NEWCASTLE COAL INFRASTRUCTURE GROUP
COAL EXPORT TERMINAL

ANNUAL ENVIRONMENTAL MANAGEMENT REPORT 2009

Newcastle Coal
INFRASTRUCTURE GROUP

July 2009

Revision 2

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LIST OF ATTACHMENTS

1 INTRODUCTION

This Annual Environmental Management Report (AEMR) has been prepared for the Newcastle Coal Infrastructure Group (NCIG) Coal Export Terminal project (the Project) in accordance with the conditions (Section 5.2) of the approved Construction Environmental Management Plan (CEMP). The CEMP was prepared in accordance with Condition 7.2, Schedule 2 of the Project Approval (06_0009) which was granted on 13 April 2007.

This is the first AEMR prepared for the NCIG Project and it covers the period from the commencement of the terminal construction activities in April 2008 to March 2009 (i.e. a 12 month period). Subsequent AEMRS will cover a similar period from April – March each year.

The AEMR reviews the performance of the Project against the requirements of the Project Approval and provides an overview of environmental management actions and summarises monitoring results over the 12 month reporting period. The AEMR will be distributed to relevant government agencies and stakeholders, and copies provided to other interested parties if requested.

During the AEMR reporting period dredging operations were undertaken concurrently by NCIG, however, these activities and related environmental management are not covered by this AEMR. Only the environmental management requirements of the CEMP which are associated with the terrestrially based coal export terminal construction activities are detailed by this AEMR. Details of the compliance of dredging activities are outline in separate reports.

1.1 APPROVALS, LEASES, LICENCES AND PERMITS

The Project is being undertaken under the approvals, leases, licences and permits presented in Table 1.

Table 1: Project Approval, Leases, Licences and Permits

Instrument	Relevant Authority	Date Granted	Duration of Approval
Project Approval (06_0009)	Department of Planning	13 April 2007	5 years unless substantially commenced
Project Lease	State Property Authority	22 January 2008	35 years
Environmental Protection Licence (EPL) (No. 12693)	Department of Environment and Climate Change	26 October 2007	Until the licence is surrendered or revoked. The licence is subject to review every 5 years.
Environment Protection and Biodiversity Conservation Act 1999	Department of the Environment and Heritage	11 October 2007	Perpetuity
Maritime Services Act 1935 s13JE	NSW Maritime	02 October 2007	Perpetuity
Water Management Act Controlled Activity Permit	Department of Environment and Climate Change	04 February 2008	2 years
Environmental Representative	Department of Planning	03 October 2007	Perpetuity
Project Ecologist	Department of Planning	02 May 2007 & 25 October 2007	Perpetuity

1.2 MANAGEMENT PLANS AND MONITORING PROGRAMMES

In accordance with the Project Approval, the Project is currently being undertaken under a number of environmental management plans and monitoring programmes, including:

- Construction Environmental Management Plan
- Construction Noise Management Plan
- Environmental Monitoring Programme
- Acid Sulfate Soil Management Plan
- Construction Surface Water Management Plan
- Erosion and sediment Control Plan
- Surface Water Monitoring Programme
- Construction Traffic Management Protocol
- Vehicle Traffic Management Plan
- Site Water Management Plan
- Green and Golden Bell Frog Management Plan
- Compensatory Habitat Environmental Management Plan
- Vegetation Clearance Protocol
- Coordinated Works Programme;
- Compliance Tracking Programme; and
- Green and Golden Bell Frog Monitoring Programme
- Avifauna Monitoring Programme

1.3 PROJECT CONTACTS

Contact Details for the Project are provided below:

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1.4 PROJECT BACKGROUND

The Newcastle Coal Infrastructure Group (NCIG) Coal Export Terminal (CET) (the Project) is located on Kooragang Island in Newcastle, New South Wales (NSW) (Figure 1.1). The Project includes the construction and operation of a CET up to 66 million tonnes per annum (Mtpa), including associated rail and coal handling infrastructure and wharf/shiploading facilities on the south arm of the Hunter River.

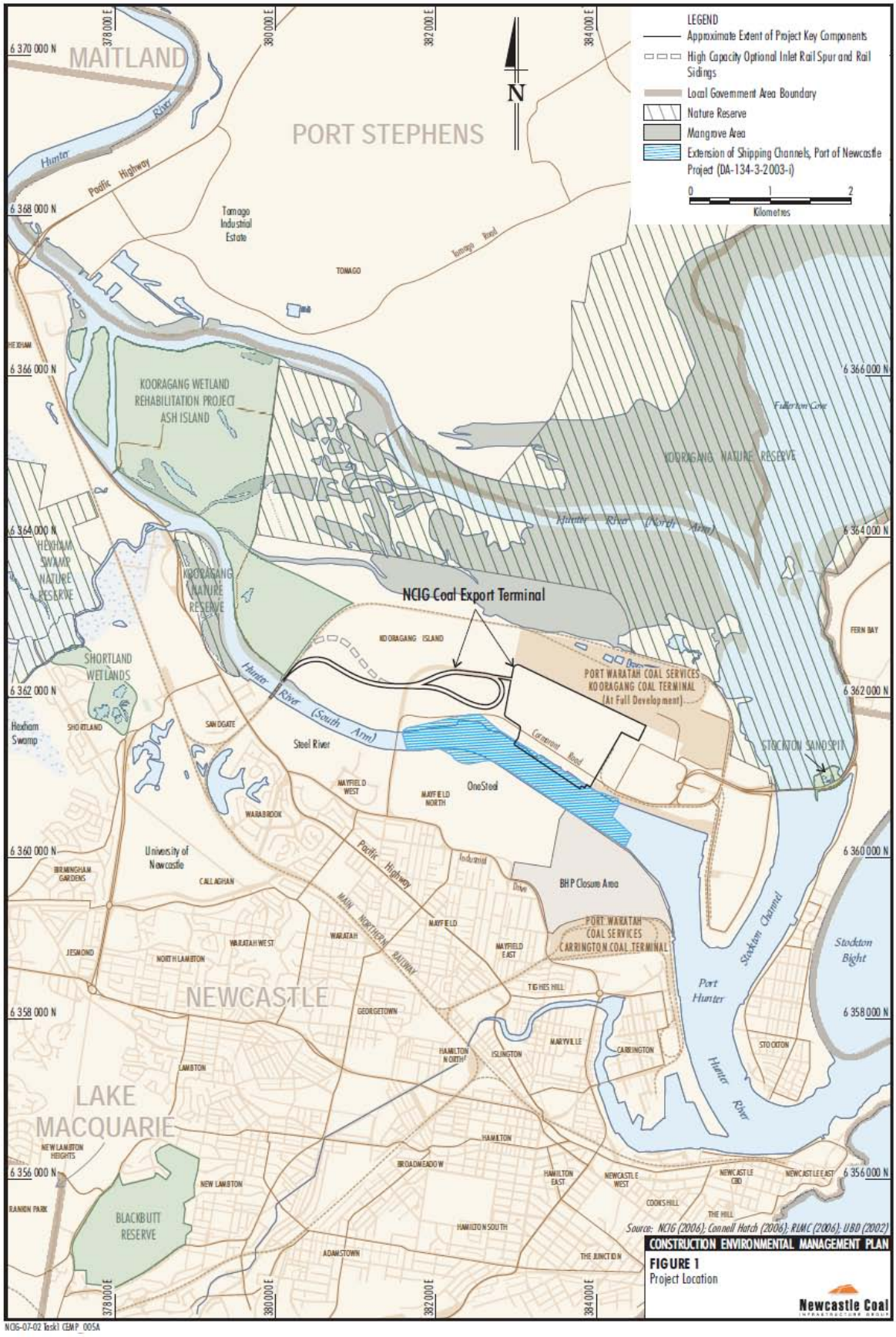

Figure 1.1: Project Location

NCIG is the proponent of the Project and is a consortium of the following six companies:

- Hunter Valley Energy Coal Limited;
- Centennial Coal Company Limited;
- Donaldson Coal Pty Limited;
- Excel Coal Limited (Peabody Energy Australia Coal Pty Limited);
- Felix Resources Limited (formerly White Mining Limited); and
- Whitehaven Coal Mining Pty Ltd.

NCIG was formed in response to a call for Expressions of Interest for the development of land on Kooragang Island by the NSW State Government in 2004. The outcome of this process was that in 2006 NCIG was awarded the right to develop the parcel of land that is now the Project site. Project Approval (06_0009) was granted in April 2007 and construction of Stage 1 of the coal export terminal (30 Mtpa) commenced in April 2008.

The Project general arrangement is shown on Figure 1.2. The general arrangement is based on the planned maximum coal throughput of 66 Mtpa. The main activities associated with the construction of the Project include:

- re-use of dredged materials from the south arm of the Hunter River as preload and engineering fill for construction of the coal storage area, rail corridor and wharf facilities;
- construction of a coal storage area including coal stockpiles, conveyors, transfer points and combined stacker/reclaimers;
- construction of wharf facilities, shiploaders, conveyors and buffer bins;
- foundation preparation, formation construction and capping of a rail corridor traversing the existing Kooragang Island Waste Emplacement Facility (KIWEF) for the development of the rail spurs, rail sidings and rail loops;
- construction of rail spurs, rail sidings and rail loops, rail overpass, train unloading stations and connecting conveyors;
- development of water management infrastructure including site drainage works, stormwater settlement ponds, primary and secondary settling ponds, site water pond, water tanks and stockpile spray system;
- installation of electricity reticulation and control systems;
- development of access roads and internal roads;
- construction of administration and workshop buildings; and
- other associated minor infrastructure, plant, equipment and activities.

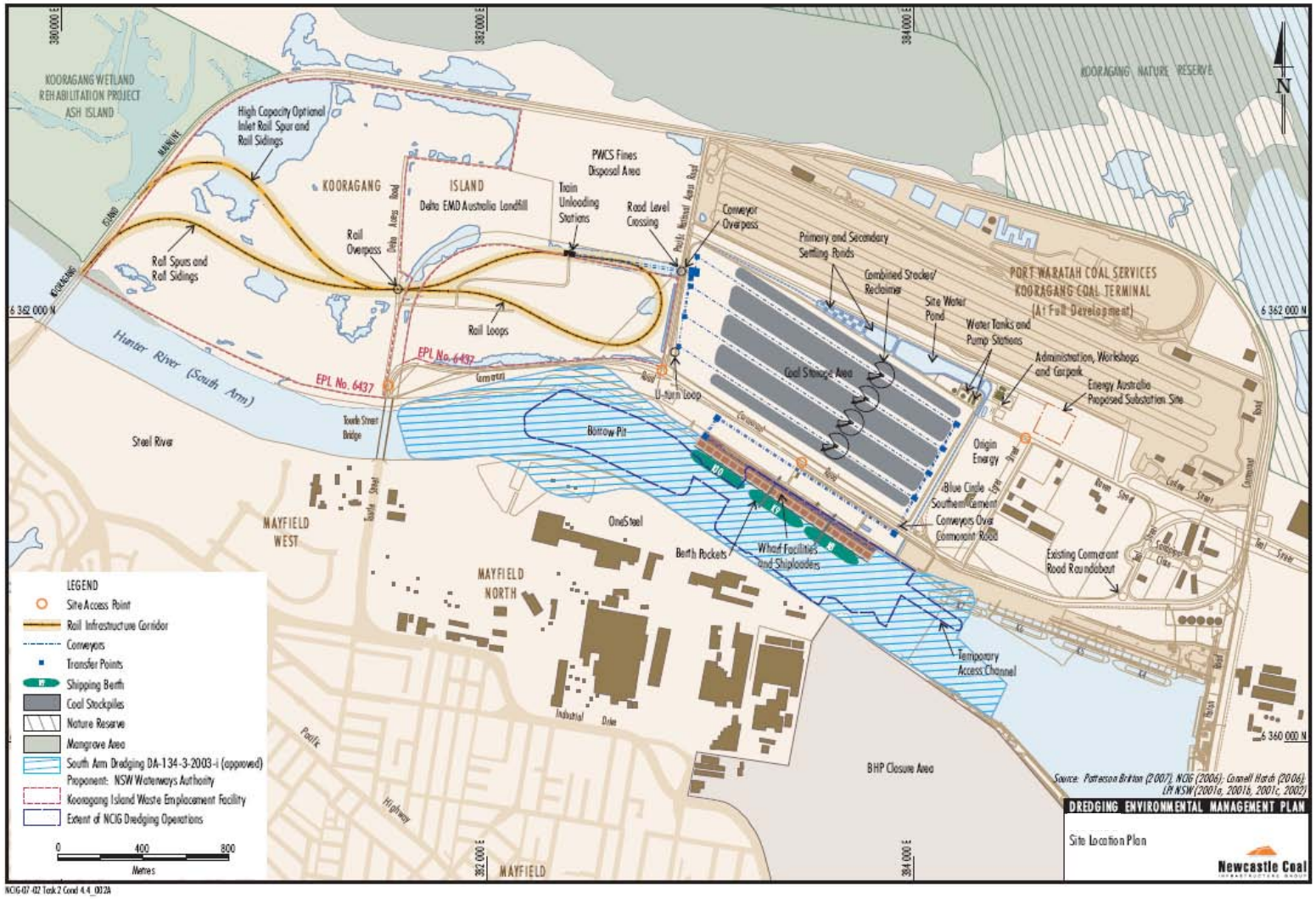

Figure 1.2: Project Layout

2 OVERVIEW OF ACTIVITIES

2.1 LAND PREPARATION

Land preparation activities commenced on the NCIG Coal Export Terminal development site in early 2008. These works primarily consisted of minor clearing of vegetation and topsoil stripping (see Figure 2.1) and the establishment of perimeter fencing and site accommodation (see Figure 2.2). These activities were conducted in accordance with the Project Approval and CEMP.

Figure 2.1: Minor Vegetation Clearance

Figure 2.2: Establishment of Site Accommodation

2.2 CONSTRUCTION

Construction of Stage 1 of the NCIG Coal Export Terminal development commenced in April 2008 with the initiation of the reclamation of general fill material (sand) from the Hunter River (see Figure 2.3) and ground improvement works (see Figure 2.4)

Figure 2.3: Sand Reclamation

Figure 2.4: Ground Improvement Works

The overall progress of construction activities during the reporting period was such that by the end of the reporting period the Project was 42.5% complete. The primary construction activities undertaken during the reporting period include:

- Reclamation of approximately 3 million cubic metres of sand and rock from the Hunter River which was subsequently utilised as preload and engineering fill for construction of the coal storage area, rail corridor and wharf facilities (see Figure 2.3 and Figure 2.5).
- Ground improvement works across stockyard area (see Figure 2.4).
- Partial construction of stockyard area including sections of the stacker/reclaimer berms.
- Delivery of major components of stacker/reclaimers from Korea (see Figure 2.6).
- Partial construction of wharf facilities (see Figure 2.7).
- Construction of the rail infrastructure formation (see Figure 2.8).
- Commencement of construction of train unloading station.
- Partial construction of rail spurs, rail sidings and rail loops (see Figure 2.9).
- Development of access roads and internal roads.
- Commencement of construction of administration and workshop buildings.

The overall progress of construction activities on the project is clearly illustrated through a comparison of aerial photographs taken in April 2008 (see Figure 2.10) and March 2009 (see Figure 2.11).

Figure 2.5: Sand Reclamation Activity

Figure 2.6: Stacker/Reclaimer Component Delivery

Figure 2.7: Wharf Construction Works

Figure 2.8: Rail Formation Construction

Figure 2.9: Rail Instillation Works

Figure 2.10: April 2008 Aerial Photograph of Project

Figure 2.11: March 2009 Aerial Photograph of Project

2.3 OPERATION

The operation of Stage 1 of the NCIG Coal Export Terminal development is expected to commence in March 2010. From the commencement of operational activities the throughput of the terminal is scheduled to be progressively increased such that by March 2011 it will be the equivalent of 30 Mtpa.

3 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

3.1 METEOROLOGY

3.1.1 Environmental Management

In accordance with Condition 2.8, Schedule 2 of the Project Approval (06_0009), an on-site meteorological monitoring station was operated during the reporting period to monitor weather conditions representative of the site. This station was installed in accordance with the requirements of the CEMP.

The meteorological monitoring station was required to be relocated in August 2008 to ensure it was not impacted by construction activity.

3.1.2 Environmental Performance

Table 3.1.1 outlines the monitoring locations, meteorological parameters recorded and frequency of monitoring for the Project in accordance with the CEMP.

Table 3.1.1: Summary of the Meteorological Monitoring Programme

Monitoring Parameter	Monitoring Sites	Frequency	Criteria
• Temperature • Relative humidity • Net solar radiation • Rainfall • Wind speed and direction • Sigma theta (rate of change of wind direction).	Project automated meteorological station[1].	Continuously monitored and the data averaged over 15 minute periods.	N/A.

[1] The location of monitoring sites is shown on Figure 3.1.1.

The meteorological monitoring results for the reporting period are summarised below.

The monthly statistical information for each of the meteorological monitoring parameters is detailed in Table 3.1.2. From this information Figure 3.1.2 illustrates the variation in average temperature during the reporting period. These variations from the winter to summer seasons are the expected seasonal norms.

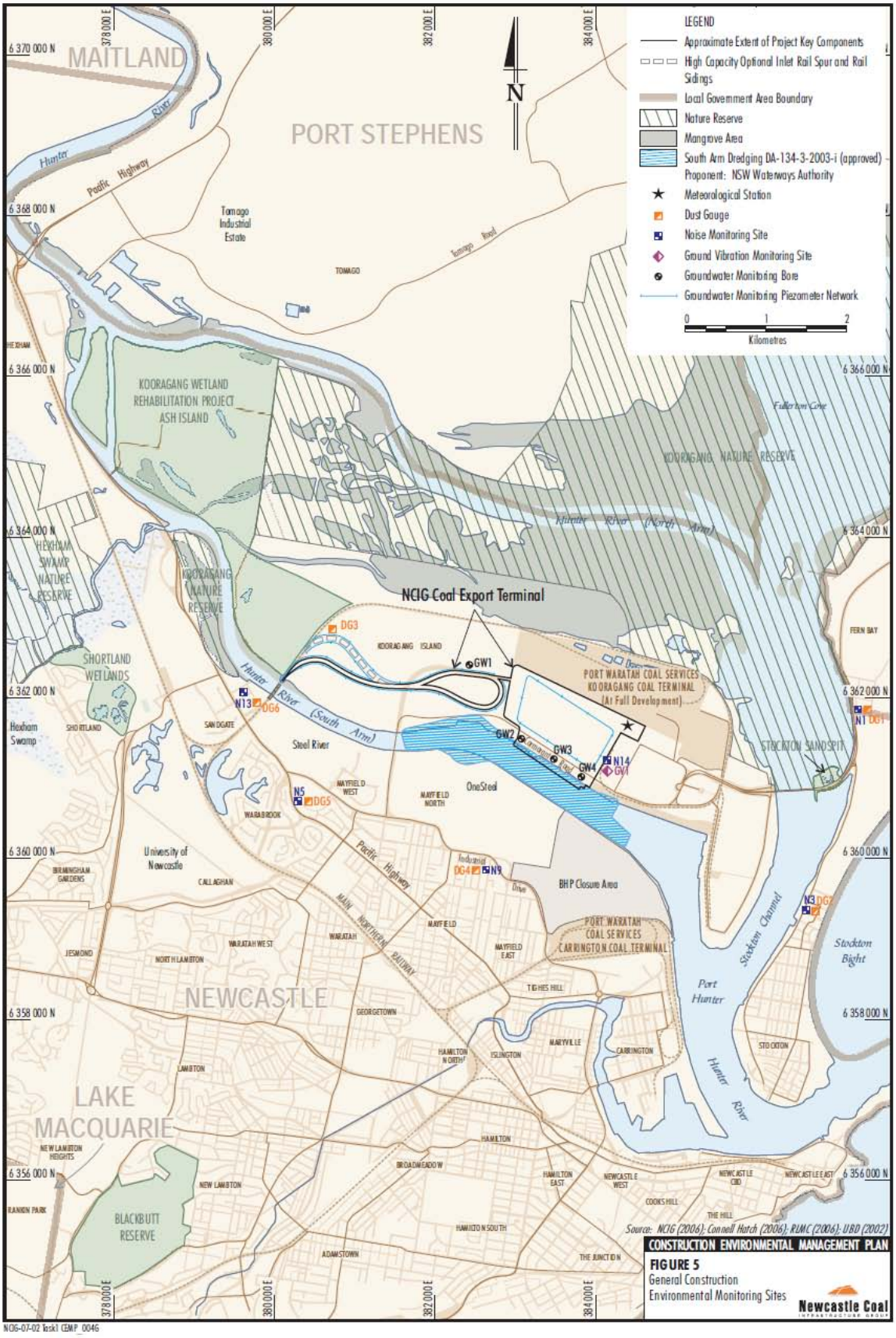

Figure 3.1.1: Environmental Monitoring Sites

Table 3.1.2: Meteorological Monitoring Information

	Rainfall (mm)				Wind direction (°)				Sigma-theta				Wind speed (m/s)			
	mean	SD	max	min	mean	SD	max	min	mean	SD	max	min	mean	SD	max	min
Apr-08	9.0	25.0	72.8	0.0	210.7	81.8	-	-	9.4	9.2	95.0	0	3.2	1.8	11.7	0
May-08	0.8	3.6	14.6	0.0	252.8	85.7	-	-	7.9	9.3	95.0	0	2.4	1.5	10.7	0
Jun-08	3.8	16.6	70.2	0.0	241.3	84.5	-	-	7.7	8.2	90.0	0	3.7	2.4	14.4	0
Jul-08	1.9	5.9	15.4	0.0	258.2	84.8	-	-	7.9	8.3	90.0	0	3.6	2.6	16.6	0
Aug-08	1.0	3.8	10.6	0.0	255.9	75.7	-	-	7.3	7.7	93.0	0	3.9	2.4	12.2	0
Sep-08	5.4	18.8	49.0	0.0	210.6	100.1	-	-	10.3	8.2	97.0	0	3.7	2.3	14.9	0
Oct-08	3.1	10.4	28.8	0.0	187.9	105.5	-	-	11.6	8.8	89.0	0	3.3	2.1	11.4	0
Nov-08	3.1	8.0	14.6	0.0	165.3	97.5	-	-	11.4	7.8	90.0	0	3.7	2.2	15.4	0
Dec-08	1.4	6.2	25.6	0.0	175.0	100.1	-	-	11.9	8.6	76.0	0	3.8	2.3	14.6	0
Jan-09	0.7	2.8	8.6	0.0	140.7	90.6	-	-	12.8	7.9	98.0	0	3.7	2.1	11.2	0
Feb-09	8.9	30.5	93.2	0.0	144.3	68.7	-	-	11.1	7.3	96.0	0	3.8	1.8	9.7	0
Mar-09	2.4	9.2	28.6	0.0	145.9	89.1	-	-	11.1	8.8	101.0	0	3.1	1.9	10.4	0

