the following matters:

- the final TOR for the EIS
- the submitted EIS (including the response to submissions on the EIS and supplementary EIS)
- all properly made submissions and any other submissions accepted by the chief executive
- the standard criteria
- another matter prescribed under a regulation.

Section 59(e) also states the prescribed matters for the assessment report, as described in section 9 of the EP Regulations.

These matters are addressed in the following subsections.

3.4.1 The final TOR

The final TOR issued, on 4 November 2011, were considered when preparing this EIS assessment report. While the TOR were written to include all the major issues associated with the project that were required to be addressed in the EIS, they were not exhaustive, nor were they to be interpreted as excluding all other matters from consideration. Where matters outside of those listed in the final TOR were addressed in the EIS, those matters have also been considered when preparing this EIS assessment report.

3.4.2 The submitted EIS

The submitted EIS was considered when preparing this report. The 'submitted EIS' comprises:

- The EIS that was made available for public submissions on 18 June 2012 until close of business on 27 July 2012, referred to as the 'initial EIS' in this report.
- The supplementary EIS (referred to as the 'supplementary EIS' in this report), consisting of:
  - amendments to the EIS (referred to as the 'amended EIS' in this report) which included further appendices and amendments to the EM plan submitted on 20 December 2012
  - report titled 'Response to public submissions for The Range Project' (referred to as 'response to submissions on the initial EIS' in this report) submitted on 20 December 2012 and Appendix A – The Range EIS Response to Interim Independent Expert Scientific Committee (IIESC) advice submitted on 21 December 2012.

3.4.3 Properly made submissions

The department accepted 35 submissions on the initial EIS from:

- Commonwealth Department of Sustainability, Environment, Water, Population and Communities
- Department of Aboriginal and Torres Strait Islander and Multicultural Affairs
- Department of Agriculture, Fisheries and Forestry
- Department of Communities, Child Safety and Disability Services
- Department of Community Safety
- Department of Education, Training and Employment
- Department of Energy and Water Supply (Office of Water Supply Regulator)

- Department of Housing and Public Works
- Former Department of Local Government (now Department of Local Government, Community Recovery and Resilience)
- Department of National Parks, Recreation, Sport and Racing
- Department of Natural Resources and Mines
- Department of Science, Information Technology, Innovation and the Arts
- Department of State Development, Infrastructure & Planning
- Department of Transport and Main Roads
- Queensland Police Service
- Department of Communities
- Office of the Coordinator General
- Queensland Health
- Queensland Treasury and Trade
- Skills Queensland
- Banana Shire Council
- Toowoomba Regional Council
- Western Downs Regional Council
- Ergon Energy
- Powerlink Queensland
- Wildlife Preservation Society of Queensland, Upper Dawson Branch
- Fitzroy Basin Association
- Queensland Murray-Darling Committee Inc.
- 7 members of the public and/or residents

EHP also provided a submission.

All Government agencies that made submissions were given the opportunity to review and provide comments on the supplementary EIS. This included comments on conditions that should apply to the project and on the adequacy or otherwise of the supplementary EIS in addressing concerns raised in submissions.

3.4.3 The standard criteria

Section 58 of the EP Act requires that, among other matters, the standard criteria listed in Schedule 3 of the EP Act must be considered when preparing the EIS assessment report. The standard criteria are:

- the principles of ecologically sustainable development as set out in the National Strategy for Ecologically Sustainable Development
- any applicable environmental protection policy
- any applicable Commonwealth, State or local government plans, standards, agreements or requirements
- any applicable environmental impact study, assessment or report
- the character, resilience and values of the receiving environment
- all submissions made by the applicant and submitters
- the best practice environmental management for activities under any relevant instrument, or proposed instrument, as follows—
  - i. an environmental authority
  - ii. a transitional environmental program
  - iii. an environmental protection order

iv. a disposal permit

v. a development approval

- the financial implications of the requirements under an instrument, or proposed instrument, mentioned in paragraph (g) as they would relate to the type of activity or industry carried out, or proposed to be carried out, under the instrument
- the public interest
- any applicable site management plan
- any relevant integrated environmental management system or proposed integrated environmental management system
- any other matter prescribed under a regulation.

3.4.4 Prescribed matters

Section 58 of the EP Act requires that the following prescribed matters, under the EP Regulation, are considered when making an environmental management decision for this project:

- Section 51, matters to be considered for environmental management decisions
- Section 52, conditions to be considered for environmental management decisions
- Section 53, matters to be considered for decisions imposing monitoring conditions
- Section 55, release of water or waste to land
- Section 56, release of water, other than stormwater, to surface water
- Section 57, release of stormwater
- Section 60, activity involving storing or moving bulk material
- Section 62, activity involving acid-producing rock
- Section 64, activity involving indirect release of contaminants to groundwater.

3.4.5 Notifiable activities

The EIS identified and listed the following relevant notifiable activities under schedule 3 of the EP Act that would apply to the project:

- *Notifiable activity 7 - Chemical storage (other than petroleum products or oil under item 29)*—storing more than 10 t of chemicals (other than compressed or liquefied gases) that are dangerous goods under the dangerous goods code.
- *Notifiable activity 23 - Metal treatment or coating*—treating or coating metal including, for example, anodising, galvanising, pickling, electroplating, heat treatment using cyanide compounds and spray painting using more than 5L of paint per week.
- *Notifiable activity 24 - Mine wastes*—storing hazardous mine or exploration wastes, including, for example, tailings dams, overburden or waste rock dumps containing hazardous contaminants.
- *Notifiable activity 29 - Petroleum product or oil storage*—storing petroleum products or oil that are class 1 or class 2 combustible liquids in above ground tanks with more than 25,000 L capacity.
- *Notifiable activity 37 - Waste storage, treatment or disposal*—storing, treating, reprocessing or disposing of regulated waste.

Stanmore would be required to provide notification to EHP in relation to the Environmental Management Register (EMR) for all notifiable activities and the notifiable activities should be clearly identified and listed in the EM Plan. Any notifiable activity, as defined under Schedule 3 of the EP Act would be a relevant mining activity if it is directly associated with, or supports or facilitates, the mining or processing of coal on the project's tenures.

3.5 Environment Protection and Biodiversity Conservation Act 1999

On 4 April 2011, SEWPaC determined the proposed project to be a controlled action under the EPBC Act. The controlling provisions were sections 18 and 18A (listed threatened species and communities) and 20 and 20A (listed migratory species).

This EIS process is accredited for the assessment under Part 8 of the EPBC Act in accordance with the agreement between the Commonwealth of Australia and the State of Queensland (the bilateral agreement) relating to environmental impact assessment. The Commonwealth was included as an advisory body for the assessment of the project and provided its comments on the draft TOR and EIS documents. A copy of this report will be given to the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities to assist in making a decision on the project under the EPBC Act.

MNES are discussed further in section 4.25 of this report.

4 Adequacy of the EIS in addressing the final TOR

This section of the EIS Assessment Report describes how the EIS addressed the TOR, the specific comments provided during the public consultation process on the EIS and the departmental comments arising from Stanmore's response to the submissions and amendments to the EIS. The sections below refer to both previous and current Queensland Government departments (see Appendix 1), depending on the particular stage of the EIS process being discussed. The previous departments commented on the draft TOR. Current departments created in 2012 commented on the EIS and supplementary EIS.

Table 1 lists the main subject headings of the TOR, notes whether the submitted EIS adequately addressed the matters described in the final TOR and highlights any remaining issues. The remainder of this section describes these significant issues, discusses the findings of the EIS and any amendments made subsequently in the supplementary EIS, and outlines the environmental protection commitments made by the proponent.

Table 1. Summary of the adequacy of the submitted EIS in addressing the final TOR, outstanding issues, significant commitments made by the proponent and management plans.

Relevant section in the final TOR	**Significant matters discussed**	**Adequacy of submitted EIS, outstanding issues and management plans**
Introduction	Overview of the project, its objectives and scope.	Adequate.
Regulatory approvals	Outline of the necessary approvals and their assessment processes.	Adequate.
Project need and alternatives	Project justification and discussion of alternatives.	Adequate.
Description of the project	Location Construction phase of the project. Operational phase of project: Mine sequencing and methods Product handling and processing Infrastructure requirements Waste management Water management Energy and telecommunication requirements Rehabilitation and decommissioning Accommodation and workforce	Adequate.
Climate and climate change	Climatic conditions at the site Potential impacts of climate change	Proponent commits to: • emergency management plan. • consider current and potential future climatic conditions in infrastructure design and water storage. • monitor actual and predicted climate change impacts on rehabilitation.

Land	Geology and topography Coal and mineral resources Land tenure and landuse Soils and land suitability Land disturbance and contamination Landscape character and visual amenity	Adequate. **Outstanding issues:** • potential for sterilisation of other coal resource tenures and EPCs along the transport corridor • impact on sand supply • mapping and mitigation measures for GQAL and SCL. **Proponent commits to:** • detailed sediment and erosion control plan to manage sodic/dispersive soils • mitigate potential impacts on soil conservation works • minimise and mitigate impacts on stock routes • mitigate impacts on landholders from transport corridor.
Transport	Road Rail Port	Adequate. **Outstanding issues:** • minimum Downfall Creek Road/Leichhardt Highway intersection upgrade • street lighting • traffic assessment during decommissioning phase • fatigue management • agreed measures to mitigate impacts on local roads. **Proponent commits to:** • upgrade Downfall Creek Road/Leichhardt Hwy intersection and Downfall Creek Road • develop a Traffic Management Plan and Operational Plan • transport hazardous materials and regulated wastes transport in accordance with regulations • contribution for road maintenance to mitigate pavement impacts on the Leichhardt Highway between Guluguba and Wandoan. • fund the provision of pilot vehicles and police escorts for over-dimensional vehicles. • sponsoring school facility upgrades.
Waste	Description of environmental values and potential impacts and mitigation measures regarding: Regulated and other waste. Waste rock characterisation.	Adequate. **Outstanding issues:** • agreement on the use of relevant council waste facilities • detailed information on wastewater system for

		EA. **Proponent commits to:** • provide a detailed Waste Management Plan.
Water resources	Description of environmental values and potential impacts and mitigation measures regarding: Water management strategy Surface watercourses and overland flow. Groundwater.	Adequate. **Outstanding issues:** • identification of water quality objectives for each environmental value • monitoring program for release of water from sediment dam at the train loading facility • groundwater monitoring program does not address impacts on non-mined aquifers i.e. Hutton Sandstone. **Proponent commits to:** • undertake a baseline water quality monitoring program • develop a receiving water quality monitoring program • water management system to manage mine water and groundwater dewatering • water management plan • management of saline water for dust suppression • erosion sediment control plan • environmental management system.
Air quality	Description of environmental values and potential impacts and mitigation measures regarding: Dust. Greenhouse gases. Other air emissions.	Adequate. **Proponent commits to:** • develop a dust management plan • veneering of coal trains • prepare an air quality management plan • mitigation measures for greenhouse gas emissions.
Noise and vibration	Description of environmental values and potential impacts and mitigation measures regarding: Noise at sensitive receptors. Vibration due to blasting.	Adequate. **Proponent commits to:** • develop a construction noise management plan.
Nature conservation	Description of environmental values and potential impacts and mitigation measures regarding: Terrestrial ecology.	Adequate. **Outstanding issues:** • secondary impacts of the project on Quandong

	Aquatic ecology. Groundwater dependent ecosystems.	State Forest and agreed mitigation measures • sampling methods for detection of stygofauna. **Proponent commits to:** • receiving environmental monitoring plan • conduct further stygofauna sampling.
Cultural heritage	Description of environmental values and potential impacts and mitigation measures regarding: Indigenous cultural heritage. Non-indigenous cultural heritage.	Adeqaute. **Proponent commits to:** • mitigate impacts on St. John's Lutheran Church and cemetery • continue negotiations with Western Wakka Wakka representatives on a Cultural Heritage Management Plan.
Social issues	Description of environmental values and potential impacts and mitigation measures regarding: Impacts on local community, housing and services. Impacts due to fly-in, fly-out workforce.	Adequate. **Outstanding issues:** • impacts on social infrastructure • impacts on local government infrastructure. **Proponent commits to:** • update a Social Impact Management Plan • prepare a Local Industry Participation Plan • prepare a Stakeholder Engagement Strategy.
Health and safety	Description of environmental values and potential impacts and mitigation measures regarding: Air and water emissions. Road haulage and traffic regimes.	Adequate. **Proponent commits to:** • provide copies of safety data sheets to landholders of hazardous materials stored on their properties • fence transport corridor for security and public safety.
Economy	Description of environmental values and potential impacts and mitigation measures regarding: Alienation of grazing land. Effects on the local, regional and State economy.	Adequate. **Proponent commits to:** • Social Impact Management Plan.
Hazard and risk	Description of environmental values and potential impacts and mitigation measures regarding: Unplanned discharges to air, water or land. Transportation, storage and use of hazardous substances.	Adequate. **Proponent commits to:** • prepare a Risk Management Plan and associated plans e.g. Hazard and Operability, Safety Management System, Emergency Planning and Independent Auditing.

	Emergency response.	
Rehabilitation	Description of environmental values and potential impacts and mitigation measures regarding: Rehabilitation of areas affected by mining activities.	Adequate. **Outstanding issues:** • agreement on post mining landuse • feasibility of rehabilitating land back to pre-mining land use particularly for fodder cropping and grazing • rehabilitation of mine water dams. **Proponent commits to:** • prepare a Mine Closure Plan, including a Rehabilitation Plan
Biodiversity offsets	Offsets proposed under State legislation.	Adequate. **Outstanding issues:** • acceptable offset strategy (needs to be provided before EA can be granted) • agreed timing of offsets (strategy and implementation).
Matters of National Environmental Significance (MNES) under the EPBC Act	Assessment report. Management plans. EPBC Act offsets.	Adequate. **Outstanding issues:** • prepare an acceptable offsets strategy.
Environmental Management Plan	Adequate.	See section 5.

4.1 Introduction

Chapter 1 (Introduction) of the EIS provided an overview of the project, its objectives and scope.

4.2 Regulatory approvals

Chapter 2 (Project approvals) of the EIS identified the necessary approvals for the project and outlined the assessment and approvals process. These are summarised in Table 2.

Table 2 Summary of the main approvals required for the project.

Approval	Legislation (administering authority)	Status update
Commonwealth legislation		
Approval to undertake action that may impact on a matter of national environmental significance (nationally-listed threatened species and ecological communities). Refer to section 3.5 EPBC Act for details.	EPBC Act (SEWPaC)	SEWPaC considers EIS is largely adequate in assessment of MNES with the exception of offsets where further information from the proponent is required.

Indigenous Landuse Agreement Right to Negotiate	*Native Title Act 1993* (NT Act) (Department of Families, Housing, Community Services and Indigenous Affairs)	Stanmore stated it would request that the State initiate the 'right to negotiate' process under section 29 of the NT Act (in relation to the section of the transport mining leases which do not cover EPC 1112).
State legislation		
Environmental authority (mining activities)	EP Act (EHP)	EIS process completed. EHP require amendments to submitted Environmental Management Plan (EM Plan) and clarification on some outstanding issues (refer to section 5 of this report) including a revised offsets strategy.
The project requires leases to be approved for mining lease applications (MLA) MLA 55001, MLA 55009 and MLA 55010 and approval to include two additional areas to MLA 55001	MR Act (Department of Natural Resources and Mines, DNRM)	Environmental Authority (EA) required before ML can be granted. Stanmore has not applied for additional areas adjacent to MLA 55001.
Water licence to take or interfere with the flow of water from an aquifer (for dewatering of the open pit)	*Water Act 2000* (DNRM)	Would be required for dewatering of the open pit
Riverine Protection Permit to destroy vegetation, excavate or place fill in a water course	*Water Act 2000* (DNRM)	
Permit to occupy – unallocated State land, a reserve or road	*Land Act 2000* (DNRM)	
Application to permanently and/or temporarily close a road	*Land Act 2000* (DNRM)	DNRM advised Stanmore needs to consult with: • DNRM and WDRC to discuss proposed mitigation measures and • adjoining land holders and members of the public affected by a proposed road closures.
Failure impact assessment for referrable dams	*Water Supply (Safety and Reliability) Act 2008*	
Application for a Validation Assessment, Compliance Certificate or Protection Decision (for area subject to disturbance by the project on potential Strategic Cropping Land (SCL) or SCL).	*Strategic Cropping Land Act 2011* (DNRM)	Stanmore lodged SCL validation application to DNRM for: • MLA 55001 in July 2012 • Transport corridor and

Assessment of land to determine if SCL present.		train loading facility in January 2013. DNRM advised that the SCL validation application on MLA 55001 contained insufficient information to confirm whether or not the land is non-SCL.
Waterway Barrier Works Permit (operational works permit) for any off tenement infrastructure that causes a barrier in waterways.	*Fisheries Act 1994* and SP Act (Department of Agriculture, Fisheries and Forestry)	Permit not required if within mining lease but Department of Agriculture Fisheries and Forestry (DAFF) advised Stanmore to comply with self assessable code for minor waterways barrier works.
Permits under the *Nature Conservation Act 1992* (NC Act) including: Protected Animals Movement Permits (section 88 of the NC Act) Protected Plants Clearing Permits (section 89 of the NC Act) Wildlife Movement Permits (section 97 of the NC Act).	NC Act (EHP)	
Approval to gain property access or other access onto a State-controlled road.	*Transport and Infrastructure Act 1994* (Department of Transport and Main Roads, TMR)	
Road Corridor Permit for project works to construct, maintain, operate or conduct ancillary works and encroachment on Leichhardt Highway (e.g. intersection upgrades).	*Transport and Infrastructure Act 1994* (TMR)	DTMR advised that Stanmore would be required to update the road impact assessment, road-use management plan and any traffic management plans
Approval to interfere with a Railway line	*Transport and Infrastructure Act 1994* (TMR)	
Cultural Heritage Management Plan (CHMP)	Aboriginal Cultural Heritage Act 2003 (DNRM)	Stanmore advised: • CHMP with Iman People #2 completed and approved by Department of Aboriginal and Torres Strait Islander and Multicultural Affairs (DATSIMA) in June 2012 • CHMP with Western Wakka Wakka People is being negotiated
State legislation—applicable to activities located off the mining lease		
Development permits for any 'assessable development' and ERA that is not on a mining lease. This would include: the rail loading facility	SP Act (Western Downs Regional Council, WDRC)	Impacts associated with the rail facility; power transmission lines; road upgrades; and the

and associated infrastructure; power transmission lines; road upgrades; and the construction of a pipeline to the Dogwood Creek discharge point.		construction of a pipeline have been assessed as part of the EIS process.
Development permit to clear native vegetation in areas outside the mining lease	*Vegetation Management Act 1999* (VM Act)(DNRM) and SP Act	DNRM advised that offsets under the VM Act would be required for clearing relevant native vegetation.

The Department of State Development Infrastructure and Planning (DSDIP) requested that Stanmore provide further information in the supplementary EIS on waterway barrier works under the Sustainable Planning Regulation 2009. Similarly the Department of Natural Resources and Mines (DNRM) requested that the EIS clarify state requirements in regards to: approvals to use State owned land; evidence of resource entitlement; and assessment requirements in relation to Strategic Cropping Land (SCL) for development applications under the SP Act. Stanmore provided this information in Chapter 2 of the amended EIS.

EHP commented that the EIS did not:

- Distinguish between activities that would be contained within the mining tenure and are approved under the provisions of the *Minerals Resources Act 1989* (MR Act) and activities that are not on the mining tenure and would require a development approval under the SP Act;
- Clarify if ERA 14 Power Generation, ERA 64 Water Treatment and ERA 31 Mineral Processing would be undertaken as part of the mining project;
- Provide a full list of ERAs that would be associated with the train loading facility.

Stanmore clarified in the supplementary EIS that ERA 14 Power Generation would no longer be required but did not provide any further information as to what activities would be conducted on and off the mining lease. In response, EHP commented that the supplementary EIS did not adequately address the issues raised in the EIS. Stanmore provided the requested information in an email to EHP on 20 March 2013.

DNRM commented that the EIS did not adequately acknowledge the main intent of State Planning Policy 1/92 which was to recognise the importance of Good Quality Agricultural Land and protect it from inappropriate development that would lead to its alienation or diminished productivity and requested the EIS be amended accordingly. Stanmore amended the supplementary EIS as requested. DNRM also advised that potential increase in flow of some drainage lines (i.e. as a result of the project) may result in them being considered watercourses and therefore requiring licensing under the *Water Act 2000* (Water Act).

The EIS identified several interrelated projects which may affect the timing and success of The Range Project but for which approvals are not being sought by Stanmore. The proponents of these projects are seeking approval via separate processes. Relevant projects include:

- The SBR Project—a proposed 210km multi-user, open access rail line to be constructed from Wandoan to Banana by the Surat Basin Railway Joint Venture.
- Wiggins Island Coal Export Terminal (WICET)—construction of new wharf and coal handling facilities.
- The Queensland Rail National Moura network upgrade.
- Accommodation facilities in Wandoan or other regional centres developed and approved by third parties for whom Stanmore intends to enter a commercial arrangement for use of all or part of the accommodation facility.
- Xstrata Weringa Quarry.
- A water supply pipeline from Woleebee Creek to Glebe Weir.
- A power transmission line from the Wandoan South 275kV powerline and substation.

4.3 Project need and alternatives

Chapter 3 (Project needs and alternatives) of the EIS described the justification for the project with reference to the economic and social benefits and the project's significance in a regional, state and national context.

In summary, the project would significantly contribute to the local, regional, state and national economies through royalties, taxes and charges, wages and by creating opportunities for employment and training, regional development, small business, development of secondary industries, investment and improved services. The EIS estimated the economic benefits from the project to be $625 million gross value added per annum and 2,472 full

time equivalent jobs per annum in Queensland during operations from direct and indirect economic activity. The positive and negative impacts, mitigation and management measures and environmental protection commitments of the project were addressed in later sections of the EIS.

The EIS discussed conceptual, technological and locality alternatives to the project. Methods and localities were considered to maximise economic benefits and minimise social and environmental impacts of mining practices, mine infrastructure, coal processing, tailings and reject management, transport of ROM and product coal, road and rail infrastructure, waste and water management and power and telecommunications. These are discussed further in sections 4.5 (Construction) and 4.6 (Operation) of this report.

Queensland Murray-Darling Committee (QMDC) commented that the EIS did not consider the impacts of the project and the wider expansion of the coal industry on other industries, particularly Queensland's renewable energy sector. QMDC requested that the supplementary EIS consider external and secondary costs associated with coal mining e.g. generation of waste, health impacts, government coal subsidies, loss of biodiversity, lost value of abandoned mine lands, cost to taxpayers of environmental monitoring and clean-up, decreased property values, etc. Stanmore asserted that the project needs had been adequately addressed in the EIS and that it was outside of the scope of the TOR to consider external and secondary costs and address the global challenges to find and implement new methods to protect the environment and address forecast climate change.

4.4 Project location

Chapter 5 (Project location) of the EIS described the location of the proposed project within the WDRC area approximately 25 km south east of the Wandoan and 20 km east of Guluguba, in south-central Queensland. The WDRC area contains a mix of traditional and emerging industries in a rural environment which is experiencing strong economic growth. The existing settlement of the Western Downs is focused in and around the towns of Dalby, Chinchilla, Miles, Jandowae, Tara and Wandoan. The nearest town to the proposed project is Wandoan, with a population of approximately 420 people.

4.5 Construction

Chapter 6 (Construction) of the EIS outlined the extent and nature of the project's construction phase. Construction of the infrastructure would be expected to take approximately two to three years.

The main components of the construction program would include: early works (e.g. design, tenders and procurement); site preparation (e.g. site security, site clearance and civil works); and construction (e.g. structure and plant erection and installation; construction of mine infrastructure; construction of infrastructure in the transport corridor, train loading facilities and other linear supply infrastructure; commissioning and testing; and site demobilisation and clearance of construction equipment and materials).

Electricity requirements for construction would be supplied via diesel generators (approximately 5MW of power). Diesel would also be used for all major mobile plant, equipment and vehicles during the construction period and would be stored in self-bunded tanks. Telecommunications during construction would be upgraded to provide microwave connection with the existing Telstra infrastructure.

The total construction workforce (including the workforce engaged in site preparation) would be between 50 and 300 (inclusive of all sub-contractors and construction management). During the early stages of construction, Stanmore may use an existing residence on the mining lease to accommodate a small number of workers. The EIS proposed two options to accommodate the construction workforce: either an existing village provided by third parties in Wandoan; or a camp established by QGC for the construction of the QCLNG project gas export pipeline, approximately 5km from the mine site.

Both EHP and WDRC commented that the use of the QGC camp for The Range Project would require a development permit (application for a Material Change of Use under SP Act), as QGC would not be entitled to offer the camp accommodation to other workers under it's pipeline authority under the *Petroleum and Gas Act 2004*. EHP requested that Stanmore provide further evidence of the practically of this accommodation option or provide a preferred option for accommodation of the construction workforce in the supplementary EIS so that authorities can comment on acceptability and potential impacts in the EIS process. In response, Stanmore acknowledged that a development approval would be required for the QGC camp, but did not provide any additional accommodation options in the amended EIS. The company asserted that the alternative accommodation option assessed in the EIS (to accommodate works in a village near Wandoan) was viable and likely to be the preferred option. The impacts of accommodating the project's workforce and mitigation measures to minimise and mitigate impacts are discussed in section 4.19 (Social impacts) of this report.

4.6 Operation

Chapter 7 (Operation) of the EIS described the location and nature of the project's operational phase.

4.6.1 Mine sequencing and methods

Stanmore considered a number of potential mine layouts and different methodologies for the project in an effort to optimise economic recoverability of good quality thermal coal to meet market expectations, while also balancing the mitigation and control measures that would minimise impact on the environment and the surrounding communities. In determining the final location of the mine infrastructure area (MIA), coal handling and preparation plant (CHPP), out-of-pit TSF and mine water dams, a range of social, economic, topographical, environmental and mine operating factors were considered. Considerations included:

- The out-of-pit waste rock dumps, out-of-pit tailings storage facilities and mine water dams would be situated in an area that would minimise the sterilisation of any economically recoverable coal.
- The location of the MIA and the CHPP was selected to minimise: the haul distance for ROM coal; sterilisation of any economically recoverable coal; impacts on environmentally sensitive areas (by locating infrastructure in previously cleared areas); impacts on sensitive receptors from mining activities (i.e. maximising the separation distance to the nearest receptors); and location above modelled Q100 flood.
- Sediment dams would be located down-slope of the out-of-pit waste rock dumps to capture runoff.
- Mine water dams and out-of-pit tailings storage facilities would be located in areas:
    - previously cleared of the majority of remnant vegetation
    - with relatively flat topography and
    - sufficient space to accommodate storage at end of mine life.

The EIS stated that further opportunities to minimise impacts may be possible during the detailed design stage.

The project would operate as an open-cut mine. Underground mining was not considered technically or economically feasible due to the shallow, multi-seam nature of the deposit and low strip ratio (strip ratio of 3:1 to 20:1). Strike cut mining methods were chosen over dip cut methods. The EIS reported that while both methods were considered to achieve similar economic returns, environmental and social impacts, the dip cut methods could constrain some aspects of mine development. Several methods of open-cut coal exposure were assessed: excavator and truck; electric shovel; rear dump truck and dozer push; rope shovel and ultra class rear dump trucks; dragline; in-pit crushing and conveying; and driverless trucks. The environmental impact of each option was assessed as being comparatively similar, although variations in impact were considered. A fleet of 250t excavators, 150t class rear dump trucks and front end loaders were considered as the final option for coal and interburden mining because of cost and practicality.

The coal deposit is suited for conventional strike cut mine layout, where the mining strips would run along strike and the overall advance down dip. The open cuts would become deeper as mining progresses to the west. The maximum depth of the open cut would be approximately 120 m below surface. The mine plan in the EIS proposed a single open pit. After more detailed mine planning, the supplementary EIS proposed three open pits (two initially and the third being utilised in the final years). This is discussed further in section 4.22 (Rehabilitation and decommissioning) of this report.

The mine would be developed over a number of horizons on 100m wide benches. The general mining methodology would involve:

- vegetation clearing (where required)
- topsoil stripping and storage, or direct spreading onto areas ready for rehabilitation
- blasting of the overburden (where required)
- removal of overburden by truck and excavator in box-cuts, creating new mining strips and filling in previously mined voids
- the excavation of ROM coal by truck and excavator
- dumping of ROM coal into the designated dump stations at the CHPP or ROM stockpile
- conveying of ROM coal to the coal handling and preparation plant (CHPP) for washing and processing
- final landform re-profiling, topsoiling and revegetation activities.

4.6.2 Products and CHPP

The EIS reported that Surat Basin coal is relatively low in of trace elements, nitrogen and sulfur content. Stanmore intends to optimise energy recovery from the resource by bypassing as much coal as possible and washing the remainder. This would reduce energy, water use and impacts from reject handling and disposal. An average of 42% (approximately equivalent to 2.7 Mt/y) of the ROM coal would bypass the CHPP and the remaining 3.8 Mt/y of ROM coal would be processed in the CHPP.

Dump trucks would be used to transport uncrushed ROM coal along haul roads from the open cut mine areas to the ROM hopper or transferred to the ROM stockpile and then fed by a front end loader to the ROM hopper. The use of in-pit conveyors to transport uncrushed ROM coal was not considered consistent with the mining strategy for The Range Project. The size of haul trucks would be maximised to minimise the number of movements and reduce dust and noise emissions. Internal haul roads would be designed to minimise environmental impacts.

A single ROM pad with multiple sections for various coal grades was considered optimal, due the volume of coal, multiple grades of coal and capital and operating expense of having more than one CHPP. The expected bypass of approximately 42% of the ROM coal would require the development of additional infrastructure around the CHPP to store the bypass coal. Options for shared or separate processes for coal bypass and beneficiation were considered. Shared coal bypass and beneficiation was preferred as this would reduce crushing time of bypass coal and lower costs. Both options were considered to have similar environmental impacts.

Raw coal would be crushed in a series of stages and more water added to the tertiary crushed raw coal allowing it to be pumped to the CHPP. All bypass coal would be dry crushed. The crushed raw coal would be either pumped to the process plant or conveyed to the product stockpile.

Stanmore reviewed a number of options and configurations to process ROM coal including the use of a jig for coarse coal processing. The dense medium cyclone and spirals configuration process is well established technology in the coal industry and was selected to be the most effective.

4.6.3 Rejects handling and disposal

Waste composition, handling and disposal is discussed in section 4.10 (Waste) of this report.

4.6.4 Product handling and overland conveyor

Product conveyors would deliver product coal from the CHPP to the product stockpiles, which would have a maximum capacity of approximately 75,000 tonnes and a maximum height of approximately 15m. Product coal would be drawn from the stockpile to the reclaim conveyor which would transfer coal to the overland conveyor. The product stockpile area would be approximately 20ha in area and would incorporate dust suppression measures. The product stockpile would be bunded to prevent ingress of clean stormwater. Dirty stormwater from the product stockpile would be directed to a mine water dam.

Options considered for transporting product coal from the product coal stockpile adjacent to the CHPP on ML 55001 to the train loading facility included: a conveyor system connected to a rail loop; road haulage along a dedicated haul road; a train line linking the SBR to the mine site; and a coal slurry pipeline (and return water line) to a dewatering facility. An overland conveyor option was selected on the basis that it represented the method with the lowest environmental and social impacts and operating costs.

Three routes for the overland conveyor were assessed in the EIS—a northern option, along the northern boundary of MLA 55001; a southern option along the southern boundary of MLA 55001; and a central option, which would pass through the centre of MLA 55001. The Department of National Parks, Recreation, Sport and Racing (NPRSR) and Fitzroy Basin Association (FBA) stated their preference for the northern option due to concerns regarding potential direct (clearing of remnant vegetation) and indirect (e.g. edge effects and dust) impacts on Quandong State Forest from positioning the overland conveyor along the southern boundary of MLA 55001.

The supplementary EIS identified the final route for the overland conveyor as the northern option along the boundary of MLA 55001 and then within MLA's 55009 and 55010 (and two small areas which pass outside MLA 55001 which Stanmore intends to add to their MLA). The northern boundary option for the overland conveyor was selected for the following reasons: it minimised the impact of the southern option on Quandong State Forest; the rail loop and rail loading facility for the southern group of options would be in close proximity to Juandah Creek and therefore at risk of flooding; Stanmore considered that there was some risk that the SBR would not extend south of the intersection with the connection to the Wandoan project due to potential social and environmental impacts on the residents of Wandoan of the rail line passing through the town; and Stanmore considered that there would be higher certainty of the rail infrastructure being available to meet the overall project development schedule. Other linear infrastructure, such as power and water supplies, in the transport corridor and on MLA 55001 would follow the route chosen for the overland conveyor.

The overland conveyor would transfer coal along a conveyor at a rate of up to 1,200 tonnes per hour, delivering coal to the train load out bin for loading. The overland conveyor would run along ridges but is required to pass over Weringa Creek. Elevated gantry structures would be provided for this crossing. The elevated structure would ensure that the conveyor is higher than the Q100 flood level and minimise obstruction to the flood plain. An unsealed (compacted gravel) access road approximately 4m wide would run parallel to the conveyor and at grade. This access road would allow for conveyor maintenance. The overland conveyor and linear power and water supply infrastructure are referred to collectively as the 'transport corridor' for the remainder of this report. The social and environmental impacts of the transport corridor are discussed in the relevant sections of this report.

4.6.5 Train loading facility

The train loading facility would comprise a rail loop and rail spur connected to the SBR, train loading bin, conveyor and product stockpile and an infrastructure area. The rail spur and loop would connect to the proposed SBR and coal would be railed to Wiggins Island Coal Export Terminal (WICET) for export. A development approval, under the SP Act would be required for the train loading facility. The location of the rail loop may change within the development approval area.

Approximately 5km of rail track would be required for a spur and loop off the SBR rail line. The location of the spur and loop was selected on the basis of: the spur and main line intersection point being close to the existing natural surface level; developing a balloon loop that enables reversal of train direction without shunting; minimising embankment and cutting design; and minimising the number of potentially impacted receptors.

Various rail loop and train loading configurations were assessed in the EIS depending on the route chosen to convey the coal. In the initial EIS, the location of the rail loop selected for impact assessment was considered a worst case scenario for disturbance to remnant vegetation and proximity to sensitive receptors. It was assumed that any changes in the location of the rail loop would likely result in an eastward shift of the rail loop and consequently a reduction in impacts to remnant vegetation and greater separation distance to sensitive receptors. The supplementary EIS identified a preferred option for the rail loop which was not included in the original EIS. This option moved the footprint approximately 700m to the east on the basis of: minimising impacts to residents in areas surrounding the infrastructure; minimising the extent of earthworks required for the rail loop; and providing safe and reliable access to the SBR with sufficient length of rail to accommodate a train. A development approval, under the SP Act, would be required for the train loading facility.

Two options for the product stockpile and reclaim area were considered in the supplementary EIS—overhead stacker and radial stacker. Both options were considered relatively equal in terms of environmental impact, so the selection of the preferred option would come down to engineering design and cost considerations. Only one product coal stockpile and train loading bin would be required for the project.

Coal would be stockpiled at the rail head and then loaded to trains for railing to WICET. The stockpile would be a maximum height of approximately 25m and a maximum capacity of approximately 100,000 tonnes, covering an area of approximately 20ha. The train loading bin would be positioned above the rail line and be approximately 30m high. Coal would be fed to the bin by a reclaim conveyor system from a product coal stockpile. The stockpile would be bunded to prevent ingress of clean stormwater. Dirty stormwater from the stockpile would be directed to an environmental dam.

The supplementary EIS identified an additional infrastructure area to be located near the train load out facility. This would include a workshop, shed for chemical storage (minor storage of lubricants, surfactants, waste oil), diesel storage tank (approximately 60,000L capacity), raw water tank (approximately 20,000L capacity), potable water tank, and combined office/lunch room.

Although the entry point of The Range Project railhead onto the SBR line has not been finalised, it was assumed in the EIS that distance from The Range Project railhead to Banana would be approximately 196km out of a total of 210km of SBR track works. This section of SBR track would be shared with other Surat Basin coal producers. Construction of the SBR line would take approximately 3 years from commitment. An existing Aurizon would be available to transport coal from Banana to WICET.

4.6.6 Mine infrastructure

The Mine Infrastructure Area (MIA) would be located in the north east of the MLA area, covering an area of approximately 77ha. The MIA would be bunded to direct clean water around the area and potentially contaminated water to a mine water dam (mine water dam 1). Areas storing fuels or oils and washdown areas would be bunded and runoff from these areas would be directed to a sump to separate oils and water prior to releasing water to the environment dam. Oils and fuel would be collected and disposed of by a licensed waste disposal contractor.

Fuel requirements over the life of the mine would increase as the depth of pit increases. It was estimated that approximately 28 million litres per annum of diesel would be required for the first 17 years of mine life. This would

increase to approximately 45 million litres per annum towards the end of mine life.

The fuel facility would comprise a number of interconnected self bunded bulk diesel storage tanks. Approximately 300 kL of fuel storage would be required on-site. There would be no in-field fuel storage. Fuel trucks would transfer fuel from the fuel storage tanks to mine vehicles.

The lube and oil facility would include: self bunded lube and oil storage tanks; a total oil storage volume of approximately 40,000L; a total storage volume for lubricants and coolants of approximately 3,000L; slab on ground oil and lube tanker unloading area; and some reticulation of oils and lubricants depending on the final configuration of the MIA facilities. Hydrocarbon and other contaminated waste would be collected, transported by a licensed waste transporter and disposed of at an appropriately licensed waste disposal facility.

Heavy vehicle and light vehicle washdown facilities would be provided on the MIA. Water from the facility would be collected in a silt trap, and discharged via an oily water separator and recycled water collection tank. All water and drainage from both washdown facilities would discharge into a grit trap then an oil/water separator, with water recycled back into the washdown process where possible, oils removed by licensed contractor, and remaining washdown water discharged to an adjacent mine water dam.

A potable water reticulation system, including storage tank, pump set and ring mains, would distribute potable water from the potable water storage tank to the administration building, main workshop, CHPP, security building and warehouse, and covered external eyewash/deluge shower. Potable water would be supplied by truck from Wandoan, with an estimated 10kL required per day, requiring approximately 3 to 6 truck movements per week. The duration that coal would be stockpiled would be minimised so as to reduce the risk of spontaneous combustion. Any coal showing signs of spontaneous combustion would be broken up and watered from the water reticulation system.

The MIA power supply would be provided by a transformer based on the maximum demand estimate for the MIA. External area lighting would be provided around all infrastructure and hardstand of the MIA and internal lighting in all buildings at the MIA.

Approximately 11,000 tonnes per annum of explosives would be required during the first 17 years of the mine life. As the coal depth increases, the quantity of explosives would increase to approximately 19,500 tonnes per annum towards the end of the mine life. Approximately 10% of the total explosives volume would be wet explosive and 90% would be Ammonium Nitrate/Fuel Oil (ANFO). An explosives magazine, to house detonating explosives, bulk storage and all associated materials, would be designed and constructed to Australian Standard (AS) 2187 Explosives—Storage, Transport and Use, and any other applicable standards and industry best practice. The magazine would be located in an isolated area for safety and security purposes.

The proposed blast magazine location would be located at least 1,500m from any other mine infrastructure (except the proposed out-of-pit TSF and mine water dam). The nearest residence to the magazine would be approximately 3 km away. EHP raised concerns regarding the location of the out-of-pit TSF and mine water dam within the 1,500m separation distance. EHP commented that if the storage magazine exploded the probability of the dams failing would be high and requested that Stanmore provide alternative locations for the explosive magazine and storage that would have a lower risk of impacts if explosion occurs. In response, Stanmore argued that the proposed location of the magazine was acceptable and would pose little risk to the integrity of nearby dams. The company calculated that the likelihood of an unplanned explosion in the bulk storage compound would be extremely low. The planned location of the explosive compounds in the EIS was carefully considered to: achieve regulated separation distances from workplaces/public roads/homesteads; minimise accidental interaction by mine workers; and maintain all weather access and security. EHP was satisfied with Stanmore's response.

4.6.7 Waste management and sewerage

The primary source of waste from mining operations would be excavated waste rock (overburden and interburden), coarse rejects and tailings from the CHPP. Management of excavated waste, rejects and tailings is described in sections 4.10.3 (Rejects and tailings) of this report. Other waste streams would include general waste, recyclable wastes, scrap steel, waste hydrocarbons, including oils, waste chemicals, waste tyres, waste batteries, and sewage. Waste management, including a description of types of waste and estimated volumes, is described in 4.10.1 (Regulated and other wastes) of this report.

4.6.8 Water supply and management

Water requirements for the project were originally estimated to be approximately 1,350 megalitres per annum. Several water supply options were considered in the initial EIS: a branch pipeline from the proposed SunWater Nathan to Dalby pipeline; from the proposed Nathan Dam to Dalby pipeline; or from an off-take agreement with a coal seam gas (CSG) producer. Following more detailed water modelling, the supplementary EIS reported new water requirements estimated to be a maximum of approximately 2,868 million litres per annum (ML/a) in year 25.

The supplementary EIS outlined the preferred water supply option for the project being from SunWater's proposed Wolleebee Creek to Glebe Weir pipeline. DNRM raised a number of concerns about the alternative water supply options (the use of untreated CSG and impacts of trenching associated with any pipeline to the proposed Nathan Dam to Dalby pipeline) which are no longer relevant. WDRC advised Stanmore that WDRC could not guarantee that domestic water supply from Wandoan would be available for the entire duration of the mine and that first priority must always be given to the residents of Wandoan. Stanmore committed to liaise further with WDRC regarding this issue.

Water management for the project is discussed in section 4.11.1 (Water management strategy) of this report. This includes a description of: water demand; raw and potable water supply; water balance considering all inflows such as rainfall, groundwater inflows; the quality of mine affected water; and management of mine affected water, storm water and waste water.

4.6.9 Transport

Roads associated with the mine would include: haul roads for mining vehicles and equipment within the mine site; site access and internal roads within the mine site; public access road to the mine site from the Leichhardt Highway; other public roads and road relocations; and stock routes.

Approximately 3km of haul roads are proposed over the life of the mine, with additional in-pit haul roads to be constructed. Haul roads would be designed to include a width of about 30m to allow two-way traffic of mining vehicles. Haul roads would not cross watercourses.

The 10.2km long site access road (proposed to be 7.6km in the initial EIS) would be constructed to the same standard as the mine access road. Drainage would be provided (as required) along the length of the road. Internal light vehicle roads would be constructed to provide access to areas on-site, such as to the magazine, tailings storage facilities, mine water dams, sedimentation dams and to the overland conveyor. These roads would be unsealed formed roads.

The main gate would be located along the site access road from the intersection with Old Chinchilla Rd and would be serviced by a permanently manned security building. Access to the site from the Wandoan township would be south along the Leichhardt Highway before turning onto Downfall Creek Road to Old Chinchilla Road. Downfall Creek Road would be upgraded by Xstrata as a requirement of the development approval for Xstrata's Weringa quarry. This upgrade would be to a WDRC standard for a sealed road with a minimum width of 8–9 metres. Some existing wooden bridges would require upgrading on this section.

