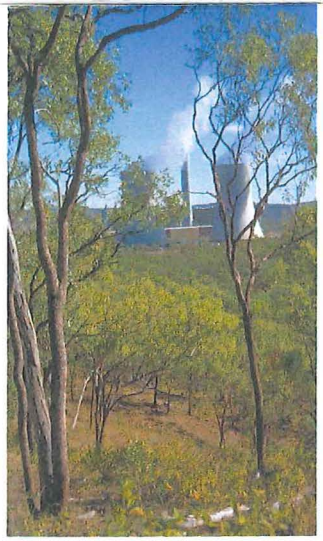

Queensland Coke and Power Plant Project

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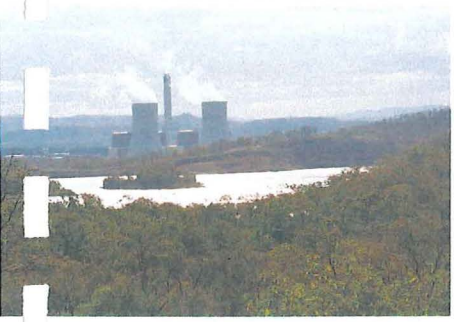



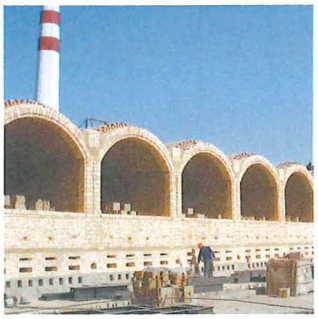

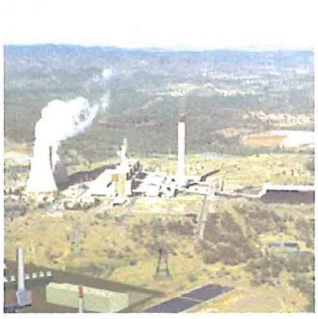
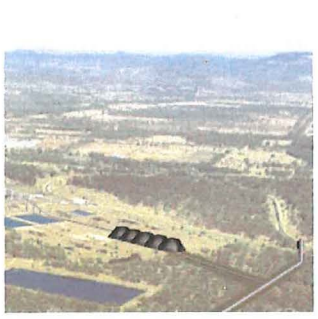





Supplement Report

June 2006

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QUEENSLAND COKE & ENERGY

STANWELL CORPORATION LIMITED

FINAL REPORT

Queensland Coke and Power Plant Project

Environmental Impact Statement Supplement

Prepared for

Queensland Coke and Energy and

Stanwell Corporation Limited

29 June 2006

42625626\EIS SUPPLEMENT

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Contents

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Background to Supplement

An Environmental Impact Statement (EIS) was prepared for the Queensland Coke and Power Plant Project (the Project) and made available for public comment and review from 16 January 2006 to 27 February 2006. As a result of public review, 26 written submissions were received. The submissions have been responded to in this EIS Supplement, however, the EIS Supplement should be read in conjunction with the EIS and is not intended to be a stand-alone document. Copies of the submissions received are provided in Appendix A.

Submissions requiring response in this EIS Supplement were received from the following respondents:

- Environmental Protection Agency (EPA);
- Department of Main Roads (DMR);
- Queensland Health (QH);
- Department of Aboriginal and Torres Strait Islander Policy (DATSIP);
- Queensland Transport (QT);
- Queensland Rail (QR);
- Department of Employment and Training (DET);
- Department of Natural Resources, Mines and Water (DNRMW);
- Department of Local Government, Planning, Sport and Recreation (DLGPSR);
- Department of Communities (DC);
- Department of Housing (DH);
- Department of Primary Industries and Fisheries (DPIF)
- Fitzroy Shire Council (FSC);
- Calliope Shire Council (CSC);
- Rockhampton City Council (RCC);
- Fitzroy Basin Association (FBA);
- Urbis JHD (Urbis);
- Ms. Diane Goldsworthy;
- Ms. Claire Tracy;
- Mr. Garth Walsh; and
- Mr. Ian Churchill.

In addition, submissions that did not require response were received from the Department of Emergency Services (DES), Queensland Treasury (QTreas), the Department of Energy (DE), Queensland Police Service (QPS) and Education Queensland (Qld Ed).

Thirty-seven different topics were raised as presented in Table 1, with some of the submissions mentioning the same or similar issues. Table 1 identifies which of these topics were commented on by each of the respondents.

This EIS Supplement contains responses to all of the submissions received (with the exception of the DES, QTreas, DE, QPS and Qld Ed submissions). It has been divided into sections corresponding to the relevant sections of the EIS to facilitate reference back to the EIS and to enable the responses to be read in context. In addition, the section in which each response is provided is indicated on the individual submissions attached as Appendix A to this Supplement.

The number in parenthesis after the heading of each section indicates which respondent made a submission on that topic. The numbers relate to the respondent numbers given in Table 1. It should be noted that respondents Messrs. Walsh and Churchill and Ms Tracy are numbered together as 19. because the submissions from these respondents were identical.

Table 1 Respondent/Issue Matrix

Respondent	1.2.1 Key Project Elements	1.3.5 Policies and Regulatory Frameworks	1.6.2 Environmental Protection Act 1994	1.6.3 Integrated Planning Act 1997	1.6.6 Policies	2.3.1 Coke Plant	2.3.2 Power Plant	2.4.1 Transport – Road, Rail and Shipping	2.4.3 Water Supply and Management	3.2.1 [*Geology and Soils*] Description of Environmental Values	3.2.2 [*Geology and Soils*] Potential Impacts and Mitigation Measures	3.4.2 [*Land Use and Tenure*] Potential Impacts and Mitigation Measures	5.1.2 [*Surface Water*] Potential Impacts and Mitigation Measures	6.1.2 [*Terrestrial Flora*] Potential Impacts and Mitigation Measures	6.3.2 [*Aquatic Ecology*] Potential Impacts and Mitigation Measures	7.2 [*Air*] Potential Impacts and Mitigation Measures	8.2 [*Greenhouse Gas Emissions*] Potential Impacts and Mitigation Measures
1. Environmental Protection Agency			■	■									■		■	■	■
2. Dept. of Main Roads						■	■	■									
3. Queensland Health	■								■				■			■	
4. Dept. of Aboriginal and Torres Strait Islander Policy																	
5. Queensland Transport						■											
6. Queensland Rail								■					■				
7. Dept. of Employment and Training		■															
8. Dept. of Natural Resources, Mines and Water				■	■					■	■	■	■	■			
9. Dept. of Local Government, Planning, Sport and Recreation		■		■													
10. Dept. of Communities																	
11. Dept. of Housing																	
12. Dept. of Primary Industries and Fisheries													■				
13. Fitzroy Shire Council																	
14. Calliope Shire Council						■											
15. Rockhampton City Council													■				
16. Fitzroy Basin Association													■				■
17. Urbis JHD																	
18. D. Goldsworthy												■	■				
19. C. Tracy, G. Walsh and I. Churchill																	

Respondent	9.2 [*Noise and Vibration*] Potential Impacts and Mitigation Measures	10.5.2 Solid Wastes	12.2.2 Demographic Profile	12.3.2 Government Agencies and other Service Providers	12.3.3 Employment	12.3.4 Housing and Accommodation	12.3.6 Direct Community Impacts and Mitigation Strategies	13.2. [*Economic Environment*] Potential Impacts and Mitigation Measures	14.3.1 [*Roads*] Existing Infrastructure	14.3.2 [*Roads*] Potential Impacts and Mitigation Measures	14.4.2 [*Rail*] Potential Impacts and Mitigation Measures	14.5 Port Facility	15.1 Hazard Analysis	15.2.4 Emergency Response	16.3 Road Use Management Plan	16.4 Air Quality Management Plan	16.5 Noise Management Plan	Appendix B Community Consultation	Appendix L Road Impact Assessment Study	Appendix J Noise and Vibration
1. Environmental Protection Agency																				
2. Dept. of Main Roads																				
3. Queensland Health																				
4. Dept. of Aboriginal and Torres Strait Islander Policy																				
5. Queensland Transport																				
6. Queensland Rail																				
7. Dept. of Employment and Training																				
8. Dept. of Natural Resources, Mines and Water																				
9. Dept. of Local Government, Planning, Sport and Recreation																				
10. Dept. of Communities																				
11. Dept. of Housing																				
12. Dept. of Primary Industries and Fisheries																				
13. Fitzroy Shire Council																				
14. Calliope Shire Council																				
15. Rockhampton City Council																				
16. Fitzroy Basin Association																				
17. Urbis JHD																				
18. D. Goldsworthy																				
19. C. Tracy, G. Walsh and I. Churchill																				

1.2.1 Key Project Elements (3)

QH requested information for any impacts from an 800,000 tpa plant that are greater than those that will occur for the 3,200,000 tpa plant.

There are no potential impacts from an 800,000 tpa plant that would be greater than those presented in the EIS as occurring for a 3,200,000 tpa plant.

1.3.5 Policies and Regulatory Frameworks (7, 9)

DET recommends that both State Government Building and Construction Contracts Structured Training Policy and the Indigenous Employment Policy for Queensland Government Building and Civil Construction Projects be cited. The reference to the "Central Queensland Training and Employment Strategy: A Smart State Initiative" should be removed, as this strategy has now concluded.

The Project supports the implementation of key State and Local Government policies and strategies. The Project will also support community based development initiatives in the Rockhampton and Gladstone communities where relevant. The relevant policies and strategies are listed below:

- Key Priorities of the Queensland Government including "managing urban growth and building Queensland's regions" (specifically regional jobs creation and building on the strengths of Queensland's diverse regions) and "growing a diverse economy and creating jobs" (Department of the Premier and Cabinet, 2005);
- Queensland Energy Policy: A Cleaner Energy Strategy (Department of Energy, 2000);
- Smart State Strategy (Department of the Premier and Cabinet, 2005a);
- Export Solutions - Queensland Government's Trade Strategy (Department of State Development, Trade and Innovation, 2005);
- The Local Industry Policy - A Fair Go for Local Industry (Department of State Development, 1999);
- State Government Building and Construction Contracts Structured Training Policy (Department of Employment and Training, 2002)
- Indigenous Employment Policy for Queensland Government Building and Civil Construction Projects (Department of Employment and Training, 2004)
- The Draft Indigenous Economic Development and Participation Strategy (IEDPS) (Department of State Development, Trade and Innovation, 2005a); and
- Community based economic development initiatives of Rockhampton Regional Development Ltd and the Gladstone Area Promotion and Development Ltd.

DLGPSR states that a comparison of how various facets of the project align with the Central Queensland Regional Growth Management Framework developed through the CQ A New Millennium regional planning project should be made.

The Project aims to meet the relevant outcomes contained in the Central Queensland Regional Growth Management Framework (CQRGMF) (Department of Local Government and Planning, 2002) as presented in the following table. For each of the dot points in the Table 1.1 below that specify project alignment with strategies and actions in the CQRGMF, more detail is provided in the relevant sections of the EIS.

Table 1.1 Project Alignment with the Central Queensland Regional Growth Management Framework

Policy Framework Element and Guiding Principle	Project Alignment with Strategies and Actions
Resource Use, Conservation and Management The allocation, use and management of the natural resources of Central Queensland shall be in accordance with the principles of ecologically sustainable development and shall be undertaken through the processes of integrated catchment management.	• Minimises energy use through the processing of coal into coke in the region, rather than overseas and saves energy by transporting lighter materials. • Optimises water use efficiency through plant design (including reuse of waste water) and location. • Applies best practice approaches to waste management through the promotion of the waste hierarchy. • Protects air quality through the use of appropriate air quality standards, air emission standards and emission control technologies. • Implements best practice management to minimise impact on air quality and minimise greenhouse gas emissions. • Considers potential impacts of cyclonic events, storm surges, erosion and flooding in the location and design of the Project. • Identifies and characterises the extent of any acid sulphate soils to ensure the Project does not adversely impact on environmental values.
Economic Development Viable, environmentally sustainable economic growth and development takes place through the recognition, protection and promotion of the region's competitive advantage, support of existing industries, diversification and the identification and encouragement of new economic opportunities.	• Promotes economic growth in the region. • Diversifies from existing industries in the region. • Adopts advanced technologies and practices to improve productivity and competitiveness. • Aims to source a significant proportion of labour and skills required for the Project from the region. • Adopts skills development/training and management strategies to maximise employment opportunities for the regional Aboriginal and Torres Strait Islander workforce. • Promotes the region as a source of best practice energy generation. • Promotes alternative energies through "no emissions" power generation.
Infrastructure The region's infrastructure shall be developed to anticipate the long term needs of communities and industries, regional prosperity and wellbeing, community vitality and ecological sustainability.	• Promotes the maintenance and improvement of the existing rail system for the safe and efficient movement of coal and coke product. • Promotes the maintenance and improvement of the existing road network system for the safe and efficient movement of people and materials. • Expands the existing port infrastructure at Fisherman's Landing, Port of Gladstone. • Capitalises upon the competitive advantages of private port loading facilities. • Promotes the maintenance and improvement of the region's energy infrastructure to ensure current and future needs of the industry and community are met.

Policy Framework Element and Guiding Principle	Project Alignment with Strategies and Actions
Social and Cultural Development Social and cultural fabric and vitality of the community that is underpinned by sound, ethically based planning, institutional support and investment that recognises the past, embraces the present and prepares for the future.	• Provides social infrastructure which supports healthy and productive communities to counter potential socio-economic impacts of the Project. • Adopts strategies to ensure balance between economic and social/community wellbeing in the area potentially impacted by the Project and to support the maintenance of family and community units as well as the connectedness of individuals. • Creates employment opportunities in the region that attract young people and semi-skilled workers. • Adopts the integration of leisure, sport and recreation through design of worker accommodation and support of local facilities. • Identifies cultural heritage in the project area and aims to protect cultural values.
Education, Training and Research The promotion of a climate and culture of learning in which Central Queensland strives for equity access to emerging technologies, knowledge, information and associated infrastructure which underpin the region's capacity for effective decision making, innovation and competitiveness.	• Provides training and skills to meet needs of the Project (and therefore industry). • Provides equitable access to training opportunities in rural/more remote areas. • Commits to maximise training and employment opportunities for local communities in both the Project's construction and operational phases and commits to strongly encouraging successful contractors to commit to the same.

1.6.2 Environmental Protection Act 1994 (1)

EPA states that the EIS has omitted Environmentally Relevant Activity 18 Power Station – generating power by consuming fuel at a rated capacity of 10 MW electrical or more. The EPA considers its inclusion appropriate for this project.

The EIS identifies ERAs pursuant to the *Environmental Protection Regulation 1998* that are relevant to the activities of the Coke Plant. These comprise ERAs 8. 'coke producing', 9. 'gas producing', 17. 'fuel burning;, 22. 'screening etc material', 28. 'motor vehicle workshop', 11. 'crude oil or petroleum product storing', 15. 'sewage treatment' and 7. 'chemical storage'.

For the Power Plant, relevant ERAs are considered to comprise the following:

- 7. 'chemical storage - storing chemicals (other than crude oil, natural gas and petroleum products), including ozone depleting substances, gases or dangerous goods under the Dangerous Goods Code in containers having a design storage volume of: (a) more than 10 m^3 but less than 1,000 m^3';
- 15. 'Sewage treatment - operating a standard sewage treatment works having a peak design capacity to treat sewage of 21 or more equivalent persons, but less than 100 equivalent persons'; and
- 16. 'municipal water treatment plant - treating water for domestic use (other than treatment that only involves disinfection)'.

The EPA comments on the ERAs likely to be involved in the Project suggest that the Power Plant triggers ERA 18 'power station – generating power by consuming fuel at a rated capacity of 10 MW electrical or more'. It is the proponent's view that this is not the case as the Power Plant will not be burning fuel and the *Environmental Protection Regulation 1998* explanatory notes (Explanatory Notes for SL 1998 No. 29) for this activity specifically excludes the recovery of waste energy through cogeneration processes.

1.6.3 Integrated Planning Act 1997 (1, 8, 9)

The EIS does not include reference to Coastal Protection and Management Act 1995 and subsequent approvals. Insufficient information has been provided in the EIS for an assessment of the impacts of the proposed port works, as a result it is unlikely that a development permit could be issued for the tidal works component of the project. The EPA states that the EIS should identify that some of the works proposed in the EIS will require a development approval under the Integrated Planning Act 1997 assessed against the Coastal Protection and Management Act 1995. It should also specify the level of approval required.