	Temperature at 2m (°C)				Solar radiation (W/m2)				Relative humidity (%)				Temperature at 10m (oC)			
	mean	SD	max	min	mean	SD	max	min	mean	SD	max	min	mean	SD	max	min
Apr-08	17.4	3.6	28.0	6.6	122.9	191.2	812.0	0.0	84.8	16.5	100.0	29.0	17.0	3.3	27.7	6.3
May-08	14.5	3.9	24.0	6.6	106.3	157.7	671.0	0.0	49.2	43.5	100.0	0.0	14.3	3.7	23.1	6.3
Jun-08	14.8	3.1	21.9	5.4	66.9	114.6	500.0	0.0	77.6	13.6	94.3	51.5	14.4	2.9	20.9	5.4
Jul-08	11.9	3.5	21.3	3.9	94.6	140.4	506.0	0.0	68.5	12.1	94.8	45.4	11.5	3.4	20.3	3.9
Aug-08	12.1	3.6	22.8	4.8	126.1	193.9	829.0	6.0	65.3	11.6	94.5	48.4	11.6	3.5	22.2	4.5
Sep-08	16.7	4.5	32.8	5.4	175.6	256.5	976.0	0.0	68.4	11.0	96.1	37.7	16.3	4.5	32.2	4.8
Oct-08	19.0	4.6	36.2	9.0	205.3	290.5	994.0	0.0	75.7	9.8	93.2	52.5	18.4	4.6	35.6	8.7
Nov-08	20.1	3.0	31.0	11.5	197.5	284.0	1053.0	0.0	74.7	10.7	97.9	51.9	19.5	2.8	30.1	11.2
Dec-08	22.3	3.5	33.8	13.0	244.5	325.5	1124.0	0.0	72.9	11.0	91.1	45.8	21.7	3.4	32.8	12.7
Jan-09	23.8	4.0	40.5	14.5	243.4	322.7	1035.0	0.0	74.0	9.1	97.9	58.5	23.1	3.9	39.6	13.6
Feb-09	23.0	3.0	36.8	15.5	196.3	288.1	1006.0	0.0	81.5	7.3	96.9	65.3	22.3	2.9	35.9	14.8
Mar-09	22.1	2.7	30.7	13.6	196.3	275.3	971.0	0.0	74.6	8.2	85.9	46.1	21.5	2.5	29.8	13.3

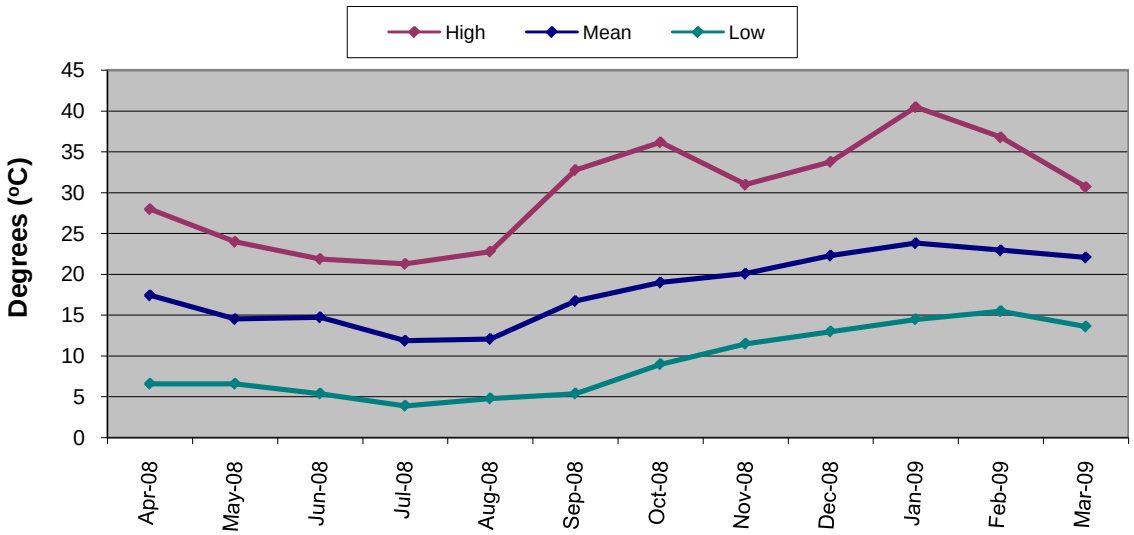

Figure 3.1.2: Average Temperature

The daily rainfall recorded at the project site is illustrated by Figure 3.1.3. A total of 1238mm of rain was received on the site during the reporting period with significant rainfall events recorded in April 2008, June 2008 and February 2009. Relatively consistent rainfall was also received during the September to December 2008 period.

Figure 3.1.4 also illustrates the seasonal variation in wind speed and direction at the site which highlights that the dominant conditions in relation to wind has a westerly aspect during the autumn and winter period and is predominately easterly during the summer period.

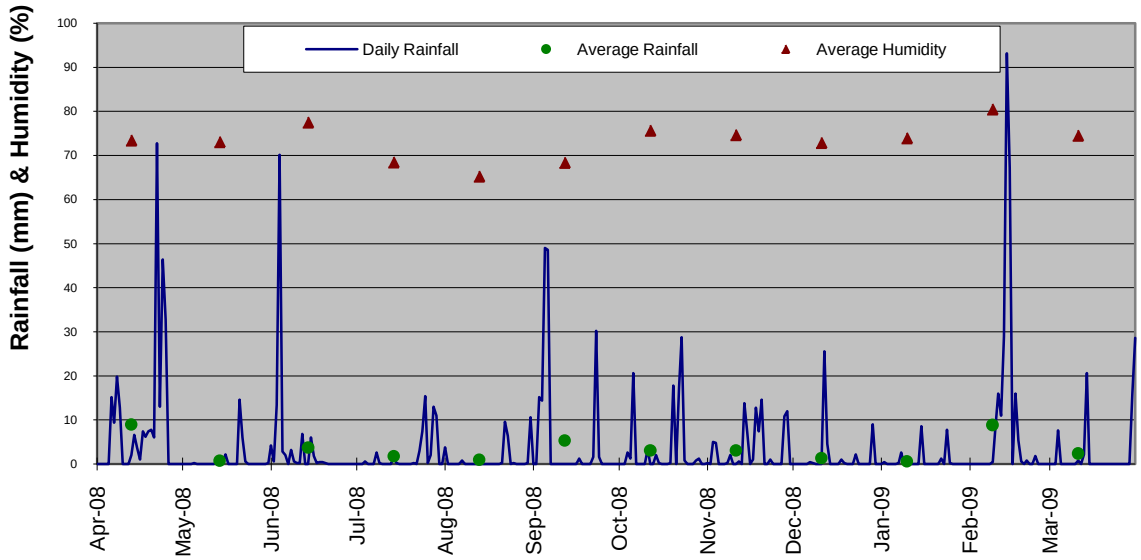

Figure 3.1.3: Daily and Average Rainfall

Figure 3.1.4: Seasonal Wind Conditions

3.1.3 Reportable Incidents

No environmental incidents or complaints relating to meteorological conditions were made during the reporting period.

3.1.4 Further Improvements

No improvement to meteorological monitoring is required for the next period. The output of the automated meteorological monitoring station will however be incorporated into the site management system prior to the commencement of NCIG operational activities in March 2010.

3.2 AIR QUALITY

3.2.1 Environmental Management

In accordance with Conditions 2.2 and 2.4, Schedule 2 of the Project Approval (06_0009) NCIG designed and is in the process of constructing the Project in a manner that minimises or prevents the emission of visible dust beyond the boundary of the site (including windblown and traffic generated dust).

In accordance with Condition 2.5, Schedule 2 of the Project Approval (06_0009) dust emissions are being controlled on all internal roads, trafficable areas and manoeuvring areas by sealing, or otherwise treating surfaces to minimise the potential for dust generation.

In accordance with Condition 2.1, Schedule 2 of the Project Approval (06_0009) NCIG did not permit any offensive odour, as defined under section 129 of the *Protection of the Environment Operations Act, 1997*, to be emitted beyond the boundary of the Project site. The development of the Project involves interaction with NSW Maritime's Extension of Shipping Channels, Port of Newcastle which is located in the south arm of the Hunter River in Newcastle, NSW. The Extension of Shipping Channels, Port of Newcastle includes dredging, excavation, treatment, reclamation and disposal of sediments from the south arm of the Hunter River. In accordance with Conditions B4.5(a) and B3.3, Sub-Schedule B, Schedule 2 of the Port Consent an Odour Management Plan was prepared which incorporates an Odour Monitoring Program.

3.2.2 Environmental Performance

Table 3.2.1 outlines the monitoring locations, air quality parameters recorded, frequency of monitoring and air quality criteria for the Project in accordance with the CEMP.

Table 3.2.1: Summary of the Meteorological Monitoring Programme

Monitoring Parameter	Monitoring Sites	Frequency	Criteria
Dust deposition[2].	DG1, DG2, DG3, DG4, DG5 and DG6[1].	Monthly during the first three months of construction, then quarterly.	4 g/m^2/month.

[1] The location of monitoring sites is shown on Figure 3.1.1.

[2] Dust deposition was analysed in accordance with AS/NZS 3580.10.1-2003 *Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method.*

The air quality monitoring results for the reporting period are summarised in Table 3.2.2 below.

Table 3.2.2: Depositional Dust Monitoring Results

	DG1	DG2	DG3	DG4	DG5	DG6
Insoluble Matter (g/m^2)	3.31	1.24	3.83	1.23	1.91	2.68

Dust deposition results for the reporting period were below the criteria for annual dust deposition of 4 grams per square metre per month. Full dust deposition data for the reporting period is provided in Attachment A.

The dust control measures implemented during construction of the Project include the following:

- demarcation and minimisation of ground disturbance areas;
- paving of appropriate internal roads;
- watering of exposed ground disturbance areas and high traffic areas using water trucks to minimise the generation of dust;
- establishment of grass pasture on disturbed areas as soon as possible;
- confining vehicle movements to designated access routes;
- limiting the speed of vehicles on unpaved roads; and
- limiting ground disturbance activities during identified windy conditions.

All stockpiled construction materials were also managed to minimise wind-blown dispersal of the materials in accordance with Condition 2.45 of Project Approval (06_0009) by limiting the height of the stockpiles and watering of the stockpiles during windy conditions. All fill/preload material brought to the Project site, as a part of the dredge material reclamation process, was managed to minimise the generation of wind-blown dust by maintaining high moisture content within the primary settling ponds and containment within the perimeter bunds during the preloading activities.

Olfactory reception monitoring was conducted by Project personnel during reclamation activities. This was undertaken on a regular basis primarily at the point of discharge and at the identification of an odour. As a part of this monitoring odour intensity was rated using German Standard VDI 3882 (I) (1992) odour intensity scale which ranks odour intensity on a scale from 0 (not perceptive) to 6 (very strong). Project personnel were trained in olfactory reception methods and their olfactory sensitivity was tested and accredited in accordance with (AS/NZS) 4323.3.2001 *Stationary Source Emissions: Part 3 Determination of Odour Concentration by Dynamic Olfactometry.*

During the monitoring period there were no significant odour issues and an odour classified as offensive was not identified. The odour reception monitoring identified only a small number of odour events during the reclamation activity with a maximum odour intensity of 2 (light). The majority of odour detected was related to a dirt/vegetative smell.

3.2.3 Reportable Incidents

No environmental incidents were reported relating to air quality conditions were made during the reporting period. Complaints regarding air quality received during the reporting period (see Section 3.13) were responded to in accordance with the Complaint Response Procedure.

3.2.4 Further Improvements

No improvement to air quality monitoring is required for the next period. The current air quality monitoring network will be incorporated into an extended monitoring system prior to the commencement of NCIG operational activities in March 2010.

3.3 WATER QUALITY

3.3.1 Environmental Management

In accordance with Condition 7.3b), Schedule 2 of Project Approval (06_0009), a Construction Surface Water Management Plan (CSWMP) was developed which defines how surface water and stormwater is managed on the NCIG Project site during construction. The Plan includes the definition of appropriately-sized stormwater controls, in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004). The Plan also includes specific measures designed to avoid sediment-laden stormwater from entering Deep Pond, wetland areas or the Hunter River, and a monitoring programme for stormwater leaving the Site

The CSWMP identified the surface water runoff from disturbance areas during the construction of the Project that could potentially contain sediments, soluble salts, fuels, oils, grease and other contaminants. The potential surface water quality impacts that relate to these contaminants from each area of the Project site are summarised in Table 3.3.1.

Table 3.3.1: Potential Surface Water Quality Impacts

Project Site	Potential Impact Scenario	Potential Contaminant
Rail Infrastructure Corridor	Uncontrolled drainage of sediment laden runoff to downstream waterbodies within the Kooragang Island Waste Emplacement Facility (KIWEF) during construction of rail embankments.	Sediments, soluble salts, heavy metals, organic contaminants, fuels, oils and grease.
	Uncontrolled drainage of runoff from access roads and construction areas to downstream waterbodies within the KIWEF.	
	Uncontrolled drainage of runoff from exposed soils within the existing KIWEF to downstream waterbodies.	
	Potential erosion and sedimentation resulting from runoff from the rail corridor and associated drainage system.	
Coal Storage Area	Uncontrolled drainage to downstream waterbodies during construction of the coal storage area.	Sediments, soluble salts, fuels, oils and grease.
	Uncontrolled drainage of runoff from access roads and construction areas to downstream waterbodies.	
	Spillage/overflow of site water to downstream waterbodies.	
Wharf Facilities and Shiploader Area	Uncontrolled drainage of sediment laden runoff to the south arm of the Hunter River during construction of the berths and wharf structure, excavation on or near the banks of the South Arm of the Hunter River and during piling operations.	Sediments, soluble salts, fuels, oils and grease.
	Uncontrolled drainage of runoff to the south arm of the Hunter River from access roads and wharf construction areas including excavation on or near the banks of the South Arm of the of the Hunter River.	

This identification of surface water flows was utilised to develop the monitoring programme defined in the CSWMP which aims to ensure adjacent waterbodies are not impacted by NCIG construction activities. The CSWMP was approved by the Department of Planning as part of the Construction Environmental Management Plan (CEMP) for the Project.

The construction surface water management strategy for the Project is based on:

- the separation of surface water runoff generated from within the active Project construction areas from that generated from surrounding areas;
- the return of supernatant waters liberated from the dredged material back to the south arm of the Hunter River in a controlled manner; and
- the implementation of adequate water management controls to minimise the potential for impacts to off-site water resources such as adjacent wetland areas, Deep Pond and the Hunter River (Figure 3).

A separate Soil and Water Management Plan was developed in accordance with Condition B4.5(b), Sub-Schedule B, Schedule 2, of the Port Consent. The Soil and Water Management Plan outlines the measures employed to manage surface water and to minimise soil erosion and the discharge of sediments and other pollutants to lands and/or waters for the duration of dredging and excavation works conducted as part of the extension of shipping channels in the Port of Newcastle.

The management of erosion and sedimentation is outlined is Section 3.4

3.3.2 Environmental Management

Table 3.3.2 outlines the monitoring locations, frequency of monitoring and groundwater monitoring parameters for the Project in accordance with the CEMP. These monitoring elements form the Surface Water Monitoring Programme for the Project.

Table 3.3.2: Surface Water Monitoring Program

Monitoring Locations	Frequency	Parameters
EPL No. 12693 Discharge Points.[1]	Continuous.	• Turbidity; • pH; and • Flow rate.
Primary settling ponds.[1]	Weekly.	• pH; • Electrical conductivity (EC); • Total dissolved solids (TDS); and • Total suspended solids (TSS).
	During period of heavy rainfall (i.e. more than 20 mm of rainfall in a 24 hour period).	• Water level.
Surface water monitoring sites.[1]	Twice weekly[2].	• pH; • EC; • TDS; and • TSS.
Drainage, erosion and sediment control infrastructure.	During period of heavy rainfall (i.e. more than 20 mm of rainfall in a 24 hour period).	• Structural stability and effectiveness in controlling sediment migration.

[1] Monitoring locations are shown on Figure 3.1.1.
[2] During the reporting period the Department of Planning approved a modification to the frequency from twice weekly to monthly.

A site drainage network was established to capture site runoff and to manage sea water draining from material dredged under the Port Consent, for use in preloading on the Project site. Dredged material

that was identified for beneficial reuse was pumped via a dedicated pipe under Cormorant Road through existing concrete drainage pipes and a concrete-lined channel on the eastern and western edge of the Project site.

As the topography grades to the north and west of the Project site an existing flow path for surface runoff across was incorporated into the drainage of runoff from the placement of dredged material. The pumping of dredged material on to the preload area across the southern portion of the site encourages runoff to flow to the north where it was contained within perimeter bunds and primary settling ponds. The relative size and number ponds is illustrated in Figure 3.3.1.