From the quarry access, a further 4.6 km of road would need to be upgraded to the MLA 55001 boundary. The upgrade to this section would be similar to that described above. Drainage would be installed as required.

The proposed coal pit would result in the requirement for the relocations of local government owned roads, new sections of road and temporary or permanent closure of some roads (Knights Rd). Stock routes occur along Old Chinchilla Road and Roche Creek Road.

The impacts of the project on existing transport infrastructure are discussed in section 4.9 (Transport) of this report.

4.6.10 Energy

Power demand is estimated to be 11 megawatts (MW) but infrastructure would be designed for the supply of between 12MW to 15MW. The main power requirements would be from the CHPP and two 800 tonne class electric hydraulic shovels, the overland conveyor and MIA facilities.

Power options investigated and outlined in the EIS were a connection to existing electricity transmission grid infrastructure near Wandoan or Guluguba, or an on-site gas-fired power utility using coal seam gas supplied from nearby pipelines. Queensland Health and EHP commented that the initial EIS provided insufficient detail on the proposed on-site power generation facility. Stanmore responded that a requirement for a gas fired power station was no longer necessary.

The final power option would involve connection of the substation/switching yard by a 66kV power line to the Powerlink Wandoan South substation west of Guluguba, for which an EIS is in progress. From Wandoan, the power line would travel up the southern side of the Roche Creek Road reserve to the Stanmore Mine substation to be constructed at the intersection with the conveyor corridor. The power line would then split at this point and a 66kV power line would run west to the train loading facility, and a 66kV power line would run east to the mine infrastructure area. There would be additional substations located at the train loading facility, conveyor mid point ("transfer 2 substation") and the mine infrastructure area. These substations would include a 66kV/11kV step down transformer sufficient to supply the relevant infrastructure.

A local landholder raised concerns about the uncertainty as to the final location of the powerlines and impacts on their property. In the amended EIS Stanmore outlined the preferred location for the powerline and pipelines.

Stanmore stated that the property in question would not be affected by the final power and pipeline location and committed to continuing negotiations with the landholder.

Approximately 10km of a Single Wire Earth Return (SWER) line, which runs through a property on the eastern side of the mining lease, would need to be relocated as part of the development of the mine. Stanmore would need to provide for power to be supplied to this residence by a connection to planned mine site power infrastructure. Other properties outside the MLA area which rely on electrical infrastructure that currently crosses the MLA areas would have power provided via the relocated infrastructure.

Powerlink and Ergon Energy advised that any impact on existing power infrastructure (developed or undeveloped) would need to be addressed by Stanmore at Stanmore's expense and advised of safety requirements when working in the vicinity of electrical infrastructure. Stanmore responded that no Powerlink assets were located near the mine site and committed that Stanmore would consult with Ergon Energy in relation to these matters at the appropriate detailed design stage.

The QMDC commented that the impacts of the project's power demand on existing electricity infrastructure and current users of this infrastructure in the project development area, had not be fully assessed and evaluated. Stanmore responded that it had been liaising with the electricity network provider, so that long term network planning can consider the power requirements of The Range Project without compromising the current users of the infrastructure.

4.6.11 Telecommunications

The EIS reported that mobile phone coverage over the project area was patchy. Stanmore has held initial discussions with Telstra Corporation who advised that mobile service to the area would be upgraded in conjunction with CSG pipeline development in the near future. Stanmore would continue discussions with Telstra prior to project construction to ensure communications in the area are sufficient for construction and operations. Fibre optic cable is present along the Leichhardt Highway. It would be possible to link site operations into this infrastructure using microwave technology. A fibre and mobile upgrade desktop study is being prepared by Telstra. WDRC requested that Stanmore collaborate with WDRC and other major project proponents to collectively fund appropriate telecommunications infrastructure to provide adequate telecommunication services to meet the needs of all projects, local businesses and local communities. Stanmore noted and responded WDRC's request in the supplementary EIS.

4.6.12 Rehabilitation and decommissioning

Rehabilitation of the mine would be progressive throughout the operation and decommissioning phase of the mine, and involves many elements addressed throughout the EIS, including but not limited to, mine scheduling, overburden and soils management, water management and terrestrial and aquatic ecology. Decommissioning would be phased over the life of the mine, with the majority of decommissioning activities occurring during the mine closure phase. Rehabilitation and decommissioning is discussed in detail in section 4.22 (Rehabilitation and decommissioning) of this report.

4.6.13 Accommodation and workforce

The total workforce during operation would initially be approximately 400 employees—increasing to an estimated 500 employees during peak production. Employees would be accommodated at a central accommodation village at or near Wandoan or Miles for the drive-in/drive-out members of the workforce. The village would be owned and operated by an external party and was therefore not included in the scope of The Range Project. Workers would commute in private vehicles or, arranged bus services from a central location, from their homes to the accommodation facilities and then be transported by bus from the accommodation facilities to the mine site. The social impact associated with accommodating workers for the project is discussed in section 4.18 (Social impact) of this report.

4.7 Climate and climate change

4.7.1 Current climate

Chapter 10 (Climate and climate change) of the EIS described the local climate of the project and how it may affect the potential for project related environmental impacts and the management of operations at the site.

The region is classified as sub-tropical, with hot dry summers (warmest months on average are December, January and February) and cold winters (coolest month is July). The climate of the region, in particular the rainfall, is largely influenced by the El Niño Southern Oscillation with El Niño cycles generally resulting in less rainfall (periodically extending to drought) and La Niña more rainfall (periodically resulting in extreme precipitation events). On average,

the region receives relatively low annual rainfall (average 653mm/y) due to its inland location and the Great Dividing Range acting as a barrier to the moist on-shore flow. Rainfall patterns are characteristic of a sub-tropical climate, with 50% of the annual precipitation occurring during the monsoonal summer period (November to February) and 15% of the average rainfall occurring in late winter and early spring (July to September).

The EIS reported that a large proportion of annual winds (60%) blow from a northeastern direction and tend to be moderate to strong. Winds from the south to southwest direction also make up a significant proportion (20%) of the annual winds at the site. There are a number of complexities in the speed and direction of wind across the region due to the site's inland location and proximity to elevated terrain around the ranges. The EIS reported that the project area would likely experience nocturnal katabatic wind—a downslope wind caused by greater air density on the slope than at some distance, horizontally from it because of the faster rate of surface cooling of the slope than in the valley below it. This effect is expected to be more pronounced during the winter months when clear skies would facilitate effective night-time cooling.

Natural hazards that may impact the project include drought, dust storms and bushfire:

- While dust storms are more common in drier inland areas of Australia, the EIS estimated the region can expect approximately one dust storm every two years. Such events are more likely to occur during periods of extreme drought and are linked to strong east-coast lows, which are most prevalent in the period between autumn and spring.
- The Range Project would be located predominately in areas of low bushfire hazard with some areas of medium bushfire hazard according to the Taroom and Murilla Planning Schemes (now part of the WDRC). The highest risk of bushfire for the project area was predicted to be in spring and summer, which are dominated by moderate to strong westerly winds, during hot, dry conditions over the region.

The EIS concluded that due to the site's elevated position in the landscape (at the apex of the Great Dividing Range) and location (inland in south central Queensland) extremes of climate associated with flooding, cyclones and earthquakes are unlikely to impact the project. In regards to flooding, the project would not possess a significant catchment area as the site would be located above and on the divide between two significant regional drainage systems (Fitzroy and Condamine-Balonne Basins).

The EIS included a risk assessment of how extremes of climate may affect management of the project, focusing on impacts to the project from extreme climatic events that have the potential to result in environmental harm. The risk ranking for impacts was assessed as low to medium for all potential impacts. Medium risk scores related to impacts including rehabilitation success being compromised, release of hazardous waste to waterways, overflow from mine pits and destruction of mine infrastructure causing release of contaminants due to fire.

To mitigate these risks the EIS committed to consider the risk of extreme climatic events in the design of infrastructure during detailed engineering and develop management plans to guide the actions required by project staff in the event of an extreme climatic event. The EIS concluded that with implementation of controls, the risk of potential impacts (under the current climate experienced at the project site) would be reduced to an acceptable level.

4.7.2 Predicted Climate Change

The EIS outlined information on predicted climate change in the area of the project from the Technical Report 2007 on Climate Change in Australia (CSIRO, 2007). Predictions for 2030 and 2050 were considered the best indication of the future climate for the project as 2030 would occur midway through operations and 2050 would occur 5 to 10 years after rehabilitation of the mine site is completed. From this data the predicted variation in temperature change by 2030 ranges from an increase of 0.6°C to 1.5°C; and by 2050 between 1°C and 3°C. The predicted variation in rainfall change at the project site by 2030, ranged from a decrease of 40% to an increase of 10% and by 2050 from a decrease of 40% to an increase of 20%. In regards to drought periods, model simulations showed up to 20% more drought months over most of Australia by 2030, with up to 40% more droughts by 2070 in eastern Australia. Wind speeds by 2030, ranges from a decrease of 2% to an increase of 10% and by 2050 from a decrease of 2% to an increase of 15%. No variations in tropic cyclone occurrence were projected at the project site.

The EIS assessed the vulnerability of potential climate changes that may affect the viability and environmental management of the project. It outlined adaptation strategies, mitigations measures and commitments for managing potential impacts resulting from climate change. The EIS concluded that climate change predictions for temperature, rainfall, drought, wind speed, storms and cyclones within the life of the mine would be small in comparison to the existing natural variability of climate experienced at the site. The residual risk for impacts from climate change (the risks associated with the changes in climate rather than extreme weather events) was assessed as low for all potential impacts except for the following medium risks:

- Rehabilitation success may be compromised during final rehabilitation due to increases in average temperature, decreases in average rainfall, increased frequency and duration of droughts or a combination of

these factors.

- Water supply to the mine may become more reliant on off-site sources or may cease due to an increase in the frequency and duration of droughts.

Stanmore committed to continually monitor actual and predicted climate changes in order to determine the likely success of rehabilitation strategies. These would be amended over the life of the mine to provide the best probability of rehabilitation success. Detailed design and planning of site water management would consider water supply under conditions of increased frequency and duration of droughts.

The Department of Community Safety (DCS) advised that it was satisfied that the EIS adequately addressed the impacts of climate change on flooding and bushfires.

4.8 Land

Chapter 10 (Landuse, tenure and planning) and Chapter 11 (Geology, topography and soils) of the EIS described the existing environment values and impacts of the project on land areas. It described objectives and practical measures for protecting or enhancing land-based environmental values, how nominated quantitative standards and indicators would be achieved, and how achieving the objectives would be monitored, audited and managed.

4.8.1 Geology and topography

The predominant geological unit underlying the site is the Mid-to-Upper Jurassic Age (i.e. 131–178 million years before present) Injune Creek Group—a sedimentary unit composed of lithic sandstone, siltstone, mudstone and coal. Level to gently undulating plains (generally <2% slope) predominate in the eastern areas of MLA 55001 and reflect the Quaternary and eroded Tertiary geological units, with some steeper low hills associated with Tertiary remnants. Gentle undulating plains associated mainly with the Injune Creek (Jurassic) Group are found to the west of the level plains and have slopes that typically vary between 2% and 12% with some more level areas near local stream channels (with localised Quaternary alluvium and colluvium) and steeper areas near the landscape of Tertiary origin. This Jurassic landscape essentially forms a broad basin within the central western area of MLA 55001 with drainage trending from a north east to south west direction. A prominent low hill, with relatively steep slopes (up to 40%), is associated with the basaltic geological unit in the south west corner of the site. Low hills, scarps and plateaus are found in the western areas of MLA 55001. Slopes are commonly steep (>25%) at the edges of the plateau however the actual plateau forms a level to undulating plain.

The transport corridor is mainly comprised of gently undulating to steeply undulating hills and rises with slopes mainly between 2 to 10%. A steep area (representing the 'dropoff' from the western limits of the Tertiary plateau) is located approximately 3km along the corridor.

4.8.2 Resource utilisation and mineral resources

The project area lies within the Walloon subgroup of the Surat Basin, which is contiguous with the Clarence-Moreton Basin across the Kumbarilla Ridge near Dalby and is comprised of a thick sequence of interbedded coal and sediments with 2 major coal groups, being the Juandah and the Taroom measures. The stratigraphic units in the project area are found within the Taroom Coal Measures.

The project contains an estimated total resource of 287 million tonnes of in situ coal (187 million tonnes indicated, 82 million tonnes inferred and 18 million tonnes measured category). The existing economic resource on MLA 55001 is expected to be mined in its entirety. Additional exploration may identify further resources in the future. It is not expected that any significant volumes of coal seam gas are present in the coal as the shallow coal seam is likely to have desorbed the majority of coal seam gas over time.

The EIS stated that discussions with other tenure holders along the path of the transport route had not identified any currently defined economic coal resources that would be impacted by the proposed transport route. DNRM requested:

- confirmation that the transport corridor (conveyor and rail spur) would not sterilise any coal resources within Cockatoo Coal's Bottle Tree project.
- that Stanmore provide evidence of consultation with affected EPC holders (specifically Xstrata and Cockatoo Coal) and details of any arrangements to mitigate impacts on resources being explored on those EPCs or on mining operations that may be developed on them in the future.

In the supplementary EIS, Stanmore responded that the transport corridor would not sterilise any coal resource, as much of the infrastructure is temporary in nature and can be moved or removed to allow subsequent land use following the decommissioning of the mine and ancillary infrastructure. The company maintained that it had consulted with Cockatoo Coal over a range of regional issues including resource location, future plans for

infrastructure and infrastructure sharing arrangements.

DNRM was initially dissatisfied with Stanmore's response on these matters in the supplementary EIS. However, following further correspondence from Stanmore, DNRM indicated that they were satisfied that Stanmore had adequately addressed the issues.

The EIS stated that the project would not use timber resources from outside the ML. It is proposed that quarry material would be obtained from the proposed Weringa quarry to be developed by Xstrata (principally to service Xstrata's proposed Wandoan Project) within the boundaries of The Range Project's MLA 55001. DNRM requested that the impact of depletion of limited resources, particularly the aggregate materials used in the manufacture of concrete, be highlighted in the EIS to ensure its consideration. DNRM requested that the volume of extractive materials that would be needed in the construction of the proposed facilities and the potential impact on the normal supply/demand of extractive resources in the region impacted by the project (including any mitigation measures) be addressed. In the supplementary EIS, Stanmore provided additional information (section 6.4.1) on the potential impact of the project on the supply/demand of extractive resources in the region. Stanmore asserted that the use of the Weringa Quarry as the likely source of aggregate materials for construction of the project, would have no impact (in terms of resource depletion) on the existing extractive resources in the region as the quarry is not yet operational and therefore does not supply material into the existing market. DNRM responded that supplementary EIS did not adequately identify potential issues around the supply of extractive resources (especially during expected high demand periods), address impacts on normal supply/demand conditions or provide measures to mitigate impacts, particularly in relation to sand.

Recommendation: *Stanmore consult with DNRM and provide additional information on the volume of extractive materials required in the construction of the project and assess the impacts of the project on the supply and demand of sand—especially during potential high demand periods.*

DSDIP commented that the EIS had not assessed the commercial standing timber trees present/not present on the freehold land of the proposed project site. It requested Stanmore: conduct an assessment of the commercial standing timber present/not present on the area's that need to be cleared/impacted by the project, specifying the product types (i.e. sawlogs, poles, girders, fencing timbers, etc), volumes/quantities (i.e. cubic metre, lineal metre, pieces, etc) and location of the commercial timber (map); and that commercial timber salvage/harvest operation is offered to timber/fencing processors in the local vicinity (200 km radius) to maximise the utilisation of this timber resource. Stanmore responded, that the vegetation communities on MLA 55001 are dominated by Brigalow, which has limited commercial value and use but committed to make any viable timber available to local sawmillers upon request. Alternatively, the vegetation would be used in the rehabilitation of the site for the provision of micro habitats, as recommended by ecologists.

4.8.3 Land tenure and landuse

The project would be situated in a rural area with relatively large properties and a low population density. There would be 9 properties directly affected by mine site activities and 10 properties intersected by the transport corridor and train loading facility. No residents would live within the boundary of the mining leases or train loading facility area at the commencement of construction. In general, land that would be impacted by project activities and land adjacent to the project is used for grazing with some fodder cropping. Additionally, there is an area of State Forest along the southern boundary of MLA55001. Impacts on State Forest are discussed in section 4.15 (Terrestrial ecology) of this report.

Stanmore committed to enter into compensation arrangements with landholders for the loss of access or use of land. The company committed to provide access to areas within the mining lease boundaries, which are not subject to disturbances from mining, for ongoing grazing or other use of the land. This would assist in mitigating impacts on affected landholders.

Approximately ten occupational crossings of the overland conveyor may be required to allow access from one side of the property to the other. Negotiations with landholders would be carried out to determine the optimal location and design for the occupational crossings. Arrangements would be entered into with landholders along the transport corridor and train loading facility to mitigate impacts through the provision of crossing points for stock and vehicles or direct negotiation for usage rights to land.

DSDIP commented that the proposed transport corridor is adjacent to the Urban Investigation Area identified in the forthcoming WDRC planning scheme, which would limit the expansion of the town to the north-east. The town is slowly becoming surrounded by mining activity, which cumulatively may limit the options for housing people in the town to support these resource projects. Stanmore responded in the supplementary EIS that the proposed conveyor lease area was more than 5km from the outskirts of the Wandoan and that it was unlikely that the township would expand to cover this area within 25 years. Additionally, as the Western Downs Regional Council Planning Scheme is not publically available Stanmore cannot amend the EIS to accommodate this identified growth area. DSDIP provided no further comment.

FBA commented that while the EIS listed the DNRM regions that the project resides in, it did not include an assessment as to how the proposed project would impact on targets in the Fitzroy Basin Regional Plan (the Central Queensland Strategy for Sustainability: 2004 and beyond). Stanmore responded that the Fitzroy Basin Regional Plan includes targets and actions to manage mining and its impacts, for example, the plan sets out management targets such as the full implementation of Environmental Authority (EA) conditions for the whole of a mine life, which they intend to achieve. Overall, Stanmore maintains that the economic, social and environmental impacts (both locally and in the Fitzroy region) of The Range Project had been considered through the EIS process, and that impacts identified would be minimised or managed through a number of strategies and plans.

4.8.3.1 Transport corridor

The proposed transport corridor (encompassing the overland conveyor and linear infrastructure) from the mine site to the product stockpile at the train loading facility would pass over 9 properties. The conveyor route location was planned to align as close to property boundaries as practical to minimise instances where land would be effectively split by the conveyor. Occupational crossings would be constructed to allow access from one side of a property to the other and to a standard that would enable heavy vehicle use if required. Negotiations with landholders would be carried out to determine the optimal location and structure for the occupational. The conveyor would be an elevated structure that would allow overland flow beneath the conveyor to minimise local ponding.

The investigation corridor for the conveyor was 200m wide to allow for minor changes in horizontal alignment during the detailed design. The corridor would be fenced along both sides with a 4 strand barb stock fence over much of its length. The width of the fenced area in the initial EIS was proposed to be 10m. With the finalisation of the transport option in the supplementary EIS (i.e. co-location of the conveyor and linear infrastructure), the anticipated width of the fence was increased to 25m. For security reasons, fencing would be provided near road crossings and where the conveyor would be visible from public roads.

Numerous landholders raised concerns about potential adverse impacts from the transport corridor adjacent to or intersecting their properties. Concerns included:

- Impacts on human health and amenity from the generation of dust from the conveyor.
- Impacts of lighting from the infrastructure corridor on livestock, amenity, social aspects and sensitive receptors 25 and 26 at night in a rural environment.
- Impacts on contour banks built by landholders to facilitate crop growth, prevent erosion and direct the flow of water into existing strategically placed dams.
- Erosion around crossings and access for farm machinery.
- Direct loss of land and pasture (e.g. existing Leucaena paddocks).
- Concerns about maintenance of any vegetation within the corridor particularly in relation to impacts on visual amenity and potential fire risk of overgrown grass.
- Concerns about an increased risk to the health and safety of both humans and cattle in the event of fire, flood or other hazardous events as a result of obstruction from restricted access points. Designated access points of restricted width would only accommodate a certain number of cattle or vehicles at a time, and may slow down any required evacuations.
- Impacts on general business operations on adjacent properties and the health and safety of livestock due to severance of the land by the corridor. Landholders were concerned that the corridor would limit the capacity of stock to move between severed areas and therefore reduce stock access to pastures, extend mustering times, require livestock to travel farther than otherwise required, reduce access to water bores and preclude maintenance and operation of existing water reticulation network. They contend that delays in treatment of livestock, may exacerbate any existing conditions of the animals, and in the case of pregnant cows, may impact upon the health of any calves.
- Uncertainty for the continued occupation and operation of properties as a result of the location of the transport corridor route not being finalised.
- Impacts on property's value and market appeal.

In the supplementary EIS, Stanmore confirmed the final route for the transport corridor (the northern option along the boundary of MLA 55001 and then within MLA's 55009 and 55010). Stanmore stated that this option would cause the least disturbance and inconvenience to land holders. Stanmore committed to continue discussions with landholders to address the issues raised in the EIS, including adequate compensation or suitable alternative arrangements. Mitigation and management measures committed by Stanmore in the supplementary EIS included:

- Landholders whose properties would be intersected by the overland conveyor would be consulted and

arrangements entered into to facilitate crossing points of the conveyor or pay compensation (if required).

- Covering of the conveyor near receptors R25 and R26 to reduce dust impacts.
- Regular maintenance regime along the transport corridor including vegetation management to minimise bushfire risk.
- Development of an Emergency Management Plan which would include a Bushfire Management Plan in accordance with SPP 1/03 and the QFRS.
- The choice and location of audible or visible alarms would be chosen to minimise environmental noise emissions to nearby noise sensitive places (while also complying with Workplace Health and Safety).
- Design of surface infrastructure, including conveyor , access track, water pipeline, and overhead power line to enable Stanmore to follow existing contours (including contour banks) and minimise the 'cutting down' of contour banks.

The impacts of dust, noise and lights from the conveyor and proposed mitigation measures are discussed further in sections 4.13 (Air quality) and 4.14 (Noise and vibration) of this report.

Recommendation: *Stanmore consult with landholders whose properties would be affected by the overland conveyor to address concerns and minimise, mitigate and compensate for impacts from the transport corridor on human and animal health and safety, business operations and efficiency, property values and market appeal.*

4.8.3.2 Stock routes

Stock routes in the vicinity of the project (one running parallel to Old Chinchilla Road and one running parallel to Roche Creek Road, where it is intersected by the transport corridor) are designated as inactive. A stockroute from Miles to Taroom which runs along the Leichhardt Highway is currently categorised as a minor route. The EIS concluded that the project would not have a significant impact on stock routes.

DNRM commented that where there would be disruptions to the stock route network, realignment/replacement with corridors of similar width and suitable country type would be required to allow for the safe and uninterrupted flow of travelling stock and the travelling public. This may require provisions for watering facilities and other infrastructure. Stanmore is requested from the early planning stages to consult with:

- The Rural Lands Officer (WDRC) regarding potential impacts to: the stock route connecting the Leichhardt Highway to Old Chinchilla Road; the stock route that follows Old Chinchilla Road; and the stock route running parallel to the Leichhardt Highway between Wandoan and Guluguba.
- The DNRM Senior Lands Officer (Stock Routes) and the Rural Lands Officer (WDRC) regarding potential impacts to the stock route along Roche Creek Road.

Recommendation: *Stanmore consult with Rural Lands Officers from WDRC and Senior Lands Officer (Stock Routes) from DNRM regarding impacts on stock routes and mitigation strategies to ensure co-existence of these routes.*

4.8.3.3 Indigenous agreements

There are two Indigenous Land Use Agreements (ILUAs) over this area:

- Iman People #2 and QGC Limited ILUA (registered 07 February 2011) which covers the northern half of MLA 55010 to the intersection with the northern boundary of Stanmore's EPC 1112.
- QGC Limited and Barunggam, Cobble Cobble, Jarowair, Western Wakka Wakka and Yiman Groups (registered 22/12/2010) which covers the southern half of MLA 55010 (from the intersection with the northern boundary of EPC 1112), the majority of EPC 1112 and all of MLA 55001.

Stanmore has undertaken a native title extinguishment assessment over land within MLA 55001, MLA 55009, MLA 55010, the power corridor and the train loading facility. Stanmore is of the view that native title has been extinguished in relation to these areas on the basis of current or historical tenure grants, except for a small portion of Weringa Creek intersected by the transport corridor. Further information on Cultural Heritage Management Plans for the project is provided in section 4.18 (Cultural heritage) of this report.

4.8.4 Soils and land suitability

The EIS estimated that 90% of MLA 55001 has subsoils that are strongly sodic and/or highly dispersive and almost all soils along the transport corridor had similar properties. Management of these soils, in regard to erosion control and rehabilitation, would present a challenge for the development of the mine area and transport corridor. The soils are especially prone to gully and tunnel erosion, even in low sloping situations, where concentrated runoff may

occur in minor drainage channels. A detailed sediment and erosion control plan would be developed for the mine area and the transport corridor. The plan would build on the erosion and sediment control strategies outlined in the EIS.

DNRM commented that the proposed transport corridor would traverse properties containing existing soil conservation works. They requested that preference be given to locating the corridor away from constructed waterways, or the discharge ends of contour banks, to minimise the risk of erosion on the corridor, or the need for additional runoff control works. Should the proposed transport corridor impact on constructed soil conservation works, Stanmore should undertake necessary steps to ensure soil conservation works are re-instated post construction to meet the purpose of managing runoff. In response, Stanmore amended the text in Chapter 12 of the supplementary EIS to reflect these comments. Stanmore noted that infrastructure following the transport corridor would be raised off the ground with intermittent piles, which would reduce disturbance to existing soil contour banks and minimise requirements for additional runoff control works.

Recommendation: *Stanmore consult with DNRM and landholders to identify and mitigate impacts from the transport corridor on soil conservation works.*

DNRM raised many issues with the sampling, mapping, analysis, characterisation and reporting of soils in the EIS—including soil drainage characteristics associated with gilgae components. DNRM requested that Stanmore provide additional information to allow DNRM to assess, confirm or verify the information provided. Stanmore conducted some additional sampling, analysis and characterisation of soils which was reported in Appendix 11A of the supplementary EIS.

4.8.5 Land suitability

Land suitability assessments conducted in accordance with the Land Suitability Assessment Techniques in the Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland (DME, 1995), determined the following for the project area:

For grazing purposes, the non-cracking and cracking clay soils (notably A1, A2, B1 and B2) on the site were determined to be most valued for pasture production and beef cattle grazing, with large areas classified as Class 2 (land which is suited to a proposed use with minor management limitations).

For agricultural purposes, the soils were determined to be less suited to permanent cropping due to limitations, with no Land Suitability Class 1 (land well suited to a proposed use with few or minor limitations) areas, some small areas of Class 2 (well suited to a proposed use with minor management limitations) and the majority of the area determined to be Classes 3 (moderately suited but requires significant input to sustain the use) to 5 (unsuitable for proposed use due to extreme limitations).

The mine closure and rehabilitation plans would seek to return rehabilitated areas to the original land suitability class. This is discussed further in section 4.22 (Rehabilitation and decommissioning) of this report.

4.8.5.1 Good quality agricultural land

Mapping in the Taroom Shire and Murilla Shire Planning schemes identified land within the project areas as Good Quality Agricultural Land (GQAL) Class A, B or C. Site assessments of the project area concluded that agricultural land quality is lower than indicated on mapped areas. The EIS calculated areas of GQAL on the project area as follows:

Class B: 4606ha

Class C: 938ha

Class D: 105ha

Class D and C: 385ha.

DNRM requested clarification on the rationale used in determining the GQAL status of mapped areas, the delineation of GQAL polygons and the relationship between soil unit polygons and GQAL polygons in the submitted maps. Stanmore clarified these issues in Chapter 11 of the amended EIS.

A landholder within MLA55010 disagreed with the contention in the EIS that there is no good quality agricultural land within MLA 55010. They content that the EIS under-estimated the quality of the land for farming purposes and did not recognise its ability to grow commercial and fodder crops as well as Leucaena. The landholder reported that sections of their land within MLA55010 had been used for farming continuously for at least the last 70 years for growing wheat, oats, sorghum, sunflower, mung beans, linseed and more recently, Leucaena. The landholder stated that the effective returns of these crops indicate that they land fits within the description of good quality agricultural land. In response, Stanmore stated that the term ‘GQAL’ is a classification used under SPP 1/92. The Taroom Shire and Murilla Shire Planning Schemes identify Good Quality Agricultural Land (GQAL). Based on the

assessment undertaken during the EIS process, the property in question was classified as Class A; with small pockets of Class C1 land but none of the Class A land would be disturbed. Class A1, A2, B1, and C1 soils are considered GQAL under the SPP1/92.

Another landholder raised similar concerns. This landholder was concerned about the mapping methodology and that the resulting classification of GQAL class was not consistent with the actual agricultural activities occurring on the land e.g. growing of forage sorghum for the last 7 seasons in a row. The landholder also commented that the limitations and assertions discussed in the EIS were not consistent with long term experience on the land e.g. gilgae formation had been levelled by the process of clearing the land of Brigalow and ploughing for cropping such that machinery passing over the land was not restricted by the hollow. The landholder reported that the land was capable of sustaining periodic cropping which justified maintenance of the Class 2 GQAL classification.

4.8.5.2 Strategic Cropping Land

Publically available mapping of Strategic Cropping Land (SCL) showed that The Range Project is located outside of the Strategic Cropping Protection Area but within the Strategic Cropping Management Area. Areas mapped as potential SCL according to the Queensland Government SCL trigger maps were:

- 839ha of MLA 55001
- 583.6ha of the transport corridor and train loading facility
- 31ha of the power linear infrastructure corridors (outside MLAs).

A site investigation was conducted to determine the actual presence of SCL in the project area. Based on the site investigation, the EIS concluded that SCL does not satisfy zone criteria or minimum area (100ha) size and aggregation guidelines within the MLA 55001 area. These conclusions are due to slope exceeding the 3% criterion and/or chloride level exceeding a level of 800mg/kg within 60cm of the soil surface over the majority of the potential SCL area.

Limited investigations were conducted in the transport corridor and train loading facility area due to access limitations. The EIS considered that the bulk of the potentially impacted area would not be SCL due to most slopes being in excess of 3% and/or elevated chloride levels in the subsoil.

The linear infrastructure corridors for power not within the transport corridor intersect approximately 31ha of land, the majority of which is mapped as potential SCL. The EIS considered that the installation of powerlines was not a permanent impact to SCL. Construction of above ground power supply infrastructure would involve vegetation clearing along a right of way but with limited disturbance to soils, confined to the base of power poles. Construction of water pipelines along the transport corridor would not involve trenching and would require minimal disturbance to soils. Right of ways for linear infrastructure would be rehabilitated following construction and hence the EIS concluded that impacts to soils would be minimal.

Overall, the EIS concluded that The Range Project would not affect SCL. Based on the findings of site investigation, Stanmore would seek a validation decision under the provisions of the SCL Act for land that is currently mapped as potential SCL to become decided non-SCL land. Alternatively, Stanmore would make application for a compliance certificate or a protection decision for temporary impacts to SCL in the Strategic Cropping Management Area.

DNRM raised many issues with the sampling, mapping and analytical methods used to classify SCL and were concerned with limited number of sites sampled in the transport corridor. DNRM commented that the conclusions drawn in the EIS regarding SCL, particularly the contention that The Range Project would not affect SCL, were unsubstantiated. DNRM stated that until an application was lodged and a decision made, the Trigger Map depiction of potential SCL applied to the subject land, and any suggestion there were smaller or more accurately identified areas of SCL present on the subject land was speculative. Thus until a validation decision is made, statements in the EIS that there was no SCL on ML55001 and only relatively minor areas in the transport corridor were not accurate. Further, DNRM commented that no details were provided in the EIS regarding measures to protect from, avoid or minimise impacts on the remaining areas of potential SCL. DNRM requested Stanmore amendment the EIS as follows:

- Correct statements in the EIS regarding the extents of SCL on the subject land to reflect the un-validated status of the land (i.e. the Trigger Map extents of potential SCL still apply).
- Provide details as to the means by which the remaining unmined areas of potential SCL would be protected from impacts, or any impacts avoided, minimised or made of a temporary nature.

Stanmore responded that it was aware of the requirements for SCL validation applications and how the SCL process interacts with the EIS decision making process. Stanmore advised that an SCL validation application for MLA 55001 was lodged with DNRM in July 2012. Stanmore advised that it did not consider the SCL Act would affect approval for the project as they expect the validation decisions to be available before a draft EA was

advertised. Stanmore conducted additional SCL investigations for the MLA55001 SCL, the transport corridor and power infrastructure and the results were included in Appendix 11A of the amended EIS. From these investigations, Stanmore concluded that there was no SCL within these areas. Further, pending the decision on the validation application, Stanmore argued that the presence or absence of SCL in the disturbance areas was not a fatal flaw for the project. The relevant legislation provides for mitigation of affected SCL in a management area, generally by a financial contribution. Stanmore contend that it would have the capacity to provide this mitigation should it be required.

In regards to measures for mitigating potential impacts on SCL, Stanmore reported that the land mapped in the SCL Trigger area in MLA55001 had not been used for cropping for at least 20 years and the mapped SCL trigger areas in the transport corridor is not actively cropped and almost all used for broadacre grazing on buffel grass pasture. Thus Stanmore concluded in their 'response to submissions on the initial EIS' that effective grazing stock management including the establishment of appropriate fencing, access and stock watering points, would be sufficient to mitigate potential SCL impacts.

DNRM reviewed the supplementary EIS and Stanmore's response to submission on the EIS in relation to SCL matters and concluded that the supplementary EIS did not:

- Provide sufficient information regarding the requirements of the project under the SP Act and State Planning Policy 1/12 – Protection of Queensland's strategic cropping land (SPP1/12).
- Adequately clarify the areas of Strategic Cropping Land (SCL) to be impacted by the project. There appeared to be some confusion within the supplementary EIS regarding the project area, its separate components and the relevant assessment processes with respect to the SCL Act.

Further, DNRM advised that the current SCL validation application on MLA 55001 contained insufficient information to confirm whether or not the land is non-SCL. DNRM noted that a second SCL validation application had recently been received for the area covered by the projects proposed transport/infrastructure corridor. DNRM also advised that if it was determined that the land impacted by the project is Strategic Cropping Land (SCL), that Stanmore would need to provide mitigation arrangements to address the loss of agricultural productive value if the development results in permanent impacts on SCL.

Recommendations**:** *DNRM has advised that any permanent or temporary impacts on SCL or potential SCL associated with the project must meet the requirements of the:*

- *State Planning Policy 1/12 – Protection of Queensland's Strategic Cropping Land*
- *Strategic Cropping Land Act 2011 and*
- *Strategic Cropping Land Regulation 2011.*

WDRC commented that they fully supported the intent of the SCL Act to protect the long term agricultural viability of the region. They advised that the council would require the proponent to provide the outcome of a validation decision under the provisions of the SCL Act to confirm that no SCL land is affected for relevant approvals sort by the proponent under council's assessment processes.

4.8.5.3 Land disturbance and contamination

The EIS reported that activities associated with The Range Project would result in disturbance to land and changes to land use. Ongoing progressive rehabilitation of waste rock stockpiles and other disturbance areas would minimise the project's disturbance area at any one time. The EIS stated that following decommissioning and final rehabilitation, the majority of the project area would be returned to grazing. Certain project areas, such as the final voids, would remain and access to these areas would be restricted. Rehabilitation and decommissioning is discussed further in section 4.22 (Rehabilitation and decommissioning) of this report.

The EIS identified the likely presence of plunge dips, spray races, fuel storage tanks, pesticide storage areas and conceivably buried waste throughout the proposed development site, but concluded that they would pose a low risk of contamination.

4.8.5.4 Landscape character and amenity

Chapter 24 (Visual amenity) and the Visual Impact Assessment Reports in Appendix 24A and 24B described the landscape character and visual environment of the project area, described potential impacts on the landscape and visual amenity, determined the significance of any impacts and proposed measures to mitigate impacts.

The visual impact assessment concluded that two sensitive receptors would be impacted to a moderate impact level from the mine site and trainload facility: sensitive receptor 17 in relation to the mine site and sensitive receptor 48 in relation to the train loading facility. No receptors were assessed as having a high or very high impact level apart from two along the transport corridor where there would be a high or very high impact to receptors 25

and 26, depending on the western option for the conveyor route.

Mitigation measures were proposed to minimise visual impacts during operations, including vegetation screen planting, building colour and design of night lighting. Progressive rehabilitation measures to re-vegetate the waste rock dump would help blend the feature into the surrounding landscape during operations. Decommissioning would result in removal of potentially visible infrastructure and waste rock dumps would continue to be rehabilitated and revegetated so that they blend into the landscape. The EIS concluded that with the mitigation measures proposed, visual impacts from the project are expected to be low.

Several adjacent landholders raised concerns regarding the impact of the mine on amenity. They reported that homesteads are presently located in a quiet rural locality with unobstructed views of grazing and farming land unobstructed by dust or noise. This would be lost to views of the mine and transport corridor from homesteads and building and have resulting impacts on land values. Concerns were also raised by a landholder about the impacts of night time lighting from the transport corridor on the rural amenity and livestock. Stanmore responded that measures had been proposed to mitigate visual impacts from the transport corridor. They advised that no lighting would be used except at a single transfer point along the conveyor and the light would be appropriately shielded to minimise light spill. Stanmore committed to discuss mitigation measures with adjacent landholders and receptors and implement agreed mitigation measures.

Recommendation: *Stanmore liaise with landholders to minimise and mitigate impacts of the project on rural amenity values.*

4.9 Transport

Chapter 16 (Traffic and transport) of the EIS detailed existing and proposed infrastructure that would be used to transport workers, materials, products or wastes to and from the project areas.

4.9.1 Roads

The EIS estimated that the project would generate 110 vehicles per day (16 buses, 66 commuter, 8 service/heavy vehicle, 20 additional private vehicle movements) during construction and 170 vehicles per day (28 buses, 108 commuter, 13 service vehicle, 21 additional private vehicle movements) during operation. The EIS proposed two access routes for the project: light and heavy vehicle access to the site from Leichhardt Highway via Downfall Creek Road and Old Chinchilla Road; and light vehicle access via Roche Creek Road and Middle Creek Road. This was amended in the supplementary EIS which committed that site access would be solely via Leichhardt Highway and Downfall Creek and Old Chinchilla Roads.

The EIS estimated a significant increase (approximately 150%) in background traffic over the life of the project due to the expansion of the resource extraction sectors in the Surat Basin. An assessment of the impacts of The Range Project on existing State and local road infrastructure concluded:

- Minimal growth (generally less than 1%) in annual average daily traffic (AADT) volume on the state controlled road network resulting from the construction of the mine, except for the stretch of the Leichhardt Highway between Wandoan and Guluguba, which is predicted to experience a 14% increase in AADT volume. Once growth in background traffic is considered, the increase in AADT attributable to The Range Project would be less than 5%.
- Significant increases in AADT volume for local access roads between the Leichhardt Highway and the mine site access (Old Chinchilla Road and Downfall Creek Road and Upper Downfall Creek Roads). The initial EIS also predicted significant increases in AADT volumes for local roads (Middle Creek and Roche Creek), but as site access to the mine via these mines is no longer proposed by Stanmore in the supplementary, significant impacts on these roads are no longer expected.
- Increased heavy vehicle traffic from the project—estimated as 8 heavy vehicles and 16 buses per day in the construction phase and 13 heavy vehicles and 28 buses per day during operation. This equates to an increase in equivalent standard axles of 4% along state controlled roads except for the section of the Leichhardt Highway between Guluguba and Wandoan which would experience a 10% increase. The EIS concluded that once growth in background traffic was considered the increase in equivalent standard axles attributable to The Range Project would be less than 5%.
- Short and/or long term closure of public roads.
- A large number of drive-in/drive-out trips, where fatigue is a significant factor.

Potential impacts on environmental (i.e. land, air, noise, water, etc) and social values (i.e. social impacts, hazardous goods and regulated waste, etc) from traffic and transport associated aspects of The Range Project are discussed in the relevant sections of this report.

The EIS identified strategies to mitigate impacts on state and local roads and infrastructure including:

1. The intersection of Downfall Creek Road with the Leichhardt Highway would be upgraded by either Stanmore for The Range Project or the proponents for other resource extraction projects in the region. Upgrades of local road intersections with Downfall Creek Road would include sealing and widening roads. Alternative access routes would be provided for any public roads severed by the mine site.
2. Road upgrades to Knights Road, for those sections which are severed by the mining lease. The mine site access road would provide the connection between Old Chinchilla Road and Knights Road for that section of Knights Road which is severed. Use of the site access road to reach Knights Road would be limited to those accessing the property to the west of the mining lease.
3. Stanmore committed to developing a Traffic Management Plan which would clearly address the movement of goods to and from site in a safe and responsible manner in order to reduce the impact on the community and the road network. It would include measures to: reduce safety risks associated with the project; manage driver behaviour and fatigue; manage traffic flows; transport hazardous materials; manage over dimensional loads; and maintain road efficiency. The Traffic Management Plan would include a monitoring and reporting process and provide a set of criteria for corrective actions when and if required. Stanmore committed to consult with all relevant authorities responsible for managing and ensuring the safe use of transport infrastructure. The plan would be adopted by all contractors delivering goods to or removing goods from the site.
4. All traffic movements of hazardous materials and regulated wastes would be in accordance with relevant regulations and will be monitored and audited. Overland conveyor crossings of watercourses would be designed at a height so that they are not at risk of flooding in a 1 in 100 year Average Reoccurrence Interval (ARI) event.
5. Provide contributions for road maintenance to mitigate pavement impacts on the Leichhardt Highway between Guluguba and Wandoan.
6. The provision of pilot vehicles and police escorts where over dimensional access is required in accordance with the Minimum Guide for Over Dimensional Vehicles.

4.9.1.1 Road closures

The EIS identified that the project would require relocation, creation of new sections and temporary and permanent closure of local roads. In particular, it is proposed to close a section of Knights Road. WDRC requested that the alternate access road be a dedicated road reserve to ensure access to properties serviced by the current Knights Road is permanent. DNRM commented that the alternative access to the Knights Road proposed in the EIS was not acceptable as it would only allow a very small number of road users to use a site access road. They commented that a road with full public access should be provided as an alternative road to replace Knights Road. Stanmore responded that alternative use options for Knights Road were still being considered. Stanmore committed in the supplementary EIS that it would engage with the relevant property owner, WDRC and relevant State departments to establish the best option in terms of alternate road access. In response, DNRM requested that Stanmore contact them and the WDRC to discuss proposed mitigation measures for impacts of the project on local roads.

Recommendations:

1. *Stanmore liaise with DNRM, WDRC, adjoining land holders and members of the affected public to comply with relevant legislation and negotiate mutually agreeable outcomes on road access alternatives and mitigation measures for the temporary or permanent closure of public roads (including Knights Road).*
2. *DNRM has advised that Stanmore would be required to obtain approvals under the Land Act 1994 in relation to the relocation and temporary and permanent closure of roads affected by the project.*

4.9.1.2 Road safety

TMR, Banana Shire Council (BSC) and QPS commented that the EIS did not adequately deal with fatigue and work place safety issues associated with drive-up starts. DTMR requested further information on crash rates for the area. They also requested that the supplementary EIS identify measures or strategies to be undertaken to combat fatigue. In the supplementary EIS, Stanmore committed to bus staff to and from the mine site and identified other commitments and activities associated with the project that would address fatigue management and improve safety including: upgrading access roads and intersections; improving sections of the Leichhardt Hwy; upgrading school bus facilities and providing a bus to a destination such as Toowoomba to limit number of drivers; work place regulations prohibiting the long drive immediately after shifts; sponsoring a rest stop between Wandoan and the coast and promote its use among employees; and using fly-in/fly-out to keep vehicles off roads.