DNRMW states that a MCU and/or RaL application under IDAS may also trigger assessment against the Vegetation Management Act 1999 for clearing of native vegetation and that the reference to the Land Act is now no longer correct as clearing of native vegetation on all land tenures is regulated by the Vegetation Management Act 1999 via the Integrated Planning Act 1997.

DLGPSR states that this section needs updating where Schedules of the IPA are referred to, and in relation to approval to clear vegetation. DLGPSR requests that a statement be added to this section to inform the public that the Coordinator-General, as a result of the EIS process, can require conditions be imposed on subsequent development permits issued by the relevant local governments. These conditions are usually set out in the Environmental Assessment Report produced by the Coordinator General's office.

Almost all development approvals are integrated into the common Integrated Development Assessment System (IDAS) and applications are made using the common Form 1 Development Application. The *Integrated Planning Act 1997* (IPA) details what development is self-assessable development, assessable development or exempt development. The Project involves several types of assessable development that would require a number of applications under IDAS.

Under the IDAS process the Project will likely trigger Material Change of Use (MCU) applications (*i.e.* separate applications for the Power Plant and the Coke Plant) for use of premises for Environmentally Relevant Activities (ERAs), for the Reconfiguration of a Lot, for Building Work, and/or for Operational Work of various types such as Clearing of Native Vegetation on Freehold Land (*i.e.* clearing of vegetation is assessable under IPA Schedule 8, as a result of 2004 amendments to the *Vegetation Management Act 1999* (VMA) and IPA).

Some of the works proposed at the Fisherman's Landing site will likely require development approval under IPA, Schedule 8 (Operational work that is tidal works), assessed against the *Coastal Protection and Management Act 1995*. The Central Queensland Port Authority (CQPA), as registered freehold title holder of Lots 502/SP144781 and 106/DS699 and lessee of Lot 503/SP144788 (Figure 3.3), holds

reclamation and dredging approvals for the development of the Fisherman's Landing Berths. Construction of the berth and any dredging required is outside the scope of the EIS and relevant licensing requirements will be addressed by persons commissioned to undertake those works.

CQPA also holds an Environmental Authority for a number of ERAs including ERA 71 'Operating a port' and ERA 23 (c) 'Abrasive blasting' under the *Environmental Protection Regulation 1998*, Schedule 1 for Lots 105 and 106/DS 699. A development application for a MCU on Lots 502/SP144781 and Lots 105 and 106/DS699 will be required to enable ERAs to be undertaken that are not covered under CQPA's current EA. These will likely include ERA 22 'Screening materials', ERA 74 stockpiling, loading or unloading goods in bulk and possibly ERA 62 'Concrete batching' depending on the construction work required.

The conveyors will also likely encroach on Lots 101/SP108924 and 102/SP108926 (Queensland Cement Australia freehold) and Lot 104/SP155862 (CQPA freehold). These lots are zoned for heavy industry, and as such the construction and operation of the proposed conveyor system would likely be considered an "as of right use" and hence will not require a MCU Application. It is yet to be confirmed whether the operation of the conveyor between the rail loop and Strategic Port Land would be considered assessable development for an ERA, which could trigger a requirement for development approval from Calliope Shire Council.

The IDAS process normally requires referrals to be made to referral agencies. However, since the EIS process is under the *State Development and Public Works Organisation Act 1971* (SDPWO Act), this referral process has been undertaken as part of the SDPWO Act assessment process. After the Environmental Assessment Report from the Coordinator-General has been received by the proponents, the required development applications are to be lodged with the relevant Local Authority for development approval. The Coordinator-General, as a result of the EIS process, can require conditions be imposed on subsequent development permits issued by the relevant Local Governments. These conditions are usually set out in the Coordinator-General's Evaluation Report. An application for a number of Registration Certificates would also be made to the EPA.

1.6.6 Policies (8)

DNRMW requires that the EIS mentions the State Planning Policy (SPP) 1/03 - Mitigating the Adverse Impacts of Flood, Bushfire and Landslide and State Planning Policy (SPP) 2/02, Planning and Managing Development Involving Acid Sulfate Soils and associated guidelines.

The State Planning Policy (SPP) 1/03 "Mitigating the Adverse Impacts of Flood, Bushfire and Landslide" (Department of Local Government and Planning and Department of Emergency Services, 2003) aims to ensure that the natural hazards of flood, bushfire, and landslide are adequately considered when making decisions about development. It applies under the *Integrated Planning Act 1997* (IPA) to the assessment of development applications when development (that meets certain criteria) is proposed in natural hazard management areas, including in Fitzroy and Calliope Shire Council Local Government Areas. Section 4 of the EIS addresses the issue of bushfires at the project site. Also, Section 3 of the EIS considers seismic events in the region, however, landslides *per se* are not considered an issue with this project. Section 5 of this Supplement addresses the impacts of flooding in accordance with SPP 1/03.

The State Planning Policy (SPP) 2/02 "Planning and Managing Development Involving Acid Sulfate Soils" (Department of Local Government and Planning, 2002) aims to ensure that development involving acid sulphate soils is planned and managed to avoid the release of potentially harmful contaminants into the environment. Under IPA, SPP 2/02 has effect when certain development applications are assessed. Within the Fitzroy and Calliope Shire Council Local Government Areas, the SPP applies to development involving excavating or otherwise removing 100 m^3 or more of soil or sediment or filling of land involving 500 m^3 or more of material with an average depth of 0.5 m or greater. Section 3 of the EIS considers the potential for acid sulphate soils at the Stanwell project site and at Fisherman's Landing. Section 3 of this Supplement addresses the potential for acid sulphate soils in accordance with SPP 2/02.

2.3.1 Coke Plant (2, 5, 14)

DMR states that the proponent should provide more precise and detailed information (including map of sufficient detail and of appropriate scale) on the origins, transport transfer points, haulage route and destination of materials and equipment for the coke plant.

Updated volumes and sources of other material and proposed haulage routes for the construction of the Coke Plant and Power Plant are provided in Table 2.1 below. Detail on origins, transport transfer points, haulage route and destination of materials and equipment for the Project is presented in Figure 14.3 and discussed in detail in Section 14 and Supplement Appendix E.

QT notes that refractory bricks will be railed from Brisbane to Rockhampton and then transported by road to site. Should transport arrangements change and bricks are brought in to Gladstone, QT requires a commitment that the bricks will still be railed to Rockhampton.

CSC states that there is no indication in the EIS as to what wharf might be used should oven bricks be transported to the Port of Gladstone or Port Alma, thereby making it difficult to determine whether only main roads would be affected or whether local roads might be affected.

The oven bricks will be sourced internationally and shipped to Auckland Point, Port of Gladstone. From Gladstone, they will be transported to site via semi-trailers or B-doubles in shipping containers. The proposed haulage route is to exit Gladstone terminal via Port Access Road, right turn into Hansen Road, then onto Port Curtis Way, Mount Larcom Road, right onto the Bruce Highway, left onto the Capricorn Highway and then left onto Power Station Road. On site the bricks will be off-loaded and placed in a dedicated storage area. Depending on the type of vehicle used and assuming bricks would be transported from Monday to Friday, truck movements along this route to the site will approximate 5,714 over approximately 24 months per project stage.

Should oven bricks be required to be shipped to the Port of Brisbane, they will then be railed to Rockhampton and transported via semi-trailer to the project site, although this would be limited to emergency situations only and to a maximum of 20% of the bricks (due to the restricted space for loading the semi-trailers at the Rockhampton rail yard). The utilisation of the Port Alma facility was investigated during the early (pre-feasibility) stages of the Project and it was decided at this time that the facility is not appropriate for use by the Project.

2.3.2 Power Plant (2)

DMR states that the EIS should provide a tabulation of all the major components of the power plant including volumes and tonnages of materials to be transported and the origin/destination of trips to clarify the impacts on the adjacent transport network.

Details of the major commodities and transport routes required for the Power Plant and Coke Plant are provided in Table 2.1 below. It is assumed for the road impact assessment that all transport vehicles are B-doubles with 35 t payloads.

Table 2.1 Estimated Major Construction Material Inputs and Outputs required for the Coke Plant and Power Plant[1]

Material	Volume	Source			
		Rockhampton (via Bruce and Capricorn Highways) (%)	Gracemere (via Capricorn Highways) (%)	Gladstone (via Bruce and Capricorn Highways) (%)	Number of Trucks
Stage 1 Coke Plant					
Construction Materials Input					
Reinforced concrete					
- *Aggregate*	30,000 m^3	0	100	0	1373
- *Cement*	15,000 m^3	50	0	50	645
- *Reinforcing steel*	5,000 m^3	50	0	50	1121
Refractory bricks	200,000 t	0	0	100	5714
Structural steel	30,000 t	50	0	50	857
Conveyor units	5,000 m	50	0	50	83
Cabling	300,000 m	50	0	50	10
General fill	100,000 t	0	35	0	1750
Materials Handling Construction Materials Inputs					
Reinforced concrete					
- *Aggregate*		0	100	0	358
- *Cement*		50	0	50	193
- *Reinforcing steel*		50	0	50	175
Fabricated steel		50	0	50	75
Procured items		50	0	50	250
Construction Waste Outputs					
General construction waste	1 load per day	0	100	0	520
Operations Inputs and Outputs					
Process related inputs	4 loads per hour (2 vehicles in, 2 out)	50	0	50	1040
Process related outputs	2 loads per hour (1 vehicle in, 1 out)	0	100	0	520
Stage 2 Coke Plant					
Construction Materials Input					
Reinforced concrete					
- *Aggregate*	30,000 m^3	0	100	0	1373
- *Cement*	15,000 m^3	50	0	50	645
- *Reinforcing steel*	5,000 m^3	50	0	50	1121
Refractory bricks	200,000 t	0	0	100	5714
Structural steel	40,000 t	50	0	50	857
Conveyor units	2,500 m	50	0	50	83
Cabling	300,000 m	50	0	50	10
General fill	100,000 t	0	35	0	1750
Power Plant					
Construction Materials Input					
Plant and construction materials		50	0	50	4000
Sundry plant and materials		50	0	50	2500
Operational supplies (*e.g.* furnace oil, chemicals etc)		50	0	50	1500
Reinforced concrete					
- *Aggregate*		0	100	0	3600
- *Cement*		50	0	50	1800
- *Reinforcing steel*		50	0	50	600
Heat recovery steam generator units	32 units	0	0	100	32

Note: [1] Estimates do not include the delivery of raw material (coal) or export of product (coke) commodities by rail or materials required for the works at Fisherman's Landing. Estimates of operational inputs and outputs include the transport of lime inputs (2 trucks/day for Stage 1 and 4 trucks/ day for Stage 2) and dust/calcium carbonate/calcium sulphate outputs (4 trucks/ day) required for Flue Gas Sulphurisation.

For the Power Plant, transportation of the transformers, condensers, turbines and generators will likely be as very heavy and oversized loads using multi-axle load platforms, comprising either single units or twin units with beams. Two trips will be required if the parts are sourced from Port of Gladstone (with transport via the Bruce Highway and not Gavial-Gracemere Road), or four trips will be required if sourced from the Port of Brisbane (transported via Warrego, Leichhardt, Dawson, Bruce and Capricorn Highways) or from Sydney.

The origin/destination of trips is presented on Figure 14.3 and associated impacts on the adjacent transport network are discussed in detail in Sections 14.3.1 and 14.3.2 and Supplement Appendix E.

2.4.1 Transport – Road, Rail and Shipping (2, 6)

DMR states that the EIS should describe the transport support infrastructure for the project in greater outline (including through the use of maps), with the full details provided in Section 14.

No major road related support infrastructure will be required just for the Project, though the Project will either require some improvements to the existing road network (such as providing turning lanes at some intersections, or extending acceleration lanes), or bring forward the year at which works will be required on parts of the road network (refer Section 14 and Supplement Appendix E). Other road transport-associated infrastructure required for the Project comprises bus stops/passenger collection points at Gracemere and Rockhampton for transport of the construction workforce and the provision of carparking at the project site.

QR refers to Section 2.4.1 stating the majority of the EIS is presented in sections determined by subject matter. QR states that it is difficult to ascertain which parts of the assessment and recommendations pertain to the core facility and which pertain to the supporting infrastructure, which would make it difficult to prepare work briefs and assess tenders in an equitable way.

It should be noted that transport infrastructure is discussed under its own heading in detail in Section 14 of the EIS. It is not intended that the EIS be used as documentation against which work briefs would be prepared and tenders would be assessed.

2.4.3 Water Supply and Management (3)

QH states that any use of recycled water should be assessed for its potential to cause infection by the transmission of bacteria and/or viruses by contact, dispersion of aerosols, and ingestion (e.g. via use on food crops). Similarly, the use of recycled water should be assessed for its potential to cause harm to health via the food chain due to contaminants such as heavy metals and persistent organic chemicals

The Project's recycled water comprises blowdown water proposed to be used for coke quenching and recycled stormwater runoff from sealed areas. QH has suggested reference be made to the draft "National Guidelines for Water Recycling" (Natural Resource Management Ministerial Council and Environment

Protection and Heritage Council, 2005) and the "Queensland Water Recycling Guidelines" (Environmental Protection Agency, 2005) in assessing the potential for the use of recycled water at the Project to cause harm.

The draft "National Guidelines for Water Recycling" provide a generic risk-assessment and management framework that is applicable to all types of water recycling. It also provides specific guidelines for the uses of recycled water initially identified as a priority. These uses comprise large-scale treated sewage and grey water to be used for purposes including industrial uses such as cooling water and grey water treated on-site for residential uses. These guidelines do not deal specifically with recycling of stormwater or water from industrial and commercial processes. However, the generic approach described here may be used to determine and manage the human health and environmental risks associated with water from any source.

The "Queensland Water Recycling Guidelines" provide for the industrial use of recycled water including for washdown, dust control on construction sites, boiler feed, process water and industrial cooling. However, as with the national guidelines, the Queensland guidelines have a strong focus on use of recycled treated sewage and grey water and are not directly applicable to the Project which will involve the reuse of stormwater and blowdown water. Generally, the water quality requirements for industrial purposes will be determined by the needs of the process being supplied.

The use of recycled water at the Project will be within an open system, for coke quenching and for dust suppression activities during construction. Under the Queensland guidelines, Class A recycled water is required for this purpose. It is anticipated that the project recycled water will meet the Class A criteria. Recycled water will not be reused directly as crop or pasture water or for stock drinking, nor will it be used for potable supply on site. Therefore, it is very unlikely to enter the food chain.

It is also unlikely that infectious bacteria/viruses in steam aerosols will cause health issues as steam aerosols are controlled by baffles on the quench tower and steam generation reduced through the application of a substantially lower rate of water when compared to traditional coke plants. Steam aerosols that are emitted will rapidly dissipate and evaporate once released from the quenching tower. Blowdown water used for recycling will also be treated to inhibit bacteriological activity.

The quality of recycled water at the Project will be regularly monitored to ensure the absence of bacteria and to ensure it meets Class A criteria. Water quality on site is discussed in relation to EPA and ANZECC Guidelines in Section 5 of this Supplement.