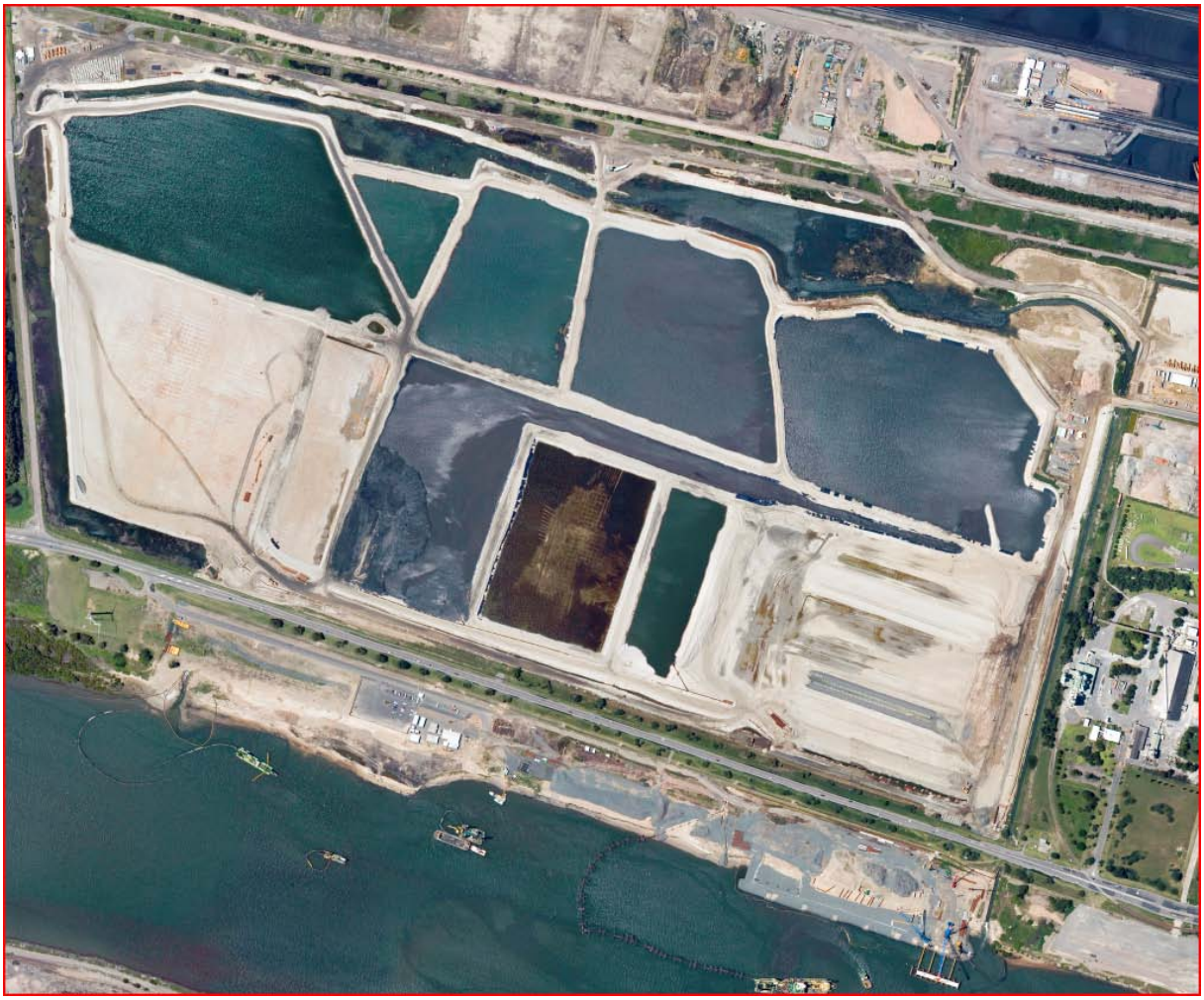

Figure 3.3.1: Dredge Settling Ponds

Runoff (including sea water) enters the primary settling ponds where fines settle out prior to discharge to the drainage channel flowing across the north and then to the east and west of the site. Controlled discharge structures were installed through each of the internal bund walls to control the residence time of runoff contained within the primary settling ponds depending on the progression of preloading activities within the coal storage area and fines settlement rates.

Water held within the primary settling ponds was released to the northern drainage channel via the discharge structures in accordance with EPL No. 12693. Only water of suitable quality, as defined by

EPL No. 12693, was returned to the south arm of the Hunter River. Water that did not meet the EPL No. 12693 water quality criteria was contained on-site until the appropriate water quality was achieved. General site water runoff was also managed by this same process during the reporting period.

The performance of the site water management network is illustrated by Figure 3.3.2 which shows the measured turbidity and pH at the EPL discharge points (EPL11 and EPL12) during the periods of water discharge. The water quality criteria for turbidity, as defined by EPLL No. 12693, was 16.5 NTU up until the 25th of May 2008 upon which time it was modified to be reflective of the variable water quality of the receiving waters (i.e. the Hunter River) and set as the measured river turbidity plus 25 NTU. In late November 2008 the water criteria was applied to in river monitoring locations. The figure in Appendix A clearly illustrates that for the majority of the reporting period that the discharge water quality was within the criteria. At those limited times water quality deteriorated a management procedure was followed which is clearly illustrated by Figure 3.3.3 which illustrates the management actions taken to minimise environmental impact. The principle elements of this procedure are:

- Continuous monitoring at discharge location EPL12 (troll turb) (see Figure 3.3.4)
- Discrete monitoring at settlement pond release points (FLT-90 turb)
- Turbidity criteria (river background + 25NTU)
- pH monitoring both continuous and discrete (criteria is 6.5 – 8.5)
- Operation of release points from the hydraulic discharge structures SP2 and SP3 and sand dredge (Wombat) illustrated by horizontal lines with gaps in the lines indicating release points closed and dredge not operating.

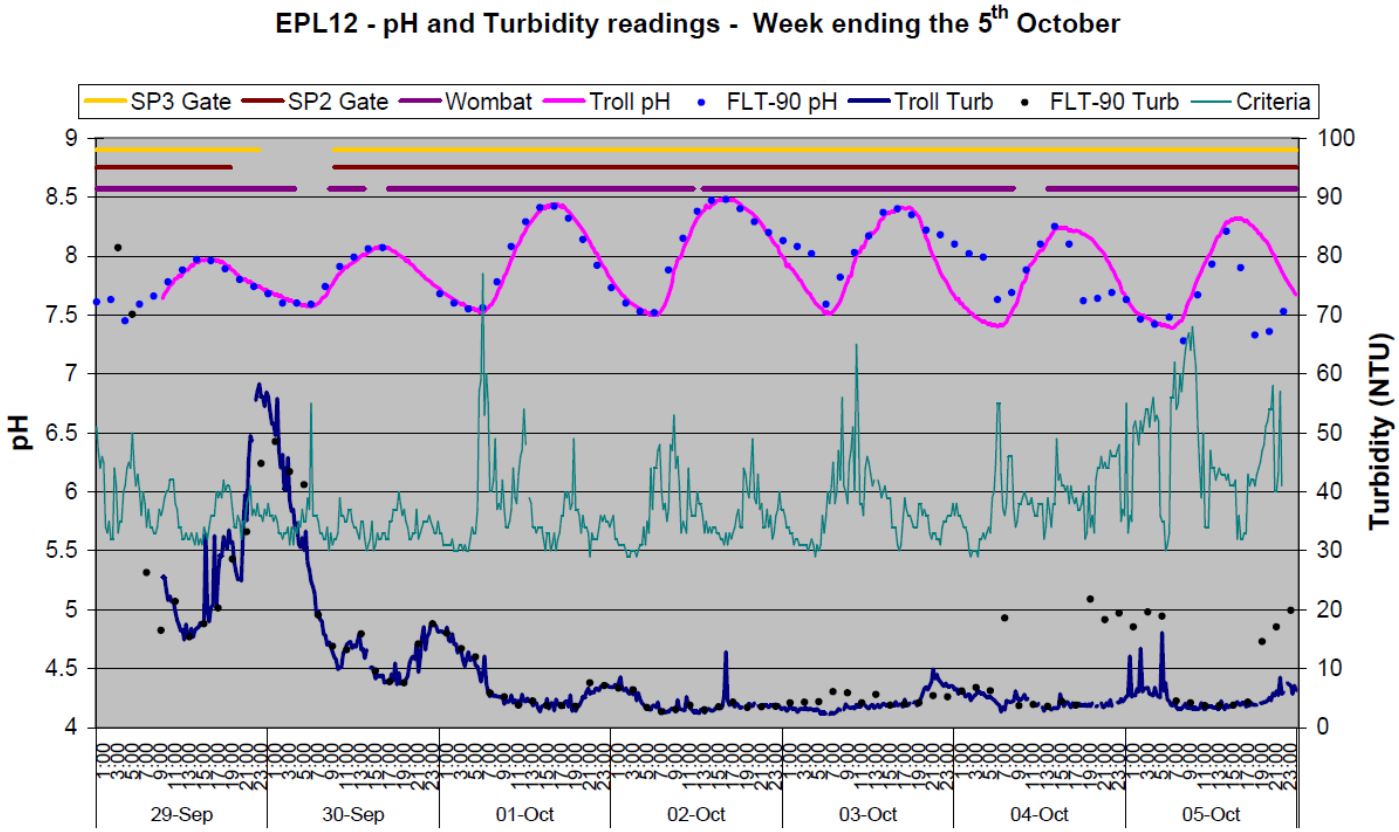

Figure 3.3.3: Example of Water Management Procedure

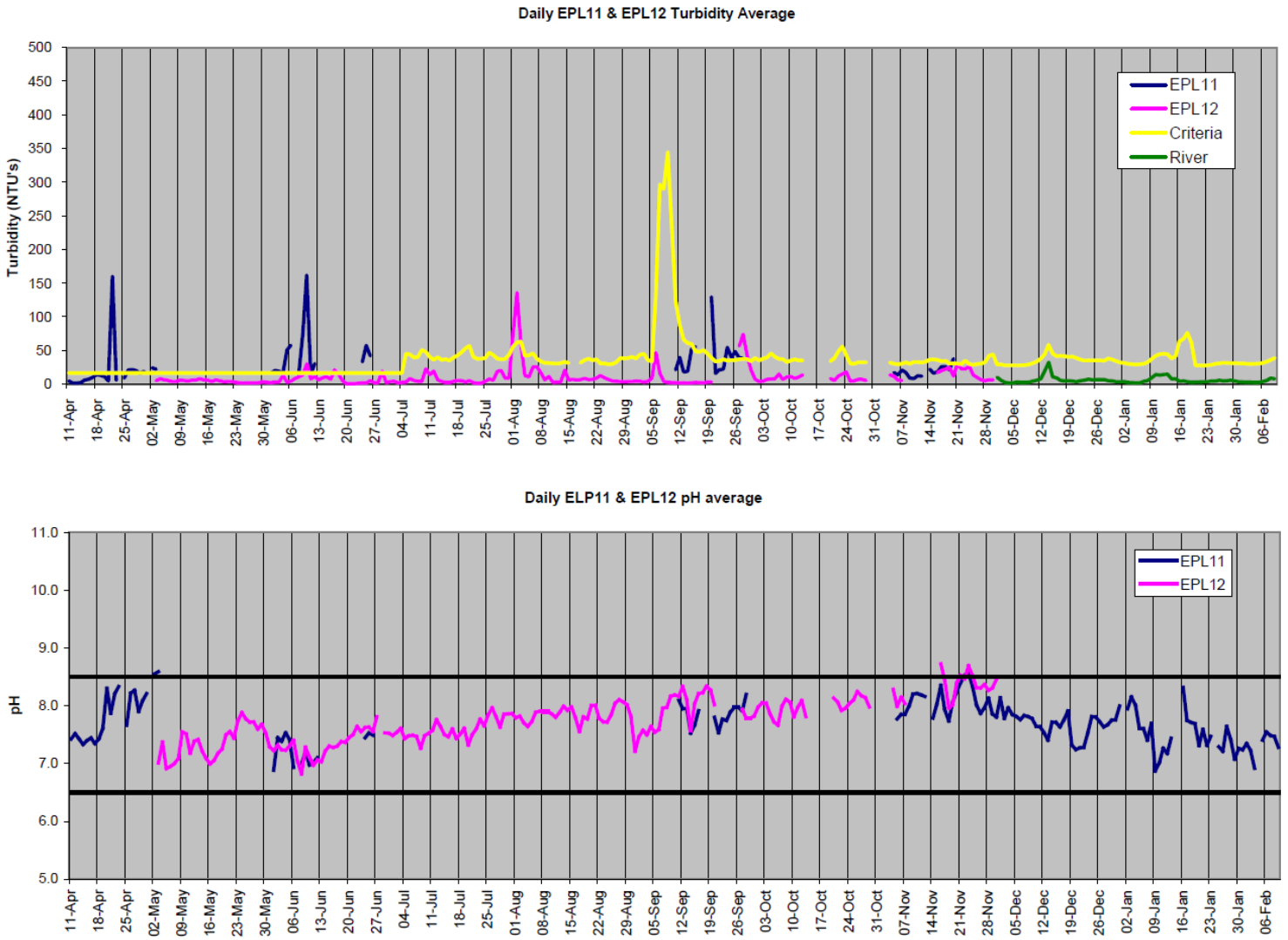

Figure 3.3.2: Discharge Water Monitoring Results

Figure 3.3.4: Monitoring location at EPL12

As can be seen on the evening of the 29 September 2008 the water quality started to trend up to the point that the limits approached exceedence then at this point the hydraulic discharge structure SP2 was closed, as it was identified as the primary source of water quality issues by discrete sampling. With no real improvement in water quality the hydraulic discharge structure SP3 was then closed and once the settlement ponds were filled to capacity the dredging with the CSD Wombat was stopped. The continuous water quality monitoring was then monitoring stagnant water in the discharge drain. Discrete water quality monitoring of the SP release points (FLT-90 turb) was continued and once it illustrated that the water quality had improved with additional settlement time, to below the criteria, the dredging was recommenced and SP2 and SP3 gates were opened. Water quality, both discrete and continuous then continued to illustrate compliance with the limits for the remainder of the period.

This procedure was utilised throughout the reporting period to ensure the water release from the NCIG Project site was within the limits of the water quality criteria.

A silt curtain was also installed at the outlet of the site discharge points into the Hunter River as a precautionary measure to control suspended sediments and minimise the potential for associated water quality impacts.

Figure 3.3.2 also illustrates that in late November 2008 the pH criteria was exceeded, with recorded levels reaching 8.7. Through investigation, and consultation with DECC, it was determined that the fluctuation in pH were a direct result of excessive algae growth in the clean shallow water of the discharge channel during an extended period of high ambient temperatures. The pH of the water varied as a result of the algal photosynthesis process and the resulting impact on the carbonic acid equilibrium. The pH fluctuations recorded were not reflective of the water quality discharge from the settling ponds.

Sampling of surface water ponds was also undertaken during the reporting period in accordance with the CSWMP. The location of the sampling undertaken is illustrated in Figure 3.3.5 with the water quality results recorded detailed in Attachment B.

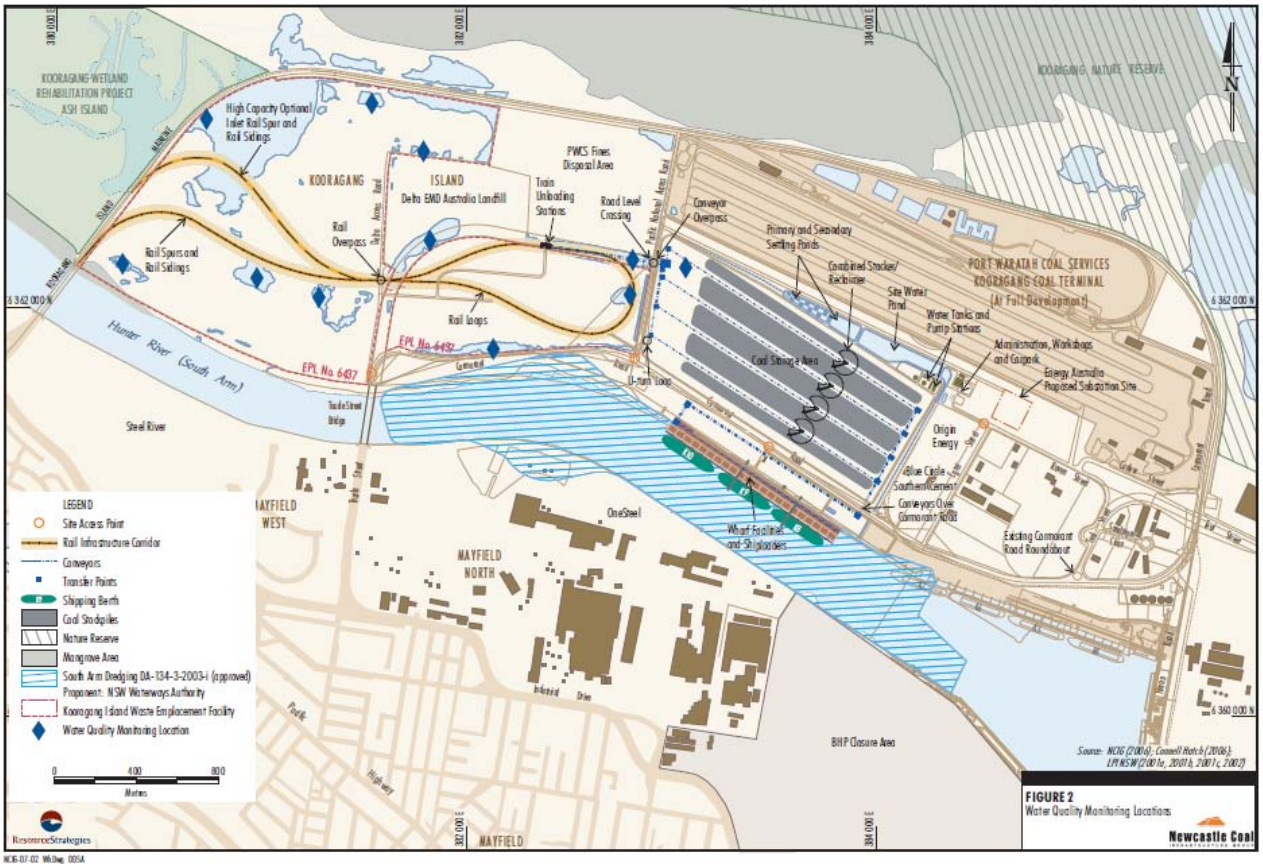

Figure 3.3.5: Surface Water Monitoring Locations

In addition to the surface water monitoring undertaken by NCIG the Hunter Development Corporation continue to conduct surface water monitoring in accordance with Condition M2.1 of EPL No. 6437 for the Kooragang Island Waste Emplacement Facility.

3.3.3 Reportable Incidents

No environmental incidents or complaints were reported relating to water quality management were made during the reporting period.

3.3.4 Further Improvements

No improvement to water quality management for the next period. The primary settling ponds used for preloading activities will be decommissioned after the completion of construction of the permanent primary and secondary settling ponds and site water pond. The drainage network will be utilised to intercept water that infiltrates through the coal stockpiles during Project operations and return it to the Project site drainage network. The construction of the permanent stormwater network will be completed in the next period to be incorporated into the operating system prior to the commencement of NCIG operational activities in March 2010.

3.4 EROSION AND SEDIMENT CONTROL

3.4.1 Environmental Management

In accordance with Condition 2.43, Schedule 2 of the Project Approval (06_0009) NCIG took all reasonable measures to prevent soil erosion and the discharge of sediments and pollutants from the site during construction activities.

In accordance with Condition 2.42, Schedule 2 of the Project Approval (06_0009) NCIG has designed and constructed surface water and stormwater management infrastructure on the site to accommodate a 1 in 100 annual recurrence interval (ARI) rainfall event. This system does not permit the discharge of any water from the site to the Hunter River unless expressly provided under the provision of an EPL (see Sections 3.3).

All erosion, sediment and pollution control infrastructure is being maintained on the Project site at or above design capacity during construction of the Project and will continue to be until such time as all ground disturbed by the works has been stabilised and rehabilitated so that it no longer acts as a source of sediment, in accordance with Condition 2.44, Schedule 2 of Project Approval (06_0009).

All stockpiled construction materials have been managed to minimise erosion or dispersal of the materials in accordance with Condition 2.45 of Project Approval (06_0009). All fill/preload material brought to the Project site is managed in a manner that minimises erosion and dispersal of those materials to the downstream waters (e.g. south arm of the Hunter River). The fill/preload material brought to the Project site is primarily contained within the perimeter bunds and primary settling ponds during the preloading activities.

Erosion and sediment control measures and general surface water management measures for the Project are documented in the approved Construction Surface Water Management Plan.

3.4.2 Environmental Performance

Table 3.4.1 outlines the monitoring locations, erosion and sediment control parameters recorded, frequency of monitoring and air quality criteria for the Project in accordance with the CEMP.