DTMR was not satisfied that Stanmore adequately addressed fatigue management issues in the supplementary EIS. They maintained that the issue was very relevant to The Range Project given that a long section of the Leichardt Highway north of Miles heading towards The Range is an identified fatigue hazard zone. DTMR

requested that Stanmore further investigate and address fatigue management issues.

Recommendation: *DTMR have advised that Stanmore must provide further assessment in relation to fatigue management in the project area.*

4.9.1.3 School bus routes

The EIS identified that the project would likely impact on two school bus routes. These are a route utilising Roche Creek Road from Wandoan to approximately 3km prior to Zillmans Road and a bus route which travels along the Leichhardt Highway from Wandoan to Downfall Creek Road and terminates at the intersection of Upper Downfall Creek Road and Stiller Bros Road. All pick-up points are near individual property accesses or near local road intersections. The EIS identified that should traffic volumes increase significantly, consideration may need to be given to providing more formalised bus facilities, including shelters, traffic signage and sealed bus stopping areas well clear of the carriageway.

WDRC, DTMR and local landholders all raised concerns regarding the impact of the project on the safety of bus routes (particularly along the Leichardt Highway and Downfall Creek Road where there would be a mix of gravel trucks, school buses and workers to and from the quarry and the mine). WDRC requests that the proponent work around school bus timetables and ensure that all key stakeholders are included in communications regarding changed or impacted bus routes, including school bus operators, school bus committees, parents and WDRC. Similarly, DTMR commented that whilst they acknowledged that the EIS included mitigation actions to minimise project-related traffic during school peak hours, they requested that the project provide improved bus stop facilities if required due to the increased traffic volumes. Further, DTMR requested that Stanmore commit to monitor operations and impacts on school bus operations, stops and school children, and to address any issues, including providing improved and safer bus stops, if required.

In the supplementary EIS, Stanmore:

- agreed with the 'notion' of the mining industry contributing to, or sponsoring, school facility upgrades
- committed to 'consider the need' to provide more formalised bus facilities, including shelters, traffic signage and sealed bus stopping areas
- provided further mitigation strategies in the social impact section of the supplementary EIS to minimise impacts on school bus operations.

In its response to the supplementary EIS, DTMR requested a written commitment from the proponent/mine operator that funding would be available for sponsoring school facility upgrades if the project went ahead.

Recommendations:

1. *Stanmore liaise with DTMR and WDRC regarding school bus facility upgrades.*
2. *DTMR has advised that Stanmore should commit funding for school facility upgrades along the Leichardt Highway and Downfall Creek Road.*

4.9.1.4 Impacts on local roads

DTMR raised concerns about the comment in the EIS that upgrades to many intersections likely to be impacted by the project would not need to be undertaken by Stanmore as other projects (for example, the Weringa quarry for Xstrata) have already been conditioned to carry out upgrades. DTMR recommended that the supplementary EIS detail the works required to mitigate the impacts of project-related traffic, independent of any works that may or may not be carried out in connection with other projects. Should The Range Project proceed prior to and/or independently of these other projects, then the proponent for The Range Project must carry out the required mitigation works to deal with the impacts of project related traffic. Similarly, WDRC commented that should the quarry development not progress prior to the project's construction, then upgrade of Old Chinchilla Road would be required by Stanmore. In its response, Stanmore committed to upgrade Downfall Creek Road if this was not completed by another entity beforehand.

DTMR requested that, due to interaction between heavy multi-combination vehicles associated with the Weringa quarry and The Range Project's bus and car traffic, that a safety and risk assessment for traffic on Downfall Creek Road and intersections be included in the EIS. The supplementary EIS included a road safety and risk assessment for Downfall Creek which incorporated increased traffic volume estimates based on this route being the only public access to the mine site. This concluded that turn lanes at intersections along the Downfall Creek Road route be configured as BAR/BAL turn movements. As only the haul route would require multi combination vehicle operation, the turn templates utilised for these intersections should generally comply with 19m articulated vehicle requirements to cater for typical rural vehicle usage.

Concerns were raised by local landowners, BSC and WDRC regarding impacts of the project on Roche Creek Road and Middle Creek Road. As a result, mine site access via Roche Creek Road and Middle Creek Roads was

no longer proposed in the supplementary EIS. Only occasional vehicle access to the northern perimeter of the site, for inspection, maintenance and emergency access would operate along the Roche Creek Road and Middle Creek Road route.

BSC commented that the potential impacts of the project on roads and associated infrastructure in the Taroom township, such as the potential need for intersection and school road crossing upgrades, heavy vehicle bypass of the town and improved overnight parking facilities, had not been addressed in the EIS. In the supplementary EIS, Stanmore responded that while they recognised that all the proposed mining projects in the area would likely have a cumulative impact on Taroom, that the impact of The Range Project on Taroom, was estimated to be small i.e. an estimated increase of less than 1 vehicle per days through Taroom. Thus Stanmore considered that further assessment and mitigation of direct impacts on Taroom were beyond the reasonable scope of the EIS. BSC responded that the council continues to hold concerns about cumulative traffic impacts of resource projects in the area on the Taroom township.

WDRC commented that major projects in the region had already increased the volume of traffic (both heavy vehicle and general traffic) resulting in increased maintenance costs and the frequency in which WDRC had to carry out its road maintenance programs. WDRC requested that Stanmore:

- Provide further information in the supplementary EIS on the impact of the project on local road use (including the interface between the conveyor belt and the council road network) and develop measures that would minimise and mitigate the impact on all WDRC roads. This should include considering prior upgrades that would need to be approved by council and ongoing maintenance requirements.
- Enter into an Infrastructure Agreement with WDRC for the life of the project, wherein they are to be responsible for the funding of any road upgrades and any additional maintenance required during and after the construction phase due to increased traffic levels. This agreement would include as minimum information on road section data, proposed traffic volumes per road, mutually agreed upgrade requirements, proposed increased maintenance requirements per road and proposed Loss of Life payment per road.
- Fit all vehicles operating on councils road networks with an approved In Vehicle Monitoring System (IVMS) and provide monitoring data to WDRC on a monthly basis.

In the supplementary EIS, Stanmore committed to provide a Traffic Management Plan/Operational Plan prior to commencement of the project. Stanmore stated that the Traffic Impact Studies completed as part of the EIS process which focused on the State and Local road networks to be utilised by the mining operations were sufficient. The company argued that further assessment of local road networks was not necessary as impacts on local road networks associated with adjacent/supporting projects such as the accommodation village in Wandoan and quarry would be assessed in the relevant approval process.

WDRC responded:

- That Stanmore had provided no response to the request for provision of information pertaining to data from the proponents vehicles fitted with Vehicle Monitoring Systems. They reiterated that this data would be required to monitor ‘actual’ traffic volumes.
- It did not agree that it was more important to focus on local roads forming direct access to the site. WDRC insisted that any traffic impact study must include an assessment of impacts of all local rods as a result of the proposed development. This is required in order to inform council of the true impacts across its networks so that informed planning of maintenance and upgrades can take place.
- Acknowledged Stanmore’s commitment to develop a traffic management plan.

Recommendation: *Stanmore consult with WDRC and BSC regarding measures to mitigate impacts of the project on local roads.*

4.9.1.5 Transport corridor

The proposed transport corridor (encompassing the overland conveyor and water and electricity infrastructure) from the mine site to the product stockpile at the train loading facility would require the crossing of two council roads (Middle Creek Road and Roche Creek Road). Conveyor underpasses are proposed at both locations. Traffic management plans would be provided for each crossing point, once the route is finalised.

4.9.1.6 Impacts on State roads

QPS requested that Stanmore facilitate the provision of an electronic traffic counter situated along Downfall Creek Road and consult with the Officer in Charge of both the Wandoan Police Station and Roma District Traffic Branch, particularly in the design of the TMP. Stanmore committed to considering these requests from QPS in the supplementary EIS.

DTMR raised the following issues regarding assessment of the impacts of the project on state controlled roads and infrastructure. DTMR deemed that these issues were not adequately addressed in the supplementary EIS or further assurances would be needed by Stanmore to ensure commitments were enacted.

1. The basic BAR/BAL (basic left turn/basic right turn) intersection for Leichardt Highway and Downfall Creek Road proposed in the EIS should be upgraded to a minimum CHR(S) and AUL(S) intersection treatment (as recommended in Appendix 16b) due to the percentage of heavy vehicles and buses which would turn off the Leichardt Highway into Downfall Creek Road. In the supplementary EIS, Stanmore provide an updated assessment (Appendix 16B) of traffic volumes at the intersection of Leichhardt Highway and Downfall Creek Roads. The supplementary EIS concluded that a CHR(s)/AUL(s) intersection configuration at the Downfall Creek Road/Leichhardt Hwy intersection was the most appropriate. DTMR was dissatisfied with this conclusion and stated that a minimum CHR(S) and AUL(S) intersection treatment upgrade would be required.

   Recommendation: *Stanmore upgrade the Downfall Creek Road/Leichhardt Hwy intersection to a minimum CHR(S) and AUL(S) intersection as requested by TMR.*

2. DTMR commented that that the EIS did not adequately assess the impact of the project on other intersections along the Leichhardt Highway e.g. other accommodation facilities or mine access routes that may be used. DTMR requested the supplementary EIS include an analysis of all roads and intersections potentially impacted by project-related traffic and detail appropriate mitigation measures. Stanmore provided no further information in the supplementary EIS as they argued that impacts associated with other uses such as the accommodation village would be considered as part of their relevant approvals and that any impacts on road infrastructure other than the access route which the EIS considered in detail would be minor. DTMR responded that the potential impacts of the project on intersections other than Downfall Creek/Leichardt Highway, such as Nathan Road/Leichardt Highway and Windeyer Road/Leichardt Highway, had not been sufficiently assessed in the supplementary EIS. Further assessment would be required to assess whether other intersections would need to be augmented. The proponent must discuss these issues with the DTMR's regional (Toowoomba) office.

   Recommendation: *Stanmore, in consultation with DTMR's regional (Toowoomba) office, assess the potential impacts of the project on intersections other than Downfall Creek/Leichardt Highway (including the Nathan Road/Leichardt Highway and Windeyer Road/Leichardt Highway) to the satisfaction of DNRM.*

3. DTMR requested that the supplementary EIS include a commitment by Stanmore to provide street lighting (Category V5 refer Fig 17.1 Road Planning and Design Manual) at the intersections of Nathan Road and Downfall Creek Road with the Leichhardt Highway, due to 24 hours day and 7 days a week operation of the mine. In the supplementary EIS, Stanmore contended that street lighting was not warranted as it was only appropriate for high activity intersections (CHR configuration) in townships or fringe areas and where street obstacles, such as raised medians, are provided, creating hazards. Stanmore argued that isolated sets of street lights on lower order rural intersections can potentially disorientate drivers and often distract from the visibility of headlights. DTMR responded that Stanmore must give further consideration to the requirements for lighting at intersections as per the Road Planning and Design Manual.

   Recommendation: *Stanmore, consider street lighting requirements at intersections along the mine route as outlined in the Road Planning and Design Manual.*

4. DTMR commented that traffic generation assumptions for the decommission phase of the project has not been included in the EIS and requested this information be included in the supplementary EIS. Stanmore responded that they did not consider a detailed assessment of the decommissioning phase was warranted in the supplementary EIS as such an assessment would be unlikely to provide a relevant representation of the impact, due to the large uncertainty of predicted road use in 30 years. DTMR did not consider this response adequate as the EIS applies to the whole duration of the project and requested that Stanmore assess traffic generation during the decommissioning phase.

   Recommendation: *Stanmore conduct an assessment of traffic generation during the decommissioning phase of the project.*

5. In regards to mitigation contributions, DTMR commented that the rehabilitation and maintenance contributions calculated in the EIS should be revised in accordance with the methodology outlined in the notes for Contribution Calculations prepared by the former Department of Main Roads, Central District known commonly as the Fitzroy Region Method. DTMR requested that Stanmore contact Darling Downs Region for current maintenance cost rates for use in these calculations. Stanmore committed in the supplementary EIS to using the Fitzroy Method to calculate rehabilitation and maintenance contributions at the detailed design stage and to negotiate an Infrastructure Agreement with the Department of Main Roads at the appropriate time. DTMR was satisfied with this response.

   Recommendation: *Stanmore to use the Fitzroy Method to calculate rehabilitation and maintenance contributions at the detailed design stage and to negotiate an Infrastructure Agreement with DTMR.*

Additionally, DTMR raised the following issues regarding the assessment of the impacts of the project in the EIS on state controlled roads and infrastructure which it deemed were adequately addressed in the supplementary EIS and no further action was deemed necessary.

1. Stanmore would be required to obtain permission from DTMR, the BSC and the QPS to access local roads as Leichhardt Highway is a Type 1 road train route. The supplementary EIS was updated to reflect this requirement.
2. The impact of roster changes (as opposed to shift change over), when many workers would drive to and from the facility were not considered in the EIS. In response, Stanmore argued that roster changeover was more directly associated with mining accommodation facilities and assessed through these applications. However, as these trips would not occur without the mine the more general indirect impacts relating to safety, such as driver fatigue and vehicle speeds, are considered in the EIS. DTMR raised no further concerns regarding this issue in their response to the supplementary EIS.
3. Mitigation measures (for example, contributions) in relation to the project's share of cumulative impacts on the road network were not addressed. In response, Stanmore argued that it intends to provide a significantly higher contribution towards the section of Leichhardt Hwy between Wandoan and Guluguba which would mitigate additional aspects of the cumulative impacts on this section. This additional contribution to this specific road section would be in lieu of more minor contributions to the cumulative impact on the wider road network. DTMR raised no further concerns regarding this issue in their response to the supplementary EIS.
4. In regards to traffic modelling, DTMR requested further justification of the following assumptions which Stanmore provided in the supplementary EIS:

- That the majority (70%) of the project's workers would be transported via bus to and from the accommodation facilities. Stanmore did not consider further considerations were necessary in the supplementary EIS. DTMR stated that the use of bus transport was realistic and commonly used in mining operations to transport workers between the mine site and accommodation as occupational health and safety requirements generally dictate that workers should not drive immediately after long shifts. Stanmore stated that other options such as fly-in/fly-out would be consider in the event that bus transportation does not result in acceptable outcomes.
- The use of the vehicle occupancy rate (2 workers per vehicle) used in the model and how the proponent proposes to ensure it is achieved (for example, making on-site parking limited/ restricted to mine-owned vehicles only etc). Stanmore responded that it was not uncommon for up to 4 people to occupy a single vehicle to and from mine sites and accommodation camps at change over times. Two or more is the norm, with some vehicles having a single occupant. As such, an occupancy rate of 2 persons is considered conservative.
- That only 70% of workers are rostered on at any time, as this reduces the trip generation and hence the impacts. Stanmore commented that a typical roster system at mines can work around a number of scenarios, including: 1 week on/1 week off; 13 days on/8 days off; 6 weeks on/2 weeks off and thus the 70% used is considered conservative.
- The use of average daily traffic volume as opposed to peak traffic period volumes and impacts.
- The accuracy of the vehicle per hour counts used to establish background traffic levels on the Leichardt Highway in the EIS.

Further DTMR, advised that once further traffic information is available on the final design and construction of the project including traffic generation, the proponent is required to update the road impact assessment (RIA), road-use management plan (RMP) and any traffic management plan (TMP) to clearly identify any necessary improvement works, rehabilitation and maintenance and road use management strategies to mitigate the impacts of project traffic. Further, DTMR advised that conditions of approval would be required for the proposal to proceed to ensure the ongoing safety, efficiency and existing condition of the State-controlled road network (SCR) and in accordance with the objectives and provisions of the *Transport Infrastructure Act 1994* (TIA), the *Transport Operations (Road-use Management) Act 1995*, other relevant legislation and DTMR policies and guidelines e g. Guidelines for Assessment of Road impacts of Development (2006) (GARID). These are listed in Appendix 2.

4.9.2 Rail

The EIS assessed the impacts of the train loading facility on environmental and social values including dust (Chapter 17), noise and vibration (Chapter 19), terrestrial ecology (Chapter 20) and drainage lines (Chapter 13). Stanmore contend that any impacts associated with the use of the SBR by The Range Project have been considered in the SBR EIS and hence these impacts are not assessed as part of The Range Project EIS. This includes impacts associated with dust, noise and vibration from operation of the SBR and impacts associated with altered use of existing rail infrastructure for freight and passengers.

DTMR commented that the transport of product coal for the project is dependent on a number of other projects that

require separate approvals. In light of the fact that that the conveyor system, SBR and rail spur line would require a Development Assessment (DA) approval/ property owners consent , DTMR requested that the supplementary EIS clarify if the project can proceed independently of these other items of transport infrastructure and provide the alternative transport infrastructure/modes/options proposed. Any major changes in the transport task for The Range Project would require impacts on the road network be re-assessed and revised mitigation measures identified. Stanmore responded that the traffic impacts of any alternatives would be developed only if the preferred option cannot be achieved. DTMR responded that it would like written confirmation from the proponent that a new Transport Impact Assessment would be completed and provided to DTMR in the case that alternative transport infrastructure/modes/options became necessary.

Recommendation**:** *That Stanmore provide written confirmation to DTMR that a new Transport Impact Assessment would be completed in consultation with DTMR in the instance that alternative transport infrastructure, modes or options are found to be necessary for the project.*

DTMR commented that the EIS did not consider the impact project traffic would have upon the existing rail open level crossings potentially being utilised by the project. Stanmore did not provide any further information on this issue in the supplementary EIS as it argued that trains do not currently operate on the Wandoan Branch line and the track is in disrepair. Traffic and train conflicts would be considered in the future if the train line reopened and was connected to the Surat Basin Line. DTMR provide no further comment on this issue.

4.9.3 Port

Stanmore proposes to export coal using the Wiggins Island Coal Export Terminal (WICET). The WICET project has already been the subject of a separate EPBC Act referral and EIS, and has been approved under the EPBC Act. The Coordinator-General has decided that the project can proceed subject to certain conditions outlined in the evaluation report. Stanmore has applied for port capacity at WICET and has acquired 7Mt/y of priority capacity rights in WICET Stage 2 port at Gladstone.

The EIS stated that any impacts associated with the use of WICET by The Range Project had already been considered in the WICET EIS and hence these impacts were not assessed as part of The Range Project EIS. This includes impacts associated with port berths, additional vessels, vessel movements, dredging and connections between rail and port infrastructure.

4.10 Waste

Chapter 23 (Waste) and Chapter 22 (Waste rock and tailings) outlined the potential wastes that would likely be generated during the construction, operation and decommissioning phases of the project and described how waste emissions, discharges and disposals could impact on environmental values.

4.10.1 Regulated and other waste

Waste streams and management of waste streams were described for the construction, operation and decommissioning phases of the project including general waste, recyclable wastes, scrap steel, waste hydrocarbons including oils, waste chemicals, waste tyres, waste batteries and sewage. The EIS proposed strategies to manage wastes in accordance with the waste management hierarchy, minimise environmental harm and to ensure proper disposal of the waste streams identified where reuse and recycling are not available. The EIS concluded that with appropriate management these streams would not impact on environmental values. Stanmore committed to provide a detailed Waste Management Plan.

All regulated waste would be disposed of at appropriately licensed waste disposal facilities. Stanmore proposed to use the WDRC's Wandoan Waste Facility for disposal of general wastes (other than wastes that are reused or recycled, either on-site or at a designated facility, wastes planned for on-site disposal and regulated wastes or other wastes that cannot be accepted by the Wandoan Waste Facility). In its comments on the EIS, WDRC advised that disposal of general waste from The Range to the Wandoan facility would not be possible. WDRC requested that Stanmore provide further estimates of the quantity of different waste to be generated by the project and pay a cash contribution prior to commencement of the project. This would contribute to future capital costs to account for the project consuming landfill airspace, and the resultant need for council to bring forward replacement landfill facilities. WDRC advised that, notwithstanding any contribution made by the proponent, normal user pays and gate fees would also apply to any waste being disposed of in council facilities.

Stanmore stated that only the project's general waste would require disposal at a local landfill. This is estimated to be less than 400t produced over the construction period. Stanmore committed to:

- engaging with WDRC to assess the future capacity of the Wandoan Waste Facility to accept wastes during the life of the project

- working to reach formal agreement with WDRC regarding the ultimate disposal of wastes at WDRC facilities
- engaging with WDRC at the appropriate time to discuss any potential contributions to local government infrastructure.

Recommendation**:** *Stanmore consult with the relevant regional council to negotiate the use and terms of agreement of waste disposal facilities.*

4.10.2 Sewerage

An underground wastewater reticulation system would be used to convey grey water and sewage from the administration building and CHPP to a small packaged waste water treatment plant. Effluent would be treated to a standard which would allow reuse on-site or irrigation and would be pumped to a holding dam or tanks prior to use or irrigation.

Biosolids would preferentially be re-used on-site, or may be transferred by truck to the Wandoan Wastewater Treatment Plant (WWTP) located in Wandoan township for treatment or disposal (subject to agreement with WDRC). As the open pit progresses a facility with an ablutions block may be established near the open pit for workers. Sewage would be captured at this site and transferred by truck (with the appropriate licenses) to the sewage treatment plant. Toilet facilities would be provided at the train load out facility, and sewage would be captured and pumped out by a suitably licensed contractor.

EHP requested that Stanmore provide further information on the type of sewage treatment plant (STP) to be installed including the equivalent person (EP) capacity and its ability to remove nutrients so that bio-solids can be reused on site. This is to ensure that it is suitable for the expected capacity and that it is capable of providing treated effluent and bio-solids to a standard required for reuse on site. In the supplementary EIS, Stanmore provided additional information which stated that a Wastewater Treatment System (rotating disc system) would be installed onsite to treat waste water to a level acceptable for re-use on-site. Each Wastewater system would be designed on a case by case basis and the scale of the system dependant on the predicted use or the number of Equivalent Persons (EP) using the system.

In response, EHP reported that there was insufficient information in the supplementary EIS to determine if the project can adequately treat and management sewage for the expected operational workforce of between 300 and 500 during the life of the mine. The EIS did not accurately describe the number of wastewater systems proposed, the size of systems, methods for treatment and quantities of waste generated. The EM Plan (Appendix 7) in the supplementary EIS indicated that the STP would be sized at 184 EP and proposed releases of effluent to land. However, no analysis of the receiving environment or consideration as to whether the effluent can be irrigated in a sustainable manner was provided nor any potential impacts associated with the activities assessed (i.e. no MEDLI modelling or soil data).

Recommendations: *Stanmore provide EHP with the following information:*

1. *the number of wastewater systems proposed, the size of systems, methods for treatment and quantities of waste generated;*
2. *assessment of the capacity of the receiving environment to receive irrigated effluent (e.g. MEDLI modelling and soil data);*
3. *assessment of the potential impacts of effluent disposal to land on relevant environmental values.*

Queensland Health requested further information on how the associated risk to public health would be managed in relation to the reuse of the waste sewage effluent. Stanmore clarified the methodology and provide further information in Chapter 23 of the supplementary EIS.

4.10.3 Coarse and fine rejects

Waste solids and process effluents produced by coal processing would comprise approximately 31.5 Mt of coarse and fine (tailings) reject material (less than 0.125 mm in particle size) over the life of the mine. The mine would produce on average 1 to 1.5 Mt/y of coarse and fine rejects. The EIS stated that the coarse and fine rejects material would likely be very similar in nature, consisting of high ash clays and a small quantity of high ash inert, and dull coal removed from the feed material during the washing process. The feed material from the deposit would be very low in sulfur and consequently the tailings would also be low in sulfur, and would not impose an acid mine drainage risk on deposition. There are no known other metal species likely to cause any problems in respect of coarse reject or tailings disposal.

EHP commented that no details of the water content of the tailings had been provided. Management of this material in the tailings dam would be largely dependent on whether this material is considered ‘flowable’ as indicated by the residual shear strength of the material. They requested that details of the moisture content of the

tailings and the residual shear strength be provided in the supplementary EIS. Details are required on how the movement of the tailings on the mine site would be managed, including an assessment of the potential for handling problems and their resolution. Stanmore provided further information in the supplementary EIS on tailings water content (comprise 30% (by weight) solids and 70% (by weight) water) and the infrastructure for tailings management and movement around the site.

The coarse rejects would be deposited by truck within the waste rock dumps. These would be placed away from dump margins, and in layers no more than 5m thick and would subsequently be covered by waste overburden material, and overlain by topsoil as part of rehabilitation.

Coal tailings would be comprised of reject coal plus interburden siltstone and sandstone. The EIS determined that settled tailings would be of very low permeability (in the order of 5.5×10^{-10} to 3.0×10^{-8}). The interburden and coal were classified as non acid forming. The proportion of total oxidisable sulfur (TOS) in coal tailings would be very low, at an average of 0.005%. No determination of pH, electrical conductivity (EC) or chloride content of tailings was undertaken, but the EIS outlined that the qualities of the tailings would reflect the interburden and coal quality, as the tailings would essentially be a mixture of these material types. Thus, tailings and seepage would exhibit a weakly to moderately alkaline pH (up to 10) and be of low to moderate EC (up to 700 µS/cm). QMDC requested that over-burden and inter-burden characterisation, management and monitoring be in accordance with the latest national and international standards. Stanmore responded that acid and metalliferous drainage and management measures had been adequately addressed in the detailed in the initial EIS.

The EIS reported that allowance had been made for storage of approximately 28,450ML of tailings (solids + water) by the end of mine life. Tailings volumes would increase from 620ML in year 2 to 3,460ML in year 5 to 12,440ML in year 13. A number of options for the location of the TSFs were considered, including in-pit TSF and out-of-pit TSF. The initial EIS proposed out-of-pit tailings storage in the first 5 years and in-it tailings storage for the remaining years. Following more detailed mine planning, the supplementary EIS proposed three out-of-pit TSF. One of these TSF's would be designed to be covered over by waste rock in later years. EHP commented that there was limited explanation in the supplementary EIS as to why therehad been a change in TSF design.

The supplementary EIS asserts that the out-of-pit waste rock dump TSF would be designed, operated and maintained to meet the required environmental and safety design standards. TSFs are likely to be classified as high hazard regulated dams and would be designed accordingly. Stage two of the tailings dams would trigger the requirement for a dam break assessment to be completed. Recoverable water from the tailings dam would flow into a return water dam, mine water dam or into water tanks for reuse in the CHPP.

During the initial years of operations tailings would be stored in Tailings Dam 1 constructed on the surface. This tailings dam would be constructed in two stages – stage 1 – north and stage 2 – south. It is envisaged that Tailings Dam 1 would hold the first 9 years of tailings production. Prior to this dam reaching capacity, additional tailings storage capacity would be constructed on surface as Tailings Dam 2 and Tailings Dam 3.

TSF designs are based on a turkey's nest configuration with no external catchment reporting to the cells within the TSFs. A batter slope of 1 vertical to 3 horizontal has been adopted for the design. The design criteria adopted for the out of pit tailings dam is:

- Design storage allowance (DSA): 100 year ARI, 4 month wet season (calculated as 820mm)
- Flood passage: 10,000 to 100,000 year ARI spillway capacity
- Flood ingress prevention: 1,000 year ARI plus 0.5m flood level freeboard for embankment crest.

The expected maximum height of the dam walls for TSF 1 is 12 metres for TSF 2 is 11.5 metres and TSF 3 is 16 metres. A 0.5m freeboard has been included to allow for storm water catchment in the facility. Crests for the TSF would be 6 metres wide to allow for access and for pipe work associated with tailings disposal and tailings water recycling. Rock lined spillways would be included but depending on availability of suitable armour rock concrete spillways may be required. The spillway design criterion is to have the capacity for a 10,000 to 100,000 year ARI event.

Initial assessment of the site geotechnical conditions determined that the natural materials (clay) on-site would have sufficient permeability to form a natural liner at the base of the tailings storage facilities. Furthermore, the clay would be available to be "extracted" and emplaced as a 300mm thick compacted clay layer on the internal embankment walls with sufficient permeability to line the embankment walls of the tailings dams. Detailed assessment would be undertaken to determine the optimum liner design that is fit for purpose.

A number of issues were raised by submitters on the management of the tailings storage facilities:

- Department of National Parks Recreation Sport and Racing requested further information on the potential impacts of runoff or seepage from TSF 3 on the land and waters on QSF and any proposed management and monitoring strategies.

- DNRM requested further information who would take responsibility for monitoring of TSF post-decommissioning. Stanmore responded that they would be the responsible party until the mining lease is relinquished. The ML would not be relinquished until Stanmore could prove to the Queensland Government that the land has been restored to a satisfactory status.
- The IIESC raised questions about potential seepage from the TSF and resulting impacts on water quality. Stanmore responded that the incorporation of a clay liner into the design of the tailings storage facilities, would prevent or contain seepage. A detailed assessment of the potential for final void overtopping was included in the supplementary EIS.

4.11 Surface water and water management

4.11.1 Water management strategy

Chapter 8 (Water management) of the EIS described the water management strategy for the mine site. Various technical reports were provided in the Appendices including Appendix 9B – Final Voids Hydrological Assessment; Appendix 9C – Proposed Tailings Storage Facility; Appendix 9D – Modelling of Potential Mine Water Release to Dogwood Creek; Appendix 9E – Water Management and Flood Study – Rail Loop and Train Load Out Facility. In the supplementary EIS an updated technical report (September 2012) on water management and water balance at the mine site was provided in Appendix 9A.

The EIS reported that water management at the mine would be strongly influenced by the climate (rainfall and evaporation), hydrology and surface waters in the area. Water demand for the mine site was estimated to be a maximum of 3,126ML per annum in year 25. Water would be supplied via a connection to Sun Water's proposed Woleebee Creek to Glebe Weir pipeline and/or from water collected and stored on the mine site.

A number of options for the management of mine water (water from disturbance areas on the mine site) were assessed in the EIS, including a no-release option and four release options with different release rates and volumes. The EIS indicated preference for a no release site and therefore a larger storage volume would be required by the end of mine operations to provide a 95% confidence that the dam volume would not encroach on the design storage allowance. Several submitters suggest that Stanmore consider the use of a reverse osmosis plant to reduce the storage requirements and allow for beneficial use of the water. Stanmore responded that a reverse osmosis plant was considered and was not the preferred option at this time, as the disposal of large quantities of highly saline brine posed extensive management and disposal.

A preliminary dam hazard assessment was conducted, in accordance with the Manual for Assessing Hazard Categories and Hydraulic Performance of Dams Version 3, February 2012 (EHP) (the Manual) for the tailings storage dams and mine water dams. These dams were considered to be high hazard dams and hence regulated dams. The design storage allowance for these dams was calculated on the basis of being high hazard dams. The design, construction and operation of all regulated dams would be undertaken in accordance with the Manual and the objective of preventing seepage and minimising the risk of overtopping or failure of the dams.

Numerous submitters discussed the importance of the mine water and TSF being appropriately lined to prevent saline leakage. DNRM requested further information on the synthetic and/or clay liners to be used for the mine water dams and TSF. They requested the design criteria requirements to be detailed in the EM Plan and the EA conditions under the EP Act. This information and details on the proposed liners were included in the supplementary EIS and liner requirements stipulated in the EM Plan.

EHP requested further analysis on the impacts on the drainage lines and creeks resulting from the diversion of overland flow. A mine site water balance was outline in the amended EIS which considered the climatic factors, preference for a no release site, water demand, water supply, groundwater inflows and reuse of mine water and decant tailings water and was used to develop a water management strategy. It was based on separating mine water, clean water and water from areas of the waste rock dump where rehabilitation was completed. Mine water (groundwater inflows and runoff water from disturbance areas including unrehabilitated waste rock dumps, the open pit and mine infrastructure areas) would be captured, stored and reused. Clean water would be diverted around disturbance areas using a network of drains and bunds. Water from rehabilitated waste rock dump areas would be directed through a sediment control system, including sediment dams, before release to the environment.

4.11.1.1 Management of saline water

Numerous submitters raised concerns about the general management of salt and saline water from the site, particularly given that part of the area is in the Murray Darling catchment in which the government had committed to reduce salt loads. QMDC raised concerns about the potential for open-cut mining operations to exacerbate the leaching of salt occurring naturally in the hydrogeological structures of the area, into groundwater and surface waters during open-cut operations. QMDC questioned the project's management of saline water from pit dewatering. In the supplementary EIS, Stanmore responded that the management of saline waters had been

addressed in the water management strategy. EHP and DNRM raised concerns about the use of saline water for dust suppression.

Stanmore replied that for the water used for dust suppression would be of a quality that is fit for purpose. Should the quality not be satisfactory then top up supplies would be obtained from the water pipeline. Water used for dust suppression would for the most part be used in the open pit, where the application of salty water to the in pit area would not cause issues in terms of land contamination as the pits would be backfilled with in excess of 20m of waste rock. In addition, leaching of salts via infiltration back to the groundwater table is not considered an impact, as the original source of the salts was the groundwater. Runoff from dust suppression activities would drain to the dirty water system and be captured by mine water dams. Should salts accumulate in surface haul roads, then this would be assessed as part of closure activities. If required, haul road base would be excavated and returned to the open pit.

Recommendation: *Stanmore develop management measures for the use of saline water for dust suppression including the quality of water to be used on site for dust suppression and the management of any accumulated salts during operations and post mining.*

4.11.1.2 Water management at the train loading facility

Several submissions were received about water management at the train loading facility. EHP requested that Stanmore provide details (including size, Design Storage Allowance and water balance) for the proposed containment dam at the rail loading facility and include the dam's details in Tables 8-8, 8-11, and 8-12 in Chapter 8. DSITIA requested justification that the sediment dams were not mine-affected water storages under the definition contained in the Model Water Conditions. If they were mine-affected storages, then DSITIA suggested that they should be conditioned appropriately in the EA. FBA questioned the treatment methods proposed for the sediment dam and the monitoring program to be used if water is proposed to be released into a nearby watercourse.

Stanmore responded that the details of the water management at the rail loading facility had been updated in the supplementary EIS and a Water Management Plan developed and included in Appendix 9E of the amended EIS. This includes diversion of "clean" catchment water around the disturbed areas and the treatment of run-off from disturbed areas via a sediment dam. The water quality following sediment removal is anticipated to be satisfactory for release. Runoff is not anticipated to contain hazardous contaminants. Monitoring of the quality of releases would be undertaken. Stanmore committed that should monitoring indicate water quality is too poor for release, there is provision for enlarging the sediment dam to capture (and retain) all runoff for possible treatment prior to release. DSITIA responded that if it was demonstrated that the sediment dams would be mine-affected and releasing to receiving waters, they should be identified as release points in the release conditions.

Recommendation: *Stanmore implement a monitoring program for release of water from the sediment dam in the vicinity of the train loading facility.*

4.11.2 Surface water

Chapter 13 (surface water and water management) described the environmental values of surface water within The Range Project catchment, potential impact on those surface waters and measures to mitigate impacts.

4.11.2.1 Environmental values

Two key watercourses, Juandah Creek and Dogwood Creek were identified within the project area, with all other streams identified as tributaries of these key watercourses. The Dawson River Sub-basin Environmental Values and Water Quality Objectives (EHP, 2011) were used to determine the ecosystem condition of the waterbodies and establish water quality objectives for physico-chemical parameters. For toxicants the Dawson River Sub-basin Environmental Values and Water Quality Objectives (EHP, 2011) refer to the ANZECC guidelines (2000). It was determined that the most appropriate classification for the streams in the MLA55001 area under the ANZECC guideline (2000) is a slight to moderately disturbed system. However because the watercourses are ephemeral and the water quality differs under this type of flow regime, QWQG (EHP, 2009) recommends the development of local separate guidelines rather than applying the default ANZECC values.

Limited historical and site-specific data on surface water quality was available for the purposes of deriving local values. The EIS committed that more relevant water quality objective would be derived and updated pending results from the ongoing baseline monitoring program. The baseline monitoring program is expected to be completed before any mine activities are undertaken. These values would be used to develop the water quality objectives for water discharge, in the event of a controlled release being required from a site that is designed to be a no-release site.

WDRC, DSITIA and landholders commented that the EIS did not consider the drinking water environmental values as the Miles town water supply is 100% dependent upon Dogwood Ck as its source. Chapter 8 and 13 of the supplementary EIS were amended to consider potential impacts of the project on the Miles town water supply.

DSITIA commented that the EIS did not address potential impacts to high ecological value (HEV) aquatic ecosystems in proximity to the project area or identify and discuss the environmental values of the Gilgai features within the project area in accordance with EPP (Water). The supplementary EIS was modified to recognise the nearest downstream HEV waters (approximately 150 km downstream of the project area on the Dawson River) and cross-reference the assessment of impacts and mitigation measures of the loss of these Gilgai areas to the relevant sections of Chapter 20 and 21.

4.11.2.2 Impacts and mitigation measures

The EIS identified potential impacts on water quality associated with construction and operational activities in the project area to be: vegetation clearing; and drainage of structures. Other impacts arising from the mine activities may result in increased erosion and sedimentation, pollutants contaminating waterbodies, additional surface water being discharged into the creeks through a controlled release to avoid an emergency situation, increased weed infestation and release of metals (e.g. zinc) and trace elements into ground and surface waters.

Mitigation strategies identified in the EIS include: the implementation an efficient water management system to ensure that The Range is a no-release site; monitoring and auditing of a Water Management Plan; an Erosion and Sediment Control Management Plan; an Environmental Management System; and the effective management of water generated by the project including water received as rainfall and/or from groundwater seepage via the site water management system.

Various options involving no releases and differing release volumes were considered for management of mine water. The preferred option identified in the EIS was a no-release site, with storage volumes providing 95% confidence that water levels would not encroach on the design storage allowance of those dams. The design storage allowance provides additional buffering against a high rainfall event before there are releases from storages. In the unlikely situation that a rainfall event may result in overtopping of the dams, then there may be controlled releases to local watercourses to prevent overtopping and uncontrolled release.

Numerous submitters (DISITIA, WDRC and QMDC) expressed their support for the proponent's plan to operate the mine as a 'no release' site. WDRC did not support the options for discharge into Dogwood and Juandah Creeks. WDRC and FBA expressed the importance of the proponent designing the mine and its water holding facilities to ensure that all of the mine affected water is contained on site, even during successive large rainfall events. WDRC requested a high level of monitoring to detect any leakages. Stanmore replied in the supplementary EIS that the dam storage had been designed very conservatively, with a 95% probability that water level would never reach the ‘Design Storage Allowance’ volume. If this cannot be achieved, mine affected water would be treated to comply with acceptable limits, before a planned release is permitted, and only if other, more suitable options were unavailable.

4.11.2.3 Water quality objectives and model conditions

DSITIA provided various comments, corrections and advice on water quality parameters and assumptions in the mine water management model and the calculation of water quality objectives for surface waters and release criteria. These were generally incorporated into the supplementary EIS by Stanmore. Significant issues identified by DSITIA included the following:

1. DSITIA commented that only very limited background water quality sampling had been conducted by Stanmore to date and raised concerns about the inclusion of interim water quality values in the EIS based on this limited sampling. DSITIA requested that the limitations of the current data set (parameters assessed, number of samples, timing and duration of sampling and flow conditions) for the purpose of baseline assessment and deriving water quality objectives for Dogwood Creek in the Condamine Balonne under the Queensland Water Quality Guidelines be clearly stipulated in the supplementary EIS. DSITIA reiterated that further baseline sampling was needed to derive Water Quality Objectives for Dogwood Creek before release conditions could be set. Stanmore amended the EIS as requested and committed to further baseline monitoring.
2. The final version of the Model Water Conditions (MWC) for Coal Mines in the Fitzroy (DERM 2012) was not considered in the scenarios for controlled releases. Further, the criterion used for an ‘extreme wet season’ in the model was not representative of such an event and would likely occur periodically. This is contrary to the “no release” site preference repeated throughout the EIS. DSITIA recommended the proponent consider the latest version of the MWC which allow for greater flexibility for operators to manage mine-affected water through controlled releases under variable flow criteria. In the supplementary EIS, Stanmore provided updated release conditions that had been remodeled using the Model Water Conditions for Coal Mines in the Fitzroy. Chapter 8 of the supplementary EIS was amended to describe the release scenarios modeled under the updated MWC.
3. The EIS should model releases derived in accordance with the MWC for Coal Mines in the Fitzroy and compare these to specific water quality objectives/guideline trigger values for relevant environmental values in order to justify whether there is potential for significant environmental impact of each specific environmental values (including those protecting drinking water). Any water users who would be impacted by controlled release under

these scenarios should be identified.

4. The potential impacts on downstream values including downstream drinking water supplies, in the event of failure or over-topping mine-affected water storages/tailings dams had not been adequately considered in the EIS. DSITIA requested that the supplementary EIS demonstrate using modelling, the distance downstream at which the relevant guidelines for environmental values (including drinking water) would be achieved in the final hazard assessment identified in section 8.7.3 of the EIS (failure to contain/dam break). This hazard assessment should consider worst case scenarios for flow (subsequent dilution) and contaminant concentrations. The hazard assessment should also consider the implications of salt loadings to the Condamine-Balonne catchments and the extent to which such failure would affect salinity downstream. The IIESC also requested matters of national environmental significance (MNES) be considered in this analysis. Stanmore incorporated the results into Chapter 29 (Hazard and Risk) of the supplementary which addressed the risk of failure of the mine water storages and tailings dams as "low".
5. The water quality objectives provided in the EIS apply only to waters of the Upper Dawson, under the Environmental Protection (Water) Policy 2009. DSITIA requested that the supplementary EIS provide interim water quality objectives for waters in the Condamine-Balonne catchment and indicated that these would be updated with scheduled water quality objective or local water quality objectives derived for waters likely to be affected by the project area (Dogwood Creek). The supplementary EIS was updated as requested.
6. DSITIA commented that insufficient information had been provided in the EIS to condition releases to Dogwood Creek in the Condamine-Balonne. They argued that Dogwood Creek in the Condamine-Balonne basin, should be removed from consideration as a release point under the proposed conditions in the EM Plan until salinity loads in the Condamine-Balonne were considered in the context of the Proposed Basin Plan prepared by the Murray Darling Authority and water quality objectives in accordance with the Queensland Water Quality Guidelines (2009). In the supplementary EIS, Stanmore retained Dogwood Creek as a proposed release point as they argued releases into Juandah Creek (via Downfall Creek in the Dawson/Fitzroy catchments) on the eastern side of MLA 55001 was impractical for various engineering and topographical reasons. Preliminary water quality discharge limits (end of pipe limits and receiving environment limits) based on the default water quality objective and Final Model Water Conditions for Coal Mines in the Fitzroy Basin (2009) were proposed in the supplementary EIS and draft conditions for releases into Dogwood Creek included in the EM Plan. Stanmore committed to conduct further baseline monitoring to derive local water quality limits for Dogwood Creek.