3.2.1 [*Geology and Soils*] Description of Environmental Values (8)

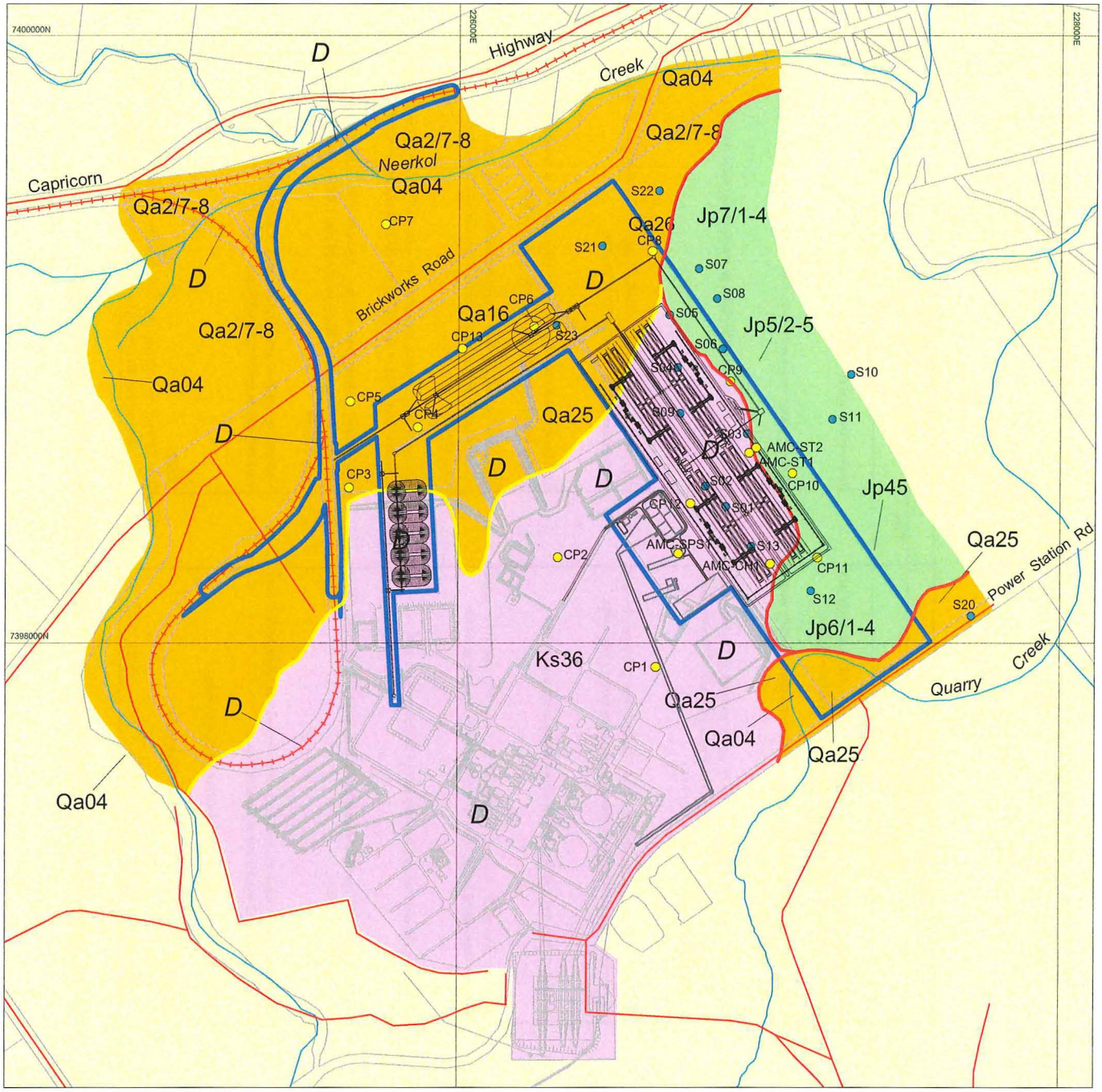
DNRMW states that the limitations for alluvial Terrain Unit Qa2/7-8 with non-cracking and cracking alluvial clays in Appendix D.5 are only minor to moderate, indicating that it should be assessed as Class A, suitable for cropping, due to moderate erosion hazard, and not Class B. DNRMW has prepared an Agricultural Land Class map for Fitzroy Shire which has been used to delineate Good Quality Agricultural Land for the Fitzroy Shire Planning Scheme. The alluvial area along Neerkol Creek (i.e. the area of Terrain Unit Qa2/7-8) has been mapped by DNRMW as Class A1, suitable for rainfed cropping. Whether it is Class A or B, the area is assessed as Good Quality Agricultural Land. DNRMW states that, based on the soil description (Appendix D.1), the small area of Terrain Unit Qa26 should be assessed as Class C, suitable for grazing. A severe moisture limitation should be listed for this soil along with the moderate erosion limitation (Appendix D.5). These limitations would preclude rainfed cropping on this soil.

EIS Appendix D has been reviewed in light of the DNRMW comments and is presented in the Supplement as Appendix B. Revised descriptions of soil types identified at each of the soil sampling locations (CP1-13) are included as Supplement Appendix B.1. The soil types associated with individual terrain units are described in Supplement Appendix B.2.

Soils

The occurrence of soil types within the project area are described in Table 3.1 below and identified on a terrain unit basis as shown in Figures 3.1a and b of this Supplement. A summary of the main soil types that occur within the project area is as follows (Table 3.1):

- Soil Type 1 (shallow rocky soils) occurs in association with Soil Type 4 (shallow to medium deep gravelly loams) and comprises mostly shallow lithosols, on the steep middle to upper slopes of the sandstone ridges and hills in terrain units Jp7(1-4) and Jp6(1-4) respectively.
- Soil Type 2 comprises shallow uniform coarse-textured sand soils over weathered rock, and locally occur in association with medium deep thick sandy surface acidic yellow mottled duplex soils (Soil Type 5) which are transitional to the weathered sandstone rock substrate in terrain units Jp4(2-5) and Jp5(2-5).
- Soil Type 3 (earthy sands) and Type 4 (medium-textured loamy soils) comprise alluvial deposits along Neerkol and Quarry Creeks in the channel floors, on the lower flood terraces, stream banks and levees. Fine sandy loamy surface duplex soils with medium to heavy non-sodic or slightly sodic clay subsoils (Soil Type 5), silt loamy duplex soils with saline and sodic heavy clay subsoils (Soil Type 6), uniform non-cracking clays (Soil Type 7) and dark-coloured uniform (cracking) clays (Soil Type 8) occur on the alluvial backplains and higher alluvial terraces.
- Soil Type 5 as mapped, includes two soil variants. One soil variant comprises thick (0.4-0.6 m) acidic sandy surface duplex soils locally with a pale or bleached subsurface (A2) horizon over locally strongly acidic coarsely mottled yellow-brown red and grey sandy medium clay subsoils, in places with a ferruginous gravelly subsoil horizon transitional to the underlying weathered sandstone bedrock. These soils are transitional between or occur in association with soil Type 2 in terrain units



LEGEND

CP1 ●	QCE Site Sampling Locations (2005)
S01 ●	AMC Site Investigation Locations (1998)
———	Geological Regime Boundary
Qa16	Terrain Unit Boundary
———	Proposed Development Footprint
———	Existing Stanwell Power Station
———	Creek
———	Road
++++++	Railway

N

0 500m 1000m

Scale 1:20 000 (A4)
Horizontal Datum GDA94 Zone 55

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NOTE:
This Figure 3.1a must be viewed with Figure 3.1b (Terrain Units Identification Key)

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QUEENSLAND COKE AND POWER PLANT PROJECT EIS SUPPLEMENT

TERRAIN UNITS AND SITE SAMPLING LOCATIONS

Drawn: VH	Approved: JMcD	Date: 29-06-2006	Figure: **3.1a**
Job No: **42625626**	File No: 42625626-g-060.wor		Rev:A **A4**

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GEOLOGICAL REGIME		LANDFORM – TERRAIN TYPE		SOILS	
Symbol	Formation and Lithology	Type	Surface Form and Slope	Type	Soil Types
Qa	Alluvium on water courses, terraces and floodplains.	0	Channel floors, banks and active levees of major streams and waterways with high, steep, and locally benched bank slopes and low floodprone terraces.	0	Rock outcrop and skeletal soils.
Ks	Lower Cretaceous Stanwell Coal Measures – mudstone, arenite, claystone.	1	Alluvial drainage flats and broadly depressional backplains, generally poorly drained; slopes generally <1%.	1	Skeletal, rocky or gravelly soils (>60% gravel) with sand, silt or clayey matrix.
Jp	Jurassic Precipice Sandstone – cross-bedded, white to brown fine to coarse-grained pebbly quartzose sandstone, arenite, some white to yellowish brown laminated siltstone.	2	Flat to gently inclined erosional plains or gently undulating alluvial plains, floodplains and higher stream terraces, with slopes generally <2%;occasionally to periodically floodprone in lower-lying areas	2	Sand soils; uniform profile; includes stratified alluvial soils; (Ucl-4).
		3	Undulating plain and gently rolling to broadly rounded rises with gently inclined planar to concave intervening depressional areas; slopes mostly in the range 2- 5%	3	Coarse to medium-textured soils; uniform or gradational profiles; predominantly sandy texture; (Uc4-5, Uml-3).
		4	Undulating plain, and rolling rises with slopes mostly in the range 5-10%	4	Medium-textured often gravelly soils with uniform or weakly gradational profiles of predominantly loamy texture; (Um4-7, Gn1-2).
		5	Gently to moderately inclined intermediate to lower hill and ridge slopes dissection slope interfluves with slopes variable mostly in the range 5-15%	5	Sandy, silty or loamy surface duplex or gradational soils with strongly acidic to neutral sandy, silty or light to medium clay subsoil (B) horizons, (Gn2, Dy4-5).
		6	Isolated low hills and rises and low hilly lands with slpopes up to 25%;	6	Fine sandy, silty or loamy surface duplex soils with alkaline and mostly sodic medium to heavy clay or sandy clay, subsoil (B) horizons. (Db1-Dy3).
		7	Steep hilly lands with mostly short steep irregular planar hill and ridge slopes; slopes typically 25 to 50%;.	7	Fine-textured, uniform (non-cracking) clay soils with medium to heavy clay surficial (A) horizons over heavy structured clay subsoils - incipient cracking clays, (Uf5-6).
		8	Steep to very steep ridges and high hilly lands; with slopes typically>50% with local subvertical rocky bluffs and escarpment slopes	8	Fine-textured uniform, (cracking) clay soils of high plasticity locally with thin weak self-mulching surficial soil horizons (Ug5-6).
		D	Land disturbed or modified by cutting and/or filling operations.		
			EXAMPLE: **Terrain Unit Qa26** Qa 2 6 (GEOLOGY) (LANDFORM) (SOIL TYPE)		**NOTE:** Dual Symbols for soil type, eg. (7-8) indicates that both material types or intergrades between the two soil types may occur within the mapping unit.

Notes:- (1) - Soil Group Name (Stace et.al. 1968; (2) - Principle Profile Form (Northcote 1971): (3) - Engineering Soil Class (AS 1764-1990); (4) - Australian Soil Classification (Isbell, 1996).

NOTE:
This Figure 3.1b must be viewed with Figure 3.1a (Terrain Units and Site Sampling Locations)

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QUEENSLAND COKE AND POWER PLANT PROJECT
ENVIRONMENTAL IMPACT STATEMENT

TERRAIN UNITS IDENTIFICATION KEY

Drawn: VH | Approved: JMcD | Date: 29-06-2006

Job No: 42625626 | File No: 42625626-g-060.wor

Figure: 3.1b

A4 | Rev:A

Jp4(2-5) and Jp5 (2-5), on the lower slope flanks and lower dissection slope interfluves of the high strike ridge; and associated low sandstone hills along the eastern boundary of the site. As mapped, the second soil variant occurs in terrain unit Qa25 and comprises thick (up to 0.4 m) acidic fine sandy to silt loamy surface duplex soils with brown or yellow-brown sometimes diffusely mottled, slightly acidic to slightly alkaline non-saline heavy clay subsoils which may locally be somewhat sodic in the deeper clay subsoil layers.

- Soil Type 6 comprises mainly thin silt loamy surface duplex soils, locally with bleached or sporadically bleached (A2) subsoil horizons over brown or yellow brown mainly heavy usually sodic alkaline and saline clay subsoils. These soils occur on the undulating plains and gently inclined slopes of the Stanwell Coal Measures (Ks) geological regime in terrain unit Ks36, and on the near flat to gently undulating alluvial plains in terrain units Qa26 and Qa16.

- Soil Types 7 and 8 occur in association on the alluvial plains and terraces along Neerkol Creek. Soil Type 7 comprises uniform dark-coloured (non-cracking) clay soils with a thin crusty weak self-mulching surface soil with no obvious surface cracking evident. The immediate subsurface (B) horizon is well structured to a depth of about 0.4-0.5 m, becoming more massive in the deeper subsoil. These soils have been termed 'incipient cracking clay soils" as they have close similarities to the dark-coloured (cracking) clay soils (Soil Type 8) which have a thin self-mulching surface soil with a weak surface crust and strongly structured, and strongly alkaline, usually sodic heavy clay subsoils. As mapped these soils occur in a complex association in terrain unit Qa2(7-8).

Table 3.1 Soil Types in the Project Site Area

Soil Type	Soil Description	Soil Classification			
		Aust. Soil[1] Group	P.P.F.[2]	U.S.C.[3]	A.S.S[4]
1	Skeletal, rocky or gravelly soils (>60% rock cobbles and weathered rock gravel) with sand, silt or clayey matrix	Skeletal Soils	NSG	GW, GP, GM-GC	Very Gravelly Paralithic Leptic Rudosols
2	Uniform sand or gravelly sand soils underlain by weathered rock	Lithosols	Uc2 12 Uc4.13	SP, SM, SM-SP	Stratic Rudosols
3	Earthy sands – sandy earth soils, moderate shallow coarse to medium-textured soils	Earthy Sands	Uc5.21	SM-SC, SP-SC, SC	Paralithic Leptic Tenosols
4	Uniform or gradational, medium-textured sandy loam or loamy alluvial soils, or gravelly loam residual soils	Alluvial Soils or Lithosols	Uc6.13, Um5.52, K-Um4.3	GM-GC	Chernic Leptic Tenosols or Gravelly Paralithic Orthic Tenosols
5	Sandy surface texture contrast (duplex) soils with red, yellow-brown and grey strongly acidic to neutral sandy clay subsoils over HW rock, or:- Fine sandy to silt loamy surface duplex soils brown or yellow-brown acidic to slightly alkaline heavy clay subsoils.	Yellow Podzolic Soils Podzolic-Solodic Soils	Dy5.81, Dy4.61, Gn2.11 Db1.12, Db1.23	SM-SP/SC-CL, SM-SP/GC-CL SC-CL/CH	Mottled-Ferric Yellow-Brown Kurosols Subnatric Brown Sodosols Sodic Brown Chromosols
6	Silty to loamy surface texture contrast (duplex) soils with alkaline, sodic saline medium to heavy clay subsoils	Solodic Soils	Db1.13 Db1.33-1.43 Dy3.33	SM or CL-ML/CL- CH or CH	Subnatric-Mesonatric Brown Sodosols
7	Uniform or weakly gradational (Non-cracking) clay soils	Dark Grey (Non-Cracking) Clays	Uf5.11-.12, Uf6.11-.12	CL-CH or CH/CH	Vertic Subnatric or Meso-natric Black Dermosols
8	Uniform dark grey-brown (cracking) clay soils	Grey-Brown (Cracking) Clays	Ug5.15	CH/CH	Endocalcareous Self-mulching Black Vertosols

Notes: [1] Common Soil Group Name (Stace *et. al.*, 1968)
[2] Principal Profile Form (Northcote, 1971)

[3] Engineering Soil Class (AS 1764:1990)
[4] The Australian Soil Classification (Isbell, 1996)

Topsoil Resources

Based on the findings of the site reconnaissance soil survey, together with the results of the indicative and laboratory testing available, an assessment of topsoil suitability for rehabilitation of lands that will be disturbed by the project development/construction process has been undertaken. Together with field observations of soil surface condition, soil texture and structure, Supplement Appendix B.3 provides the basis used to evaluate topsoil suitability for rehabilitation in terms of the physical and chemical properties of the soils purposes. The criteria and parameters used for the assessment are included in Supplement Appendix B.4 and indicative topsoil stripping depths of suitable (S) material have been determined. Supplement Appendix B.4 also provides an assessment of materials that are considered to be marginal (M) for use as topsoil material, but would have acceptable properties for the use as subsoil resources, if required.

At the Stanwell project site, useable topsoil resources are mainly confined to the surficial (A) horizon materials and locally in the upper part of the subsurface (B1) horizons, which contain seed-stock, micro-organisms and nutrients necessary for plant growth. Soil microbial activity, organic matter content and other parameters affecting soil fertility, tend to decrease with depth. In terms of acceptable soil properties and extent of occurrence, the most suitable sources of topsoil resources occur in terrain units with Soil Types 5, 7 and 8 and to a lesser extent the alluvial Soil Types 4 and 6. The surficial (A) soil horizons of these soil types are typically about 0.2 to 0.4 m thick and usually comprise the most suitable material resources in terms of soil physical and chemical properties. The subsoil (B1) horizons that occur within the zone to depths of about 0.4 to 0.5 m (bgl), are usually of lesser quality in terms of soil nutrient levels but may be useable, particularly if blended in part with the surficial (A) soil horizons. However in the main these (B1) materials are unsuitable for use alone as topsoil, due to locally elevated levels of alkalinity, salinity, sodicity and other adverse soil attributes such as excessively coarse soil structure, very strong (tough) dry consistence or dispersive characteristics.