Table 3.4.1: Summary of the Erosion and Sediment Control Monitoring Programme

Monitoring Parameter	Monitoring Sites	Frequency	Criteria
Structural stability and effectiveness in controlling sediment migration.	Drainage, erosion and sediment control infrastructure.	Monthly and following significant rainfall events (i.e. greater than 20 mm in 24 hours).	N/A.

The management of erosion and sedimentation for the NCIG Project is detailed by the Erosion and Sediment Control Plan (ESCP). The ESCP is a document that is continually modified to account for project areas and activities of identified risk of erosion and sedimentation. Activities that have the potential to cause or increase soil erosion at the Project have been identified and are primarily due to exposure of soils during construction activities.

The general erosion and sediment control principles adopted take into account the general recommendations for site drainage works presented in *Managing Urban Stormwater: Soils and Construction – Volume 1* (Landcom, 2004) which underpin the goal of protecting adjacent wetland areas, Deep Pond and the Hunter River. These principles involve:

- Minimising surface disturbance and restricting access to undisturbed areas.
- Separation of runoff from disturbed and undisturbed areas where practicable.

- Construction of surface drains to facilitate the efficient transport of surface runoff or utilisation of existing stormwater systems.
- Construction of the site drainage network including perimeter bunds, internal bunds, primary settling ponds and hydraulically controlled discharge structures.
- Construction of primary and secondary settling ponds, site water pond and sediment dams to contain runoff up to specified design criterion.
- Installation of a silt curtain in the south arm of the Hunter River local to the disturbance area during construction of the shipping berth batters, wharf structure and during piling operations (in the River) that may create excessive material disturbance.
- Installation of a silt curtain in the south arm of the Hunter River during construction around the outlet of the existing concrete-lined stormwater channel and concrete pipelines.

In ensuring the erosion and sediment control principles are adhered to, development activities on the Project have been typically undertaken in the following order:

1. Construction of sediment fences (down slope of disturbance areas) where required.
2. Installation of silt curtains in identified water bodies, including the Hunter River, where required.
3. General construction works are only commenced once erosion and sediment control measures are in place.
4. Construction of drainage diversions (typically upslope of disturbance areas) – these were only constructed where they significantly reduced the runoff catchment of disturbance areas and connected to the site drainage network where practicable.
5. Construction of the perimeter bunds, internal bunds, primary settling ponds and hydraulically controlled discharge structures initially to manage runoff and sea water draining from dredged material during preloading of the coal storage area.
6. Construction of the primary and secondary settling ponds and a site water pond.
7. Construction of collection drains (down slope of disturbance areas) where required to convey runoff to the site drainage network (including primary and secondary settling ponds and a site water pond).

Erosion and Sediment Control Plan (ESCP) plans, detailing specific erosion and sediment control measures, are developed in a progressive manner prior to the development of each Project component requiring land disturbance. This is undertaken through a risk assessment process associated with the individual task proposed and are modified as required to ensure that the goal of protecting water bodies from erosion and sedimentation is achieved.

Temporary erosion and sediment controls (e.g. silt fences and sediment control structures) are installed prior to the commencement of construction activities on the Project site. Routine (i.e. monthly) inspections of sediment control structures, as well as inspections following significant rainfall events (e.g. 20 millimetres (mm) or more in a 24 hour period), are conducted by NCIG personnel. During these inspections, sediment control structures were inspected for capacity, structural integrity and effectiveness. Any deficiencies identified by these inspections are assessed, prioritised and rectified in the appropriate timeframe.

A network of permanent stormwater structures is also being constructed to manage runoff around the site. All long-term site water management structures are lined with low permeability materials (e.g. compacted clay) to minimise the potential for leakage. Water management structures are designed with sufficient capacity for a 1 in 100 year average recurrence interval (ARI) rainfall event. The construction of these structures was ongoing during the reporting period as illustrated by Figure 3.4.1.

Figure 3.4.1: Construction of Stormwater Infrastructure:

3.4.3 Reportable Incidents

No environmental incidents or complaints relating to erosion or sediment control were made during the reporting period.

3.4.4 Further Improvements

No improvement to erosion and sediment control is required for the next period. The construction of the permanent stormwater network will be completed in the next period to be incorporated into the operating system prior to the commencement of NCIG operational activities in March 2010.

3.5 GROUNDWATER

3.5.1 Environmental Management

In accordance with the requirements of the Construction Environmental Management Plan (CEMP) groundwater quality monitoring was undertaken on a monthly basis.

3.5.2 Environmental Performance

Table 3.5.1 outlines the monitoring locations, groundwater monitoring parameters recorded, frequency of monitoring and groundwater criteria for the Project in accordance with the CEMP.

Table 3.5.1: Summary of the Groundwater Monitoring Programme

Monitoring Parameter	Monitoring Sites	Frequency	Criteria
pH, EC, TDS, TSS, sulfate, polycyclic aromatic hydrocarbons (PAH), As III, Cd, Cu, Pb, Hg, Zn, Cr VI, Mn and Ni (refer Table 5).	GW1 to GW4, and piezometer network[1].	Monthly.	Refer CEMP.
Groundwater level.		Monthly.	N/A.

[1] The location of monitoring sites is shown on Figure 3.1.1.

The Project site includes a relatively shallow groundwater table in areas of fill from previous landuse activities. Consequently, any interception of the groundwater table during Project construction activities or effect on the groundwater system as a result of Project operations is being managed. NCIG has incorporated into the design of the Project a comprehensive suite of construction methods and design systems. In response to groundwater conditions encountered on the project site the following groundwater management contingency measures were adopted for specific Project elements:

- piled foundations together with a diaphragm sub-surface perimeter walls and jet-grouted base for construction of the train unloading stations base and adjacent conveyors were under construction to minimise groundwater inflow or connection;
- a low permeability capping layer is being incorporated into the rail embankment formation to minimise infiltration; and
- groundwater bores were established to monitor groundwater levels, and water quality around the perimeter of the coal storage area and along the rail infrastructure corridor.

A summary of the groundwater monitoring results recorded during the reporting period is illustrated in Table 3.5.2.

Table 3.5.2: Summary of the Groundwater Monitoring

		Depth	pH	EC	TDS	TSS	SO_4	PAH	Mg	Na	K	Al	As III	Cd	Co	Cu	Pb	Mn	Ni	Zn	Fe	Hg	Cr VI
		m		mg/L								ug/L											
GW 1	Min	1	7.15	4500	2500	<1	156	<1	45	798	36	<1	<1	<0.1	<1	<1	<1	43	<1	<1	<1	<0.1	<1
	Max	2.13	7.88	8850	5280	26	660	<1	80	1740	113	20	<1	0.2	<1	16	4	105	2	107	<1	<0.1	10
GW2	Min	2.8	6.24	741	466	25	<1	<1	15	55	10	<1	<1	<0.1	<1	<1	<1	71	<1	<1	8420	<0.1	<1
	Max	3.87	7.41	26500	21500	139	1120	2.5	453	5630	143	10	3	0.2	1	3	10	3980	61	61	133000	0.1	<1
GW3	Min	3.27	6.73	507	326	16	32	<1	6	12	7	<1	3	<0.1	<1	<1	<1	11	2	<1	<1	<0.1	<1
	Max	3.89	7.72	10600	8950	208	461	<1	128	1480	34	40	7	0.5	15	3	<1	1330	20	44	430	<0.1	<1
GW4	Min	3.17	6.75	7650	4510	5	<1	<1	111	1510	25	30	<1	<0.1	<1	<1	<1	238	1	<1	<1	<0.1	<1
	Max	3.92	7.3	17000	10700	46	177	<1	326	3510	93	260	3	0.1	2	7	4	1200	5	44	310	0.2	<1

An assessment of the monitoring records found that the variability and magnitude of the groundwater quality results was relatively consistent with the baseline water quality which was defined prior to commencement of project activities. There was no activity undertaken during the reporting period that would have impacted detrimentally on the quality of the groundwater system.

3.5.3 Reportable Incidents

No environmental incidents or complaints were reported relating to groundwater quality conditions were made during the reporting period.

3.5.4 Further Improvements

No improvement to groundwater quality monitoring is required for the next period. The current groundwater quality monitoring network will be incorporated into an extended monitoring system prior to the commencement of NCIG operational activities in March 2010.

3.6 LAND CONTAMINATION

3.6.1 Environmental Management

In accordance with Condition 2.53, Schedule 2 of the Project Approval (06_0009) NCIG engaged an appropriately qualified person to audit construction of the rail infrastructure over land used as part of the Kooragang Island Waste Emplacement Facility (KIWEF) against the commitments contained in the NCIG Project Environmental Assessment and supporting documents.

Prior to any excavation on the Project, a comprehensive surface and sub-surface soil sampling and analysis programme was undertaken in order to characterise the material to be excavated. The sampling programme was undertaken in accordance with the NSW Environment Protection Authority (EPA) (2004b) *Guidelines for the Assessment, Classification and Management of Liquid and Non-Liquid Waste*. The aim of the programme was to identify the risk associated with contamination across the stockyard and rail areas and to determine the suitability of the site for the development of the NCIG project. The findings of this process were that there existed a manageable risk associated with contamination and that the site was suitable for the proposed development.

In accordance with Condition 2.54, Schedule 2 of the Project Approval (06_0009) NCIG did not direct any contaminated materials removed from the site to a waste management facility that was not lawfully permitted to accept the materials.

3.6.2 Environmental Performance

There were minimal excavations into the existing ground surface during the construction of the stockyard and rail infrastructure areas. The construction activities in these area primarily focussed on filling to raise the level of the existing ground therefore there was little disturbance with potentially contaminated soils.

The construction of the train unloading station was commenced during the reporting period. This infrastructure is located on the northern side of the rail loop and the existing KIWEF embankment. Construction of the train unloading station required excavation for the preparation of foundations. To minimise the risk of these foundation excavations resulting in disturbance of pre-existing contaminated material and the development of a hydraulic connection between the fill and estuarine aquifers, diaphragm sub-surface perimeter walls and a jetgrouted base were utilised. Excavations were also required in the R2 rail infrastructure area, however, at this location the excavated material was incorporated into an adjacent embankment and capped with low permeability to minimise any associated perceived risk.

In accordance with the NCIG Environmental Assessment, capping of the rail infrastructure area with a low permeability material commenced during the reporting period. At the completion of the works within the of the rail infrastructure area (i.e. the KIWEF) the entire footprint of the NCIG activities will be capped with low permeability material in accordance with the commitments made in the NCIG Environmental Assessment and to DECC.

Audits of the NCIG construction activity on the KIWEF site commenced with initiation of rail construction preliminary works in June 2008. During the reporting period these audits were conducted by ENVIRON Australia on a quarterly basis, as required by Condition 2.53, and the subsequent reports were provided to the Department of Planning and the department of Environment and Climate Change. ENVIRON consistently found during the reporting period that the works undertaken by NCIG were in accordance with the project approval conditions and the commitments made in the NCIG Environmental Assessment.

3.6.3 Reportable Incidents

No environmental incidents or complaints were reported relating to land contamination were made during the reporting period.

3.6.4 Further Improvements

No improvement to land contamination management is required for the next period.

3.7 ACID SULFATE SOILS

3.7.1 Environmental Management

In accordance with Condition 7.3(a), Schedule 2 of Project Approval (06_0009), an Acid Sulfate Soil Management Plan (ASSMP) was developed in accordance with the guidance provided in the *Acid Sulfate Soil Manual* (ASSMAC, 1998). This addresses the management of Acid Sulfate Soils (ASS) identified during excavations on the Project site. The ASSMP was approved by the Department of Planning.

3.7.2 Environmental Performance

Table 3.7.1 outlines the monitoring locations, ASS monitoring parameters recorded, frequency of monitoring and ASS criteria for the Project in accordance with the ASSMP.

Table 3.7.1: Summary of the ASS Monitoring Programme

Monitoring Parameter	Monitoring Sites	Frequency	Criteria
Presence of acid sulfate soils or potential acid sulfate soils.	Excavation sites.	Prior to any excavation.	See ASSMP.
	ASS treatment area.	After treatment.	

Previous soil testing and assessments of the ASS risk at the Project site has determined the potential ASS risk to be limited. However, due to the location of the Project and the requirement for limited excavations (i.e. train unloading stations, surface water management infrastructure and sections of rail infrastructure corridor), a residual risk of encountering ASS remains. Therefore, the ASSMP was prepared to provide sampling, validation and management measures if ASS is encountered during construction of the Project.

The NSW Acid Sulfate Soil Management Advisory Committee (ASSMAC), *Acid Sulfate Soil Manual* (1998), presents guidelines for the sampling, determination and management of ASS materials dependent on the quantity of material to be disturbed and the type of disturbance (linear, bulk). The

guidelines provided in the *Acid Sulfate Soil Manual* (ASSMAC, 1998) are considered appropriate for use at the Project site.

The *Acid Sulfate Soil Manual* (ASSMAC, 1998) outlines 'Action Criteria' based on laboratory analysis of ASS characteristics. These Action Criteria are based on the soil texture together with the volume of material which is to be disturbed to determine if the material is to be managed as an ASS. The Action Criteria was used to assess 'neutralisation' of lime treated soils.

During the reporting period a representative surface and sub-surface soil sampling and analysis programme was undertaken for the Project elements requiring excavations, as well as for material reclaimed from the Hunter River, in order to characterise material disturbed during construction activities. The presence or otherwise of ASS was identified during this surface and sub-surface soil sampling and analysis program.

The results of the ASS representative sampling are illustrated in Attachment C. This testing programme determined that the majority of soil material tested was found not to be ASS or Potential Acid Sulfate Soils (PASS). Two of the samples were however determined to theoretically be an ASS soil but due to their marine originals, and in particular the presences of abundant shell and grit, these soils were determined to be self buffering and did not require any treatment.

3.7.3 Reportable Incidents

No incidents or complaints were reported relating to acid sulphate soils management during the reporting period.

3.7.4 Further Improvements

No improvement to acid sulphate soils management is required for the next period.

3.8 NOISE AND VIBRATION

3.8.1 Environmental Management

In accordance with Condition 2.9, Schedule 2 of the Project Approval (06_0009) NCIG and its contractors minimised noise emissions from plant and equipment operated on the Project site as outlined in the *NSW Industrial Noise Policy* (EPA, 2000).

In accordance with Condition 2.10, Schedule 2 of the Project Approval (06_0009), general site preparation, filling/preloading and construction works that may generate an audible noise at any residential receptor was only undertaken between 7.00 am and 6.00 pm.

However for the purposes of maintaining constant clearance of dredged material from the dredge pipe outlet on the Project site, in accordance with Condition 2.12, Schedule 2 of the Project Approval (06_0009), NCIG received Director-General's approval to conduct land-based dredging support works on the Project site 24 hours a day, seven days a week for the duration of dredging operations.

Extension of operating hours for ground improvement works was also conducted over the May 2008 to July 2008 period. Director General approval was provided for this activity to be undertaken for the 6.00am to 12.00am period.

In accordance with Condition 2.11, Schedule 2 of the Project Approval (06_0009) piling works was not be conducted on Sundays or public holidays.

Construction noise management measures are further detailed in the Construction Noise Management Plan (CNMP).

3.8.2 Environmental Performance

Table 3.8.1 outlines the monitoring locations, noise and vibration monitoring parameters recorded, frequency of monitoring and noise and vibration criteria for the Project in accordance with the CEMP.

Table 3.8.1: Summary of the Meteorological Monitoring Programme

Monitoring Parameter	Monitoring Sites	Frequency	Criteria
Attended and unattended noise monitoring.	N1, N3, N5, N9, N13 and N14[1].	Monthly for first 3 months then quarterly.	See below.
Unattended continuous noise monitoring.	Selected locations.	Minimum period of one week per quarter.	See below.
Attended noise monitoring.	Reference locations proximal to the Project[1].	At the commencement of night-time land-based dredging support works and at two monthly intervals thereafter.	See below.
Ground vibration.	Adjacent industrial receivers within 180 m of piling activities.	Weekly when piling within 180m of industrial receiver.	See CNMP.

[1] The location of monitoring sites is shown on Figure 3.1.1.

The noise impact assessment criteria as defined by the Project approval and the Environmental Protection Licence (EPL12693) are provided in Table 3.8.2.

Table 3.8.2: Noise Impact Assessment Criteria

Location	Day, Evening, Night At all times	Night 10:00pm to 7:00am Monday to Saturday 10:00pm to 8:00am on Sundays and Public Holidays	
	LAeq(15 minute)	LAeq(night)	LA1(1 minute)
Fullerton Lane (FW1) Fern Bay West	41 dBA	37 dBA	57 dBA
Fern Bay East	39 dBA	36 dBA	55 dBA
Fullerton Street (SW1), Stockton West	41 dBA	37 dBA	57 dBA
Stockton East	38 dBA	35 dBA	56 dBA
Mangrove Road (SG1), Stevenson Avenue (W1) Warabrook/Mayfield West	45 dBA	40 dBA	55 dBA
Simpson Crescent (M2), Mayfield	44 dBA	39 dBA	62 dBA
Arthur Street (M4), Mayfield	44 dBA	39 dBA	62 dBA
Blue Circle Southern (KI1), Kooragang Island	70 dBA	70 dBA	70 dBA

Where: a) wind speeds up to 3 ms^{-1} (measured at 10m above ground level).
b) temperature inversion conditions up to 3^{0}C per 100 m and wind speeds up to 2 ms^{-1} (measured at 10 m above ground level).

Noise and vibration monitoring was undertaken by specialists acoustic consultants during the reporting period. This monitoring was conducted on a monthly basis (over three months) to coincide with the initiation of woks on the project site and then continued on a quarterly and two monthly bases for construction and land based dredging support works respectively throughout the remainder of the reporting period.

The monitoring undertaken principally consisted of:

- Unattended noise monitoring – two (2) Type EL316 environmental noise loggers were deployed at the nearest potentially affected receptors for a period of one week. The noise loggers were programmed to record statistical noise level indices continuously in 15 minute intervals, including LAmax, LA1, LA50, LA90, LA99, LAmin and LAeq.
- Attended noise monitoring - operator attended noise survey was conducted at each noise logger location to assist in defining noise sources and the character of noise in the area and therefore to qualify unattended noise logging results. These measurements were conducted over 15 minute periods using a Bruel & Kjaer Type 2250 sound level meter.
- Land based dredging support works monitoring - the objective of dredging noise monitoring surveys was to measure LA10 (15minute) noise levels at the nearest potentially affected receptors during the night-time (i.e. when dredging is taking place) and to determine the noise contribution of the dredging activities associated with the Project. Operator attended noise surveys were conducted at the nearest potentially affected residents to determine audibility and associated noise contribution.
- Vibration monitoring - In accordance with the CNMP, vibration monitoring was conducted during construction piling activities within 180m of adjacent industrial receivers (i.e. Blue Circle Southern) on a weekly basis. Vibration surveys were conducted weekly for a significant amount of the monitoring period whilst piling activities were conducted on the northern bank of the Hunter River (South Arm) and the eastern section of the stockyard area to determine vibration levels at the nearest industrial receiver (Blue Circle Southern).

The conclusion of the specialised acoustic consultants was that throughout the reporting period noise and vibration surveys identified that current construction, land-based dredging support works and piling activities were conducted below the relevant noise and vibration criteria.

3.8.3 Reportable Incidents

No environmental incidents were reported relating to noise or vibration during the reporting period. Complaints regarding noise received during the reporting period (see Section 3.13) were responded to in accordance with the Complaint Response Procedure.

3.8.4 Further Improvements

No improvement to noise monitoring is required for the next period. An operational noise monitoring procedure will be developed in the next period to be incorporated into the environmental monitoring system prior to the commencement of NCIG operational activities in March 2010.

3.9 HERITAGE

3.9.1 Environmental Management

The DECC advised that as the Project construction site has been the subject of extensive disturbance over a period of more than 50 years, it considers that no Aboriginal heritage objects of significance will be present (DEC, pers. comm. 15 February 2007).