In their response to the supplementary EIS, DSITIA was satisfied that Stanmore had largely integrated the model water conditions into their release scenarios but recommended a number of issues be addressed prior to establishing release conditions for the EA. These included: specification of release points; development of criteria for electrical conductivity and sulfate under variable flow; specifying a receiving water flow criteria value rather than a range of values associated with each maximum release rate under the medium flow criteria; and re-calculation of maximum release rates under medium and high flow criteria using a lower EC instream (design value) to ensure drinking water values are protected at Gil Weir. DSITIA also recommended a number of modifications to the conditions for variable flow criteria for releases into Dogwood Creek and corrections to water quality triggers (LOR for toxicants, silver, uranium, corrections to units, values for EC and sulfate). These are incorporated into the conditions for the draft EA in Appendix 3.

Recommendation: *Stanmore conduct baseline water quality monitoring to assist with the development of local water quality objectives.*

DSITIA commented that the supplementary EIS did not adequately identify water quality objectives protective of each environmental value (including those protective of drinking water) for all parameters of relevance to coal mines (identified in the Model Condition). This is a basic requirement for the EM Plan and would be required in the revised EM Plan.

Recommendation: *Stanmore to identify water quality objectives protective of each environmental value (including those protective of drinking water) for all parameters of relevance to coal mines.*

4.11.2.4 Monitoring

The EIS proposed a water quality monitoring program to assist with: the development of localised water quality objectives; support effective planning and control of discharges (in the event of discharges) into the receiving watercourses; and allow for performance review of the various mitigation measures and plans implemented to protect the integrity of the waterbodies.

A number of submissions were received on the project's various monitoring programs. Issues identified included:

1. Monitoring of Regulated Dams—numerous submitters identified the importance of appropriate monitoring of the dams for salt leakage. DNRM commented that the EM Plan should identify parameters that are to be monitored by installed piezometers, the frequency of monitoring and what information would be recorded. FBA argued that

Stanmore should undertake monitoring of its regulated dams and groundwater monitoring sites at least quarterly to take account of any seasonal differences in water quality. Stanmore addressed these issues in the supplementary EIS and committed to quarterly monitoring.

2. Monitoring of receiving waters—FBA argued that local creeks should continue to be monitored throughout the project in the event that waterway contamination from the mining process is not detected through terrestrial monitoring and surveys. The recommended the proponent continues to monitor the water quality in the creeks near the mine site for the duration of the mine's operational and rehabilitation phases. In response, Stanmore committed to periodic monitoring, depending on the requirements of the EA.

   Recommendation: *Stanmore develop a receiving water quality monitoring plan in consultation with EHP.*

3. Monitoring of creek crossings—in regards to constructing permanent or temporary creek crossings, the EIS committed to monitor turbidity levels in the creeks upstream and downstream of the crossing daily during construction in the wet season. If turbidity levels downstream of the crossing site are more than 10% above background turbidity levels, construction would cease and stormwater and erosion and sediment control measures would be revised prior to re-commencement of construction.

   DSITIA advised that the '10% above background' trigger for turbidity to cease construction proposed in the EIS may be too stringent in the context of natural variation and for this type of activity. DSITIA recommended that the 80th percentile of the upstream results plus a defined "loading" i.e. + 10 NTU for a defined period of time is used for this short term type of activity as a review trigger for sediment control measures. Stanmore responded that the suggestion to include the 80th percentile as a review trigger for sediment control measures was not practical or workable. The construction crew on the ground requires a simple and workable threshold and collection methods that they can easily be implement and used on the ground. DSITIA reiterated that they consider the 10 % above background would be too stringent as a cease construction trigger and recommended putting a defined value X (NTU) above background that would be acceptable i.e. background (i.e 80th percentile) + 'X' NTU = cease release trigger.

   DSITIA recommended that water quality parameters, such as pH, TSS, dissolved oxygen, electrical conductivity and petroleum hydrocarbons, be collected in addition to turbidity. Stanmore responded that it was not practical to monitor for all of the suggested parameters as laboratory tests can take up to two weeks and the workers on the ground cannot wait for two weeks until they take remedial action. The impact assessment identified increased sedimentation and turbidity as being one of the major impacts of construction activities, such as creek crossings. Therefore they argued that this would be the best parameter to test for as it can be tested in the field and provide instant results. DSITIA responded that pH and dissolved oxygen can also be measured together with turbidity using in-situ probes and do not require laboratory analysis i.e. instantaneous results. DSITIA reported that total suspended solids provide the best indication of the efficacy of sediment and erosion control measures (they would recommend some sampling during baseline monitoring and in the event of an incident as part of good environmental management/record-keeping). Similarly DSITIA would also recommend petroleum hydrocarbon monitoring be conducted so that, in the event of a spill, results could be compared to baseline sampling has occurred.

   Recommendation: *Stanmore consider amending the EM Plan to incorporate DSITIA's recommendations regarding the existing stringent trigger values for turbidity and include pH, TSS, DO and petroleum hydrocarbons in the monitoring requirements for construction phases of the creek crossing. Note: The conditions for the draft EA have been amended to incorporate these recommendations.*

4.11.2.5 Indirect downstream Impacts

The IIESC commented that surface water quality assessed in drainage lines on the site was considered to be poor to moderate. In particular, all creeks draining into the Dawson and Condamine Rivers had high turbidity and pH and low dissolved oxygen. The IIESC noted that accidental discharge from the raw water dam, mine water dam and sediment dam through stormwater may add dissolved salts or sediment to the waters in local creeks, but that communities should recover quickly, and that it would be unlikely for there to be an impact on waters further downstream. Further, risks of soil erosion and sedimentation associated with vegetation clearing and earthworks may affect local waterways, but they consider that because of the naturally high levels of turbidity in the area, it would be unlikely for there to be a significant impact on aquatic ecology.

There are no Ramsar Wetlands within the survey area, however, the Condamine-Balonne River catchment is a part of the Murray-Darling Basin, which, about 580km downstream, contains the Ramsar Wetland 'Narran Lakes Nature Reserve'. The IIESC considered it very unlikely that mining associated activities on The Range would adversely affect the Narran Lakes Nature Reserve.

4.12 Groundwater

Chapter 15 (Groundwater) of the EIS described the groundwater resources and impacts of the project on groundwater resources. The Range Project is located within the Surat Basin, which is a component of the Great Artesian Basin.

The EIS identified the aquifers within the Injune Creek Group to generally be low yield (0.2 L/s to 3 L/s), poor quality (1,000 µS/cm to 10,000 µS/cm) and targeted for stock use. The main aquifer unit in the region is the Hutton Sandstone, with good quality water (500–2,000 µS/cm) and good flows (up to 10 L/s) supporting urban and intensive stock use. The Hutton Sandstone outcrops in the north of the region and is associated with spring complexes. Deeper aquifers of note include the Precipice Sandstone, which has potable water (100 – 600 µS/cm) supporting significant stock and domestic use. The closest springs to the project site are located approximately 50 km to the north.

Conservative estimates of pit wall inflows were: 0m^3/day for years 0–5; 423 m^3/day for years 5–10; 934 m^3/day for years 10–15; 891 m^3/day for years 15–21 years; and 1,343 m^3/day for years 21–26. These were considered conservative estimates as the evaporation of pit inflow had not been taken into account. The estimated radius of influence (draw down) ranges from 700m to a maximum of 2km. An assessment of the potential for vertical leakage (pit floor inflow) concluded that the floor of the pit would be the Eurombah Formation, a regional aquitard. The estimation of vertical flows concluded that vertical leakage would be negligible.

The EIS identified the following activities would have the potential to impact on the Taroom Coal Measures Aquifer:

- extraction of water for construction and operational uses
- dewatering in advance of mining
- removal of the aquifer during overburden and coal mining
- seepage of leachate from tailings storage, chemicals, fuels, treated sewage, process (mine) water ponds
- in-pit placement of overburden
- final void water quality.

The EIS concluded that the impact of leachate from tailings storage on existing groundwater quality within the Taroom Coal measures would likely to be minimal as:

- Seepage of leachate would be minimal due to the lining of tailings and mine water dams, and strategy of de-watering the tailings.
- Any seepage of tailings would be “self sealing” due to the presence of suspended clays in the leachate.
- Any seepage of leachate would migrate into the part of the Taroom Coal Measures that are currently unsaturated.
- Quality of leachate in terms of salinity and metals would likely to be better than the groundwater quality currently existing in the Taroom Coal Measures.

Groundwater levels in the Taroom Coal Measures are anticipated to recover post mining. Assessment of final void water quality and inflows indicates salinity levels similar to, or less than, the surrounding groundwater. The EIS reported that the current water quality in the Taroom Coal Measures excludes almost all uses, apart from industrial use, due the very high salinity levels.

Numerous submission were received that raised concerns or questions about the potential impacts of the project on groundwater flow, quality and quantity. Significant issues are discussed further below.

4.12.1 Environmental values

The EIS identified 18 water bore licenses for groundwater extraction (from the Great Artesian Basin aquifers) within approximately 10km radius from the site. The main aquifer utilised for licensed groundwater extraction is the Hutton Sandstone. Several landowners raised concerns regarding impacts of the project on groundwater bores—in terms of access, quality and quantity.

DNRM requested that the supplementary EIS expand the discussion on Environmental Values of groundwater to reflect the importance of groundwater in the region. DNRM commented that the generalised statements regarding the environmental values of water in section 5.6 of the EIS did not recognise the use and importance of groundwater in the region noting that waters from Walloon Coal Measures was used as a source of water for stock purposes. Stanmore responded that the EIS had considered the use of water within the project area and while use of groundwater from the Walloon Coal measures is significant on a basin wide scale, a search of the water

licensing database (described in section 5.3.1) with a 10 km radius from the site found a single bore which extracts groundwater from the Walloon sub group. Together with the relatively high saline nature of the groundwater in the Walloon Sub group found on-site, Stanmore contends that it is reasonable to discount the importance of the use of groundwater from the Walloon sub group, at the scale of the project area.

4.12.2 Impacts on groundwater

DNRM commented that the EIS contained insufficient information and associated justification on groundwater impacts for it to assess the recommendation and proposed mitigation measures. QMDC also argued that the modelling and assessment of groundwater responses was not adequate to fully address potential environmental impacts. Particularly those associated with: ongoing open cut de-watering and associated aquifer de-pressurisation; leachate seepage and inter-aquifer connectivity; significant inflow from aquifers to the mine; minimising mine wastewater, maximising use or re-use of mine wastewater, and realistic ability of the mine to achieve a 'nil discharge' status; residual risk to groundwater and surface water and their ecosystems; final void configurations, modelled groundwater inflow post mining, and post-mining management options and outcomes for any residual water resources impacts; and water resource concerns of the local community. Stanmore responded that additional modelling of groundwater extraction and zone of influence had been undertaken to address these issue and the outcomes reported in the amended EIS. Stanmore contends that the management strategies for the impacts are satisfactory for the predicted or potential impacts.

Based on the outcomes of a conceptual hydrogeological model, the EIS concluded that the groundwater flow direction within the Taroom Coal Measures is generally towards the north to north-east, in the area of investigation. DNRM and other submitters commented that there were conflicting statements in the EIS regarding the direction of local and regional groundwater, which appeared to be based on limited sampling. For example, DNRM commented that section 5.2 of the EIS identified the regional flow direction to the north west, section 5.3 identified the flow direction to the west (acknowledging limited data) and in 5.4.2 the local flow direction of the Taroom Coal Measures is a north-north east direction. DNRM requested that the supplementary EIS:

- Provide further groundwater monitoring data and modelling to ascertain the direction of groundwater flow from both a local and regional perspective.
- Discuss the impacts of geologic structures on groundwater in the area.

DNRM also raised concerns about the project's conceptual hydrogeological model. DNRM commented that groundwater connection between aquifers had not been discussed in the EIS. Appendix 15 (section 5.5) stated that there was potential for recharge via upwards leakage to occur in the Hutton, Eurombah and Walloon subgroup. Recharge may also be coming via the Burgunga fault. DNRM requested further investigation of the likelihood of groundwater connection between the lower sandstone aquifers and overlying aquifers. DNRM requested that Stanmore discuss and assess other possibilities of potential causes of hydraulic connection between aquifers such as bed thinning or facies changes.

In response to DNRM's concerns, Stanmore argued that the groundwater assessment undertaken was sufficiently detailed for the scale and scope of the proposed project. The company stated that they had considered the local and regional groundwater flow directions discussed in the EIS in its assessment of the potential impacts of the project and the management of these impacts. Stanmore noted that another study has recorded a range in flow directions across a number of basin aquifers, including flows to the north and east in some aquifers, particularly in the margins to the Surat Basin. Thus, the north-north east flow direction observed in the Taroom Coal Measures on-site is not considered to be out of step with the findings from other studies. The most reasonable explanation is the elevated topography that exists to the south and west of the site. Such local scale influences on groundwater flow are well documented.

Stanmore advised that additional assessments have been undertaken using more advanced groundwater modelling. This modelling is discussed in Chapter 15 of the amended EIS, with the technical report included as Appendix 15B. The EIS concluded that the results of this additional modelling support the earlier work which indicated that the groundwater extraction by the mine would not impact on the Hutton Sandstone aquifer (the underlying aquifer of significance). Furthermore, the distinct difference in water chemistry and potentiometric surface between the two aquifers further supports the lack of connectivity between the two aquifers. With the aquitard formation (Eurombah Formation) between the coal measures and the Hutton Sandstone being at least 50m thick, and up to 200m thick, Stanmore has sufficient confidence in the model predictions of "no impact" to not suggest extending the monitoring program to the Hutton Sandstone.

Stanmore commented that the "major fault" noted by DNRM is recognised as an important feature controlling the eastern extent of the Bowen Basin. Stanmore argued that other studies had demonstrated this structure had no influence on the Walloon Coal Measures in the region of the project area. In addition, Stanmore has drilled in excess of 300 drill holes across the project area and reported no influence of the Burunga Fault on the correlation or thickness of the coal seams in the project area. Thus Stanmore contends that there is no need for discussion on

the potential influence of this fault on the groundwater. Groundwater flow in a number of formations in the Surat Basin is observed in some areas to flow in a different direction to overall regional flow directions, thus the flow direction observed in the Taroom Coal Measures on-site is not "unusual".

DNRM was unsatisfied with the data provided in the draft EIS and supplementary EIS about the potential impact of the project on the Hutton Sandstone Aquifer. Given the information currently available, which suggests the likely presence of a major fault and interaction between the Taroom Coal measures aquifer and the Hutton Sandstone aquifer, DNRM recommended that groundwater monitoring component be implemented (and included in the project's EA) to assess the impacts of the project on the Hutton Sandstone aquifer.

4.12.3 Groundwater monitoring

DNRM noted that the supplementary EIS identifies that a groundwater monitoring program would be implemented, however, the monitoring program is limited to the mined aquifer. While there is justification for limited impact on other aquifers, there needs to be appropriate monitoring to substantiate this claim. This report does not address the potential impact of a major fault running through the mining lease and the implications for groundwater in the local and regional area. For example, it is unusual to have groundwater flow directions in the Taroom Coal Measures in a different direction to the regional flow direction and dip direction of the formations in the area. DNRM requested the supplementary EIS identify how the design of the proposed groundwater monitoring program would achieve its goals in relation to modelled offsite impacts in the Taroom Coal Measures and adjacent aquifers, from which the majority of private bores access their water, particularly if it is proposed to use these aquifers for water supply. Stanmore responded that it did not consider monitoring of other aquifers necessary.

In response, DNRM commented that the draft EIS and supplementary EIS had not provided sufficient data about the potential impact of the project on the Hutton Sandstone Aquifer. Given the information currently available, which suggests the likely presence of a major fault and interaction between the Taroom Coal measures aquifer and the Hutton Sandstone aquifer, DEHP may wish to consider conditioning the project with a groundwater monitoring component to monitor the impacts of the project on the Hutton Sandstone aquifer. DNRM recommended that condition 6.7.1 and 6.7.2 of the Environmental Management Plan are amended as follows:

- Groundwater, contained within the Taroom Coal Measures and Hutton Sandstone, must be monitored at a location and frequency defined in the Groundwater Monitoring Plan.
- The Groundwater Monitoring Plan must be developed and implemented within three (3) months prior to the commencement of operations.

Recommendation: *Stanmore expand the monitoring strategy proposed for the mined aquifer to the Hutton Sandstone aquifer and other relevant aquifers.*

4.12.4 Water security

The EIS predicted some loss of flow in the headwaters of Downfall Creek and Dogwood Creek as the water management strategy is for no release of mine affected waters. Stanmore committed to enter into arrangements with landholders with water entitlements for any loss of water experienced due to project activities.

Several landholders raised concerns about impacts of the project on existing water infrastructure on their properties. One landholder was concerned about reduced overland flow of water to dams on the property as a result of the transport corridor. Any reduction in the volume, reliability or quality of the water may impact of stock water and have economic impacts. Stanmore responded that only 1 dam is immediately downstream of the conveyor and that the corridor would be designed and constructed with drainage in appropriate places to enable runoff to follow its natural path. Stanmore reported that there would be minimal impacts on the catchment size (hence water volumes) and water quality of overland flow. Furthermore, the location of infrastructure would not require the loss of any dams within the land.

Landholder submission expressed concern that the eastern conveyor option would block access to a water bore that provides 90% of water to the homesteads, livestock and feeds into the extensive underground water reticulation network across the property. Stanmore responded that the final transport option chosen in the supplementary EIS would not block access to the water bore.

4.13 Air quality

Chapter 17 (Air Quality) and Appendix 17A (Air Quality Assessment) of the EIS described the existing air environment and airshed that may be affected by the construction or operation of The Range Project. It described the project's potential sources of air emissions, the expected composition of these emissions and predicts the fate of all significant emissions via atmospheric dispersion modelling. Air emission control measures were proposed.

The existing air quality for the project area was determined from local and regional data sets. Sensitive receptors

(principal places of residence) were identified for the project area. Modelling of the projects potential sources of emissions to air, expected composition of the emissions and fate of these emissions was undertaken for two years of operation, year 3 and year 26, as they represent the scenarios likely to contribute most to dust levels at the closest sensitive receptors. Conclusions from the modelling were:

- The Queensland Air Environmental Protection Policy 2008 (Air EPP) objective for the predicted annual average ground-level concentration of TSP would be achieved.
- The Air EPP objective for the predicted 24-hour and annual average ground-level concentration of PM2.5 would be achieved.
- The EHP guideline for dust deposition at the majority of receptors would be achieved. The monthly maximum dust deposition rate from the project including a background level is predicted to exceed the guideline at one location in year 26.

In years 3 and 26, the predicted 6th highest 24-hour average ground-level concentration of PM_{10} from the project in isolation is below 50µg/m3 at all sensitive receptors, except for the Weringa Quarry site which exceeds the air quality objective. In year 3, at one site north of the mine there are 7 days where the predicted 24-hour average ground-level concentration exceeded 50µg/m3 and exceedances were predicted at three receptors for year 26. EHP requested that 24-hour average PM_{10} predicated for receptor location R16 (expected to become the quarry site office), be compared to occupational health and safety standards. Further assessment was provided in the supplementary EIS which concluded that the predicted ground-level concentrations of PM_{10} at R16 for The Range Project with a background and including the Weringa Quarry comply with the relevant workplace exposure standard.

The analysis of the exceedances of the 24-hour air quality objective for PM_{10} showed that the key activity that would contribute to the exceedances is the use of haul roads. An analysis of a 50% reduction of haul road activity demonstrated compliance with this criteria and has been nominated as the preferred mitigation measures during times when monitoring indicates exceedance of this objective. The EIS concluded the project has the potential to exceed air quality objectives at some of the nearest sensitive receptors. Implementation of mitigation measures would reduce emissions such that air quality objectives could be met.

An air quality monitoring plan including continuous real time monitoring of PM_{10} at representative sites of potential high dust occurrences and real time meteorological monitoring at a site representative and surrounds of the mine would be used to provide the mine management team with real time information on PM_{10} concentrations outside of the MLA boundaries. The system would be linked to a trigger action response plan (TARP) that would be activated once the rolling 24-hour average concentrations exceed 80% (40µg/m^3) of the Air EPP objective of 50µg/m^3.

In the EIS Stanmore advised that it was no longer considering an on-site power generation.

EHP requested clarification of the methodology used to estimate quarry dust emissions in the cumulative impact assessments for air and clarification of table headings and figures in Chapter 17 Air Quality and the Air Quality Assessment in Chapter 17. EHP was satisfied that all the requested information was clarified or provided in the supplementary EIS.

QMDC commented that arsenic levels, anthropogenic emissions of products of combustion and other air pollutants typical to coal mine operations were not considered in the EIS and should be fully assessed as part of the supplementary EIS. In the supplementary EIS, Stanmore included an additional section which discussed additional pollutants likely to be emitted from the project. QMDC argued that coal contains trace amounts of metals including arsenic, boron, cadmium, mercury, molybdenum, lead, selenium, chromium, copper), nickel, vanadium and zinc. QMDC also argued there is a risk that dust from coal mining could contain these trace metals and that if sufficient quantities were emitted, that adverse impacts could occur. QMDC stated that The Range Project would emit various other pollutants, such as oxides of nitrogen (NO_x), sulfur dioxide (SO_2) and carbon monoxide (CO) during its operational life from other sources associated with coal mining, for example the haulage of material.

The supplementary EIS stated that the emission rates of these air pollutants from these activities are low compared to the emission rates of particulate matter from mining activities. Hence, particulate matter is the critical air pollutant that determines the feasibility of the activity from an air quality perspective. Compliance with air quality standards for particulate matter at nearest sensitive locations would, as a consequence, demonstrate easy compliance with air quality standards for nitrogen dioxide, carbon monoxide and sulphur dioxide. Thus the supplementary EIS concluded that emissions of NO_x, SO_2 and CO from these activities did not require further assessment.

4.13.1 Coal dust

Several landholders adjacent to the project area and the QMDC expressed concern about the impact of dust from the mine and transport corridor on health of residents and sensitive receptors. Stanmore replied that the dispersion of dust had been considered and assessed within the air quality assessment for the project in light of sensitive

receptors which included adjacent and nearby landholders. Stanmore committed to developing a dust management plan and implement an air quality management plan consisting of both proactive and reactive measures.

DTMR commented that the EIS did not adequately identify coal loss and coal dust emissions during rail transport to the export port as a source of dust emissions requiring mitigation measures. DTMR requested that the supplementary EIS identify:

- The transport of coal by rail to port is an activity associated with the project that would be significant source of coal dust emissions and the loss of coal leading to fouling of rail ballast.
- Include design and control measures for dust control at the rail load out facility.
- Determine the degrees of coal loss and dust emissions generated during transport of coal to port.
- Detail measures to mitigate dust generation during rail-haul of coal to the export port.

In the supplementary EIS, Stanmore committed to reviewing the QR Coal Dust Management Plan and implementing mitigation measures where appropriate including the installation of a veneering system at the rail load out facility.

4.13.2 Blasting impacts

The blasting activities in open-cut mining use an explosive in the form of ammonium nitrate fuel oil (ANFO) which has a number of by-products including: H_2O in the form of steam; CO_2 carbon dioxide; N_2 nitrogen; and SO_2 sulfur dioxide. The explosion generates a large volume of gas in a very short time period. Under non-ideal conditions blasting can cause excess NO_x production. QMDC commented that the air quality modelling conducted by the proponent for the project did not adequately addressed the issues of air pollutants contained in blast fume, particularly in terms of occupational health and safety. In the supplementary EIS, Stanmore committed to managing blasting activities to minimise emissions and engaging experienced providers to undertake blasting activities. Additional dispersion modelling was conducted and reported in the supplementary EIS (Appendix 17B) to address concerns regarding air emissions from blasting. The dispersion modelling showed:

- Blasting between 4pm and 5pm results in the highest 1-hour average ground-level concentrations of NO_2.
- At the most impacted receptors (within 5km) predicted ground-level concentrations are very small.
- 1-hour average ground-level concentrations of NO_2 and 8-hour average ground-level concentrations of CO_2 are predicted to comply with the relevant air quality objectives at sensitive receptors in the vicinity of the mine.

The supplementary EIS concluded that there was no risk of unacceptable health impacts arising from fumes from blasting.

4.13.3 Greenhouse gas

Chapter 18 (Greenhouse gases) of the EIS included a greenhouse gas assessment to establish an inventory of projected annual emissions for each relevant greenhouse gas, attributable to the project, and to consider the impact of these emissions on state and national greenhouse gas inventories. The operation phase assessment concluded that the fugitive emissions from coal production are expected to have the greatest contribution to the total emissions from the project, with diesel combustion and natural gas consumption the next two largest contributors. A comparison of the projected emissions from the project against the state and national inventories shows that the maximum annual emissions for the project is 301,137t CO_2-e, which is 0.31% and 0.07% of the state and national inventories for the energy sector, respectively. The EIS proposed a suite of greenhouse gas reduction measures for consideration during the design, construction and operation of the project.

The Murray Darling Water Commission (MDWC) raised concerns regarding the projects greenhouse gas emissions and contribution of the project to global warming. MDWC requested the proponent provide more detailed information on greenhouse gas emissions and consequences in the supplementary EIS, including:

- calculations of cumulative Scope 1, 2 and 3 emissions for the life of the project
- assessment the resilience of the environment to receive further emissions
- description of the significance of the impact of cumulative emissions
- description the cumulative impacts caused by the project and
- assessment of the proportional contribution of the project's cumulative emissions to the impacts of climate change, including an assessment of the social cost of carbon.

Further, MDWC requested the proponent identify strategies to manage or mitigate carbon emissions to

demonstrate that all of the emissions from the project can be safely and permanently sequestered.

Stanmore provided no further information on greenhouse gas emission in the supplementary EIS. Stanmore stated that the EIS had adequately addressed greenhouse gas emissions in accordance with the project's TOR. Stanmore argued that greenhouse gas emissions in the context of international targets are beyond the scope of the EIS, and are not a requirement of the TOR.

4.13.4 Transport corridor dust concerns

Several landholders adjacent to the corridor expressed concern about the impact of coal dust from the conveyor and dust from the movement of traffic within the transport corridor on their agricultural activities. One landholder was particularly concerned that the dust would make the pastures (i.e. Leucaena immediately adjacent to the transport corridor) less palatable to stock which would cease grazing in these area and reduce carry capacity on the property. Stanmore responded that it had considered the dust from vehicles in the air quality assessment and it would be no more than dust generated from day to day general farming use. Assessment of dust deposition outside of the MLA averaged less than 100mg/m^2/day which was 2.5% of the deposition rate (4000mg/m^2/day) that a University of Western Sydney study found made feed unpalatable to cattle.

Recommendation: *Stanmore consult with landholders to investigate potential impacts of dust on cattle and feed palatability and identify mitigation measures to limit any identified impacts.*

4.14 Noise and vibration

Chapter 19 (Noise) of the EIS described the environmental values associated with the acoustic environment in the vicinity of The Range Project, identified sensitive receptors potentially affected by noise and vibration emissions, established noise and vibration criteria against which noise and vibration emissions are measured, predicted the noise and vibration levels experienced by sensitive receptors from construction and operations of the project and provided mitigation measures for receptors where predicted noise and vibration levels exceed relevant criteria.

The Range Project is located in a rural area typified by low background noise levels. Background noise monitoring was undertaken at 12 locations, selected to represent potentially affected residences near to the proposed site of the mine and proposed conveyor route. Ambient vibration levels were not considered significant in the vicinity of the mine or conveyor infrastructure. The exception would be locations close to heavy vehicle road corridors that contain pot-holes or other significant surface irregularities.

The design planning noise limits ($L_{Aeq,1hour,adj}$) at residential receivers adopted in the EIS were:

- Day (0700–1800): 37dBA (38dBA in proximity to Leichhardt Highway)
- Evening (1800–2200): 33dBA
- Night (2200–0700): 28dBA.

Applicable noise limits adopted in the EIS for heavy vehicles on roads for the day, evening and night periods were:

- Day (0700–1800): 65dBA L_{Amax}
- Evening (1800–2200): <60dBA $L_{Amax, adj}$
- Night (2200–0700): 42dBA L_{Amax} naturally ventilated and 57dBA L_{Amax} air-conditioned.

These maximum noise levels would only be applied adjoining low-volume roads with a high proportion of heavy vehicles. Public roads such as the Leichhardt Highway would not be assessed in this manner.

Noise modelling for construction noise showed the predicted adjusted noise levels from construction comply with the design PNL of $L_{Aeq,adj,1hr}$ 28dBA and the 42dBA $_{maxLpA}$ noise level during the night-time period. Thus the EIS concluded that no exceedances of mine site construction noise planning noise levels at receptors were predicted. Stanmore committed to preparing and implementing a Construction Noise Management Plan for construction activities outside of 6.30am and 6.30pm on business days and Saturdays where noise levels at receptors exceed the PNL of $L_{Aeq,adj,1hr}$ 28dBA at night (6:30pm to 6:30am) and $L_{Aeq,adj,1hr}$ 37dBA during the day on public holidays and Sundays .

Noise modelling for the operational stage of the project which included the mine site, conveyor route, rail loop and coal loading facility and surrounding area and the noise sensitive locations, was used to predict the "worst case" noise at sensitive receptors, by assuming a mild temperature inversion and slight wind blowing from the noise source to the sensitive receptor. Three different scenarios were modelled for operations: Year 1, year 5, and year 10. These scenarios were chosen to identify the initial earthworks on the site then progressive expansion of the pit during coal extraction. Modelling for scenarios beyond year 10 year was not undertaken as it was judged that the depth of the open pit would provide additional acoustic shielding beyond this time, and that year 10 was likely to be

the “noisiest” in terms of assessing impacts on receptors.

Comparison of the modelled predicted noise levels with the derived design PNL’s adopted for the project showed:

- The noise from the overland conveyor results in exceedances at 11 receptors, identified as 14, 15, 24, 25, 26, 27, 28, 30, 39, 40 and 41.
- The noise from the mine site operations results in exceedances at 3 receptors, identified as 1, 2 and 17.
- The combined noise from the mine site operations and conveyor results in exceedances at 2 receptors, identified as 16 and 53.
- The noise from the rail loop and rail loading results in exceedances at 1 receptor, identified as 48.

The EIS concluded that with the use of purpose built quiet conveyor, enclosure of specific conveyor sections and appropriately placed spoil dumps, achievement of the planning noise levels would be achieved at all receptors, apart from receptors 16, 25, 26. Receptor 16 is the residence at Weringa Quarry and would become unoccupied prior to commencement of The Range Project. Stanmore is currently in discussions with receptors 25 and 26 regarding alternative arrangements.

One receptor (receptor 48) adjacent to the rail loading facility is predicted to experience noise levels that exceed night time planning noise levels. This exceedance is predicted to be 2dBA. Mitigation measures such as the formation of earth mounds between the receptor and the rail should result in compliance with night time planning noise levels.

The predicted ground vibration levels at all of the closest receptors are well within the recommended ground vibration guideline. No residences fall within the minimum distance of 1,300m from blasting activities and hence the airblast criteria would be met at all the nearest residences. EHP requested Stanmore review the human vibration comfort level standard used in the EIS. Stanmore amended the human vibration comfort level in the supplementary EIS in line with AS2670.2 i.e. 0.58mm/s at 1Hz and 0.28mm/s at 2Hz.

EHP requested further justification of the sound power levels of proposed machinery in the EIS. EHP requested clarification of why there was a reduction in sound levels between current levels and the expected year 1 levels for all locations (N1–N12). The response provided by Stanmore did not adequately explain or discuss this attenuation. Further justification is needed from Stanmore on the reason for discrepancies between the measured and predicted results, prior to EA being issued by EHP.

Stanmore further clarified the discrepancy in an email to EHP on 20 March 2013. They stated that the noise levels monitored during the baseline studies on the EIS included contributions from all source at each locality. The higher existing noises are from the activity of birds or breezes rustling the leaves or distance farming activities. The predicted noise levels only refer to the component noise levels due to the operation of the operation. The noise criteria are expressed in terms of the design component levels (i.e. PNLs) without the addition of baseline noise levels. Hence, the predicted noise levels are lower than the current measured noise levels because the predicted levels refer to the component levels only. EHP was satisfied with this response. The noise limits in the conditions for the draft EA have been modified (Appendix 3).

4.14.1 Transport corridor

Several landowners adjacent to the corridor expressed concern about the impact of noise from the conveyor on their agricultural activities. They had concerns regarding both the constant noise from the rollers on the conveyor belt and the impacts of sirens at regular intervals along the corridor (which sounds in the event of a fault in the line) and the potential impact of the sudden noise event on livestock. They requested that all noise attenuation options available including revision of any structural and operational specifications proposed for the overland conveyor be used to minimise the impact of the transport corridor upon residents. Stanmore replied that the noise attenuation treatments applied to the conveyor in the vicinity of sensitive receptors R25 and R26 would achieve the planning noise level of 28dBA.

An adjacent landholder raised concerns regarding the impact of the conveyor noises on an embryo transfer building. They contend that agricultural buildings such as the embryo transfer building should be treated as sensitive receptors and assessed accordingly in the noise impact modelling for the EIS. They content that a "sensitive receptor means an area or place where noise is measured' under the Environmental Protection Policy (Noise) 1998 and as such, there is no explicit exclusion of an agricultural building such as the embryo transfer building from being classified as a sensitive receptor. They requested that noise impacts to certain buildings such as the embryo transfer building be considered in mitigation measures.

In the supplementary EIS, Stanmore contended that the embryo transfer building as a noise sensitive receptor would be consistent with application of the EPP (Noise) at a workplace, such as a commercial and retail activity (indoors) (EPP (Noise) Schedule 1). The environmental value to be protected for a workplace is health and

wellbeing of the personnel and the ability to effectively communicate. The noise criteria applied under this approach would be much higher (nominally 60dBA) than the noise criteria that Stanmore are using for their design criteria (28dBA). Alternatively, Stanmore argue that the embryo transfer building and the animals within it are covered by the first environmental value of the EPP (Noise) which states "*The environmental values to be enhanced or protected under this policy are: (a) the qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems*" and therefore have already been assessed in the EIS. Stanmore contend that for the cattle and embryos to be the subject of special treatment under the EPP (Noise) would require the submitter to produce research evidence relating to suitable noise exposure limits for handling cattle and for protection of embryos involved in the transfer process. The research related to noise and keeping animal stress levels low is generally related to abattoir processes. Although this may have a general application to handling of cattle, it is not specifically targeted towards normal cattle handling activities, such as involved in an embryo transfer shed.

Recommendation: *Stanmore liaise with landholders and experts to minimise and mitigate noise impacts from the overland conveyor on cattle and embryo transfer building.*

4.15 Terrestrial ecology

Chapter 20 of the EIS addressed the terrestrial ecology component of the EIS TOR. It summarised planned construction and operational activities in relation to the existing terrestrial ecology, and described the potential impacts of these activities on fauna, flora and vegetation communities. Mitigation practices that would limit the impact of activities on the terrestrial ecology were described and residual impacts of the project area assessed.

The project area is within the Brigalow Belt South Bioregion. The area has been historically used for grazing and has limited remnant vegetation and high quality regrowth vegetation. To the south MLA 55001 it is bordered by Quandong State Forest and Barakula State Forest lies to the east and the south of the project area.

Nine remnant Regional Ecosystems (RE) and four regrowth RE were identified within MLA 55001 area during the 2011 surveys. One of the remnant RE, 11.9.5 (*Acacia harpophylla* and/or *Casuarina cristata* open-forest on fine-grained sedimentary rocks), is Endangered under the Queensland VM Act, has Endangered Biodiversity Status (Category B Environmentally Sensitive Area) under the EP Act, and the corresponding Threatened Ecological Community (TEC), *Acacia harpophylla* dominant and co-dominant, is listed as Endangered under the EPBC Act.

The coal transport corridor, water supply corridor and power supply corridor combined contain approximately 10.9ha of remnant RE 11.9.5, which has an Endangered biodiversity status (Category B Environmentally Sensitive Area), of this, it is anticipated that up to 0.85ha would be cleared.

The terrestrial habitats within the project area were assigned to three broad categories:

1. woodland and open forest on alluvial soils (RE 11.3.2, 11.3.4 and 11.3.25)
2. woodland and open forest on non-alluvial soils (all other RE mapped for the MLA 55001)
3. grasslands including pasture and cleared gilgais not mapped as RE.

The EIS reports that the majority of the project area is cleared pasture that provides habitat of limited value to a range of widespread and common fauna species. This pasture includes isolated Brigalow remnants which may provide limited shelter for a range of taxa. Remnant and regrowth woodland communities identified were generally of poor to moderate condition and habitat value.

Habitat within the proposed linear infrastructure corridors has largely been cleared for grazing. The remaining vegetated areas within the infrastructure corridors are restricted to thin strips of disturbed woodland largely following fence lines or drainage lines.

Three threatened animal species were recorded within the Disturbance Area—Golden-tailed Gecko *Strophurus taenicauda* (NC Act Near Threatened), Glossy Black-Cockatoo *Calyptorhynchus lathami* (NC Act Vulnerable), and Little Pied Bat *Chalinolobus picatus* (NC Act Near Threatened). Fifteen native terrestrial flora species of conservation significance may potentially occur within the project area, 14 native terrestrial fauna species of conservation significance are known to occur within the project area, and, based on habitats and species known distributions, a further 22 native terrestrial fauna species of conservation significance are considered to potentially occur in the project area.

The EIS concluded that if the mitigation measures are implemented, most of the impacts of the project on terrestrial ecological values are predicted to be minor or negligible. The exception being the direct loss of up to 89.41ha of remnant and regrowth RE 11.9.5 and 11.9.6, which corresponds to an Endangered TEC under EPBC Act, and is an Endangered RE and Category B Environmentally Sensitive Area (ESA) under VM Act. These losses may be ameliorated by a direct land based, or indirect relocation or re-establishment compensatory offsets (section 4.23 of this report).

Submitters raised a number of concerns regarding the impacts of the project on terrestrial ecology and ensuring the mitigation measures minimised impacts to existing ecological communities and maximised ecological outcomes and ecosystem connectivity across the landscape. Issues that were raised included:

- NPRRS, QMDC, FBA, EHP and DNRM each raised concerns about the clearing of RE 11.9.5 and emphasised that the project should minimise clearance as much as possible. In response, Stanmore advised that it had orientated the mine and associated infrastructure to have the least possible impact on remnant Endangered RE 11.9.5/*Acacia harpophylla* TEC. Where it is not possible to avoid activities within the Endangered RE/TEC, Stanmore committed to providing Biodiversity Offsets to mitigate any loss of habitat and ecosystem of these areas.
- NPRSR and QMDC raised concerns about the impact of the project on 3 terrestrial Endangered, Vulnerable or Near Threatened (EVNT) fauna species, 6 bird species listed as migratory under the EPBC Act and 6 fauna species listed as significant within the Brigalow Belt South Bioregion. Stanmore responded that the alignment for the mine infrastructure had been chosen so as to minimise the impacts on flora and fauna. Additionally, pre-clear surveys would be undertaken by licensed spotter-catchers to ensure that no significant or migratory fauna species or their habitat are disturbed for infrastructure, tracks and access paths.
- DNRM, WPSQ and EHP each stated their strong preference for the linear infrastructure to avoid clearing vegetation, by locating it in cleared agricultural land and collocated with other infrastructure and fence boundaries (where possible). DNRM requested justification of the need for a 20m wide corridor width for construction activities. In response, Stanmore advised that the location of water, power and conveyor infrastructure had been optimised and the area of impacted vegetation has been significantly reduced in the supplementary EIS. In particular, the disturbance to areas of linear vegetation in road reserves had been almost entirely eliminated.

DNRM commented that areas outside of the mining lease had not been assessed in accordance with the VM Act, regrowth vegetation code, Policy for Vegetation Management Offsets or the Regional Vegetation Management Code. DNRM requested Chapter 20 of the EIS be amended to consider the impact of the rail loading facility, water and power corridors on assessable vegetation, including all native woody vegetation on State land tenures. Stanmore responded that the water pipeline and the transmission line had been re-located to run along the Mining Lease with the conveyor belt, therefore these issues were no longer relevant as the infrastructure is now on mining tenure. Assessable vegetation for the powerline in the Roche Creek Road reserve was addressed in Chapter 20 of the EIS.

4.15.1 Impacts on Quadong State Forest

Numerous submitters, including NPSRR, QMDB and EHP, raised concerns about the impacts of the project on Quandong State Forest (QSF), particularly the location of a proposed infrastructure corridor within the MLA 55001 on QSF land. Stanmore responded that the project had been amended in the supplementary EIS to reduce impacts on the State Forest, with the infrastructure corridor no longer to be located within the MLA on/adjacent to QSF.

In response to the supplementary EIS, NPSRR acknowledged that the relocation of the transport corridor would reduce direct impacts of the project on QSF values. The supplementary EIS did not adequately describe secondary impacts of the project on State Forest or provide management and mitigation strategies to reduce potential impacts. NPSRR had particular concerns about the location of the site access road along the length of the QSF. The EIS outlined that the open forest/woodland at the southern section of the MLA adjoining QSF, has the highest habitat values in the MLA area 55001. The habitat is well developed and complex with good ground cover, tree hollows and some fallen timber that provides habitat for a range of vertebrate fauna including *Rufous Fantail* (Migratory EPBC Act), *Little Pied Bat* (Near Threatened (NT) NC Act), *Golden Tailed Gecko* (NT NC Act), and regionally significant species including the Speckled Warbler, Grey-crowned Babbler, Common Brushtail Possum and Black-striped Wallaby. With the proposed road (designed to carry heavy vehicles and operate at a speed of 100km/h), running in close proximity to, and the length of this high value habitat area, the likelihood of fauna casualties due to vehicle strikes is significant. To mitigate such impacts NPSRR recommended: that the internal site access road traversing QSF be regarded as a ‘go-slow zone’ restricting speed to 40km/h; and speed reduction devices and appropriate roadside signage alerting mining personnel of wildlife movement in the area should be installed. NPSRR also advised that Stanmore would be required under the MR Act to obtain consent from the reserve land owner (NPRSR for the QSF) before entering reserve land. NPRSS advised that it would seek to condition the development of the roads adjacent to QSF if consent was provided to Stanmore.

Recommendation: *Stanmore assess the potential secondary impacts of the project (including internal haul roads) on Quandong State Forest and associated EVNT species and habitat and consider management and mitigation measures, including internal road alignment and design (e.g. restricting speed limits and provision of roadside signage), to minimise impacts.*

4.15.2 Weed management

WDRC, BSC and landholders raised concerns regarding the impact of the project on the spread of weeds and the provision of appropriate mitigation measures. Landholders were particularly concerned about the risk of weeds spreading along the infrastructure corridor and the potential negative impacts to their businesses, reduced productivity and increased expenses for weed management if weeds were to spread onto their properties. BSC requested that a Banana Rural Land Officer be involved in the approval and implementation phase of pest and weed management. WDRC requested that Stanmore:

- Reference WDRC's Pest Management Plan to ensure a coordinated approach against weed management within the region and agree to meet any relevant requirements of the Pest Management Plan.
- Ensure that all vehicles entering and leaving construction sites within the region be adequately washed down to prevent the spread of noxious weeds such as the Parthenium weed, which has been contained in the north of the WDRC boundary.
- Make a total contribution towards the construction of new wash down facilities in Wandoan, Dalby and Chinchilla. These would be essential wash down facilities for use by all vehicles and heavy plant and equipment entering or exiting the region.