The occurrences of terrain units with soil Types 1 and the loamy residual soil Type 4 may contain high amounts of gravelly scree or weathered rock lag gravel, typically only about 0.3 to 0.4 m thick and underlain by weathered rock. These material types are of limited extent within terrain units Jp6(1-4) and Jp7(1-4) and as such, they are considered to be unsuitable or marginal for topsoil use. Soil occurrences within terrain unit Jp5(2-5), with soil Types 2 and possibly Type 3, are considered to be marginal for use as topsoil due to the predominantly coarse sandy texture, stoniness and low water storage capacity. However the surficial (0.2 m) which contain organic matter and seed-stock may be worth recovering for use as top-dressing materials.

Land Use Suitability

The assessment of land use suitability for the site of the proposed Project has indicated that, in terms of agricultural land capability, within the area that may be disturbed, some small areas suitable for cropping occur along the proposed railway alignment (including near Neerkol Creek) and in the northern most

corner of the project footprint near Brickworks Road. The remainder of the area that may be disturbed is mainly suitable for grazing on improved or native pasture.

An assessment of the agricultural land capability of the area was conducted to provide a benchmark of existing/potential agricultural land use. As required by the Project Terms of Reference, in accordance with State Planning Policy 1/92 "Development and the Conservation of Agricultural Land" (Department of Housing, Local Government and Planning (DHLGP), 1992), the assessment has been based on the four class system for defining Good Quality Agricultural Land as detailed in the "Planning Guidelines for the Identification of Good Quality Agricultural Land" (Department of Primary Industries (DPI) and DHLGP, 1993) as summarised below:

- *Class A*: Crop Land – land suitable for current and potential crops with limitations to production which range from nil to moderate levels;
- *Class B:* Limited Crop Land – land that is marginal for current and potential crops due to severe limitations, but is suitable for pastures. Engineering and/or agronomic improvements may be required before the land is considered suitable for sustainable cropping/cultivation;
- *Class C:* Pasture Land – land suitable for improved or native pastures due to limitations which preclude continuous cultivation for crop production. Some areas may tolerate a short period of ground disturbance for pasture establishment; and
- *Class D*: Non-Agricultural Land - land not suitable for agricultural uses due to extreme limitations. This may comprise undisturbed land with significant habitat, conservation and/or catchment values, or land that may be unsuitable because of very steep slopes, shallow soils, rock outcrop or poor drainage.

In order to determine the appropriate agricultural land class, terrain units identified within the project area have been evaluated for Land Suitability for dryland (rainfed) cropping. The soil and landform limitations criteria on which the land suitability classifications have been determined are based on the "Guidelines for Agricultural Land Evaluation in Queensland" published by the DPI (1990), modified to some extent by inclusion of criteria proposed by Schields and Williams (1991). The system of classification is generally based on the identification of physical and chemical limiting factors or constraints applied to specific land uses by adopting the following format:

- *Class 1*: High quality land with few or very minor limitations for the intended land use;
- *Class 2*: Land with minor limitations for the intended land use;
- *Class 3*: Land with moderate limitations to sustaining the intended land use;
- *Class 4*: Marginal land requiring major inputs to sustain the intended land use; and
- *Class 5*: Unsuitable land due to extreme limitations for the intended land use.

For the terrain units identified within the project area, the land suitability assessment for dryland cropping, from which the agricultural land capability classes have been assessed, are included in

Supplement Appendix B.4. The agricultural land classes determined are shown in Figure 3.2. Table 3.2 below summarises the agricultural land capability of the land within the project area as a whole, as well as the respective areas of the agricultural land classes that may be affected within the proposed development footprint.

Table 3.2 Agricultural Land Class Affected by Project

Agricultural Land Class	Total Area of Agricultural Land Class (ha)	Approximate Area of Agricultural Land Class Affected by Project Footprint (ha)	Percentage of Agricultural Land Class Affected by Project Footprint (%)
Class A	136.6	7.7	6
Class B	65.2	17.8	27
Class C	135.6	32.3	24
Class D	288.6	65.2	23

The project area as mapped includes a total land area of approximately 626 ha. Based on the cumulative areas of the terrain units described in Supplement Appendix B.2 and the corresponding agricultural land classes determined, a summary of the results of the land capability assessment is as follows:

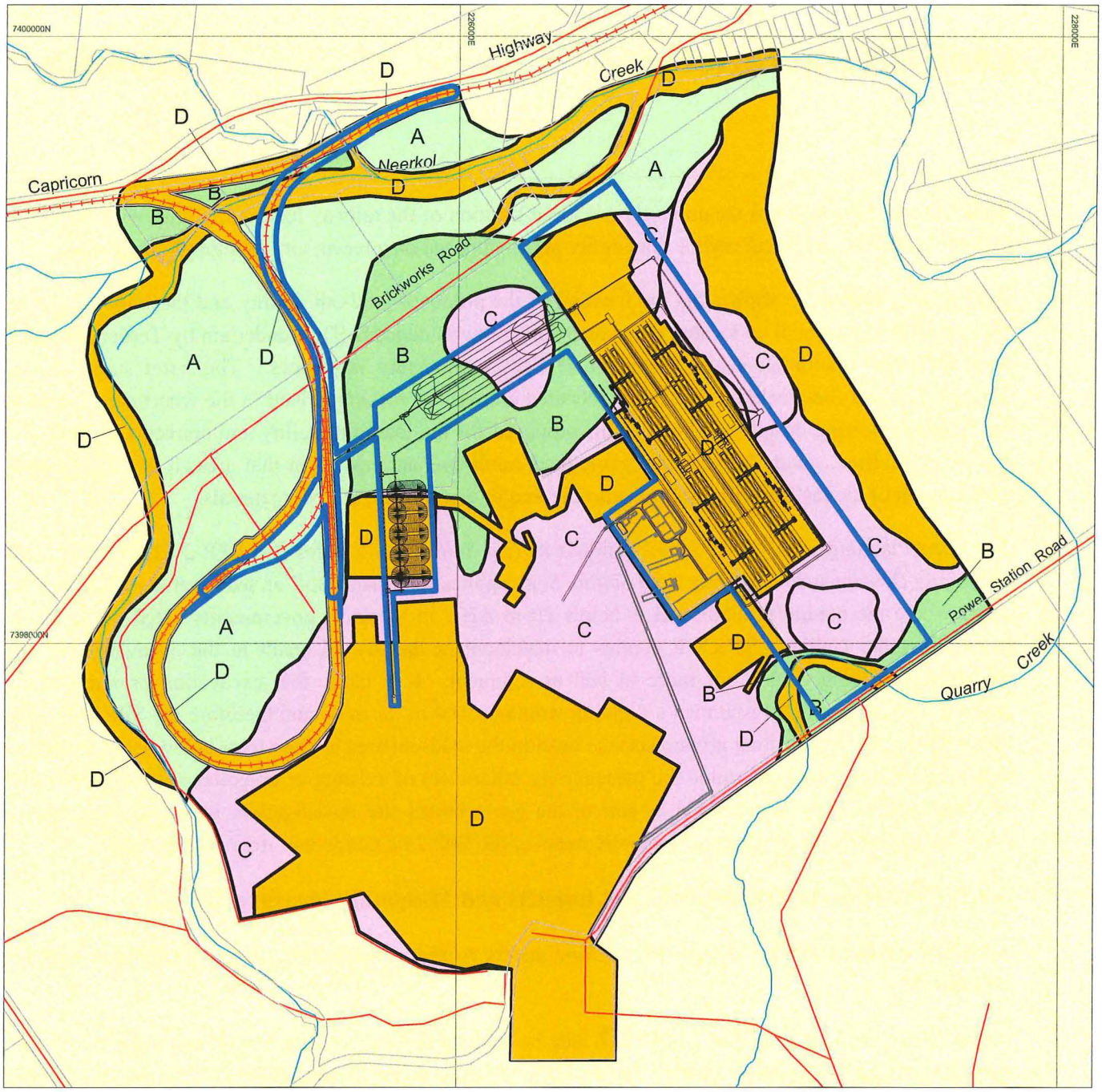
- Class A land comprises approximately 136.6 ha (21.8%) of the project area;
- Class B land comprises approximately 65.2 ha (10.4%) of the project area;
- Class C land comprises approximately 135.6 ha (21.6%) of the project area; and
- Class D land comprises approximately 288.6 ha (46.1%) of the project area.

The land affected by the proposed project footprint comprises approximately 7.7 ha (6%) of Class A land primarily along the proposed railway corridor and in northern corner near Brickworks Road. The Class A land along the proposed rail spur corridor is privately owned (a total of 1.2 ha on Lots 214/P4047 and 2/RP614973) and is being used for cropping. The justification for the loss of this Good Quality Agricultural Land is discussed below, as are measures to mitigate impacting the Class A land adjacent to the rail spur corridor. Elsewhere within the development footprint, there is approximately 17.8 ha (27%) of Class B land and 32.3 ha (24%) of Class C land. Approximately 65.2 ha (23%) of the Class D land is likely to be affected. This land (including the Class A land near Brickworks Road) is owned by SCL as part of the SEP and falls within the Special Industry zoning under the Fitzroy Shire Planning Scheme (FSC, 2005). None of the SCL land is currently used for agricultural purposes.

3.2.2 [*Geology and Soils*] Potential Impacts and Mitigation Measures (8)

DNRMW states that the location of the proposed conveyor system (Figure 3.5 from the rail loop to the wharf) should be determined and presented on an air photo base (similar to Figure 3.7), and an assessment of ASS undertaken as per the requirements outlined in SPP 2/02.

DNRMW have requested additional information regarding any potential impacts with respect to Acid Sulphate Soils (ASS) in the area proposed for the construction of a rail load-out facility, conveyor system and product stockpile in the Fisherman's Landing wharf area. To address these issues, Figure 3.3 has



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A	Crop Land - land suitable for crops with nil to moderate levels of limitations.
B	Limited crop land - land that is marginal for crops due to severe limitations and suitable for pastures. Engineering and/or agronomic improvements may be required before the land is suitable for cropping.
C	Pasture land - land suitable only for improved or native pastures, continuous cultivation precluded, but some areas may tolerate short periods of ground disturbance for pasture establishment.
D	Non-agricultural land - land not suitable for agricultural uses due to extreme limitations including steep slopes, shallow rocky soils, poor drainage, water courses or existing industrial developments.

N

0 500m 1000m

Scale 1:20 000 (A4)

Horizontal Datum GDA94 Zone 56

Proposed Development Footprint
Proposed Coke and Power Plant
Existing Stanwell Power Station
Property Boundaries
Creek
Road
Railway

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AGRICULTURAL LAND CLASSES

Drawn: VH	Approved: JMcD	Date: 29-06-2006	Figure: **3.2**
Job No: **42625626**	File No: 42625626-g-061.wor		Rev:A A4

been prepared which shows the currently proposed location of the railway load-out facility with the GSQ (2004) 1:100,000 geological regime boundaries super-imposed on a recent air photograph image base.

Reference to Figure 3.3 shows that the location of the proposed load-out facility and the initial stage of the conveyor system will be located in residual soil/colluvial deposits (Qrs) underlain by Tertiary Rundle Formation (Tr) and/or Doonside Formation (DCcd) sedimentary sequences. The latter stage of the conveyor system and stockpile area will be located on existing reclaimed land in the wharf area. Whilst the final engineering design and foundations proposed for the load-out facility and conveyor system are yet to be finalised, given the substrate geological conditions anticipated in that area, it is unlikely that construction of the facility will result in exposure and/or disturbance of ASS materials.

The State Planning Policy (SPP) 2/02 Guideline: *Acid Sulfate Soils* states that SPP 2/02 *Planning and Managing Development Involving Acid Sulfate Soils* applies to all land, soil or sediment at or below 5 m AHD where the natural ground level is below 20 m AHD in the local governments listed in Annex 1 (which includes Calliope Shire). It applies to development that would result in the excavation of, or otherwise removing, 100 m^3 or more of soil or sediment. It is likely that excavation or removal of soil/sediment required at Fisherman's Landing would be 100 m^3 or more and therefore the SPP 2/02 will apply. Given that the existing ground surface level in the load-out area is close to or below RL 5 m AHD, sampling and testing to determine the presence (or otherwise) of existing or potential acid sulphate soils will be undertaken as a precaution as part of the geotechnical site investigation, yet to be undertaken. This will be done in accordance with requirements of the SPP 2/02 Guideline: *Acid Sulfate Soils.*

3.4.2 [*Land Use and Tenure*] Potential Impacts and Mitigation Measures (8, 18)

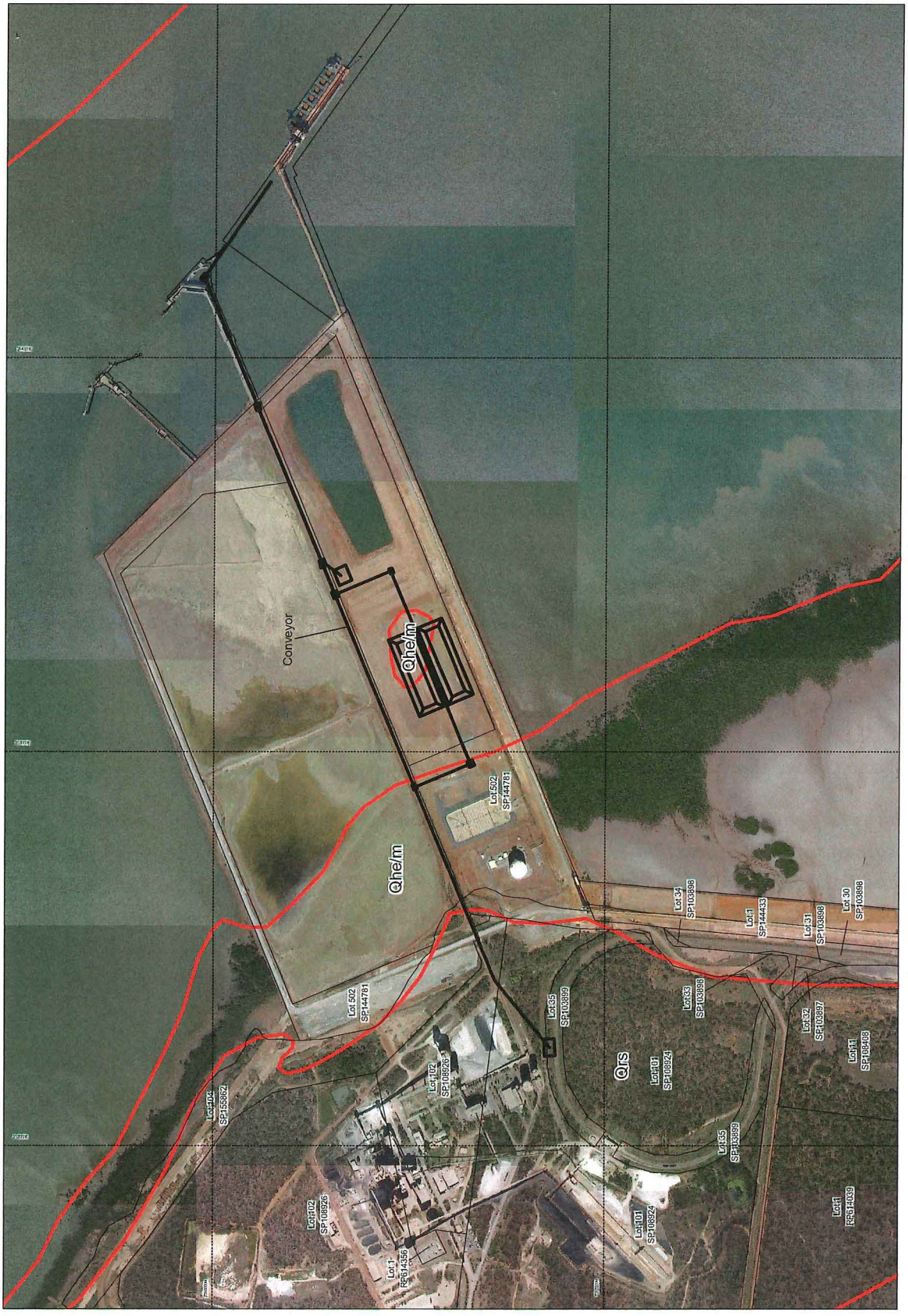
DNRMW requires further discussion on how access to the severed land on Lot 214/P4047 will be maintained.