Notwithstanding, the management of items of Aboriginal cultural heritage significance during construction of the Project incorporated the following elements:

- During induction training, NCIG personnel were advised of their responsibility to advise management if they uncover any item that could be of Aboriginal heritage significance.
- If potential archaeological material is identified, construction activities proximal to the potential archaeological material will cease and the DECC's, North East Branch - Environment Protection and Regulation Division, Regional Archaeologist will be contacted to determine appropriate management requirements.
- If items of Aboriginal cultural heritage significance are salvaged on-site, they will be stored in a keeping place on-site for the duration of the Project.
- At the cessation of the Project, if any salvaged Aboriginal objects are stored on-site their ongoing management will be determined in consultation with the Aboriginal community and the DECC.

3.9.2 Environmental Performance

During the reporting period induction training was attended by all site personnel. This training included information relating to aboriginal heritage and the potential identification of items of archaeological significance.

During the reporting period there were no items of potential Aboriginal cultural heritage significance identified.

3.9.3 Reportable Incidents

No incidents or complaints were reported relating to heritage during the reporting period.

3.9.4 Further Improvements

No improvement to heritage is required for the next period.

3.10 FLORA AND FAUNA

3.10.1 Environmental Management

In accordance with Conditions 2.16 and 2.19, Schedule 2 of the Project Approval (06_0009) NCIG has employed two qualified ecologists (Dr David Goldney and Dr Arthur White), approved by the Director-General, to undertake a pre-construction survey of areas affected by construction works for the presence of *Litoria aurea* (the Green and Golden Bell Frog) (see Figure 3.10.1). These ecologists also provided advice on the mitigation and management of impacts to listed threatened species that may be affected by the NCIG Project works.

While Green and Golden Bell Frog individuals were not identified during the pre-construction survey, previous surveys have identified the presence of the species on the Project site. Therefore a management plan for the relocation of Green and Golden Bell Frog individuals was prepared in accordance with Condition 2.16, Schedule 2 of the Project Approval (06_0009). The Green and Golden Bell Frog Management Plan (GGBFMP) was developed in consultation with DECC and the Regional Land Management Corporation.

In accordance with Condition 2.17, Schedule 2 of the Project Approval (06_0009) NCIG has designed and commenced construction of relevant rail infrastructure associated with the Project to include culverts, underpasses or other similar measures to permit the movement of *Litoria aurea* and other amphibian species under the NCIG rail infrastructure. The culverts and underpasses are being

installed to include suitable habitat for the Green and Golden Bell Frogs and to provide protection from predators in accordance with guidance provided by Dr Arthur White.

Figure 3.10.1: The Green and Golden Bell Frog (*Litoria aurea)*

In accordance with Condition 2.18, Schedule 2 of the Project Approval (06_0009) all employees and contractors involved in construction of the Project are trained in site hygiene management in accordance with *Hygiene Protocol for the Control of Disease in Frogs* (NPWS, 2001) prior to the commencement of work.

A Compensatory Habitat Environmental Management Plan (CHEMP) has also been prepared to guide the construction of Green and Golden Bell Frog habitat which suitable replaces habitat damaged or destroyed by construction works. This plan is being considered by DECC and DoP.

A Vegetation Clearance Protocol (VCP) was also prepared to satisfy those commitments of the Project Environmental Assessment (EA) that relate to vegetation clearance during construction of the Project.

3.10.2 Environmental Performance

The Green and Golden Bell Frog *Litoria aurea* is listed as Endangered under the *Threatened Species Conservation Act, 1995* (TSC Act) and Vulnerable under the EPBC Act. The Green and Golden Bell Frog are estimated to have disappeared from 90% of its former range within NSW.

Known and potential Green and Golden Bell Frog habitat is located across the Project site and surrounds. Project disturbance to habitat would include Big Pond which would be fully infilled and Ponds H, K and Q which would be partially disturbed (see Figure 3.10.2). However, most of the known and potential Green and Golden Bell Frog habitat recorded across the Project site and surrounds would not be directly disturbed by the Project (i.e. Ponds A, B, C, D, E, F, G, I, J, L, O, T, U, V, AA, AC, AD).

Figure 3.10.2: Green and Golden Bell Frog Habitat Areas.

In order to minimise Project-related impacts on the Green and Golden Bell Frog the following management procedures were implemented in accordance with the GGBFMP:

- environmental induction training;
- site hygiene management;
- delineation of disturbance areas;
- pre-clearance surveys;
- Green and Golden Bell Frog relocation procedures; and
- construction works procedures.

All employees and contractors involved in construction of the Project were informed about the presence and importance of the Green and Golden Bell Frog as a part of the site induction process. Training was also provided on appropriate site hygiene practices in accordance with *Hygiene Protocol for the Control of Disease in Frogs* (NPWS, 2001) prior to the commencement of work.

Pre-clearance surveys included targeted active searches of potential Green and Golden Bell Frog habitat and were conducted within proposed Project disturbance areas. These areas were delineated by fencing, which prevented the movement of amphibian species back into the area of disturbance once it had been cleared. The surveys were undertaken by a suitably qualified and licensed ecologist in accordance with the relevant measures outlined in the Hygiene Protocol. The pre-clearance surveys (and if applicable relocation activities) were conducted to minimise disruption to breeding activities and the need to relocate tadpoles or metamorphs, where practicable. Habitat resources typically associated with the lifecycle components of the Green and Golden Bell Frog (e.g. ponded areas and rocks, logs, tussock forming vegetation and other cover) were searched during a diurnal visual inspection. Following the diurnal habitat searches, a nocturnal habitat search may have been conducted to assess nocturnal usage (i.e. breeding/calling) in the habitat area. The nocturnal habitat searches included:

- searching of habitat features which were searched during the day;
- spotlighting; and/or
- call play-back.

In the event that any Green and Golden Bell Frogs were observed during the diurnal or nocturnal searches for the pre-clearance surveys, prior to the commencement of construction works the relocation procedures defined in the GGBFMP were initiated. Similarly outside of the pre-clearance surveys, if a frog was observed within the Project site, and it could be potentially harmed by the Project activities, the relocation procedures were followed.

During the reporting period a total of 338 Green and Golden Bell Frogs were sighted and subsequently relocated. The majority of these frogs were identified between the 14th and the 27th of April 2008 in the northwest corner of the stockyard site (former Big Pond area) as illustrated by Figure 3.10.3. These relocations were conducted in accordance with the requirements of the GGBFMP. The information collected on each of the frogs relocated revealed that 97% were considered juveniles and were likely the result of breeding activity stimulated by rainfall events in early March 2008.

Figure 3.10.3: Location of GGBF Sightings

In accordance with the Project requirements under the *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act) approval, NCIG undertook Green and Golden Bell Frog monitoring during the reporting period. The overall objective of this Green and Golden Bell Frog monitoring programme is to monitor the dynamics of the Green and Golden Bell Frog within habitat areas adjacent to the Project site (within the Kooragang Island Waste Emplacement Facility), and any other locations where captured frogs have been relocated. Table 3.10.1 details the monitoring programme components.

Table 3.10.1: Green and Golden Bell Frog Monitoring Programme

Monitoring Component	Details
Timing	Surveys will be conducted during favourable seasonal and climatic conditions (e.g. between September and February, after heavy rain). Where logistically practicable, diurnal and nocturnal monitoring surveys will be conducted for a period of approximately two to four days and generally covering the locations identified in Figure 2, and will include locations where captured frogs have been released. A minimum of two surveys will be conducted each year during favourable seasonal and climatic conditions. Surveys will be separated by at least 2 weeks. Monitoring will be conducted annually until 2020. Thereafter, monitoring will be undertaken on a three-yearly basis until 2030. The requirement to monitor beyond 2030 will be determined at that time in consultation with the DEWR.
Locations	Monitoring locations will include Green and Golden Bell Frog habitat within the Kooragang Island Waste Emplacement Facility (Figure 2) and any other locations where captured frogs have been relocated (Section 3.2)
Methodology	Monitoring methodology may include, however not necessarily be limited to, frog call recording, active searches, spotlighting and call playback. The monitoring programme will be conducted in accordance with *Threatened Species Survey and Assessment: Guidelines for Developments and Activities (Working Draft)* (DEC, 2004). In addition, the monitoring surveys will be conducted in accordance with relevant DECC permits.
Parameters	Monitoring parameters will include, but not necessarily be limited to: • Green and Golden Bell Frog presence/absence, distribution, habitat utilisation, behaviour and abnormalities. • Observations of other frog species distribution, relative abundance and abnormalities. • Observations of other threatened frog species (listed under the TSC Act and/or the EPBC Act). • Water quality (i.e. salinity and pH) and habitat condition. Additional general information recorded during monitoring surveys may include: • date; • time of day; • rainfall (mm); • site location (GPS co-ordinates and map location); • survey methodology utilised; • sampling effort; • habitats surveyed; • weather conditions (including temperature); • number of observers; • photographs taken; and • any other relevant information.

The results of the monitoring programme conducted by Dr Arthur White during favourable seasonal and climatic conditions between September 2008 and March 2009 are illustrated in Table 3.10.2.

Table 3.10.2: Green and Golden Bell Frog Monitoring Results

Pond ID	Survey Date						
	11 Sept 08	26 Oct 08	11 Nov 08	16 Dec 08	21 Jan 09	20 Feb 09	20 March 09
A	-	-	4©	2©	-	2©	-
C	-	1©	-	4©	2©	3©	1
D	-	-	-	-	-	1	-
E	-	-	-	-	-	-	-
DPE1	-	-	2©	4, tadpoles	3,3©	4©	-
DPE2	-	-	1©	2, tadpoles	3©	2(2)	1, Tadpoles
DPSW	-	-	-	-	-	1	1
DP Rail	-	-	-	-	-	-	-
H	-	-	-	-	-	-	-
I	-	-	3©	-	-	3©	1©
J	-	-	-	-	-	-	-
K West	-	-	1	-	-	-	-
AF	-	-	-	-	-	1	-
AG	-	3,3©	2, tadpoles	2,1©	7©	3©,tadpoles	-
AC	-	-	-	-	-	-	-
AE	-	1©	-	-	-	-	-
AB	-	-	-	-	-	-	-
X	-	-	-	-	1©	-	-
F	-	-	-	-	2,1©	1	-
T	-	-	-	-	-	-	-
G	-	-	-	1	2©	1	-
Q	-	-	-	1©	-	-	1, tadpoles
ASH ISLAND	NS	4	NS	3	NS	11	4

NS = NOT SURVEYED
ASH ISLAND = ponds along Bell Frog track
© calling

A monitoring programme was also conducted during the reporting period to survey the utilisation of Deep Pond, adjacent to the NCIG rail infrastructure area, by bird species with the primary focus on Australasian Bittern and shorebirds. This Avifauna Monitoring Programme was undertaken by the Hunter Bird Observers Club and the resulting information was provided to NCIG by way of agreement. The results of the monthly surveys conducted during the 2008 calendar year are illustrated by Table 3.10.3. The aim of the monitoring programme is to identify the pattern of usage of Deep Pond by all birds over the annual cycle and determined the extent of any potential impact by the NCIG activities on this usage.

Table 3.10.3: Avifauna Monitoring Results

Avifauna Survey - Kooragang Island - Deep Pond

Newcastle Coal INFRASTRUCTURE GROUP

Species	19/01/2008	23/02/2008	8/03/2008	19/04/2008	17/05/2008	21/06/2008	19/07/2008	16/08/2008	13/09/2008	18/10/2008	15/11/2008	13/12/2008	10/01/2009
Magpie Goose *Anseranas semipalmata*													1
Musk Duck *Biziura lobata*		1	2	4	5			7		1			1
Black Swan *Cygnus atratus*	16	9	13	8	21	2	14	15	12	19		13	15
Pacific Black Duck *Anas superciliosa*	2	15	15	35	55	12	8	3		1		9	25
Australasian Shoveler *Anas rhynchotis*	44	3	2	11	28	125	256	151	4				20
Grey Teal *Anas gracilis*	10	6	7	7		182	31	92	37			14	16
Chestnut Teal *Anas castanea*	3	43	14	10	20	155	320	218	2			71	430
Pink-eared Duck *Malacorhynchus membranaceus*							62	22					
Hardhead *Aythya australis*	2	1		8	11	63	84	79		11		33	17
Australasian Grebe *Tachybaptus novaehollandiae*				25	15	16	24	26	27	4		11	13
Hoary-headed Grebe *Poliocephalus poliocephalus*	1		4	12	38	1	24	9	14	13		18	1
Australasian Darter *Anhinga novaehollandiae*	1	1	1	3						1			1
Little Pied Cormorant *Microcarbo melanoleucos*			2	1					1			2	3
Little Black Cormorant *Phalacrocorax sulcirostris*	2	1	6	1					1	1			37
Pied Cormorant *Phalacrocorax varius*					2		1	1					
Great Cormorant *Phalacrocorax carbo*	2							1	1	3			1
Australian Pelican *Pelecanus conspicillatus*	8	1	1		1					3		27	7
Eastern Great Egret *Ardea modesta*	1					2			1				3
Intermediate Egret *Ardea intermedia*				1									
White-faced Heron *Egretta novaehollandiae*			1				1					1	2
Australian White Ibis *Threskiornis molucca*	1		2						1			2	3
Royal Spoonbill *Platalea regia*	1												1
White-bellied Sea-Eagle *Haliaeetus leucogaster*			1		3		1	2	2				
Black-shouldered Kite *Elanus axillaris*									2				
Whistling Kite *Haliastur sphenurus*			1		1				2	1			2
Spotted Harrier *Circus assimilis*									2				
Swamp Harrier *Circus approximans*		1			1		2	6	4	1		2	2
Brown Goshawk *Accipter fasciatus*										1			
Nankeen Kestrel *Falco cenchroides*					2		1	3		1		1	
Purple Swamphen *Porphyrio porphyrio*	2				10		10	2	11	3		3	11
Dusky Moorhen *Gallinula tenebrosa*					5					2			1
Eurasian Coot *Fulica atra*					20	31	20	51	52	16		27	17
Black-winged Stilt *Himantopus himantopus*													3
Black-fronted Dotterel *Elseyornis melanops*										2			2
Masked Lapwing *Vanellus miles*	3				11								3
Caspian Tern *Hydroprogne caspia*										1			
Silver Gull *Chroicocephalus novaehollandiae*		2		1									1
Australasian Pipit *Anthus novaeseelandiae*	2	2			50								
Australian Reed-Warbler *Acrocephalus australis*	2								5	15			11
Golden-headed Cisticola *Cisticola exilis*	2				50				5	25			10+
Tawny Grassbird *Megalurus timoriensis*									5	5			20+
Little Grassbird *Megalurus gramineus*	1						1		5	5			3
Welcome Swallow *Hirundo neoxena*		2											
Chestnut-breasted Mannikin *Lonchura castaneothorax*					6								
European Goldfinch *Carduelis carduelis*		4			7								
Comments	3 Grey Teal ducklings	1 immature European Goldfinch			Includes 6 dependent Black Swans		Includes 6 dependent Black Swans		Includes 7 dependent Black Swans		NOT Surveyed		1 Magpie Goose flying over

The VCP was implemented to minimise impacts on threatened flora and fauna species within the Project area. The key components of the VCP are outlined below and include:

- delineation of areas to be cleared of existing vegetation;
- pre-clearance surveys;
- managing impacts on fauna; and
- vegetation clearance procedures.

The delineation of areas that were identified to be cleared of existing vegetation was undertaken to prevent accidental damage to vegetation not targeted for removal. Pre-clearance surveys involved habitat assessments to identify potential habitat features located within areas requiring vegetation clearance for construction of the Project.

Features with the potential to provide roosting and/or nesting resources for birds and/or arboreal mammals (e.g. grass tussocks and hollow openings, cracks, loose bark of trees) or shelter and/or breeding resources for frogs and/or reptiles (e.g. grass swales, grass tussocks and rock crevices) were identified during the habitat assessment.

Following the preliminary habitat assessment, a secondary habitat assessment was conducted to assess the usage of habitat features by fauna. The secondary habitat assessment may include:

- active searches and/or spotlighting for arboreal mammals, frogs and or reptiles; and/or
- observation of hollows and nests/roosts for usage by bird species.

The vegetation clearance procedure was undertaken by the approved ecologist (Dr Arthur White) for a number of relatively small areas on the project site. Each of the assessments undertaken determined that there was no habitat or fauna species of significance within the delineated areas of vegetation. Areas of vegetation were felled/cleared as soon as practicable following the completion of the pre-clearance surveys habitat assessments to ensure that the occupation status of the cleared area did not change in the intervening time period.

3.10.3 Reportable Incidents

No incidents or complaints were reported relating to flora and fauna management during the reporting period.

3.10.4 Further Improvements

No improvement to flora and fauna management is required for the next period.

3.11 TRAFFIC MANAGEMENT

3.11.1 Environmental Management

The Project Approval (06_0009) contains a range of requirements that pertain to road transport (Conditions 2.21 to 2.37, Schedule 2). These requirements are addressed where relevant in the Construction Traffic Management Protocol.

3.11.2 Environmental Performance

The road improvements proposed to conform to the Conditions of the Project Approval for the construction phase of the CET are generally those permanent works that would be required during the future operation of the proposed coal loader.

Traffic management during the construction phase focussed on the immediate imposition of movement restrictions at key intersections to limit the potential for delays to traffic flows on Cormorant Road.

NCIG has developed a Vehicle Traffic Management Plan (VTMP) in accordance with the Construction Traffic Management Protocol. This plan provides the approved traffic routes for NCIG construction traffic across the site. This plan also dictates the approved traffic routes for construction traffic on adjacent public roads, including the prevention of right-hand turns onto Cormorant Road from Egret Street, Pacific National Road and the NCIG Wharf Access Road intersection, in order to minimise any disruption to through traffic on this road. Each contractor on the NCIG project site also developed VTMPs to ensure that construction traffic is adequately managed on internal and external roads.

NCIG continues to work with the NSW Roads and Traffic Authority (RTA) to finalise the design and gain approval to undertake works on three intersections on Cormorant Road. This work will focus on the construction of permanent infrastructure to prevent right-hand turns from Egret Street, Pacific National Road and the NCIG Wharf Access Road onto Cormorant Road.

3.11.3 Reportable Incidents

No incidents or complaints were reported relating to traffic management during the reporting period.

3.11.4 Further Improvements

No improvement to traffic management is required for the next period. A Vehicle Traffic Management Plan will be developed in the next period for operational vehicles to be incorporated into the environmental management system prior to the commencement of NCIG operational activities in March 2010.

3.12 WASTE MANAGEMENT

3.12.1 Environmental Management

Measures to avoid and minimise the generation of wastes and promote waste re-use and recycling have been adopted during construction of the Project and include:

- waste avoidance – practices were developed that reduce the amount of waste on-site, via selective purchasing procedures and the use of bulk purchasing, where practicable;
- material reuse – reuse of recyclable or reusable materials where practicable; and
- recycling – materials such as metals, oil, timber, plastics, glass and paper were recycled where practicable.

In accordance with Conditions 2.54 and 2.56, Schedule 2 of the Project Approval (06_0009), all waste materials removed from the site was directed to a waste management facility lawfully permitted to accept the materials.

In accordance with Condition 2.57, Schedule 2 of the Project Approval (06_0009), waste was not received at the site. In addition, NCIG complied with the requirements of EPL No. 6437 as it relates to the on-going management of the Kooragang Island Waste Emplacement Facility.

3.12.2 Environmental Performance

The principles of waste management, being waste avoidance, material reuse and recycling have been adopted by NCIG and all construction contractors on the site during the reporting period. The focus of this process has been the avoidance of waste, however the recycling of waste products was also actively pursued with paper, aluminium, steel, plastics, timber and glass being the primary materials collected. Recycled concrete has also been incorporated into the pavement design for the rail and stockyard areas as a means of improving reuse of waste materials.

A 12,000 litre (L) waste oil tank has been incorporated into the project design to enable the collection and storage of waste hydrocarbons during NCIG operational activities, before being removed by licensed waste transporters on a periodic basis. The workshop and truck washdown areas will have purpose built oil/water separator systems installed which will be inspected and maintained on a regular basis during operations. This infrastructure is expected to be constructed during the next period.

During the reporting material there was no waste material stored, treated, processed or reprocessed or disposed of on the Kooragang Island Waste Emplacement Facility that would constitute a breach of the conditions of EPL No. 6437.

3.12.3 Reportable Incidents

No incidents or complaints were reported relating to waste management during the reporting period.

3.12.4 Further Improvements

No improvement to waste management is required for the next period. A Waste Management Plan will be developed in the next period to be incorporated into the environmental management system prior to the commencement of NCIG operational activities in March 2010.