Stanmore responded that weed management issues had been adequately addressed in the EIS and mitigation measures included in the EM Plan. Stanmore's Pest Management Plan refers to and has been developed in conjunction with the WDRC Pest Management Plan. No further commitments were made.

4.16 Aquatic ecology

Chapter 21 (Aquatic ecology and Sygofauna) of the EIS described the existing aquatic ecology of the project area, outlined activities that may affect the existing aquatic and groundwater ecology, considered potential changes in surface water quality and groundwater associated with these activities and discussed the impacts these changes may have on aquatic fauna, flora and communities. It also described potential changes in the quality, level or quantity of groundwater and the impacts that these changes may have on stygofauna, if present.

The EIS reported that the biological values of aquatic ecosystems within the project area were relatively low and consistent with those of the wider catchment. Environmental values are dictated primarily by the ephemeral and intermittent nature of the region's waterways, although agricultural development within the region has influenced water quality and the physical characteristics of aquatic habitat. Creeks in the catchments and project area are generally in moderate condition and are characterised by low habitat diversity, damage caused by cattle access to creeks, road crossings that restrict passage of fish and other aquatic fauna, and invasion of weed species.

Nevertheless, creeks in the survey area provide upstream dispersal habitat for fish species and possibly breeding habitat for some species. Therefore, macroinvertebrate and fish communities in the survey area are likely to contribute to the success of upstream and downstream populations through movement or migration. No vulnerable or endangered species of aquatic flora or fauna were recorded from, or are likely to occur, in the waterways of the survey area. No wetlands of regional, state or national significance were present in the project area. The EIS concluded that the impact of the project on the local aquatic environments would be low and that regional impacts are likely to be negligible. Long-term residual impacts after the completion of mining are expected to be minor.

Construction and operation of the project is likely to result in a localised loss of aquatic habitat, flora and fauna. Impacts on aquatic ecology are most likely to occur as a result of the loss of onsite dams and minor ephemeral watercourses, changes in groundwater levels, creek crossing; flow diversions; vegetation clearing and earthworks; vegetation clearing and earthworks; or the unplanned discharge of mine-affected or contaminated water.

Measures were identified to minimise and mitigate construction and operational activities of the project on aquatic ecology, and for input into ongoing adaptive management of the project. A Receiving Environment Monitoring Program (REMP) would be developed to monitor the downstream aquatic environment and assess the level of impacts of the project. The REMP would focus on aquatic habitat and macroinvertebrates as indicators and would:

- Describe the background condition of waterways in the receiving environment.
- Describe the environmental values and water quality objectives of the receiving environment.
- Determine water quality objectives and compliance for the receiving environment.
- Discuss potential causes for non-compliance and the potential effects on environmental values.
- Determine site-specific background values for the receiving environment within two years of implementing the REMP.
- Incorporate statistically robust, quantitative design methodologies.

- Include aquatic habitat and key indicator macroinvertebrate monitoring.
- Include on-site and off-site monitoring sites to assess direct impacts and indirect downstream impacts.
- Be implemented by qualified aquatic biologists.
- Inform the continual improvement of the mine's Environmental Management Plan of Operations.
- Trigger the requirement for remedial action, should an impact be detected.

DAFF noted that waterway barriers may be required for the project (e.g. construction of road crossings). It advised the following:

- For areas outside of the MLA area, a waterway barrier works approval would be needed to build any structure across a freshwater waterway whether it is temporary or permanent.
- For areas within the MLA area, a waterway barrier works approval would not be required. However, to mitigate the impacts of the project on fish passage, DAFF recommended that any waterway crossings over 3rd order streams and above be constructed in line with the department's self-assessable code for minor waterway barrier works.

Stanmore updated the text of the supplementary EIS to reflect these comments from DAFF.

4.16.1 Stygofauna

A pilot survey completed at four groundwater bores in the project area found no stygofauna. The groundwater sampled at these bores had high salinity and a low concentration of dissolved oxygen, and the pilot study therefore concluded that the groundwater in the project area was not conducive to the presence of stygofauna and it is highly unlikely stygofauna would be recovered from groundwater with these physico-chemical properties.

DNRM reported that the sampling protocol used to detect stygofauna presence did not comply with guideline stipulated in the project's TOR. Specifically, the number of bores sampled in the pilot study and insufficient length of time between bore installation and sampling did not meet the sampling protocols from the Western Australian Environmental Protection Authority. DNRM requested stygofaunal sampling be repeated in the same bores in a season other than spring, and other bores should be included so that a total of 6–10 bores are sampled. In the supplementary EIS, Stanmore committed to undertake additional sampling for stygofauna both before and after the wet season in the existing and additional bores (where available). DNRM was satisfied with this response.

Recommendation: *Stanmore conduct additional sampling for stygofauna both before and after the wet season in the existing and additional bores (where available) in accordance with the stygofaunal sampling guidelines by the Western Australian Environmental Protection Authority and to the satisfaction of DNRM.*

4.17 Cultural Heritage

4.17.1 Indigenous heritage

Chapter 25 of the EIS outlined activities to ascertain Indigenous cultural heritage values within The Range Project. The chapter detailed the relevant Aboriginal parties for The Range area, summarised what was known with regards to Indigenous cultural heritage, and detailed the cultural heritage management process that would apply to the project area. Information regarding specific locations of cultural heritage was not included in the Environmental Impact Statement due to the sensitivity of information about recorded sites of Indigenous cultural heritage significance.

The relevant Indigenous parties for negotiation of Cultural Heritage Management Plans are the Western Wakka Wakka People and Iman People #2. The EIS stated that a Cultural Heritage Management Plan (CHMP) was being prepared with the indigenous parties—namely Western Wakka Wakka People and Iman People #2. The supplementary EIS detailed further progress on these discussions:

- A CHMP between Stanmore and the Iman People #2 had been completed and was approved in June 2012 by DATSIMA.
- Field surveys undertaken by representatives of the Western Wakka Wakka People and an archaeologist to identify the presence of Indigenous cultural heritage values within their claim area underlying the project area identified the potential for the discovery of unmarked burial sites along creek beds. A management strategy was developed in the draft CHMP that provides for an inspection regime and discovery process that complies with the Aboriginal Cultural Heritage Act 1993. The CHMP with the Western Wakka Wakka People, once executed, would be submitted to DATSIMA for approval and lodged with DATSIMA's Cultural Heritage Coordination Unit. Aspects would also be incorporated into the project's Environmental Management Plan.

4.17.2 Non-indigenous cultural heritage

Chapter 26 of the EIS provided an analysis of the historical cultural heritage undertaken for the area of The Range Project. There were no sites of historical cultural heritage identified that would suggest further archaeological investigation would be required. Therefore, the EIS concluded that the risk of project activities impacting on historical cultural heritage was low in the short and long term. None-the-less, the EIS included a Historical Cultural Heritage Management Strategy (Appendix 25) to provide a process for managing yet undiscovered historical cultural heritage values should they become apparent during the development of the project.

Despite not being located within the mining area, the EIS identified potential impacts on St. John's Lutheran Church and cemetery. Increased road traffic and the movement of equipment in the area may affect access to this well known and frequently used site. The EIS recommended that consideration be given to minimising heavy traffic or increased noise in the vicinity of this site. Managing or timing traffic movements to limit impact on church services and events would be considered.

Recommendation: *Stanmore identify and implement measures to minimise project related impacts from heavy traffic and increased noise on St. John's Lutheran Church and cemetery.*

4.18 Social impacts

Chapter 28 of the EIS described the existing social and cultural values within the project's area of influence, identified potentially beneficial and adverse impacts of the project and outcomes of the stakeholder engagement processes. Mitigation and enhancement strategies as well as monitoring regimes to ensure social and cultural values are enhanced, or at least maintained were also identified. A Social Impact Assessment for the project was provided in Appendix 27.

Assessment of the social impacts of the project in the EIS identified key issues that should be addressed in order to minimise identified adverse impacts and enhance potential local, regional and State benefits of the project. The EIS also identified there is potential for escalation of adverse social impacts where a number of major industrial and infrastructure projects are developed concurrently in the region.

To address these issues, Stanmore prepared a Social Impact Management Plan (SIMP). This plan includes the management strategies for mitigating social impacts, implementation actions, and roles and responsibilities for Stanmore, government and service providers.

Under the SIMP, Stanmore would be required to undertake and provide relevant Queensland Government authorities with annual progress reports, describing measures undertaken in adhering to proposed mitigation and enhancement strategies. Performance indicators would be required in the SIMP.

Numerous submissions were received on the social impacts of the project and the SIMP. Major issues identified are discussed in the following sections.

4.18.1 Accommodation

Several submitters raised concerns about the limited information provided on the proposed use of workers camp and accommodation village and potential impacts and mitigation strategies. DSDIP requested Stanmore consider the potential impacts of the accommodation component of the project in the EIS. BSC requested a plan of the proposed construction camps and village location and a detailed management plan. WDRC requested Stanmore make a contribution per full time project worker housed within camps towards augmentation of existing council facilities and infrastructure. Stanmore responded that it anticipated that the development approval conditions granted by WDRC to a third party accommodation village provider would include appropriate infrastructure charges. Stanmore reported updated mitigation strategies to minimise impacts from the project's accommodation requirements had been provided in the supplementary EIS and committed that a detailed housing strategy would be developed at Final Investment Decision.

BSC and DSDIP raised further concerns about the project's housing strategy. DSDIP commented that the housing options in the EIS to accommodate 100% of the project workforce in a village or camp was not consistent with the State's policy direction for providing accommodation choices for workers. No strategy or commitment to offer or provide accommodation for families in the town or local area was provided despite the fact that ownership of dwellings was referred to as a direct and flow-on effect of the project. Further, provision of low cost housing in The Range catchment area for key service industry workers was not addressed. DSDIP requested that Stanmore conduct an Integrated Accommodation and Housing Monitoring Data Collection Project (IAHMDCP) in collaboration with Office of Economic and Statistical Research (OESR), the Department of Housing and Public Works, and the Social Impact Assessment Unit of the Office of the Coordinator-General to inform the development of evidence-based accommodation and housing impact mitigation and management strategies for the project and provide financial contributions, subject to appropriate cost recovery arrangements to the State agencies for the IAHMDCP.

In response Stanmore updated the Economic Impact Assessment, Social Impact Assessment and SIMP in the supplementary EIS to commit to:

1. Develop a housing strategy for Wandoan and surrounding towns (e.g. Miles, Taroom) that includes consultation to assess workers' housing requirements, an assessment of options to support housing developments (e.g. lease buy back), and schedules for housing delivery. This detailed housing strategy would be developed at Final Investment Decision.
2. Collaborate with local and state government, as well as other project proponents in or near Wandoan, in developing and implementing strategies to assist in alleviating any impacts on housing affordability. This is outlined in mitigation strategies presented in Chapter 28, Appendix 27 (Social Impact Assessment) and Appendix 8 (SIMP).
3. Continue to be involved in a reference group that is part of the Western Downs Housing Trust and provide information and recommendations regarding housing requirements and where affordable housing should be located.

Stanmore did not commit to collation and provision of data under the IAHMDCP, but committed to discussing and clarifying strategies and options with Queensland Government.

After reviewing the supplementary EIS, BSC and DSDIP commented that the EIS did not adequately address workforce accommodation issues.

Recommendation: *Stanmore Coal liaises with WDRC, BSC and DSDIP in developing a housing strategy for the project and address advisory agency concerns regarding the impacts of the project on housing and accommodation.*

4.18.2 Employment

Numerous submissions were received on the project's employment and participation strategies. The Department of Education and Training (DETE) commented on the strength of the Social Impact Management Plan and the inclusion of Key Performance Indicators and employment targets. WDRC commented that strategies to mitigate skills shortages and draw-down on local labour were not sufficient as businesses outside the resources sector were likely to see their costs of recruitment rise, without the advantages of perceived high wages of the resources sector and limited recruitment funds. WDRC requested the proponent collaborate with council and partners to assist with funding and in-kind support in mitigating these issues through programs identified in the Western Downs Skills Strategy. Stanmore provided additional mitigation measures in the supplementary EIS and committed to collaborate with WDRC to develop solutions. Stanmore would consider support for Western Downs Skills Strategy when it is available.

In regards to recruitment, DSDIP and DATSIMA acknowledged that Stanmore had committed to develop an equal opportunity recruitment policy that would encourage participation from under-represented groups (e.g. women, indigenous, disabled and mature). However, DSDIP commented that there were little detail on strategies as to how Stanmore intends to target these and requested Stanmore provide details of training and recruitment strategies in the final SIMP. DATSIMA requested the proponent imbeds in the contracts a requirement for an Indigenous participation plan, including key performance indicators, to help ensure Indigenous employment outcomes are delivered. In response, Stanmore updated the supplementary EIS and committed to developing a Workforce Management Plan at Final Investment Decision. This would provide details of Stanmore's training and recruitment policies, including requirements for contractors to adhere to proponent policies in regards to recruitment.

4.18.3 Local Industry participation

BSC requested that the proponent prepare and implement a strategy that enables and encourages the use of local businesses and suppliers in the completion of the project. DSDIP requested Stanmore develop a Local Industry Participation Plan (LIPP) to ensure local businesses are provided with a fair and reasonable access to opportunities arising from the project. In the supplementary EIS, Stanmore committed to developing and implementing a LIPP in accordance with the requirements of the Local Industry Policy Guidelines (2011). The preparation of the LIPP would be undertaken in parallel with the development of the project and at the commencement of the initial conception phase of the procurement process.

4.18.4 Impact on council resources

DLG and WDRC both acknowledged the impact of the project, along with the cumulative impact of other resource projects within the region, would place greater pressure on WDRC to provide and maintain service standards on local roads, community services and infrastructure demands. WDRC requested that Stanmore make a financial contribution towards the preparation of the application response in line with the Coordinator General's recent decisions for other projects. Stanmore committed to engage with WDRC at the appropriate time to discuss any

contribution to local government time and cost of engaging with project proponents.

4.18.5 Social impact management plan

Several submitters commented that while the Social Impact Assessment (Appendix 27) had acknowledged and described in great detail the plethora of cumulative impacts associated with resource related activities both in the immediate Wandoan area and in the wider Surat Basin, it lacked specific detail in relation to how these impacts could be successfully managed. Deficiencies identified included:

- DSDIP commented that the SIMP did not include mitigations measures addressing family support and counselling services especially support for landholders. Stanmore amended the EIS to include new measures for directly affected landholders.
- DCS and DSDIP considered the mitigation measures do not adequately address impacts to disadvantaged and low income groups. Stanmore responded that the mitigation strategies focused on education and training, health, law and emergency services as these sectors were identified to have the biggest impact in the impact assessment. Other community services were also assessed but impacts were assessed as low and specific mitigation strategies were not developed for these services.
- DSDIP commented that mitigation strategies for social investments and community development should seek to build the capacity of communities to undertake activities and minimise dependency on proponents. Certain disadvantaged groups within the community such as low income families, youth, seniors, people with a disability and Indigenous communities may experience undue hardship as a result of the negative consequences of growth; particularly in the area of affordable housing. Stanmore responded that a range of mitigation strategies to reverse the current trend of decreasing population in Wandoan and assist in delivering a positive impact on community cohesion had been developed and included in the supplementary EIS.
- WDRC commented that while the EIS highlighted impacts in relation to education, childcare, health, aged care, law enforcement, emergency services, cultural and recreational facilities, family and community support services and tourism on the Wandoan area, from experience, the impacts identified for Wandoan would have a domino effect across the whole of the region. WDRC requested Stanmore works closely with WDRC and relevant community groups to periodically publish a review of issues, completed activity and measures of success. Stanmore included a mitigation measure relating to this issue in the supplementary EIS.
- DSDIP disagreed with the 'low' assessment of the impacts of land value due to loss of agricultural in the EIS. They commented that this assessment did not consider the impact on land owners directly affected by the project. Stanmore revised the assessment in the supplementary EIS.
- DSDIP commented that the response timeframes and a category for urgent complaints had not been included in the dispute resolution process for handling comments, enquiries or grievances in the SIMP. Stanmore updated this process in the SIMP.
- WDRC raised concern that the proponent's assessment of crime and anti-social behaviour was limited across the project area and mitigation strategies were not identified. WDRC did not agree that the assessment in the EIS reflects the impact of increased criminal and antisocial behaviour that may occur in specific locations, including small towns such as Wandoan. Stanmore responded that crime rates per 100,000 people were unlikely to increase and that the likely impact would be the reduction in the communities' feelings of safety as the population increased. Stanmore provided additional mitigation strategies in the SIMP to address these issues.
- DSDIP disagreed with the 'low' assessment of risk of unsociable behaviour and stress on worker's relationships in the EIS. They recommended this rating be re-examined to reflect the potential cumulative impacts of a male construction workforce, given the number of projects in the Surat Basin occurring at the same time. Stanmore responded that the impacts of male dominated workforces had been addressed in the EIS and mitigation strategies identified.

After reviewing the supplementary EIS, BSC responded that the EIS failed to adequately deal with the flow on social and infrastructure impacts to their region and that it did not address the cumulative impacts of these issues from the proposed resource and related projects in the area.

Recommendation: *Stanmore update it's SIMP to address advisory body comments provided on the EIS and supplementary EIS.*

4.18.6 Community consultation

DSDIP expressed concern about the level of community consultation on the SIMP. They stated that the timing for community engagement, or joining or establishing a community reference group, should be commenced during the

scoping phase of the SIA and early in the EIS development. By the EIS stage, SIMP action plans should be well developed with various stakeholders and potential partner agencies in relation to mitigating actions, Key Performance Indicator's and timeframes. Section 3 Monitoring, Reporting and Review of the SIMP demonstrates the mitigation strategies to some degree but it is not evident as to how much stakeholder engagement has occurred in relation to the strategies as the mechanisms appear not to be established (e.g. a Community Reference Group (CRG)). The CRG is instrumental in implementing the SIMP action plans. It is recommended that timeframes are provided for establishing the CRG. Stanmore responded that a CRG was not formed for this project due to the extensive pre-existing stakeholder engagement and reference groups in the local area (potential for stakeholder burnout). It is anticipated the Stanmore would leverage one of the existing CRGs rather than forming an additional CRG. After reviewing the supplementary EIS, DSDIP reconfirmed that the CRG should have been set up in the early stages of the EIS development. DSDIP noted Stanmore committed to develop a CRG, but no information was provided on timing, structure and function.

Recommendations:

1. *Stanmore engage with new or existing CRG in finalising the SIMP.*
2. *Stanmore work with community groups to disseminate information throughout the life of the project, and provide a forum for discussion.*

4.18.7 Impacts on emergency services

4.18.7.1 Emergency incidences

Emergency Management Queensland (EMQ) requested the proponent develop an Emergency Action Plans and keep WDRC, QFRS and QAS updated on location of any camps, work crews, etc including the number of personal at the various locations. DCS requested Stanmore address the following in the Emergency Management Plan:

- What actions the company would take to control and limit the effects of an emergency incident both on their property and its neighbouring properties if an incident was to spread from the company's property.
- What interaction would the QFRS expect from the company and its resources to control an emergency incident?
- What resources would be available for use to control an emergency incident on the company's property?

Stanmore responded that an Emergency Management Plan developed for the project would address the DCS requirements.

4.18.7.2 Queensland police

DCS disagreed with the 'low' rating assigned to pressures on emergency services and requested Stanmore engage with police and emergency services agencies to ensure that the impacts of the project on the business of these agencies were comprehensively addressed. Stanmore upgraded the risk to medium in SIA and SIMP. Queensland Police Service (QPS) commented that the increase in resource projects in the areas had lead to a dramatic increase in the non-resident population and traffic flows on the Leichhardt Highway and other roads, resulting in a significant impact on the demand for policing services. The QPS made the following requests which Stanmore incorporated as mitigation strategies in the SIMP in the supplementary EIS:

- Supply details of the locations of all workers camps to QPS to facilitate effective response capability to calls for service.
- Emergency plans should be reviewed and approved by the relevant disaster management groups and that consultation occurs with the Roma District Officer with respect to development and documentation of plans.
- Appoint a project liaison officer to work in consultation with the Officer in Charge of Wandoan Police Station to deal with any instances of anti- social behaviour exhibited by all employees involved in the project.

Additionally, QPS requested the following from Stanmore:

- o Commit to making a financial contribution to the provision of increased policing services including staffing, vehicles, communications and accommodation.
- o Consider the potential opportunity to mitigate the extra demand on police resources in the Southern Region by committing to discussions with the QPS Southern Region about the provision of temporary accommodation (dongas or demountables) in Wandoan or alternatively Taroom.
- o The QPS requests the proponent consult with WDRC and other the other local resource companies to fund and support a Close Circuit Television System (CCTV) within the main CBD of Wandoan. The system would assist the QPS with prevention, reduction and detection strategies in relation to behaviour and liquor related

incidents.

Stanmore did not commit to funding the CCTV or police resources at this time.

4.18.7.3 Queensland Ambulance

DCS commented that the project has the potential to increase QAS demand in an area with limited response capacity, as well as the potential to increase the usage of the helicopter based service and fixed wing aircraft. The project would require mitigation strategies around the provision of emergency care on site, ongoing consultation and information, around the project status and emergency access to ensure a timely and appropriate QAS response. QAS requested the following:

- An orientation of the project site should be provided to the Officer-in-Charge of Wandoan and Miles stations.
- The proponent notifies QAS of planned exercises, either practical or tabletop, for attendance and participation by QAS.
- The QAS would seek an opportunity to meet with the Principal, regarding a proposal for the provision of dedicated paramedical services on site during the construction period and when the mine is fully operational.
- The QAS would discuss with the Principal, the possible formulation and introduction of a Contract for Service, between QAS and the Principal, in line with similar contracts held with other mine sites in the state.

Stanmore responded that these issues have been noted and the supplementary EIS had been amended accordingly.

4.18.7.4 Fire

Landholders adjacent to the transport corridor raised concerns that the conveyor would pose a serious fire risk to the Leucaena and pastures adjacent to the infrastructure corridor, homesteads, machinery sheds, plants and livestock. Stanmore replied that the transport corridor would include the vegetation clearing for fire breaks to minimise fire risk posed to adjacent land holders.

DCS and QFRS commented that a bushfire risk analysis map prepared by the QFRS covered the project mine site and transport corridor. Most of the study area is classified low risk, with small medium risk areas identified across the study area associated with forest areas to the east of Wandoan (and the mine site). The QFRS identified limited resources located in the project area and advised that there may be a delay in assembling sufficient resources to control an emergency incident.

The QFRS provided the following comments on the EIS:

- QFRS requests Stanmore prepare a Bushfire Management Plan. The EIS should contain a map which identifies the areas of medium risk bushfire hazard areas and all components of the mine, including mine, infrastructure. Stanmore committed to develop an Emergency Management Plan which would include a Bushfire Management Plan.
- QFRS requests Stanmore describe the actions to be taken by the company in the event of a fire, including a wildfire event or chemical spillage or other emergency event to limit the effects to life and property, including the environment.
- Recommends that fire fighting water supplies be identified in the EIS, if relevant, to the protection of structures or for the control of other emergency incidents within the property e.g. chemical incident. Depending on the size of structures and the associated risks, contaminated water runoff from fire-fighting purposes or chemical incidents maybe required to be addressed in the EIS.

Stanmore responded that raw water dam would contain approximately 114ML of water which is available for fire fighting purposes. A ring main would be provided in the mine infrastructure area to facilitate this. Runoff from the mine infrastructure area would drain to Mine Water Dam 1, which would have sufficient capacity to hold the entire volume of the raw water dam. These issues and those raised above would be addressed in the Emergency Management Plan.

Recommendation: *That Stanmore liaise with DCS, EMQ, QPS, QAS and QFRS to incorporate relevant requests and requirements into the Emergency Management Plan and relevant operational plans.*

4.19 Health and safety

Chapter 30 described the environmental values associated with public health and safety including air quality, noise, traffic, disease and pest vectors, water and sensitive receptors and the potential impacts on the community and individuals in terms of health, safety and quality of life. The EIS outlined mitigation measures for protecting or enhancing health and safety community values. Individual objectives that relate to noise, air, traffic and water were

detailed in the relevant Chapters of the EIS.

Landholders adjacent to the transport corridor raised concerns regarding access to their properties by contractors and workers from the mine and impacts on the security of the people, stock, machinery and equipment stored on the properties. Stanmore responded that the conveyor route and track would be fenced for security and access restricted.

WDRC reported that landholders had raised concerns regarding chemicals being brought on properties as part of mining activities. Landholders are required under legislation to maintain a Material Safety Data Sheet of chemicals for workplace, health and safety purposes. Thus WDRC requested that Stanmore provide each landholder with data sheets of all chemicals brought on the properties, the quantities of each chemical taken on the property; and the quantity of waste chemicals t removed from that property. In the supplementary EIS Stanmore committed to:

- Provide copies of safety data sheets to landholders of all hazardous materials (if any) that are stored on their properties.
- Maintain a hazardous materials register as per legislative requirements, and make this available to the regulator and landholders as required.
- Maintain waste management records and make these available to the regulator on request.

4.20 Economy

Chapter 27 (Economic impact) of the EIS and the economic impact assessment report in Appendix 26, described the existing infrastructure and economic values associated with project.

An economic assessment identified beneficial and adverse economic impacts of the project on state and regional economies (and national and local economies where relevant). The EIS identified that the cumulative impacts resulting from concurrent development of a number of major resource, industrial and infrastructure projects currently proposed for The Range catchment would exacerbate identified adverse impacts as they compete for the same resources.

Assessment of the economic impacts of the project identified the following key issues to be addressed in order to minimise any adverse impacts of the project and to maximise any potential benefits:

- Likely impacts on local business as a result of: competition for and draw of labour to the project and its supply chain; contribution to deepening skills shortages in both the construction and mining industries; escalating costs of labour; reducing business profits and viability; support for the Australian dollar as a result of high value coal exports.
- Potential impacts to agricultural production from disturbance of grazing and cropping land
- Potential impacts on availability and affordability of housing resulting from increased temporary and permanent population in the region.

Mitigation strategies proposed to mitigate and minimise these impacts included:

- Skills development and training opportunities to assist in sourcing required skilled labour.
- Opportunity for local business to secure supply contracts.
- Strategies for minimising impacts on agricultural production.
- Minimising impacts on local property markets by:
    - Ensuring the accommodation village is available prior to commencement of construction activity.
    - Monitoring availability of residential property to accommodate workers migrating to the region.
    - Developing an accommodation program to encourage workers and their families to live locally (for example, house building and lease back program).

In addition to the above impacts and proposed mitigation strategies, there is potential for escalation of adverse economic impacts of The Range, if a number of major industrial and infrastructure projects are developed concurrently in the region. To assist in mitigating cumulative impacts, Stanmore would seek to coordinate construction works and infrastructure usage with other proponents, where possible, to minimise cumulative effects of overlapping timeframes.

Several landholders raised concerns about negative impacts on their business due to potential impacts on grazing and reduced land values stemming from the location of a transport corridor through their property. Stanmore committed to enter into compensation arrangements with landholders for the loss of access or use of land.

WDRC provided the following comments in relation to economic impacts to their area:

- To assist WDRC assess the economic impacts of the projects within their jurisdiction, WDRC requested that Stanmore provide a break down of the outputs from economic impact modelling for specific industries and for the WDRC area.
- The population estimates in the EIS do not include the growing transient population. WDRC raised concerns that the cumulative impacts of the transient population from all the resource sector activities across the region would place a massive burden on infrastructure, community services and facilities. WDRC requested Stanmore consult with council to discuss a social contribution outside of the infrastructure, utilities and housing contributions.
- WDRC noted that the EIS predicted approximately 50% of goods and services required during construction and up to 45% of goods and services required during operations would be sourced from the project area. WDRC encouraged Stanmore to collaborate with the council's Major Developments and Economic Strategy Unit to utilise the Advance Western Downs Business Opportunities Program designed to support local businesses and facilitate streamlined local purchasing processed for the major projects.

Stanmore responded that the economic impacts pertaining to each individual stakeholder was beyond the reasonable scope of the impact assessment. Stanmore committed to collaborate with WDRC's Major Developments and Economic Strategy Unit to provide information for the Business Opportunities Program.

DSDIP requested clarification and justification of a number of assumptions in the economic modelling including:

- A more in depth and consistent account of the regional labour market and qualification of assumptions in the economic impact assessment that assumed 80% of the construction workforce would be sourced locally. If this lead to changes to the assumed labour market for the project then DSDIP requested Stanmore amend its assessment of the impacts on property prices.
- Refrain from including type II impacts in the total impacts of the project entirely or if is not feasible, clearly state that recognised shortcomings/caveats of using type II multipliers, specifically, their tendencies to grossly overstate impacts at the State Level.

Stanmore replied that a change in the proportion of regional labour market in the modelling was not warranted at this stage as it was based on consultation with local industry and would depend on the timing of projects and the availability of suitably qualified labour. The company provide additional discussion on the limitations of Input Output modelling and potential to overstate impacts in the amended EIS. DSDIP provide no further comments on these issues.

4.21 Hazard and risk

Chapter 29 of the EIS described the potential hazards and risks to people and property that may be associated with The Range Project. The identified hazards and risks were analysed and evaluated, assuming implementation of standard risk measures. Additional risk treatment measures were considered where necessary to further reduce residual risks to "as low as reasonably practicable" and a risk management plan was provided.

The EIS reported the following risks of hazards to people and property associated with the activities proposed as part of the project:

- One extreme risk resulting from vehicle interactions between the project and the Xstrata Weringa Quarry within the project MLA 55001. Following additional mitigation measures, the risk was lowered to "high".
- The majority of hazards associated with the proposed activities have a low risk level based on the potential consequences and likelihood of the hazard assuming standard risk treatment measures are implemented.

Factors contributing to lower risk levels included the low population density in the area surrounding the MLA boundary, separation distances from the MLA boundary to sensitive receptors and the storage of dangerous goods such as fuel and explosives on the MLA area. The activities with the highest risk levels (relative scale) attributable to the project were:

- product coal conveyance and handling
- coal stockpiling and handling off-site (i.e. rail load out facility)
- transportation of construction personnel, equipment and materials to, from and within the site
- transportation of personnel, equipment and materials (particularly fuel and explosives) to, from and within the site during the operational phase
- final pit void following mine closure.

The risks of a hazardous event occurring on public land were primarily associated with the supply of power, water and potentially gas to the project site. The Range Project activities undertaken outside the MLA may interact with other project activities but this interaction is unlikely to increase the risk level, assuming implementation of the recommended risk treatment measures

The risk levels associated with natural hazards, such as bushfire and landslide were generally low. The risk of health consequences from flooding and interactions with wildlife (i.e. snakes) however, were moderate. Additional control measures include appropriate emergency response planning and wildlife habitat surveys prior to any clearing activities.

The EIS included a framework for the on-going assessment and management of risks for the project. This plan addresses the assessments that should be conducted at each stage of the project cycle, which include Hazard and Operability, Safety Management System, Emergency Planning and Independent Auditing.

4.22 Rehabilitation and decommissioning

Chapter 9 (Rehabilitation and decommissioning) of the EIS described rehabilitation and decommissioning procedures. Vegetation clearance would incorporate vegetation removal, salvage and storage if unable to be immediately used for beneficial use(s). Topsoil would be stripped, salvaged and stockpiled to ensure viability for future rehabilitation. In later years, topsoil would be stripped and then directly placed on the re-profiled waste rock dump.

As mining strips progress, void spaces would be filled with overburden from the following strip and partings used to fill between the overburden stockpiles in preparation for rehabilitation. Overburden stockpiles would be levelled out to cap all materials and shaped to provide a gently undulating landform. Given the low strip ratios, final landforms are anticipated to be similar to the existing topography, with typically up to around 5 to 15m increased elevation for in-pit waste rock dumps, and 20 to 30m for out-of-pit waste rock dumps, compared to existing landform. Initial boxcut stockpiles would form higher final stockpile shapes as overburden material would be placed on the existing natural surface. Rehabilitation of the landform would commence within two years following a pit strip being mined.

The initial EIS proposed a single final void of approximately 700ha in extent. In the supplementary EIS, three final voids were proposed and the total area reduced to 70ha (including the low wall and high wall faces). The final voids would be formed by reducing the side slopes of the pit highwall and adjacent overburden stockpiles to partially infill the void, bringing the pit floor up towards natural topographical surface. Depths of final voids would vary with the volume of material available for infilling. Three small final voids, approximately 70ha in extent including the low wall and high wall faces, would remain after completion of mining.

Decommissioning would be phased over the life of the mine with the majority of decommissioning activities occurring during the mine closure phase.

Stanmore committed to prepare a Mine Closure Plan, including Rehabilitation Plan, which would list the specific operational activities required to be undertaken in order to complete rehabilitation and decommissioning of the project. The criteria for achieving self-sustaining final landforms would be developed as part of the Mine Closure Plan calling upon-site specific rehabilitation trials, monitoring and research programs.

4.22.1 Post-mine landuse

DNRM commented that the EIS did not adequately address the requirements for rehabilitation required in the former DERM Guideline: Rehabilitation requirements for mining projects. The Guideline states that strategies listed higher in the rehabilitation hierarchy should be adopted in preference to those listed lower. Therefore the project should aim to reinstate previous land use over developing a lower value land use. Stanmore should also aim to return GQAL to its existing productive use so that it would support a viable rural community post mining, similar to the current situation. DNRM deemed that the use of words such as ‘as close as practicable to its pre-mining land use’ was not adequate. It requested Stanmore commit to reinstating the pre-mining productive land use.

Stanmore responded that it had used the rehabilitation hierarchy to develop the strategy and criteria for rehabilitation in Chapter 9. While Stanmore committed to use leading practice and the best methodology available in the supplementary EIS, it was argued that it was practical to expect that land would be exactly the same as the pre-mining condition. The company noted that rehabilitation of the project area, with its thin topsoil and saline subsoils, would be challenging. Stanmore contended that to promise to return the land to the current or a higher land use would create an unrealistic, and possibly unachievable, community expectation.

Various submitters commented or made recommendations on the proposed post-mine landuse:

- SEWPaC requested a clear definition of what the post mining land use would be in relation to the different areas of the project site. They requested the developed Rehabilitation Plan reflect the occurrence of remnant vegetation and regrowth areas cleared, particularly where potential habitat for EPBC Act listed threatened

species could potentially occur, in the PMLUP to be prepared by the proponent.

- NPRSS commented that the post mine land use in the EIS does not include land uses associated with forestry activities. They recommended that consideration be given to reinstating land uses associated with the part of the MLA 55001 covering the State Forest (i.e. conservation, recreation and/or forestry operations).
- FBA requested that the proponent commit to rehabilitating all disturbances to natural ecosystems so that disturbed areas are reinstated in as similar condition as possible to the original ecosystem.

Recommendation: *Stanmore consult with and consider the requests from SEWPaC, NPRSS and DNRM to include pre-mining landuse (including grazing and fodder cropping, natural ecosystems and habitat for EVNT species and landuses associated with the State Forest) as part of the post-mine landscape.*

Numerous submitters, including local landholders, raised serious concerns about the practicality of returning the land to productive use after mining. QMDC commented that the EIS did not provide sufficient evidence to demonstrate that rehabilitation back to pre-mining condition could be achieved. They noted the negative consequences for the landholders and businesses if the land could not be returned to its pre-mining use.

Another submitter raised issues about the statement in the EIS that land suitability would be downgraded by at least by one class post mining. The submitter noted that in some cases where the land suitability class is Class III/IV this would make the site virtually unusable for agricultural purposes. The submitter considered that at present there were no mined sites in Queensland which had been signed off as fulfilling the restoration requirements of the EA. They discussed numerous characteristics of the landscape likely to impede rehabilitation on the project areas which they were concerned were not addressed in the EIS. These included: the saline and sodic subsoils which would be very difficult to manage once stripped; the spoil heaps would be very difficult to cap and would leach salt; the height and slope of the spoil heaps and the material used to cap them would be critical to prevent erosion and leaching.

Submitters were also concerns about Stanmore's ability to rehabilitate the site effectively for agricultural use by capping returned subsoil and spoil with approximately 10cm depth of topsoil. Submitters identified that there was a very strong possibility that intense rainfall events (as predicted with climate change) would cause major erosion of this very thin capping. Submitters also emphasised the need for mine water dams, tailings dams and any dams (that contain or could potentially contain water or waste contaminated by the mine or operation) to be constructed in such a way to ensure that post mining, this land can be fully rehabilitated. The top soil and sub soil would need to be salvaged and stock piled before any levelling took place. Some submitters argued that the whole structure should then be lined to the same standard that is required for evaporation ponds in the Coal Seam Gas Industry.

Stanmore responded that it would aim to, as a minimum, replace or reinstate grazing lands of comparable extent, productivity and viability as the as the pre-mining grazing lands; and would re-establish areas of native vegetation including 'cattle camps', watercourse stabilisation vegetation, and habitat or corridor vegetation in proportions and of a quality, as a minimum, comparable to the pre-mining native vegetation. Reinstatement of natural ecosystems to as similar condition as possible to the original ecosystem is dependent on a range of factors including: final landform; substrate structure, chemistry and microflora/fauna etc; agreement with landholder re final land use; availability of seed or other propagules; outcome of trials; etc. Stanmore committed to preparing a Mine Closure Plan, including Rehabilitation Plan, which would list the specific operational activities required to be undertaken in order to complete rehabilitation and decommissioning of the project. The criteria for achieving self-sustaining final landforms would be developed as part of the Mine Closure Plan calling upon site specific rehabilitation trials, monitoring and research programs.

4.22.2 Rehabilitation plan and criteria

DNRM commented that insufficient information was provided in the rehabilitation strategies proposed in Chapter 9 of the EIS to demonstrate that desired rehabilitation outcomes can be achieved. Matters DNRM considered require more detailed information in the supplementary EIS to demonstrate how desired rehabilitation outcomes would be achieved included:

- Provision of a more specific data and/or a detailed site plan showing:
  - The proposed extents and areas of different post-mining land uses.
  - The rehabilitation standard applicable to those area (e.g. 1200ha of GQAL class 8 land in these locations; 150ha of replanted brigalow-belah woodland in that location, etc.).
  - The relationship between the pre-mining and post-mining extents of those landuses (e.g. the likely quantitative impact on GQAL).
- A more specific statement of draft end-of-lease 'handover' criteria.
- Identification of potential reference sites for the different post-mining land uses, which are to be used when

establishing compliance with handover criteria (particularly important if the workings were to consume all of a specific class of GQAL within the lease and thus areas of that land type under company's direct control).

- Given the climatic regime at the site, the scheduling of land-forming and vegetation sowing/planting that is proposed to ensure good germination and growth in sown species, as well as the minimisation of erosive soil loss (due to both water and wind) in those periods during which it would be extremely difficult to establish or maintain a suitable vegetative cover.
- Specific details of the species or cultivars it is proposed to use when sowing pasture areas - particularly since nearly all grass and legume species likely to the provide the required level of sustained pasture productivity would inevitably be considered 'environmental weeds' (refer the stated exclusion of potential weed species pp 9-22 & 9-23 in Chapter 9 of EIS).

Stanmore responded that the supplementary EIS had been amended to include additional information on decommissioning and rehabilitation objectives; rehabilitation strategies; post mine land use; indicative rehabilitation program; species selection and establishment; and completion criteria. Stanmore argued that providing specific details on reference site locations, land forming schedule, specific species, specific land slope gradients, sizing of drains and sediment dams is considered to be a level of detail not justified at this stage of the project.

Other concerns raised regarding the rehabilitation plans and criteria in the EIS included:

1. FBA requested that Stanmore describe in the supplementary EIS the composition of species and approximate ratio of each species to be included in each seed mix. SEWPaC requested a list of flora species to be utilised in the rehabilitation, or failing this detailed descriptions of the species to be trialled, the methodologies for conducting the trials and the timeframe for the completion of the rehabilitation trials. In response, Stanmore updated the supplementary EIS with a discussion on the factors affecting seed/planting mix and fertiliser composition and rate of application. Stanmore commented that appropriate species, provenances, varieties and establishment techniques would be reviewed before rehabilitation commences to reflect current rehabilitation research and recommendations, and to use pasture varieties recently developed that possess desirable or required characteristics.
2. EHP commented that the EIS and EM Plan did not refer to the establishment of reference sites for the monitoring of the success of rehabilitation works. Reference sites provide benchmarking for rehabilitation activities. EHP recommended that at least two reference sites should be established for each ecosystem type being rehabilitated. Stanmore responded that the supplementary EIS (including the EM Plan) had been amended to address this issue. EHP commented that Stanmore had not directly addressed the issue.
3. SEWPaC commented that the EIS had not provided any success or monitoring criteria for the management of the rehabilitated areas. While SEWPaC noted that Stanmore has stated it would provide these criteria in the future (Chapter 34) the department considers it appropriate for these criteria to be established and provided for review prior to approval. These criteria should reflect clearly defined commitments as to when it would utilise native species.

Recommendation: *Stanmore amend the EM Plan to include reference sites and monitoring criteria to gauge success of rehabilitation works.*

In regards to rehabilitation of the transport corridor, DNRM advised that after removal the conveyor route and maintenance track would require deep ripping, profiling, top soiling and seeding to restore the structure and productivity of the soil. Any areas of sodic subsoil would need to be covered with suitable topsoil. Stanmore committed in the supplementary EIS to rehabilitate the conveyor route and maintenance track by deep ripping, profiling, top soiling and seeding.

4.22.3 Voids and final landform

Numerous submissions raised concerns and questions regarding the final voids. Matters identified include:

- SEWPaC requested further explanation as to the lack of economic feasibility of backfilling the final void.
- FBA requested that the proponent provide assurance in the next version of the EIS that the final void would be able to contain all water that enters it, in perpetuity and provide a monitoring program is also established to ensure that the current proponent and all subsequent land or lease holders of the proposed mine site are able to monitor structural integrity of the final void and assess whether it may overtop.
- EHP requested more detailed information and an accurate estimation of the final equilibrium level in the mining void lake, the likely water quality and how long it would take to achieve this level post-mining.

Stanmore responded that a final void assessment had been undertaken to complete the detailed design of the mine infrastructure and rehabilitation, including the final void. As part of this an assessment of the water balance in the void has been carried out and an appropriate water monitoring programme would be established and included

as part of the mine rehabilitation plan. The outcome of the final void modelling indicated;

- that the voids are forecast to reach a stable water level within a period of 30 to 65 years (post mining)
- the stable water depth is predicted at a depth below surface level of between 22m and 43m
- the final void water quality assessment indicates salinity levels similar, or less, than the surrounding groundwater.

DNRM noted that the EIS proposed to leave a 700ha void (which would contain saline water) from an open pit extent of approximately 2200ha which equates to over 31% of the pit area and a final landform for the waste rock stockpiles that would have an elevation varying from around 5 to 30m above the existing natural surface area. This proposed use is lowest in the rehabilitation hierarchy. Leaving a void (potentially over 100m in depth) containing saline water which has been identified as a hazardous zone would leave ongoing maintenance requirements for future managers of the land due to the safety issues. DNRM requested Stanmore reconsider its rehabilitation strategy particularly in relation to the size of the final void and provide more detailed justification as to why higher order strategies in the rehabilitation hierarchy cannot be achieved and why waste rock could not be used to reduce the size of the final void. Stanmore responded that the final void plan in the supplementary EIS had changed and rather than one large final void (covering 700ha) Stanmore proposed to have three smaller final voids (covering 70ha). The cost to fill the final void area of 73ha would be in the order of $644 million, which would be 1.7 times the entire capital cost of the mine. Stanmore committed to preparing a Mine Closure Plan, including Rehabilitation Plan, which would list the specific operational activities required to be undertaken in order to complete rehabilitation and decommissioning of the project. The criteria for achieving self-sustaining final landforms would be developed as part of the Mine Closure Plan calling upon site specific rehabilitation trials, monitoring and research programs.