Access to severed land on Lot 214/P4047 will be maintained via an access way/underpass under the proposed rail spur adjacent to Neerkol Creek. This will be accommodated as part of the bridge design and will be of sufficient dimensions to allow for the movement of farm machinery to the severed portion.

DNRMW requires further discussion on the overriding need for the project to justify the loss of valuable agricultural land in relation to the loss of Good Quality Agricultural Land, specifically in the area designated as K – Rural Village Balance (see Figure 3.8).

Under Part 4 Gracemere-Stanwell Zone of the "Fitzroy Shire Planning Scheme" (Fitzroy Shire Council, 2005) industrial development may locate in Precinct K where:

- The use has specific needs in relation to access to the transport network that cannot be met within any of the industry precincts;
- The site provides the only opportunity to meet specific operational requirements;
- The use will be located to ensure compatibility with existing industry; and
- Provision is made for the mitigation of potential adverse impacts on nearby residential and rural land uses.



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EIS SUPPLEMENT

GEOLOGICAL BOUNDARIES FISHERMANS LANDING

Drawn: VH	Approved: JMcD	Date: 29-06-06	Figure: **3.3**
Job No: **42625626**	File No: 42625626-g-062.wor		Rev:A **A4**

The Project has specific transport needs that cannot be met on SCL land within Precinct I. It is likely that the rail spur will be aligned through a small area of Good Quality Agricultural Land on Lot 214/P4047. Redesign of the rail spur for the Supplement (see below) has resulted in no anticipated impact to Lot 2/RP614973. Alignment towards the east is necessary to ensure coke product can be railed to Fisherman's Landing, as currently the SPS rail loop only allows for the movement of trains to and from the west. As such, Lot 214/P4047 (and unallocated State land Lot 161/LN2211) are the only lots available that can accommodate the rail spur and therefore allow for the operation of the Project.

The proposed rail spur is located as close to the existing rail infrastructure as possible and the potential footprint minimised (including during construction) to reduce the impact on surrounding land uses. The Project location on a disturbed site adjacent to the SPS also reduces impact on land in the area and facilitates sharing of services infrastructure (such as for water, electricity, telecommunications and transport). Access to land currently used for agriculture on Lot 214/P4047 will be maintained, and should the land be acquired, the proponents envisage its current use to continue through lease agreements.

The proposed rail spur will dissect Lot 161 on LN2211 (Unallocated State Land). Tenure issues in relation to the proposed use of State land will need to be resolved with DNRMW prior to construction.

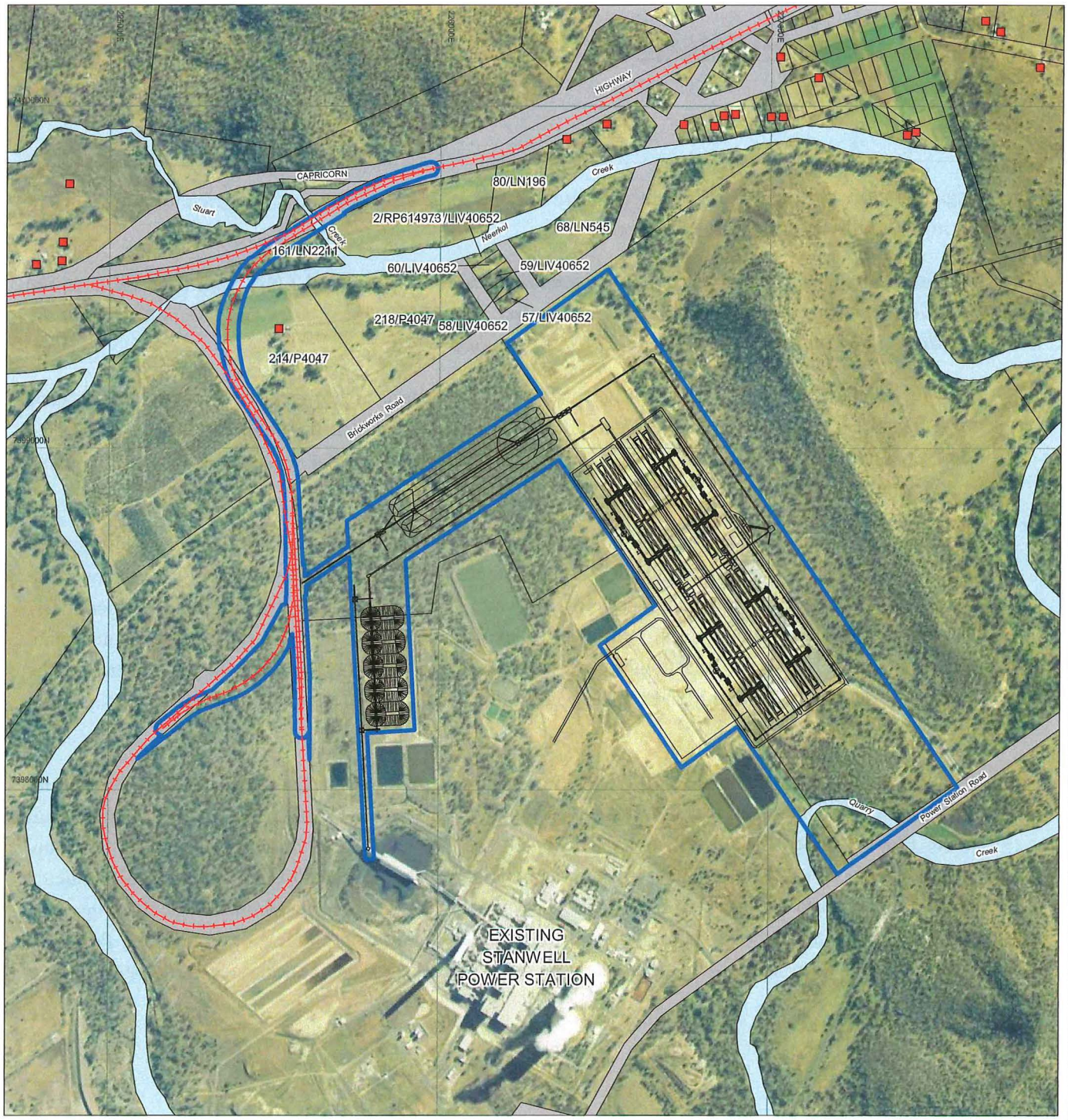
Tenure issues in relation to the proposed use of Lot 161/LN2211 will be resolved by the proponents and rail infrastructure provider in consultation with DNRMW prior to construction of the rail spur. Any Native Title issues in relation to unallocated state land including Lot 161/LN2211 traversed by the rail spur will also be investigated and appropriately addressed prior to construction.

Ms. Goldsworthy states that the EIS does not adequately consider the potential impact on the land that will be caused by the construction of the rail spur per se, including vehicle access over Lots 80-81 LN196 and Lot 2 RP614973. Vehicle movement on and around Lots 80-81 LN196 and Lot 2 RP614973 has the potential to create an accident and injury risk. Ms. Goldsworthy states that benefit of outlays for pasture improvement will be lost as a result of railway construction as the land will become degraded and unusable. Ms. Goldsworthy states that construction of the rail spur in its proposed location would restrict access to Neerkol and Stuart Creeks for irrigation purposes.

Responses to the EIS relating to the layout of the rail spur and potential flooding and access issues have been addressed through the redesign and alignment of the rail spur. The rail spur will no longer traverse Lot 2/RP614973, but will extend over approximately 1.2 ha of Lot 214/P4047 (private freehold) and 0.77 ha of Lot 161/LN2211 (unallocated State land) (Figure 3.4) before joining into the existing Blackwater rail corridor, parallel to the Capricorn Highway.

Access for construction activities will be via the proposed rail spur corridor which will approximate 60 m in width, extending south/south-west from the Blackwater corridor to meet the SPS rail loop. The merging point where the proposed rail spur would join the Blackwater line (east/west) may require approximately 0.018 ha along the northern-western boundary of Lot 2/RP614973 (near Stuart Creek), although this is yet to be confirmed. Access along the Blackwater rail corridor will be via existing maintenance tracks and will not impact on Lots 80 and 81/LN196.

Depending on the final design, the physical impact on Lot 2/RP614973 from the construction and operation of the rail spur will be minimal to none. There will be no access across the lot nor will



LEGEND

- Proposed Development Footprint
- Proposed Coke and Power Plant
- Existing Stanwell Power Station
- Road
- Railway
- Rural Dwelling

N

0 200 400m

Scale 1:17 500 (A4)

Horizontal Datum GDA94 Zone 56

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STANWELL CORPORATION LIMITED

QUEENSLAND COKE & ENERGY

URS

QUEENSLAND COKE
AND POWER PLANT PROJECT
EIS SUPPLEMENT

REVISED PROJECT LAYOUT

Drawn: VH	Approved: JMcD	Date: 29-06-2006	Figure: **3.4**	Rev:A
Job No: **42625626**	File No: 42625626-g-070.wor			**A4**

irrigation/water abstraction be impacted. There may be some very small loss of agricultural land (0.018 ha) in the north-western corner of the lot.

Ms. Goldsworthy states that there is a residential dwelling on Lot 80-81 LN196 not referred to in the EIS. Given the environmental impacts of the project, Ms. Goldsworthy states that it is unlikely that the dwelling will be rentable, with subsequent loss of income.

Lots 80 and 81/LN196 are not identified in the EIS, as tenure identification was restricted to those properties directly impacted by the Project, or those that comprised SCL freehold land. It should be noted however, that the dwelling on Lot 81/LN196 is identified on Figure 3.4 with the exception of a small structure to the south of the dwelling.

Noise impact assessment for neutral conditions (Figure 9.1) indicates that project noise levels will meet criteria (36 dBA) for these lots, although criteria for these locations are higher than in Stanwell township due to their close proximity to the Capricorn Highway. Visual impact assessment (refer EIS Section 3.7 Visual Amenity and Scenic Values) indicates that the top portions of the SPS cooling towers and main stack are visible from some locations in the Neerkol Creek Corridor, including in the vicinity of the residences along the Capricorn Highway, but generally, views toward the project site from that area are screened by tree canopies.

In addition, it is anticipated that by 2009/2010, the rail usage on the main east-west line of the Blackwater corridor will have increased to 230 trains per week, of which 7% (or 16 trains per week) will be a result of the Project. Given the overall lower amenity of the immediate area due to the existing rail loop, position of the Blackwater rail line and Capricorn Highway in relation to the dwelling (and predicted increase in rail traffic), location of existing industry and the fact that in close vicinity to the dwelling is an extensive area zoned Precinct I for industrial development, the impact on amenity due to the Project is considered to be low and would be unlikely to deter potential tenants seeking accommodation in that location.

No submissions made.

5.1.2 [*Surface Water*] Potential Impacts and Mitigation Measures (1, 3, 6, 8, 12, 15, 16, 18)

The EPA states that the EIS should present relevant concentrations of wastewater contaminants. The factors that result in the various contaminants being present (or not present) should be discussed in characterising the nature of the waste waters and explaining how best practice measures have been incorporated in the proposal. The EPA requires that the EIS present proposed water quality monitoring for wastewater discharges, receiving waters and groundwater. The quality characteristics included in the monitoring program need to be informed by the quality of the wastewater discharges and expected contaminant loads.

Potential wastewater streams associated with the Project include stormwater runoff from plant areas and the coal and coke stockpiles, cooling and boiler blowdown water from the Power Plant, and treated runoff from washdown areas and operational areas. It is proposed that all blowdown water from the Power Plant will be used in the Coke Plant quenching process. However, if not used as quenching water, blowdown would be the only continuous wastewater discharge. The remaining streams are a direct result of rainfall. A further potential wastewater stream would occur if a demineralisation plant is commissioned.

Stanwell Project Site Stockpile Runoff

Coal and coke particulates will be mobilised in stormwater runoff from the coal or coke stockpiles and from the main coke plant areas. Key potential contaminants associated with coal and coke particulates include trace elements such as some heavy metals and hydrocarbons. Particulates also influence water turbidity.

Water quality monitoring results of runoff from Stanwell Power Station's (SPS) Coal Stockpile Runoff Pond No. 2 between 31 January 2005 and 2 January 2006 have been reviewed in comparison with screening criteria used for Neerkol and Quarry Creeks in the EIS as a reference of the potential quality of runoff from project stockpiles (Table 5.1). SPS' coal stockpile runoff enters no release dams/ponds. SPS uses thermal coal that contains 12-18% ash, whereas coking coal is processed through a coal preparation plant or washery and discrete mineral matter (*e.g.* clays, mudstones, other rock, pyrite and carbonates) is present in lower quantities as it is washed prior to arrival at SPS to a low ash content (approx 8.5%). Therefore, differences exist in the runoff water quality between washed coking coals and thermal coals, with stockpiles of coking coal releasing water of a higher quality than typical thermal coals.

This data in Table 5.1 is supplied subject to the following qualifications:

- The coal stockpile at SPS is drained to a series of holding ponds. Some of these ponds are also being or have been used for other purposes and as such the water chemistry is not entirely representative of coal drainage.
- The data for Coal Stockpile Pond No. 2 is not influenced by groundwater, but does receive some hose-down/dust suppression water (derived from raw water).
- The data relates to coal supplied to SPS's quality specification for power generation and hence may not be 100% representative of runoff from coals used for the Coke Plant.

Table 5.1 SPS Water Quality Monitoring Data Coal Stockpile Runoff Pond No. 2 (2005-2006)

Indicator	EPA/ANZECC Guidelines[1]			Mean	Maximum	Minimum
	Aquatic Ecosystem	Stock Watering	Irrigation			
Conductivity (µS/cm)	340	NR	VAR[2]	1,280	1,480	1,010
pH	8	NR	6.5-9	8.5	8.7	8.3
M-Alkalinity (mg/L)	NR	NR	NR	120	135	98
Turbidity (NTU)	50	NR	NR	43	80	10
TSS (mg/L)	NR	NR	NR	20	36	2
TDS (mg/L)	NR	4,000	NR	806	903	638
Arsenic (acid extractable) (µg/L)	13	NR	NR	5	6	2
Boron (acid extractable) (µg/L)	370	NR	NR	200	300	100
Calcium (mg/L)	NR	1000	NR	74	86	59
Chloride (mg/L)	NR	NR	175-700	160	180	135
Fluoride (mg/L)	NR	NR	1,000	0.8	1.2	0.7
Lead (acid extractable) (µg/L)	3.4	NR	NR	<1	<1	<1
Magnesium (mg/L)	NR	NR	NR	33	38	28
Mercury (acid extractable) (µg/L)	0.6	NR	NR	<0.1	<0.1	<0.1
Potassium (mg/L)	NR	NR	NR	21	32	16
Selenium (soluable) (µg/L)*	11	20	NR	<10	<10	<10
Silica (mg/L)	NR	NR	NR	25	28	23
Sodium (mg/L)	NR	NR	115-460	140	158	112
Sulphate (mg/L)	NR	1,000	NR	271	315	188
Cadmium (acid extractable) (µg/L)	0.2	10	100	<0.1	<0.1	<0.1
Chromium (acid extractable) (µg/L)*[3,4]	4.9	1,000	100	2	4	BD
Copper (acid extractable) (µg/L)[3]	7.3	1,000	200	3.5	4	3

Notes: * No Limits of Reporting (LOR) provided so 0 is equivalent to <LOR.

[1] EPA (2005a) guidelines given for pH, total nitrogen, total phosphorus and EC. ANZECC/ARMCANZ (2000) default trigger values for lowland river aquatic ecosystems, livestock (beef cattle) watering and irrigation of general crops given for all other indicators where relevant.

[2] Guideline values of EC for irrigation of crops are highly variable dependent on a range of factors including type of crop.

[3] Trigger values corrected for water hardness.

[4] Trigger value for CrVI.

Exceedance of the guideline criteria (upland river aquatic ecosystems) is shown as shaded cells, exceedance of irrigation upper limits is shown in bold. There was no exceedance of stock watering criteria for mean values.

NR = No values recommended.

BD = Below detection

Generally the SPS data indicates water quality from the SPS coal stockpile meets guideline criteria for discharge to the environment. The exceptions are for EC and pH. However, the mean EC value (1,280 µS/cm) is at a similar level to or lower than the median values for EC detected on Neerkol Creek upstream of the SPS discharge at the Murray's Farm (1,394 µS/cm) and Brickworks Road (3,705 µS/cm) monitoring locations (as presented in Table 5.1.4 of the EIS). Mean pH is slightly higher than that

detected in Neerkol Creek but is within the pH discharge limits for pH for Quarry Creek. It should be noted that the SPS coal stockpile runoff pond does not discharge directly to the environment.