3.13 COMMUNITY RELATIONS

3.13.1 Environmental Management

During Project construction the following complaints handling system was implemented:

- In accordance with Conditions 6.2, Schedule 2 of the Project Approval (06_0009), NCIG established a telephone number, postal address and email address prior to the commencement of construction for community complaints and enquiries. Current details are provided below:

  - 24-hour complaints telephone hotline: 1800 016 304
  - Postal address for written complaints: PO Box 644
Newcastle NSW 2300
  - Email address for electronic complaints: enquiries@ncig.com.au

- In accordance with Condition 6.2, Schedule 2 of the Project Approval (06_0009), the community were informed of the phone, email and postal addresses via the NCIG website (www.ncig.com.au), notices in local newspapers and signage adjacent to the Project.
- In accordance with Conditions 6.3, Schedule 2 of the Project Approval (06_0009), NCIG recorded all complaints received in a Complaints Register.

- In accordance with Condition 6.4 of the Project Approval (06_0009), NCIG established and maintained a website for the provision of electronic information associated with the Project including all relevant Management Plans.

3.13.2 Environmental Performance

The general structure of Complaint Response Procedure is shown on Figure 3.13.1. Upon receiving a complaint all details relating to the issue of concern were recorded in the Complaints Register including:

- the date and time, where relevant, of the complaint;
- the means by which the complaint was made (telephone, mail or email);
- any personal details of the complainant that were provided, or if no details were provided, a note to that effect;
- the nature of the complaint; and
- a record of any operational or meteorological conditions that may have potentially contributed to the complaint.

Within 2 working days of a complaint being registered, an initial response was provided to the complainant and a preliminary assessment commenced to determine likely causes of the complaint using relevant available information (i.e. climatic conditions, environmental monitoring results and current construction activities). Table 3.13.1 provides a summary of the complaints received during the reporting period. In every case the investigation of the complaint determined that the issue of concern was not as a result of an exceedence of relevant Project Approval or EPL criteria.

The outcome of the complaints handling process was recorded in the Complaints Register, including:

- action taken by NCIG in relation to the complaint, including all follow-up contact with the complainant; and
- details of the finding of the investigation and the reason(s) why no action was taken.

Every effort was made to ensure that the concerns of the complainant were addressed in a manner that resulted in a mutually acceptable outcome.

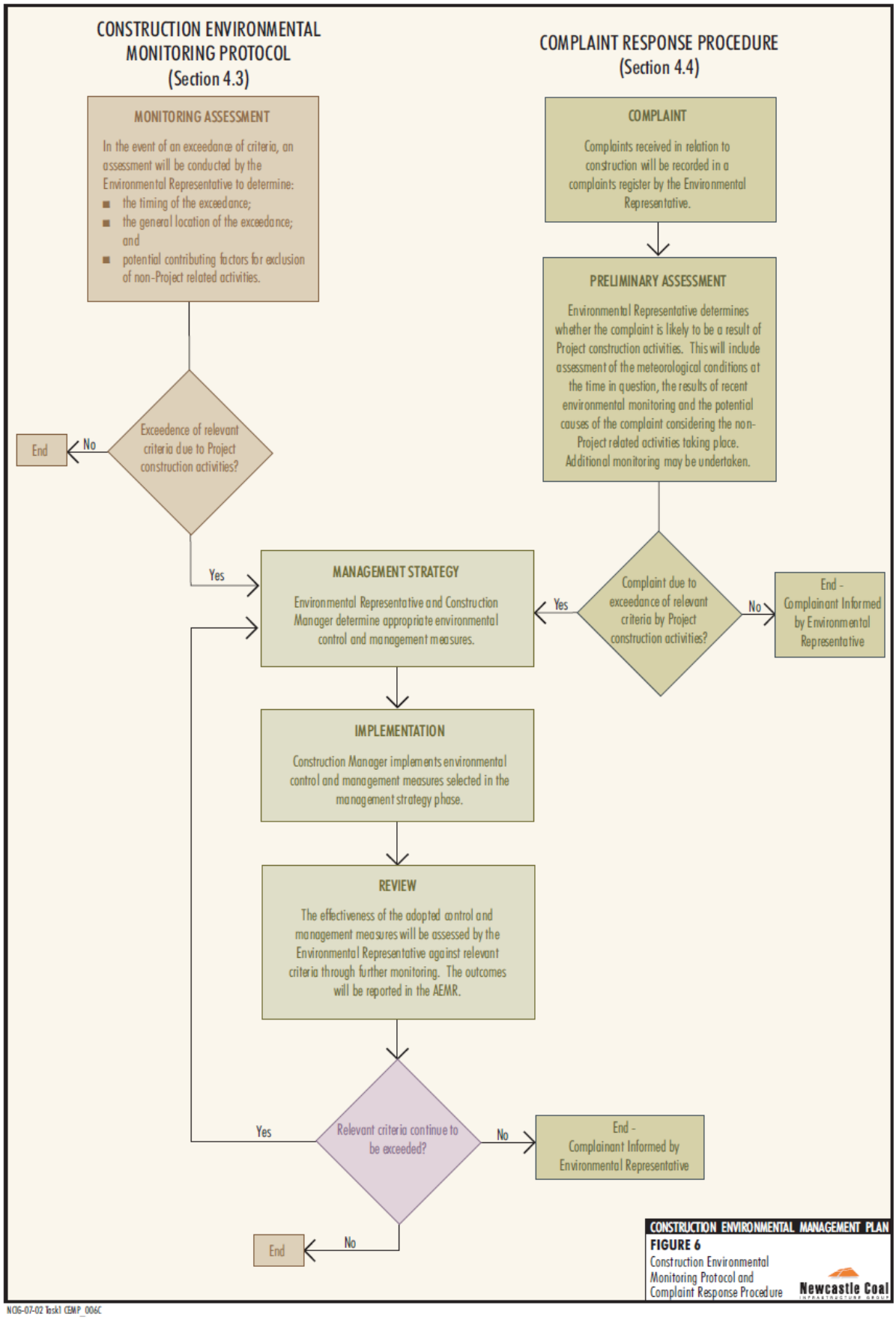

Figure 3.13.1: Complaint Response Procedure

Table 3.13.1: Community Complaints Register Summary

Date of Complaint	Environmental Concern Raised	Issue	Action Taken
10/04/08	Noise	Excessive noise during night	Logged as complaint. Investigation undertaken. Attended and unattended noise monitoring arranged for residence. No exceedences attributed to night dredging activities were identified during monitoring. Noise levels below background. Results communicated to resident. No further action taken.
02/10/08	Air Quality - Dust	Excessive dust at adjacent industrial site	Logged as complaint. Investigation undertaken. Mitigation measures discussed with complainant and implemented. Issue resolve with no further complaint. No further action taken.
3/10/08	Noise	Excessive noise	Logged as complaint. Investigation undertaken. No NCIG activity capable of generating noise described undertaken at time of complaint. Investigation outcome discussed with resident. No further action taken.
06/01/09	Noise	Excessive noise during night	Logged as complaint. Investigation undertaken. Attended and unattended noise monitoring arranged for residence. No exceedences attributed to night dredging activities were identified during monitoring. Noise levels below background. Results communicated to resident. No further action taken.
26/03/09	Noise	Excessive noise	Logged as complaint. Investigation undertaken. Attended and unattended noise monitoring arranged for residence. No exceedences attributed to NCIG activities were identified during monitoring. Noise levels below background. Results communicated to resident. No further action taken.

In addition to the management of community complaint NCIG also liaised with local community groups in the form of presentations and information sessions. This liaison was typically undertaken on request and was designed to provide information about the progress of the project to interested parties.

A Project newsletter was also prepared by NCIG and distributed to surrounding residents of the suburbs of Fern Bay, Stockton, Mayfield West, Mayfield East, Mayfield North, Warrabrook, Tighes Hill, Sandgate and Shortland. The newsletter provided residents with general information on the progress of the Project and to notify residents of the commencement of Project construction activities and outline noise and vibration generating construction activities to be undertaken that may affect their noise and vibration amenity. The newsletter included details for registering community complaints and enquiries (i.e.. telephone number, postal address and email address). The chronology of community liaison held during the reporting period is outlined in Table 3.13.2.

Table 3.13.2: Community Liaison Summary

Date	Type
April 2008	Hunter Environment Institute Meeting
April 2008	EPAPAC Meeting
April 2008	Mayfield Community Forum Meeting
May 2008	Stockton Community Forum Meeting
June 2008	University of Newcastle Presentation
July 2008	Local Politicians Presentation
December 2008	Community Reference Group Meeting
March 2009	Community Newsletter Distribution

3.13.3 Reportable Incidents

No incidents were reported relating to community relations during the reporting period. Complaints received during the period are detailed in the section above

3.13.4 Further Improvements

No improvement to community relations is required for the next period.

3.14 ENVIRONMENTAL MONITORING PROGRAM

An Environmental Monitoring Programme was implemented to monitor the environmental performance of the Project during construction in accordance with the Project Approval (06_0009), environmental licences and other statutory conditions. The programme was established and implemented at the commencement of construction works.

The Environmental Representative was responsible for the implementation of the construction environmental monitoring programme and is responsible for ensuring that adequate environmental monitoring is maintained throughout the Project construction.

The details of the monitoring undertaken is provided in the previous sections, however, an overview of the construction Environmental Monitoring Programme is provided in Table 3.14.1.

Table 3.14.1: Construction Environmental Monitoring Program

Monitoring Focus	Monitoring Sites	Frequency
Meteorology		
Temperature, relative humidity, net solar radiation rainfall, wind speed and direction and sigma theta (rate of change of wind direction).	Project automated meteorological station[1].	Continuously monitored and the data averaged over 15 minute periods.
Erosion and Sediment Control		
Structural stability and effectiveness in controlling sediment migration.	Drainage, erosion and sediment control infrastructure.	Monthly and following significant rainfall events (i.e. greater than 20 mm in 24 hours).
Noise		
Attended and unattended noise monitoring.	N1, N3, N5, N9, N13 and N14[1].	Monthly.
Unattended continuous noise monitoring.	Selected locations.	Minimum period of one week per quarter.
Attended noise monitoring.	Reference locations proximal to the Project[1].	At the commencement of night-time land-based dredging support works and at two monthly intervals thereafter.
Air Quality		
Dust deposition[2].	DG1, DG2, DG3, DG4, DG5 and DG6[1].	Monthly during the first three months of construction, then quarterly.
Vibration		
Ground vibration.	Adjacent industrial receivers within 180 m of piling activities.	Weekly.
Surface Water		
pH, electrical conductivity (EC), total dissolved solids (TDS) and total suspended solids (TSS).	Primary settling ponds and EPL Release Point.	Weekly.
	Surface water monitoring sites.	Monthly.
	Excavation sites that have accumulated water.	Weekly.
Water level.	Primary settling pond and EPL Release Point.	Following heavy rainfall (i.e. more than 20 mm of rainfall in a 24 hour period).
Groundwater		
pH, EC, TDS, TSS, sulfate, polycyclic aromatic hydrocarbons (PAH), As III, Cd, Cu, Pb, Hg, Zn, Cr VI, Mn and Ni (refer Table 5).	GW1 to GW4, and piezometer network[1].	Monthly.
Groundwater level.		Monthly.
Acid Sulfate Soils		
Presence of acid sulfate soils or potential acid sulfate soils.	Excavation sites.	Prior to any excavation.
	ASS treatment area.	After treatment.

1 The location of monitoring sites is shown on Figure 3.1.1.

2 Dust deposition was analysed in accordance with AS/NZS 3580.10.1-2003 *Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method.*

4 COMPLIANCE AUDITS

A number of audits were undertaken in relation to NCIG Construction activities which considered the compliance status of the Project for the reporting period. These reviews were conducted to meet the requirements of Condition 5.1 of development Approval 06-009 a) as outlined below:

> 5.1 The Proponent shall develop and implement a **Compliance Tracking Program** to track compliance with the requirements of this approval. The Program shall include, but not necessarily limited to:
>
> a) provisions for periodic review of the compliance status of the project against the requirements of this approval;

The details and outcomes of the audits conducted are illustrated below:

4.1 JANUARY 2008

A review of the NCIG Coal Export Terminal Compliance Tracking Program was undertaken by Blake Dawson in accordance with Condition 5.1a) of Development Consent (06_0009) for the Construction and operation of a coal export terminal, Newcastle.

This review was undertaken to validate the compliance status of the project against the requirements of the approval, to enable commencement of the Early Construction Phase Works on the proposed coal export terminal site. The outcome of the reviewers' assessment of the Compliance Tracking Program is as follows:

> In conclusion, I am satisfied that NCIG will be in compliance with the relevant conditions of Project Approval (06_009) if it proceeds with its intention to commence the Early Construction Phase Works next week.

On this basis, the Early Construction Phase Works commenced on the coal export terminal site.

4.2 DECEMBER 2008

A review of the compliance status of the NCIG Coal Export Terminal Construction activities was undertaken by Environmental Resources Management Australia Pty Ltd (ERM) for works conducted in the period up until December 2008. This review specifically focussed on the compliance of the Stage 1 NCIG Coal Export Terminal construction works against the Development Consent (06_0009).

The outcome of the ERM assessment of the NCIG compliance status is as follows:

> *NCIG is implementing construction activities in accordance with the Environmental Assessment and associated management plans, approvals, licences and permits.*

On this basis NCIG continued to undertake the Stage 1 NCIG Coal Export Terminal construction works in accordance with the approved management plans, licences and permits.

4.3 JULY 2009

Environmental Resources Management Australia Pty Ltd (ERM) undertook a review of the compliance status of the NCIG Coal Export Terminal Construction activities for the period up until the end of July 2009. This review was conducted as a component of an Environmental and Social Due Diligence Assessment.

This review was undertaken to confirm the compliance status of the project against the requirements of the project approvals, being for both the terminal construction (06_0009) and dredging (DA-134-3-2003-i) activities. The outcome of the ERM assessment of the NCIG compliance status is as follows:

> *the assessment found that NCIG is implementing construction activities in accordance with its formal Environmental Assessment (EA) (compliance with which is a condition of development consent (Project Approval 06_0009), the relevant components of the Port Consent (DA-134-3-2003-i) for dredging, and associated management plans, approvals, licences and permits.*

On this basis NCIG continued to undertake the Stage 1 NCIG Coal Export Terminal construction works in accordance with the approved management plans, licences and permits.

5 ACTIVITIES PROPOSED IN NEXT AEMR PERIOD

Significant activity is proposed to be undertaken in the next AEMR period in accordance with the Project Approval and environmental management and monitoring programmes. The principle elements are:

- Construction of 30 Mtpa Stage 1 of the NCIG Coal Export Terminal is scheduled to be completed by March 2010.
- Commencement of the operation of 30 Mtpa Stage 1 of the NCIG Coal Export Terminal is scheduled to be initiated in March 2010.
- The feasibility of the 66 Mtpa Stage 2 of the NCIG Coal Export Terminal project is to be concluded. The commencement of the construction of this additional infrastructure may occur in the next period.

ATTACHMENT A

DUST DEPOSITION MONITORING RESULTS

Newcastle Coal
INFRASTRUCTURE GROUP

Dust Gauge Monthly Data

	DG1				DG2				DG3				DG4				DG5				DG6			
	IS	Limit	Ash	Com.	IS	Limit	Ash	Com.	IS	Limit	Ash	Com.	IS	Limit	Ash	Com.	IS	Limit	Ash	Com.	IS	Limit	Ash	Com.
Apr-08	3.5	3.1	1.9	1.6	0.6	4	0.3	0.3	5	2.6	0	5	0.7	3	0.1	0.6	0.9	3	0.4	0.5	1.3	3.7	0.5	0.8
May-08	1.7	4	0.4	1.3	1.2	2.6	0.5	0.7	1.4	4	0.5	0.9	1.4	2.7	0.6	0.8	1.6	2.9	0.8	0.8	1.6	3.3	1	0.6
Jun-08	1.5	3.7	0.6	0.9	1.1	3.2	0.6	0.5	1.1	3.4	0.3	0.8	0.6	3.4	0.2	0.4	1.1	3.6	0.5	0.6	0.6	3.6	0	0.6
Jul-08	0.9	3.5	0.4	0.5	1.2	3.1	0.7	0.5	2.1	3.1	0.6	1.5	0.5	2.6	0.3	0.2	1.2	3.1	0.8	0.4	1.8	2.6	1.3	0.5
Aug-08	1.5	2.9	0.5	1	1	3.2	0.6	0.4	1.1	4	0.6	0.5	0.4	2.5	0.2	0.2	1.3	3.2	0.9	0.4	2.5	3.8	2	0.5
Sep-08	1.3	3.5	0.6	0.7	1.2	3	0.4	0.8	1.6	3.1	0.8	0.8	1.6	2.4	0.8	0.8	1.4	3.3	0.9	0.5	5.6	4	4.4	1.2
Oct-08	2.4	3.3	0.9	1.5	1.2	3.2	0.7	0.5	4.6	3.6	2.7	1.9	1.6	3.6	1.1	0.5	2	3.4	1.3	0.7	2.5	4	1.7	0.8
Nov-08	3.1	4	1.2	1.9	1.4	3.2	0.8	0.6	1.7	4	0.9	0.8	1.3	3.7	0.7	0.6	1.9	4	1.1	0.8	3.3	4	2.5	0.8
Dec-08	4.1	4	1.5	2.6	1.4	3.4	0.9	0.5	4.2	3.7	2.9	1.3	1.5	4	1	0.5	2.5	3.9	1.8	0.7	3.4	4	2.2	1.2
Jan-09	3.3	4	1.5	1.8	1.7	3.4	1.1	0.6	13.9	4	7.5	6.4	1.7	4	1.1	0.6	3.2	4	2.4	0.8	3.2	4	1.8	1.4
Feb-09	7.6	4	2	5.6	0.7	3.7	0.4	0.3	5.4	4	3.4	2	0.8	4	0.4	0.4	2.2	4	1.6	0.6	1.8	4	0.9	0.9
Mar-09	8.8	4	3.7	5.1	2.2	2.7	1.5	0.7	Broken Funnel				2.6	4	1.9	0.7	3.6	4	2.7	0.9	4.5	3.8	3.3	1.2

ATTACHMENT B

SURFACE WATER MONITORING RESULTS

Newcastle Coal
INFRASTRUCTURE GROUP

Temperature (°C)