4.22.4 Waste rock dump rehabilitation

DNRM commented that the EIS proposed a number of strategies, including revegetation, for the rehabilitation of waste rock dumps and other disturbed areas. DNRM recommended that *Vetiver zizanoides* should be considered as a tool for the stabilisation of the rock waste dumps in association with other appropriate species. Stanmore responded that the vegetative species chosen for waste rock stabilisation would be selected on the basis of the best species available at the time, suitability for the site, climate, soils and time of year. The species considered may include *Vetiver zizanoides*, but nominating specific species at this stage is not considered necessary, considering the life of the mine, and the advancements in mine technology and rehabilitation that would be made over this period.

4.22.5 Mine water dams

EHP, WDRC and DSITIA commented that insufficient information had been provided in the EIS on the decommissioning of mine water dams. WDRC requested confirmation that the dams would not be converted to 'landfills' with high levels of salt. WDRC also request that information be provided in the supplementary EIS as to how the salt waste would be managed, especially as salt does not 'bio-remediate or stabilise' like conventional waste types. EHP and DNRM requested further explanation of how the saline water in the mine water dams would be managed on completion of mining activities. DSITIA requested further information regarding the treatment and the conditions of water releases from the mine water dams if the water was to be released to the environment. In the supplementary EIS, Stanmore provided a comprehensive overview of different options for the removal of water (i.e. evaporation, managed aquifer discharge, treatment, enhanced evaporation and final void storage) and decommissioning of the dam structure (reuse or removal). However, Stanmore did not provide a commitment for a particular option nor did Stanmore discuss any options in details for the project, analyse the environmental, social or economic impacts or outline mitigation or management measures.

Recommendation: *Stanmore provide detailed information on rehabilitation and decommissioning of mine water dams in the Mine Closure and Rehabilitation Plans.*

4.23 Offsets

Chapter 33 of the EIS reviewed and presented an offset proposal to ameliorate the unavoidable residual ecological impacts associated with mine and infrastructure development, over the entire project (including MLA 55001, transport MLA's 55010 and 55009, power corridors and the rail loading facility). Offsets relating to MNES are discussed in section 4.25 of this report.

The strategy attempts to meet the combined Commonwealth and State requirements of the:

- EPBC Act (Commonwealth)
- EP Act (Queensland)

- NC Act (Queensland)
- VM Act (Queensland)
- Relevant policies prepared under these Acts include the:
  - EPBC Act Environmental Offsets Policy (EPBCAEOP)
  - Queensland Government Environmental Offsets Policy (QGEOP)
  - Queensland Biodiversity Offset Policy (QBOP)
  - Policy for Vegetation Management Offsets (PVMO).

Permits and authorities for MLAs 55001, 55010 and 55009 would be assessed for an EA under the EP Act therefore are assessable for biodiversity offsets under the QBOP, whereas the rail loop and load out area would be assessed for a Development Authority under the SP Act and consequently be assessed for offsets under the PVMO.

The draft offset strategy proposes to ameliorate the loss of up to 87.58ha of remnant and regrowth RE 11.9.5 and RE 11.9.6 which corresponds to an Endangered TEC under the EPBC Act and is an Endangered RE and Category B ESA under VM Act. This would be met through a direct land based, or, in part, by indirect compensatory offsets. The EIS reports that a land based offset program that meets the criteria for all the affected environmental values would be employed to meet the residual impacts of the project. The land based offset program would be supported by a research program and be audited, monitored and reported on. The EIS reported that all fifteen State and Commonwealth offset criteria would be met and would provide net conservation gain by protecting and maintaining two ERE/TECs, and developing knowledge and understanding of the rehabilitation and management requirements for those ERE/TECs.

The EIS reported that a Deed of Agreement between Stanmore and EHP, and between Stanmore and SEWPaC, would be entered into to the effect that, within 12 months of the date of the Deed of Agreement and of receiving an EA for MLA 55001, a detailed proposal for offsets under the QBOP and the EPBCAEOP, and within 24 months of the date of the Deed of Agreement and of the EA being issued Stanmore would have legally secured offsets as described. These timeframes may be varied if the project is delayed for commercial reasons.

Numerous submissions were received about the proposed offset strategy. Various submitters including WPSQ, QMDC and FBA recommended Stanmore consider ways of maximising and enhancing the environmental outcomes of project's offset strategy e.g. by co-locating The Range's offsets with other project's offset in the catchment, ensuring offsets are in place before development starts, locating offsets areas as close as possible to the area of vegetation that are cleared, locating offsets adjacent to areas of non-fragmented vegetation, rather than be an isolated remnant in an otherwise cleared landscape. In response, Stanmore committed to providing offsets in accordance with all current national and state requirements and guidelines.

FBA requested that the proponent commit to installing nest boxes in areas adjacent to where hollow-bearing trees are cleared. FBA requested that Stanmore install fauna next boxes in adjacent habitat on a 1:1 ratio for every hollow that is removed through clearing or disturbance. A variety of nest box sizes should be installed to accommodate the preferences of different fauna species. In the supplementary EIS, Stanmore committed to carrying out all recommendations of the ecologists who assessed the site, including installing nest boxes in areas where hollow-bearing trees must be removed, and also relocating large fallen logs and boulder piles to adjacent habitat where it is not feasible to avoid these features during clearing.

4.23.1 Biodiversity offsets

EHP raised a number of issues on the proposed offset strategy in relation to the requirements of the QBOP. EHP commented that a large amount of information outlined within this chapter was general advice on the procedure and that more specific information is required to assess the proposed offset strategy. EHP requested Stanmore provide all information as required by the QBOP for an offset strategy or packages for the proposed project. Particular issues include:

1. State Significant Biodiversity Values (as per QBOP) which would be impacted as part of the proposed project, including all protected species and their habitat, 'known' or 'considered to have the potential to occur' in the proposed impact areas are missing. As these species and their habitat have been identified in the EIS assessment, these should be included in the offset proposal. EHP requested Stanmore include protected animals (and their habitat) which are 'known' or 'considered to have the potential to occur' on the proposed impact areas in the residual impacts investigations as part of the offset requirements.
2. The offset strategies in Chapter 33 of the EIS did not adequately address the requirements of the QBOP. The strategies are very generic and do not contain the specific information required to complete a QBOP assessment. Final impact areas have not been decided; therefore no details on location and total area of the

impact have been calculated. Due to the final total area not being known, an ecological equivalence assessment has not been completed on the impact area. Without an ecological equivalence assessment on the impact area it cannot be compared to an ecological equivalence assessment on a proposed offset area to see if ecological equivalence has been met. Ecological equivalence of the two areas is a requirement of land based offsets in the QBOP.

3. A management plan needs to be submitted with specific details such as mechanisms for securing the offset areas, dates and locations. While Stanmore provided a very good outline of what is to be included in the management plan, the detailed plan would be required before an assessment against QBOP. The applicant mentions the potential to use a rolling plan for offset delivery. This is a viable option as long as the information requirements are met at each stage.
4. The timeframe in the EIS that proposes that the offset area would be legally secured within 24 months of the EA being issued does not meet the QBOP requirements. These are, 4 months to legally secure direct offsets and 12 months to legally secure offset transfers and specific requirements for mining, petroleum and gas activities under the EP Act. EHP advised that no impacts can occur on the State Significant Biodiversity Values before the offset area has been legally secured.
5. The timing stated in the EIS for providing an offset strategy to the administrating authority (i.e. within 6 months of the granting of this EA), is incorrect. The offset strategy must be provided for assessment prior to the EA being granted.

In response, Stanmore reported that the final impact areas had been assessed and more accurate estimations provided in the supplementary EIS. Ecological equivalence assessments had not been undertaken at the time, but would be part of the detailed assessment at the appropriate time (final approval of the offset strategy). Stanmore stated that they would not undertake extensive ecological equivalence assessments on impact and proposed offset areas before the project had proceeded through the EIS stage. The company anticipated the EA would condition the requirements in regards to offset strategy approvals and timeframes.

In response to offsets for protected species and their habitat, Stanmore commented that it was logical to conclude that the protected species either known or with the potential to occur in the impacted habitat would likewise also be offset by the offsetting of the impacted habitat. Stanmore argued that providing extensive detail on the offsetting of each and every protected species either known or with the potential to occur in the impacted habitat is considered to be a level of detail that is not warranted at this stage of the project. The company considered the details provided in the supplementary EIS sufficient for deciding if the EIS can proceed to the next stage of the EIS process.

In response to the supplementary EIS, EHP indicated it was satisfied that the remaining issues and specific details requested by EHP could be dealt with through an offsets strategy, to be provided to EHP after the EIS process is completed. EHP identified the revised offsets strategy submitted by Stanmore would need to address the following:

- Be based on the requirements on page 25 of the Queensland Biodiversity Offset Policy (QBOP).
- Be required prior to the granting of the EA as outlined in the Queensland Biodiversity Offset Policy. While Stanmore argued in the supplementary EIS that this was unachievable, EHP contends that the offset strategy has no requirements to purchase any land, or to identify potential offsets by Ecological Equivalent Methodology (EEM), but only to provide sufficient evidence that an offset can be found.
- Provide specific information regarding each species impacted, and offset requirements for these. For the Glossy Black Cockatoo *Calyptorhynchus lathami*'s, the offset strategy should map the area of the specific feeding trees located in the impacted area.

To assist with finalising an acceptable offset strategy, EHP requested that the proponent consult with them on the specific offset requirements for the project and negotiate project specific delivery schedules.

Recommendation: *Stanmore consult with EHP on the specific offset requirements for the project and submit a revised offsets strategy which addresses EHP's requirements.*

4.24 Environmental Management Plan

A draft Environmental Management Plan (EM Plan) was provided in Appendix 7 of the EIS and is supported by the Social Impact Management Plan (Appendix 8), Risk Management Plan (Appendix 30) and Groundwater Monitoring Plan (Appendix 29). The EM Plan aimed to assess the potential environmental impacts of The Range Project and associated mitigations and controls to be implemented during mining activities, and to propose EA conditions that should be applied to the project.

In regards to surface water management, DSITIA commented that the EM Plan did not define sufficient and measurable performance criteria for the protection of aquatic ecosystems. These should include, as a minimum,

statements regarding the achievement of Water Quality Objectives and the management intent/condition assessment for these waters which would reflect the level of disturbance considered acceptable if the relevant management plans and conditions are working effectively. Stanmore updated the EM Plan to incorporate this request.

EHP and DSITIA made various submissions on the discharge conditions proposed by Stanmore in the EM Plan. This is discussed in detail in section 4.11.2 (Surface water) of this report. For the most part, Stanmore amended these conditions and appropriate sections of the EM Plan in the supplementary EIS as requested. Following review of these changes, DSITIA and EHP identified a number of areas where further monitoring is necessary and recommended some adjustments to the proposed conditions in the EM Plan (as discussed in section 4.11.2). These have been incorporated in the conditions for the draft EA in Appendix 3.

In regards to terrestrial ecology, EHP commented that the EM Plan should provide a guide to how environmental impacts are managed and controlled at all phases of the project, especially considering this project is staged. EHP requested the supplementary EIS be amended to provide specific information on management actions, rather than general information including but not limited to:

- information on how vegetation would be cleared, and precautions taken to not impact other values (i.e. a fauna spotter or fauna survey prior to the clearing)
- storage of soil or cleared materials for use in rehabilitation
- timing of processes for construction for the project phases and the management of the impacts at these stages.

Stanmore replied that the EM Plan included very detailed mitigation measures to be undertaken for all the environmental values to be protected and managed. The company stated that providing step by step actions for each of these mitigation measures at this stage of the project was considered a level of detail that is unnecessary (for example a methodology on how a GIS system is maintained). They committed to amend and update the EM Plan as the design develops for the construction and operational stages of the project.

DTMR commented that the EM Plan did not include measures required by QR National Network Services to mitigate coal dust emissions generated during the rail haulage of coal to the port. The EM Plan was updated as requested. Stanmore committed to installing a veneering system at the mine rail load out facility and associated support systems.

4.25 Matters of National Environmental Significance

On 24 February 2011, the Project was referred to the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC). On 4 April 2011, SEWPaC determined the proposed project to be a controlled action pursuant to section 75 of the EPBC Act. The controlling provisions were sections 18 and 18A (listed threatened species and communities) and 20 and 20A (listed migratory species) as the project was likely to have significant impacts on listed threatened species and communities and listed migratory species. Consequently, the project will require approval under Part 9 of the EPBC Act. An assessment of the potential impacts due to the project on MNES was included in the EIS.

4.25.1 Existing MNES

Database searchers and field surveys were used to assess terrestrial, aquatic and groundwater fauna, flora and ecological communities of conservation significance present in the project area. The EIS confirmed that the project has the potential to impact MNES as a number of EPBC Act listed threatened flora and fauna species and vegetation communities were either found on-site or have the potential to occur on-site.

According to the EIS, field surveys confirmed that the project area contains:

- A threatened ecological community (TEC) under the EPBC Act, Brigalow (*Acacia harpophylla*) dominant and co-dominant (RE 11.9.5—*Acacia harpophylla* and/or *Casuarina cristata* open-forest on fine-grained sedimentary rocks). The total area of the Brigalow TEC likely to be disturbed by the project is approximately 179.65ha, comprising approximately 132.52ha of remnant and 47.13ha of regrowth RE 11.9.5. The EIS stated that the condition of the TEC is generally very poor, although larger patches of Brigalow and particularly those areas adjoining other remnant vegetation were in some cases in moderate to good condition. Where the Brigalow occurred in small patches the ground story flora was devoid of native species and the EIS reported that there was considerable ground disturbance due to grazing.
- Bird species listed as migratory under the EPBC Act:
    - White-throated Needletail (*Hirundapus caudacutus*)
    - Eastern Great Egret (*Ardea modesta*)

- Cattle Egret (*Ardea ibis*)
- Rainbow Bee-eater (*Merops orna*tus)
- Rufous Fantail (*Rhipidura rufifrons*).

The EIS also reported that existing data bases indicate the project area has the potential to contain:

- One flora species listed as Endangered under the EPBC Act: Slender Tylophora (*Tylophora linearis*).
- Seven flora species listed as vulnerable under the EPBC Act: Curly bark wattle (Acacia curranii); Ooline (Cadellia pentastylis); Gurulmundi fringe myrtle (*Calytrix gurulmundensis*); Cadarga kurrajong (*Commersonia argentea*); Belson's panic (*Homopholis belsonii*); Decumbent homoranthus (*Homoranthus decumbens*);and Cobar greenhood orchid (*Pterostylis cobarensis*)
- Three fauna species listed as Endangered under the EPBC Act: Swift Parrot (*Lathamus discolor*); Star Finch (eastern subsp.) (*Neochmia ruficauda ruficauda*); and Northern Quoll (*Dasyurus hallucatus*).
- 13 fauna species listed as Vulnerable under the EPBC Act: Collared Delma (*Delma torquata*); Brigalow Scaly-foot (*Paradelma orientalis*); Yakka Skink (*Egernia rug*osa); Ornamental Snake (*Denisonia maculate*); Dunmall's Snake (*Furina dunmalli*); Fitzroy River Turtle (*Rheodytes leukops*); Red Goshawk (*Erythrotriorchis radiates*); Australian Painted Snipe (*Rostratula australis*); Squatter Pigeon (southern subsp.) (*Geophaps scripta scripta*); Black-breasted Button-quail (*Turnix melanogaster*); Brush-tailed Rock Wallaby (*Petrogale penicillata*); South-eastern Longeared Bat (*Nyctophilus corbeni*); and Large-eared Pied Bat (*Chalinolobus dwyeri*).
- 7 species listed as Migratory under the EPBC Act: Australian Cotton Pygmy-goose (*Nettapus coromandelianus albipennis*); Fork-tailed Swift (*Apus pacificus*); White-bellied Sea-Eagle (*Haliaeetus leucogaster*); Latham's Snipe (Gallinago hardwickii); Sharp-tailed Sandpiper (*Calidris acuminate*); Satin Flycatcher (*Myiagra cyanoleuca*); and Australian Reedwarbler (*Acrocephalus australis*).

No additional MNES were identified in the disturbance area.

4.25.2 Impacts of the project on MNES

The EIS assessed the potential impacts to MNES by the project for the Brigalow TEC, EVNT flora species, 10 EVNT fauna species1 and 5 migratory bird species2. The EIS concluded the project would have significant impacts on Brigalow TEC as a result of clearing and minor or negligible impacts on the remainder of MNES, provided the proposed mitigation measures are successfully implemented. The potential impacts of the proposed project on MNES and proposed avoidance and mitigation strategies identified in the EIS include:

1. A significant impact on Brigalow (*Acacia harpophylla* dominant and co-dominant), an Endangered Threatened Ecological Community under the EPBC Act, due to clearing a maximum of 89.6ha.
    - The proposed clearing estimates in the EIS were up to 179.5ha. In the supplementary EIS, the project footprint was refined to avoid most of the larger, well connected tracts of remnant vegetation which reduced the proposed clearing of Brigalow TEC by approximately 88.4ha. However, smaller areas of remnant and regrowth Brigalow TEC are still proposed to be cleared for pit development, infrastructure areas and transport corridor construction, resulting in a maximum direct loss of 81ha of remnant RE 11.9.5 and 8.6ha of regrowth RE 11.9.5.
    - A cumulative impacts assessment predicted the total amount of proposed clearing of RE 11.9.5 in the bioregion from this project and due to other mining and coal seam gas projects proposed or approved within the region (estimated at 2463ha). The EIS reported that The Range Project has the potential to contribute approximately 3.3% to this clearing.
    - Measures to reduce impacts of the project on Brigalow TEC were identified in the Environmental Management Plan. These included: the provision of appropriate techniques for dust suppression and the control of weeds, fire, chemical contaminants, waste; erosion and sedimentation control during construction and during operation; and the revegetation and rehabilitation of areas not needing to be left cleared to

1 Red Goshawk (*Erythrotriorchis radiates*), Brigalow scaly-foot (*Paradelma orientalis*), Yakka skink (*Egernia rugosa*), Australian Painted Snipe (*Rostratula australis*), Squatter Pigeon (southern subspecies) (*Geophaps scripta scripta*), Greater Long-eared Bat (*Nyctophilus corbeni*), Fork-tailed Swift (*Apus pacificus*), Latham's Snipe (*Gallinago hardwickii*), Sharp-tailed Sandpiper (*Calidris acuminate*), Australian Reed-Warbler (*Acrocephalus australis*).

2 (Eastern Great Egret (Ardea modesta), Cattle Egret (Ardea ibis), White-throated Needletail (*Hirundapus caudacutus*), Rainbow Bee-eater (*Merops ornatus*) and Rufous Fantail (*Rhipidura rufifrons*)

original habitat (where-ever possible) using locally native species. A strategy was proposed (discussed in section 4.4.16 of the EIS) to offset residual loss of Endangered Brigalow TEC.

2. A moderate to minor unmitigated impact on 7 listed terrestrial flora species which may occur within the project area (none were recorded during the field surveys). The EIS reported that many of these species are highly restricted in distribution or occur sparsely throughout their distribution. Avoidance and mitigation measures were proposed to reduce impacts on local populations on the project site. If individuals are to be disturbed, the EIS proposed translocation, propagation and re-establishment. If removal is required, an offset program would be implemented that results in no net loss to population extent and viability. The EIS concluded that, subject to the successful implementation of these controls, the residual impacts on EVNT flora due to the project would be minor.
3. Moderate impacts on local populations of 16 listed EVNT fauna species and 12 migratory bird species were identified in the EIS. These impacts would result from clearing of remnant woodland habitat; clearing of gilgai habitat, the ongoing degradation of habitats through edge effects; changes to hydrological conditions that may affect habitat for migratory waders; and increasing fauna vehicle strikes. Avoidance and mitigation measures were proposed to reduce impacts on local populations of EVNT and migratory species including: undertaking pre-clearance surveys to identify and avoid, relocate or replace important habitat features wherever possible; the use of fauna spotters during clearing; development controls including minimising access within and adjacent to retained vegetation; establishment of 'go slow zones' adjacent to potential habitat areas; routine monitoring of habitats and animal mortalities; using native species to rehabilitate cleared areas not required to remain cleared during mine operation; and the development and implementation of an EM Plan addressing EVNT species and weed management and monitoring. Subject to the successful implementation of these controls, the EIS concluded that the residual impacts on EVNT fauna and migratory bird species to be minor.

No other matters requiring mitigation and offsets under Commonwealth legislation were indicated for the Disturbance Area.

In considering the EIS, SEWPaC identified that information was needed regarding:

- Further detail regarding the description and justification of the methodology for flora and fauna surveys undertaken at the proposed project site, particularly in regard to: the level of surveying under taken during each sampling period; herpetofauna and evening bird surveys; surveys in larger patches of remnant vegetation with potential habitat for Yakka Skink (Egernia Rugosa); delineation of farm dams; and areas that were not surveyed which are likely to be subject to direct impact containing remnant Brigalow (Acacia harpophylla dominant and co-dominant), gilgais and regrowth vegetation.
- Further consideration of regrowth areas for EPBC Act listed ecological communities areas.
- Secondary impacts associated with the project activities, especially as they relate to the adjacent Quandong State Forest and nearby Barakula State Forest which are noted as being important habitat for a number of EPBC Act listed threatened species.
- Discussion of indirect and/or downstream impacts to water courses which may occur as a result of the construction and operation of this project.
- Further discussion of potential cumulative impacts in relation to how the clearing of vegetation by the project and nearby projects would impacts on EPBC Act listed threatened flora and fauna and migratory species.

In response, the proponent provided information in the supplementary EIS on the regrowth of TEC communities, secondary impacts on listed threatening species in the adjoining state forest, downstream and cumulative impacts. SEWPaC reviewed the proponent's responses and the supplementary EIS. SEWPaC considered the information provided was largely adequate with regard to the assessment of impacts to MNES associated with the development and operation of the project, with the exception of the offsets strategy where further clarification was required (discussed in section 4.4.16.3 of the supplementary EIS).

4.25.3 Offsets

The EIS proposed the use of offsets to compensate for the loss of Endangered *Acacia harpophylla* dominant and co-dominant (Brigalow TEC). The EIS reported that the areas of remnant and regrowth RE 11.9.5 that would be removed for pit development are mostly in poor condition with poorly developed understory as they are scattered across the project area and fragmented by large cleared areas that have been used for cattle grazing.

A detailed discussion of the environmental offset proposal for '*Acacia harpophylla* dominant and co-dominant' TEC was presented in Chapter 33 of the EIS. Stanmore stated that it would provide an offset that meets the Commonwealth requirements of EPBC Act as well as identified State offset requirements. The EIS identified the following requirements for the Commonwealth components:

- offset vegetation to be secured to meet the areal loss of the remnant and the regrowth TEC to be cleared—this may be met by established vegetation or by a revegetation or rehabilitation program.
- the regrowth Brigalow TEC component may be met by, at a minimum, securing an area of land equivalent to the area of regrowth TEC to be cleared and which may be revegetated or otherwise managed to offset the loss of regrowth Brigalow TEC. The proponent may invest in research into effective regeneration and management techniques for the Brigalow TEC.
- the offset vegetation needs to be secured in perpetuity.

The EIS identified potential offset areas in Bioregion 11 (Brigalow Belt South) that meet the combined Commonwealth and State requirements. The areas included properties or lots on plan that have at least the same area of offset vegetation as the remnant RE 11.9.5 planned to be cleared or contain an area of lesser quality vegetation that can potentially be revegetated or otherwise managed to replace the area of regrowth RE 11.9.5 planned to be cleared.

The proponent committed to:

- Engage closely with SEWPaC and EHP to determine how the offset may be provided to meet the requirements and the intent of the relevant Acts and Policies.
- Engage with landholders identified by the process described above to negotiate access to land for the purpose of enacting the offset protection strategies (once the administering authority indicates approval of the EA conditional on a finalised offset proposal to address the loss of RE 11.9.5).
- Legally secure offsets within 24 months of the EA being issued.

In considering the offsets strategy provided in the EIS, SEWPaC stated that further consideration was needed regarding:

- Offset liabilities may need to extend beyond areas of RE 11.9.5 Brigalow TEC. Potential habitat for a number of EPBC Act protected matters has been identified as being impacted by the construction and operation of the project (EPBC 2011/5860). While aspects of these impacts may overlap, for example remnant Brigalow woodland may also provide habitat for listed species, the Environmental Offset Strategy must consider all matters likely to be impacted by the project.
- Consideration that offsets for MNES be located in closer proximity to the areas to be disturbed.
- A finalised Environmental Offset Strategy, including management plans, to be supplied to and approved by SEWPaC prior to the commencement of The Range Project.
- Gonocarpus urceolatus is not a species protected by the EPBC Act and the provision of suitable habitat for this species would not be considered by SEWPaC in the evaluation of environmental offsets proposed to meet Commonwealth requirements.

In response, the proponent provided information in the supplementary EIS on offsets for matters of MNES. SEWPaC reviewed the proponent's responses to their comments and the supplementary EIS. It advised that further clarification of the location, composition, quality, management measures and delivery of proposed offsets is required to assess whether any residual impacts, after avoidance and mitigation measures are applied, are acceptable through the application of offsets. Specifically, SEWPaC requested that the following information be provided and/or clarified in an amended offsets strategy to be submitted to SEWPaC:

- Compliance with the document titled 'Policy guiding the use of offsets under the Environment Protection and Biodiversity Conservation Act 1999' released on 3 October 2012.
- Justification as to why an offset greater than 100 km from the impact site provides a greater conservation benefit for the impacted protected matters than a site closer to the impact site.
- Additional detail regarding the quality of habitat for listed species and ecological communities likely to be impacted by the proposed project. For example the supplementary EIS states that areas of Brigalow (*Acacia harpophylla* dominant and co-dominant) woodland found in the development area are generally in poor condition, though patches of Brigalow attached to other remnant vegetation were in moderate to good condition. Information about how much of each "quality class" is present in the project site and is likely to be impacted by the proposed development is required in considering whether there are any residual impacts which may need to be offset.
- Further consideration of the potential impacts to listed EVNT species considered likely to be impacted by the development, including "core habitat" areas for the Yakka Skink (*Egernia rugosa*; 340.2 hectares), Australian Painted Snipe (*Rostratula australis*; 20.2 hectares), Red Goshawk (*Erythrotriorchis radiatus*; 5.21 hectares) and Brigalow Scaly-Foot (*Paradelma orientalis*; 144.8 hectares) which are identified in the supplementary EIS

as being present within the disturbance area.

- Clarification on the amount of potential habitat for the South-eastern Long-eared Bat (*Nyctophilus corbeni*) and the Squatter Pigeon, southern subspecies (*Geophaps scripta scripta*) identified as occurring in the nominated disturbance area of the proposed project.
- Clarification of the residual impacts associated with the direct loss of habitat for EVNT species protected under the EPBC Act. For example, while the EIS identified mitigation strategies for the Yakka Skink, it states that the direct loss of habitat is considered unlikely, despite 340.2 hectares of habitat being identified in the disturbance areas.

4.25.4 Interim Independent Expert Scientific Committee

SEWPaC referred the project to the IIESC on Coal Seam Gas and Coal Mining on 30 July 2012 following the completion of the submission period on the EIS on 27 July 2012. The Interim Committee was asked to comment on a number of water related aspects of the project including surface and groundwater, on site water management ('no release' commitment), monitoring and cumulative impacts.

The response from the IIESC was provided to SEWPaC on the 6 August 2012 and to Stanmore on 10 September 2012. Stanmore responded to the comments from the IIESC in a report to the assessment manager and SEWPaC dated 20 December 2012. The report provided a brief and concise response to each of the nine comments made by the IIESC. Of primary concern to the IIESC was the potential for indirect impacts that may occur as a result of changes to surface water flow and quality. In a brief response, Stanmore referred to the relevant section of the EIS that dealt with cumulative assessment of impacts to surface water quality. It was stressed that this assessment included downstream impacts and that a number of mitigation measures were proposed including development and implementation of a site specific erosion and sediment control plan. Also see section 4.11.2.5 of this report. A related matter raised by the IIESC concerned the potential for discharge of contaminants from site water dams. In response, Stanmore reiterated its 'no release' approach to mine water management as well as commitments to conservative design of the capacity of site water containment structures. Stanmore mentioned that even with the water management system on site as planned, there remains a small probability that a controlled release may be required to prevent dam over topping. Suggested conditions for this eventuality were proposed in the amended EM Plan submitted with the supplementary EIS.

The on site water storage capacity of the project would impact on surface water flows downstream. However, as the project is located at the top of the catchment of the Condamine and Fitzroy river systems, the impact is relatively minor. The largest predicted impact is a 29% decrease in total runoff to Downfall Creek and 17% decrease in Dogwood Creek. These reductions are proportional to the changes in catchment area contributing runoff on the project site. These changes translate to a less than 1% decrease in creek flows in Juandah and Dogwood Creeks.

EHP considers that the response by Stanmore, if read in conjunction with the EIS, supplementary EIS and amended EMP, substantially addresses the matters raised by the IIESC.

4.25.5 Conclusion

On the basis of advice from SEWPaC on the supplementary EIS, it is apparent that the proponent has provided adequate information with regard to the assessment of impacts to MNES associated with the development and operation of the project.

However, insufficient details have been provided to finalise an offset strategy for the project. Information is required concerning the suitability of the proposed offset site, condition of the Brigalow communities impacted by the project, likelihood of impact on habitat of several EVNT species and clarification of residual impacts associated with loss of habitat for ENVT species.

Recommendation: *Stanmore provide the information required by SEWPaC and finalise the Offset Strategy in consultation with EHP and SEWPaC.*

5 Adequacy of the Environmental Management Plan

The EM Plan developed through this EIS process has included input from the department, other state government departments, the commonwealth, industry and the public. Throughout the EIS process, the proponent has advised of a range changes needed to the submitted EM Plan, Those changes have progressively improved the submitted EM Plan to the extent required for the EIS process. However, a number of outstanding commitments to finalise the EM Plan are to be delivered subsequent to the EIS process. Also, the draft EM Plan should be revised according to the recommendations included in this report.

The EM Plan requires additional information in relation to water quality management, groundwater management, sewage treatment and more detail on delivering biodiversity offsets. It is recommended that Stanmore seek specific advice on the various aspects of the EM Plan and proposed conditions from the delegate responsible for the EA located in the Mining and Extractive Industries Unit in EHP's Regional Services, Southern office (Toowoomba) before submitting any amended documentation.

Matters that should be addressed in the revised EM Plan include:

- Wastewater systems:
  - the number of wastewater systems proposed, the size of systems, methods for treatment and quantities of waste generated
  - assessment of the capacity of the receiving environment to receive irrigated effluent (e.g. MEDLI modelling and soil data)
  - assessment of the potential impacts of effluent disposal to land on relevant environmental values.
- Water:
  - Identify water quality objectives protective of each environmental value (including those protective of drinking water) for all parameters of relevance to coal mines.
  - A monitoring program for baseline water quality monitoring to assist with the development of local water quality objectives.
  - A monitoring program for release of water from the sediment dam in the vicinity of the train loading facility.
  - A receiving water quality monitoring plan.
  - Trigger values for turbidity and include pH, TSS, DO and petroleum hydrocarbons in the monitoring requirements for construction phases of the creek crossing.
  - Groundwater monitoring strategy to address Hutton Sandstone aquifer and other relevant aquifers.
  - Management measures for the use of saline water for dust suppression including the quality of water to be used on site for dust suppression and the management of any accumulated salts during operations and post mining.
- Updated rehabilitation and mine closures plan which addresses relevant DNRM's issue, reference sites for the monitoring of the success of rehabilitation works and decommissioning and rehabilitation of mine water dams.
- A revised offsets strategy which addresses EHP's issues and BOP requirements.

6 Recommendations about the suitability of the project

In this EIS process the detailed information compiled by Stanmore about the environmental values of the proposed The Range Project, and the potential impacts on those values from project activities, has been scrutinised by representatives of State and local government, industry and members of the public through an open, public review process.

The EIS has largely complied with the TOR and has outlined a range of mitigation measures to avoid or minimise environmental impacts. While the majority of issues were covered satisfactorily in the EIS and in Stanmore's responses to the submissions and revised documents, a number of issues have not been fully resolved.

This report recommends that the following outstanding matters be addressed by Stanmore prior to the project proceeding:

- Consult with DNRM and provide sufficient information on the volume of extractive materials required in the construction of the project and assess the impacts of the project on the supply and demand of sand—especially during potential high demand periods.
- Consult with landholders whose properties would be affected by the overland conveyor, to address concerns and minimise, mitigate and compensate for impacts from the transport corridor on human and animal health and safety, business operations and efficiency, property values and market appeal.
- Consult with Rural Lands Officers from WDRC and Senior Lands Officer (Stock Routes) from DNRM regarding impacts on stock routes and mitigation strategies to ensure co-existence of these routes.
- Consult with DNRM and adjoining landholders to identify and mitigate impacts from the transport corridor on soil conservation works.
- Meet the requirements of the:
  - State Planning Policy 1/12 – Protection of Queensland's Strategic Cropping Land
  - *Strategic Cropping Land Act 2011*
  - Strategic Cropping Land Regulation 2011.
- Liaise with landholders to minimise and mitigate impacts of the project on rural amenity values.
- Liaise with DNRM, WDRC, adjoining land holders and members of the affected public to comply with relevant legislation and negotiate mutually agreeable outcomes on road access alternatives and mitigation measures for the temporary or permanent closure of public roads (including Knights Road).
- Obtain approvals under the *Land Act 1994* in relation to the relocation and temporary and permanent closure of roads affected by the project.
- Provide further assessment in relation to fatigue management in the project area.
- Liaise with DTMR and WDRC regarding school bus facility upgrades.
- Address funding for school facility upgrades along the Leichardt Highway and Downfall Creek Road.
- Consult with WDRC and BSC regarding measures to mitigate impacts of the project on local roads.
- Consult with DTMR regional (Toowoomba) office, to assess the potential impacts of the project on intersections other than Downfall Creek/Leichardt Highway (including Nathan Road/Leichardt Highway and Windeyer Road/Leichardt Highway) to the satisfaction of DNRM.
- Consider street lighting requirements at intersections along the mine route as outlined in the Road Planning and Design Manual.
- Use the Fitzroy Method to calculate rehabilitation and maintenance contributions at the detailed design stage and to negotiate an Infrastructure Agreement with DNRM.
- Assess traffic generation during the decommissioning phase of the project.
- Provide written confirmation to DTMR that a new Transport Impact Assessment would be completed in consultation with DTMR in the instance that alternative transport infrastructure, modes or options become necessary for the project.
- Consult with the relevant local government to negotiate the use and terms of agreement of waste disposal facilities.

- Provide EHP with the following information:
  - the number of wastewater systems proposed, the size of systems, methods for treatment and quantities of waste generated
  - an assessment of the capacity of the receiving environment to receive irrigated effluent
  - an assessment of the potential impacts of effluent disposal to land on relevant environmental values.
- Develop management measures for the use of saline water for dust suppression including the quality of the water to be used on site and management of any accumulated salts during operations and post mining.
- Develop a monitoring program for release of water from the sediment dam in the vicinity of the train loading facility.
- Conduct baseline water quality monitoring to assist with the development of local water quality objectives.
- Identify water quality objectives protective of each Environmental Value (including those protective of drinking water).
- Develop a receiving water quality monitoring plan, in consultation with EHP.
- Consider amending the EM Plan to incorporate DSITIA's recommendations regarding the existing stringent trigger values for turbidity and include pH, TSS, DO and petroleum hydrocarbons in the monitoring requirements for creek crossings. The draft conditions for EA have been amended to incorporate these recommendations.
- Expand the monitoring strategy proposed for the mined aquifer to the Hutton Sandstone aquifer and other relevant aquifers.
- Consult with landholders to investigate potential impacts of dust on cattle and feed palatability and identify mitigation measures to limit any identified impacts.
- Liaise with landholders and experts to minimise and mitigate noise impacts from the overland conveyor on cattle and embryo transfer building.
- Assess the potential secondary impacts of the project (including internal haul roads) on Quandong State Forest and associated EVNT species and habitat and consider management and mitigation measures, including internal road alignment and design (e.g. restricting speed limits and provision of roadside signage), to minimise impacts.
- Conduct additional sampling for stygofauna both before and after the wet season in the existing and additional bores (where available) in accordance with the stygofaunal sampling guidelines by the Western Australian Environmental Protection Authority and to the satisfaction of DNRM.
- Identify and implement measures to minimise project related impacts from heavy traffic and increased noise on St. John's Lutheran Church and cemetery.
- Liaise with WDRC, BSC and DSDIP in developing a housing strategy for the project and address advisory agency concerns regarding the impacts of the project on housing and accommodation.
- Engage with new or existing CRG in finalising the SIMP and work with community groups to disseminate information throughout the life of the project and provide a forum for discussion.
- Liaise with DCS, EMQ, QPS, QAS and QFRS to incorporate all relevant requests and requirements into the Emergency Management Plan and relevant operational plans.
- Consult with and consider the requests from SEWPaC, NPRSS and DNRM to include pre-mining landuse, including grazing and fodder cropping, natural ecosystems and habitat for EVNT species and landuses associated with the State Forest, as part of the post-mine landscape.
- Provide regulatory authorities with an updated rehabilitation plan which addresses DNRM's issues and requirements.
- Provide detailed information on rehabilitation and decommissioning of mine water dams in the Mine Closure and Rehabilitation Plans.
- Amend the EM Plan to include of reference sites and monitoring criteria to gauge the success of rehabilitation works.
- Consult with EHP on the specific offset requirements for the project and submit a revised offsets strategy which addresses EHP's requirements

7 Recommendations for conditions for any approval

Section 202 of the EP Act states the purpose of the EM plan is to propose environmental protection commitments to help the administering authority prepare a draft EA for a project. The EM plan for The Range Project contains a number of general and specific commitments or conditions. EHP considers that the EM Plan is sufficiently detailed and contains suitable environmental protection commitments to provide a sound basis for EHP to decide a range of conditions for a draft EA for the project and for Stanmore to manage most potential impacts of the project. As required under section 59 of the EP Act, this report includes as Appendix 1, a set of recommended conditions for air quality, water, regulated structures, noise, waste and land. The model conditions for mines were considered in the development of these conditions. The proposed conditions are not considered complete or finalised and are provided for consideration in developing draft EA conditions for the project under the EP Act.

Some of the proposed conditions are incomplete as sufficiently detailed information was not provided in the EIS or EMP. Matters for which revised conditions should be developed include:

- water quality monitoring
- groundwater monitoring
- rehabilitation
- offsets.

Additional or revised conditions relating to these matters would be developed once a finalised EM Plan has been submitted that substantially addresses the matters identified in Part 5 of this report.

8 Suitability of the project

EHP has considered the submitted EIS, all submissions and the standard criteria under the EP Act. The project is assessed as being suitable on the basis of the Environmental Management Plan being completed and any subsequent EA being conditioned suitably to implement the specific environmental protection commitments set out in the EIS documentation and as described in this report. Consequently, the project is considered suitable to proceed to the next stage of the approval process noting that the recommendations of this EIS assessment report should be fully implemented.

Approved by

Lindsay Delzoppo	3 April 2013
Signature	Date

Lindsay Delzoppo
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Appendix 1 Changes to Queensland Government departments in 2012

Departments as of 26 March 2009	New departments (as of August 2012)
Department of Employment, Economic Development and Innovation Queensland Treasury	Department of State Development, Infrastructure and Planning Queensland Treasury and Trade Department of Agriculture, Fisheries and Forestry
Department of Environment and Resource Management	Department of Environment and Heritage Protection Department of Natural Resources and Mines Department of Energy and Water Supply Department of Science, Information Technology, Innovation and the Arts Department of National Parks, Recreation, Sport and Racing
Department of Infrastructure and Planning	Department of Local Government
Department of Transport and Main Roads	Department of Transport and Main Roads
Department of Community Safety Queensland Police Service Queensland Health	Department of Community Safety Queensland Police Service Queensland Health
Department of Communities	Department of Education, Training and Employment Department of Communities, Child Safety and Disability Services Department of Housing and Public Works Department of Aboriginal and Torres Strait Islander and Multicultural Affairs

Appendix 2 Conditions proposed by Department of Transport and Main Roads

1. Post-assessment report/ pre-construction liaison with the Department of Transport and Main Roads

Once the Assessment Report is finalised for The Range Project and the proponent decides to proceed with the project, the proponent must contact the Manager (Road System and Corridor) of the DTMR Downs South West (Toowoomba) Regional Office, no later than nine (9) months prior to the commencement of any project construction works, to liaise over the finalisation of the road impact assessment (RIA), road-use management plan (RMP) and traffic management plan (TMP).

2. Finalising the Road Impact Assessment

The proponent must complete the following no later than six months prior to the commencement of any significant project construction works:

- Update and finalise the road impact assessment (RIA) based on the proponent's latest project traffic generation projections, to identify and deal with the transport impacts on the safety and efficiency of state-controlled roads in accordance with Guidelines for Assessment of Road impacts of Development (2006), in consultation with the Manager of DTMR's Downs South West (Toowoomba) Regional Office.
- Submit the updated RIA to the Manager (Road Systems and Corridor) of the DTMR Downs South West (Toowoomba) Office for review and approval.

3. Finalising the Road Impact Assessment and drafting the Road-Use Management Plan

The proponent must complete the following no later than six months prior to the commencement of any Significant project construction works:

- Prepare a road-use management plan (RMP) for all use of state-controlled roads for each phase of the project, in consultation with the regional office contact and in accordance with DTMR's Guide to Preparing a Road Use Management Plan (attached). The RMP must summarise:
  - Latest traffic generation (vehicle numbers/routes etc.).
  - Finalised assessment of impacts on safety, efficiency and condition at intersections, on road links and on pavements etc.
  - Updated impact mitigation strategies both "hard" (infrastructure, such as adequate project access to state-controlled roads) and "soft" (such as road safety strategies - dealing with worker/driver fatigue), and any other necessary improvements or contributions towards road maintenance and so on. In particular, the "soft" impact mitigation strategies should detail how the proponent intends to ensure preferred routes are used by all traffic and how the proportion of FIFO and BIBO trips are to be achieved and maintained over the life of the project.
- Submit the RMP to the Manager (Road Systems and Corridor) of the DTMR Downs South West (Roma) Office for review and approval.