The Conceptual Stormwater Management Plan for this Project (EIS Appendix F) outlined the strategy for minimising discharges of particulate-laden waste water to the environment. The plan incorporates several measures for stormwater management including the construction of appropriate settlement and evaporation ponds to capture, treat (through settlement) and dispose of (through water re-use in the plant and evaporation) this waste water so that discharges to the environment would only occur with an Average Recurrence Interval (ARI) of 10 years. Any discharges would therefore be during extreme weather events when the likely concentration of potential contaminants would be diluted both within the ponds and in the watercourse into which the discharge would be directed (*i.e.* Neerkol Creek).

The total volume of particulate-laden wastewater from this source will be highly dependent on rainfall conditions and is therefore likely to be highly variable. The average volume of water discharged during any one of these events was modelled for the Conceptual Stormwater Management Plan. Modelling suggested that, dependent on the final configuration of the plant, an average of between 15 and 42 ML would be discharged during an overflow event. With an ARI of 10 years for discharges, it should be noted however that flow in the receiving watercourse is likely to be a great deal higher than the rate of discharge during an overflow event and that for most years the total discharge from the settlement and evaporation ponds will be zero.

Contaminant loadings in discharge from the settlement and evaporation ponds will also be highly variable and dependent on a wide range of parameters such as prevailing weather conditions, duration and severity of rainfall events, and the type and volume of coal and coke stockpiled and used within the Project. Water captured within the settlement and evaporation ponds is derived from the main plant area and both coke and coal stockpiles. This may therefore include hose-down and dust suppression water and is likely to be of a similar quality to that presented in Table 5.1 at the SPS site. This suggests that water contained within the settlement and evaporation ponds is likely to generally meet screening criteria. Furthermore, this would only discharge to the environment on average once every 10 years, most likely during heavy rainfall when there will be significant dilution within the receiving watercourse.

A monitoring program that includes sampling periodically from the settlement and evaporation ponds will be implemented to ensure that waste waters are characterised through the duration of the Project. The suite of analytes for this monitoring is presented in Table 5.2. Appropriate measures to ensure that contaminant concentrations are reduced and impacts to the environment are mitigated will be directed by analysis of the results of the monitoring programs.

Table 5.2 Analytical Suite for Monitoring from Coke Plant Settlement and Evaporation Ponds

Analytical Suite	
Electrical Conductivity	Chromium
pH	Copper
Temperature	Iron
Total Hardness	Lead
Alkalinity	Magnesium
Turbidity	Manganese
Total Suspended Solids	Mercury
Total Dissolved Solids	Nickel
Total Petroleum Hydrocarbons	Selenium
EPA recommended suite of associated Poly Aromatic Hydrocarbons (PAHs)	Potassium
Arsenic	Silica
Boron	Sodium
Cadmium	Strontium
Calcium	Sulphate
Chloride	Zinc

Cooling Water Blowdown

It is proposed that 100% of the Power Plant cooling water blowdown be used as quenching water in the Coke Plant. In this scenario no blowdown would be discharged directly as wastewater except during unforseen circumstances. Should the situation arise where blowdown could not be used for quenching, between 200 and 1,400 ML per year will be discharged (after treatment in a settlement pond) dependent on the final configuration of the plant. This is less than that currently discharged from SPS (between 1,600 and 2,200 ML per year).

The type of mechanical draft cooling tower to be used at the Power Plant may influence the level of metals and other compounds in the blowdown wastewater stream. Should a tower which uses CCA treated timber for its structure be selected, it is possible that copper (Cu), arsenic (As) and chromium (Cr) levels may be slightly elevated. Table 5.3 below presents data gathered from each of the SPS cooling towers over the period 3 January 2005 to 13 March 2006 in comparison with screening criteria used for Neerkol and Quarry Creeks in the EIS. This data is considered to be indicative of the likely quality of cooling water blowdown from the proposed Power Plant as it is released from the cooling towers.

Table 5.3 SPS Water Quality Monitoring Data Cooling Water Blowdown (2005 – 2006)

Indicator	EPA/ANZECC Guidelines[1]			Mean	Maximum	Minimum
	Aquatic Ecosystem	Stock Watering	Irrigation			
Electrical Conductivity (EC) (µS/cm)	340	NR	VAR[2]	1,760	2,390	850
pH	8	NR	6.5-9	8.5	8.8	8.2
M-Alkalinity (mg/L)	NR	NR	NR	142	168	116
Turbidity (NTU)	50	NR	NR	588	2,400	15
Total Suspended Solids (mg/L)	NR	NR	NR	388	1,640	18
Total Dissolved Solids (mg/L)	NR	4,000	NR	1,174	1,713	528
Arsenic (acid extractable) (µg/L)	13	NR	NR	14	18	7
Boron (acid extractable) (µg/L)	370	NR	NR	-	-	-
Calcium (mg/L)	NR	1000	NR	95	148	82
Chloride (mg/L)	NR	NR	175-700	277	353	128
Fluoride (mg/L)	NR	NR	1,000	-	-	-
Lead (acid extractable) (µg/L)	3.4	NR	NR	9	16	1
Magnesium (mg/L)	NR	NR	NR	44	67	25
Mercury (acid extractable) (µg/L)	0.6	NR	NR	BD	BD	BD
Potassium (mg/L)	NR	NR	NR	32	50	15
Selenium (acid extractable) (µg/L)*	11	20	NR	BD	BD	BD
Silica (mg/L)	NR	NR	NR	86	134	50
Sodium (mg/L)	NR	NR	115-460	208	280	86
Sulphate (mg/L)	NR	1,000	NR	328	658	98
Cadmium (acid extractable) (µg/L)	0.2	10	100	0.05	0.3	BD
Chromium (acid extractable) (µg/L)*[3,4]	NR	1,000	100	58	105	13
Chromium VI (µg/L)	4.9	NR	NR	-	-	-
Copper (acid extractable) (µg/L)[3]	7.3	1,000	200	52	127	14
Total Phosphorous (mg/L)	0.05	NR	0.05	1.7	11.3	0.02
Total Nitrogen (mg/L)	0.5	NR	5	**4.6**	10.6	0.3

Notes: Amongst this data set are some rank outliers (*e.g.* maximum total phosphorous) that may not represent good data.

* No Limits of Reporting (LOR) provided so 0 is equivalent to <LOR.

[1] EPA (2005a) guidelines given for pH, total nitrogen, total phosphorus and EC. ANZECC/ARMCANZ (2000) default trigger values for lowland river aquatic ecosystems, livestock (beef cattle) watering and irrigation of general crops given for all other indicators where relevant.

[2] Guideline values of EC for irrigation of crops are highly variable dependent on a range of factors including type of crop.

[3] Trigger values corrected for water hardness.

[4] Trigger value for CrVI.

Possible exceedance of the guideline criteria (upland river aquatic ecosystems) shown as shaded cells as total concentrations not dissolved fraction are provided here. Exceedance of irrigation upper limits shown in **bold**. There was no exceedance of stock watering criteria for mean values.

NR = No values recommended.

BD = Below detection.

It should be noted that blowdown from the SPS is discharged to Quarry Creek via settlement ponds with reed beds at the Northern Storm Water Dam (NSWD), and not directly from the cooling towers. Settlement in the NSWD results in the following:

- Total Suspended Solids (TSS) are removed by plants in the reed beds which reduce TSS down to approximately 10 mg/L or less before release from the NSWD;
- pH tends to drift upwards across the NSWD under the action of biological growth; and
- Silica is sometimes reduced as a consequence of the TSS removal.

As stated above, it is the preference that all of the cooling water blowdown from the proposed Power Plant will be re-used for coke quenching. However, it is still possible that some or all of this water will need to be discharged to Quarry Creek in unforeseen circumstances. It is assumed that the requirements of an EA would be similar to those currently applying to the SPS discharge.

In order to meet these requirements, a degree of treatment would be needed. The Power Plant cooling water blowdown is proposed to be stored in a settlement pond prior to release to Quarry Creek, if it is not used for coke quenching. The design of this pond will follow best practice guidelines and likely follow a similar approach to that currently being used for the SPS discharge. Water will be diluted by rainfall events and the chemistry modified as described above. The likely quality of this water will be similar to the current SPS cooling water blowdown discharged from the NSWD. Water quality data relating to this wastewater stream has been previously presented in EIS Table 5.1.4.

Periodic monitoring of Power Plant cooling water blowdown into the settlement pond would be carried out with additional monitoring at the discharge from the ponds. The suite of analysis would be as presented in Table 5.3 with the addition of monitoring of Total Phosphorous and Total Nitrogen.

Boiler Blowdown

Boiler blowdown is largely demineralised water with a trace of minor chemicals. The predicted quality would be 1 to 2 mg/L ammonia (deliberately added for pH control) and up to 1 mg/L each of sodium, chloride and sulphate. From an environmental perspective, this is still very clean water and as such will almost always be acceptable for reuse in the coke quench system (*i.e.* it is much cleaner than raw water from the Fitzroy River).

The need for a demineralisation plant as part of the proposed Power Plant has yet to be determined. The Power Plant may purchase demineralisation water from SPS, or may provide its own from a new demineralisation plant that would be sited adjacent to the Power Plant. The waste stream from such a plant may require disposal back within SPS due to its chemical nature depending on technology choice.

Assuming that a new demineralisation plant is required separate from SPS and the disposal of effluent from it is not permitted back into the SPS system, the technology choice is likely to be reverse osmosis (RO) or electrodeionisation (EDI). This plant would produce a benign effluent that is acceptable for environmental release. Specific waste water quality details are not available.

Other Stanwell Project Site Wastewater

Other potential sources of wastewater include potentially contaminated runoff from bunded oil and chemical storage areas. Although this is unlikely to occur because of the low likelihood of failure from the proposed storage and pipeline infrastructure and precautions within the Environmental Management Plan for the site (which will include a spillage response plan), rainwater may come into contact with contaminant leakage or spillage. Water within the bunds of chemical or oil storage areas will be inspected and tankered off-site if there is risk of contaminated water overtopping the bunds. As such the wastewater will be prevented from discharging to the environment. Where this water is found not to contain contaminants, it will be of a similar quality to rainwater and will be left *in situ* (within appropriately sized bunds) to evaporate.

A similar approach will be adopted at washdown areas. Potential contaminants are likely to include coal and coke particulates and various hydrocarbon-based fuels and lubricants used in motor vehicles. The washdown water will be contained *in situ* to evaporate or directed to the settlement and evaporation ponds through an oil/water separator to prevent the generation of wastewater containing free product. Any loading of particulate matter and associated potential contaminants within this water will therefore be treated in the same way as stormwater runoff from around the Coke Plant and the stockpiles. All bunded areas and wastewater collection pits will be isolated from surface runoff to prevent excessive volumes of wastewater production.

Fisherman's Landing Wastewater

The majority of fine coke material will be removed from the coke product prior to arrival at the Fisherman's Landing site and potential contaminants such as PAHs will be burned off during coke production at the Stanwell project site. However, the coke stockpile at the wharf will remain a potential source of fine inert carbon particulates. Particulates that may originate from the coke stockpiles will have minimal impact on wastewater quality when compared to fines from thermal coals (Table 5.1).

Measures will be taken to limit the mobilisation of coke particulates, including dust suppression and routing surface runoff from the stockpiles into a settlement and evaporation pond (see below). Initial pond designs suggest that there is a risk of overflow on average once every 17 years. Rainfall events of the nature that would lead to an overflow would provide substantial dilution within site runoff. There would also be much greater rainwater input directly into Port Curtis at the same time. Site operations at Fisherman's Landing are unlikely to produce significant amounts of other potential pollutants. Periodic monitoring of the settlement and evaporation pond will be carried out for the same suite of analysis as for the Coke Plant settlement and evaporation ponds (Table 5.2).

The EPA recommends that the EIS explain the practicalities in reusing various blowdown waters for quenching and how such reuse can be maximised so as to avoid or minimise releases of wastewater to surface waters.

As discussed above, the preferred option is to use all of the Power Plant cooling blowdown water for coke quenching as this will reduce the overall raw water demand for the Project. There are no significant water quality restrictions on this approach. Should some or all of this water be required to be discharged to

Quarry Creek, the proponents will apply for an EA to allow for this. It is assumed that the requirements of an EA would be similar to those currently applying to the SPS discharge. Treatment prior to discharge to Quarry Creek would comprise storing the blowdown in a settlement pond, if it is not used for coke quenching. The design of this pond will comply with best practice guidelines and likely follow a similar approach to that currently being used for the SPS discharge. Water will be diluted by rainfall events and the chemistry changed as described above. The likely quality of this water will be similar to the current SPS cooling water blowdown discharged from the NSWD.

The EPA requires more detail to be provided on stormwater management at the port facility.

Stormwater management at Fisherman's Landing will comprise measures to prevent environmental or operational impacts. Stormwater will be separated through a system of appropriately-sized v-drains for 'dirty' areas with the potential to produce contaminants (the coke stockpile area) and 'clean' areas (the remainder of the site). Runoff from the 'dirty' areas will be routed to a settlement and evaporation pond with a similar conceptual design strategy as that outlined for the Coke Plant (EIS Appendix F). The water balance model used for this work was revised using preliminary dimensions for the coke stockpile at Fisherman's Landing and rainfall and evaporation data for Gladstone. Water from the pond will be re-used for dust suppression at the coke stockpiles, however, no other re-use was assumed. Further details of the original model set-up are provided in EIS Appendix F.

The results of the modelling suggest that a pond with surface area of approximately 11,000 m^2 and average depth of 2.5 m will have sufficient volume capacity to contain stormwater runoff from the coke stockpile to ensure overflows will only occur into the Port Curtis bay, on average, once every 17 years. The average volume of overflow was modelled to be approximately 2,400 m^3. Further information on likely frequency, volume and quality of discharge from the pond at Fisherman's Landing will be provided at the detailed design stage. However, at this stage, preliminary modelling suggests that there is sufficient land available for pond to be designed with the required dimensions as outlined above.

Once the source of the supply of potable water is determined QH advises that it would be appropriate to contact the local Population Health Unit to advise them of the source of the water supply.

The proponents will advise the local Population Health Unit of the potable water supply source for the Project once it has been confirmed.

Currently eight abstraction licences for creek water include domestic supply. QH states that if discharges from the project affect these users, alternative water supplies will be required. QH questions whether the proponents have any contingency plans in place for these users, if their water supply becomes unusable. FBA recommends that water license conditions take into account the pressures already exerted on the waterway, and therefore, the quality of water that can be discharged without adversely affecting the environmental values of the waterway.

It should be noted that water licence conditions as discussed by FBA is beyond the scope of the EIS and Supplement. These comments should be directed to the EPA for consideration as any discharges of water from the Project under an EPA Environmental Authority will take into consideration current downstream

users and existing environmental values. As such, any discharges from the Project are unlikely to adversely impact the water quality of Neerkol Creek to the extent that is becomes unusable.

Discharges from the site are only likely to occur through one of two possibilities. The first is via overflows from the settlement and evaporation ponds during periods of high rainfall which are predicted to occur on average once every 10 years. As such, these events are unlikely to lead to significant impacts on the long-term usability of creek water for supply to licensees especially considering that these discharges will be coincident with heavy rainfall which will significantly reduce any potential for impacts on water quality through dilution of the overflow discharge.

The second possibility for discharge is from Power Plant blowdown via settling ponds into Quarry Creek, should unforseen circumstances result in the blowdown not being used for quench water. As discussed above, discharge will be controlled via an EA to ensure that discharge water quality criteria are met. Should blowdown be discharged to Quarry Creek, this will be managed through the site's Environmental Management Plans and environmental systems to ensure it meets EA requirements. The water should therefore not adversely affect the environmental values of the waterway.

DNRMW states that the proponent should provide a detailed assessment of the impact of any fill on the flood immunity of surrounding properties, upstream and downstream of the proposed development. The EIS should also demonstrate how the specific outcomes of State Planning Policy (SPP) 1/03 - Mitigating the Adverse Impacts of Flood, Bushfire and Landslide in relation to flooding will be met by the development. Figure 5.3 shows a substantial section of the rail spur and link will be affected by flood, however there is no discussion on this aspect in the EIS. DNRMW states that further discussion is required on how the affects of flooding will be mitigated.