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
04-Apr	19.7	16.7	17	20.6	18.5	18.2	No access	18.7	16.2	19.5	20.2	16.1
08-Apr	21.7	20.7	20.3	22.4	21	21	No access	19.7	21.4	18.6	19.8	17.8
11-Apr	20.6	17.8	19.6	22	19.7	20.3	No access	19.3	16.3	19.1	18.3	18.2
15-Apr	18.2	18.7	18.5	19.9	21.8	19	No access	18.7	17.6	18.9	18.9	19.3
18-Apr	19.4	19.2	18.1	20.7	17.6	18.2	No access	17	18.1	17.1	18.5	18.2
22-Apr	18.4	18.6	18.1	19.7	18.5	18.1	No access	17.6	16.8	17.5	18	18.4
24-Apr	19.7	17.5	17.1	18.9	18.2	19.3	No access	17.7	17.1	17.1	16.8	16.8
29-Apr	15.1	14.7	14.7	15.1	17.8	15	No access	15.4	14.5	15.8	14.6	14.8
02-May	17.4	17.5	18.5	20.4	20	17.9	No access	18.6	16.1	19.2	20.4	17.2
06-May	19	18.5	18.6	19.7	19.9	17.8	No access	17.4	16	15.4	18.9	18.1
09-May	14.9	14.2	15.1	16.9	15.9	15.1	No access	15.5	14.7	15	15.6	15.1
13-May	19.3	18.8	18.1	20.2	19.6	18.2	No access	17.8	16.9	17.5	18.4	18.9
16-May	16.8	14.5	15.2	16	15.4	15.6	No access	16	14.7	14.8	15.2	15
20-May	14.7	14.6	14.6	15.5	15.8	14.6	No access	14.5	13.6	14.5	14.2	12.8
23-May	14.9	13.4	13.5	14.3	14.2	14.1	No access	14.2	14.2	14	14.2	13.3
27-May	19.6	16.7	20	18.9	18.5	17.8	No access	17.6	15.1	17.6	17.8	17.4
30-May	14.4	14.1	15.7	17.1	16.1	15.5	No access	15.9	14.7	15.5	15.1	16.5
03-Jun	17	16.7	17	18.3	17.1	16.6	No access	16.4	15.1	15.3	16.5	19.1
06-Jun	16.1	15.7	15.3	16.2	15.8	15.3	No access	15.6	15.6	15.6	15.1	16.4
10-Jun	15.9	14.8	15	16.2	15.8	14.9	No access	15.3	15	14.7	15.1	16.7
13-Jun	15.6	15.9	16.1	16.9	17.5	17	No access	16.8	16.4	16.3	17.3	17.8
17-Jun	14.7	14.5	14.3	15.1	14.5	14.1	No access	14.4	14.2	13.8	17.1	15.8
20-Jun	16.5	16.8	19	17.7	17.3	16.7	No access	16.9	16.9	16.6	18.1	17.5
24-Jun	13.9	14.1	13.8	14.9	14.2	13.1	No access	12.9	14.1	12.3	12.7	14.9
26-Jun	13.2	13.2	12.4	12.7	14.3	13.3	No access	12.3	12.4	11.9	13.5	12.9
01-Jul	12.2	11.6	11.8	13.3	12.9	12.2	No access	12.3	11.1	11.1	12	12.8
04-Jul	12	13.4	13.1	13.3	13.4	12.4	No access	12.9	11.7	12.8	12	12
08-Jul	14.2	14.2	12.8	14.2	13.2	12.9	No access	13.8	12.1	12.7	12.8	12
11-Jul	9.9	10	10.4	10.6	11.4	10.4	No access	10.9	10.6	11.3	11.3	9.7
15-Jul	16.5	17.5	17.5	19.6	15	15.1	No access	14.3	14	13.6	16.5	15.8
18-Jul	10.9	10.5	14.1	14.6	14.1	15.7	No access	14.1	12.1	12.7	14.8	14
22-Jul	13.2	10.8	11.3	11.9	11.9	11.3	No access	11.9	11.5	11.3	11.7	10.9
25-Jul	14	12.6	14.3	13.7	13.4	13.2	No access	12.8	12.4	13	13.4	14.1
29-Jul	11.9	11.5	12.7	13.4	11.8	11.7	No access	11.4	11.5	11.3	12.2	11.8
01-Aug	13.5	11.9	12.9	13.7	13.6	12.7	No access	12.1	11.6	11.9	12.8	14.1
05-Aug	11.1	10.7	13	13.7	12.8	12.6	No access	12.9	11.5	12.8	12.2	11.1
08-Aug	10.2	10	9.8	11	11.3	10.8	No access	10.8	10.5	10.2	10.9	9.6
12-Aug	10.4	10.3	10.8	10.1	11.5	10.9	No access	10.8	10.8	10.1	10.6	10.1
15-Aug	11.1	11.6	7.9	10.8	11.6	10.9	No access	11.5	11.5	10.6	10.7	10
19-Aug	11.8	11.1	14.1	12.6	14	12.8	No access	12.2	12.9	13.3	13.5	12.2
22-Aug	12.7	12.6	14.1	13.7	13.8	13.8	No access	13.9	13	13.3	12.2	13.3
26-Aug	15.1	15.5	17	15.5	15.1	14.9	No access	15.4	14.7	14.6	14.4	15.5
29-Aug	14.8	12.9	15.6	15.5	15	14.8	No access	14.3	13.6	14	13.5	17.4
02-Sep	16.6	13.5	16.6	16.2	16	16.1	No access	16.6	15.3	15.2	15.4	16.6
05-Sep	15.5	14.2	15	15.4	14.9	14.6	No access	14.5	13.9	14.3	14.8	14.8
09-Sep	15.1	13.9	15.4	14.6	16.1	14.8	No access	15.4	14.6	14.8	15.7	13
12-Sep	17.4	17.2	17.8	13.6	17.2	17.8	No access	17.5	15.5	17.1	18.2	12.9
16-Sep	17.9	17.1	16.8	16.5	16.9	16.7	No access	16.9	16.2	16.1	17.2	16
19-Sep	23.5	23.1	Dry	Dry	24	23.5	No access	24.5	23	23.8	25	23
24-Sep	17.5	16.7	Dry	Dry	17.2	17.2	No access	17.5	16	17.4	17.9	17.1
29-Sep			Dry	Dry	22.9	22.7	No access	23.7	23	22.5	22.5	20.9
30-Sep	24.2	24	Dry	23.1	24.1	23.8	No access	24.9	23.9	24.1	26.1	Dry
03-Oct	24.9	24.4	Dry	24	24.4	24.1	No access	24.2	25	24.2	24.3	Dry
08-Oct	23.3	24	Dry	21.3	21.1	21.3	No access	21	23.8	21.2	23.8	Dry
10-Oct	24	23	Dry	22.1	25.4	24.4	No access	24.4	26.2	27.3	28	Dry
17-Oct	27.1	29.9	Dry	24.2	24.7	24.7	No access	27	29	26.2	29.7	Dry
15-Oct	19.8	18.3	Dry	17.7	19	20.4	No access	19.2	18.5	18.8	19.3	Dry
22-Oct	17.8	16.5	Dry	15.9	18.2	18.6	No access	17.4	17.8	17.3	19	Dry
26-Nov	22	21.7	Dry	20.3	21.2	21.2	No access	21.6	23.4	21.3	21.9	20.5
17-Dec	28.1	29.5	Dry	25.1	25.4	25.1	No access	26.4	28.5	27.6	30.4	27.6
28-Jan	31.2	31.3	Dry	28.7	31.2	30.2	No access	28.9	25.3	29.5	31.5	28.3
26-Feb	23.6	21.9	Dry	Dry	23.3	23.8	No access	23.2	21.1	22.9	23.7	Dry
26-Mar	21.7	20.1	Dry	Dry	21.2	22.1	No access	21.5	18.1	21.5	20.5	Dry
30-Apr	19.3	19.6	Dry	Dry	16.6	16.4	No access	16.4	17.3	16.7	16.8	Dry

Turbidity (NTU)

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
04-Apr	30	40	6	70	30	10	No access	45	45	15	20	5
08-Apr	15	20	5	42	26	10	No access	61	113	14	20	8
11-Apr	25	6	2	37	10	4	No access	50	43	9	18	14
15-Apr	20	5	4	13	5	1	No access	47	61	3	2	18
18-Apr	15	11	3	16	1	1	No access	23	52	14	13	32
22-Apr	10	65	3	29	3	12	No access	46	24	12	9	17
24-Apr	11	12	3	5	5	3	No access	58	13	8	15	51
29-Apr	6	2	2	8	2	6	No access	24	20	3	5	15
02-May	2	3	3	9	3	4	No access	71	33	5	2	71
06-May	4	4	4	21	4	3	No access	54	27	2	5	43
09-May	23	2	1	15	2	1	No access	48	21	1	1	6
13-May	20	2	8	14	8	7	No access	51	25	4	7	18
16-May	17	2	12	12	2	10	No access	54	22	4	5	10
20-May	9	5	19	19	1	5	No access	55	22	2	5	11
23-May	9	3	9	16	0	5	No access	50	44	2	1	6
27-May	15	10	11	20	4	9	No access	69	34	6	4	44
30-May	16	8	2	33	6	9	No access	57	12	3	3	30
03-Jun	22	17	6	32	5	12	No access	55	15	7	8	42
06-Jun	27	3	2	13	2	1	No access	47	35	0	2	43
10-Jun	45	3	5	80	2	6	No access	46	40	6	2	80
13-Jun	40	2	13	29	3	9	No access	44	26	9	3	62
17-Jun	2	11	2	80	1	3	No access	39	21	3	1	47
20-Jun	1	13	5	11	3	8	No access	36	22	20	64	21
24-Jun	10	8	10	35	5	10	No access	6	4	1	1	66
26-Jun	1	4	4	68	1	4	No access	24	10	4	5	146
01-Jul	70	23	1	7	1	4	No access	25	6	2	20	23
04-Jul	18	13	5	19	6	9	No access	37	14	3	2	117
08-Jul	7	21	3	47	43	6	No access	21	4	7	5	14
11-Jul	133	25	2	41	3	6	No access	27	66	12	3	16
15-Jul	1.5	9.3	2.5	9.5	1.1	1.4	No access	25	4.5	6	5	3.3
18-Jul	34	58	77	66	5	7	No access	34	7	8	9	14
22-Jul	30	28	47	25	3	5	No access	26	8	14	10	15
25-Jul	32	22	65	157	1	6	No access	27	13	15	8	42
29-Jul	71	59	224	218	1	1	No access	17	10	3	10	85
01-Aug	46	32	68	12	0	1	No access	16	18	7	28	475
05-Aug	109	22	63	77	3	5	No access	33	14	145	18	20
08-Aug	66	5	72	91	6	7	No access	35	70	70	7	10
12-Aug	113	10	37	55	3	3	No access	34	78	25	18	21
15-Aug	120	20	79	210	5	6	No access	30	70	10	10	24
19-Aug	34	25	22	6	1	2	No access	3	25	2	13	10
22-Aug	43	3	205	34	3	1	No access	37		1	70	25
26-Aug	7	13	64	18	1	1	No access	29	30	3	90	34
29-Aug	23	35	90	11	2	3	No access	18	44	1	44	11
02-Sep	5	45	21	6	1	1	No access	13	27	1	15	21
05-Sep	23	32	393	52	2	1	No access	16	10	2	20	85
09-Sep	18	19	202	52	2	7	No access	30	8	23	9	40
12-Sep	7	35	125	11	7	25	No access	11	135	27	28	25
16-Sep	17	7	132	2	0	1	No access	0	15	0	0	34
19-Sep	8.7	5.1	6.3	6.5	7.6		No access	7.6	16.3	2	4.2	147.1
24-Sep	5	5.7	Dry	Dry	18	3.7	No access	9.1	8.7	2.8	3	27.8
26-Sep			Dry	Dry	2.7	17	No access	30	8.8	5.2	3	43.1
30-Sep	4.7	4.5	Dry	Dry	13.4	6.6	No access	16.6	16.6	5	9	Dry
03-Oct	5.7	1.8	Dry	10.4	10.2	9.9	No access	24	103	2.6	4.4	Dry
08-Oct	7.4	5.2	Dry	20.6	4.8	2.7	No access	14.5	59.6	5.6	63	Dry
10-Oct	6.5	2.1	Dry	94.4	7.5	5.2	No access	13.1	10.2	31.3	4.5	Dry
17-Oct	4.9	5.4	Dry	21.5	19.6	5.2	No access	13.1	96.6	6.1	8	Dry
15-Oct	6.1	4.9	Dry	20	19.2	5.4	No access	14.9	37.3	17.7	18.2	Dry
22-Oct	5.5	3.9	Dry	55.7	1.6	7.2	No access	17.1	45.2	11.3	5.6	Dry
26-Nov	5.3	1	Dry	11.5	20.8	5	No access	27.4	55	14.2	16.1	14.8
17-Dec	5.3	1	Dry	11.5	20.8	5	No access	27.4	55	14.2	16.1	14.8
28-Jan	4.7	2.5	Dry	2170	6.6	4.4	No access	22.9	280	12.1	11	1042
26-Feb	16.4	4	Dry	Dry	72.6	19.1	No access	102.6	65.6	25.2	28.3	Dry
26-Mar	15	5.3	Dry	Dry	11.2	4.6	No access	34.9	11.6	20.4	47.8	Dry
30-Apr	13.5	7.9	Dry	Dry	7.3	5.8	No access	192.8	100.1	15.1	15.1	Dry

Newcastle Coal
INFRASTRUCTURE GROUP

pH

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
04-Apr	8.2	7.8	8.5	11.2	7.8	8		9.8	7.8	9.7	7.7	7.7
08-Apr	8.3	7.7	8.4	11.3	8.3	8.8		9.67	7.6	9.8	7.7	7.2
11-Apr	8	7.9	8.5	11.2	8.8	8.7		9.8	7.7	9.77	7.7	7.2
15-Apr	8.5	8.1	8.6	11.3	8.3	8.4		9.7	7.8	9.6	8	7.3
18-Apr	7.8	8.2	8.6	11.4	8	8.4		7.9	9.6	9.8	8.3	7.4
22-Apr	9	8.8	8.8	11.5	8.7	9.2		9.7	7.7	9.4	8	7.9
24-Apr	7.73	7.9	8.39	11.2	9.13	9.19		11.02	8.62	9.63	7.84	7.47
29-Apr	8.4	7.9	7.7	11.1	8.7	7.8		9.4	9.3	7.8	9.6	7.9
02-May	8.24	8.09	7.71	8.42	8.6	6.46		8.09	8.93	9.59	7.82	8.52
06-May	8.29	7.99	8.68	7.31	7.41	8.15		9.17	8.86	9.7	7.77	8.23
09-May	7.63	7.45	8.19	7.61	7.7	8.06		9.29	8.81	9.47	7.87	8.14
13-May	7.6	7.56	8.34	7.52	7.74	7.93		9.08	8.27	9.55	8.03	7.7
16-May	7.23	7.85	7.8	7.44	8.66	7.89		9.12	8.12	9.45	7.6	7.26
20-May	7.8	7.5	8.12	7.83	7.79	7.95		9.6	8.43	9.26	7.79	7.29
23-May	7.73	6.2	7.33	7.75	8.01	7.43		9.16	8.51	9.17	7.96	6.47
27-May	8.5	8	8.5	7.9	8.4	8.2		8.9	8.4	9.6	8.5	7.7
30-May	7.48	7.49	8.23	7.49	8.46	8.09		9.08	8.2	8.13	9.36	7.6
03-Jun	7.39	7.49	7.74	7.67	8	7.85		8.89	7.85	9.34	8.07	7.51
06-Jun	7.43	7.03	7.59	6.61	7.78	7.67		7.12	6.92	9.23	7.57	7.49
10-Jun	7.57	6.88	7.94	7.46	8.05	7.99		9.14	7.13	8.91	7.91	7.15
13-Jun	7.39	7.19	8.14	7.8	8.15	8.65		9.51	8.97	9.26	8.52	7.36
17-Jun	7.01	7.01	7.04	7.48	7.43	7.2		8.28	8	7.91	6.95	7.5
20-Jun	7.8	7.7	8.4	8	7.9	8		9.2	8.6	8.8	8.1	7.6
24-Jun	7.51	7.94	7.93	8.06	8	8.09		9.47	8.73	9.25	8.15	7.67
26-Jun	8.41	7.87	7.8	8.05	7.69	7.86	8.4	8.82	8.35	9.13	7.68	7.78
01-Jul	7.54	7.57	8.21	7.77	8.02	8.16		8.69	8.15	9.09	8.03	7.39
04-Jul	7.24	8.2	8.35	8.07	8	8.15		8.61	8.24	9.04	8.03	7.75
08-Jul	7.59	7.88	8.33	7.71	7.7	8.08		8.78	8.07	9.02	7.74	8.02
11-Jul	8.06	7.96	8.03	8.01	8	8.21		8.62	7.96	8.93	8.14	8.03
15-Jul	8.15	7.82	7.46	7.74	7.76	7.95		8.31	7.49	8.5	7.64	8.09
18-Jul	6.92	7.54	8	7.89	8.13	7.88		8.6	7.9	8.74	8.26	8.44
22-Jul	7.87	7.87	8	7.98	8.18	8.31		8.59	8.07	8.63	8.31	7.95
25-Jul	7.45	7.79	8	8.03	8.08	8.23		8.65	8.02	8.74	8.32	8.12
29-Jul	7.5	7.8	8.08	7.91	8.16	8.14	No access	8.69	8.07	8.28	8.23	8.16
01-Aug	7.45	7.67	7.84	7.94	8.06	8.19	No access	8.89	8.02	8.48	8	7.92
05-Aug	7.57	7.64	7.94	7.95	8.13	8.2	No access	9.01	7.94	8.51	7.83	8.01
08-Aug	7.73	7.8	8.12	8.1	8.16	8.22	No access	9.02	8.05	8.31	8.23	7.94
12-Aug	7.78	7.8	8.25	8.13	8.28	8.3	No access	9.09	8	8.43	7.97	7.96
15-Aug	8.07	8.07	8.44	8.18	8.17	8.32	No access	9.04	8.03	8.45	7.72	8.16
19-Aug	7.66	7.91	8.15	7.93	8.31	8.22	No access	7.93	9.09	8.77	8.16	8.2
22-Aug	7.9	7.94	8.39	7.98	8.27	8.32	No access	9.05	7.71	8.7	7.92	8.14
26-Aug	7.43	7.99	8.41	8.15	8.33	8.35	No access	8.83	7.83	8.4	7.93	7.84
29-Aug	7.51	7.71	8.11	8.07	8.32	8.19	No access	8.69	7.77	8.29	7.89	7.53
02-Sep	7.41	7.7	8.02	7.76	8.15	8.2	No access	8.66	7.93	8.56	7.8	7.55
05-Sep	7.67	7.76	8.22	7.9	8.32	8.28	No access	9.12	7.58	8.36	7.91	7.84
09-Sep	7.42	7.88	8.05	8.1	8.84	8.29	No access	10.48	7.97	9.59	8.03	7.83
12-Sep	7.63	8.1	8.24	8.33	8.78	8.43	No access	10.65	7.89	9.55	8.11	7.87
16-Sep	7.38	7.74	8.13	8.23	8.39	8.15	No access	9.8	7.68	8.97	8.26	8.23
19-Sep	8.31	8.2	Dry	Dry	9.63	8.1	No access	9.32	7.64	9.15	7.9	8.14
24-Sep	8.2	8.41	Dry	Dry	7.54	7.28	No access	8.95	7.31	8.28	7.41	7.84
29-Sep			Dry	Dry	7.92	8.62	No access	9.46	8.07	8.82	8.54	8.15
30-Sep	8.06	8.34	Dry	8.36	8.68	8.03	No access	9.07	7.32	8.77	8.64	Dry
03-Oct	7.7	7.72	Dry	8.03	8.59	8.01	No access	9.18	7.74	8.69	7.71	Dry
08-Oct	7.69	8.02	Dry	8.36	8.35	7.83	No access	8.62	7.5	8.01	7.75	Dry
10-Oct	7.83	7.75	Dry	8	8.48	7.94	No access	8.96	7.46	9.11	8.11	Dry
17-Oct	7.85	7.3	Dry	8.78	8.57	7.82	No access	8.75	7.48	8.52	8.26	Dry
15-Oct	7.29	7.18	Dry	8.12	7.86	7.48	No access	8.75	7.34	8.35	8.78	Dry
22-Oct	7.83	7.69	Dry	7.69	8.71	8.52	No access	9.01	7.99	8.5	8.47	Dry
26-Nov	8.15	7.63	Dry	8.7	8.22	7.6	No access	9.36	8.48	8.8	7.82	8.07
17-Dec	7.75	7.7	Dry	7.28	7.23	7.96	No access	11.32	7.68	8.89	7.68	7.31
28-Jan	8.49	8.21	Dry	7.31	8.39	8.11	No access	9.72	7.29	9.29	9.42	7.29
26-Feb	7.47	7.41	Dry	Dry	8.33	7.5	No access	9.83	9.43	9.03	7.04	Dry
26-Mar	6.89	6.75	Dry	Dry	6.07	7.13	No access	8.02	7.1	8.06	7.05	Dry
30-Apr	8.12	7.49	Dry	Dry	8.6	9.09	No access	8.71	7.61	8.16	7.65	Dry

Electrical Conductivity (µS)