Permits, approvals, finalising detailed drawings and preparation of Traffic Management Plan/s for any required roadworks

The proponent must, no later than three months prior to the commencement of any significant project-related construction traffic, or such other period agreed with TMR, complete the following:

- Prepare detailed drawings for any works required to mitigate the impacts of project-related traffic for review and approval by TMR.
- Obtain road corridor permit approvals for any accesses to, works or other activities in state-controlled road corridors.
- Prepare a Traffic Management Plan/s (TMP) in accordance with DTMR's Guide to Preparing a Traffic Management Plan (attached). The TMP/s must be approved by DTMR and would be required to be implemented during the construction and commissioning of any site accesses, road intersections or other works undertaken in the state-controlled road corridor.
- Obtain the necessary permits for any excess mass or over-dimensional loads associated with the project as required under the Transport Operations (Road Use Management) Act (Qld) 1995.
- Consult with TMR's Transport Services Division, the Queensland Police Service and the WDRC to ensure these

excess mass or over-dimensional transport movements are safely undertaken, without damaging infrastructure.

4. Completing required roadworks before commencement of significant project traffic

The proponent must, prior to the commencement of any significant project-related construction traffic, complete the following:

- Construct any required road works before commencement of project-related construction traffic.
- Prior to undertaking any works, obtain the relevant licenses and permits under the Transport Infrastructure Act 1994 for works within the state-controlled road corridor. As required under Condition 4 above, any required plans, permits and TMPs must be approved by DTMR three months prior to commencement of project construction traffic.
- Implement the approved Traffic Management Plan for the works during construction and commissioning of the above mentioned intersection upgrade.

Advice only regarding Infrastructure Agreements

While requirements to mitigate road impacts of project traffic can generally be adequately dealt with via these conditions of approval, the proponent may enter into an Infrastructure Agreement with DTMR about:

- Upgrading affected intersection/s as determined and agreed upon with DTMR Downs South West (Toowoomba) Regional Office.
- access to/from state-controlled roads, including project accommodation facilities and material stockpile locations.
- Rehabilitation and maintenance contributions associated with project traffic as calculated and agreed upon with DTMR Downs South West (Toowoomba) Regional Office.

Infrastructure agreements between the proponent and DTMR should be concluded prior to commencement of any significant construction works on-site.

Appendix 3 Draft Environmental Authority conditions

Schedule A: General

Schedule B: Air

Schedule C: Water

Schedule D: Regulated structures

Schedule E: Noise

Schedule F: Waste

Schedule G: Land

Schedule H: Figures

SCHEDULE A: GENERAL

A1 This environmental authority authorises environmental harm referred to in the conditions. Where there is no condition or this environmental authority is silent on a matter, the lack of a condition or silence does not authorise environmental harm.

A2 In carrying out the mining activity authorised by this environmental authority, the holder of this environmental authority must comply with Schedule H—Figure 1a (Project Infrastructure Layout—Mine Area) and Schedule H—Figure 1b (Project Infrastructure Layout—Support Infrastructure).

A3 The holder of this environmental authority must:

a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority

b) maintain such measures, plant and equipment in a proper and efficient condition

c) operate such measures, plant and equipment in a proper and efficient manner

d) ensure all instruments and devices used for the measurement or monitoring of any parameter under any condition of this environmental authority are properly calibrated.

Scope of activity

A4 This environmental authority authorises a coal extraction rate of up to seven (7) million tonnes per annum (Mt/y) of run-of-mine ore.

Monitoring

A5 Except where specified otherwise in another condition of this authority, all monitoring records or reports required by this environmental authority must be kept for a period of not less than 5 years.

A6 Where monitoring is a requirement of this environmental authority, ensure that a competent person(s) conducts all monitoring.

Financial assurance

A7 Provide to the administering authority financial assurance for the amount and in the form acceptable to the administering authority in accordance with the most recent edition of the administering authority's: Guideline—Calculating financial assurance for mining projects, before the proposed mining activities can commence.

A8 The amount of financial assurance must be reviewed by the holder of this environmental authority when a plan of operations is amended or replaced or the authority is amended.

Risk management

A9 The holder of this environmental authority must develop and implement a risk management system for mining activities which mirrors the content requirement of the Standard for Risk Management (ISO31000:2009), or the latest edition of an Australian standard for risk management, to the extent relevant to environmental management, by <<Insert date 3 months from date of issue>>

Notification of emergencies, incidents and exceptions

A10 The holder of this environmental authority must notify the administering authority by written notification within 24 hours, after becoming aware of any emergency or incident which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with the conditions of this environmental authority.

A11 Within 10 business days following the initial notification of an emergency or incident, or receipt of monitoring results, whichever is the latter, further written advice must be provided to the administering authority, including the following:

a) results and interpretation of any samples taken and analysed

b) outcomes of actions taken at the time to prevent or minimise unlawful environmental harm

c) proposed actions to prevent a recurrence of the emergency or incident.

A12 The notification of emergencies or incidents as required by condition A10 must include, but not be limited to:

a) the holder of the environmental authority

b) the location of the emergency or incident

c) the number of the environmental authority

d) the name and telephone number of the designated contact person

e) the time of the release

f) the time the holder of the environmental authority became aware of the release

g) the suspected cause of the release

h) the environmental harm caused, threatened, or suspected to be caused by the release

i) actions taken to prevent any further release and mitigate any environmental harm caused by the release.

A13 Not more than 14 days following the initial notification of an emergency or incident, written advice must be provided of the information supplied in accordance with condition A10 in relation to:

a) proposed actions to prevent a recurrence of the emergency or incident, and

b) outcomes of actions taken at the time to prevent or minimise environmental harm.

A14 As soon as practicable, but not more than six weeks following the conduct of any environmental monitoring performed in relation to the emergency or incident, which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with the conditions of this environmental authority, written advice must be provided of the results of any such monitoring performed to the administering authority.

Complaints

A15 The holder of this environmental authority must record all environmental complaints received about the mining activities including:

a) name, address and contact number for of the complainant

b) time and date of complaint

c) reasons for the complaint

d) investigations undertaken

e) conclusions formed

f) actions taken to resolve the complaint

g) any abatement measures implemented

h) person responsible for resolving the complaint.

A16 The holder of this environmental authority must, when requested by the administering authority, undertake relevant specified monitoring within a reasonable timeframe nominated or agreed to by the administering authority to investigate any complaint of environmental harm. The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures, where implemented, must be provided to the administering authority within 10 business days of completion of the investigation, or no later than 10 business days after the end of the timeframe nominated by the administering authority to undertake the investigation.

Third party reporting

A17 The holder of this environmental authority must:

a) within 1 year of the commencement of this authority, obtain from a suitably qualified and experienced third party a report on compliance with the conditions of this environmental authority,

b) obtain further such reports at regular intervals not exceeding 3 years from the completion of the report referred to above,

c) provide each report to the administering authority within 90 days of its completion.

A18 Where a condition of this environmental authority requires compliance with a standard, policy or guideline published externally to this environmental authority and the standard is amended or changed subsequent to the issue of this environmental authority the holder of this environmental authority must:

a) comply with the amended or changed standard, policy or guideline within 2 years of the amendment or change being made, unless a different period is specified in the amended standard or relevant legislation, or where the amendment or change relates specifically to regulated structures referred to in condition <insert relevant condition no> the time specified in that condition

b) until compliance with the amended or changed standard, policy or guideline is achieved, continue to remain in compliance with the corresponding provision that was current immediately prior to the relevant amendment or change.

Prevent and/or minimise likelihood of environmental harm

A19 In carrying out the activities authorised under this environmental authority, you must take all reasonable and practicable measures to prevent and/or to minimise the likelihood of environmental harm being caused. Any environmentally relevant activity, that, if carried out incompetently, or negligently, may cause environmental harm, in a manner that could have been prevented, shall be carried out in a proper manner in accordance with the conditions of this authority.

Storage and handling of flammable and combustible liquids

A20 Spillage of all flammable and combustible liquids must be contained within an on-site containment system and controlled in a manner that prevents environmental harm (other than trivial harm) and maintained in accordance with the current version of Australian Standard (AS) 1940—Storage and Handling of Flammable and Combustible Liquids.

A21 Spillage of all chemicals must be contained within an on-site containment system and controlled in a manner that prevents environmental harm.

Definitions

A22 Words and phrases used throughout this environmental authority are defined in the Definitions section of this authority. Where a definition for a term used in this environmental authority is sought and the term is not defined within this environmental authority, the definitions in the *Environmental Protection Act 1994,* its regulations and policies must be used.

SCHEDULE B: AIR

Odour nuisance

B1 The release of noxious or offensive odours or any other noxious or offensive airborne contaminants resulting from the activity must not cause a nuisance at any nuisance sensitive or commercial place.

B2 When requested by the administering authority, odour monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any sensitive place, and the results must be notified within fourteen (14) days to the administering authority following completion of monitoring.

B3 If the administering authority determines the odour released to constitute an environmental nuisance, the environmental authority holder must:

a) address the complaint including the use of appropriate dispute resolution if required; and

b) immediately implement odour abatement measures so that emissions of odour from the activity do not result in further environmental nuisance.

Dust and particulate matter monitoring

B4 The release of dust and/or particulate matter resulting from the mining activity must not cause an environmental nuisance at any nuisance sensitive or commercial place.

B5 Dust and particulate matter must not exceed the following levels when measured at any sensitive or commercial place:

a) Dust deposition of 120 milligrams per square metre per day, averaged over 1 month, when monitored in accordance with the most recent version of Australian Standard AS3580.10.1 Methods for sampling and analysis of ambient air—Determination of particulate matter—Deposited matter – Gravimetric method.

b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometres (PM_{10}) suspended in the atmosphere of 50 micrograms per cubic metre over a 24-hour averaging time, when monitored in accordance with the most recent version of either:

i. Australian Standard AS3580.9.6 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM_{10} high volume sampler with size-selective inlet – Gravimetric method, or

ii. Australian Standard AS3580.9.9 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM_{10} low volume sampler—Gravimetric method.

c) A concentration of particulate matter suspended in the atmosphere of 90 micrograms per cubic metre over a 1 year averaging time, when monitored in accordance with the most recent version of AS/NZS3580.9.3:2003 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—Total suspended particulate matter (TSP)—High volume sampler gravimetric method.

B6 When requested by the administering authority, dust and particulate monitoring must be undertaken to investigate any complaint of environmental nuisance caused by dust and/or particulate matter, and the results notified within 14 days to the administering authority following completion of monitoring. Monitoring must be carried out at a place(s) relevant to the potentially affected nuisance sensitive place and at upwind control sites and must include:

a) for a complaint alleging dust nuisance, dust deposition

b) for a complaint alleging adverse health effects caused by dust, the concentration per cubic metre of particulate matter with an aerodynamic diameter of less than 10 (μm) (PM_{10}) suspended in the atmosphere over a 24 hour averaging time.

B7 If monitoring conducted as a result of a complaint indicates an exceedence of the guidelines detailed in condition B5, the holder must:

a) address the complaint through the use of appropriate dispute resolution if required

b) immediately implement dust abatement measures.

General dust control

B8 The holder must design, construct, commission, operate and maintain the project in a manner that minimises or prevents the emission of dust from the site including wind blown and traffic generated dust.

B9 The holder must design, construct, operate and maintain the project in a manner that minimises the potential

generation of fugitive dust emission from plant and equipment, including where relevant and practicable, design of the project to minimise the number of coal transfer points, minimise the drop height from stackers to stockpiles, full or partial enclosure of conveyors and installation of wind shields and belt cleaning systems to conveyors.

B10 For the purpose of avoiding any release of dust or particulate matter from the approved place which could cause an environmental nuisance, the following measures must be taken:

a) Stockpiles must be maintained using all reasonable and practicable measures to minimise the release of wind blown dust or particulate matter to the atmosphere. Reasonable and practicable measures may include, but are not limited to, anemometer switching systems which trigger operation of effective water spray systems during winds likely to generate such releases; use of approved dust suppressants; shielding and storage in bunkers.

b) Trafficable areas must be maintained using all reasonable and practicable measures to minimise the release of windblown dust or traffic generated dust to the atmosphere. Reasonable and practicable measures may include, but are not limited to, sealing with bitumen or other suitable material; keeping surfaces clean; use of water sprays; adoption and adherence to speed limits (e.g. less than 40 kilometres per hour for unsealed road); use of approved dust suppressants; and wind breaks.

c) Raw material preparation plants and external transfer conveyors must be operated and maintained using all reasonable and practicable measures to minimise the release of wind blown dust or particulate matter to the atmosphere. Reasonable and practicable measures may include, but are not limited to, transfer of materials in a moist state; enclosure or sealing of conveyors; use of water sprays at transfer points; shielding; and wind breaks.

d) Water sprays must be installed at all major dust emission sources.

SCHEDULE C: WATER

Contaminant Release

C1 Contaminants that will, or have the potential to cause environmental harm must not be released directly or indirectly to any waters as a result of the authorised mining activities, except as permitted under the conditions of this Environmental Authority.

C2 Unless otherwise permitted under the conditions of this Environmental Authority, the release of mine affected water to waters must only occur from the release points specified in Table 1: Mine Water Release Points, Sources and Receiving Waters and depicted in Figure 2 (*to be determined*) attached to this environmental authority.

C3 The release of mine affected water to internal water management infrastructure that is installed and operated in accordance with a water management plan that complies with conditions C33 to C38 inclusive is permitted.

Table 1: Mine Water Release Points, Sources and Receiving Waters

Receiving waters/streams	Release point (RP)	Gauging station	Gauging station latitude (decimal degree, GDA94)	Gauging station longitude (decimal degree, GDA94)	Receiving water flow recording frequency	Receiving water flow criteria for discharge (m^3/s)	Maximum release rate (for all combined RP flows)	Electrical conductivity and sulphate release limits
Dogwood creek	RP1	Gauging station 1 (to be advised)	- 26.24654	150.311 231	Continuous (minimum hourly)	Low Flow - <1.1 m^3/s for the period of 4 weeks after natural flow events that exceed 1.1 m^3/s	<1.1 m^3/s	Electrical conductivity: <136 µS/cm (Gil Weir back ground data) Sulphate: <250mg/L
						Medium Flow - >1.1 m^3/s	<1.4 m^3/s	Electrical conductivity: <1500 µS/cm (End of pipe EC) Sulphate: <440 mg/L (sulphate based on 250 mg/L instream and 11 mg/L background)
						Medium Flow – >3 m^3/s	<0.9 m^3/s	Electrical conductivity: <3500 µS/cm (End of pipe EC) Sulphate: <900 mg/L
						High Flow - >5 m^3/s	<0.42 m^3/s	Electrical conductivity: <10,000 µS/cm (End of pipe EC) Sulphate: <3000 mg/L
						Very High Flow – >10 m^3/s	<0.84 m^3/s	Electrical conductivity: <10,000 µS/cm (End of pipe EC) Sulphate: <3000 mg/L

C4 The release of mine affected water to waters in accordance with condition C2 must not exceed the release limits stated in Table 2: Mine Affected Water Release Limits when measured at the release points specified in Table 1: Mine Water Release Points, Sources and Receiving Waters for each quality characteristic.

Table 2: Mine Affected Water Release Limits

Quality Characteristic	Release Limits	Monitoring frequency
Electrical conductivity (µS/cm)	Release limits specified in Table 1 for variable flow criteria	Daily during release (the first sample must be taken within 2 hours of commencement of release)
pH (pH unit)	6.5 (minimum) 9.0 (maximum)	Daily during release (the first sample must be taken within 2 hours of commencement of release)
Turbidity (NTU)	Current limit to be determined*	Daily during release (the first sample must be taken within 2 hours of commencement of release)
Suspended Solids (mg/L)	To be measured but not required as a release limit*	Daily during release (the first sample must be taken within 2 hours of commencement of release)
Sulphate (SO_4^{2-}) (mg/L)	Release limits specified in Table 1 for variable flow criteria.	Daily during release (the first sample must be taken within 2 hours of commencement of release)

*Limit for suspended solids can be omitted if turbidity limit is included. Limit for turbidity not required if suspended solids limit included. Both indicators should be measured in all cases.

C5 The release of mine affected water to waters from the release points must be monitored at the locations specified in Table 1 for each quality characteristics and at the frequency specified in Table 2 and Table 3.
Note: The administering authority will take into consideration any extenuating circumstances prior to determining an appropriate enforcement response, in the vent condition C5 is contravened due to a temporary lack of safe or practical access. The administering authority expects the environmental authority holder to take all reasonable and practicable measures to maintain safe and practical access to designated monitoring locations.

C6 The release of mine affected water to waters from the release points must be monitored at the locations specified in Table 1 for each quality characteristic and at the frequency specified in Table 2 and Table 3: Release Contaminant Trigger Investigation Levels. Consideration should also be given to the relevant Model Water Conditions for Coal Mines in the Fitzroy (EHP 2012)

Table 3: Release Contaminant Trigger Investigation Levels

Quality Characteristic	Trigger Levels (µg/L)	Monitoring Frequency
Aluminium	55	Commencement of release and thereafter weekly during release
Arsenic	13	
Cadmium	0.2	
Chromium	1	
Copper	2	
Iron	300	
Lead	4	
Mercury	0.2	
Nickel	11	
Zinc	8	
Boron	370	
Cobalt	90	
Manganese	1900	
Molybdenum	34	
Selenium	10	
Silver	1	
Uranium	1	
Vanadium	10	
Ammonia	900	
Nitrate	1100	
Petroleum hydrocarbons (C6-C9)	20	
Petroleum hydrocarbons (C10-C36)	100	
Fluoride (total)	2000	

1. All metals and metalloids must be measured as dissolved (filtered)

2. The quality characteristics required to be monitored as per Table 3 can be reviewed once the results of two years monitoring data is available, or if sufficient data is available to adequately demonstrate negligible environmental risk, and it may be determined that a reduced monitoring frequency is appropriate or that certain quality characteristics can be removed from Table 3 by amendment.

C7 If quality characteristics of the release exceed any of the trigger levels specified in Table 3 during a release event, the environmental authority holder must compare the down stream results in the receiving waters to the trigger values specified in Table 3 and:

1. where the trigger values are not exceeded then no action is to be taken; or
2. where the down stream results exceed the trigger values specified Table 3 for any quality characteristic, compare the results of the down stream site to the data from background monitoring sites and;
   a) if the result is less than the background monitoring site data, then no action is to be taken; or
   b) if the result is greater than the background monitoring site data, complete an investigation into the potential for environmental harm and provide a written report to the administering authority in the next annual return, outlining:
      i. details of the investigations carried out; and
      ii. actions taken to prevent environmental harm.

Note: Where an exceedence of a trigger level has occurred and is being investigated, in accordance with 2(b)ii of this condition, no further reporting is required for subsequent trigger events for that quality characteristic.

C8 If an exceedence in accordance with condition C7 2(b) is identified, the holder of the authority must notify the administering authority within 14 days of receiving the result.

C9 The holder must ensure a stream flow gauging station/s is installed, operated and maintained to determine and record stream flows at the locations and flow recording frequency specified in Table 1: Mine Water Release Points, Sources and Receiving Waters.

C10 Notwithstanding any other condition of this environmental authority, the release of mine affected water to waters in accordance with C2 must only take place in accordance with the receiving water flow criteria for discharge and for the release point(s) specified in Table 1.

C11 The release of mine affected water to waters in accordance with condition C2 must not exceed the electrical conductivity and sulphate release limits or the maximum release rate (for all combined release point flows) for each receiving water flow criteria for discharge specified in Table 1 when measured at the monitoring points specified in Table 1.

C12 The daily quantity of mine affected water released from each release point must be measured and recorded at the monitoring points in Table 1.

C13 Releases to waters must be undertaken so as not to cause erosion of the bed and banks of the receiving waters, or cause a material build up of sediment in such waters.

Notification of Release Event

C14 The authority holder must notify the administering authority as soon as practicable (no later than 24 hours of having commenced releasing mine affected water to the receiving environment). Notification must include the submission of written verification to the administering authority of the following information:

1. release commencement date/time;
2. expected release cessation date/time;
3. release point/s;
4. release volume (estimated);
5. receiving water/s including the natural flow rate; and
6. any details (including available data) regarding likely impacts on the receiving water(s).

Note: Notification to the administering authority must be addressed to the Manager and Project Manager of the local Administering Authority via email or facsimile.

C15 The authority holder must notify the administering authority as soon as practicable, (nominally within twenty-four (24) hours after of cessation of a release) of the cessation of a release notified under condition C14 and within 28 days provide the following information in writing:

a) release cessation date/time;
b) natural flow volume in receiving water;

c) volume of water released;
d) details regarding the compliance of the release with the conditions of Agency Interest: Water of this environmental authority (i.e. contamination limits, natural flow, discharge volume);
e) all in-situ water quality monitoring results; and
f) any other matters pertinent to the water release event.

Note: Successive or intermittent releases occurring within twenty-four (24) hours of the cessation of any individual release can be considered part of a single release event and do not require individual notification for the purpose of compliance with conditions C14 and C15, provided the relevant details of the release are included within the notification provided in accordance with conditions C14 and C15.

C16 Within 28 days of a release notified under condition C14, the holder must provide a report to the administering authority demonstrating compliance with this environmental authority.

Notification of Release Event Exceedence

C17 If the release limits defined in Table 2 are exceeded, the holder of the environmental authority must notify the administering authority within twenty-four (24) hours of receiving the results.

C18 The authority holder must, within twenty-eight (28) days of a release that exceeds the conditions of this authority, provide a report to the administering authority detailing:
a) the reason for the release;
b) the location of the release;
c) all water quality monitoring results;
d) any general observations;
e) all calculations;
f) the level of environmental harm (if any) caused by the release; and
g) any other matters pertinent to the water release event.

Receiving Environment Monitoring and Contaminant Trigger Levels

C19 The quality of the receiving waters must be monitored at the locations specified in Table 4: Receiving Water Monitoring Points, for each quality characteristic and at the monitoring frequency stated in Table 5: Receiving Water Contaminant Trigger Levels.

Table 4: Receiving Water Monitoring Points

Monitoring Points	Receiving Waters Location Description	Latitude or northing (GDA94)	Longitude or easting (GDA94)
Upstream Background Monitoring Points			
Monitoring Point 1	*Location on Dogwood Creek to be determined*	*to be determined*	*to be determined*
Representative Site Background Monitoring Points[1]			
Monitoring Point 2	*to be determined e.g. Roche Creek*	*to be determined*	*to be determined*
Downstream Monitoring Points[2]			
Monitoring Point 3	*Location on Downfall Creek to be determined*	*to be determined*	*to be determined*
Monitoring Point 4	*Dogwood Creek 120m downstream of RP1*	*to be determined*	*to be determined*

Note 1: the downstream point should not be greater than *15km* from the release point.

Note 2: The data from background monitoring points must not be used where they are affected by releases from other mines

Table 5: Receiving Water Contaminant Trigger Levels

Quality Characteristic	Trigger Level	Monitoring Frequency
pH	6.5 – 8.0	Daily during the release
Electrical Conductivity (µC/cm)	1000	
Sodium (Na) (mg/L)	180	
Suspended solids (mg/L)	To be determined. Turbidity may be required to assess ecosystem impacts and can provide instantaneous results.	
Sulphate (SO_4^{2-}) (mg/L)	250	

Consideration should also be given to the relevant Model Water Conditions for Coal Mines in the Fitzroy (EHP 2012)

C20 If quality characteristics of the receiving water at the downstream monitoring points exceed any of the trigger levels specified in Table 4 during a release event the environmental authority holder must compare the down stream results to results from background water monitoring in the receiving waters and:

a) where the down stream result is the same or a lower value than the background value for the quality characteristic then no action is to be taken; or

b) where the downstream results exceed the background results complete an investigation in accordance with the ANZECC & ARMCANZ 2000 methodology, into the potential for environmental harm and provide a written report to the administering authority in the next annual return, outlining:
   i. details of the investigations carried out; and
   ii. actions taken to prevent environmental harm.

Note: Where an exceedence of a trigger level has occurred and is being investigated, in accordance with b(ii) of this condition, no further reporting is required for subsequent trigger events for that quality characteristic.

Receiving Environment Monitoring Program (REMP)

C21 The environmental authority holder must develop and implement a Receiving Environment Monitoring Program (REMP) to monitor, identify and describe any adverse impacts to surface water environmental values, quality and flows due to the authorised mining activity. This must include monitoring the effects of the mine on the receiving environment periodically (under natural flow conditions) and while mine affected water is being discharged from the site. A copy of the REMP must be provided to the administering authority prior to its implementation and due consideration given to any comments made on the REMP by the administering authority.

For the purposes of the REMP, the receiving environment is the waters of the Downfall Creek and Dogwood Creek catchments and connected waterways within a distance to be established downstream of the release.

C22 The REMP must address (but not necessarily be limited to) the following:

a) Assess the condition or state of receiving waters, including upstream conditions, spatially within the REMP area, considering background water quality characteristics based on accurate and reliable monitoring data that takes into consideration temporal variation (e.g. seasonality); and

b) Be designed to facilitate assessment against water quality objectives for the relevant environmental values that need to be protected; and

c) Include monitoring from background reference sites (e.g. background) and downstream sites from the release (as a minimum, the locations specified in Table 8); and

d) Specify the frequency and timing of sampling required in order to reliably assess ambient conditions and to provide sufficient data to derive site specific background reference values in accordance with the Queensland Water Quality Guidelines 2006. This should include monitoring during periods of natural flow irrespective of mine or other discharges; and

e) Include monitoring and assessment of dissolved oxygen saturation, temperature and all water quality parameters listed in Table 2 and 3; and

f) Include, where appropriate, monitoring of metals/metalloids in sediments (in accordance with ANZECC & ARMCANZ 2000, BATLEY and/or the most recent version of AS5667.1Guidance on Sampling of Bottom Sediments); and

g) Include, where appropriate, monitoring of macroinvertebrates in accordance with the AusRivas methodology, and

h) Apply procedures and/or guidelines from ANZECC & ARMCANZ 2000 and other relevant guideline documents; and

i) Describe sampling and analysis methods and quality assurance and control; and

j) Incorporate stream flow and hydrological information in the interpretations of water quality and biological data.

C23 A REMP Design Document that addresses each criterion presented in conditions C21 and C22 must be prepared and submitted to the administering authority no later than 3 months after the date of issue of this environmental authority. Due consideration must be given to any comments made by the administering authority on the REMP Design Document and subsequent implementation of the program.

C24 A report outlining the findings of the REMP, including all monitoring results and interpretations in accordance with condition 20 and 21 of the *Model Water Conditions for Coal Mines in the Fitzroy Basin* (EHP 2012), must be prepared annually and made available on request to the administering authority. This must include an assessment of background reference water quality, the condition of downstream water quality compared

against water quality objectives, and the suitability of current discharge limits to protect downstream environmental values.

Water Reuse

C25 Mine affected water may be piped or trucked or transferred by some other means that does not contravene the conditions of this environmental authority and deposited into artificial water storage structures, such as farm dams or tanks, or used directly at properties owned by the environmental authority holder or a third party for the purpose of:

i) supplying stock water subject to compliance with the quality release limits specified in Table 6; or
ii) supplying irrigation water subject to compliance with quality release limits in Table 7; or
iii) supplying water for construction and/or road maintenance in accordance with the conditions of this environmental authority.

Table 6: Stock Water Release Limits

Quality Characteristic	Units	Minimum	Maximum
pH	pH units	6.5	8.5
Electrical Conductivity	µS/cm	N/A	5000

Table 7: Irrigation Water Release Limits

Quality Characteristic	Units	Minimum	Maximum
pH	pH units	6.5	8.5
Electrical Conductivity	µS/cm	N/A	*Site specific value to be determined in accordance with ANZECC & ARMCANZ (2000) Irrigation Guidelines*

C26 Mine affected water may be piped or trucked off the mining lease for the purpose of supplying water in accordance with C25 or to a third party for purpose of construction and/or road maintenance in accordance with the conditions of this environmental authority.

C27 If the responsibility of mine affected water is given or transferred to another person in accordance with conditions C25 or C26:

a) the responsibility of the water must only be given or transferred in accordance with a written and signed agreement (the third party agreement); and
b) include in the third party agreement a commitment from the person utilising the water to use water in such a way as to prevent environmental harm or public health incidences and specifically make the persons aware of the General Environmental Duty (GED) under section 319 of the *Environmental Protection Act 1994*, environmental sustainability of the water disposal and protection of environmental values of waters; and
c) the third party agreement must be signed by both parties to the agreement.

Water General

C28 All determinations of water quality must be:

a) performed by a person or body possessing appropriate experience and qualifications to perform the required measurements;

b) made in accordance with methods prescribed in the latest edition of the Department of Environment and Resource Management's *Monitoring and Sampling Manual*;

Note: Condition C28 requires the Monitoring and Sampling Manual to be followed and where it is not followed because of exceptional circumstances this should be explained and reported with the results.

c) collected from the monitoring locations identified within this environmental authority, within 24 hours of each other where possible; and
d) carried out on representative samples.
e) laboratory testing must be undertaken using a laboratory accredited (e.g. NATA) for the method of analysis being used.

C29 The release of any contaminants as permitted by this environmental authority, directly or indirectly to waters, other than internal water management infrastructure that is installed and operated in accordance with a water management plan that complies with conditions C31 to C36 inclusive:
a) must not produce any visible discolouration of receiving waters; nor
b) must not produce any slick or other visible or odorous evidence of oil, grease or petrochemicals nor contain visible floating oil, grease, scum, litter or other objectionable matter.

Annual Water Monitoring Reporting

C30 The following information must be recorded in relation to all water monitoring required under the conditions of this environmental authority and submitted to the administering authority in the specified format with each annual return:
a) the date on which the sample was taken;
b) the time at which the sample was taken;
c) the monitoring point at which the sample was taken;
d) the measured or estimated daily quantity of the contaminants released from all release points;
e) the release flow rate at the time of sampling for each release point;
f) the results of all monitoring and details of any exceedences with the conditions of this environmental authority; and
g) water quality monitoring data must be provided to the administering authority in the specified electronic format upon request.

Water Management Plan

C31 A Water Management Plan must be developed and implemented within 3 months prior to commencement of operations that provides for the proper and effective management of the actual and potential environmental impacts resulting from the mining activity and to ensure compliance with the conditions of this environmental authority.

C32 The Water Management Plan must:
a) provide for the effective management of actual and potential environmental impacts resulting from water management associated with the mining activity carried out under this environmental authority; and
b) be developed in accordance with EHP's guideline *Preparation of Water Management Plans for Mining Activities* (EM324) and include:
    i. a study of the source of contaminants;
    ii. a water balance model for the site;
    iii. a water management system for the site;
    iv. measures to manage and prevent saline drainage;
    v. measures to manage and prevent acid rock drainage;
    vi. contingency procedures for emergencies; and
    vii. program for monitoring and review of the effectiveness of the water management plan.

C33 The Water Management Plan must be reviewed each calendar year and a report prepared by an appropriately qualified person. The report must:
a) assess the plan against the requirements under condition C32;
b) include recommended actions to ensure actual and potential environmental impacts are effectively managed for the coming year; and
c) identify any amendments made to the water management plan following the review.

C34 The holder of this environmental authority must attach to the review report required by condition C33, a written response to the report and recommended actions, detailing the actions taken or to be taken by the environmental authority holder on stated dates:
a) to ensure compliance with this environmental authority; and
b) to prevent a recurrence of any non-compliance issues identified.

C35 The review report required by condition C33 and the written response to the review report required by condition C34 must be submitted to the administering authority with the subsequent annual return under the signature of the appointed signatory for the annual return.

C36 A copy of the Water Management Plan must be provided to the administering authority on request.

Saline Drainage

C37 The holder of this environmental authority must ensure proper and effective measures are taken to avoid or otherwise minimise the generation and/or release of saline drainage.

Acid Rock Drainage

C38 The holder of this environmental authority must ensure proper and effective measures are taken to avoid or otherwise minimise the generation and/or release of acid rock drainage.

Stormwater and Water Sediment Controls

C39 An Erosion and Sediment Control Plan must be developed by an appropriately qualified person and implemented for all stages of the mining activities on the site to minimise erosion and the release of sediment to receiving waters and contamination of stormwater.

C40 Stormwater, other than mine affected water, is permitted to be released to waters from:
i) erosion and sediment control structures that are installed and operated in accordance with the Erosion and Sediment Control Plan required by condition C39; and
ii) water management infrastructure that is installed and operated, in accordance with a Water Management Plan that complies with conditions C31 to C36 inclusive, for the purpose of ensuring water does not become mine affected water.

C41 The maintenance and cleaning of any vehicles, plant or equipment must not be carried out in areas from which contaminants can be released into any receiving waters.

C42 Any spillage of wastes, contaminants or other materials must be cleaned up as quickly as practicable to minimise the release of wastes, contaminants or materials to any stormwater drainage system or receiving waters.

All Dams

C43 The hazard category of each dam must be determined by a suitably qualified and experienced person at least once in each two year period.

C44 Dams having a hazard category determined to be significant or high must be specifically authorised by an environmental authority.

C45 The base and walls of the Tailings Storage Facility and environmental dams must be constructed, installed and maintained:

i. so as to minimise the likelihood of a release of contaminants through the bed or banks of the dam to any waters (including groundwater); and
ii. so as to ensure the stability of the dam(s) construction.

C46 On 1 November of each year, storage must be available in each Site Water Containment System, to meet the Design Storage Allowance (the DSA) for the containment system detailed in Table 12: Hydraulic Performance of Containment Systems.

C47 The DSA must be determined in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*

C48 The holder of this EA must not abandon any dam but must decommission each dam so as to avoid any environmental harm.

Groundwater

C49 The holder of this environmental authority must not release contaminants to groundwater.

C50 Groundwater, potentially affected by the mining activities and contained in the Taroom Coal Measures and Hutton Sandstone must be monitored at the locations and frequencies defined in the Groundwater Monitoring Plan.

C51 The Groundwater Monitoring Plan must be developed and implemented within 3 months prior to commencement of operations. The Groundwater Monitoring Plan must include;

a) characterization of potential impacts to the groundwater system arising from the mining activity;
b) groundwater monitoring bore locations and construction details;
c) justification for the location of the proposed groundwater monitoring locations;
d) allowance for the collection of representative groundwater samples from aquifers identified as potentially being affected by mining activities, including but not limited to quality characteristics listed in table xx, groundwater flow rates, hydraulic conductivity within the aquifer and any hydraulic connection with other aquifers or surface water resources and impacts on groundwater levels (such as the development of groundwater contours for the aquifer) with consideration of how these parameters may change during the life of the mine;
e) a sampling regime that determines background quality data (including any groundwater aquifer that has been determined by a suitably qualified person as likely to be impacted by the mining activity) which provides sufficient spatial coverage to enable scientifically justifiable conclusions in relation to potential impacts to groundwater as a result of the mining activity. This can be achieved by sampling for a two year period with a minimum of 12 sampling events not spaced more than 2 months apart prior to the commencement of the mining activities;
f) the identification of natural groundwater levels;
g) monitoring locations and frequencies determined in accordance with the methods of groundwater sampling required in the latest edition of the Queensland Monitoring and Sampling Manual, AS/NZS 5667:11 1998 Water Sampling Guidelines – Part 11 Guidance on groundwater, and the Australian Governments Groundwater Sampling and Analysis – A Field Guide (2009:27 GeoCat#6890:1);
h) groundwater monitoring bores constructed in accordance with methods prescribed in the Minimum construction Requirements for Water Bores in Australia – 3rd Edition (LWBC);
i) independent certification by an appropriately qualified person that the monitoring program is compliant in all respects with the environmental authority;
j) a process for review at least once a year to ensure that proper and effective measures, practices or procedures are in place so that the mine is operated in accordance with the conditions of this environmental authority and environmental harm is prevented or minimized.

C52 In accordance with the Groundwater Monitoring Plan,

a) groundwater levels must be monitored; and
b) groundwater draw down fluctuations investigated.

C53 Groundwater quality and level must be monitored at the locations and frequencies defined in Table 8: Groundwater monitoring locations and frequency, for water quality parameters identified in Table 9: Groundwater quality triggers and limits.

Table 8: Groundwater monitoring locations and frequency

Monitoring Point	Location		Surface RL (m)[1]	Monitoring Frequency
	Easting (GDA 94 – Zone 54)	Northing (GDA94 – Zone 54)		

[1] RL must be measured to the nearest 5cm from the top of the bore casing.

[2] Reference sites must:

(a) have a similar flow regime;
(b) be from the same bio-geographic and climatic region;
(c) have similar geology, soil types and topography; and
(d) not be so close to the test sites that any disturbance at the test site also results in a change at the reference site.

Table 9: Groundwater quality triggers and limits

Parameter	Unit	Contaminant Triggers	Contaminant Limit
pH	pH units	6.5 – 8.5	Minimum/Maximum
Electrical conductivity	µS/cm	(To be provided by the proponent after 2 years of background quality monitoring in accordance with condition C51)	Maximum
Total dissolved solids	mg/L		Maximum
Calcium	µg/L		Maximum
Magnesium	µg/L		Maximum
Sodium	µg/L		Maximum
Potassium	µg/L		Maximum
Chlorine	µg/L		Maximum
SO_4	µg/L		Maximum
CO_3	µg/L		Maximum
HCO_3	µg/L		Maximum
Iron	µg/L		Maximum
Aluminium	µg/L		Maximum
Silver	µg/L		Maximum
Arsenic	µg/L		Maximum
Mercury	µg/L		Maximum
Antimony	µg/L		Maximum
Molybdenum	µg/L		Maximum

Selenium	µg/L		Maximum
Total Petroleum Hydrocarbons	µg/L		Maximum

C54 If quality characteristics of groundwater compliance bores identified in Table 8: Groundwater monitoring locations and frequency, exceed any of the trigger levels stated in Table 9: Groundwater quality triggers and limits, the holder of this environmental authority must compare the compliance monitoring bore results to the reference bore results and complete an investigation in accordance with the ANZECC and ARMCANZ 2000.

C55 The method of water sampling required by this environmental authority must comply with that set out in the latest edition of the administering authority's *Water quality monitoring and sampling manual*.

C56 All groundwater monitoring wells will be installed and maintained by a person possessing appropriate qualifications and experience in the fields of hydrogeology and groundwater monitoring program design to be able to competently make recommendations about these matters.

C57 All wells will be constructed in accordance with methods prescribed in the latest edition of the Agriculture and Resource Management Council of Australia and New Zealand manual titled *Minimum Construction Requirements for Water Bores in Australia*; and

C58 Samples that are obtained by the holder of this environmental authority must measure and record standing groundwater levels in metres accurate to 0.01 metres. The elevation of the reference point, relative to Australian Height Datum, for use in any groundwater level measurement must be determined to an accuracy of 0.01 metres.

C59 Groundwater level fluctuations as measured in the bores that are caused by seepage from the mine water or tailings dams must be notified within 14 business days to the administering authority following completion of monitoring.

SCHEDULE D: REGULATED STRUCTURES

D1 The hazard category of any structure must be assessed by a suitably qualified and experienced person:

a) in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (EM365);* and
b) in any of the following situations:
    i. prior to the design and construction of the structure; or
    ii. prior to any change in its purpose or the nature of its stored contents

D2 A hazard assessment report and certification must be prepared for any structure assessed and the report may include a hazard assessment for more than one structure.

D3 The holder must on receipt of a hazard assessment report and certification provide to the administering authority one paper copy and one electronic copy of the hazard assessment report and certification.

D4 Certification must be provided by the suitably qualified and experienced person who undertook the assessment, in the form set out in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (EM635).*

D5 The holder must take reasonable and practical measures so that each dam associated with the mining activity is designed, constructed, operated and maintained in accordance with accepted engineering standards and is fit for the purpose for which it is intended.

Design and construction of a regulated structure

D6 All regulated structures must be designed by, and constructed under the supervision of a suitably qualified and experienced person in accordance with the requirements of the *Manual for Assessing hazard Categories and Hydraulic Performance of Dams (EMC635).*

D7 Construction of a regulated structure is prohibited unless the holder has:

a) submitted a hazard category assessment report and certification to the administering authority;
b) commissioned a suitably qualified and experienced person to prepare a design plan for the structure; and
c) received the certification from a suitably qualified and experienced person for the design and design plan and the associated operating procedures in compliance with the relevant condition of this authority

D8 Certification must be provided by the suitably qualified and experienced person who oversees the preparation of the design plan, in the form set out in the *Manual for Assessing Hazard categories and Hydraulic Performance of Dams (EMC635).*

D9 Regulated structures must:

a) be designed and constructed in accordance with and conform to the requirements of the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*

b) be designed and constructed with due consideration given to ensuring that the design integrity would not be compromised on account of:

i. floodwaters from entering the regulated dam from any watercourse or drainage line

ii. wall failure due to erosion by floodwaters arising from any watercourse or drainage line.

D10 The design plan for a regulated structure must include, but is not limited to:

a) certification that the design plan:

i. is in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams,* including subsidiary certifications if necessary

ii. addresses the requirements in D10(b) to (h)

b) a design report which provides:

i. a description of all the documents which constitute the design plan

ii. a statement of:

a. the applicable standards including engineering criteria, industry guidelines, relevant legislation and regulatory documents, relied upon in preparing the design plan; and

b. all relevant facts and data used in preparing the design plan, including any efforts made to obtain necessary facts and data, and any limitations or assumptions to facts and data used in preparing the design plan;

c. the hazard category of the regulated structure; and

d. setting out the reasoning of the suitably qualified and experienced person who has certified the design plan, as to how the design plan provides the necessary required performance.

iii. documentation of hydrological analyses and estimates required to determine all elements of the design including volumes and flow capacities;

iv. detailed criteria for the design, operation, maintenance and decommissioning of the regulated structure, including any assumptions;

v. design, specification and operational rules for any related structures and systems used to prevent failure scenarios;

c) drawings showing the lines and dimensions, and locations of built structures and land forms associated

with the regulated structure;

d) consideration of the interaction of the pit design with the levee or regulated dam design

e) an operational plan that includes:

i. normal operating procedures and rules (including clear documentation and definition of process inputs in the DSA allowance)

ii. contingency and emergency action plans including operating procedures designed to avoid and/or minimise environmental impacts including threats to human life resulting from any overtopping or loss of structural integrity of the regulated structure;

f) a plan for the decommissioning and rehabilitation of the regulated structure at the end of its operational life;

g) details of reports on investigations and studies done in support of the design plan;

h) any other matter required by the suitably qualified and experienced person.

D11 Certification by the suitably qualified and experienced person who supervises the construction must be submitted to the administering authority on the completion of construction of the regulated structure, and state that:

a) the 'as constructed' drawings and specifications meet the original intent of the design plan for that regulated structure;

b) construction of the regulated structure is in accordance with the design plan.

D12 Where a regulated dam is to be managed as part of an integrated containment system and the DSA volume is to be shared across the integrated containment system, the design and operating rules for the system as a whole must be documented in a system design plan that is certified by a suitably qualified and experienced person.

D13 The system design plan must contain:

a) the design plans, and

b) the ‘as constructed’ plans, and

c) the operational rules for each individual regulated dam that forms part of the integrated system, and

d) the standards of serviceability and accessibility of water transfer equipment or structures, and

e) the operational rules for the system as a whole.

Operation of a regulated structure

D14 Operation of a regulated structure is prohibited unless:

a) the holder has submitted to the administering authority:

i. one paper copy and one electronic copy of the design plan and certification of the ‘design plan’ in accordance with condition D7, and

ii. a set of ‘as constructed’ drawings and specifications, and

iii. certification of those ‘as constructed drawings and specifications’ in accordance with condition D8, and

iv. where the regulated structure is to be managed as part of an integrated containment system for the purpose of sharing the DSA volume across the system, a copy of the certified system design plan.

b) the requirements of this authority relating to the construction of the regulated structure have been met; and

c) relevant details for the dam have been included in Table 10: Location of regulated structures and Table 11: Basic details of regulated dams of this authority.