An initial flood hazard assessment was completed as part of the EIS. This suggested that the 100-year Average Recurrence Interval (ARI) flood from Neerkol Creek may possibly affect, or be affected by, proposed infrastructure to be constructed adjacent to the creek. A more detailed assessment of the impact of the Project within the floodplain on the flood immunity of surrounding properties, upstream and downstream of the proposed development, has been carried out as part of this Supplement.

The overall aims of this assessment were as follows:

- Development of more detailed hydrologic and hydraulic models to allow clearer understanding of the pre-existing mechanisms of flooding at the site;
- Assessment of post-development impacts on flood levels (afflux) upstream and downstream; and
- Characterisation of potential post-development flood hazards.

Key alterations to the model used in the original EIS assessment were as follows:

- More accurate measurement of sub-catchments contributing flow to Neerkol Creek allowing greater confidence in adjustments made to peak flows between the existing gauging station (approximately 3.8 km downstream from site) and the point closest to the site;

- Additional flow data compiled giving a more complete, continuous flow record between June 1987 and August 2006;
- Inclusion of bridge structures at both upstream and downstream ends of the modelled channel section;
- Addition of outline designs for flood protection at the coke stockpile; and
- Analysis of discrete modelling of the Stuart Creek – Neerkol Creek intersection, upstream of the site.

Flood hydrology was calculated by developing a flood frequency relationship from flow data at the gauging station on Neerkol Creek (130008A). The analysis utilised annual maxima discharges from 18 years of record (1987 - 2005; October to September water years). A Log-Pearson Type III distribution was applied to the recorded peak flood flow data to determine 2-, 5-, 10-, 20-, 50- and 100-year ARI peak flows for Neerkol Creek. Results of the flood frequency analysis are shown in Table 5.4.

Table 5.4 Flood Frequency Results for the Neerkol Creek Gauging Station (130008A)

ARI	Peak Discharge (m^3/s)
5-years	356
10-years	983
20-years	2,082
50-years	4,423
100-years	6,947

Peak flood flows for the 50- and 100- year floods were estimated for locations adjacent to the site using scaling relationships between the contributing catchment area to the gauging station and the catchment area as follows:

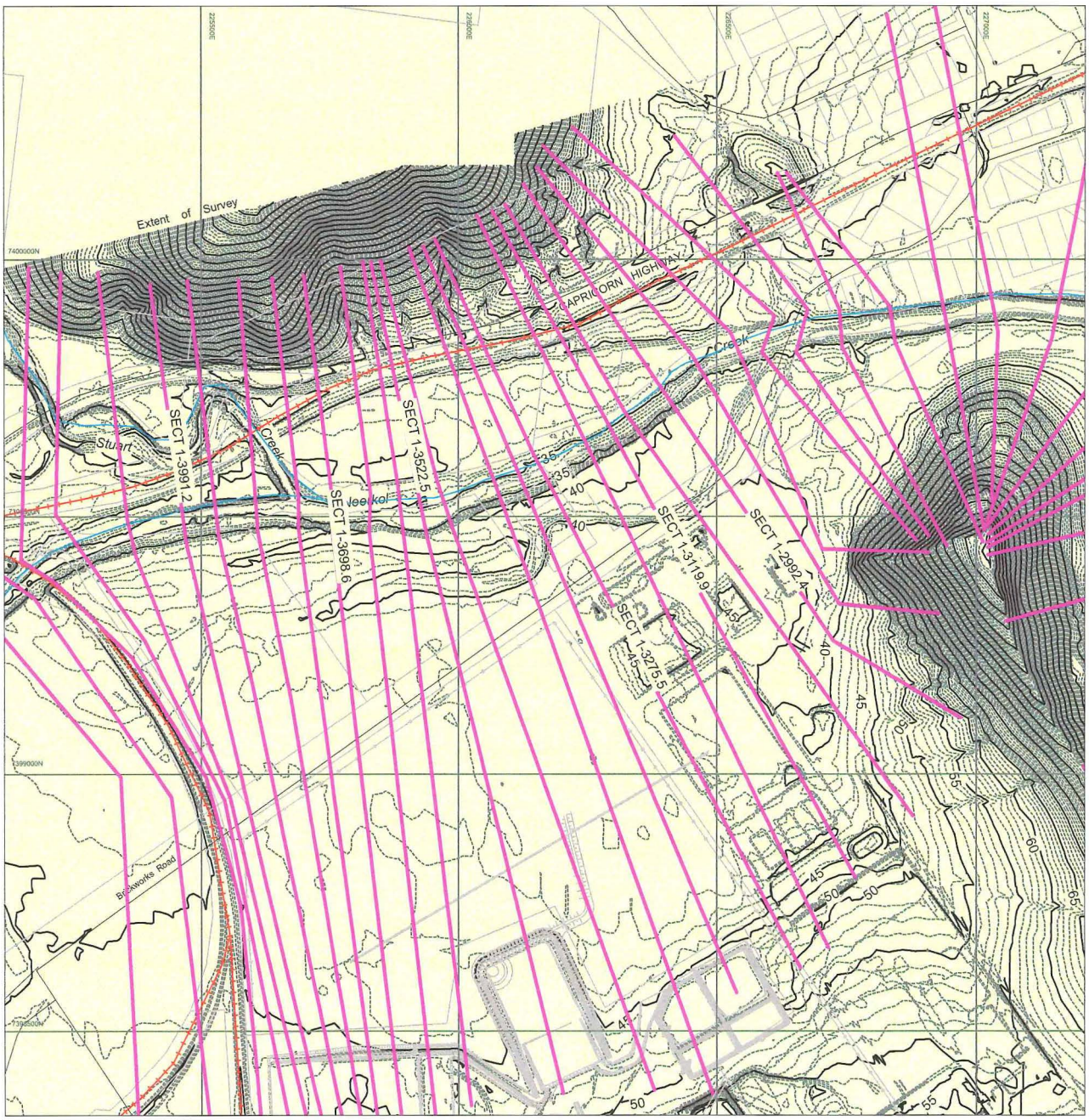
$$Q_{50} = 45A^{0.7}$$

$$Q_{100} = 68A^{0.7}$$

Design flows used in modelling were therefore 3,300 m^3/s for the 50-year ARI event and 5,000 m^3/s for the 100-year ARI event. Initial model runs suggested that at the Stuart Creek – Neerkol Creek intersection, the water level would encompass both creeks. As such, no discrete flow was modelled for Stuart Creek and Neerkol Creek upstream of their intersection.

A hydraulic model was created using the current version of HEC-RAS (v3.1.3). Due to a lack of suitable calibration data or specific anecdotal evidence on the extents of flooding during known flood events the hydraulic model has been left uncalibrated. However, the parameters defined in the model have been developed from published sources and are based on URS' experience in rivers of this type. Cross sections for Neerkol Creek adjacent to the Stanwell project site were developed from contour data for the site and surrounding area and these were input to a steady-state model in HEC-RAS (Figure 5.1).

The existing rail bridge (immediately downstream of Neerkol Creek and Stony Creek confluence) and culverted causeway under Brickworks Road (immediately downstream of the site) were included in the



LEGEND

- HECRAS Cross Section
- Proposed Coke and Power Plant
- Existing Stanwell Power Station
- Road
- Railway

N

0 200 400m

Scale 1:12 500 (A4)

Horizontal Datum GDA94 Zone 56

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STANWELL CORPORATION LIMITED

QUEENSLAND COKE & ENERGY

URS

QUEENSLAND COKE
AND POWER PLANT PROJECT
EIS SUPPLEMENT

HECRAS CROSS SECTIONS

Drawn: VH	Approved: JMcD	Date: 29-06-2006	Figure: **5.1**
Job No: **42625626**	File No: 42625626-g-071.wor		Rev:C A4

HEC-RAS hydraulic model, to take into account any energy losses and, in turn, water levels differences caused by the structures. Levels and widths of the structures were determined from survey data. Deck depth, pier diameter and spacing were estimated from photographs and site knowledge.

Simulation runs were completed for the existing baseline situation without any development and a case which included conceptual infrastructure designs based on spot levels for the main plant site, coke stockpiles and conveyors. Areas where filling within the floodplain are likely to take place are at the northern end of the main coke plant site in order to provide a flat platform at 51 m AHD and a flood protection bund surrounding the coke stockpile to raise this area outside the limits of flooding. All other topography is likely to remain relatively similar to the existing situation, although some excavation for the conveyors is possible. The extents of flooding for 50- and 100-year ARI floods for the existing situation are presented in Figure 5.2 and the extents of flooding for the same flood magnitudes for the post-development situation are presented in Figure 5.3.

A comparison of flood levels between the existing and post-development situations at selected cross sections is provided in Table 5.5 and Table 5.6 below.

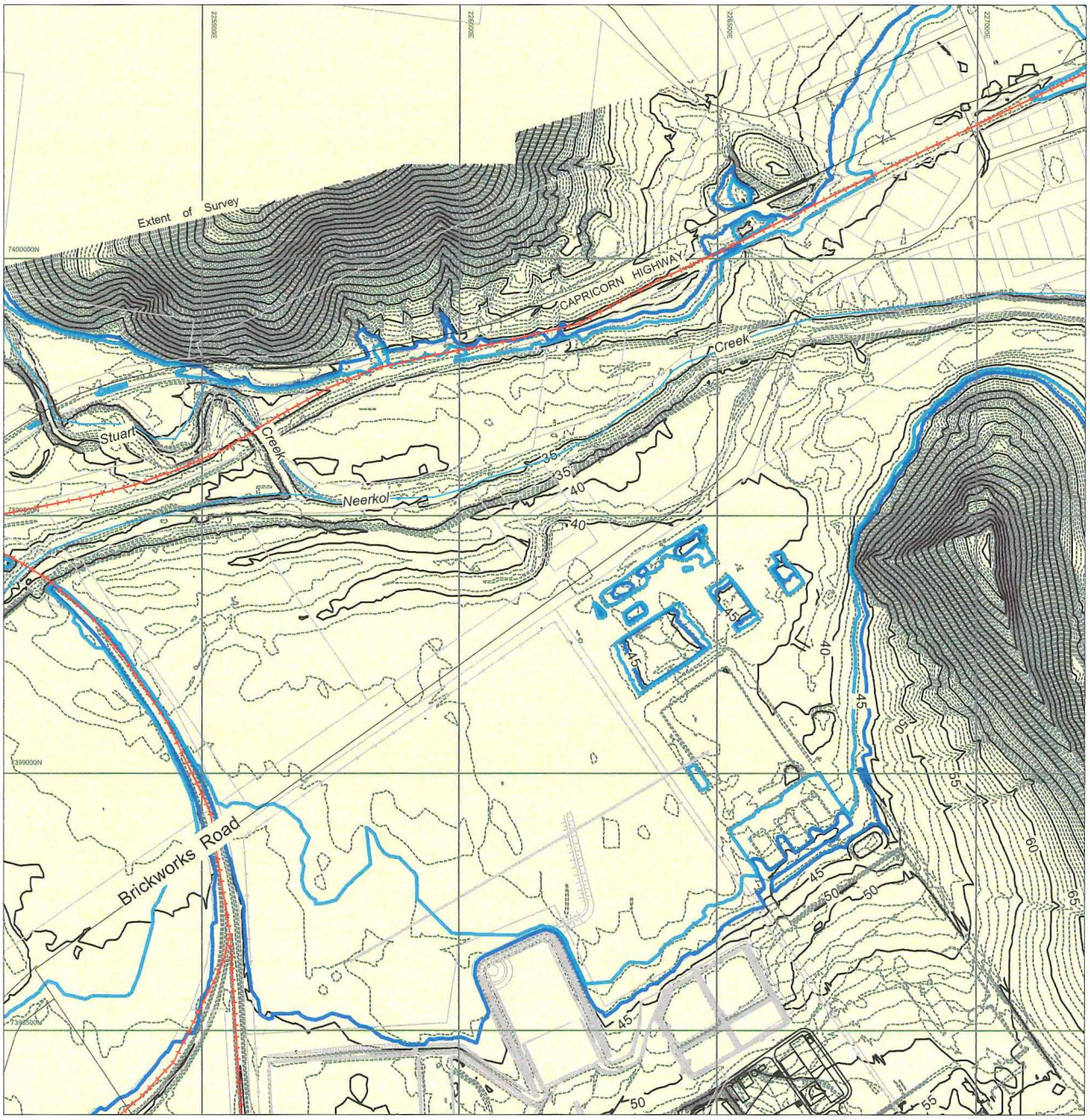
Table 5.5 50-yr ARI Flood Level Comparison

HEC-RAS Cross Section	Existing 50-yr ARI Flood Level (m AHD)	Post-Development 50-yr ARI Flood Level (m AHD)	Afflux (m)
3991.2	43.81	43.83	0.02
3698.6	43.22	43.27	0.05
3522.5	43.15	43.18	0.03
3370.3	43.10	43.11	0.01
3275.5	43.02	43.02	0.00
3119.9	42.86	42.86	0.00
2992.4	42.74	42.74	0.00

Table 5.6 100-yr ARI Flood Level Comparison

HEC-RAS Cross Section	Existing 100-yr ARI Flood Level (m AHD)	Post-Development 100-yr ARI Flood Level (m AHD)	Afflux (m)
3991.2	44.99	45.04	0.05
3698.6	44.57	44.66	0.09
3522.5	44.51	44.55	0.04
3370.3	44.48	44.50	0.02
3275.5	44.37	44.37	0.00
3119.9	44.25	44.25	0.00
2992.4	44.11	44.11	0.00

Within the constraints imposed by the site and development needs, the impacts of the site on flooding upstream and downstream have been minimised by moving the emergency coke stockpile to the south of its previous proposed location, within the coke plant area, and ensuring that the coke stockpile is located as far back from Neerkol Creek as possible. The proposed strategy to surround the coke stockpile with a



LEGEND

- Existing Indicative 50-year Average Recurrence (Inferred Flood Plain)
- Existing Indicative 100-year Average Recurrence (Inferred Flood Plain)
- Proposed Coke and Power Plant
- Existing Stanwell Power Station
- Road
- Railway

N

0 200 400m

Scale 1:12 500 (A4)

Horizontal Datum GDA94 Zone 56

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EXISTING AVERAGE RECURRENCE FLOODPLAIN

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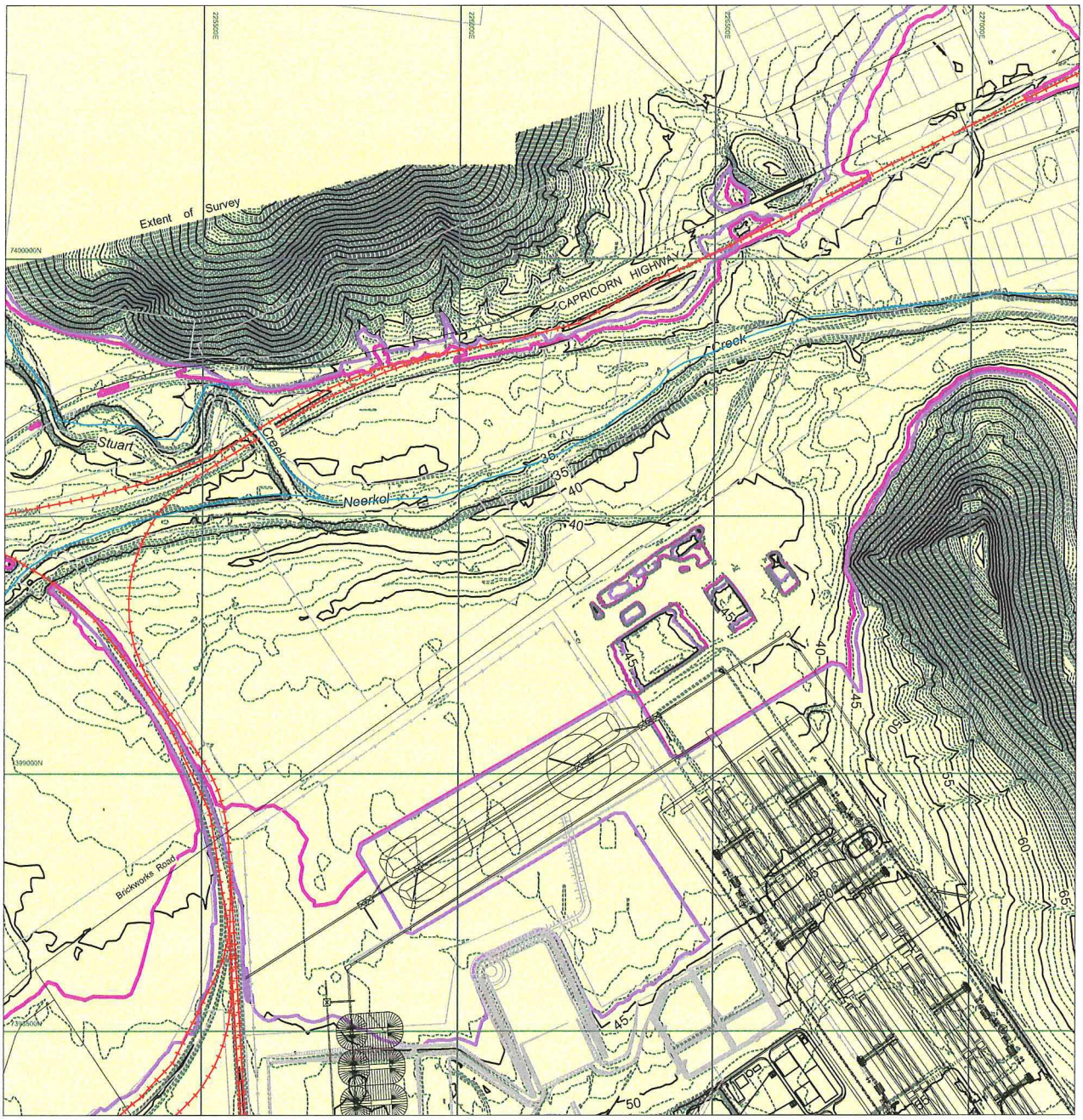
Job No: **42625626**	File No: 42625626-g-063.wor			**A4**