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
04-Apr	3080	5690	4660	5680	2440	3000	No access	2730	1810	1130	840	6220
08-Apr	2895	5270	4560	5960	2176	3230	No access	2788	1955	1063	829	6650
11-Apr	2920	3850	4420	5720	2295	3090	No access	2537	1543	1110	629	10350
15-Apr	2833	4290	4350	6290	2296	3120	No access	2606	1728	1085	697	
18-Apr	2850	4190	4380	6560	2300	3110	No access	1740	2580	1090	626	
22-Apr	2670	3960	4560	6720	2170	2970	No access	2380	1620	1060	631	
24-Apr	1859	1637	2970	3530	1672	2243	No access	2111	1447	937	353	22200
29-Apr	2290	2660	2340	4150	2250	2850	No access	2280	2140	763	847	
02-May	2840	2840	2799	3690	3115	2695	No access	2197	2118	862	787	
06-May	3000	3630	2780		2101	2860	No access	2177	2090	858	831	
09-May	3160	3490	3050		2042	2877	No access	2565	2027	944	838	
13-May	3160	2700	3140		2143	2768	No access	2165	2126	904	846	27130
16-May	3160	4450	3200		1734	2841	No access	2172	2074	885	847	21760
20-May	4050	3470	3390		2298	2980	No access	2168	2043	922	903	
23-May	2990	4360	3360		2206	2820	No access	2086	1990	948	814	26340
27-May	3280	3540	3500		2200	2480	No access	2180	1960	950	870	16110
30-May	3920	3820	4350		2108	2960	No access	2168	2074	925	951	
03-Jun	3290	4240	4640		2070	2725	No access	2072	2026	901	844	
06-Jun	4080	3920	3350		1983	2401	No access	1928	1782	741	663	
10-Jun	5010	4950	3740		1967	2537	No access	1907	1873	841	696	
13-Jun	5700	5400	3760		1973	2616	No access	1915	1877	849	720	
17-Jun	6580	4580	3090		2148	2760	No access	1825	1812	885	766	
20-Jun	5830	4030	3910		2240	2630	No access	1930	1840	890	810	
24-Jun	6020	4540	3310		2264	2719	No access	1975	2736	1028	842	
26-Jun	6160	3370	5170		2192	2949	No access	1954	907	917	873	
01-Jul	5410	5080	4650		2271	3020	No access	1993	1916	951	906	
04-Jul	5490	5420	3560	50700	2326	2980	No access	1970	1871	824	907	6950
08-Jul	5880	5000	4210	37600	2406	2863	No access	2010	1913	907	930	3560
11-Jul	7260	4800	5080		2386	2972	No access	2004	1975	969	893	10760
15-Jul	5030	5480	4770	30800	2240	2700	No access	1828	1731	873	836	4120
18-Jul	5470	5790	1463		2519	333	No access	2006	1890	1015	988	4220
22-Jul	6470	6960	7440		2487	317	No access	2034	1942	1032	972	12650
25-Jul	7110	7140	6860		2551	3030	No access	2012	1847	1047	948	3980
29-Jul	8190	6950	6780		2545	2900	No access	1938	1744	1046	875	3030
01-Aug	9380	7860	7880	8810	2474	2992	No access	1997	1878	1022	963	
05-Aug	9620	11890	7800		2445	2968	No access	2018	1921	1083	969	522
08-Aug	9710	8030	8180		2185	2975	No access	2022	1953	1082	960	15370
12-Aug	10320	10720	8050		2521	3050	No access	2065	1963	1080	1048	19010
15-Aug	11050	8330	9650		2603	3190	No access	2071	1967	1090	1117	10900
19-Aug	12240	8360	8170		2633	3050	No access	2051	2131	1121	1019	3054
22-Aug	11670	7690	7780		2505	2993	No access	2171	2367	1105	990	3430
26-Aug	11500	7480	6400		2680	4750	No access	2156	2053	1118	1047	7700
29-Aug	11300	7930	8330		2637	3058	No access	2200	2076	1150	1108	26250
02-Sep	10500	8160	7870		2567	2910	No access	2162	1986	1099	1090	2366
05-Sep	9540	6410	6170		2389	2483	No access	1850	1023	1066	537	3290
09-Sep	5970	6170	6160		2045	2422	No access	1801	827	836	703	2726
12-Sep	6560	6890	6020		2016	3380	No access	1920	1122	861	757	3340
16-Sep	7640	7590	6750		2167	2872	No access	1967	1867	932	830	
19-Sep	6710	3440	Dry	Dry	4930	1790	No access	838	954	767	752	
24-Sep	6550	4950	Dry	Dry	1910	3380	No access	1733	1156	1018	907	37000
29-Sep			Dry	Dry	2610	2160	No access	2870	1831	1669	2800	36700
30-Sep	7380	8090	Dry	3900	2660	2530	No access	3810	1980	1283	1216	Dry
03-Oct	7130	7110	Dry	3870	2220	2600	No access	1980	2080	1552	1179	Dry
08-Oct	7400	7230	Dry	3920	2170	3910	No access	1839	1870	1051	1032	Dry
10-Oct	8720	7750	Dry	3750	1980	2630	No access	1091	2000	1088	1090	Dry
17-Oct	8430	8030	Dry	2950	210	3180	No access	1880	2180	1049	1037	Dry
15-Oct	8280	7470	Dry	3370	1922	2470	No access	1990	1849	990	895	Dry
22-Oct	8580	8770	Dry	3970	2160	2620	No access	1770	1920	945	937	Dry
26-Nov	6050	15790	Dry	4200	2102	2510	No access	1919	13892	984	960	42500
17-Dec	26100	28100	Dry	41300	2990	2190	No access	2880	2450	949	1018	43000
28-Jan	44400	40100	Dry	48000	7480	3360	No access	3150	3710	1167	1639	48800
26-Feb	16070	13040	Dry	Dry	2210	2990	No access	2330	2116	801	845	Dry
26-Mar	15500	13180	Dry	Dry	2650	2770	No access	2470	3620	498	15.4	Dry
30-Apr	15840	20400	Dry	Dry	2380	2600	No access	2120	2000	766	877	Dry

Newcastle Coal
INFRASTRUCTURE GROUP

Total Dissolved Soilds (PPM)

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
04-Apr	1540	2990	2430	2960	870	1450	No access	1414	998	552	421	3340
08-Apr	1580	2800	2360	3130	1093	1630	No access	1414	993	544	404	3550
11-Apr	1494	2020	2290	3000	1159	1580	No access	1287	875	537	335	5850
15-Apr	1447	2230	2250	3310	1150	1600	No access	1318	899	533	334	
18-Apr	1454	2180	2260	3440	1161	1590	No access	879	1313	535	299	
22-Apr	1364	2050	2370	3460	1088	1514	No access	1202	803	516	300	
24-Apr	934	813	1500	1810	831	1132	No access	1058	714	448	162	12440
29-Apr	1165	1349	1175	2170	1161	1449	No access	1151	1077	367	410	
02-May	1440	1460	1414	1900	1018	1421	No access	1127	1072	416	389	
06-May	1540	1860	1150		1048	1450	No access	1095	1044	1116	401	
09-May	1620	1790	1540		1025	1467	No access	1094	1032	457	404	
13-May	1650	1460	1600		1077	1422	No access	1089	1064	436	408	
16-May	1630	2270	1630		714	1445	No access	1089	1042	428	411	12210
20-May	2070	1700	1750		1155	1150	No access	1090	1023	448	435	
23-May	1560	2260	1750		1126	1453	No access	1059	1020	464	398	15120
27-May	1720	1830	1810		1115	1370	No access	1083	1026	464	424	8800
30-May	1760	2020	2410		1103	1550	No access	1121	1065	451	470	
03-Jun	1800	3210	2520		1032	1444	No access	1072	1051	456	420	
06-Jun	2200	2090	1770		1027	1255	No access	992	923	371	327	
10-Jun	2660	2630	1950		1020	1322	No access	984	963	418	345	
13-Jun	3080	2410	2030		1019	1360	No access	978	959	422	355	
17-Jun	3600	2450	1640		1118	1440	No access	948	936	435	382	
20-Jun	3070	2090	2040		1126	1334	No access	964	940	435	397	
24-Jun	3160	2400	1690		1139	1482	No access	973	1190	500	407	
26-Jun	3210	1730	2700		1097	1495	No access	976	940	442	420	
01-Jul	2820	2640	2480		1139	1540	No access	995	954	459	434	
04-Jul	2890	2880	1770		1171	1520	No access	977	950	390	446	3700
08-Jul	3260	2540	2180		1213	1464	No access	1006	967	447	446	1840
11-Jul	3820	2470	2670		1250	1511	No access	997	985	464	426	5791
15-Jul	3350	3890	3170		1420	1740	No access	1167	1084	545	541	2780
18-Jul	2930	3060	6440		1297	1680	No access	1009	957	486	473	2160
22-Jul	3470	3670	3970		1248	1610	No access	1021	958	504	469	6900
25-Jul	3880	3890	3580		1236	1580	No access	1034	947	521	469	2100
29-Jul	4480	3780	3720		1311	1492	No access	989	888	521	433	1570
01-Aug	5160	4290	3300	4780	1280	1548	No access	1021	956	503	478	
05-Aug	5270	6580	4250		1260	1545	No access	1036	981	540	477	2960
08-Aug	5350	4360	4520		1290	1554	No access	1039	1002	541	477	8560
12-Aug	5670	5960	4550		1308	1590	No access	1059	1010	539	526	10600
15-Aug	6130	4540	5210		1355	1670	No access	1069	1004	545	560	6080
19-Aug	6840	4560	4480		1372	1580	No access	1067	1097	568	508	1583
22-Aug	6490	4170	4250		1301	1558	No access	1116	1225	550	492	1820
26-Aug	6390	4040	3470		1389	2490	No access	1110	1056	558	524	4210
29-Aug	6190	4260	4480		1359	1575	No access	1122	1051	570	546	1502
02-Sep	5760	4360	4230		1319	1500	No access	1101	1006	544	541	1345
05-Sep	5300	3440	3250		1234	1283	No access	948	509	531	258	1720
09-Sep	3260	3310	3310		1049	1258	No access	928	410	408	341	1437
12-Sep	3530	3740	3240		1033	1700	No access	982	555	426	372	2450
16-Sep	4130	4120	3720		1118	1497	No access	1006	955	463	412	
19-Sep	5200	4660	Dry	Dry	3330	1750	No access	1380	393	701	520	5190
24-Sep	5060	3800	Dry	Dry	1380	2450	No access	1268	8360	728	643	31500
29-Sep			Dry	Dry	1920	1610	No access	2240	1342	1221	1650	30800
30-Sep	5740	6170	Dry	3340	1980	1860	No access	2880	1440	924	869	Dry
03-Oct	5510	5530	Dry	3310	1610	1920	No access	1460	1450	1124	849	Dry
08-Oct	5830	5700	Dry	3380	1620	2840	No access	1364	1374	767	740	Dry
10-Oct	6770	6070	Dry	3240	1490	1940	No access	1403	1470	7790	7290	Dry
17-Oct	6620	6300	Dry	2470	1460	2360	No access	1380	1590	749	793	Dry
15-Oct	6450	5300	Dry	2870	1415	1820	No access	1290	1357	1090	635	Dry
22-Oct	6750	6810	Dry	3420	1590	1940	No access	1280	1380	670	667	Dry
26-Nov	4560	12560	Dry	3360	1450	1830	No access	1395	949	689	675	33000
17-Dec	21000	22900	Dry	34300	2210	2160	No access	2140	1710	689	739	36600
28-Jan	32400	29600	Dry	36200	5100	2200	No access	2500	2410	689	1060	36800
26-Feb	11250	9040	Dry	Dry	1400	1960	No access	1490	1346	489	516	Dry
26-Mar	11600	9790	Dry	Dry	1820	1900	No access	1690	2550	318	820	Dry
30-Apr	11930	15300	Dry	Dry	1630	1800	No access	1440	1919	498	576	Dry

Total Suspended Solids (mg/L)

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
04-Apr	11	100	5	25	26	5	No access	30	92	5	26	38
08-Apr	16	14	5	130	16	5	No access	21	45	5	140	5
11-Apr	8.5	82	5	160	5	5	No access	32	58	5	21	5
15-Apr	43	5.6	5	72	19	5	No access	32	160	5	5	14
18-Apr	9.5	19	5	76	5	5	No access	98	190	5	32	13
22-Apr	5.2	5	5	100	6	5	No access	21	270	5	110	20
24-Apr	9	5	5	20	5	5	No access	86	14	5	13	69
29-Apr	8.8	5	30	5	5	5	No access	19	21	5	5	20
02-May	5.2	5	28	5	5	5	No access	24	14	5	5	20
06-May	5	5	5	12	5	5	No access	18	12	5	5	9.2
09-May	10	5	6	9.2	5	5	No access	20	22	5	5	8.5
13-May	9.5	7.5	10	5	6.2	5	No access	19	58	5	5	14
16-May	11	25	12	12	12	17	No access	88	48	18	27	23
20-May	5	6	12	8	5	5	No access	29	26	5	14	9.5
23-May	5	5	11	5.5	5	5	No access	22	28	5	5	5
27-May	2	1	7	13	1	8	No access	35	92	6	3	3
30-May	1	13	1	12	1	1	No access	25	36	8	1	9
03-Jun	1	10	18	10	18	2	No access	33	22	1	8	15
06-Jun	7	2	3	8	2	2	No access	32	57	5	3	14
10-Jun	6	1	5	56	3	3	No access	26	18	1	1	210
13-Jun	10	1	8	21	1	1	No access	16	12	1	1	45
17-Jun	18	4	10	35	1	1	No access	20	1	1	3	34
20-Jun	2	2	14	8	1	11	No access	31	23	8	3	130
24-Jun	1	1	2	14	1	1	No access	10	5	1	1	21
26-Jun	1	9	1	31	1	1	No access	73	13	26	1	2
01-Jul	1	12	1	22	1	1	No access	6	14	1	3	5
04-Jul	4	49	12	6	2	1	No access	15	6	1	14	5
08-Jul	3	32	1	15	1	1	No access	9	33	1	4	7
11-Jul	2	1	1	13	1	1	No access	7	69	1	7	1
15-Jul	1	8	1	10	1	1	No access	2	2	21	1	1
18-Jul	12	38	23	21	4	6	No access	17	7	3	8	6
22-Jul	10	18	14	8	2	4	No access	13	9	4	9	6
25-Jul	8	6	21	42	5	1	No access	11	24	1	5	8
29-Jul	3	9	60	110	1	1	No access	8	18	1	5	23
01-Aug	1	3	29	320	9	1	No access	9	14	1	24	1
05-Aug	1	1	9	16	1	1	No access	5	19	11	9	3
08-Aug	1	<1	21	13	<1	<1	No access	5	17	5	10	3
12-Aug	1	4	8	16	<1	<1	No access	6	24	<1	10	3
15-Aug	1	1	13	62	1	1	No access	8	45	1	14	2
19-Aug	<1	7	18	30	<1	25	No access	12	16	<1	19	<1
22-Aug	7	3	55	19	1	1	No access	26		1	18	13
26-Aug	3	13	20	12	1	1	No access	21	35	1	20	14
29-Aug	5	35	32	9	1	1	No access	16	44	1	14	2
02-Sep	3	45	8	5	1	1	No access	13	32	1	9	7
05-Sep	6	32	104	26	1	1	No access	14	20	1	10	45
09-Sep	5	19	54	26	1	1	No access	20	15	6	7	22
12-Sep	3	35	44	10	1	1	No access	11	135	7	11	9
16-Sep	5	7	45	1	1	1	No access	1	23	1	1	16
19-Sep	3	3	2	Dry	6	0	No access	4	17	3	4	62
24-Sep	2	4	Dry	Dry	14	3	No access	5	9	3	3	12
29-Sep	0	0	Dry	Dry	2	14	No access	15	9	3	3	18
30-Sep	2	3	Dry	7	11	6	No access	8	18	3	8	Dry
03-Oct	2	1	Dry	3	8	8	No access	12	109	3	4	Dry
08-Oct	3	3	Dry	7	4	2	No access	7	63	3	55	Dry
10-Oct	2	1	Dry	30	6	4	No access	7	11	6	4	Dry
17-Oct	2	4	Dry	7	15	4	No access	7	103	3	7	Dry
15-Oct	2	3	Dry	6	15	5	No access	7	40	4	16	Dry
22-Oct	2	3	Dry	18	1	6	No access	9	48	4	5	Dry
26-Nov	2	1	Dry	4	16	4	No access	14	58	4	14	Dry
17-Dec	2	2	Dry	690	5	4	No access	11	298	4	10	438
28-Jan	6	3	Dry	242	57	16	No access	51	70	5	25	1035
26-Feb	5	3	Dry	Dry	9	4	No access	17	12	4	42	Dry
26-Mar	5	5	Dry	Dry	6	5	No access	96	106	4	13	Dry
30-Apr	1	3	Dry	Dry	3	3	No access	58	13	3	2	Dry

ATTACHMENT C

ACID SULFATE SOILS MONITORING RESULTS

Newcastle Coal
INFRASTRUCTURE GROUP

Acid Sulfate Soil Register

Ref. No	Sample Date	Location	texture & grit	pH Field	pH FOX	Testing Method	Effervescence	Classification	Actions Required
1	3/04/2008	Wharf area 10m west of eastern drain	Sand	7.5		pH test kit	Nil	NOT ass or pass	
2	10/04/2008	Reclamation	Sand	8.5		pH test kit	Nil	NOT ass or pass	
3	17/04/2008	Reclamation	Sand	8.5		pH test kit	Nil	NOT ass or pass	
4	24/04/2008	Reclamation	Sand	8.5		pH test kit	Nil	NOT ass or pass	
5	30/04/2008	Reclamation	Sand	8.5		pH test kit	Nil	NOT ass or pass	
6	8/09/2008	30R Reclamation sand	Sandy, low silt, high shell grit /black flakes	8	6.04	Field H2O2	Nil	NOT ass or pass	
7	9/09/2008	R11 dump station stockpile	Jet black, blocky, organic clay	8.1	2.8	Field H2O2	Heavy	**Acid Sulfate soil**	Sent away for testing at Scone lab - Self buffering matieral
8	9/09/2008	R11 dump station stockpile	Slop gel, jet black, organic	8.82	8.5	Field H2O2	Smoking not bubbling	unknown result	Follow up tests resulted in highly organic soils.
9	15/09/2008	30R	Gray cause sand, fine shell grit & silt, salty	8.56	6.8	Field H2O2	Nil	NOT ass or pass	
10	22/09/2008	30R - Cell 6	Coarse sand black specks, high shell pieces	8.25	5.91	Field H2O2	Nil	NOT ass or pass	
11	29/09/2008	30L - Cell 3	Coarse gray sand, black specks, high shell content (10mm size)	8.28	5.91/7.03	Field H2O2	Nil	NOT ass or pass	Allowed for the material to fully digest 18 hours & pH dropped ph 7.03
12	7/10/2008	30 R - Cell 2	Fine gray sand, black specks, 2-3mm shell grit, salty	8.58	6.2	Field H2O2	Nil	NOT ass or pass	
13	7/10/2008	30 R - cell 2	Black/gray 2mm fine silt layer	8.57	6.09	Field H2O2	15min low bubbling	NOT ass or pass	Organic soils
14	13/10/2008	30C 0-250 mm	Light colour, medium texture, little shell grit	8.24	5.77	Field H2O2	Very low	NOT ass or pass	
15	13/10/2008	Raven St drain	Jet black gel, rich organic matter	7.8	4.4	Field H2O2	Extreme	unknown result	Organic soils
16	13/10/2008	R11 south stockpile	Black Sand, silty	7.99	3.7	Field H2O2	Vigorous	**Acid Sulfate soil**	Self buffering matieral - Allowed to brake down & mix with shell grit sand
17	20/10/2008	Reclamation (No Pumping)	Sand				Nil	NOT ass or pass	
18	27/10/2008	Reclamation (No Pumping)	Sand				Nil	NOT ass or pass	
19	4/11/2008	30C 0-250 mm	Light gray sand, fine to medimum coarse grains, low shell grit / black flakes	8.71	6.16	Field H2O2	Nil	NOT ass or pass	
20	4/11/2008	R11 south stockpile	Black silt heavy cracking 300mm	8.99	6.89	Field H2O2	Nil	NOT ass or pass	
21	11/11 to 21/11	Reclamation (No Pumping)	Sand				Nil	NOT ass or pass	
22	24/11/2008	30R 0 -300mm	Black fine silts with sand & soft mud stone	8.72	6.25	Field H2O2	Extreme	NOT ass or pass	Organic soils
23	24/11/2008	K7 foreshore wharf	Mangrove material pulled up onto the bank bagged for 7 days	4.78	1.47	Field H2O2	Increasingly vigorous	**Acid Sulfate soil**	Material was pushed back under the water & not allowed to oxidise
24	1/03/2009	Wharf Pile 208	Mud	7.89	7.68	Field H2O2	Long bubbling time	NOT ass or pass	