D15 Each regulated structure must be maintained and operated in a manner that is consistent with the current design plan, the current operational plan, and the associated certified ‘as constructed’ drawings for the

duration of its operational life until decommissioned and rehabilitated.

D16 The holder must take reasonable and practicable control measures to prevent the causing of harm to persons, livestock or wildlife through the construction and operation of a regulated structure. Reasonable and practicable control measures may include, but are not limited to:

a) the secure use of fencing, bunding or screening; and

b) escape arrangements for trapped livestock and fauna.

Mandatory reporting level

D17 The mandatory reporting level (the MRL) must be marked on a regulated dam in such a way that during routine inspections of that dam, it is clearly observable.

D18 The holder must, as soon as practical and within 48 hours of becoming aware, notify the administering authority when the level of the contents of a regulated dam reaches the MRL.

D19 The holder must, immediately on becoming aware that the MRL has been reached, act to prevent the occurrence of any unauthorised discharge from the regulated dam.

Annual inspection report

D20 Each regulated structure must be inspected each calendar year by a suitably qualified and experienced person.

D21 At each annual inspection, the condition and adequacy of all components of the regulated structure must be assessed:

a) against the most recent hazard assessment report and design plan (or system design plan);

b) against recommendations contained in previous annual inspections reports;

c) against recognised dam safety deficiency indicators;

d) for changes in circumstances potentially leading to a change in hazard category;

e) for conformance with the conditions of this authority;

f) for conformance with the ‘as constructed’ drawings;

g) for the adequacy of the available storage in each regulated dam, based on an actual observation or observations taken after 31 May each year but prior to 1 November of that year, of accumulated sediment, state of the containment barrier and the level of liquids in the dam (or network of linked containment systems);

h) for evidence of conformance with the current operational plan.

D22 A suitably qualified and experienced person must prepare an annual inspection report containing details of the assessment and including recommended actions to ensure the integrity of the regulated structure.

D23 The suitably qualified and experienced person who prepared the annual inspection report must certify the report in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (EMC635)*.

D24 The holder must:

a) upon receipt of the annual inspection report, consider the report and its recommendations and take action to ensure that the regulated structure will safely perform its intended function; and

b) within twenty (20) business days of receipt of the annual inspection report, notify the administering authority in writing, of the recommendations of the inspection report and the actions being taken to ensure the integrity of each regulated structure.

D25 A copy of the annual inspection report must be provided to the administering authority upon request and within ten (10) business days.

Design storage allowance

D26 On 1 November of each year, storage capacity must be available in each regulated dam (or network of linked containment systems with a shared DSA volume), to meet the Design Storage Allowance (DSA) volume for the dam (or network of linked containment systems).

D27 The holder must, as soon as possible and within 48 hours of becoming aware that the regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, notify the administering authority.

D28 The holder must, immediately on becoming aware that a regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, act to prevent the occurrence of any unauthorised discharge from the regulated dam or linked containment systems.

Performance review

D29 The holder must assess the performance of each regulated dam or linked containment system over the preceding November to May period based on actual observations of the available storage in each regulated dam or linked containment system taken prior to 1 July of each year.

D30 The holder must take action to modify its water management or linked containment system so as to ensure that the regulated dam or linked containment system will perform in accordance with the requirements of this authority, for the subsequent November to May period.

Note: Action may include seeking the necessary approvals for physical modification of a regulated dam.

Transfer arrangements

D31 The holder must provide a copy of any reports, documentation and certifications prepared under this authority, including but not limited to any register of regulated structures, hazard assessment, design plan and other supporting documentation, to a new holder and the administering authority on transfer of this authority.

Decommissioning and rehabilitation

D32 Prior to the cessation of the environmentally relevant activity, each regulated structure must be decommissioned such that:

1. ongoing environmental harm is minimised by the regulated structure by:

   (i) becoming a safe site for humans and animals at the completion of rehabilitation; or

   (ii) becoming a stable landform, that no longer contains flowable substances and minimises erosion impacts; or

   (iii) not allowing acid mine drainage; or

   (iv) being approved or authorised under relevant legislation for a beneficial use; or

   (v) being a void authorised by the administering authority to remain after decommissioning; and

2. the regulated dam is compliant with all other relevant rehabilitation requirements of this authority.

Regulated structures location and performance

D33 Each regulated structure named in Column 1, Table 10: Location of regulated structures must be wholly located within the control points noted in columns 2 and 3 of Table 10: Location of regulated structures, below, for that structure.

Table 10: Location of regulated structures

Column 1	Column 2	Column 3
Name of regulated structure[1]	**Latitude[2] (GDA 94)**	**Longitude[2] (GDA 94)**
Mine Water Dam 1	150.2312	-26.2028
Mine Water Dam 2	150.2104	-26.9829
Mine Water Dam 3	150.2549	-26.2104
Mine Water Dam 4	150.2620	-26.2272
Tailings Storage Dam 1	150.2025	-26.985
Tailings Storage Dam 2	To be confirmed	To be confirmed
Tailings Storage Dam 3	To be confirmed	To be confirmed

[1] The 'name of the regulated structure' should refer to the name for example, process residue facility and decant pond.

[2] A minimum of three control points is required to constrain the location of all activities associated with the regulated structure. Additional infrastructure which forms part of any regulated dam may include appurtenant works consisting of seepage collection systems, runoff diversion bunds, containment systems, pressure relief wells, decant and recycle water systems. Note that details on tailing discharge pipelines would be included in this table only if they have not been included in the design plan required in condition G10.

[3] This location reference is the reference for Schedule D table 4 flood level and crest level

D34 Each regulated dam named in column 1 of Table 10: Location of regulated structures, must be consistent with the details noted in columns 2 through to and including 7 of Table 11: Basic details of regulated dams, below, for that dam.

Table 11: Basic details of regulated dams

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Name of regulated dam[1]	**Hazard category**	**Surface area of dam at spillway (ha)**	**Max. volume of dam at spillway (ML)**	**Max. depth of dam[2] at spillway (m)**	**Spillway level (mAHD)**	**Use of dam[3]**
Mine Water	High	46	1120	7.5		Capture of water from mine

Dam 1						infrastructure areas before release to other mine water dams
Mine Water Dam 2 (Stage 1)	High	58	3150	7.5		Storage of runoff from disturbance areas and groundwater inflows to the open pit
Mine Water Dam 2 (Stage 2)	High	58	5250	12		Storage of runoff from disturbance areas and groundwater inflows to the open pit
Mine Water Dam 3	High	38	2520	7.5		Storage of runoff from disturbance areas and groundwater inflows to the open pit
Mine Water Dam 4	High	84	5750	7.5		Storage of runoff from disturbance areas and groundwater inflows to the open pit
Tailings Storage Dam 1 (Stage 1)	High	127	5010	7.5		Storage of tailings
Tailings Storage Dam 1 (Stage 2)	High	127	9330	12		Storage of tailings
Tailings Storage Dam 2	High	45	4000	11.5		Storage of tailings
Tailings Storage Dam 3	High	157	17360	16		Storage of tailings

1 The name of the regulated dam should refer to the name of the dam, for example, process residue facility and decant dam and should be the same name used in Table 26: Location of Regulated Structures for the dam.

2 For regulated dams which do not require a dam wall, input the maximum void depth, for example, where dams are formed by excavating below natural ground surface or backfilling a residual void.

3 The use or purpose of the regulated dam should outline the designed function, for example, 'the permanent containment of

tailings resulting from the extraction of nickel, cobalt and other metals at the XYZ refinery'.

D35 Each regulated dam named in column 1 of Table 10: Location of regulated structures, must meet the hydraulic performance criteria noted in columns 2 through to and including 4 of Table 12: Hydraulic performance of regulated dams, below, for that dam.

Table 12: Hydraulic performance of regulated dams[1]

Column 1	Column 2	Column 3	Column 4
Name of regulated dam	**Spillway capacity (AEP)**	**Design storage allowance (AEP)**	**Mandatory reporting level (AEP)**
Mine Water Dam 1	10,000 to 100,000 year ARI	100 year ARI, 4 month wet season	To be determined
Mine Water Dam 2	10,000 to 100,000 year ARI	100 year ARI, 4 month wet season	To be determined
Mine Water Dam 3	10,000 to 100,000 year ARI	100 year ARI, 4 month wet season	To be determined
Mine Water Dam 4	10,000 to 100,000 year ARI	100 year ARI, 4 month wet season	To be determined
Tailings Storage Dam 1	10,000 to 100,000 year ARI	100 year ARI, 4 month wet season	To be determined
Tailings Storage Dam 2	10,000 to 100,000 year ARI	100 year ARI, 4 month wet season	To be determined
Tailings Storage Dam 3	10,000 to 100,000 year ARI	100 year ARI, 4 month wet season	To be determined

1 Hydraulic Performance may change during detailed design and this table will be updated accordingly

Regulated Dams - Certification and Operation

D36 From the commencement of this Environmental Authority the holder of this Environmental Authority must not commence construction of a regulated dam unless:

a) the Registered Operator has submitted to the Administering Authority two copies of a design plan, together with the certification of a suitably qualified and experienced person that the design of the regulated dam will deliver the performance stated in the design plan and that it will be compliant in all respects with this EA, and

b) at least 20 business days has passed since the receipt of those documents, or the administering authority notifies the Registered Operator that a design plan and certification, has been received.

D37 When construction or modification of any regulated dam is complete, or when a dam becomes a regulated dam due to changes in the circumstances affecting a hazard assessment for that dam; the registered operator of this EA must submit to the Administering Authority two copies of a set of 'as constructed' drawings, together with the certification of a suitably qualified and experienced person that the dam 'as constructed' will deliver the performance stated in the certification and it is compliant in all respects with this EA.

D38 An operational plan must be kept current for each regulated dam, and cover all matters relevant to its operation and maintenance.

D39 Where an operational plan covers decommissioning and rehabilitation, those operations are to be consistent with the objectives in any design plan for the dam and the rehabilitation requirements of this Environmental Authority.

D40 The Registered Operator of this Environmental Authority must notify the Administering Authority immediately when the level in any regulated dam reaches the mandatory reporting level (MRL), and immediately act to prevent or minimize any actual or potential environmental harm.

Overflow of mine-affected water from regulated structures

D41 The overflow of mine affected water from one or more of the dams listed in Table 10: Location of Regulated Structures to receiving waters is authorised if:

a) the holder has complied with **ALL** conditions listed in Schedule G—Regulated structures of this environmental authority

b) the overflow is a direct result of rainfall events which since 1 November have generated a total rainfall depth in excess of that determined under the design storage allowance (DSA) annual exceedence probability (AEP) event listed in Table 12: Hydraulic performance of regulated dams, for the relevant dam (or network of linked containment systems)

c) the holder has taken all reasonable and practicable measures to prevent an overflow from the relevant dam.

D42 Any release of mine affected water resulting from an overflow from one or more of the dams listed in Table 10: Location of regulated structures and Table 13: Overflow release to the receiving environment, to receiving waters must be monitored at the locations specified in Table 13: Overflow release to the receiving environment and Table 14: Monitoring locations for overflow releases for those quality characteristics and at the frequencies specified in Table 3: Release contaminant trigger investigation levels.

Table 13: Overflow release to the receiving environment

Release point (RP)	Northing (GDA94)	Easting (GDA94)	Contaminant source and location	Monitoring point	Receiving waters description

*To be negotiated between the proponent and the department during the EA development stage

Table 14: Monitoring locations for overflow releases

Monitoring Point	Northing (GDA94)	Easting (GDA94)
Upstream		
Downstream		

*To be negotiated between the proponent and the department during the EA development stage

SCHEDULE E: NOISE

Noise nuisance

E1 Subject to conditions E2 and E3 noise from the mining activity must not cause an environmental nuisance at any sensitive or commercial place.

E2 When requested by the administering authority, noise monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any sensitive or commercial place, and the results must be notified within 14 days to the administering authority following completion of monitoring.

E3 If the environmental authority holder can provide evidence through monitoring that the limits defined in Table 15: Noise limits and Table 17: Airblast overpressure level, are not being exceeded then the holder is not in breach of condition E1. Monitoring must include:

a) $L_{A, max\ adj, T}$

b) relevant background sound level

c) the level and frequency of occurrence of impulsive or tonal noise

d) atmospheric conditions including wind speed and direction

e) location, date and time of recording.

E4 Noise is not considered to be a nuisance under condition E1 if monitoring shows that noise from operations and/or mine site construction does not exceed the following levels in the time periods specified in Table 15.

Table 15: Noise limits

Noise Source	Monday to Sunday (dBA)		
	Day (7am – 6pm)	Evening (6pm - 10pm)	Night (10pm – 7am)
Noise from Operations and Mine Site construction	40 dBA $L_{Aeq, 1\ hour, adj}$	35 dBA $L_{Aeq, 1\ hour, adj}$	30 dBA $L_{Aeq, 1\ hour, adj}$

E5 The method of measurement and reporting of noise levels must comply with the latest edition of the administering authority's Noise Measurement Manual.

E6 If monitoring indicates exceedence of the relevant limits in condition E4, then the environmental authority holder must:

a) address the complaint including the use of appropriate dispute resolution if required; and

b) immediately implement noise abatement measures so that emissions of noise from the activity do not result in further environmental nuisance.

Vibration nuisance

E7 Vibration from the licensed activities must not cause an environmental nuisance, at any sensitive or commercial place.

E8 When requested by the administering authority, vibration monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any sensitive or commercial place, and the results must be notified within 14 days to the administering authority following completion of monitoring.

E9 Vibration monitoring must include the following descriptors, characteristics and conditions:

a) location of the blast(s) within the mining area (including which bench level)

b) atmospheric conditions including temperature, relative humidity and wind speed and direction

c) location, date and time of recording.

E10 If monitoring indicates exceedence of the relevant limits in Table 16: Vibration limits, then the environmental authority holder must:

a) address the complaint including the use of appropriate dispute resolution if required; and

b) immediately implement vibration abatement measures so that vibration from the activity does not result in further environmental nuisance.

Table 16: Vibration limits

Location	Vibration measured
Sensitive or commercial place	5 mm/s peak particle velocity for 9 out of 10 consecutive blasts and not greater than 10 mm/s peak particle velocity at any time

Note: The method of measurement and reporting of vibration levels must comply with the latest edition of the administering authority vibration and air blast overpressure monitoring guideline.

Airblast overpressure nuisance

E11 The airblast overpressure level from blasting operations on the premises must not exceed the limits defined in Table 17: Airblast overpressure level at any nuisance sensitive or commercial place.

Table 17: Airblast overpressure level

Location	Airblast overpressure measured
Sensitive or commercial place	Air blast overpressure level of 115 db (linear peak) for 9 out of 10 consecutive blasts initiated and not greater than 120 db (linear peak) at any time.

E12 When requested by the administering authority, airblast overpressure monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any sensitive or commercial place, and the results must be notified within 14 days to the administering authority following completion of monitoring.

E13 Airblast overpressure monitoring must include the following descriptors, characteristics and conditions:

a) location of the blast(s) within the mining area (including which bench level)

b) atmospheric conditions including temperature, relative humidity and wind speed and direction

c) location, date and time of recording.

E14 If monitoring indicates exceedence of the relevant limits in Table 17: Airblast overpressure level, then the environmental authority holder must:

a) address the complaint including the use of appropriate dispute resolution if required

b) immediately implement airblast overpressure abatement measures so that airblast overpressure from the activity does not result in further environmental nuisance.

E15 The method of measurement and reporting of airblast overpressure levels must comply with the current edition of the administering authority's Noise Measurement Manual.

SCHEDULE F: WASTE

General

Notification of Improper Disposal of Regulated Waste

F1 If the environmental authority holder becomes aware that a person has removed waste from the licensed place and disposed of the waste in a manner which is not authorised by this environmental authority or is improper or unlawful, then the holder of environmental authority must, as soon as practicable, notify the administering authority of all relevant facts, matters and circumstances known concerning the disposal.

F2 For the purpose of conditions F1 to F27, effluent, waste rock, spoil, overburden, rejects and tailings generated on mining lease (ML) 55001 are not defined as 'waste'.

Storage of tyres

F3 Scrap tyres stored awaiting disposal or transport for take-back and recycling, or waste-to energy options must be stored in stable stacks and at least 10 metres from any other scrap tyre storage area, or combustible or flammable material, including vegetation.

F4 All reasonable and practicable fire prevention measures must be implemented, including removal of grass and other materials within a 10 metre radius of the scrap tyre storage area.

F5 Where no feasible recycling or waste-to-energy options area available, disposing of scrap tyres resulting from the mining activities in spoil emplacements is acceptable, provided tyres are placed as deep in the spoil as reasonably practicable.

F6 Scrap tyres resulting from the mining activities disposed within the operational land must not impede saturated aquifers or compromise the stability of the consolidated landform.

Waste management

F7 A waste management plan must be implemented and must:

a) describe how the environmental authority holder recognises and applies the waste and resource management hierarchy in accordance with the *Waste Reduction and Recycling Act 2011*

b) identify characterisations of wastes generated from the project and general volume trends over the past five years

c) include a program for safe recycling or disposal of all wastes—reusing and recycling where possible

d) include waste commitments with auditable targets to reduce, reuse and recycle

e) the waste management control strategies must consider:

- o the type of wastes
- o segregation of the wastes
- o storage of the wastes
- o transport of the wastes
- o monitoring and reporting matters concerning the waste
- o emergency response planning
- o disposal, reused and recycling options

f) identify the potential adverse and beneficial impacts of the wastes generated

g) detail the hazardous characteristics of the waste generated (if any)

i) outline the process to be implemented to allow for continuous improvement of the waste management systems

j) identify responsible staff (positions) for implementing, managing and reporting the waste management plan

k) cover a staff awareness and induction program that encourages re-use and recycling.

F8 Waste is not permitted to be disposed of within mining lease 55001.

F9 General waste may be temporarily stored on mining lease 55001 before being directed to a facility that can lawfully accept such waste.

F10 Regulated waste generated in the mining activity can be temporarily stored on site awaiting removal provided it is stored in a place and circumstance in which there is a minimal risk of it causing contamination to land or waters, or a fire hazard.

F11 Subject to conditions F1 to F6, the following regulated waste may be temporarily stored on mining lease 55001 before being directed to a facility that can lawfully accept such waste:

a) tyres

b) batteries

c) hydrocarbons

d) oils

e) oil interceptor sludges

f) oil water emulsions and mixtures

g) chemicals listed under the *Environmental Protection Act 1994* and subordinate legislation.

F12 A designated area or storage containers must be set aside for the laydown and segregation of wastes.

F13 An effective fire break must be provided and maintained around all waste laydown areas.

F14 All reasonable and practicable fire prevention measures must be implemented, including removal of grass and other materials within a 10 metre radius of all waste laydown areas.

F15 Unless otherwise permitted by the conditions of this environmental authority or with prior approval from the administering authority and in accordance with a relevant standard operating procedure, waste must not be burnt.

F16 Waste batteries must be stored:

a) in a bunded and roofed area, or

b) palletised and plastic wrapped.

F17 A record of all wastes must be kept detailing:

a) date of pickup of waste

b) description of waste

c) quantity of waste

d) origin of the waste

e) destination of the waste.

Note: Trackable wastes as listed in Schedule 1 of the Environmental Protection (Waste Management) Regulation 2000 are not covered by this condition. Trackable wastes have similar recording requirements to this condition in accordance with a waste tracking system established under the above regulation.

F18 All regulated waste removed from the site must be removed by a person who holds a current approval to transport such waste under the provisions of the *Environmental Protection Act 1994*.

F19 Each container of regulated waste must be marked to identify the waste contained therein.

Sewage Effluent

F20 Treated effluent may only be released to land in accordance with the conditions of this approval at the following locations:

a) within the nominated area(s) identified in Schedule H - Figure 3: sewage treatment plant and effluent disposal

b) other land for the purpose of dust suppression and/or fire fighting.

F21 The application of treated effluent to land must be carried out in a manner such that:

a) vegetation is not damaged;

b) there is no surface ponding of effluent;

d) there is no run-off of effluent

F22 All sewage effluent released to land must be monitored at the frequency and for the parameters specified in Table 18: Treated Sewage Effluent Release Limits to Land.

Table 18: Treated Sewage Effluent Release Limits to Land

Quality Characteristics/Contaminant	Sampling and In-situ Measurement Point Location	Unit	Limit Type	Release Limit	Monitoring Frequency
5-day biochemical oxygen demand	At the outlet of the sewage treatment plant	mg/L	Maximum	20	Monthly
Thermotolerant coliforms		Cfu/100mL	Maximum	<100	Monthly

Free Chlorine Residual		mg/L	Maximum	1	Monthly
pH			Maximum	6.0 to 9.0	Monthly
Total Nitrogen (TN)		mg/L	Maximum	Note 1	Monthly
Total Phosphorous (TP)		mg/L	Maximum	Note 1	Monthly

1: Total nitrogen and total phosphorous will be determined on a case by case basis depending on the area intended for irrigation of treated effluent and any requirements to improve nutrients in soils used in rehabilitation.

F23 The daily volume of effluent release to land must be measured and records kept of the volumes of effluent released.

F24 When circumstances prevent the irrigation or beneficial reuse of treated sewage effluent such as during or following rain events, waters must be directed to a wet weather storage or alternative measures must be taken to store/lawfully dispose of effluent.

F25 A minimum area of <<insert area>> of land, excluding any necessary buffer zones, must be utilised for the irrigation and/or beneficial reuse of treated sewage effluent.

F26 Notwithstanding the quality characteristic limits specified in Table 18: Treated Sewage Effluent Release Limits to Land, releases of effluent must not have any properties nor contain any organisms or other contaminants in concentrations that are capable of causing environmental harm.

F27 Treated sewage effluent must only be supplied to another person or organisation that has a written plan detailing how the user of the treated sewage effluent will comply with their general environmental duty under section 319 of the *Environmental Protection Act 1994* whilst using the treated sewage effluent.

F28 Sewage effluent used for irrigation must not cause spray drift or over spray to any sensitive receptor.

F29 If areas irrigated with effluent are accessible to employees or the general public, prominent signage must be provided advising that effluent is present and care should be taken to avoid consuming or otherwise coming into unprotected contact with the effluent.

Tailings disposal

F30 Tailings must be managed in accordance with procedures contained within the current plan of operations. These procedures must include provisions for:

a) containment of tailings
b) the management of seepage and leachates both during operation and the foreseeable future
c) the control of fugitive emissions to air
d) a program of progressive sampling and characterisation to identify acid producing potential and metal concentrations of tailings
e) maintaining records of the relative locations of any other waste stored within the tailings
f) rehabilitation strategy
g) monitoring of rehabilitation, research and/or trails to verify the requirements and methods for decommissioning and final rehabilitation of tailings, including the prevention and management of acid mine drainage, erosion minimisation and establishment of vegetation cover.

SCHEDULE G: LAND

Topsoil

G1 Topsoil and subsoils must be strategically stripped ahead of mining in accordance with a Soils Management

Plan.

G2 The Soils Management Plan must be prepared prior to the commencement of operations.

G3 A soils inventory which identifies the soil requirements for The Range Project and availability of suitable soils on site for rehabilitation must be identified in the Soils Management Plan.

Preventing contaminant release to land

G4 Contaminants must not be released to land in a manner which constitutes nuisance, material or serious environmental harm.

G5 The environmental authority holder must take all practicable actions necessary to secure loads prior to transporting materials off site to minimise emissions or spillage of any material from vehicles or other transport infrastructure.

Chemicals and flammable or combustible liquids

G6 All flammable and combustible liquids must be contained within an on-site containment system and controlled in a manner that prevents environmental harm and maintained in accordance with the current edition of *AS 1940—Storage and Handling of Flammable and Combustible Liquids*.

G7 Spillage of all flammable and combustible liquids must be controlled in a manner that prevents environmental harm.

G8 All chemicals must be contained within an on-site containment system and controlled in a manner that prevents environmental harm and maintained in accordance with the current version of the relevant Australian standard.

G9 Spillage of all chemicals must be controlled in a manner that prevents environmental harm.

G10 All explosives, corrosive substances, toxic substances, gases and dangerous goods must be stored and handled in accordance with the relevant Australian Standard.

G11 All chemicals and flammable or combustible liquids stored on site that have the potential to cause environmental harm must be stored in or serviced by an effective containment system that is impervious to the materials stored and managed to prevent the release of liquids to waters or land. Where no relevant Australian Standard is available, the following must be applied:

a) storage tanks must be bunded so that the capacity and construction of the bund is sufficient to contain at least 110 per cent of a single storage tank or 100 per cent of the largest storage tank plus 10 per cent of the second largest storage tank in multiple storage areas

b) drum storages must be bunded so that the capacity and construction of the bund is sufficient to contain at least 25 per cent of the maximum design storage volume within the bund.

Spill kit

G12 An appropriate spill kit, personal protective equipment and relevant operator instructions/emergency procedure guides for the management of wastes, chemicals and flammable and combustible liquids associated with the activity must be kept at the site.

G13 Anyone operating with wastes, chemicals or flammable and combustible liquids under this approval must be trained in the use of the spill kit.

Infrastructure

G14 All buildings, structures, mining equipment and plant erected and/or used for the mining activities must be removed from the site prior to surrender, except where agreed in writing by the administering authority and the landowner.

Rehabilitation landform criteria

G15 Land disturbed by mining must be rehabilitated in accordance with Table 19: Rehabilitation requirements.

Table 19: Rehabilitation requirements

Mine domain	Mine feature name	Rehabilitation goal	Rehabilitation objectives	Indicators	Completion criteria[1]

*Table to be populated as part of the EM Plan assessment and EA generation processes

Rehabilitation landform criteria

G16 All areas significantly disturbed by mining activities must be rehabilitated to a stable landform with a self-sustaining vegetation cover in accordance with Table 20: Final land use and rehabilitation approval schedule and Table 21: Landform design criteria.

Table 20: Final land use and rehabilitation approval schedule

Details	Disturbance type					
	Subsided areas	Ponded areas (>1.25 metre)	Worked water dam/s	Infrastructure	ROM, topsoil material stockpiles	Road(s) and tracks
Projective surface area (ha)*						
Map reference						
Pre-mine land						

use						
Post-mine land use						
Post-mine land capability classification						
Projective cover range (%)						

*Table to be populated as part of the EM Plan assessment and EA generation processes

Table 21: Landform design criteria

Disturbance type	Maximum slope range %	Projective surface area (ha)
Subsided landform *		

*Table to be populated as part of the EM Plan assessment and EA generation processes

G17 Rehabilitation must commence progressively as areas become available and in accordance with the plan of operations.

G18 Self-sustaining vegetation, as per Table 19: Rehabilitation requirements, must be consistent with the reference sites identified in Table 22: Reference sites.

Table 22: Reference sites

Reference site	Domain reference	Northing (GDA94)	Easting (GDA94)	Description

*Table to be populated as part of the EM Plan assessment and EA generation processes

Post-mine land use plan

G19 The holder must develop and submit to the administering authority a post-mine land use plan (PMLUP) with the initial plan of operations and update and resubmit the plan with each subsequent plan of operations. The PMLUP must describe how the rehabilitation objectives in Table 19: Rehabilitation Requirements will be achieved:

a) schematic representation of final land form inclusive of drainage features

b) drainage design

c) erosion controls proposed on reformed land

d) geotechnical, geochemical and hydrological studies

e) chemical, physical and biological properties of soil and water

f) proposed revegetation methods inclusive of plant species selection, re-profiling, respreading soil, soil ameliorants/amendments, surface preparation and method of propagation

g) a rehabilitation monitoring program.

Rehabilitation monitoring program

G20 Once rehabilitation has commenced, the holder of the environmental authority must conduct a rehabilitation monitoring program on a yearly basis, which must include sufficient spatial and temporal replication to enable statistically valid conclusions as established under the rehabilitation program.

G21 The rehabilitation monitoring program must be developed and implemented by a person possessing appropriate qualifications and experience in the field of rehabilitation management, nominated by the environmental authority holder.

G22 Verification of rehabilitation success is to be carried out as follows:

a) The minimum sampling intensity must be specified for the monitoring of progressive rehabilitation.

b) Justification of the suitability of the minimum sampling intensity must be provided.

c) Monitoring must include sufficient replication to enable statistical analysis of results at an acceptable power.

d) Monitoring must be undertaken at 12-monthly intervals.

G23 The rehabilitation monitoring program must be included in the plan of operations and updated with each subsequent plan of operations, describing:

a) how the rehabilitation objectives as per the rehabilitation management plan will be achieved

b) verification of rehabilitation success as per condition G16 and Table 20.

Post closure management plan

G24 A post-closure management plan for the site must be developed and submitted to the administering authority at least 18 months prior to the final coal processing on site and implemented for a nominal period of:

a) at least 30 years following final coal processing on site, or

b) a shorter period if the site is proven to be geotechnically and geochemically stable and it can be demonstrated to the satisfaction of the administering authority that no release of contaminants from the site will result in environmental harm.

G25 The post-closure management plan must include the following elements:

a) operation and maintenance of:

i. wastewater collection and reticulation systems

ii. wastewater treatment systems

iii. the groundwater monitoring network

iv. final cover systems of spoil dumps

v. vegetative cover

b) monitoring of:

i. surface water quality

ii. groundwater quality

iii. seepage rates

iv. erosion rates

v. the integrity and stability all slopes, ramps and voids

vi. the health and resilience of native vegetation cover.

G26 Cleared vegetation from the site must be managed in accordance with the following hierarchy:

a) reuse, e.g. use of logs and tree stumps as shelter for fauna in rehabilitated areas

b) recycle, e.g. mulching of vegetation and use in rehabilitation on the site

c) other alternative management options implemented in a way that causes the least amount of environmental harm.

G27 A weed and pest management plan must be developed and implemented during the continuation of this environmental authority, and prior to the commencement of construction activities. The weed and pest management plan must describe how the weeds and pests are to be managed in accordance with the *Land Protection (Pest and Stock Route Management) Act 2002* and/or local government requirements for weeds not declared under state legislation.

Offsets

G28 The holder of this environmental authority must, within 12 months of the granting of this environmental authority, provide to the administering authority an Offset Strategy.

G29 The holder of this environmental authority must enter into a Deed of Agreement with the State of Queensland (chief executive administering the *Environmental Protection Act 1994*) that provides that within 24 months of the granting of this environmental authority, or longer period agreed to by the chief executive administering the *Environmental Protection Act 1994*, legally securing an offset area consistent with Offset Strategy.

Exploration

G30 Disturbance due to exploration activities in areas not authorised to be mined must be rehabilitated in accordance with provisions detailed in the Code of Environmental Compliance for Exploration and Mineral Development Projects.

SCHEDULE H: FIGURES

Figure 1a: Project Infrastructure Layout—Mine Area (to be provided)

Figure 1b: Project Infrastructure Layout—Support Infrastructure (to be provided)

Figure 2: Release points for mine affected water (to be determined)

Figure 3: Sewage treatment plant and effluent disposal (to be provided)

DEFINITIONS

Words and phrases used throughout this licence are defined below except where identified in the *Environmental Protection Act 1994* or subordinate legislation. Where a word or term is not defined, the ordinary English meaning applies, and regard should be given to the Macquarie Dictionary.

Acceptance criteria means the measures by which the actions implemented to rehabilitate the land are deemed to be complete. The acceptance criteria indicate the success of the rehabilitation outcome or remediation of areas which have been significantly disturbed by the mining activities.

Acceptance criteria may include information regarding:

a) vegetation establishment, survival and succession

b) vegetation productivity, sustained growth and structure development

c) fauna colonisation and habitat development

d) ecosystem processes such as soil development and nutrient cycling, and the recolonisation of specific fauna groups such as collembola, mites and termites which are involved in these processes

e) microbiological studies including recolonisation by mycorrhizal fungi, microbial biomass and respiration

f) effects of various establishment treatments such as deep ripping, topsoil handling, seeding and fertiliser application on vegetation growth and development

g) resilience of vegetation to disease, insect attack, drought and fire

h) vegetation water use and effects on ground water levels and catchment yields.

Acid rock drainage means any contaminated discharge emanating from a mining activity formed through a series of chemical and biological reactions, when geological strata is disturbed and exposed to oxygen and moisture as a result of mining activities.

Administering authority means the Department of Environment and Heritage Protection or its successor.

Aggregation dam means a regulated dam that receives and contains coal seam gas water or coal seam gas concentrate. The primary purpose of the dam must not be to evaporate the water even though this will naturally occur.

Airblast overpressure means energy transmitted from the blast site within the atmosphere in the form of pressure waves. The maximum excess pressure in this wave, above ambient pressure, is the peak airblast overpressure measured in decibels linear (dBL).

Ambient (or total) noise at a place, means the level of noise at the place from all sources (near and far), measured as the Leq for an appropriate time interval.

Annual exceedence probability or AEP is the probability that at least one event in excess of a particular magnitude will occur in any given year.

ANZECC means the Australian and New Zealand Guidelines for Fresh Marine Water Quality 2000

Appropriately qualified person means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis on performance relative to the subject matter using the relevant protocols, standards, methods or literature.

Assessed and assessment by a suitably qualified and experienced person in relation to a hazard assessment of a dam, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit of the assessment:

(a) exactly what has been assessed and the precise nature of that determination;
(b) the relevant legislative, regulatory and technical criteria on which the assessment has been based;
(c) the relevant data and facts on which the assessment has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and
(d) the reasoning on which the assessment has been based using the relevant data and facts, and the relevant criteria.

Associated works in relation to a dam, means:

(a) operations of any kind and all things constructed, erected or installed for that dam; and

(b) any land for those operations.

Authority means environmental authority (mining activities) under the *Environmental Protection Act 1994*.

Bed and banks for a waters, river, creek, stream, lake, lagoon, pond, swamp, wetland or dam means land over which the water of the waters, lake, lagoon, pond, swamp, wetland or dam normally flows or that is normally covered by the water, whether permanently or intermittently; but does not include land adjoining or adjacent to the bed and banks that is from time to time covered by floodwater.

Blasting means the use of explosive materials to fracture:

a) rock, coal and other minerals for later recovery, or

b) structural components or other items to facilitate removal from a site or for reuse.

Bunded means within bunding consistent with Australian Standard 1940.

Certification means assessment and approval must be undertaken by a suitably qualified and experienced person in relation to any assessment or documentation required by theis manual, including design plans, 'as constructed' drawings and specifications, construction, operation or annual report regarding regulated structures, undertaken in accordance with the Board of Professional Engineers of Queensland Policy certification by RPEQs (ID: 1.4(2A)).

Certifying, certify or certified have a corresponding meaning as 'certification'.

Commercial place means a work place used as an office or for business or commercial purposes, which is not part of the mining activity and does not include employees accommodation or public roads.

Competent person means a person with the demonstrated skill and knowledge required to carry out the task to a standard necessary for the reliance upon collected data or protection of the environment.

Construction or constructed in relation to a dam includes building a new dam and modifying or lifting an existing dam, but does not include investigations and testing necessary for the purpose of preparing a design plan.

Dam means a land-based structure or a void that contains, diverts or controls flowable substances, and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void and **associated works**. A dam does not mean a fabricated or manufactured tank or container, designed and constructed to an Australian Standard that deals with strength and structural integrity of that tank or container.

Design storage allowance or DSA means an available volume, estimated in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams* (EM635) published by the administering authority, must be provided in a dam as at 1 November each year in order to prevent a discharge from that dam to an annual exceedence probability (AEP) specified in that manual.

Design plan is the documentation required to describe the physical dimensions of the dam, the materials and standards to be used for construction of the dam, and the criteria to be used for operating the dam and includes a plan that manages an integrated containment system. The documents must include all investigation and design reports, drawings and specifications sufficient to hand to a contractor for construction, and planned decommissioning and rehabilitation outcomes; so as to address all hazard scenarios that would be identified by a properly conducted hazard assessment for the structure. Documentation must be such that a 'suitable qualified and experience person' could conduct an independent review without seeking further information from the designer.

Dwelling means any of the following structures or vehicles that is principally used as a residence:

a) a house, unit, motel, nursing home or other building or part of a building

b) a caravan, mobile home or other vehicle or structure on land

c) a water craft in a marina.

Effluent means treated waste water discharged from sewage treatment plants.

End-of-pipe means the location at which water is released to waters or land.

Environmental authority holder means the holder of this environmental authority.

Financial assurance means a security required under the *Environmental Protection Act 1994* by the administering authority to cover the cost of rehabilitation or remediation of disturbed land or to secure compliance with the environmental authority.

Floodwater means water overflowing, or that has overflowed, from waters, river, creek, stream, lake, pond, wetland or dam onto or over riparian land that is not submerged when the watercourse or lake flows between or is contained within its bed and banks.

Flowable substance means matter or a mixture of materials which can flow under any conditions potentially

affecting that substance. Constituents of a flowable substance can include water, other liquids fluids or solids, or a mixture that includes water and any other liquids, fluids or solids either in solution or suspension.

Foreseeable future is the period used for assessing the total probability of an event occurring. Permanent structures and ecological sustainability should be expected to still exist at the end of a 150-year period

Infrastructure means water storage dams, roads and tracks, buildings and other structures built for the purpose of mining activities but does not include other facilities required for the long-term management of mining impacts or the protection of potential resources. Such other facilities include dams, waste rock dumps, voids, or ore stockpiles and buildings as well as other structures whose ownership can be transferred and which have a residual beneficial use for the next owner of the operational land or the background land owner.

LA 10, adj, 10 mins means the A-weighted sound pressure level, (adjusted for tonal character and impulsiveness of the sound) exceeded for 10 per cent of any 10-minute measurement period, using Fast response.

LA 1, adj, 10 mins means the A-weighted sound pressure level, (adjusted for tonal character and impulsiveness of the sound) exceeded for one per cent of any 10-minute measurement period, using Fast response

LA, max adj, T means the average maximum A-weighted sound pressure level, adjusted for noise character and measured over any 10 minute period, using Fast response.

Land capability as defined in the DME 1995 Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland.

Land suitability as defined in the DME 1995 Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland.

Land use term to describe the selected post-mining use of the land, which is planned to occur after the cessation of mining operations.

Landfill means land used as a waste disposal site for lawfully putting solid waste on the land.

mg/L means milligrams per litre.

Mine-affected water means the following types of water:

i) pit water, tailings dam water, processing plant water

ii) water contaminated by a mining activity which would have been an environmentally relevant activity under Schedule 2 of the Environmental Protection Regulation 2008 if it had not formed part of the mining activity

iii) rainfall runoff which has been in contact with any areas disturbed by mining activities which have not yet been rehabilitated, excluding rainfall runoff discharging through release points associated with erosion and sediment control structures that have been installed in accordance with the standards and requirements of an erosion and sediment control plan to manage runoff containing sediment only, provided that this water has not been mixed with pit water, tailings dam water, processing plant water or workshop water

iv) groundwater which has been in contact with any areas disturbed by mining activities which have not yet been rehabilitated

v) groundwater from the mine's dewatering activities

vi) a mix of mine-affected water (under any of paragraphs i)-v)) and other water

Natural flow means the flow of water through waters caused by nature.

Nature includes:

a) ecosystems and their constituent parts

b) all natural and physical resources

c) natural dynamic processes.

Noxious means harmful or injurious to health or physical well being.

Offensive means causing reasonable offence or displeasure; is disagreeable to the sense; disgusting, nauseous or repulsive, other than trivial harm.

Operational land means the land associated with the project for which this environmental authority has been issued.

Palletised means stored on a movable platform on which batteries are placed for storage or transportation.

Peak particle velocity (ppv) means a measure of ground vibration magnitude which is the maximum rate of change of ground displacement with time, usually measured in millimetres/second (mms-1).

Probable maximum flood (PMF) is the flood that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in a particular drainage area.

Progressive rehabilitation means rehabilitation (defined below) undertaken progressively or a staged approach to rehabilitation as mining operations are ongoing.

Receiving environment means all groundwater, surface water, land and sediments that are not disturbed areas authorised by this environmental authority.

Receiving waters means all groundwater and surface water that are not disturbed areas authorised by this environmental authority.

Reference site (or analogue site) may reflect the original location, adjacent area or another area where rehabilitation success has been completed for a similar biodiversity. Details of the reference site may be as photographs, computer generated images and vegetation models etc.

Rehabilitation the process of reshaping and revegetating land to restore it to a stable landform and in accordance with the acceptance criteria set out in this environmental authority and, where relevant, includes remediation of contaminated land.

Representative means a sample set which covers the variance in monitoring or other data either due to natural changes or operational phases of the mining activities.

Saline drainage the movement of waters, contaminated with salt(s), as a result of the mining activity.

Self sustaining means an area of land which has been rehabilitated and has maintained the required acceptance criteria without human intervention for a period nominated by the administering authority.

Sensitive place means:

a) a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises

b) a motel, hotel or hostel

c) an educational institution

d) a medical centre or hospital

e) a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 2004* or a World Heritage Area

f) a public park or gardens.

Sewage means the used water of person's to be treated at a sewage treatment plant.

Stable in relation to land, means land form dimensions are or will be stable within tolerable limits now and in the foreseeable future. Stability includes consideration of geotechnical stability, settlement and consolidation allowances, bearing capacity (trafficability), erosion resistance and geochemical stability with respect to seepage, leachate and related contaminant generation.

Stormwater means all surface water runoff from rainfall.

Suitably qualified and experienced person in relation to dams means a person who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Engineers Act 2002*, or at the relevant time holds a 'deemed registration' within the meaning of the *Mutual Recognition (Queensland) Act 1992*; and has knowledge, suitable experience and demonstrated expertise in relevant fields, as set out below:

(a) knowledge of engineering principles related to the structures, geomechanics, hydrology, hydraulics, chemistry and environmental impact of dams

(b) a total of five years of suitable experience and demonstrated expertise in the geomechanics of dams with particular emphasis on stability, geology and geochemistry

(c) a total of five years of suitable experience and demonstrated expertise each, in three of the following categories:

- investigation and design of dams
- construction, operation and maintenance of dams
- hydrology with particular reference to flooding, estimation of extreme storms, water management or meteorology
- hydraulics with particular reference to sediment transport and deposition, erosion control, beach processes
- hydrogeology with particular reference to seepage, groundwater
- solute transport processes and monitoring thereof
- dam safety.

Water quality means the chemical, physical and biological condition of water.

Waters includes:

a) river, creek, stream in which water flows permanently or intermittently either:

i. in a natural channel, whether artificially improved or not, or

ii. in an artificial channel that has changed the course of the river, creek or stream, or

b) lake, lagoon, pond, swamp, wetland, dam, or

c) unconfined surface water, or

d) storm water channel, storm water drain, roadside gutter, or

e) bed and banks and any other element of a river, creek, stream, lake, lagoon, pond, swamp, wetland, storm water channel, storm water drain, roadside gutter or dam confining or containing water, or

f) groundwater, or

g) non-tidal or tidal waters (including the sea), or

h) any part-thereof.

u**g/L** means micrograms per litre

u**S/cm** means microsiemens per centimetre

20th percentile flow" means the 20th percentile of all daily flow measurements (or estimations) of daily flow over a 10-year period for a particular site. The 20th percentile calculation should only include days where flow has been measured (or estimated), i.e. not dry weather days.