LEGEND

- Proposed Indicative 50-year Average Recurrence (Inferred Flood Plain)
- Proposed Indicative 100-year Average Recurrence (Inferred Flood Plain)
- Proposed Coke and Power Plant
- Existing Stanwell Power Station
- Road
- Railway

N

0 200 400m

Scale 1:12 500 (A4)
Horizontal Datum GDA94 Zone 56

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PROPOSED AVERAGE RECURRENCE FLOODPLAIN

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Job No: **42625626**	File No: 42625626-g-064.wor			**A4**

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bund, rather than provide flood protection for the entire development area to the south of the coke stockpile also minimises the reduction in volume storage whilst still providing a degree of protection for the coke and mitigating potential environmental hazards from coke mobilised into flood flows. These measures limit the requirement for fill within the floodplain and prevent the Project from significantly increasing the extent or the severity of natural hazards. Further flood assessment work will be carried out at the detailed design stage to ensure that all flood hazards are managed in accordance with regulatory requirements. At the detailed design stage, more detail on potential mitigation plans for reducing afflux and protecting the site from floodwaters will be provided.

Prior to approval being sought for the proposed rail spur, the proponent in conjunction with the rail infrastructure provider will undertake flood modelling. This would be used to design the proposed rail spur such that current flood levels would not noticeably change as a result of the works. The modelling results would be made available to DNRMW for comment.

DNRMW states that the site is within the area covered by the Fitzroy Basin Water Resource Plan. Any take of water will need an authorisation which can only be issued if it is in accordance with the principles of the plan and the subsequent Resource Operations Plan.

Of the potential options available for raw water supply, uses that do not increase the overall burden on the Fitzroy Basin would be the most sustainable, reliable and environmentally friendly. The "Fitzroy Basin Resource Operations Plan" (ROP) (DNRM, 2004) is the chief implementation tool of the "Fitzroy Basin Water Resource Plan" (DNRM, 1999) as defined by the Qld *Water Act 2000*. This seeks to manage water in an integrated and sustainable way to achieve a balance between the needs of current water users, further water-related development in the area and environmental flows needed for aquatic ecosystems.

Several opportunities for re-using water at the proposed site have been explored. These include re-use of blowdown from both the proposed Power Plant and the existing Stanwell Power Station and recycled water from the settlement and evaporation ponds collecting stormwater runoff from the project site. The quantity of this water available will be variable dependent on the size and configuration of the plant, the quality of raw water supplied for the Project, the heat of the coke ovens and seasonal rainfall patterns.

The total volume of raw water required for coke quenching and in the coke power plant will be between 1,800 ML/year for a 1.6 Mtpa Coke Plant with no Power Plant and 11,400 ML/year for a 3.2 Mtpa Coke Plant with Stage 2 Power Plant operating at full capacity. The Conceptual Stormwater Management Plan (EIS Appendix F) suggests that, for the latter scenario, up to an average of approximately 180 ML/year of recycled water from the settlement and evaporation ponds could be used for quenching to make up 10% of the total daily amount of quench water required. The volume of blowdown available for re-use is likely to be between 400 and 1,400 ML/year. The reason for the variability of these figures is explained above.

The maximum amount of water required is therefore likely to be approximately 11,000 ML/year. It is proposed that this will be sourced from the existing allocation held by Rockhampton City Council. Existing water allocations licensed by DNRM are already part of the ROP and Water Resource Plan and therefore authorisation is likely to be forthcoming.

DNRMW notes that the proponents are considering utilising the water discharged into Neerkol Creek from Stanwell Power Station (SPS). If this option is to be pursued, a pipeline directly from SPS to this site should be considered instead of applying for an authorisation to take the discharged water from the creek.

As an alternative to using 100% of the Power Plant blowdown as quenching water in the Coke Plant, the proponents are considering using SPS blowdown water in the Project, either accessed directly from the SPS or sourced from the NSWD. Should sourcing the water directly from SPS prove viable, the proponents will consider the option of installing a pipeline directly from SPS to the project site.

DNRMW states that any referable dam will require authorisation under the Water Act 2000. If the proponent requires an overland flow storage that is larger than, or is to be used for purposes other than the 'Code for self-assessable development' permits (under the Integrated Planning Act 1997), a development permit from DNRMW will be required. Any works which involve excavation, placing fill or clearing native vegetation within a watercourse will require authorisation.

It has been confirmed with DNRMW (A. McDonald, Senior Technical Officer, Pers. Comm. 18.04.06) that the *Water Act 2000* provisions relating to referable dams and overland flow storage will not apply to the Project. Since the settlement dams will have the primary purpose of capturing contaminated water, they will be assessed under the IDAS process as part of the overall development application. The captured water may be used in processing facilities as long as the use is incidental to the primary purpose of containing contaminated runoff. The construction of the rail spur may involve the placing of fill or clearing native vegetation within Neerkol and Stuart Creeks and authorisation for these works will be sought from DNMRW by the proponent and rail infrastructure provider once the design of the spur is determined.

DPIF states that the proponents should be aware of the Waterway Barrier Works (the maintenance of fish passage legislation), should the drains at the Stanwell site be considered "waterways". If it is proposed to construct a new, or to raise/lower an existing, weir/dam/water-pipe and other barrier across a waterway (both freshwater and tidal), including temporary structures, a Development Approval application under the Fisheries Act 1994 and Integrated Planning Act 1997, must be submitted for consideration by DPIF. The installation of a fishway may be required as part of any approval, to ensure fish passage across the barrier.

It is not proposed that any waterway barrier works (*i.e.* dam, weir or other barrier across a waterway) be constructed for the Project. It is anticipated that the bridge required for the rail spur across Neerkol Creek will be designed so as not to interfere with these waterways such that a development approval application would be required under IPA or the *Fisheries Act 1994*. However, if design or construction of the rail spur bridge involves works that may interfere with fish passage, all relevant approvals will be obtained. No new bridge is proposed over Stuart Creek, although the existing rail bridge may require some modification.

RCC asks that the proponents be requested to re-examine the design parameters for the two sedimentation ponds "on the basis that a 1/10 yr overtopping frequency is not considered appropriate".

The Conceptual Stormwater Management Plan suggests that a feasible approach to managing stormwater runoff at the Coke Plant and Fisherman's Landing is via settlement and evaporation ponds. A review of the parameters used in the preliminary modelling for this plan implies that an increase in the average depth and/or surface area of the settlement ponds would be required in order to meet more stringent overflow requirements. At this stage, numerous alternatives for the final plant configuration and water reuse options may still be adopted prior to the detailed design stage including design of the settlement and evaporation ponds. This information provides a clearer indication of what overflow frequency could be achieved within the limitations imposed by available space at the site.

The strategy of achieving a 10 year ARI for overflows is considered to provide an acceptable level of protection for the receiving environment in view of the likely water quality within the settlement and evaporation ponds (as described above), which will generally be within the screening criteria used in the EIS. Furthermore, overflows are likely to be significantly diluted by natural flows in the receiving watercourse during an overflow event. A review of the stormwater management strategy at Fisherman's Landing (as described above) suggests that an overflow ARI of 17 years can be achieved within the limitations on space at the site. As with the Stanwell project site, the overall impact of overflows on water quality at Fisherman's Landing is likely to be low due to the probable water quality and dilution in the receiving water body.

RCC asks that the proponents be requested to look at the susceptibility "and impact" of solids carrying over "in the event of a localised 1/100 yr flood event".

For the purpose of flood modelling, as outlined above, the coke stockpile will be located within an area of the floodplain potentially affected by floods with an ARI of 50-years and greater. As such, it is proposed to protect the coke stockpile by means of a bund surrounding the stockpiles platform area. Initial estimates from flood modelling suggest that a bund approximately 3 m high would be required around the coke stockpile to ensure that solids would not be carried over from the stockpiles during a large flood event (1/100 yr flood event). Therefore, in the event of a localised 1/100 year flood event there will be no overflow of solids and therefore no impact. In flood events greater than 1/100 year, solids (coke) will be carried over the bund and downstream unless removed from the stockpile prior to flooding (e.g. in response to advanced weather warning). Coke is relatively inert, and combined with the dilution effect of a flood event of that magnitude, any downstream impacts will be minimal/negligible.

FBA states that the environmental, economic and social implications of securing a 10,740 ML/year water allocation are not thoroughly covered in the EIS.

Dependent on the final configuration of the plant it is proposed that the maximum approximate raw water requirement of 11,000 ML/year for the Project will be met through utilising the existing water allocation granted to Rockhampton City Council. This allocation is provided for under the "Fitzroy Basin Resource Operations Plan" (ROP) (DNRM, 2004) as the chief implementation tool of the "Fitzroy Basin Water Resource Plan" (WRP as amended July 2005) (DNRM, 1999). The ROP must ensure that strategies established in the WRP for advancing sustainable water allocation and management in the Fitzroy Basin are met and aims to achieve this through the provision of monitoring requirements to confirm that the WRP's environmental flow and water security outcomes are being met. The potential impact of the water

allocation proposed for use at the Project has already been considered in issuing the allocation and therefore, does not require in-depth discussion for the purposes of the EIS.

FBA states that the volume of 2.01 GL of water on average per annum drawn by the SPS seems quite low and should be checked for accuracy.

The annual average use of water drawn by the SPS is 20.1 GL (presented incorrectly in the EIS of January 2006) from their current allocation of 24 GL/year from the Fitzroy River. This means that approximately 3.9 GL/year may be available for use by SPS for other purposes. If required, it is anticipated that the approximate maximum raw water requirement of 11 GL will be sourced from existing allocations held by Rockhampton City Council.

FBA states that 'unallocated' water use is the least preferred option for sourcing water for the project and water trading is the most preferred option as it will not impact Central Queensland Strategy for Sustainability 2004 and Beyond - Target A220 (barriers to fishways).

As mentioned above, it is anticipated that the approximate maximum raw water requirement of 11 GL will be sourced from existing allocations held by Rockhampton City Council through water trading. It is proposed that the water be provided by the existing pipeline used by SPS which commences approximately 30 km upstream of the Rockhampton Barrage. There are no new barriers proposed to be installed as part of the Project, either on-site or at the Fitzroy River and therefore no effect on the movement of fish that would require the installation of fish passages.

FBA states that the reference to Fitzroy Basin Association 2004a in relation to the "Fitzroy Basin Water Resource Plan" is incorrect and should be Department of Natural Resources, Mines and Energy, 2004.

The referencing error relating to the "Fitzroy Basin Water Resource Plan" (DNRM, 1999) has been noted.

FBA requests that any modelled and future monitored load-based water quality data from base flows and the 10 year ARI overflows from the project be provided to FBA to aid in regional and catchment based planning.

The proponents note the request and it will be given due consideration.

FBA states that the EIS does not mention how the new eastern angle connection from the SPS rail loop will be designed to deal with aquatic organism migration, flooding and erosion problems.

The proposed rail spur connecting the SPS rail loop to the main east-west line of the Blackwater rail system, including the bridge over Neerkol Creek, will be designed by the rail infrastructure provider such that current flood levels and flows would not noticeably change as a result of the work and so that there would be no interference with fish migration. The rail infrastructure provider will ensure that appropriate erosion control measures are installed during construction to minimise erosion. Once construction is complete, disturbed areas will be rehabilitated.

Ms. Goldsworthy states that the proposed rail spur could result in impeded flow rate and volume with consequential back up effects in Neerkol Creek, impacting Lots 80-81/LN196 and 2/RP614973.

As mentioned above, redesign of the rail spur including bridge has reduced the potential for flood impacts around Neerkol Creek. Prior to approval being sought for the proposed rail spur, the proponent in conjunction with the rail infrastructure provider would undertake flood modelling. This would be used to design the proposed rail spur such that current flood levels would not noticeably change as a result of the works. The modelling results would be made publicly available and any comments would be appropriately considered.

6.1.2 [*Terrestrial Flora*] Potential Impacts and Mitigation Measures (8)

In Table 6.1.4 and the Mitigation section, DNRMW advises that the proponents consider the use of offsets for the proposed clearing of remnant of concern and endangered vegetation. Similarly, the Flora Management Plan does not consider the potential use of offsets to meet performance requirements relating to of concern and endangered vegetation. DNRMW advise that this approach be considered when applying for vegetation clearing permits.

The proponents will address the impacts on vegetation resulting from the Project during the development approval process under the *Integrated Planning Act 1997*. A consideration of vegetation "offsets" will be evaluated at this time. Consultation will be held with DNRMW and EPA as to the viability of any mitigation measures in relation to current vegetation management policy and codes. Adopted measures will be reflected in the detailed Flora Management Plan to be developed at a later stage of the Project.

6.3.2 [*Aquatic Ecology*] Potential Impacts and Mitigation Measures (1)

EPA states that the EIS needs to discuss the potential impact of water discharges on the Fitzroy River Floodplain which is located 15 km downstream of the project (e.g. of increased flows or contaminants).

As stated in the EIS, there are a number of scenarios under which flows from the site will be altered in comparison with the current baseline situation. Current proposals are for 100% re-use of blowdown from the Power Plant in the quench process. Under these circumstances, there would be no change to the existing flow regime in terms of continuous discharge from the site. However, there is still the potential for some Power Plant blowdown to be discharged to Quarry Creek via settlement ponds.

The quantity of blowdown produced will be dependent on a range of factors including the configuration of the Coke Plant (*e.g.* 1.6 Mtpa or 3.2 Mtpa), the heat of the coke ovens and the quality of raw water supplied. Current estimates for the quantity of blowdown that would be produced are between 200 and 1,400 ML/year depending on final configuration of the Coke Plant. Flow records at the Neerkol Creek gauging station managed by DNRMW suggest an average annual flow of approximately 6,000 ML/year.

In the event that the preferred option is for both SPS and the proposed Power Plant to discharge blowdown to the Quarry Creek, both would be via settlement ponds to provide treatment in order to meet Environmental Authority (EA) conditions. Any discharges of blowdown from the Power Plant would require additional authorisation by the EPA and it is assumed that water quality criteria would be required for this discharge. It is noted that the total blowdown from SPS (up to 1,600 ML/year) and that predicted from the Power Plant (up to 1,400 ML/year) is less than the maximum flow rate authorised under SPS' EA (18 ML/day which is equivalent to more than 6,500 ML/year). A further possibility is that up to 75% of SPS's combined stormwater and blowdown discharge to Quarry Creek will be re-used for coke quenching. Total blowdown from the SPS site is between approximately 1,600 and 2,200 ML/year. It is unlikely that this water would be used without the Power Plant blowdown being re-used as well.

Based on this information, it is anticipated that there will be no change to the quality of water in the Fitzroy River Floodplain as a result of the Project and minimal changes to flow. It should be noted that the quantity of water flowing downstream from Quarry Creek/Neerkol Creek confluence to the floodplain

is artificially inflated due to SPS discharge, allowing regular water abstraction by a number of properties downstream of the project site. Regardless of this, the volume of water that may originate from the project site and reach the floodplain is minor when compared to the overall catchment feeding the floodplain.